DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
CSS	6	F 2024(993),ETC		FM 982,ETC
GRAPHICS CSS	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK MS	TEXAS	DALLAS	COLLIN	1
CHECK BL	CONTROL 0387	SECTION 05	JOB 026,ETC	

FINAL PLANS

NAME OF CONTRACTOR: _____

DATE OF LETTING: _____

DATE WORK BEGAN: _____

DATE WORK COMPLETED: _____

DATE WORK ACCEPTED: _____

SUMMARY OF CHANGE ORDERS:

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT

F 2024(993),ETC

CCSJ: 0387-05-026,ETC

FM 982,ETC
COLLIN COUNTY

CSJ: 0387-05-026

LIMITS: FROM MYRICK LANE

TO FM 546

TOTAL LENGTH OF PROJECT =

ROADWAY	= 24419.19 *FT.* =	4.625 *MI.*	
BRIDGE	= 300.09 FT. =	0.057 MI.	
TOTAL	= 24719.28 FT. =	4.682 MI.	

CSJ: 3476-02-015

LIMITS: FROM LOST VALLEY DR

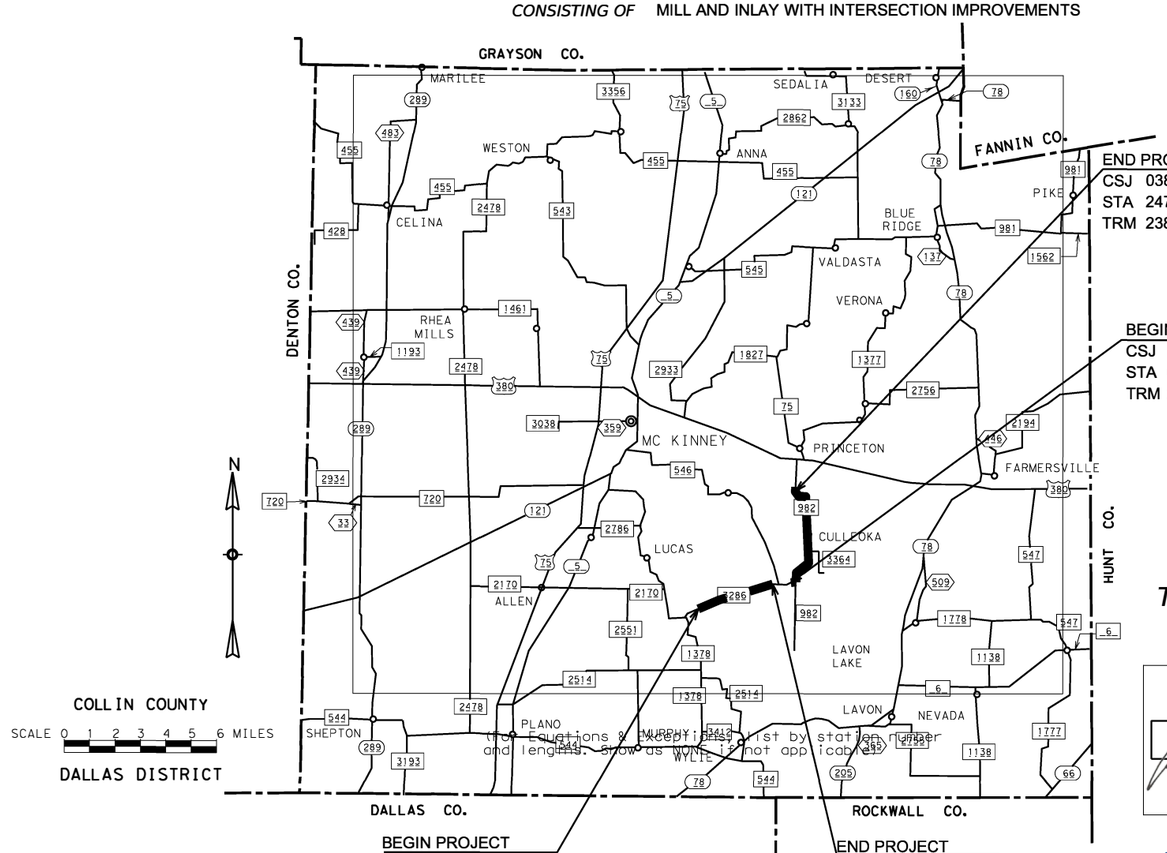
TO E FM 546

TOTAL LENGTH OF PROJECT =

ROADWAY	= 11292.11 *FT.* =	2.138 *MI.*	
BRIDGE	= 7051.00 FT. =	1.336 MI.	
TOTAL	= 18343.11 FT. =	3.474 MI.	

FOR THE CONSTRUCTION OF RESTORATION

CONSISTING OF MILL AND INLAY WITH INTERSECTION IMPROVEMENTS



COLLIN COUNTY

SCALE 0 1 2 3 4 5 6 MILES

DALLAS DISTRICT

END PROJECT
CSJ 0387-05-026
STA 247+19.28
TRM 238+1.148

BEGIN PROJECT
CSJ 0387-05-026
STA 0+00.00
TRM 242+1.445

BEGIN PROJECT
CSJ 3476-02-015
STA 0+00.00
TRM 598+0.252

EQUATIONS: NONE
EXCEPTIONS: NONE
RAILROAD CROSSINGS: NONE

END PROJECT
CSJ 3476-02-015
STA 174+26.09
TRM 598+3.816

CSJ: 0387-05-026 (FM 982)
DESIGN SPEED = 50 MPH
FUNCTIONAL CLASSIFICATION = RURAL MAJOR COLLECTOR
ADT 11,867 (2022)
20,886 (2042)

CSJ: 3476-02-015 (FM 3286)
DESIGN SPEED = 60 MPH
FUNCTIONAL CLASSIFICATION = RURAL MINOR ARTERIAL
ADT 12,245 (2022)
24,490 (2042)

NOTE:

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, SEPTEMBER 1, 2024, AND THE CONTRACT PROVISIONS LISTED AND DATED AS FOLLOWS SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, OCTOBER 23, 2023)

TEXAS DEPARTMENT OF TRANSPORTATION

SUBMITTED FOR LETTING 09/05/2024

_____ , P.E.
DESIGN ENGINEER

RECOMMENDED FOR LETTING 9/6/2024
Signed by: James T. Campbell , P.E.
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

RECOMMENDED FOR LETTING: 9/5/2024
Docusigned by: Jennifer Vorster , P.E.
DISTRICT ENGINEER

APPROVED FOR LETTING: 9/6/2024
Docusigned by: Casson Clemens , P.E.
DISTRICT ENGINEER

WORK WAS COMPLETED ACCORDING TO THE PLANS AND CONTRACT.

_____ , P.E.
Signature of Registrant & Date

DATE: _____

INDEX OF SHEETS

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

FM 982

INDEX OF SHEETS

N.T.S

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	Collin		2

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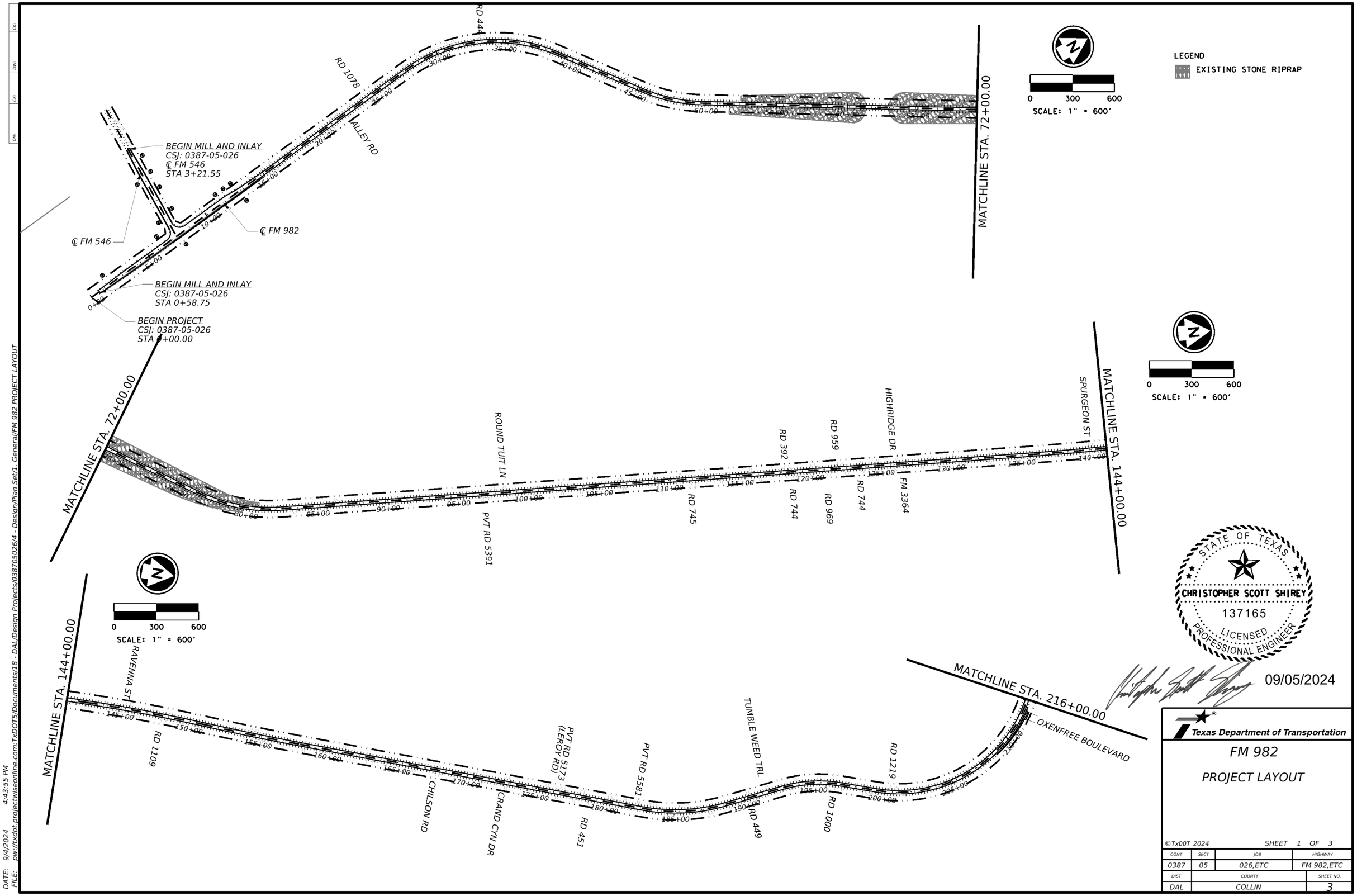

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/05/2024

Texas Department of Transportation

FM 982

PROJECT LAYOUT

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		3

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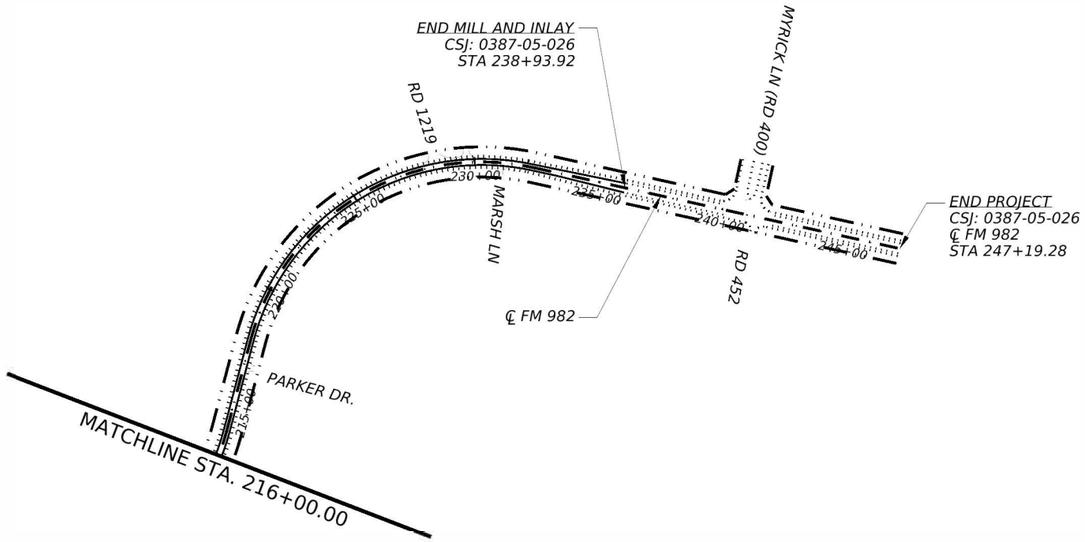

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/05/2024

Texas Department of Transportation

FM 982

PROJECT LAYOUT

SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		4

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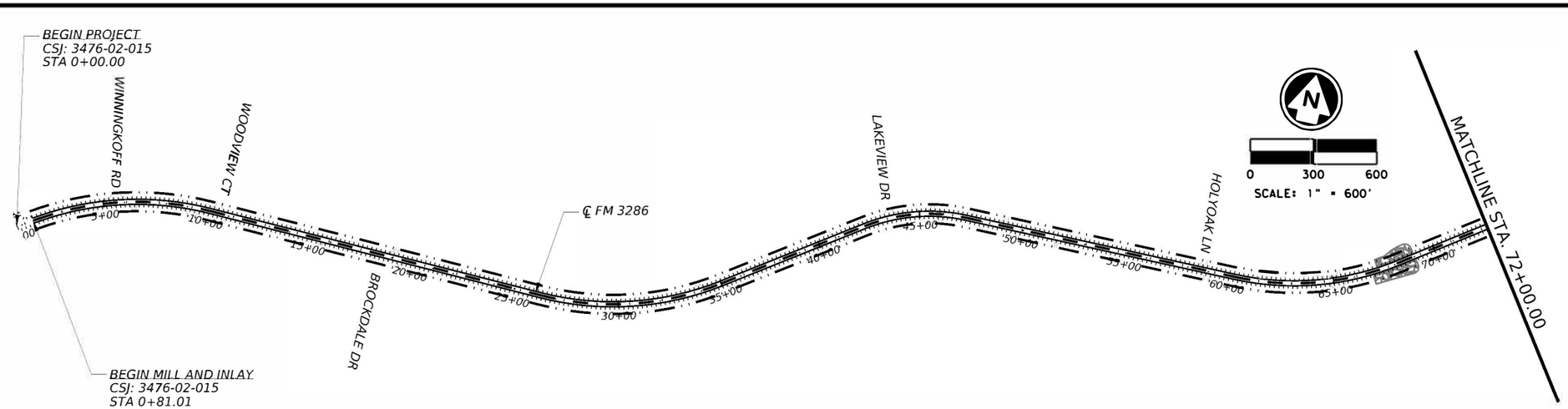

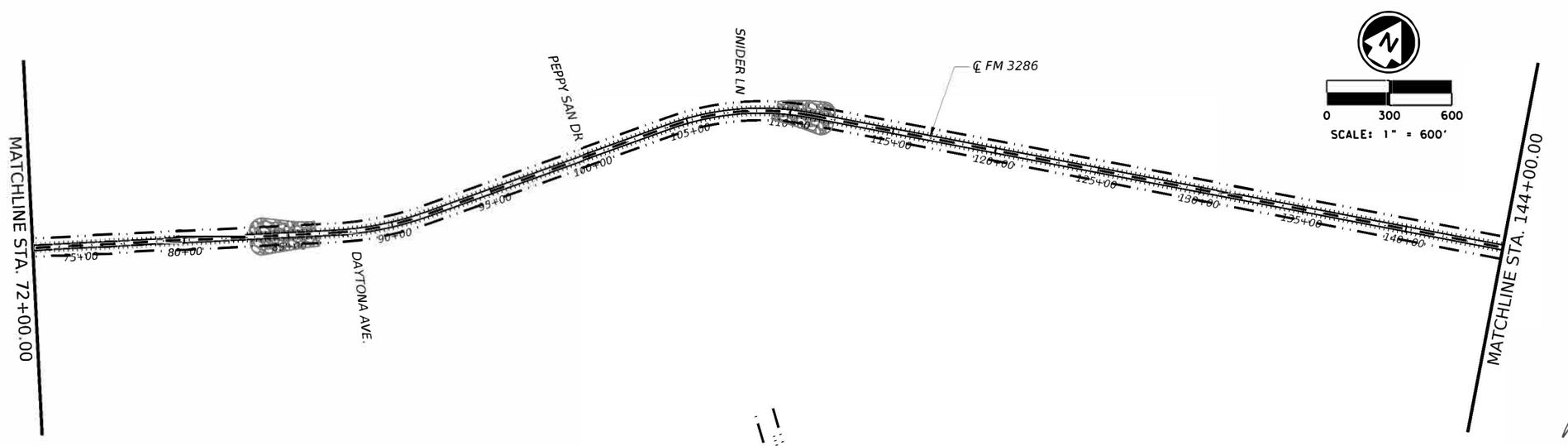

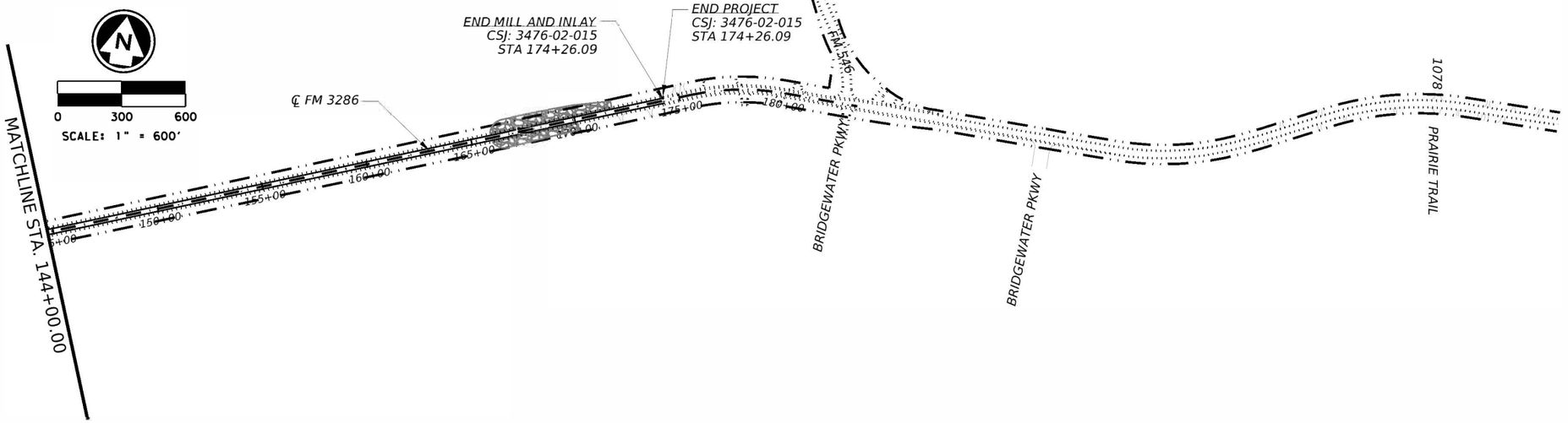

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED PROFESSIONAL ENGINEER

09/05/2024

Texas Department of Transportation

FM 982

PROJECT LAYOUT
(FM 3286)

SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		5

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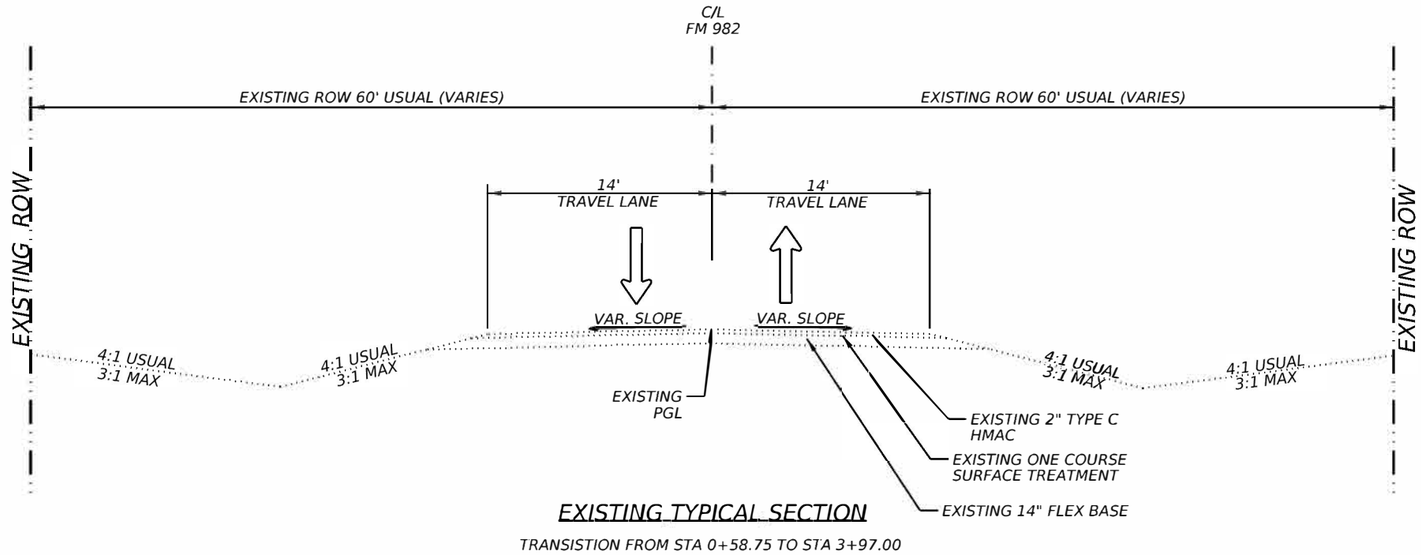
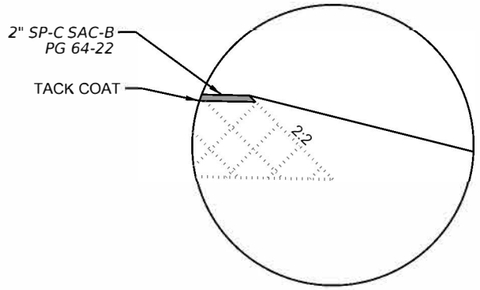


EXISTING TYPICAL SECTION

TRANSISTION FROM STA 0+58.75 TO STA 3+97.00



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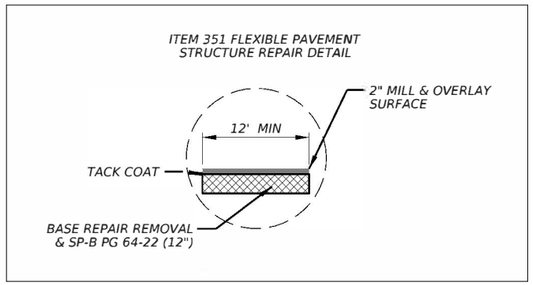

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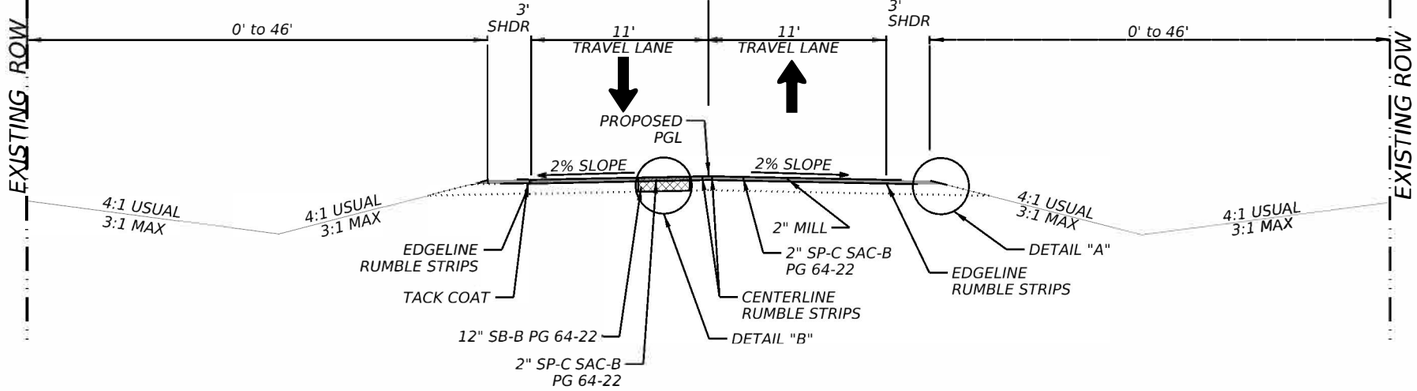
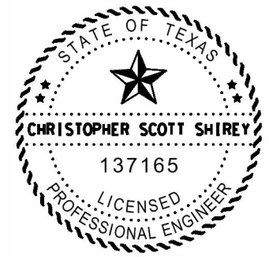


PROPOSED TYPICAL SECTION

TRANSISTION FROM STA 0+58.75 TO STA 3+97.00

NOTE:

1. PROPOSED PGL WILL MATCH THE EXISTING PGL.
2. FLEXIBLE PAVEMENT STRUCTURE REPAIR - AT VARIOUS LOCATIONS AS DIRECTED BY THE ENGINEER. PAID FOR UNDER ITEM 351.
3. MINIMIZE VEGETATION AND SOIL DISTURBANCE TO THE EXTENT PRACTICAL, WHILE STILL ACCOMPLISHING NECESSARY CONSTRUCTION. REVEGETATE DISTURBED SOILS PROMPLY.



09/03/2024

Texas Department of Transportation

FM 982

TYPICAL SECTION

STA 0+00.00 TO STA 3+97.00

SHEET 1 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		6

DATE: 9/3/2024 12:02:45 PM
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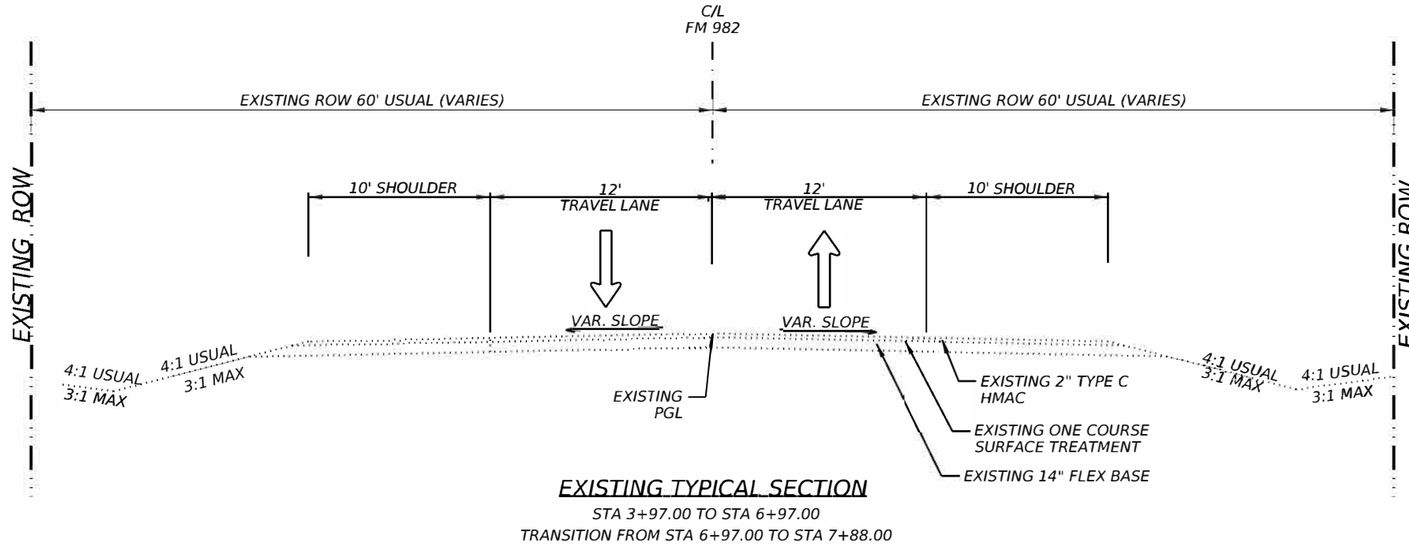
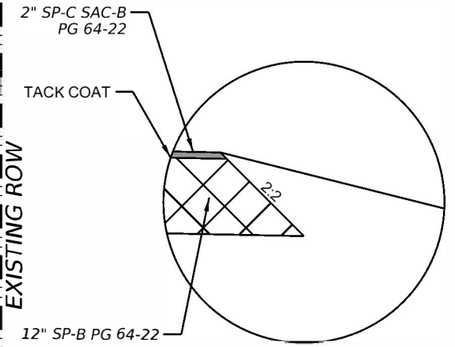


EXISTING TYPICAL SECTION

STA 3+97.00 TO STA 6+97.00

TRANSITION FROM STA 6+97.00 TO STA 7+88.00



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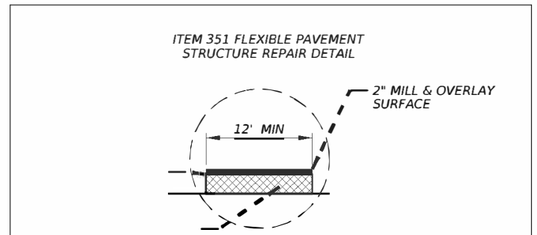

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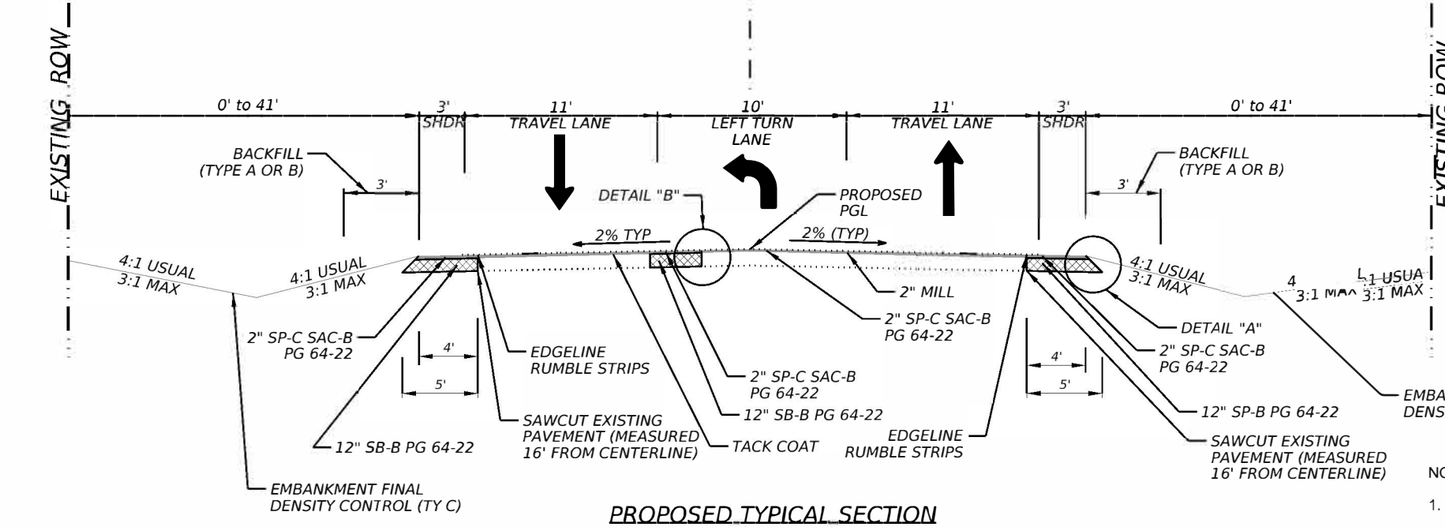

PROPOSED TYPICAL SECTION

STA 3+97.00 TO STA 6+97.00

TRANSITION FROM STA 6+97.00 TO STA 7+88.00

NOTE:

1. PROPOSED PGL WILL MATCH THE EXISTING PGL.
2. FLEXIBLE PAVEMENT STRUCTURE REPAIR - AT VARIOUS LOCA AS DIRECTED BY THE ENGINEER. PAID FOR UNDER ITEM 351.
3. MINIMIZE VEGETATION AND SOIL DISTURBANCE TO THE EXTEN PRACTICAL, WHILE STILL ACCOMPLISHING NECESSARY CONST REVEGETATE DISTURBED SOILS PROMPLY.

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

TYPICAL SECTION

STA 3+97.00 TO STA 7+88.00

SHEET 2 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		7

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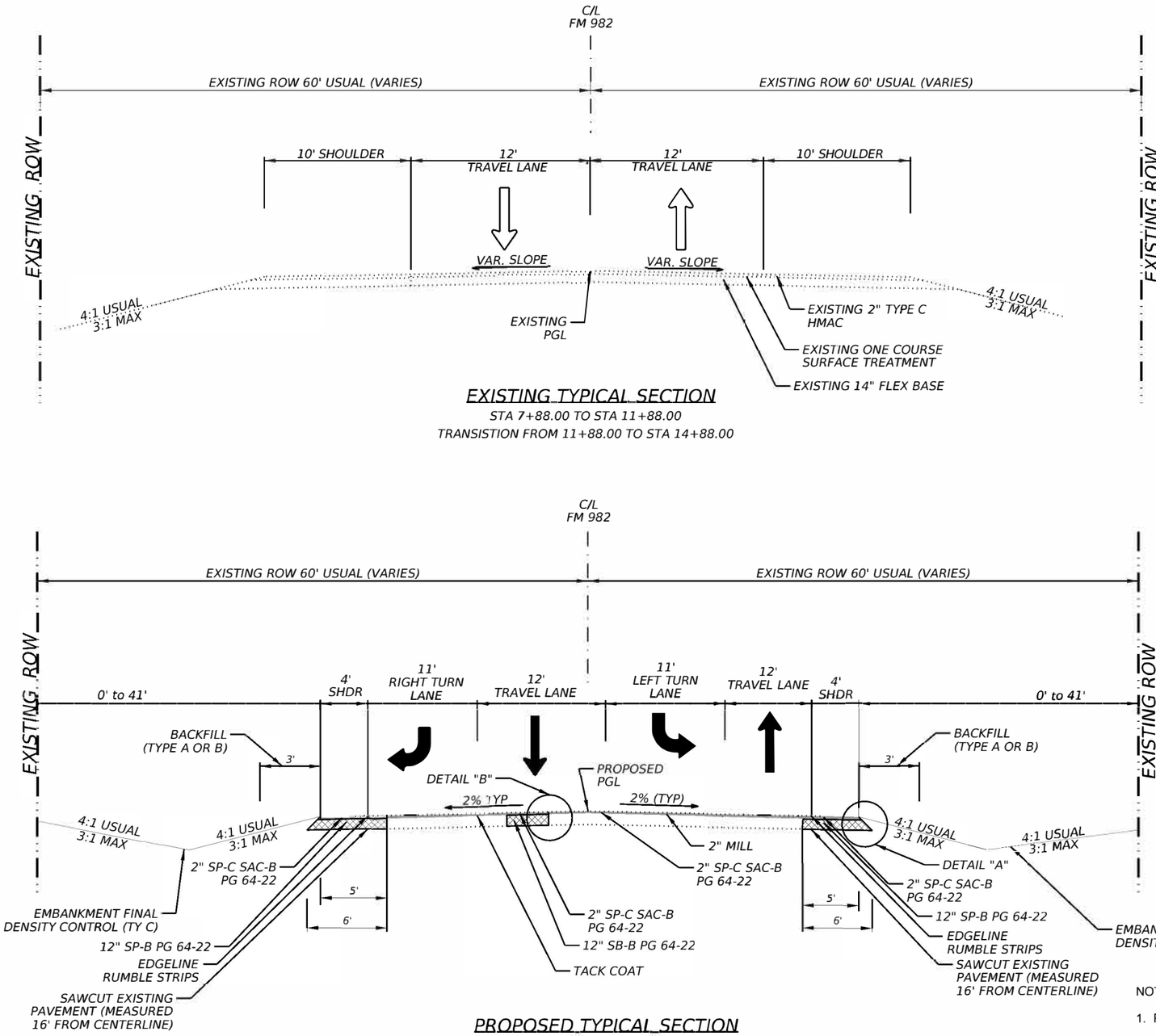


EXISTING TYPICAL SECTION

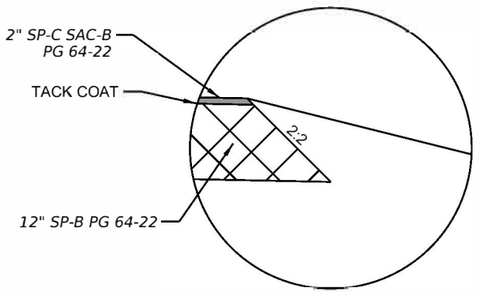
STA 7+88.00 TO STA 11+88.00

TRANSISTION FROM 11+88.00 TO STA 14+88.00

PROPOSED TYPICAL SECTION

STA 7+88.00 TO STA 11+88.00

TRANSISTION FROM 11+88.00 TO STA 14+88.00



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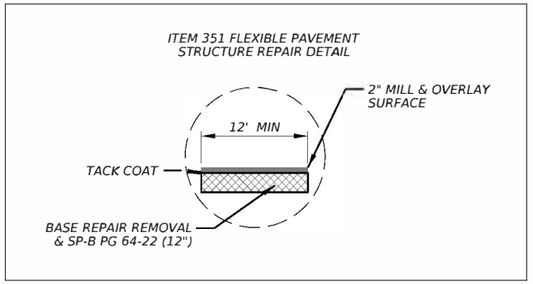

DETAIL "B"

NOTE:

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STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

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TYPICAL SECTION

STA 7+88.00 TO STA 14+88.00

SHEET 3 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		8

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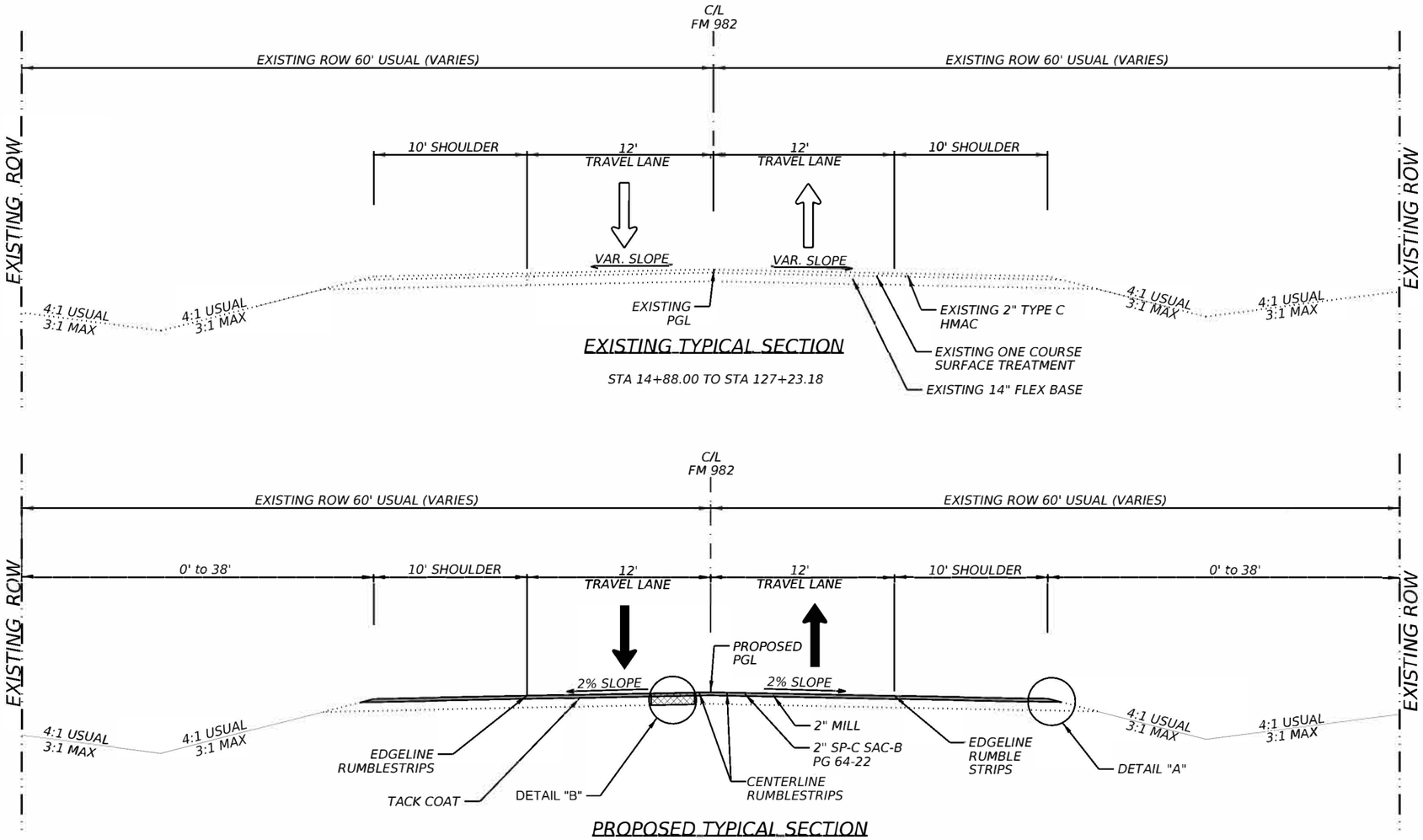

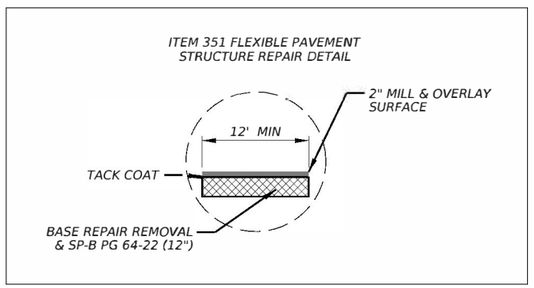

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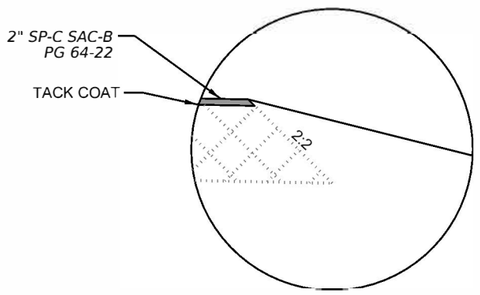

DETAIL "A"

NOTE:

1. PROPOSED PGL WILL MATCH THE EXISTING PGL.
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STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

TYPICAL SECTION

STA 14+88.00 TO STA 120+78.04

STA 139+49.19 TO STA 232+43.51

SHEET 4 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		9

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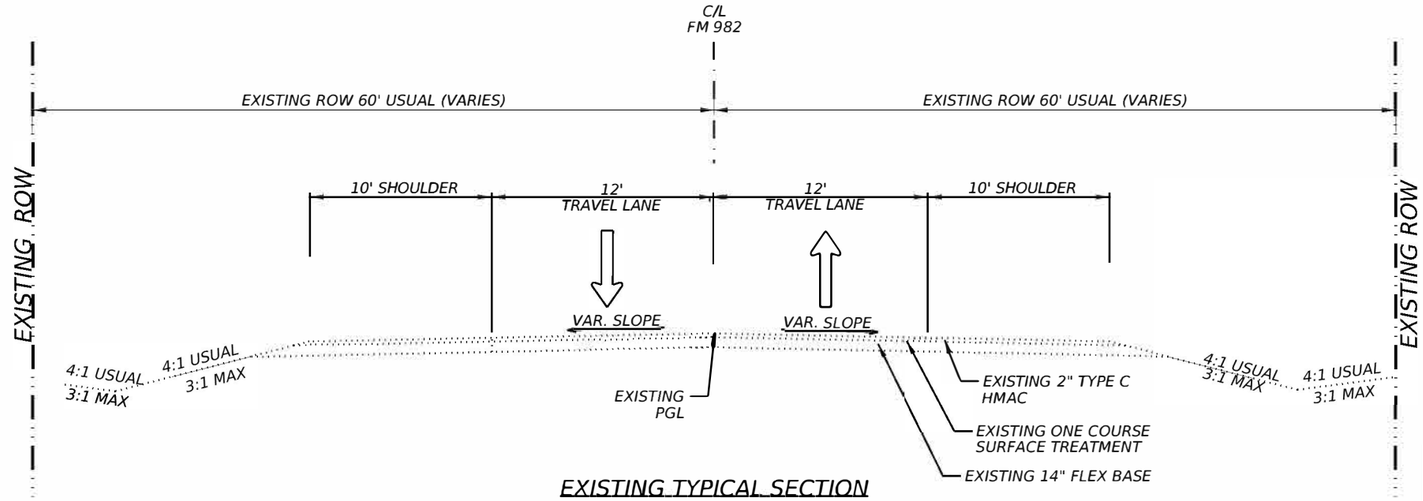
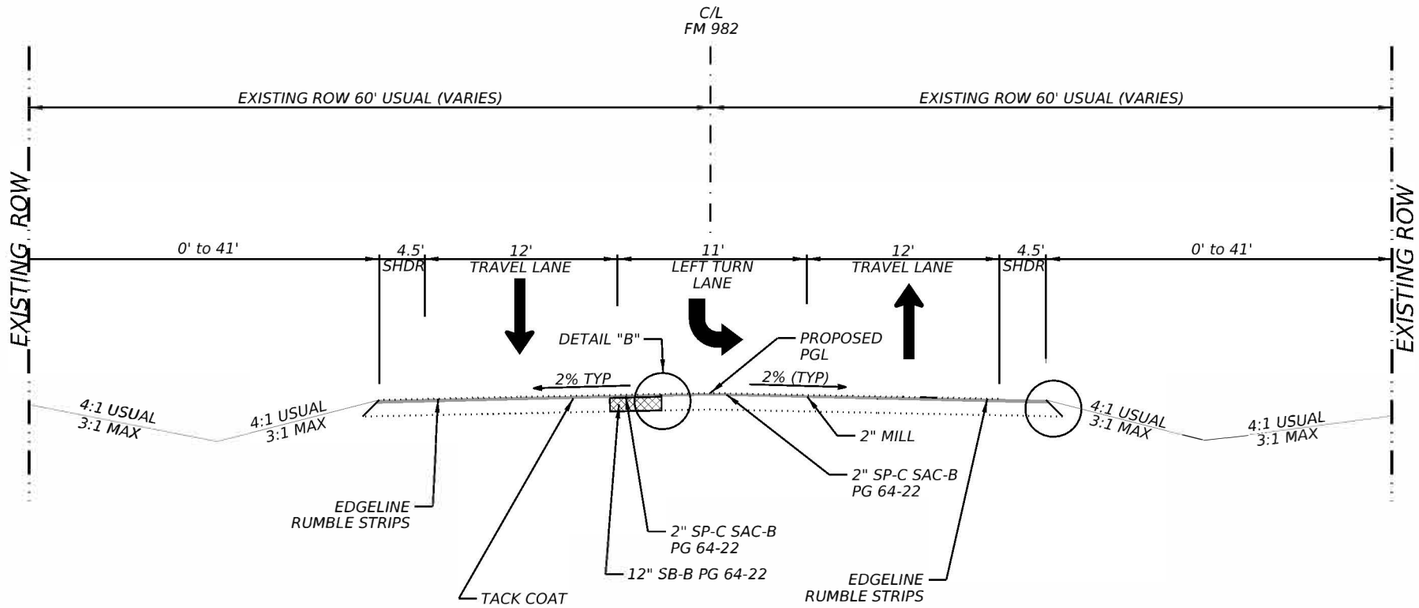


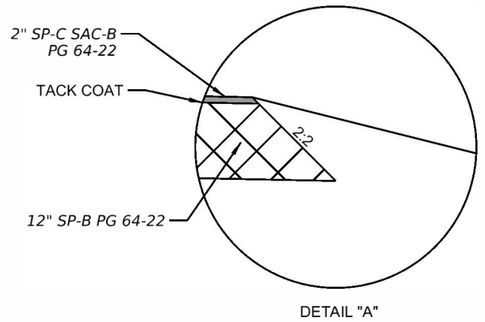
EXISTING TYPICAL SECTION

STA 127+23.18 TO STA 129+49.39
TRANSITION FROM STA 120+78.04 TO 127+23.18
TRANSITION FROM STA 129+49.39 TO STA 139.49.19



PROPOSED TYPICAL SECTION

STA 127+23.18 TO STA 129+49.39
TRANSITION FROM STA 120+78.04 TO 127+23.18
TRANSITION FROM STA 129+49.39 TO STA 139+49.19



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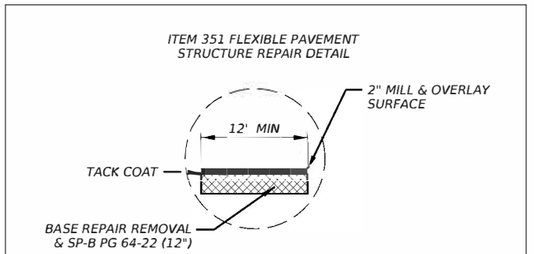

DETAIL "B"

NOTE:

1. PROPOSED PGL WILL MATCH THE EXISTING PGL.
2. FLEXIBLE PAVEMENT STRUCTURE REPAIR - AT VARIOUS LOCATIONS AS DIRECTED BY THE ENGINEER. PAID FOR UNDER ITEM 351.
3. MINIMIZE VEGETATION AND SOIL DISTURBANCE TO THE EXTENT PRACTICAL, WHILE STILL ACCOMPLISHING NECESSARY CONSTRUCTION. REVEGETATE DISTURBED SOILS PROMPLY.

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/04/2024

Texas Department of Transportation

FM 982

TYPICAL SECTION

STA 120+78.04 TO STA 139+49.19

SHEET 5 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		10

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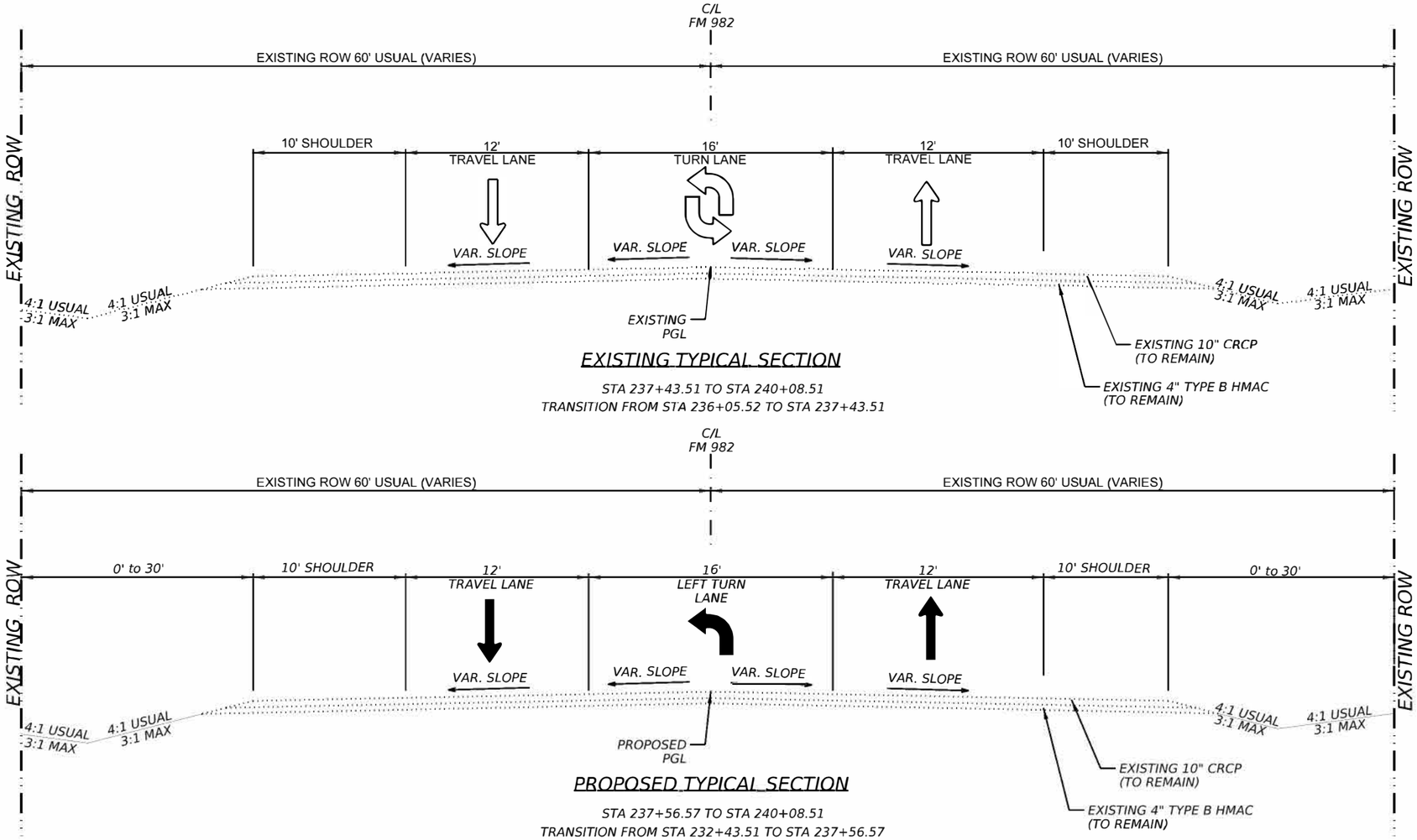

EXISTING TYPICAL SECTION

STA 237+43.51 TO STA 240+08.51
TRANSITION FROM STA 236+05.52 TO STA 237+43.51

PROPOSED TYPICAL SECTION

STA 237+56.57 TO STA 240+08.51
TRANSITION FROM STA 232+43.51 TO STA 237+56.57

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

NOTE:

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Texas Department of Transportation

FM 982

TYPICAL SECTION
STA 232+43.51 TO 240+08.51

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		11

DATE: 9/3/2024 12:03:13 PM
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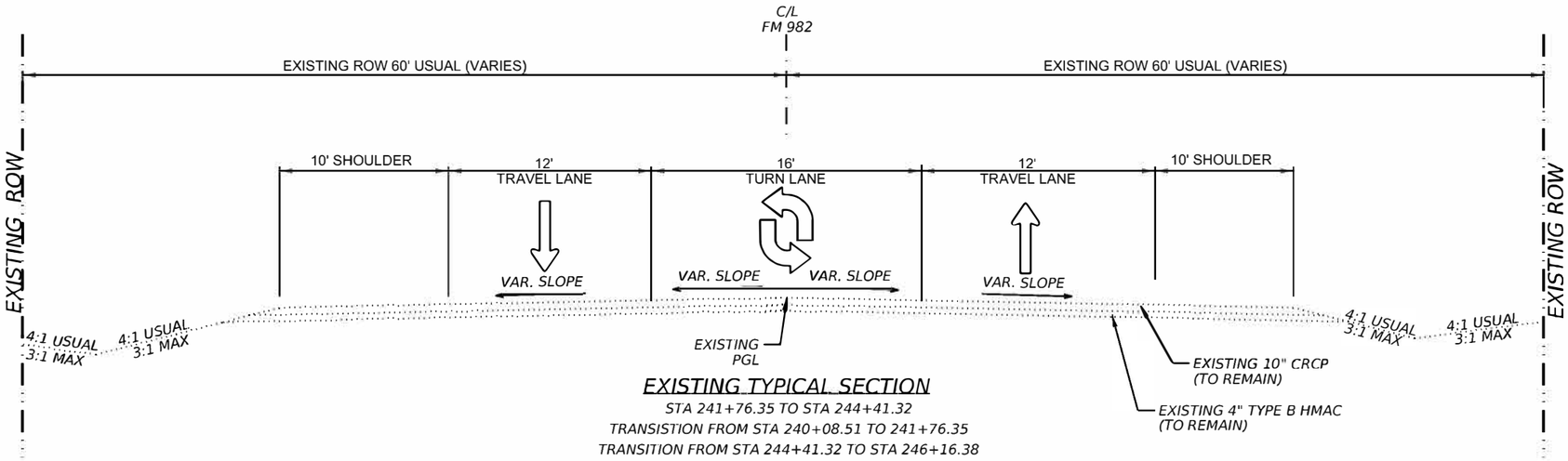
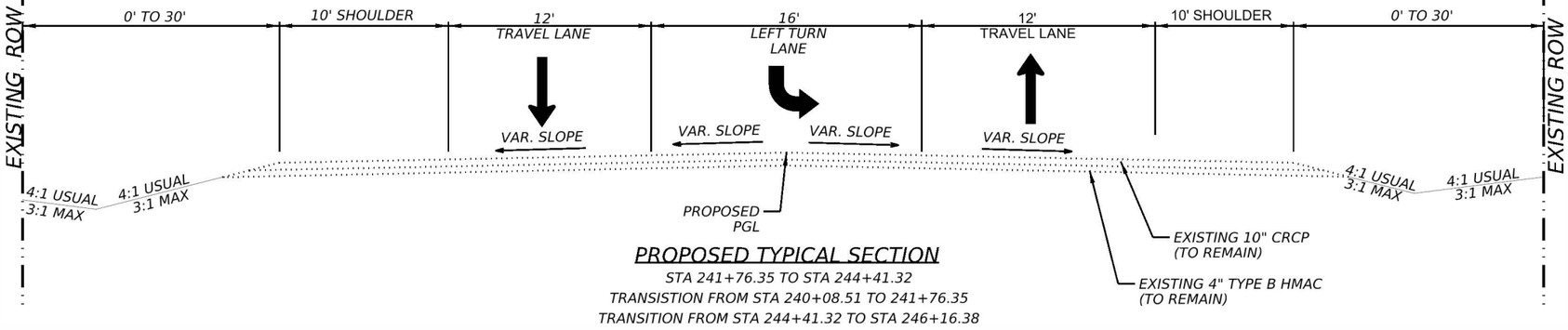


EXISTING TYPICAL SECTION

STA 241+76.35 TO STA 244+41.32
TRANSISTION FROM STA 240+08.51 TO 241+76.35
TRANSITION FROM STA 244+41.32 TO STA 246+16.38



PROPOSED TYPICAL SECTION

STA 241+76.35 TO STA 244+41.32
TRANSISTION FROM STA 240+08.51 TO 241+76.35
TRANSITION FROM STA 244+41.32 TO STA 246+16.38

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

NOTE:

1. PROPOSED PGL WILL MATCH THE EXISTING PGL.
2. FLEXIBLE PAVEMENT STRUCTURE REPAIR - AT VARIOUS LOCATIONS AS DIRECTED BY THE ENGINEER. PAID FOR UNDER ITEM 351.
3. MINIMIZE VEGETATION AND SOIL DISTURBANCE TO THE EXTENT PRACTICAL, WHILE STILL ACCOMPLISHING NECESSARY CONSTRUCTION. REVEGETATE DISTURBED SOILS PROMPLY.

Texas Department of Transportation

FM 982

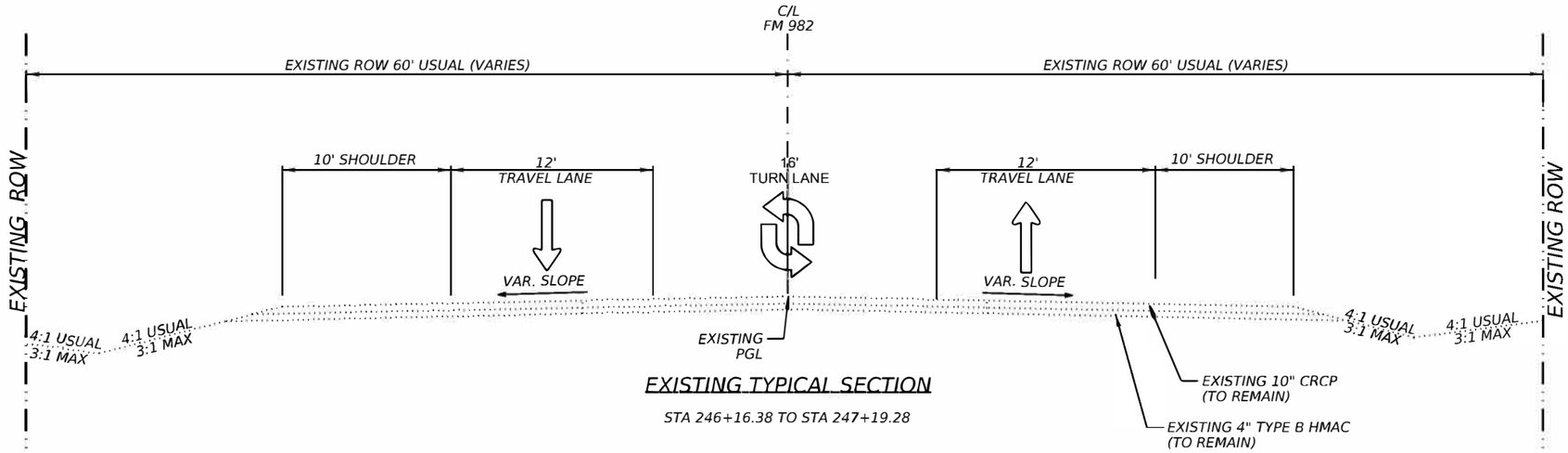
TYPICAL SECTION

STA 240+08.51 TO 246+16.38

SHEET 7 OF 11

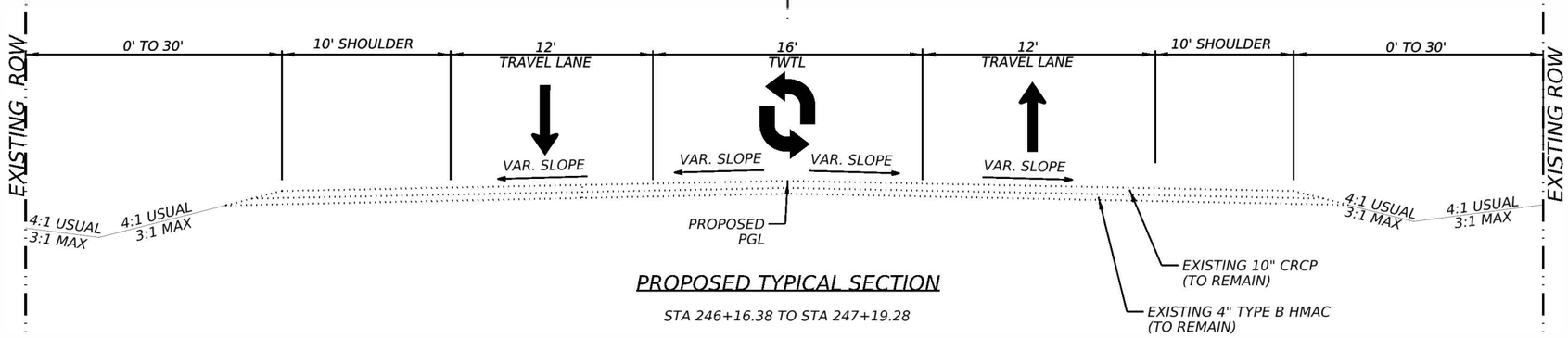
CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		12

DATE: 9/3/2024 12:03:19 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/038705026/4 - Design/Plan Set/1. General/FM 982 TYPICAL SECTIONS.dgn



EXISTING TYPICAL SECTION

STA 246+16.38 TO STA 247+19.28



PROPOSED TYPICAL SECTION

STA 246+16.38 TO STA 247+19.28

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

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Texas Department of Transportation

FM 982

TYPICAL SECTION

STA 246+16.38 TO STA 247+19.28

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		13

DATE: 9/3/2024 12:03:24 PM
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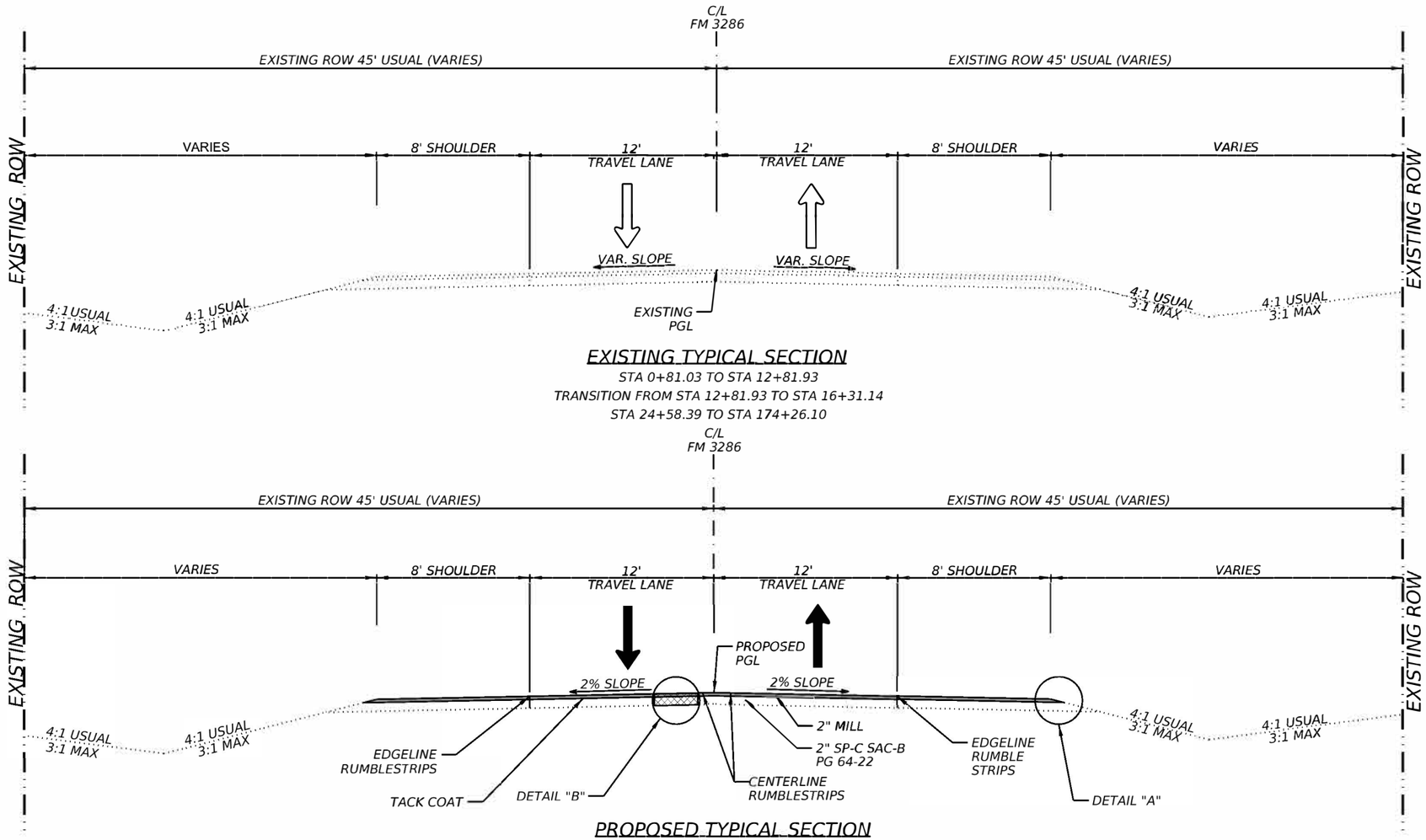
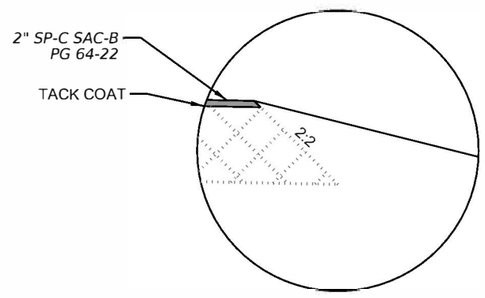


EXISTING TYPICAL SECTION

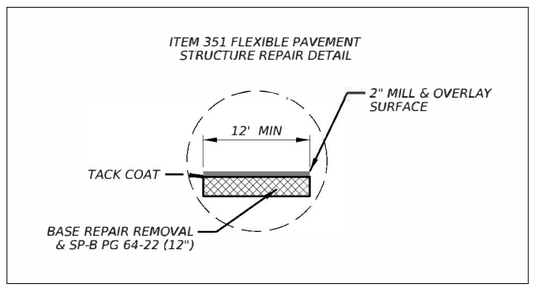
STA 0+81.03 TO STA 12+81.93
TRANSITION FROM STA 12+81.93 TO STA 16+31.14
STA 24+58.39 TO STA 174+26.10

PROPOSED TYPICAL SECTION

STA 0+81.03 TO STA 12+81.93
TRANSITION FROM STA 12+81.93 TO STA 16+31.14
STA 24+58.39 TO STA 174+26.09



DETAIL "A"



DETAIL "B"

NOTE:

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STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/04/2024

Texas Department of Transportation

FM 982

TYPICAL SECTION
STA 0+81.03 TO STA 12+81.93
STA 24+58.39 TO STA 174+26.09
(FM 3286)

SHEET 9 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		14

DATE: 9/4/2024 5:09:42 PM
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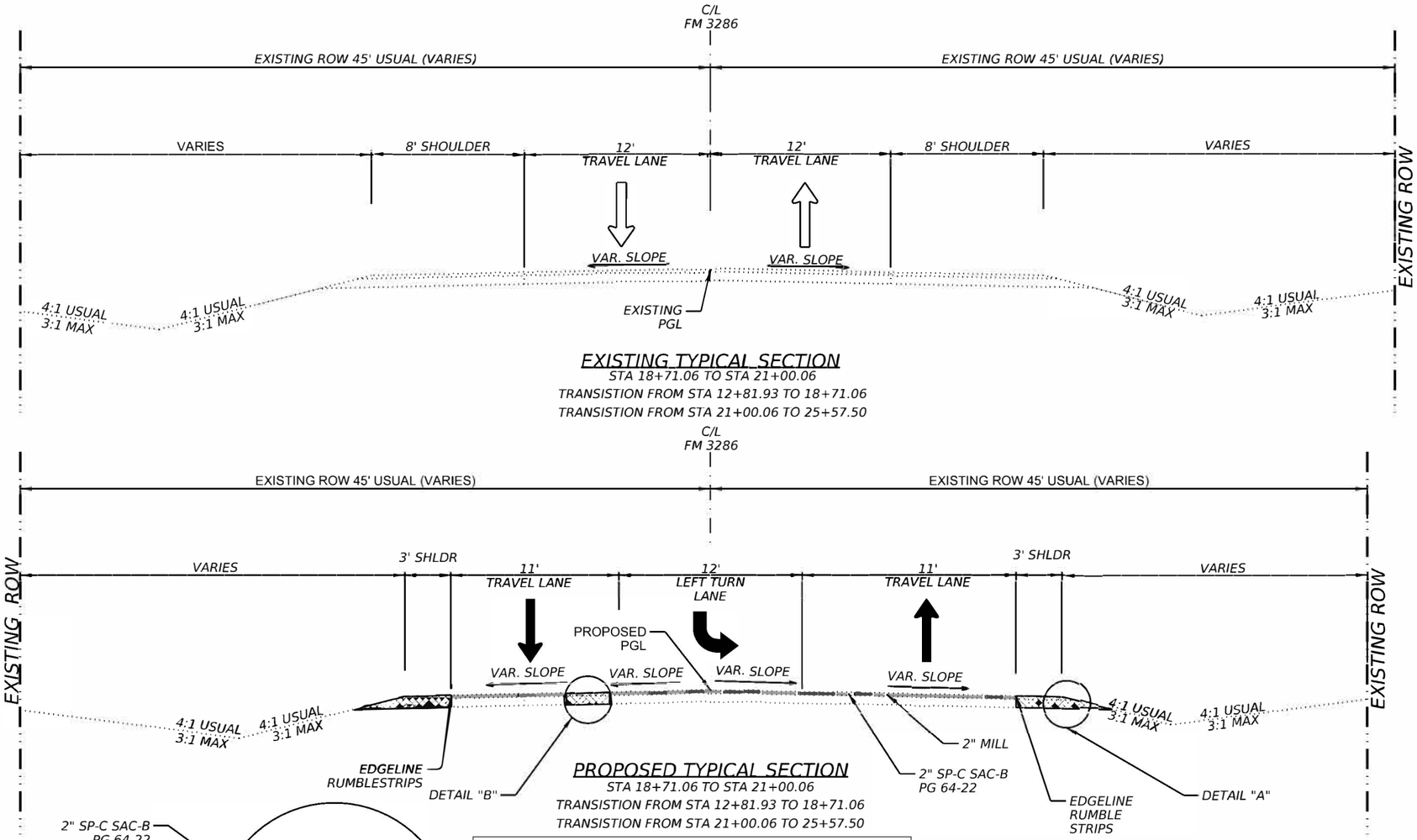

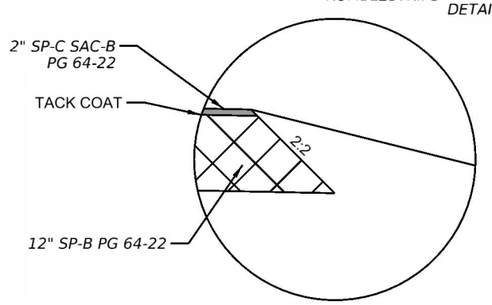

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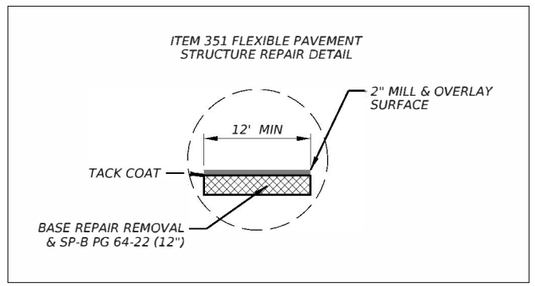

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3. MINIMIZE VEGETATION AND SOIL DISTURBANCE TO THE EXTENT PRACTICAL, WHILE STILL ACCOMPLISHING NECESSARY CONSTRUCTION. REVEGETATE DISTURBED SOILS PROMPLY.
4. EXISTING SHOULDERS TO BE REPLACED TO PROVIDE STRENGTH. SEE DETAIL "A".

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

TYPICAL SECTION

STA 18+71.06 TO STA 25+57.50

(FM 3286)

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		15

DATE: 9/3/2024 12:03:35 PM
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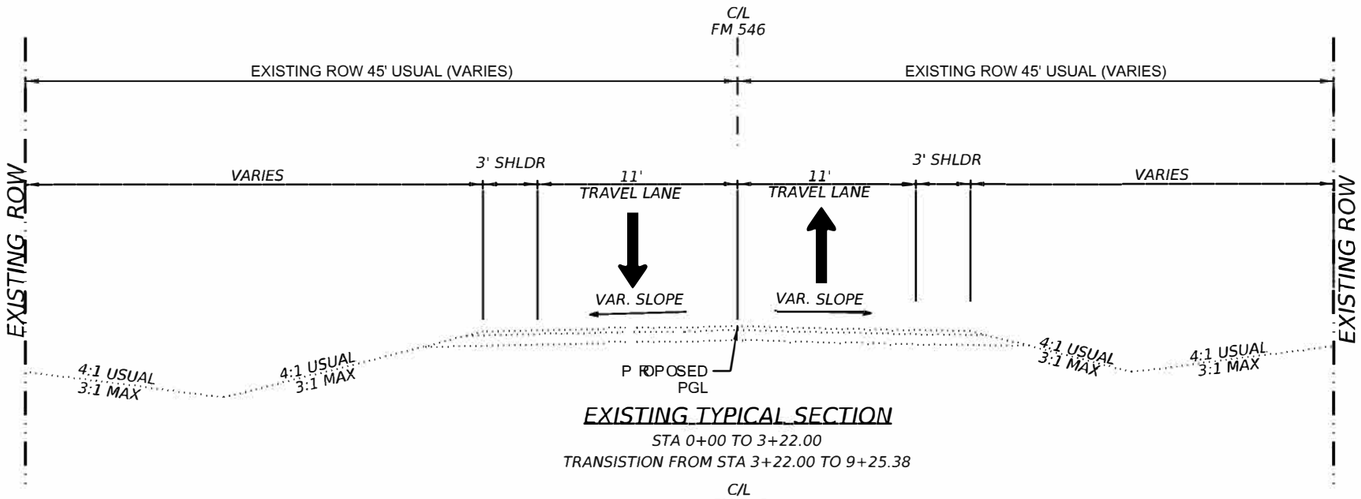
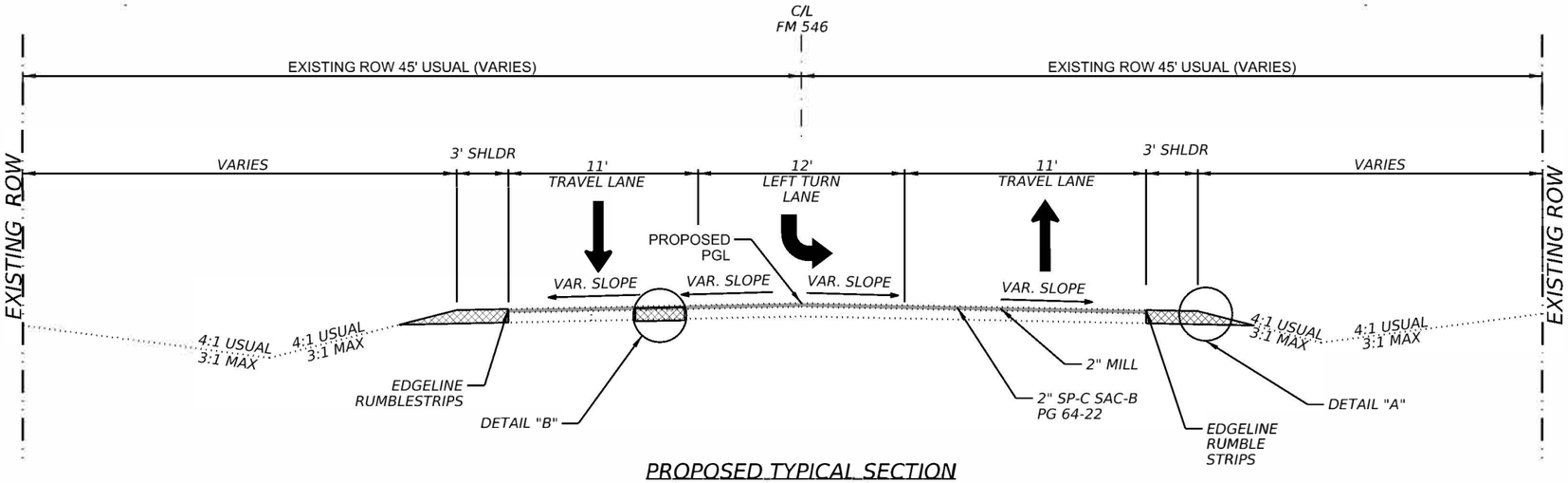


EXISTING TYPICAL SECTION

STA 0+00 TO 3+22.00

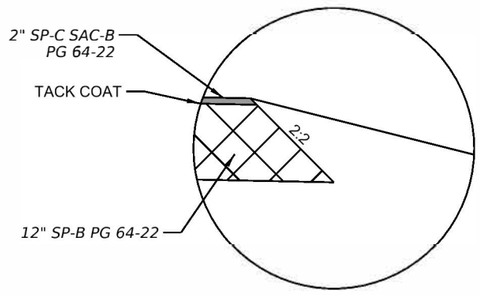
TRANSISTION FROM STA 3+22.00 TO 9+25.38



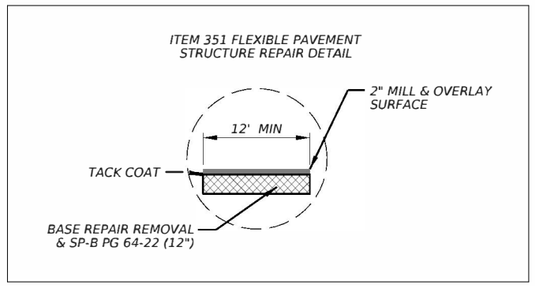
PROPOSED TYPICAL SECTION

STA 0+00 TO 3+22.00

TRANSISTION FROM STA 3+22.00 TO 9+25.38



DETAIL "A"



DETAIL "B"

NOTE:

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STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

TYPICAL SECTION
0+00 TO 9+25.38
(FM 546)

SHEET 11 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		16

DATE: 9/3/2024 12:03:41 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/038705026/4 - Design/Plan Set/1. General/FM 982 TYPICAL SECTIONS.dgn

SPECIFICATION DATA

Table 1: Soil Constants Requirements

Item	Description	Plasticity Index		Note
		Max	Min	
132	EMBANK (FNL)(DC)(TY C)	40	8	1

Note 1: Material excavated from the project must meet the PI requirements when used in the top 10 feet of embankment that supports the pavement structure or other locations shown in the plans. Do not use shale and obtain approval to incorporate shaley clay produced by the construction project.

Table 2: Basis of Estimate for Permanent Construction

Item	Description	Thickness	Rate		Quantity
164	Drill Seed (Perm) (R) (C)	N/A	See Specifications		6808 SY
166 *	Fertilizer (12-6-6)	N/A	500	Lbs./Ac	0.35 Ton
168	Vegetative Watering (Warm)**	N/A	12	TGL/Ac/Day	1013 TGL
344	SP MIXES SP-C SAC-B PG64-22	See Plans	110	Lbs./SY/In	19996 Ton
344	SP MIXES SP-B PG64-22	See Plans	110	Lbs./SY/In	3298 Ton
344	Tack Coat (Undiluted Application Rate)	New HMA	0.06	Gal/SY	18186 Gal
		Milled HMA	0.11		

*For contractor's information only
**Use Summer rate for calculation, adjust for actual field conditions/temperatures as necessary. See Vegetation Establishment Plan Sheet for estimated daily rates.

Note:
(1) Asphalt weight based on 110 Lbs./SY/In
(2) Subgrade weight based on 1.5 Ton/CY (dry-compacted)

CSJ: 0387-05-026,ETC Sheet 17

County: COLLIN

Highway: FM 982

Table 3: Basis of Estimate for Temporary Erosion Control Items

Item	Description	Rate		Quantity
164	Drill Seeding (Temp) (Warm or Cool)	See Specifications		6808 SY
166*	Fertilizer (12-6-6)	500	Lb/Ac	0.35 Ton
168	Vegetative Watering (Warm)**	12	TGL/Ac/Day	1013 TGL

*For Contractor's Information Only.
**Use Summer rate for calculation, adjust for Actual Field Conditions/Temperatures as Necessary. See Vegetation Establishment Sheet for estimated daily rates.

GENERAL

The construction, operation and maintenance of the proposed project will be consistent with the state implementation plan as prepared by the Texas Commission on Environmental Quality.

The disturbed area for this project, as shown on the plans is 1.47 acres. However, the Total Disturbed Area (TDA) will establish the required authorization for storm water discharges. The TDA of this project will be determined by the sum of the disturbed area in all project locations in the contract, and all disturbed area on all Project-Specific Locations (PSL) located in the project limits and/or within 1 mile of the project limits. The department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction site as shown on the plans, according to the TDA of the project. The contractor will obtain any required authorization from the TCEQ for the discharge of storm water from any PSL for construction support activities on or off of the project row according to the TDA of the project. When the TDA for the project exceeds 1 acre, provide a copy of the appropriate application of permit (NOI, or Construction Site Notice) to the engineer, for any PSL located in the project limits or within 1 mile of the project limits. Follow the directives and adhere to all requirements set forth in the TCEQ, Texas Pollution Discharge Elimination System, Construction General Permit (TPDES, CGP).

This project required permitting with environmental resources agencies. There is a high probability that an environmentally sensitive area could be encountered on the contractor designated Project-Specific Locations (PSL) for this project (haul roads, equipment staging areas, borrow pits, disposal sites, field offices, storage areas, parking areas, etc.). Item 7.6 "Project-Specific Locations", provides a listing of regulatory agencies that may need to be contacted regarding this project.

Install traffic marking signs prior to sealcoat application and remove within three days after placement of traffic markings.

Leave all right of way areas undisturbed until actual construction is to be performed in said areas.

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:

County: COLLIN

Highway: FM 982

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

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

Jennifer Vorster Jennifer.Vorster@txdot.gov
Dereje Tesemma Dereje.Tesemma@txdot.gov

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

All contractor questions will be reviewed by the Engineer. 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.

Cross sections may be requested by posting a question to the above Letting Pre-Bid Q&A web page. This data is for non-construction purposes only and it is the responsibility of the prospective bidder to validate the enclosed data with appropriate plans, specifications and estimate for the project(s).

Item 5:
Underground utilities owned by the Texas Department of Transportation may be present within the Right-Of-Way on this project. For signal, illumination, surveillance, and communications & control maintained by TxDOT, call the TxDOT Traffic Signal Office (214-320-6682) for locates a minimum of 48 hours in advance of excavation. For irrigation systems, call TxDOT Landscape Office (214-320-6205) for locates a minimum of 48 hours in advance of excavation. If city or town owned irrigation facilities are present, call the appropriate department of the local city or town a minimum of 48 hours in advance of excavation. The Contractor is liable for all damages when utilities are damaged due to Contractor's negligence including, but not limited to, repair or replacement at the Contractor's expense.

For the project to be deemed complete, permanently stabilize all unpaved disturbed areas of the project with a vegetative cover at a minimum of 70% density for the control of erosion.

Place construction stakes/station markings at intervals of no more than 100 feet or as directed by the Engineer. Place stakes and markings so as not to interfere with normal construction operations.

Submit all shop drawings, working drawings, or other documents which require review sufficiently in advance of scheduled construction to allow no` less than thirty (30) calendar days for review and response.

CSJ: 0387-05-026,ETC **Sheet 17A**

County: COLLIN

Highway: FM 982

Item 6:
The Buy America Material Classification Sheet is located at the below link. https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html for clarification on material categorization.

Item 7:
Repair or replace any structures and utilities that might have been damaged by negligence or a failure to have utility locates performed.

Holiday restrictions – The Engineer may decide that no lane closures or construction operations shall be allowed during the restricted periods listed in the following holiday schedule. TxDOT has the right to lengthen, shorten, or otherwise modify these restricted periods as actual, or expected, traffic conditions may warrant. Working days will not be charged for these restricted periods. No additional compensation will be allowed for these closures (i.e., overhead, delays, stand-by, barricades or any other associated cost impacts).

- New Year's Eve and Day (5 am on December 31 thru 10:00 pm January 1)
- Easter Holiday weekend (5 am on Friday thru 10:00 pm Sunday)
- Memorial Day weekend (5 am on Friday thru 10:00pm Monday)
- Independence Day (5 am on July 3 thru 10:00 pm on July 5)
- Labor Day weekend (5 am on Friday thru 10:00 pm Monday)
- Thanksgiving Holiday (5 am on Wednesday thru 10:00 pm Sunday)
- Christmas Holiday (5 am on December 23 thru 10:00 pm December 26)

No significant traffic generator events identified.

Item 8:
This Project will be a Standard Workweek.

Critical Path Method (CPM) schedule in P6 format will be required for this project. Submit baseline schedule and obtain approval prior to beginning construction. The Estimate will be held if monthly schedule update is not submitted.

This project contains a 60 day convenience delay per the item 8 special provisions for material aquistition.

Item 100:
Remove the existing roadway small signs, delineators and object markers as shown on the plans, or as directed, during construction within the right of way. Small sign, delineator and object marker removals are subsidiary to this Item.

The limits of preparing right of way will be measured from Sta. 0+00.00 to Sta. 247+19.28 along the centerline of construction on FM 982 and from Sta. 0+00.00 to Sta. 174+26.09 along the centerline of construction on FM 3286

Items 105 and 354:
Saw existing asphalt along neat lines where portions are to be left in place temporarily or permanently. Sawing is not paid for directly, but is subsidiary to this item.

Separate the asphalt pavement from the base material. Stockpile the asphalt pavement at TxDOT's Collin County Area Office at 2205 SH 5 Mckinney, Texas. Place the asphalt pavement material in a stockpile that meets the dimensions and requirements designated by the engineer.

Stockpile materials in uniform piles up to 15 feet in height unless otherwise instructed. Furnish adequate equipment at the stockpile to keep and leave the materials in a neat and orderly manner.

Properly dispose of unsalvageable material at your own expense.

Item 110:
Excavated shale is not an acceptable material for embankment.

Items 110 and 132:
Scarify and loosen the excavated areas, unpaved surface areas, except rock, to a depth of at least 8 inches and compact in accordance with the specifications.

Excavation and embankment for driveways, sleeper slabs, alleys and intersections will not be paid for directly, but will be considered subsidiary to these items.

Item 132:
Excavated material from the project site has not been determined to be suitable for embankment. The bidder assumes all risk for the use of excavated materials for embankment and is expected to meet all material requirements for embankment regardless of the source.

Perform Tex-106-E (Plasticity Index) by an approved laboratory on excavated soils from sources outside right of way when used in roadway embankment. Provide the test results at no expense to the department. The engineer will sample and test soils produced by the construction project for specification requirements or material sources specified in the plans.

Earth embankment Type C, is mainly composed of material other than shale. Furnish material that is free from vegetation or other objectionable material and that conforms to the requirements of Table 1 (Sheet A). If necessary, treat material with lime slurry in accordance with Item 260, "Lime Treatment (Road-Mixed)" in order to meet these requirements. Use Tex-121-E, figure 1, page 4 to calculate the amount of lime required. When lime treated subgrade is specified, 3000 PPM is the maximum allowed sulfate content in the top 3 feet when material comes from borrow source. Follow recommendations of 260.4.4 for mixing and mellowing. The engineer will test material placed or excavated to a depth of one foot below and laterally to one foot outside the proposed treatment limit. Lime treatment of this material will not be paid for directly, but will be considered subsidiary to this item.

Do not use shaley clays in embankment unless approved in writing.

Use embankment material Type C2 described in Table 1 "Soil Constants Requirements" for embankments behind bridge abutments to the extent of the bridge approach slabs, and other embankments enclosed by an abutment and / or retaining walls.

CSJ: 0387-05-026,ETC **Sheet 17B**

County: COLLIN

Highway: FM 982

Item 134:
Start backfilling pavement edges as soon as possible after the surface course is started.

Backfill and compact the pavement edges to produce a smooth surface adjacent to the pavement with no vertical edges.

Use Type "A" or "B" material to backfill pavement edges as shown in plans. Type "A" or "B" material shall consist of suitable material that when compacted will support the pavement edge. Rap is considered suitable Type "A" or "B" material.

Blade the existing vegetation into a neat wind-row prior to overlay. After placing Ty A or Ty B backfill and placing seeding, the material from the wind-row shall be replaced on the completed slopes. Emulsion shall be placed at a 50/50 solution of water to emulsion over disturbed area.

Emulsion rate=0.15 Gal/SY residual. This work, materials and equipment shall be subsidiary to Item 134.

Item 301:
Provide liquid antistripping agents unless otherwise directed. Add the minimum dosage determined by the manufacturer or higher dosage determined by design requirement and try subsequent trials at 0.25% increments.

Item 320:
Use a self-propelled wheel mounted MTV capable of receiving mix from the haul trucks, separate from the paver. It shall have a minimum storage capacity of approximately 25 tons. It shall be equipped with a pivoting discharge conveyor and shall completely and thoroughly remix the material prior to placement. The effectiveness of the MTV's remixing ability is subject to the approval of the Engineer. In addition, the paver shall have a surge storage insert with a minimum capacity of 20 tons.

The use of windrow pick-up equipment is allowed except on the first course of roadway material placed over the subgrade.

Item 344:
Use aggregate that meets the Surface Aggregate Classification (SAC) requirement of Class B.

Provide PG binder 64-22 in Type SP-C and SP-B mixture.

Item 354:
Stockpile the asphalt pavement at TxDOT's Collin County Area Office at 2205 SH 5 Mckinney, Texas. Place the asphalt pavement material in a stockpile that meets the dimensions and requirements designated by the engineer.

Properly dispose of unsalvageable material at your own expense.

Slope longitudinal faces greater than 1 ¼" to a minimum of 1:1 slope at the end of the work period if traffic is able to traverse the joint. Slope transverse tapers to a minimum of 36:1 at the end of the workday. Remove the taper prior to continuing the milling.

For open shoulder sections, plane the asphalt so the flow of water is not impeded at the shoulder edge or across the surface. Added planing up to three feet in width outside the lines and grades of the plans, necessary to provide proper drainage, will be subsidiary to the bid item.

Remove the loose material from the roadway before opening to traffic.

Patch pavement cut to excessive depth by equipment failure with an approved epoxy material. Re-plane patched area to an acceptable approved ride quality. Payment for these corrections is subsidiary to this item.

Item 502:
The Contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

Access will be provided to all business and residences at all times. Where turning radii are limited during phased construction at intersections, provide all weather surfaces such as RAP or base in turning movements to accommodate and to protect the traffic from edge drop-offs. Materials, labor, maintenance and removal for these temporary accesses and radii will not be paid for directly but will be considered subsidiary to the various bid items.

Provide written proposed lane closure information by 1:00 pm on the business day prior to the proposed closures. Do not close lanes when this requirement is not met.

When excavation is required next to a pavement lane carrying traffic and the widening is not completed by the end of the work day, backfill against the edge of the pavement with at least a 3:1 slope using an acceptable material to support vehicular traffic. Carefully remove and dispose of this material when work resumes. Backfilling pavement edges, and the materials required for the work will be subsidiary to this item.

Place barricades and signs in locations that do not obstruct the sight distance of drivers entering the highway from driveways or side streets.

Do not commence work on the road before sunrise. Do not operate or park any equipment/machinery closer than 30 feet from the traveled roadway after sunset unless authorized by the engineer.

When moving unlicensed equipment on or across any pavement or public highways, protect the pavement from all damage using an acceptable method.

CSJ: 0387-05-026,ETC **Sheet 17C**

County: COLLIN

Highway: FM 982

Traffic Control Plans with Lane Closures causing back-ups of 8 minutes or greater in duration will be modified by the Engineer up to and including removal of the lane closure.

Additional lanes may be closed, started earlier, or extended later with written permission of the Engineer.

Item 505:
The total number of truck mounted attenuators (TMAs) or trailer attenuators (TAs) required when utilizing the traffic control standards are shown in the tables below.

TCP 2 Series	Scenario	Required TMA/TA
(2-1)-18 / (2-2)-18	All	1

TCP 3 Series	Scenario			Required TMA/TA
(3-1)-13	All			2
(3-3)-14	A	B	D	2
	C			3

The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs/TAs needed for the project. Additional TMAs/TAs used that are not specified in the plans in which the contractor expects compensation will require prior approval from the Engineer.

Stationary TMA's/TA's will be only paid for by the operations classified in theTCP sheets as short term, short term stationary, intermediate term stationary and long term stationary. Mobile TMA's/TA's will only be paid for by the operations classified in the TCP standards as mobile operations. TMA's/TA's used for installation/removal of traffic control for a work area will be subsidiary to the TMA/TA used to perform the work.

Item 506:
Take all practicable precautions to prevent debris from being discharged into the Waters of Texas or a designated wetland. Install Best Management Practices before demolition begins and maintain them during the demolition. Remove any debris or construction material that escapes containment devices and are discharged into the restricted areas, before the next rain event or within 24 hours of the discharge.

If temporary construction stream crossings are allowed under a Nationwide Permit, submit in writing for approval the type and location of each temporary stream crossing. Use temporary bridges, timber mats, or other structurally sound and non-eroding material for temporary stream crossings. A temporary culvert crossing will consist of storm sewer pipes and 4- to 8-inch nominal size rock. Temporary stream crossings must not cause more than minimal changes to the hydraulic flow characteristics of the stream, increase flooding, or cause more than minimal degradation of water quality. Remove the temporary stream crossings in their entirety and return the affected areas to their pre-existing elevation. All work and materials use for

Slope longitudinal faces greater than 1 ¼" to a minimum of 1:1 slope at the end of the work period if traffic is able to traverse the joint. Slope transverse tapers to a minimum of 36:1 at the end of the workday. Remove the taper prior to continuing the milling.

For open shoulder sections, plane the asphalt so the flow of water is not impeded at the shoulder edge or across the surface. Added planing up to three feet in width outside the lines and grades of the plans, necessary to provide proper drainage, will be subsidiary to the bid item.

Remove the loose material from the roadway before opening to traffic.

Patch pavement cut to excessive depth by equipment failure with an approved epoxy material. Re-plane patched area to an acceptable approved ride quality. Payment for these corrections is subsidiary to this item.

Item 502:
The Contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

Access will be provided to all business and residences at all times. Where turning radii are limited during phased construction at intersections, provide all weather surfaces such as RAP or base in turning movements to accommodate and to protect the traffic from edge drop-offs. Materials, labor, maintenance and removal for these temporary accesses and radii will not be paid for directly but will be considered subsidiary to the various bid items.

Provide written proposed lane closure information by 1:00 pm on the business day prior to the proposed closures. Do not close lanes when this requirement is not met.

When excavation is required next to a pavement lane carrying traffic and the widening is not completed by the end of the work day, backfill against the edge of the pavement with at least a 3:1 slope using an acceptable material to support vehicular traffic. Carefully remove and dispose of this material when work resumes. Backfilling pavement edges, and the materials required for the work will be subsidiary to this item.

Place barricades and signs in locations that do not obstruct the sight distance of drivers entering the highway from driveways or side streets.

Do not commence work on the road before sunrise. Do not operate or park any equipment/machinery closer than 30 feet from the traveled roadway after sunset unless authorized by the engineer.

When moving unlicensed equipment on or across any pavement or public highways, protect the pavement from all damage using an acceptable method.

CSJ: 0387-05-026,ETC **Sheet 17C**

County: COLLIN

Highway: FM 982

Traffic Control Plans with Lane Closures causing back-ups of 8 minutes or greater in duration will be modified by the Engineer up to and including removal of the lane closure.

Additional lanes may be closed, started earlier, or extended later with written permission of the Engineer.

Item 505:
The total number of truck mounted attenuators (TMAs) or trailer attenuators (TAs) required when utilizing the traffic control standards are shown in the tables below.

TCP 2 Series	Scenario	Required TMA/TA
(2-1)-18 / (2-2)-18	All	1

TCP 3 Series	Scenario			Required TMA/TA
(3-1)-13	All			2
(3-3)-14	A	B	D	2
	C			3

The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs/TAs needed for the project. Additional TMAs/TAs used that are not specified in the plans in which the contractor expects compensation will require prior approval from the Engineer.

Stationary TMA's/TA's will be only paid for by the operations classified in theTCP sheets as short term, short term stationary, intermediate term stationary and long term stationary. Mobile TMA's/TA's will only be paid for by the operations classified in the TCP standards as mobile operations. TMA's/TA's used for installation/removal of traffic control for a work area will be subsidiary to the TMA/TA used to perform the work.

Item 506:
Take all practicable precautions to prevent debris from being discharged into the Waters of Texas or a designated wetland. Install Best Management Practices before demolition begins and maintain them during the demolition. Remove any debris or construction material that escapes containment devices and are discharged into the restricted areas, before the next rain event or within 24 hours of the discharge.

If temporary construction stream crossings are allowed under a Nationwide Permit, submit in writing for approval the type and location of each temporary stream crossing. Use temporary bridges, timber mats, or other structurally sound and non-eroding material for temporary stream crossings. A temporary culvert crossing will consist of storm sewer pipes and 4- to 8-inch nominal size rock. Temporary stream crossings must not cause more than minimal changes to the hydraulic flow characteristics of the stream, increase flooding, or cause more than minimal degradation of water quality. Remove the temporary stream crossings in their entirety and return the affected areas to their pre-existing elevation. All work and materials use for

temporary construction stream crossings will not be paid for directly but are subsidiary to pertinent Items.

Provide SW3P Signs. Obtain from the Engineer a copy of the project's completed TPDES Storm Water Program Construction Site Notice and Contractor Site Notice. Laminate the sheets and bond with adhesive to 36" X 36" plywood sign blanks. Ensure the sheets remain dry. Apply Type C Blue reflective sheeting as the background and add the text "SW3P" in 5" white lettering, centered at the top. Attach the signs to approved temporary mounts and locate at each of the project limits just inside the right of way line at a readable height or as directed by the Engineer. If the sign cannot be placed outside the clear zone, it must adhere to the TMUTCD. SW3P signs, maintenance, and reposting (for replacement or as needed to ensure readability) will be subsidiary to Item 502.

Concrete Washouts are required per the CGP. The Concrete Washout Area(s) structural controls must consist of temporary berms, temporary shallow pits, and/or temporary storage tanks to prevent contaminated runoff and must be lined as to prevent contamination of underlying soil. Ensure pits properly maintained including removal of concrete as not to allow over flow. The location(s) of washout area will be approved by the Engineer. When washout pits are no longer needed, they will be removed and area will be restored to original condition. This work, materials and labor will not be measured or paid for directly but will be subsidiary to Item 506, "Temporary Erosion, Sedimentation, and Environmental Controls."

Item 585:
Use Surface Test Type A on all intersections and driveways.

Use Surface Test Type B pay adjustment schedule 3 on the travel lanes.

Item 644:
Provide two (2) sets of shop drawings for signs. The shop drawings shall conform to the details shown on the plans. The shop drawings shall show the details of the panels, wind beams, stiffeners, joint backing plates, splices, fasteners, brackets, and sign support connections. The shop drawings shall show letter types and sizes, interline spacing and message arrangements.

Affix a sign identification decal to the back of all signs in accordance with Item 643.

Prior to taking elevations to determine lengths for fabrication of signposts and/or sign support towers, obtain verification of all proposed locations.

All sign mounts shall have a clamp base system for all small roadside sign assemblies.

Items 662 and 672:
Black adhesive will be used on asphalt pavements and white adhesive will be used on concrete pavements.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0387-05-026 **DISTRICT** Dallas **COUNTY** Collin
HIGHWAY FM 3286, FM 982

			CONTROL SECTION JOB		**0387-05-026**		**3476-02-015**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00195784**		**A00208447**			
			COUNTY		**Collin**		**Collin**			
			HIGHWAY		**FM 982**		**FM 3286**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL		
	100-7002	PREPARING ROW		STA	25.880				25.880	
	104-7011	REMOV CONC (DRIVEWAYS)		SY	238.000				238.000	
	105-7010	RMV (10"-14") TRT/UNTRT BASE & ASPH PAV		SY	352.000				352.000	
	110-7001	EXCAV (ROADWAY)		CY	124.000				124.000	
	132-7005	EMBANK (FNL)(OC)(TY C)		CY	491.000				491.000	
	134-7004	BACKFILL (TY A OR B)		STA	25.880				25.880	
	150-7001	BLADING		STA	25.880				25.880	
	164-7010	DRILL SEED (PERM_RURAL_CLAY)		SY	6,808.000				6,808.000	
	164-7015	DRILL SEED (TEMP_WARM_COOL)		SY	6,808.000				6,808.000	
	168-7001	VEGETATIVE WATERING		TGL	2,026.000				2,026.000	
	344-7001	SP MIXES SP-B PG64-22		TON	3,298.000				3,298.000	
	344-7011	SP MIXES SP-C SAC-B PG64-22		TON	14,414.000		5,582.000		19,996.000	
	344-7077	TACK COAT		GAL	13,108.000		5,078.000		18,186.000	
	351-7011	FLEXIBLE PAVEMENT STRUCTURE REPAIR(12")		SY	275.000		175.000		450.000	
	354-7032	PLANE ASPH CONC PAV(0" TO 2")		SY	118,747.000		46,122.000		164,869.000	
	401-7001	FLOWABLE BACKFILL		CY	24.000				24.000	
	432-7043	RIPRAP (STONE PROTECTION)(18 IN)		CY	265.000				265.000	
	464-7003	RC PIPE (CL III)(18 IN)		LF	74.000				74.000	
	464-7005	RC PIPE (CL III)(24 IN)		LF	174.000				174.000	
	467-7308	SET (TY II) (18 IN) (RCP) (6: 1) (P)		EA	4.000				4.000	
	467-7328	SET (TY II) (24 IN) (RCP) (6: 1) (P)		EA	6.000				6.000	
	496-7004	REMOV STR (SET)		EA	2.000				2.000	
	496-7007	REMOV STR (PIPE)		LF	61.000				61.000	
	496-7040	REMOVING ROCK RIPRAP		LF	160.000				160.000	
	500-7001	MOBILIZATION		LS	0.700		0.300		1.000	
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING		MO	13.000				13.000	
	503-7002	PORTABLE CHANGEABLE MESSAGE SIGN		EA	2.000		2.000		4.000	
	505-7001	TMA (STATIONARY)		DAY	130.000		76.000		206.000	
	505-7002	TMA (MOBILE OPERATION)		HR	130.000		76.000		206.000	
	506-7003	ROCK FILTER DAMS (INSTALL) (TY 3)		LF	360.000				360.000	
	506-7011	ROCK FILTER DAMS (REMOVE)		LF	360.000				360.000	
	506-7020	CONSTRUCTION EXITS (INSTALL) (TY 1)		SY	164.000				164.000	
	506-7024	CONSTRUCTION EXITS (REMOVE)		SY	164.000				164.000	
	506-7039	TEMP SEDMT CONT FENCE (INSTALL)		LF	11,419.000		1,668.000		13,087.000	
	506-7041	TEMP SEDMT CONT FENCE (REMOVE)		LF	11,419.000		1,668.000		13,087.000	
	506-7044	BIODEG EROSN CONT LOGS (INSTL) (12")		LF	147.000				147.000	
	506-7046	BIODEG EROSN CONT LOGS (REMOVE)		LF	147.000				147.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0387-05-026 **DISTRICT** Dallas **COUNTY** Collin
HIGHWAY FM 3286, FM 982

			CONTROL SECTION JOB		**0387-05-026**		**3476-02-015**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00195784**		**A00208447**			
			COUNTY		**Collin**		**Collin**			
			HIGHWAY		**FM 982**		**FM 3286**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL		
	530-7006	DRIVEWAYS (CONC)		SY	205.000				205.000	
	530-7010	DRIVEWAYS (ACP)		SY	743.000				743.000	
	533-7001	MILL RUMBLE STRIPS (ASPHALT) (SHLDR)		LF	45,287.000		19,977.000		65,264.000	
	533-7002	MILL RUMBLE STRIPS (ASPH) (CENTERLINE)		LF	20,141.000		9,258.000		29,399.000	
	560-7006	MAILBOX INSTALL-S (RR-POST) TY 4		EA	6.000				6.000	
	644-7001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)		EA	1.000				1.000	
	644-7031	IN SM RD SN SUP&AM TYS80(1)SA(U)		EA	3.000				3.000	
	644-7034	IN SM RD SN SUP&AM TYS80(1)SA(U-BM)		EA	1.000				1.000	
	662-7038	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)		LF	50,925.000		36,111.000		87,036.000	
	662-7114	WK ZN PAV MRK SHT TERM (TAB)TY Y-2		EA	2,547.000		1,806.000		4,353.000	
	666-7009	REFL PAV MRK TY I (W)6"(DOT)(100MIL)		LF			21.000		21.000	
	666-7018	REFL PAV MRK TY I (W)8"(DOT)(100MIL)		LF	111.000		30.000		141.000	
	666-7024	REFL PAV MRK TY I (W)8"(SLD)(100MIL)		LF	1,972.000		100.000		2,072.000	
	666-7036	REFL PAV MRK TY I (W)24"(SLD)(100MIL)		LF	360.000		35.000		395.000	
	666-7042	REFL PAV MRK TY I (W)(ARROW)(100MIL)		EA	15.000		2.000		17.000	
	666-7066	REFL PAV MRK TY I (W)(WORD)(100MIL)		EA	15.000		2.000		17.000	
	666-7123	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)		LF	893.000		362.000		1,255.000	
	666-7411	REFL PAV MRK TY I (W)6"(SLD)(100MIL)		LF	46,838.000		33,774.000		80,612.000	
	666-7423	REFL PAV MRK TY I (Y)6"(SLD)(100MIL)		LF	50,925.000		36,111.000		87,036.000	
	672-7002	REFL PAV MRKR TY I-C		EA	4,232.000		3,380.000		7,612.000	
	672-7004	REFL PAV MRKR TY II-A-A		EA	5,094.000		1,806.000		6,900.000	
	677-7001	ELIM EXT PM & MRKS (4")		LF	2,828.000		28,214.000		31,042.000	
	678-7002	PAV SURF PREP FOR MRK (6")		LF	2,828.000		28,214.000		31,042.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)		LS	1.000		1.000		2.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PART)		LS	1.000		1.000		2.000	

CSJ:0387-05-026
SUMMARY OF ROADWAY ITEMS

PLAN SHEET NO.	LOCATION	100 7002 PREPARING ROW STA	105 7010 RMV (10"-14") TRT/UNTRT BASE & ASPH PAV SY	134 7004 BACKFILL (TY A OR B) STA	150 7001 BLADING STA	* 344 7001 SP MIXES SP-B PG64-22 TON	* 344 7011 SP MIXES SP-C SAC-B PG64-22 TON	344 7077 TACK COAT GAL	351 7011 FLEXIBLE PAVEMENT STRUCTURE REPAIR(12") SY	354 7032 PLANE ASPH CONC PAV(0" TO 2") SY	401 7001 FLOWABLE BACKFILL CY	432 7043 RIPRAP (STONE PROTECTION) (18 IN) CY	496 7040 REMOVING STONE RIPRAP LF	503 7002 PORTABLE CHANGEABLE MESSAGE SIGN EA
SHEET 1	BEGIN PROJECT TO STA 21+00.00	25.88	352.00	25.88	25.88	3298	1184	1080		9433				
SHEET 2	STA 21+00.00 TO STA 45+00.00						1420	1291		11734				
SHEET 3	STA 45+00.00 TO STA 69+00.00						1243	1130		10267	24	265	160	
SHEET 4	STA 69+00.00 TO STA 93+00.00						1420	1291		11734				
SHEET 5	STA 93+00.00 TO STA 117+00.00						1420	1291		11734				
SHEET 6	STA 117+00.00 TO STA 141+00.00						1420	1291	275	11734				2
SHEET 7	STA 141+00.00 TO STA 165+00.00						1420	1291		11734				
SHEET 8	STA 165+00.00 TO STA 189+00.00						1420	1291		11734				
SHEET 9	STA 189+00.00 TO STA 213+00.00						1420	1291		11734				
SHEET 10	STA 213+00.00 TO STA 237+00.00						1420	1291		11734				
SHEET 11	STA 237+00.00 TO STA 247+19.28						627	570		5175				
PROJECT TOTALS		25.88	352.00	25.88	25.88	3298	14414	13108	275	118747	24	265	160	2

CSJ:0387-05-026
SUMMARY OF ROADWAY ITEMS

PLAN SHEET NO.	LOCATION	505 7001 TMA (STATIONARY) DAY	505 7002 TMA (MOBILE OPERATION) HR	533 7001 MILL RUMBLE STRIPS (ASPHALT) (SHOULDER) LF	533 7002 MILL RUMBLE STRIPS (ASPHALT) (CENTERLINE) LF	560 7006 MAILBOX INSTALL-S (TWW-POST) TY 4 EA
SHEET 1	BEGIN PROJECT TO STA 21+00.00			4568	962	6
SHEET 2	STA 21+00.00 TO STA 45+00.00			4800	2400	
SHEET 3	STA 45+00.00 TO STA 69+00.00			4200	2100	
SHEET 4	STA 69+00.00 TO STA 93+00.00			4800	2400	
SHEET 5	STA 93+00.00 TO STA 117+00.00			4630	2230	
SHEET 6	STA 117+00.00 TO STA 141+00.00	130	130	4081	915	
SHEET 7	STA 141+00.00 TO STA 165+00.00			4690	2400	
SHEET 8	STA 165+00.00 TO STA 189+00.00			4704	2400	
SHEET 9	STA 189+00.00 TO STA 213+00.00			4183	2400	
SHEET 10	STA 213+00.00 TO STA 237+00.00			4631	1934	
SHEET 11	STA 237+00.00 TO STA 247+19.28					
PROJECT TOTALS		130	130	45287	20141	6

* INCLUDES ADDITIONAL 10%

NOTES
1.FM 546 INCLUDED IN QUANTITY CALCULATIONS

FM 982

ROADWAY QUANTITY SUMMARY

CONT	SECT	JOB	HIGHWAY
0387	05	026	FM 982
DIST	COUNTY		SHEET NO.
DAL	Collin		19

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CSJ:3476-02-015
SUMMARY OF ROADWAY ITEMS

PLAN SHEET NO.	LOCATION	344 7011 SP MIXES SP-C SAC-B PG64-22	344 7077 TACK COAT	351 * 7011 FLEXIBLE PAVEMENT STRUCTURE REPAIR(10")	354 7032 PLANE ASPH CONC PAV(0" TO 2")	503 7002 PORTABLE CHANGEABLE MESSAGE SIGN	505 7001 TMA (STATIONARY)	505 7002 TMA (MOBILE OPERATION)	533 7001 MILL RUMBLE STRIPS (ASPHALT) (SHOULDER)	533 7002 MILL RUMBLE STRIPS (ASPHALT) (CENTERLINE)
		TON	GAL	SY	SY	EA	DAY	HR	LF	LF
SHEET 1	BEGIN PROJECT TO STA 24+00.00	1291	1174		10667				3920	1282
SHEET 2	STA 24+00.00 TO STA 48+00.00	1291	1174		10667				4904	2342
SHEET 3	STA 48+00.00 TO STA 72+00.00	1109	1009		9165				4124	2062
SHEET 4	STA 72+00.00 TO STA 96+00.00	646	588	175	5338	2	76	76	2402	1258
SHEET 5	STA 96+00.00 TO STA 120+00.00	836	760		6907				3108	1554
SHEET 6	STA 120+00.00 TO STA 144+00.00									
SHEET 7	STA 144+00.00 TO STA 168+00.00	72	66		595				267	134
SHEET 8	STA 168+00.00 TO STA 174+26.09	337	307		2783				1252	626
PROJECT TOTALS		5582	5078	175	46122	2	76	76	19977	9258

* INCLUDES ADDITIONAL 10%

FM 982

ROADWAY QUANTITY SUMMARY (FM 3286)

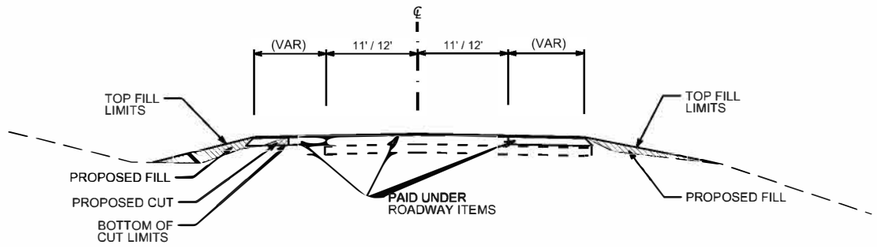
SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0387	05	026	FM 982
DIST	COUNTY		SHEET NO.
DAL	Collin		20

SUMMARY OF EARTHWORK ITEMS		
LOCATION	110 7001	132 7005
AT FM 982	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL)(DENS CONT)(TY C)
	CY	CY
0+00.00	0	
1+00.00	2	
2+00.00	9	8
3+00.00		18
4+00.00		22
5+00.00		10
6+00.00		8
7+00.00	1	3
8+00.00	1	1
9+00.00	1	10
10+00.00	1	20
11+00.00	1	23
12+00.00	6	13
13+00.00	6	1
14+00.00	1	1
14+88.00		1
FM 982 TOTALS	29	139

SUMMARY OF EARTHWORK ITEMS		
LOCATION	110 7001	132 7005
AT FM 546	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL)(DENS CONT)(TY C)
	CY	CY
2+70.00	1	1
3+00.00	1	2
4+00.00	2	25
5+00.00	2	52
6+00.00		53
7+00.00		107
8+00.00		95
9+00.00	1	14
9+50.00	88	3
FM 3286 TOTALS	95	352

LOCATION	110 7001	132 7005
	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL)(DENS CONT)(TY C)
FM 981	29	139
FM 546	95	352
PROJECT TOTALS	124	491



EARTHWORK CALCULATION DETAILS
N.T.S.

CONTRACTOR'S INFORMATION:

EARTHWORK QUANTITY CALCULATIONS WERE DONE USING OPEN ROAD DESIGN SOFTWARE

LEGEND:

EXCAVATION (CUT)

EMBANKMENT (FILL)

2024
Texas Department of Transportation

FM 982

EARTHWORK QUANTITY SUMMARY

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0387	05	026	FM 982
DIST	COUNTY		SHEET NO.
DAL	Collin		21

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CSJ:0387-05-026
SUMMARY OF EROSION CONTROL ITEMS

PLAN SHEET NO.	LOCATION	164 7010 DRILL SEED (PERM_RURAL_CLAY) SY	164 7015 DRILL SEED (TEMP_WARM_COOL) SY	168 7001 VEGETATIVE WATERING TGL	506 7003 ROCK FILTER DAMS (INSTALL) (TY 3)	506 7011 ROCK FILTER DAMS (REMOVE)	506 7020 CONSTRUCTION EXITS (INSTALL) (TY 1) SY	506 7024 CONSTRUCTION EXITS (REMOVE) SY	506 7039 TEMP SEDMT CONT FENCE (INSTALL) LF	506 7041 TEMP SEDMT CONT FENCE (REMOVE) LF	506 7044 BIODEG EROSN CONT LOGS (INSTL) (12") LF	506 7046 BIODEG EROSN CONT LOGS (REMOVE) LF
SHEET 1	BEGIN PROJECT TO STA 21+00.00	6808	6808	2026			78	78	2140	2140	140	140
SHEET 2	STA 21+00.00 TO STA 45+00.00											
SHEET 3	STA 45+00.00 TO STA 69+00.00				360	360			4901	4901		
SHEET 4	STA 69+00.00 TO STA 93+00.00								2605	2605		
SHEET 5	STA 93+00.00 TO STA 117+00.00								557	557		
SHEET 6	STA 117+00.00 TO STA 141+00.00								328	328		
SHEET 7	STA 141+00.00 TO STA 165+00.00								181	181		
SHEET 8	STA 165+00.00 TO STA 189+00.00											
SHEET 9	STA 189+00.00 TO STA 213+00.00								163	163		
SHEET 10	STA 213+00.00 TO STA 237+00.00											
SHEET 11	STA 237+00.00 TO STA 247+19.28						78	78				
*ADDITIONAL QUANTITY FOR REPLACEMENT DUE TO NORMAL WEAR OR CHANGING SITE CONDITIONS. QUANTITY INCREASED BY 5%.							8	8	544	544	7	7
PROJECT TOTALS		6808	6808	2026	360	360	164	164	11419	11419	147	147

NOTES
1.FM 546 INCLUDED IN QUANTITY CALCULATIONS

FM 982

SWP3 QUANTITY SUMMARY

CONT	SECT	JOB	HIGHWAY
0387	05	026	FM 982
DIST	COUNTY		SHEET NO.
DAL	Collin		22

CSJ:3476-02-015
SUMMARY OF EROSION CONTROL ITEMS

PLAN SHEET NO.	LOCATION	* 506 7039 TEMP SEDMT CONT FENCE (INSTALL) LF	* 506 7041 TEMP SEDMT CONT FENCE (REMOVE) LF
SHEET 1	BEGIN PROJECT TO STA 24+00.00		
SHEET 2	STA 24+00.00 TO STA 48+00.00		
SHEET 3	STA 48+00.00 TO STA 72+00.00	521	521
SHEET 4	STA 72+00.00 TO STA 96+00.00	300	300
SHEET 5	STA 96+00.00 TO STA 120+00.00	572	572
SHEET 6	STA 120+00.00 TO STA 144+00.00		
SHEET 7	STA 144+00.00 TO STA 168+00.00		
SHEET 8	STA 168+00.00 TO STA 174+26.09	195	195
*ADDITIONAL QUANTITY FOR REPLACEMENT DUE TO NORMAL WEAR OR CHANGING SITE CONDITIONS. QUANTITY INCREASED BY 5%.		80	80
PROJECT TOTALS		1668	1668

FM 982

SWP3 QUANTITY SUMMARY (FM 3286)

CONT	SECT	JOB	HIGHWAY
0387	05	026	FM 982
DIST	COUNTY		SHEET NO.
DAL	Collin		23

CSJ:0387-05-026
SUMMARY OF PAVEMENT MARKING ITEMS

PLAN SHEET NO.	LOCATION	662 7038	662 7114	666 7018	666 7024	666 7036	666 7042	666 7066	666 7123	666 7411	666 7423
		WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	REFL PAV MRK TY I (W)8"(DOT) (100MIL)	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	REFL PAV MRK TY I (W)(ARROW) (100MIL)	REFL PAV MRK TY I (W)(WORD) (100MIL)	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	REFL PAV MRK TY I(W)6"(SLD)(100 MIL)	REFL PAV MRK TY I(Y)6"(SLD)(100 MIL)
		LF	EA	LF	LF	LF	EA	EA	LF	LF	LF
SHEET 1	BEGIN PROJECT TO STA 21+00.00	3652	183		1472	101	7	7		4536	3652
SHEET 2	STA 21+00.00 TO STA 45+00.00	4800	240							4800	4800
SHEET 3	STA 45+00.00 TO STA 69+00.00	4800	240							4800	4800
SHEET 4	STA 69+00.00 TO STA 93+00.00	4800	240							4800	4800
SHEET 5	STA 93+00.00 TO STA 117+00.00	4800	240							4069	4800
SHEET 6	STA 117+00.00 TO STA 141+00.00	6120	306	30	100	23	4	4	367	4168	6120
SHEET 7	STA 141+00.00 TO STA 165+00.00	4800	240							4687	4800
SHEET 8	STA 165+00.00 TO STA 189+00.00	4800	240							4700	4800
SHEET 9	STA 189+00.00 TO STA 213+00.00	4800	240	18	200					3857	4800
SHEET 10	STA 213+00.00 TO STA 237+00.00	5738	287						348	4914	5738
SHEET 11	STA 237+00.00 TO STA 247+19.28	1815	91	63	200	236	4	4	178	1507	1815
	PROJECT TOTALS	50925	**2547**	111	1972	360	15	15	893	**46838**	50925

CSJ:0387-05-026
SUMMARY OF PAVEMENT MARKING ITEMS (CONT'D)

PLAN SHEET NO.	LOCATION	672 7002	672 7004	677 7001	678 7002
		REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	ELIM EXT PAV MRK & MRKS (4")	PAV SURF PREP FOR MRK (6")
		EA	EA	LF	LF
SHEET 1	BEGIN PROJECT TO STA 24+00.00	148	366		
SHEET 2	STA 24+00.00 TO STA 48+00.00	480	480		
SHEET 3	STA 48+00.00 TO STA 72+00.00	480	480	600	600
SHEET 4	STA 72+00.00 TO STA 96+00.00	480	480		
SHEET 5	STA 96+00.00 TO STA 120+00.00	407	480		
SHEET 6	STA 120+00.00 TO STA 144+00.00	417	612		
SHEET 7	STA 144+00.00 TO STA 168+00.00	469	480		
SHEET 8	STA 168+00.00 TO STA 192+00.00	470	480		
SHEET 9	STA 192+00.00 TO STA 216+00.00	386	480		
SHEET 10	STA 213+00.00 TO STA 237+00.00	492	574	189	189
SHEET 11	STA 237+00.00 TO STA 247+19.28	151	182	2039	2039
	PROJECT TOTALS	**4232**	**5094**	**2828**	**2828**

CSJ:0387-05-026
SUMMARY OF SIGNING ITEMS

PLAN SHEET NO.	LOCATION	644 7001	644 7031	644 7034
		IN SM RD SN SUP&AM TY10BWG(1)SA(P)	IN SM RD SN SUP&AM TYS80(1)SA(U)	IN SM RD SN SUP&AM TYS80(1)SA(U-BM)
		EA	EA	
SHEET 1	STA 0+00.00 TO STA 24+00.00	1	3	1
SHEET 2	STA 24+00.00 TO STA 48+00.00			
SHEET 3	STA 48+00.00 TO STA 72+00.00			
SHEET 4	STA 72+00.00 TO STA 96+00.00			
SHEET 5	STA 96+00.00 TO STA 120+00.00			
SHEET 6	STA 120+00.00 TO STA 144+00.00			
SHEET 7	STA 144+00.00 TO STA 168+00.00			
SHEET 8	STA 168+00.00 TO STA 192+00.00			
SHEET 9	STA 192+00.00 TO STA 216+00.00			
SHEET 10	STA 216+00.00 TO STA 240+00.00			
SHEET 11	STA 240+00.00 TO STA 247+19.28			
	PROJECT TOTALS	**1**	3	**1**

NOTES
1.FM 546 INCLUDED IN QUANTITY CALCULATIONS

FM 982

SIGN & PAVEMENT MARKING QUANTITY SUMMARY

CONT	SECT	JOB	HIGHWAY
0387	05	026	FM 982
DIST	COUNTY		SHEET NO.
DAL	Collin		24

CSJ:3476-02-015
SUMMARY OF PAVEMENT MARKING ITEMS

PLAN SHEET NO.	LOCATION	662 7038	662 7114	666 7009	666 7018	666 7024	666 7036	666 7042	666 7066	666 7123	666 7411	666 7423
		WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	REFL PAV MRK TY I (W)6"(DOT) (100MIL)	REFL PAV MRK TY I (W)8"(DOT) (100MIL)	REFL PAV MRK TY I (W)8"(SLD)(100 MIL)	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	REFL PAV MRK TY I (W)(ARROW) (100MIL)	REFL PAV MRK TY I (W)(WORD) (100MIL)	REFL PAV MRK TY I (Y)24"(SLD) (100MIL)	REFL PAV MRK TY I(W)6"(SLD)(100 MIL)	REFL PAV MRK TY I(Y)6"(SLD)(100 MIL)
		LF	EA	LF	LF	LF	LF	EA	EA	LF	LF	LF
SHEET 1	BEGIN PROJECT TO STA 24+00.00	6057	303		30	100	35	2	2	362	4080	6057
SHEET 2	STA 24+00.00 TO STA 48+00.00	4800	240	21							4763	4800
SHEET 3	STA 48+00.00 TO STA 72+00.00	4800	240								4744	4800
SHEET 4	STA 72+00.00 TO STA 96+00.00	4800	240								4733	4800
SHEET 5	STA 96+00.00 TO STA 120+00.00	4800	240								4600	4800
SHEET 6	STA 120+00.00 TO STA 144+00.00	4800	240								4800	4800
SHEET 7	STA 144+00.00 TO STA 168+00.00	4800	240								4800	4800
SHEET 8	STA 168+00.00 TO STA 174+26.09	1254	63								1254	1254
PROJECT TOTALS		36111	1806	21	30	100	35	2	2	362	33774	36111

CSJ:3476-02-015
SUMMARY OF PAVEMENT MARKING ITEMS (CONT'D)

PLAN SHEET NO.	LOCATION	672 7002	672 7004	677 7001	678 7002
		REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	ELIM EXT PM & MRKS (4")	PAV SURF PREP FOR MRK (6")
		EA	EA	LF	LF
SHEET 1	BEGIN PROJECT TO STA 24+00.00	408	303		
SHEET 2	STA 24+00.00 TO STA 48+00.00	477	240		
SHEET 3	STA 48+00.00 TO STA 72+00.00	475	240	1646	1646
SHEET 4	STA 72+00.00 TO STA 96+00.00	474	240	4506	4506
SHEET 5	STA 96+00.00 TO STA 120+00.00	460	240	3680	3680
SHEET 6	STA 120+00.00 TO STA 144+00.00	480	240	9600	9600
SHEET 7	STA 144+00.00 TO STA 168+00.00	480	240	8782	8782
SHEET 8	STA 168+00.00 TO STA 192+00.00	126	63		
PROJECT TOTALS		3380	1806	28214	28214

FM 982

SIGN & PAVEMENT MARKING QUANTITY SUMMARY (FM 3286)

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0387	05	026	FM 982
DIST	COUNTY		SHEET NO.
DAL	Collin		25

DATE: 2024/09/02 9:35:41 AM
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CK: DW: CK: DW:

SUMMARY OF DRIVEWAY ITEMS 0387-05-026												
				104 7011	464 7003	464 7005	467 7308	467 7328	496 7004	496 7007	530 7006	530 7010
DRIVEWAY NO.	EXISTING MATERIAL/TYPE	WIDTH	RADII	REMOVING CONC (DRIVEWAYS)	RC PIPE (CL III)(18 IN)	RC PIPE (CL III)(24 IN)	SET (TY II) (18 IN) (RCP) (6: 1) (P)	SET (TY II) (24 IN) (RCP) (6: 1) (P)	REMOV STR (SET)	REMOV STR (PIPE)	DRIVEWAYS (CONC)	DRIVEWAYS (ACP)
		FT	FT	SY	LF	LF	EA	EA	EA	LF	SY	SY
DW1	DIRT	MATCH	15			34		2				111
DW2	DIRT	28	15			40		2				131
DW3	CONCRETE	MATCH	15	69							69	
DW3A	ASPHALT	MATCH	15									70
DW4	ASPHALT	MATCH	15									50
DW5	ASPHALT	MATCH	15									53
DW6	ASPHALT	MATCH	15									53
DW7	DIRT	28	15		40		2					87
DW8	ASPHALT	MATCH	15		34		2					63
DW9	CONCRETE	MATCH	15	121							96	
DW10	ASPHALT	MATCH	15									84
DW11	ASPHALT	MATCH	15									41
DW12	CONCRETE	MATCH	15	48							40	
FM 546	ASPHALT	MATCH	MATCH			100		2	2	61		
PROJECT TOTAL				238	74	174	4	6	2	61	205	743

1. MATCH EXISTING DRIVEWAY WIDTH WITH A MINIMUM OF 11'.
2. MATCH EXISTING DRIVEWAY RADIUS WITH A MINIMUM OF 15'.
3. MATCH EXISTING DRIVEWAY RADIUS (CROSS STREETS) WITH A MINIMUM OF 30'.
4. SEE "PLAN SHEET" AND "MISCELLANEOUS ROADWAY DETAILS" SHEET FOR DRIVEWAY AND DRIVEWAY PIPE LOCATIONS AND DETAILS.
5. REMOVAL OF ASPHALT DRIVEWAY IS SUBSIDIARY TO ITEM 530.
   NO ADDITIONAL COST FOR CUTTING PIPE AT DRIVEWAY CROSSING.
6. FM 546 QUANTIES INCLUDING IN QUANTITY CALCULATIONS.

FM 982

DRIVEWAY QUANTITY SUMMARY

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0387	05	026	FM 982
DIST	COUNTY		SHEET NO.
DAL	Collin		26

DW: DW: CK: CK:

DATE: 2024/09/03 7:01:44 PM
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DATE: 2022/8/29
FILE: DOCUMENT NAME

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
1	1	R1-1	STOP	36 x 36	X		10BWG	1	SA	P		
	2	W1-7T	<BI-DIRECTIONAL LRG ARRW w/ CHEVRONS>	96 x 36	X		S80	1	SA	U	BM	
	3	M3-1	NORTH <AUXILIARY SIGN>	24 x 12	X		S80	1	SA	U		
		M1-6F	<FM SHIELD> FARM ROAD (ROUTE #)	24 x 24	X							
		M6-1	<ARROW - HORIZ. STRGHT> <AUXILIARY SIGN>	21 x 15	X							
		M3-3	SOUTH <AUXILIARY SIGN>	24 x 12	X							
		M1-6F	<FM SHIELD> FARM ROAD (ROUTE #)	24 x 24	X							
		M6-1	<ARROW - HORIZ. STRGHT> <AUXILIARY SIGN>	21 x 15	X							
	4	M3-4	WEST <AUXILIARY SIGN>	24 x 12	X		S80	1	SA	U		
		M1-6F	<FM SHIELD> FARM ROAD (ROUTE #)	24 x 24	X							
		M6-1	<ARROW - HORIZ. STRGHT> <AUXILIARY SIGN>	21 x 15	X							
		M3-1	NORTH <AUXILIARY SIGN>	24 x 12	X							
		M1-6F	<FM SHIELD> FARM ROAD (ROUTE #)	24 x 24	X							
		M6-3	<ARROW - VERTICAL STRGHT> <AUX. SIGN>	21 x 15	X							
	5	M3-3	SOUTH <AUXILIARY SIGN>	24 x 12	X		S80	1	SA	U		
		M1-6F	<FM SHIELD> FARM ROAD (ROUTE #)	24 x 24	X							
		M6-3	<ARROW - VERTICAL STRGHT> <AUX. SIGN>	21 x 15	X							
		M3-4	WEST <AUXILIARY SIGN>	24 x 12	X							
		M1-6F	<FM SHIELD> FARM ROAD (ROUTE #)	24 x 24	X							
		M6-1	<ARROW - HORIZ. STRGHT> <AUXILIARY SIGN>	21 x 15	X							

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

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

http://www.txdot.gov/

NOTE:

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

** Salvage signs and reinstall on the new post.

CSJ:0387-05-026

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 1 OF 1

FILE: sumsi6.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0387	05	026	FM 982
4-16	DIST	COUNTY		SHEET NO.
8-16	DAL	Collin		27

GENERAL SEQUENCE OF WORK (CSJ: 0387-05-026)

1.) ERECT PROJECT LIMIT AND ADVANCE WARNING SIGNS AS SHOWN IN THE PLANS, BC, TCP, AND WZ STANDARDS AND AS DIRECTED BY THE ENGINEER.

2.) PLACE AND MAINTAIN SWP3 DEVICES AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER. TEMPORARY SWP3 EROSION CONTROL MEASURES SHALL ONLY BE PLACED IN AREAS WHERE SOIL DISTRUBANCE OR OTHER POTENTIAL POLLUTANT-GENERATING ACTIVITIES ARE EXPECTED TO OCCUR WITHIN TWO WEEKS.

* 3.) BLADE THE TOPSOIL OFF THE SLOPE, SALVAGE/WINDROW OUT OF THE WAY OF WORK. PLACE SWP3 CONTROL MEASURES AT STOCKPILE AS APPROPRIATE TO PROTECT SOIL QUALITY AND PREVENT SEDIMENTATION OF DOWNSLOPE PERIMETER, ROADWAYS, CULVERTS AND WATERWAYS

4.) CONSTRUCT FLEXIBLE PAVEMENT REPAIR AS DIRECTED BY THE ENGINEER.

* 5.) SAW CUT AND REMOVE 1 FOOT OF EXISTING PAVEMENT AND CONSTRUCT NOTCH WIDENING AS SHOWN IN THE TYPICAL SECTIONS. BACKFILL PAVEMENT EDGES AT THE END OF EACH WORK DAY.

* 6.) CONSTRUCT DRIVEWAYS AND DRIVEWAY DRAINAGE STRUCTURES .

7.) MILL 2" OF EXISTING SURFACE. PLACE WORKZONE NON-REMOVABLE PAVEMENT MARKINGS. CONSTRUCT 2" OVERLAY IN HALF WIDTH SECTIONS. THE ROAD (UP TO 2000 LF MAX OR AS APPROVED BY THE ENGINEER BASED UPON THE DAILY PRODUCTION RATE OF THE CONTRACTOR) ON THE SAME DAY. REPEAT THE SAME PROCEDURE FOR THE ENTIRE LENGTH OF THE PROJECT.

* 8.) PLACE TABS FOR THE ENTIRE LENGTH OF THE PROJECT AND INSTALL PERMANENT STRIPING WITHIN 14 DAYS.

9.) BACKFILL/ EMBANKMENT EDGES AND GRADE TO DRAIN IN ACCORDANCE WITH CROSS-SECTIONS AND THE EXISTING TOPOGRAPHY. PULL TOPSOIL BACK UP THE SLOPE.

10.) PLACE PERMANENT SIGNS AND PLACE PERMANENT PAVEMENT MARKINGS.

11.) ESTABLISH PERMANENT VEGETATIVE COVER.

12.) TEMPORARY SW3P EROSION CONTROL MEASURES SHALL BE REMOVED WITHIN TWO WEEKS OF VEGETATION ESTABLISHMENT IN THEIR CONTROL AREA OR AS APPROVED BY THE ENGINEER.

13.) PERFORM FINAL SITE CLEAN UP AS DIRECTED BY THE ENGINEER AND REMOVE PROJECT LIMIT/ADVANCE WARNING SIGNS.

GENERAL SEQUENCE OF WORK (CSJ: 3476-02-015)

1.) ERECT PROIECT LIMIT AND ADVANCE WARNING SIGNS AS SHOWN IN THE PLANS, BC, TCP, AND WZ STANDARDS AND AS DIRECTED BY THE ENGINEER.

2.) PLACE AND MAINTAIN SWP3 DEVICES AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER. TEMPORARY SWP3 EROSION CONTROL MEASURES SHALL ONLY BE PLACED IN AREAS WHERE SOIL DISTRUBANCE OR OTHER POTENTIAL POLLUTANT-GENERATING ACTIVITIES ARE EXPECTED TO OCCUR WITHIN TWO WEEKS.

3.) PLACE SWP3 CONTROL MEASURES AT STOCKPILE AS APPROPRIATE TO PROTECT SOIL QUALITY AND PREVENT SEDIMENTATION OF DOWNSLOPE PERIMETER, ROADWAYS, CULVERTS AND WATERWAYS

4.) CONSTRUCT FLEXIBLE PAVEMENT REPAIR AS DIRECTED BY THE ENGINEER.

5.) MILL 2". PLACE WORKZONE NON-REMOVABLE PAVEMENT MARKINGS. AND OVERLAY 2" SP-C IN SECTIONS OF ROADWAY FOR THE HALF WIDTH OF THE ROAD (UP TO 2000 LF MAX OR AS APPROVED BY THE ENGINEER BASED UPON THE DAILY PRODUCTION RATE OF THE CONTRACTOR) ON THE SAME DAY. REPEAT THE SAME PROCEDURE FOR THE ENTIRE LENGTH OF THE PROJECT.

6.) PLACE TABS FOR THE ENTIRE LENGTH OF THE PROJECT.

7.) PLACE PERMANENT PAVEMENT MARKINGS AND RUMBLE STRIPS.

8.) ESTABLISH PERMANENT VEGETATIVE COVER.

9.) TEMPORARY SW3P EROSION CONTROL MEASURES SHALL BE REMOVED WITHIN TWO WEEKS OF VEGETATION ESTABLISHMENT IN THEIR CONTROL AREA OR AS APPROVED BY THE ENGINEER.

10.) PERFORM FINAL SITE CLEAN UP AS DIRECTED BY THE ENGINEER AND REMOVE PROJECT LIMIT/ADVANCE WARNING SIGNS.

TCP GENERAL NOTES:

1.) INTERMITTENT ONE-WAY TRAFFIC CONTROL (LANE CLOSURES) WILL BE IN ACCORDANCE WITH THE TCP STANDARDS AND AS DIRECTED BY THE ENGINEER.

2.) OVERNIGHT LANE CLOSURES WILL NOT BE PERMITTED.

3.) THE CONTRACTOR WILL PROVIDE AND MAINTAIN SKILLED FLAGGERS EQUIPPED WITH TWO-WAY RADIOS TO HANDLE TRAFFIC THROUGH THE WORK AREAS.

4.) COMPLY WITH TCP(7-1)-13 WHICH INCLUDES PROVISIONS FOR CERTAIN SIGNS TO BE INSTALLED AND TO REMAIN UNTIL PERMANENT PAVEMENT MARKINGS ARE IN PLACE. THESE SIGNS ARE IN ADDITION TO SIGNS THAT MAY BE REQUIRED BY THE VARIOUS TCP AND BC STANDARDS.

* REFER TO ROADWAY LAYOUT SHEET 01(FM 982) FOR LOCATIONS AND STATIONS FOR SHOULDER WIDENING.

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

FM 982

TCP SEQUENCE OF WORK

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0387	05	026ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		28

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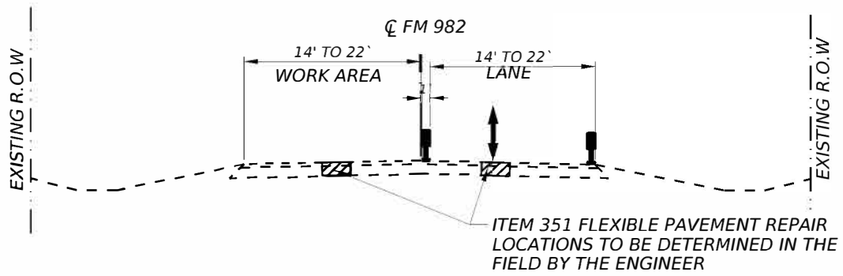
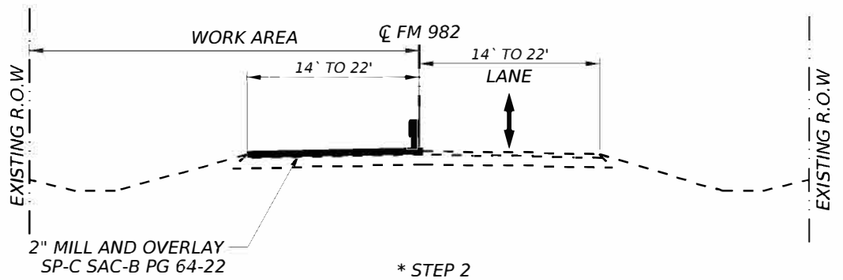
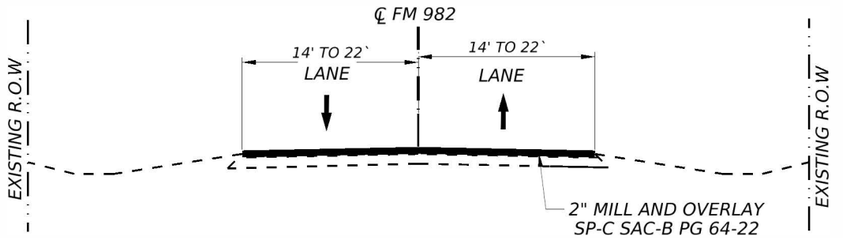


* STEP 1
CONSTRUCTION OPERATION PRESENT



* STEP 2
CONSTRUCTION OPERATION PRESENT



* STEP 3
CONSTRUCTION OPERATION PRESENT

VERTICAL PANEL

CONSTRUCTED IN PREVIOUS STEP

NOTES:
1. TWO WAY TRAFFIC SHALL BE ESTABLISHED AT THE END OF EACH WORK DAY.
2. * OPERATION WILL REFLECT ON OPPOSITE TRAVEL LANE OF CONSTRUCTION

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

FM 982

TCP TYPICAL SECTIONS

N.T.S SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		29

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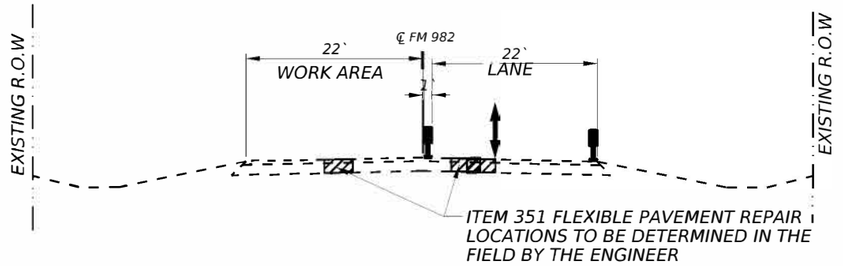
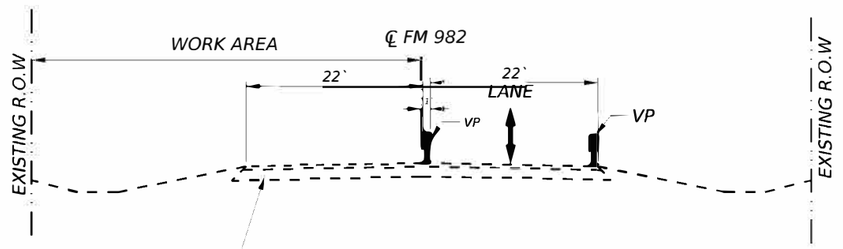
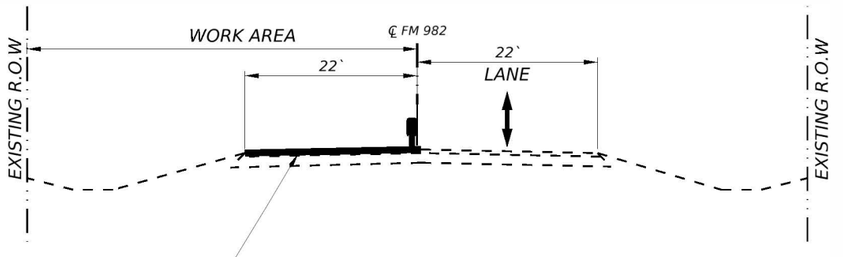


* STEP 1
CONSTRUCTION OPERATION PRESENT



* STEP 2
CONSTRUCTION OPERATION PRESENT



* STEP 3
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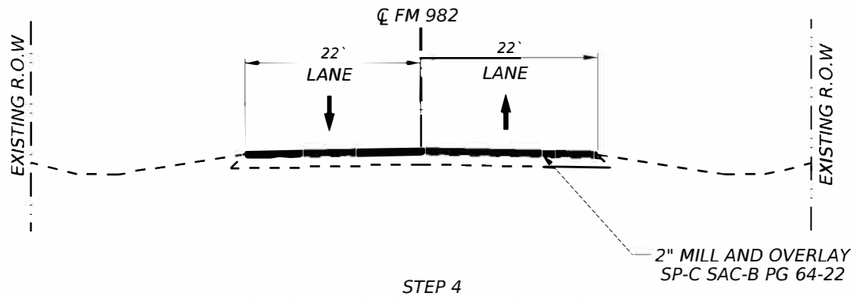

STEP 4
CONSTRUCTION OPERATION NOT PRESENT

VERTICAL PANEL

CONSTRUCTED IN PREVIOUS STEP

NOTES:
1. TWO WAY TRAFFIC SHALL BE ESTABLISHED AT THE END OF EACH WORK DAY.
2. * OPERATION WILL REFLECT ON OPPOSITE TRAVEL LANE OF CONSTRUCTION

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/05/2024

FM 982

TCP TYPICAL SECTIONS
(FM 3286)

N.T.S SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		30

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FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/038705026/4 - Design/Plan Set/2. TCP/STANDARDS/bc-21.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 9-07 8-14 5-10 5-21	0387	05	026,ETC	FM 982,ETC
	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		31

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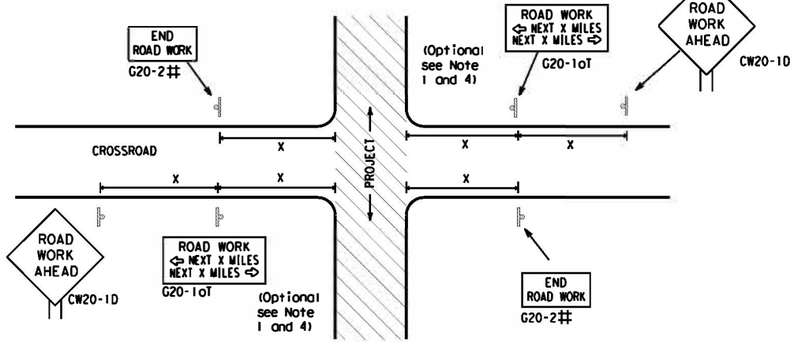
TYPICAL LOCATION OF CROSSROAD SIGNS



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]

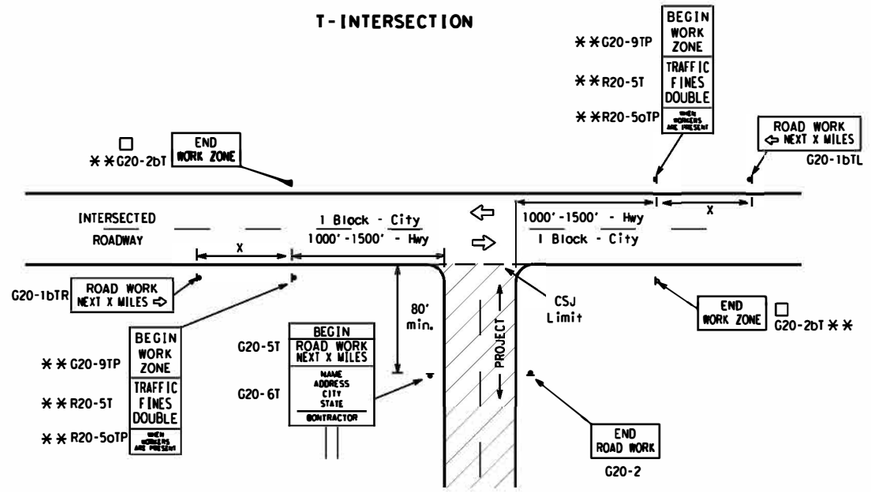
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ 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.

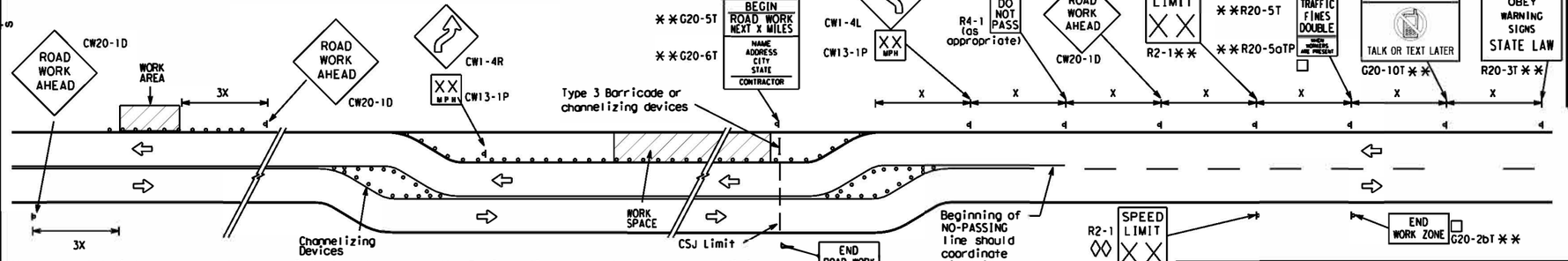
T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

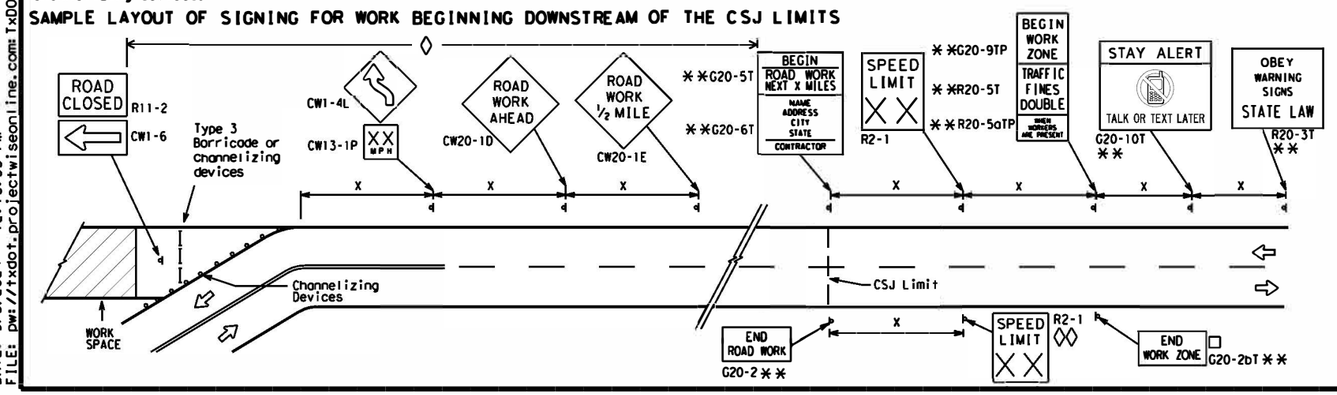
1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
2. If construction closes the road at a T-intersection, the Contractor 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.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



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

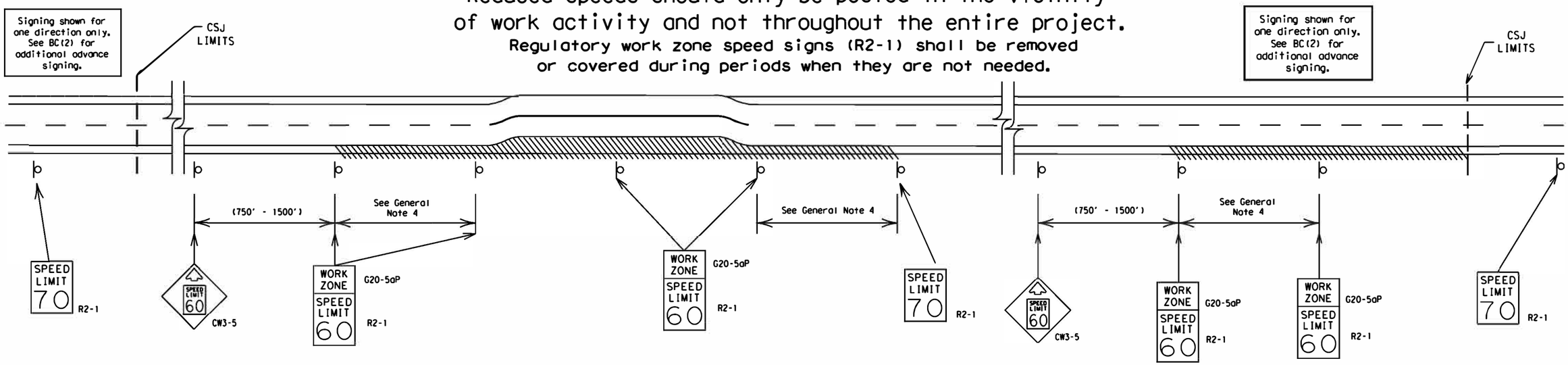
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0387	05	026, ETC	FM 982, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	DAL	COLLIN		32

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
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REVISIONS 9-07 8-14 7-13 5-21	0387	05	026,ETC	FM 982,ETC
	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		33

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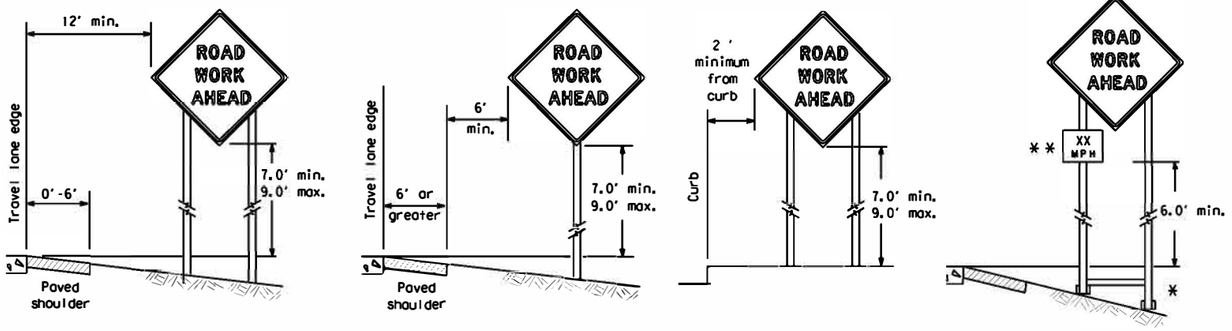
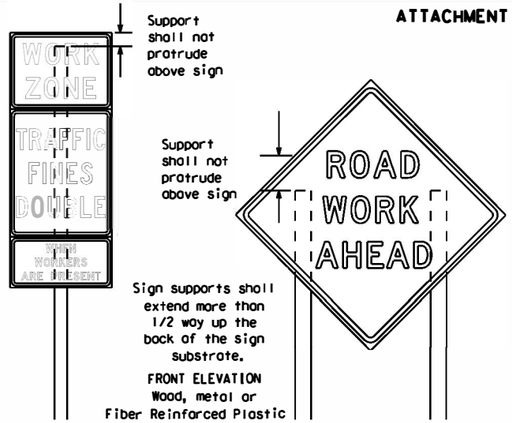
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

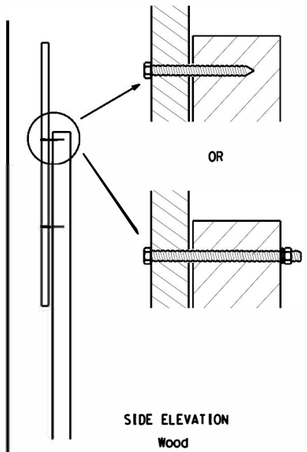


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





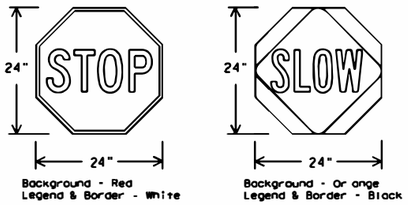
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

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BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0387	05	026,ETC	FM 982,ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	DAL	COLLIN		34

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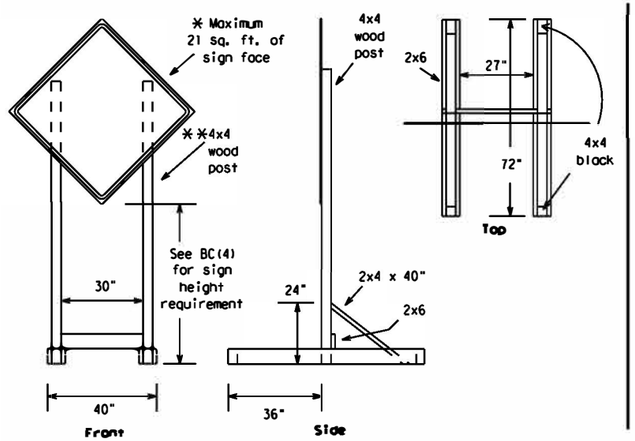
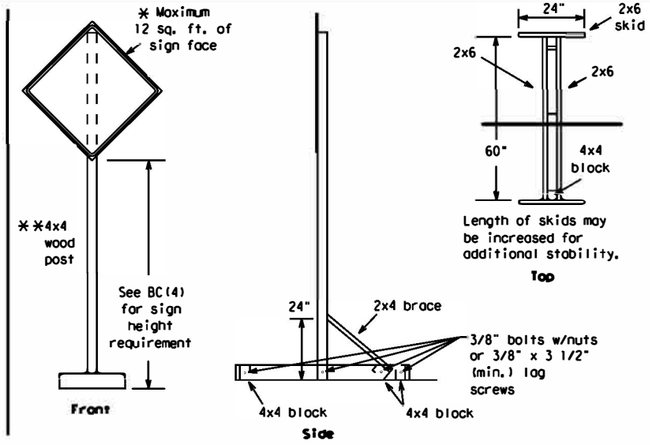
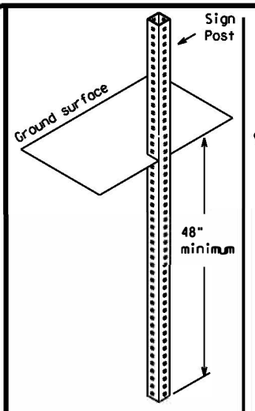


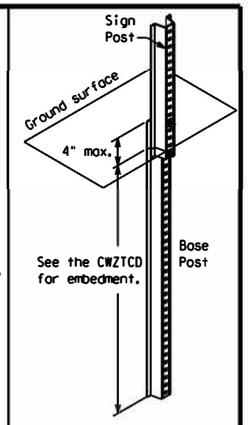


SKID MOUNTED WOOD SIGN SUPPORTS

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



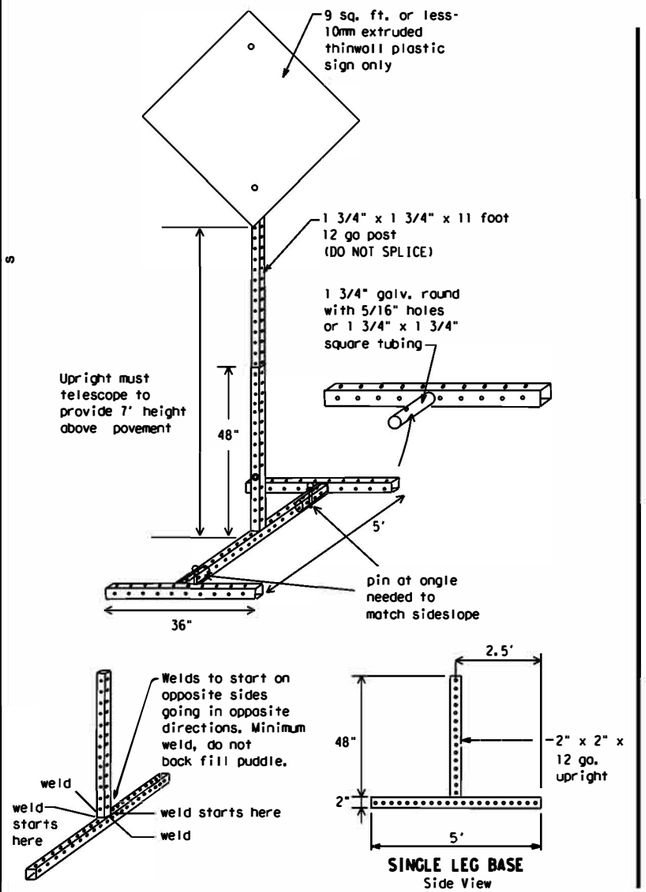
PERFORATED SQUARE METAL TUBING

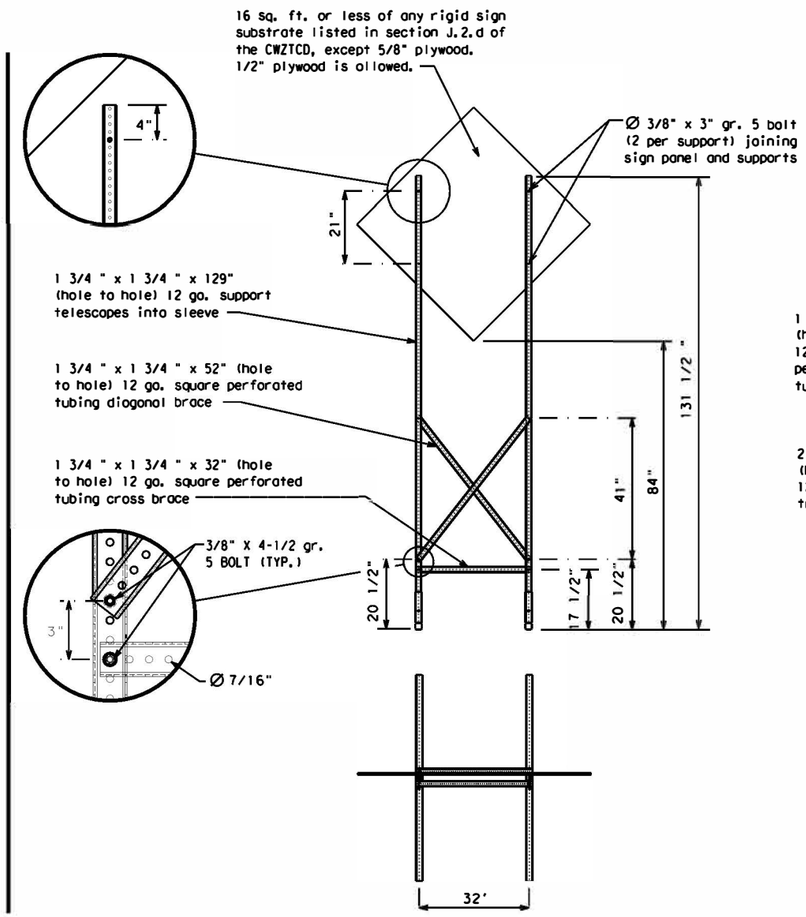


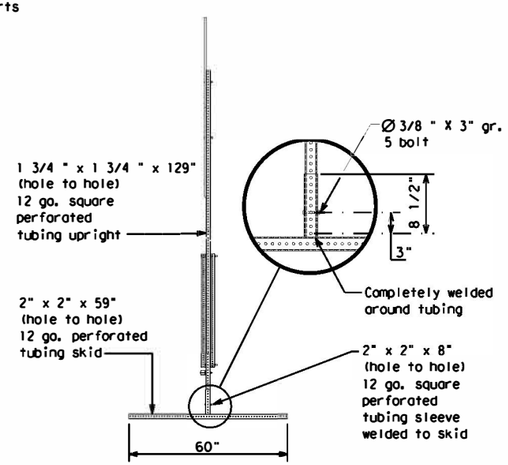
WING CHANNEL
Lap-splice/base bolted anchor

GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

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BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	DAL	COLLIN		35

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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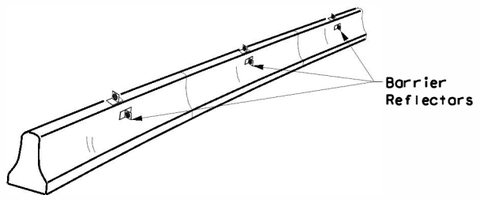
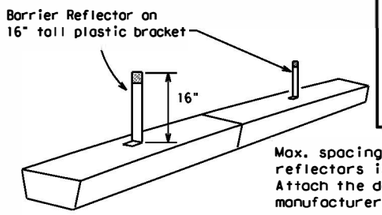
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



CONCRETE TRAFFIC BARRIER (CTB)

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

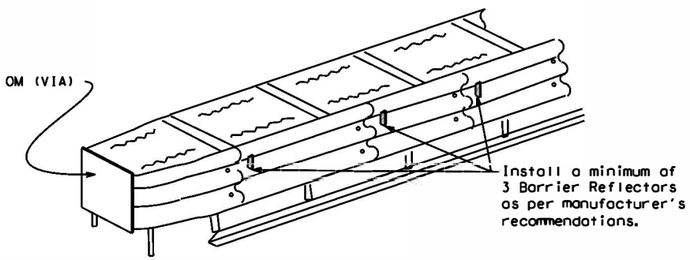


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)

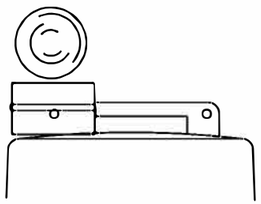


DELINEATION OF END TREATMENTS

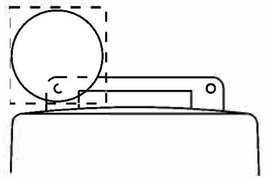
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

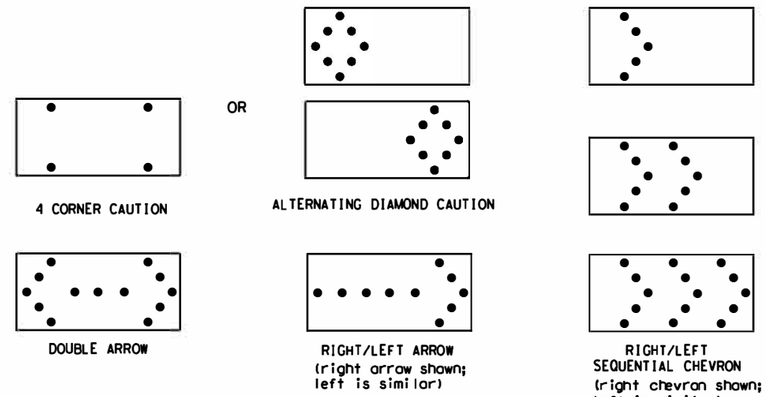
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is on 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	0387	05	026,ETC	FM 982,ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	DAL	COLLIN		37

DATE: 9/3/2024 12:17:07 PM
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

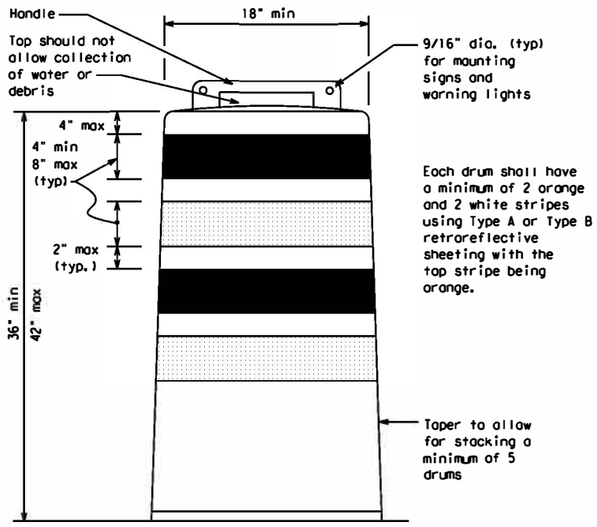
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

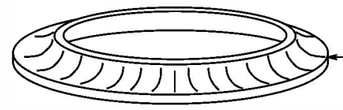
RETROREFLECTIVE SHEETING

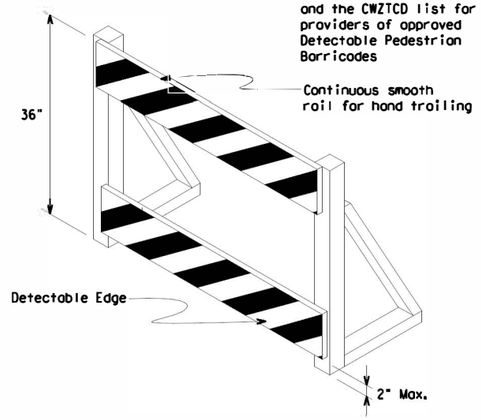
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

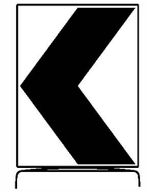




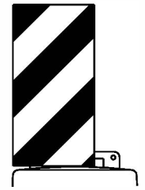


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	03B7	05	026,ETC	FM 982,ETC
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	DAL	COLLIN		38
7-13				

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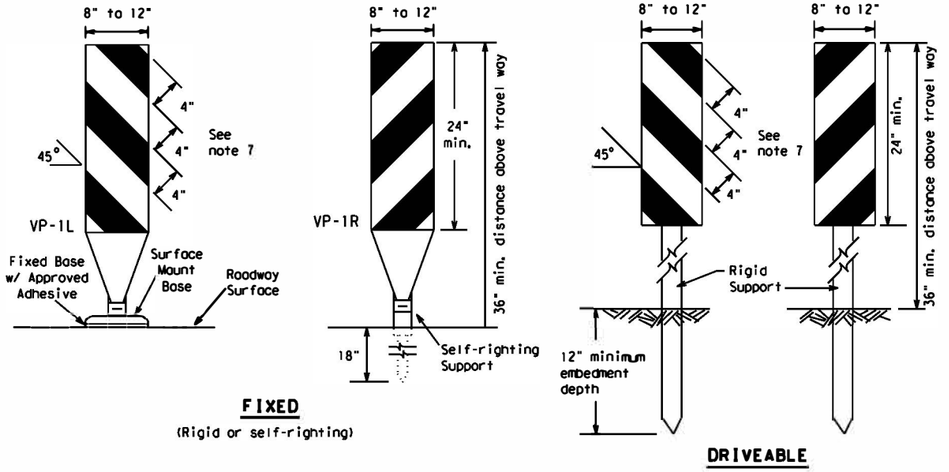
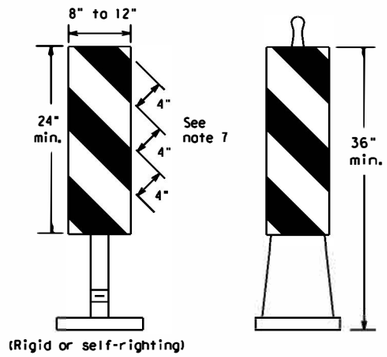


FIXED
(Rigid or self-righting)

DRIVEABLE

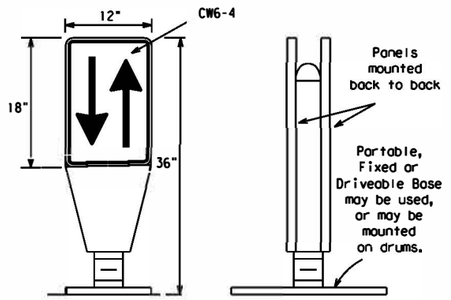


(Rigid or self-righting)

PORTABLE

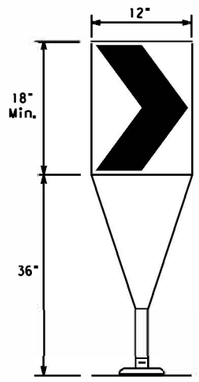
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



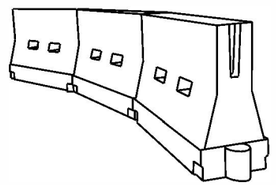
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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9-07 8-14	DIST	COUNTY		SHEET NO.
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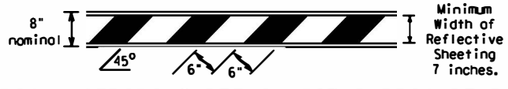
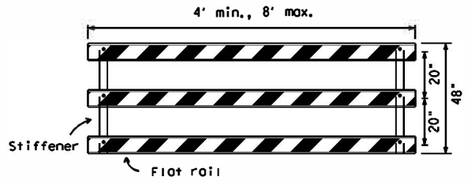
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



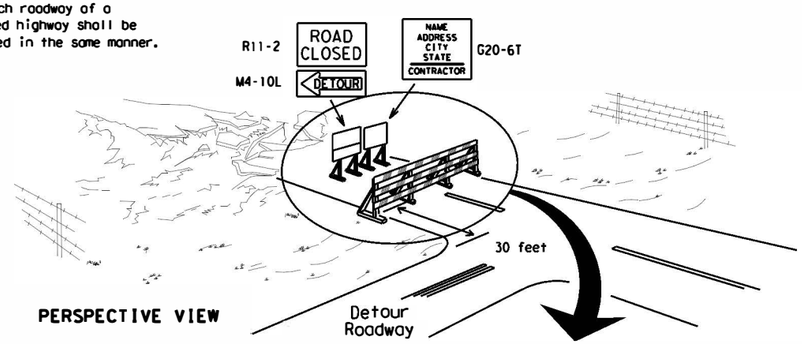
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

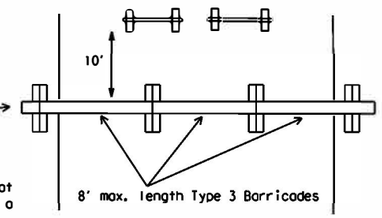
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

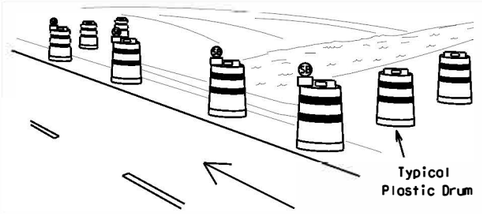
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

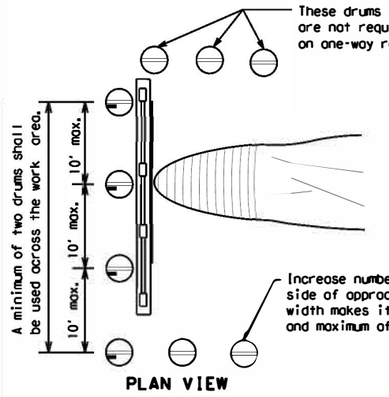
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

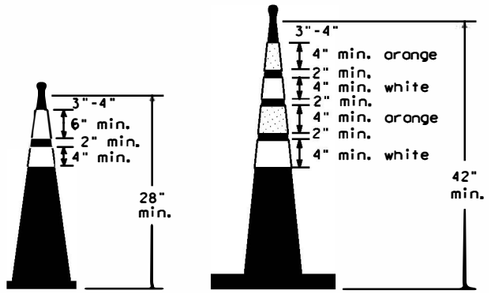
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



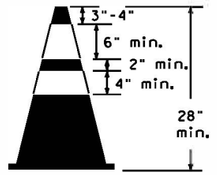
LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

PLAN VIEW

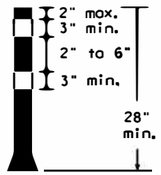
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

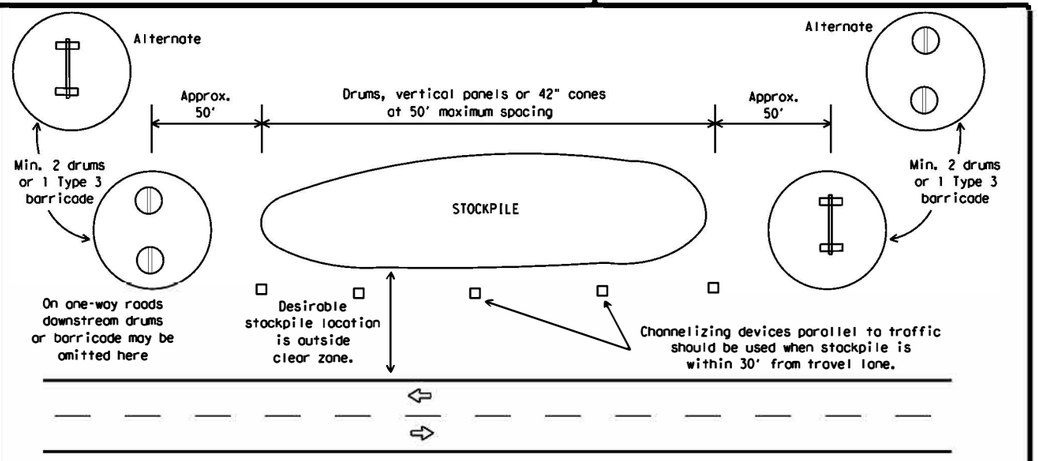


Tubular Marker

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE:	bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002		CONT	SECT	JOB	HIGHWAY
REVISIONS		0387	05	026, ETC	FM 982, ETC
9-07 8-14		DIST	COUNTY		SHEET NO.
7-13 5-21		DAL	COLLIN		40

DATE: 9/3/2024 12:17:13 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/038705026/4 - Design/Plan Set/2. TCP/STANDARDS/bc-21.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.

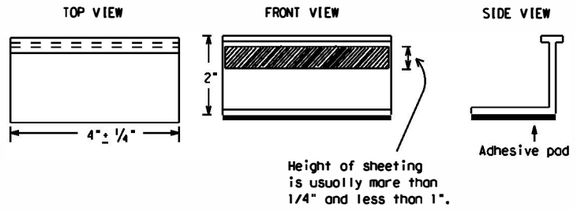
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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 2-98 9-07 5-21	0387	05	026,ETC	FM 982,ETC
1-02 7-13	DIST	COUNTY		SHEET NO.
11-02 8-14	DAL	COLLIN		41

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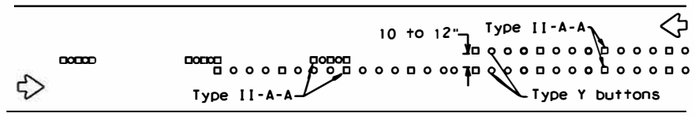
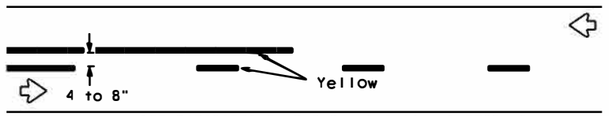
PAVEMENT MARKING PATTERNS

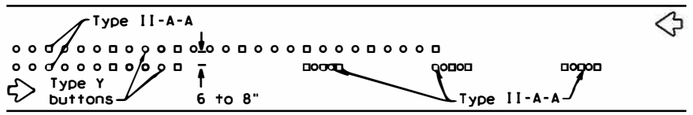
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



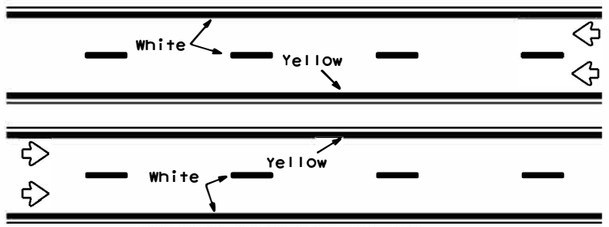
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



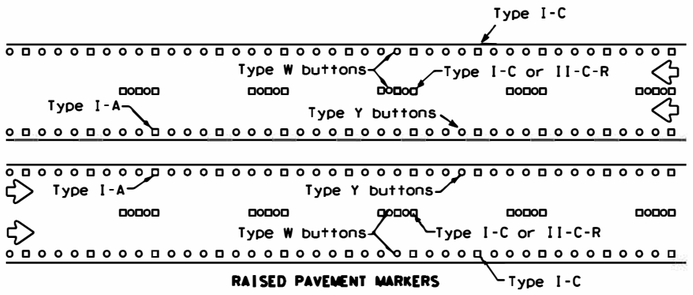
RAISED PAVEMENT MARKERS - PATTERN B

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



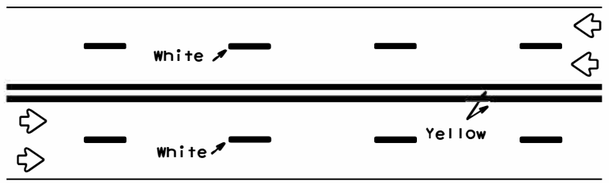
REFLECTORIZED PAVEMENT MARKINGS



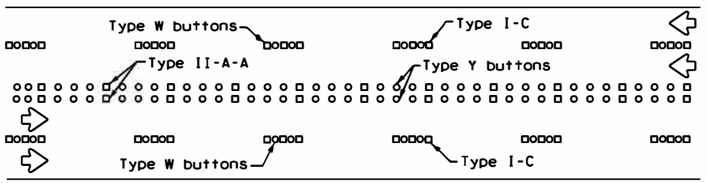
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



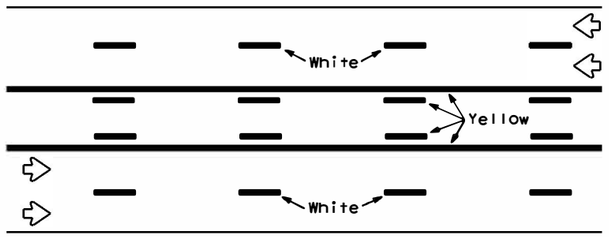
REFLECTORIZED PAVEMENT MARKINGS



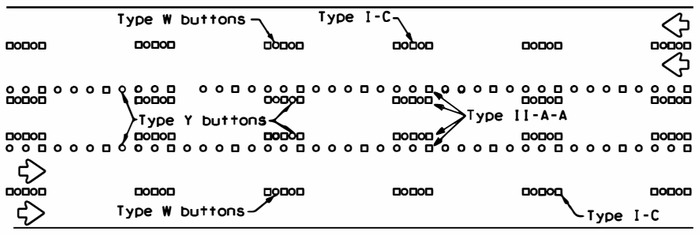
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

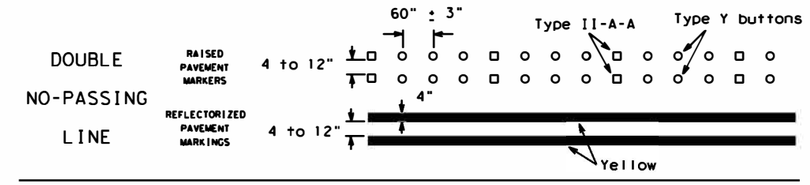
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

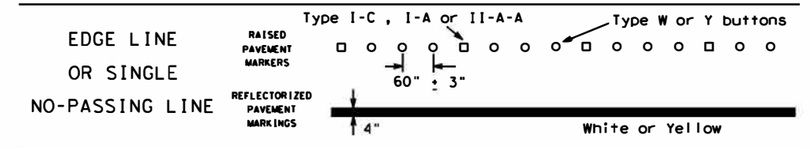
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

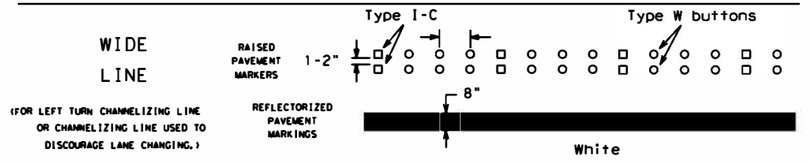


EDGE LINE OR SINGLE NO-PASSING LINE



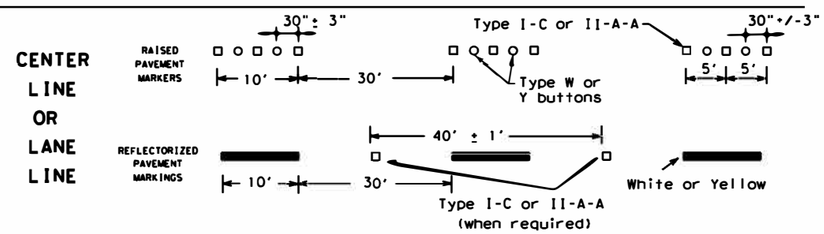
WIDE LINE

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

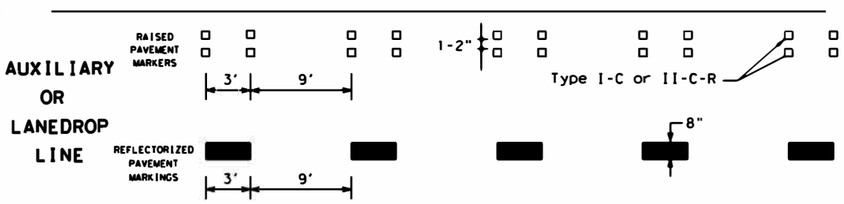


BROKEN LINES

CENTER LINE OR LANE LINE

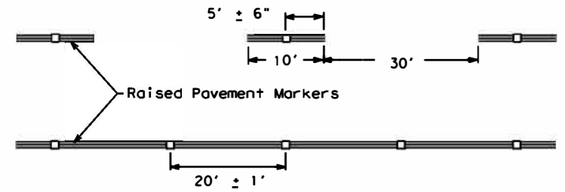


AUXILIARY OR LANEDROP LINE



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
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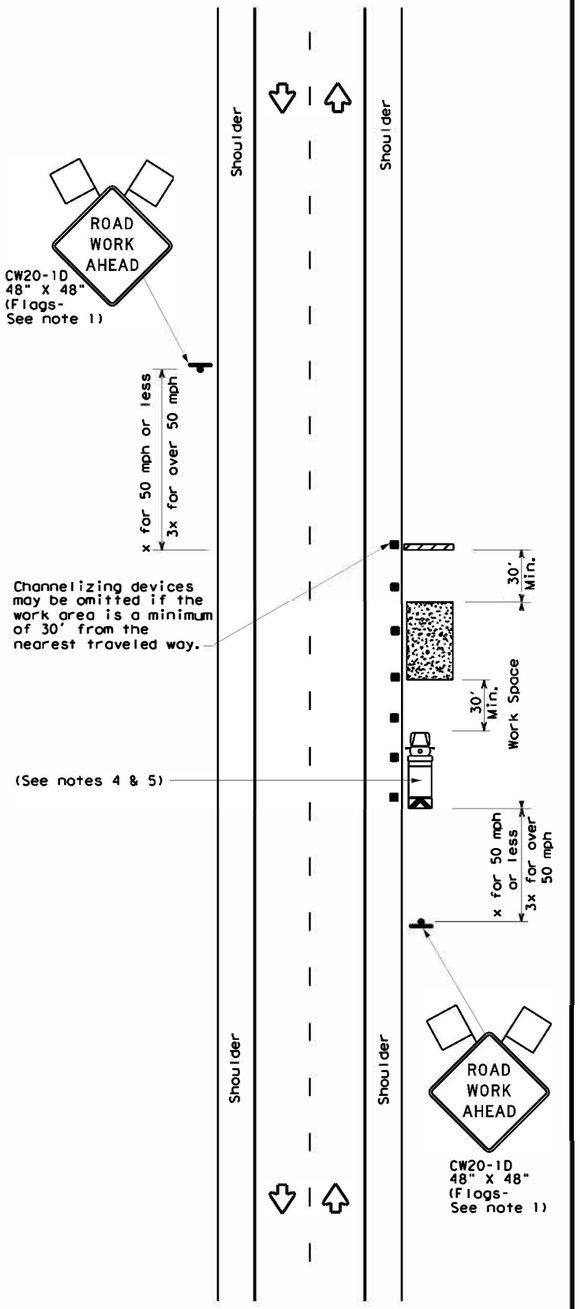
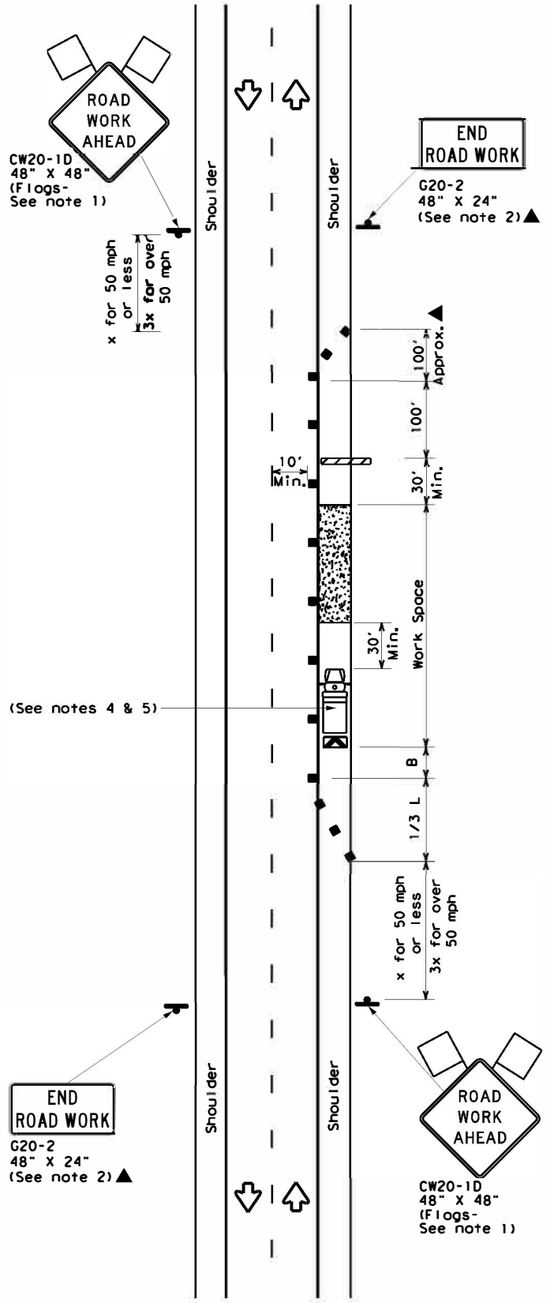


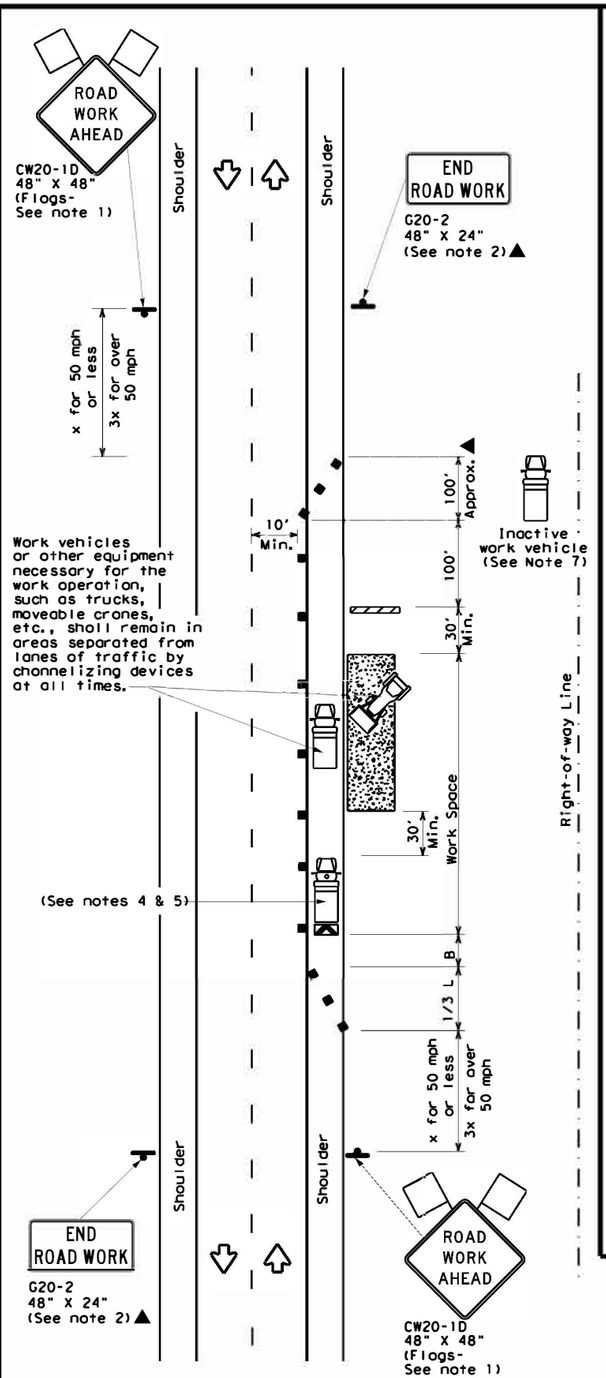
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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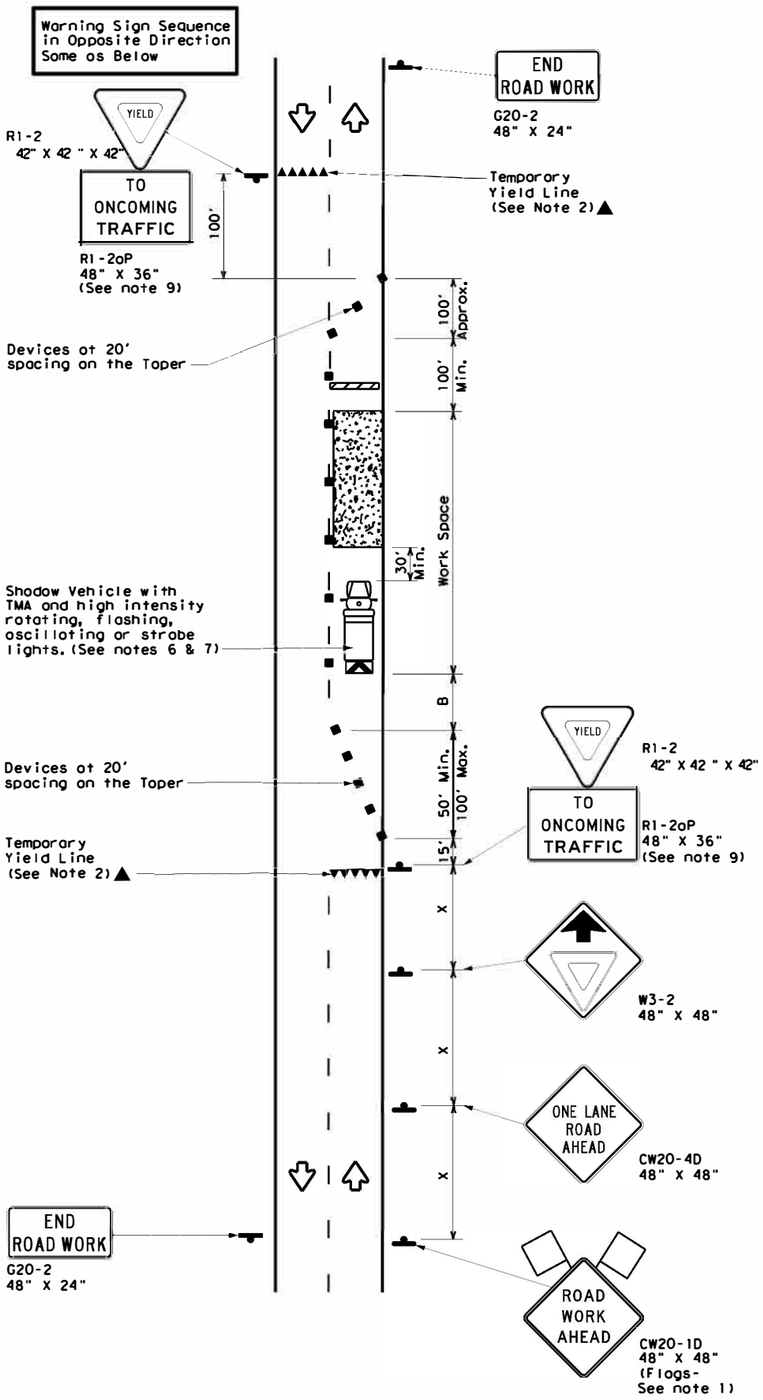
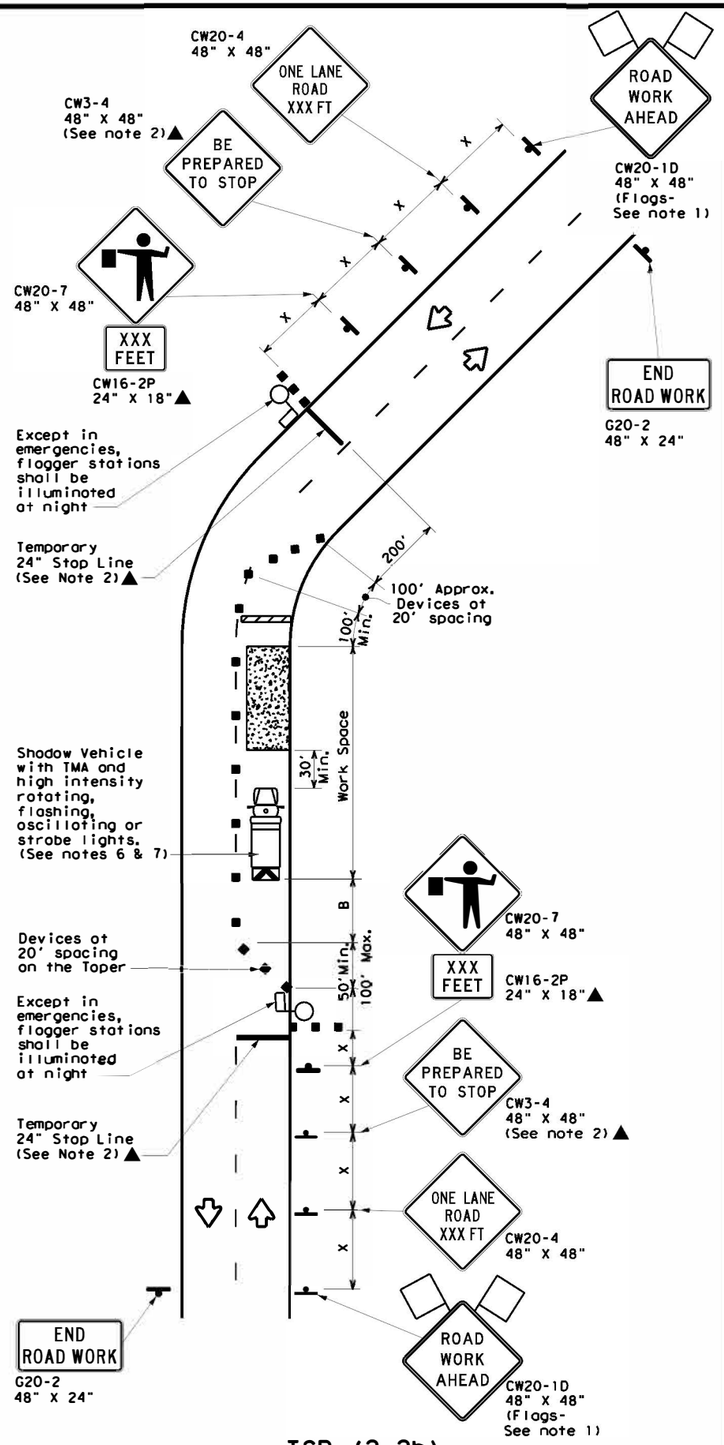


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



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 R1-2oP "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 situations.

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
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1-97 2-12	DAL	COLLIN		44
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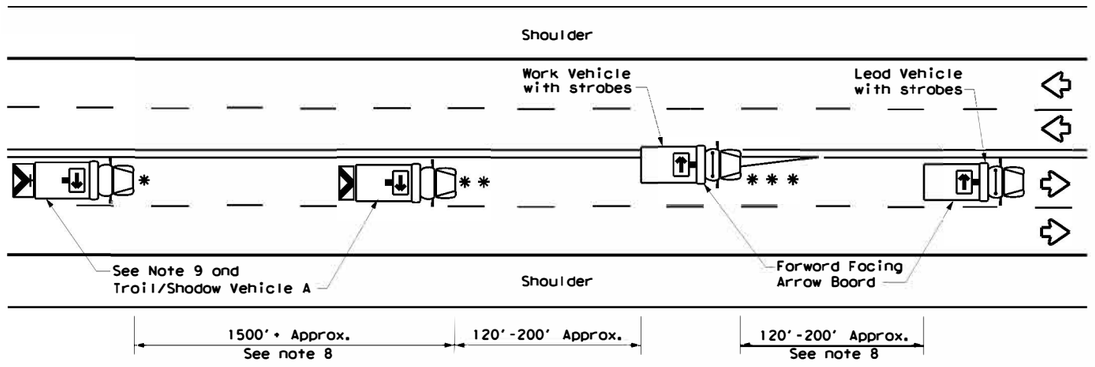
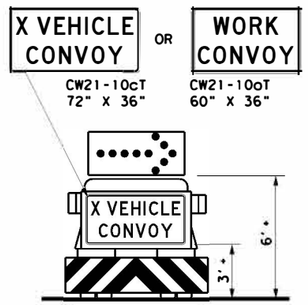
162



TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

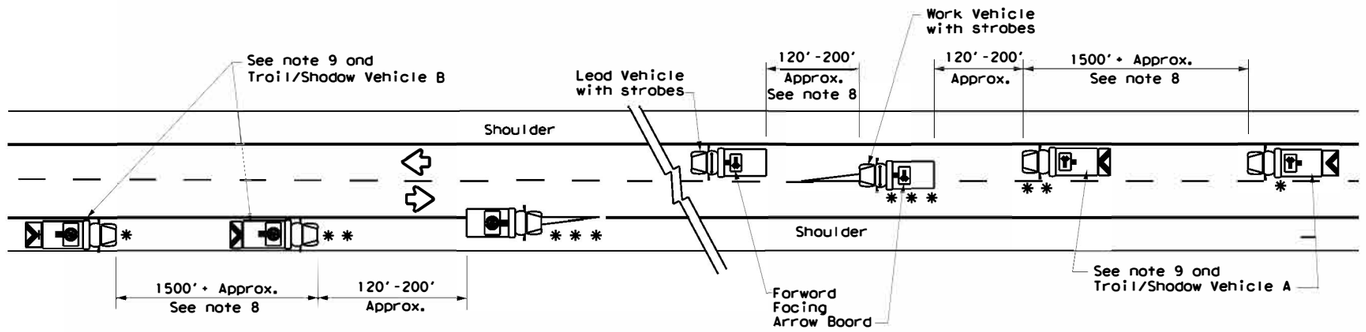
with RIGHT Directional display Flashing Arrow Board

LEGEND			
*	Troil 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 illustroted. 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, oscilloting, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscilloting 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" (CW21-10oT) 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.

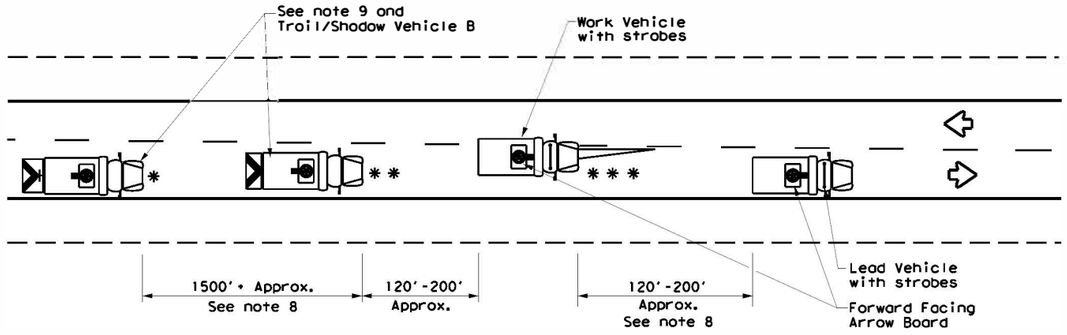


WORK ON SHOULDER

WORK ON TRAVEL LANE

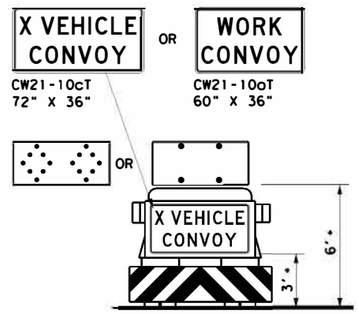
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



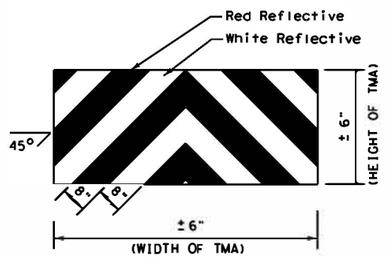
TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in CAUTION display



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	0387	05	026,ETC	FM 982,ETC
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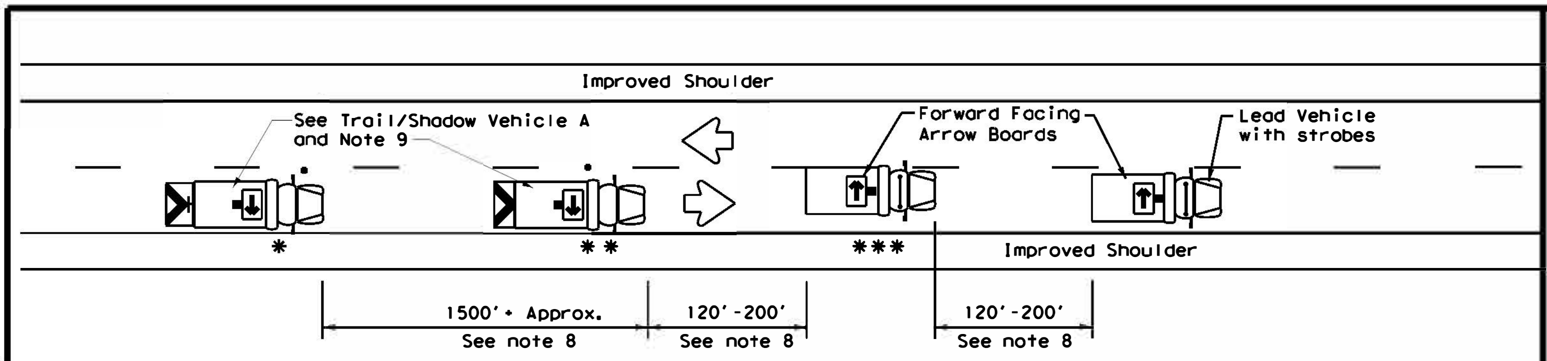
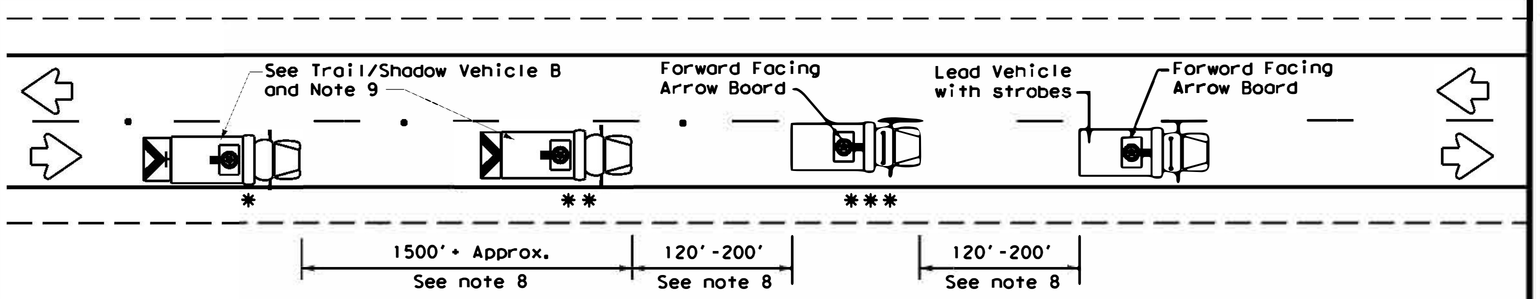


TCP (3-3a)

TWO LANE HIGHWAY WITH PAVED SHOULDERS

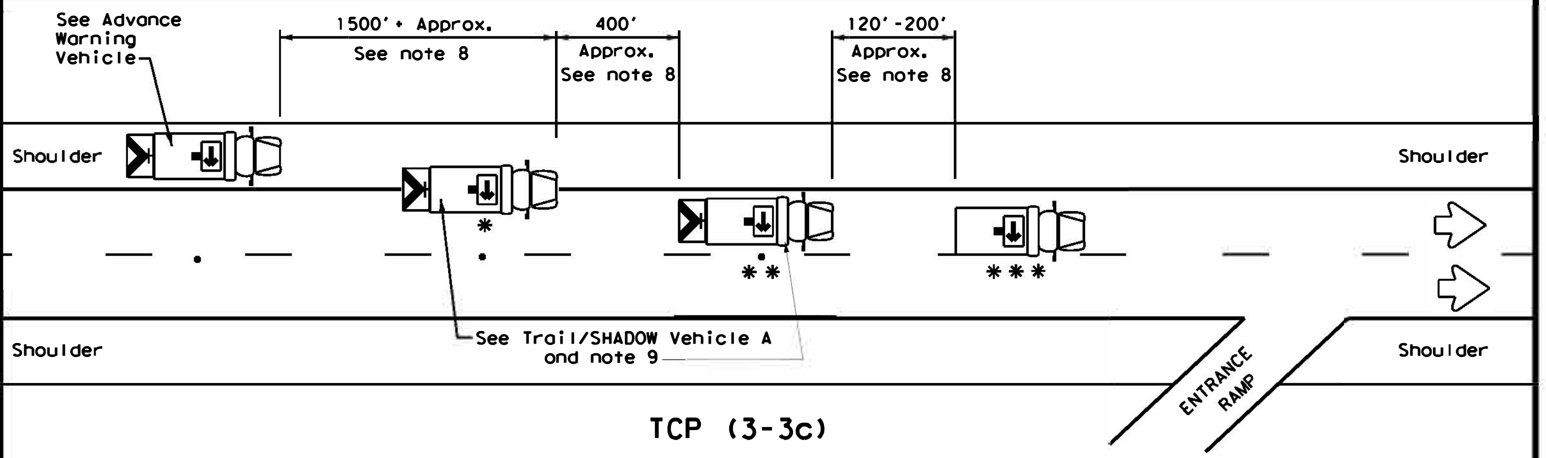
(WORK ON TRAVEL LANE)



TCP (3-3b)

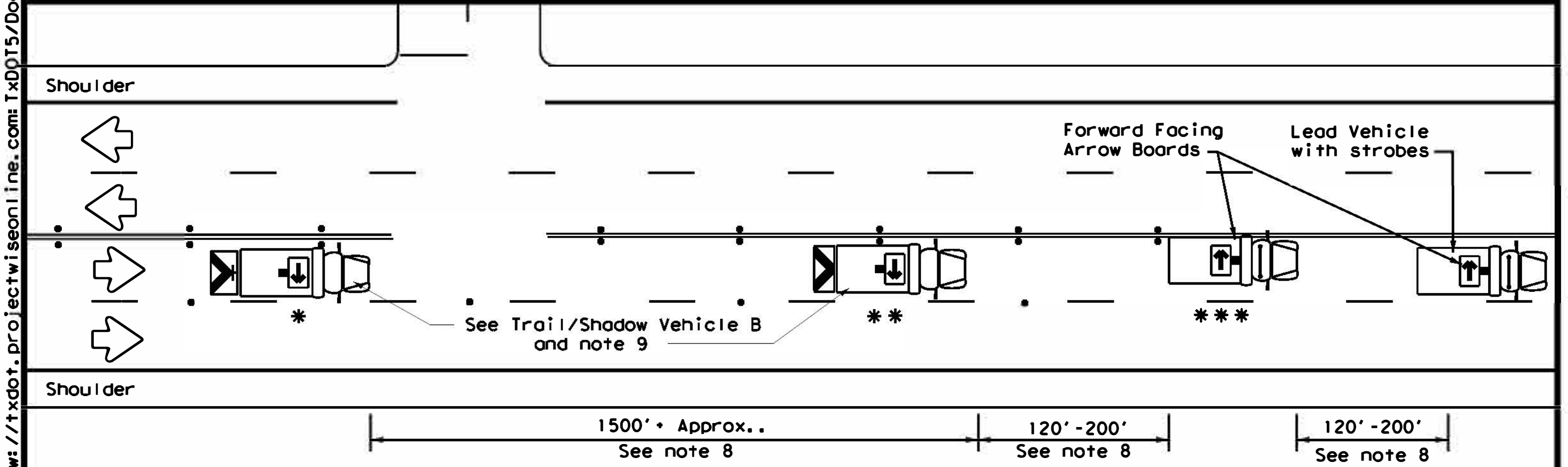
TWO LANE HIGHWAY WITHOUT PAVED SHOULDERS

(WORK ON TRAVEL LANE)



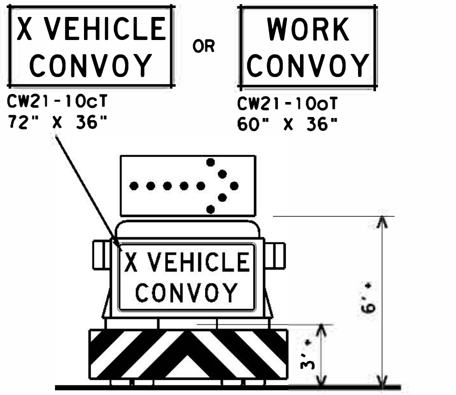
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



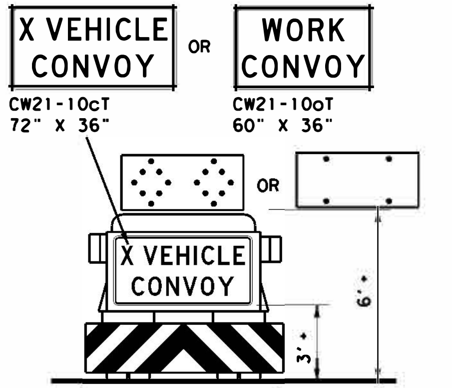
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



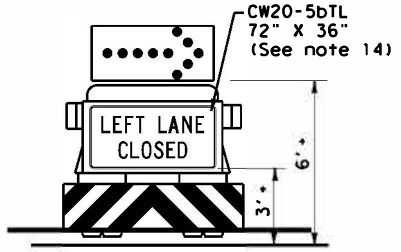
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

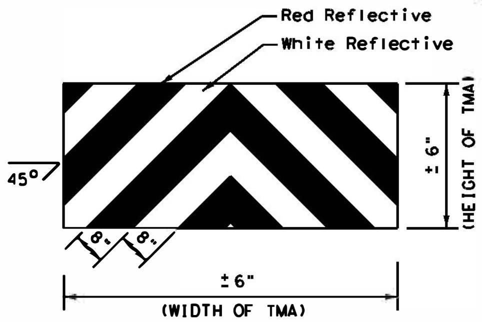


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

LEGEND

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

TYPICAL USAGE

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
MOBILE OPERATIONS
RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL

TCP(3-3)-14

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT

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REVISIONS
2-94 4-98
8-95 7-13
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CONT	SECT	JOB	HIGHWAY
0387	05	026, ETC	FM 982, ETC

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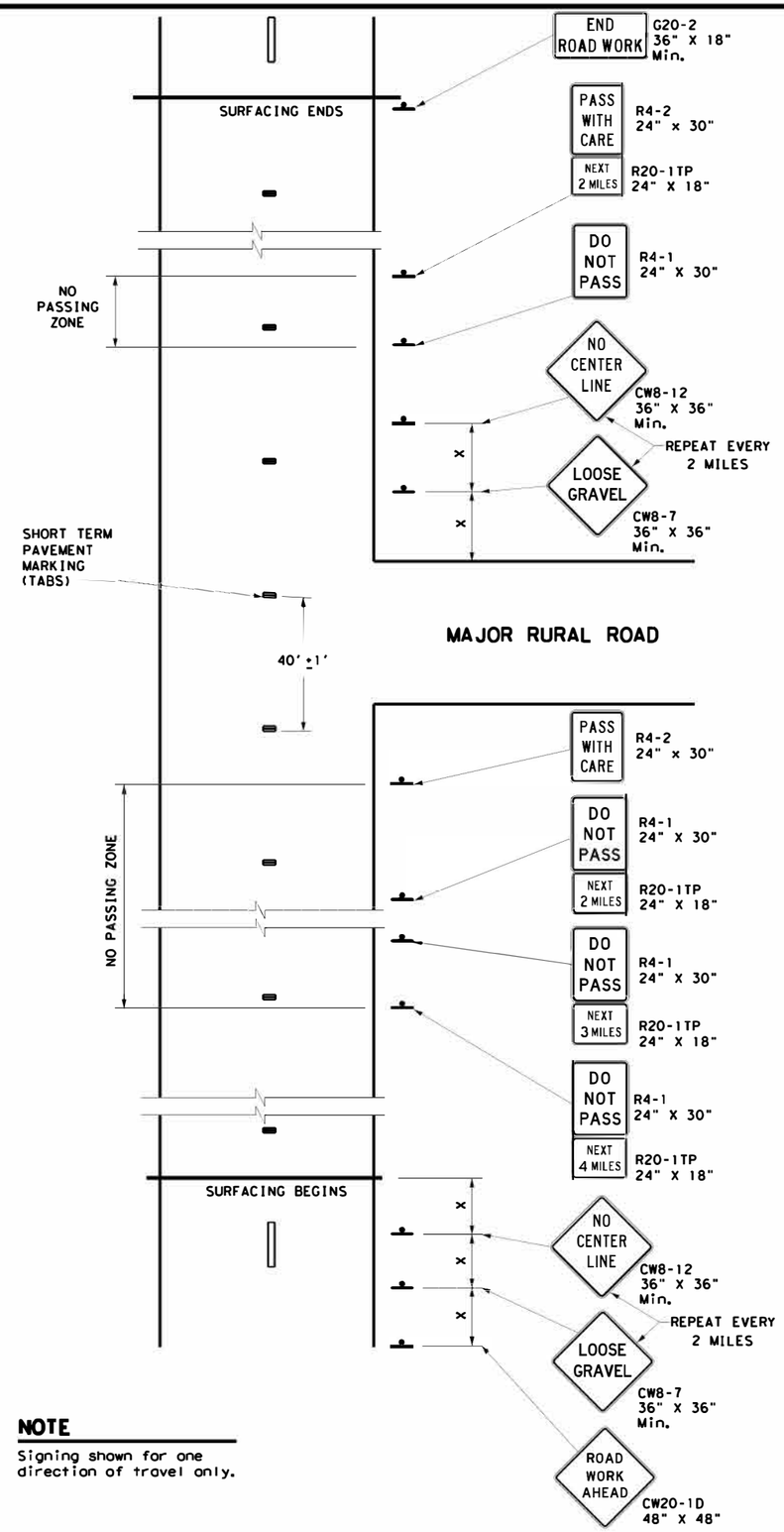
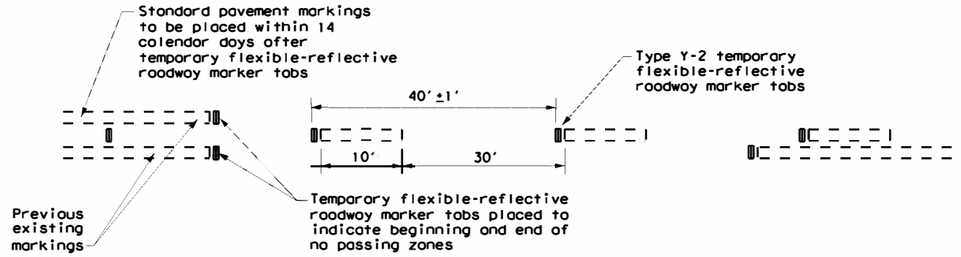


NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

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

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

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

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

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

"NO CENTER LINE" SIGN (CW8-12)

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

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

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

"LOOSE GRAVEL" SIGN (CW8-7)

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

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

PAVEMENT MARKINGS

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

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

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

COORDINATION OF SIGN LOCATIONS

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

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

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

* Conventional Roads Only

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

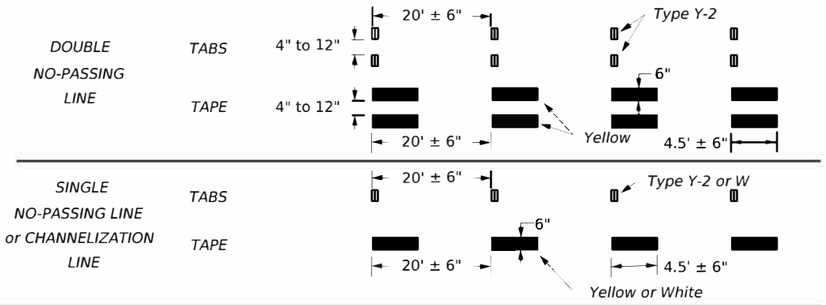
TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP(7-1)-13

FILE: tcp7-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT March 1991	CONT	SECT	JOB	HIGHWAY
REVISIONS	0387	05	026,ETC	FM 982,ETC
4-92 4-98	DIST	COUNTY		SHEET NO.
1-97 7-13	DAL	COLLIN		47

216

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



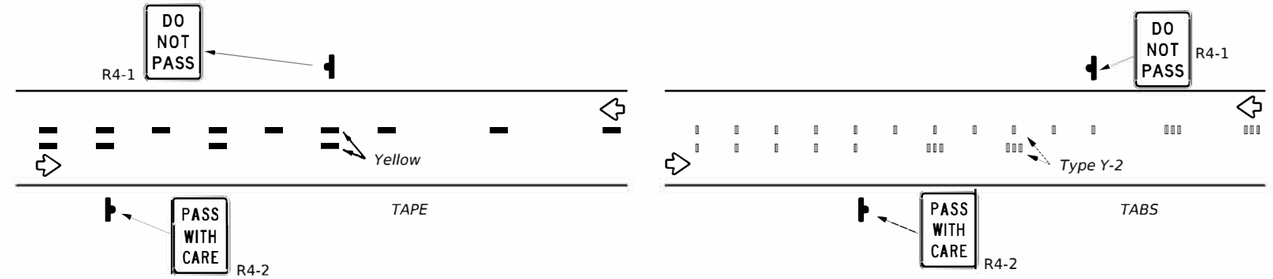
NOTES:

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

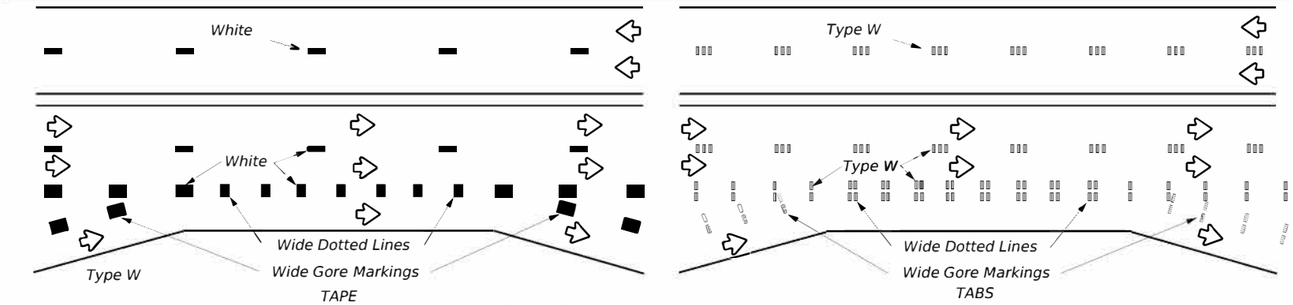
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

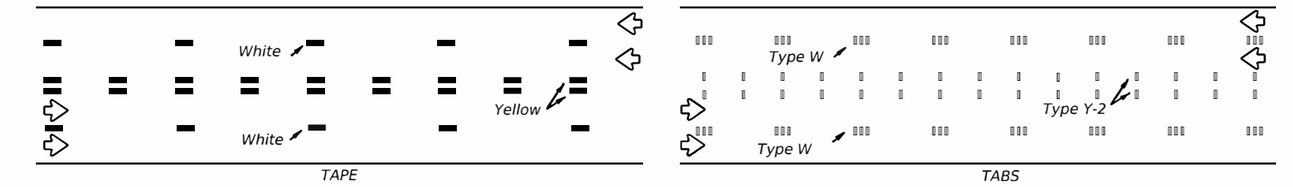
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



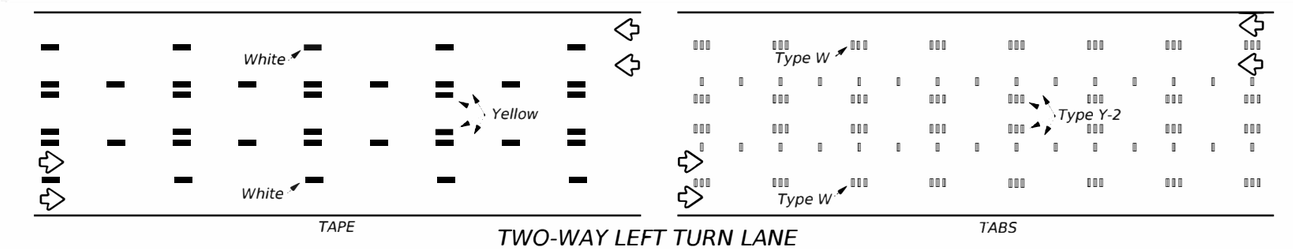
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



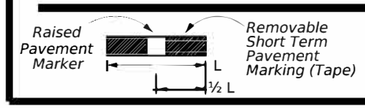
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

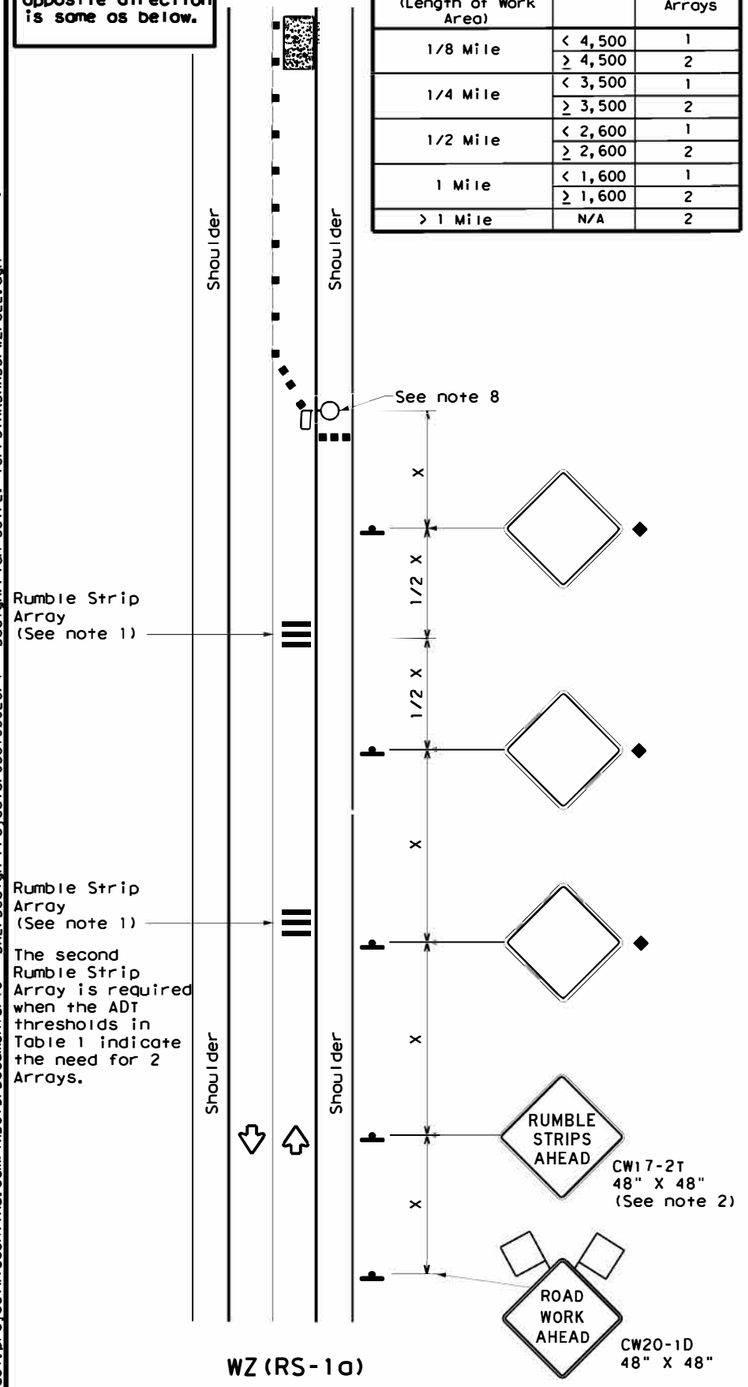
FILE: wzstpm-23.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 7-13 1-97 2-23 3-03	0387	05	026	FM 982
	DIST	COUNTY		SHEET NO.
	DAL	Collin		48

DATE: 2024/01/08
FILE: DOCUMENT NAME

DATE: 9/3/2024 12:19:25 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/0387050266/CAD/STANDARDS/wzrs22.dgn

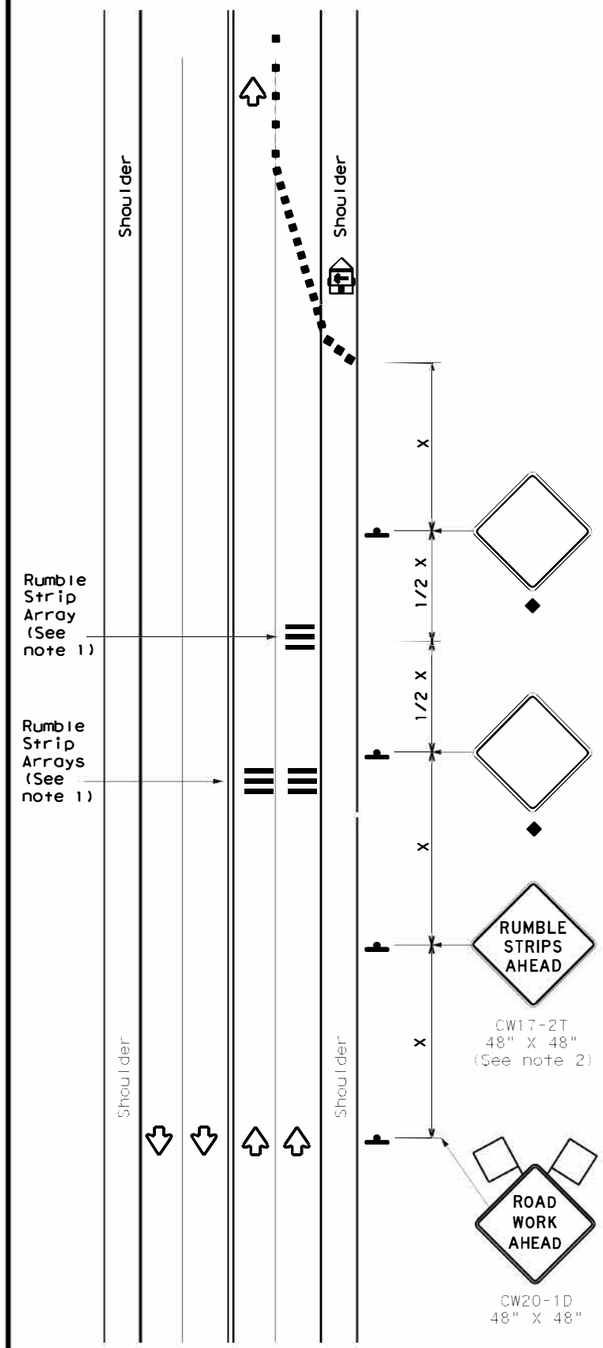
Warning sign and rumble strip sequence in opposite direction is same as below.

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



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

* Conventional Roads Only

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

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

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

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

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

Texas Department of Transportation — Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	0387	05	026,ETC	FM 982,ETC
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	DAL	COLLIN		49

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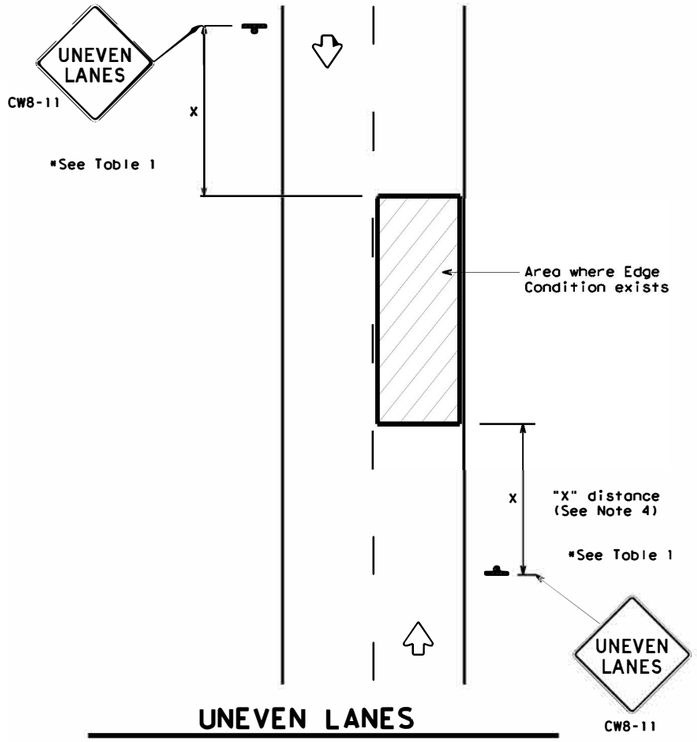
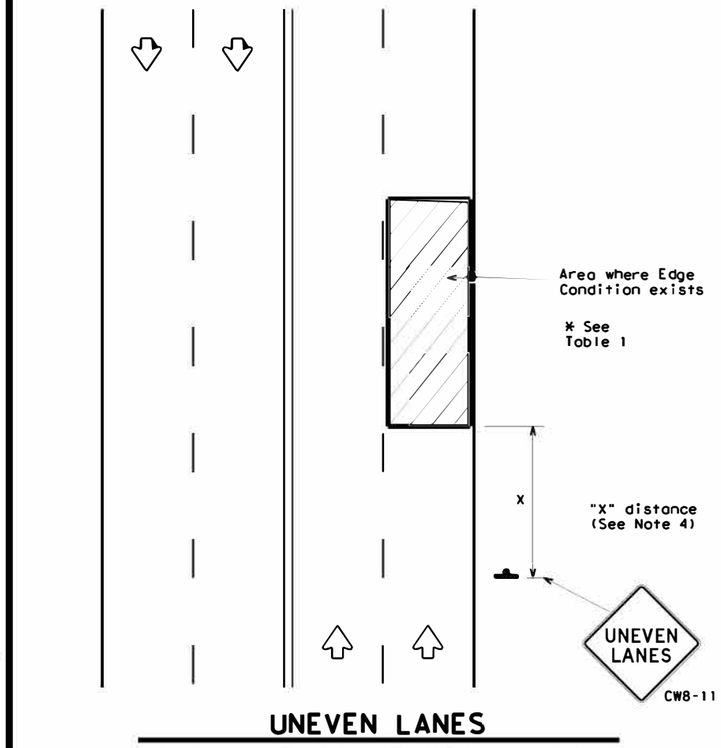
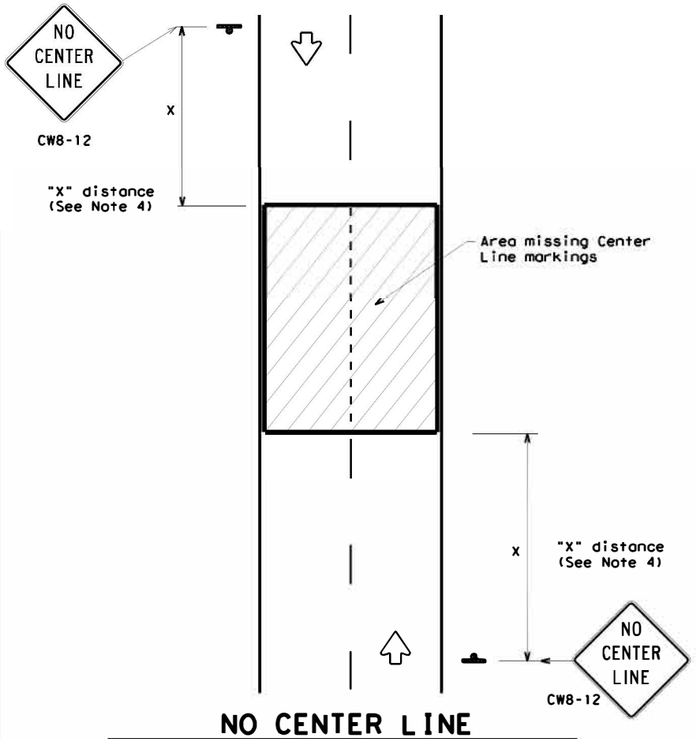


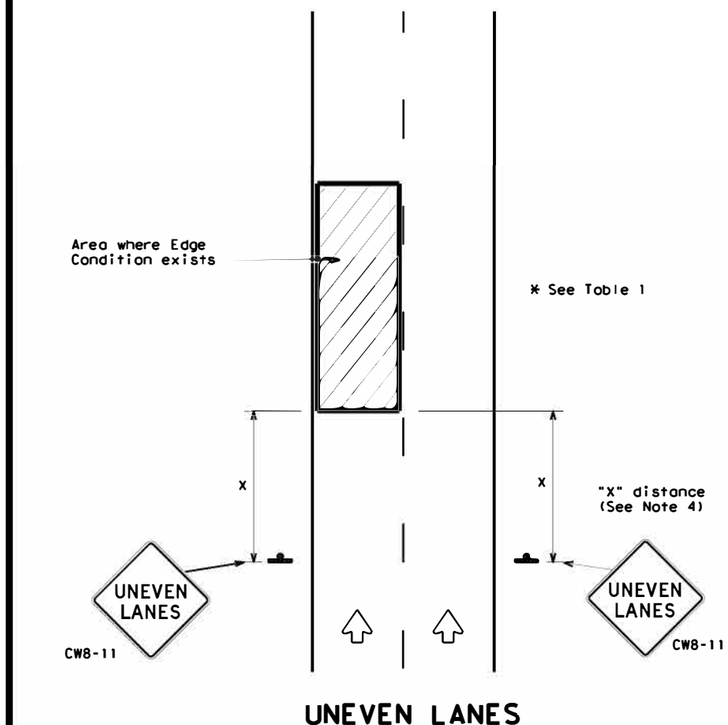
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

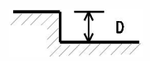
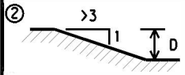
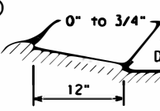
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

TABLE 1

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0387	05	026, ETC	FM 982, ETC
8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	DAL	COLLIN		50

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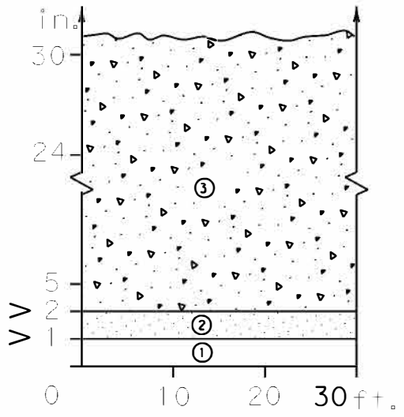
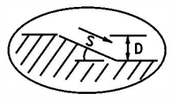
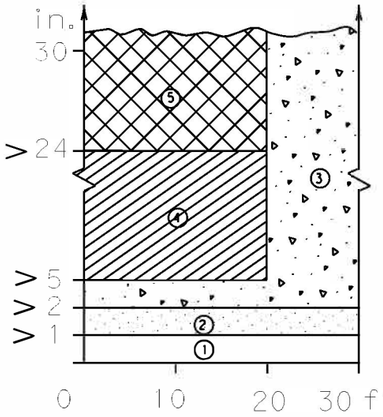
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

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

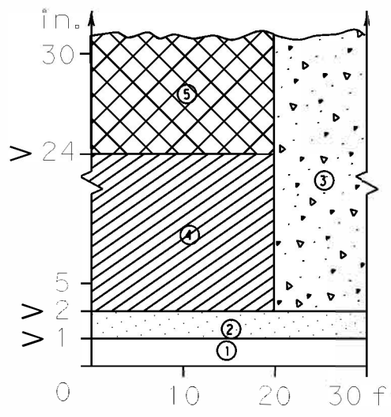


Edge Condition I
S = (3:1) (or flatter)

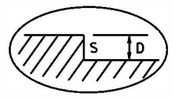


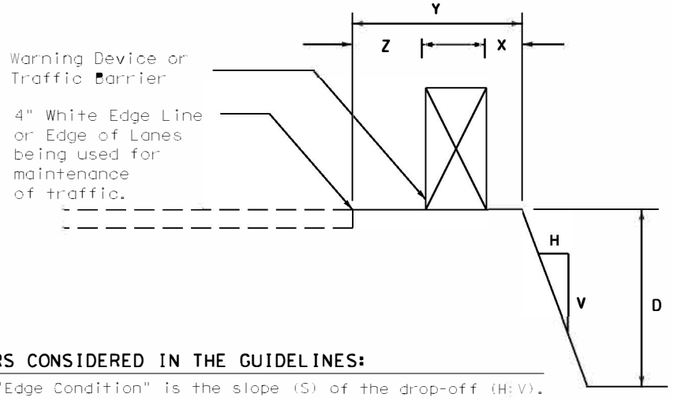


Edge Condition II
S = ((2.99):1) to (1:1)



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:

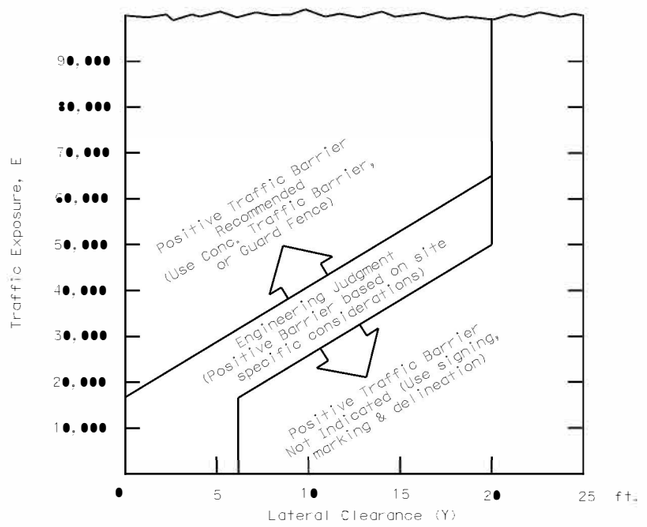
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

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 × 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.

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER
09/03/2024

Texas Department of Transportation

Traffic Safety Division Standard

TREATMENT FOR VARIOUS EDGE CONDITIONS

FILE: edgeeon.dgn	DN:	CK:	DW:	CK:
©TxDOT August 2000	CONT	SECT	JOB	HIGHWAY
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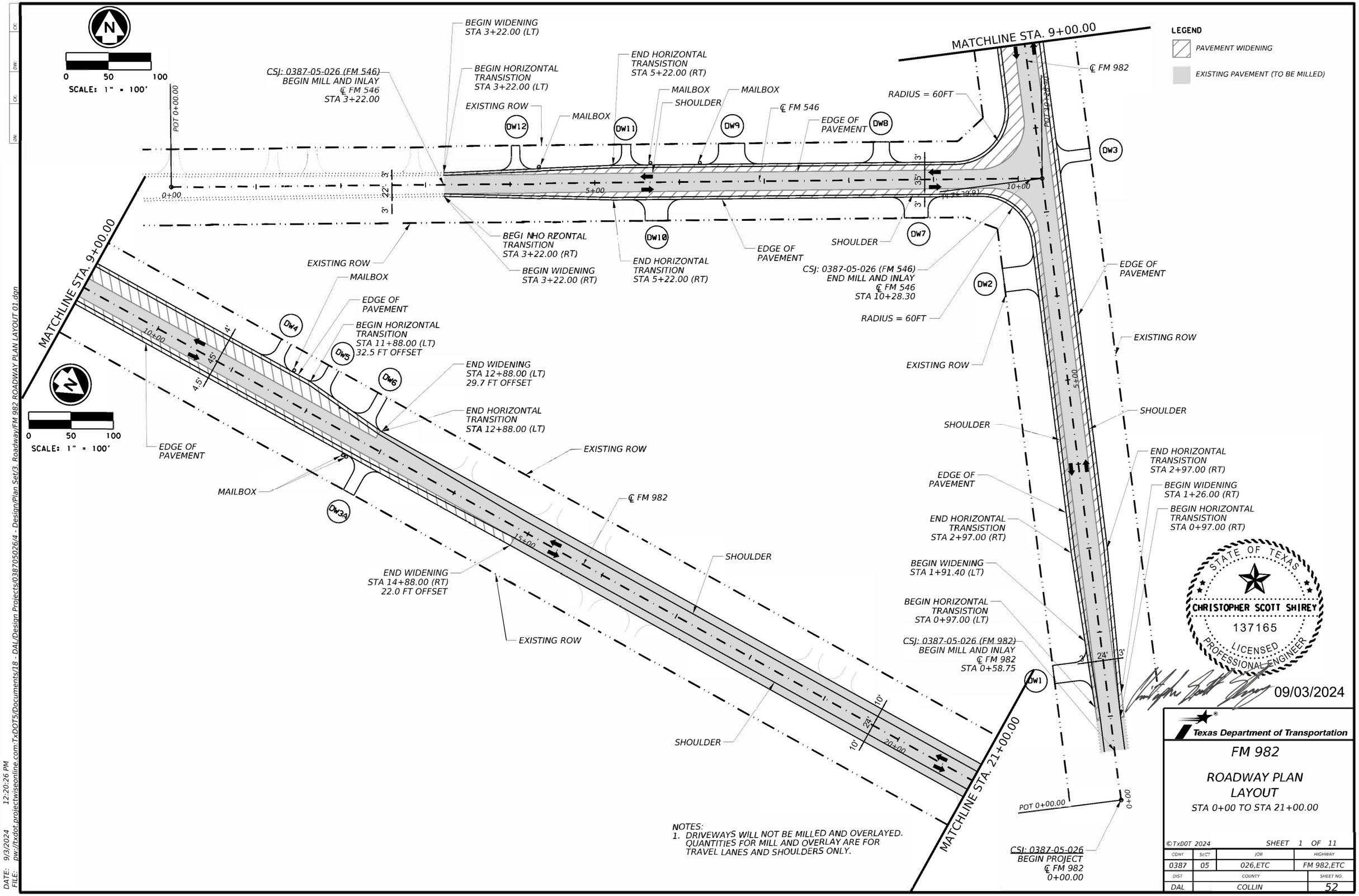
	DAL	COLLIN		51



NOTES:
1. DRIVEWAYS WILL NOT BE MILLED AND OVERLAYED. QUANTITIES FOR MILL AND OVERLAY ARE FOR TRAVEL LANES AND SHOULDERS ONLY.

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

ROADWAY PLAN LAYOUT

STA 0+00 TO STA 21+00.00

SHEET 1 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		52

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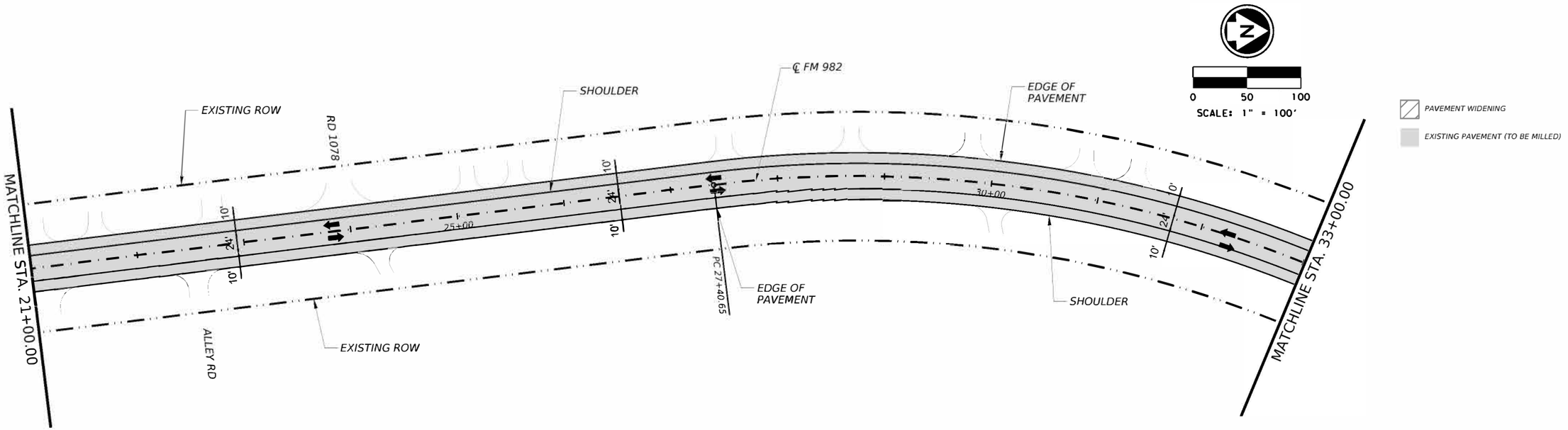

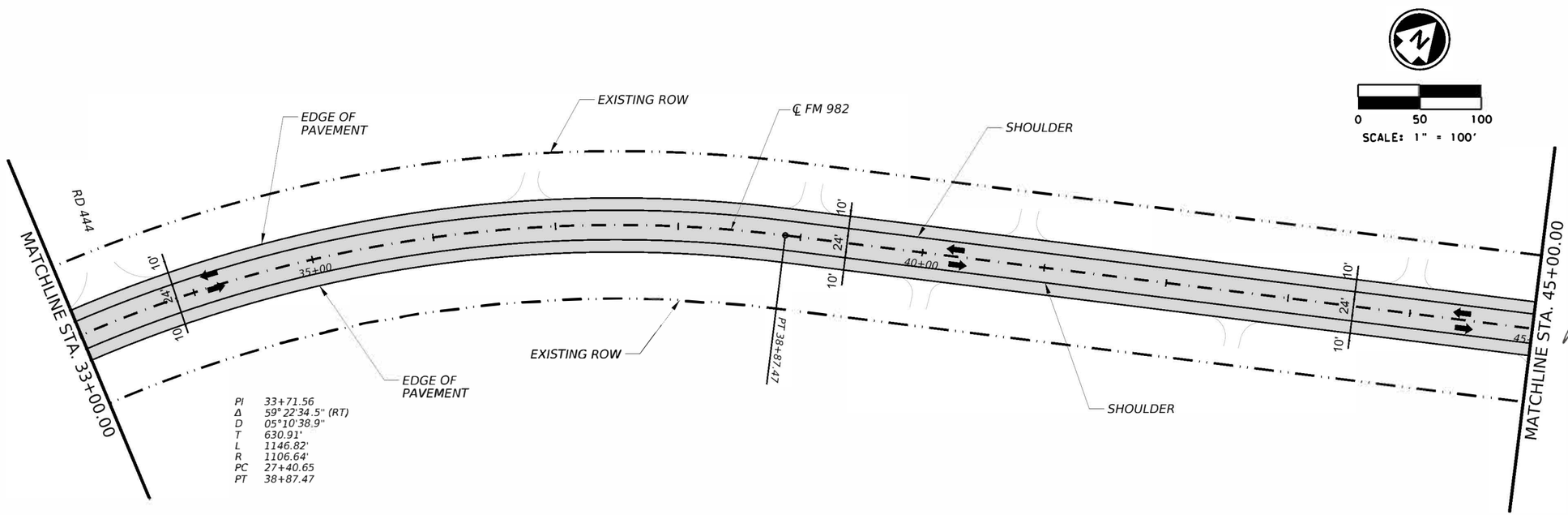

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T 630.91'
L 1146.82'
R 1106.64'
PC 27+40.65
PT 38+87.47

NOTES:
1. DRIVEWAYS WILL NOT BE MILLED AND OVERLAYED. QUANTITIES FOR MILL AND OVERLAY ARE FOR TRAVEL LANES AND SHOULDERS ONLY.

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

ROADWAY PLAN LAYOUT

STA 21+00.00 TO STA 45+00.00

SHEET 2 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		53

DATE: 9/3/2024 12:20:46 PM
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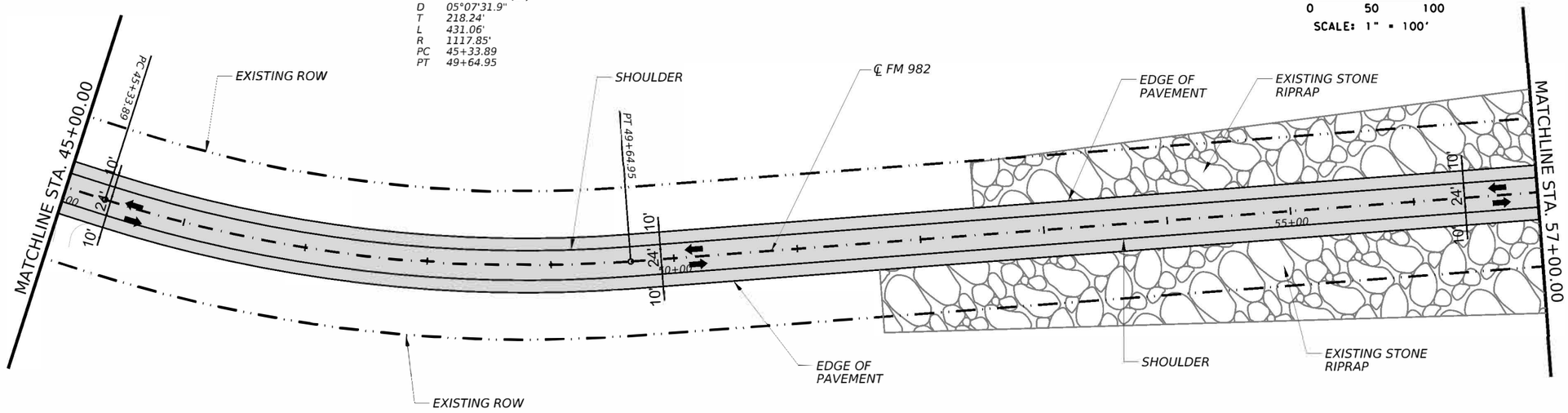
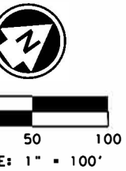
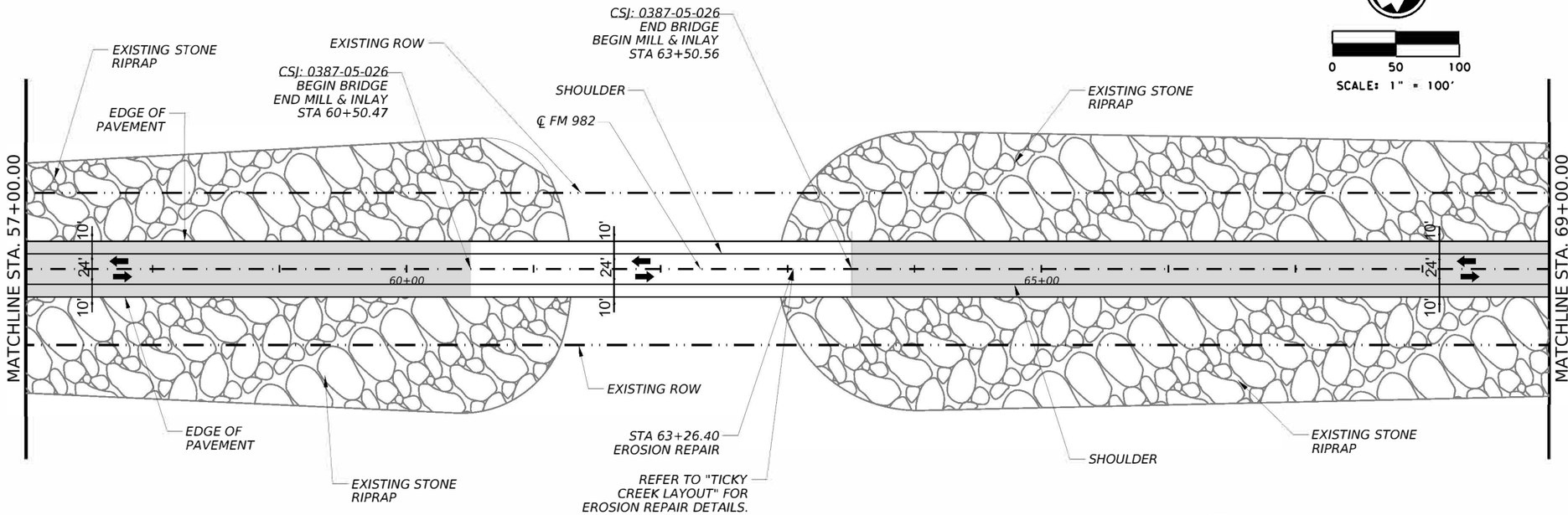
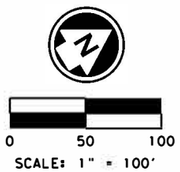




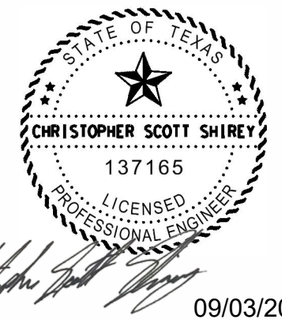
LEGEND

EXISTING STONE RIPRAP





NOTES:
1. DRIVEWAYS WILL NOT BE MILLED AND OVERLAYED. QUANTITIES FOR MILL AND OVERLAY ARE FOR TRAVEL LANES AND SHOULDERS ONLY.



09/03/2024

Texas Department of Transportation

FM 982

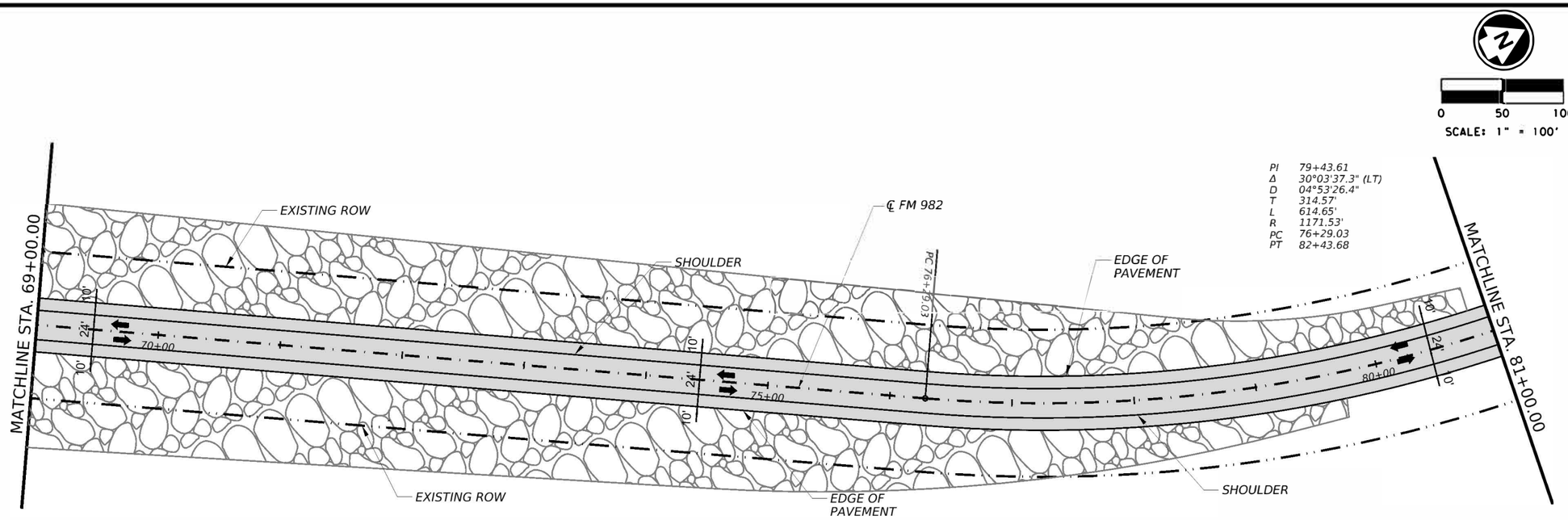
ROADWAY PLAN LAYOUT

STA 45+00.00 TO STA 69+00.00

SHEET 3 OF 11

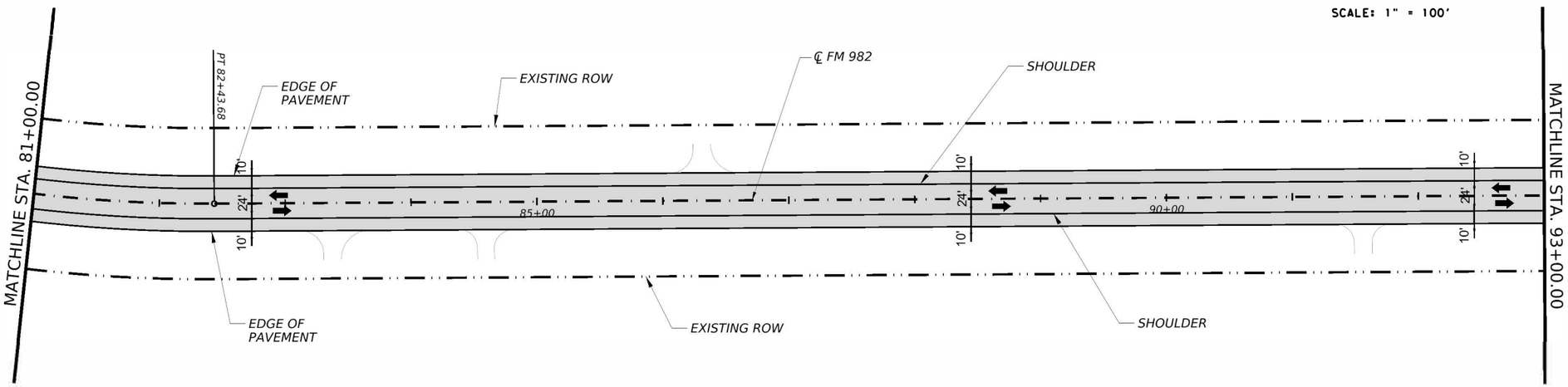
CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO
DAL	COLLIN		54

DATE: 9/3/2024 12:21:07 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/0387050264 - Design/Plan Set/3. Roadway/FM 982 ROADWAY PLAN LAYOUT 03.dgn



PI 79+43.61
Δ 30°03'37.3" (LT)
D 04°53'26.4"
T 314.57'
L 614.65'
R 1171.53'
PC 76+29.03
PT 82+43.68

0 50 100
SCALE: 1" = 100'



0 50 100
SCALE: 1" = 100'

NOTES:
1. DRIVEWAYS WILL NOT BE MILLED AND OVERLAYED. QUANTITIES FOR MILL AND OVERLAY ARE FOR TRAVEL LANES AND SHOULDERS ONLY.

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

ROADWAY PLAN LAYOUT

STA 69+00.00 TO STA 93+00.00

SHEET 4 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		55

DATE: 9/3/2024 12:21:27 PM
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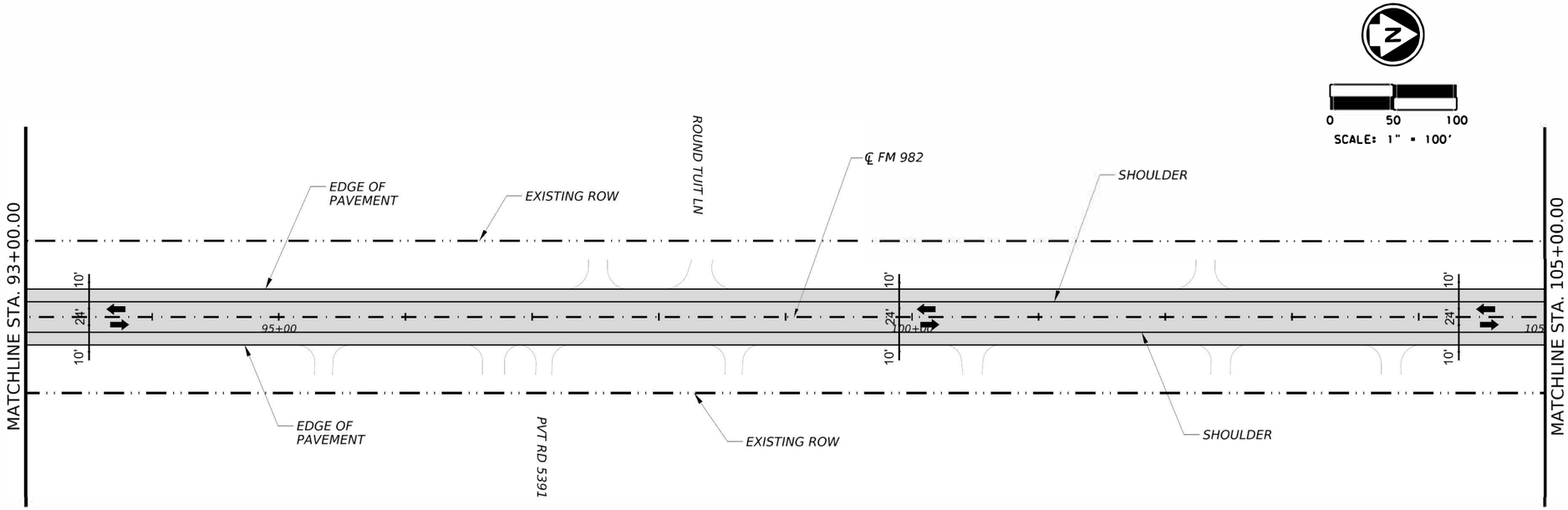

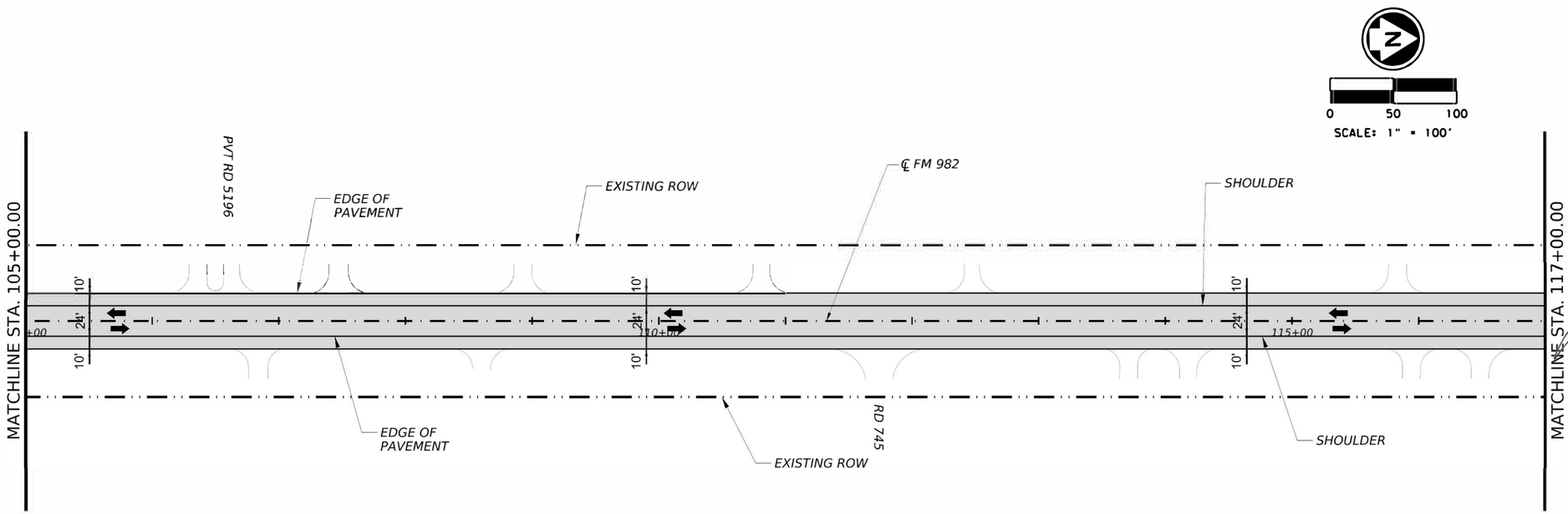

NOTES:
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CHRISTOPHER SCOTT SHIREY
137165
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

09/03/2024

Texas Department of Transportation

FM 982

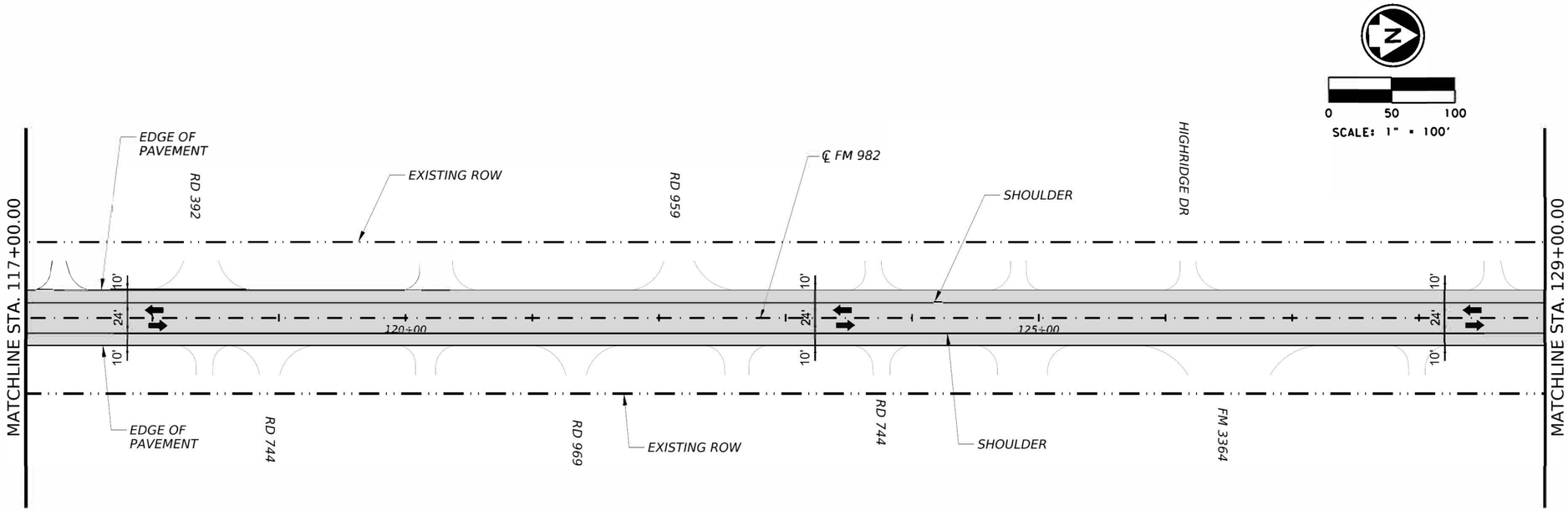
ROADWAY PLAN LAYOUT

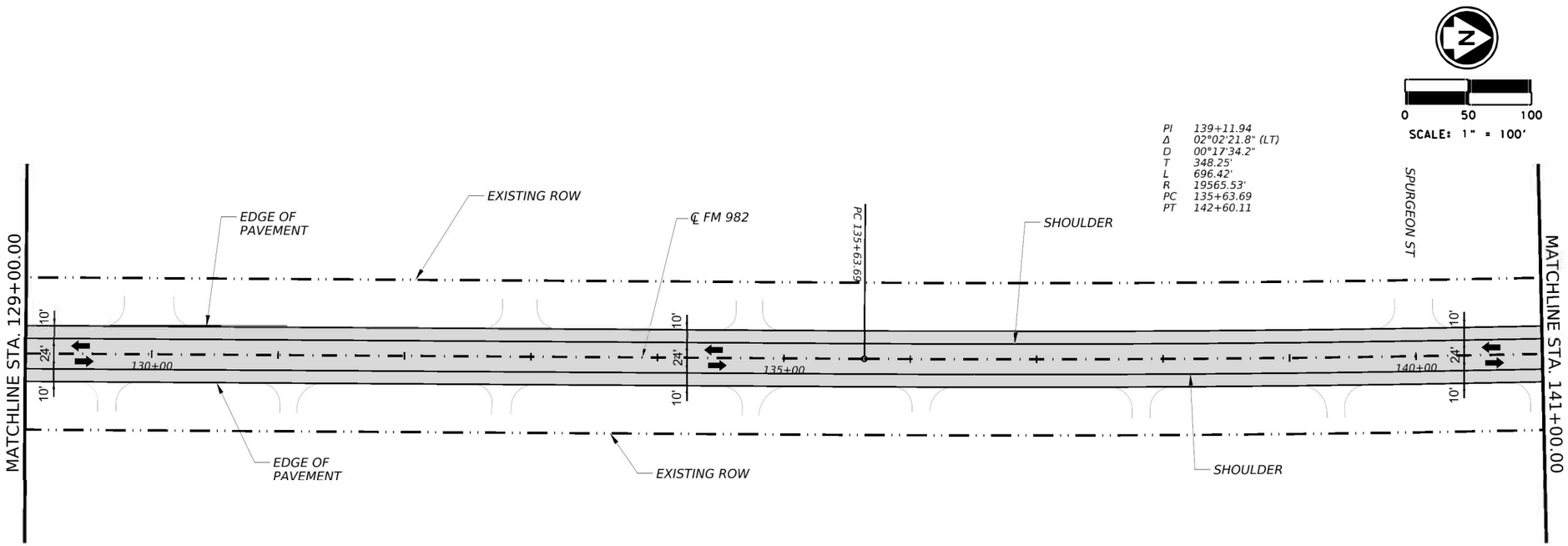
STA 93+00.00 TO 117+00.00

SHEET 5 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		56

DATE: 9/3/2024 12:21:47 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/0387050264 - Design/Plan Set/3. Roadway/FM 982 ROADWAY PLAN LAYOUT 05.dgn





NOTES:
1. DRIVEWAYS WILL NOT BE MILLED AND OVERLAYED. QUANTITIES FOR MILL AND OVERLAY ARE FOR TRAVEL LANES AND SHOULDERS ONLY.

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
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PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

ROADWAY PLAN LAYOUT

STA 117+00 TO STA 141+00

SHEET 6 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		57

DATE: 9/3/2024 12:22:08 PM
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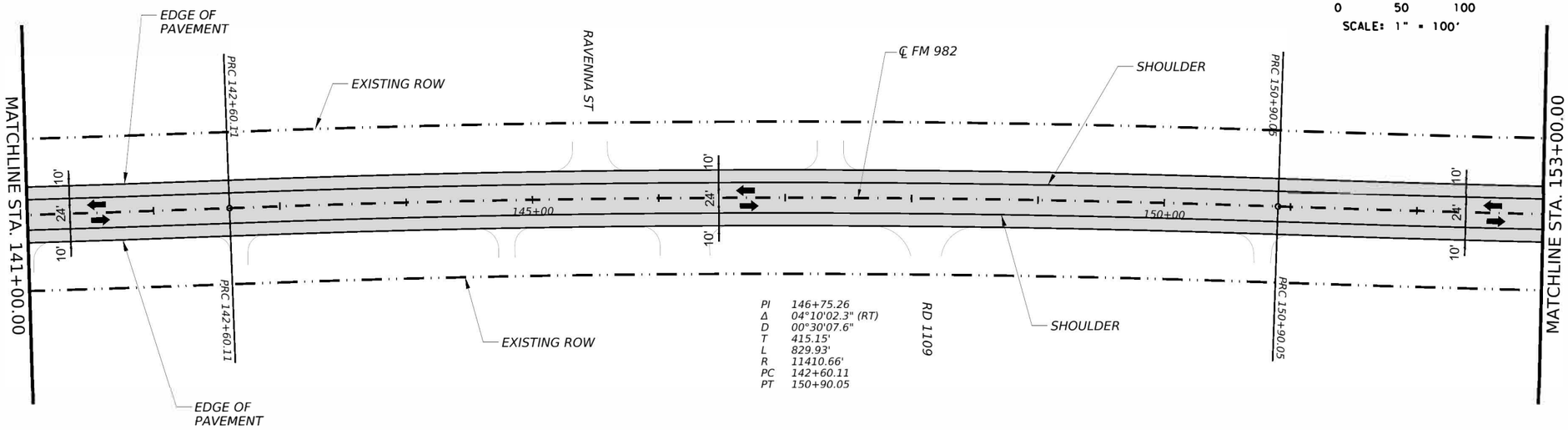

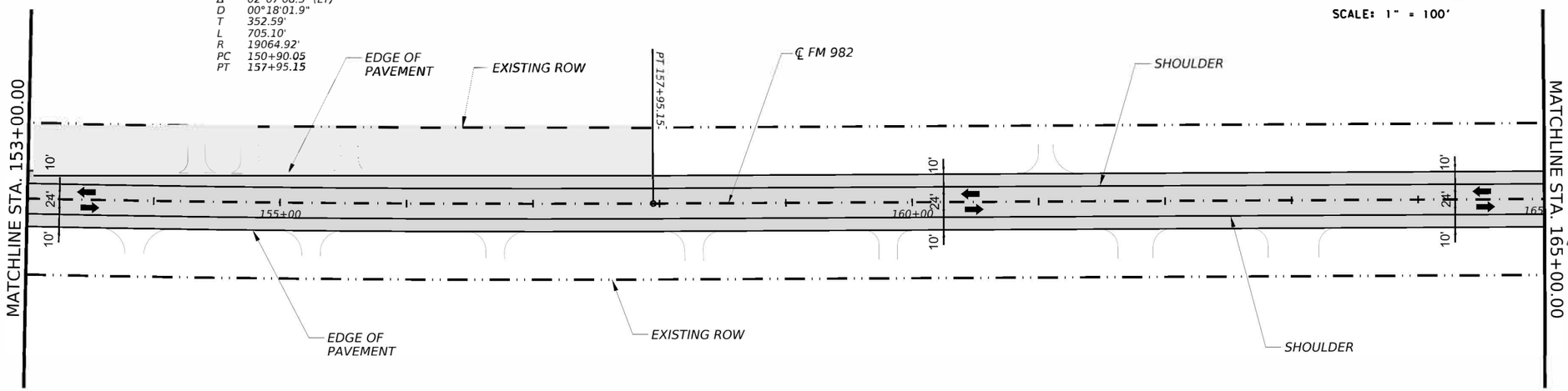

NOTES:
1. DRIVEWAYS WILL NOT BE MILLED AND OVERLAYED. QUANTITIES FOR MILL AND OVERLAY ARE FOR TRAVEL LANES AND SHOULDERS ONLY.

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
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09/03/2024

Texas Department of Transportation

FM 982

ROADWAY PLAN LAYOUT

STA 141+00 TO STA 165+00

SHEET 7 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		58

DATE: 9/3/2024 12:22:28 PM
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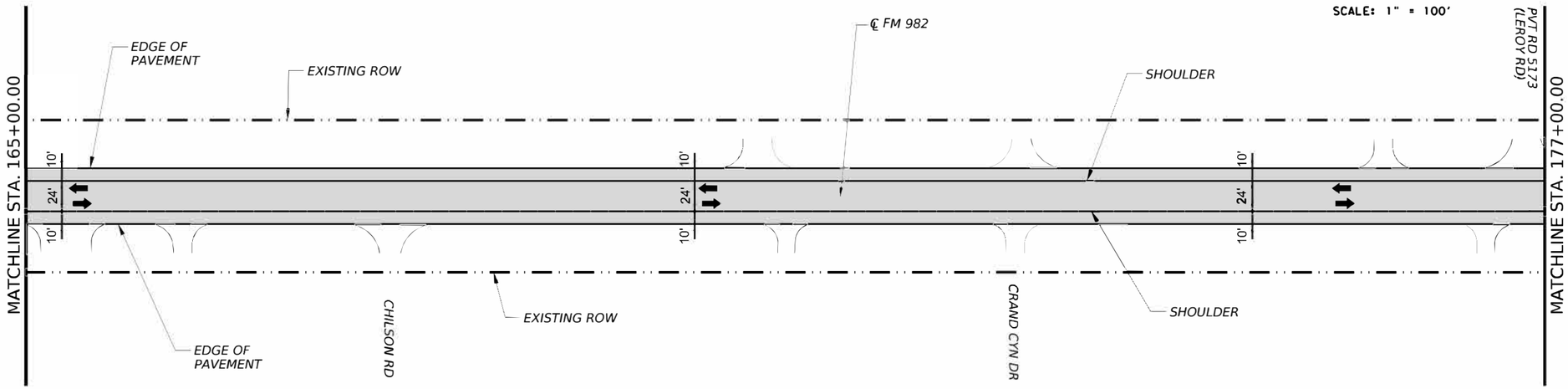
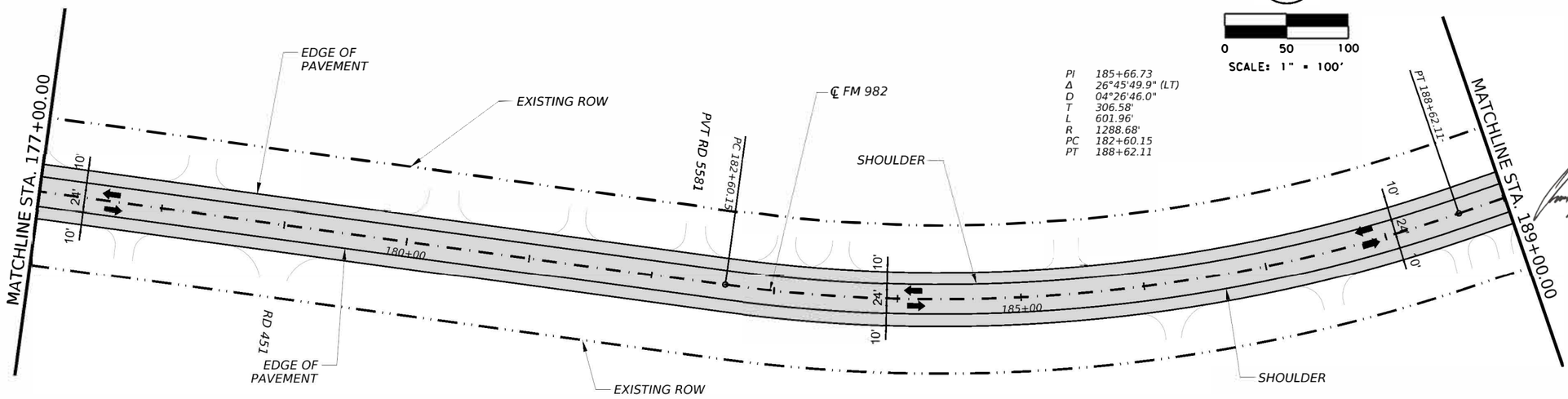


0 50 100

SCALE: 1" = 100'



PI 185+66.73
Δ 26°45'49.9" (LT)
D 04°26'46.0"
T 306.58'
L 601.96'
R 1288.68'
PC 182+60.15
PT 188+62.11

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

NOTES:
1. DRIVEWAYS WILL NOT BE MILLED AND OVERLAYED. QUANTITIES FOR MILL AND OVERLAY ARE FOR TRAVEL LANES AND SHOULDERS ONLY.

Texas Department of Transportation

RM 982

ROADWAY PLAN LAYOUT

STA 165+00.00 TO STA 189+00.00

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO
DAL	COLLIN		59

DATE: 9/3/2024 12:22:48 PM
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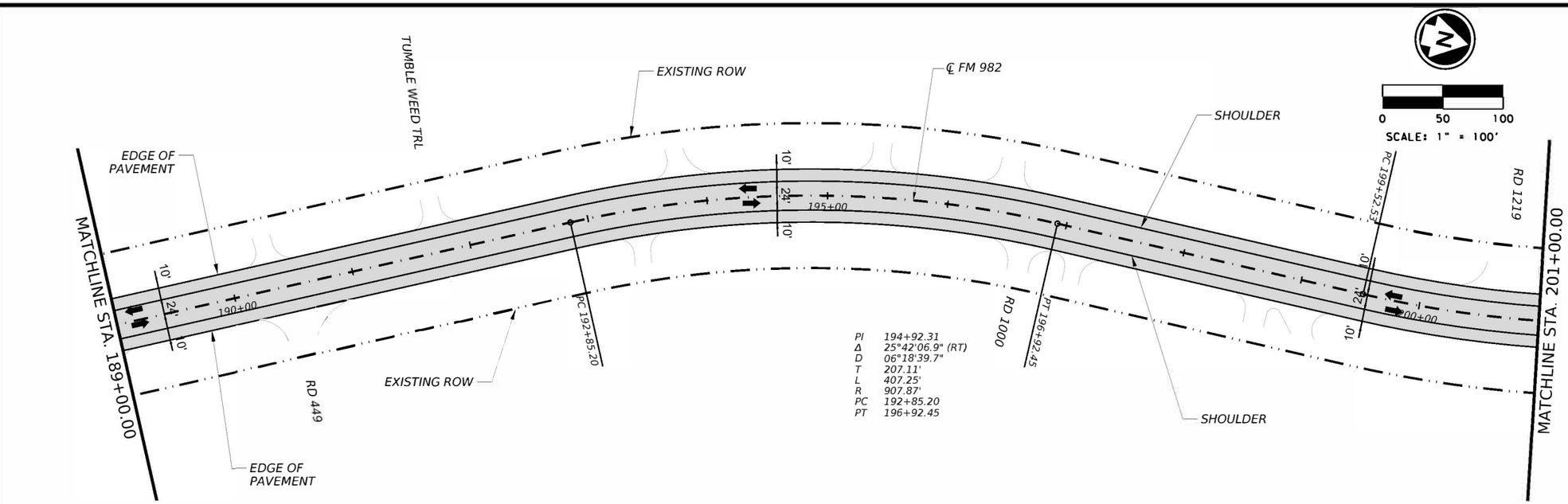

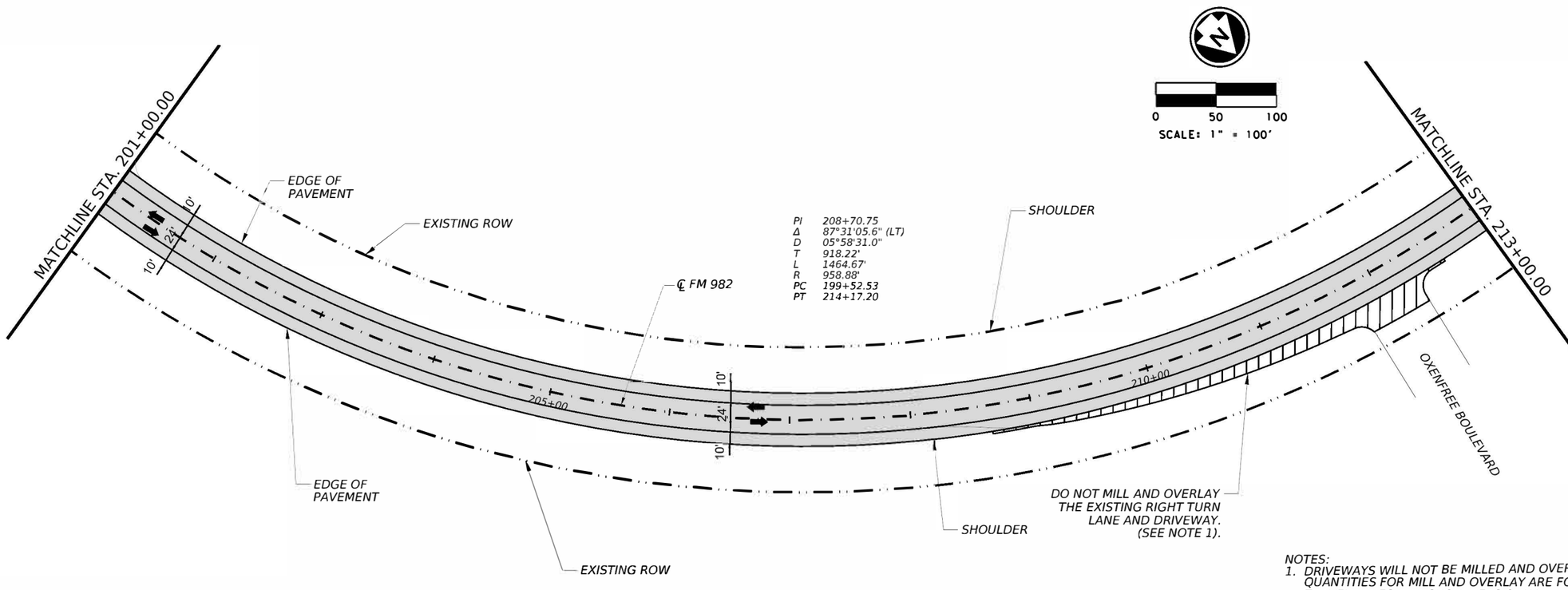

NOTES:
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STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

ROADWAY PLAN LAYOUT

STA 189+00.00 TO 213+00.00

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO
DAL	COLLIN		60

DATE: 9/3/2024 12:23:09 PM
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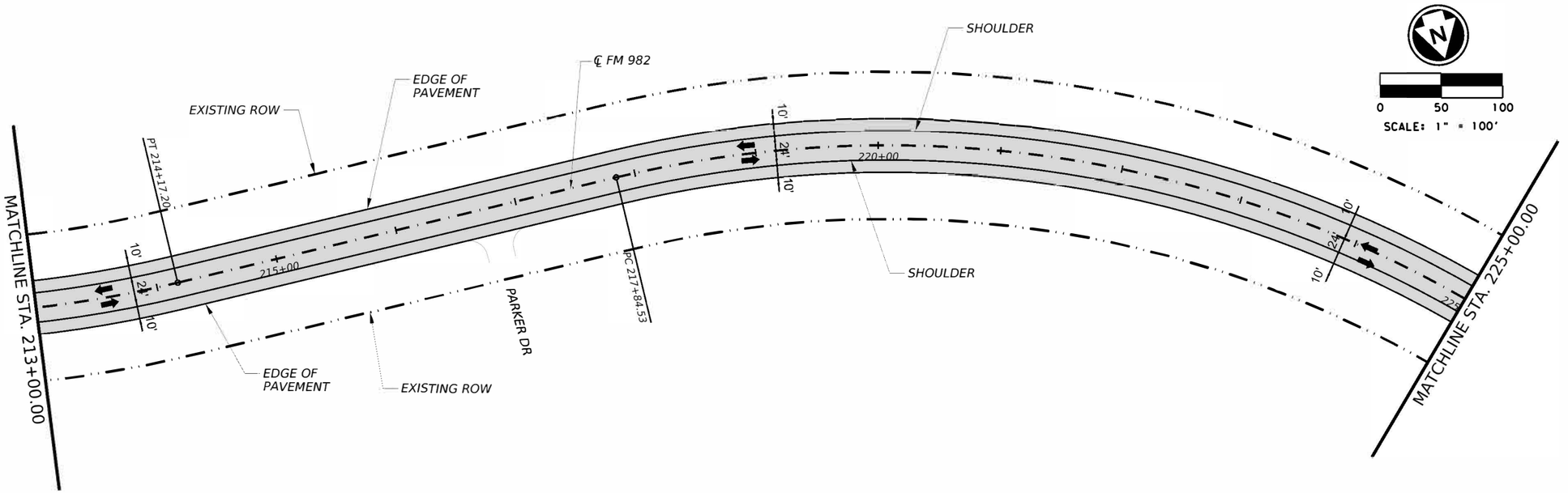

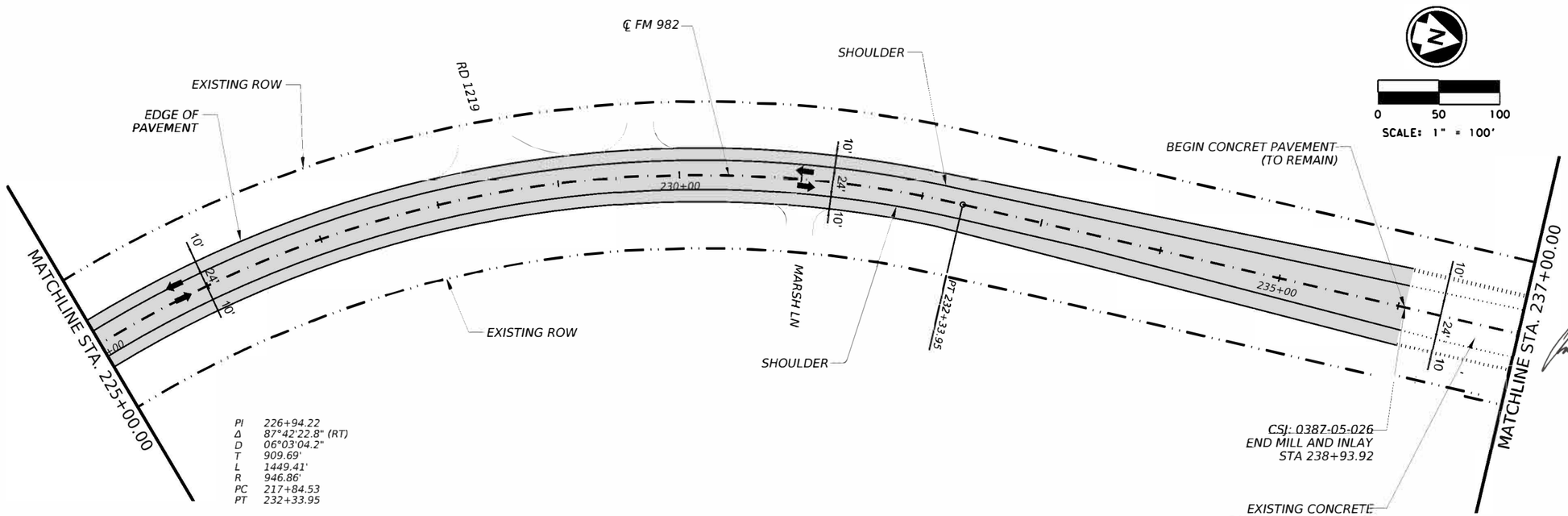

PI 226+94.22
Δ 87°42'22.8" (RT)
D 06°03'04.2"
T 909.69'
L 1449.41'
R 946.86'
PC 217+84.53
PT 232+33.95

NOTES:
1. DRIVEWAYS WILL NOT BE MILLED AND OVERLAYED. QUANTITIES FOR MILL AND OVERLAY ARE FOR TRAVEL LANES AND SHOULDERS ONLY.

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

ROADWAY PLAN LAYOUT

STA 213+00 TO STA 237+00

SHEET 10 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		61

DATE: 9/3/2024 12:23:30 PM
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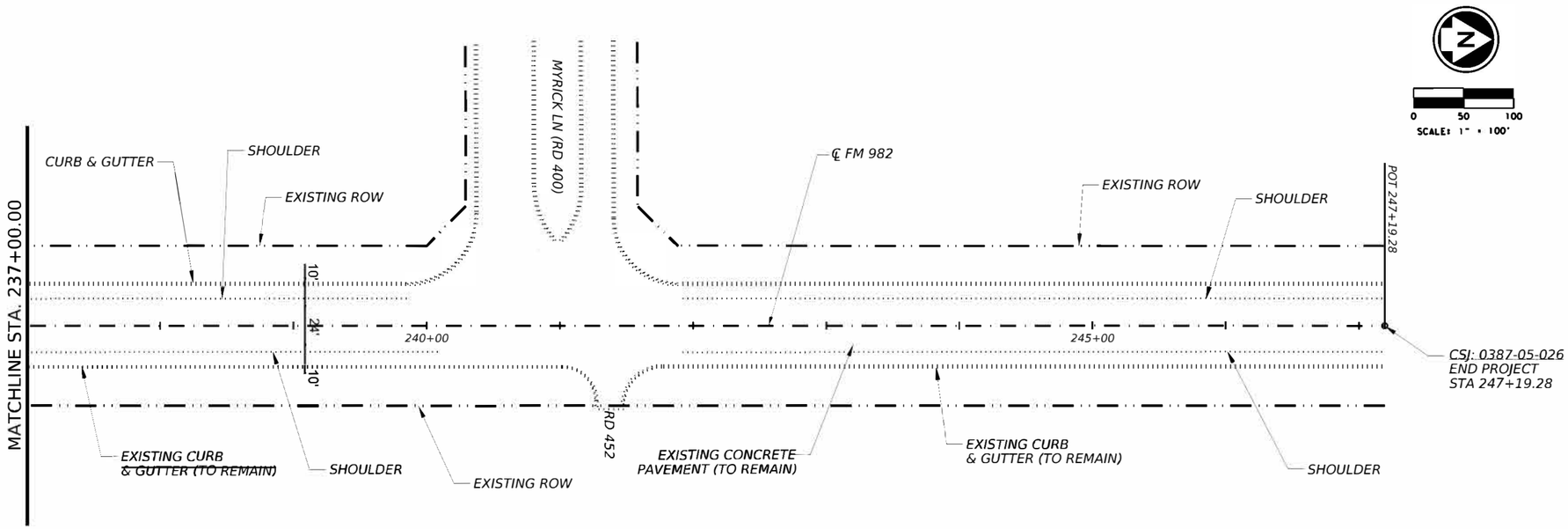
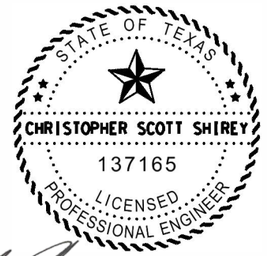


NOTES:
1. DRIVEWAYS WILL NOT BE MILLED AND OVERLAYED. QUANTITIES FOR MILL AND OVERLAY ARE FOR TRAVEL LANES AND SHOULDERS ONLY.



09/03/2024

Texas Department of Transportation

FM 982

ROADWAY PLAN
LAYOUT

STA 237+00 TO STA 247+19.28

SHEET 11 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		62

DATE: 9/3/2024 12:23:50 PM
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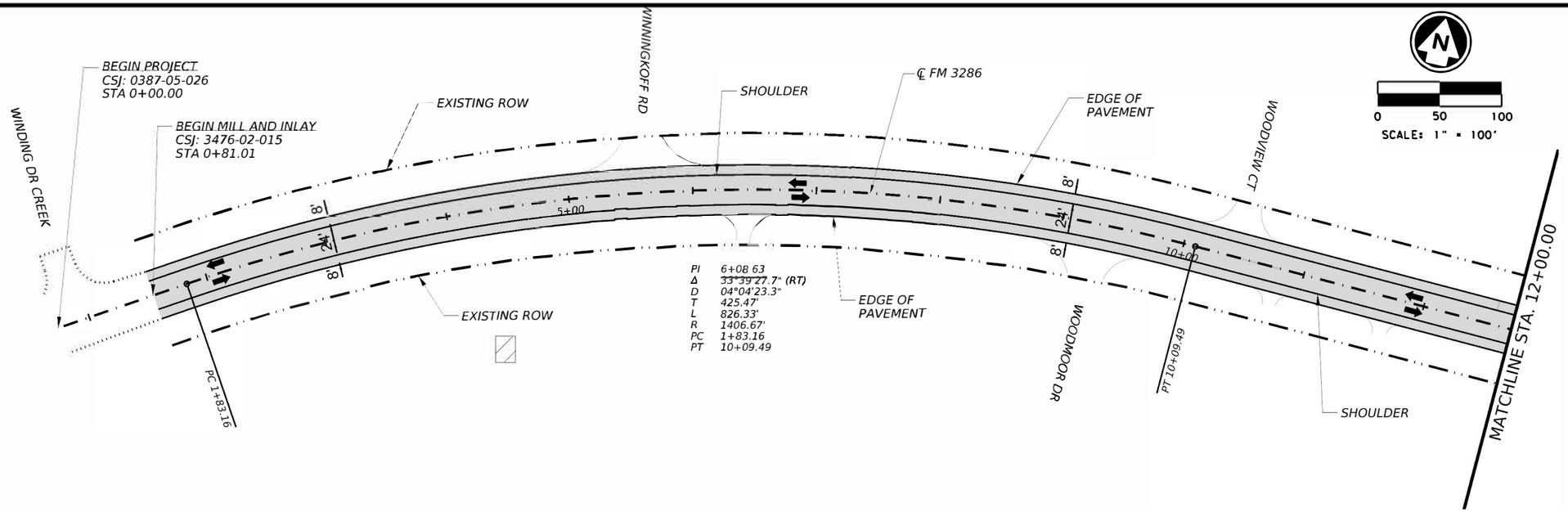

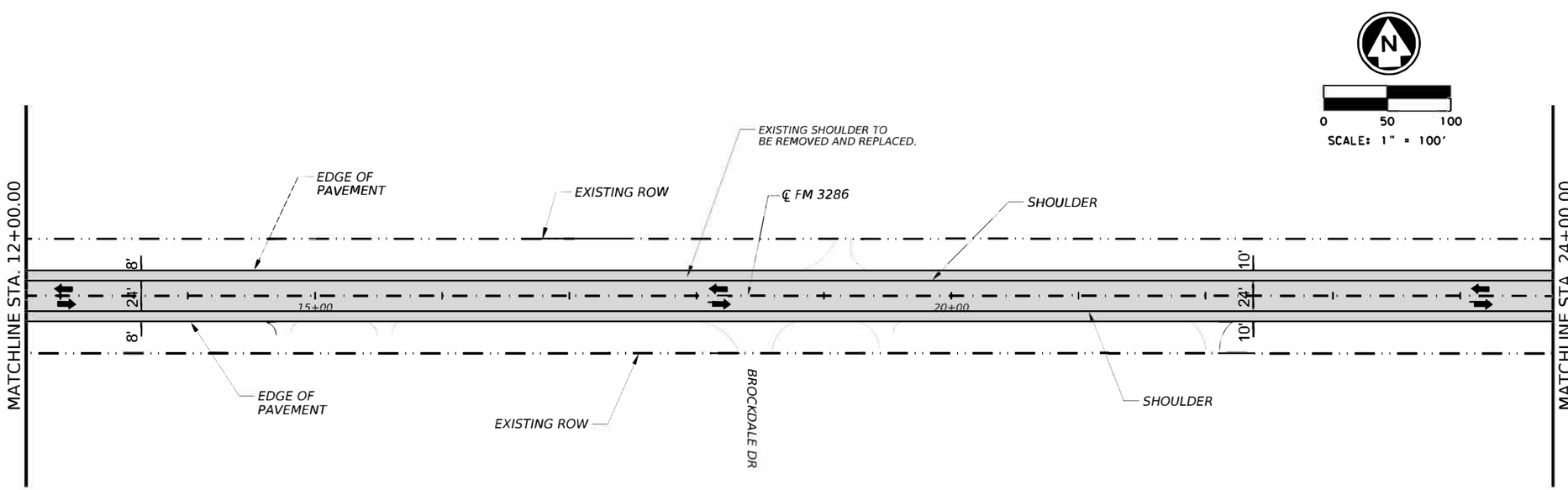

NOTES:
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STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

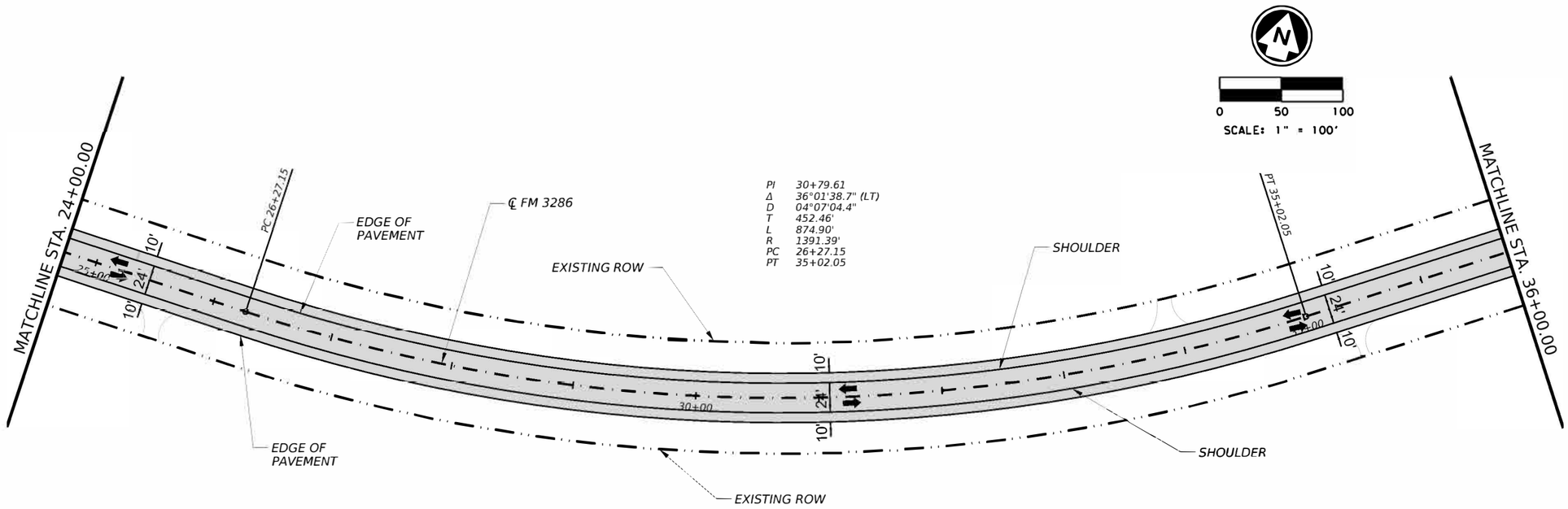
ROADWAY PLAN LAYOUT

STA 0+00.00 TO STA TO 24+00.00

(FM 3286)

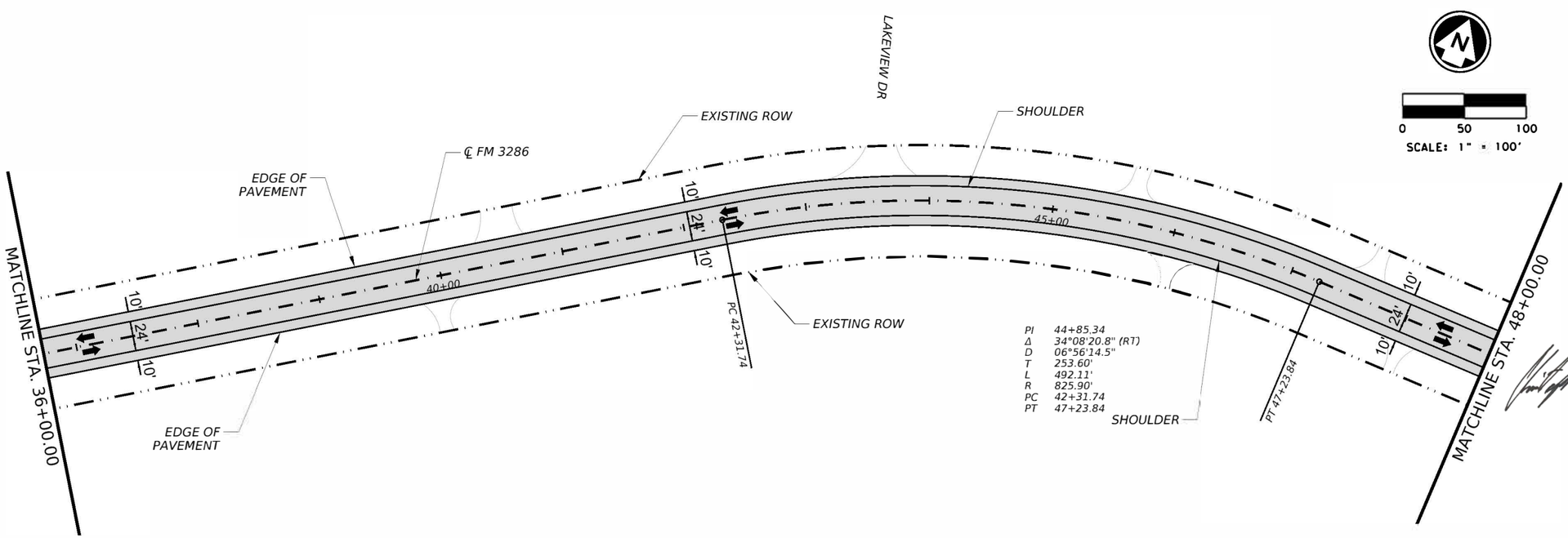
CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		63

DATE: 9/3/2024 12:24:10 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/0387050264 - Design/Plan Set/3. Roadway/FM 3286 ROADWAY PLAN LAYOUT 01.dgn



PI 30+79.61
Δ 36°01'38.7" (LT)
D 04°07'04.4"
T 452.46'
L 874.90'
R 1391.39'
PC 26+27.15
PT 35+02.05

0 50 100
SCALE: 1" = 100'



PI 44+85.34
Δ 34°08'20.8" (RT)
D 06°56'14.5"
T 253.60'
L 492.11'
R 825.90'
PC 42+31.74
PT 47+23.84

0 50 100
SCALE: 1" = 100'

NOTES:
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STATE OF TEXAS
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137165
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09/03/2024

Texas Department of Transportation

FM 982

ROADWAY PLAN LAYOUT

STA 24+00.00 TO STA 48+00.00

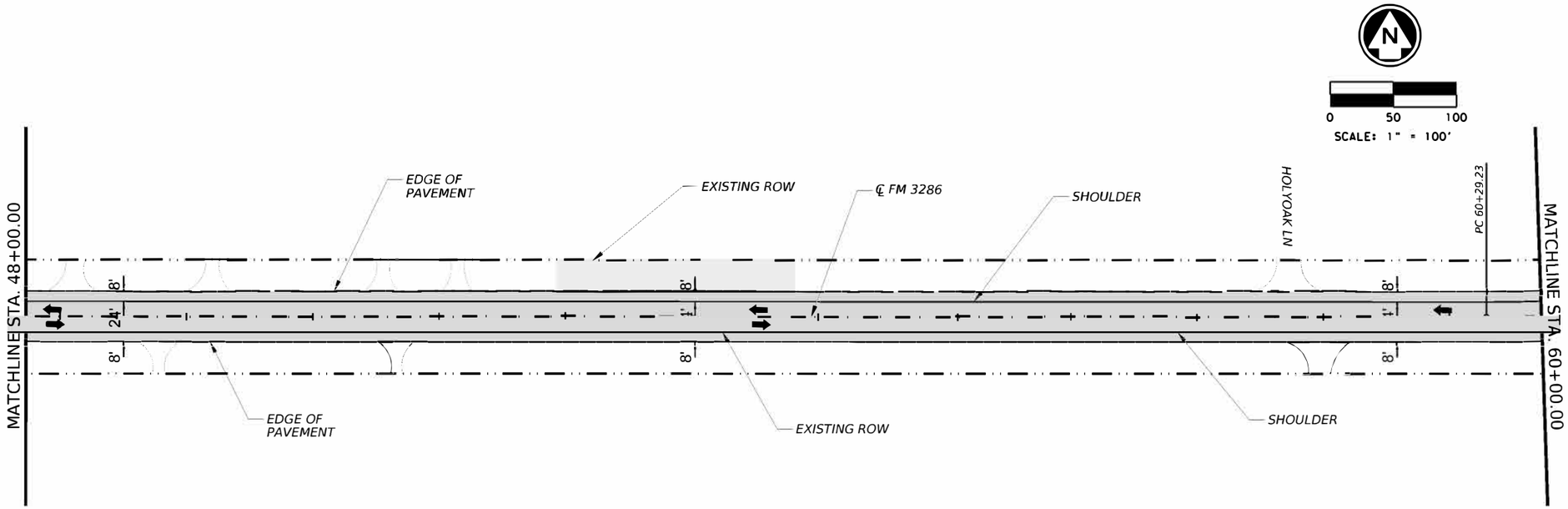
(FM 3286)

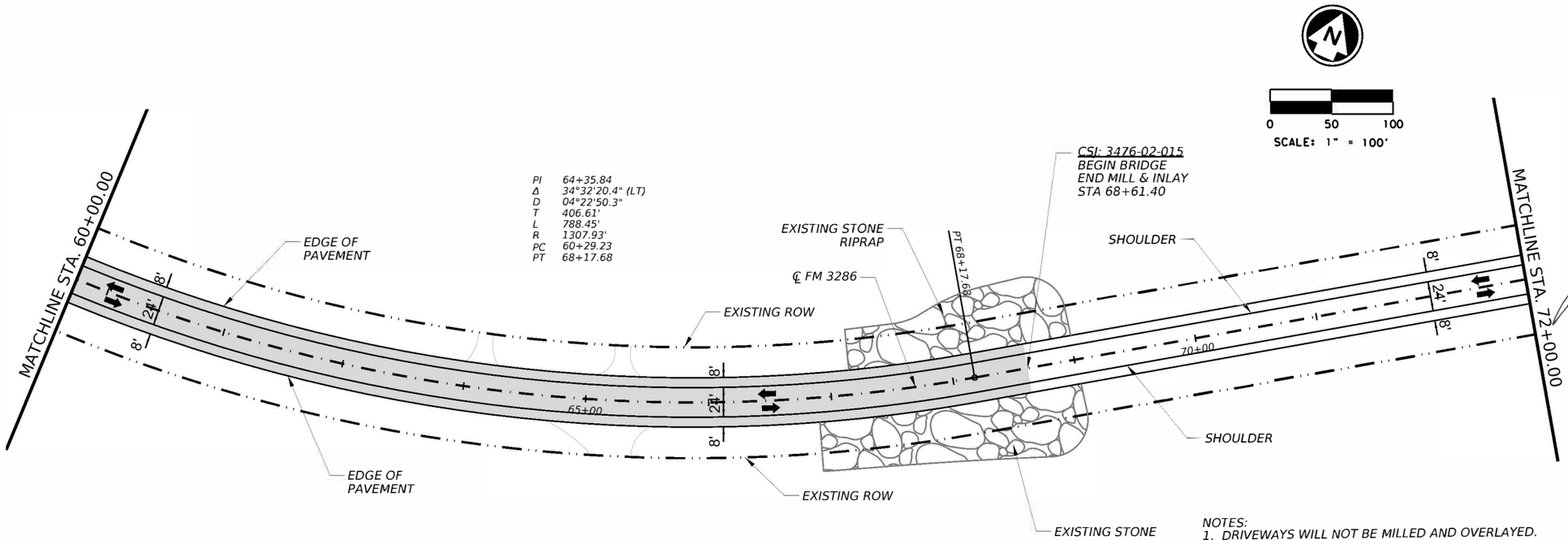
SHEET 2 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		64

DATE: 9/3/2024 12:24:30 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/038705026/4 - Design/Plan Set/3_Roadway/FM 3286 ROADWAY PLAN LAYOUT 02.dgn

DW CK DW CK





NOTES:
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STATE OF TEXAS
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09/03/2024

Texas Department of Transportation

FM 982

ROADWAY PLAN LAYOUT

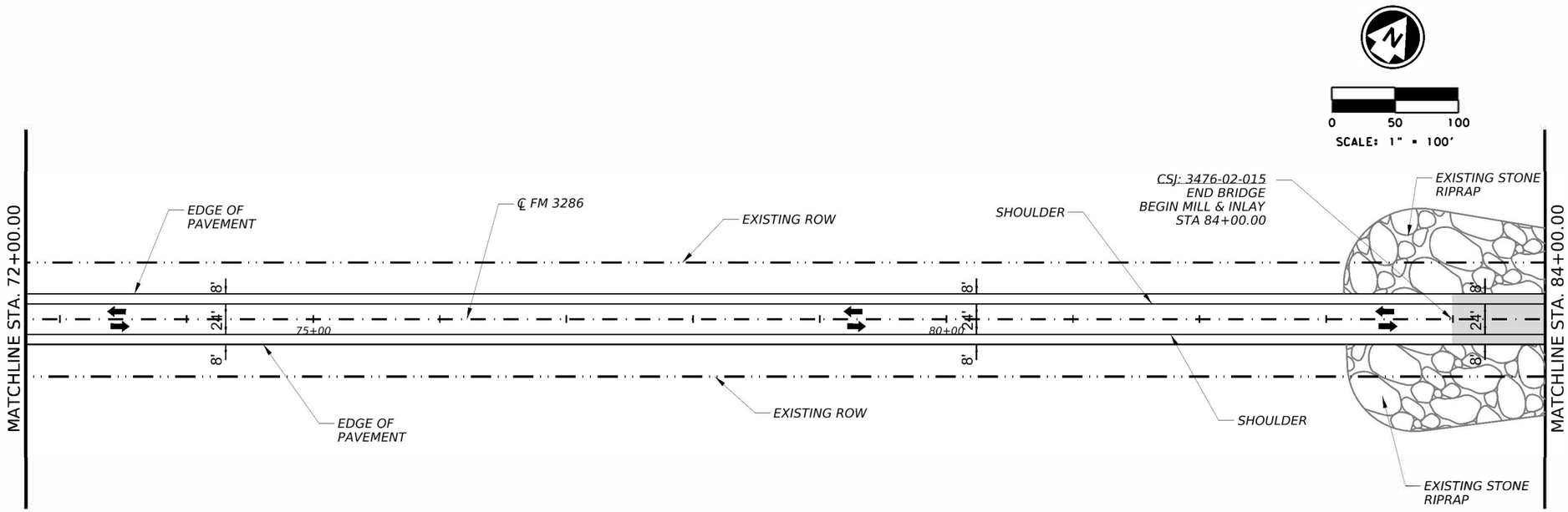
STA 48+00.00 TO STA 72+00.00

(FM 3286)

SHEET 3 OF 8

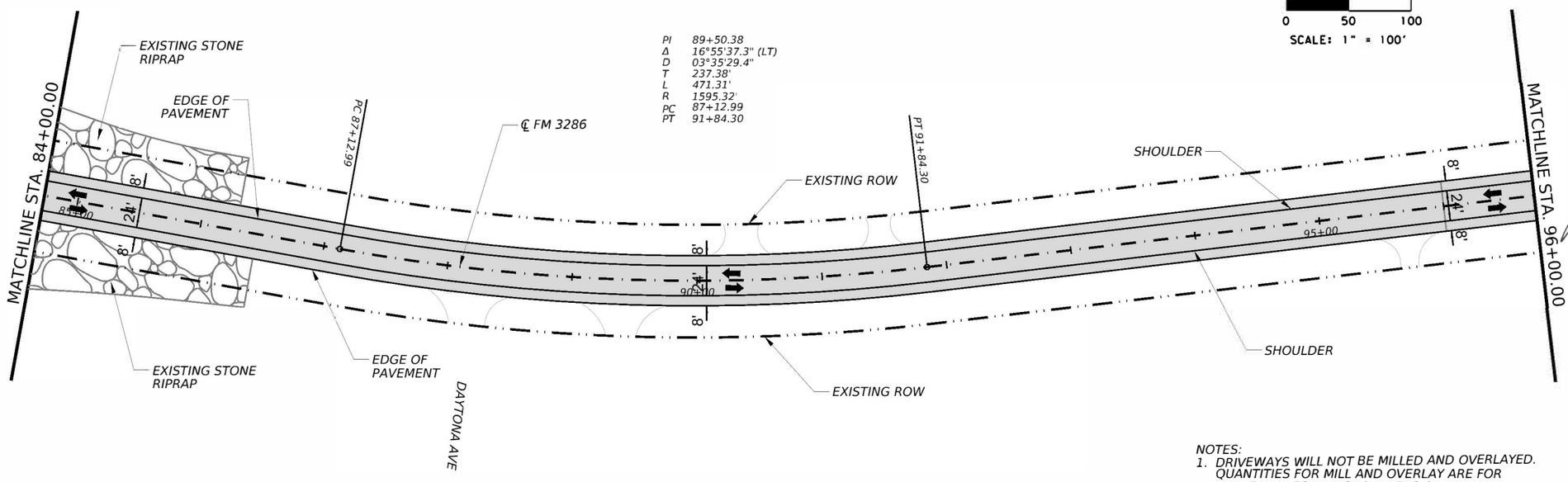
CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO
DAL	COLLIN		65

DATE: 9/3/2024 12:24:50 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/038705026/4 - Design/Plan Set/3. Roadway/FM 3286 ROADWAY PLAN LAYOUT 03.dgn



0 50 100

SCALE: 1" = 100'



0 50 100

SCALE: 1" = 100'

NOTES:
1. DRIVEWAYS WILL NOT BE MILLED AND OVERLAYED. QUANTITIES FOR MILL AND OVERLAY ARE FOR TRAVEL LANES AND SHOULDERS ONLY.

STATE OF TEXAS
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137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

ROADWAY PLAN LAYOUT

TITLE 72+00.00 TO 96+00.00

(FM 3286)

SHEET 4 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		66

DATE: 9/3/2024 12:25:10 PM
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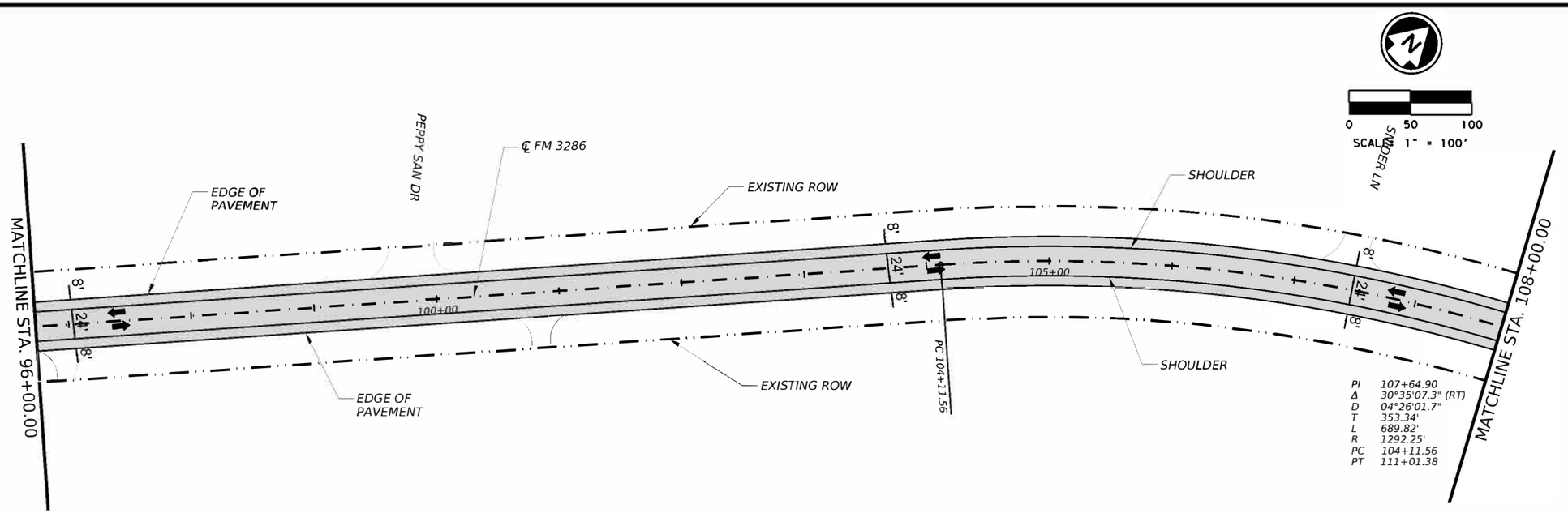

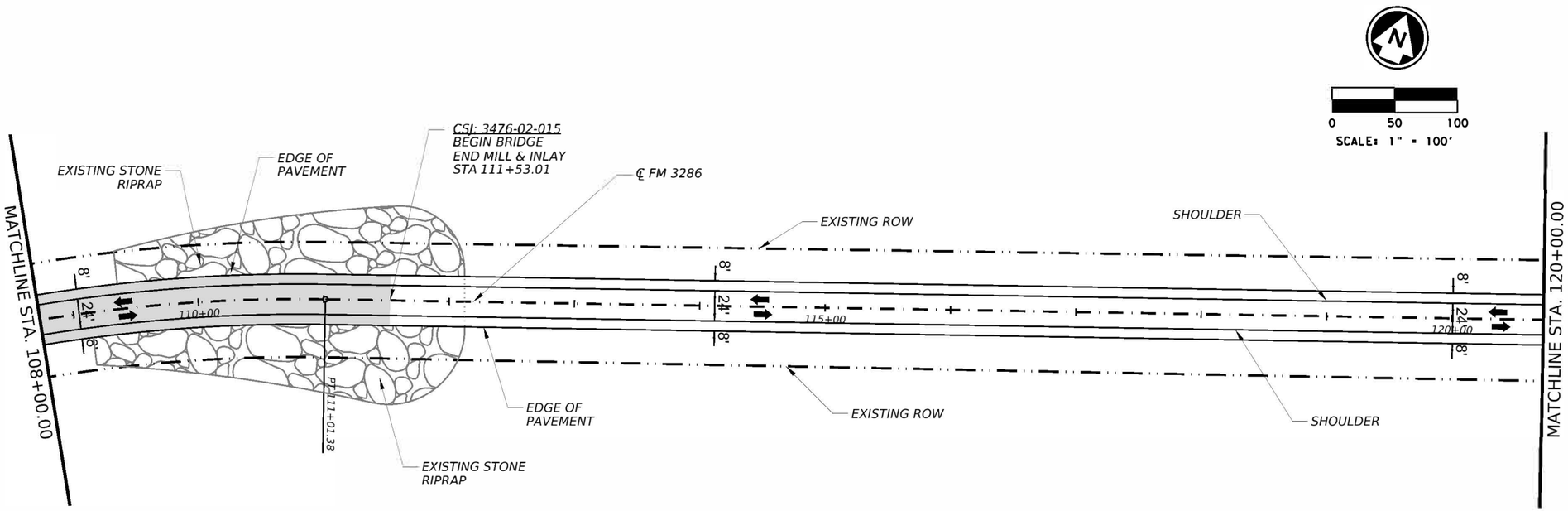

0 50 100
SCALE: 1" = 100'

NOTES:
1. DRIVEWAYS WILL NOT BE MILLED AND OVERLAYED. QUANTITIES FOR MILL AND OVERLAY ARE FOR TRAVEL LANES AND SHOULDERS ONLY.

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

ROADWAY PLAN LAYOUT

STA 96+00.00 TO STA 120+00.00

(FM 3286)

SHEET 5 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO
DAL	COLLIN		67

DATE: 9/3/2024 12:25:30 PM
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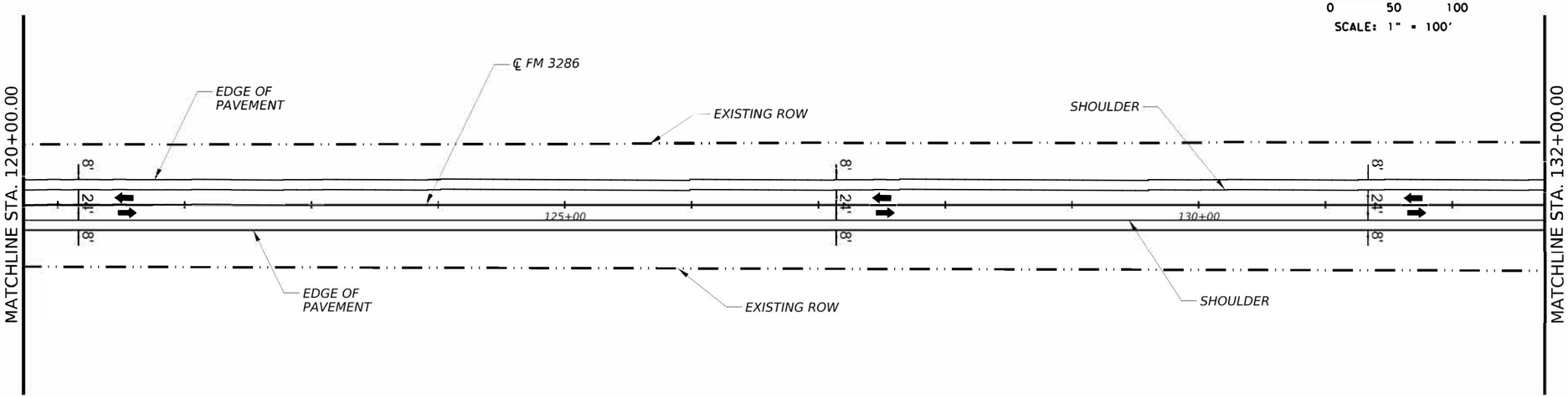
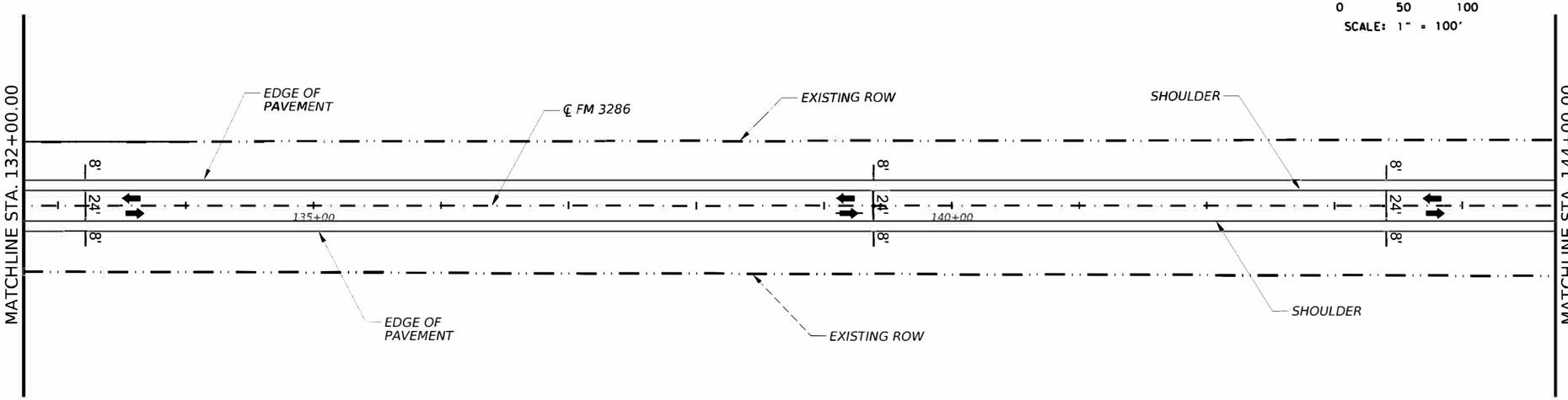


0 50 100

SCALE: 1" = 100'



0 50 100

SCALE: 1" = 100'

NOTES:
1. DRIVEWAYS WILL NOT BE MILLED AND OVERLAYED. QUANTITIES FOR MILL AND OVERLAY ARE FOR TRAVEL LANES AND SHOULDERS ONLY.

STATE OF TEXAS
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09/03/2024

Texas Department of Transportation

FM 982

ROADWAY PLAN LAYOUT

STA 120+00.00 TO STA 144+00.00

(FM 3286)

SHEET 6 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		68

DATE: 9/3/2024 12:25:51 PM
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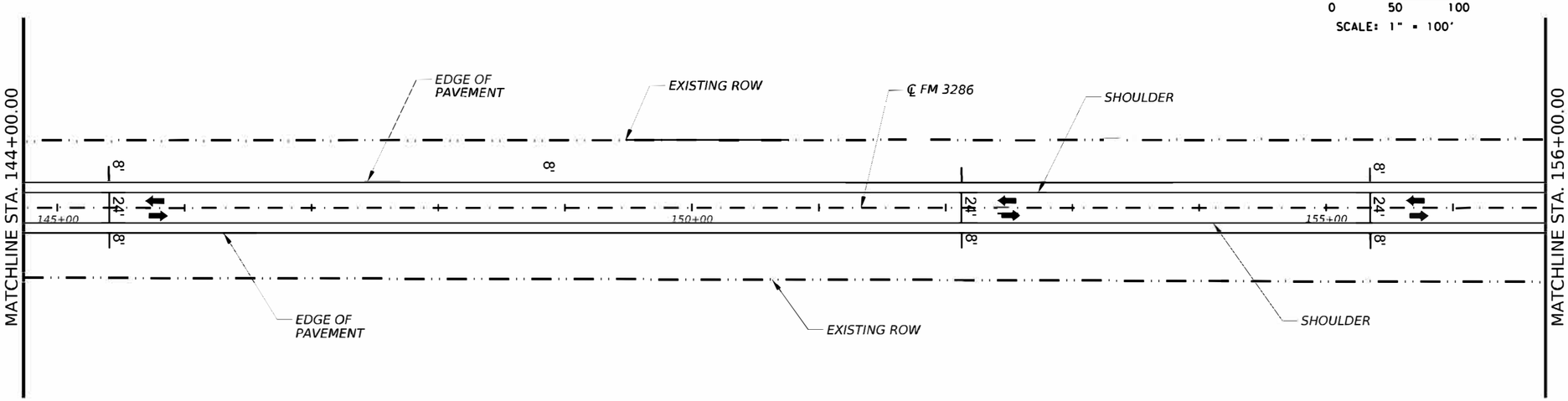
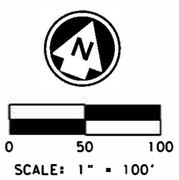
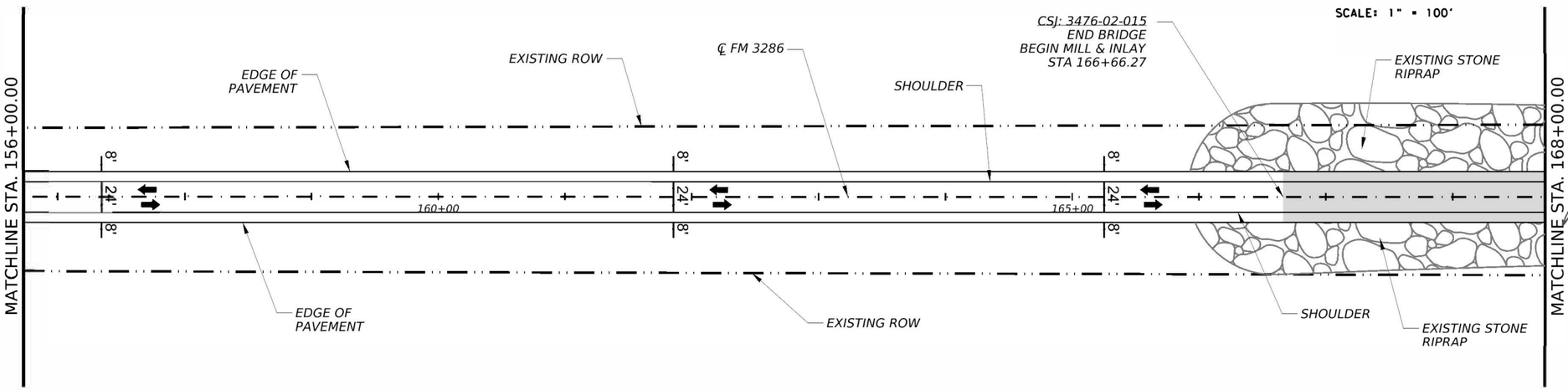
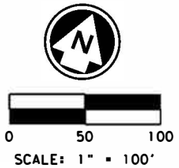
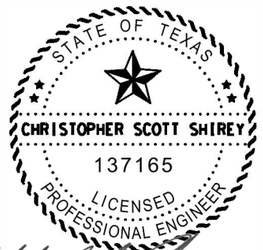








NOTES:
1. DRIVEWAYS WILL NOT BE MILLED AND OVERLAYED. QUANTITIES FOR MILL AND OVERLAY ARE FOR TRAVEL LANES AND SHOULDERS ONLY.



09/03/2024

Texas Department of Transportation

FM 982

ROADWAY PLAN LAYOUT

STA 144+00.00 TO STA 168+00.00

(FM 3286)

SHEET 7 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO
DAL	COLLIN		69

DATE: 9/3/2024 12:26:11 PM
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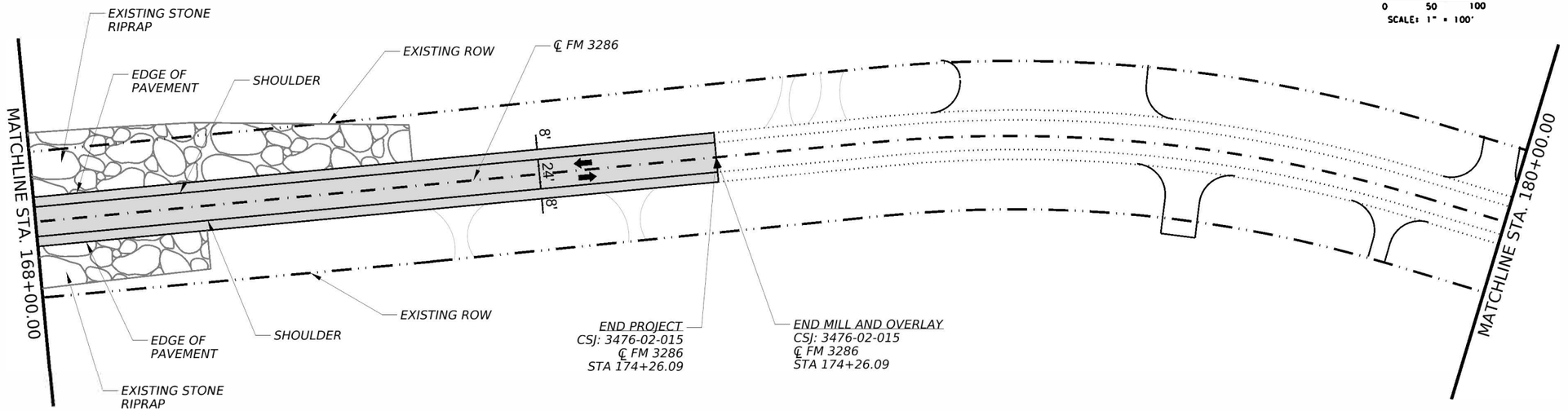
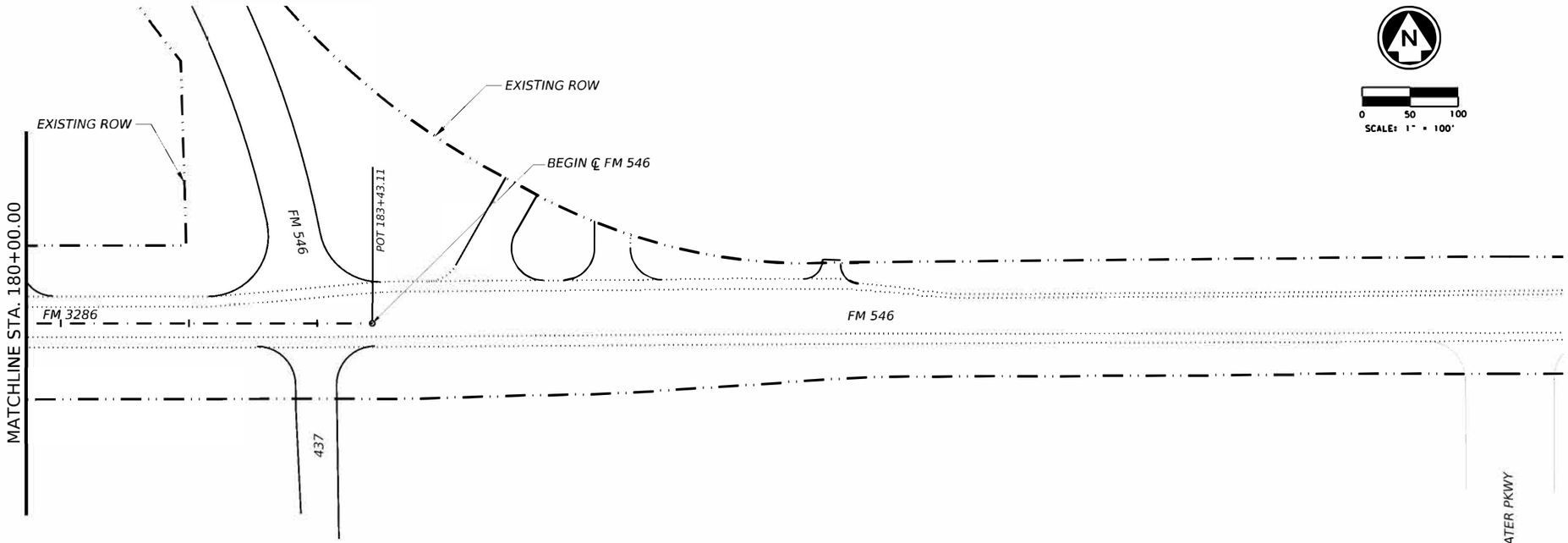
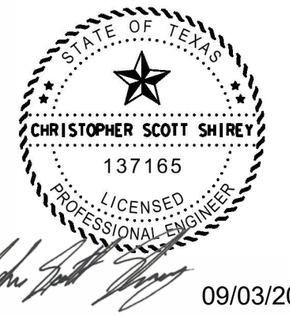




NOTES:
1. DRIVEWAYS WILL NOT BE MILLED AND OVERLAYED. QUANTITIES FOR MILL AND OVERLAY ARE FOR TRAVEL LANES AND SHOULDERS ONLY.



09/03/2024

Texas Department of Transportation

FM 982

ROADWAY PLAN LAYOUT

STA 158+00 TO STA 173+53.19

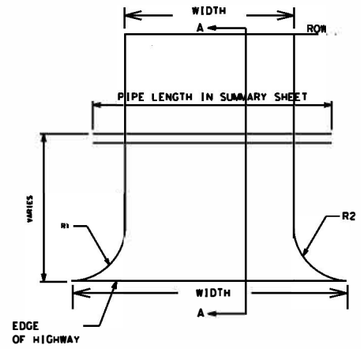
(FM 3286)

SHEET 8 OF 8

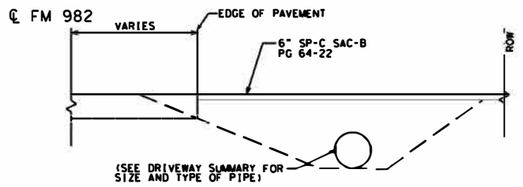
CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO
DAL	COLLIN		70

DATE: 9/3/2024 12:26:31 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/0387050264 - Design/Plan Set/3. Roadway/FM 3286 ROADWAY PLAN LAYOUT 08.dgn

ASPHALT DRIVEWAY OVERLAY DETAILS W/PIPE REPLACEMENT

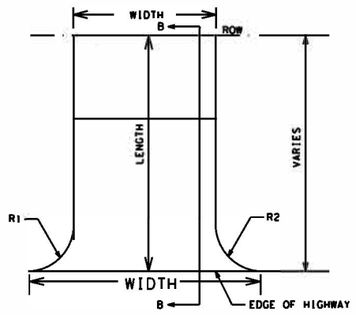


PLAN VIEW

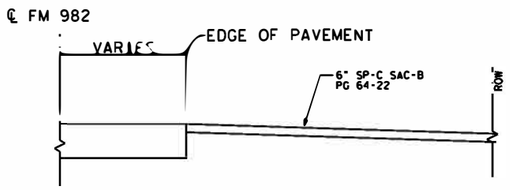


SECTION A-A

ASPHALT DRIVEWAY OVERLAY DETAILS WITHOUT PIPE REPLACEMENT

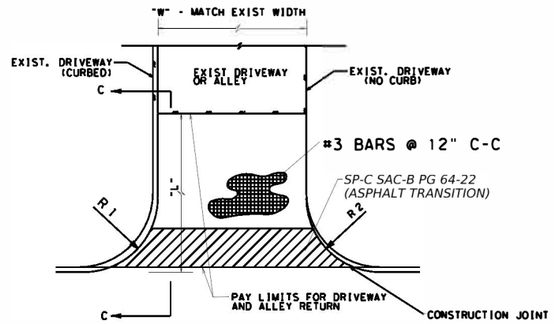


PLAN VIEW

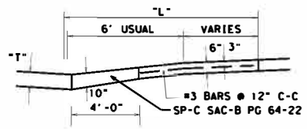


SECTION B-B

CONCRETE DRIVEWAYS



PLAN VIEW



SECTION C-C

NOTES:

1) DRIVEWAY LOCATIONS MAY BE SHIFTED AT TIME OF CONSTRUCTION AS DIRECTED BY THE ENGINEER TO MATCH EXISTING CONDITIONS.
2) MATCH EXISTING DRIVEWAY WIDTH WITH A MINIMUM OF 11'.
3) MATCH EXISTING DRIVEWAY RADIUS WITH A MINIMUM OF 15'.
4) SEE "DRIVEWAY SUMMARY" SHEET FOR ADDITIONAL INFORMATION.

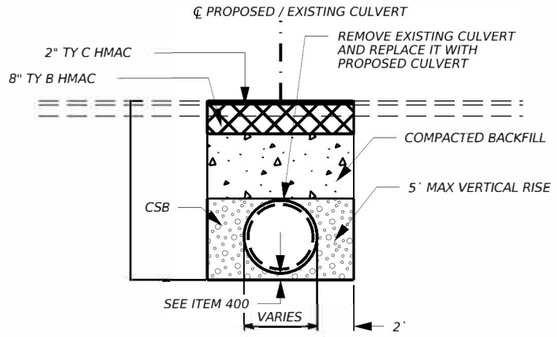
STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED PROFESSIONAL ENGINEER

09/03/2024

FM 982

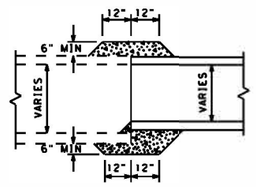
MISCELLANEOUS ROADWAY DETAILS

CONT	SECT	JOB	HIGHWAY
0387	05	026	FM 982
DIST	COUNTY		SHEET NO.
DAL	Collin		71



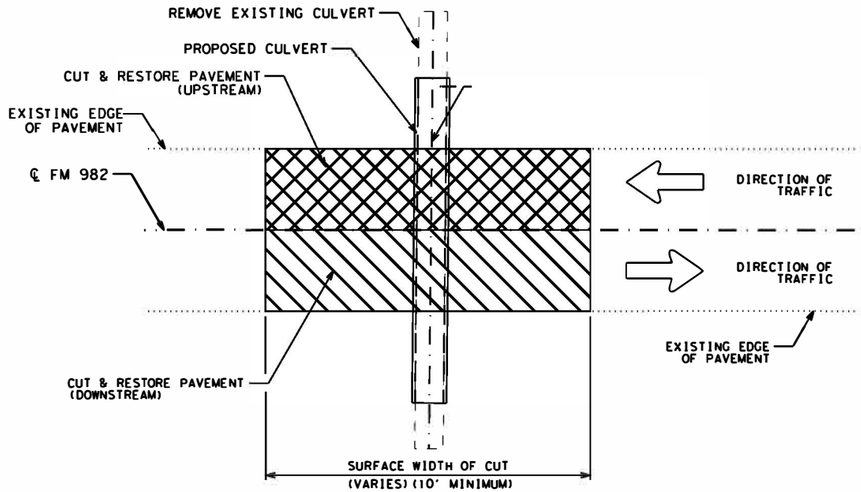
CUT & RESTORE DETAIL

SIDE VIEW



CONCRETE COLLAR FOR PIPE CONNECTION DETAIL

THIS DETAIL IS TO ALSO BE USED ON ALL CONNECTIONS BETWEEN NEW AND EXISTING PIPES.



CUT & RESTORE DETAIL

PLAN VIEW

NOTES:

1. SEE THE TxDOT BARRICADE AND CONSTRUCTION AND TRAFFIC CONTROL PLAN STANDARDS FOR ADDITIONAL INFORMATION.
2. SEE CULVERT LAYOUTS FOR ADDITIONAL INFORMATION.
3. CULVERTS SHALL BE CONSTRUCTED FROM DOWNSTREAM TO UPSTREAM.
4. MAINTAIN POSITIVE DRAINAGE DURING CULVERT CONSTRUCTION.
5. MATCH EXISTING CROSS SLOPES AND ELEVATIONS.
6. PROVIDE DAYTIME ONE-WAY TRAFFIC CONTROL AS NECESSARY FOR PHASED CONSTRUCTION. RE-OPEN BS 289C TO TWO-WAY TRAFFIC AT THE CONCLUSION OF EACH DAY'S WORK.

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED PROFESSIONAL ENGINEER

09/03/2024

FM 982

MISCELLANOUS ROADWAY DETAILS

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0387	05	026	FM 982
DIST	COUNTY		SHEET NO.
DAL	Collin		72

DATE: 2024/08/24 12:26:57 PM
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DATE: 9/3/2024 12:27:17 PM
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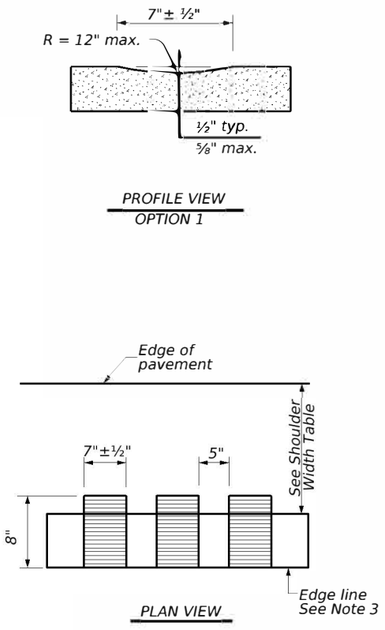
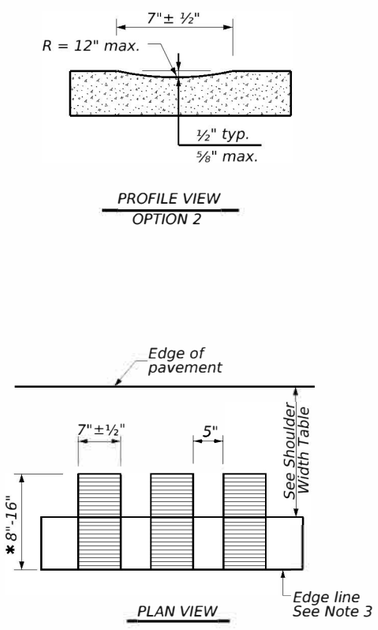
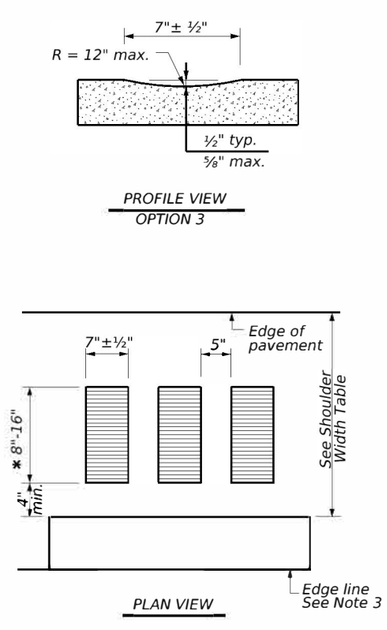


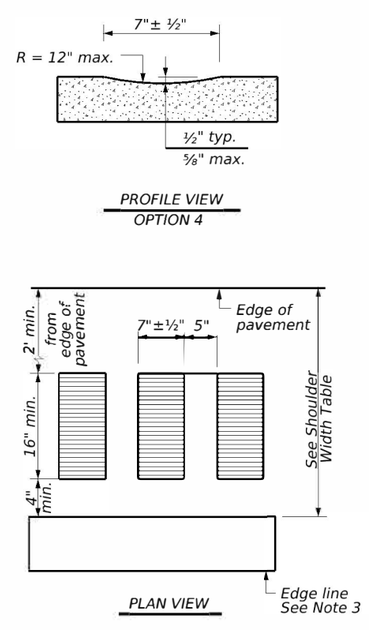
CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



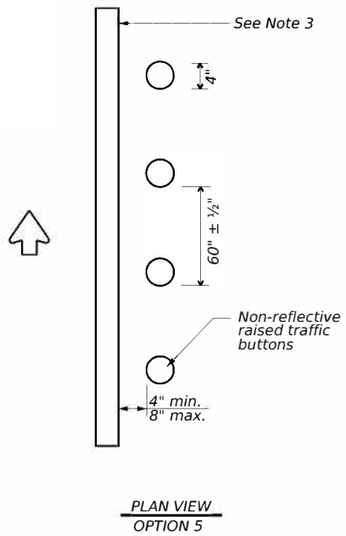
CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



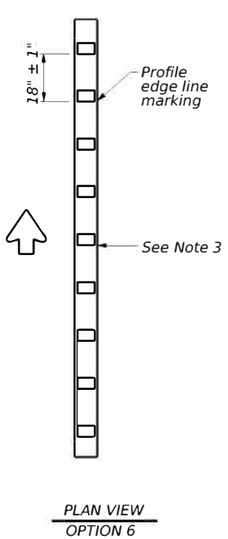
CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



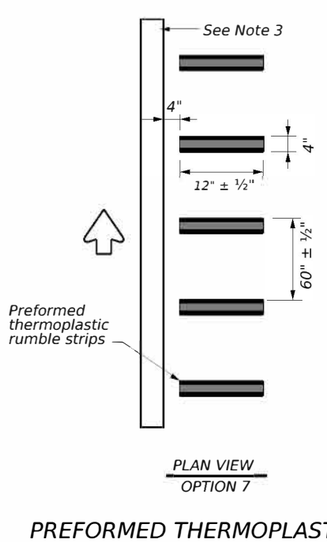
CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



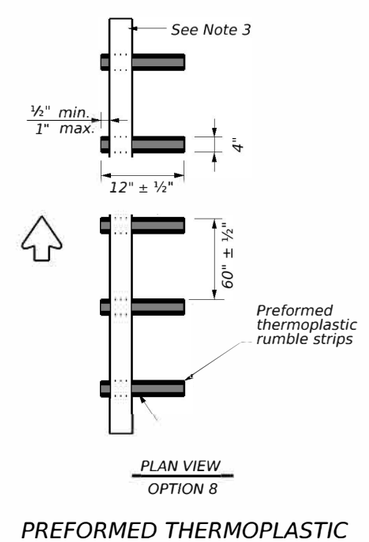
RAISED EDGE LINE (Rumble Strips)



PROFILE EDGE LINE MARKINGS (Rumble Strips)



PREFORMED THERMOPLASTIC EDGE LINE (Rumble Strips)



PREFORMED THERMOPLASTIC EDGE LINE (Rumble Strips)

SHOULDER WIDTH TABLE		
EQUAL TO OR LESS THAN 2 FEET	GREATER THAN 2 FEET LESS THAN 4 FEET	EQUAL TO OR GREATER THAN 4 FEET
Option 1, 5, 6 or 8	Option 1, 2, 3 5, 6 or 7	Option 2, 4, 5 6 or 7

GENERAL NOTES

1. Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
2. 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.
3. Use Standard Sheet PM(2) and FPM(1) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
4. See the Shoulder Width Table below for determining what options may be used for edge line rumble strips.
5. Breaks in edge line 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 when installed on conventional highways.
6. Rumble strips shall not be placed across exit or entrance ramps, acceleration or deceleration lanes, crossovers, gore areas, or intersections with other roadways.
7. Consideration should be given to noise levels when edgeline 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. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING MILLED DEPRESSION EDGE LINE RUMBLE STRIPS:

9. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
10. Pavement markings can be applied over milled shoulder rumble strips to create an edge line rumble strip.

WHEN INSTALLING RAISED OR PROFILE EDGE LINE RUMBLE STRIPS:

11. 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 the manufacturer's recommendations.
12. Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edge line when used as a rumble strip. The color of the button should match the color of the adjacent edge line marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
13. Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
14. The minimum distance between the edge line and the buttons should be used if the shoulder is less than 8 feet in width.
15. Raised profile thermoplastic markings used as edge lines may substitute for buttons.

Texas Department of Transportation

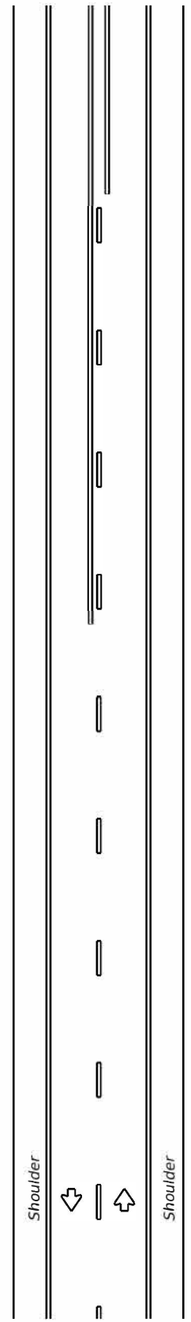
Traffic Safety Division Standard

EDGE LINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS RS(2)-23

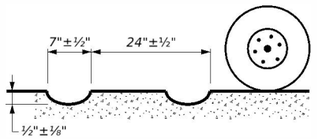
FILE: rs(2)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0387	05	026,ETC	FM 982,ETC
10-13 1-23	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		73

DATE: 9/3/2024 12:27:37 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/038705026/4 - Design/P1 on Set/3. Roadway/STANDARDS/rs(4)-23.dgn

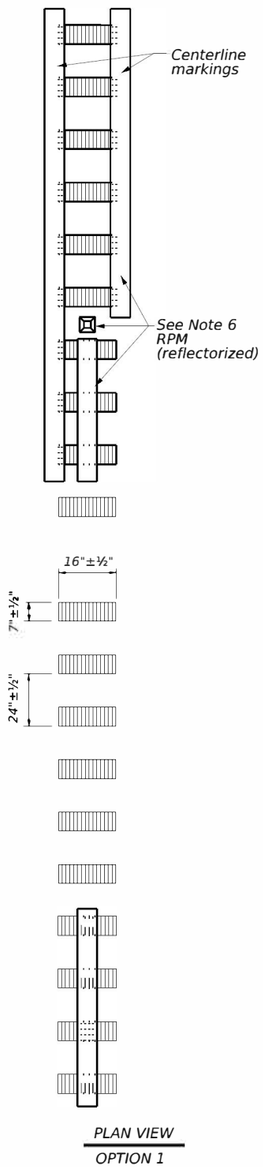
CENTERLINE RUMBLE STRIPS



TWO LANE TWO-WAY HIGHWAYS

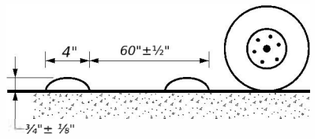


PROFILE VIEW

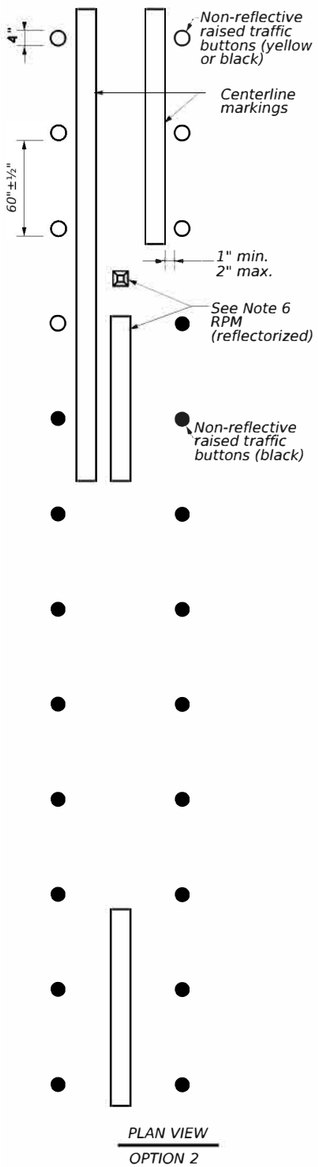


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

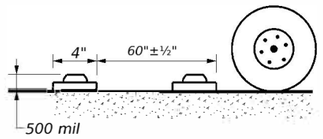


PROFILE VIEW

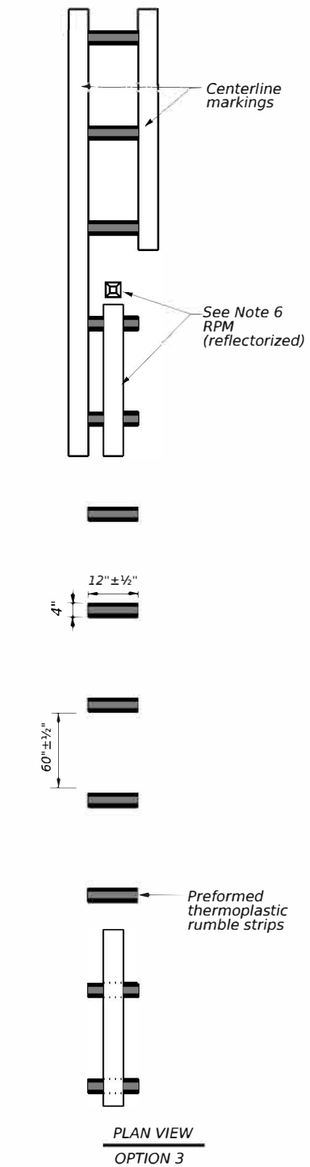


PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS

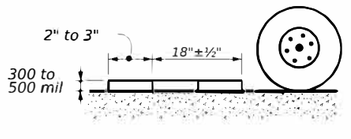


PROFILE VIEW

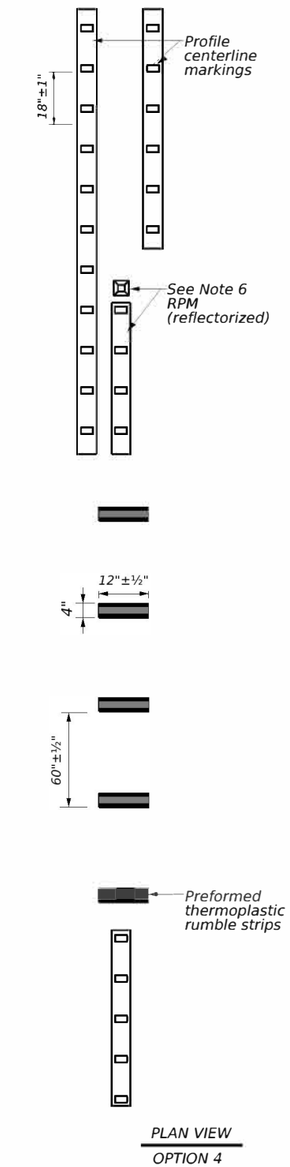


PLAN VIEW
OPTION 3

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).

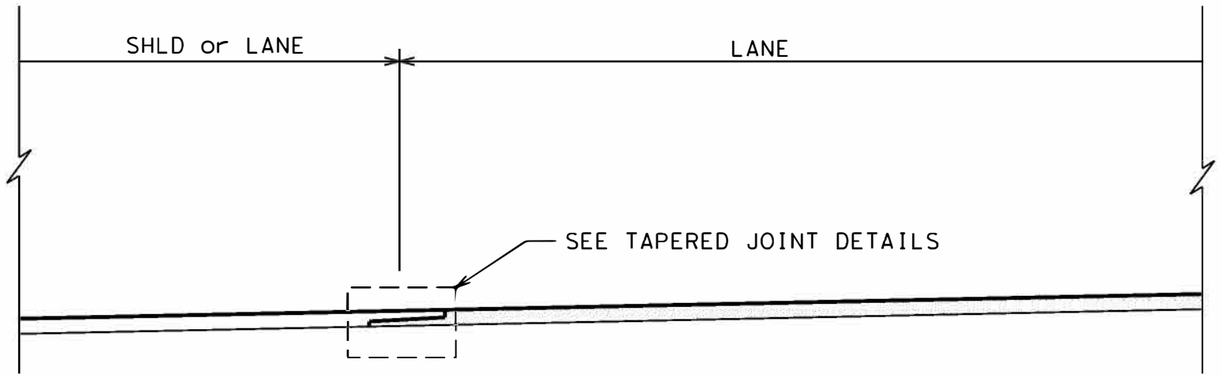
Texas Department of Transportation

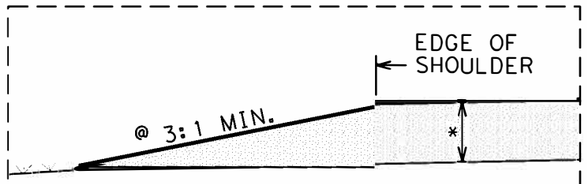
Traffic Safety Division Standard

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

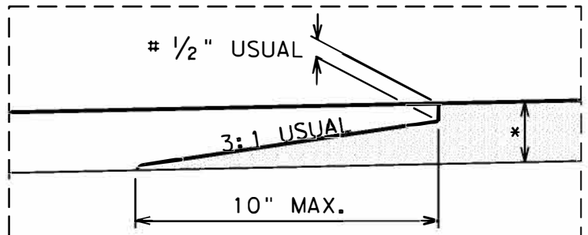
FILE: rs(4)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK TxDOT
©TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0387	05	026,ETC	FM 982,ETC
10-13 1-23	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		74

93

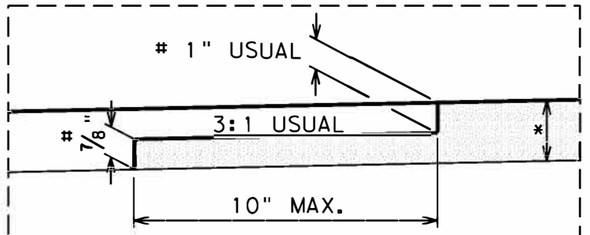




TAPERED OUTSIDE EDGE DETAIL



TAPERED JOINT DETAIL 1.5" TO 4" LIFTS



TAPERED JOINT DETAIL OVER 4" LIFTS

@ IF BACKFILLED SLOPE IS LESS THAN 3:1, COVER WEDGE WITH APPROVED BACKFILL.

* SEE TYPICAL SECTION FOR DEPTH AND TYPE OF HMA.
\# NOTCH DEPTH SHALL NOT BE LESS THAN NOMINAL AGGREGATE SIZE.

NOTES:

1. THE ABOVE DETAILS SHALL BE CONSTRUCTED BY TAPERING THE BITUMINOUS MAT. THE TAPERED PORTION SHALL EXTEND BEYOND THE NORMAL LANE WIDTH AND BE LAID MONOLITHICALLY WITH ADJOINING MAT. THE TAPERED PORTION OF THE MAT SHALL BE CONSTRUCTED BY THE USE OF AN APPROVED STRIKE-OFF DEVICE THAT WILL PROVIDE A UNIFORM SLOPE AND WILL NOT RESTRICT THE MAIN SCREED. CLEAN WEDGE PRIOR TO PLACEMENT OF TACK COAT. TACK COAT SHALL BE APPLIED UNIFORMLY TO THE IN-PLACE TAPER WITH A DISTRIBUTOR BEFORE THE ADJACENT MAT IS PLACED. FINAL DENSITY REQUIREMENTS FOR THE ENTIRE PAVEMENT, INCLUDING THE TAPER AREA, WILL REMAIN UNCHANGED. COMPACTION OF THE INITIAL TAPER SECTION WILL BE REQUIRED AS NEAR TO FINAL DENSITY AS POSSIBLE. ROLL ADJACENT MAT FROM HOT SIDE TO COLD.

2. THE TYPE OF DEVICE TO PRODUCE ABOVE REFERENCED DETAILS SHALL PROVIDE INITIAL COMPACTION EQUIVALENT TO LAYDOWN MACHINE, WITH FINAL DENSITY ADHERING TO NOTE 1, AND BE APPROVED BY THE ENGINEER.

3. HOT MIX MATERIAL AND PLACEMENT SHALL BE PAID FOR UNDER THE PERTINENT ITEM. ANY ADDITIONAL SURFACE PREPARATION, TACK COAT, TACK COAT PLACEMENT, EQUIPMENT, LABOR, TOOLS AND INCIDENTALS TO PRODUCE TAPERED EDGE AND JOINTS AS DESCRIBED ABOVE SHALL BE CONSIDERED SUBSIDIARY TO THE HOT MIX ITEM.

4. THE TAPERED JOINT DETAIL IS NOT INTENDED FOR USE ON 2 WAY 2 LANE ROADBED CENTERLINE WITH LESS THAN 22' OVERALL WIDTH.

5. FULL PAVING OF ALL LANES AND SHOULDRS BY THE END OF EACH DAY PRODUCTION WILL NOT REQUIRE A TAPERED JOINT.

REVISED ON 9/10/08

HOT MIX EDGE AND LONGITUDINAL JOINT DETAILS DALLAS DISTRICT STANDARD

LJD(1-1)-07

FED. RD. DIV. NO.	PROJECT NUMBER		SHEET NUMBER
18	SEE TITLE SHEET		75
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	COLLIN	
CONTROL	SECTION	SECTION	HIGHWAY NUMBER
0091	09	017	BS 289C

DATE: 9/3/2024 12:28:13 PM
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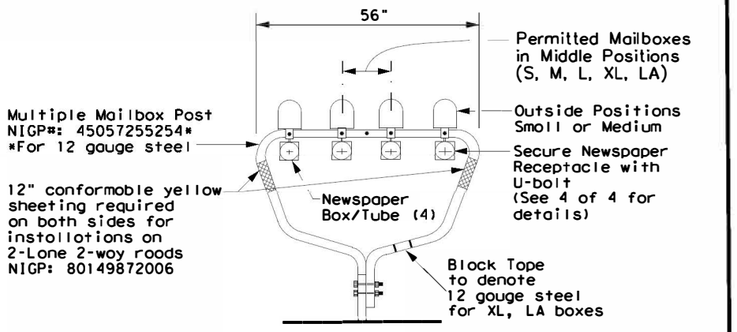
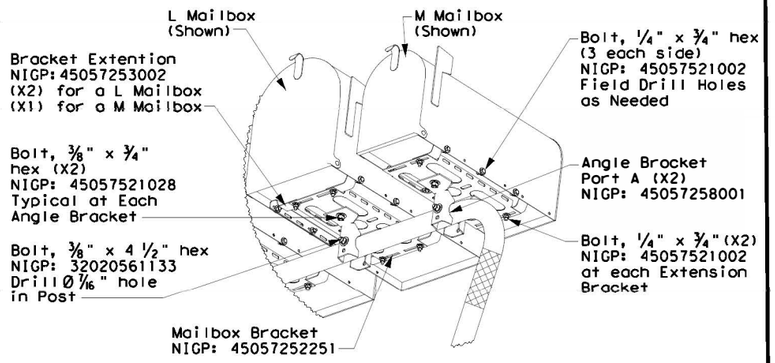
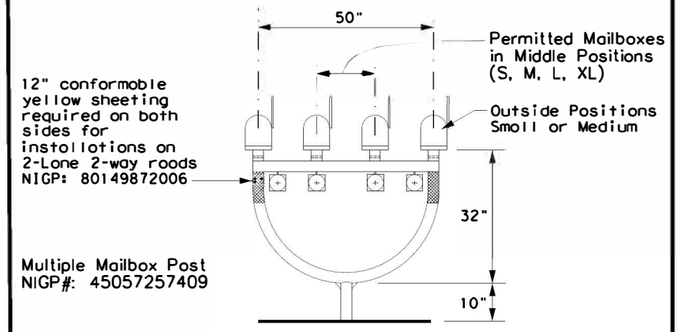
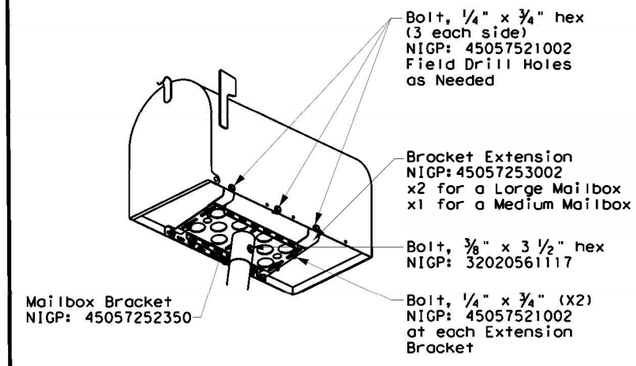
TYPE 1 - MULTIPLE





TYPE 4 - MULTIPLE





MAILBOX SIZES

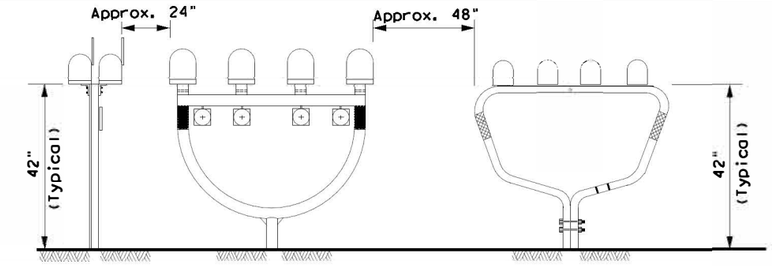
MAILBOX SIZE	TYPICAL DIMENSIONS			MAX **
	LENGTH	WIDTH	HEIGHT	WEIGHT
SMALL	19 1/2"*	6"	7"	6 LBS
MEDIUM	22 1/2"*	8"*	11 1/2"*	8 LBS
LARGE	23 1/2"	11 1/2"	13 1/2"	11 LBS
EXTRA LARGE	18"	14"	12"	13 LBS
LOCKABLE	18"	11 1/2"	15"	23 LBS

* See Note 1.
** Excluding Molded Plastic on 4 X 4 Post

GENERAL NOTES:

1. Dimensions shown (length, width, and height) ore typical, not maximums. However, anytime a medium size mailbox is mounted on a single/double mount or on the outside position on a multi mount, the dimensions shown ore moximums.
2. Mailboxes shall be mode of light weight sheet metal or light weight plastic. Heavy steel, cost iron or decorative mailboxes shall not be used on the state highway system.

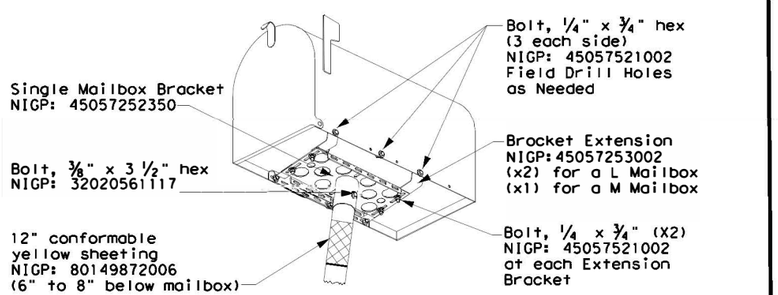
TYPICAL INSTALLATION MEASUREMENTS

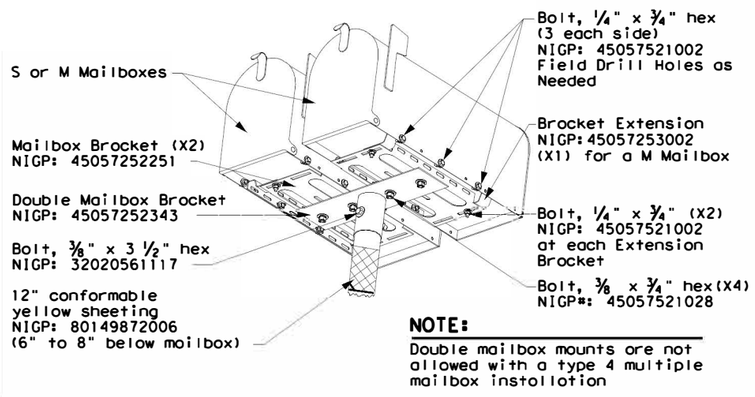


NOTE:

Mailbox installations in sidewalk areas shall be in accordance with the latest TxDOT Design Standard sheets PED-Pedestrian Facilities Curb Ramps.

TYPE 2 and 4 - SINGLE/DOUBLE

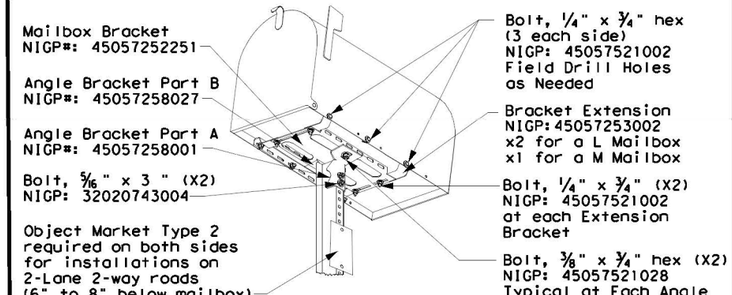


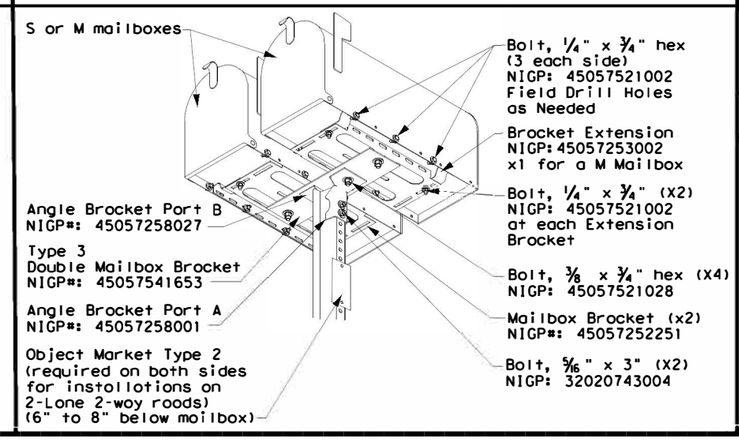


NOTE:

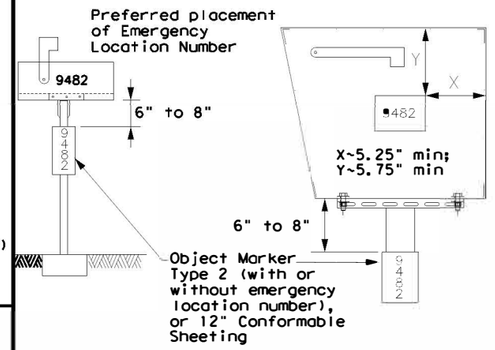
Double mailbox mounts ore not allowed with a type 4 multiple mailbox instollotion

TYPE 3 - SINGLE/DOUBLE





PLACEMENT OF EMERGENCY LOCATION NUMBER

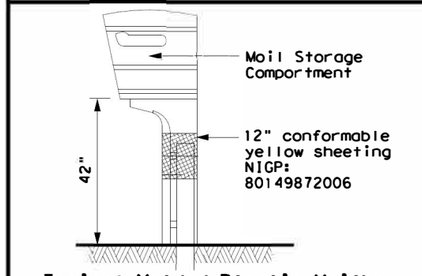


NOTES:

1. Location numbers are provided by homeowner. Minimum size 1" height.
2. Location number is typically placed on the mailbox in a contrasting color.
3. Block numbers may be placed on the Type 2 object marker if the numbers cannot be placed on the mailbox.
4. Alternatively, a green or blue plate with white numbers ottoched may be mounted below the object marker. Other contrasting color configuration, as approved, may be used.
5. See 3 of 4 for Foundation detoils.
6. See 4 of 4 for Hardware details.

SHEET 1 OF 4

TYPE 5



Typical Molded Plastic Mailbox

Texas Department of Transportation

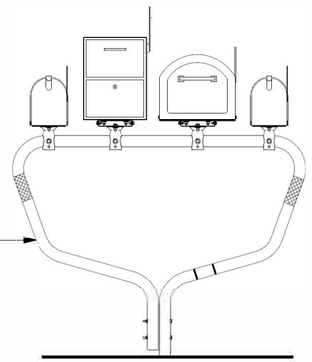
Maintenance Division Standard

MAILBOX MOUNTING AND ASSEMBLY

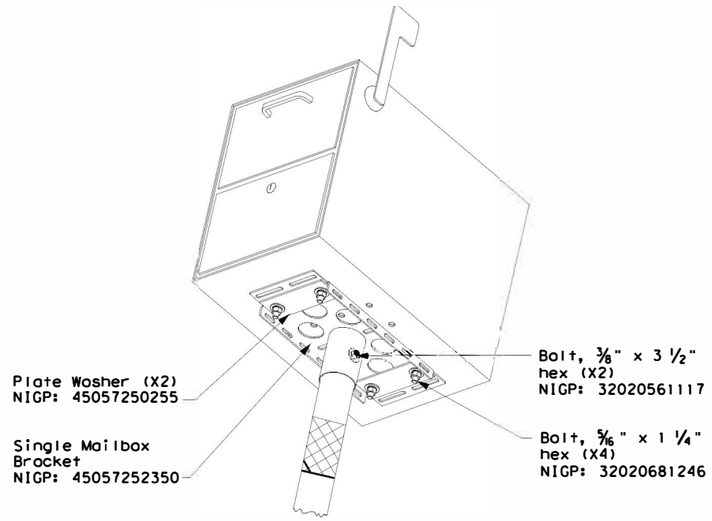
MB(1)-21

FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 2/2005 11/2008 4/2015 6/2005 1/2011 11/2006 7/2014	0387	05	026,ETC	FM 982,ETC
	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		76

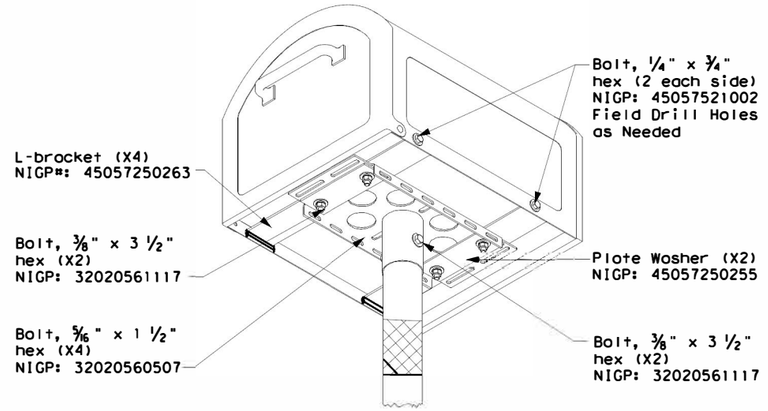
TYPE 1- MULTI LOCKABLE AND XL MAILBOX



TYPE 2/4 - SINGLE LOCKABLE MAILBOX

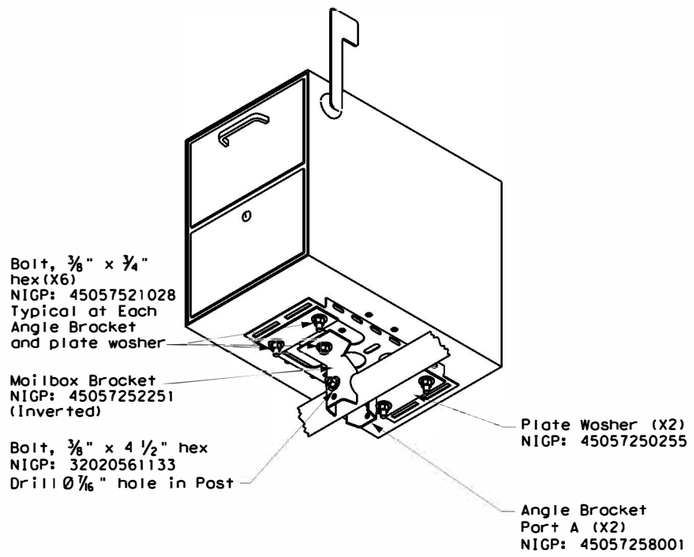


TYPE 2/4 - SINGLE XL MAILBOX

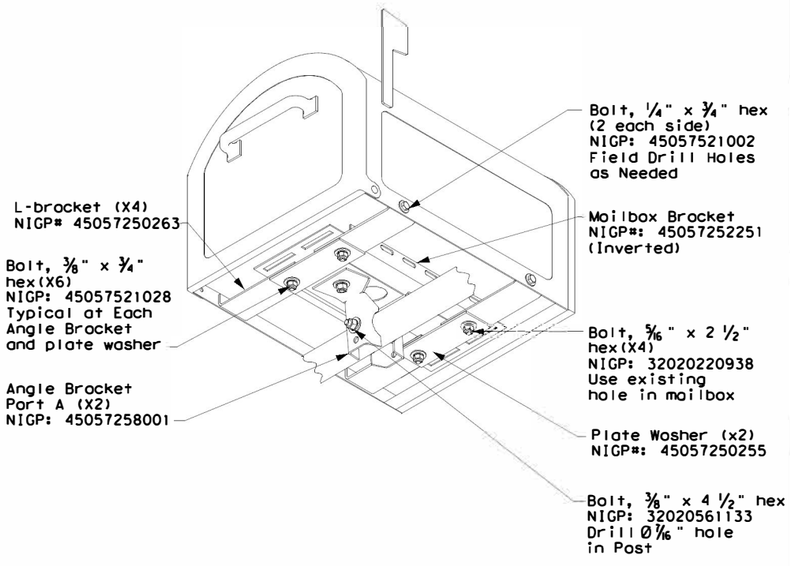


NOTE:
Follow some configuration when mounting on XL mailbox on o Type 4 multi post.

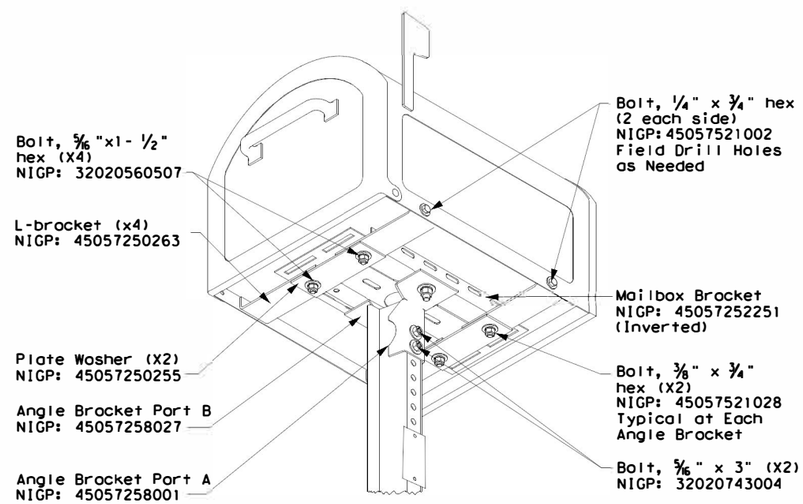
TYPE 1 MULTI – LOCKABLE ARCHITECTURAL (LA)



TYPE 1 MULTI – XL MAILBOX



TYPE 3 - XL MAILBOX MOUNTING



Texas Department of Transportation | Maintenance Division Standard

XL AND LOCKABLE ARCHITECTURAL MAILBOX ASSEMBLY

MB(2)-21

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© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		77

DATE: 9/3/2024 12:028822PM
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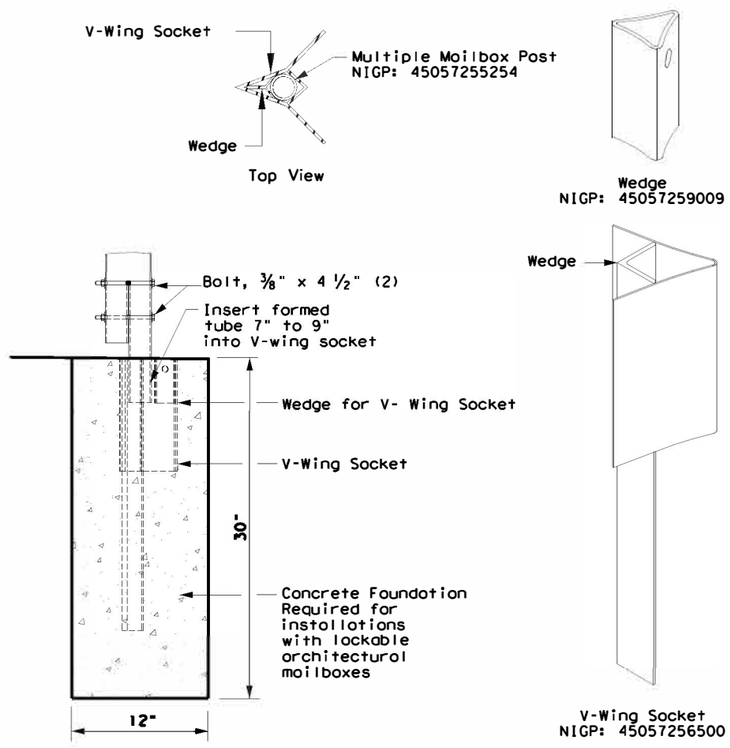
TYPE 1 - SUPPORT/FOUNDATION
Thin Wall Tube w/ V-LOC Anchorage



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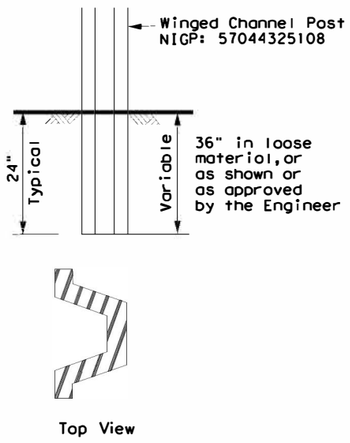
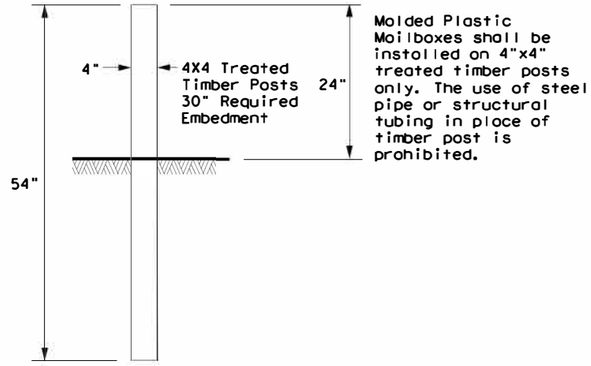


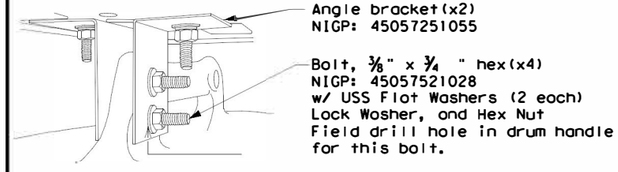
NOTES:

1. Attach Object Marker (OM) facing direction of traffic.
2. OM will also be required on opposite side if installed on a 2-Lane, 2-Way roadway.

TYPE 5 - SUPPORT/FOUNDATION



TYPE 6 - TEMPORARY MAILBOX SUPPORT



Plastic Drum NIGP: 55093383655
Rubber Collar NIGP: 55093387102

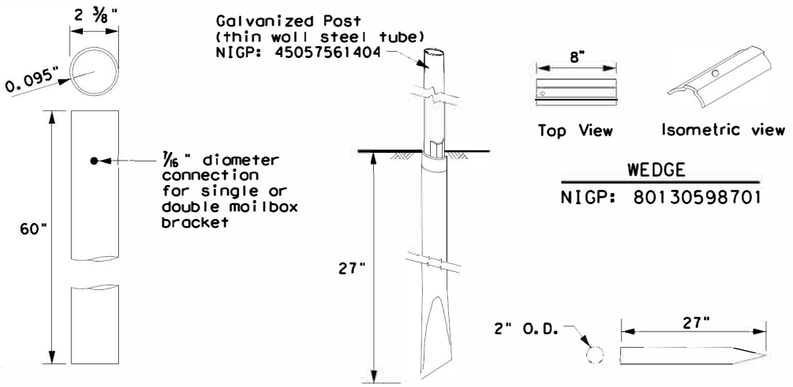
NOTES:

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

GENERAL NOTES:

1. Erect post plumb or vertical.
2. When galvanized port is required galvanize in accordance with Item 445.
3. Use a concrete footing as shown or when directed. Concrete footing will be required when soils do not hold the support/foundations in a stable condition, only on Type 1, Type 2, and Type 4

TYPE 2 - SUPPORT/FOUNDATION
Thin Wall Steel Tube w/Wedge Anchor System

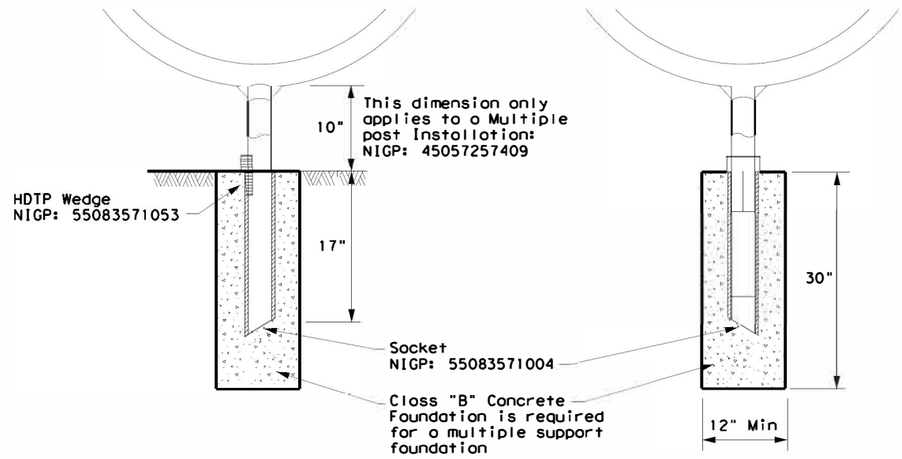


WEDGE
NIGP: 80130598701

MAILBOX POST

WEDGE ANCHOR
NIGP: 80130238407

TYPE 4 - SUPPORT/FOUNDATION
Whitecoated steel post NIGP: 45057561107
Multiple post NIGP: 45057257409
Recycled Rubber post (RR) NIGP: 45057561057



SHEET 3 OF 4

Texas Department of Transportation

Maintenance Division Standard

MAILBOX SUPPORT AND FOUNDATION

MB(3)-21

FILE: MB-21.dgn	DN:	CK:	DW:	CK:
© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	0387	05	026,ETC	FM 982,ETC
	DIST	COUNTY		SHEET NO.
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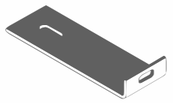
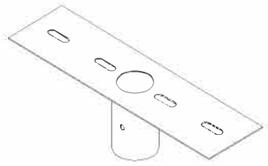
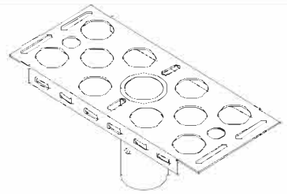
TYPE	TYPE 1	TYPE 2	TYPE 3	TYPE 4			TYPE 5	TYPE 6
Configuration	Multiple	Single or Double	Single or Double	Single	Double	Multiple	Single	Single
Mailbox Size NIGP #	Outside Position: S or M Inside Position: S, M, L, XL, or LA	Single: S, M, L, XL, or LA Double: SS, SM, MM	Single: S, M, L, or XL Double: SS, SM, MM	S, M, L, XL, or LA	SS, SM, or MM	Outside Position: S or M Inside Position: S, M, L, or XL	Molded Plastic	S, or M
Mailbox Post NIGP #	45057255254 (Galvanized Multiple)	45057561404 (Thin Walled Govonize)	57044325108 (Wing Channel Post)	45057561107 (Thin walled white powder coated) 45057561057 (Recycled Rubber Post: S or M only)	45057561107 (Thin Walled White Powder Cooted)	45057257409 (White Powder Coated Multiple)	4x4 Timber	Construction Barrel
Post and Mailbox Hardware NIGP #	45057259009 (Wedge) 45057256500 (V-Wing Socket) 45057253002 (Bracket Extension) 45057252251 (Mailbox Bracket) 45057258001 (Port A Angle Bracket x2) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	80130598701 (Wedge) 80130238407 (Wedge Anchor) 45057253002 (Bracket Extension) 45057252343 (Double MB Bracket) 45057252350 (S. Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket forXL x4)	45057541653 (Type 3 Double Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057253002 (Bracket Extension) 45057258001 (Port A Angle Bracket) 45057258027 (Port B Angle Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057252350 (Single Mailbox Bracket) 45057253002 (Bracket Extension) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252343 (Double Mount Bracket) 45057252251 (Mailbox Bracket x2)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252350 (Single Mount Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)	None	45057251055 Angle Bracket (x2)
Foundation Used	Class B Concrete (Required for LA Mailboxes)	Class B Concrete (Required for LA Mailboxes)	None	Class B Concrete (not used with recycled rubber post, required for LA Mailboxes)	Class B Concrete (not required)	Class B Concrete	None	None



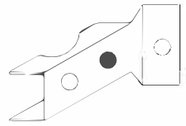
NIGP: 45057250263
L-Bracket x4 for
XL sized mailboxes



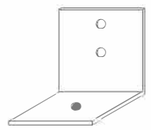
NIGP: 45057252343
Double Mailbox Brocket
For Type 2 and Type 4
double mount



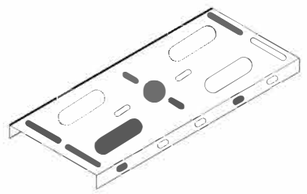
NIGP: 45057252350
Single Mailbox Bracket
For Type 2 single and for
Type 4 single and multi mount



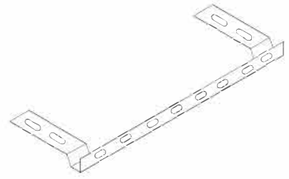
NIGP: 45057258001
Port "A" Angle Bracket
For Type 1 multi (2 per mailbox)
and Type 3 single and double



NIGP: 45057251055
Type 6 Angle Bracket
(2 per mailbox)



NIGP: 45057252251
Mailbox Brocket
For Type 1 multi ond
any double mount (use 2)



NIGP: 45057253002
Bracket Extension
Use 1 for a medium Mailbox
Use 2 for a Large Mailbox

NIGP: 45057258027
Port "B" Angle Brocket
For Type 3 single
ond double

NIGP: 80130598701
Wedge for Type 2

NIGP: 45057250255
Plate Washer for Architecurol
and XL Mailboxes

NIGP: 45057541653
Type 3 double mailbox bracket

NIGP: 55083571053
Type 4 Mailbox Wedge

NIGP: 55083571004
Type 4 Mailbox Socket

NIGP: 80130238407
Type 2 Wedge Anchor

NIGP: 45057259009
Wedge for Type 1 V-wing Socket

NIGP: 45057256500
V-wing Socket for
Type 1 Foundation

NIGP #	OBJECT MARKERS AND CONFORMABLE SHEETING
55008311759	Type 2 OM 4"x4" (3 Needed) for Type 3 Wing Channel Post
55008312906	Type 2 OM 6"x12" (1 needed) for Type 3 Wing Channel Post
80149872006	12" Conformable Reflective Yellow Sheeting for Flexible Posts

NOTES:

1. Type 2 object marker in accordance with Traffic Engineering Standard Delineators & Object Markers.
2. A light weight receptacle for newspaper delivery can be attached to mailbox posts if the receptacle does not touch the mailbox, present o hazard to traffic or delivery of the mail, extend beyond the front of the moilbox, or display advertising, except the publication title.

BID CODES FOR CONTRACTS

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

Type of Mailbox
- S = Single
- D = Double
- M = Multiple
- MP = Molded Plastic

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

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

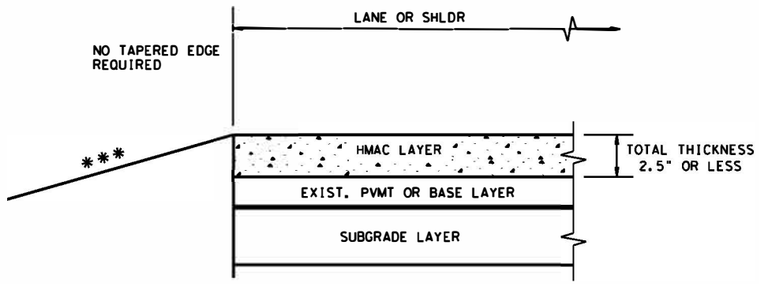
Texas Department of Transportation — Maintenance Division Standard

NIGP PARTS LIST AND COMPATIBILITY

MB(4)-21

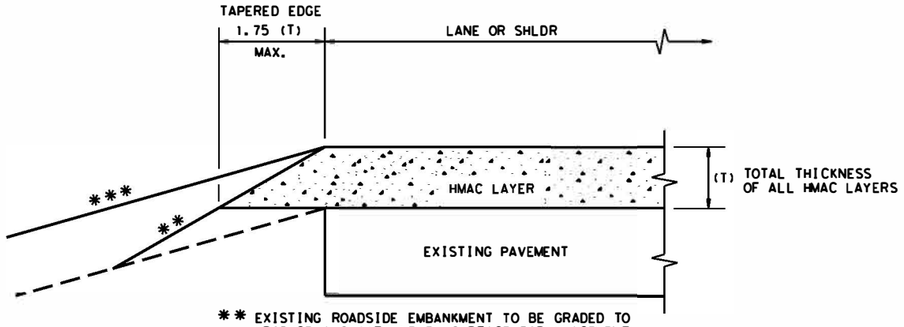
FILE: MB-21v.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 2/2005 11/2006 4/2015 9/2005 1/2011 11/2006 7/2014	0387	05	026,ETC	FM 982,ETC
	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		79

DATE: 9/3/2024
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/0387050264 - Design/Plan Set/3. Roadway/STANDARDS/tehmac11.dgn



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

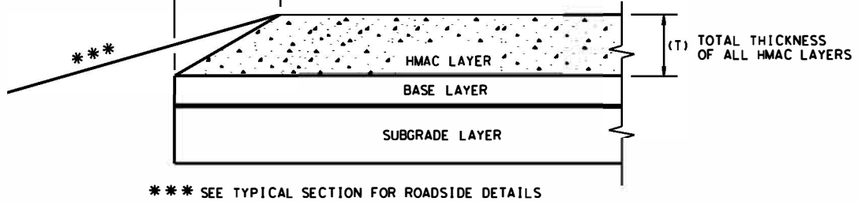
CONDITION - 1
THIN HMAC SURFACES OR HMAC OVERLAY WITH THICKNESS OF 2.5" OR LESS



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

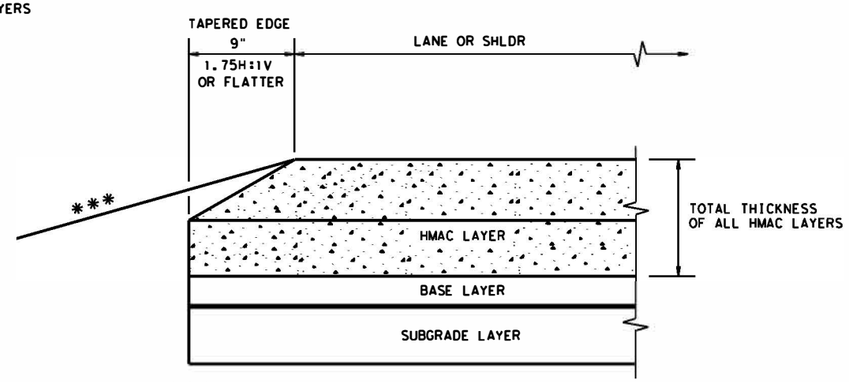
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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

(NOT TO SCALE)

GENERAL NOTES

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

Texas Department of Transportation | Design Division Standard

TAPERED EDGE DETAILS HMAC PAVEMENT

TE(HMAC)-11

FILE: tehmac11.dgn	DN: TxDOT	CK: RL	DW: KB	CK:
©TxDOT January 2011	CONT	SECT	JOB	HIGHWAY
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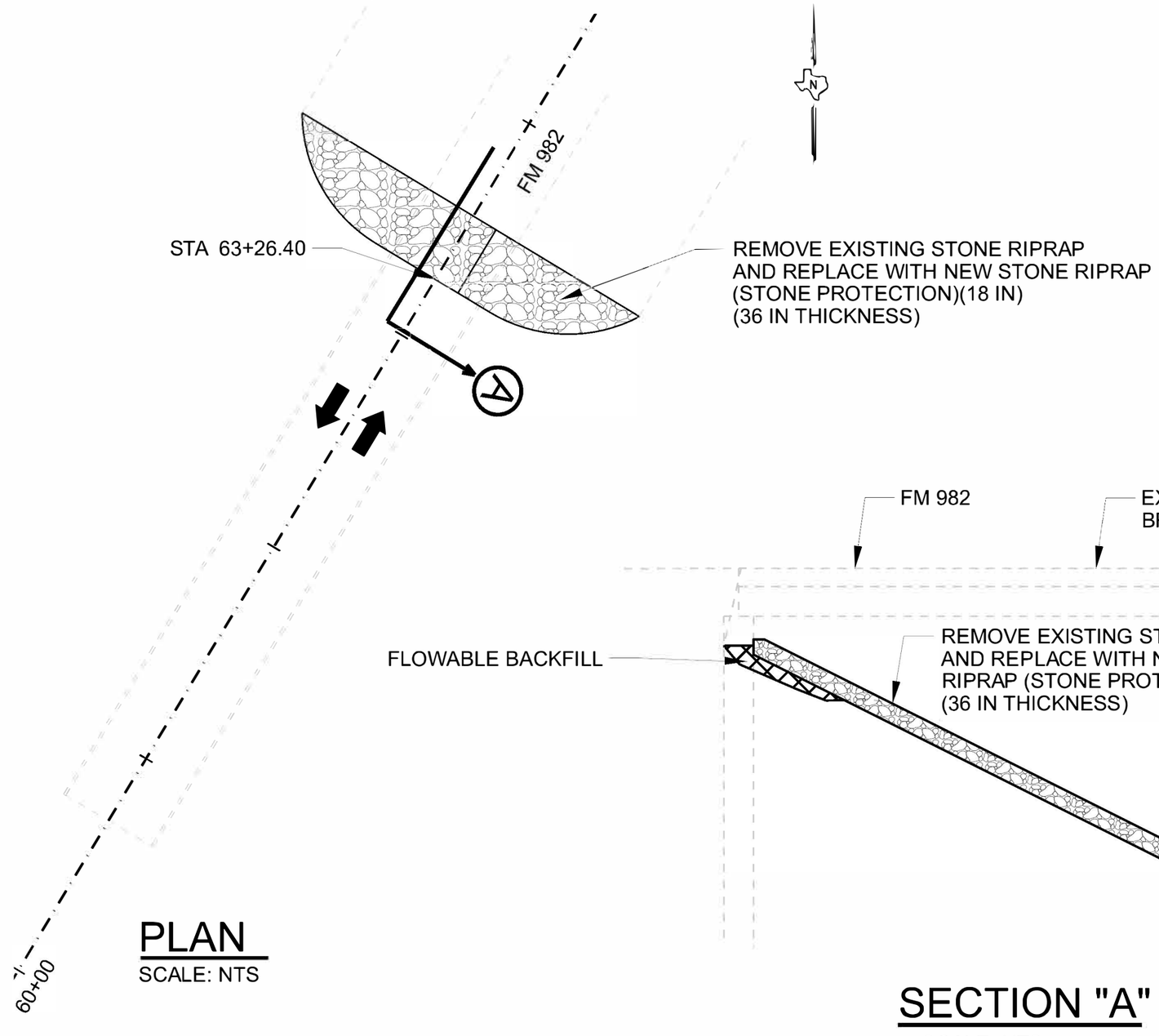
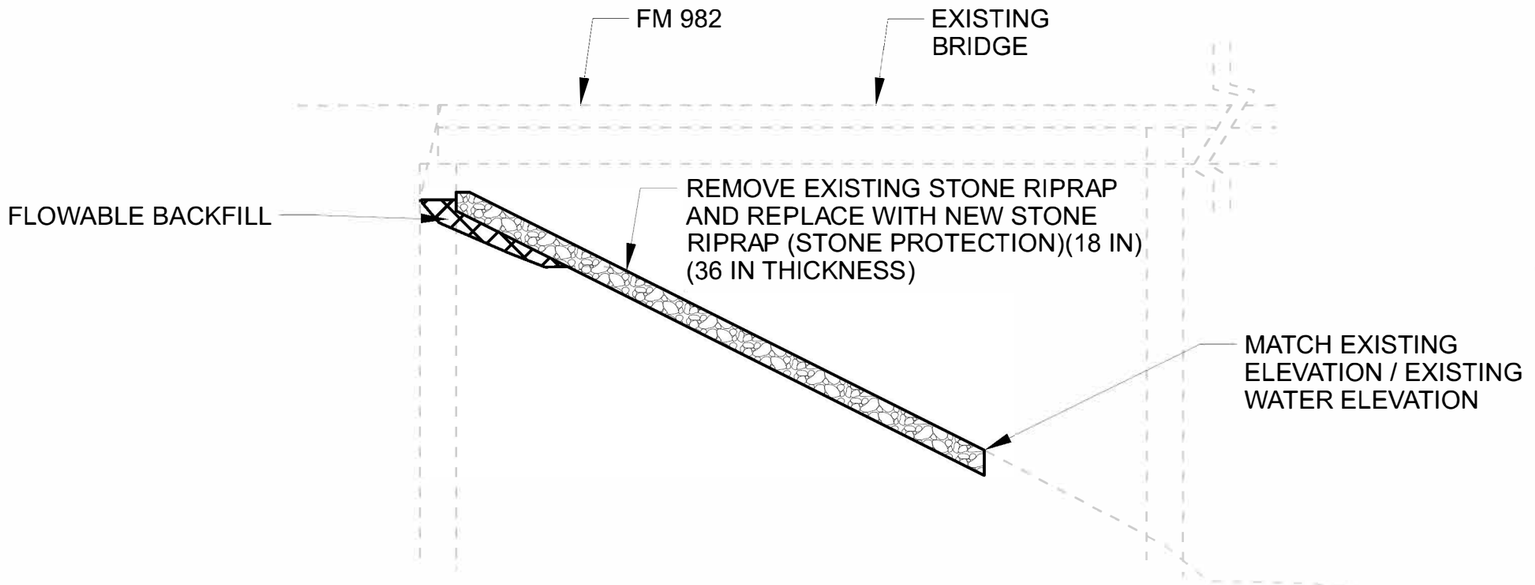
	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		80



PLAN

SCALE: NTS



SECTION "A"

SCALE: NTS

	DESCRIPTION	UNIT	SHEET TOTAL
0401 7001	FLOWABLE BACKFILL	CY	24
0432 7043	RIPRAP (STONE PROTECTION)(18 IN)	CY	530
0496 7040	REMOVING STONE RIPRAP	LF	160

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

009/03/2024

Texas Department of Transportation

TICKY CREEK
LAYOUT

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0387	05	026	FM 982
DIST	COUNTY		SHEET NO.
DAL	COLLIN		81

DATE: 9/3/2024 9:15:54 PM
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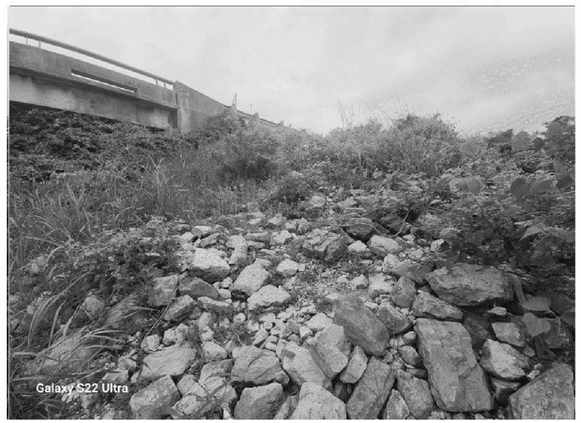
NORTH ABUTMENT

WEST SIDE
LOOKING SOUTH

LOOKING EAST

EAST SIDE
LOOKING WEST



EAST SIDE
LOOKING NORTH

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

TICKY CREEK
LAYOUT

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0387	05	026	FM 982
DIST	COUNTY		SHEET NO.
DAL	COLLIN		82

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DN | OK | DW | CK

DATE: 9/3/2024 9:08:06 PM
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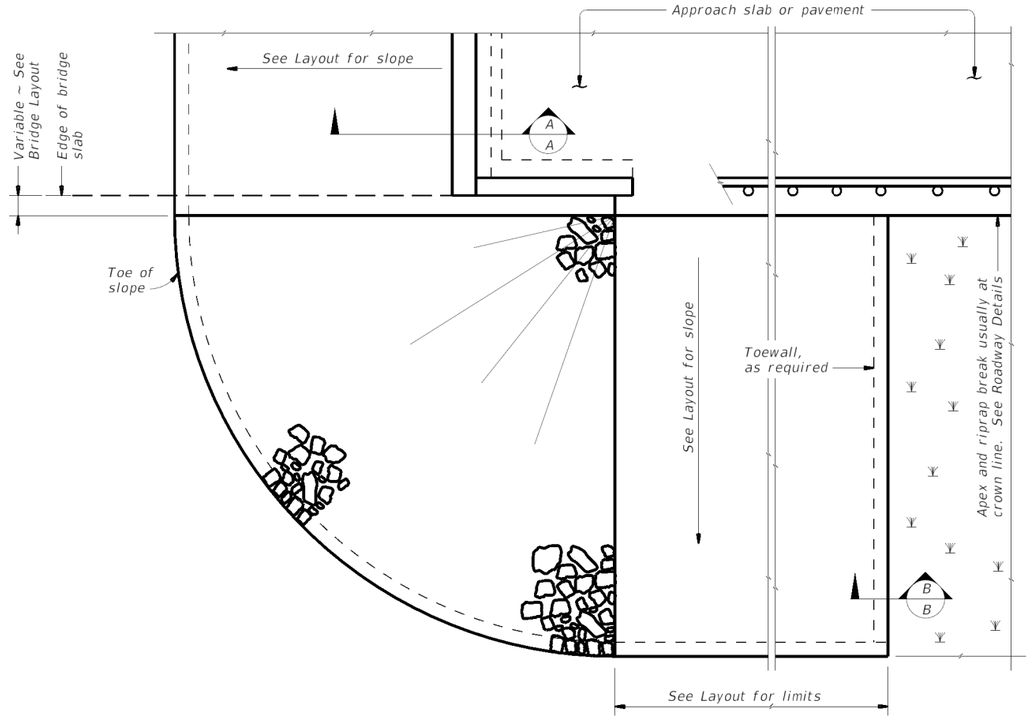
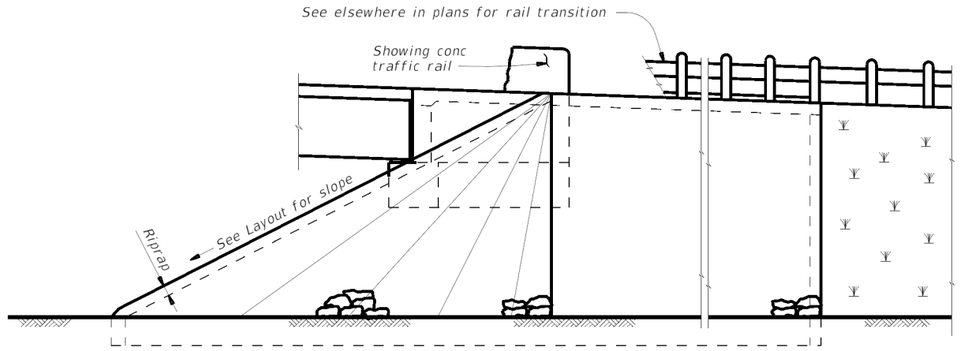
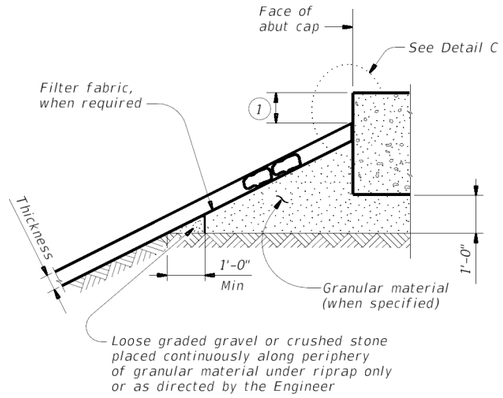


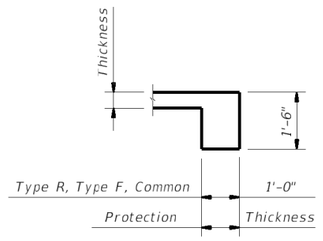
PLAN



ELEVATION

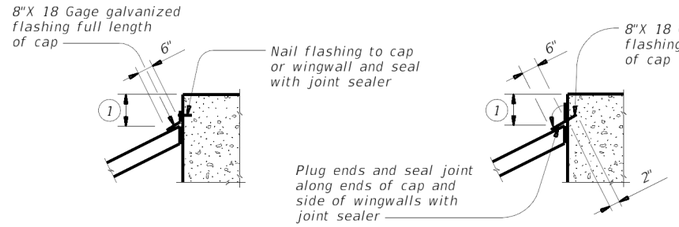


SECTION A-A AT CAP



SECTION B-B

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



CAP OPTION A

CAP OPTION B

DETAIL C

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

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

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0387	05	026,ETC	FM 982,ETC
	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		83

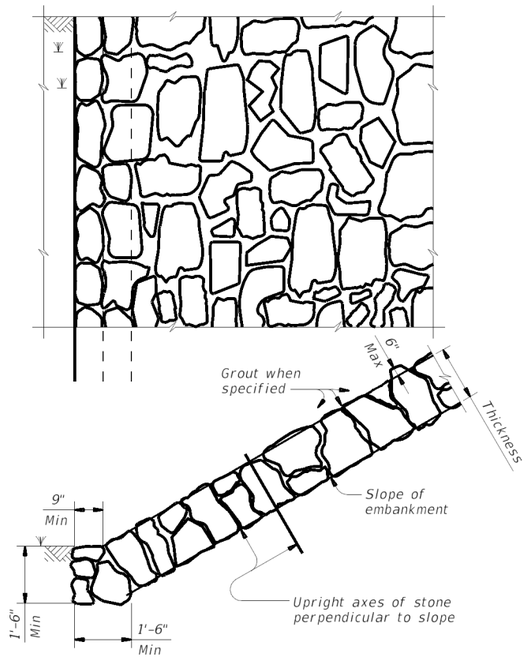


FIGURE 1 ~ TYPE R STONE RIPRAP

dry or grouted

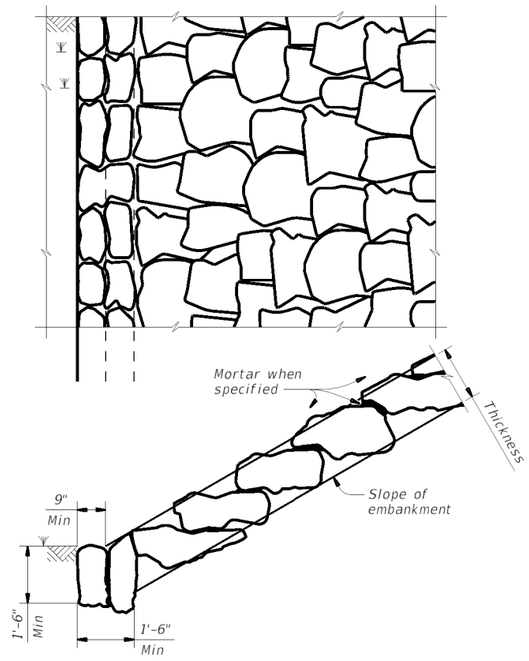


FIGURE 2 ~ TYPE F STONE RIPRAP

dry or mortared

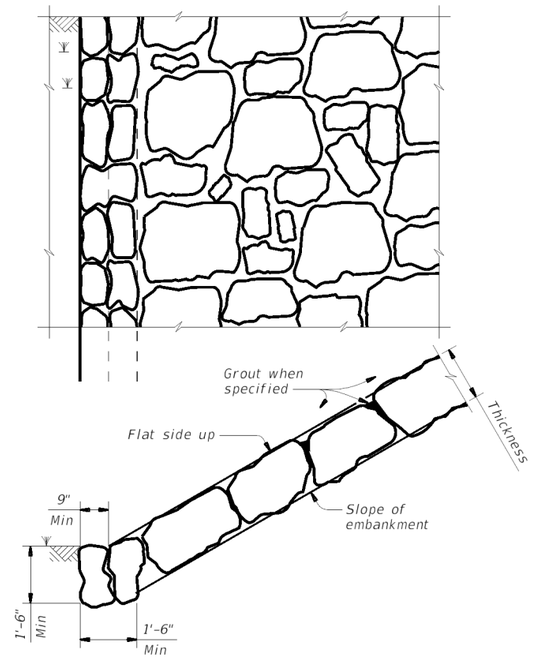


FIGURE 3 ~ TYPE F STONE RIPRAP

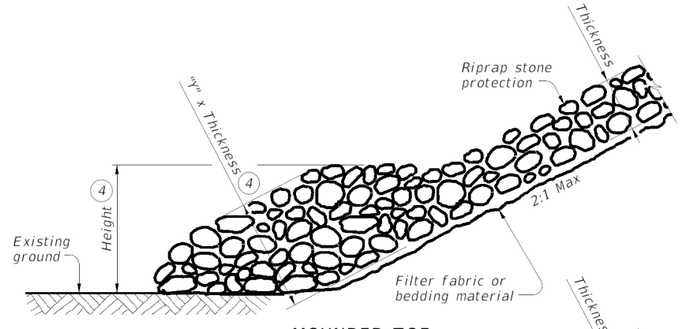
grouted

2 *Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.*

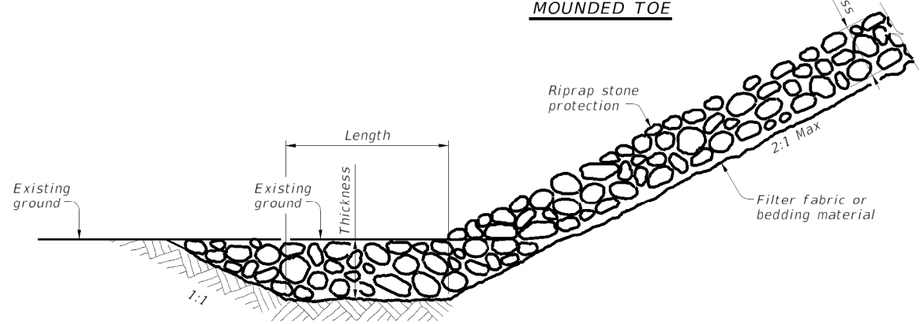
3 *Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.*

4 *"Y" and Height need to be defined. See layout or detail sheet for values if this option is used.*

5 *List Stone Protection as size (XX inch) and thickness (YY inch) on the layout.*
Example: Riprap (Stone Protection) XX inch, Thickness = YY inch.



MOUNDED TOE



EXTENDED ROCK FILLED TRENCH

PROTECTION STONE RIPRAP TOE OPTIONS 5

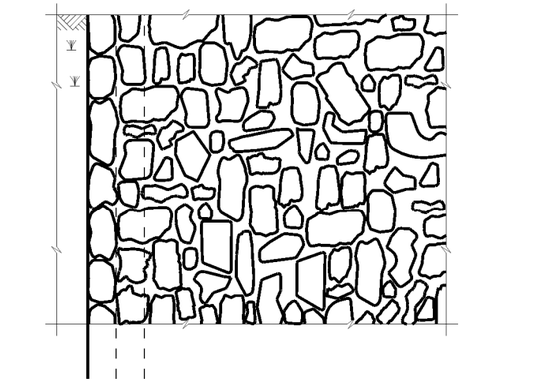


FIGURE 4 ~ COMMON STONE RIPRAP

dry or grouted

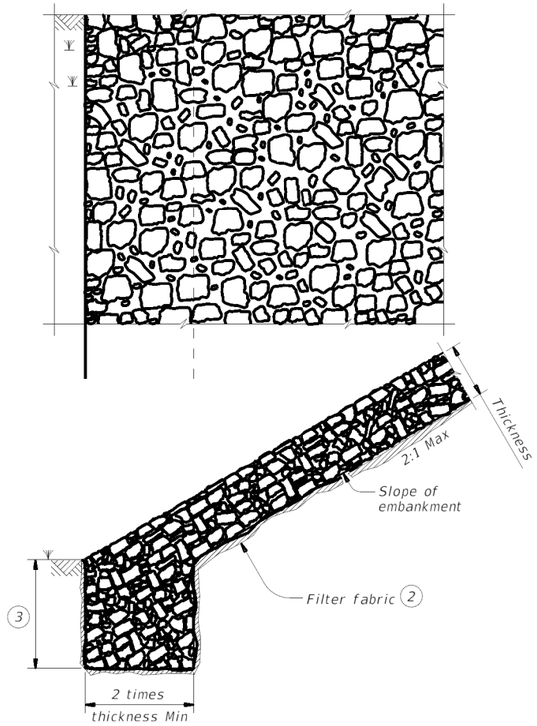


FIGURE 5 ~ PROTECTION STONE RIPRAP 5

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

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©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		84

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CSJ: 0387-05-026
BEGIN MILL AND INLAY
℄ FM 546
STA 3+22.00

SCALE: 1" = 100'

EXISTING ROW

℄ OF FM 546

SHOULDER

REFL PAV MRK TY I(Y)6" (SLD)(100 MIL) - 1800 FT

EDGELINE RUMBLESTRIPS

RPM TYPE II-A-A SPACED AT 20 FT

RPM TYPE II-A-A SPACED AT 20 FT

EDGE OF PAVEMENT

RE PM W/REQ TY (W) 6"(SLD)(100MIL) - 604 FT

REFL PAV MRK TY I(Y)6" (SLD)(100 MIL) - 124 FT

END EDGELINE RUMBLESTRIPS STA 9+05.63 (LT)

MATCHLINE STA. 9+00.00

RPM TYPE I-C SPACED AT 20 FT

REFL PAV MRK TY I (W)(WORD)(100MIL)

REFL PAV MRK TY I(W)6" (SLD)(100 MIL) - 187 FT

REFL PAV MRK TY I (W)8" (SLD)(100MIL) - 248 FT

REFL PAV MRK TY I (Y)24" (SLD)(100MIL) - 78 FT

REFL PAV MRK TY I(W)6" (SLD)(100 MIL)- 100 FT

REFL PAV MRK TY I (W)(ARROW)(100MIL)

RPM TYPE II-A-A SPACED AT 20 FT

5+00

10+00

00

BEGIN EDGELINE RUMBLESTRIPS STA 3+22.00

EDGE OF PAVEMENT

SHOULDER

REFL PAV MRK TY I (W)(WORD)(100MIL)

REFL PAV MRK TY I (W)(ARROW)(100MIL)

EDGELINE RUMBLESTRIPS

END CENTERLINE RUMBLESTRIPS STA 9+05.63

END EDGELINE RUMBLESTRIPS STA 9+05.63 (RT)

REFL PAV MRK TY I (W)(WORD)(100MIL)

REFL PAV MRK TY I (W)(ARROW)(100 MIL)

REFL PAV MRK TY I(W)6" (SLD)(100 MIL) - 634 FT

REFL PAV MRK TY I (W)8" (SLD)(100MIL) - 350 FT

RPM TYPE 1-C SPACED AT 20 FT

EXISTING ROW

BEGIN CENTERLINE RUMBLESTRIPS STA 3+22.00

REFL PAV MRK TY I (W)(ARROW)(100MIL)

REFL PAV MRK TY I (W)(WORD)(100MIL)

REFL PAV MRK TY I(W)6" (SLD)(100 MIL) - 600 FT

REFL PAV MRK TY I(Y)6" (SLD)(100 MIL)- 951 FT

REFL PAV MRK TY I (W)(ARROW)(100MIL)

REFL PAV MRK TY I (W)(WORD)(100MIL)

END EDGELINE RUMBLESTRIPS STA 5+84.00 (LT)

REFL PAV MRK TY I(W)6" (SLD)(100 MIL)- 664 FT

EDGE OF PAVEMENT

EDGELINE RUMBLESTRIPS - 584 LF

REFL PAV MRK TY I (W)(ARROW)(100MIL)

REFL PAV MRK TY I (W)(WORD)(100MIL)

SHOULDER

REFL PAV MRK TY I(Y)6" (SLD)(100 MIL) - 901 FT

EDGE OF PAVEMENT

REFL PAV MRK TY I (Y)24" (SLD)(100MIL) - 23 FT

RPM TYPE 1-C SPACED AT 20 FT

REFL PAV MRK TY I(W)6" (SLD)(100 MIL) - 1060 FT

END EDGELINE RUMBLESTRIPS STA 5+84.00 (LT)

RPM TYPE II-A-A SPACED AT 20 FT

REFL PAV MRK TY I (W)8" (SLD)(100MIL) - 300 FT

EDGE OF PAVEMENT

EXISTING ROW

SHOULDER

EDGELINE RUMBLESTRIPS - 584 LF

RPM TYPE II-A-A SPACED AT 20 FT

REFL PAV MRK TY I (W)(WORD)(100MIL)

REFL PAV MRK TY I (W)(ARROW)(100MIL)

REFL PAV MRK TY I(W)8" (SLD)(100MIL)- 574 FT

RPM TYPE II-A-A SPACED AT 20 FT

EXISTING ROW

BEGIN EDGELINE RUMBLESTRIPS STA 17+76.22 (LT)

EDGE OF PAVEMENT

BEGIN CENTERLINE RUMBLESTRIPS STA 17+76.22

EDGE OF PAVEMENT

SHOULDER

REFL PAV MRK TY I(W)6" (SLD)(100 MIL)- 197FT

RPM TYPE II-A-A SPACED AT 40 FT

EDGELINE RUMBLESTRIPS - 324 LF

SHOULDER

REFL PAV MRK TY I(W)6" (SLD)(100 MIL) - 600 FT

EDGELINE RUMBLESTRIPS - 324 LF

CENTERLINE RUMBLESTRIPS - 324 LF

15+00

20+00

MATCHLINE STA. 21+00.00

CSJ: 0387-05-026
BEGIN MILL AND INLAY
℄ FM 982
STA 0+58.75

CSJ: 0387-05-026
BEGIN PROJECT
℄ FM 982
0+00.00

0+00

W1-7T

1-2

1-3

1-4

1-5

1-1

STOP R1-1

M6-1L

M6-1R

M6-3

M1-6F

M3-1 North

M3-3 South

M3-4 West

LEGEND

(1-5) PROPOSED SIGN

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED PROFESSIONAL ENGINEER

09/05/2024

Texas Department of Transportation

FM 982

SIGNING & PAVEMENT MARKING LAYOUT

STA 0+00 TO STA 21+00

SHEET 1 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		85

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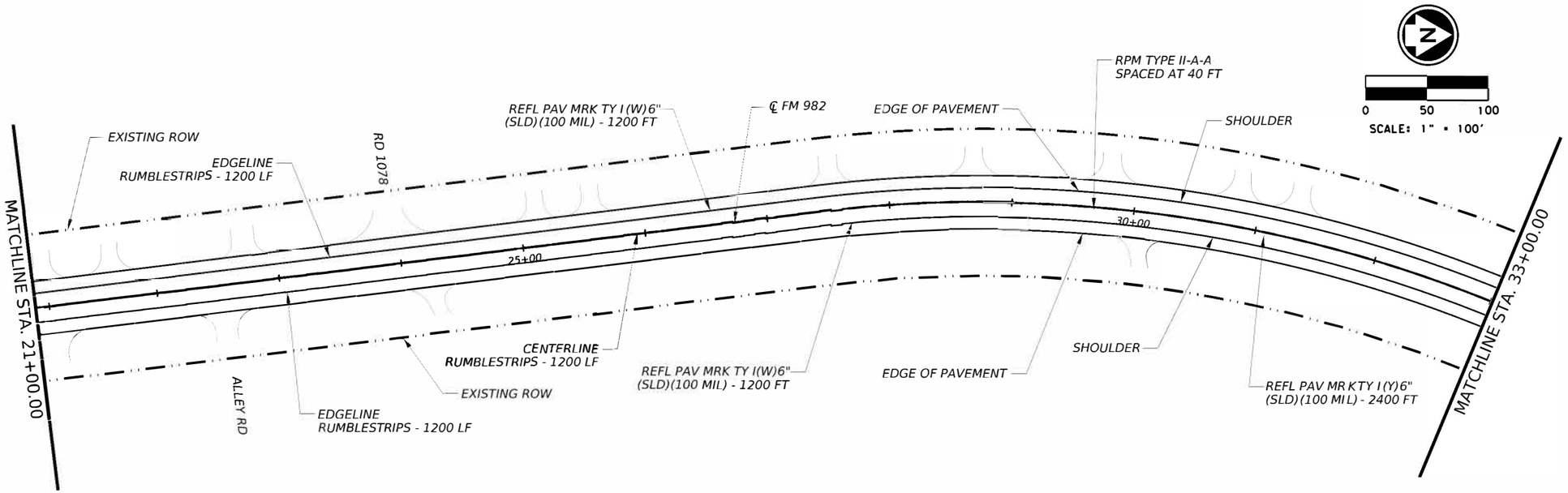

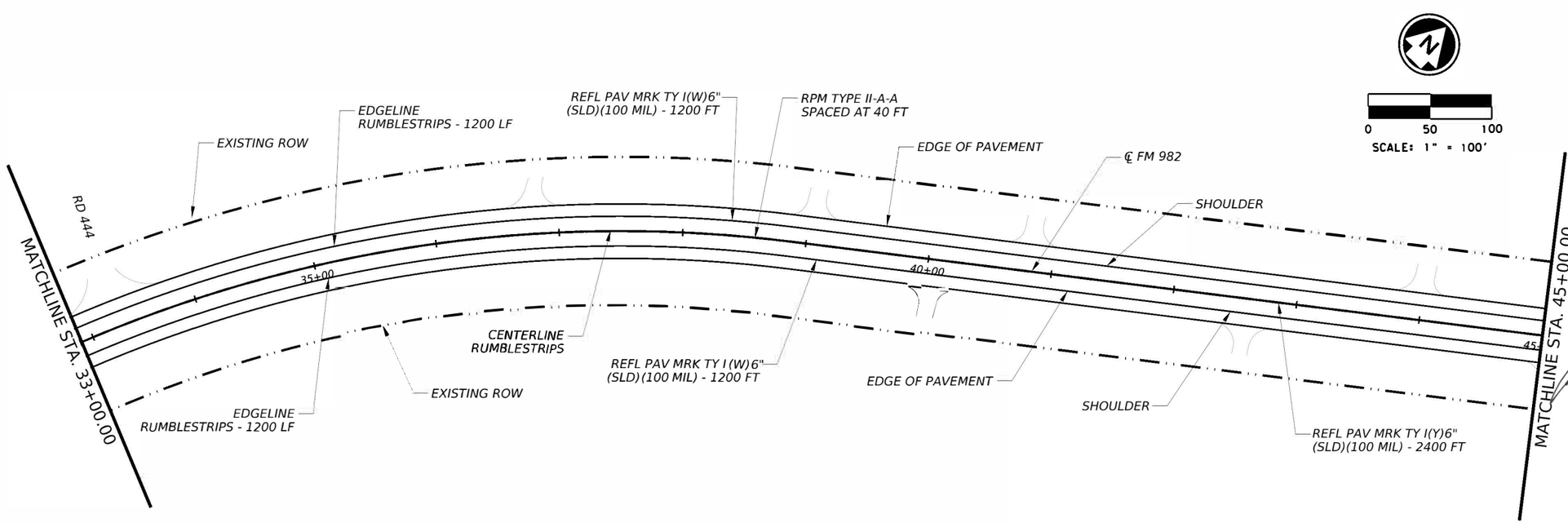

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/05/2024

Texas Department of Transportation

FM 982

SIGNING & PAVEMENT MARKING LAYOUT

STA 21+00 TO STA 45+00

SHEET 2 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		86

DATE: 9/27/2024 9:48:54 AM
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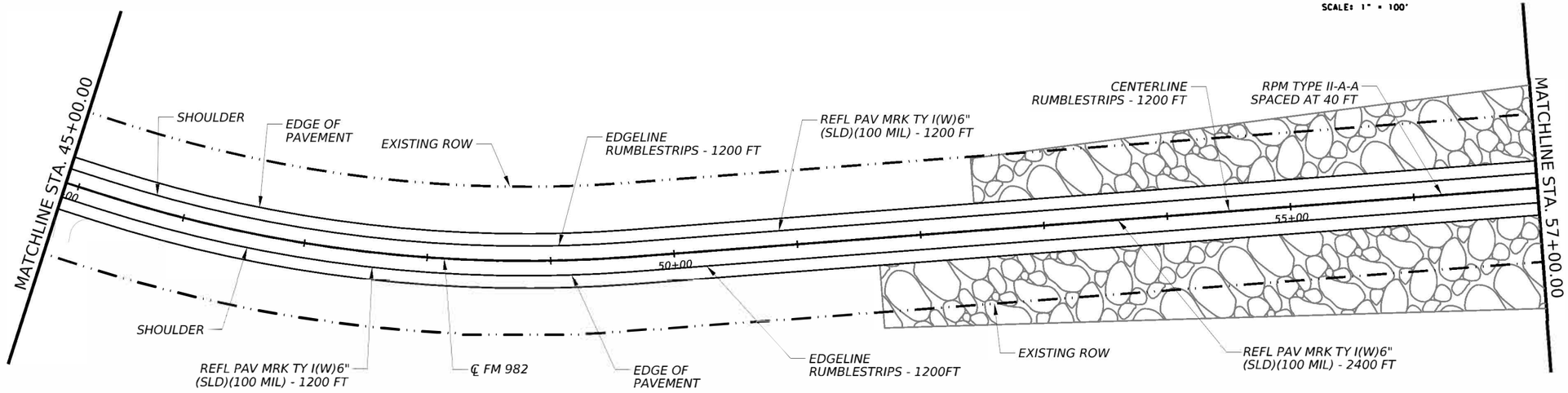
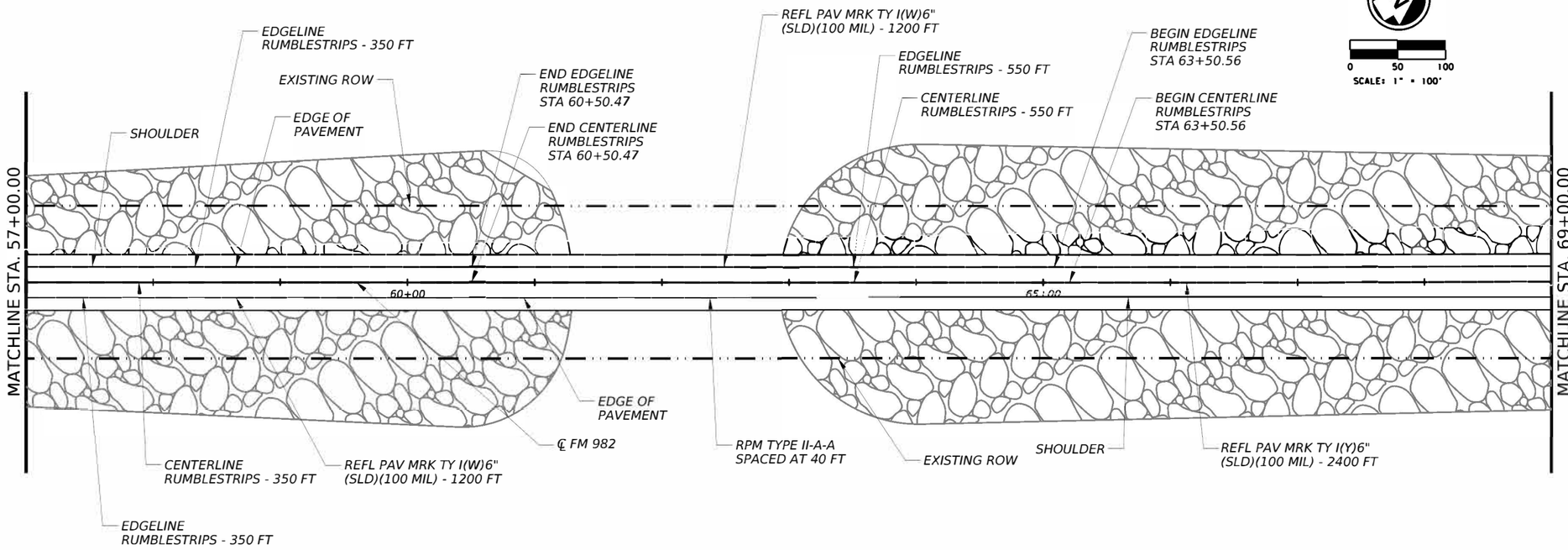


0 50 100
SCALE: 1" = 100'



0 50 100
SCALE: 1" = 100'

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
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09/05/2024

Texas Department of Transportation

FM 982

SIGNING & PAVEMENT MARKING LAYOUT

STA 45+00 TO STA 69+00

SHEET 3 OF 10

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		87

DATE: 9/27/2024 9:49:16 AM
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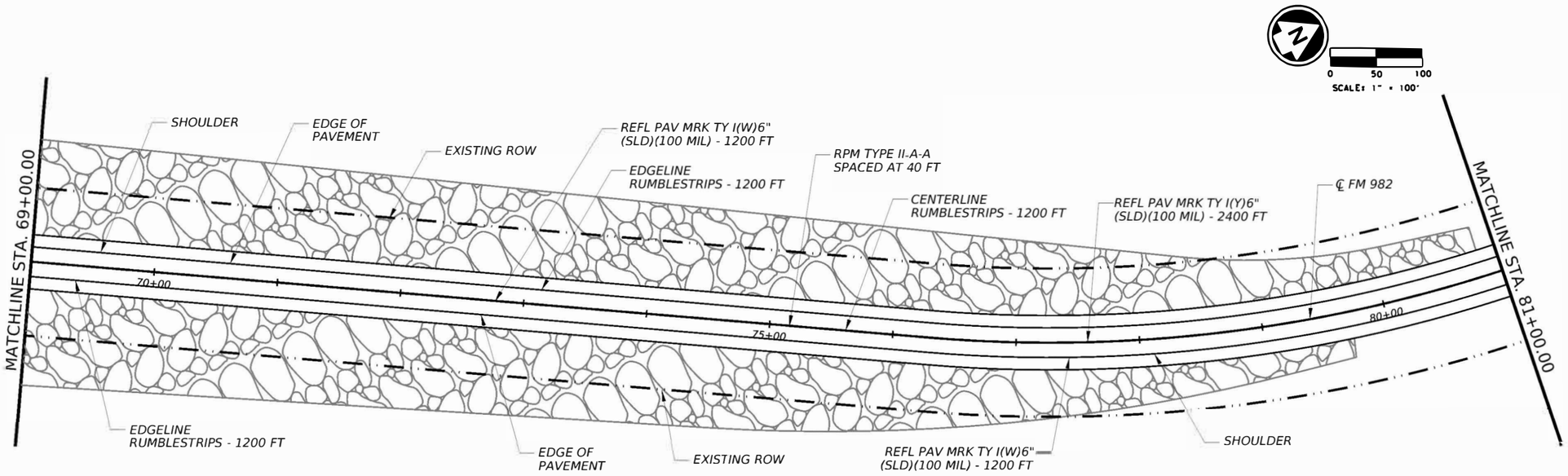

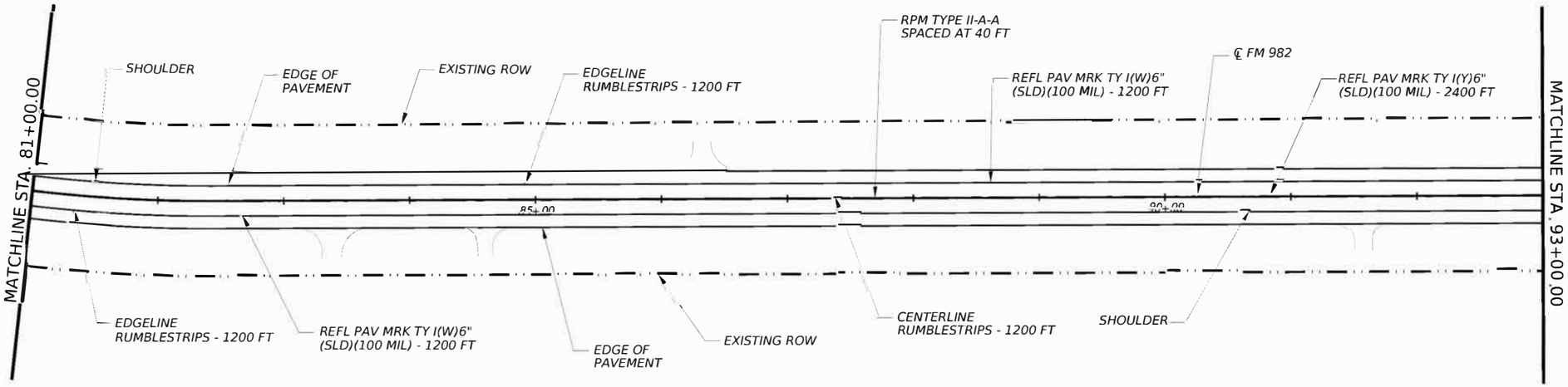

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Texas Department of Transportation

FM 982

SIGNING & PAVEMENT MARKING LAYOUT

STA 69+00 TO STA 93+00

SHEET 4 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		88

DATE: 9/5/2024 9:49:40 AM
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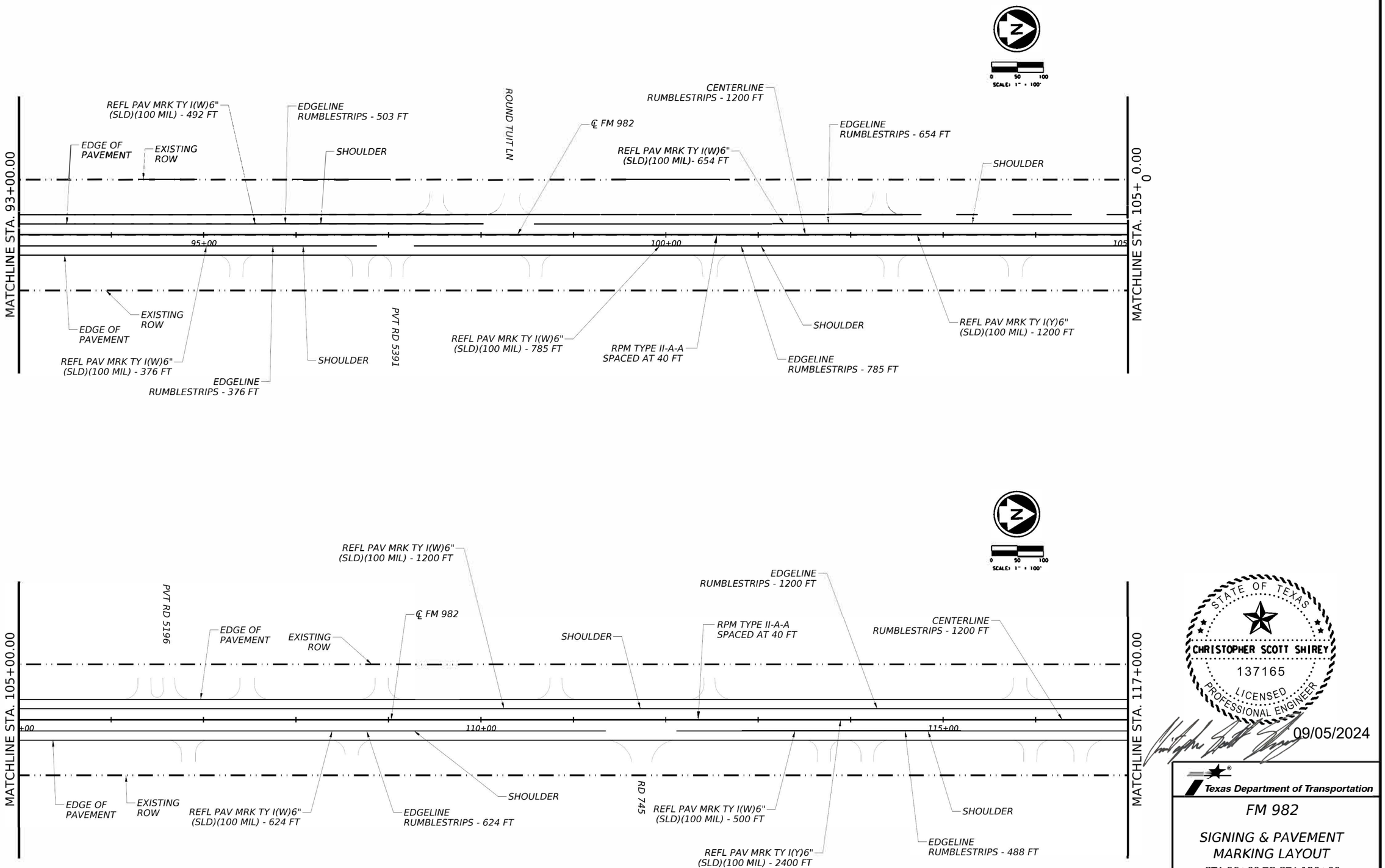

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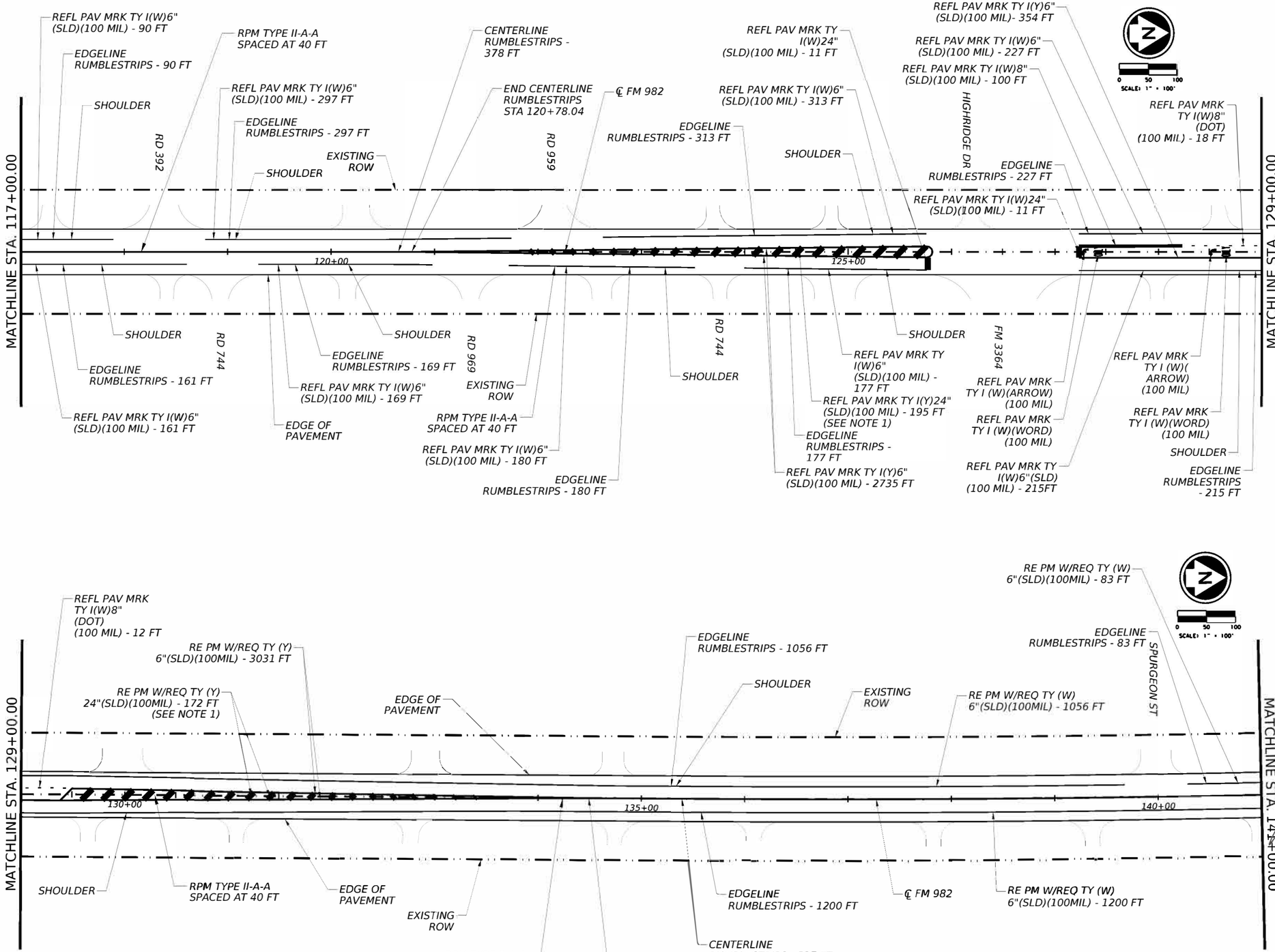
Texas Department of Transportation

FM 982

SIGNING & PAVEMENT MARKING LAYOUT

STA 96+00 TO STA 120+00

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		89



NOTE 1.
1. 24"(SLD)(100MIL) TO BE PLACED AT A 20 FT SPACING.

2. 24"(SLD)(100MIL) TO BE PLACED AT AN ANGLE OF 30° TO 45° FROM BASELINE.

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FM 982

SIGNINIG & PAVEMENT MARKING LAYOUT

STA 117+00 TO STA 141+00

SHEET 6 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		90

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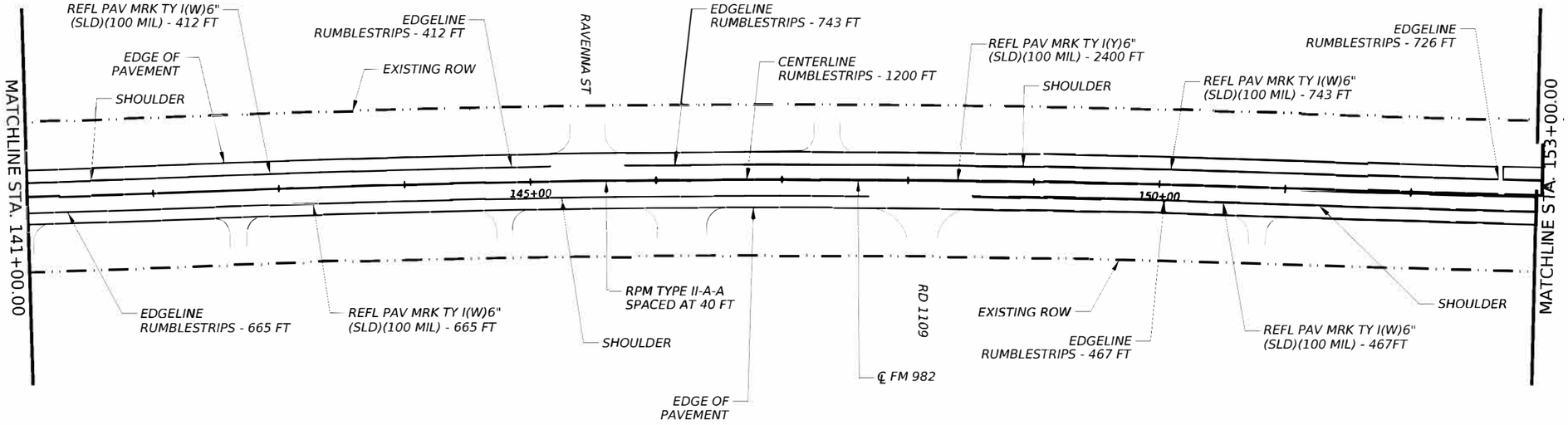

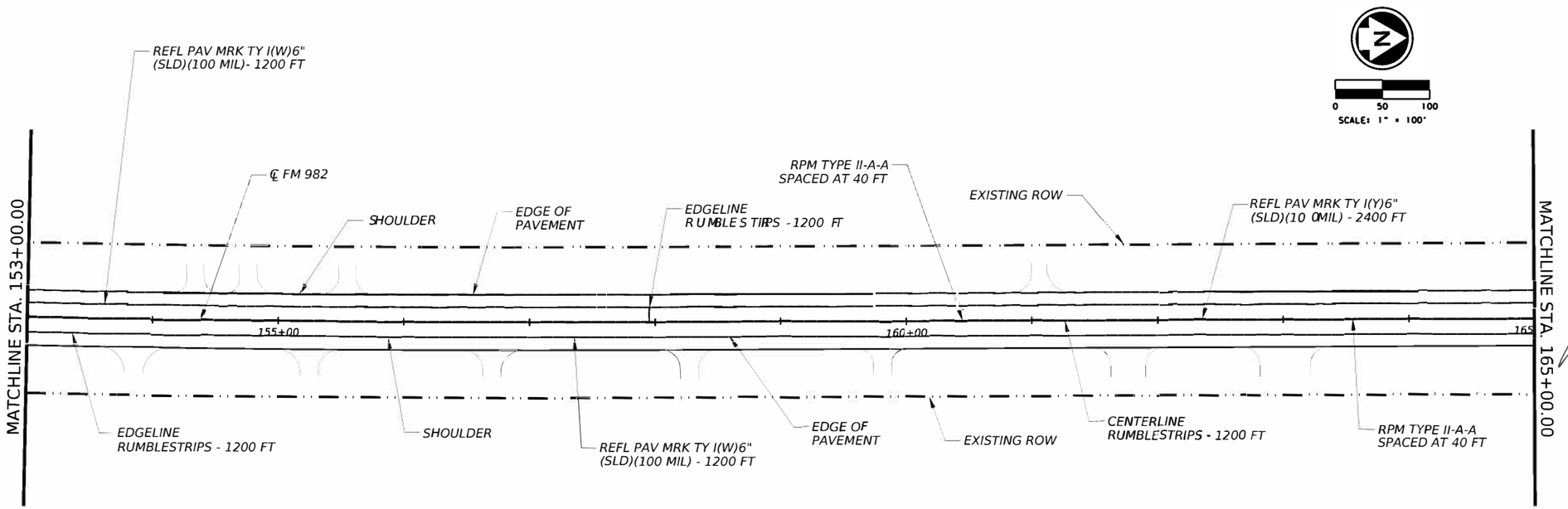

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09/05/2024

Texas Department of Transportation

FM 982

SIGNING & PAVEMENT MARKING LAYOUT

STA 141+00 TO STA 165+00

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		91

DATE: 9/27/2024 9:50:51 AM
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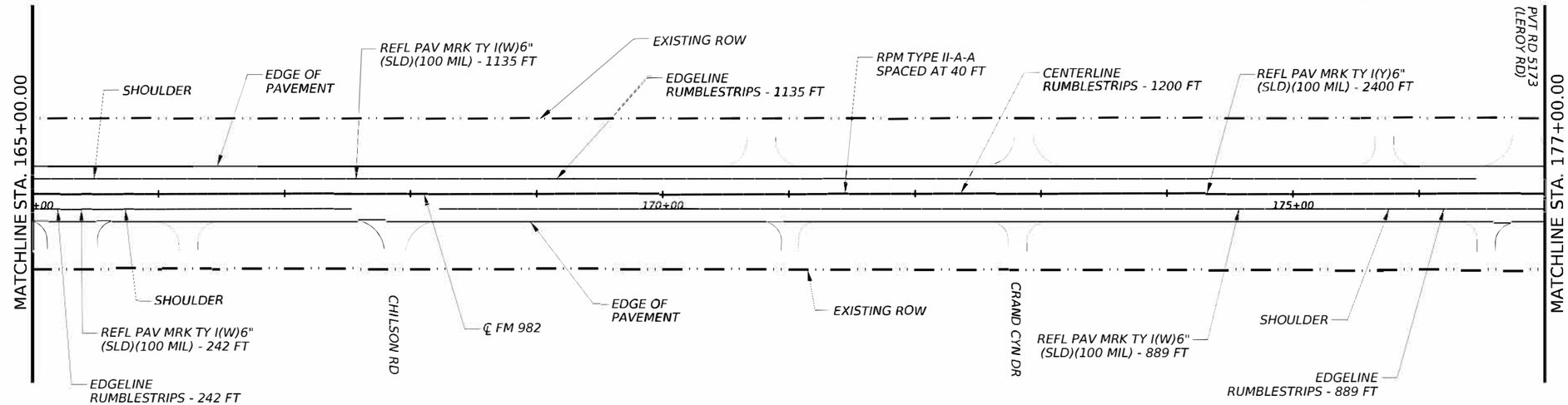

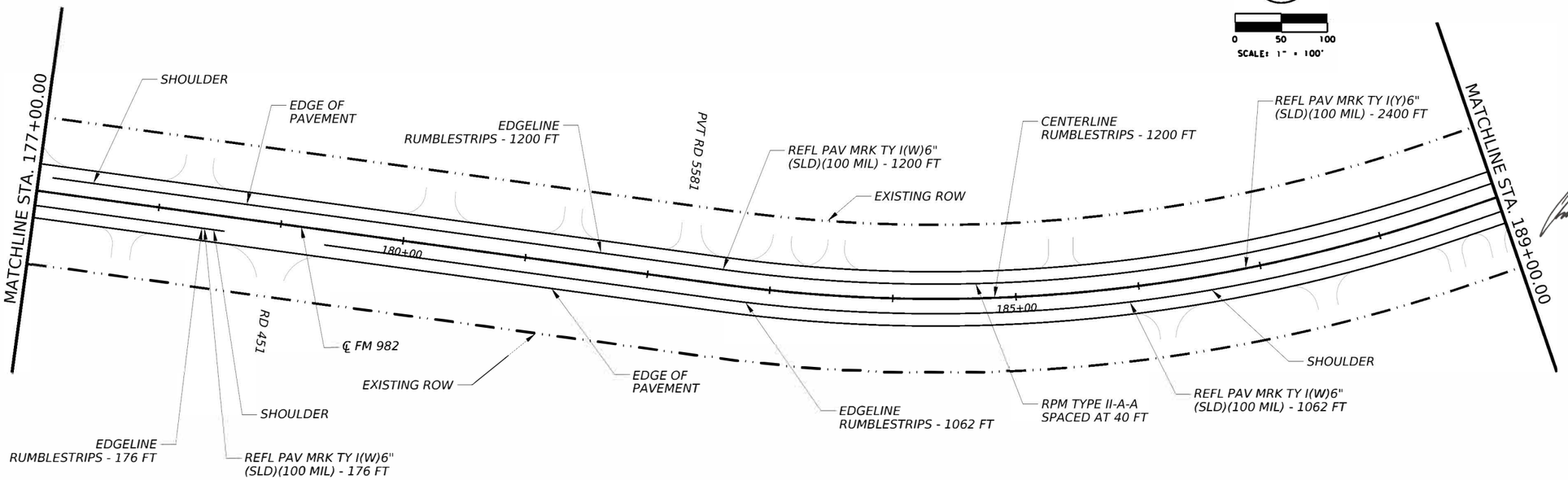

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Texas Department of Transportation

FM 982

SIGNING & PAVEMENT MARKING LAYOUT

STA 165+00 TO STA 189+00

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		92

DATE: 9/5/2024 9:51:13 AM
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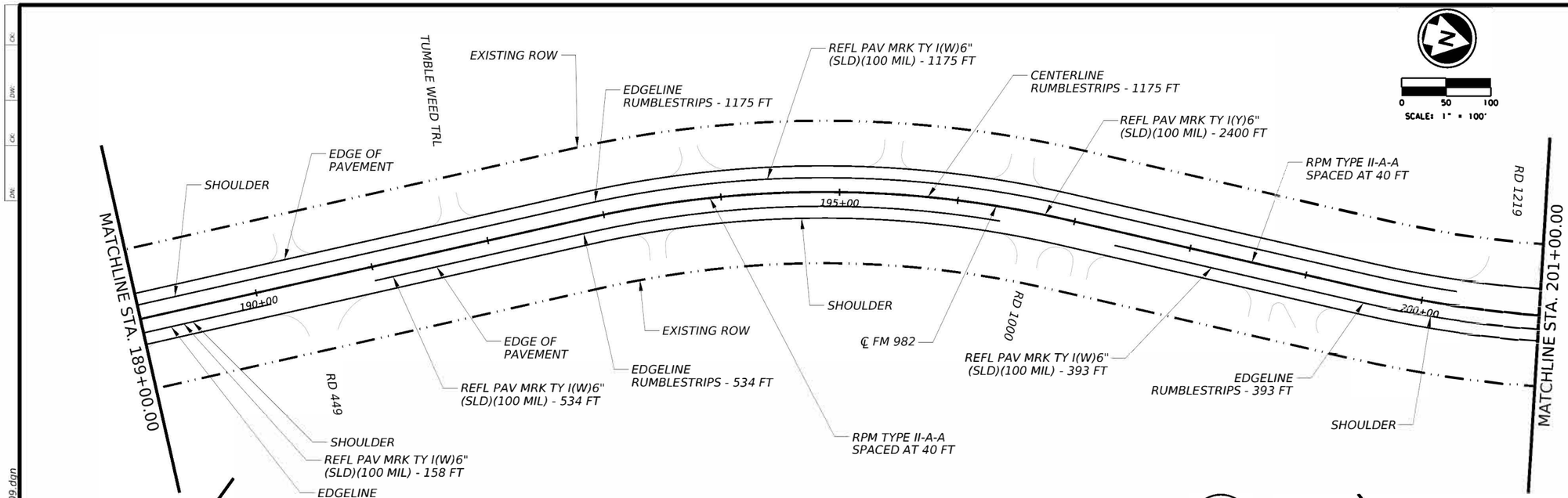

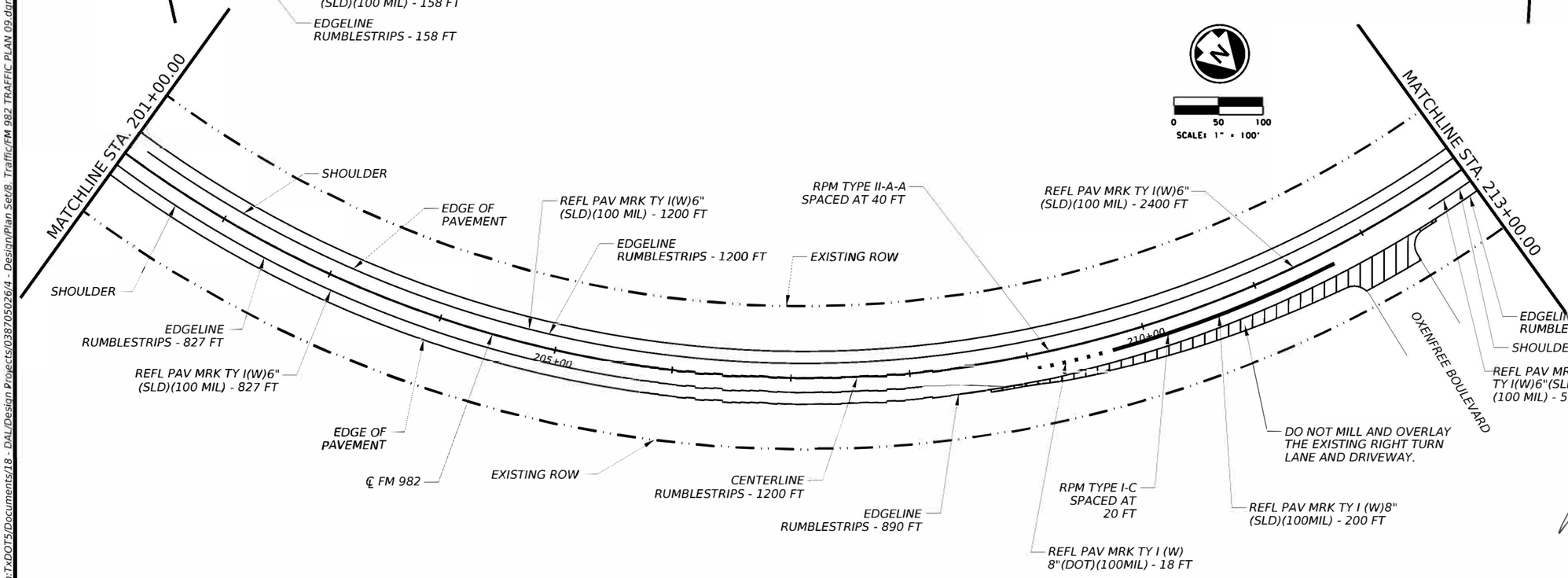

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09/05/2024

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FM 982

SIGNING & PAVEMENT MARKING LAYOUT

STA 189+00 TO STA 213+00

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		93

DATE: 9/27/2024 8:29 9:51:35 AM
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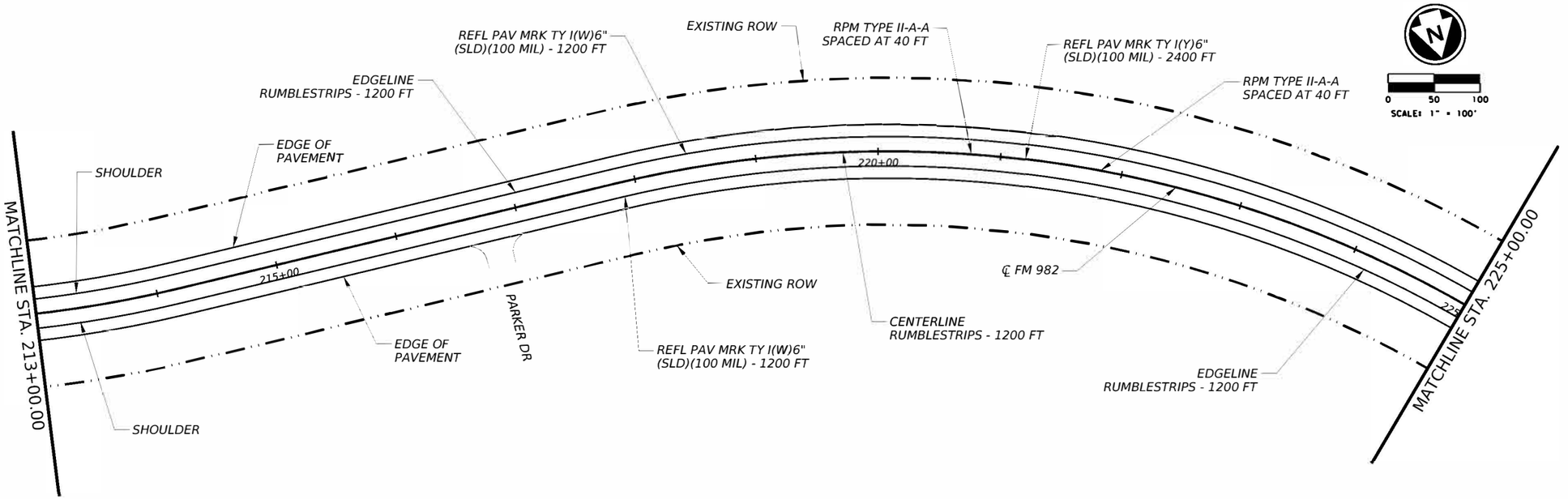

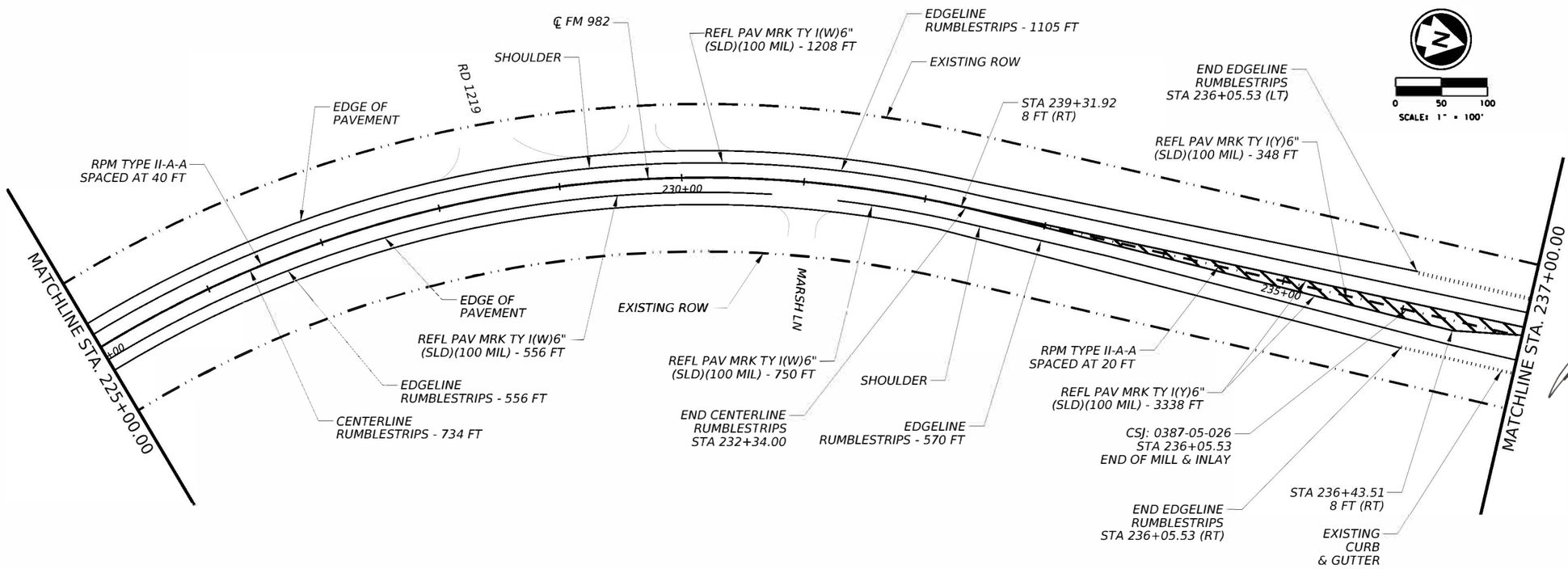

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SIGNING & PAVEMENT MARKING LAYOUT

STA 213+00 TO STA 237+00

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		94

DATE: 9/27/2024 9:51:58 AM
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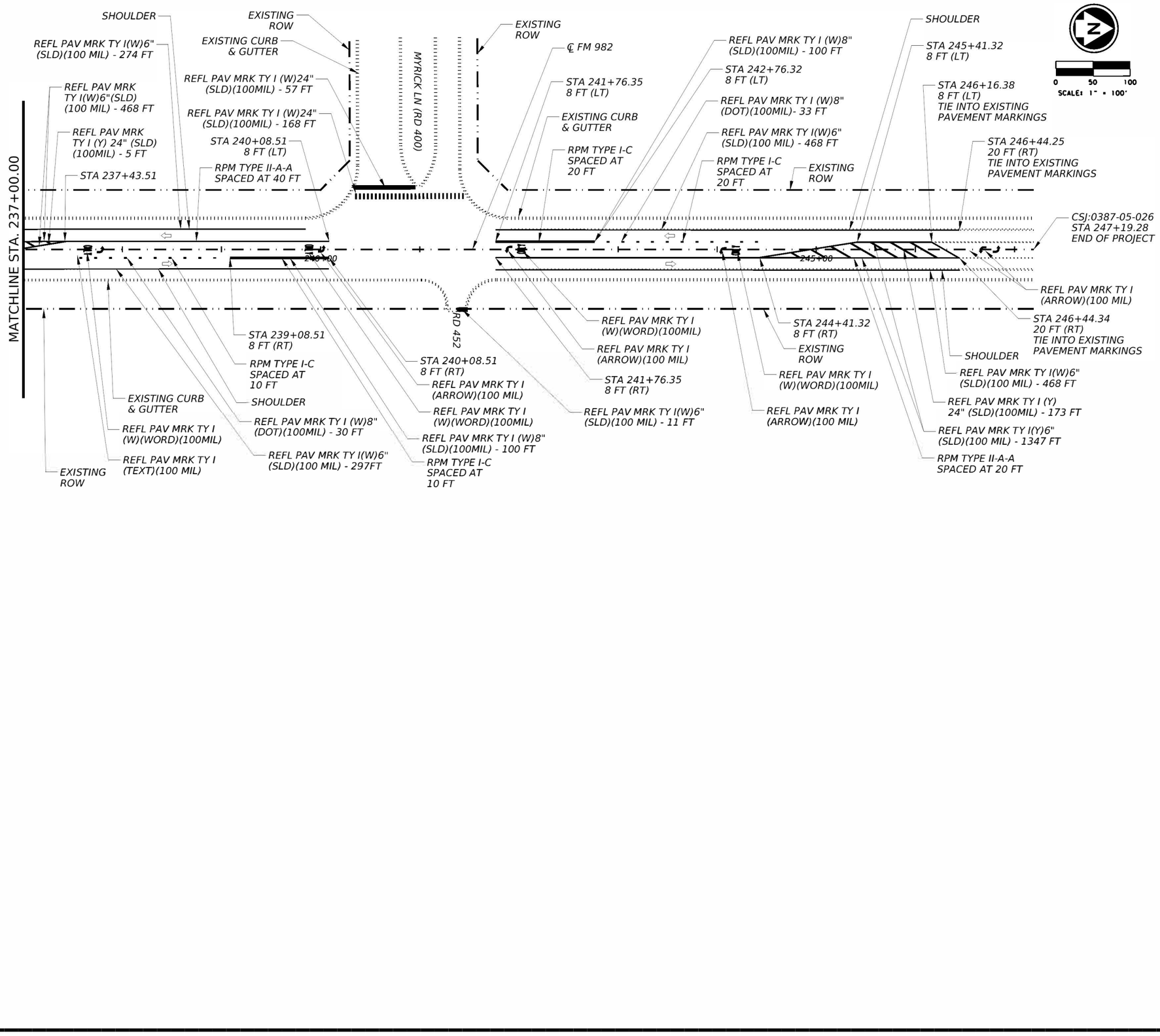

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FM 982

SIGNING & PAVEMENT MARKING LAYOUT

STA 240+00 TO STA 250+07.76

SHEET 11 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		95

DATE: 9/3/2024 9:52:20 AM
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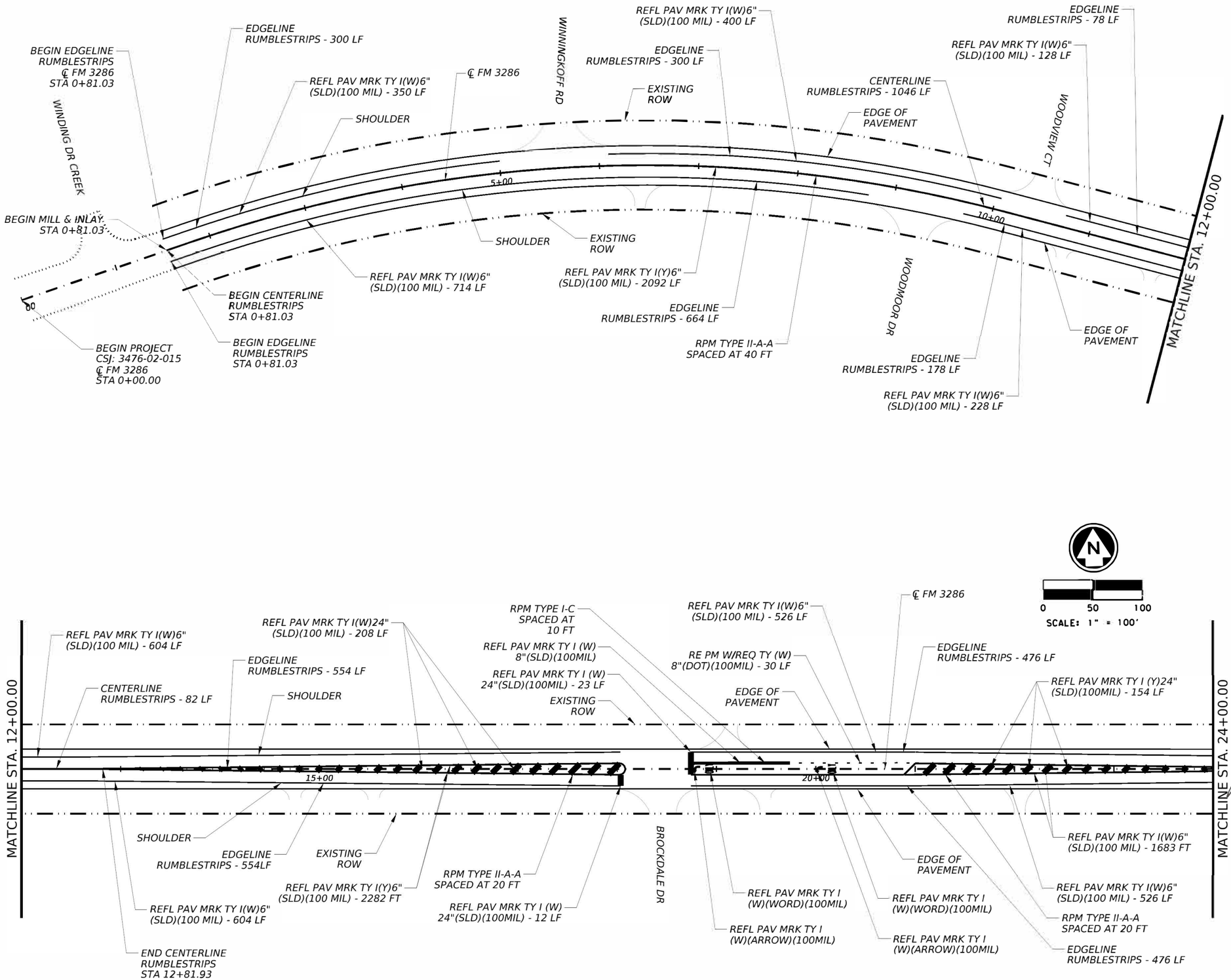

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
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09/03/2024

Texas Department of Transportation

FM 982

SIGNING & PAVEMENT MARKING LAYOUT

STA 0+00 TO STA 24+00

(FM 3286)

SHEET 1 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		96

DATE: 9/3/2024 12:35:14 PM
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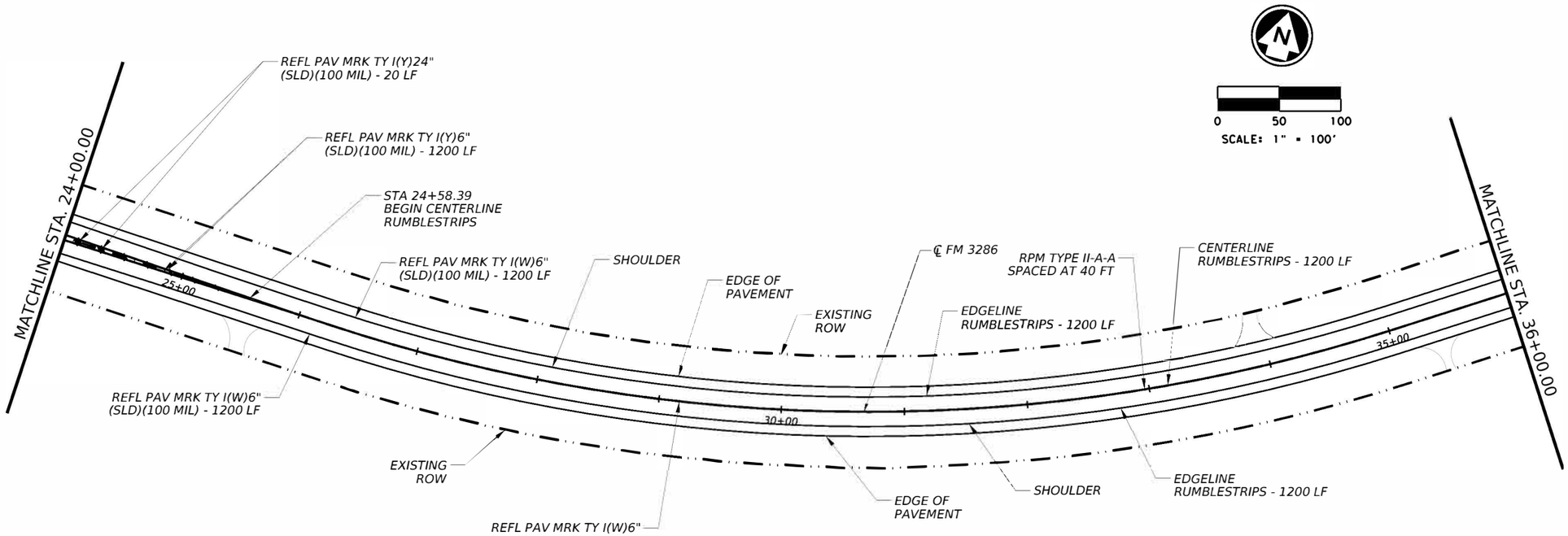

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
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09/03/2024

Texas Department of Transportation

SIGNING & PAVEMENT MARKING LAYOUT

STA 24+00 TO STA 48+00

(FM 3286)

SHEET 2 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		97

DATE: 9/3/2024 12:35:36 PM
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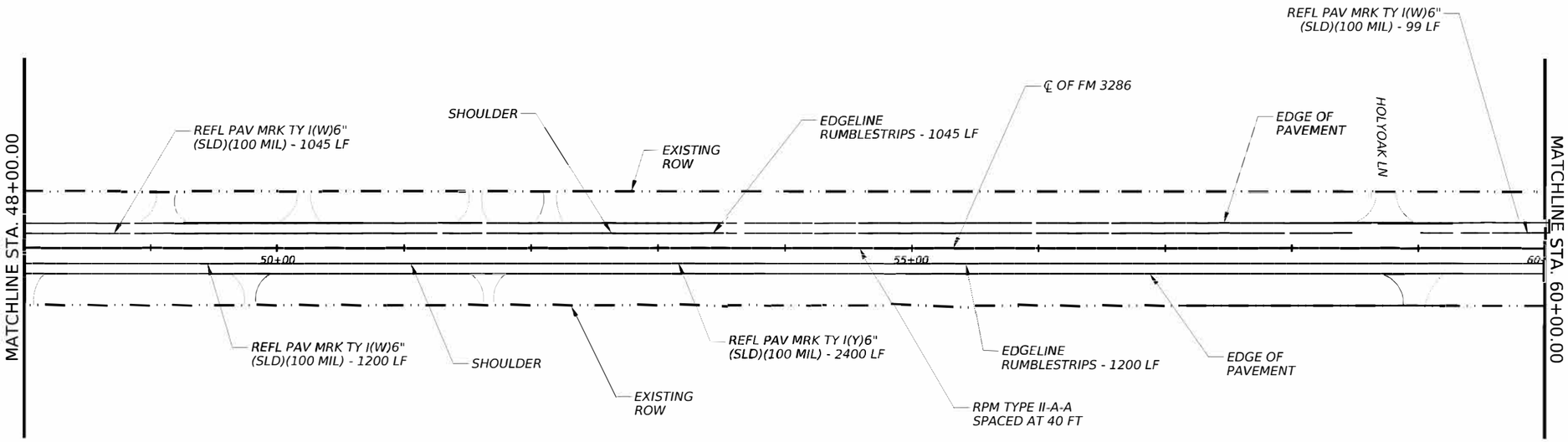

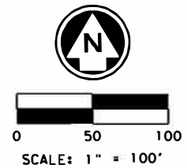

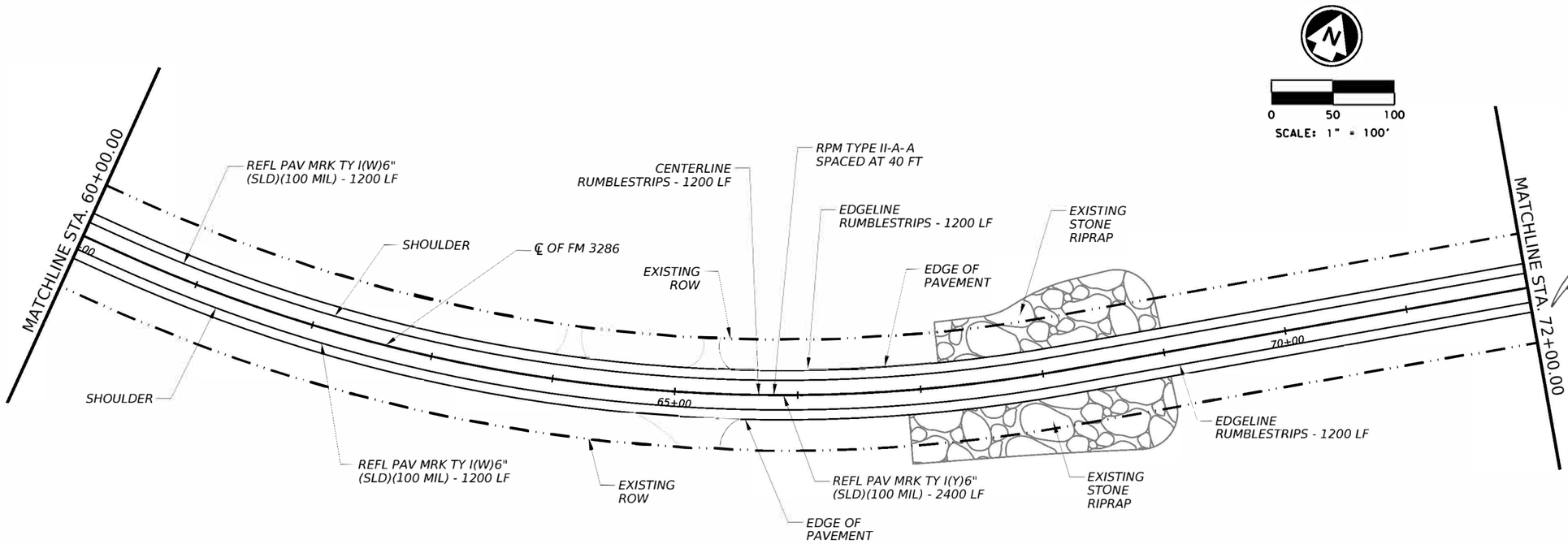

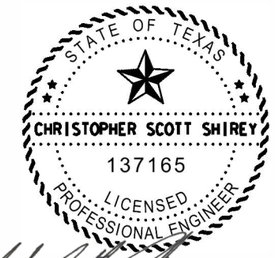

09/03/2024

Texas Department of Transportation

FM 982

SIGNING & PAVEMENT MARKING LAYOUT

STA 72+00 TO STA 96+00

(FM 3286)

SHEET 3 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		98

DATE: 9/3/2024 12:35:57 PM
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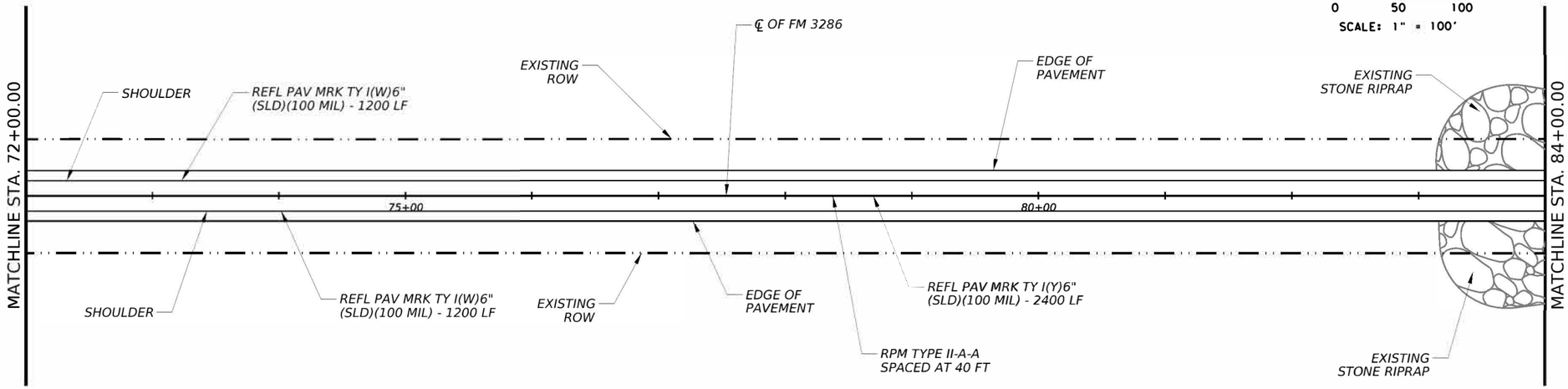

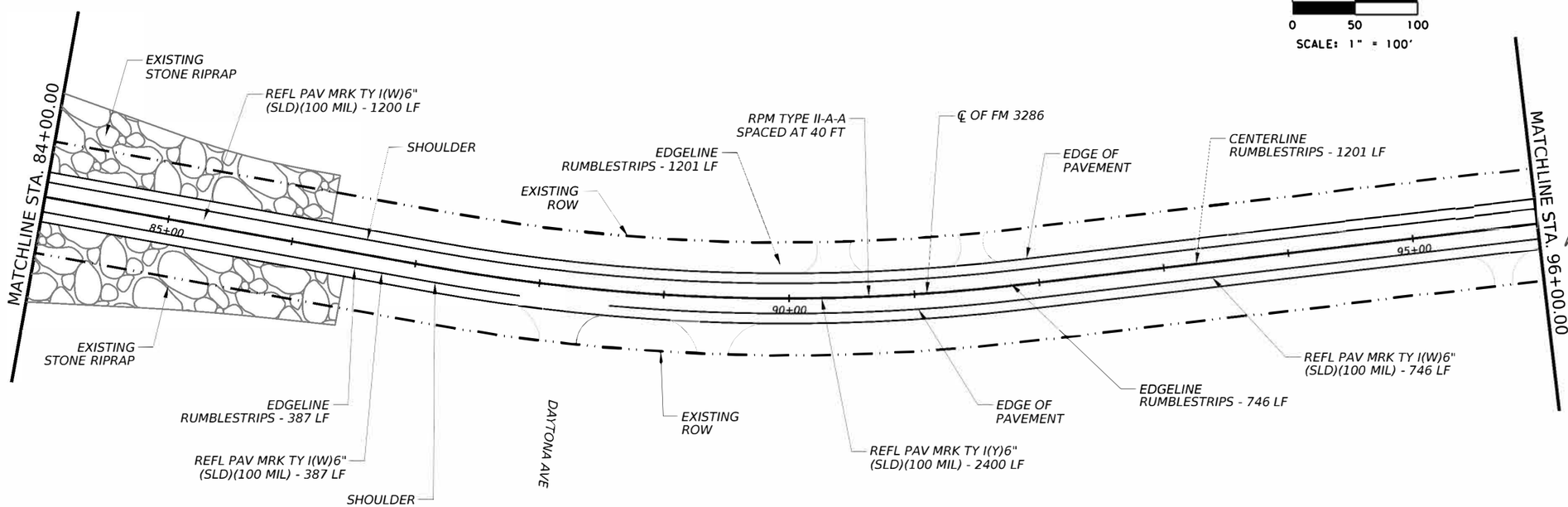

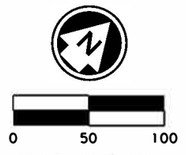

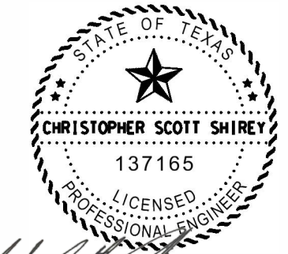

09/03/2024

Texas Department of Transportation

FM 982

SIGNING & PAVEMENT MARKING LAYOUT

STA 72+00 TO STA 96+00

(FM 3286)

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		99

DATE: 9/27/2018 12:36:17 PM
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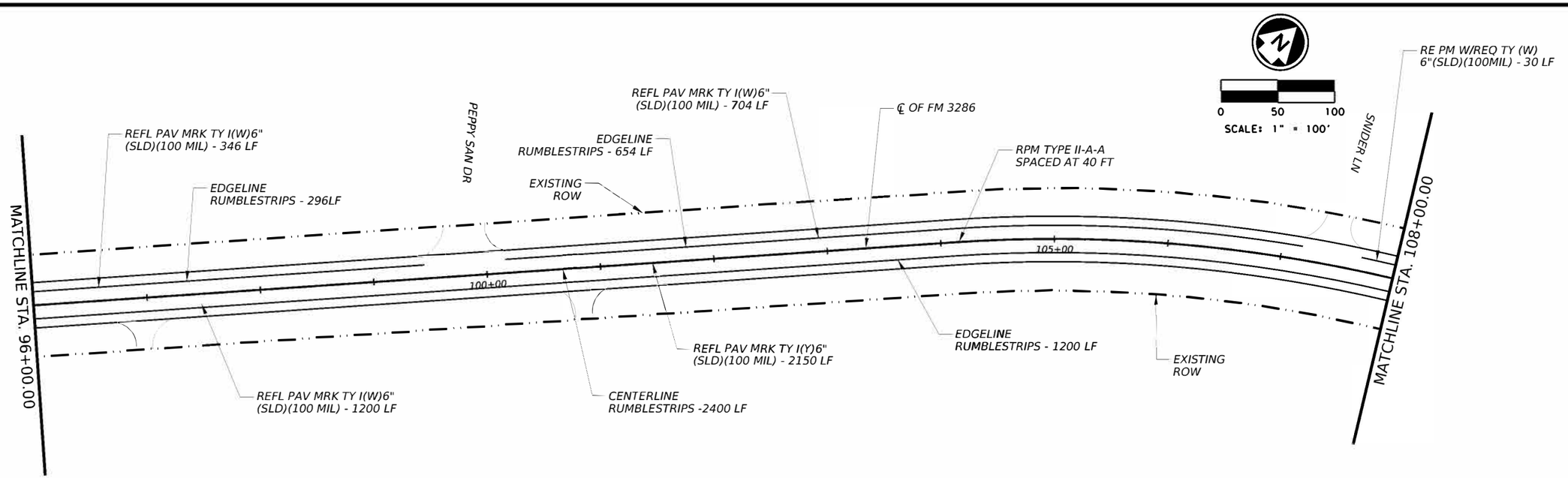

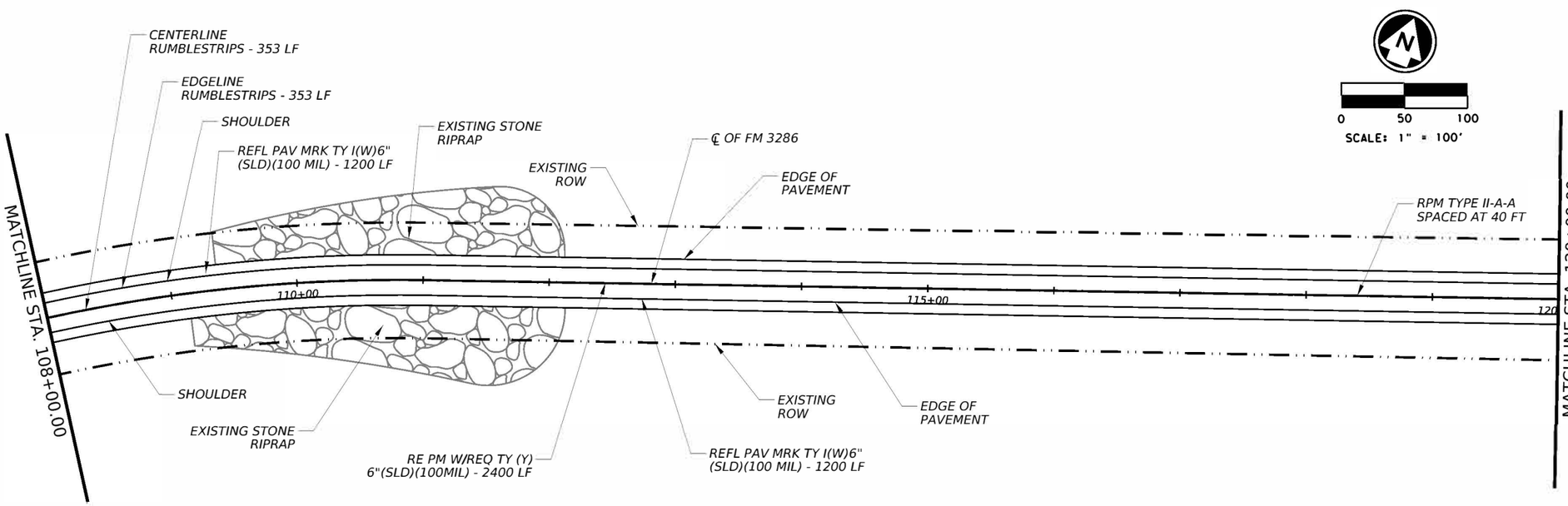

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
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09/03/2024

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SIGNING & PAVEMENT MARKING LAYOUT

STA 96+00 TO STA 120+00

(FM 3286)

SHEET 5 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		100

DATE: 9/27/2024 12:36:37 PM
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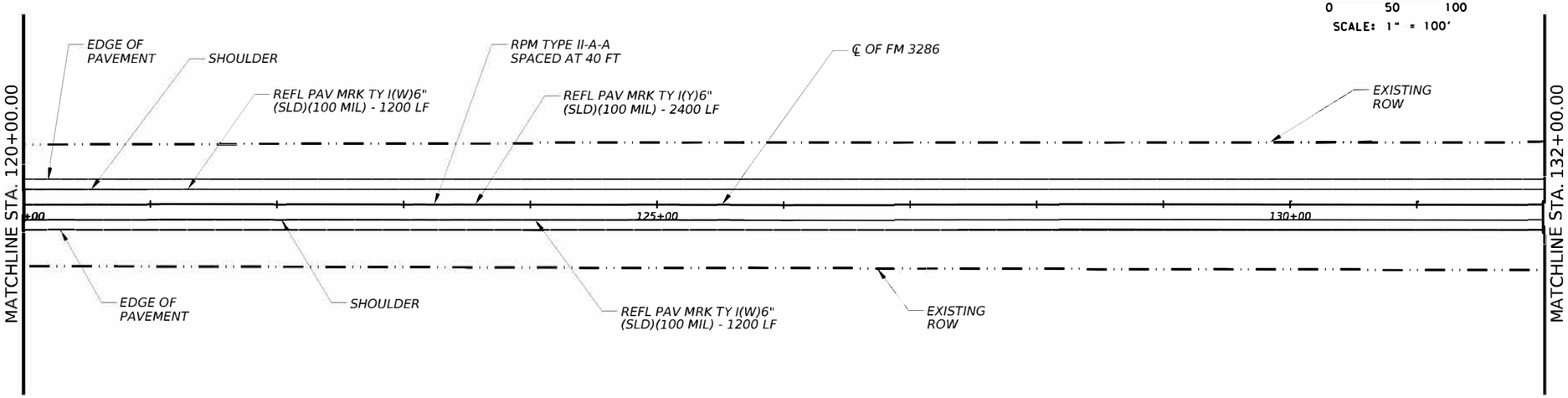
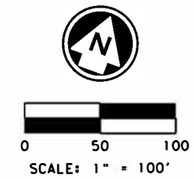
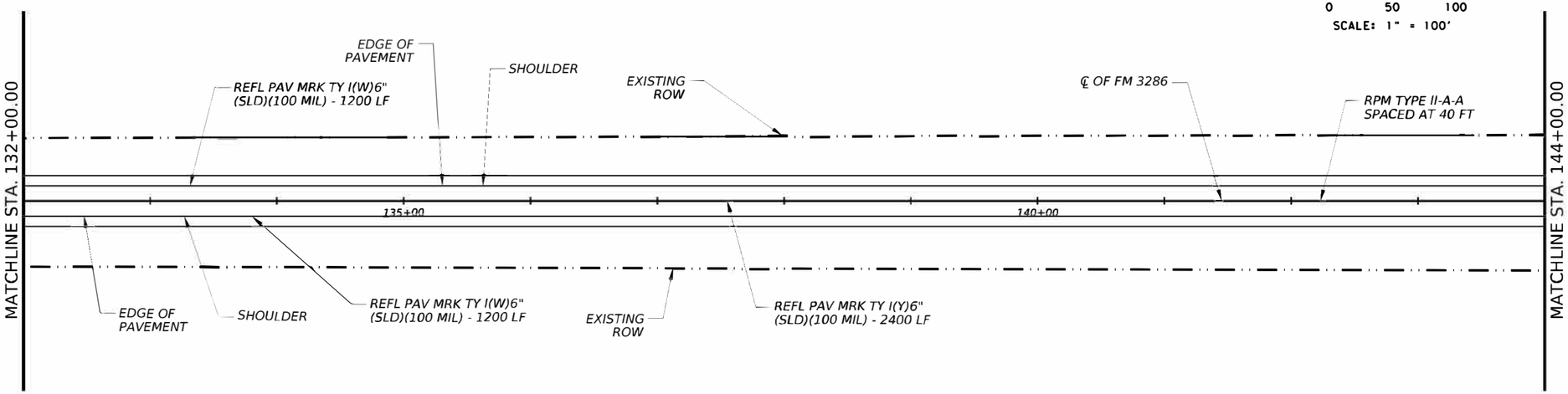
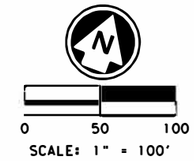








09/03/2024

Texas Department of Transportation

FM 982

SIGNING & PAVEMENT MARKING LAYOUT

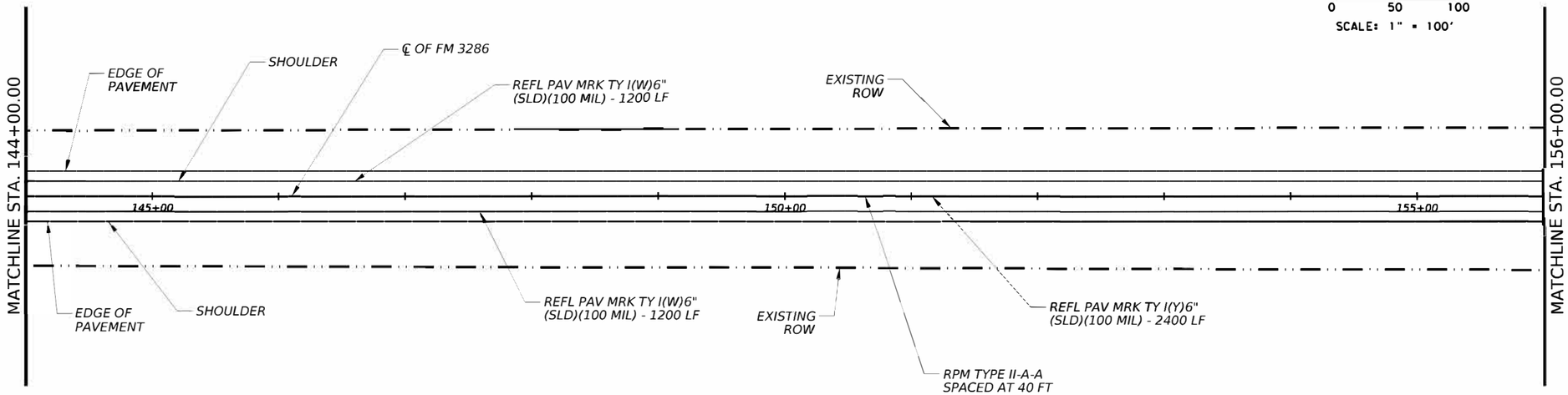
STA 120+00 TO STA 144+00

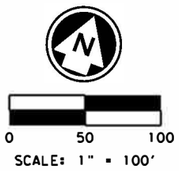
(FM 3286)

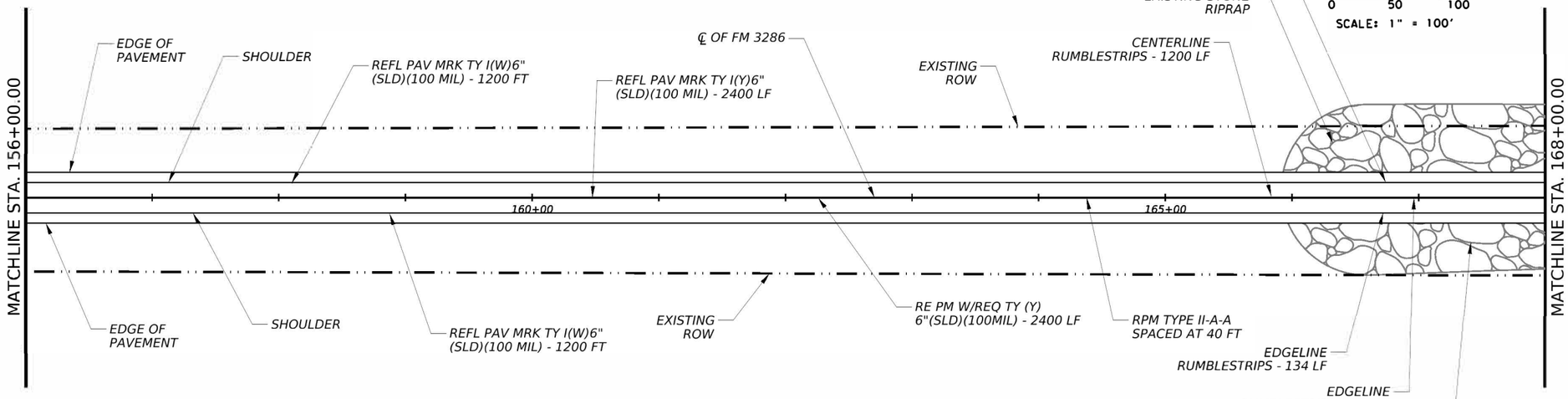
SHEET 6 OF 8

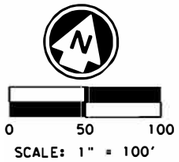
CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		101

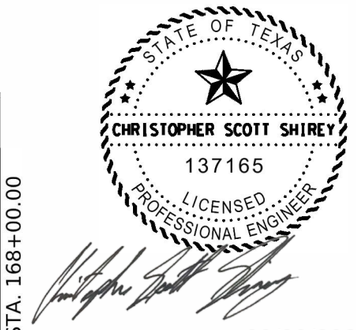
DATE: 9/27/2024 12:36:57 PM
FILE: pw://txdotconnect.bentleyconnect.bentleyconnect.com:TxDOT5/Documents/18 - DAL/Design Projects/0387050264 - Design/Plan Set/8. Traffic/FM 3286 TRAFFIC PLAN 06.dgn











09/03/2024

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SIGNING & PAVEMENT MARKING LAYOUT

STA 144+00 TO STA 168+00

(FM 3286)

SHEET 7 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		102

DATE: 9/3/2024 12:37:17 PM
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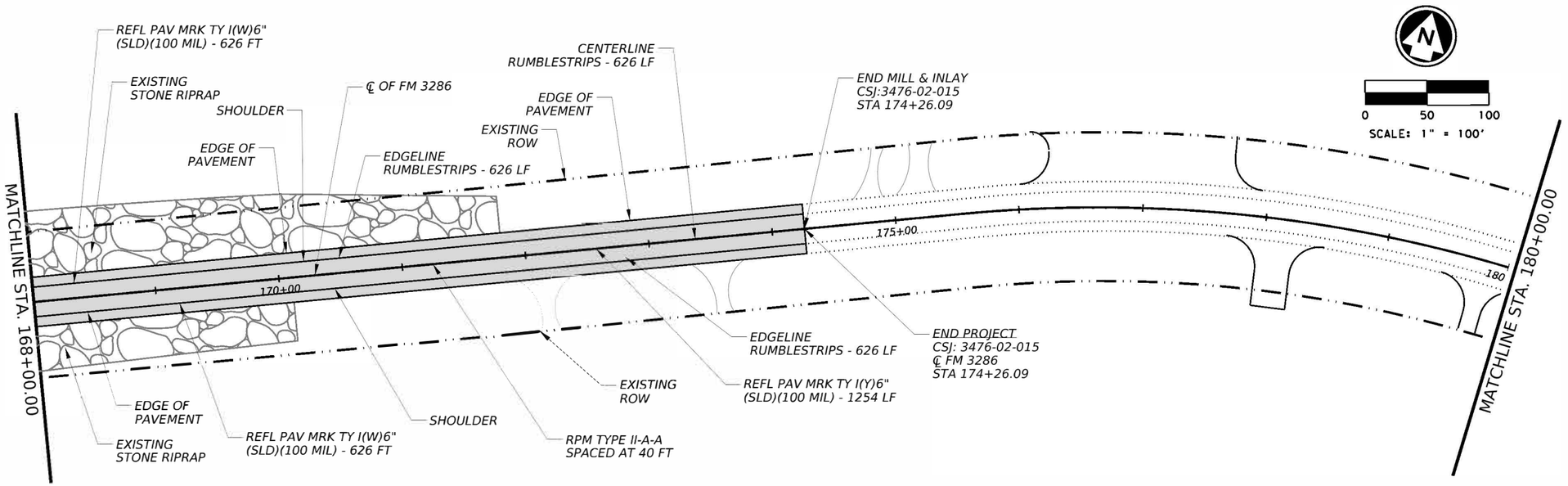

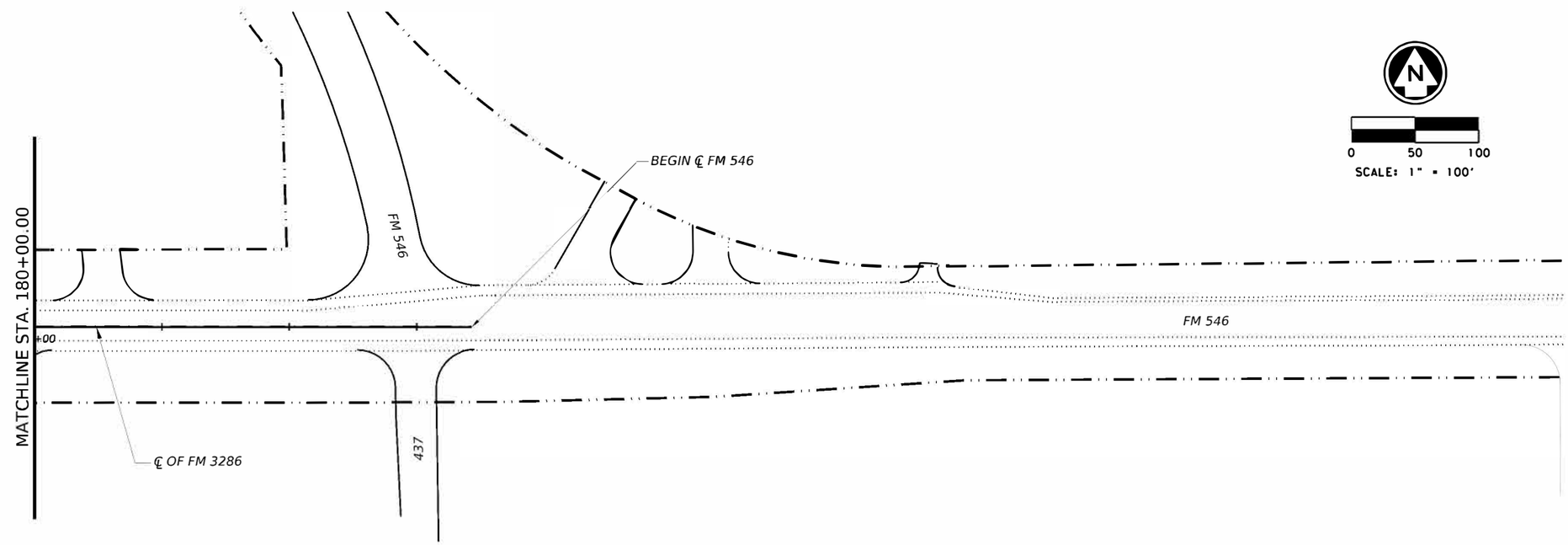

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

SIGNING & PAVEMENT MARKING LAYOUT

STA 168+00 TO STA 180+00

(FM 3286)

SHEET 8 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		103

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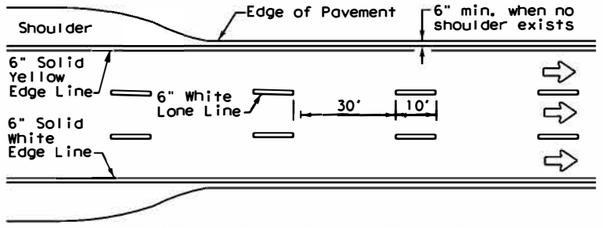
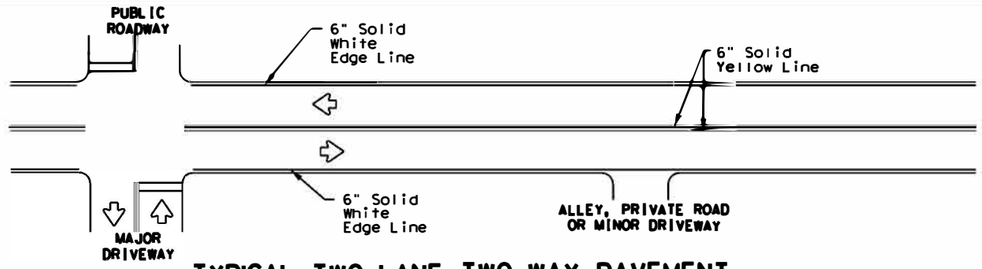
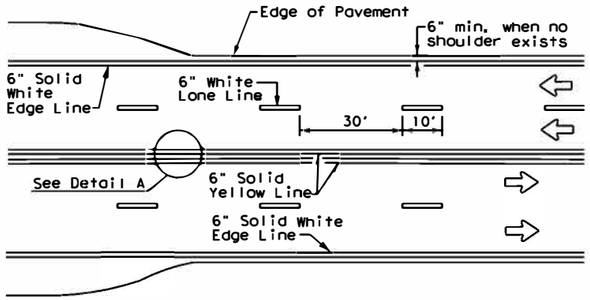
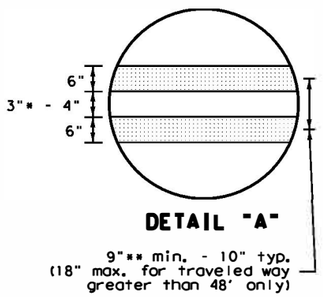


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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





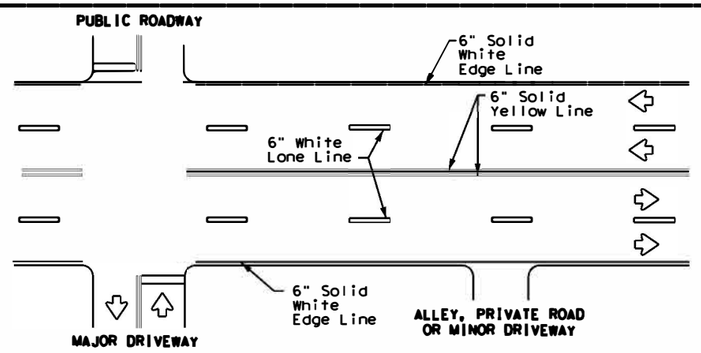
DETAIL "A"

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

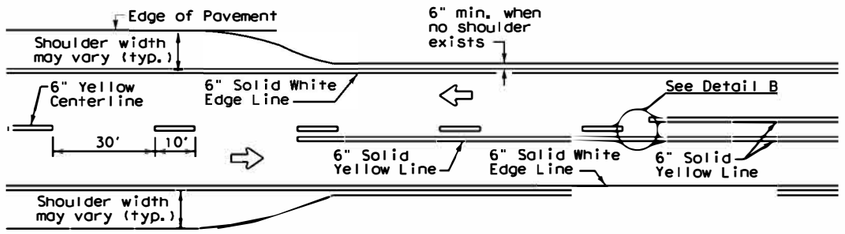
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

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

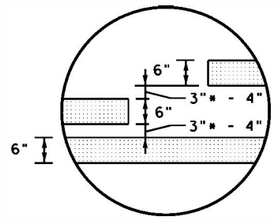
** 8" minimum for restripe projects when approved by the Engineer.



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



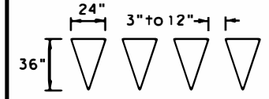
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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

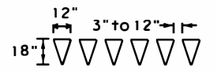
DETAIL "B"

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

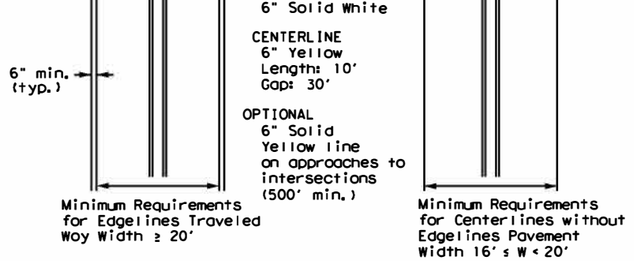


For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



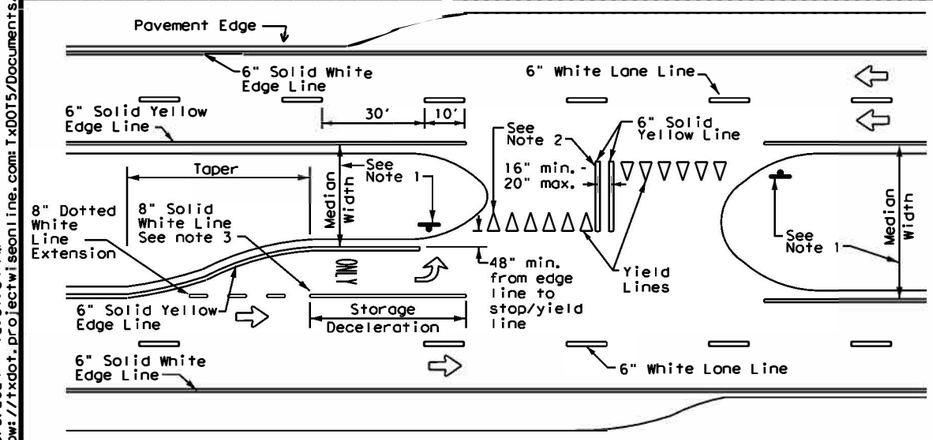
For posted speed on road being marked equal to or less than 40 MPH.



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

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways ore 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 ore required. Yield signs ore the typical intersection control. Stop signs and stop bars ore 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 con be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.

3. Length of turn boys, including toper, 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 ore 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.

Texas Department of Transportation

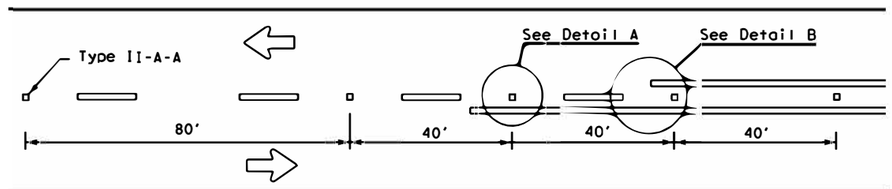
Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

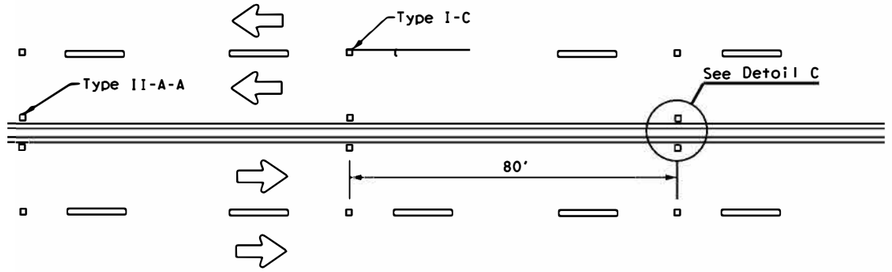
PM(1)-22

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	0387	05	026,ETC	FM 982,ETC
	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		104

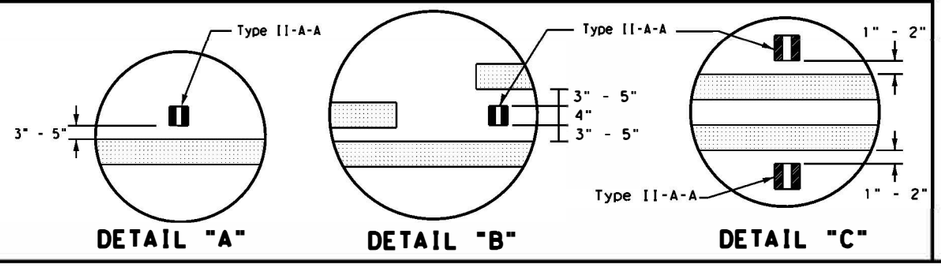
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

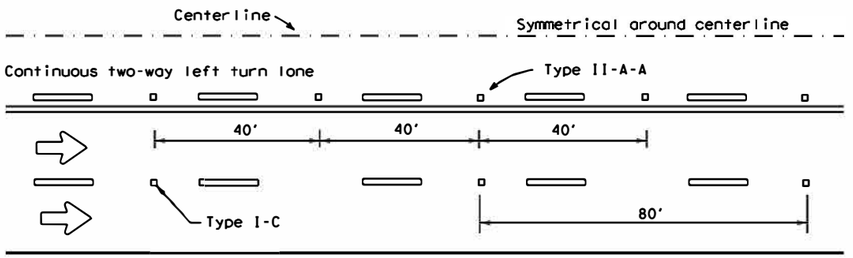


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

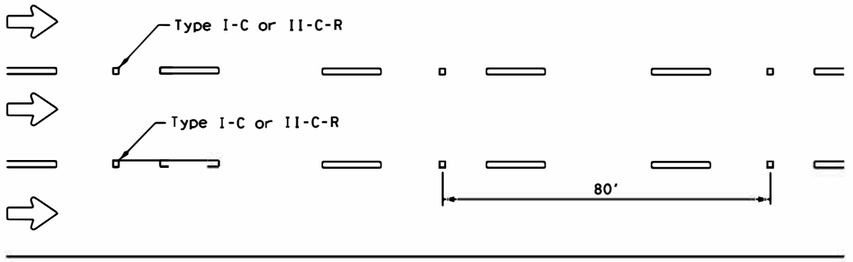


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



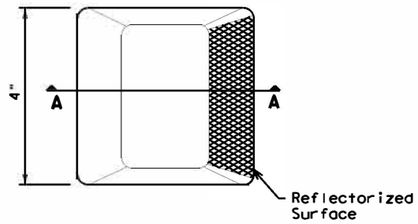
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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

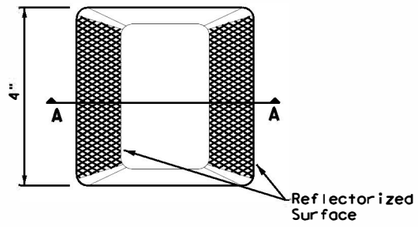
See Note 3.

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

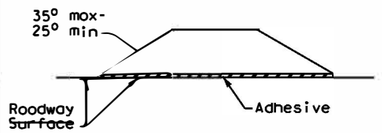
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

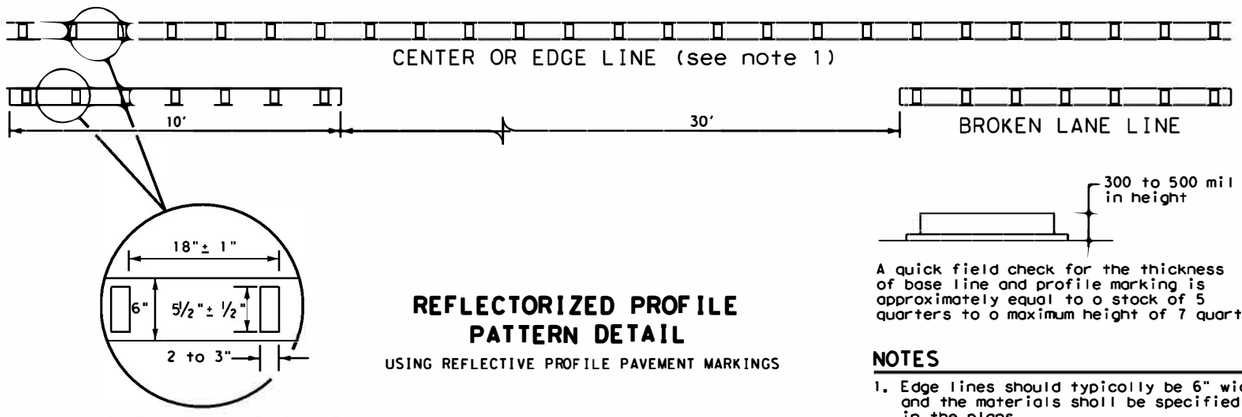


Type II (Top View)



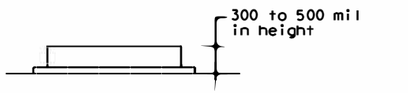
SECTION A

RAISED PAVEMENT MARKERS



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



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

NOTES

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

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

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-77 8-00 6-20 4-92 2-10 12-22 5-00 2-12	0387	05	026, ETC	FM 982, ETC
	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		105

22B

DATE: 9/3/2024 12:38:10 PM
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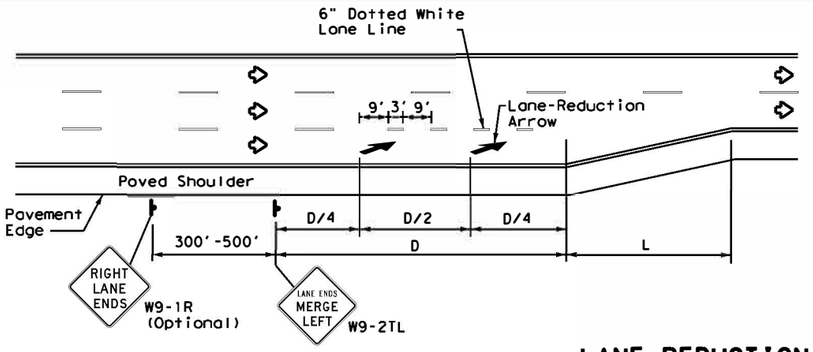


LANE REDUCTION

NOTES

1. Lane reduction pavement markings ore 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 lone. For Texas Super 2 Passing Lones, see TS2(PL) standard sheets.
2. On divided highways, on 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. Lone 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.

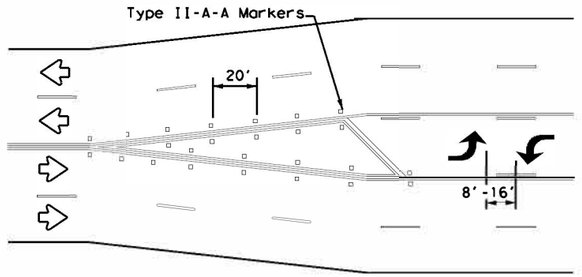
ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L = \frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

GENERAL NOTES

1. Lone use word and arrow markings shall be used where through lanes approaching on intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliory 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 ore as shown in the Standard Highway Sign Designs for Texas.
2. When lone-use words and arrow markings are used, two sets of arrows should be used if the length of the boy 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 lone.
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 boys, 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.

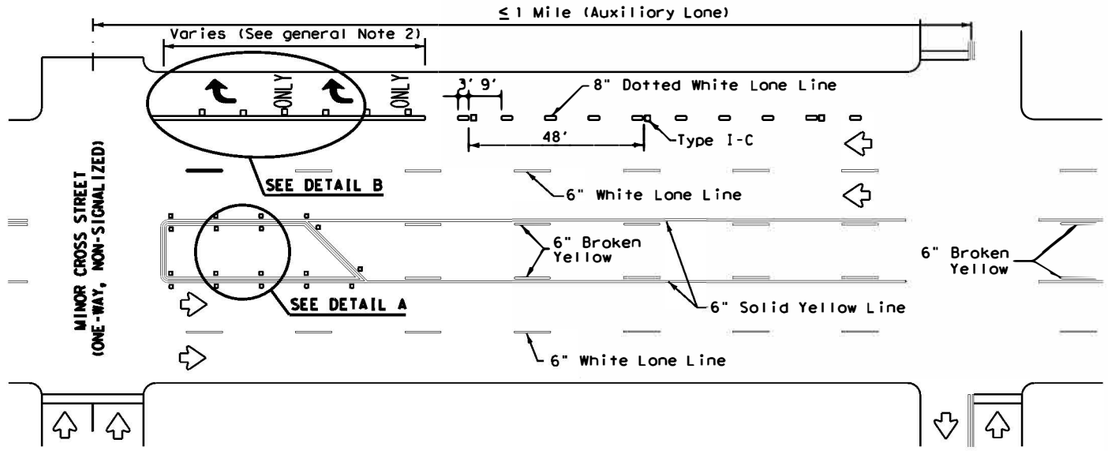
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

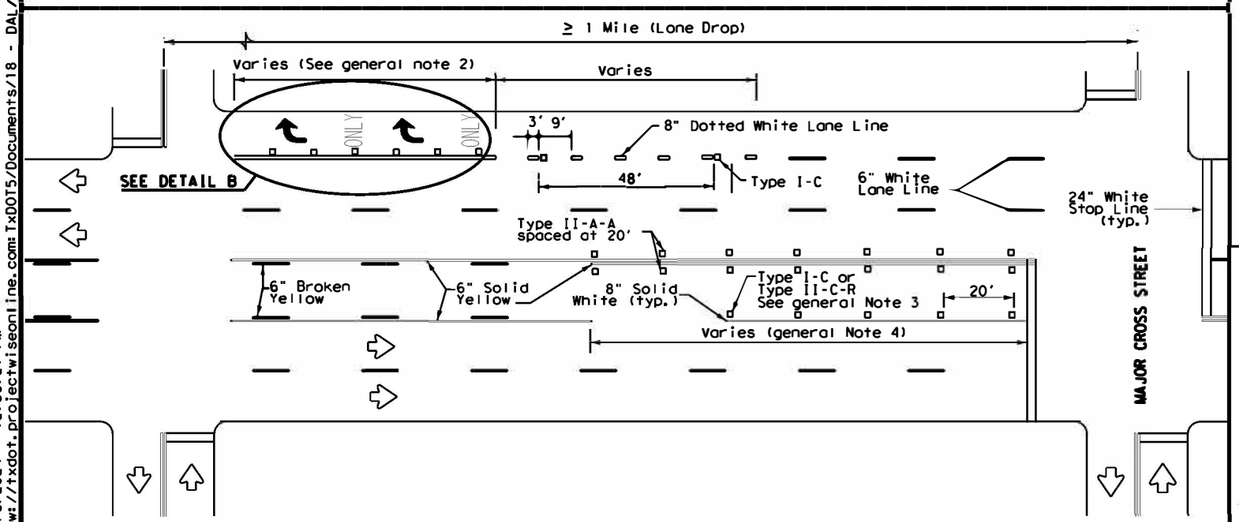


A two-way left-turn (TWLT) lone-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lone within a corridor. Repeating the marking after each intersection or dedicated turn boy is not required unless stated elsewhere in the plans.

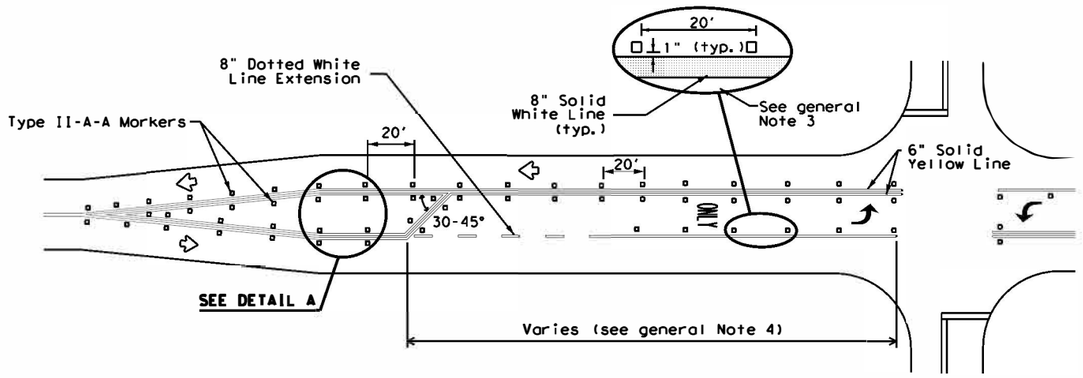
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY



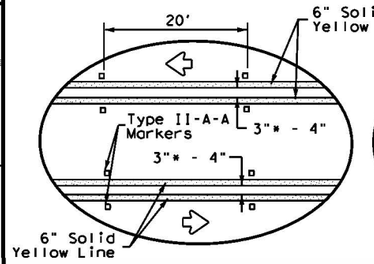
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



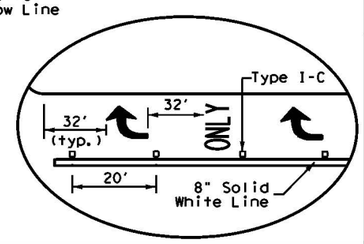
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A



DETAIL B

* 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 8-20 5-00 2-10 12-22 8-00 2-12	0387	05	026,ETC	FM 982,ETC
	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		106

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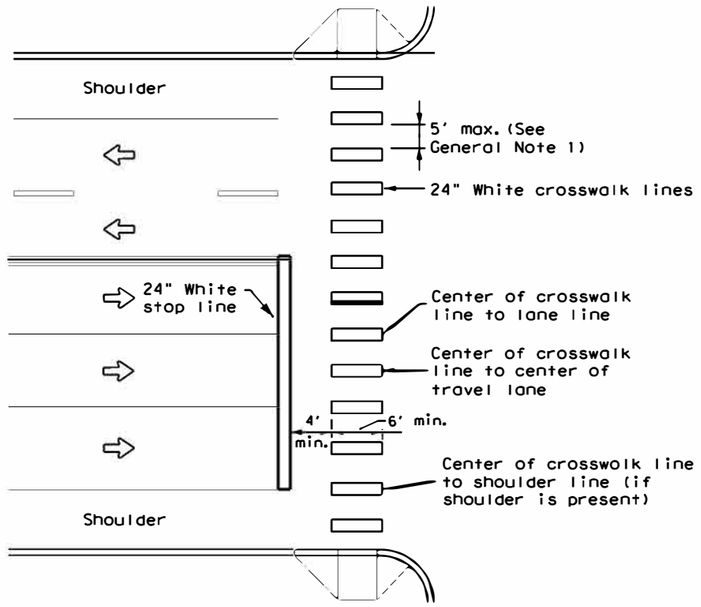


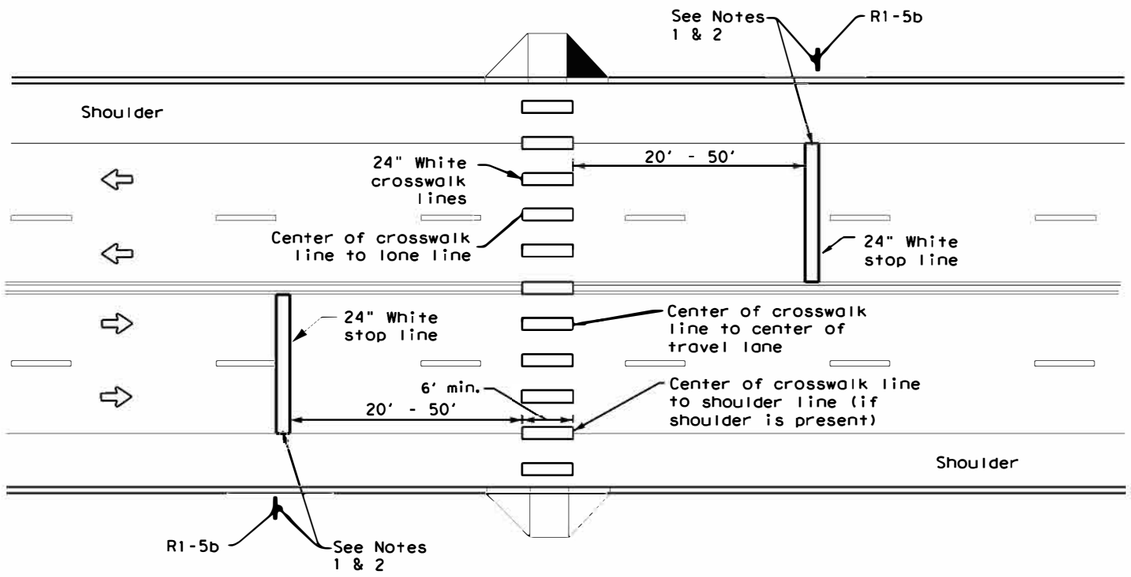
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

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.



UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with Stop Here For Pedestrians (R1-5b) signs at unsignalized midblock cross walks.
2. Use stop bars with STOP HERE ON RED (R10-6 or R10-6a) signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-22A

FILE: pm4-22a.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 6-20 9-22 12-22	0387	05	026,ETC	FM 982,ETC
	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		107

22b

DATE: 9/3/2024 12:39:05 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT15/Documents/18 - DAL/Design Projects/038705026/4 - Design/Plan Set/8. Traffic/STANDARDS/smdgen.dgn

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)

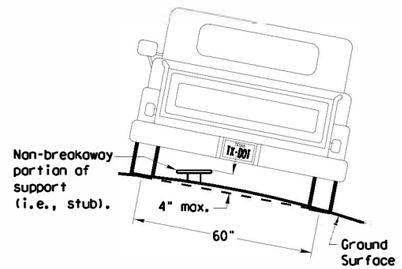
Anchor Type

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))

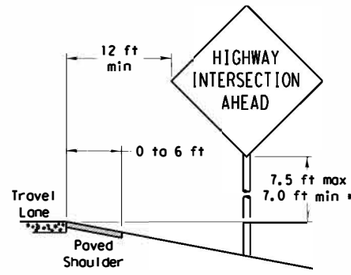
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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).

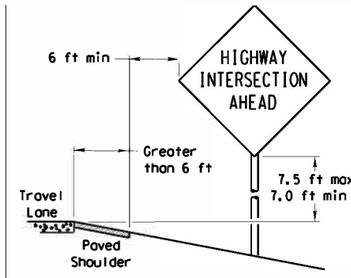
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

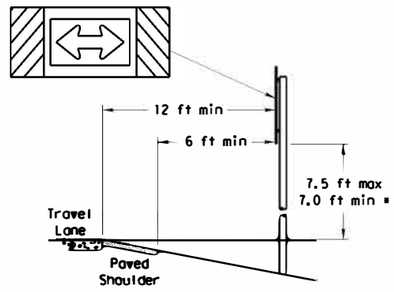
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



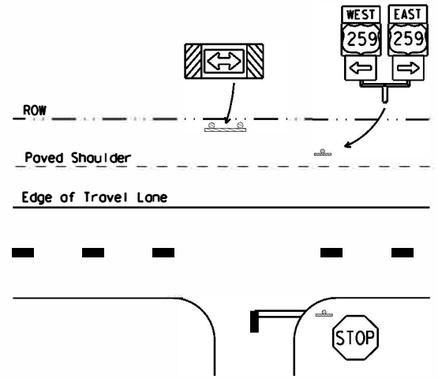
GREATER THAN 6 FT. WIDE

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.

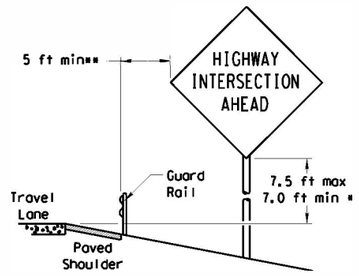
T-INTERSECTION



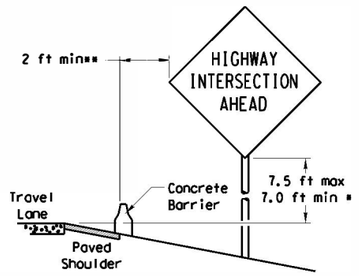
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



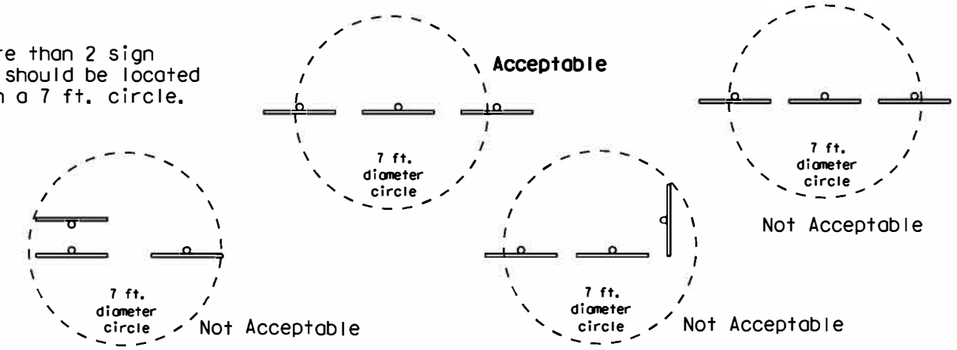
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

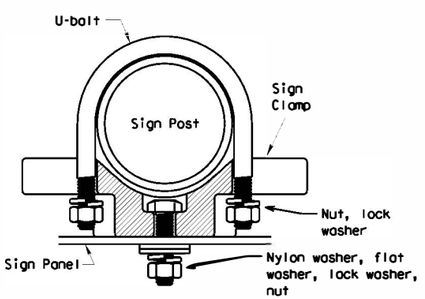
**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

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



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

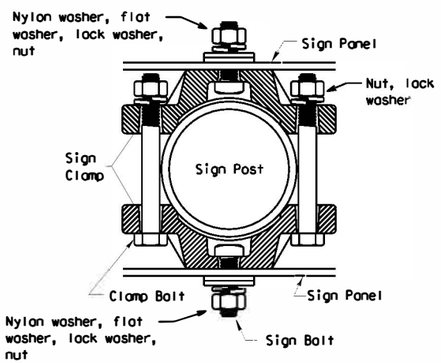


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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.

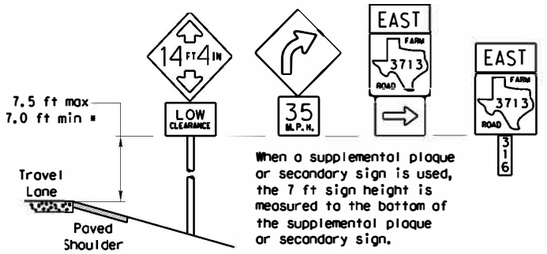
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



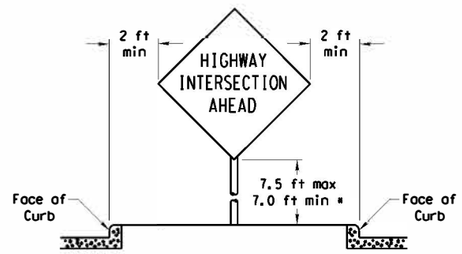
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



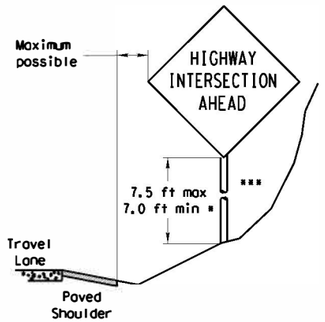
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

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

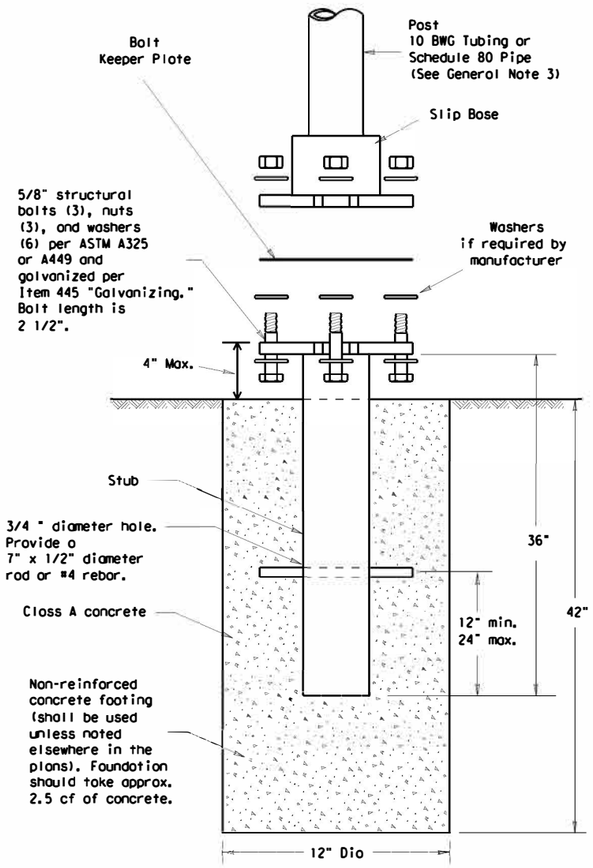
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

REVISIONS	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0387	05	026,ETC	FM 982,ETC
	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		108

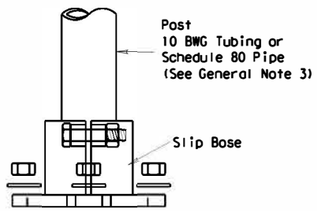
DATE: 9/3/2024 12:39:25 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/0387050264 - Design/Plan Set/8. Traffic/STANDARDS/slip-1 dal.DGN

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS

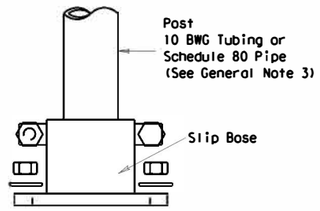


SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

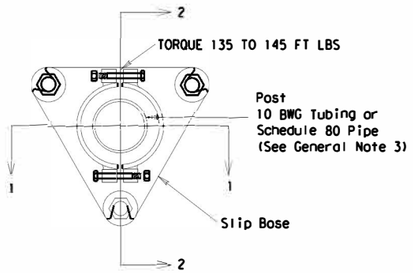
NOTE
The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.



SIDE VIEW 1-1



SIDE VIEW 2-2



TOP VIEW

DETAIL A

GENERAL NOTES:

1. Slip bose shall be permanently marked to indicate manufacturer. Method, design, and location of marking ore subject to approval of the TxDOT Traffic Standards Engineer.
2. Moteriol used os post with this system shoil conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   0.134" nominol woll thickness
   Seamless or electric-resistance welded steel tubing or pipe
   Steel shoil 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"
   Woll thickness (uncooted) shoil be within the range of 0.122" to 0.138"
   Outside diameter (uncooted) shoil be within the range of 2.867" to 2.883"
   Golvonization per ASTM A123 or ASTM A653 G210. For precooted steel tubing (ASTM A653), recoot tube outside diameter weld seam by metollizing with zinc wire per ASTM B833.
   Schedule 80 Pipe (2.875" outside diameter)
   0.276" nominol woll thickness
   Steel tubing per ASTM A500 Gr C
   Other seamless or electric-resistance welded steel tubing or pipe with equivolent outside diameter ond woll 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"
   Woll thickness (uncooted) shoil be within the range of 0.248" to 0.304"
   Outside diameter (uncooted) shoil be within the range of 2.855" to 2.895"
   Golvonization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbose System components. The website address is:
   http://www.txdot.gov/publicotions/troffic.htm
4. Sign supports shoil not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

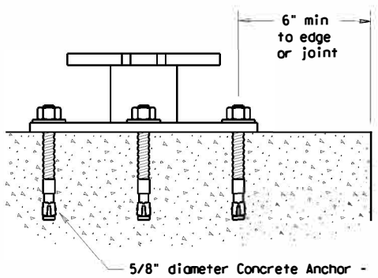
Foundation

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 o minimum of 18 inches into the solid rock.
2. The Engineer may permit botches of concrete less than 2 cubic yards to be mixed with o portoble, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in o suitoble contoiner may be ollowed by Engineer. Concrete shoil be Closs A.
3. Push the pipe end of the slip bose stub into the center of the concrete. Rotote the stub bock ond forth while pushing it down into the concrete to ossure good contact between the concrete ond stub. Continue to work the stub into the concrete until it is between 2 to 4 inches obove the ground.
4. Plumb the stub. Allow o minimum of 4 doys to set, unless otherwise directed by the Engineer.
5. The triongulor slipbose system is multidirectionol ond is designed to release when struck from ony direction.

Support

1. Cut support so thot the bottom of the sign will be 7 to 7.5 feet obove the edge of the trovelway (i.e., edge of the closest lone) when slip plote is below the edge of pavement or 7 to 7.5 feet obove slip plate when the slip plote is obove the edge of the trovelway. The cut shoil be plumb ond straight.
2. Attach sign to support using connections shown. When multiple signs ore installed on the same support, ensure the minimum clearance between each sign is maintoined. See SMD(SLIP-2) for clearances bosed on sign types.

CONCRETE ANCHOR



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

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

ADDED DETAIL A FOR CLAMP BASE
10-2010

Texas Department of Transportation
Dallas District Standard

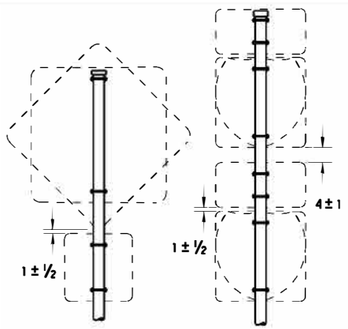
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08(DAL)

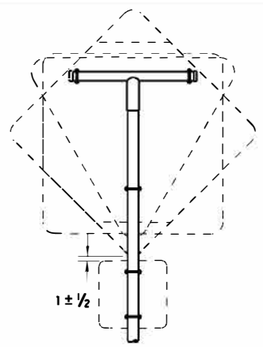
DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT

9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
12-10 (DISTRICT) ADDED CLAMP BASE DETAIL FOR SLIP BASE INSTALLATION	0387	05	026,ETC	FM 982,ETC
	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		109

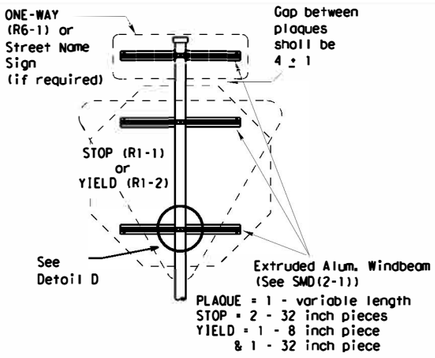
DATE: 9/3/2024 12:39:43 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/0387050264 - Design/Plan Set/8. Traffic/STANDARDS/smd82.dgn



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



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



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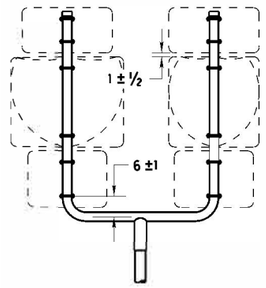

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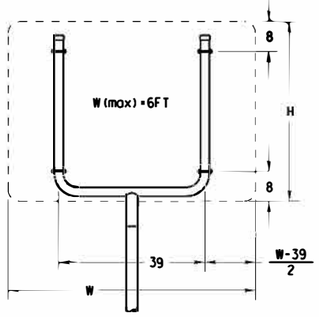

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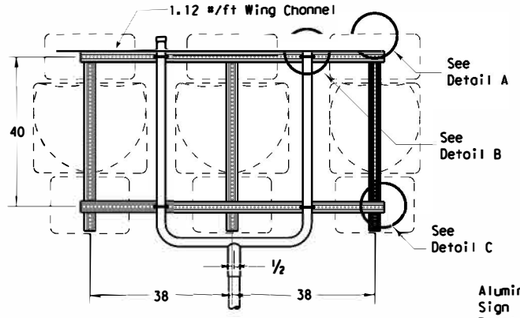
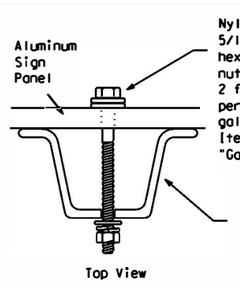
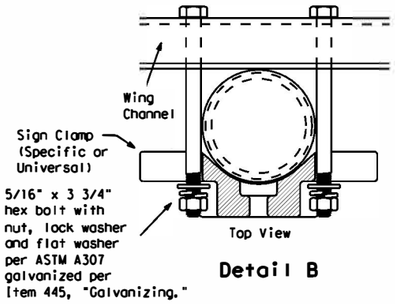


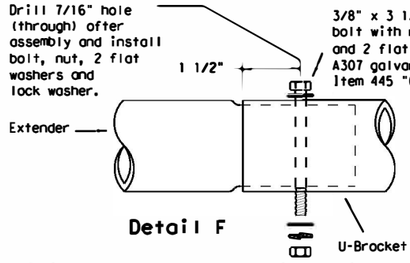
SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)



Detail A

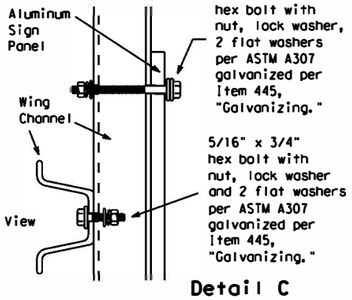


Detail B

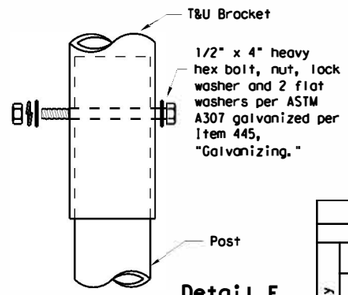


Detail F

Splices shall only be allowed behind the sign substrate.



Detail C

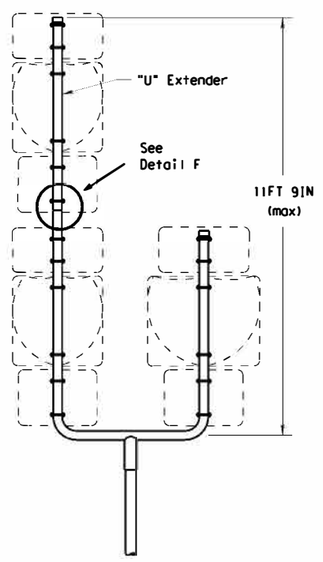


Detail E

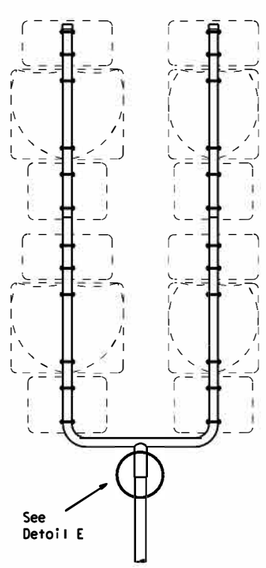
GENERAL NOTES:

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

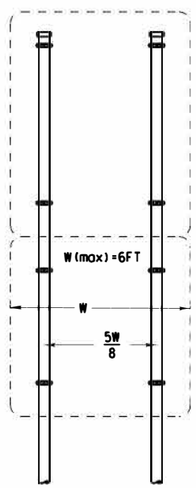
1. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
2. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
3. Aluminum sign blanks shall conform to Departmental Material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



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

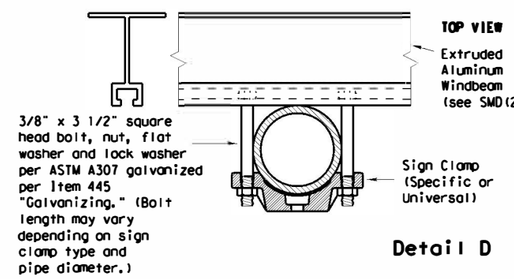


SM RD SGN ASSM TY S80(1)XX(U-2EXT)

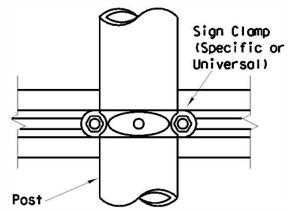


SM RD SGN ASSYM TY XXXXX(2)XX(P)

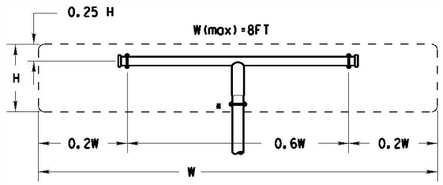
SIDE VIEW



Detail D



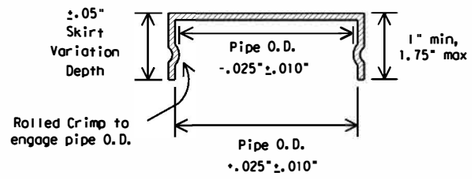
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)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



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

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



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

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

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

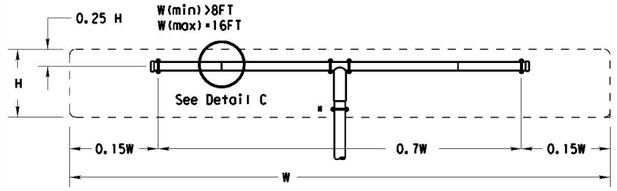
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

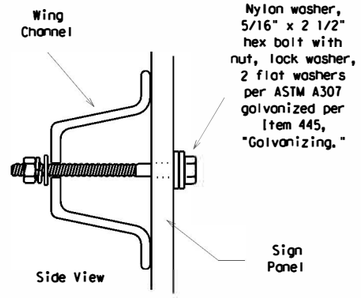
SMD(SLIP-2)-08

REVISIONS	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0387	05	026,ETC	FM 982,ETC
	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		110

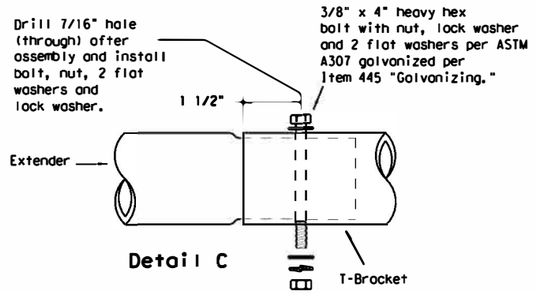
DATE: 9/3/2024 12:40:01 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/0387050264 - Design/Plan Set/8. Traffic/STANDARDS/smds3.dgn



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



Detail B



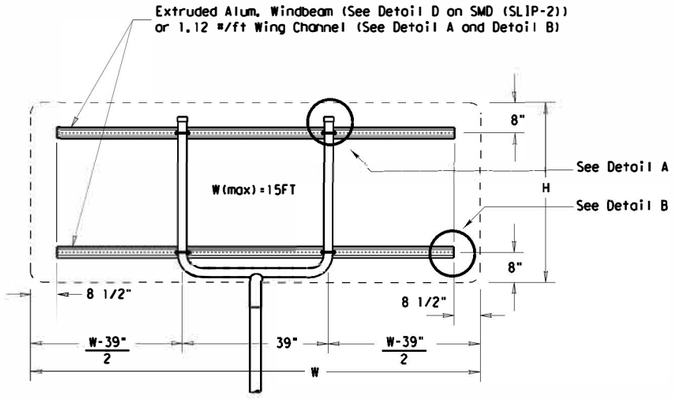
Detail C

Splices shall only be allowed behind the sign substrate.

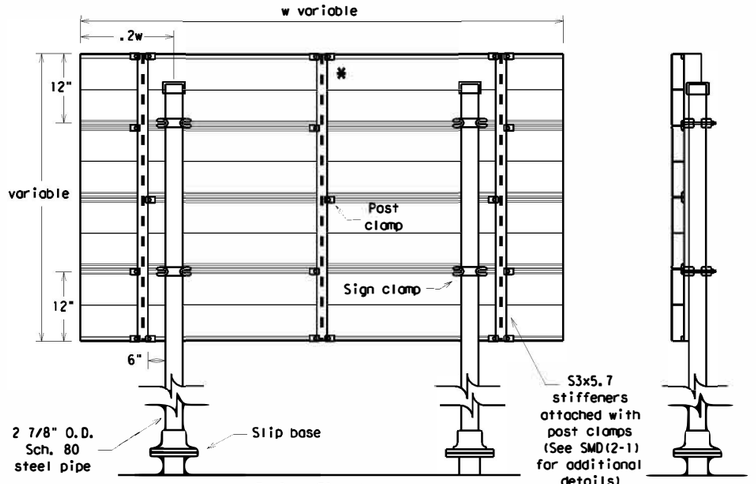
GENERAL NOTES:

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

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.



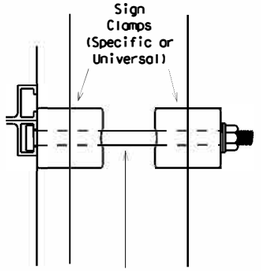
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



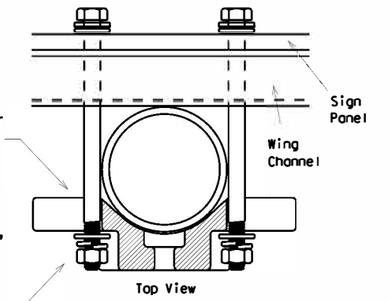
Typical Sign Mount

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

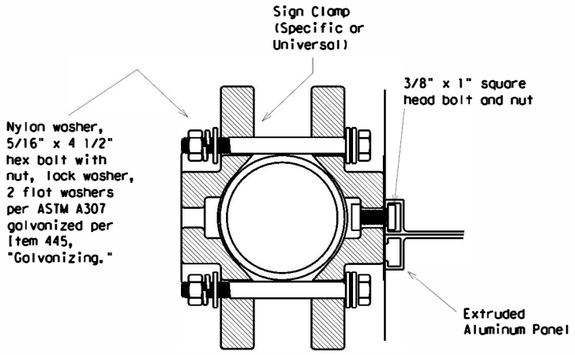
* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



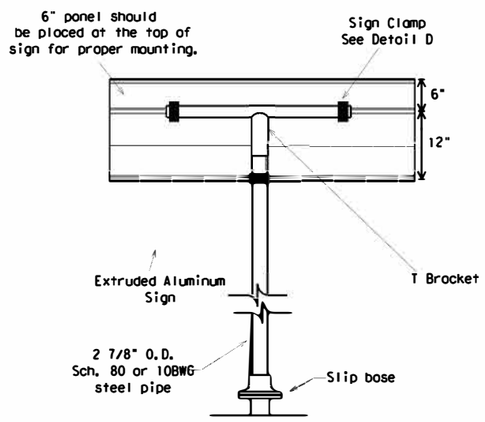
Detail E



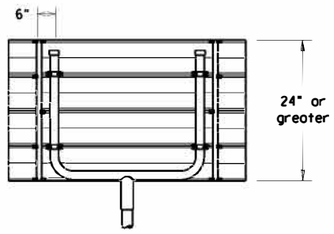
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET



Extruded Aluminum Sign
With T Bracket



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

See Detail E
for clamp installation

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

REVISIONS
9-08

DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT

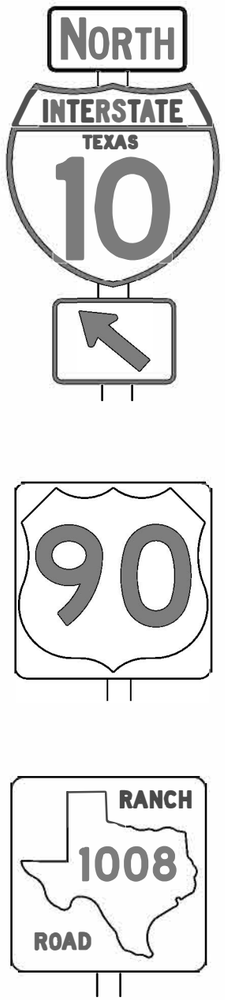
CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC

DIST	COUNTY	SHEET NO.
DAL	COLLIN	111

DATE: 9/3/2024 12:40:19 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/0902694 angles/[illegible]

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

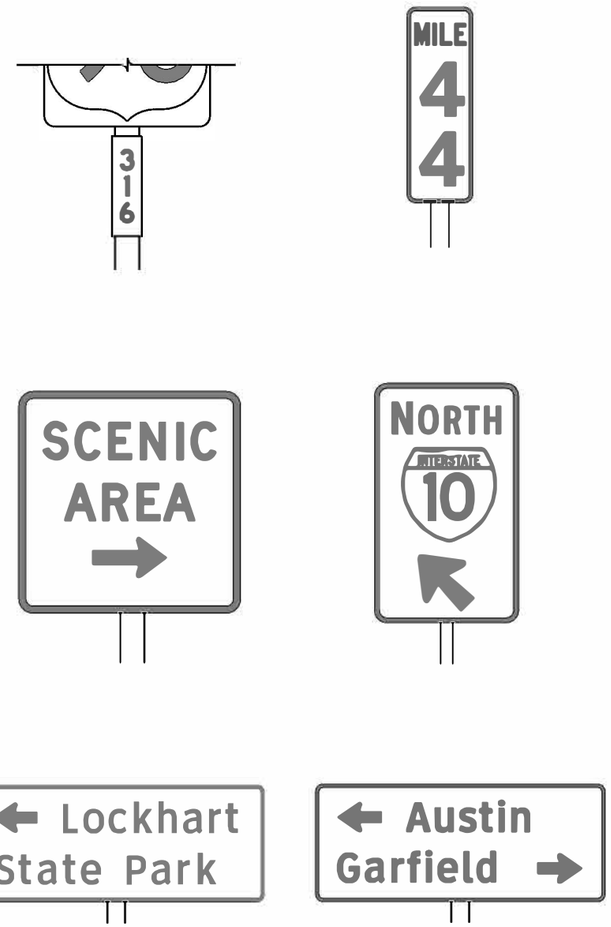
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

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

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



TYPICAL EXAMPLES

GENERAL NOTES

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

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

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

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

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

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

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

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

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

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

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

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

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(3)-13

FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0387	05	026, ETC	FM 982, ETC
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	DAL	COLLIN		112

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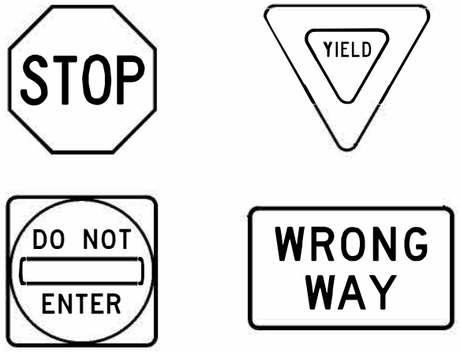
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/0918-05-026/Traffic/Signs/0918050261R4 Standard Sign Requirements.dgn

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

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



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

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

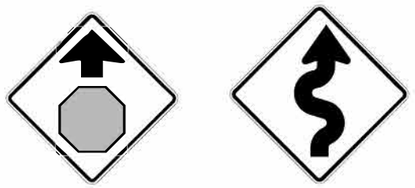
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

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

TYPICAL EXAMPLES

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

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

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

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

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

GENERAL NOTES

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

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

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

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

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

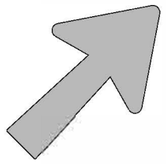
TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0387	05	026, ETC	FM 982, ETC
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	DAL	COLLIN		113

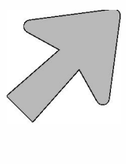
DATE: 9/3/2024 12:40:55 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/0387050216/4 Sheets/0387050216 arrows for SHSD 8.dgn

ARROW DETAILS

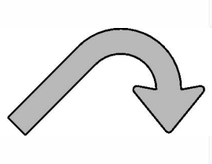
for Large Ground-Mounted and Overhead Guide Signs



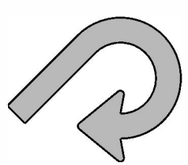
Type A



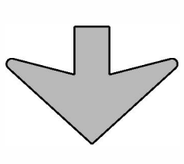
Type B



E-3



E-4



Down Arrow

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

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

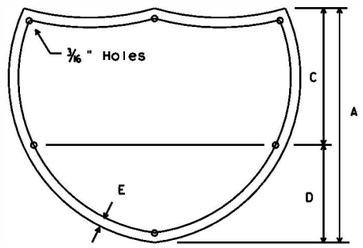
NOTE

Arrow dimensions ore shown in the "Standard Highway Sign Designs for Texas" manuol.

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

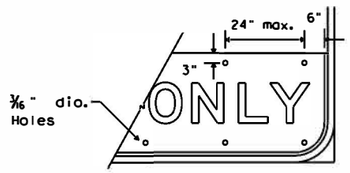
http://www.txdot.gov/

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

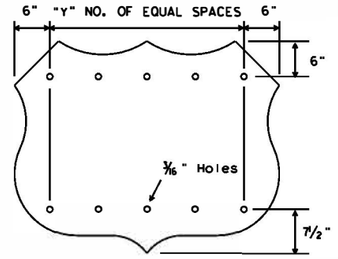


INTERSTATE ROUTE MARKERS

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

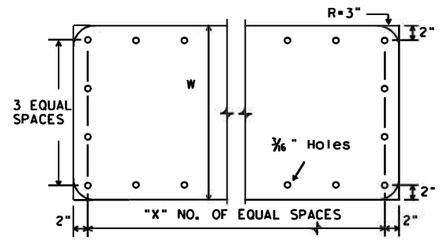


EXIT ONLY PANEL



U.S. ROUTE MARKERS

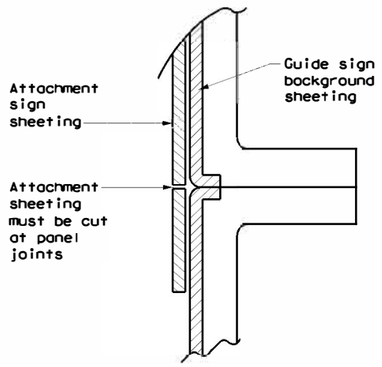
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



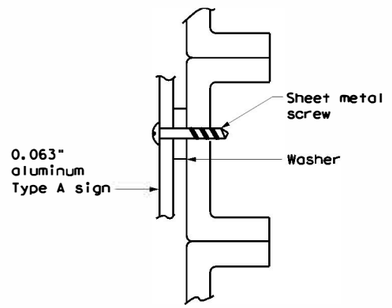
STATE ROUTE MARKERS

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

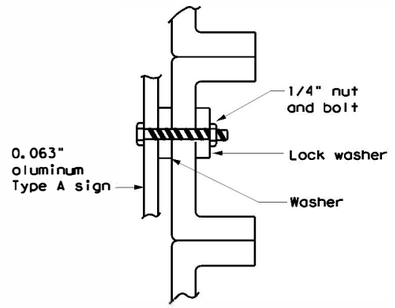
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



DIRECT APPLIED ATTACHMENT



SCREW ATTACHMENT



NUT/BOLT ATTACHMENT

NOTE:

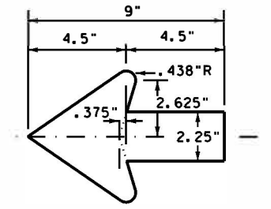
1. Sheeting for legend, symbols, and borders must be cut at panel joints.
2. Direct applied attachment signs will be subsidiory to "Aluminum Signs" or "Fiberglass Signs".

NOTE:

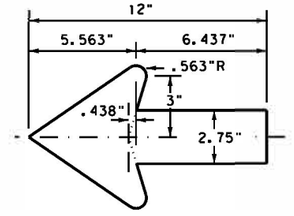
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS

for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(5)-13

FILE:	tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS		0387	05	026,ETC	FM 982,ETC
12-03 7-13		DIST	COUNTY		SHEET NO.
9-08		DAL	COLLIN		114

5

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with the TPDES Construction General Permit TXR150000 (CGP). The Texas Department of Transportation (TxDOT) ensures that project specifications include adequate best management practices (BMPs) for this project.

For all projects with soil disturbing activity and for projects that have Environmental, Permits, Issues, and Commitments (EPICs) dependent on stormwater controls and water quality measures TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office, Area Office, or electronically.

This SWP3 is consistent with requirements specified in applicable stormwater plans and the projects environmental permits, issues, and commitments (EPICs). A copy of the CGP is included in Attachment 2.12 of the SWP3 binder.

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

0387-05-026,ETC (FM 982,ETC)

1.2 PROJECT LIMITS:

FM 982
From: **0.1 SOUTH OF FM 546** To: **MYRICK LANE**

FM 3286
From: **LOST VALLEY DR** To: **E FM 546**

1.3 PROJECT COORDINATES:

FM 982
BEGIN: (Lat) **33.1742603** ,(Long) **-96.4989154**
END: (Lat) **33.1025404** ,(Long) **-96.5013648**

FM 3286
BEGIN: (Lat) **33.0843766** ,(Long) **-96.5722806**
END: (Lat) **33.1017443** ,(Long) **-96.5165130**

1.4 TOTAL PROJECT AREA (Acres): 86.25

1.5 TOTAL AREA TO BE DISTURBED (Acres): 1.47

1.6 NATURE OF CONSTRUCTION ACTIVITY:

MILL AND INLAY AND INTERSECTION IMPROVEMENTS

1.7 MAJOR SOIL TYPES:

Soil Type	Description
HoB	Houston Black Clay, 1 to 3% Slopes
HcC2	Heiden clay, 3 to 5 percent slopes, eroded
FeE3	Ferris-Heiden clay, 5 to 12 percent slopes, severely eroded
BcB2	Leson clay, 2 to 4 percent slopes, eroded
HcD2	Heiden clay, 5 to 8 percent slopes, eroded

The Vegetative Cover is in good condition with approximately 95% density.

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

- [X] PSLs determined during preconstruction meeting
- [ ] PSLs determined during construction
- [ ] No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.5.)

- [X] Mobilization
- [X] Install sediment and erosion controls
- [X] Blade existing topsoil into windrows, prep ROW, clear and grub
- [X] Remove existing pavement
- [X] Grading operations, excavation, and embankment
- [ ] Excavate and prepare subgrade for proposed pavement widening
- [ ] Remove existing culverts, safety end treatments (SETs)
- [ ] Remove existing metal beam guard fence (MBGF), bridge rail
- [X] Install proposed pavement per plans
- [ ] Install culverts, culvert extensions, SETs
- [X] Install mow strip, MBGF, bridge rail
- [ ] Place flex base
- [ ] Rework slopes, grade ditches
- [X] Blade windrowed material back across slopes
- [X] Revegetation of unpaved areas
- [X] Achieve site stabilization and remove sediment and erosion control measures
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

- [X] Sediment laden stormwater from stormwater conveyance over disturbed area
- [X] Fuels, oils, and lubricants from construction vehicles, equipment, and storage
- [X] Solvents, paints, adhesives, etc. from various construction activities
- [X] Transported soils from offsite vehicle tracking
- [X] Construction debris and waste from various construction activities
- [X] Contaminated water from excavation or dewatering pump-out water
- [X] Sanitary waste from onsite restroom facilities
- [X] Trash from various construction activities/receptacles
- [X] Long-term stockpiles of material and waste
- [X] Discharges from concrete washout activities, runoff from concrete cutting activities, and other concrete related activities.
- [X] Other: _____
- [X] Other: _____
- [ ] Other: _____

1.11 RECEIVING WATERS:

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
TICKEY CREEK AND ITS TRIBUTARIES	LAKE LAVON (0821)
LAKE LAVON (0821) AND ITS TRIBUTARIES (INCLUDING WHITE ROCK CREEK, EAST' FORK TRINITY RIVER, AND MULTIPLE UNAMED)	LAKE LAVON (0821)

No water quality impairments.

1.12 ROLES AND RESPONSIBILITIES: TxDOT

- [X] Development of plans and specifications
- [X] Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
- [X] Post Construction Site Notice
- [X] Submit NOI/CSN to local MS4
- [X] Perform SWP3 inspections
- [X] Maintain SWP3 records and update to reflect daily operations
- [X] Complete and submit Notice of Termination to TCEQ
- [X] Maintain SWP3 records for 3 years
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

- [X] Day To Day Operational Control
- [X] Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
- [X] Post Construction Site Notice
- [X] Submit NOI/CSN to local MS4
- [X] Maintain schedule of major construction activities
- [X] Install, maintain and modify BMPs
- [X] Complete and submit Notice of Termination to TCEQ
- [X] Maintain SWP3 records for 3 years
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

1.14 LOCAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OPERATOR COORDINATION:

MS4 Entity
COLLIN COUNTY PHASE II MS4 CONTACT TRACY HAMFIELD
STANTON FOERSTER, PUBLIC WORKS DIRECTOR
TRACY HOMFELD, ASSISTANT DIRECTOR OF ENGINEERING

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

July 2023 Sheet 1 of 2

Texas Department of Transportation

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		115
STATE	STATE DIST.	COUNTY	
TEXAS	DAL	COLLIN	
CONT.	SECT.	JOB	HIGHWAY NO.
0387	05	026,ETC	FM 982,ETC

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- [X] [ ] Protection of Existing Vegetation
- [X] [ ] Vegetated Buffer Zones
- [ ] [ ] Soil Retention Blankets
- [ ] [ ] Geotextiles
- [ ] [ ] Mulching/ Hydromulching
- [ ] [ ] Soil Surface Treatments
- [X] [ ] Temporary Seeding
- [ ] [X] Permanent Planting, Sodding or Seeding
- [X] [ ] Biodegradable Erosion Control Logs
- [X] [ ] Rock Filter Dams/ Rock Check Dams
- [X] [ ] Vertical Tracking
- [ ] [ ] Interceptor Swale
- [ ] [X] Riprap
- [ ] [ ] Diversion Dike
- [ ] [ ] Temporary Pipe Slope Drain
- [ ] [X] Embankment for Erosion Control
- [ ] [ ] Paved Flumes
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- [X] [ ] Biodegradable Erosion Control Logs
- [X] [ ] Dewatering Controls
- [X] [ ] Inlet Protection
- [X] [ ] Rock Filter Dams/ Rock Check Dams
- [ ] [ ] Sandbag Berms
- [X] [ ] Sediment Control Fence
- [X] [ ] Stabilized Construction Exit
- [ ] [ ] Floating Turbidity Barrier
- [X] [ ] Vegetated Buffer Zones
- [ ] [ ] Vegetated Filter Strips
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

Sediment control BMPs requiring design capacity calculations (See SWP3 Attachment 1.3.):

T / P

- [ ] [X] Sediment Trap
  - [ ] Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
  - [ ] 3,600 cubic feet of storage per acre drained
- [ ] [ ] Sedimentation Basin
  - [ ] Not required (<10 acres disturbed)
  - [ ] Required (>10 acres) and implemented.
    - [ ] Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
    - [ ] 3,600 cubic feet of storage per acre drained
  - [ ] Required (>10 acres), but not feasible due to:
    - [ ] Available area/Site geometry
    - [ ] Site slope/Drainage patterns
    - [ ] Site soils/Geotechnical factors
    - [ ] Public safety
    - [ ] Other: _____

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
RIPRAP	63+26.40	63+56.15

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- [X] Excess dirt/mud on road removed daily
- [X] Haul roads dampened for dust control
- [X] Loaded haul trucks to be covered with tarpaulin
- [X] Stabilized construction exit
- [X] Daily street sweeping
- [X] Other: **SITE DAMPENED FOR DUST CONTROL**
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- [X] Chemical Management
- [X] Concrete and Materials Waste Management
- [X] Debris and Trash Management
- [X] Dust Control
- [X] Sanitary Facilities
- [X] Other: **Avoid storing portable sanitary units, concrete washouts or chemicals within 50 feet upgradient of a reveiving water or drainage conveyance without adequate pollution controls.**
- [X] Other: **Capture saw-cutting debris and concrete slurry for proper disposal.**
- [X] Other: **Maintain paved surfaces free of project sedimentation and debris.**

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To
TICKEY CREEK AND ITS TRIBUTARIES	**NONE**	**NONE**
LAKE LAVON (0821) AND ITS TRIBUTARIES (INCLUDING WHITE ROCK CREEK, EAST' FORK TRINITY RIVER, AND MULTIPLE UNAMED)	**NONE**	**NONE**
LAKE LAVON (0821) AND ITS TRIBUTARIES (INCLUDING WHITE ROCK CREEK, EAST' FORK TRINITY RIVER, AND MULTIPLE UNAMED)	**NONE**	**NONE**

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- [X] Fire hydrant flushings
- [X] Irrigation drainage
- [X] Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- [X] Potable water sources
- [X] Springs
- [X] Uncontaminated groundwater
- [X] Water used to wash vehicles or control dust
- [X] Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 DEWATERING:

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

2.9 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

When dewatering activities are present, a daily inspection will be conducted once per day during those activities and documented in accordance with CGP and TxDOT requirements.

2.10 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/05/2024

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

July 2023 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		116
STATE	STATE DIST.	COUNTY	
TEXAS	DAL	COLLIN	
CONT.	SECT.	JOB	HIGHWAY NO.
0387	05	026,ETC	FM 982,ETC

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

Notes To Designer:
1. Do not alter Sheet Design or Font style, size or weight - match text attributes.
2. If additional space is needed for a numbered section, fence and adjust sections up or down as needed for proportioning and readability but do not relocate from its relative position.
3. All areas should be addressed thoroughly and verify the necessary pay items are set up to support actions needed.

Filled Out: xx/xx/xxxx
Prepared by: Name/Section

I. STORMWATER POLLUTION PREVENTION PLAN-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 adjacent MS 4 Operator(s) that receive discharges from this project. They need to be notified prior to construction activities.
(Note: Leave blank only if no adjacent MS 4 Operator(s) are affected.)

1. County of Collin - Phase II MS4 - Contact Tracy Homfeld

2.

☐ No Action Required ☒ Required Action

Action Number:

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

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

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas. No equipment is allowed in any sream channel below the ordinary High Water Mark except on approved temporary stream crossings or drill pads.

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

☐ No Permit Required

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

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

☐ Individual 404 Permit Required

☒ Other Nationwide Permit Required: NWP# 3(a)

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.

Non-reportable crossings authorized under NWP3 (a):

1. Wetland 1 - STA 109+00 to 110+00 Lt - Unnamed Tributary to Stover Creek
Adjacent Wetland - Wetland Impacts

See page 2 for continuation

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 for applicable 401 General Conditions:
(Note: If CORP Permit not required, do not check boxes.)

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action Number:

IV. VEGETATION RESOURCES

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

☒ No Action Required ☐ Required Action

Action Number:

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

☐ No Action Required ☒ Required Action

Action Number:

1. The following species could occur in the project area: Texas fawnsfoot, Alligator snapping turtle, southern crawfish frog, Woodhouses toad, eastern spotted skunk, long-tailed weasel, swamp rabbit, western hog-nosed skunk, eastern box turtle, slender glass lizard, timber (canebrake) rattlesnake, western box turtle, and Texas garter snake. Follow the special note on the EPIC sheet and the BMPs listed below to protect these species.

2. Contractor to implement the following BMPs from Beneficial Management Practices: Avoiding, Minimizing, and Mitigating Impacts of Transportation Projects on State Natural Resources available at https://ftp.txdot.gov/pub/txdot-info/env/toolkit/300-01-bmp.pdf.
a. Minimize impacts to wetland and riverine habitats
b. Minimize impacts to wetland habitats including isolated ephemeral pools
c. Section 1.2 Vegetation BMP
d. Section 1.4 Water Quality BMP
e. Section 2.6.1 Aquatic Amphibian and Reptile BMP
f. Section 2.6.2 Terrestrial Amphibian and Reptile BMP

Special Notes:

1. Avoid harming all wildlife species if encountered and allow them to safely leave the project site. Due diligence should be used to avoid killing or harming any wildlife species in the implementation of transportation projects.

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

3. The Migratory Bird Act of 1918 states that it is unlawful to kill, capture, collect, possess, buy, sell, trade or transport any migratory bird, nest, young, feather or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations. The contractor would remove all old migratory bird nests from any structure or trees where work would be done from October 1 to February 15. In addition, the contractor would be prepared to prevent migratory birds from building nest(s) between February 15 to October 1. In the event that migratory birds are encountered on-site during project construction, efforts to avoid adverse impacts on protected birds, active nests, eggs and/or young would be observed.

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

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

Obtain and keep on-site Safety Data Sheets (SDS) 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 SDS. In the event of a spill, take actions to mitigate the spill as indicated in the SDS, 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, canisters, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation(s) or replacement(s) (bridge class structures not including box culverts)?

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☐ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

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

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action Number:

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action Number:

1.

GENERAL NOTE:

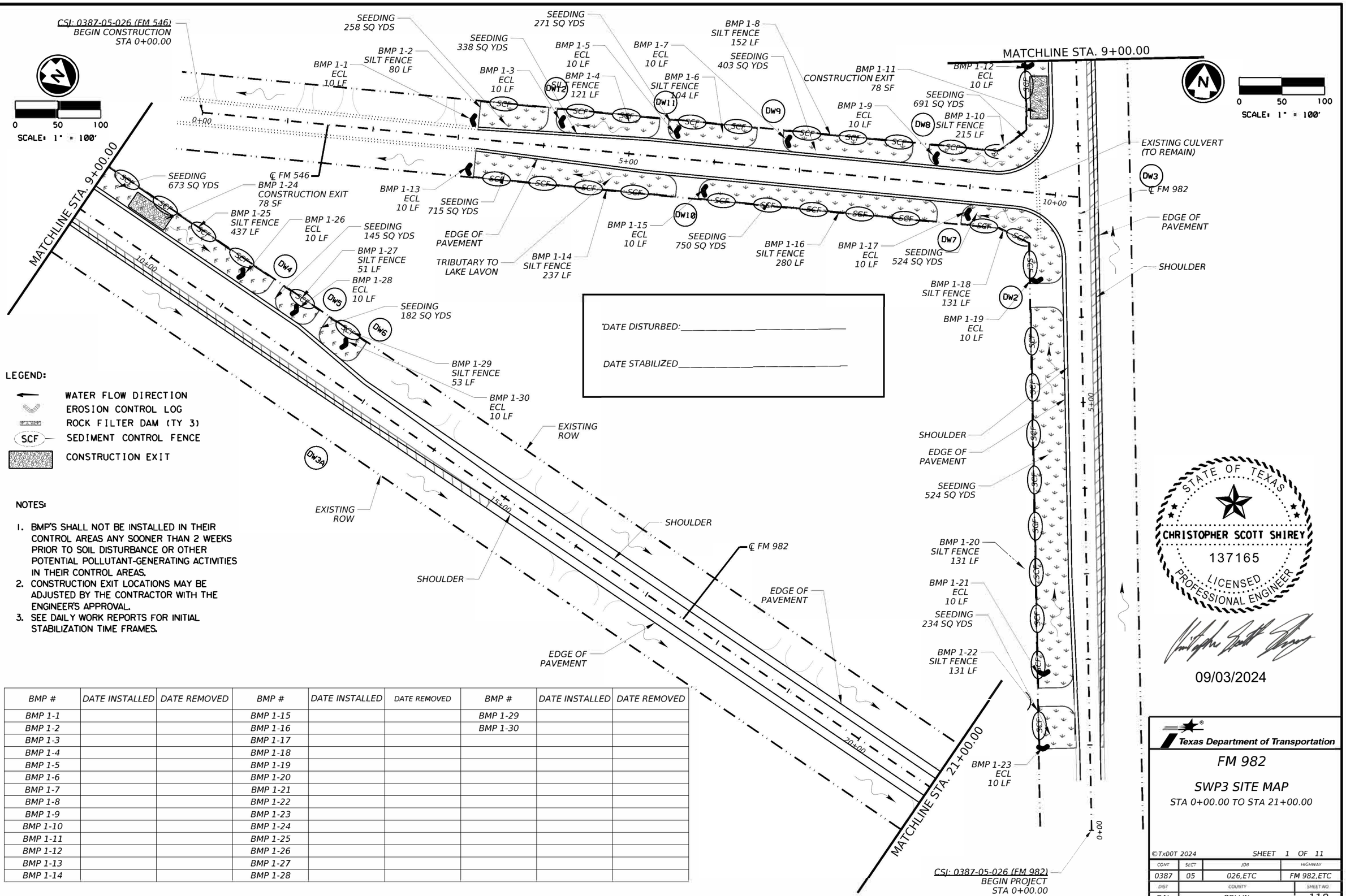
Any change orders and/or deviations from the final design must be reported to the Engineer prior to commencement of construction activities, as additional environmental clearance may be required.

LAST REVISION: 1/15/15

Dallas District

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	TITLE SHEET		FM2478
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	COLLIN	
CONTROL	SECTION	JOB	SHEET NO.
2351	02	017	117



BMP #	DATE INSTALLED	DATE REMOVED	BMP #	DATE INSTALLED	DATE REMOVED	BMP #	DATE INSTALLED	DATE REMOVED
BMP 1-1			BMP 1-15			BMP 1-29		
BMP 1-2			BMP 1-16			BMP 1-30		
BMP 1-3			BMP 1-17					
BMP 1-4			BMP 1-18					
BMP 1-5			BMP 1-19					
BMP 1-6			BMP 1-20					
BMP 1-7			BMP 1-21					
BMP 1-8			BMP 1-22					
BMP 1-9			BMP 1-23					
BMP 1-10			BMP 1-24					
BMP 1-11			BMP 1-25					
BMP 1-12			BMP 1-26					
BMP 1-13			BMP 1-27					
BMP 1-14			BMP 1-28					

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

SWP3 SITE MAP

STA 0+00.00 TO STA 21+00.00

SHEET 1 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO
DAL	COLLIN		118

DATE: 9/3/2024 12:41:58 PM
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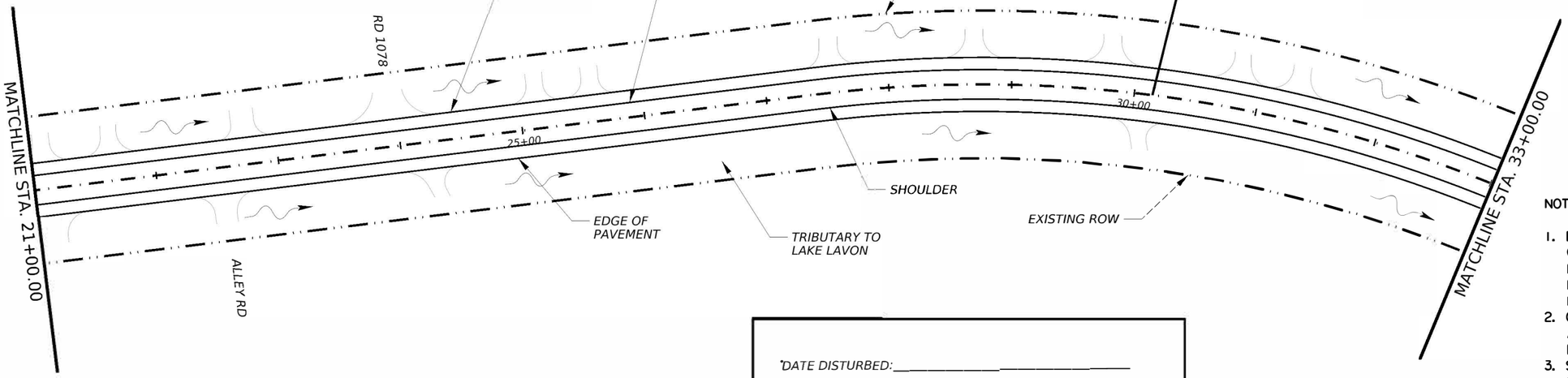


N

0 50 100

SCALE: 1" = 100'

LEGEND:

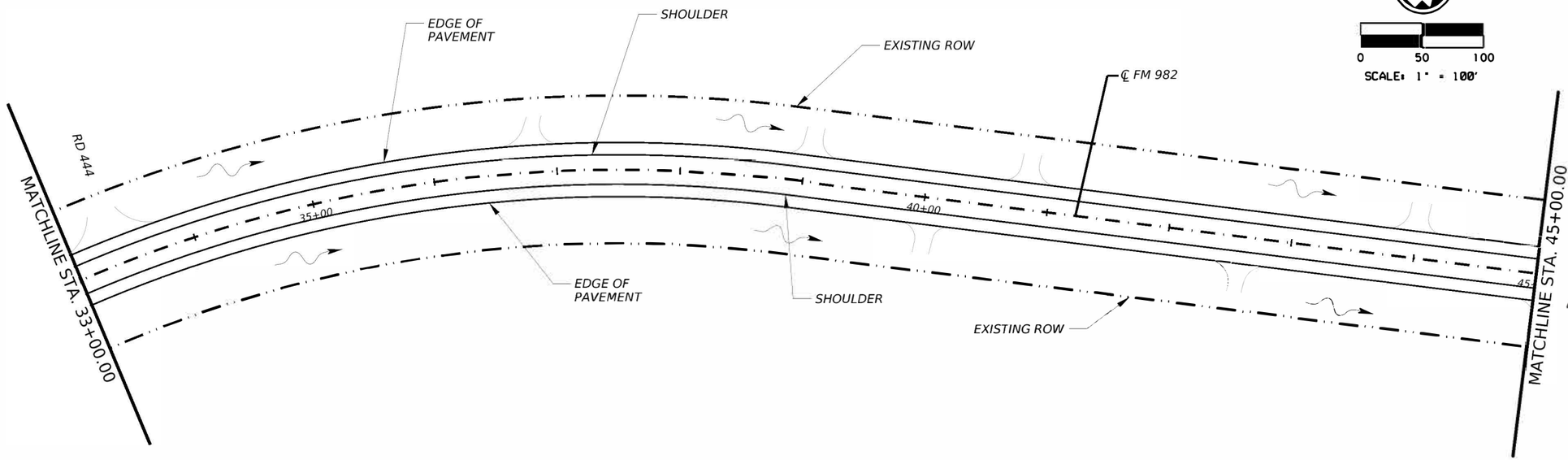
- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 3)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

NOTES:

1. BMP'S SHALL NOT BE INSTALLED IN THEIR CONTROL AREAS ANY SOONER THAN 2 WEEKS PRIOR TO SOIL DISTURBANCE OR OTHER POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREAS.
2. CONSTRUCTION EXIT LOCATIONS MAY BE ADJUSTED BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL.
3. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

*DATE DISTURBED:_____

*DATE STABILIZED_____



N

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

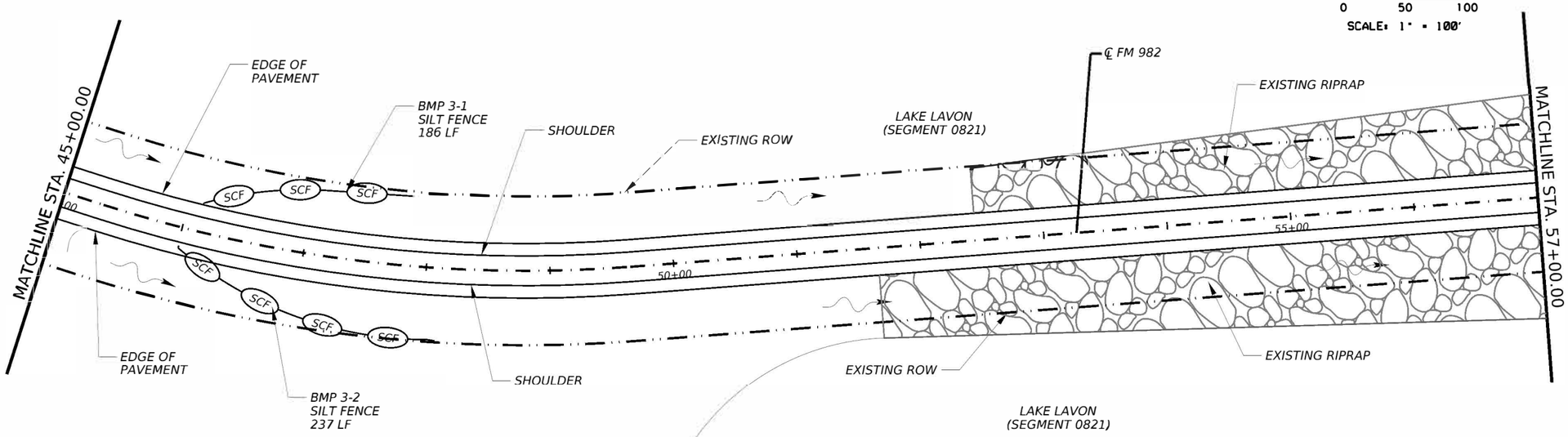
SWP3 SITE MAP

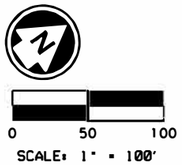
STA 21+00.00 TO STA 45+00.00

SHEET 2 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		119

DATE: 9/3/2024 12:42:20 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/0387050264 - Design/Plan Set/9. Environmental/FM 982 SWP3 SITE MAP 02.dgn





LEGEND:

- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 3)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

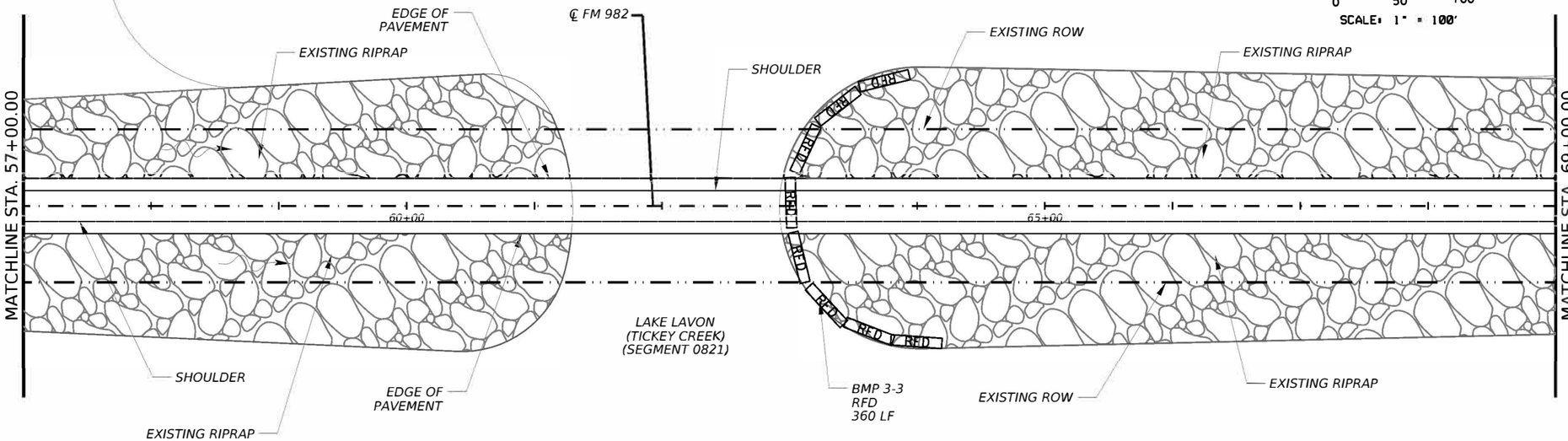
NOTES:

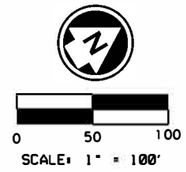
1. BMP'S SHALL NOT BE INSTALLED IN THEIR CONTROL AREAS ANY SOONER THAN 2 WEEKS PRIOR TO SOIL DISTURBANCE OR OTHER POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREAS.
2. CONSTRUCTION EXIT LOCATIONS MAY BE ADJUSTED BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL.
3. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

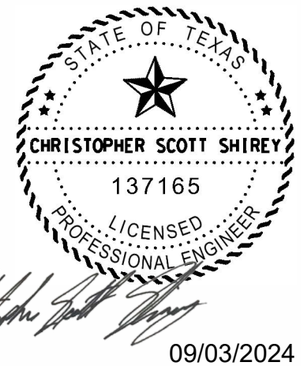
BMP #	DATE INSTALLED	DATE INSTALLED
BMP 3-1		
BMP 3-2		
BMP 3-3		

DATE INSTALLED:_____

DATE REMOVED:_____







09/03/2024

Texas Department of Transportation

FM 982

SWP3 SITE MAP

STA 45+00.00 TO STA 69+00.00

SHEET 3 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		120

DATE: 9/3/2024 12:42:41 PM
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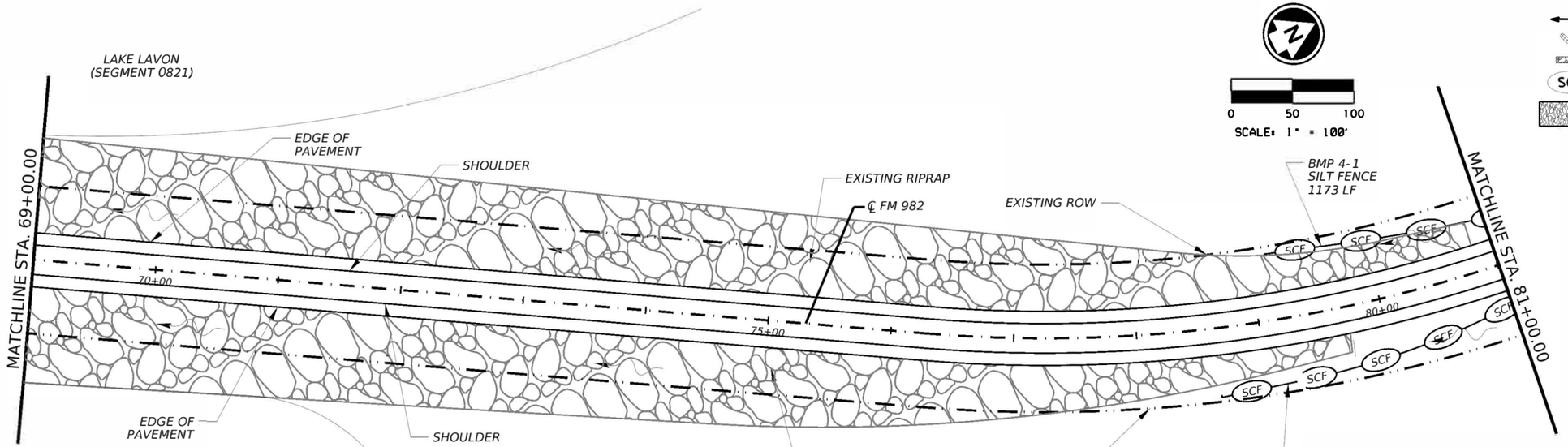

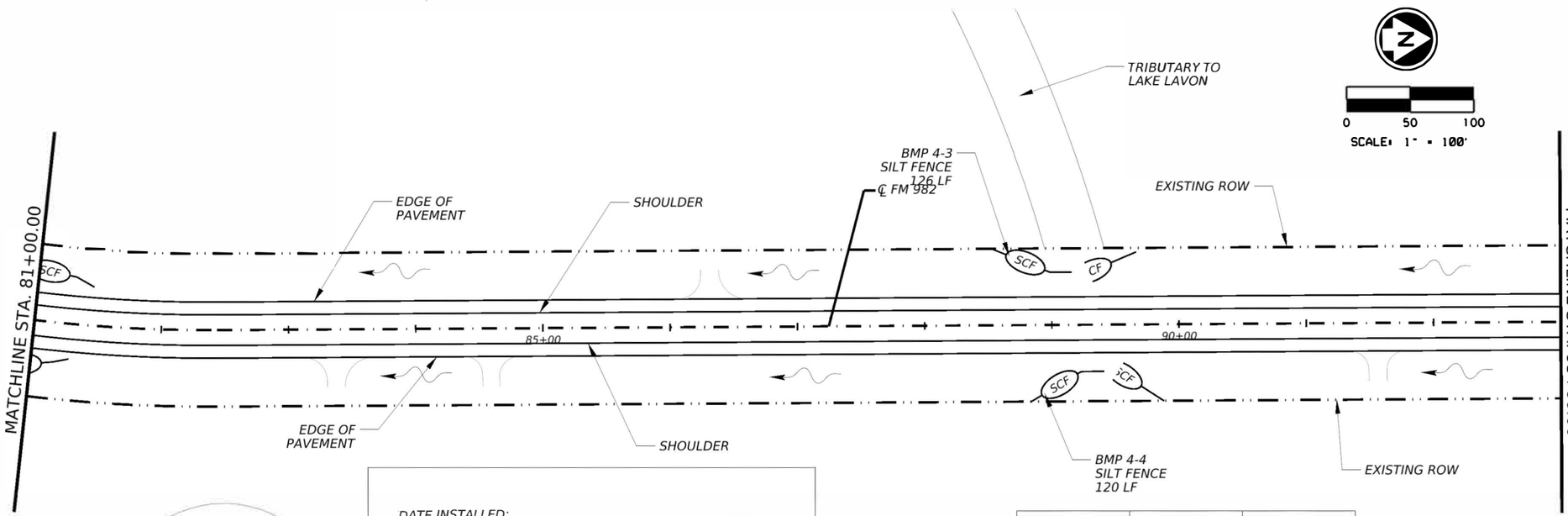

LEGEND:

- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

0 50 100
SCALE: 1" = 100'

NOTES:

1. BMP'S SHALL NOT BE INSTALLED IN THEIR CONTROL AREAS ANY SOONER THAN 2 WEEKS PRIOR TO SOIL DISTURBANCE OR OTHER POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREAS.
2. CONSTRUCTION EXIT LOCATIONS MAY BE ADJUSTED BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL.
3. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

DATE INSTALLED:_____

DATE REMOVED:_____

BMP #	DATE INSTALLED	DATE REMOVED
BMP 4-1		
BMP 4-2		
BMP 4-3		
BMP 4-4		

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

SWP3 SITE MAP

STA 69+00.00 TO STA 93+00.00

SHEET 4 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		121

DATE: 9/3/2024 12:43:02 PM
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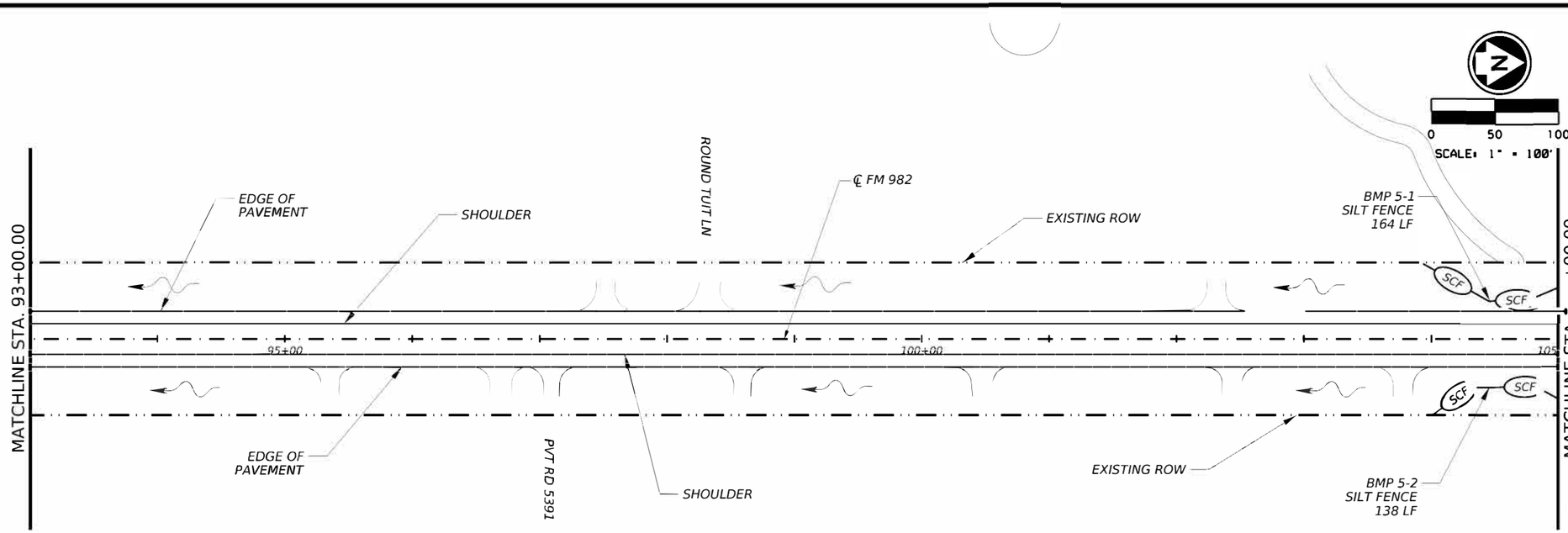
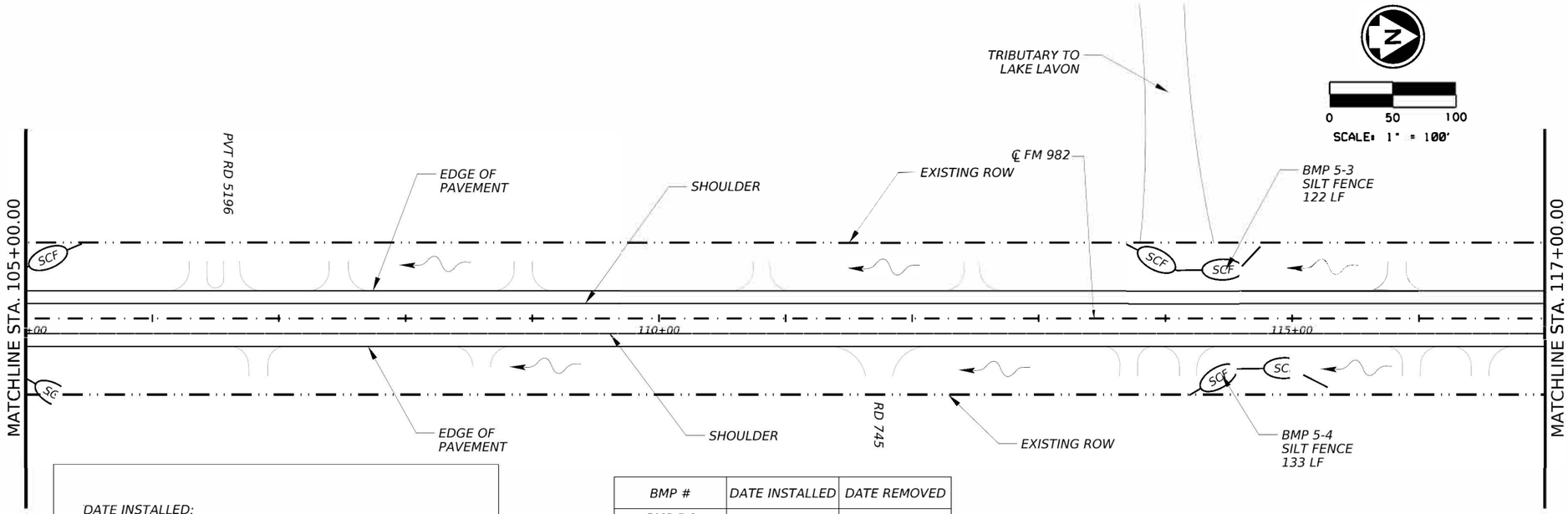


LEGEND:

- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 3)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

NOTES:

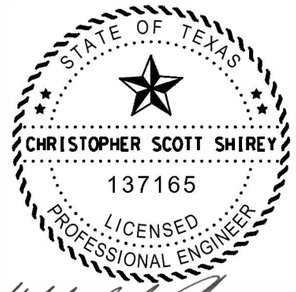
1. BMP'S SHALL NOT BE INSTALLED IN THEIR CONTROL AREAS ANY SOONER THAN 2 WEEKS PRIOR TO SOIL DISTURBANCE OR OTHER POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREAS.
2. CONSTRUCTION EXIT LOCATIONS MAY BE ADJUSTED BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL.
3. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.



DATE INSTALLED:_____

DATE REMOVED:_____

BMP #	DATE INSTALLED	DATE REMOVED
BMP 5-1		
BMP 5-2		
BMP 5-3		
BMP 5-4		



09/03/2024

Texas Department of Transportation

FM 982

SWP3 SITE MAP

STA 93+00.00 TO STA 117+00.00

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		122

DATE: 9/3/2024 12:43:24 PM
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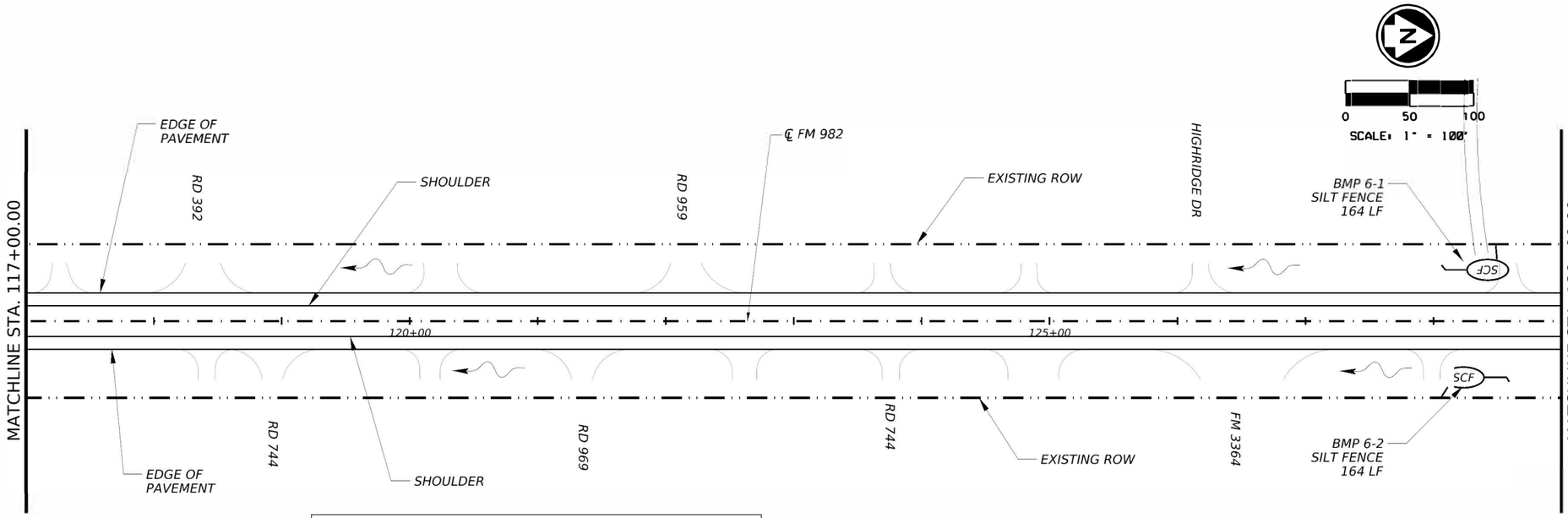


DATE INSTALLED:_____

DATE REMOVED:_____

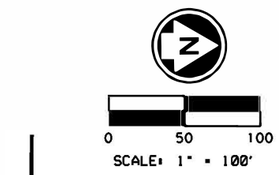
BMP #	DATE INSTALLED	DATE REMOVED
BMP 6-1		
BMP 6-2		

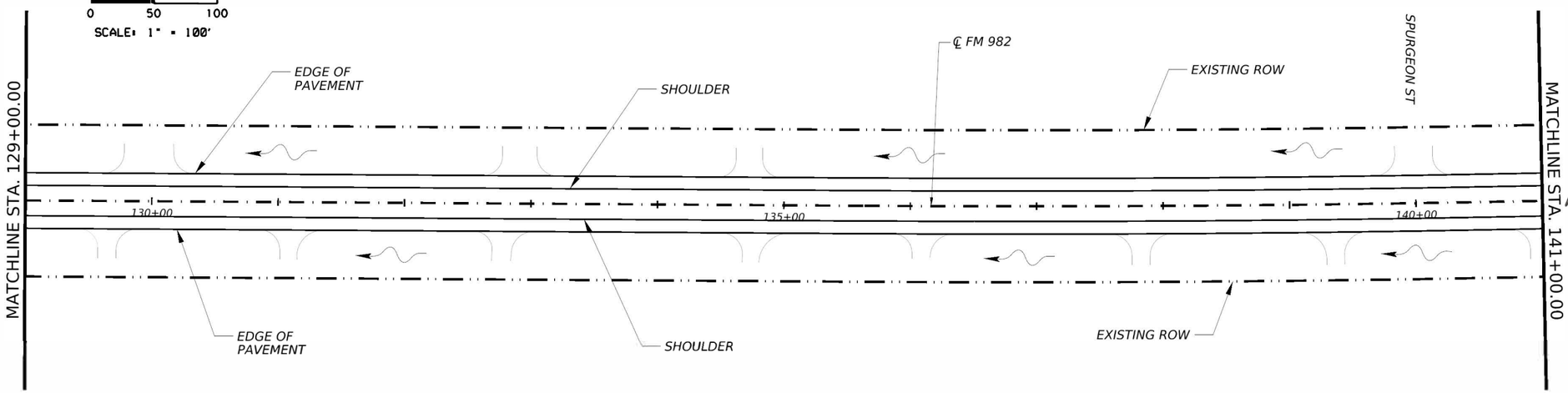
LEGEND:

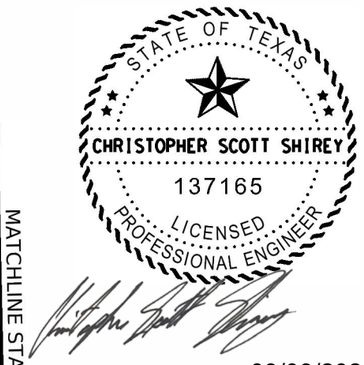
- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

NOTES:

1. BMP'S SHALL NOT BE INSTALLED IN THEIR CONTROL AREAS ANY SOONER THAN 2 WEEKS PRIOR TO SOIL DISTURBING OF THAT AREA.
2. ACTUAL LOCATION OF THE EROSION CONTROL LOG TO BE DETERMINED BY THE ENGINEER.
3. CONSTRUCTION EXIT LOCATIONS TO BE DETERMINED BY CONTRACTOR AND APPROVED BY THE ENGINEER.
4. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.
5. SEE TYPICAL SECTIONS FOR THE DISTURBANCE AND SEEDING LIMITS.







09/03/2024

Texas Department of Transportation

FM 982

SWP3 SITE MAP

STA 117+00 TO STA 141+00.00

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		123

DATE: 9/3/2024 12:43:45 PM
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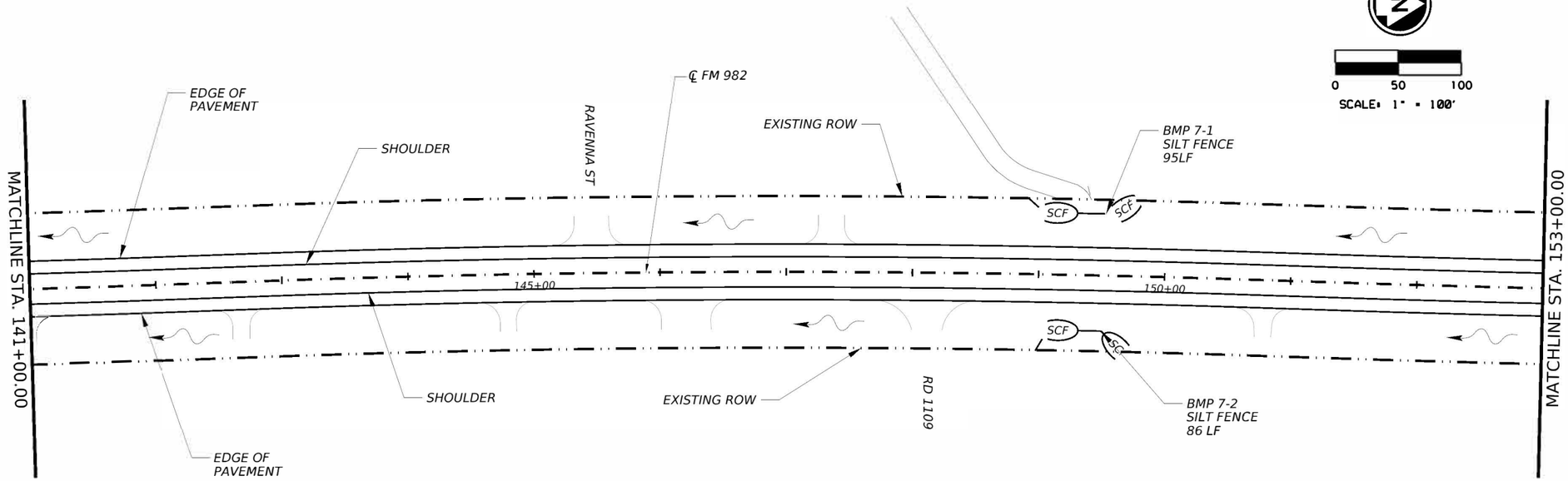
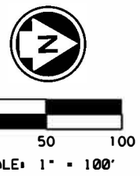




LEGEND:

- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 3)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

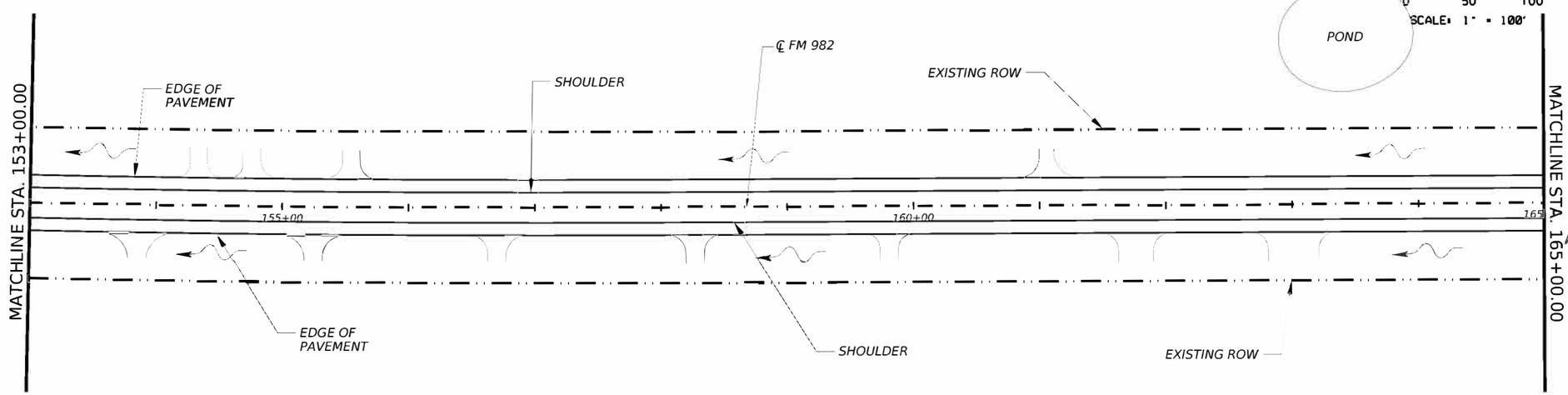
DATE INSTALLED:_____

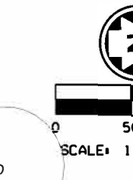
DATE REMOVED:_____

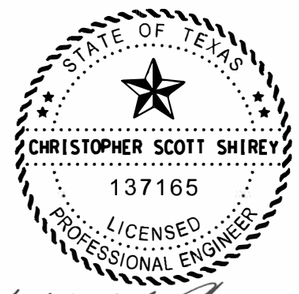
BMP #	DATE INSTALLED	DATE REMOVED
BMP 7-1		
BMP 7-2		

NOTES:

1. BMP'S SHALL NOT BE INSTALLED IN THEIR CONTROL AREAS ANY SOONER THAN 2 WEEKS PRIOR TO SOIL DISTURBANCE OR OTHER POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREAS.
2. CONSTRUCTION EXIT LOCATIONS MAY BE ADJUSTED BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL.
3. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.







09/03/2024

Texas Department of Transportation

FM 982

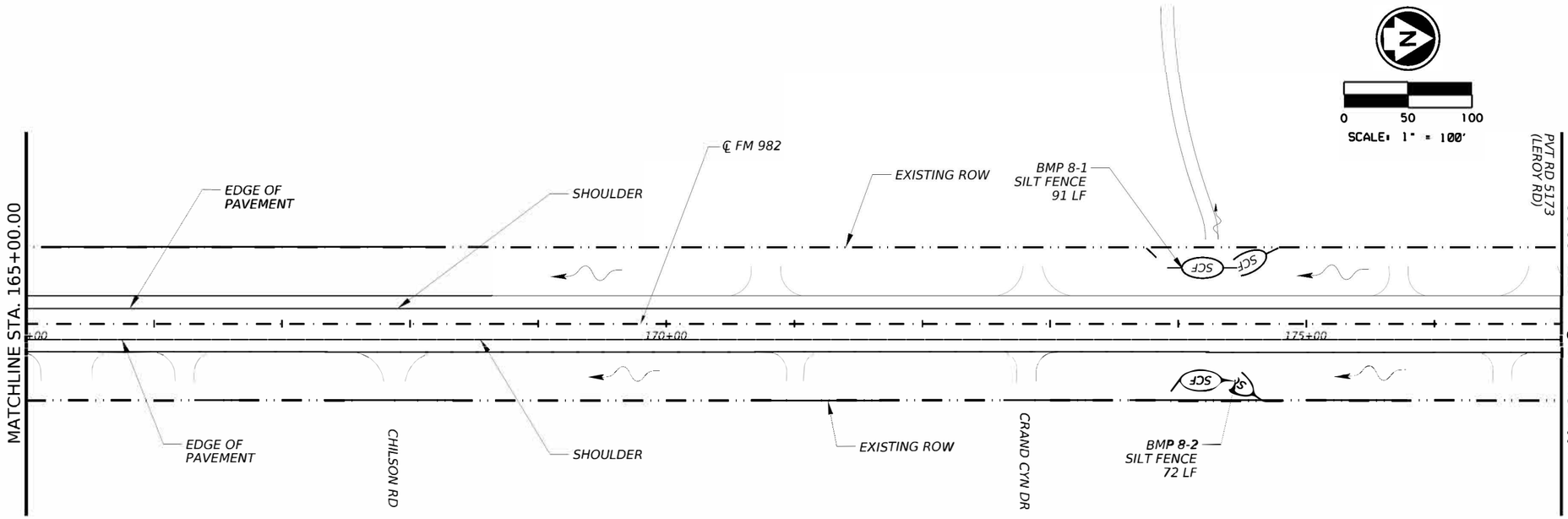
SWP3 SITE MAP

STA 141+00 TO STA 165+00

SHEET 7 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		124

DATE: 9/3/2024 12:44:07 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/038705026/4 - Design/Plan Set/9. Environmental/FM 982 SWP3 SITE MAP 07.dgn



0 50 100

SCALE: 1" = 100'

LEGEND:

- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 3)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

NOTES:

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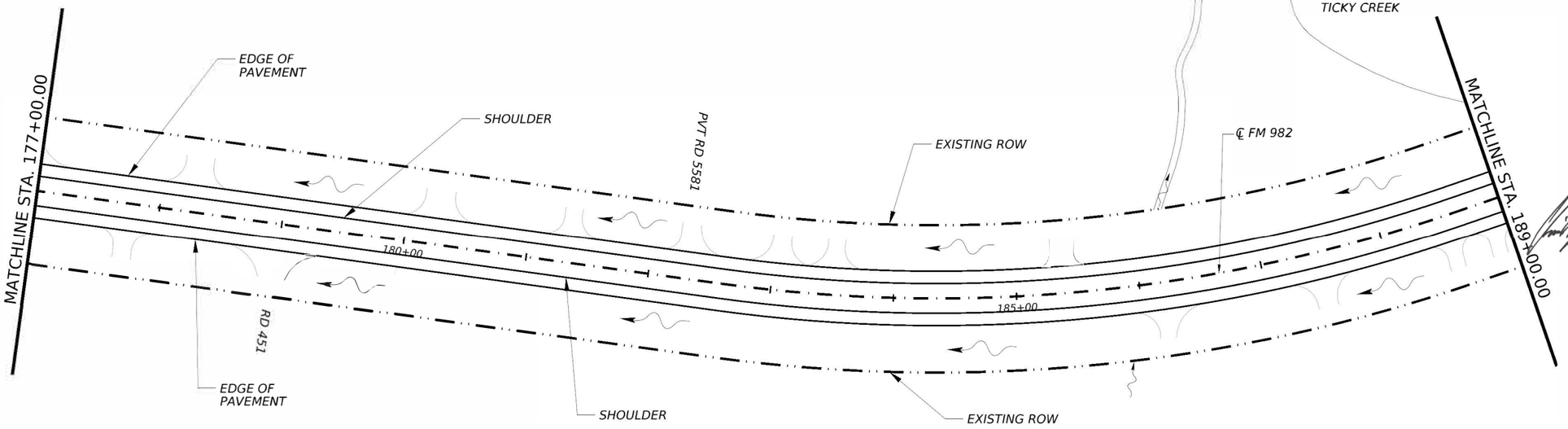
2. CONSTRUCTION EXIT LOCATIONS MAY BE ADJUSTED BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL.
3. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

DATE INSTALLED:_____

DATE REMOVED:_____

BMP #	DATE INSTALLED	DATE REMOVED
BMP 8-1		
BMP 8-2		



0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

SWP3 SITE MAP

STA 165+00 TO STA 189+00.00

SHEET 8 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		125

DATE: 9/3/2024 12:44:29 PM
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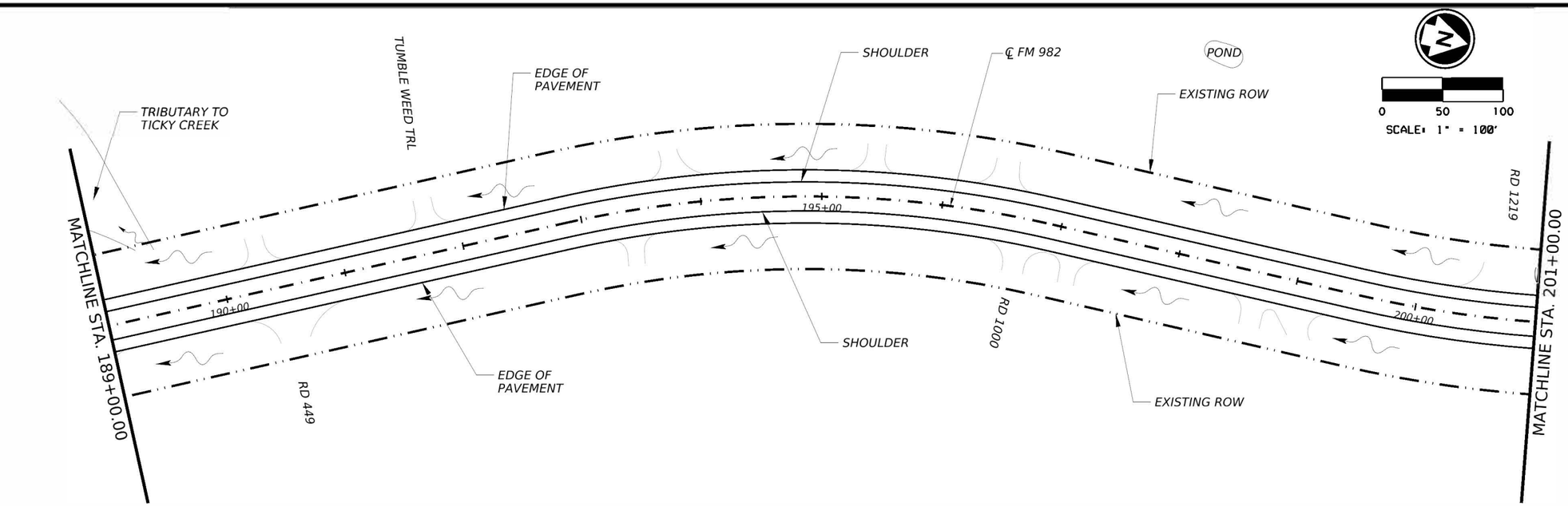
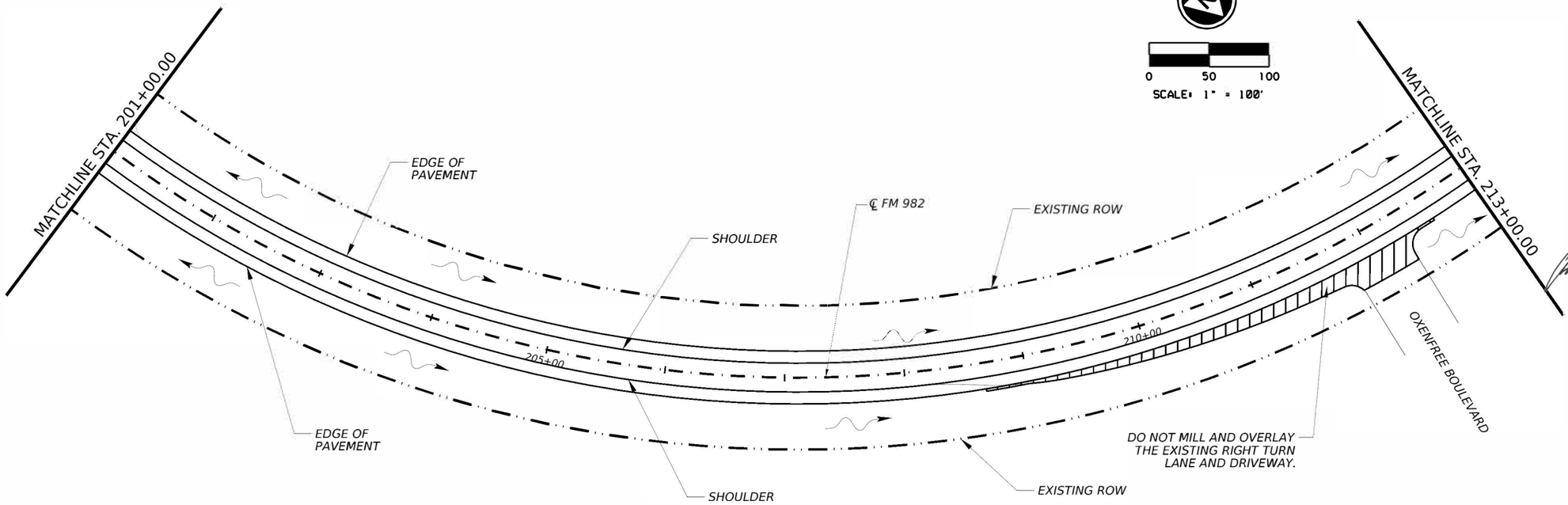


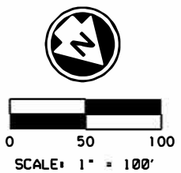
LEGEND:

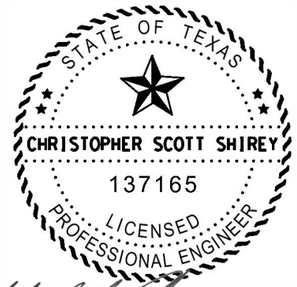
- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 3)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

NOTES:

1. BMP'S SHALL NOT BE INSTALLED IN THEIR CONTROL AREAS ANY SOONER THAN 2 WEEKS PRIOR TO SOIL DISTURBANCE OR OTHER POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREAS.
2. CONSTRUCTION EXIT LOCATIONS MAY BE ADJUSTED BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL.
3. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.







09/03/2024

Texas Department of Transportation

FM 982

SWP3 SITE MAP

STA 189+00 TO STA 213+00.00

SHEET 9 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		126

DATE: 9/3/2024 12:44:51 PM
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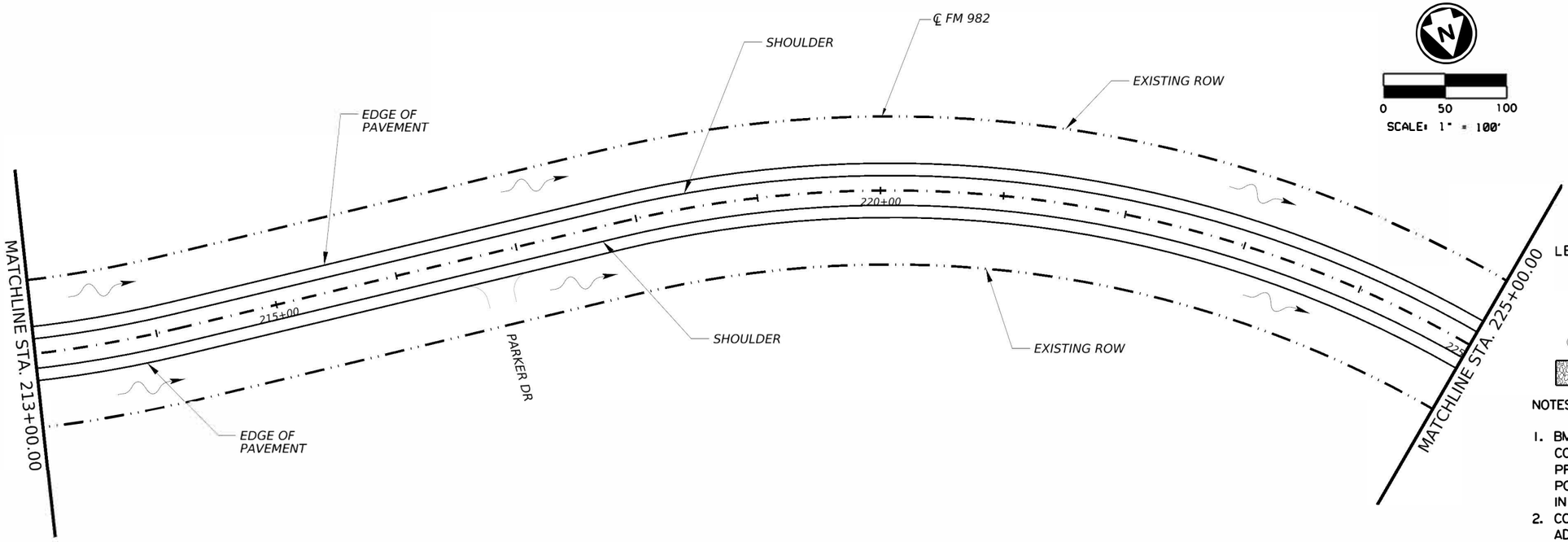

LEGEND:

- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 3)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

NOTES:

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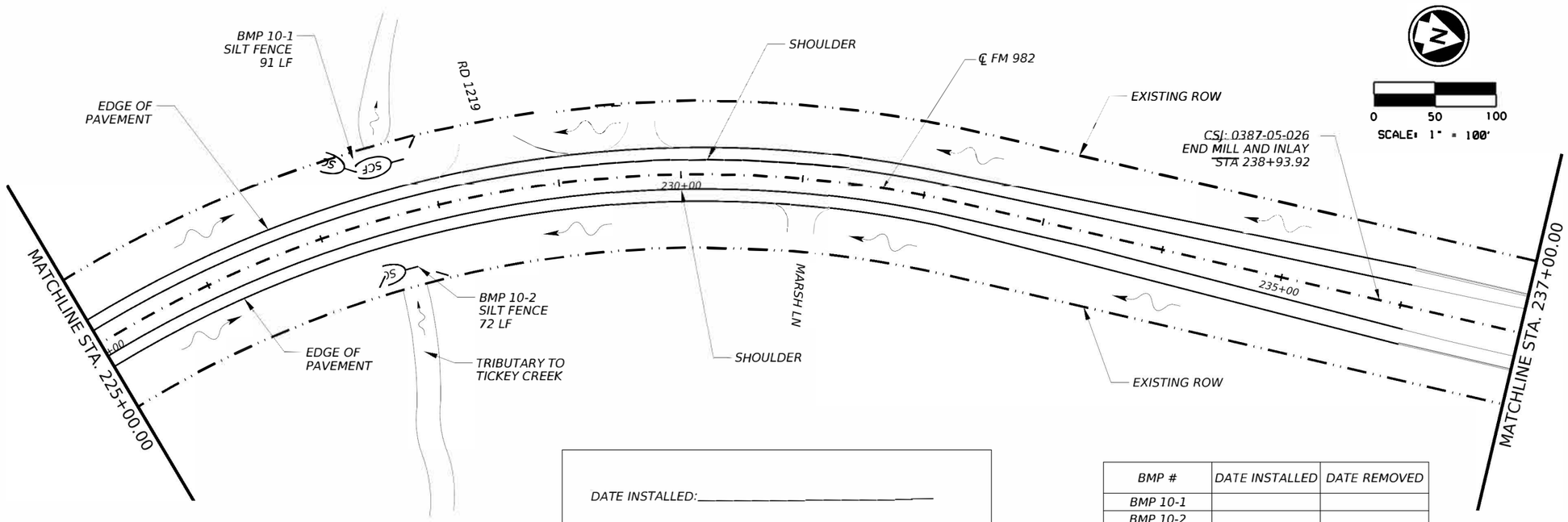
2. CONSTRUCTION EXIT LOCATIONS MAY BE ADJUSTED BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL.
3. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.



DATE INSTALLED:_____

DATE REMOVED:_____

BMP #	DATE INSTALLED	DATE REMOVED
BMP 10-1		
BMP 10-2		

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

SWP3 SITE MAP

STA 213+00.00 TO STA 237+00.00

SHEET 10 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		127

DATE: 9/3/2024 12:45:14 PM
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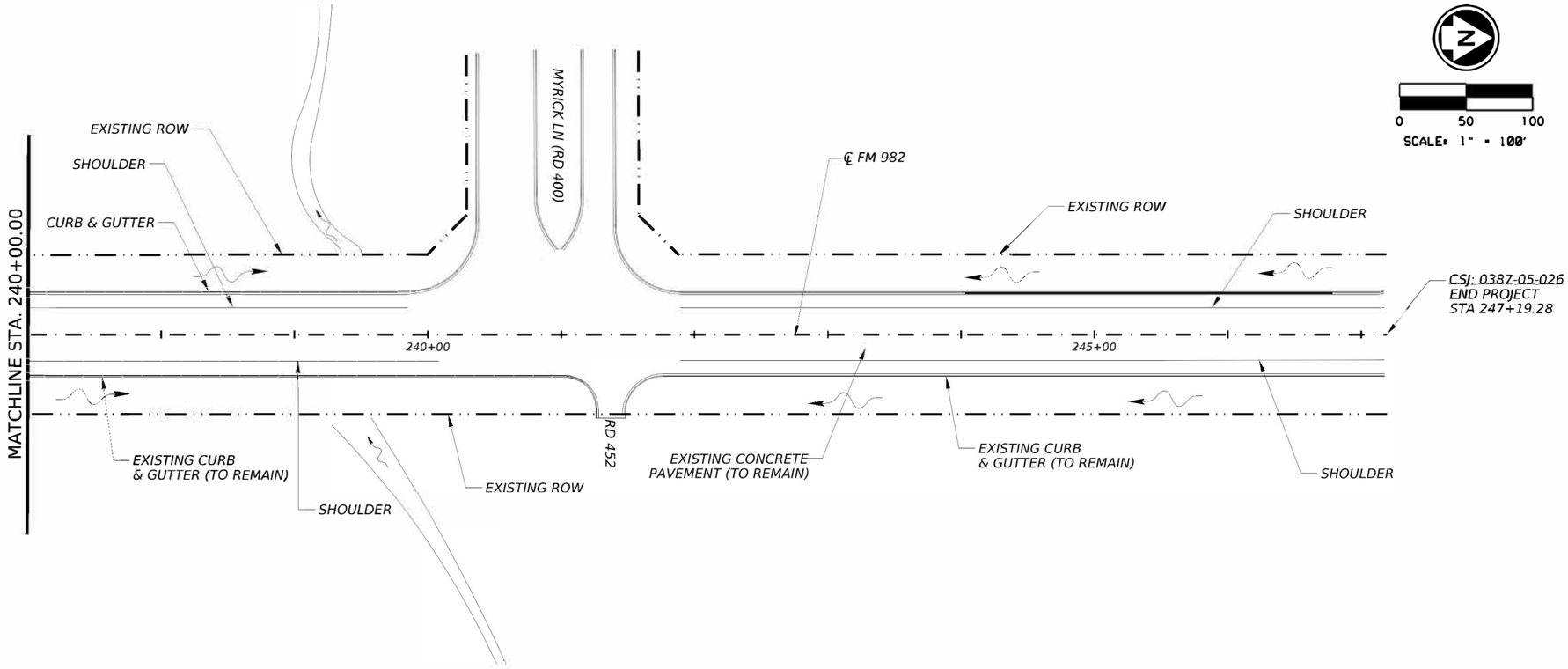
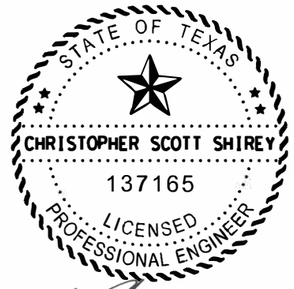


LEGEND:

- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

NOTES:

1. BMP'S SHALL NOT BE INSTALLED IN THEIR CONTROL AREAS ANY SOONER THAN 2 WEEKS PRIOR TO SOIL DISTURBING OF THAT AREA.
2. ACTUAL LOCATION OF THE EROSION CONTROL LOG TO BE DETERMINED BY THE ENGINEER.
3. CONSTRUCTION EXIT LOCATIONS TO BE DETERMINED BY CONTRACTOR AND APPROVED BY THE ENGINEER.
4. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.
5. SEE TYPICAL SECTIONS FOR THE DISTURBANCE AND SEEDING LIMITS.



09/03/2024

Texas Department of Transportation

FM 982

SWP3 SITE MAP

STA 237+00 TO STA 247+19.28

SHEET 11 OF 11

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		128

DATE: 9/3/2024 12:45:35 PM
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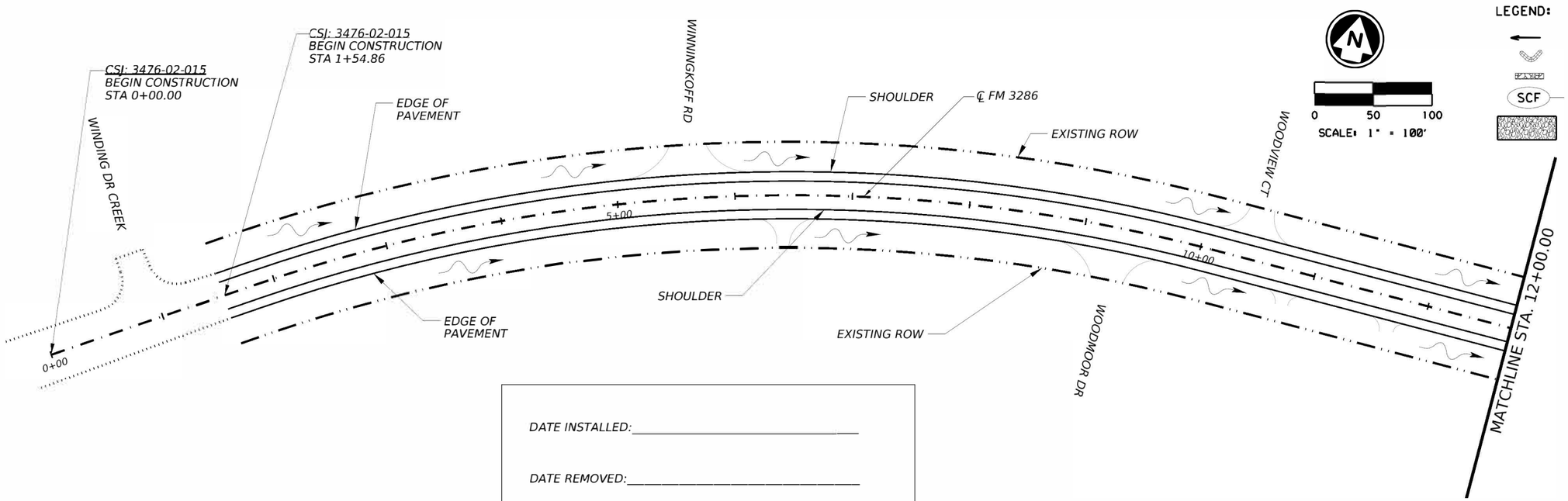


DATE INSTALLED:_____

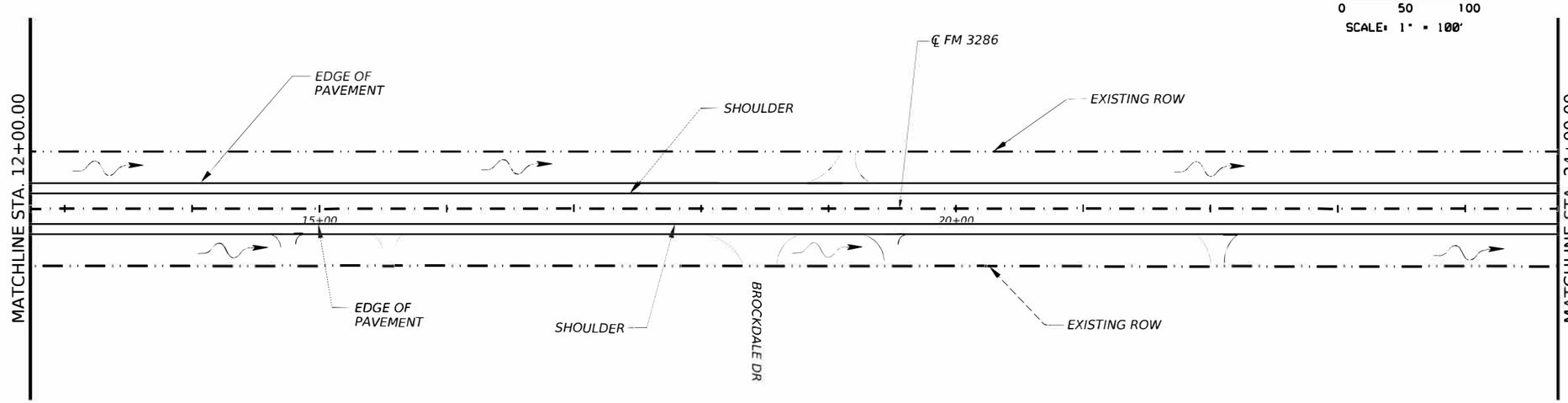
DATE REMOVED:_____

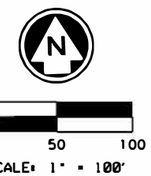
LEGEND:

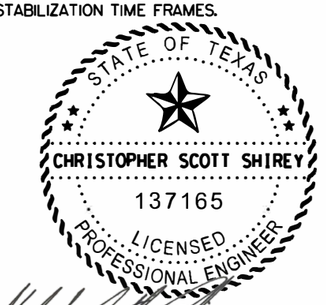
- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 3)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

NOTES:

1. BMP'S SHALL NOT BE INSTALLED IN THEIR CONTROL AREAS ANY SOONER THAN 2 WEEKS PRIOR TO SOIL DISTURBANCE OR OTHER POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREAS.
2. CONSTRUCTION EXIT LOCATIONS MAY BE ADJUSTED BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL.
3. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.







09/03/2024

Texas Department of Transportation

FM 982

SWP3 SITE MAP

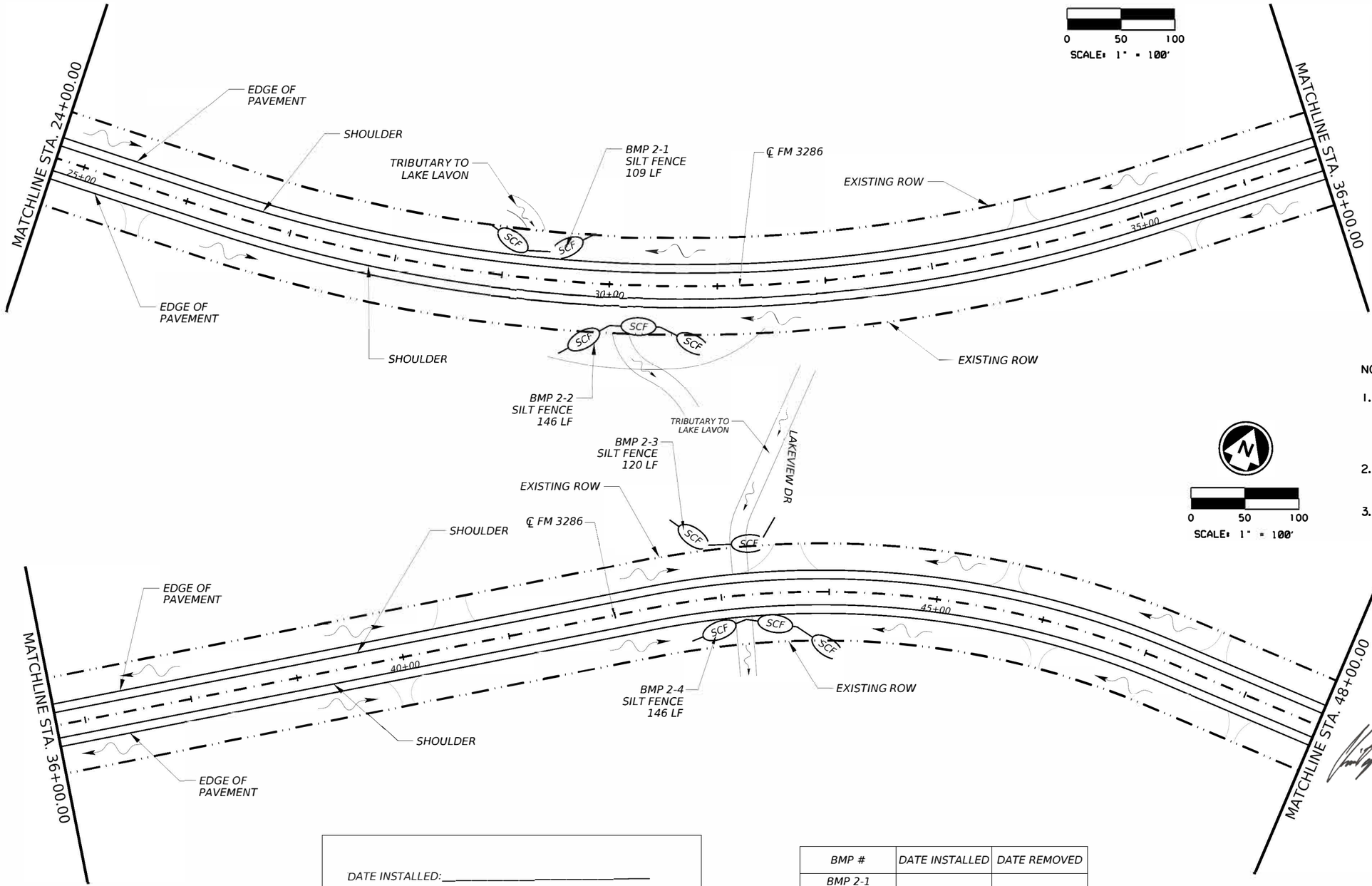
STA 0+00 TO STA 24+00

(FM 3286)

 SHEET 1 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		129

DATE: 9/3/2024 12:45:56 PM
FILE: dw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/0387050264 - Design/Plan Set/9. Environmental/FM 3286 SWP3 SITE MAP 01.dgn



LEGEND:

- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 3)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

0 50 100
SCALE: 1" = 100'

NOTES:

1. BMP'S SHALL NOT BE INSTALLED IN THEIR CONTROL AREAS ANY SOONER THAN 2 WEEKS PRIOR TO SOIL DISTURBANCE OR OTHER POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREAS.
2. CONSTRUCTION EXIT LOCATIONS MAY BE ADJUSTED BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL.
3. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

DATE INSTALLED:_____

DATE REMOVED:_____

BMP #	DATE INSTALLED	DATE REMOVED
BMP 2-1		
BMP 2-2		
BMP 2-3		
BMP 2-4		

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

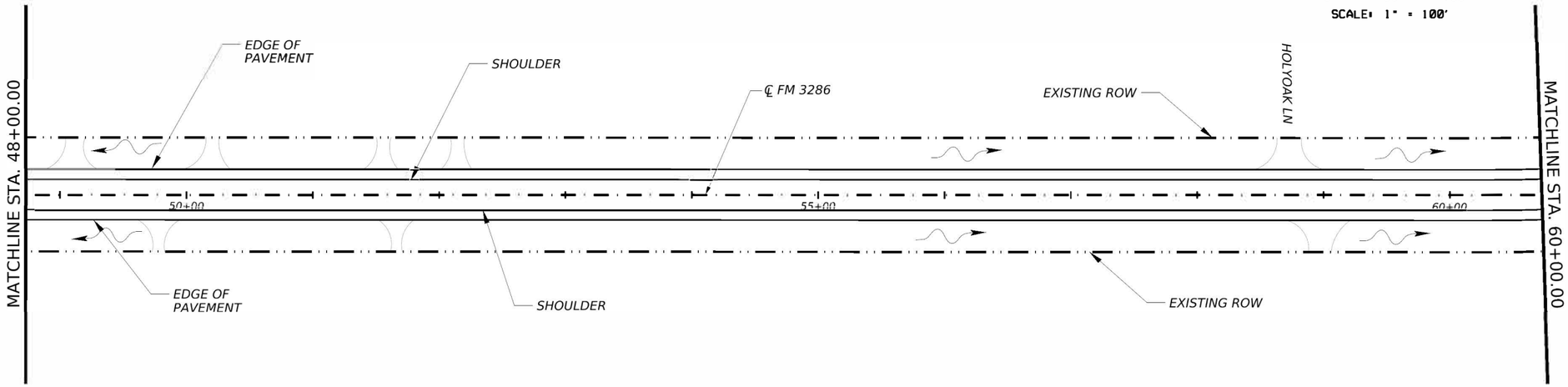
SWP3 SITE MAP

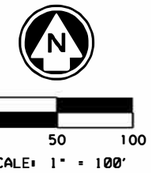
STA 24+00 TO ST 48+00

(FM 3286)

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO
DAL	COLLIN		130

DATE: 9/3/2024 12:46:18 PM
FILE: pw://txdot.proiectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/038705026/4 - Design/Plan Set/9. Environmental/FM 3286 SWP3 SITE MAP 02.dgn





LEGEND:

- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 3)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

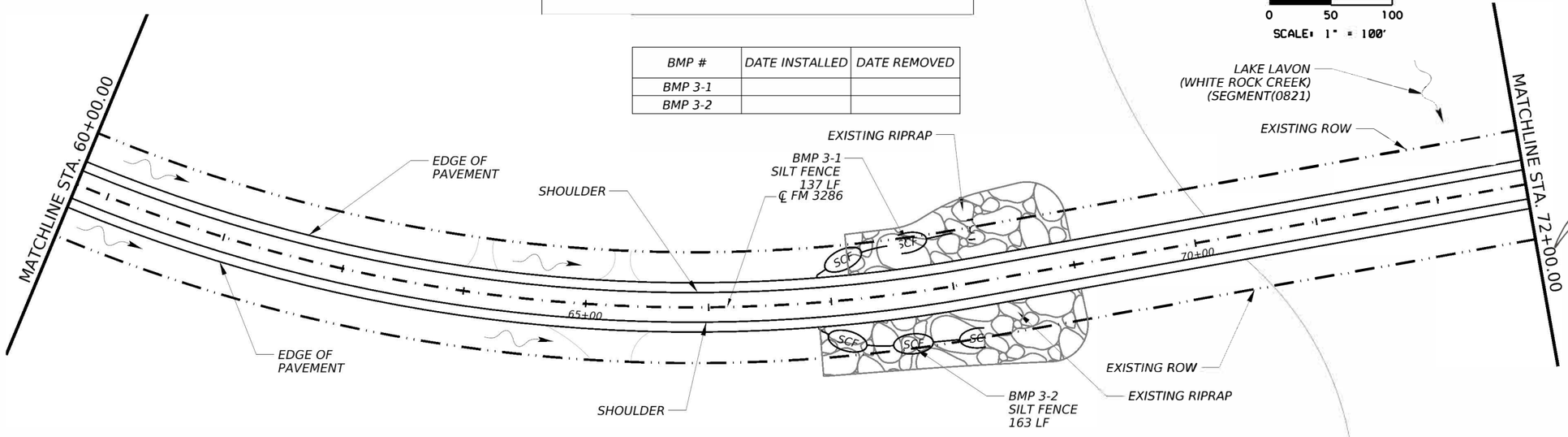
NOTES:

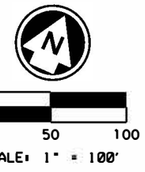
1. BMP'S SHALL NOT BE INSTALLED IN THEIR CONTROL AREAS ANY SOONER THAN 2 WEEKS PRIOR TO SOIL DISTURBANCE OR OTHER POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREAS.
2. CONSTRUCTION EXIT LOCATIONS MAY BE ADJUSTED BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL.
3. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

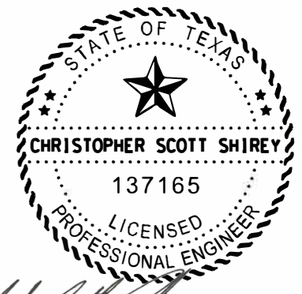
DATE INSTALLED:_____

DATE REMOVED:_____

BMP #	DATE INSTALLED	DATE REMOVED
BMP 3-1		
BMP 3-2		







09/03/2024

Texas Department of Transportation

FM 982

SWP3 SITE MAP

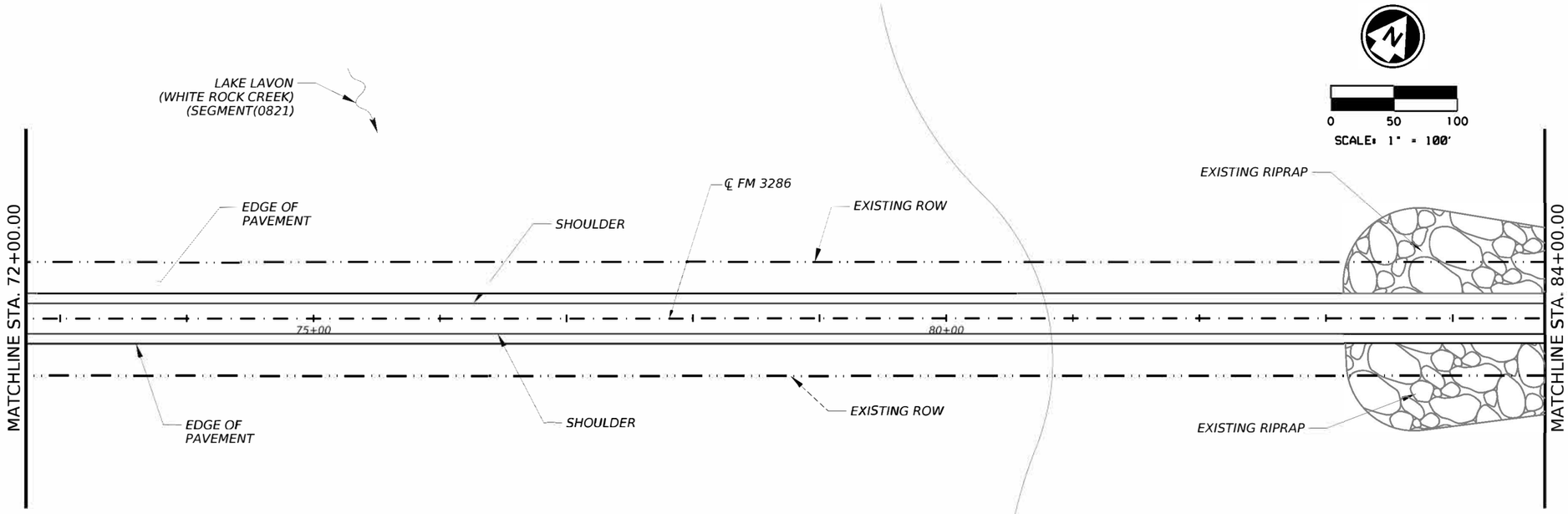
STA 48+00 TO STA 72+00

(FM 3286)

SHEET 3 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		131

DATE: 9/3/2024 12:46:39 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/038705026/4 - Design/Plan Set/9. Environmental/FM 3286 SWP3 SITE MAP 03.dgn



0 50 100

SCALE: 1" = 100'

LEGEND:

- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 3)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

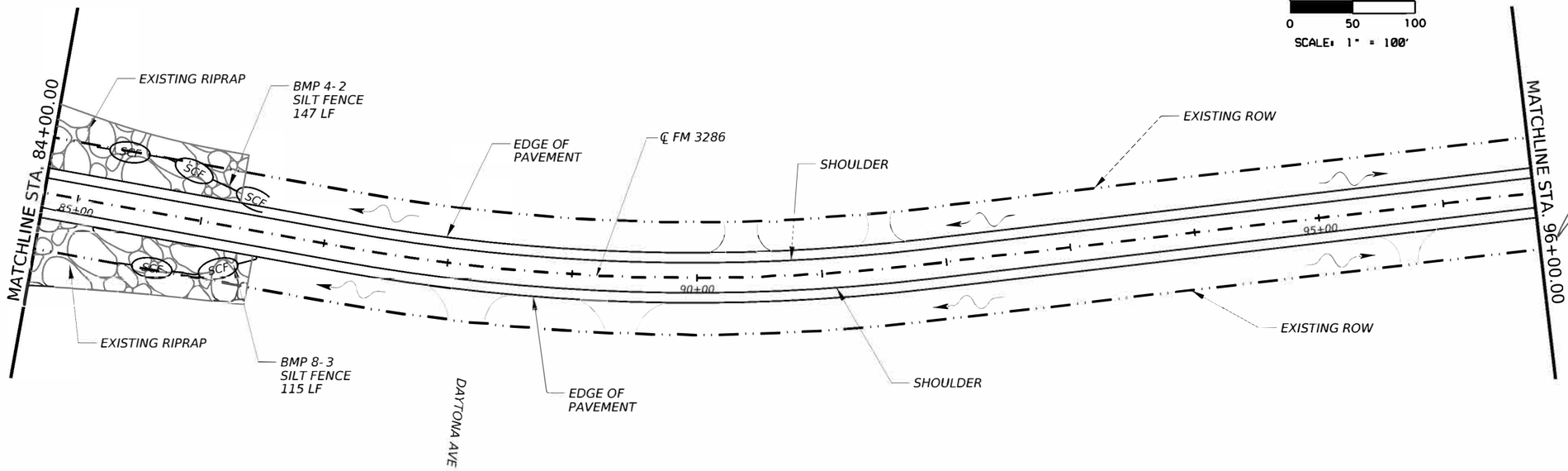
DATE INSTALLED:_____

DATE REMOVED:_____

BMP #	DATE INSTALLED	DATE REMOVED
BMP 4-1		
BMP 4-2		
BMP 4-3		
BMP 4-4		

NOTES:

1. BMP'S SHALL NOT BE INSTALLED IN THEIR CONTROL AREAS ANY SOONER THAN 2 WEEKS PRIOR TO SOIL DISTURBANCE OR OTHER POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREAS.
2. CONSTRUCTION EXIT LOCATIONS MAY BE ADJUSTED BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL.
3. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.



0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

SWP3 SITE MAP

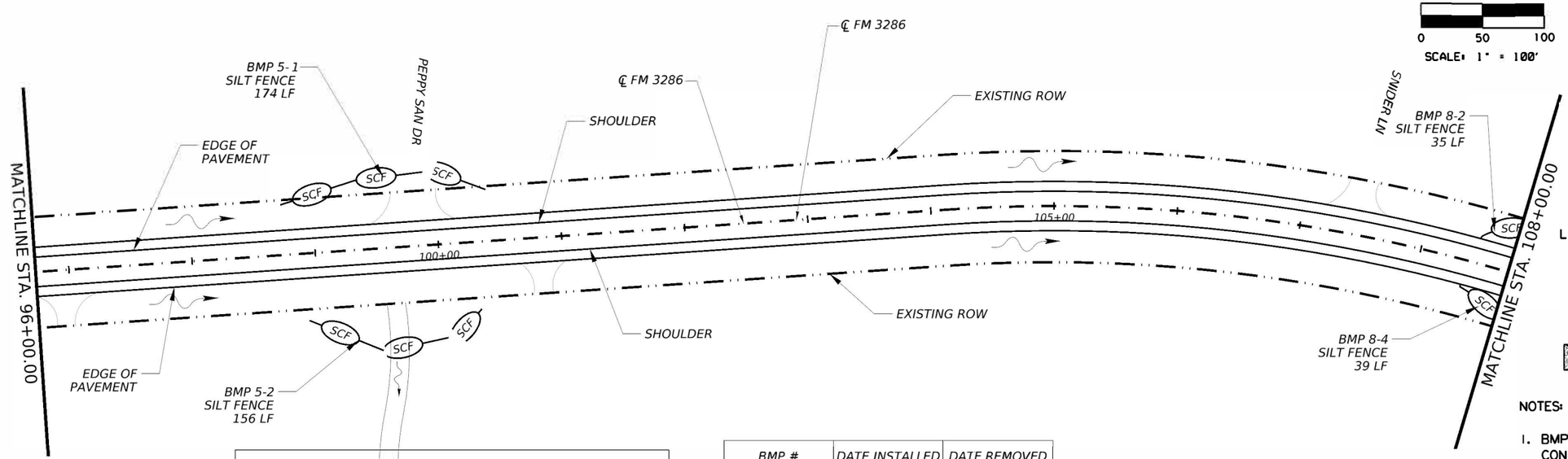
STA 72+00 TO STA 96+00

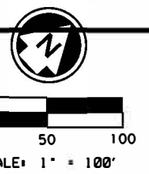
(FM 3286)

SHEET 4 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		132

DATE: 9/3/2024 12:47:00 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/038705026/4 - Design/Plan Set/9. Environmental/FM 3286 SWP3 SITE MAP 04.dgn





LEGEND:

- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 3)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

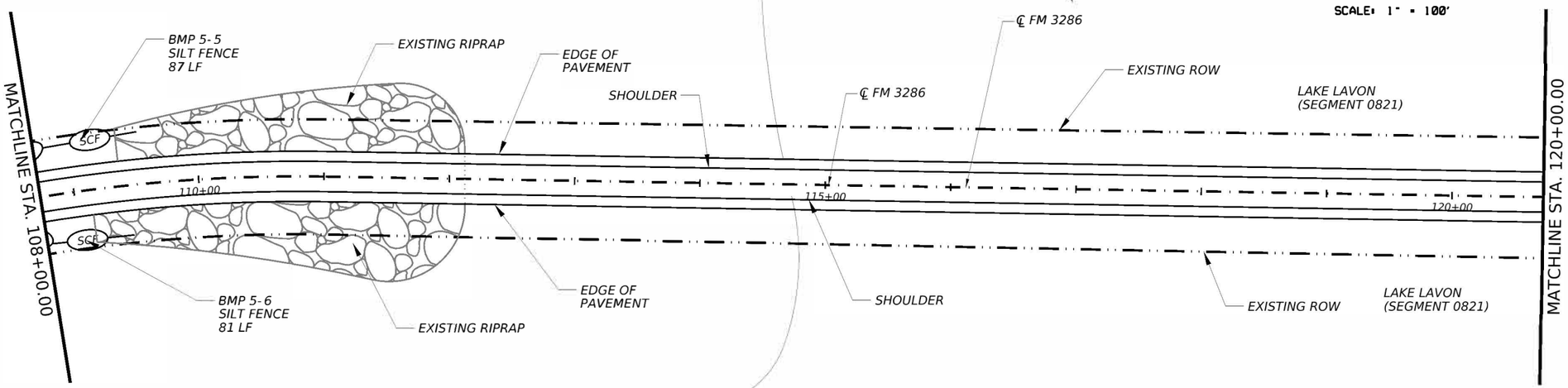
NOTES:

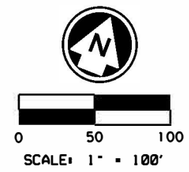
1. BMP'S SHALL NOT BE INSTALLED IN THEIR CONTROL AREAS ANY SOONER THAN 2 WEEKS PRIOR TO SOIL DISTURBANCE OR OTHER POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREAS.
2. CONSTRUCTION EXIT LOCATIONS MAY BE ADJUSTED BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL.
3. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

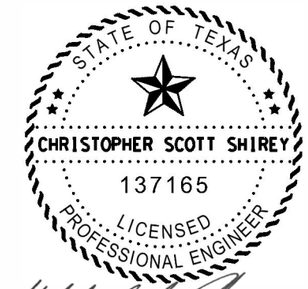
DATE INSTALLED: _____

DATE REMOVED: _____

BMP #	DATE INSTALLED	DATE REMOVED
BMP 5-1		
BMP 5-2		
BMP 5-3		
BMP 5-4		
BMP 5-5		
BMP 5-6		







09/03/2024

Texas Department of Transportation

FM 982

SWP3 SITE MAP

STA 96+00 TO STA 120+00

(FM 3286)

SHEET 5 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		133

DATE: 9/3/2024 12:47:21 PM
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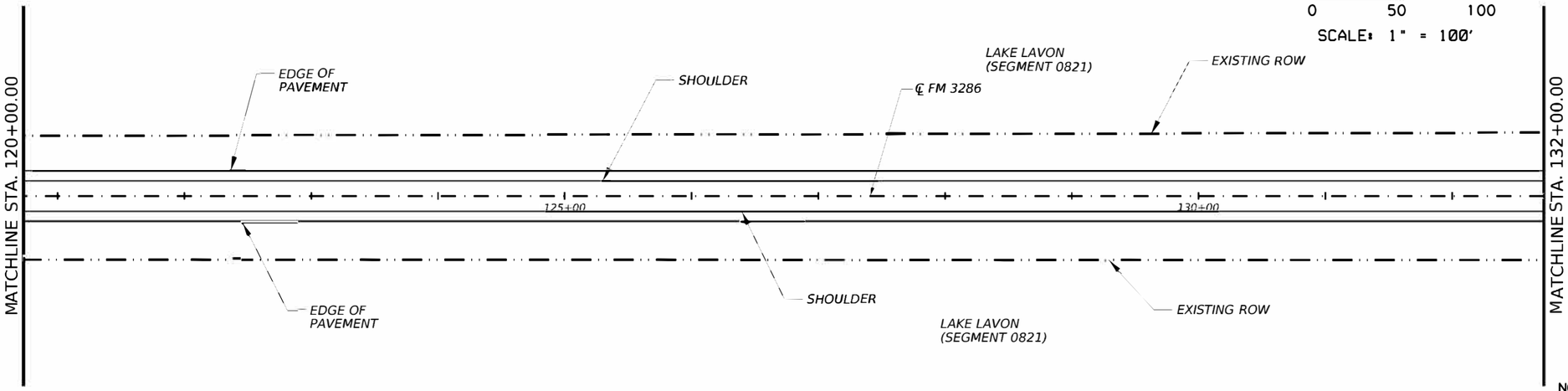
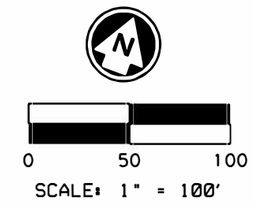


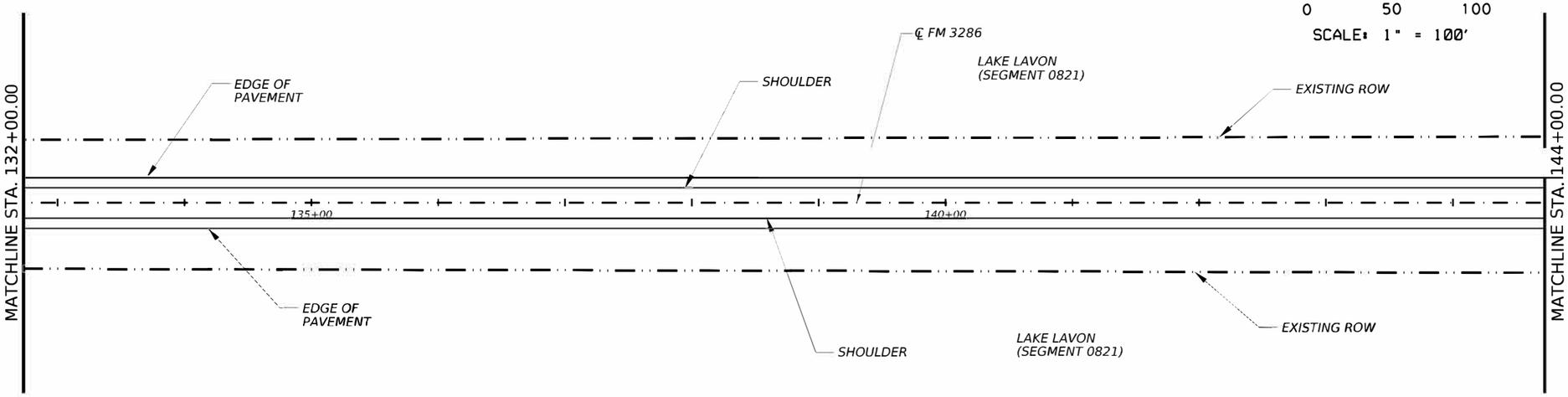


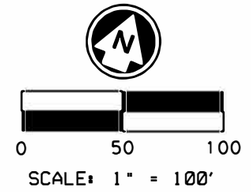
LEGEND:

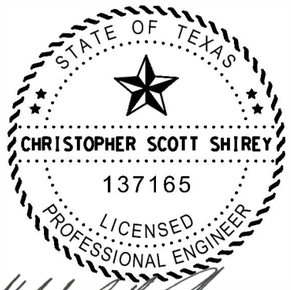
- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 3)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

NOTES:

1. BMP'S SHALL NOT BE INSTALLED IN THEIR CONTROL AREAS ANY SOONER THAN 2 WEEKS PRIOR TO SOIL DISTURBANCE OR OTHER POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREAS.
2. CONSTRUCTION EXIT LOCATIONS MAY BE ADJUSTED BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL.
3. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.







09/03/2024

Texas Department of Transportation

FM 982

SWP3 SITE MAP

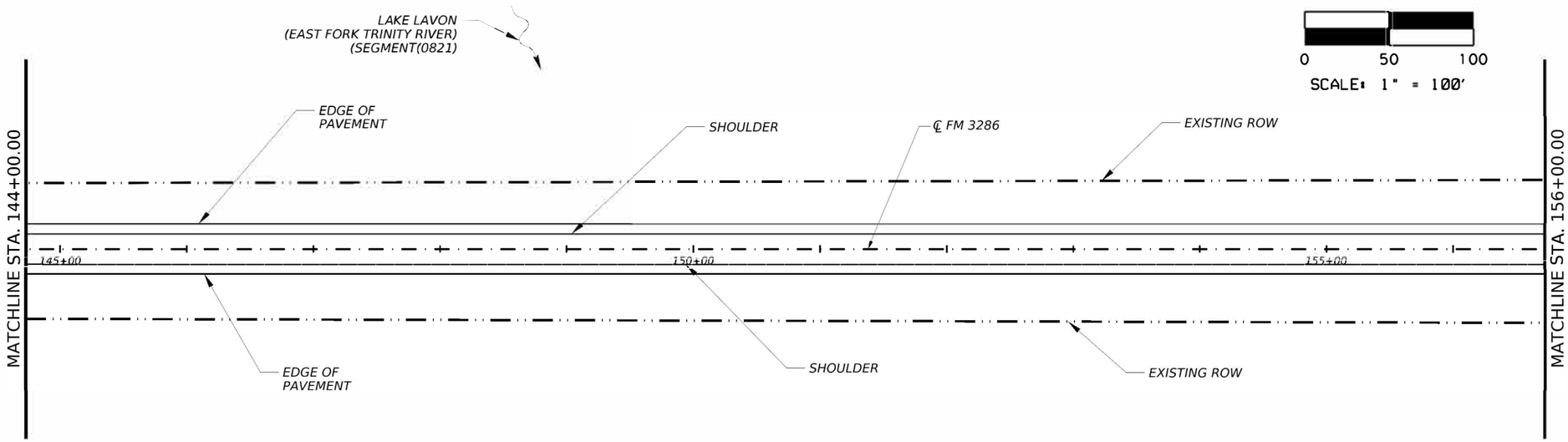
STA 120+00.00 TO STA 144+00.00

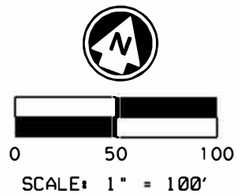
(FM 3286)

SHEET 6 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		134

DATE: 9/3/2024 12:47:42 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/038705026/4 - Design/Plan Set/9. Environmental/FM 3286 SWP3 SITE MAP 06.dgn



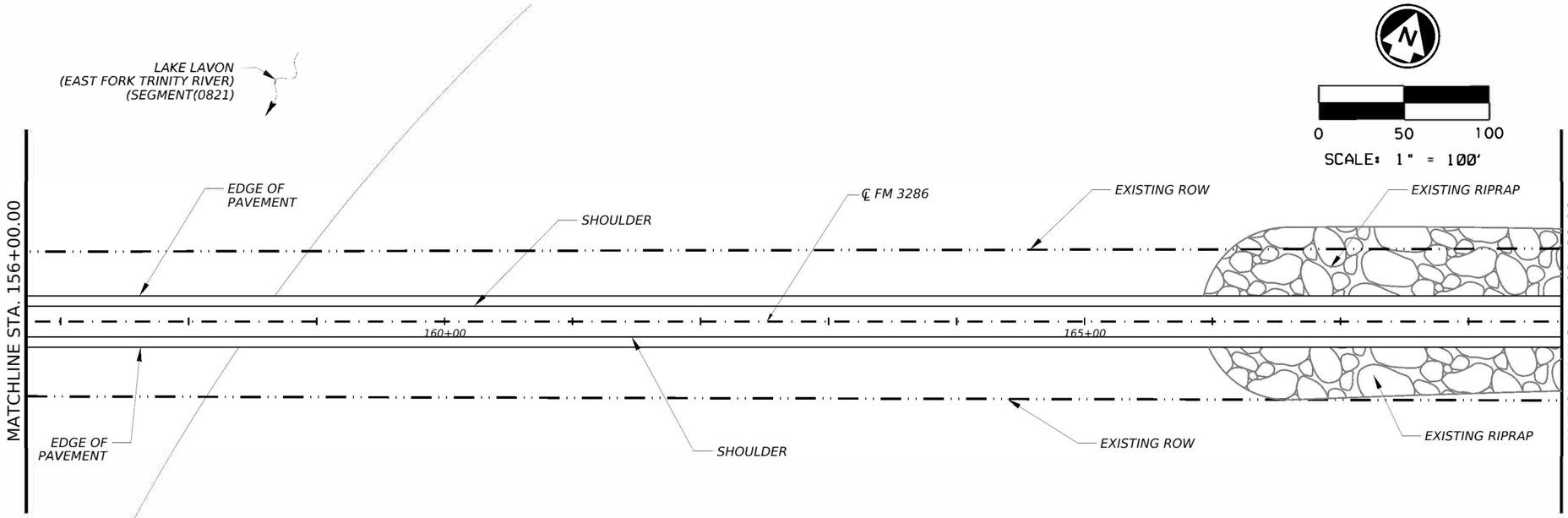


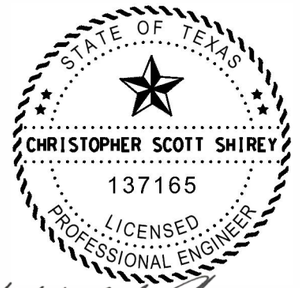
LEGEND:

- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 3)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

NOTES:

1. BMP'S SHALL NOT BE INSTALLED IN THEIR CONTROL AREAS ANY SOONER THAN 2 WEEKS PRIOR TO SOIL DISTURBANCE OR OTHER POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREAS.
2. CONSTRUCTION EXIT LOCATIONS MAY BE ADJUSTED BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL.
3. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.





09/03/2024

Texas Department of Transportation

FM 982

SWP3 SITE MAP

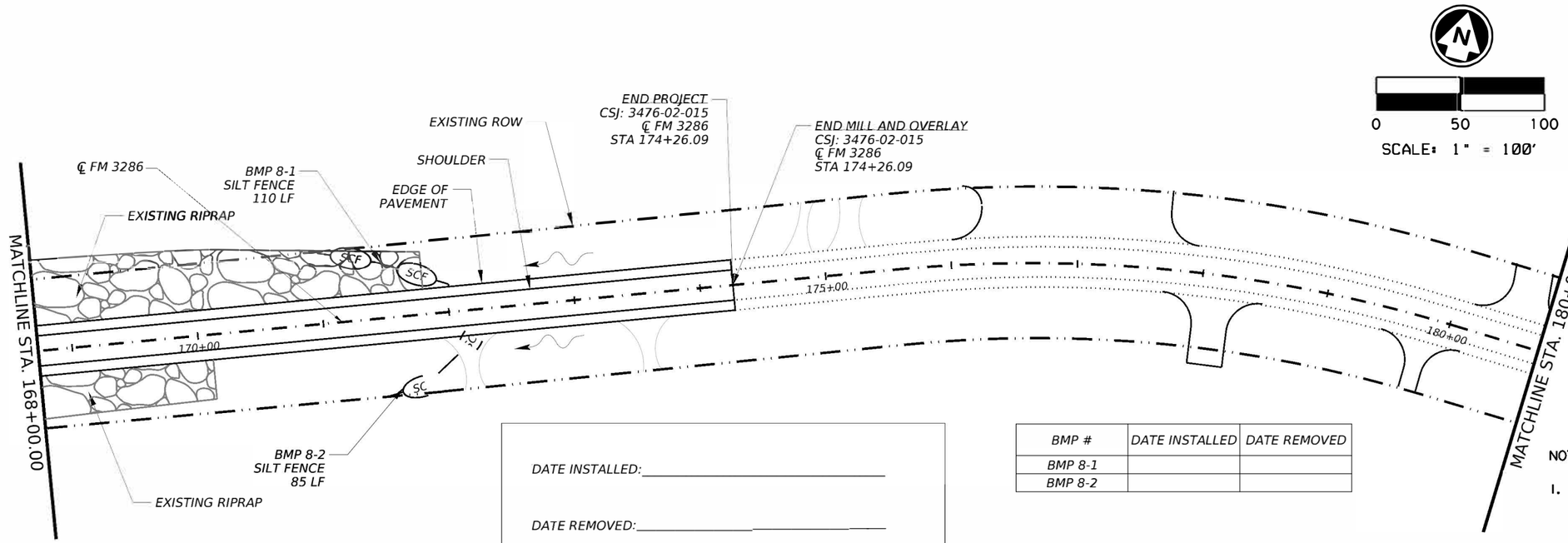
STA 144+00.00 TO STA 168+00.00

(FM 3286)

SHEET 7 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		135

DATE: 9/3/2024 12:48:04 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/038705026/4 - Design/Plan Set/9. Environmental/FM 3286 SWP3 SITE MAP 07.dgn



DATE INSTALLED:_____

DATE REMOVED:_____

BMP #	DATE INSTALLED	DATE REMOVED
BMP 8-1		
BMP 8-2		

0 50 100

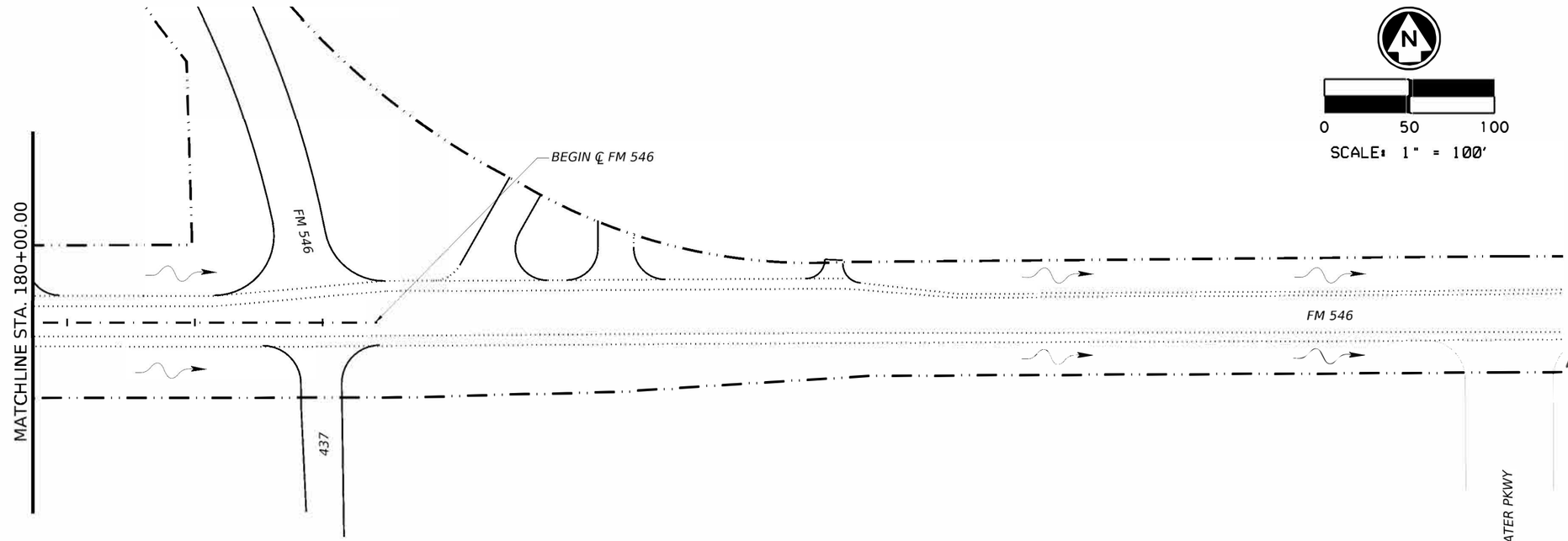
SCALE: 1" = 100'

LEGEND:

- WATER FLOW DIRECTION
- EROSION CONTROL LOG
- ROCK FILTER DAM (TY 3)
- SCF — SEDIMENT CONTROL FENCE
- CONSTRUCTION EXIT

NOTES:

1. BMP'S SHALL NOT BE INSTALLED IN THEIR CONTROL AREAS ANY SOONER THAN 2 WEEKS PRIOR TO SOIL DISTURBANCE OR OTHER POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREAS.
2. CONSTRUCTION EXIT LOCATIONS MAY BE ADJUSTED BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL.
3. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.



0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

SWP3 SITE MAP

STA 168+00.00 TO STA 180+00.00

(FM 3286)

SHEET 8 OF 8

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		136

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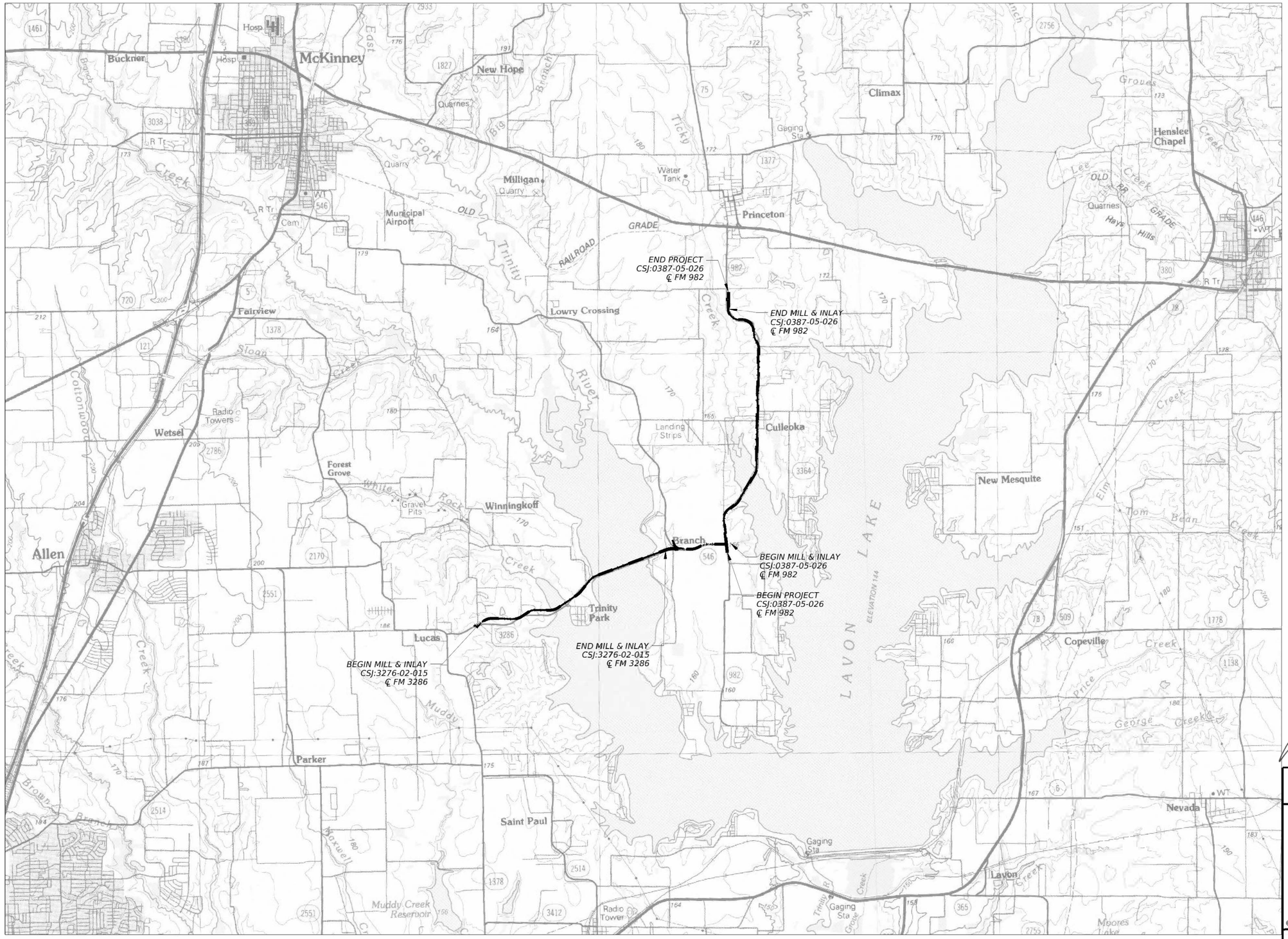

0 50000 100000

SCALE: 1" = 100000'

N

STATE OF TEXAS
CHRISTOPHER SCOTT SHIREY
137165
LICENSED
PROFESSIONAL ENGINEER

09/03/2024

Texas Department of Transportation

FM 982

RECEIVING WATERS MAP

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0387	05	026,ETC	FM 982,ETC
DIST	COUNTY		SHEET NO.
DAL	COLLIN		137

DATE: 9/3/2024 12:48:49 PM
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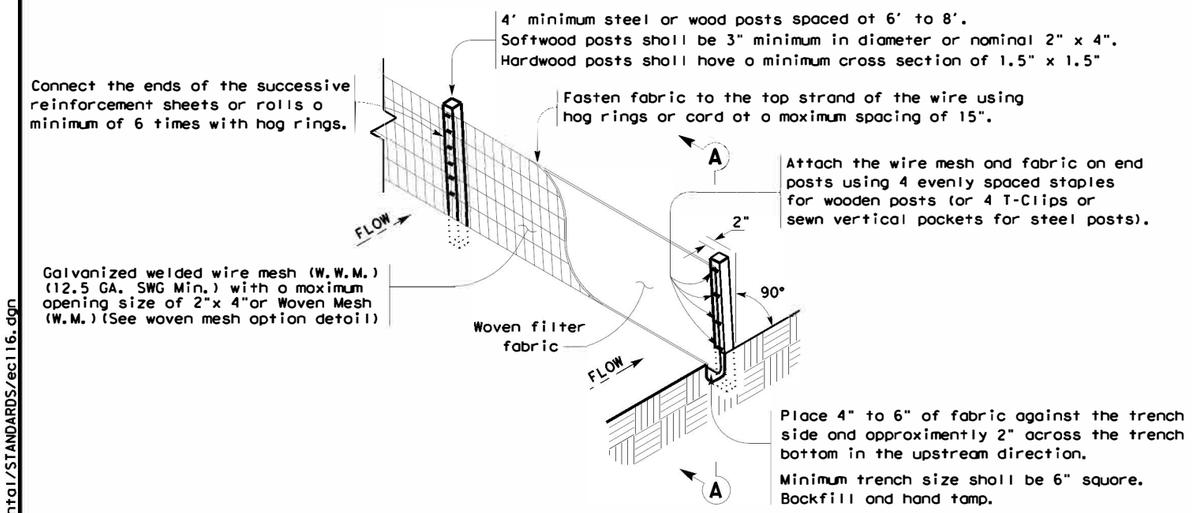
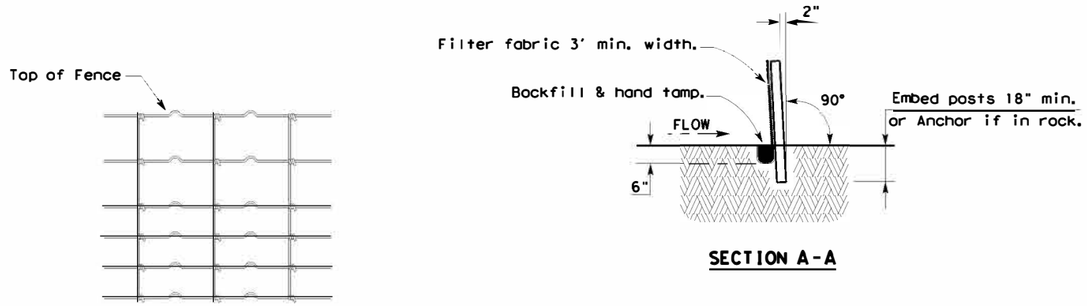


TEMPORARY SEDIMENT CONTROL FENCE

SCF



SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires o minimum of five horizontal wires spaced ot o maximum of 12 inches oport ond all vertical wires spaced ot o moximum of 12 inches oport.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence moy be constructed near the downstream perimeter of o disturbed oreo olong o contour to intercept sediment from overland runoff. A 2 year storm frequency moy be used to colculote the flow rote to be filtered.

Sediment control fence should be sized to filter o maximum flow through rote of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from o drainage oreo larger than 2 acres.

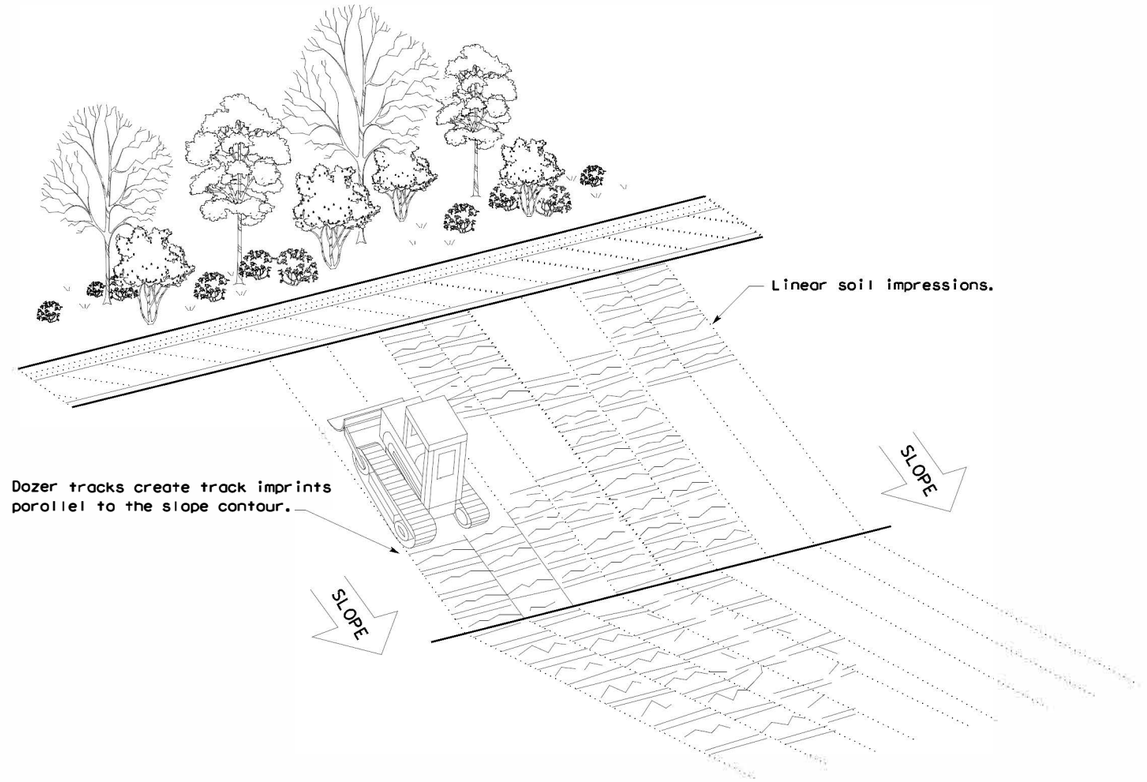
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities hove occurred unless otherwise approved.
2. Perform vertical tracking on slopes to tempororily stobilize soil.
3. Provide equipment with o track undercarriage capable of producing linear soil impressions measuring o minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions ore perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

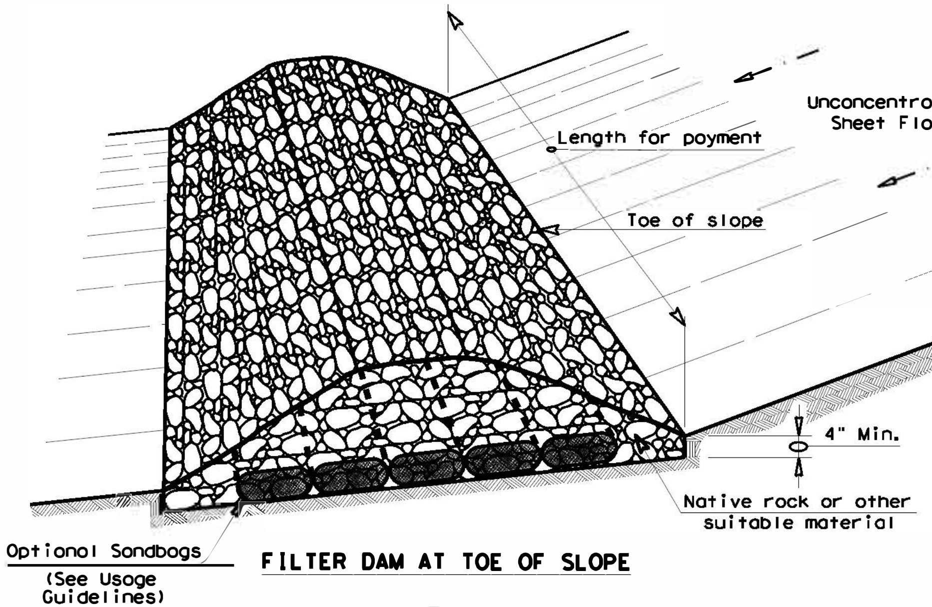
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

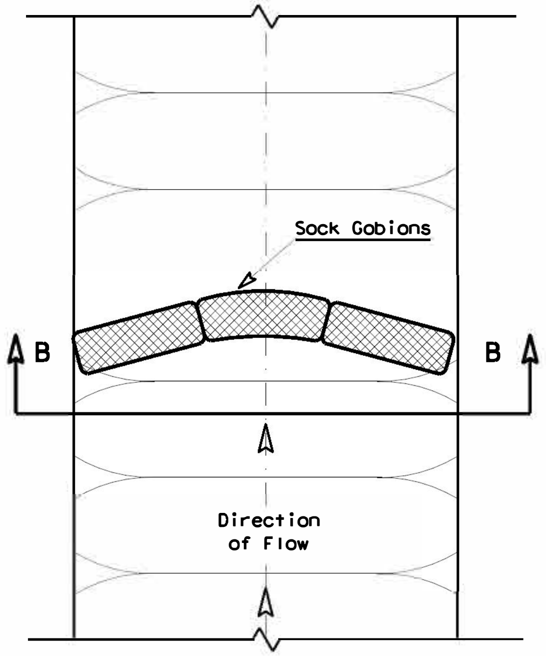
FENCE & VERTICAL TRACKING

EC(1)-16

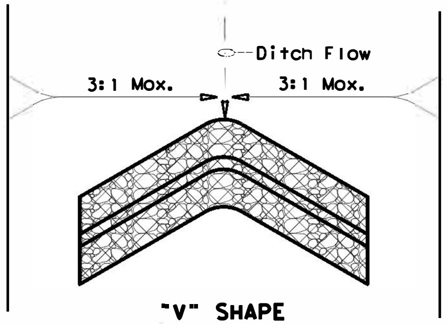
FILE: ec116	DN: TxDOT	CK: KM	DW: VP	CK: LS
© TxDOT JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0387	05	026,ETC	FM 982,ETC
	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		138



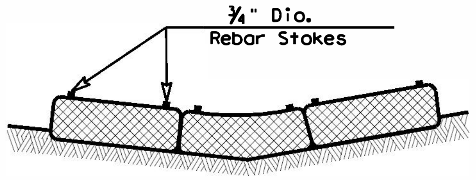
FILTER DAM AT TOE OF SLOPE



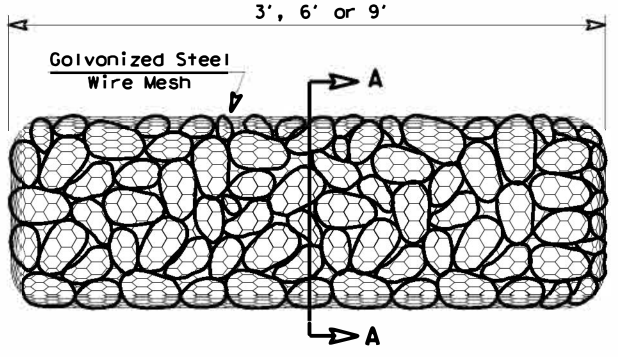
PLAN VIEW



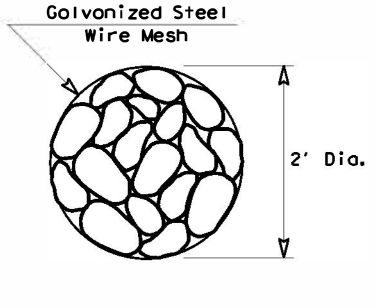
"V" SHAPE PLAN VIEW



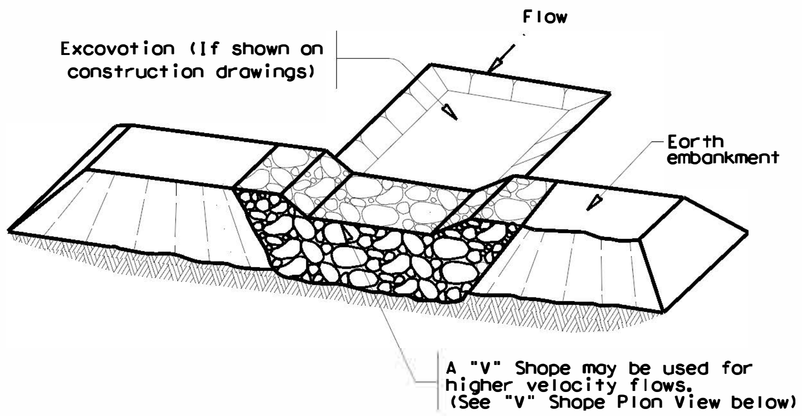
SECTION B-B



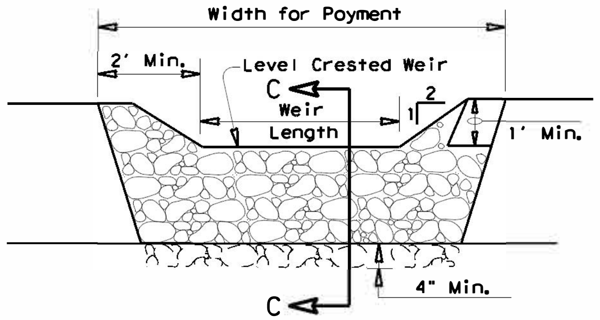
TYPE 4 (SACK GABIONS)



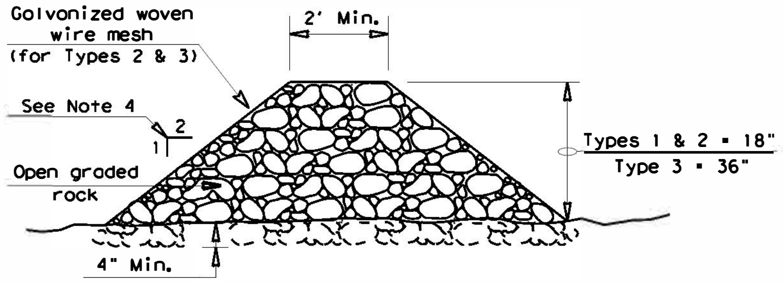
SECTION A-A



FILTER DAM AT SEDIMENT TRAP



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.

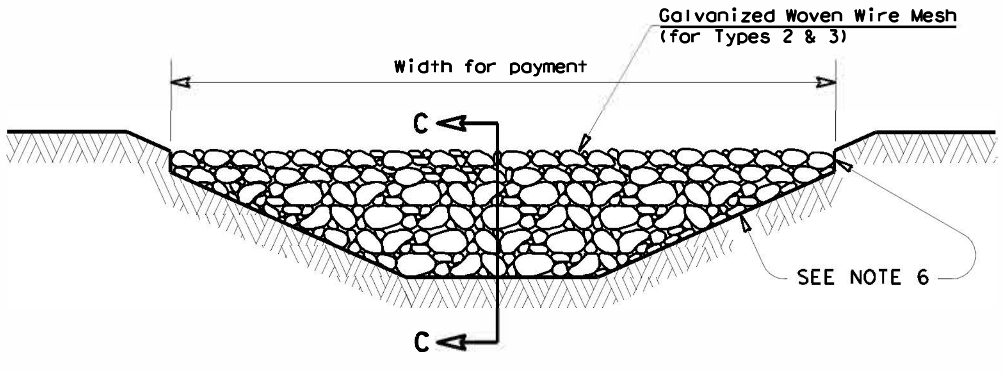
Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity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

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. Sock 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	0387	05	026,ETC	FM 982,ETC
	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		139

DATE: 9/3/2024
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/0387O5026/4 - Design/Plan Set/9. Environmental/STANDARDS/ec216.dgn

DATE: 9/3/2024
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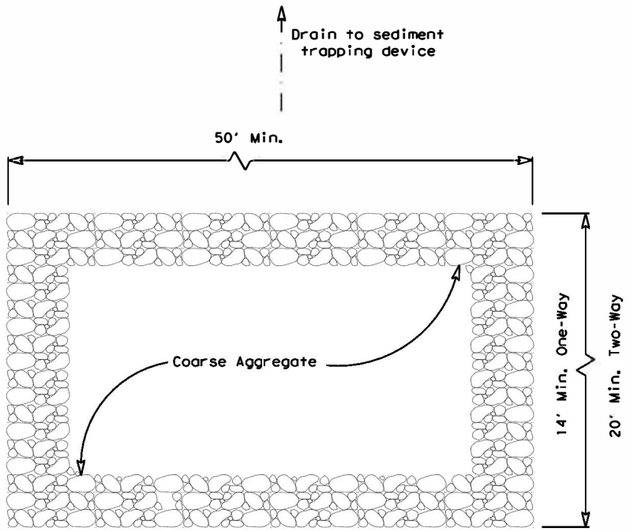
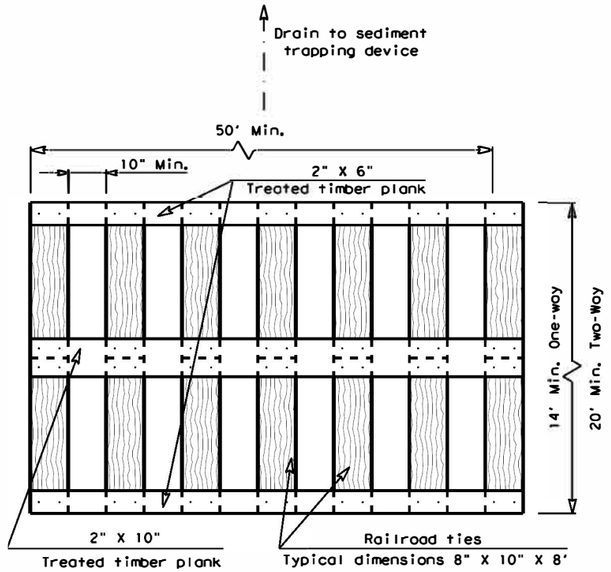


PLAN VIEW



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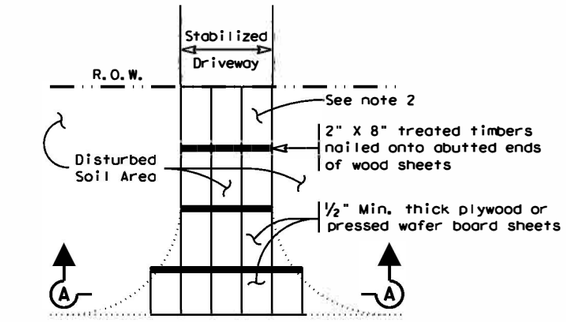
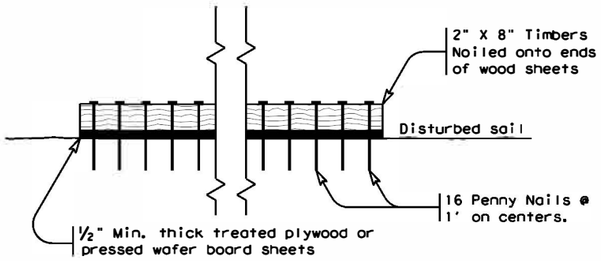
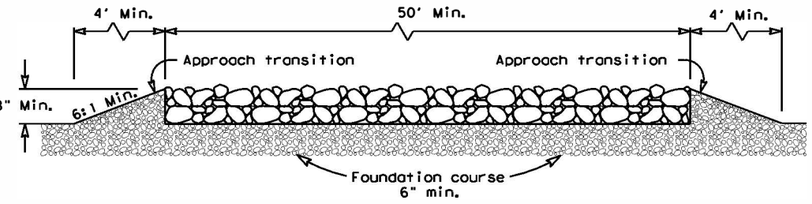


PLAN VIEW



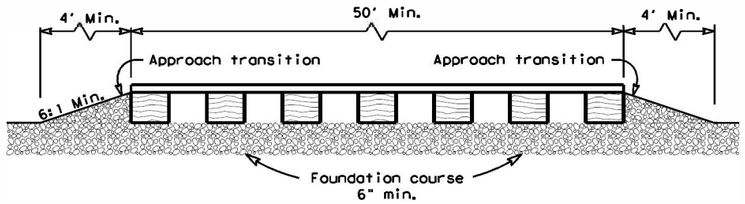
SECTION A-A



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

SHORT TERM

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other moteriolos approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon ore suggestions only and may be modified by the Engineer.
7. Construct exits with o width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to o sediment trapping device.
7. The guidelines shown hereon ore suggestions only and may be modified by the Engineer.
8. Construct exits with o width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon ore suggestions only and may be modified by the Engineer.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	CK: LS
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0387	05	026	FM 982
	DIST	COUNTY		SHEET NO.
	DAL	Collin		140

DATE: 9/3/2024
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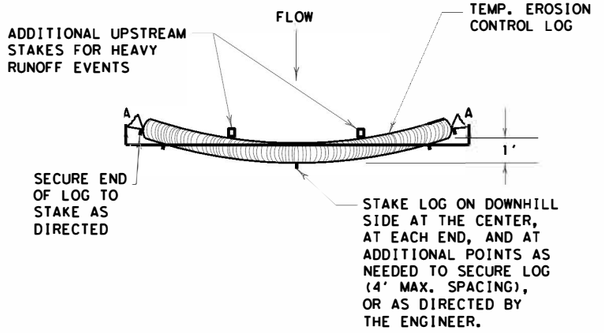
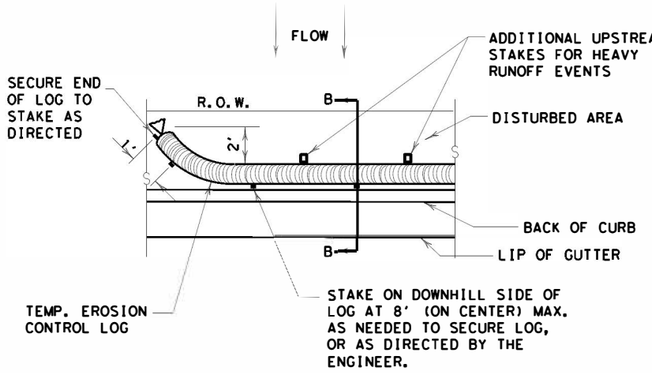


PLAN VIEW



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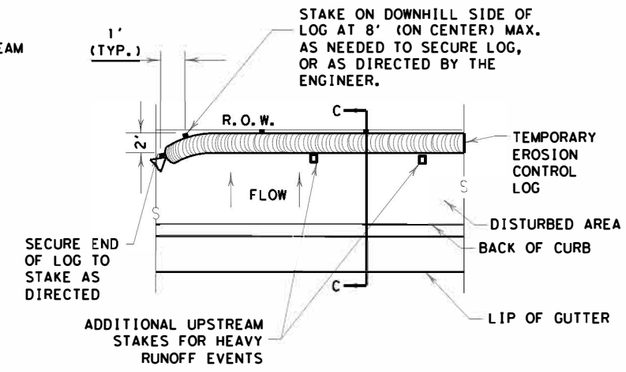

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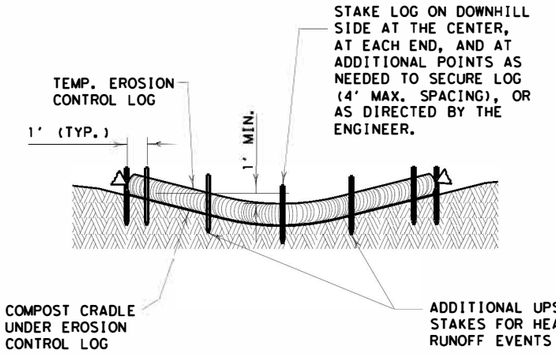
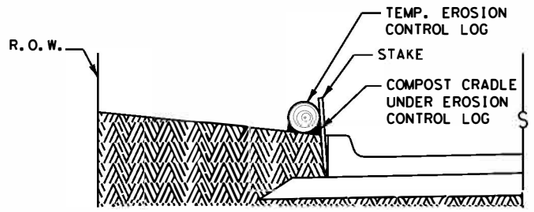


SECTION A-A

EROSION CONTROL LOG DAM

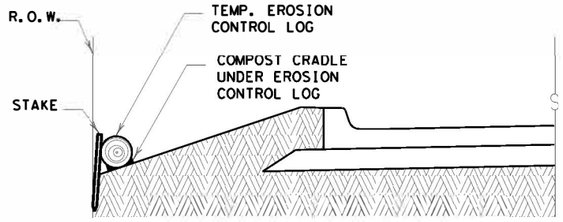
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



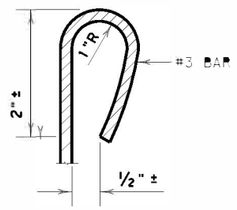
SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW

LEGEND

CL-D	EROSION CONTROL LOG DAM
CL-BOC	EROSION CONTROL LOG AT BACK OF CURB
CL-ROW	EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
CL-SST	EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
CL-SSL	EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
CL-DI	EROSION CONTROL LOG AT DROP INLET
CL-CI	EROSION CONTROL LOG AT CURB INLET
CL-GI	EROSION CONTROL LOG AT CURB & GRATE INLET



REBAR STAKE DETAIL

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

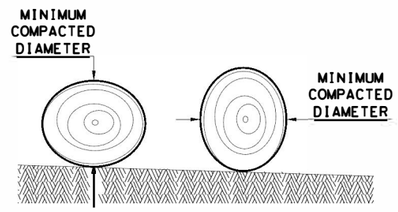
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS	
© TxDOT JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0387	05	026,ETC	FM 982,ETC	
	DIST	COUNTY		SHEET NO.	
	DAL	COLLIN		141	

DATE: 9/3/2024
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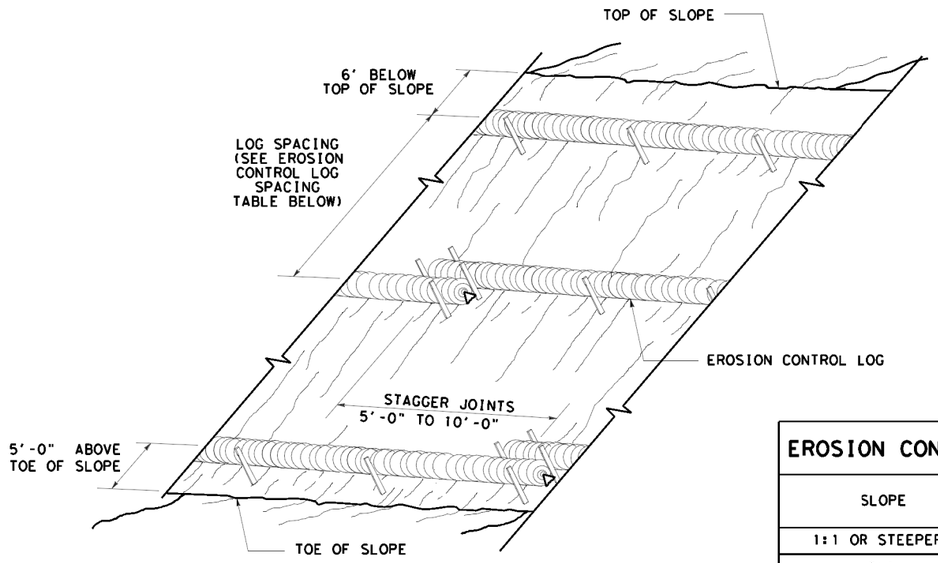
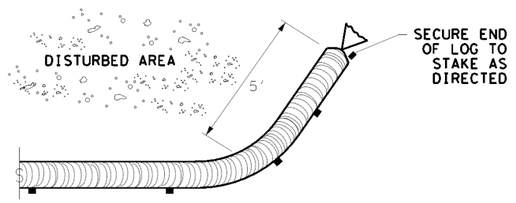


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

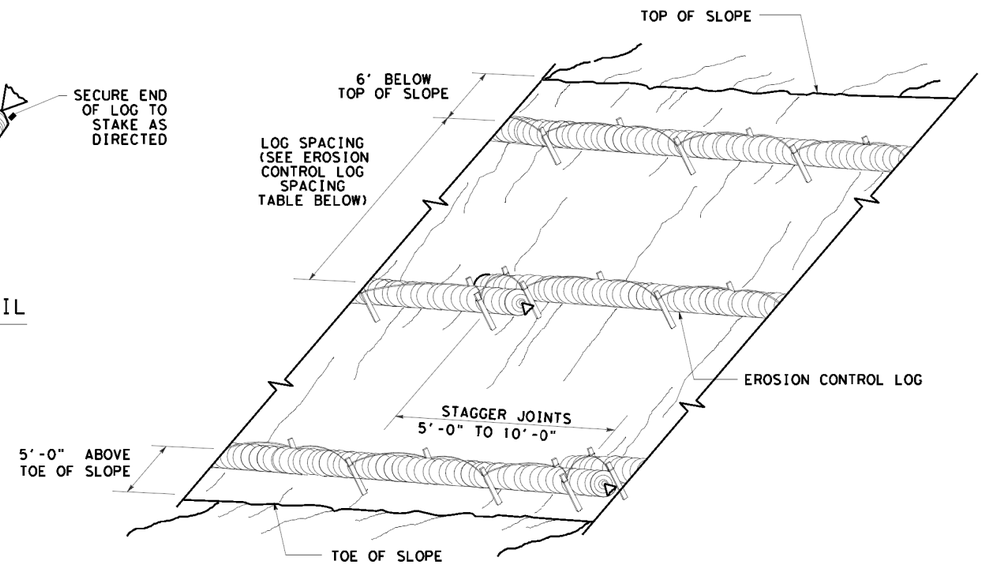
CL-SST



END SECTION RAP DETAIL

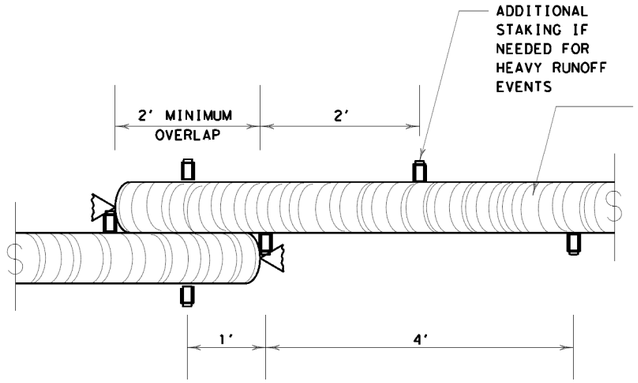
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

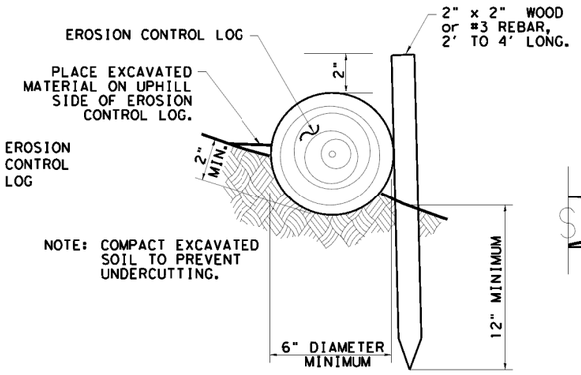
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

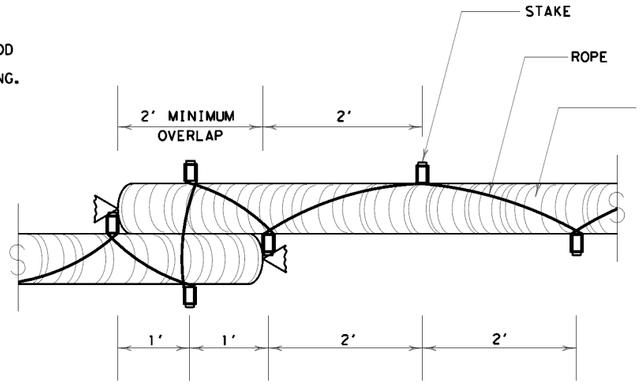


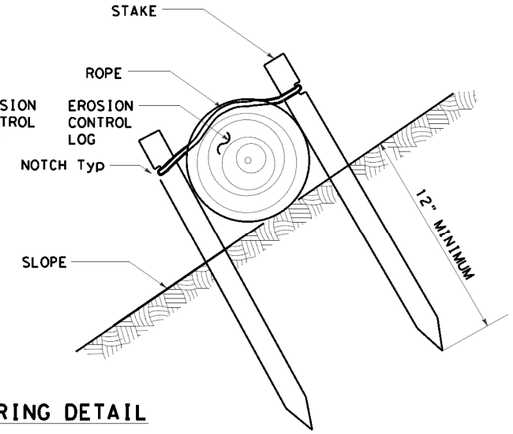


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

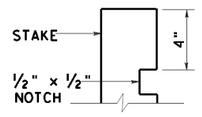
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

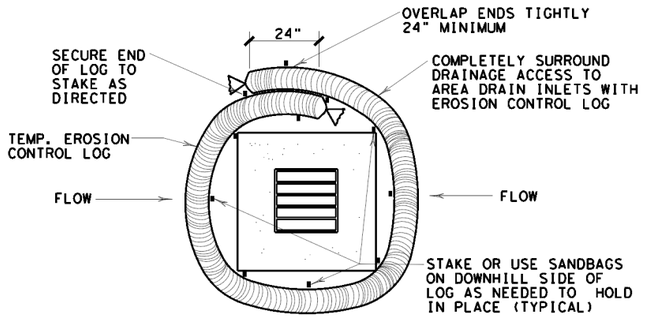
Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

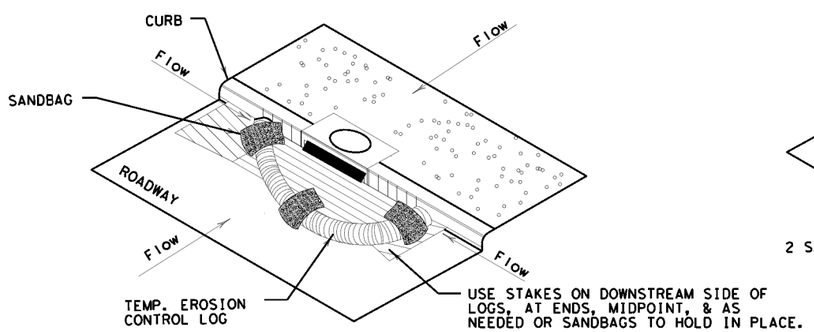
FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0387	05	026, ETC	FM 982, ETC
	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		142

DATE: 9/3/2024
FILE: dw://txdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/0387050264 - Design/Plan Set/9. Environmental/STANDARDS/ec916.dgn



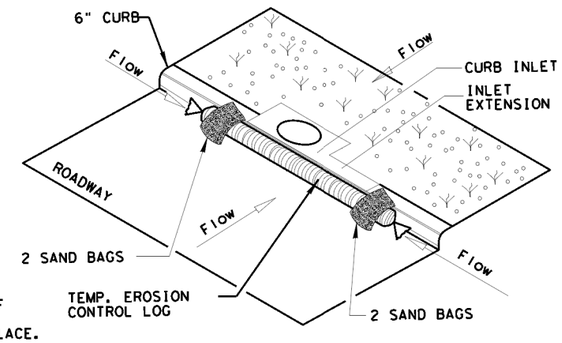
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

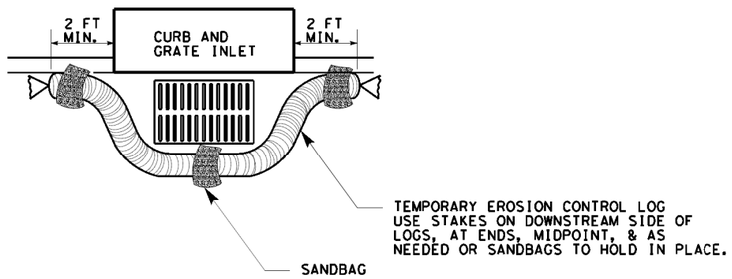
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

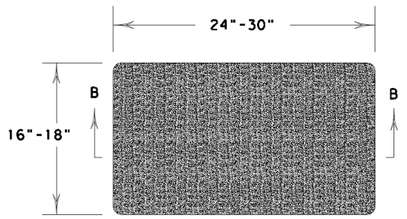
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0387	05	026,ETC	FM 982,ETC
	DIST	COUNTY		SHEET NO.
	DAL	COLLIN		143

USER ID

SURFACE PREPARATION ITEM 160× FURN & PLACE TOPSOIL / ITEM 161× COMPOST MANUF TOPSOIL (4") SY

SURFACE PREPARATION

Prepare planting area surface BEFORE placing Topsoil, Compost, Fertilizer, Seed and/or Sod.
Once project area has been completed to finallines, grade and compaction, remove objectionable materials from planting area surface and scarify existing surface to a depth of 4-inches, unless otherwise specified or directed.

Refer to Items 160 and 161 of TxDOT 2024 Standard Specifications× for specifications, dimensions, volumes, and measurements that have been modified or not shown in plans. Materials and construction shall meet all specifications.

TOPSOIL NOTES:
1. When Topsoil is specified under Item 160, use suitable material salvaged from the project ROW in accordance with Item 160 specifications, and/or secure additional good material from approved sources.
2. Topsoil shall include only the top 6-inches of its native surface, and be easily cultivated, fertile, erosion-resistant and free of objectionable materials. Topsoil obtained from sites outside of the ROW must come from approved sources and have a pH between 5.5 and 8.5 su.
3. Place Topsoil on pre-scarified surface, spread to a uniform loose cover at thickness specified, and shape per plans.
4. Water and roll the finished surface with a light roller or other suitable equipment per Item 160.3; do not over-compact.

COMPOST NOTES:
1. When Compost Manufactured Topsoil (4") is specified under Item 161, use compost meeting all requirements of Item 161.2 and Table 1. Provide quality control (QC) documentation and obtain Engineer approval prior to compost delivery.
2. Contractor shall provide tickets/invoices that document material type quantity and placement for all compost delivered.
3. Additional topsoil may be required to be imported to achieve the compost/topsoil mix ratio. Topsoil must meet Item 160 specifications.

APPLICATION OF COMPOST MANUFACTURED TOPSOIL (4")

AFTER Surface Preparation, uniformly spread a 1-inch layer of compost on-grade with 3-inches topsoil over pre-scarified planting area.
(25% compost and 75% topsoil = 1" compost and 3" topsoil.)
Then mix compost and topsoil together by cultivating the compost into the topsoil (by till or disk) to a 4-inch (4") depth.
Roll the finished surface with a light corrugated drum; do not over-compact.

FERTILIZER ITEM 166× FERTILIZER TON

SOIL ANALYSIS FOR FERTILIZER APPLICATION RATE

Unless otherwise stated in the plans, Contractor shall perform at least one soil analysis on each project before fertilization, and submit results to Engineer with recommended fertilizer rates based on soil analysis. Engineer may direct sample location(s).
Soil analysis may be waived if both compost and sod are used on entire project.

FERTILIZER NOTES:
1. Refer to Item 166 of TxDOT 2024 Standard Specifications× for specifications, dimensions, volumes, and measurements that have been modified or not shown in plans. Materials and construction shall meet all specifications.
2. Apply fertilizer BEFORE seeding, or AFTER placing sod.
3. Use fertilizer containing nitrogen (N), phosphoric acid (P) and potash (K) nutrients, unless otherwise specified. At least 50% of the Nitrogen component shall be a slow-release sulfur-coated urea as described in Item 166.3. Do not apply more than 60-pounds (lbs) Nitrogen per acre without Engineer concurrence.
4. Deliver fertilizer in bags, clearly labeled to show contents, unless otherwise specified or approved prior to delivery. When non-bagged, loose fertilizer is approved, provide documentation for each load of material delivered, to validate authenticity of the material.
5. Apply fertilizer uniformly, as a dry, granular material, essentially dust-free, and do not mix with water for application as a slurry.
6. When both temporary and permanent seeding are specified for the same area, apply half of the required fertilizer before the temporary seeding operation and the other half before the permanent seeding operation.

SEEDING FOR EROSION CONTROL ITEM 164× DRILL SEED SY

PERMANENT SEEDING MIXES (ADD FLOWER SEEDING MIX TO PERMANENT SEED, ALL SOILS) PERMANENT SEED PLANTING SEASON: FEB. 1 TO MAY 15

			Pure Live Seed Rate **	
RURAL CLAY SOILS (PERM_RURAL_CLAY)	Sideoats Grama (Haskell)	15%	1.5	lbs PLS per acre
	Hooded Windmillgrass (Burnet)	15%	0.3	lbs PLS per acre
	White Tridens (Guadalupe)	15%	0.3	lbs PLS per acre
	Little Bluestem (OK Select)	15%	1.05	lbs PLS per acre
	Buffalograss (Texoka)***	10%	1.5	lbs PLS per acre
	Silver Bluestem (Santiago)	05%	0.2	lbs PLS per acre
	Green Sprangletop (Van Horn)	05%	0.2	lbs PLS per acre
	Shortspike Windmillgrass (Welder)	05%	0.1	lbs PLS per acre
	Canada Wildrye (Lavaca)	10%	2.0	lbs PLS per acre
	Sand Dropseed (Taylor)	05%	0.1	lbs PLS per acre
URBAN CLAY SOILS (PERM_URBAN_CLAY)	Green Sprangletop		0.3	lbs PLS per acre
	Sideoats Grama (ElReno)		3.6	lbs PLS per acre
	Buffalograss (Texoka)***		1.6	lbs PLS per acre
	Bermudagrass		2.4	lbs PLS per acre

			Pure Live Seed Rate **	
RURAL SANDY SOILS (PERM_RURAL_SAND)	Shortspike Windmillgrass (Welder)	10%	0.2	lbs PLS per acre
	Hairy Grama (Chaparral)	15%	0.6	lbs PLS per acre
	Sand Dropseed (Taylor)	10%	0.2	lbs PLS per acre
	Little Bluestem (OK Select)	15%	1.05	lbs PLS per acre
	Sideoats Grama (Haskell)	10%	1.0	lbs PLS per acre
	Green Sprangletop (Van Horn)	10%	0.4	lbs PLS per acre
	Hooded Windmillgrass (Burnet)	10%	0.2	lbs PLS per acre
	Sand Lovegrass (Mason)	10%	0.4	lbs PLS per acre
	Silver Bluestem (Santiago)	10%	0.4	lbs PLS per acre
URBAN SANDY SOILS (PERM_URBAN_SAND)	Green Sprangletop		0.3	lbs PLS per acre
	Buffalograss (Texoka)***		1.6	lbs PLS per acre
	Bermudagrass		3.6	lbs PLS per acre
	Sand Dropseed (Borden Co.)		0.4	lbs PLS per acre

TEMPORARY SEEDING MIX DRILL SEED (TEMP_WARM_COOL)

		Pure Live Seed Rate **
COOL SEASON (Sept.1 to Jan.31)	Brownton Millet	20.0 lbs PLS per acre
WARM SEASON (Feb.1 to Aug.30)	Oats	30.0 lbs PLS per acre
	Wheat	30.0 lbs PLS per acre
	Little Barley	5.0 lbs PLS per acre
	Western Wheatgrass	5.0 lbs PLS per acre

FLOWER SEEDING MIX (INCLUDE WITH PERMANENT SEED, ALL SOILS)

Engelmann Daisy (Eldorado)	1.5	lbs PLS per acre
Awnless Bushsunflower (Plateau)	1.5	lbs PLS per acre
Partridge Pea	1.5	lbs PLS per acre
Illinois Bundleflower (Sabine)	1.5	lbs PLS per acre
Rio Grande Clammyweed (Zapata)	2.0	lbs PLS per acre

** Note: The amount of Pure Live Seed (PLS) in one-pound (1 lb) of bulk seed is based on three factors: % Purity, % Germination, and % Dormant. Use the following formula to calculate PLS in bulk seed: PLS = % Purity X (% Germination + % Dormant) Ensure that the specified amount of pure live seed is placed.
*** Note: When Buffalograss is specified, use seed that is treated with potassium nitrate to overcome dormancy.

SEEDING NOTES:
1. When seeding is specified under Item 164, refer to TxDOT 2024 Standard Specifications× for specifications, dimensions, volumes, and measurements that have been modified or not shown. Materials and construction shall meet all specifications.
2. Conduct seeding upon completion of each applicable construction stage (dependent upon planting season requirements), without compensation for additional move-ins.
3. Place seed AFTER preparing planting area surface. Refer to Surface Preparation detail this sheet, as well as Topsoil Item 160 and Compost Manufactured Topsoil Item 161 when specified. Apply fertilizer per Item 166 BEFORE seeding, per specifications and this sheet, to help drill the fertilizer into the soil.
4. When temporary grasses are well-established and more than 2-inches tall, mow planting area before seeding permanent grasses; mowing for this purpose will be subsidiary. When vegetation is not already well-established, scarify planting area to a depth as described in Item 164.3. before temporary seeding and before permanent seeding.
5. Seed material must be appropriate to the location, soil type and season. Use the seed mix species and pure live seed rates designated in Tables 1-5 of the TxDOT 2024 Standard Specifications× for Item 164, unless otherwise specified.
6. All seed shall meet labeling, delivery, analysis, and testing requirements described in Item 164.2.1. Deliver seed in labeled, unopened bags or containers to Engineer prior to planting.
7. Uniformly plant seed over the designated planting area, along the contour of slopes, and drill seed to a depth as described in Item 164.3.5.
8. Hydroseeding per Item 164.2.5.2 and 164.3.4 may be allowed, when specified or Engineer concurs. For hydroseeding, increase PLS rate by 25% and avoid microplastics.
9. Implement and continue Vegetative Watering per the schedule, rate and volume specified under Item 168.

TXDOT REFERENCE MATERIALS:

- "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES" 2024
- "A GUIDANCE TO ROADSIDE VEGETATION ESTABLISHMENT" 2004
- ONLINE TRAINING COURSE: MNT415 REVEGETATION DURING CONSTRUCTION
- DALLAS DISTRICT "VEGETATION ESTABLISHMENT GUIDELINES"

SODDING FOR EROSION CONTROL ITEM 162× BLOCK SODDING SY

BLOCK OR ROLL SOD	COMMON NAME	BOTANICAL NAME
	Common Bermuda Grass	Cynodon dactylon

SODDING NOTES:
1. Refer to Item 162 of TxDOT 2024 Standard Specifications× for specifications, dimensions, volumes, and measurements that have been modified or not shown in plans. Materials and construction shall meet all specifications.
2. Place sod between the average date of the last freeze in the Spring and 6 weeks before the average date of the first freeze in the Fall, per the Texas Almanac for the project area.
3. Place sod only AFTER soil surface preparation is complete as detailed in this sheet. Dry soil may require pre-watering.
4. Place all sod (blocks or rolls) within 24-hours of delivery to the site, and keep moist from the time it is dug up until it is planted. Sod with dried roots will not be accepted.
5. Place sod with joints alternating on each row to prevent all joints from lining up, and place blocks firmly against adjacent blocks. Roll, tamp and trim sod per Item 162.3.
6. Place fertilizer promptly AFTER sodding operation is complete in each area.
7. Water sod immediately following placement, and continue Vegetative Watering per Item 168.

VEGETATIVE WATERING FOR ESTABLISHING SEED AND SOD ITEM 168× VEGETATIVE WATERING TGL

WATERING SCHEDULE

SEASON (Usual Months)	RATE	TIME SCHEDULE	TOTAL WATER ESTIMATE
SPRING & FALL (March, April, May, and October)	7,000 gallons/acre per working day	Vegetative watering for seed shall begin on the day after rainfall described below and continue for 60-consecutive working days. Vegetative watering for sod shall begin on the day sod is placed and continue for a minimum of 15-consecutive working days.	420,000 gallons/acre (60 working days)
SUMMER (June through September)	12,000 gallons/acre per working day		720,000 gallons/acre (60 working days)
WINTER (November through February)	1,000 gallons/acre per working day	Vegetative watering for seed and/or sod shall begin on the day after placement and continue for 15-consecutive working days	15,000 gallons/acre (15 working days)

Notes: Watering rate and frequency may be adjusted, with the approval of the Engineer, to meet site conditions (especially with sod).
For informational purposes only: 1,000-gallons equals 1 TGL

VEGETATIVE WATERING NOTES:
1. Refer to Item 168 of TxDOT 2024 Standard Specifications× for specifications, dimensions, volumes, and measurements that have been modified or not shown in plans. Materials and construction shall meet all specifications.
2. Use clean water, free of industrial waste and other substances harmful to vegetation growth, per Item 168.2.
3. For seeding, use Vegetative Watering to keep the seed bed moist during germination; not to provide initial watering. [After drill seeding, postpone watering operations until site receives at least 1/2-inch of natural rainfall in a single day. Also delay watering operations for warm season grasses until soil temperature exceeds 70 degrees F.]
4. For sod, water immediately.
5. All water distribution equipment shall be furnished and operated to provide water at a uniform and controllable rate. Use a metering device on all watering equipment.
6. Evenly distribute water over entire area designated for seeding and/or sodding, using even spray patterns that do not disturb seed bed and/or dislodge seed from seed bed.
7. Do not water between the hours of 12:00 p.m. and 6:00 p.m. when daytime temperatures exceed 95 degrees F.
8. After initial establishment period, continue intermittent watering of newly established seed or sod at a rate of approximately 1-inch water/week, during summer months until end of contract.
9. If 1/4-inch or more of rainfall occurs on site on any given working day, no vegetative watering will be needed on that working day. (Note: 1/4-inch of rain equals 7,000 gallons of water per acre.)
10. Should the Contractor fail to apply the specified amount of water within the time allowed, any seed or sod in poor condition shall be replaced, fertilized, and watered at Contractor's expense.

ROADSIDE MOWING ITEM 730× AC

MOWING NOTES:
1. During project construction, once seed is established, use mowing to promote permanent grasses by mowing any remaining temporary grasses.
2. Also mow established turf and ROW grasses in designated areas of project limits as specified or directed by Engineer.
3. Remove litter and debris prior to mowing.
4. Do not mow on wet ground when soil rutting can occur.
5. Hand-trim around obstructions and stormwater control devices as needed.
6. Maintain paved surfaces free of tracked soils and clipped vegetation.

SEQUENCE OF WORK:

- SCARIFY SURFACE SOIL.
- PREPARE / PLACE TOPSOIL, OR
- PREPARE / PLACE COMPOST MANUFACTURED TOPSOIL.
- APPLY FERTILIZER AND THEN PLACE SEEDING, OR
- PLACE SOD AND THEN APPLY FERTILIZER.
- CONDUCT VEGETATIVE WATERING.
- CONDUCT ROADSIDE MOWING, AS DIRECTED.

Texas Department of Transportation

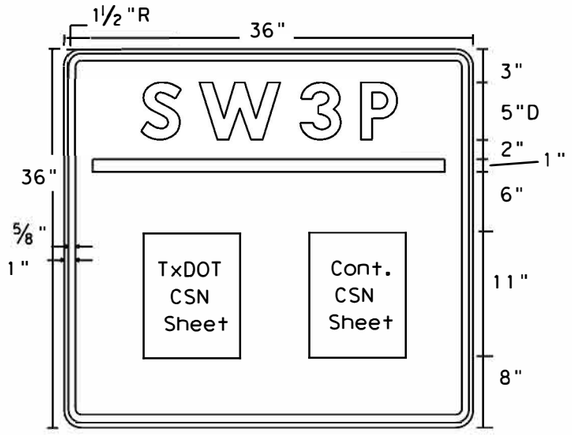
VEGETATION ESTABLISHMENT SHEET

(DALLAS DISTRICT)

TEMPLATE REVISION DATE: 07/17/24

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
RAD	6	(See Title Sheet)		FM 982
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
XXX	TEXAS	DALLAS		144
CHECK	CONTROL	SECTION	JOB	
XXX	0387	05	026	
CHECK				
XXX				

DATE



SW3P SIGN

TxDOT & Contractor Construction Site Note (CSN)

Sign Dimensions

36" X 36"

Letters - White
Numbers - White
Border - White
Background - Blue

GENERAL NOTES:

1. The alphabets and lateral spacing between letters and numerals shall conform with the "Texas Manual on Uniform Traffic Control Devices for Streets and Highways", (TMUTCD) latest edition, and the "Compliant Work Zone Traffic Control Devices List". Lateral spacing of text shall provide a balanced appearance. All materials shall conform to Department Specifications.
2. Legend and border may be applied by reverse screening process with transparent colored ink, cut-out white reflective sheeting applied to colored background or combination thereof. Background shall be reflective sheeting Type C.
3. CSN Sheets will be laminated and attached to the sign with an adhesive. Ensure sheets remain dry. (See Figure 1).
4. SW3P Signs should be placed just inside the ROW line at the project limits at a readable height. It may be placed perpendicular or parallel to ROW line. If the sign cannot be placed outside the clear zone, it will be mounted per TMUTCD requirements.
5. Final location of the signs will be as approved by the Engineer.

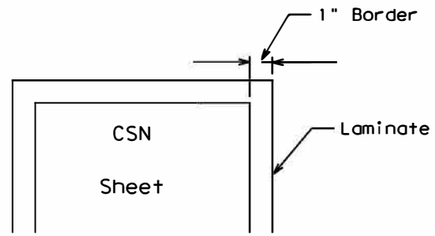
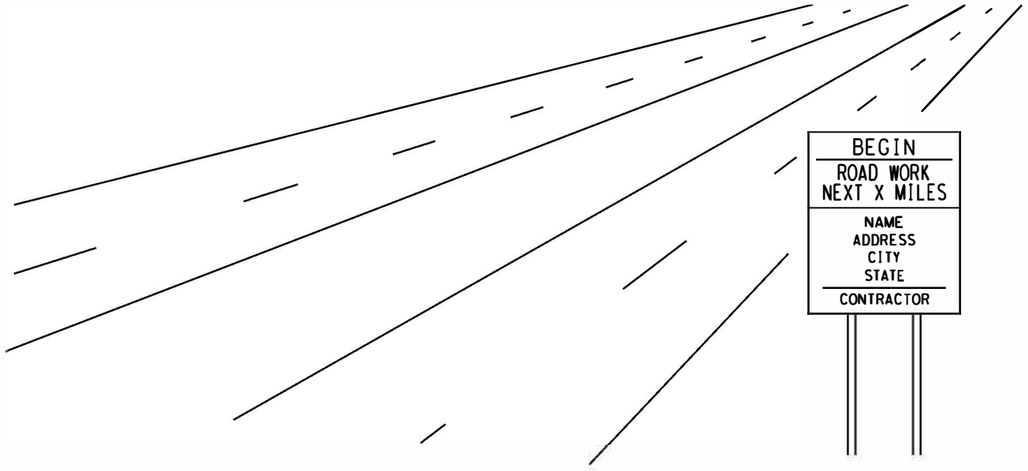
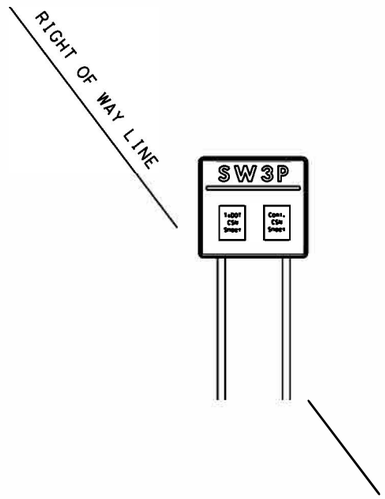


Figure 1





DEPARTMENT MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
FLAT SURFACE REFLECTIVE SHEETING	DMS-8300
VINYL NON-REFLECTIVE DECAL SHEETING	DMS-8320

COLOR	USAGE	REFLECTIVE SHEETING OR OTHER MATERIAL
BLUE	BACKGROUND	TYPE C (FLUORESCENT PRISMATIC)
WHITE	LEGEND & BORDERS	VINYL NON-REFLECTIVE DECAL SHEETING

Texas Department of Transportation
DALLAS DISTRICT STANDARD

SW3P SIGN SHEET

FILE:	DN: TxDOT	CK:	DW:	CK:
© TxDOT 2016	DISTRICT	PROJECT NO.		SHEET
REVISION DATE: 10-16-15	18	SEE TITLE SHEET		145
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	COLLIN	0387	05	026	FM 982

LEVELS DISPLAYED
PATH: