

DESIGN	FED.RD. DIV.NO.	PROJECT NO.			
VD	6	C 197 -4-84, ETC.			
GRAPHICS	STATE	CONT	SECT	JOB	HIGHWAY NO.
VD	TEXAS	0197	04	084, ETC.	US 175, ETC.
CHECK	CHECK	DIST	COUNTY		SHEET NO.
ME	FR	DAL	Kaufman, ETC.		1

**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

STATE PROJECT  
 C 197-4-84, ETC.  
 CCSJ: 0197-04-084, ETC.  
**US 175, ETC.**  
 KAUFMAN COUNTY, ETC.

CCSJ: 0197-04-084 (US 175)  
 DESIGN SPEED = N/A  
 FUNCTIONAL CLASSIFICATION: 2 - URBAN PRINCIPAL ARTERIAL  
 CSJ: 2588-01-021 (FM 548)  
 DESIGN SPEED = N/A (PM)  
 FUNCTIONAL CLASSIFICATION: 4 - RURAL MINOR ARTERIAL  
 CSJ: 2588-02-011 (FM 548)  
 DESIGN SPEED = N/A (PM)  
 FUNCTIONAL CLASSIFICATION: 4 - RURAL MINOR ARTERIAL  
 ADT CCSJ: 2588-01-021 (FM 548) 6,280 (2020) --- 8,792 (2040)  
 ADT CSJ: 2588-02-011 (FM 548) 6,280 (2020) --- 8,792 (2040)

CCSJ: 0197-04-084  
 LIMITS: FROM W SH 243  
 TO SH 34 BUSINESS  
 TOTAL LENGTH OF PROJECT =  $\left\{ \begin{array}{l} \text{ROADWAY} = 7,945.00 \text{ FT.} = 1.504 \text{ MI.} \\ \text{BRIDGE} = 155.00 \text{ FT.} = 0.029 \text{ MI.} \\ \text{TOTAL} = 8,100.00 \text{ FT.} = 1.533 \text{ MI.} \end{array} \right.$   
 FOR THE CONSTRUCTION OF \_\_\_\_\_  
 CONSISTING OF \_\_\_\_\_  
 INSTALL/REPLACE SIGNS  
 DYNAMIC LED CURVE WARNING

CSJ: 2588-01-021  
 LIMITS: FROM WINDMILL FARMS BLVD  
 TO ROCKWALL COUNTY LINE  
 TOTAL LENGTH OF PROJECT =  $\left\{ \begin{array}{l} \text{ROADWAY} = 17,945.00 \text{ FT.} = 3.321 \text{ MI.} \\ \text{BRIDGE} = 247.00 \text{ FT.} = 0.047 \text{ MI.} \\ \text{TOTAL} = 17,783.00 \text{ FT.} = 3.368 \text{ MI.} \end{array} \right.$   
 FOR THE CONSTRUCTION OF \_\_\_\_\_  
 CONSISTING OF \_\_\_\_\_  
 BASE REPAIR, MILL AND INLAY, RUMBLE STRIP AND PAVEMENT MARKINGS

CSJ: 2588-02-011  
 LIMITS: FROM KAUFMAN COUNTY LINE  
 TO SH 205  
 TOTAL LENGTH OF PROJECT =  $\left\{ \begin{array}{l} \text{ROADWAY} = 2,779.00 \text{ FT.} = 0.527 \text{ MI.} \\ \text{BRIDGE} = 30.00 \text{ FT.} = 0.005 \text{ MI.} \\ \text{TOTAL} = 2,809.00 \text{ FT.} = 0.532 \text{ MI.} \end{array} \right.$   
 OVERLAY

**NOTE:**

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014, AND THE CONTRACT PROVISIONS LISTED AND DATED AS FOLLOWS SHALL GOVERN ON THIS PROJECT: SPECIAL LABOR PROVISIONS FOR STATE PROJECTS (000-008)

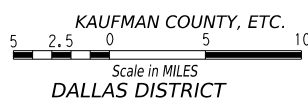
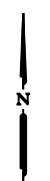
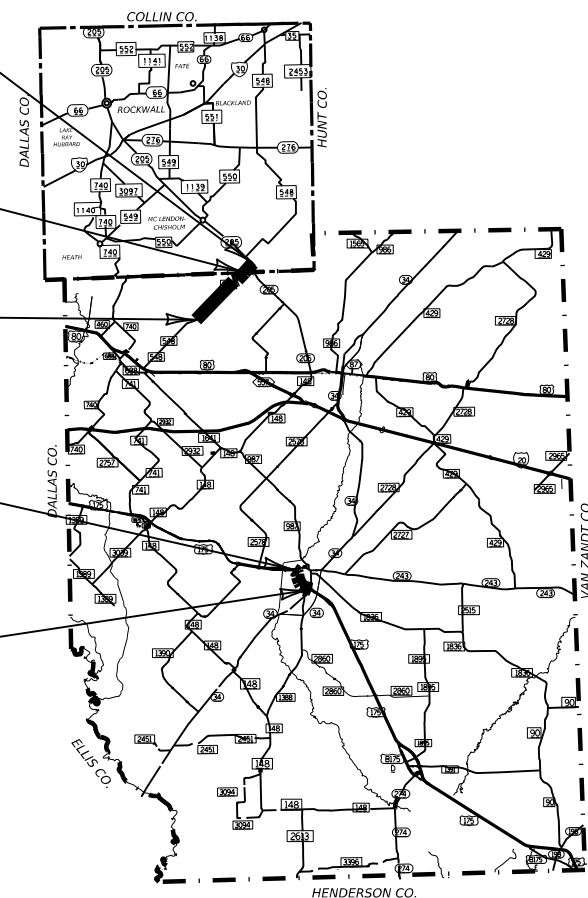
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 STA 413+98  
 TRM 266-0.684

END CSJ 2588-01-021  
 BEGIN CSJ 2588-02-011  
 STA 385+89  
 TRM 266-0.152

BEGIN PROJECT  
 CSJ 2588-01-021  
 STA 208+06  
 TRM 268+1.214

BEGIN PROJECT  
 CSJ 0197-04-084  
 STA 100+00  
 TRM 620+1.955

END PROJECT  
 CSJ 0197-04-084  
 STA 181+00  
 TRM 620+0.063



EQUATIONS: NONE  
 EXCEPTIONS: NONE  
 RAILROAD CROSSINGS: NONE

WORK WAS COMPLETED ACCORDING  
 TO THE PLANS AND CONTRACT.

\_\_\_\_\_, P.E.  
 Signature of Registrant & Date

TEXAS DEPARTMENT OF TRANSPORTATION

SUBMITTED FOR LETTING 12/29/2022  
 DocuSigned by: *Macl Ceig P.E., P.E.*  
 DESIGN ENGINEER  
 397E29DE16A744E...

RECOMMENDED FOR LETTING 12/30/2022  
 DocuSigned by: *Lane Selman*, P.E.  
 AREA ENGINEER  
 29F92BAFC50478E...

RECOMMENDED FOR LETTING 12/30/2022  
 DocuSigned by: *James T. Campbell*, P.E.  
 DIRECTOR OF TRANSPORTATION  
 04C4FD0E1A00A2F...

APPROVED FOR LETTING 12/30/2022  
 DocuSigned by: *Casson Clemens*, P.E.  
 DISTRICT ENGINEER  
 A879E0D10C706C...

# INDEX OF SHEETS

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8-10	QUANTITY SUMMARY
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* 28	TCP (1-5)-18
* 29	TCP (1-6)-18
* 30	TCP (2-2)-18
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* 32	TCP (3-2)-13
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SHEET	DESCRIPTION
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* 70	TSR (5) -13
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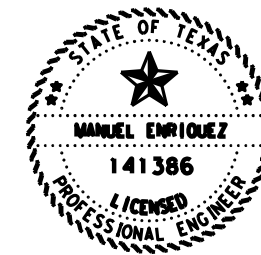
PAVEMENT MARKINGS & DELINEATION	
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\*STATEWIDE STANDARDS  
\*\* DALLAS DISTRICT STANDARDS

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



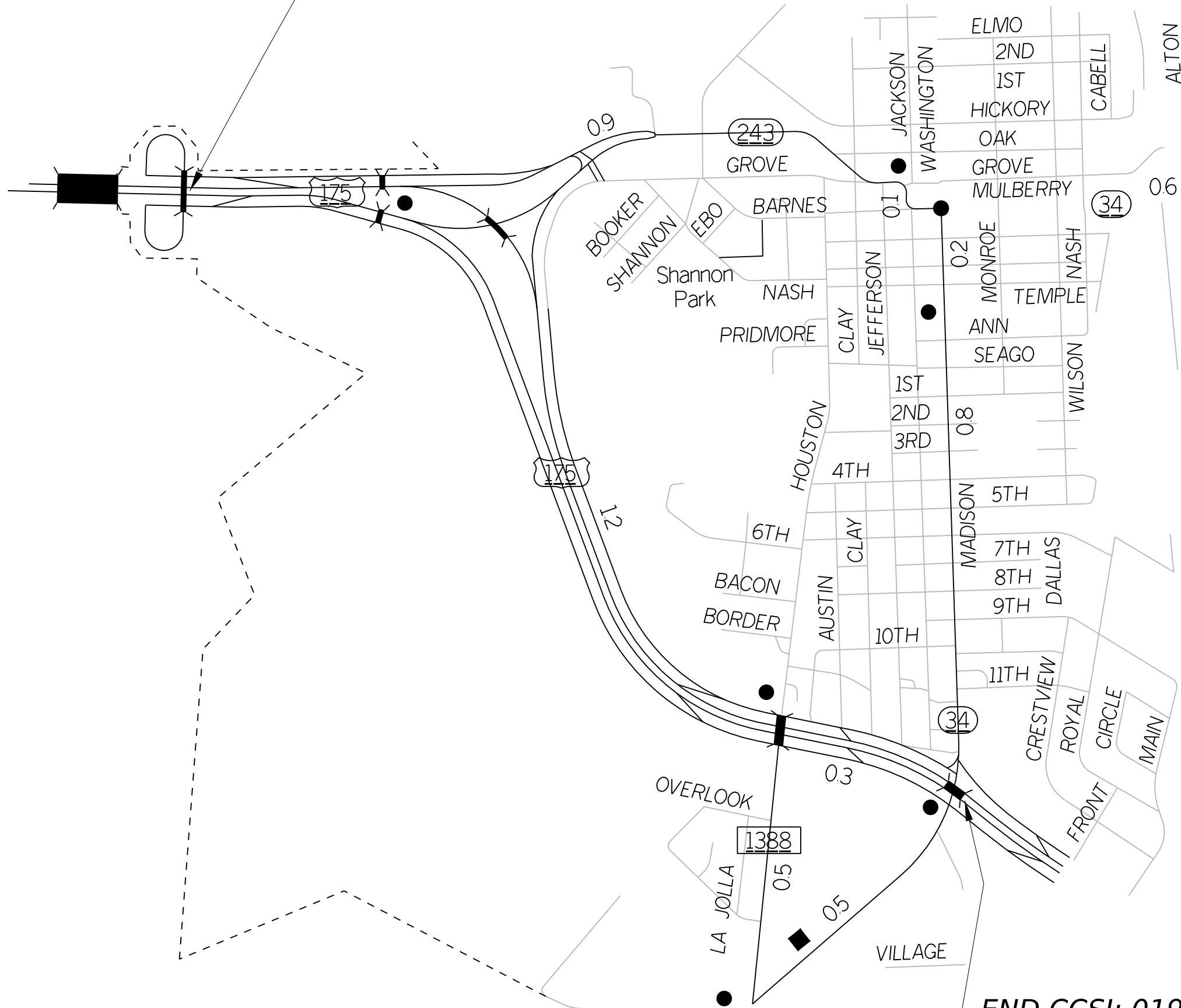
*Manuel Enriquez P.E.*, P.E. 12-20-22  
Signature of Registrant & Date



## INDEX OF SHEETS

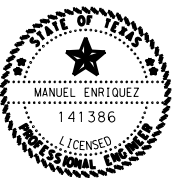
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VD	6	(SEE TITLE SHEET) US 175, ETC		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
VD	TEXAS	DALLAS	KAUFMAN, ETC.	
CHECK	CONTROL	SECTION	JOB	
ME	FR	0197	04	084, ETC.
CHECK				2

BEGIN CCSJ: 0197-04-084  
STA. 100+00.00



END CCSJ: 0197-04-084  
STA. 181+00.00

DATE: 1/3/2023 7:40:34 PM  
FILE: p:\w\txdot\projectwiseonline.com\TXDOT5\Documents\18 - DAL\Design Projects\019704084\4 - Design\Plan Set\1 - General\US 175 PROJECT LAYOUT



*Manuel Enrriquez* P.E. 12-20-22  
Signature of Registrant & Date



US 175  
PROJECT LAYOUT

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0197	04	084, ETC.	US 175, ETC.
DAL		KAUFMAN, ETC.	3

NOTE:  
 PLACE ADVANCE WARNING SIGN IN ACCORDANCE WITH BC, TCP AND  
 WZ STANDARDS AND MUTCD, AND AS DIRECTED BY THE ENGINEER.



DATE: 1/3/2023 7:41:26 PM  
 FILE: pw://ttdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/258801021/4 - Design/Plan Set/1. General/03\_PROJECT\_LAYOUT.dgn

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 STA. 208+06.00

**BEGIN CSJ**  
 STA. 385+89.00  
 CSJ 2588-02-011

**END CSJ**  
 STA. 385+89.00  
 CSJ 2588-01-021

**END PROJECT**  
 STA. 413+98.00  
 CSJ 2588-02-011

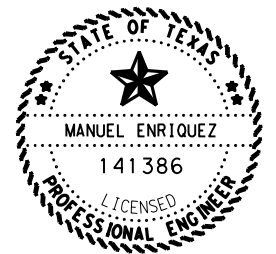
**MBGF INSTALLATION**

**HIGH POINT CREEK**

**BIG BRUSHY CREEK**

**SH 205**

**WINDMILL FARMS BLVD.**



*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date

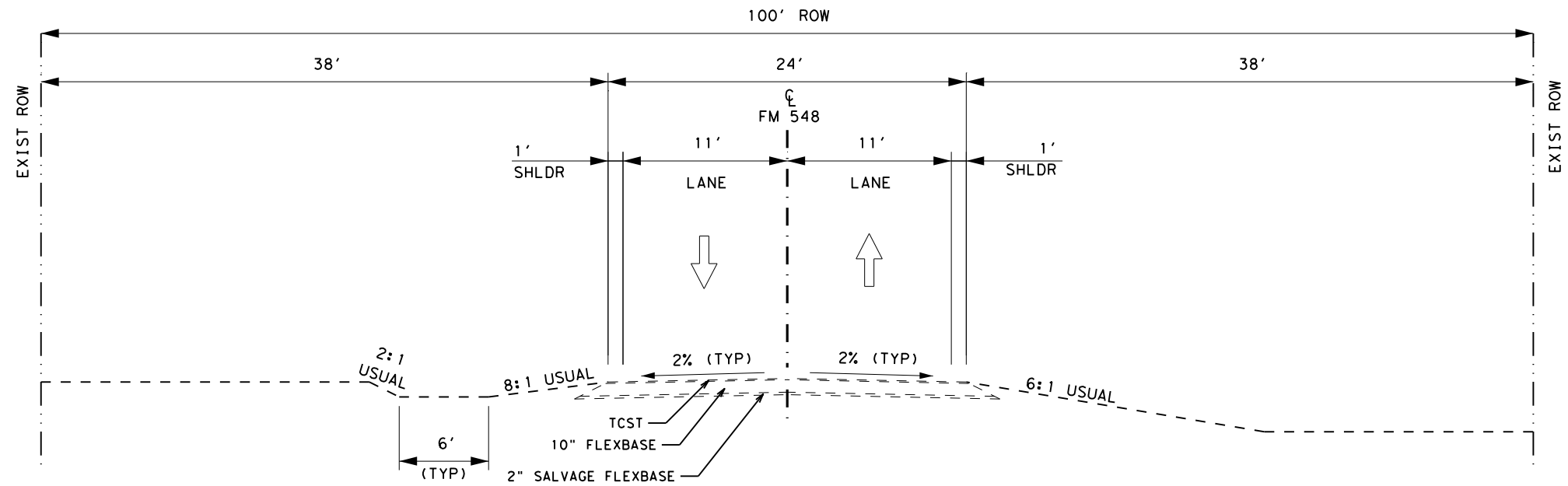


**FM 548  
 PROJECT LAYOUT**

SCALE: 1" = 2000 FT SHEET 2 OF 2

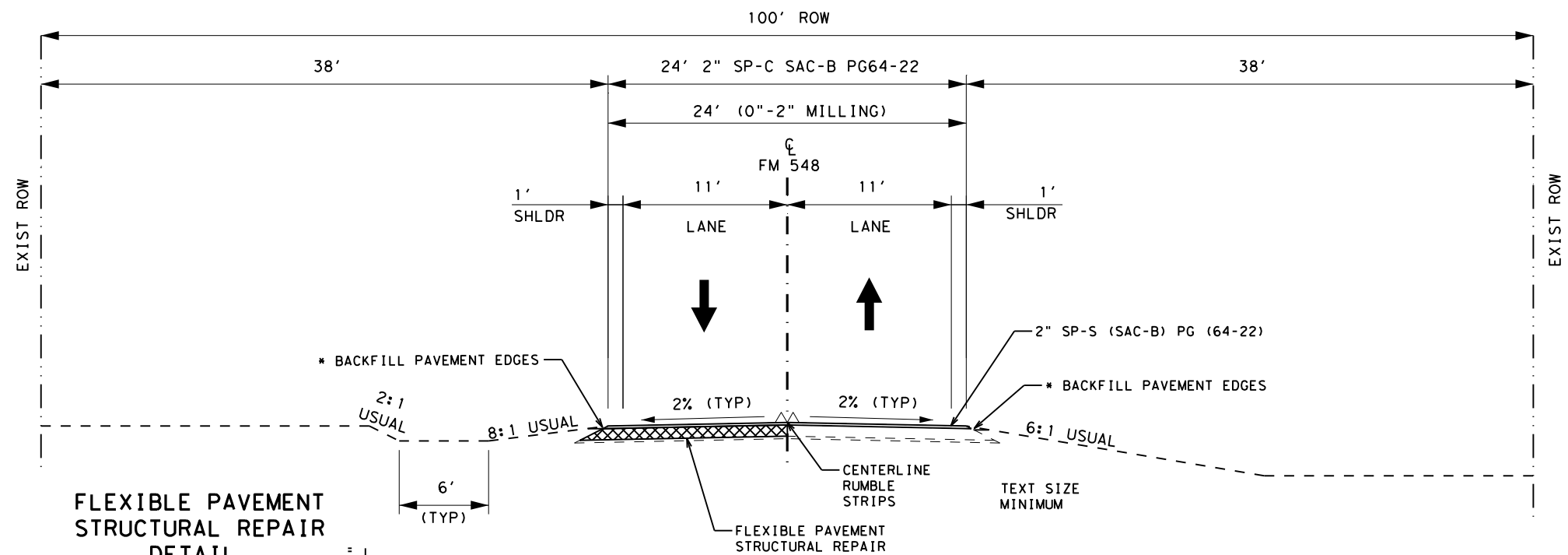
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VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	
VD	TEXAS	DAL	KAUFMAN, ETC.	
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ME	FR	0197	04	084, ETC.
CHECK				4

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**EXISTING TYPICAL SECTION**

STA 208+06 TO STA 413+98



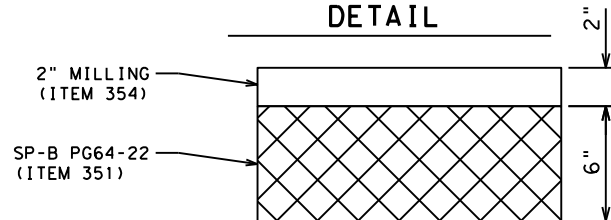
**PROPOSED TYPICAL SECTION**

STA 208+06 TO STA 413+98

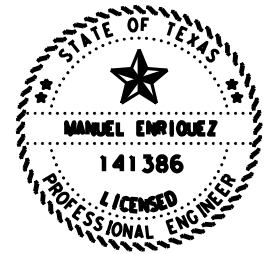
**NOTES:**

1. 2" OVERLAY SP-C (SAC-B) PG (64-22) 24' WIDE (ITEM 3077)
2. PAVEMENT CROSS SLOPES SHALL MATCH EXISTING CROSS SLOPE UNLESS OTHERWISE NOTED
3. LOCATIONS OF FLEXIBLE PAVEMENT REPAIR WILL BE DETERMINED BY ENGINEER IN THE FIELD.
4. \* RANGES OF BACKFILLING PAVEMENT EDGES WILL BE DETERMINED BY ENGINEER IN THE FIELD.

**FLEXIBLE PAVEMENT STRUCTURAL REPAIR DETAIL**



1. MILL AND REMOVE 0"-2" OF EXISTING ASPHALT (ITEM 354)
2. REPAIR VARIOUS PAVEMENT AREAS AT FULL LANE WIDTHS AS IDENTIFIED BY THE ENGINEER. (ITEM 351)
3. APPLY TACK COAT (ITEM 3077)
4. PLACE 2" SP-C SAC-B PG64-22 (ITEM 3077)
5. PGL WILL MATCH EXISTING



*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date



**FM 548  
 TYPICAL SECTION**

SCALE: N.T.S.		SHEET 1 OF 1	
DESIGN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US	175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY
VD	TEXAS	DAL	KAUFMAN, ETC.
CHECK	CONTROL	SECTION	JOB
ME	FR	0197	04
CHECK			084, ETC.
			5

**SPECIFICATION DATA**

Table 1: Basis of Estimate for Permanent Construction					
Item	Description	Thickness	Rate		Quantity
161	Compost Manufactured Topsoil	4"	See Specifications		2,295 SY
164	Drill Seed (Perm) (R) (C)	N/A	See Specifications		2,295 SY
164	Broadcast Seed (Perm) (R) (C/S)	N/A	See Specifications		7931 SY
166 *	Fertilizer (12-6-6)	N/A	500	Lbs./Ac	0.45 Ton
168	Vegetative Watering (Warm)**	N/A	12	MG/Ac/Day	1638.5 MG
3077	SP-C MIXES	See Plans	110	Lbs./SY/In	6,041 Ton
3077	Tack Coat (Undiluted Application Rate)	Milled HMA	0.11	Gal/SY	6,041 Gal
*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					

Table 2: Basis of Estimate for Temporary Erosion Control Items					
Item	Description	Rate		Quantity	
164	Broadcast Seed (Temp) (Warm or Cool)	See Specifications		7931 SY	
166 *	Fertilizer (12-6-6)	N/A	500	Lbs./Ac	.45 Ton
168	Vegetative Watering (Warm)**	12	MG/Ac/Day		1297.5 MG
*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 2.114 acres, which includes 1.64 acres on US 175, and .47 acre on FM 548. 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.

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

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

Lane Selman, P.E. Lane.Selman@txdot.gov  
 Nicholas Wadlington, P.E. Nicholas.Wadlington@txdot.gov

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

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

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

The Letting Pre-Bid Q&A web page for each project can be accessed by using the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the

County: Kaufman

Highway: US 175

controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

**Item 5:**

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.

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.

**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.

Nighttime work is allowed in accordance with Article 8.3.3

Meet weekly with the engineer to notify him or her of planned work for the upcoming week.

Provide the engineer with a daily work schedule of planned work.

**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.

County: Kaufman

Highway: US 175

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 160:**

Sequence construction operations to salvage topsoil from one location and spread on areas ready to receive topsoil. Keep stockpiling of topsoil to a minimum.

Use fertile clay or loam from the project site not more than six inches below natural grade as topsoil.

**Item 161:**

Provide tickets representing quantity of compost delivered to site.

**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.

**Items 305 and 354**

Take possession of recycled asphalt pavement from the project and recycle the material.

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 planning 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

**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.

County: Kaufman

Highway: US 175

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

**Item 354:**

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.

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.

**Item 421:**

Furnish mix designs to the Engineer in a format compatible to the latest version of the Department's Construction Management System (Site Manager). Mix Design templates will be provided by the Engineer.

Strength evaluation using maturity testing, Tex-426-A, may be used for all concrete elements except drilled shafts and mass concrete pours.

Supply the Engineer with a list of certified personnel and copies of their current ACI certificates before beginning production and when personnel changes are made. Supply hard copies of calibration reports for testing equipment when required by the Engineer.

**Item 500:**

Material On Hand (MOH) will not be used in calculating partial payments for Mobilization.

**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.

County: Kaufman

Highway: US 175

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 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.

The Contractor may begin closing 1 Lane of the *EBML & WBML's* at 9:00 AM. The Contractor all the *EBML & WBML's* open by 3:30 PM. Full Freeway closures are not allowed unless otherwise approved in writing by the Engineer.

Traffic Control Plans with Lane Closures causing backups of 20 minutes or greater in duration will be modified by the Engineer up to and including removal of the lane closure and adjustment of lane closure times

Work in other areas of the project is not restricted to this time frame.

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

**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.



County: Kaufman

Highway: US 175

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 540:**

Furnish one type of post throughout the project except as specifically noted in the plans.

**Item 542:**

Remove and dispose metal beam guard fence from this project. The work involved in hauling this material will not be paid for directly but will be considered subsidiary to this item.

**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 662 and 672:**

Non-removable markings with an anticipated use of less than 12 months may be paint and beads.

Place flexible reflective roadway tabs in accordance with TCP (7-1)-13 prior to seal coat operations. Place tabs to indicate the beginning and ending of no passing zones.

Place work zone tabs before sundown on all roadway surfaces sealed during a workday.

Cut, remove, and properly dispose of the upright portions of all work zone tabs prior to acceptance of any roadway. Remove entire tab when located on concrete surfaces.

No section of highway included in this contract will be without standard pavement markings for a period longer than 14 calendar days.

Black adhesive will be used on asphalt pavements and white adhesive will be used on concrete pavements.

County: Kaufman

Highway: US 175

**Item 666:**

Dispose of all paint waste in accordance with EPA and Texas Commission on Environmental Quality (TCEQ) rules and regulations or as directed. Furnishing cleaning agents and disposal of paint waste is subsidiary to this item.

Place pavement markings according to the "Texas Manual on Uniform Traffic Control Devices" and the applicable plan sheets

No contract stripe will be placed unless the striping inspector is present and at least 24 hours advance notice has been given by the Contractor.

Lay out pilot lines for approval 24 hours prior to all final pavement marking applications.

Use equipment with footage counters capable of measuring the linear footage placed. Calibrate counters prior to the beginning of striping operations.

Use a double-drop bead system with an application rate of 7.0 lbs/gal Type II and 7.0 lbs/gal Type III beads. Apply the Type II beads before applying Type III beads. Use a gravity flow applicator to funnel beads onto the stripe. Reduce truck speed enough to ensure that the beads drop onto the stripe and do not roll in the paint film.

Apply all stripes in one coat.

A portable retroreflectometer may be used in accordance to the specifications for this project if total quantity of striping is less than 200,000 linear foot.

Due to problems in traffic handling, do not place a dash center stripe and edge line at the same time.

Remove all Type Y-2 tabs within the limits to be striped immediately prior to the placement of permanent pavement markings.

**Item 730:**

At the discretion of the Engineer, mow non-paved areas within the project prior to placement of permanent vegetation. Mow ONE (1) cycle per growing season.

**Item 644:**

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 sign posts and/or sign support towers, obtain verification of all proposed locations.

County: Kaufman

Highway: US 175

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

**Item 3077:**

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

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

Furnish a weight ticket for each load to the Engineer at the lay-down operation. When directed, weigh furnished loads on certified public scales to verify ticket accuracy.

**Item 6185:**

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 1 Series	Scenario	Required TMA/TA
(1-1)-18		1
(1-5)-18		1
(1-6)-18		1

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

TCP 3 Series	Scenario			Required TMA/TA
(3-1)-13	All			2
(3-2)-13	All			3
(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.

**Item 6350:**

Software shall include the ability to notify TXDOT when a knock down occurs to the product.



# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0197-04-084

DISTRICT Dallas  
HIGHWAY FM 548, US 175

COUNTY Kaufman, Rockwall

CONTROL SECTION JOB				0197-04-084		2588-01-021		2588-02-011		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00190739		A00129548		A00183546			
COUNTY				Kaufman		Kaufman		Rockwall			
HIGHWAY				US 175		FM 548		FM 548			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	3077-6075	TACK COAT	GAL			5,217.000		824.000		6,041.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000		2.000				4.000	
	6185-6002	TMA (STATIONARY)	DAY	43.000		56.000		12.000		111.000	
	6185-6003	TMA (MOBILE OPERATION)	HR			60.000		20.000		80.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	15.000						15.000	
	6350-6001	LEAD LED CHEVRON	EA	4.000						4.000	
	6350-6002	LED CHEVRON	EA	46.000						46.000	
	08	CONTRACTOR FORCE ACCOUNT LAW ENFORCEMENT (NON-PARTICIPATING)	LS			1.000				1.000	
		CONTRACTOR FORCE ACCOUNT SAFETY CONTINGENCY (NON-PARTICIPATING)	LS			1.000				1.000	
		CONTRACTOR FORCE ACCOUNT EROSION CONTROL MAINTENANCE (NON-PARTICIPATING)	LS			1.000				1.000	



# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0197-04-084

DISTRICT Dallas  
HIGHWAY FM 548, US 175

COUNTY Kaufman, Rockwall

CONTROL SECTION JOB				0197-04-084		2588-01-021		2588-02-011		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00190739		A00129548		A00183546			
COUNTY				Kaufman		Kaufman		Rockwall			
HIGHWAY				US 175		FM 548		FM 548			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	134-6004	BACKFILL (TY A OR B)	STA			18.000		3.000		21.000	
	161-6017	COMPOST MANUF TOPSOIL (4")	SY			2,295.000				2,295.000	
	164-6003	BROADCAST SEED (PERM) (RURAL) (CLAY)	SY	8,721.000						8,721.000	
	164-6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY			2,295.000				2,295.000	
	164-6071	BROADCAST SEED (TEMP)(WARM OR COOL)	SY	8,712.000						8,712.000	
	168-6001	VEGETATIVE WATERING	MG	2,595.000		341.000				2,936.000	
	351-6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR(6")	SY			14,300.000		2,300.000		16,600.000	
	354-6002	PLAN & TEXT ASPH CONC PAV(0" TO 2")	SY			47,421.000		7,491.000		54,912.000	
	500-6001	MOBILIZATION	LS	0.100		0.770		0.130		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	3.000		4.000				7.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	53.000		1,229.000		105.000		1,387.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	53.000		1,229.000		105.000		1,387.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	252.000		882.000		126.000		1,260.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	22.000		882.000		126.000		1,030.000	
	533-6002	RUMBLE STRIPS (CENTERLINE)	LF			17,783.000		2,809.000		20,592.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF			200.000				200.000	
	540-6035	MTL BM GD FEN TRANS (31"-28")	EA			4.000				4.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF			200.000				200.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA			4.000				4.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA			4.000				4.000	
	644-6027	IN SM RD SN SUP&AM TYS80(1)SA(P)	EA	49.000						49.000	
	644-6066	IN SM RD SN SUP&AM (RAIL MOUNT)	EA	1.000						1.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	36.000						36.000	
	658-6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA			4.000				4.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA			9.000				9.000	
	658-6109	INSTL OM ASSM (OM-2Z)(WFLX)SRF(BI)	EA			12.000		4.000		16.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA			2,371.000		375.000		2,746.000	
	666-6170	REFL PAV MRK TY II (W) 4" (SLD)	LF			71,132.000		11,020.000		82,152.000	
	666-6205	REFL PAV MRK TY II (Y) 4" (BRK)	LF			61,674.000		18,040.000		79,714.000	
	666-6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF			21,126.000		3,392.000		24,518.000	
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF			2,290.000		570.000		2,860.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF			14,668.000		2,276.000		16,944.000	
	666-6342	REF PROF PAV MRK TY I(W)4"(SLD)(100MIL)	LF			30,837.000		9,020.000		39,857.000	
	666-6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF			3,762.000		1,000.000		4,762.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA			320.000		50.000		370.000	
	730-6107	FULL - WIDTH MOWING	CYC			1.000				1.000	
	3077-6013	SP MIXESSP-CSAC-B PG64-22	TON			5,217.000		824.000		6,041.000	

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DW: CK: DW: CK: CK:


SUMMARY OF SIGNING ITEMS					
LOCATION	644	644	6350	6350	644
	6027	6076	6001	6002	6066
	IN SM RD SN SUP&AM TYS80(1)SA(P)	REMOVE SM RD SN SUP&AM	LEAD LED CHEVRON	LED CHEVRON	IN SM RD SN SUP&AM (RAIL MOUNT)
	EA	EA	EA	EA	EA
CCSJ: 0197-04-084					
100+00 TO 112+00	2	5	1	1	
112+00 TO 124+00	10	12		10	
124+00 TO 136+00	13	12	1	15	1
136+00 TO 148+00					
148+00 TO 160+00					
160+00 TO 172+00	15	3	1	14	
172+00 TO 181+00	10	4	1	10	
PROJECT TOTALS	49	36	4	46	1

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS			
LOCATION	6001	6185	6185
	6002	6002	6005
	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)
	EA	DAY	DAY
CCSJ 0197-04-084			
100+00 TO 181+00	2	43	15

SUMMARY OF EROSION CONTROL ITEMS								
LOCATION	164	164	166	168	506	506	506	506
	6003	6071	6002	6001	6038	6039	6041	6043
	BROADCAST SEED (PERM) (RURAL) (CLAY)	BROADCAST SEED (TEMP)(WARM OR COOL)	FERTILIZER *	VEGETATIVE WATERING	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (12")	BIODEG EROSN CONT LOGS (REMOVE)
	SY	SY	TON	MG	LF	LF	LF	LF
CCSJ: 0197-04-084								
100+00 TO 112+00	336	336	0.03	100	50	50		
112+00 TO 124+00	1560	1560	0.16	464			180	180
124+00 TO 136+00	2440	2440	0.25	726			60	60
136+00 TO 148+00								
148+00 TO 160+00								
160+00 TO 172+00	2459	2459	0.25	732				
172+00 TO 181+00	1927	1927	0.20	573				
ADDITIONAL 5% *					3	3	12	12
PROJECT TOTALS	8721	8721	0.90	2595	53	53	252	252

\* FOR CONTRACTORS INFORMATION ONLY

\* 5% INCREASE FOR SW3P QUANTIES TO ACCOUNT FOR REPLACEMENT DUE TO NORMAL WEAR OR CHANGING SITE CONDITIONS.



US 175, ETC.  
QUANTITY SUMMARY

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
0197	04	084,ETC.	US 175,ETC
DIST	COUNTY	SHEET NO.	
DAL	KAUFMAN,ETC.	8	

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SUMMARY OF ROADWAY ITEMS									
LOCATION		LENGTH	WIDTH	AREA	134	351	354	3077	3077
					6004	6002	6002	6013	6075
STA.	STA.	FT	FT	SY	BACKFILL (TY A OR B)	FLEXIBLE PAVEMENT STRUCTURE REPAIR (6")	PLAN & TEXT ASPH CONC PAV (0" TO 2")	SP MIXES SP-C SAC-B PG64-22	TACK COAT
CSJ: 2588-01-021									
208+06.00	385+89.00	17783.00	24	47421	18	14300	47421	5217	5217
CSJ: 2588-01-021 TOTALS									
CSJ: 2588-02-111									
385+89.00	413+98.00	2809.00	24	7491	3	2300	7491	824	824
CSJ: 2588-02-011 TOTALS									
<b>PROJECT TOTALS:</b>					21	16600	54912	6041	6041

RATES:  
 3077-6013: SP MIXES SP-C SAC-B PG64-22= 110 LBS/INCH/SY  
 3077-6075: TACK COAT= 0.11 GAL/SY

SUMMARY OF CULVERT ITEMS		
STATION	DESCRIPTION	658
		6109
		INSTL OM ASSM (OM-22) (W FLX) SRF (BI)
		EA
<b>CSJ: 2588-01-021</b>		
209+50	3- 9' X 8' X 38' RC BOX CULVERT	4
253+20	2- 54" X 75" RC PIPE	2
290+00	4- 10' X 10' X 38' RC BOX CULVERT	4
357+00	1- 6' X 3' X 35' RC BOX CULVERT	2
CSJ: 2588-01-021 TOTALS		12
<b>CSJ: 2588-02-011</b>		
400+70	2- 10' X 9' X 38' RC BOX CULVERT	4
CSJ: 2588-02-011 TOTALS		4
<b>PROJECT TOTALS:</b>		16

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS					
LOCATION		662	6001	6185	6185
		6111	6002	6002	6003
STA.	STA.	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)
CSJ: 2588-01-021		EA	EA	DAY	HR
208+06.00	385+89.00	2371	2	56	60
CSJ: 2588-02-011					
385+89.00	413+98.00	375		12	20
<b>PROJECT TOTALS:</b>		<b>2746</b>	<b>2</b>	<b>68</b>	<b>80</b>

SUMMARY OF MGF ITEMS									
LOCATION		STATION	540	540	542	544	544	658	658
			6001	6035	6001	6001	6003	6014	6062
			MTL W-BEAM GD FEN (TIM POST)	MTL BM GD FEN TRANS (31"-28")	REMOVE METAL BEAM GUARD FENCE	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	INSTL DEL ASSM (D-SW) SZ (BRF) CTB (BI)	INSTL DEL ASSM (D-SW) SZ (BRF) GF (BI)
			LF	EA	LF	EA	EA	EA	EA
(BIG BRUSHY CREEK)		296+51 TO 297+44 (LT)	50	1	50	1	1	2	2
		296+65 TO 297+44 (RT)	25	1	25	1	1	2	2
		299+04 TO 300+46 (LT)	75	1	75	1	1		3
		299+04 TO 299+96 (RT)	50	1	50	1	1		2
<b>PROJECT TOTALS:</b>			200	4	200	4	4	4	9



## FM 548 QUANTITY SUMMARY

SHEET 2 OF 3

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
VD	TEXAS	DAL	KAUFMAN, ETC.	9
CHECK	ME	CONTROL	SECTION	
CHECK	FR	0197	04	
			084, ETC.	

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SUMMARY OF PAVEMENT MARKING ITEMS											
LOCATION		LENGTH	533	666	666	666	666	666	666	666	672
			6002	6170	6205	6207	6312	6315	6342	6343	6009
STA.	STA.	FT	RUMBLE STRIPS (CENTERLINE)	REFL PAV MRK TY II (W) 4" (SLD)	REFL PAV MRK TY II (Y) 4" (BRK)	REFL PAV MRK TY II (Y) 4" (SLD)	RE PM W/RET REQ TY I (Y)4"(BRK) (100MIL)	RE PM W/RET REQ TY I (Y)4"(SLD) (100MIL)	REF PROF PAV MRK TY I(W)4"(SLD) (100MIL)	REF PROF PAV MRK TY I(W)6"(SLD) (100MIL)	REFL PAV MRKR TY II-A-A
LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	EA	
CSJ: 2588-01-021											
208+06.00	210+35.00	229.00	229	916	916	916	0	458	458		6
210+35.00	225+75.00	1540.00	1540	6160	5852	0	390	0	2926		20
225+75.00	235+25.00	950.00	950	3800	3800	1900	240	1900	1900		24
235+25.00	241+05.00	580.00	580	2320	2320	2320	0	1160	1160		15
241+05.00	251+60.00	1055.00	1055	4220	4220	4220	260	2110	2110		27
251+60.00	252+50.00	90.00	90	360	360	0	0	0	180		2
252+50.00	261+60.00	910.00	910	3640	3456	1820	230	1820	1728		23
261+60.00	263+95.00	235.00	235	940	940	0	60	0	470		3
263+95.00	273+50.00	955.00	955	3820	3820	1910	240	1910	1910		24
273+50.00	337+15.00	6365.00	6365	25460	25280	0	0	0	12640		80
337+15.00	344+70.00	755.00	755	3020	1254	1510	190	1510	627	725	19
344+70.00	358+35.00	1365.00	1365	5460	0	5460	0	2730	0	2730	35
358+35.00	363+70.00	535.00	535	2140	580	1070	130	1070	290	307	14
363+70.00	385+89.00	2219.00	2219	8876	8876	0	550	0	4438		28
CSJ: 2588-01-021 TOTALS			17783	71132	61674	21126	2290	14668	30837	3762	320
CSJ: 2588-02-011											
385+89.00	402+60.00	1671.00	1671	6468	12936	0	420	0	6468		21
402+60.00	408+40.00	580.00	580	2320	4640	1160	150	1160	2320		15
408+40.00	413+98.00	558.00	558	2232	464	2232	0	1116	232	1000	14
CSJ: 2588-02-011 TOTALS			2809	11020	18040	3392	570	2276	9020	1000	50
<b>PROJECT TOTALS:</b>			<b>20592</b>	<b>82152</b>	<b>79714</b>	<b>24518</b>	<b>2860</b>	<b>16944</b>	<b>39857</b>	<b>4762</b>	<b>370</b>

SUMMARY OF EROSION CONTROL ITEMS								
LOCATION	161	164	168	506	506	506	506	730
	6017	6035	6001	6038	6039	6041	6043	6107
	COMPOST MANUF TOPSOIL (4")	DRILL SEEDING (PERM) (RURAL) (CLAY)	VEGETATIVE WATERING	TEMP SEDMT CONT FENCE (INSTALL) *	TEMP SEDMT CONT FENCE (REMOVE) *	BIODEG EROSN CONT LOGS (INSTR) (12") *	BIODEG EROSN CONT LOGS (REMOVE) *	FULL - WIDTH MOWING **
	SY	SY	MG	LF	LF	LF	LF	CYC
CSJ: 2588-01-021								
209+50						180	180	
253+20						180	180	
277+80				500	500	120	120	
290+00				100	100	120	120	
297+50 TO 299+01	2295	2295	341	530	530	120	120	
357+00				40	40	120	120	
CSJ: 2588-01-021 TOTAL:	2295	2295	341	1229	1229	882	882	1
CSJ: 2588-02-011								
400+70				100	100	120	120	
CSJ: 2588-02-011 TOTAL:	0	0	0	105	105	126	126	
PROJECT TOTALS:	2295	2295	341	1334	1334	1008	1008	1

\* 5% QUANTITY ADDED TO ACCOUNT FOR REPLACEMENT OF WORN MATERIAL.  
 \*\* FOR CONTRACTOR'S INFORMATION ONLY APPROXIMATELY 23.36 ACRES OF ROW MOWING.



## FM 548 QUANTITY SUMMARY

SHEET 3 OF 3

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	DAL	KAUFMAN, ETC.	10
ME	CONTROL	SECTION	JOB	
CHECK	FR	0197	04	084, ETC.

# SUMMARY OF SMALL SIGNS

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DATE: FILE:

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U"	
1	1	W1-8R	RIGHT LEAD LED CHEVRON	36 x 48	x		S80	1	SA	P	
	2	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P	
2	1	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	2	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	3	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	4	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	5	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	6	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	7	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	8	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	9	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	10	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P	
3	1	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	2	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	3	W1-8L	LEFT LED CHEVRON	36 x 48	x		RAIL *MOUNT	1	SA	P	
	4	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	5	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	6	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	7	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	8	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	9	W1-8L	LEFT LEAD LED CHEVRON	36 x 48	x		S80	1	SA	P	
	10	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	11	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	12	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	13	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	14	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	15	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P	
6	1	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	2	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P	
	3	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P	

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:**
- 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.
  - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
  - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

SHEET 1 OF 2



## SUMMARY OF SMALL SIGNS

### SOSS

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0197	04	084, ETC.	US 175, ETC
4-16	DIST	COUNTY	SHEET NO.	
8-16	DAL	KAUFMAN, ETC.	11	



# SUMMARY OF SMALL SIGNS

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DATE: FILE:

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED		1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels
	4	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P		
	5	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P		
	6	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P		
	7	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P		
	8	W1-8L	LEFT LEAD LED CHEVRON	36 x 48	x		S80	1	SA	P		
	9	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P		
	10	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P		
	11	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P		
	12	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P		
	13	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P		
	14	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P		
	15	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P		
7	1	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P		
	2	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P		
	3	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P		
	4	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P		
	5	W1-8R	RIGHT LED CHEVRON	36 x 48	x		S80	1	SA	P		
	6	W1-8R	RIGHT LEAD LED CHEVRON	36 x 48	x		S80	1	SA	P		
	7	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P		
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	10	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P		
	11	W1-8L	LEFT LED CHEVRON	36 x 48	x		S80	1	SA	P		

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:**
- 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.
  - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
  - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Sheet 1 of 2



## SUMMARY OF SMALL SIGNS

### SOSS

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0197	04	084, ETC.	US 175, ETC
4-16	DIST	COUNTY	SHEET NO.	
8-16	DAL	KAUFMAN, ETC.	12	

DATE: 1/3/2023 9:05:31 PM  
 FILE: pw://txdot-projectwiseonline.com/TxDOT5/Documents/18 - DAL/Design Projects/019704084/4 - Design/Plan Set/2 - TCP/TCP NARRATIVE

CK: DW: CK: DW:

**SUGGESTED SEQUENCE OF WORK**

**PHASE - INSTALL/REMOVE SIGNS**

1. ERECT PROJECT SIGNS & ADVANCE WARNING SIGNS IN ACCORDANCE WITH ALL APPLICABLE STANDARDS OR AS DIRECTED BY ENGINEER.
2. PLACE SW3P DEVICES AS PER STANDARD AND AS DIRECTED BY THE ENGINEER.
3. SET UP TRAFFIC CONTROL FOR SIGN REMOVAL AND PLACEMENT OF SIGNS.
4. REMOVE EXISTING SIGNS AS CALLED OUT IN THE PLANS AND REPLACE WITH DYNAMIC LEDS SIGNS
5. SEED AS NEEDED OR AS DIRECTED BY THE ENGINEER IN ACCORDANCE WITH DALLAS DISTRICT VEGETATION ESTABLISHMENT STANDARDS.
6. REMOVE TEMPORARY SW3P CONTROLS, PERFORM PUNCHLIST, AND FINAL AS DIRECTED BY THE ENGINEER.
7. REMOVE PROJECT BARRICADES.

**TCP GENERAL NOTES**

THE CONTRACTOR WILL PROVIDE WRITTEN NOTICE TO THE ENGINEER BEFORE 1:00 PM ON THE BUSINESS DAY PRECEDING PROPOSED LANE AND SHOULDER CLOSURES. LANE CLOSURES WILL NOT BE PERMITTED WITHOUT THIS NOTIFICATION.

THE CONTRACTOR SHALL COVER OR REMOVE ANY CONFLICTING SIGNS OR PAVEMENT MARKINGS DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER AND THIS WORK SHALL BE SUBSIDIARY TO ITEM 502.

PAY ATTENTION TO OVERHEAD UTILITIES.

TEMPORARY SW3P EROSION CONTROL MEASURES SHALL ONLY BE PLACED IN AREAS WHERE SOIL DISTURBANCE OR OTHER POLLUTANT GENERATING-GENERATING ACTIVITIES ARE EXPECTED TO OCCUR WITHIN TWO WEEKS. TEMPORARY SW3P EROSION CONTROL MEASURES SHALL BE REMOVED IN EACH AREA WITHIN TWO WEEKS OF VEGETATION ESTABLISHMENT OR AS DIRECTED BY THE ENGINEER.



*Neal Campbell P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date



US 175, ETC.  
 TCP NARRATIVE

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0197	04	084,ETC.	US 175,ETC
DIST	COUNTY	SHEET NO.	
DAL	KAUFMAN,ETC.	13	

SUGGESTED SEQUENCE OF WORK

PHASE I

1. ERECT PROJECT SIGNS & ADVANCE WARNING SIGNS IN ACCORDANCE WITH ALL APPLICABLE STANDARDS OR AS DIRECTED BY ENGINEER.
2. PLACE SW3P DEVICES AS PER STANDARD AND DIRECTED BY ENGINEER.

PHASE II

1. SET TRAFFIC CONTROL FOR BASE REPAIR AND MILLING/OVERLAYING EXISTING PAVEMENT IN ACCORDANCE WITH TCP (2-2) & TCP (7-1).
2. PERFORM 0"-2" MILLING OPERATIONS THEN BASE REPAIR OPERATIONS TO FOLLOW.
3. PREFORM 2" OVERLAY AS SPECIFIED IN THE TYPICAL SECTIONS.  
APPLY TACK COAT BEFORE PLACING SUPERPAVE.  
FLAGGERS SHALL BE USED FOR ONE-LANE TWO WAY TRAFFIC CONTROL.  
BOTH LANES SHALL BE OPENED AT THE END OF EACH WORKDAY.
4. PLACE TABS FOR TEMPORARY STRIPING IN ACCORDANCE WITH WZ(STPM).  
INSTALL PERMANENT PAVEMENT MARKINGS AND RUMBLE STRIPS  
WITHIN 14 DAYS AFTER PLACING OVERLAY IN ACCORDANCE WITH TCP 3-1 & TCP 3-3.
5. REMOVE EXISTING MBGF STRUCTURES NOT DESIGNATED TO REMAIN IN PLACE  
AND INSTALL NEW MBGF/SGT STRUCTURES AT PROPOSED LOCATIONS.
6. PLACE BACKFILL ALONG PAVEMENT EDGES WHERE DEEMED NECESSARY BY ENGINEER  
IN ACCORDANCE WITH TCP (2-2).

PHASE III

1. SEED ALL DISTURBED AREAS AS DIRECTED BY THE ENGINEER AND IN ACCORDANCE WITH WITH TCP (2-2) AND DALLAS DISTRICT VEGETATION ESTABLISHMENT STANDARDS.
2. TEMPORARY SW3P EROSION CONTROL MEASURES SHALL BE REMOVED IN EACH AREA WITH IN TWO WEEKS OF VEGETATION ESTABLISHMENT OR AS APPROVED BY THE ENGINEER.
3. PERFORM FINAL CLEANUP AS DIRECTED BY ENGINEER.

TCP GENERAL NOTES

OVERNIGHT LANE CLOSURES WILL NOT BE PERMITTED.

LIMIT THE LENGTH OF DAILY WORK TO THAT AREA OF OPERATION THAT CAN BE COMPLETED IN ONE WORK DAY IN ORDER TO ALLOW FOR TWO-WAY TRAFFIC AT NIGHT. SUCH AREAS MUST NOT EXCEED ONE (1) MILE, UNLESS APPROVED BY THE ENGINEER. WITHIN THE 1 MILE SECTION, ONLY CLOSE OFF THE AREA WHERE ACTUAL WORK IS BEING PERFORMED.

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

PAVEMENT EDGE DROP-OFFS WILL NOT BE ALLOWED TO REMAIN OVER NIGHT. AT THE END OF EACH WORKDAY ALL PAVEMENT EDGE DROP-OFFS SHALL BE BACK FILLED BY A SUITABLE MATERIAL TO FORM A STABLE 3:1 SLOPE OR FLATTER.

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.

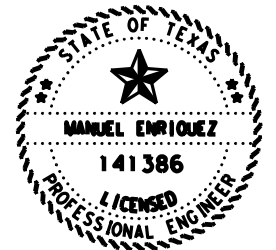
THE CONTRACTOR SHALL COVER OR REMOVE ANY CONFLICTING SIGNS OR PAVEMENT MARKINGS DURING CONSTRUCTION AS DIRECTED BY ENGINEER AND THIS WORK SHALL BE SUBSIDIARY TO ITEM 502.

THE CONTRACTOR WILL PROVIDE AND MAINTAIN SKILLED FLAGGERS EQUIPPED WITH TWO-WAY RADIOS TO HANDLE TRAFFIC THROUGH THE WORK AREAS FOR THE SAFETY AND CONVENIENCE OF THE TRAVELING PUBLIC AND CONTRACTOR PERSONNEL.

AUTOMATED FLAGGER ASSISTANCE DEVICES (AFADS) MAY BE USED AT THE CONTRACTOR'S EXPENCE. IF THE CONTRACTOR CHOOSES TO USE AFADS, TCP (1-6) SHALL BE FOLLOWED.

PAY ATTENTION TO OVERHEAD UTILITIES.

MAINTAIN DRIVEWAY AND SIDE STREET ACCESS AT ALL TIMES WITH AN ALL WEATHER SURFACE CONSISTING OF RAP OR BASE. THIS WORK IS SUBSIDIARY TO ITEM 502.



*Manuel Enriquez P.E.*, P.E. 12-20-22  
Signature of Registrant & Date



**FM 548  
TCP NARRATIVE**

SCALE: NTS			SHEET 2 OF 2	
DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	
VD	TEXAS	DAL	KAUFMAN, ETC.	
CHECK	CONTROL	SECTION	JOB	
ME	FR	0197	04	084, ETC.
				14

DATE: 1/3/2023 9:06:24 PM  
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DATE: 1/3/2023 9:06:34 PM  
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 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 manual to PDF format.  
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**BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:**

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

**WORKER SAFETY NOTES:**

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

**COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES**

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

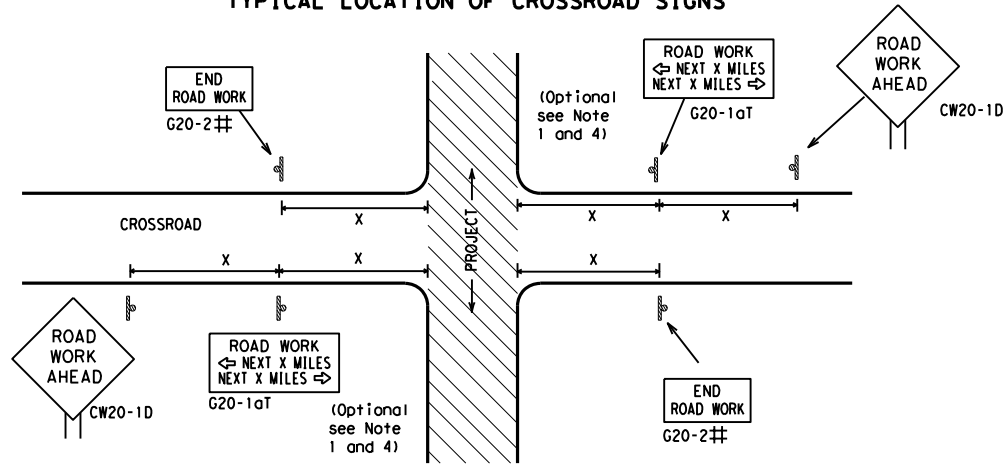
<p><b>THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT</b>  <a href="http://www.txdot.gov">http://www.txdot.gov</a></p>
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS) "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

SHEET 1 OF 12

<p><b>BARRICADE AND CONSTRUCTION          GENERAL NOTES          AND REQUIREMENTS</b></p>			
<p><b>BC (1) -21</b></p>			
FILE:	bc-21.dgn	DN:	TxDOT
© TxDOT	November 2002	CON:	SECT:
		JOB:	0197 04 084, ETC.
		DIST:	COUNTY:
REVISIONS			SHEET NO.
4-03	7-13	DAL	KAUFMAN, ETC.
9-07	8-14		15
5-10	5-21		

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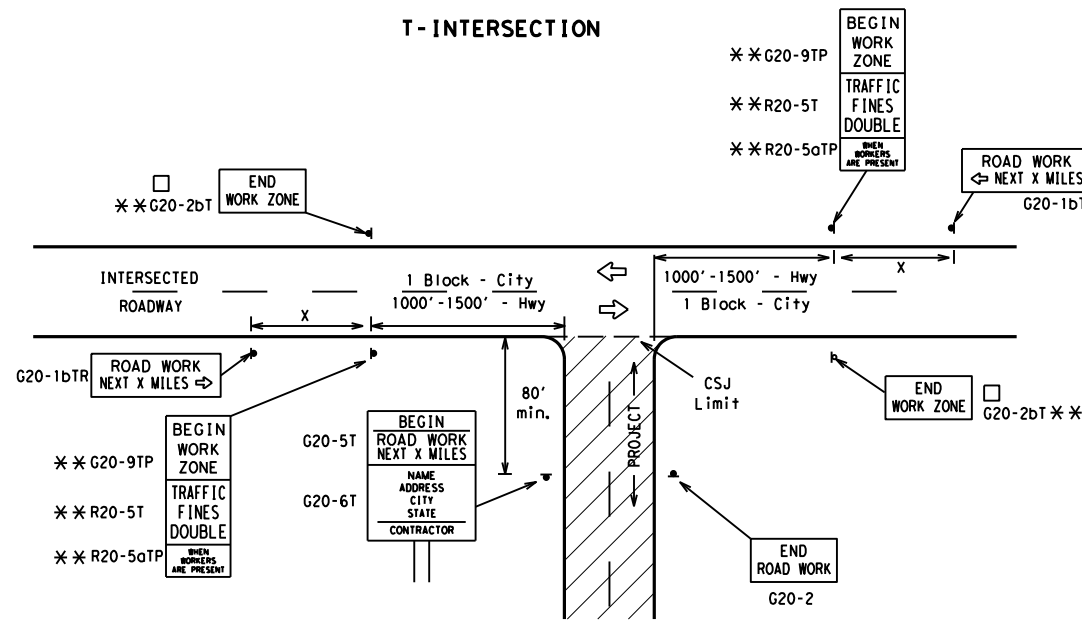
**TYPICAL LOCATION OF CROSSROAD SIGNS**



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

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

**T-INTERSECTION**



**CSJ LIMITS AT T-INTERSECTION**

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

**TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING<sup>1,5,6</sup>**

Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed MPH	Sign Δ Spacing "x" Feet (Apprx.)
CW20 <sup>4</sup>	48" x 48"	48" x 48"	30	120
CW21			35	160
CW22			40	240
CW23			45	320
CW25	36" x 36"	48" x 48"	50	400
CW1, CW2, CW7, CW8, CW9, CW11, CW14			55	500 <sup>2</sup>
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12			60	600 <sup>2</sup>
			65	700 <sup>2</sup>
			70	800 <sup>2</sup>
			75	900 <sup>2</sup>
			80	1000 <sup>2</sup>
			*	* <sup>3</sup>

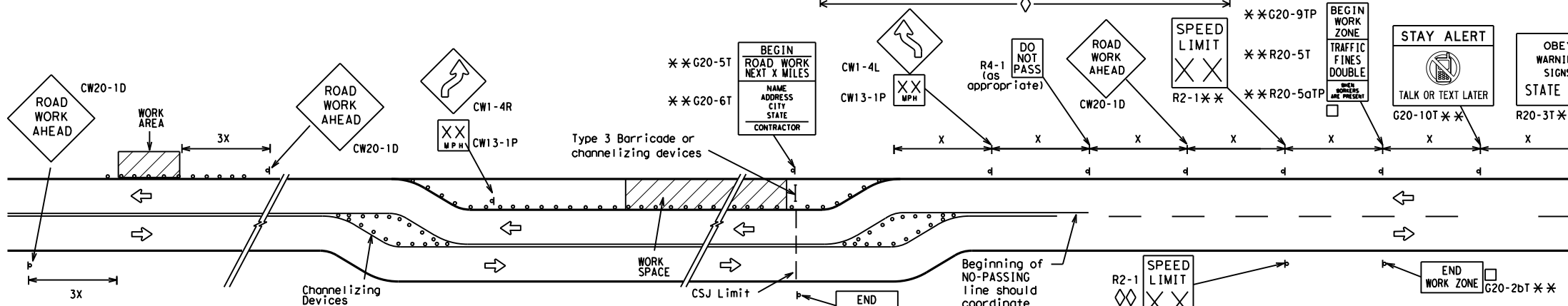
\* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

**GENERAL NOTES**

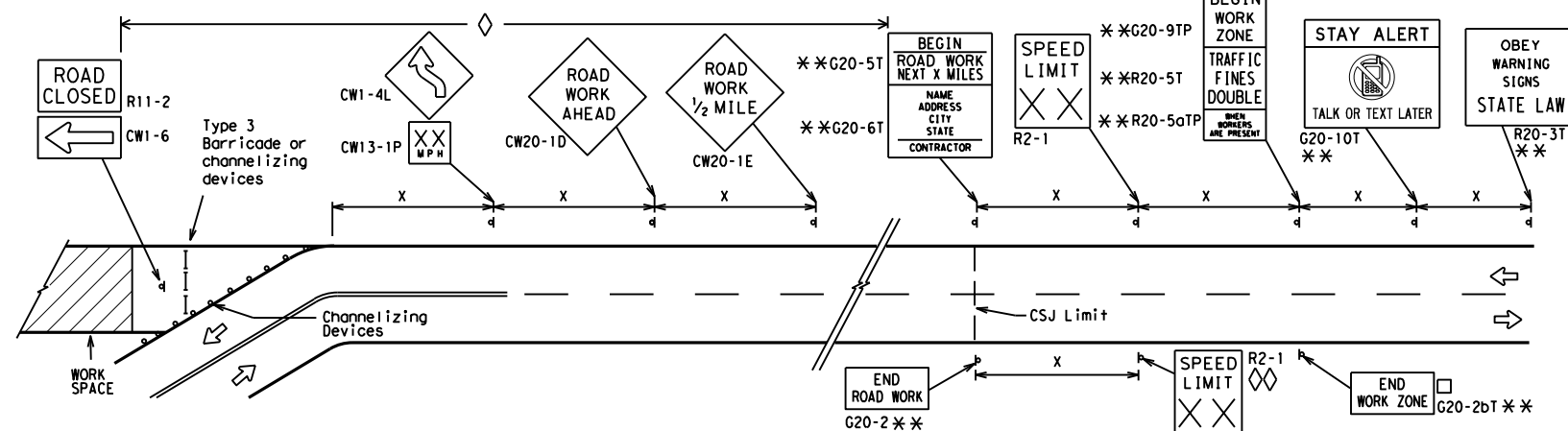
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

**WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS**



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

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



**NOTES**

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

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

SHEET 2 OF 12

Texas Department of Transportation Traffic Safety Division Standard

**BARRICADE AND CONSTRUCTION PROJECT LIMIT**

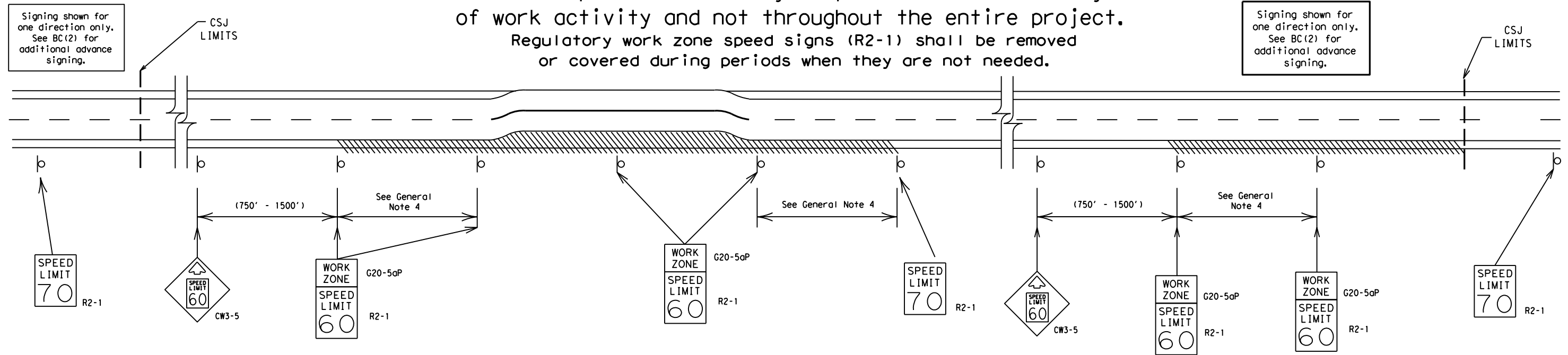
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9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	DAL	KAUFMAN, ETC.	16	

# TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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



## GUIDANCE FOR USE:

### LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

### SHORT TERM WORK ZONE SPEED LIMITS

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

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

## GENERAL NOTES

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

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

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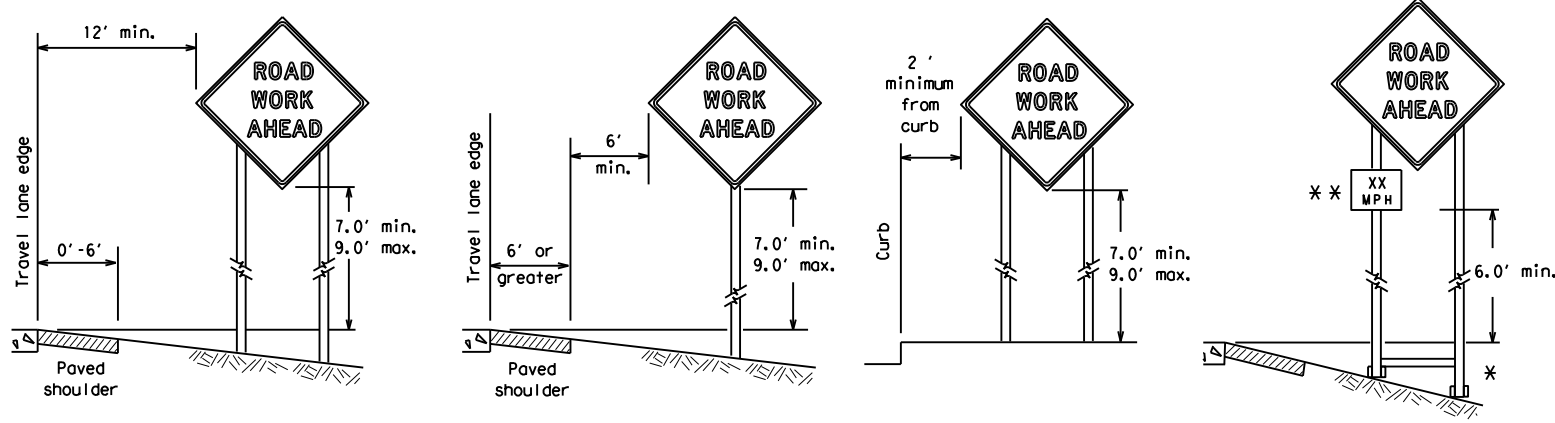
SHEET 3 OF 12

		Traffic Safety Division Standard	
<h2>BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT</h2>			
<h3>BC (3) - 21</h3>			
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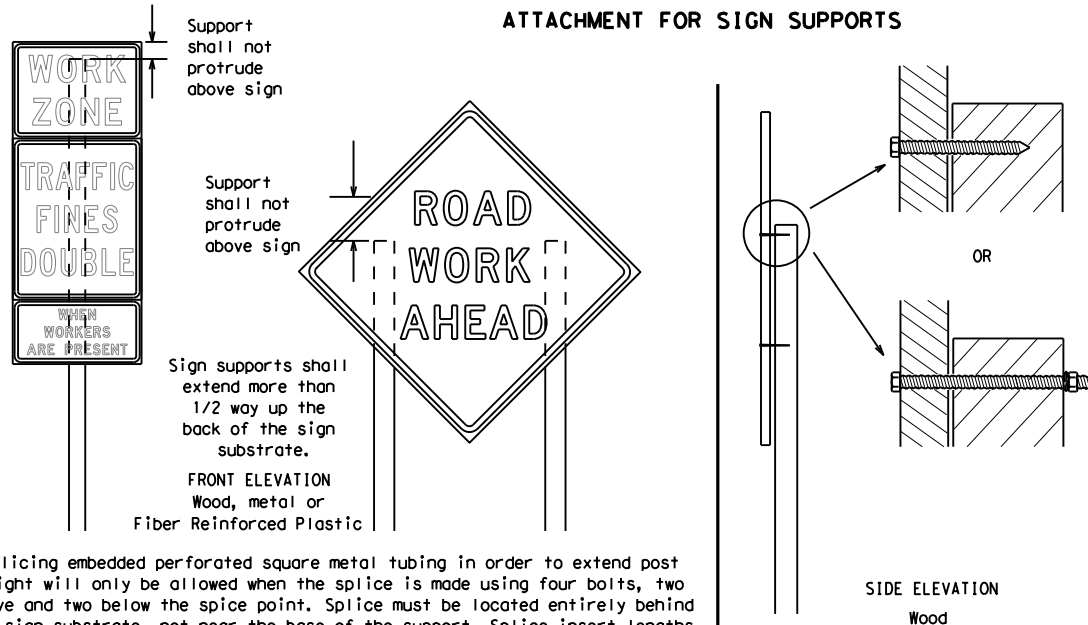
**TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS**



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

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

**ATTACHMENT FOR SIGN SUPPORTS**



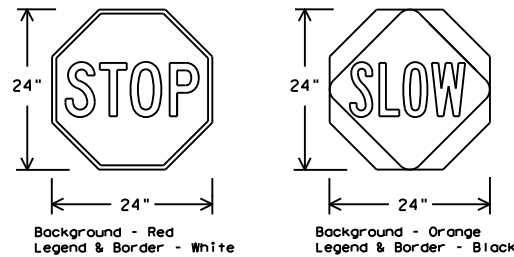
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

**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 <sub>FL</sub> OR C <sub>FL</sub> SHEETING
LEGEND & BORDER	WHITE	TYPE B OR C SHEETING
LEGEND & BORDER	BLACK	ACRYLIC NON-REFLECTIVE FILM

**CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS**

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

**GENERAL NOTES FOR WORK ZONE SIGNS**

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

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

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

**SIGN MOUNTING HEIGHT**

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

**SIZE OF SIGNS**

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

**SIGN SUBSTRATES**

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

**REFLECTIVE SHEETING**

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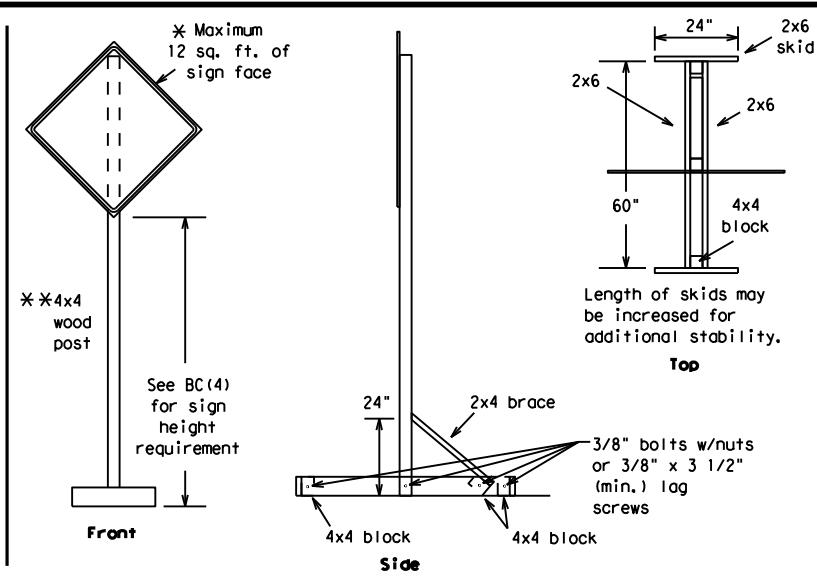
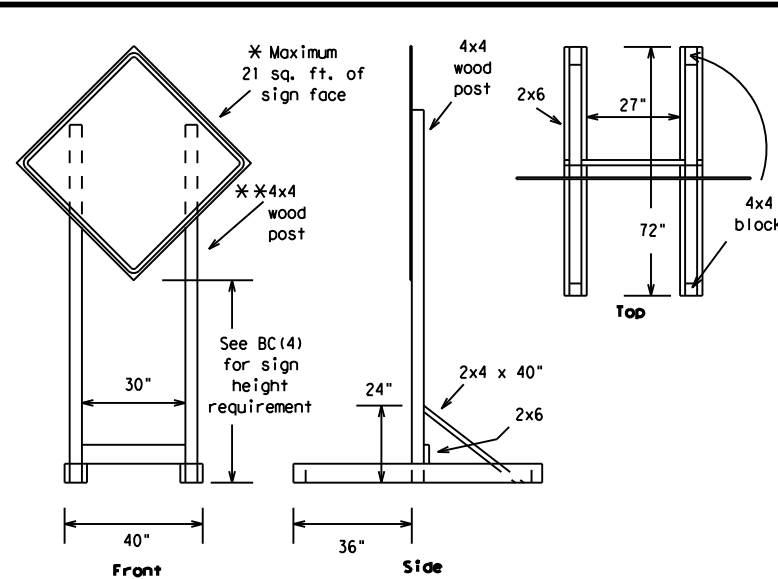


**BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES**

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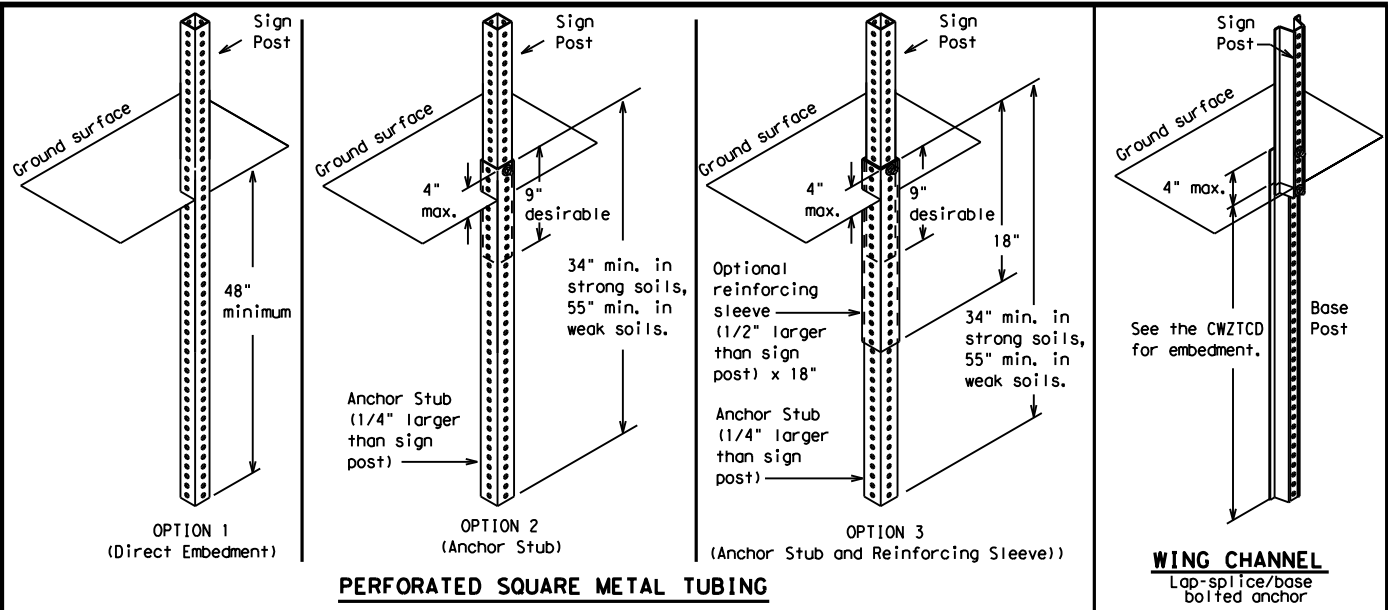
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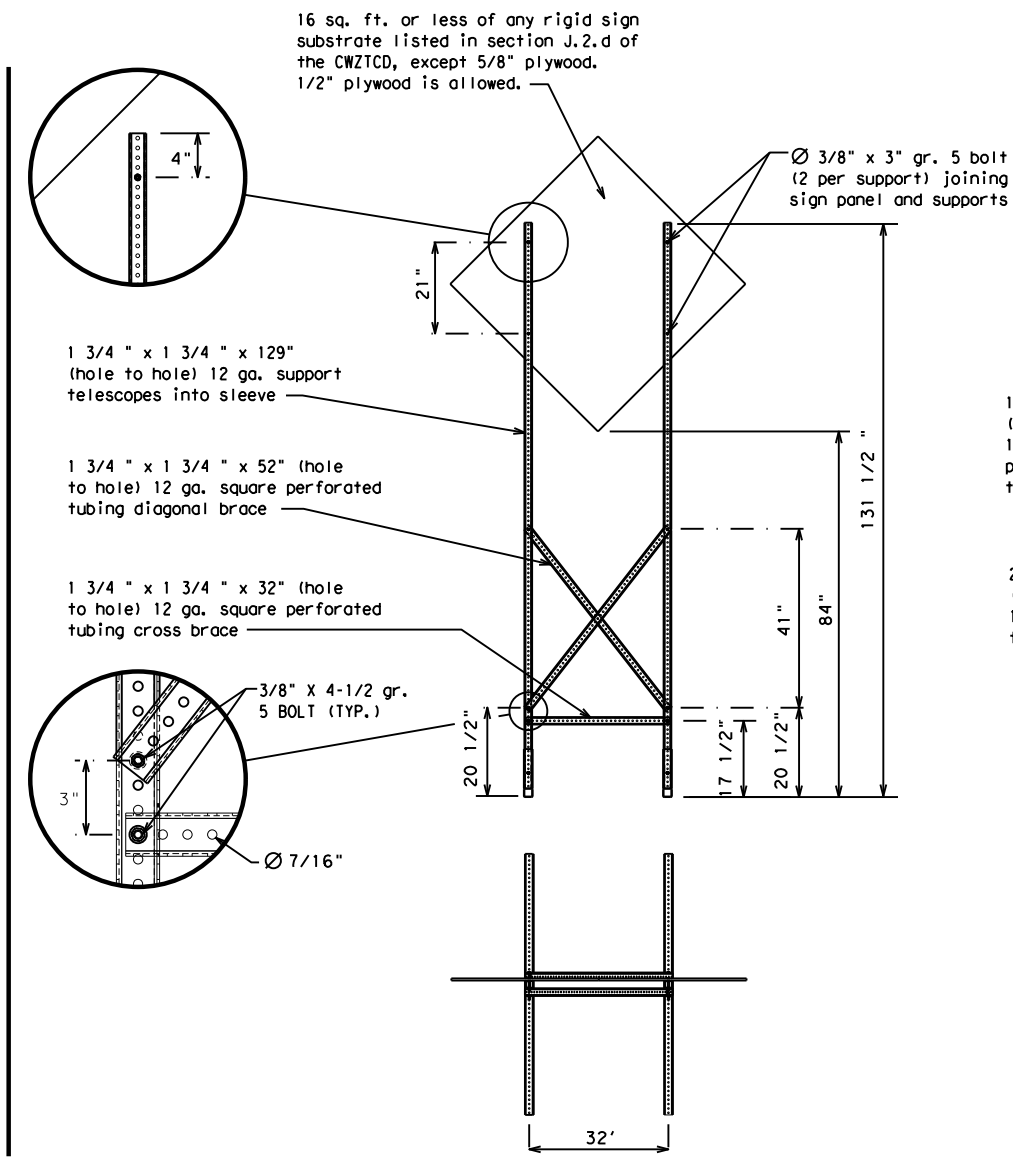
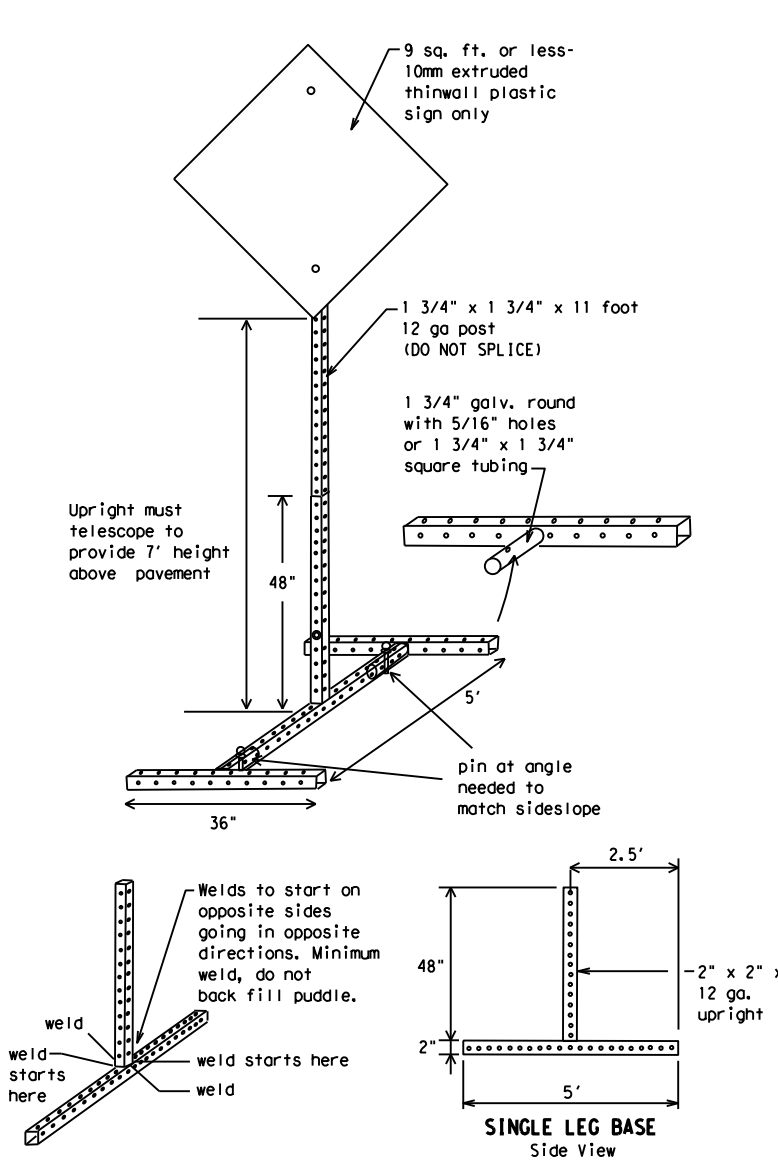
**SKID MOUNTED WOOD SIGN SUPPORTS**

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



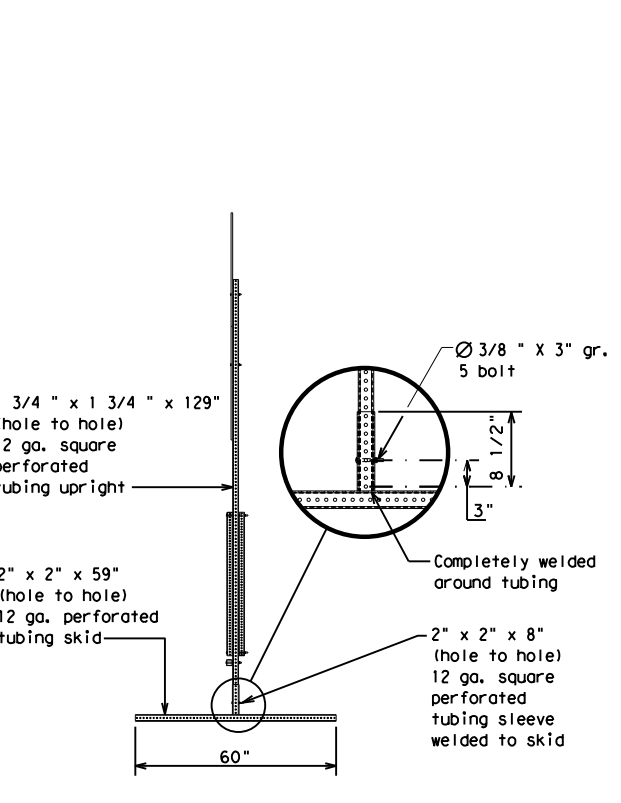
**GROUND MOUNTED SIGN SUPPORTS**

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



**SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS**

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



**WEDGE ANCHORS**

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

**OTHER DESIGNS**

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

**GENERAL NOTES**

- 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.
  - No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
  - When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.
- \* See BC(4) for definition of "Work Duration."
  - \*\* Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
  - ☐ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

SHEET 5 OF 12



**BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT**

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7-13	5-21	DAL	KAUFMAN, ETC.	19					



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

# RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

## PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

## Phase 1: Condition Lists

### Road/Lane/Ramp Closure List

FREEWAY CLOSED X MILE
ROAD CLOSED AT SH XXX
ROAD CLSD AT FM XXXX
RIGHT X LANES CLOSED
CENTER LANE CLOSED
NIGHT LANE CLOSURES
VARIOUS LANES CLOSED
EXIT CLOSED
MALL DRIVEWAY CLOSED
XXXXXXXX BLVD CLOSED

### Other Condition List

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

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

## Phase 2: Possible Component Lists

### Action to Take/Effect on Travel List

MERGE RIGHT
DETOUR NEXT X EXITS
USE EXIT XXX
STAY ON US XXX SOUTH
TRUCKS USE US XXX N
WATCH FOR TRUCKS
EXPECT DELAYS
REDUCE SPEED XXX FT
USE OTHER ROUTES
STAY IN LANE

### Location List

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

### Warning List

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

### \*\* Advance Notice List

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

\*\* See Application Guidelines Note 6.

## APPLICATION GUIDELINES

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

## WORDING ALTERNATIVES

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

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

## FULL MATRIX PCMS SIGNS

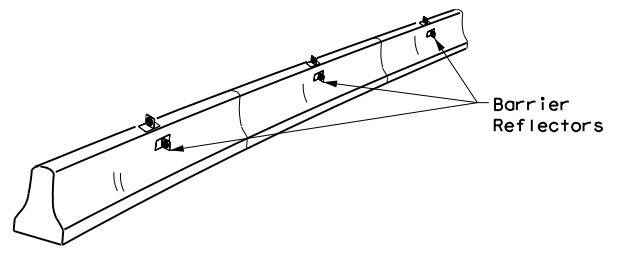
- When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
- When symbol signs, such as the "Flagger Symbol" (CW20-7) are represented graphically on the Full Matrix PCMS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

SHEET 6 OF 12

<h3>BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)</h3>			
<h2>BC (6) - 21</h2>			
FILE:	bc-21.dgn	DN:	TxDOT
© TxDOT	November 2002	CONT:	SECT:
REVISIONS	0197	04	084, ETC.
9-07	8-14	DIST:	COUNTY:
7-13	5-21	DAL	KAUFMAN, ETC.
		SHEET NO.	20

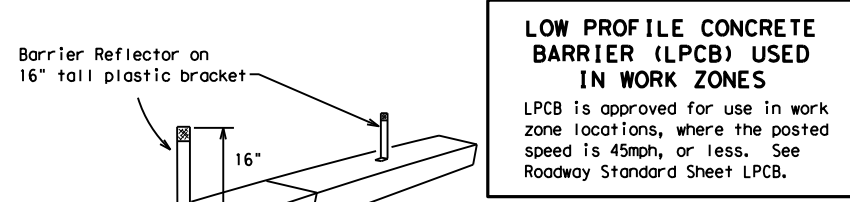
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 DATE: 1/3/2023 9:06:36 PM  
 FILE: pw://txdot.projectwiseonline.com:18 - DAL/Design Projects/258801021/4 - Design/Plan Set/8 - Traffic/STANDARDS/bc-21.dgn

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



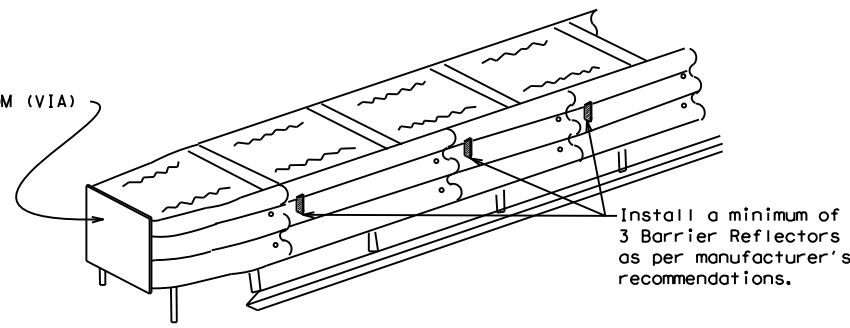
**CONCRETE TRAFFIC BARRIER (CTB)**

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



**LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES**  
 LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

**LOW PROFILE CONCRETE BARRIER (LPCB)**



**DELINEATION OF END TREATMENTS**

**END TREATMENTS FOR CTB'S USED IN WORK ZONES**  
 End treatments used on CTB's in work zones shall meet the appropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). Refer to the CWZTCD List for approved end treatments and manufacturers.

**BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS**

**WARNING LIGHTS**

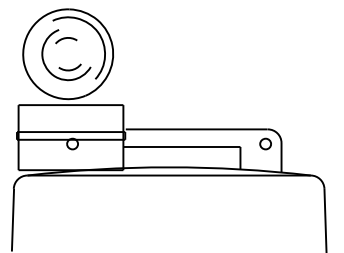
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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

**WARNING LIGHTS MOUNTED ON PLASTIC DRUMS**

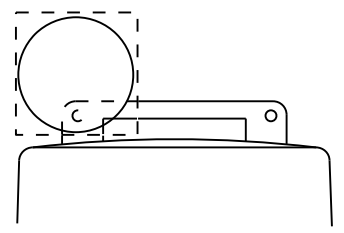
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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

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

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



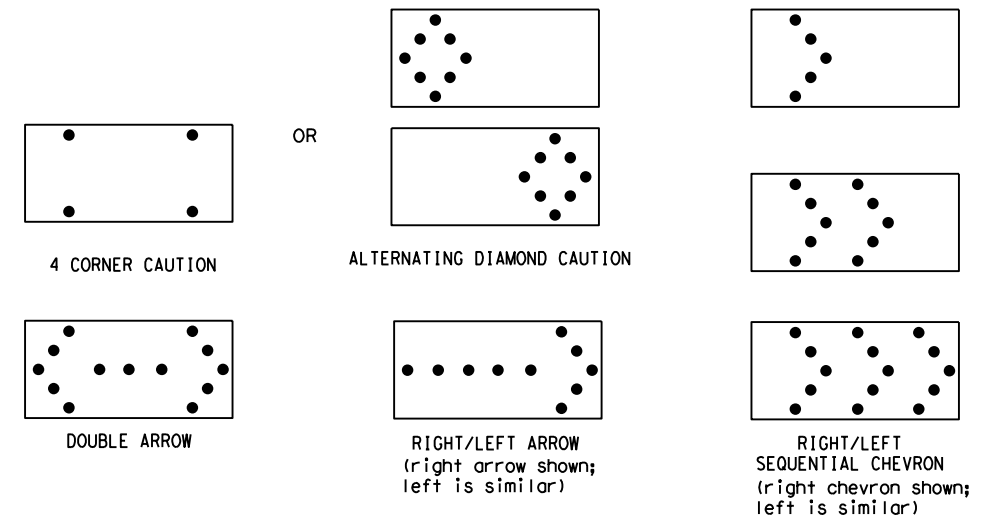
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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

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



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

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

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

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

**FLASHING ARROW BOARDS**

SHEET 7 OF 12

**TRUCK-MOUNTED ATTENUATORS**

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

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	CR:	TxDOT	OW:	TxDOT	CK:	TxDOT
©TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0197	04	084, ETC.	US	175, ETC			
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	DAL	KAUFMAN, ETC.	21					

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**GENERAL NOTES**

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

**GENERAL DESIGN REQUIREMENTS**

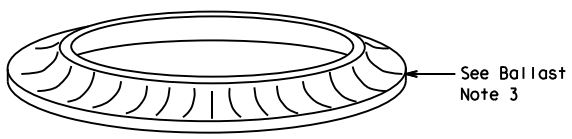
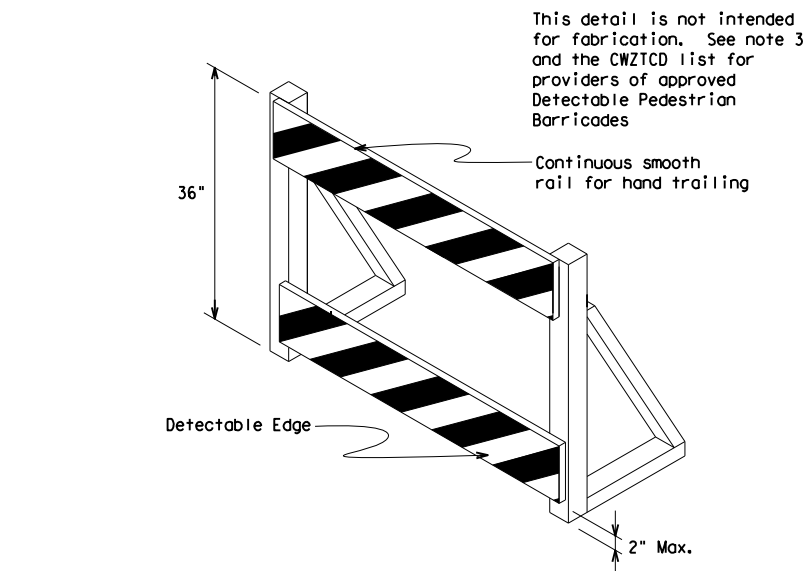
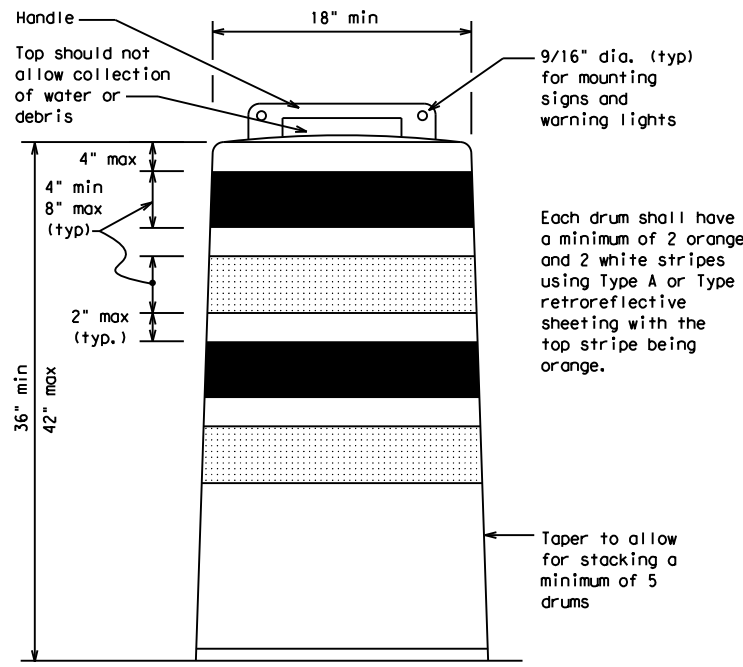
- Pre-qualified plastic drums shall meet the following requirements:
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
  - The body and base shall lock together in such a manner that the body separates from the base when impacted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

**RETROREFLECTIVE SHEETING**

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

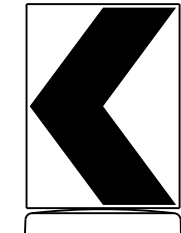
**BALLAST**

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

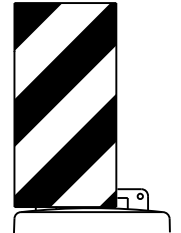


**DETECTABLE PEDESTRIAN BARRICADES**

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



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



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

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

**SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS**

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

SHEET 8 OF 12



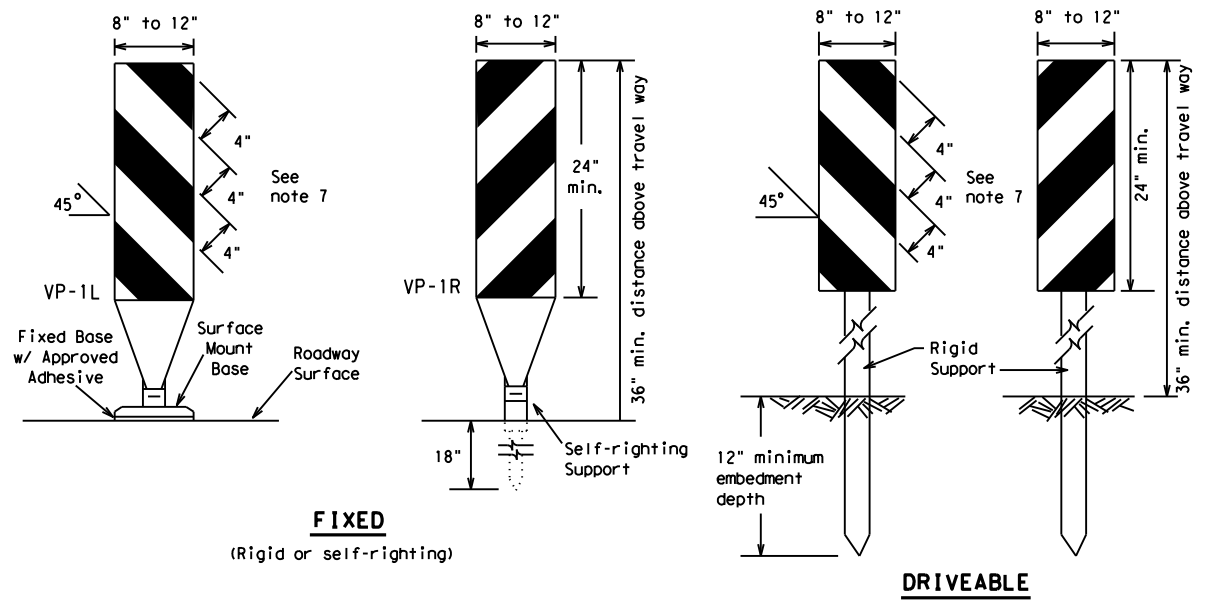
**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (8) - 21**

FILE:	bc-21.dgn	DN:	TxDOT	CR:	TxDOT	OW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
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4-03	8-14								
9-07	5-21	DIST		COUNTY		SHEET NO.			
7-13		DAL		KAUFMAN, ETC.		22			

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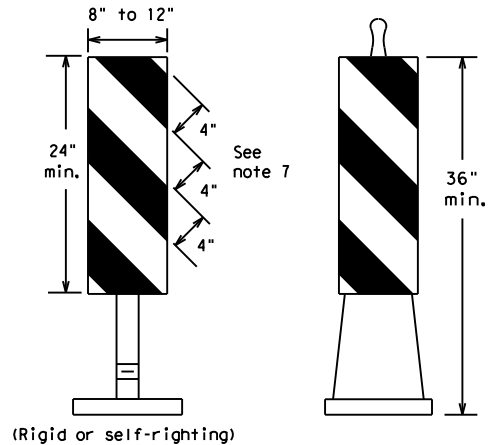
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**FIXED**  
(Rigid or self-righting)

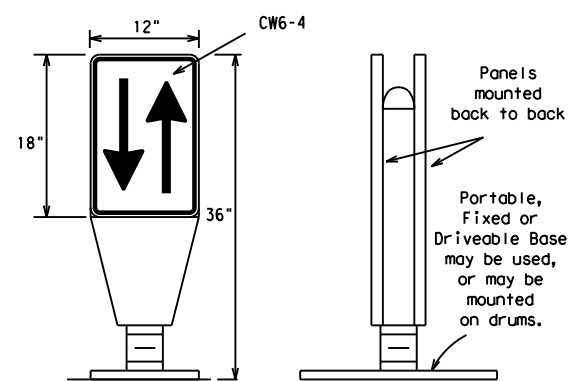
**DRIVEABLE**

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



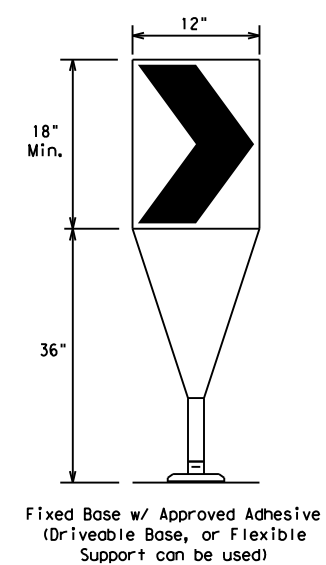
**PORTABLE**

**VERTICAL PANELS (VPs)**



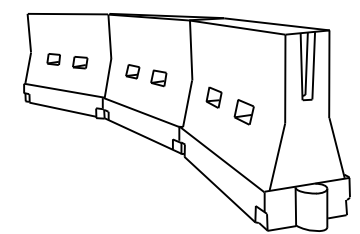
**OPPOSING TRAFFIC LANE DIVIDERS (OTLD)**

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



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

**CHEVRONS**



**LONGITUDINAL CHANNELIZING DEVICES (LCD)**

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

**WATER BALLASTED SYSTEMS USED AS BARRIERS**

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

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

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

**GENERAL NOTES**

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

Posted Speed	Formula	Minimum Desirable Taper Lengths * *			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent
30	L = WS <sup>2</sup> / 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



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (9) - 21**

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© TxDOT	November 2002	CONT	SECT	JOB	SECT	HIGHWAY			
REVISIONS		0197	04	084, ETC.		US 175, ETC			
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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.

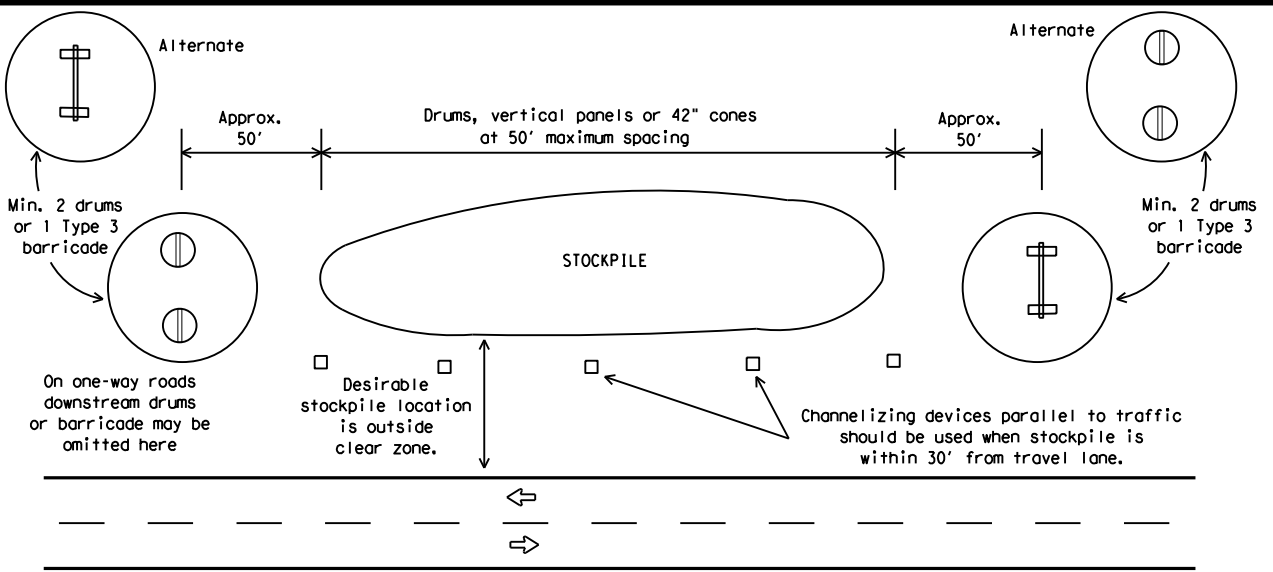


**TYPICAL STRIPING DETAIL FOR BARRICADE RAIL**



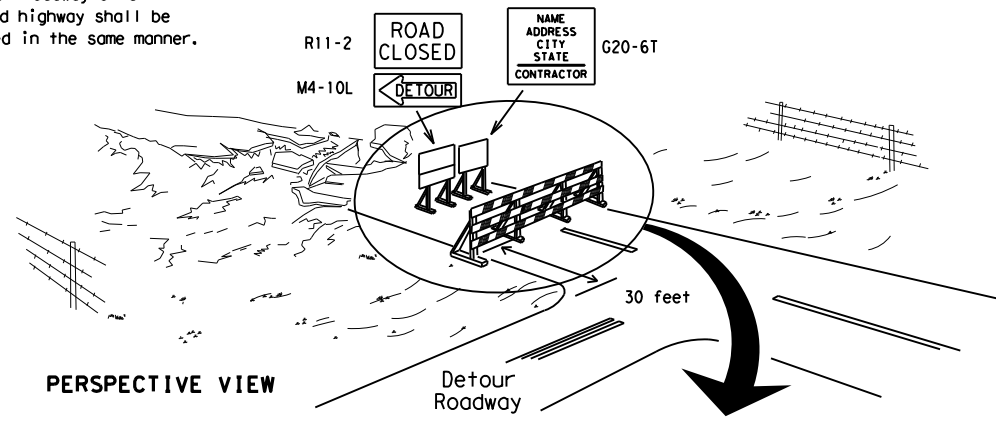
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

**TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES**



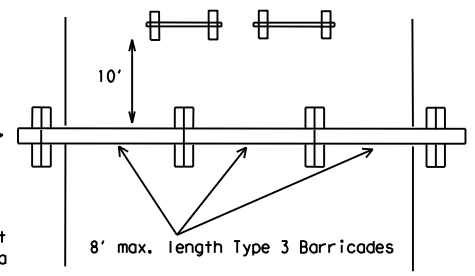
**TRAFFIC CONTROL FOR MATERIAL STOCKPILES**

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



PERSPECTIVE VIEW

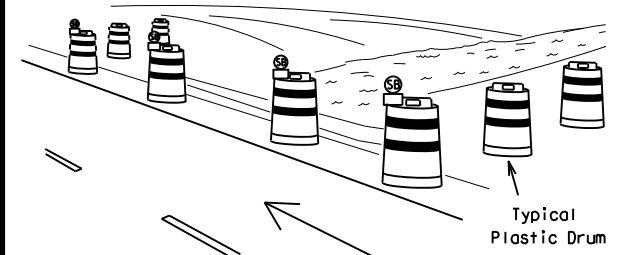
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



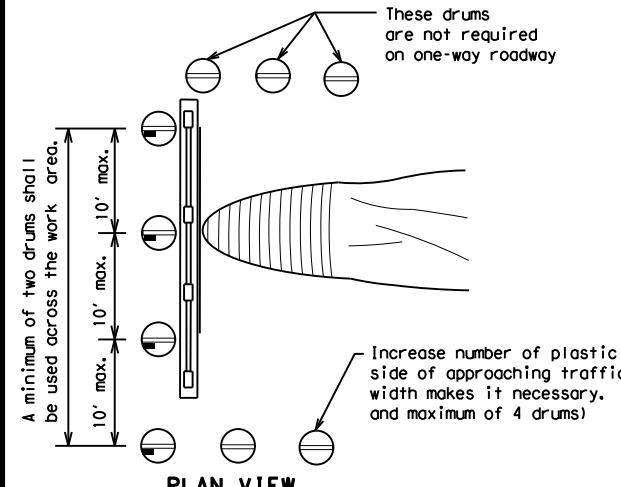
PLAN VIEW

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

**TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION**



PERSPECTIVE VIEW

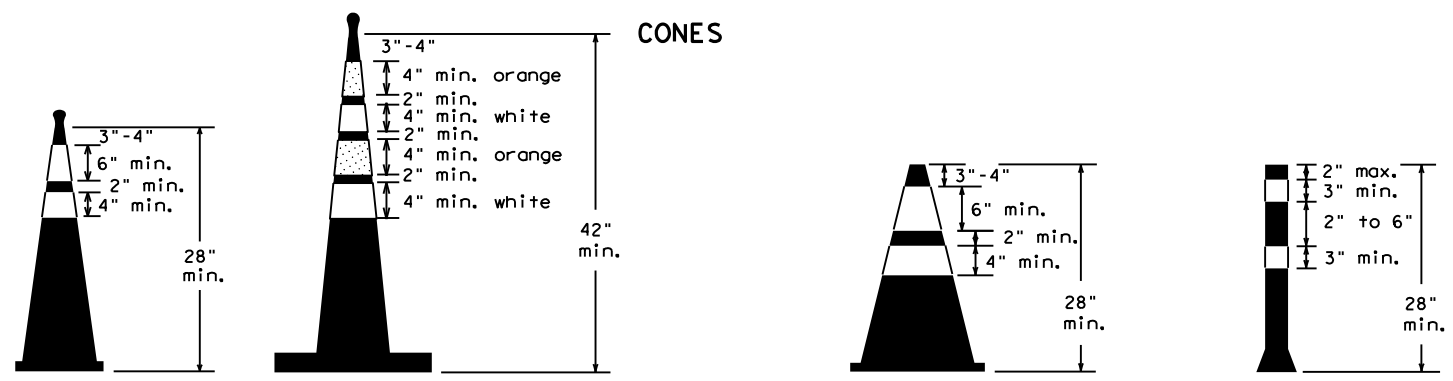


PLAN VIEW

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

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

**CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS**



Two-Piece cones

One-Piece cones

Tubular Marker

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

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

**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (10) - 21**

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CR: TxDOT
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REVISIONS	0197	04	084, ETC.	US 175, ETC
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	DAL	KAUFMAN, ETC.	24	

## WORK ZONE PAVEMENT MARKINGS

### GENERAL

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

### RAISED PAVEMENT MARKERS

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

### PREFABRICATED PAVEMENT MARKINGS

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

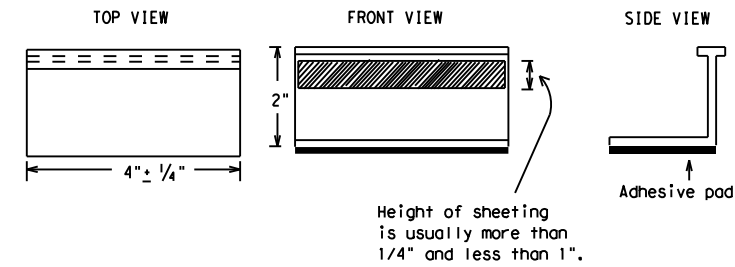
### MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

### REMOVAL OF PAVEMENT MARKINGS

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

## Temporary Flexible-Reflective Roadway Marker Tabs



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

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

### RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

SHEET 11 OF 12



## BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

**BC(11)-21**

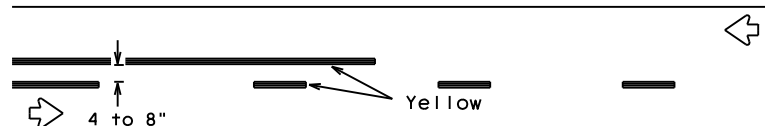
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## PAVEMENT MARKING PATTERNS

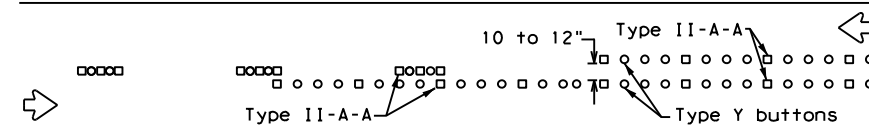


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

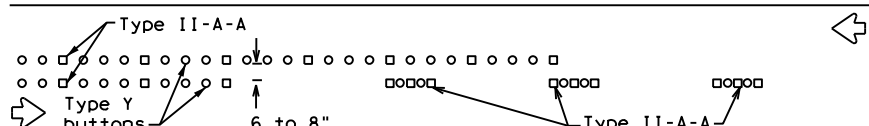


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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



RAISED PAVEMENT MARKERS - PATTERN A



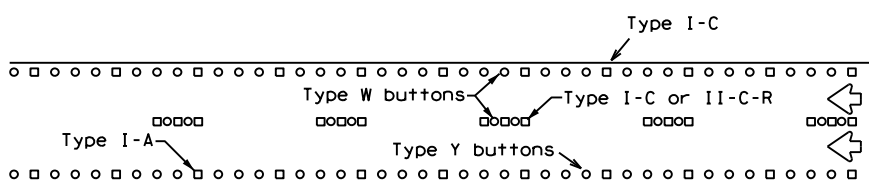
RAISED PAVEMENT MARKERS - PATTERN B

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



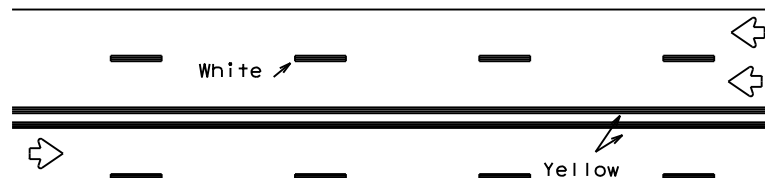
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



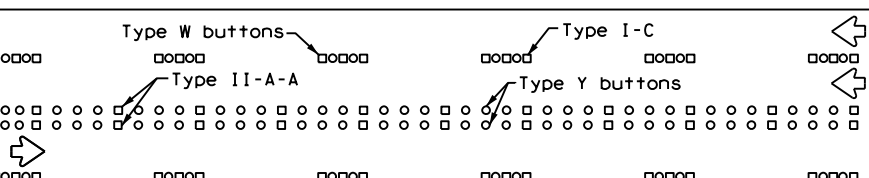
RAISED PAVEMENT MARKERS

## EDGE & LANE LINES FOR DIVIDED HIGHWAY



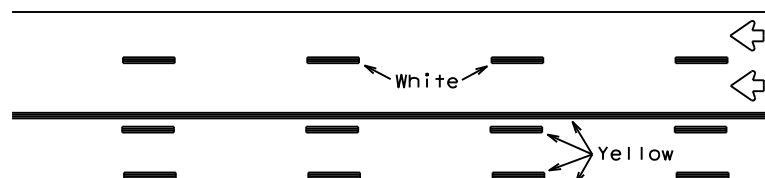
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



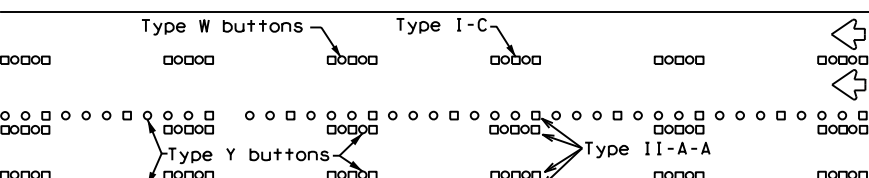
RAISED PAVEMENT MARKERS

## LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

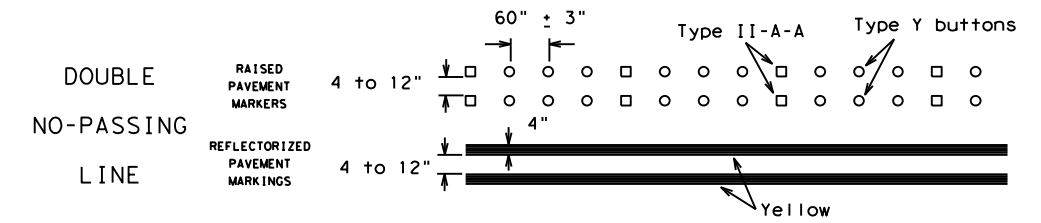
Prefabricated markings may be substituted for reflectORIZED pavement markings.



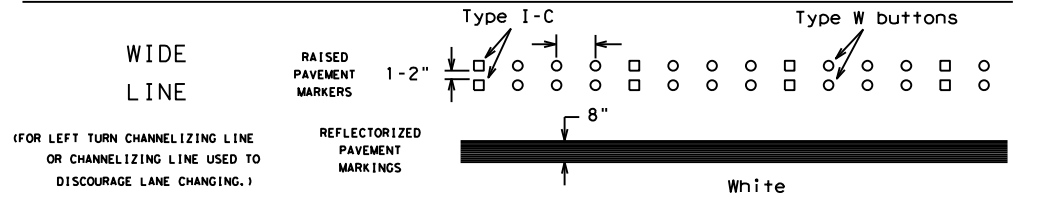
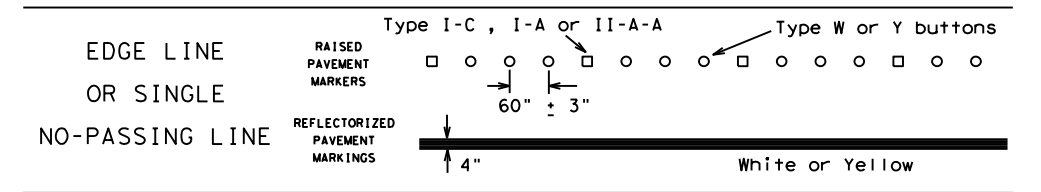
RAISED PAVEMENT MARKERS

## TWO-WAY LEFT TURN LANE

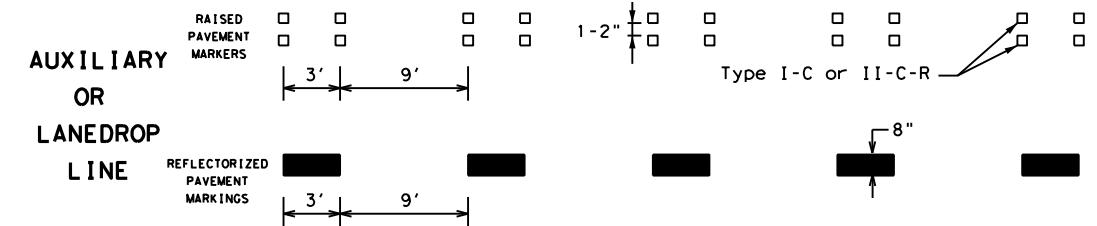
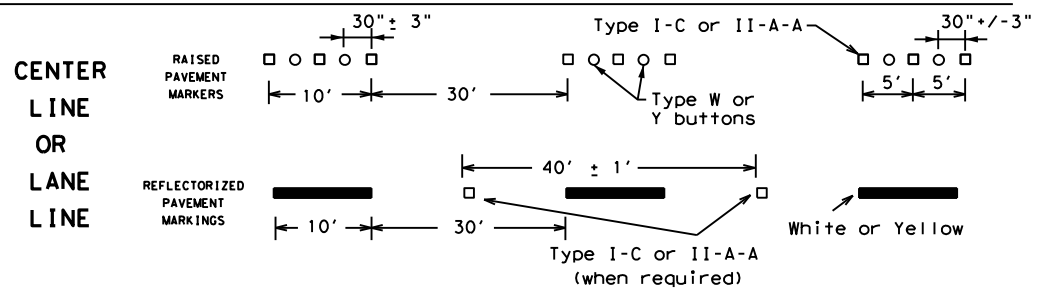
## STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



### SOLID LINES

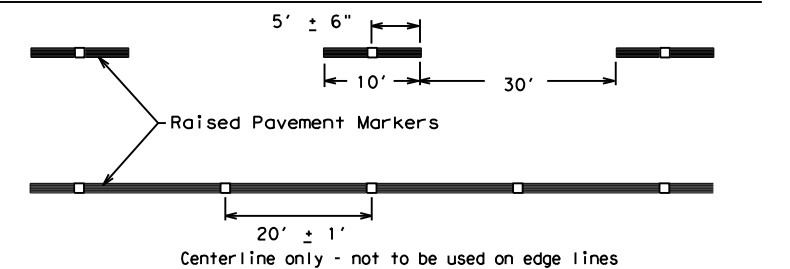


### BROKEN LINES



### REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



SHEET 12 OF 12



## BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

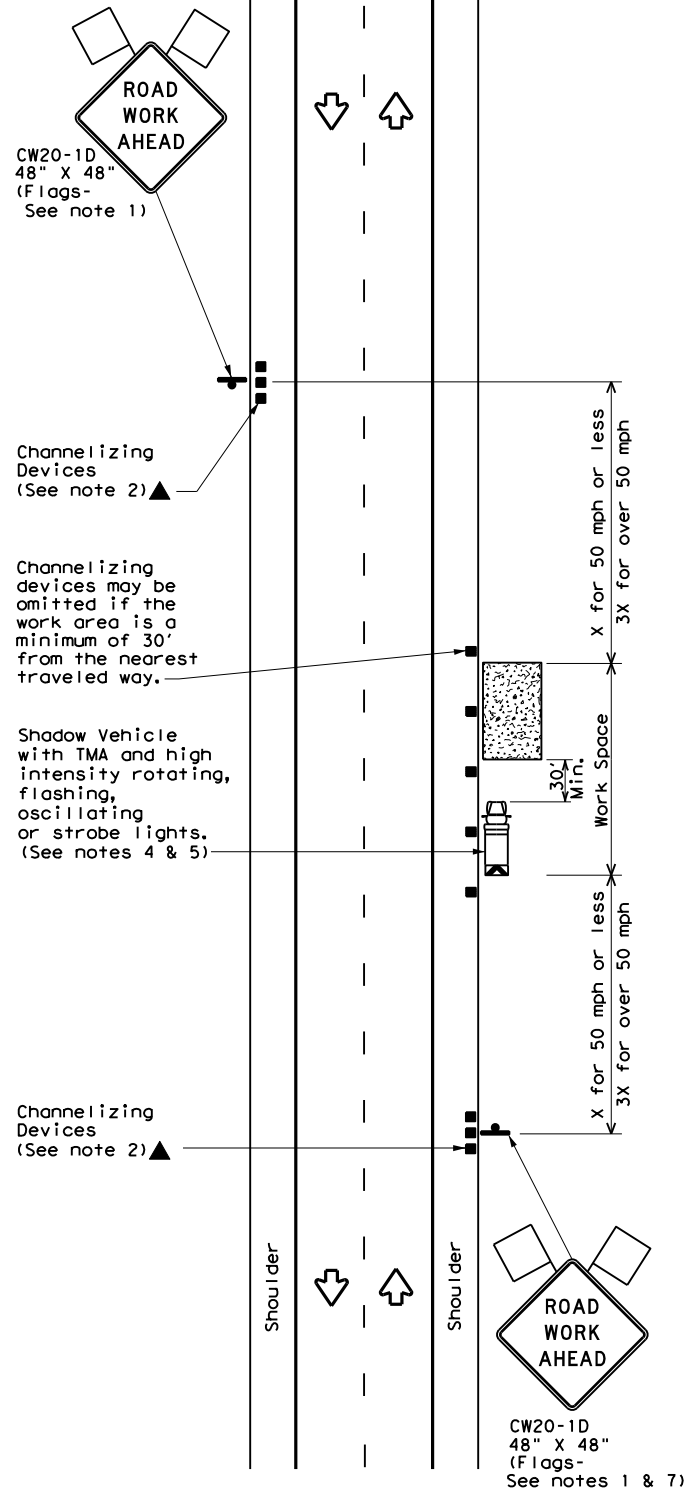
BC(12)-21

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11-02 8-14				

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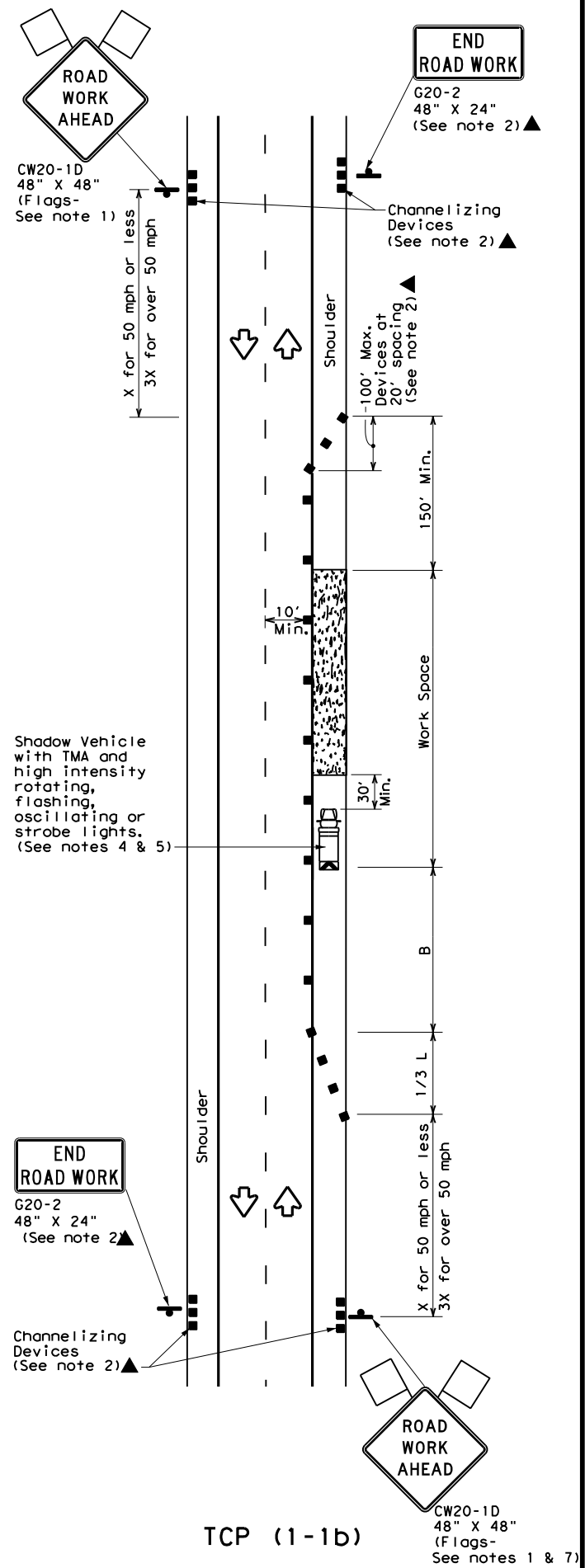
Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

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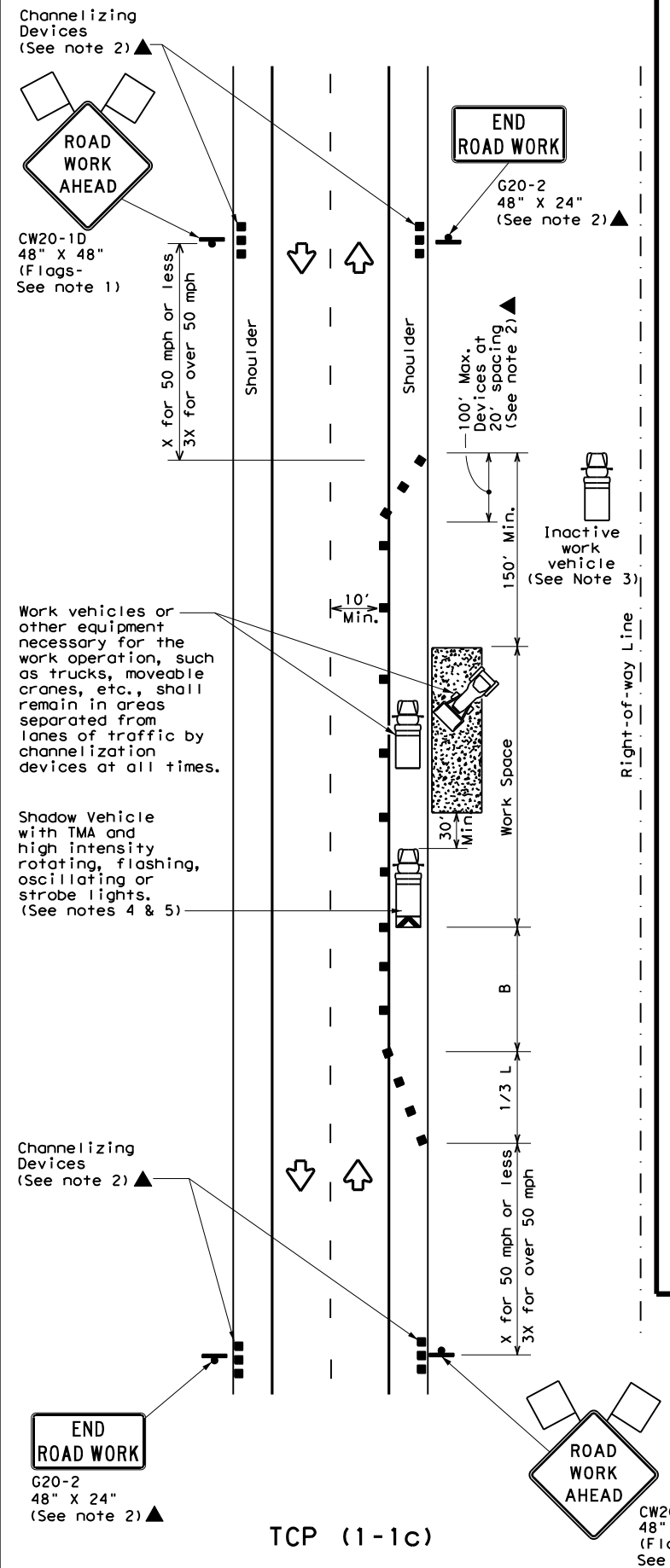
TCP (1-1a)

**WORK SPACE NEAR SHOULDER**  
Conventional Roads



TCP (1-1b)

**WORK SPACE ON SHOULDER**  
Conventional Roads



TCP (1-1c)

**WORK VEHICLES ON SHOULDER**  
Conventional Roads

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
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**
- Flags attached to signs where shown are REQUIRED.
  - 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.
  - Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
  - 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.
  - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
  - See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
  - CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

**TRAFFIC CONTROL PLAN**  
**CONVENTIONAL ROAD**  
**SHOULDER WORK**

**TCP (1-1) - 18**

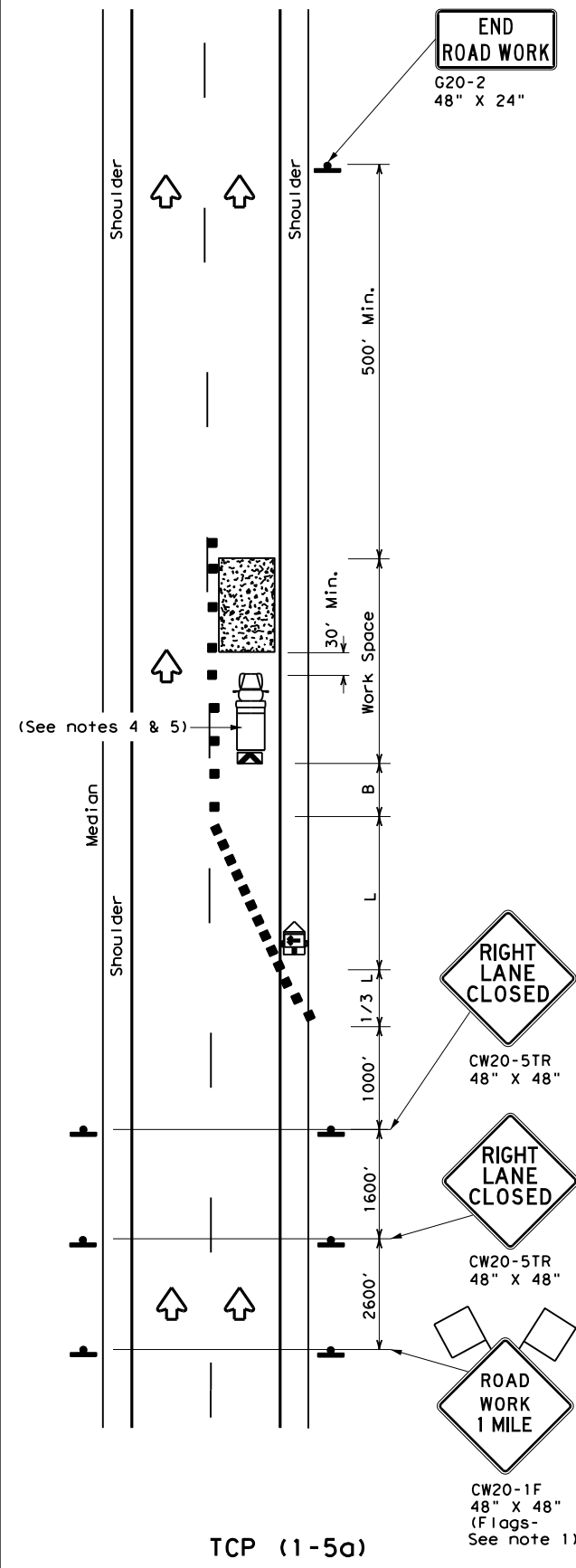
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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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8-95 2-12	DAL	KAUFMAN	27	
1-97 2-18				

DATE:  
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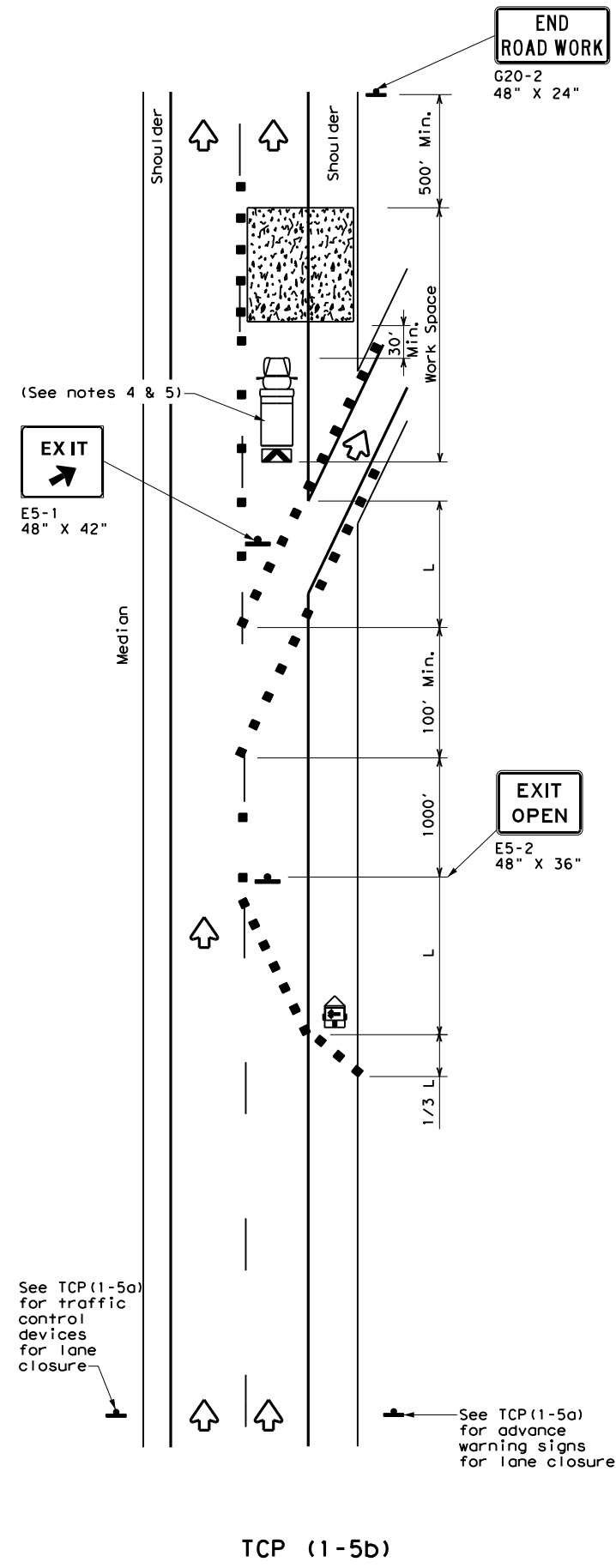


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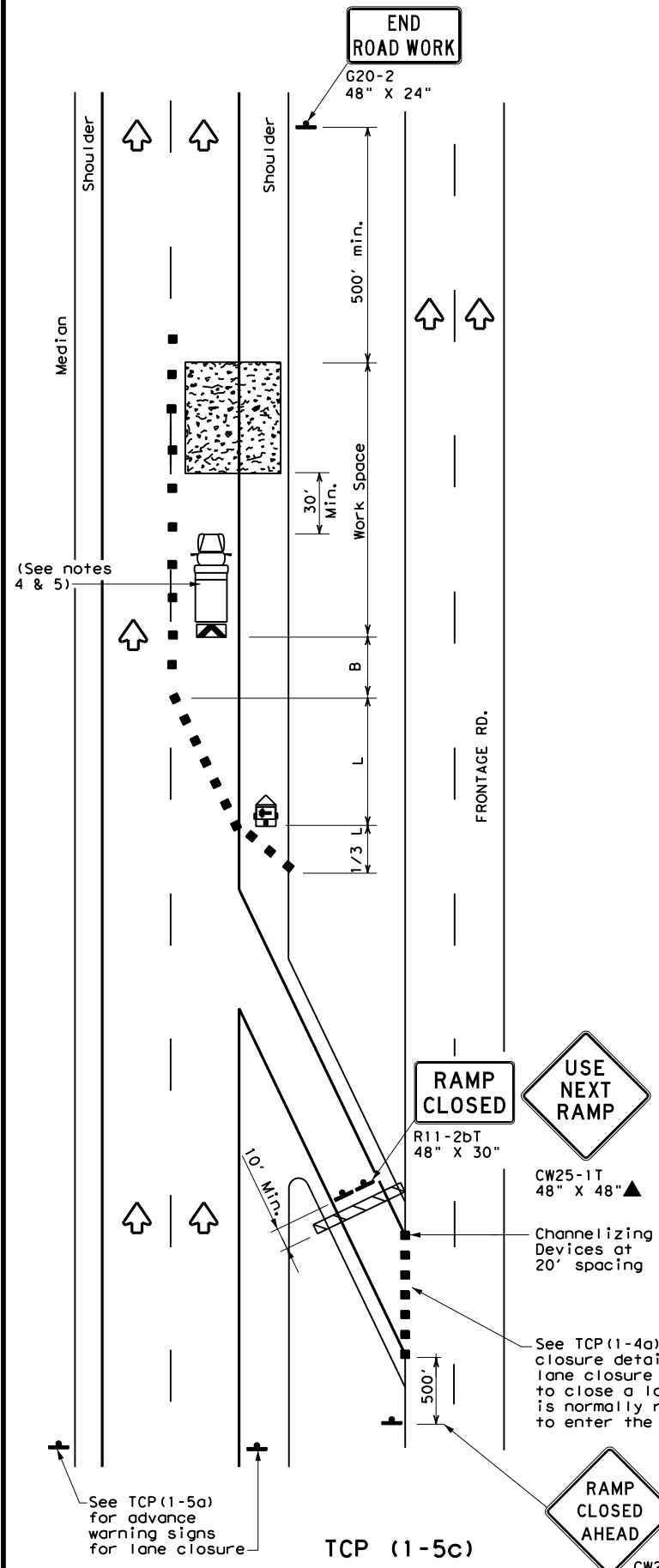
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FILE:



**ONE LANE CLOSURE**



**LANE CLOSURE NEAR EXIT RAMP**



**LANE CLOSURE NEAR ENTRANCE RAMP**

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
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**
- Flags attached to signs where shown, are REQUIRED.
  - 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.
  - Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
  - 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.
  - Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

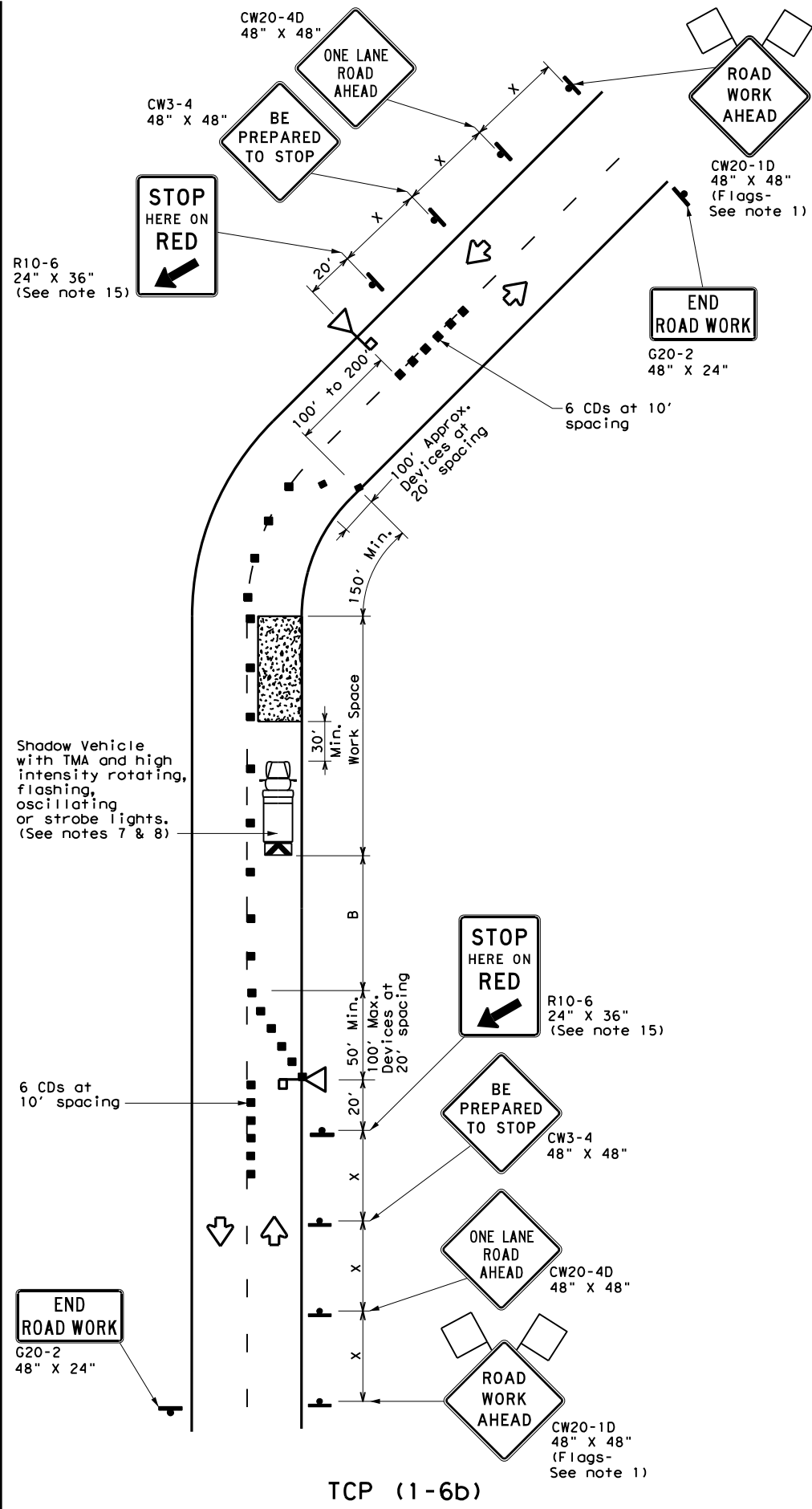
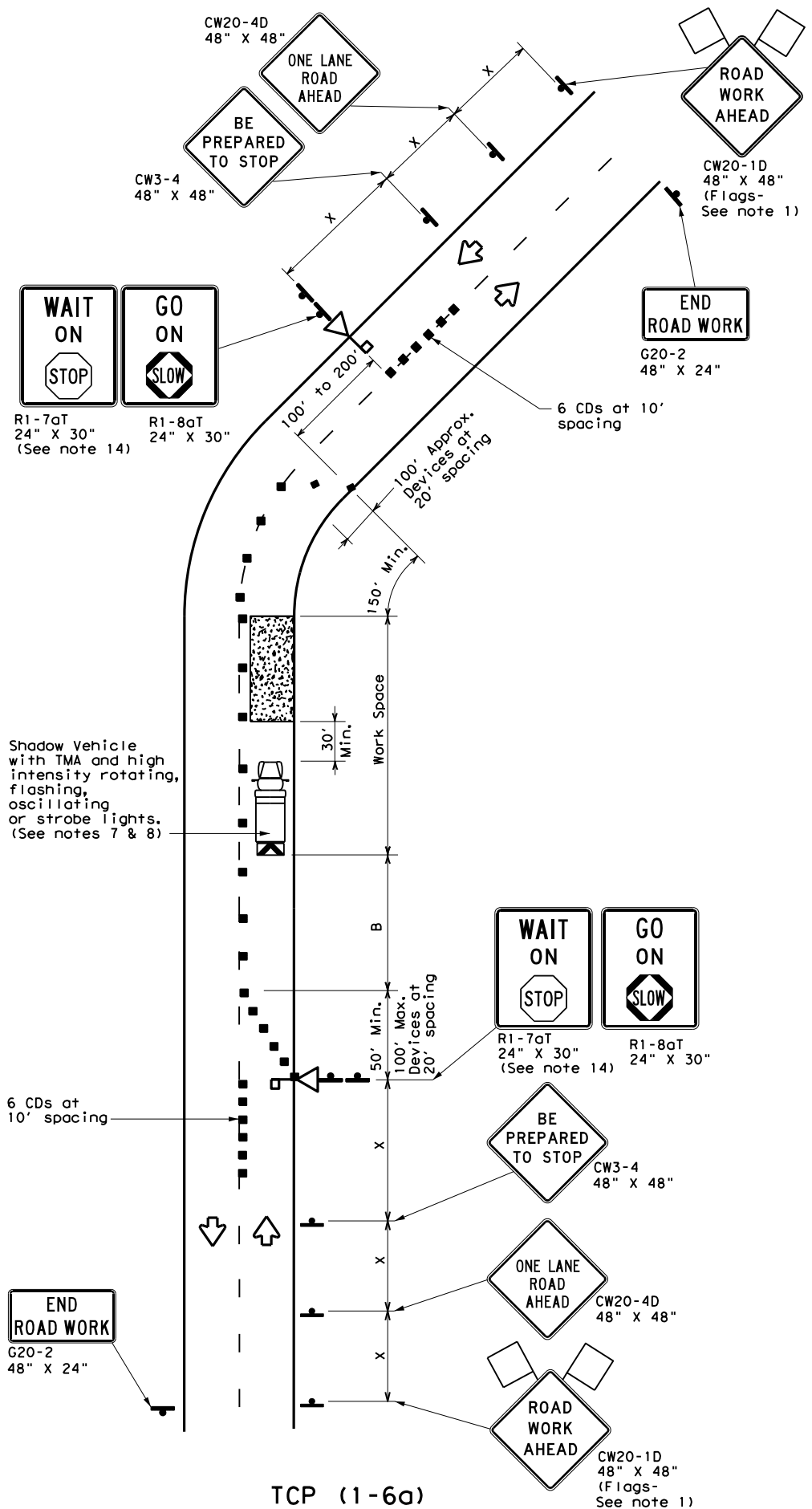
Texas Department of Transportation  
 Traffic Operations Division Standard

**TRAFFIC CONTROL PLAN  
LANE CLOSURES FOR  
DIVIDED HIGHWAYS**

**TCP (1-5) - 18**

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© TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
2-18	REVISIONS	0197	04	084, ETC. US 175, ETC
	DIST	COUNTY	SHEET NO.	
	DAL	KAUFMAN, ETC.	28	

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LEGEND			
	Type 3 Barricade		Channelizing Devices (CDs)
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Automated Flagger Assistance Device (AFAD)		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
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**

- Flags attached to signs where shown are REQUIRED.
- AFADs shall only be used in situations where there is one lane of approaching traffic in the direction to be controlled.
- Adequate stopping sight distance must be provided to each AFAD location for approaching traffic. (See table above).
- Each AFAD shall be operated by a qualified/certified flagger. Flaggers operating AFADs shall not leave them unattended while they are in use.
- One flagger may operate two AFADs only when the flagger has an unobstructed view of both AFADs and of the approaching traffic in both directions.
- When pilot cars are used, a flagger controlling traffic shall be located on each approach. AFADs shall not be operated by the pilot car operator.
- All AFADs shall be equipped with gate arms with an orange or fluorescent red-orange flag attached to the end of the gate arm. The flag shall be a minimum of 16" square.
- 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.
- Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
- Flaggers should use two-way radios or other methods of communication to control traffic.
- Length of work space should be based on the ability of flaggers to communicate.
- 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 AFAD.
- Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
- The R1-7aT "WAIT ON STOP" sign and the R1-8aT "GO ON SLOW" sign shall be installed at the AFAD location on separate supports or they may be fabricated as one 48" x 30" sign. They shall not obscure the face of the STOP/SLOW AFAD.
- The R10-6 "STOP HERE ON RED" arrow sign shall be offset so as not to obscure the lenses of the AFAD.

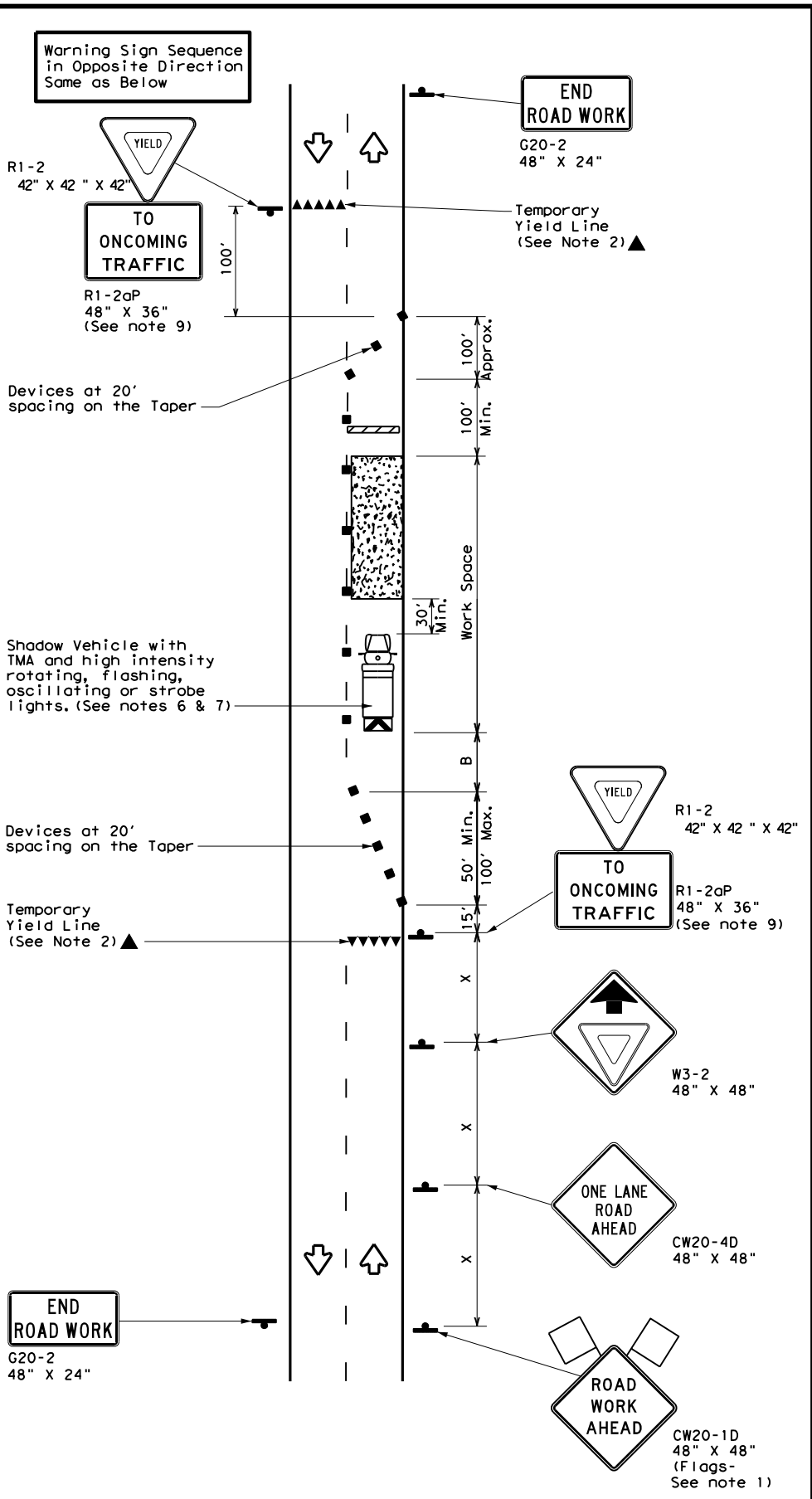
Texas Department of Transportation  
 Traffic Operations Division Standard

**TRAFFIC CONTROL PLAN  
 AUTOMATED FLAGGER ASSISTANCE DEVICES (AFADs)**

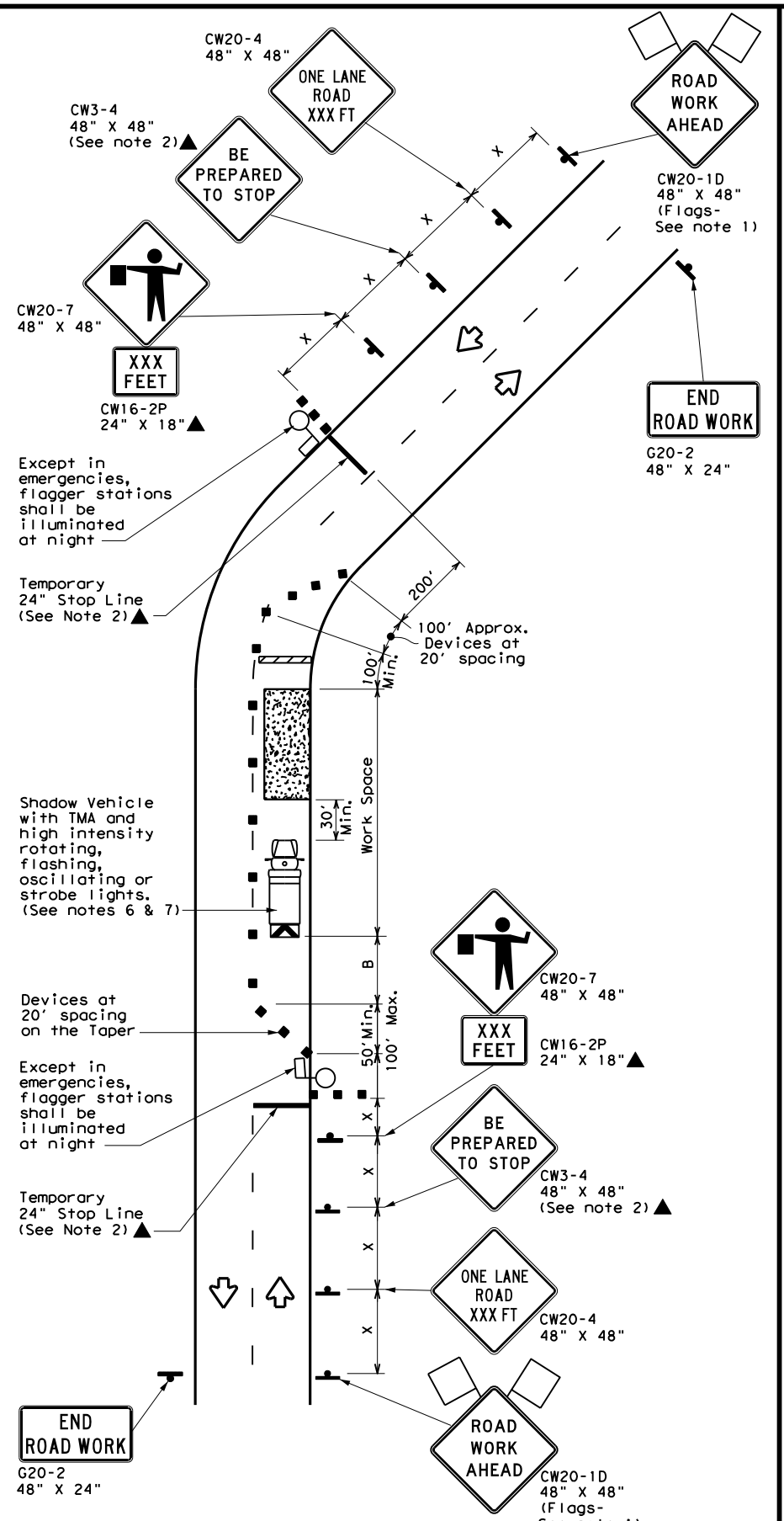
**TCP (1-6) - 18**

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© TxDOT	February 2012	CONT	SECT	JOB	HIGHWAY
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		DIST	COUNTY	SHEET NO.	
		DAL	KAUFMAN, ETC.	29	

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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		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	L = WS <sup>2</sup> / 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'	

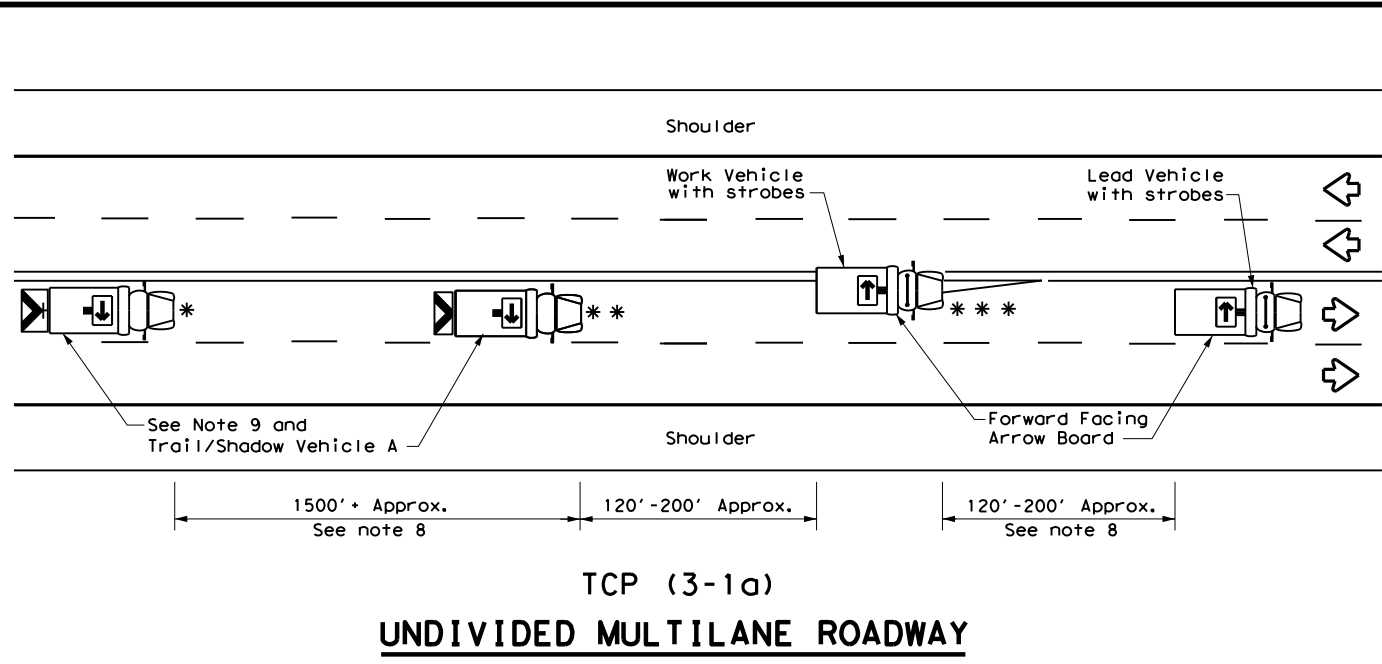
\* Conventional Roads Only  
 \*\* Taper lengths have been rounded off.  
 L=Length of Taper (FT) W=Width of Offset (FT) S=Posted Speed (MPH)

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

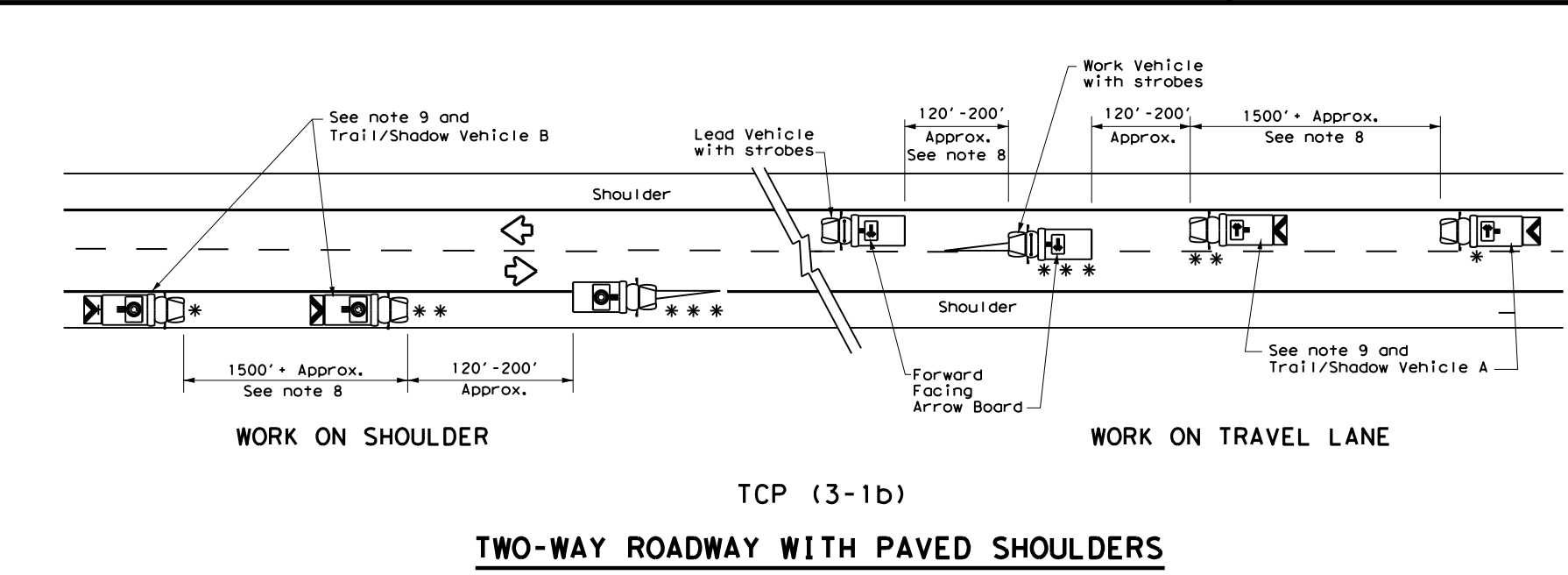
- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
  - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
  - The CW3-4 "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.
  - Flaggers should use two-way radios or other methods of communication to control traffic.
  - Length of work space should be based on the ability of flaggers to communicate.
  - 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.
  - 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)**
- 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.
  - The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.
- TCP (2-2b)**
- Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
  - 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).
  - Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

		Traffic Operations Division Standard	
<b>TRAFFIC CONTROL PLAN</b>			
<b>ONE-LANE TWO-WAY</b>			
<b>TRAFFIC CONTROL</b>			
<b>TCP (2-2) - 18</b>			
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© TxDOT	REVISIONS	CON:	SECT:
8-95	3-03	0197	04
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4-98	2-18	DIST COUNTY SHEET NO.	
DAL KAUFMAN, ETC.		30	

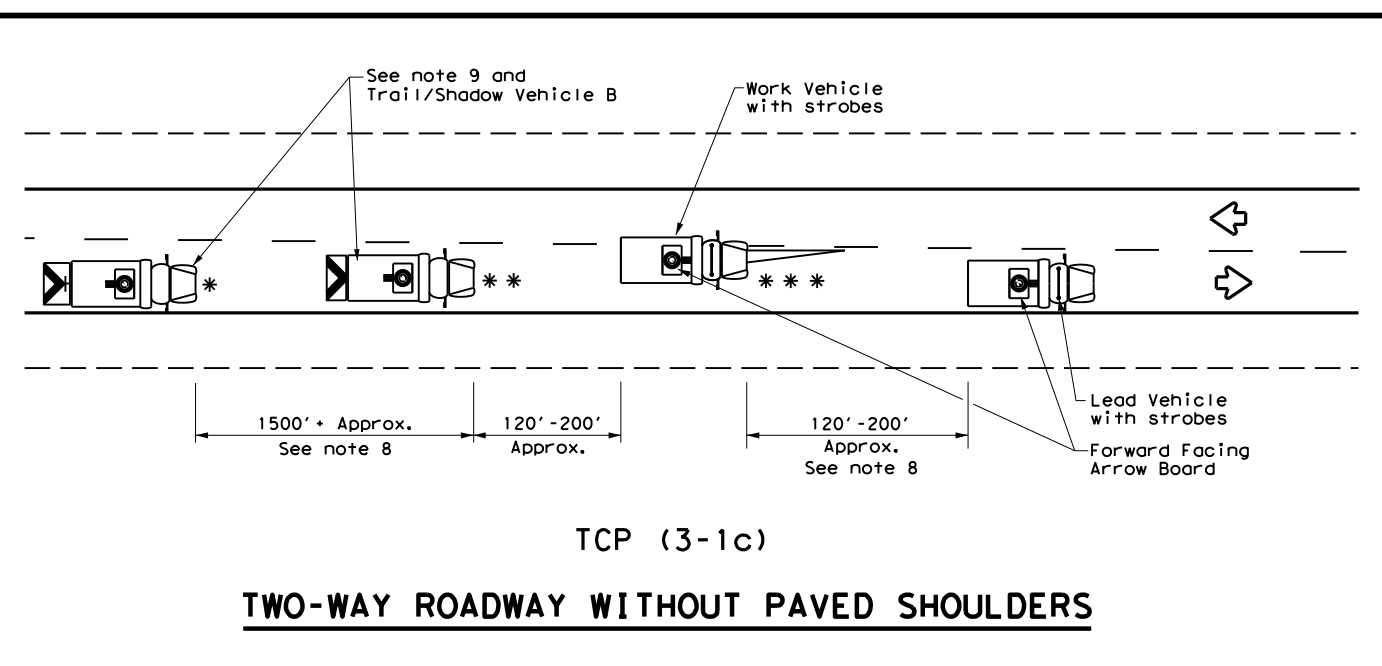
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 SHEET: 31  
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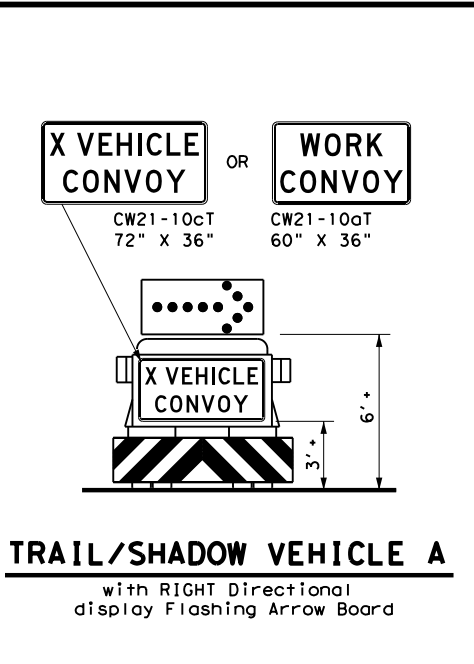
**TCP (3-1a)**  
**UNDIVIDED MULTILANE ROADWAY**



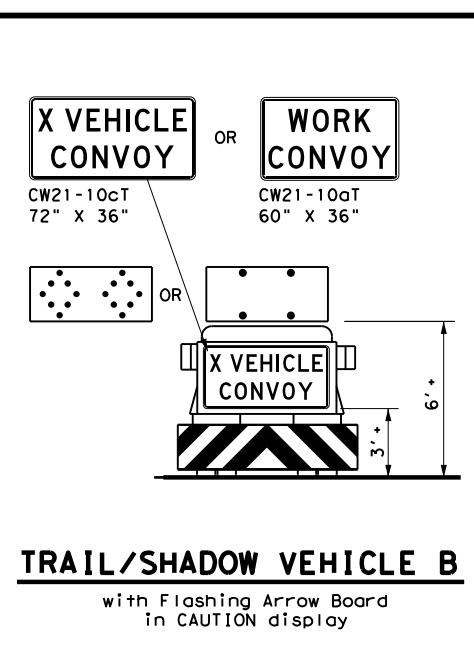
**TCP (3-1b)**  
**TWO-WAY ROADWAY WITH PAVED SHOULDERS**



**TCP (3-1c)**  
**TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS**



**TRAIL/SHADOW VEHICLE A**  
with RIGHT Directional display Flashing Arrow Board



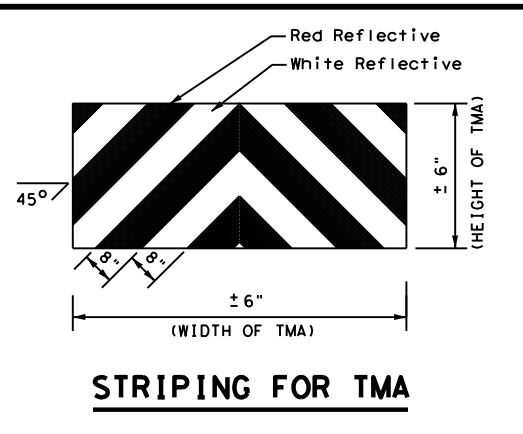
**TRAIL/SHADOW VEHICLE B**  
with Flashing Arrow Board in CAUTION display

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

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
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**GENERAL NOTES**

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



**STRIPING FOR TMA**

Texas Department of Transportation  
 Traffic Operations Division Standard

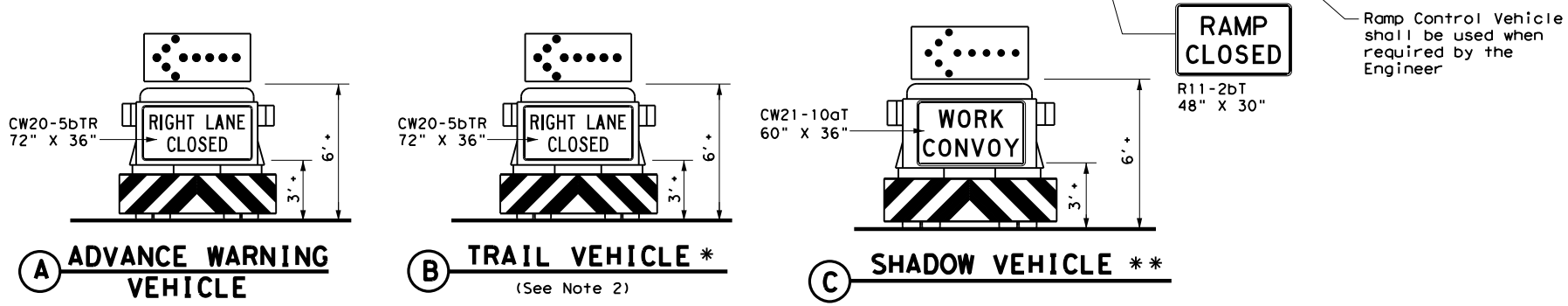
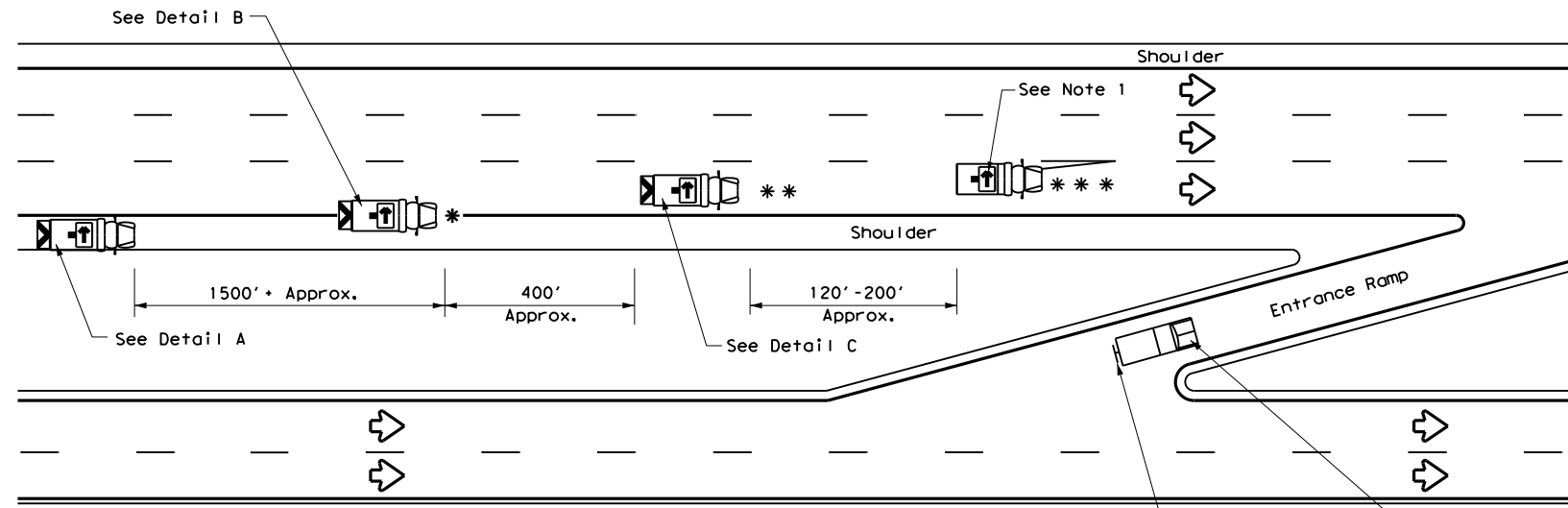
TRAFFIC CONTROL PLAN  
 MOBILE OPERATIONS  
 UNDIVIDED HIGHWAYS

TCP(3-1)-13

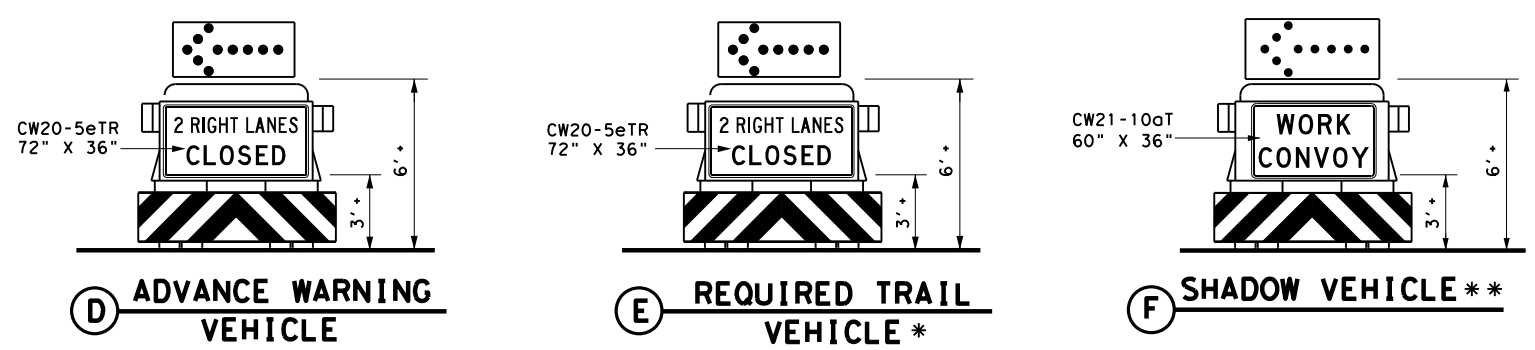
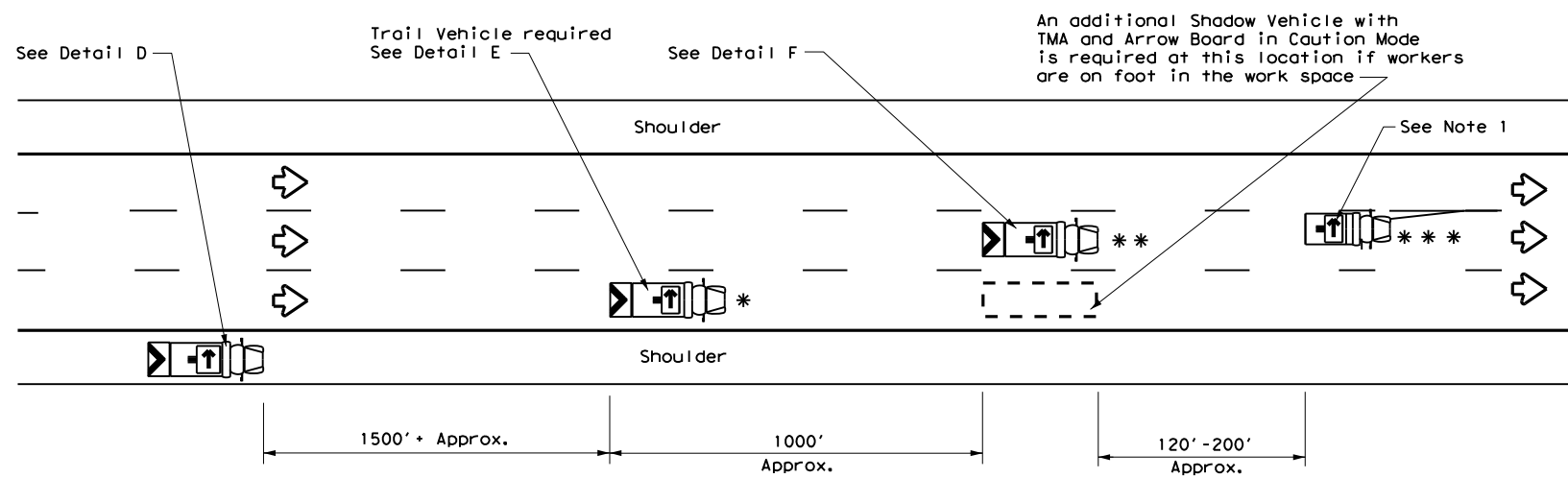
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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 7-13	DAL	KAUFMAN, ETC.	31	
1-97				

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DATE: FILE:



**RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)**



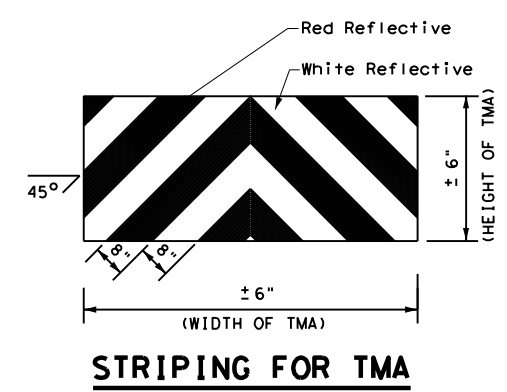
**INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)**

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
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**GENERAL NOTES**

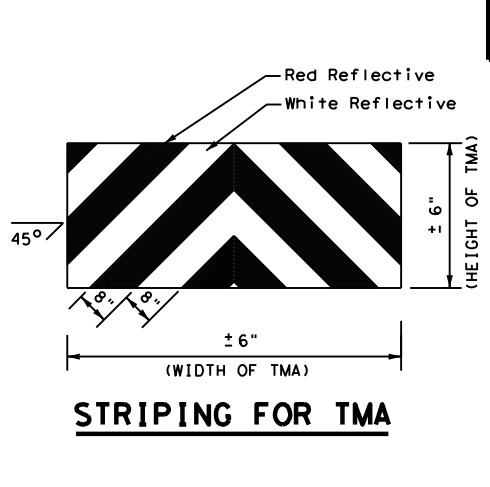
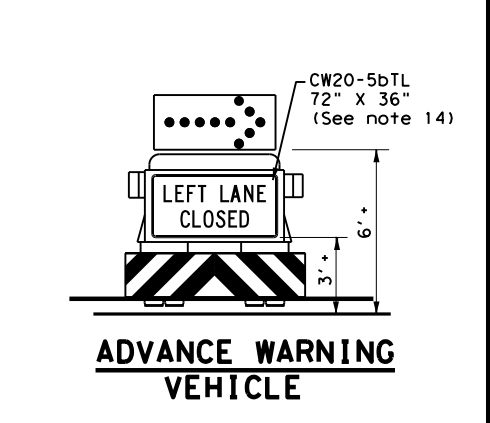
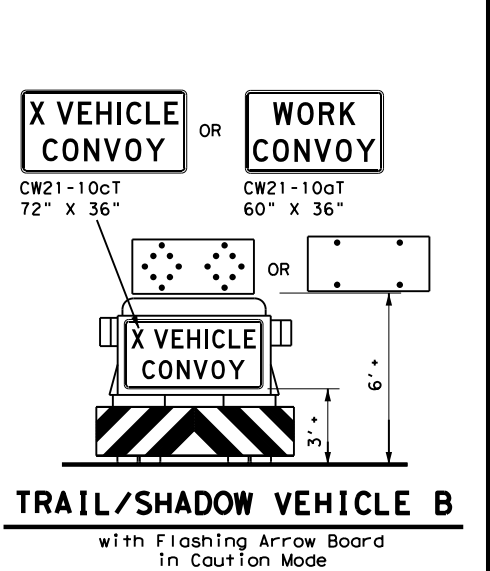
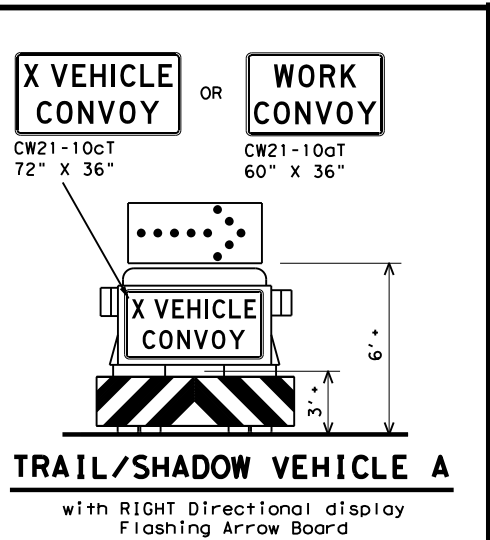
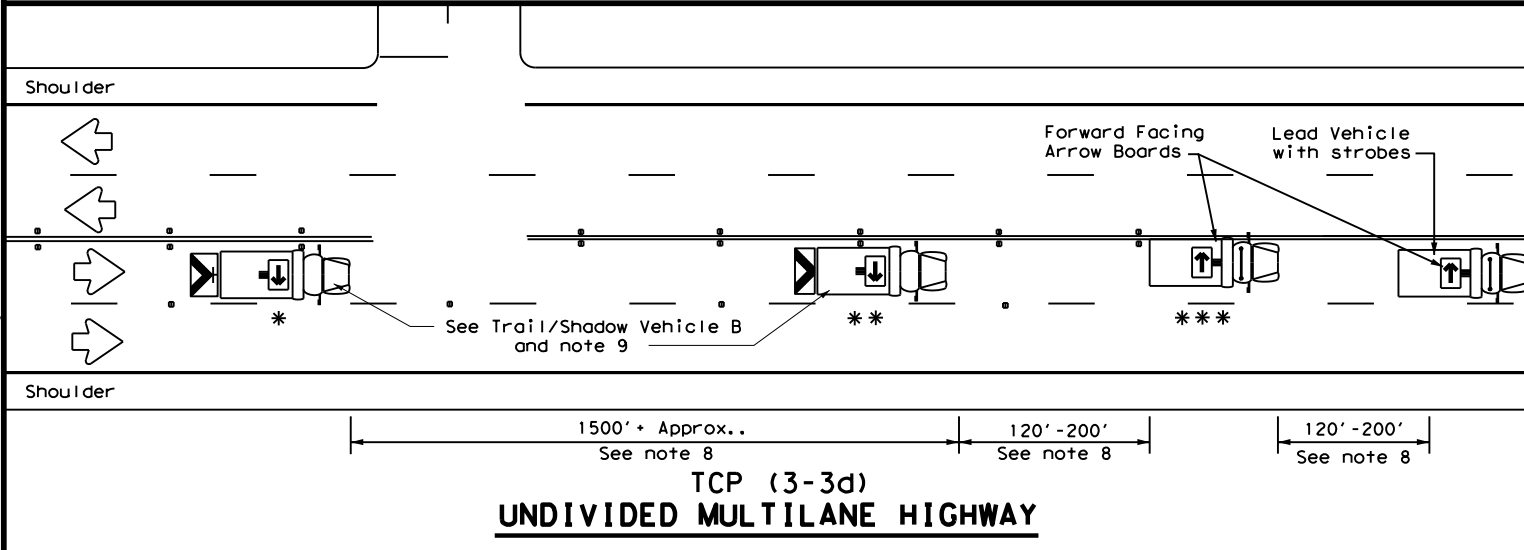
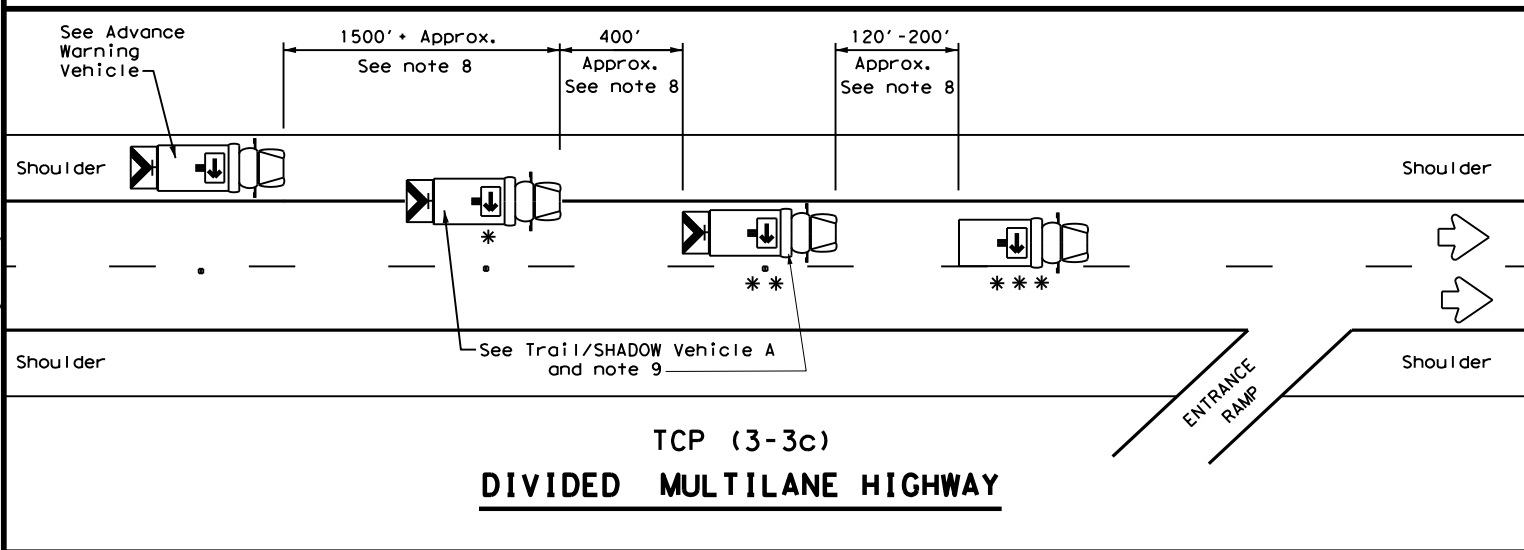
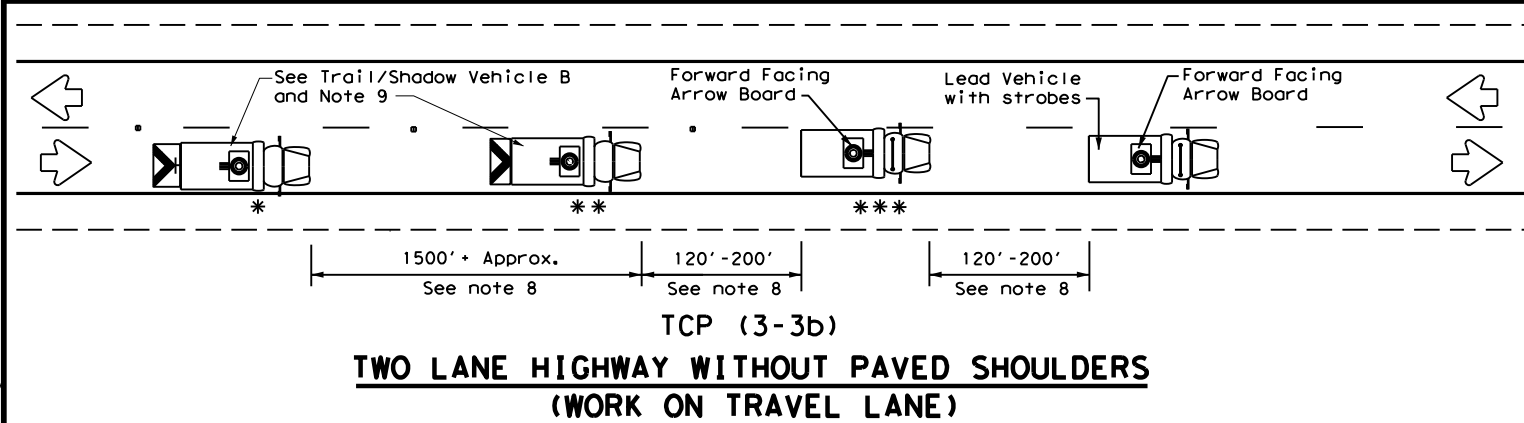
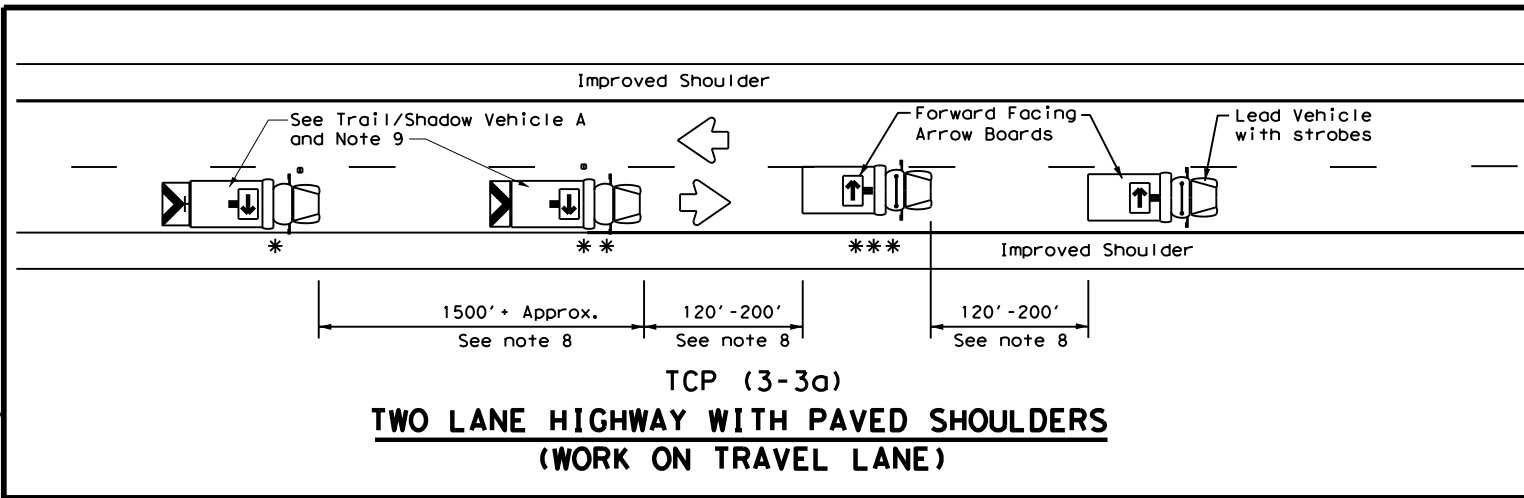
- ADVANCE WARNING, TRAIL and SHADOW vehicles shall be equipped with Type B or Type C flashing arrow boards as per the Barricade and Construction (BC) standards. Arrow boards on WORK vehicles will be optional based on the type of work being performed. The arrow boards shall be operated from inside the vehicle.
- For TCP(3-2a) the Engineer will determine if the TRAIL VEHICLE is required based on prevailing roadway conditions, traffic volume, and sight distance restrictions. All other vehicles shown for both TCP(3-2a) and TCP(3-2b) are required.
- 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.
- The use of truck mounted attenuators (TMA) on the ADVANCE WARNING, SHADOW, and TRAIL vehicles are required.
- Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DMS 8300, Type A.
- Each vehicle shall have two-way radio communication capability.
- When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
- 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 may vary according to terrain, work activity and other factors.
- Standard 48" X 48" diamond shaped warning signs with the same message as those shown may be used where adequate mounting space exists.
- The signs shown should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or a 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, must 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.
- Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
- The principles on this sheet may be used to close lanes from the left side of the roadway considering the number of lanes, shoulder width, sight distance, and ramp frequency.
- Signs and flashing arrow board modes shall be appropriately altered when implementing left lane closures or interior closures which close the left lanes.
- The Advance Warning Vehicle may straddle the edgeline when shoulder width makes it necessary.



**STRIPING FOR TMA**

		<b>Traffic Operations Division Standard</b>	
<b>TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS</b>			
<b>TCP(3-2)-13</b>			
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© TxDOT December 1985	CONT	SECT	JOB
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2-94 4-98			US 175, ETC
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DIST	COUNTY	SHEET NO.	
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 DRAWING: 18090118.dwg  
 TITLE: TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/REMOVAL  
 SHEET: 33  
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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**

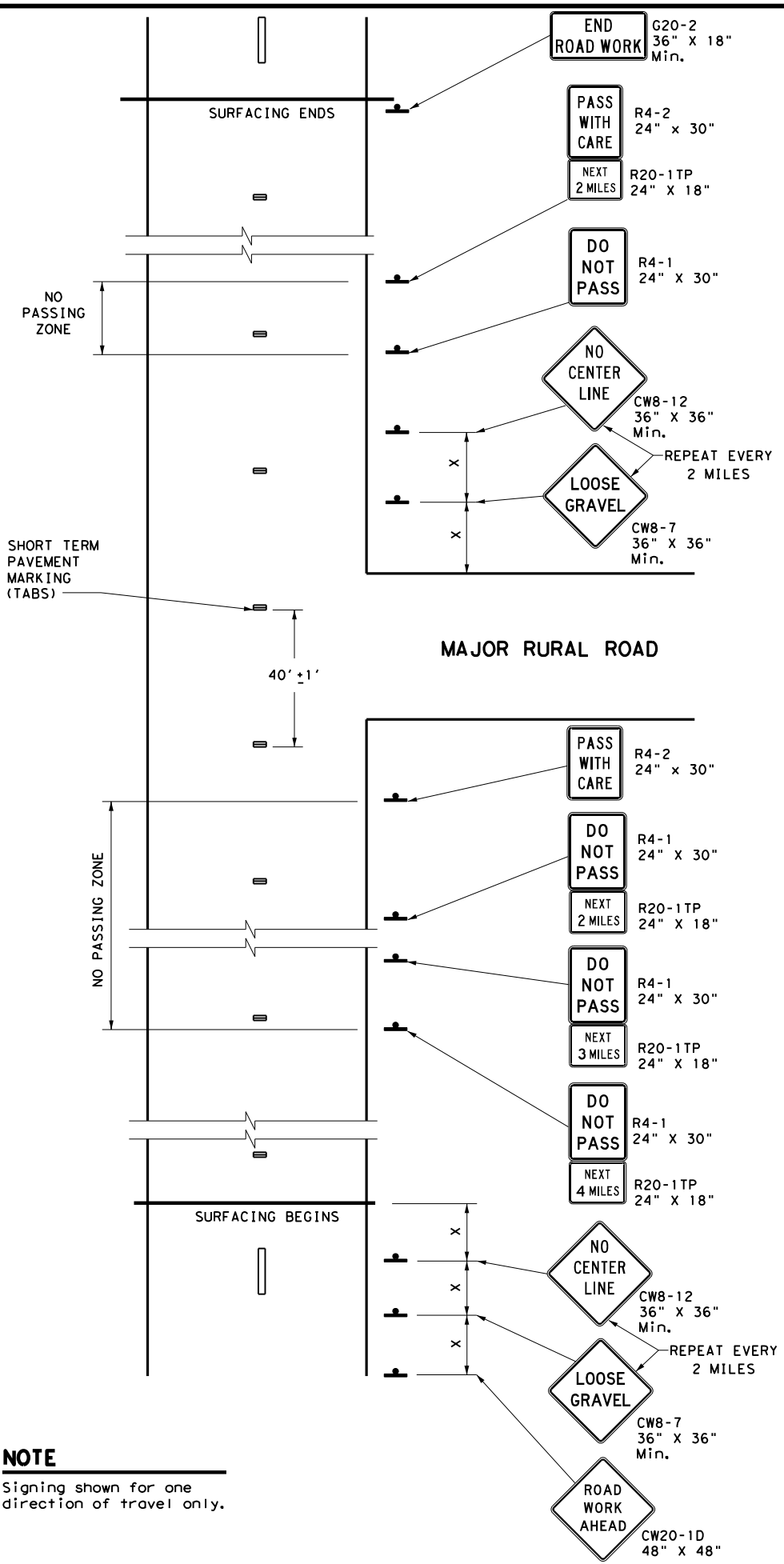
- TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer will determine if the LEAD vehicle and/or TRAIL vehicle are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
- 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.
- The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE, ADVANCE WARNING and TRAIL VEHICLE are required.
- 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.
- 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.
- Each vehicle shall have two-way radio communication capability.
- When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
- 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.
- 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.
- 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.
- A double arrow shall not be displayed on the arrow board on the Advance Warning Vehicle.
- For divided highways with three or four lanes in each direction, use TCP(3-2).
- Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
- The Advance Warning Vehicle may straddle the edgeline when Shoulder width makes it necessary.
- On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a DO NOT PASS (R4-1) sign should be placed on the back of the rearmost protection vehicle.

Texas Department of Transportation  
Traffic Operations Division Standard

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

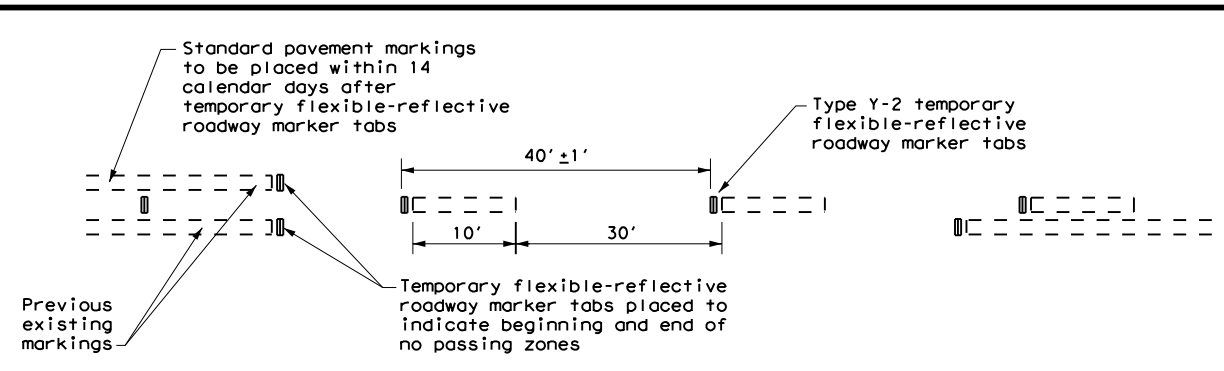
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8-95 7-13	DAL	KAUFMAN, ETC.	33	
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**NOTE**  
 Signing shown for one direction of travel only.

**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.



**TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS**  
**TCP (7-1) - 13**

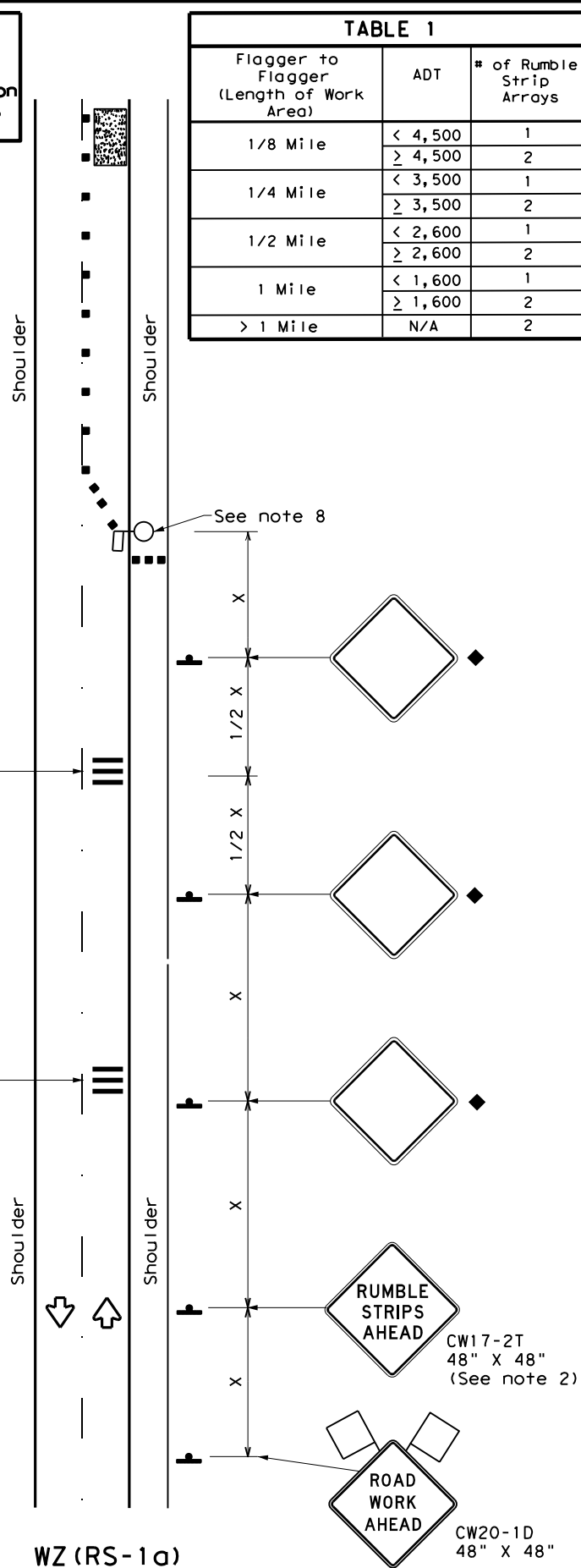
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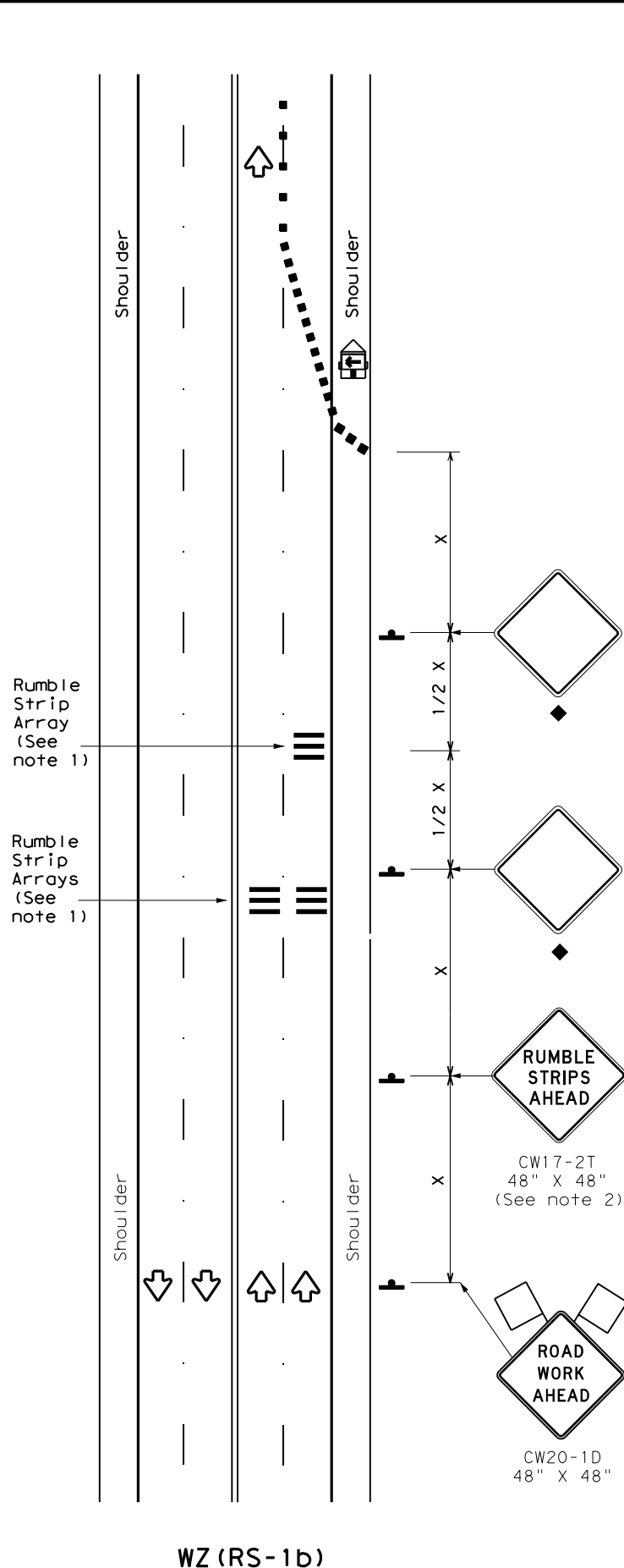
Warning sign and rumble strip sequence in opposite direction is same as below.

**TABLE 1**

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



**RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION**



**RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY**

**GENERAL NOTES**

- 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.
- 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.
- Temporary Rumble Strips will be considered subsidiary to Item 502, and shall be a product listed on the Compliant Work Zone Traffic Control Devices.
- Remove Temporary Rumble Strips before removing the advanced warning signs.
- Temporary Rumble Strips should not be used on horizontal curves, loose gravel, soft or bleeding asphalt, heavily rutted pavements or unpaved surfaces.
- Temporary Rumble Strips shall be installed and maintained as per manufacturer's recommendations.
- This standard sheet shall be used in conjunction with other appropriate TCP standard, TMUTCD typical application or project specific detail for the project.
- The one-lane two-way application may utilize a flagger, an Automated Flagger Assistance Device (AFAD) or a Portable Traffic Signal (PTS).
- Replace defective Temporary Rumble Strips as directed by the Engineer.
- Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment and written direction from the Engineer.

**TABLE 2**

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

**LEGEND**

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	L = WS / 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.

Traffic Safety Division Standard

**TEMPORARY RUMBLE STRIPS**

**WZ (RS) - 22**

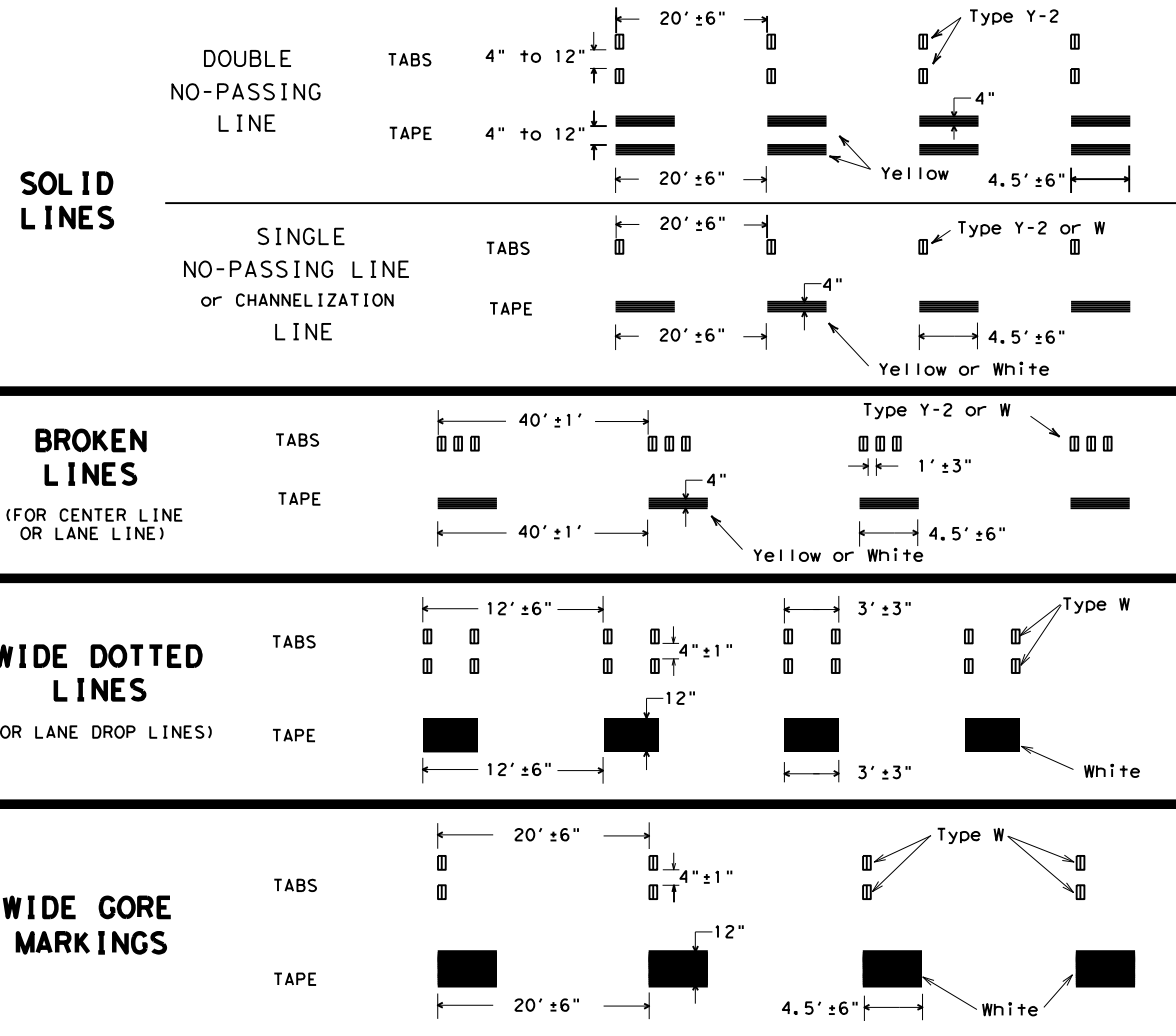
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## WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



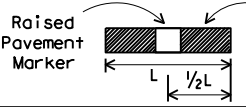
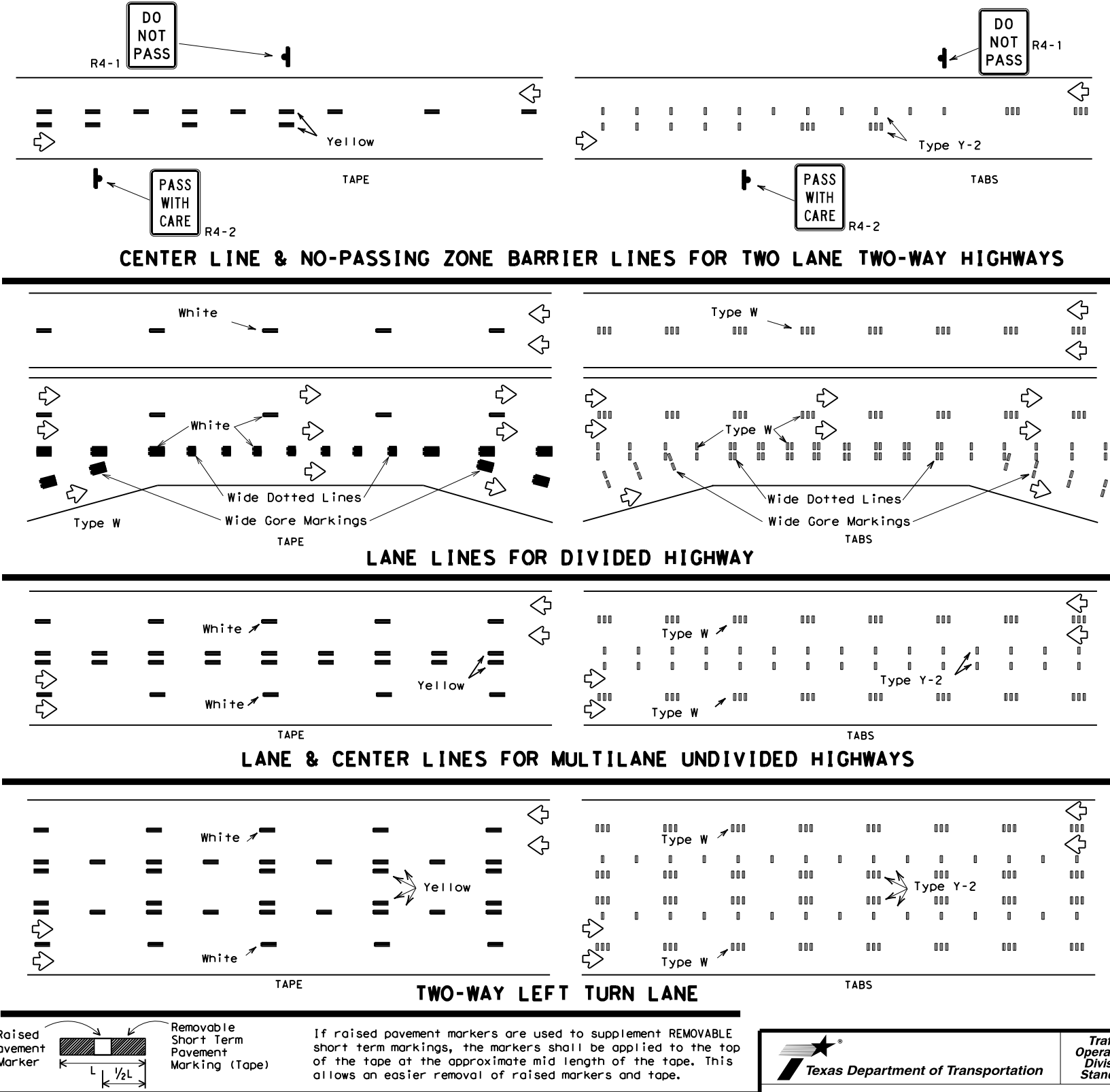
### NOTES:

- Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible-reflective roadway marker tabs unless otherwise specified elsewhere in plans.
- Short term pavement markings shall NOT be used to simulate edge lines.
- 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.
- 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.
- 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.
- 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.
- 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).
- 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)

- 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).
- Tabs shall meet requirements of Departmental Material Specification DMS-8242.
- 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.
- 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



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

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

### RAISED PAVEMENT MARKERS

- 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)

- 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](http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm)

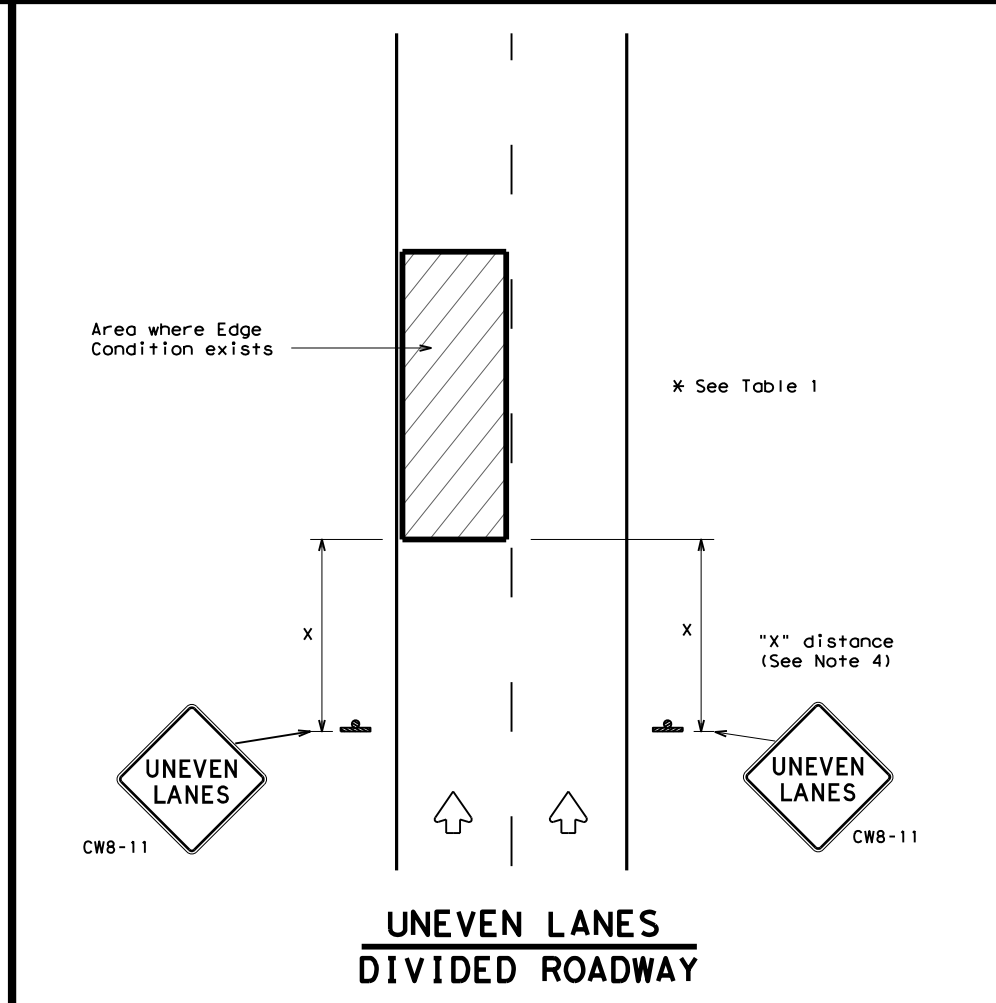
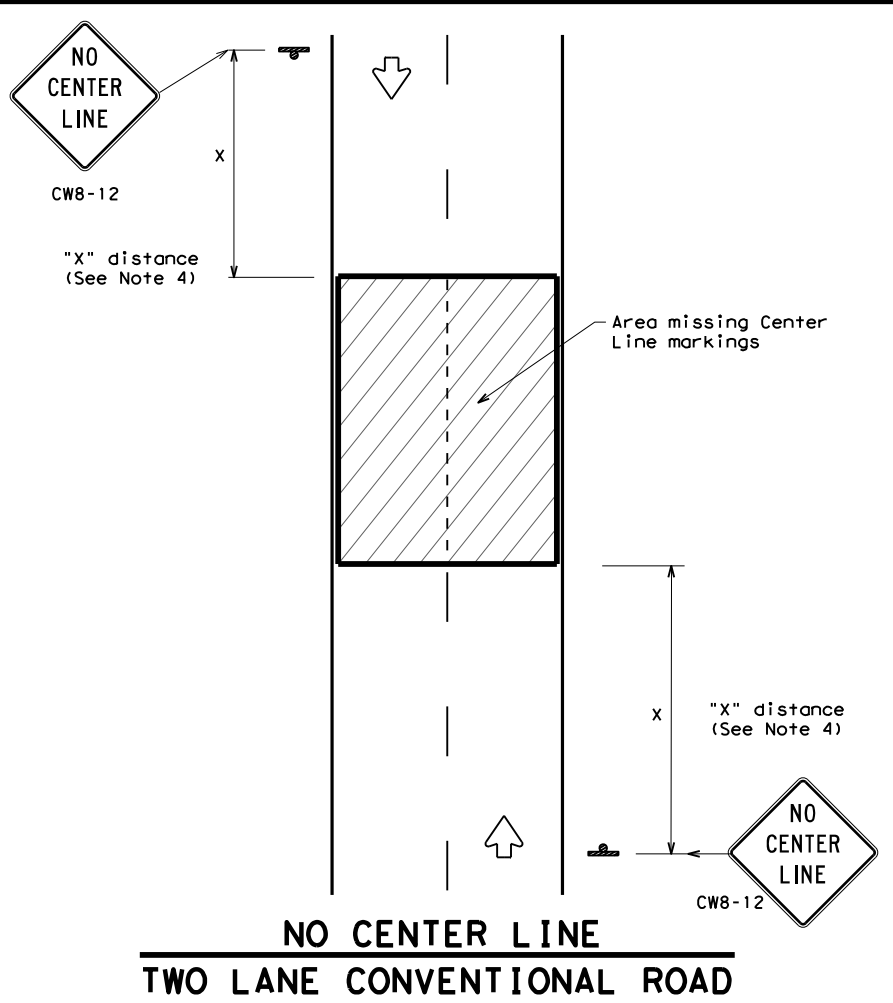
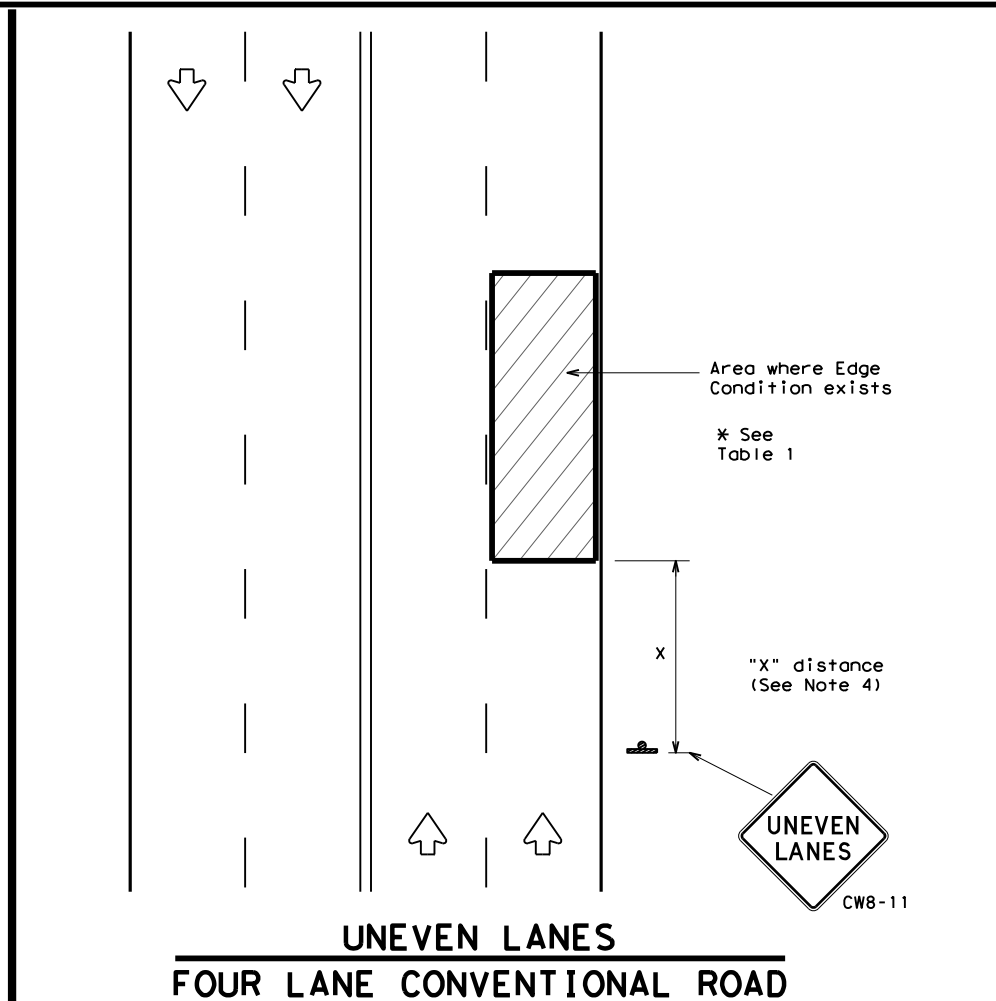
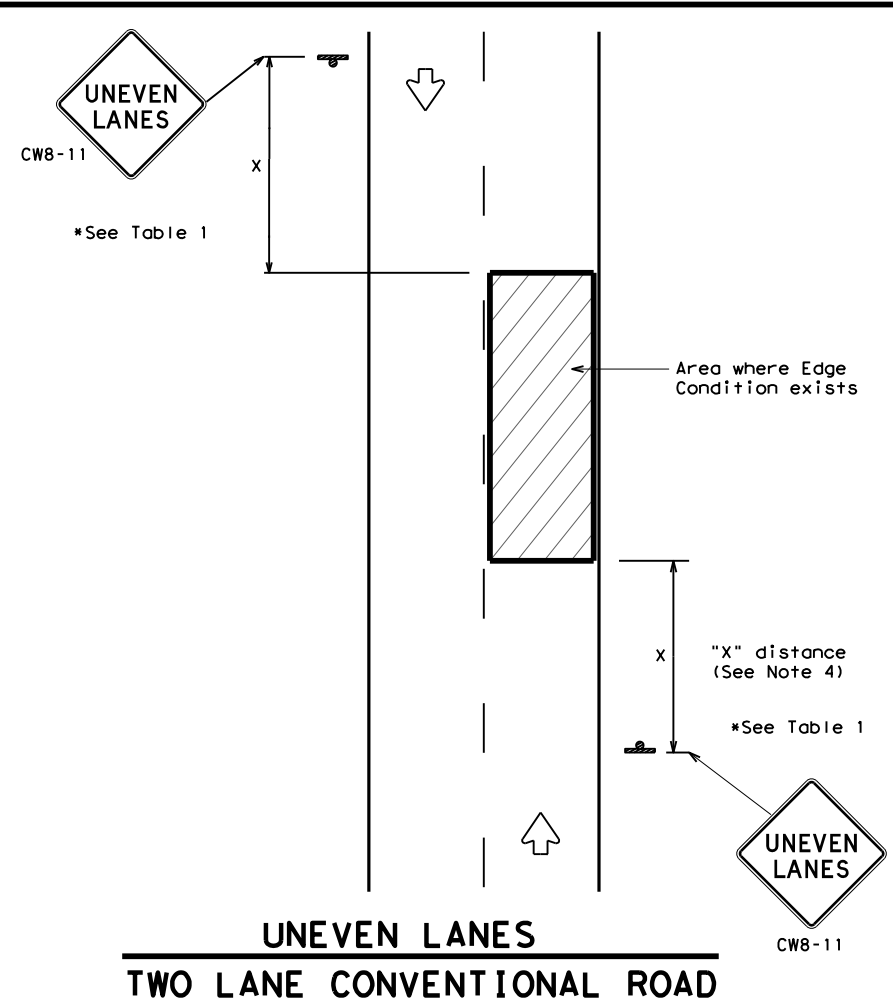


## WORK ZONE SHORT TERM PAVEMENT MARKINGS

### WZ (STPM) - 13

FILE:	wzstpm-13.dgn	DN:	TxDOT	CK:	TxDOT	OW:	TxDOT	CK:	TxDOT
© TxDOT	April 1992	CONT:	0197	SECT:	04	JOB:	084, ETC.	US:	175, ETC
REVISIONS:		DIST:		COUNTY:		SHEET NO.:			
1-97		DAL:		KAUFMAN, ETC.					36
3-03									
7-13									

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or the accuracy of the information provided. This standard is not intended to be used for any other purpose than that for which it was developed. DATE: 1/3/2023 9:10:20 PM FILE: pw://txdot.projectwiseonline.com:txdot15/Documents/18 - DAL/Design Projects/1801001001/1801001001.dgn



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 <sub>FL</sub> OR TYPE C <sub>FL</sub> 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.

Edge Condition	Edge Height (D)	* Warning Devices
①	Less than or equal to: 1/4" (maximum-planing) 1/2" (typical-overlay)	Sign: CW8-11
②	Less than or equal to 3"	Sign: CW8-11
③	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: wzu1-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT	APRIL 1992	CONT	SECT	JOB
REVISIONS	0197	04	084, ETC.	US 175, ETC
8-95 2-98 7-13	DIST	COUNTY	SHEET NO.	
1-97 3-03	DAL	KAUFMAN, ETC.	37	

DATE: 1/3/2023 9:10:37 PM  
 FILE: pw://ttdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/258801021/4 - Design/Plan Set/1. General/Plan Layout/1 PAVEMENT MARKING AND SIGNING LAYOUT.dgn

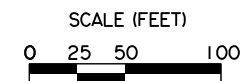
NOTES:

- EXISTING SIGNS AND MAILBOXES ARE TO REMAIN IN PLACE.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO AVOID DAMAGING EXISTING SIGN PANELS AND ASSEMBLIES. ANY DAMAGED SIGNS AND/OR ASSEMBLIES SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE DEPARTMENT.
- INSTALL OBJECT MARKERS ON HEADERS OF EXISTING STRUCTURE.

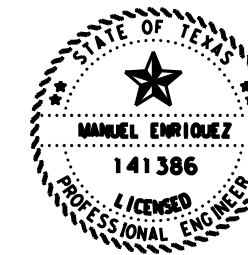
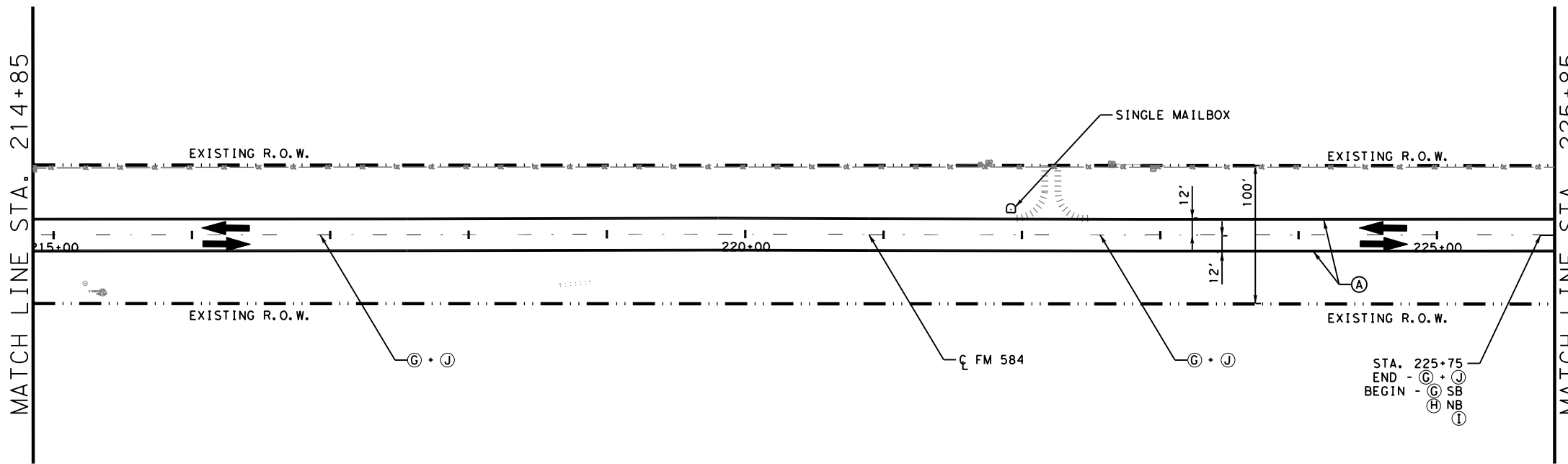
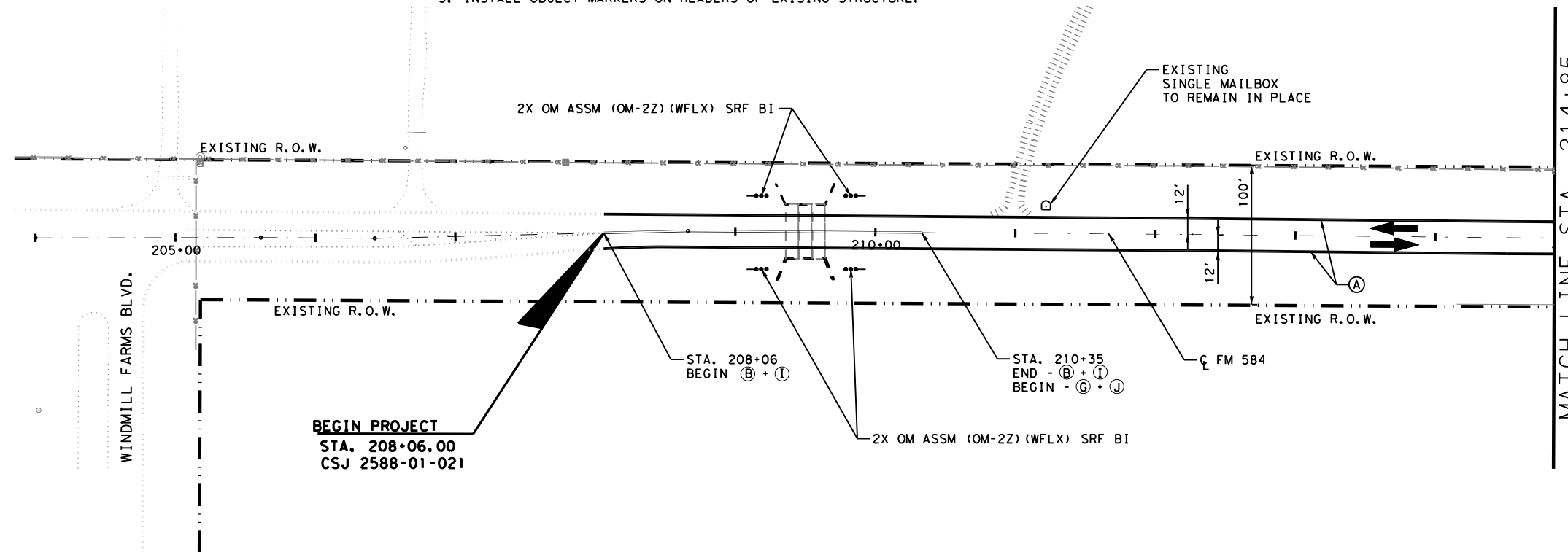
LEGEND:

- (A) RE PM W/RET REQ TY I (W)4" (SLD) (100MIL)
- (B) 2 x RE PM W/RET REQ TY I (Y)4" (SLD) (100MIL)
- (C) REFL PAV MRK TY I (W)8" (SLD) (100MIL)
- (D) REFL PAV MRK TY I (W)24" (SLD) (100MIL)
- (E) REFL PAV MRKR TY I (W)6" (DOT) (100MIL)
- (F) RE PM W/RET REQ TY I (W)6" (SLD) (100MIL)
- (G) RE PM W/RET REQ TY I (Y)4" (BRK) (100MIL)
- (H) RE PM W/RET REQ TY I (Y)4" (SLD) (100MIL)
- (I) REFL PAV MRKR TY II-A-A AT 40'
- (J) REFL PAV MRKR TY II-A-A AT 80'

- - - EXISTING R.O.W.
- OM ASSM (OM-2Z) (WFLX) SRF BI
- ← TRAVEL LANE & DIRECTION



NOTE  
 USE PC STATION AS BEGIN CURVE AND PT STATION AS END CURVE WHEN STRIPING EXISTING SECTIONS.



*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date



**FM 584  
 PLAN & PAVEMENT MARKINGS  
 LAYOUT**

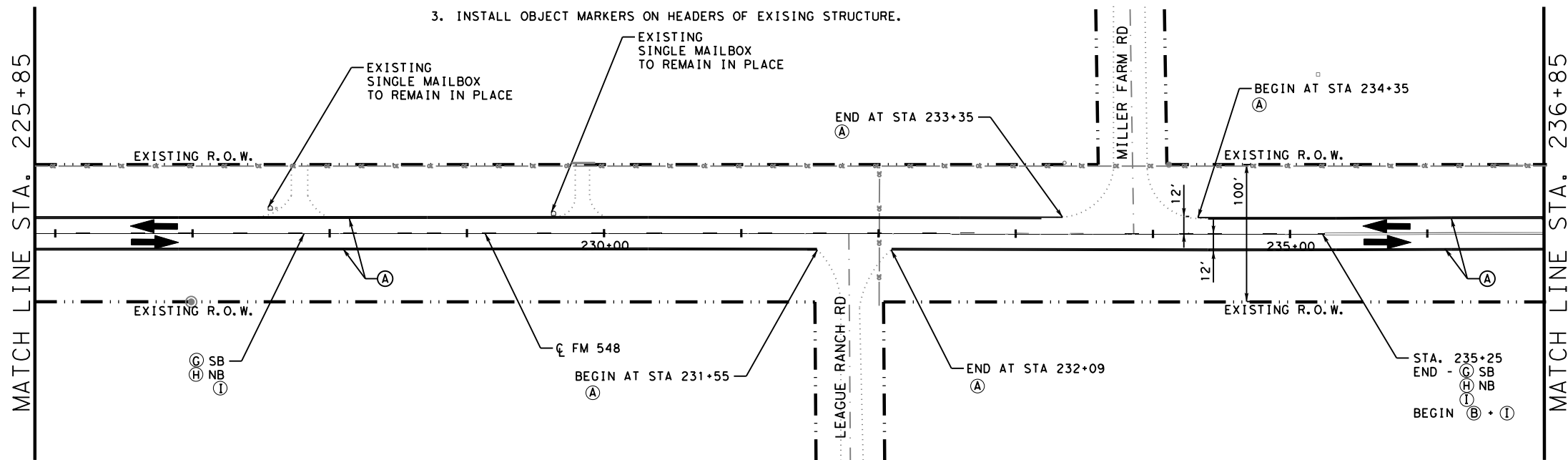
SCALE: 1"=100' SHEET 1 OF 10

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
VD	TEXAS	DAL	KAUFMAN, ETC.	38
CHECK	ME	CONTROL	SECTION	
CHECK	FR	0197	04	
			JOB	
			084, ETC.	



**NOTES:**

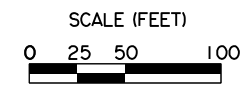
1. EXISTING SIGNS AND MAILBOXES ARE TO REMAIN IN PLACE.
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3. INSTALL OBJECT MARKERS ON HEADERS OF EXISTING STRUCTURE.



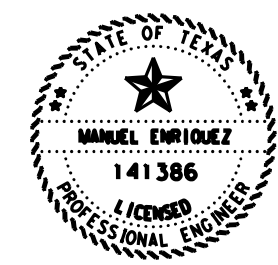
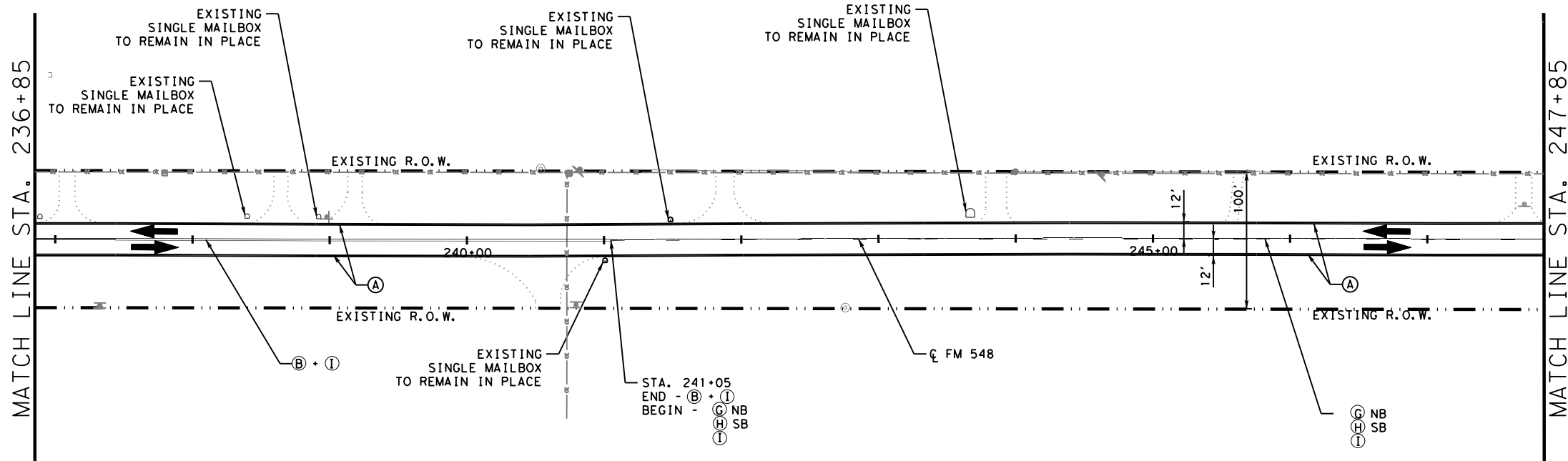
**LEGEND:**

- (A) RE PM W/RET REQ TY I (W)4" (SLD) (100MIL)
- (B) 2 x RE PM W/RET REQ TY I (Y)4" (SLD) (100MIL)
- (C) REFL PAV MRK TY I (W)8" (SLD) (100MIL)
- (D) REFL PAV MRK TY I (W)24" (SLD) (100MIL)
- (E) REFL PAV MRK TY I (W)6" (DOT) (100MIL)
- (F) RE PM W/RET REQ TY I (W)6" (SLD) (100MIL)
- (G) RE PM W/RET REQ TY I (Y)4" (BRK) (100MIL)
- (H) RE PM W/RET REQ TY I (Y)4" (SLD) (100MIL)
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- (L) REFL PAV MRK TY II-A-A AT 80'

- EXISTING R.O.W.
- OM ASSM (OM-2Z) (WFLX) SRF BI
- ← TRAVEL LANE & DIRECTION



NOTE  
 USE PC STATION AS BEGIN CURVE AND PT STATION AS END CURVE WHEN STRIPING EXISTING SECTIONS.



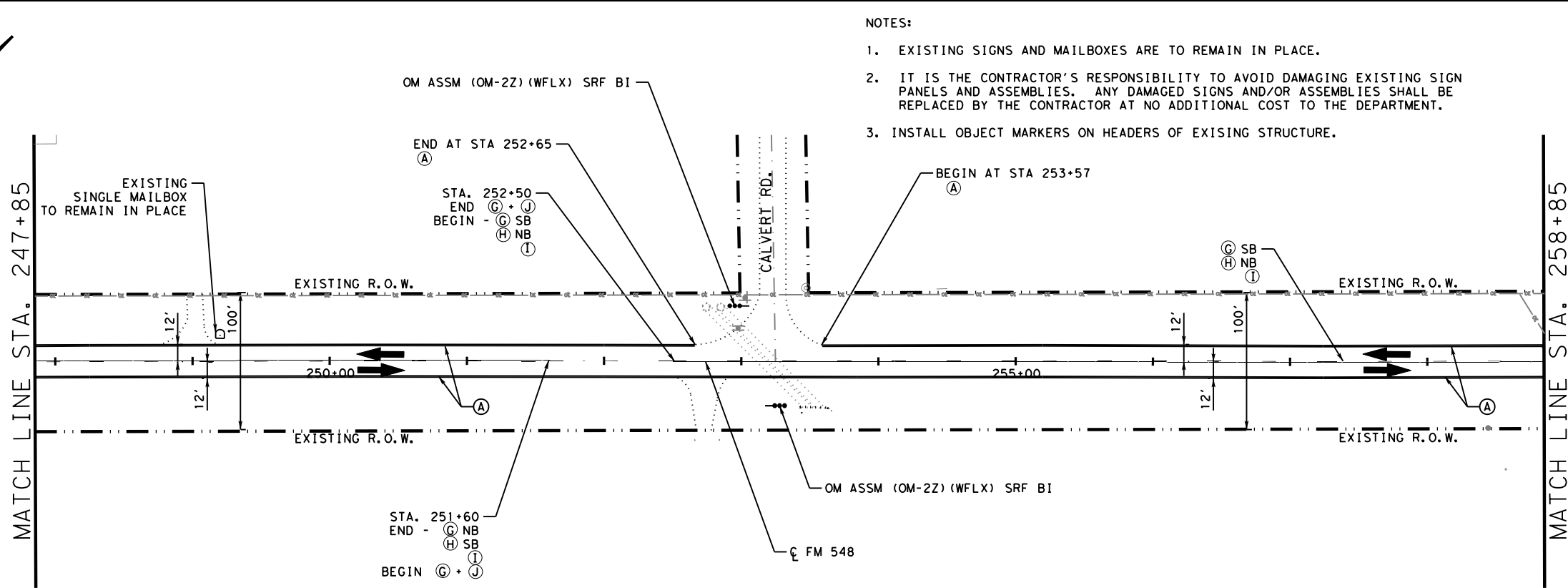
*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date



**FM 548  
 PLAN & PAVEMENT MARKINGS  
 LAYOUT**

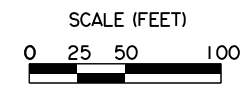
SCALE: 1"=100' SHEET 2 OF 10

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
VD	TEXAS	DAL	KAUFMAN, ETC.	39
CHECK	ME	CONTROL	SECTION	
CHECK	FR	0197	04	
			JOB	
			084, ETC.	

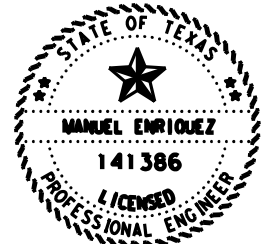
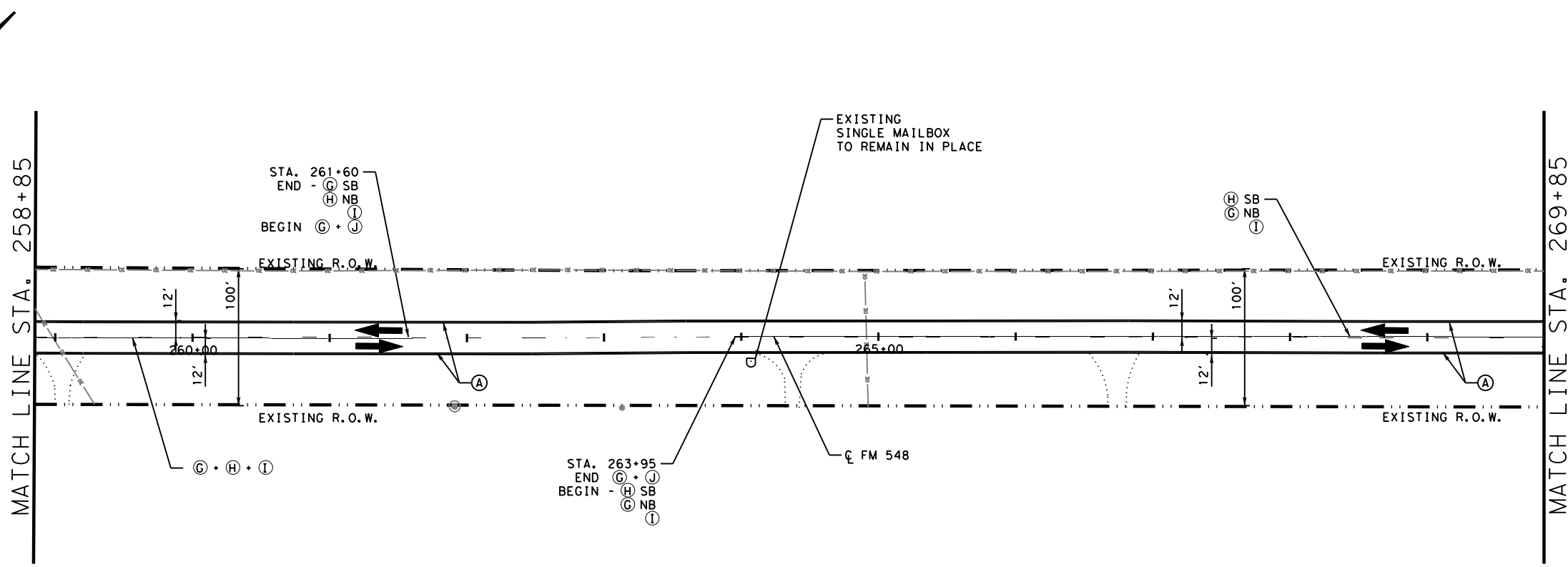


- NOTES:
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  - (D) REFL PAV MRK TY I (W)24" (SLD) (100MIL)
  - (E) REFL PAV MRKR TY I (W)6" (DOT) (100MIL)
  - (F) RE PM W/RET REQ TY I (W)6" (SLD) (100MIL)
  - (G) RE PM W/RET REQ TY I (Y)4" (BRK) (100MIL)
  - (H) RE PM W/RET REQ TY I (Y)4" (SLD) (100MIL)
  - (I) REFL PAV MRKR TY II-A-A AT 40'
  - (J) REFL PAV MRKR TY II-A-A AT 80'
- EXISTING R.O.W.  
 --- OM ASSM (OM-22) (WFLX) SRF BI  
 ← TRAVEL LANE & DIRECTION



NOTE  
 USE PC STATION AS BEGIN CURVE AND PT STATION AS END CURVE WHEN STRIPING EXISTING SECTIONS.



*Manuel Enriquez P.E.* P.E. 12-20-22  
 Signature of Registrant & Date



**FM 548  
 PLAN & PAVEMENT MARKINGS  
 LAYOUT**

SCALE: 1"=100' SHEET 3 OF 10

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
VD	TEXAS	DAL	KAUFMAN, ETC.	40
CHECK ME	CONTROL	SECTION	JOB	
CHECK FR	0197	04	084, ETC.	

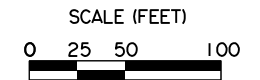
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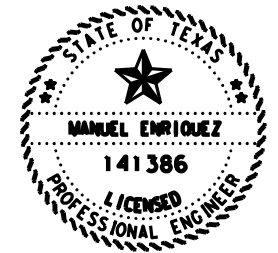
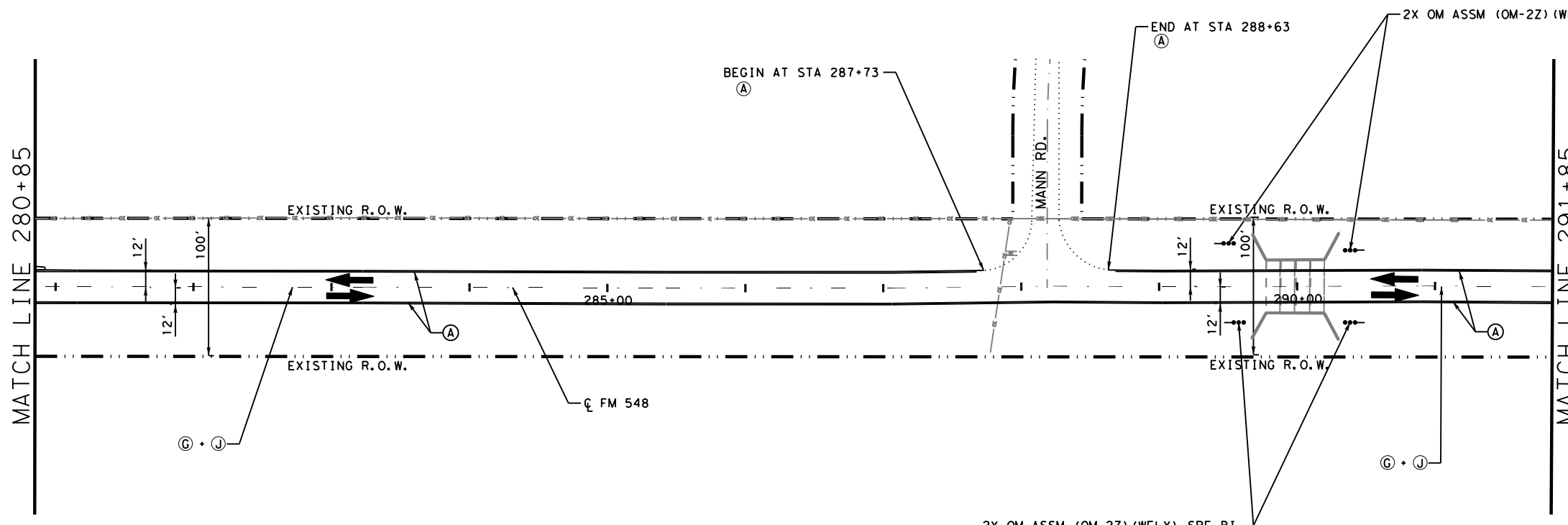
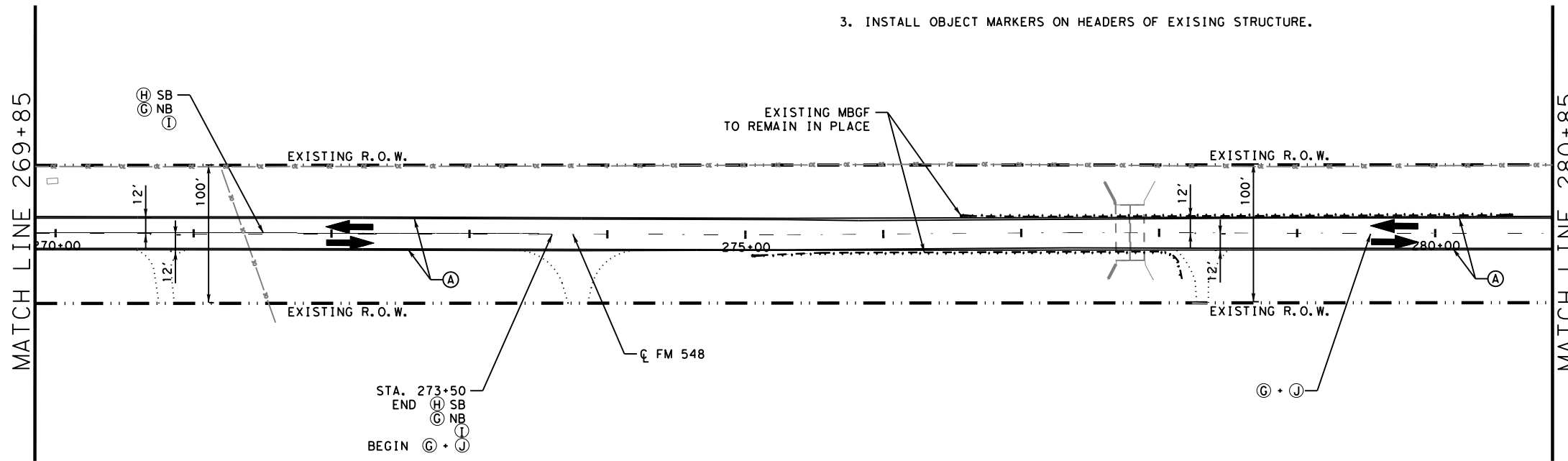
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- - - EXISTING R.O.W.
- OM ASSM (OM-2Z) (WFLX) SRF BI
- ← TRAVEL LANE & DIRECTION



NOTE  
USE PC STATION AS BEGIN CURVE AND PT STATION AS END CURVE WHEN STRIPING EXISTING SECTIONS.



*Manuel Enriquez P.E.*, P.E. 12-20-22  
Signature of Registrant & Date



**FM 548  
PLAN & PAVEMENT MARKINGS  
LAYOUT**

SCALE: 1"=100' SHEET 4 OF 10

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
VD	TEXAS	DAL	KAUFMAN, ETC.	41
CHECK ME	CONTROL	SECTION	JOB	
CHECK FR	0197	04	084, ETC.	

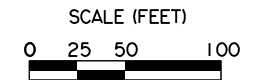
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LEGEND:

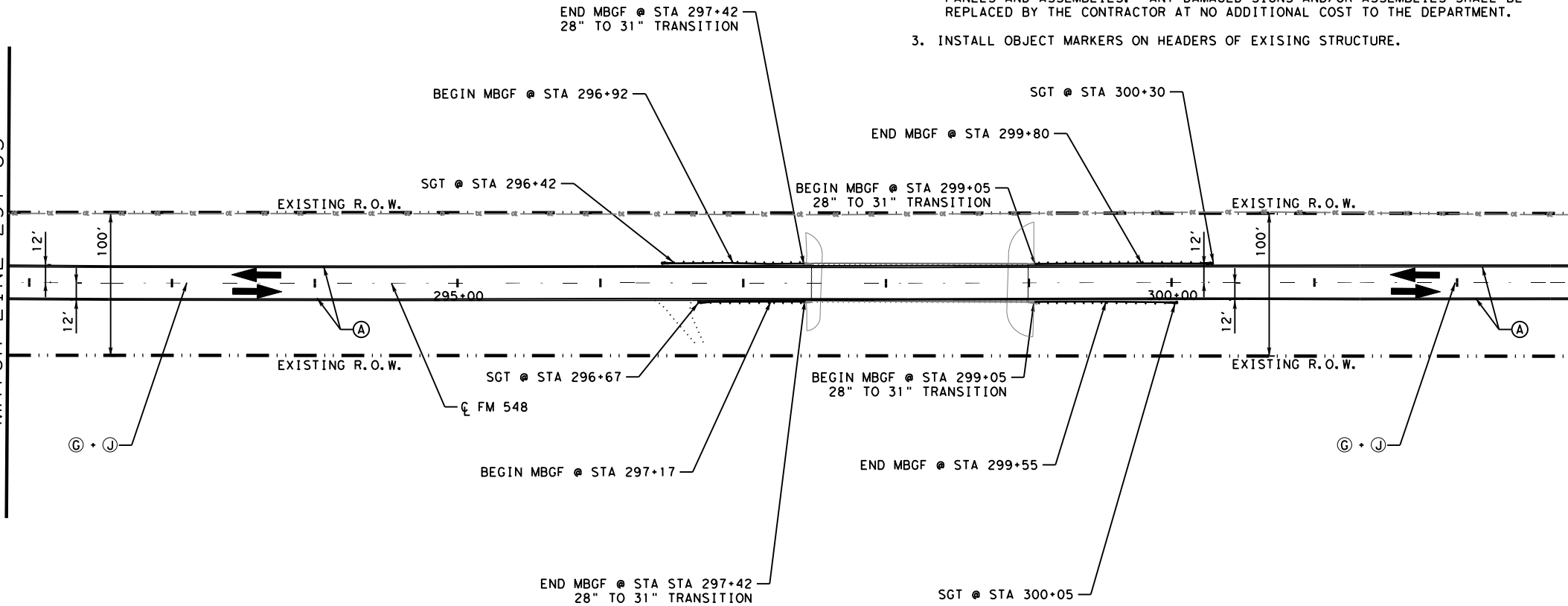
- (A) RE PM W/RET REQ TY I (W)4" (SLD) (100MIL)
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- EXISTING R.O.W.
- INSTL OM ASSM (OM-2Z) (FLX)GND
- ← TRAVEL LANE & DIRECTION



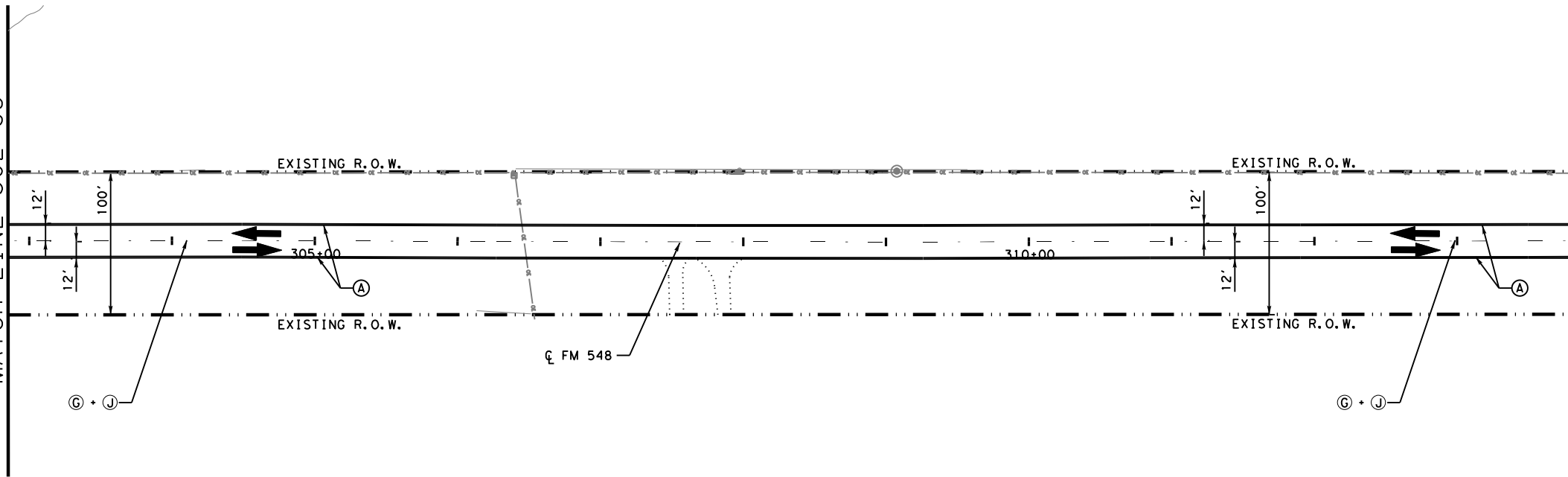
NOTE  
USE PC STATION AS BEGIN CURVE AND PT STATION AS END CURVE WHEN STRIPING EXISTING SECTIONS.

MATCH LINE 291+85

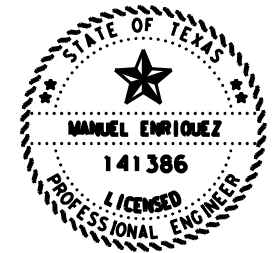


MATCH LINE 302+85

MATCH LINE 302+85



MATCH LINE 313+85



*Manuel Enriquez P.E.*, P.E. 12-20-22  
Signature of Registrant & Date



**FM 548  
PLAN & PAVEMENT MARKINGS  
LAYOUT**

SCALE: 1"=100' SHEET 5 OF 10

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	
VD	TEXAS	DAL	KAUFMAN, ETC.	
CHECK	ME	CONTROL	SECTION	JOB
CHECK	FR	0197	04	084, ETC.

42

DATE: 1/3/2023 9:11:21 PM  
 FILE: pw://ttdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/258801021/4 - Design/Plan Set/1. General/Plan Layout/6 PAVEMENT MARKING AND SIGNING LAYOUT.dgn

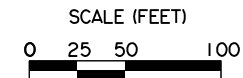
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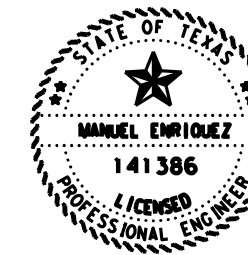
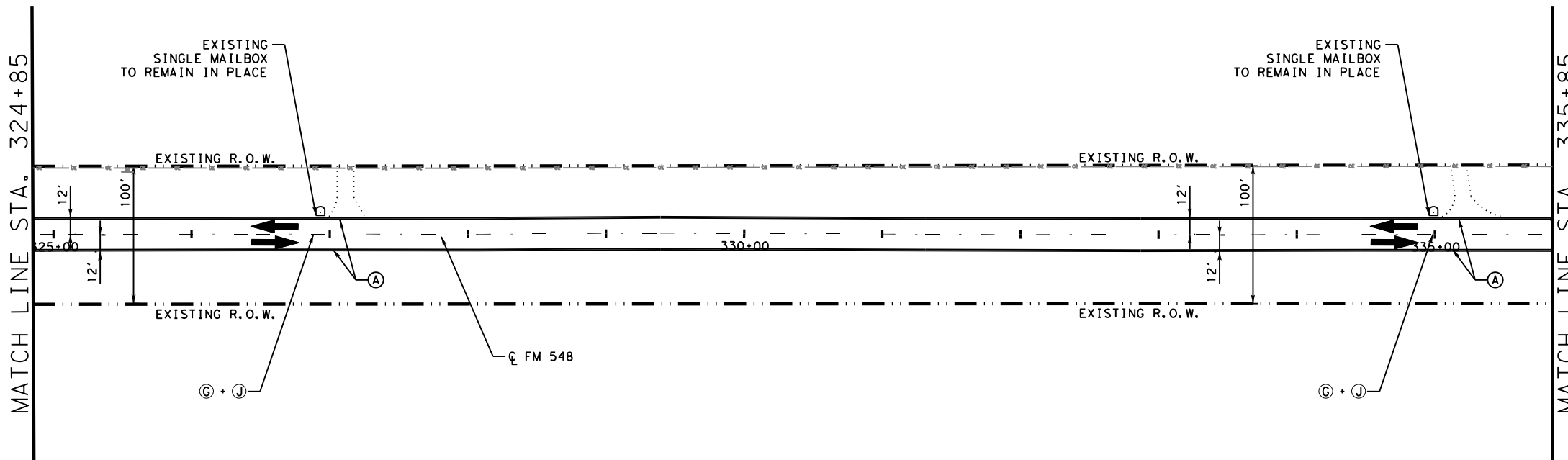
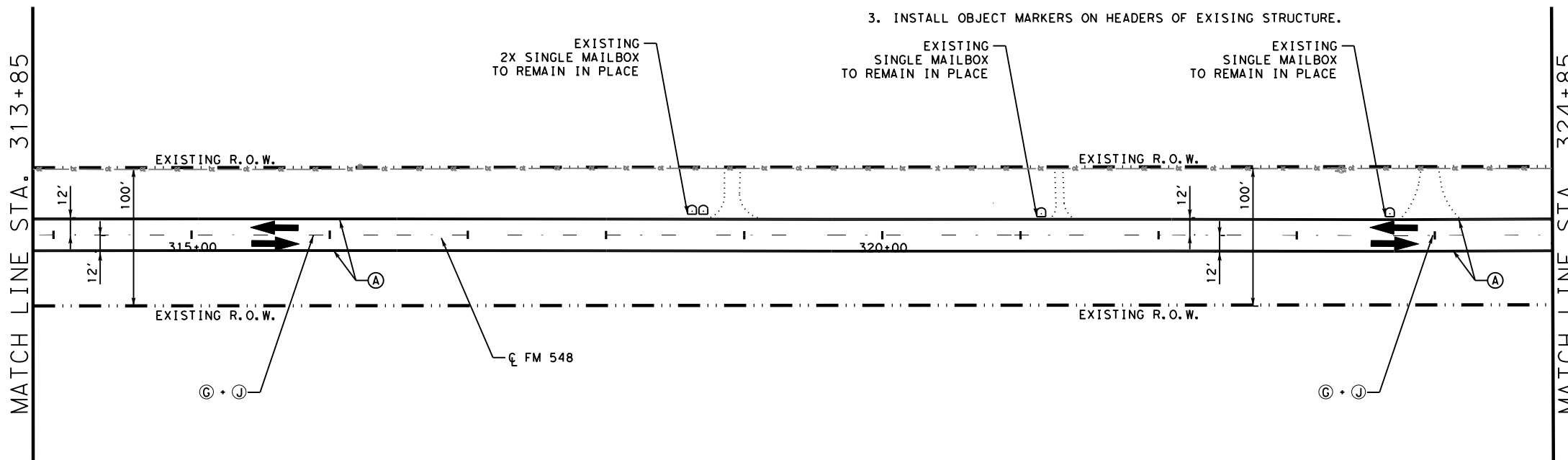
LEGEND:

- (A) RE PM W/RET REQ TY I (W)4" (SLD) (100MIL)
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- (C) REFL PAV MRK TY I (W)8" (SLD) (100MIL)
- (D) REFL PAV MRK TY I (W)24" (SLD) (100MIL)
- (E) REFL PAV MRKR TY I (W)6" (DOT) (100MIL)
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- OM ASSM (OM-2Z) (WFLX) SRF BI
- ← TRAVEL LANE & DIRECTION



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*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date



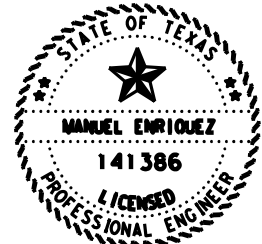
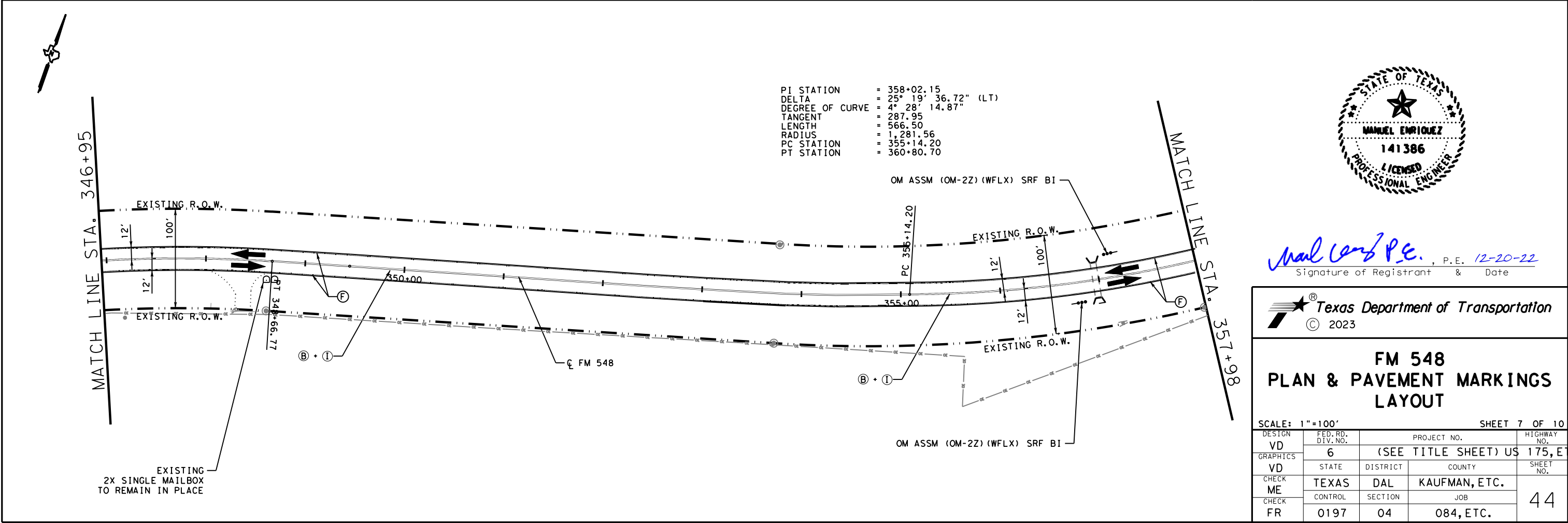
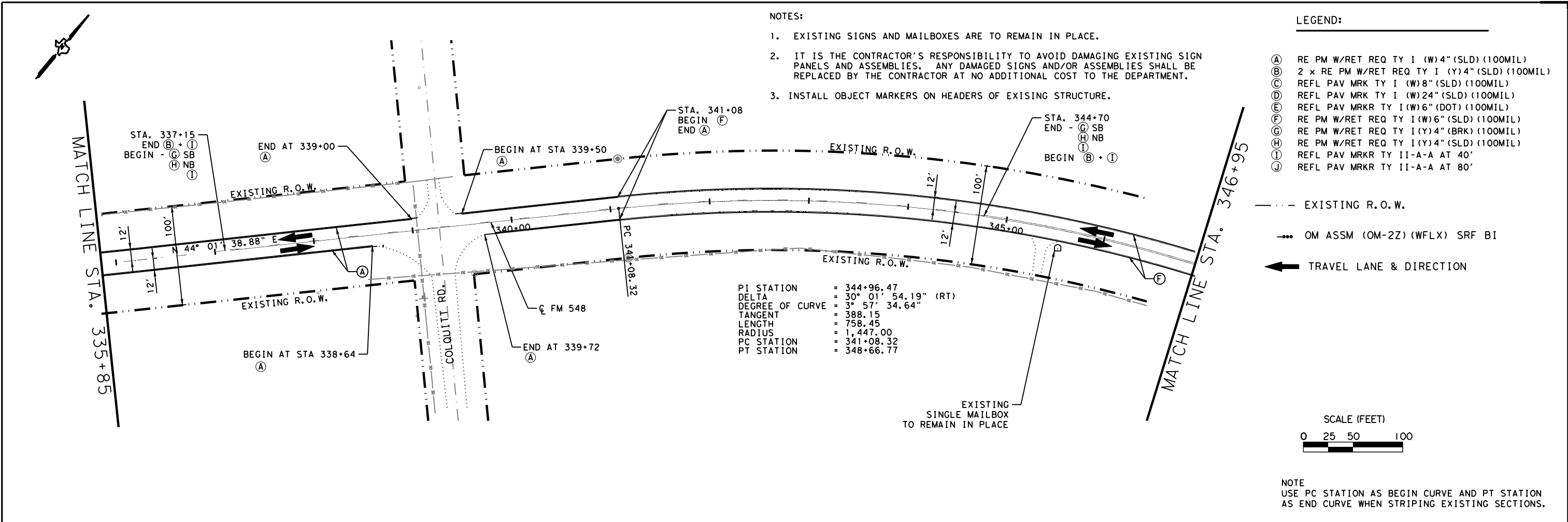
**FM 548  
 PLAN & PAVEMENT MARKINGS  
 LAYOUT**

SCALE: 1"=100' SHEET 6 OF 10

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	
VD	TEXAS	DAL	KAUFMAN, ETC.	
CHECK	CONTROL	SECTION	JOB	
ME	0197	04	084, ETC.	
CHECK	FR			

43





*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date



**FM 548  
 PLAN & PAVEMENT MARKINGS  
 LAYOUT**

SCALE: 1"=100' SHEET 7 OF 10

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
VD	TEXAS	DAL	KAUFMAN, ETC.	44
CHECK	CONTROL	SECTION	JOB	
ME	0197	04	084, ETC.	

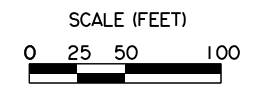
NOTES:

- EXISTING SIGNS AND MAILBOXES ARE TO REMAIN IN PLACE.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO AVOID DAMAGING EXISTING SIGN PANELS AND ASSEMBLIES. ANY DAMAGED SIGNS AND/OR ASSEMBLIES SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE DEPARTMENT.
- INSTALL OBJECT MARKERS ON HEADERS OF EXISTING STRUCTURE.

LEGEND:

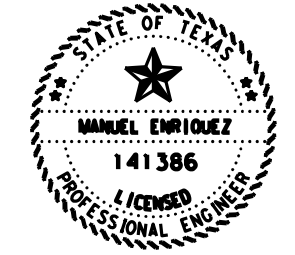
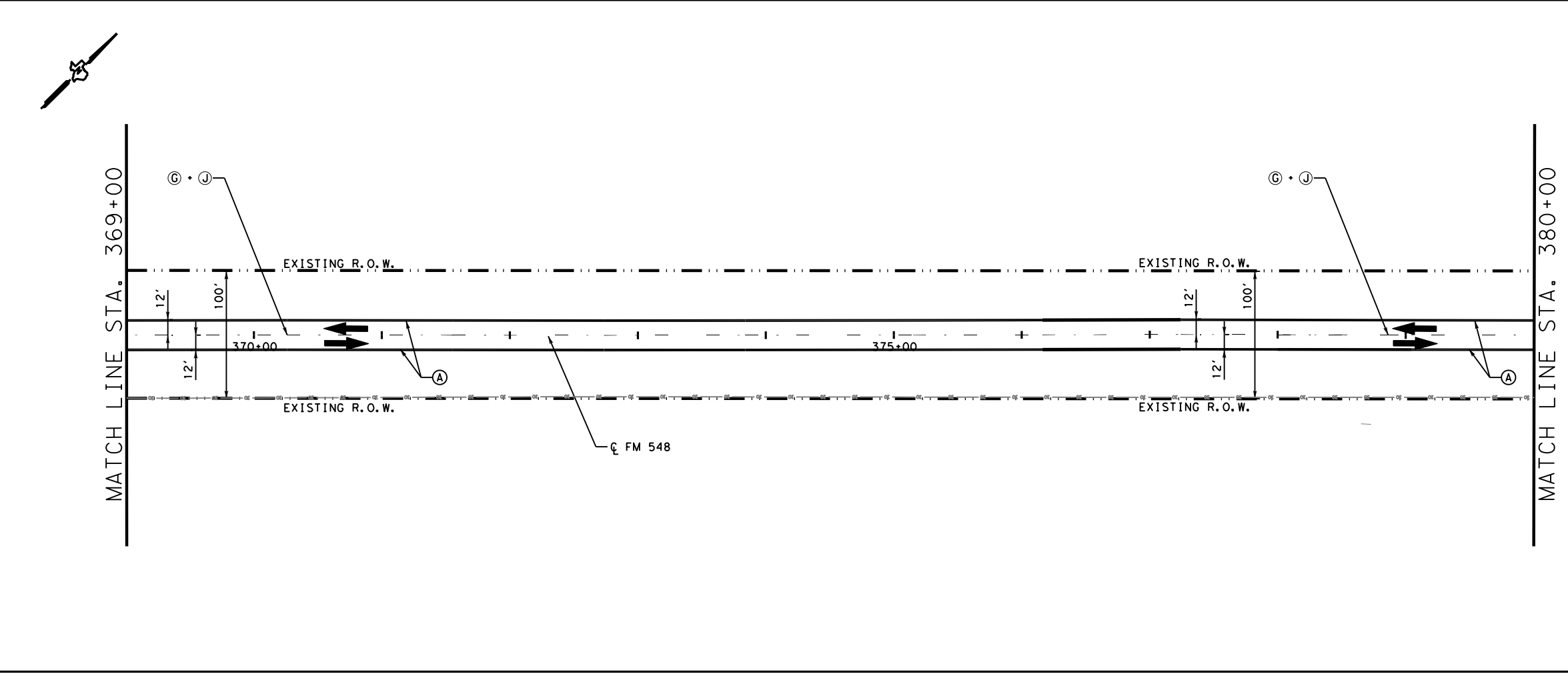
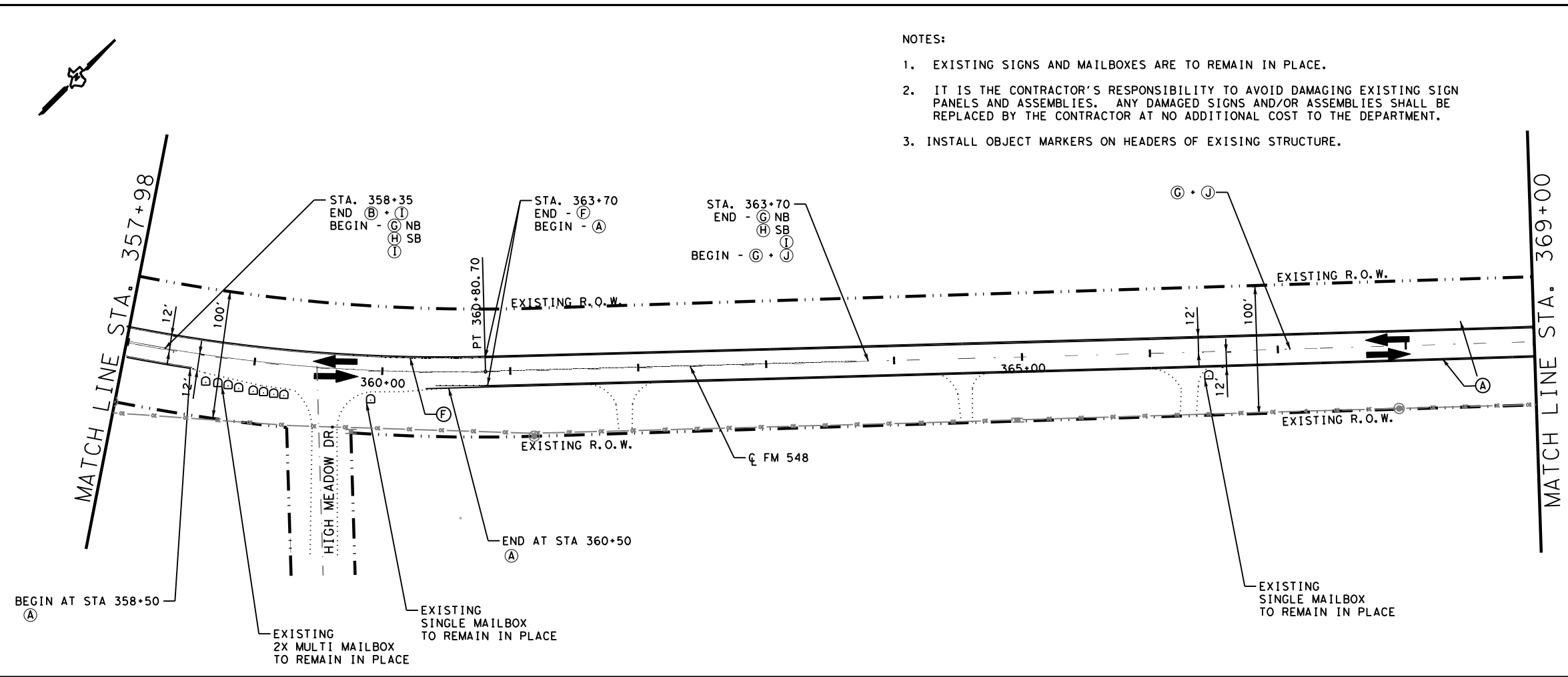
- (A) RE PM W/RET REQ TY I (W)4" (SLD) (100MIL)
- (B) 2 x RE PM W/RET REQ TY I (Y)4" (SLD) (100MIL)
- (C) REFL PAV MRK TY I (W)8" (SLD) (100MIL)
- (D) REFL PAV MRK TY I (W)24" (SLD) (100MIL)
- (E) REFL PAV MRKR TY I (W)6" (DOT) (100MIL)
- (F) RE PM W/RET REQ TY I (W)6" (SLD) (100MIL)
- (G) RE PM W/RET REQ TY I (Y)4" (BRK) (100MIL)
- (H) RE PM W/RET REQ TY I (Y)4" (SLD) (100MIL)
- (I) REFL PAV MRKR TY II-A-A AT 40'
- (J) REFL PAV MRKR TY II-A-A AT 80'

- - - EXISTING R.O.W.
- OM ASSM (OM-2Z) (WFLX) SRF BI
- ← TRAVEL LANE & DIRECTION



NOTE  
USE PC STATION AS BEGIN CURVE AND PT STATION AS END CURVE WHEN STRIPING EXISTING SECTIONS.

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*Manuel Enriquez P.E.*, P.E. 12-20-22  
Signature of Registrant & Date



**FM 548  
PLAN & PAVEMENT MARKINGS  
LAYOUT**

SCALE: 1"=100' SHEET 8 OF 10

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
VD	TEXAS	DAL	KAUFMAN, ETC.	45
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				JOB
				084, ETC.

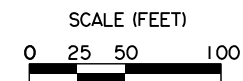
NOTES:

- EXISTING SIGNS AND MAILBOXES ARE TO REMAIN IN PLACE.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO AVOID DAMAGING EXISTING SIGN PANELS AND ASSEMBLIES. ANY DAMAGED SIGNS AND/OR ASSEMBLIES SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE DEPARTMENT.
- INSTALL OBJECT MARKERS ON HEADERS OF EXISTING STRUCTURE.

LEGEND:

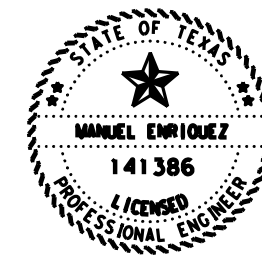
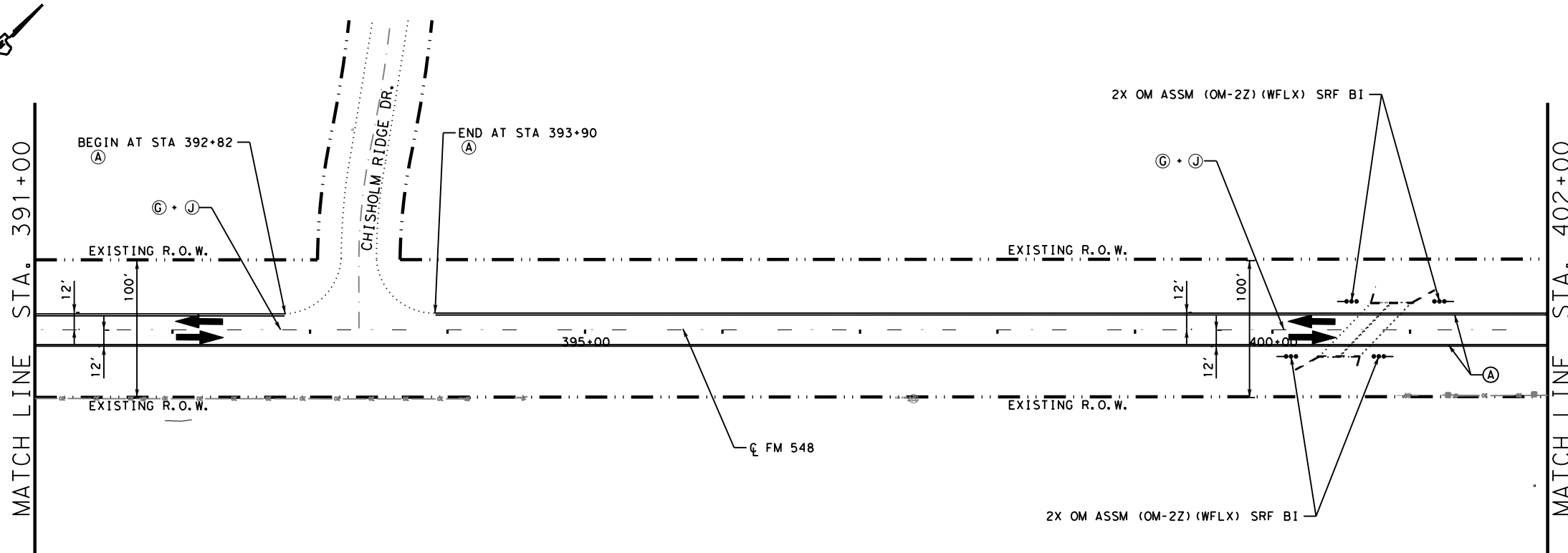
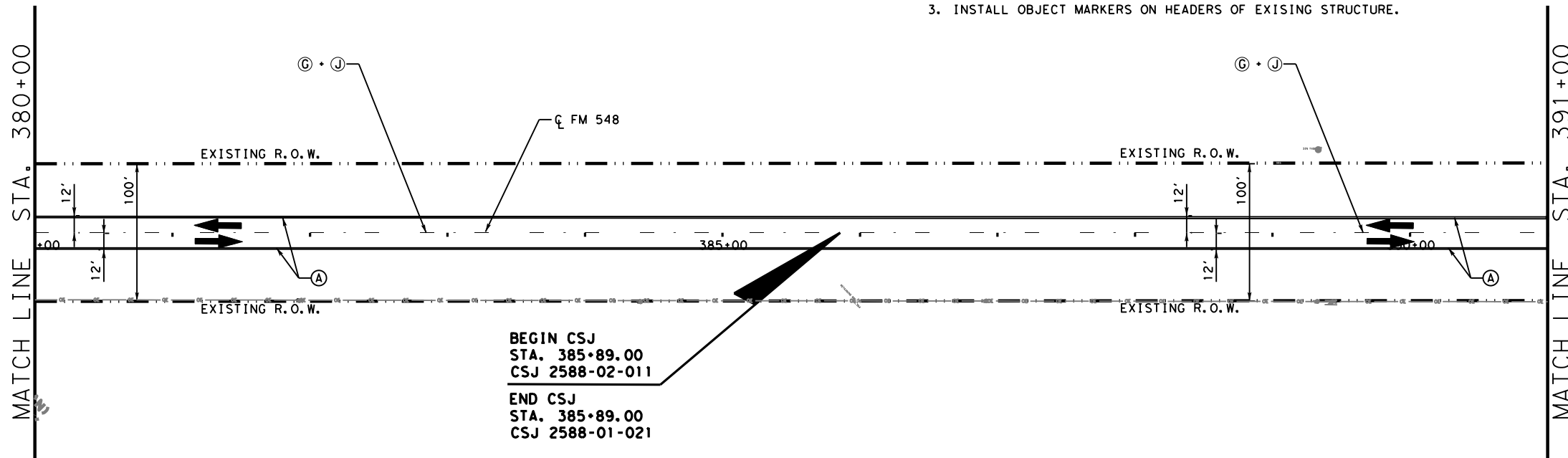
- (A) RE PM W/RET REQ TY I (W)4" (SLD) (100MIL)
- (B) 2 x RE PM W/RET REQ TY I (Y)4" (SLD) (100MIL)
- (C) REFL PAV MRK TY I (W)8" (SLD) (100MIL)
- (D) REFL PAV MRK TY I (W)24" (SLD) (100MIL)
- (E) REFL PAV MRKR TY I (W)6" (DOT) (100MIL)
- (F) RE PM W/RET REQ TY I (W)6" (SLD) (100MIL)
- (G) RE PM W/RET REQ TY I (Y)4" (BRK) (100MIL)
- (H) RE PM W/RET REQ TY I (Y)4" (SLD) (100MIL)
- (I) REFL PAV MRKR TY II-A-A AT 40'
- (L) REFL PAV MRKR TY II-A-A AT 80'

- - - EXISTING R.O.W.
- OM ASSM (OM-2Z) (WFLX) SRF BI
- ← TRAVEL LANE & DIRECTION



NOTE  
USE PC STATION AS BEGIN CURVE AND PT STATION AS END CURVE WHEN STRIPING EXISTING SECTIONS.

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*Manuel Enriquez P.E.*, P.E. 12-20-22  
Signature of Registrant & Date



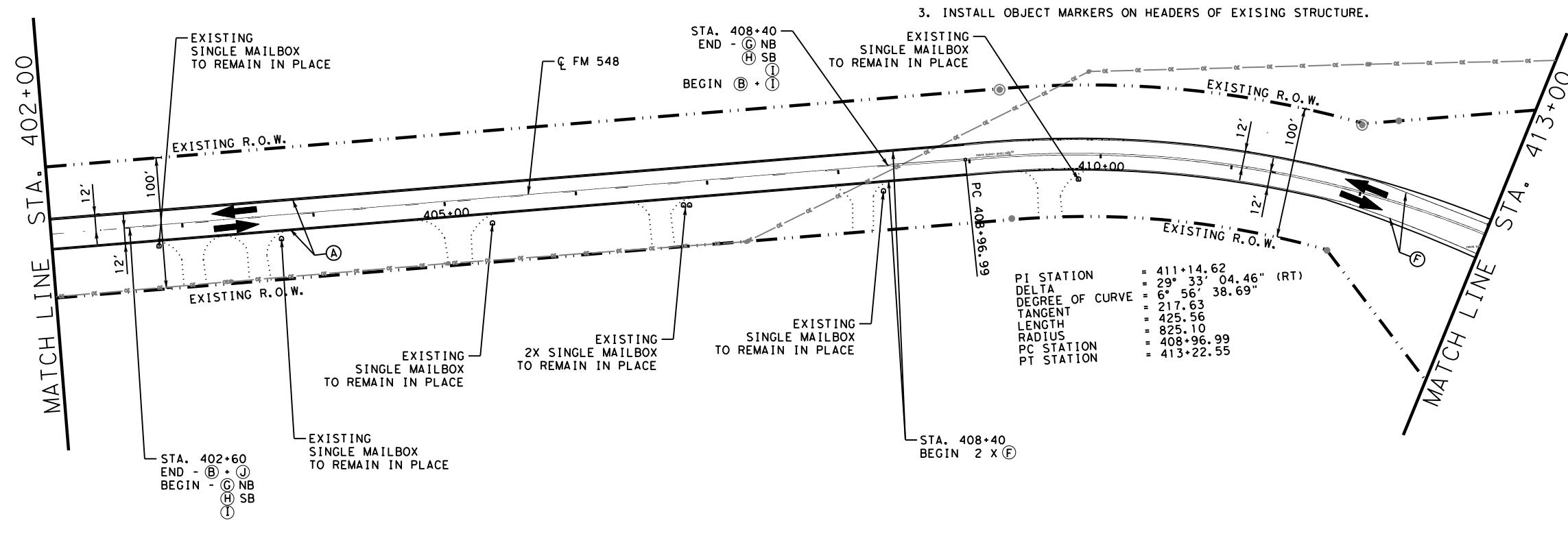
**FM 548  
PLAN & PAVEMENT MARKINGS  
LAYOUT**

SCALE: 1"=100' SHEET 9 OF 10

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	
VD	TEXAS	DAL	KAUFMAN, ETC.	
CHECK	ME	CONTROL	SECTION	JOB
CHECK	FR	0197	04	084, ETC.

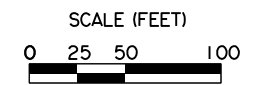
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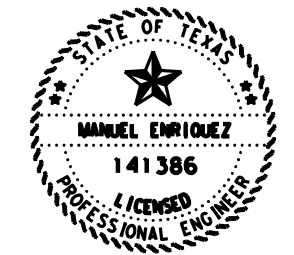
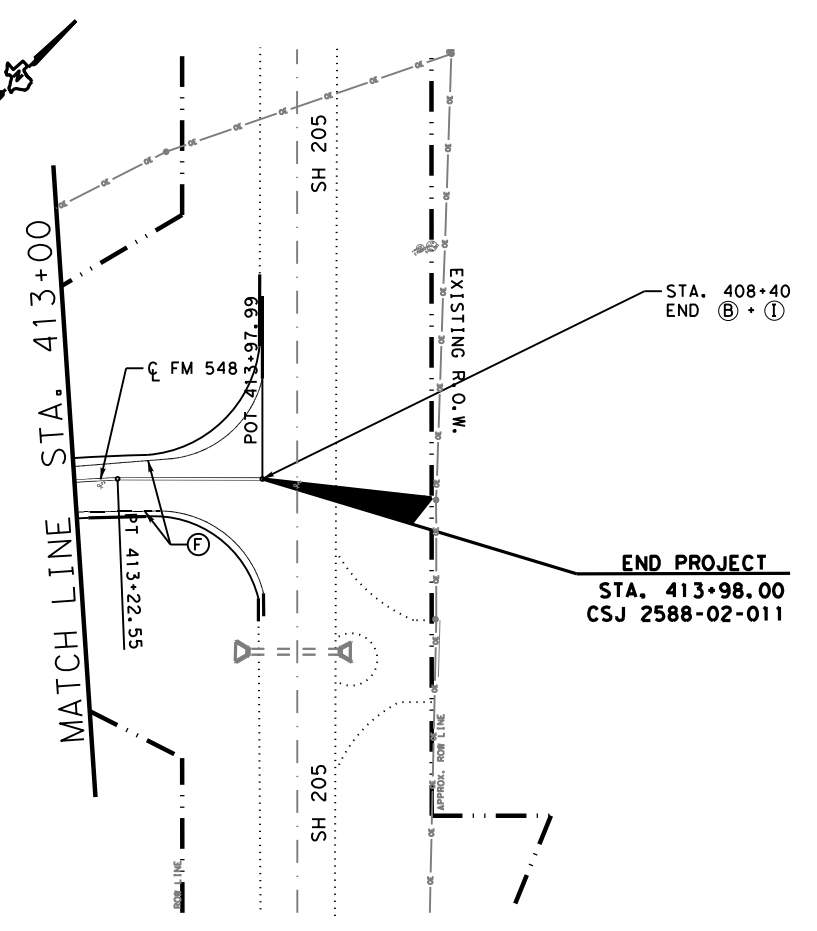


- NOTES:
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  - IT IS THE CONTRACTOR'S RESPONSIBILITY TO AVOID DAMAGING EXISTING SIGN PANELS AND ASSEMBLIES. ANY DAMAGED SIGNS AND/OR ASSEMBLIES SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE DEPARTMENT.
  - INSTALL OBJECT MARKERS ON HEADERS OF EXISTING STRUCTURE.

- LEGEND:
- (A) RE PM W/RET REQ TY I (W)4" (SLD) (100MIL)
  - (B) 2 x RE PM W/RET REQ TY I (Y)4" (SLD) (100MIL)
  - (C) REFL PAV MRK TY I (W)8" (SLD) (100MIL)
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  - (E) REFL PAV MRKR TY I (W)6" (DOT) (100MIL)
  - (F) RE PM W/RET REQ TY I (W)6" (SLD) (100MIL)
  - (G) RE PM W/RET REQ TY I (Y)4" (BRK) (100MIL)
  - (H) RE PM W/RET REQ TY I (Y)4" (SLD) (100MIL)
  - (I) REFL PAV MRKR TY II-A-A AT 40'
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- EXISTING R.O.W.
- OM ASSM (OM-2Z) (WFLX) SRF BI
- ← TRAVEL LANE & DIRECTION



NOTE  
 USE PC STATION AS BEGIN CURVE AND PT STATION AS END CURVE WHEN STRIPING EXISTING SECTIONS.



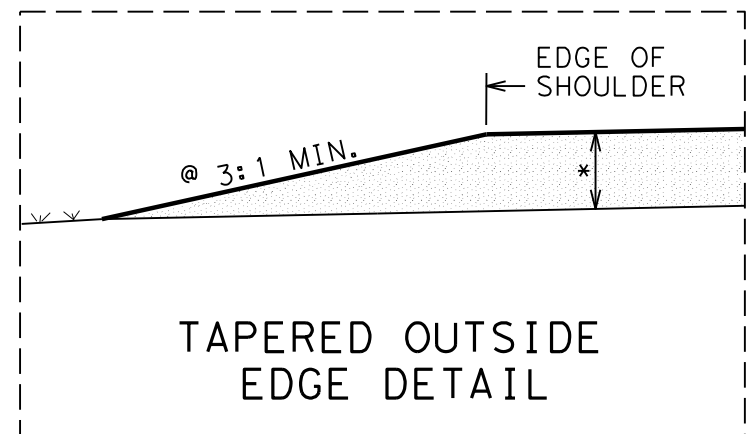
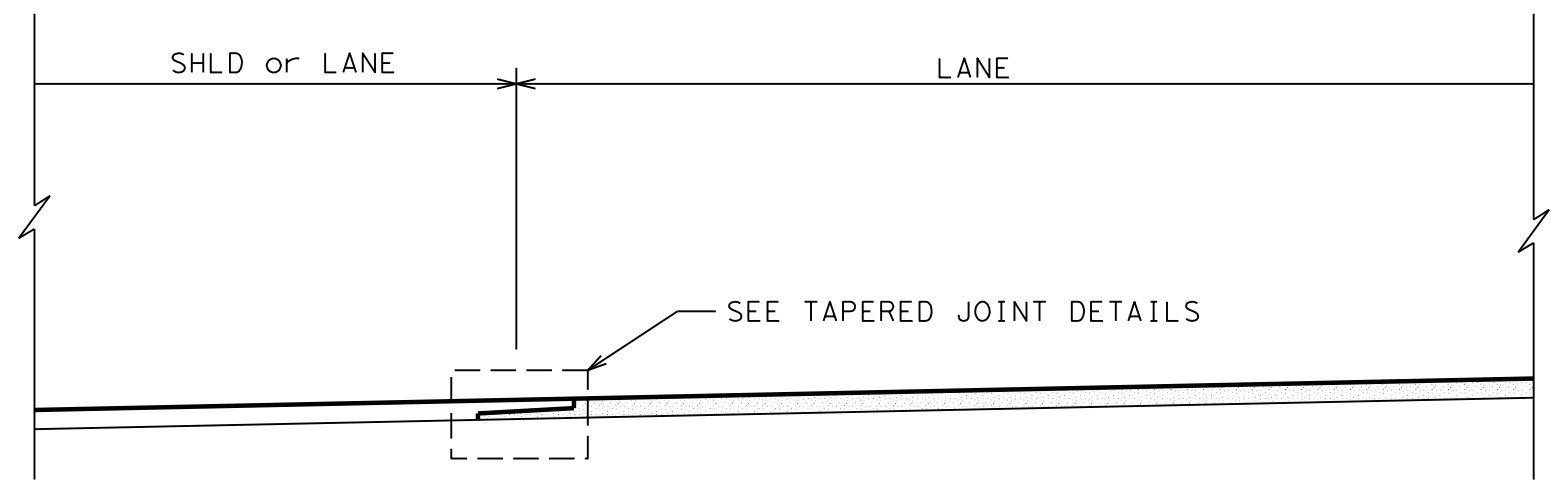
*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date



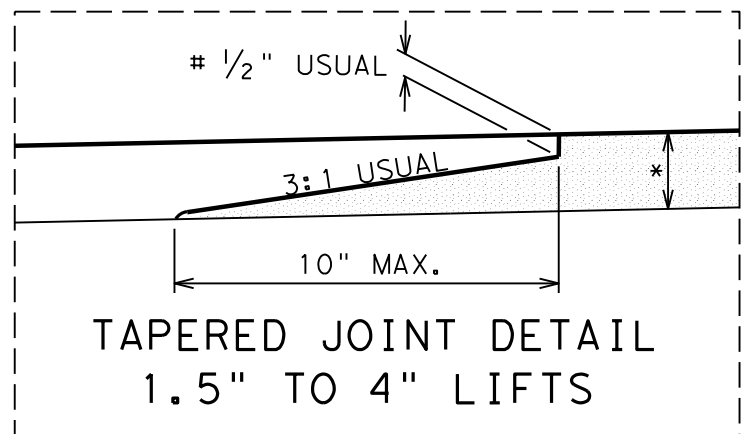
**FM 548  
 PLAN & PAVEMENT MARKINGS  
 LAYOUT**

SCALE: 1"=100' SHEET 10 OF 10

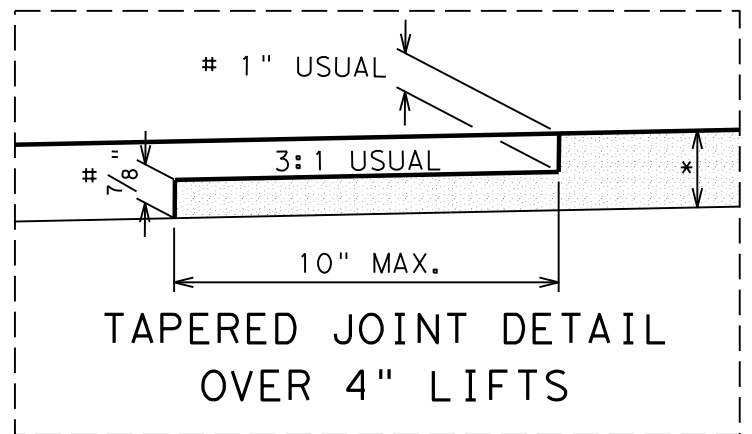
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VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
VD	TEXAS	DAL	KAUFMAN, ETC.	47
CHECK	CONTROL	SECTION	JOB	
ME	0197	04	084, ETC.	
CHECK				
FR				



TAPERED OUTSIDE  
EDGE DETAIL



TAPERED JOINT DETAIL  
1.5" TO 4" LIFTS



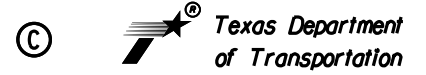
TAPERED JOINT DETAIL  
OVER 4" LIFTS

@ 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.



**HOT MIX EDGE AND  
LONGITUDINAL JOINT DETAILS  
DALLAS DISTRICT STANDARD**  
**LJD(1-1)-07**

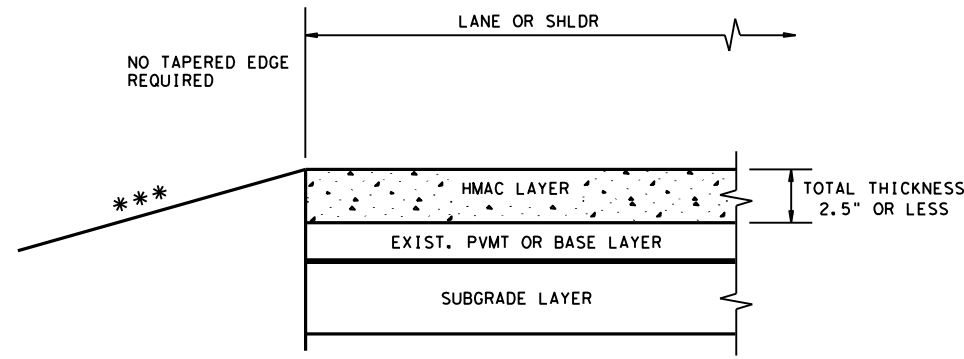
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STATE	DISTRICT	COUNTY
TEXAS	DALLAS	KAUFMAN, ETC.
CONTROL	SECTION	SECTION HIGHWAY NUMBER
0197	04	084, ETC. US 175, ETC

REVISED ON 9/10/08

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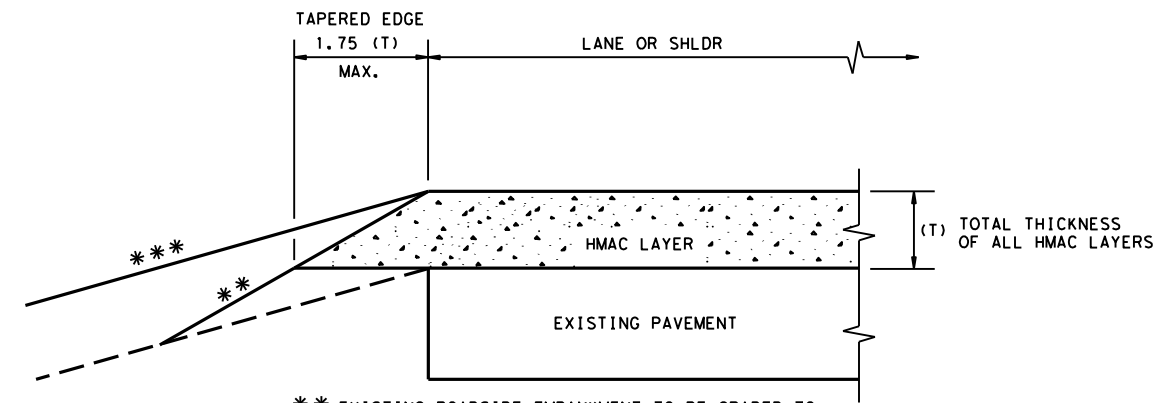
DISCLAIMER:  
 The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its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

DATE: 1/3/2023  
 FILE: pw://txdot.projectwiseonline.com:txdot15/Documents/18 - DAL/Design Projects/258801021/4 - Design/Plan Set/3. Roadway/STANDARDS/tehmac11.dgn



\*\*\* SEE TYPICAL SECTION FOR ROADSIDE DETAILS

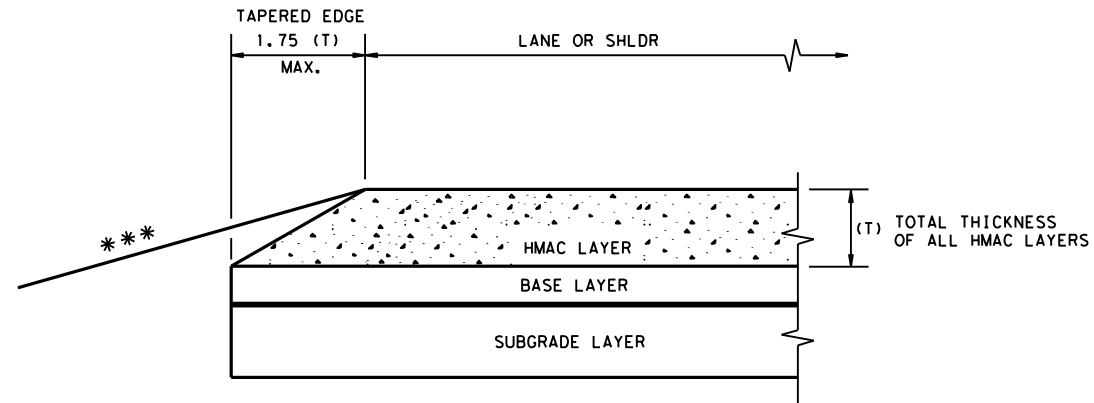
**CONDITION - 1**  
 THIN HMAC SURFACES OR HMAC OVERLAY  
 WITH THICKNESS OF 2.5" OR LESS



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

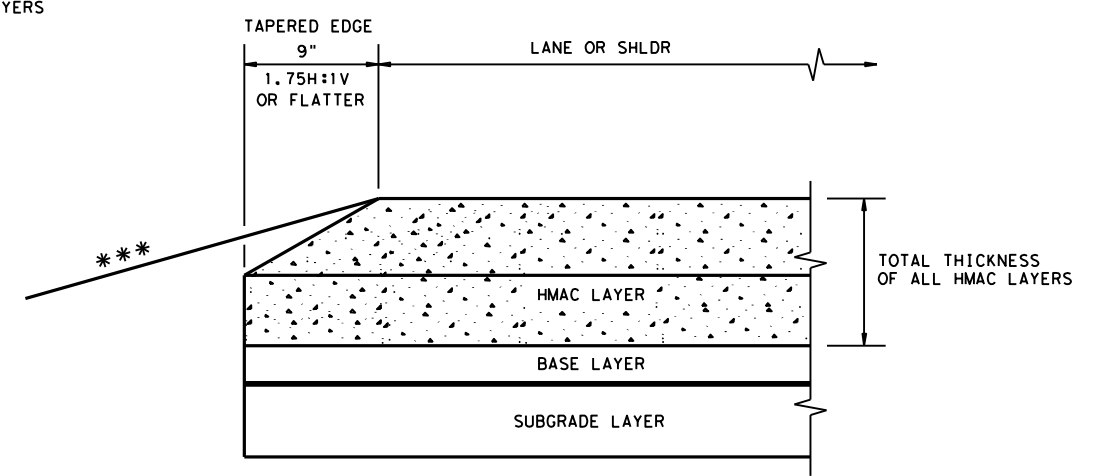
\*\*\* SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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



\*\*\* SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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



\*\*\* SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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

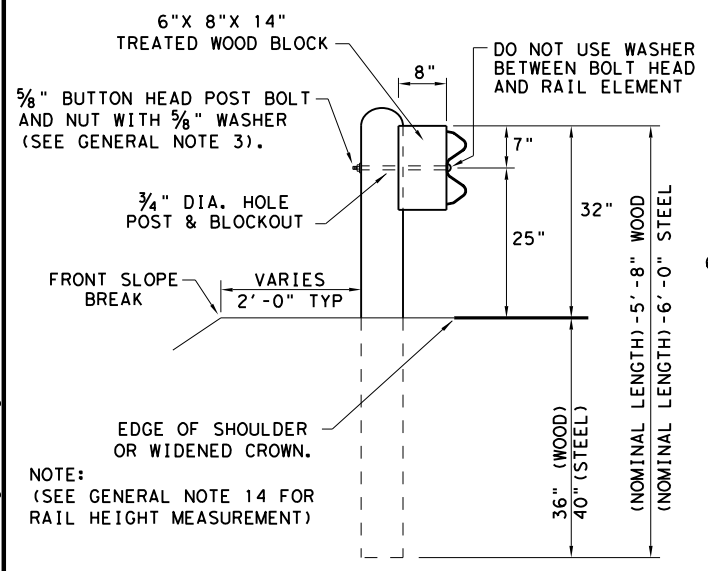
**GENERAL NOTES**

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.

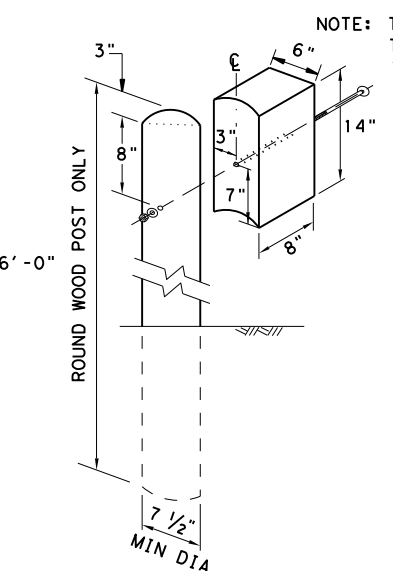
(NOT TO SCALE)

					Design Division Standard	
<b>TAPERED EDGE DETAILS                  HMAC PAVEMENT</b>						
<b>TE (HMAC) - 11</b>						
FILE: tehmac11.dgn	DN: TxDOT	CK: RL	DW: KB	CK:		
© TxDOT January 2011	CONT	SECT	JOB	HIGHWAY		
REVISIONS			0197	04	084, ETC.	US 175, ETC
DIST	COUNTY		SHEET NO.			
DAL	KAUFMAN, ETC.				49	

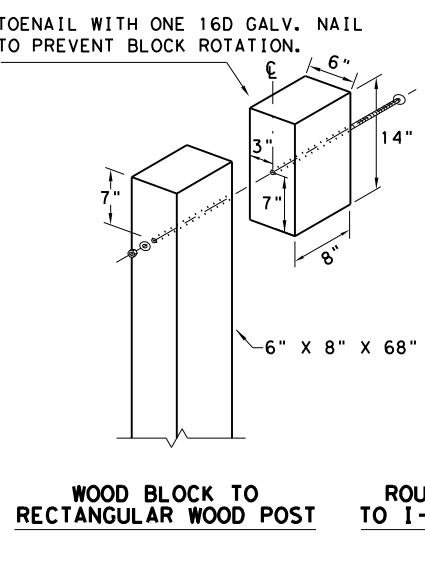
DISCLAIMER: THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.  
 DATE: 1/3/2023  
 FILE: \\txdot.projectwiseonline.com:txdot\Documents\18 - DAL\Design Projects\258801021\4 - Design\Plan Set\3. Roadway\STANDARDS\gf3119.dgn



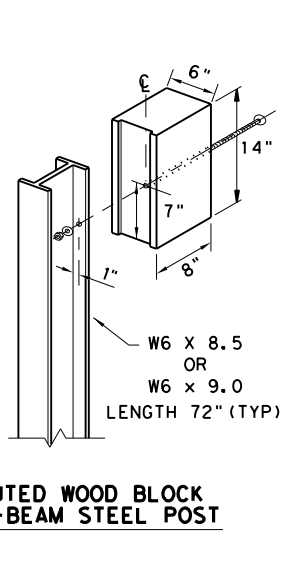
**TYPICAL POST PLACEMENT**



**WOOD BLOCK TO ROUND WOOD POST**



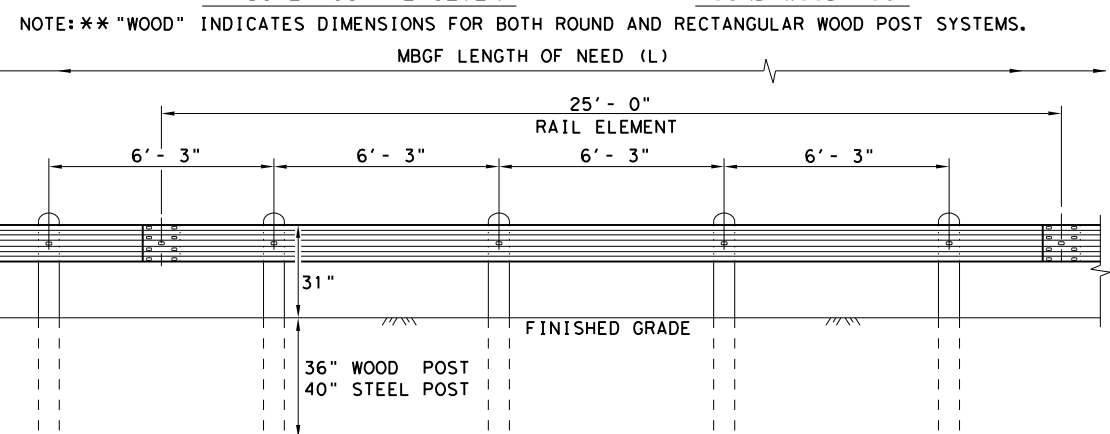
**WOOD BLOCK TO RECTANGULAR WOOD POST**



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

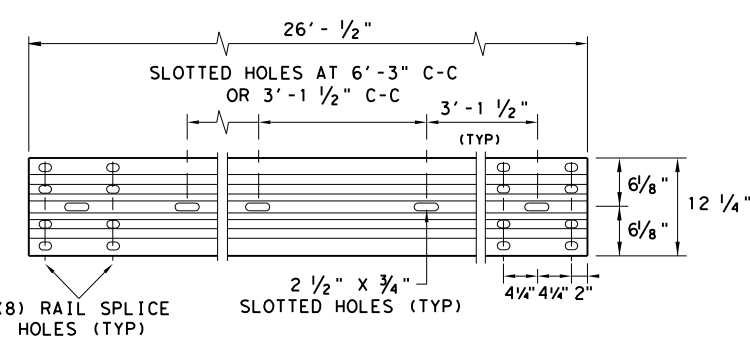
**GENERAL NOTES**

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'-0", OR 12'-6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 1/2" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
3. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND 3/8" WASHER (FWC16G) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
14. GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.



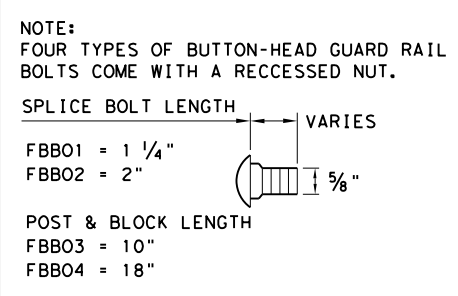
**ELEVATION MID-SPAN RAIL SPLICE**

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

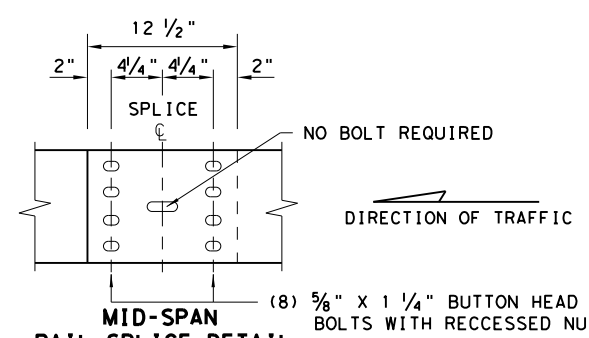


**ELEVATION 25'-0" (NOM.) W-BEAM SECTION**

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



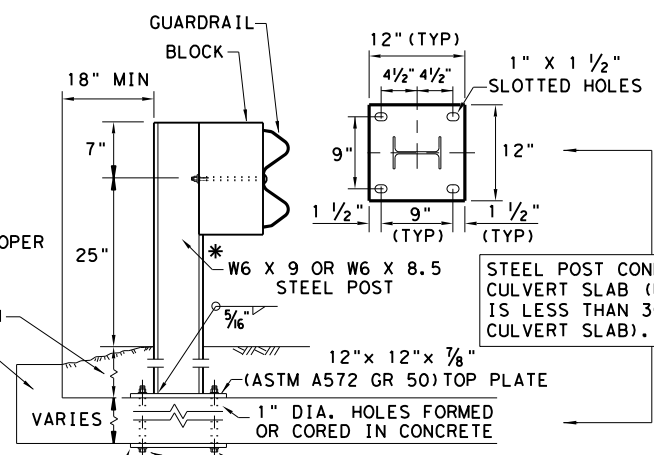
**BUTTON HEAD BOLT**



**MID-SPAN RAIL SPLICE DETAIL**

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

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



**LOW FILL CULVERT POST**

NOTE: TWO INSTALLATION OPTIONS.

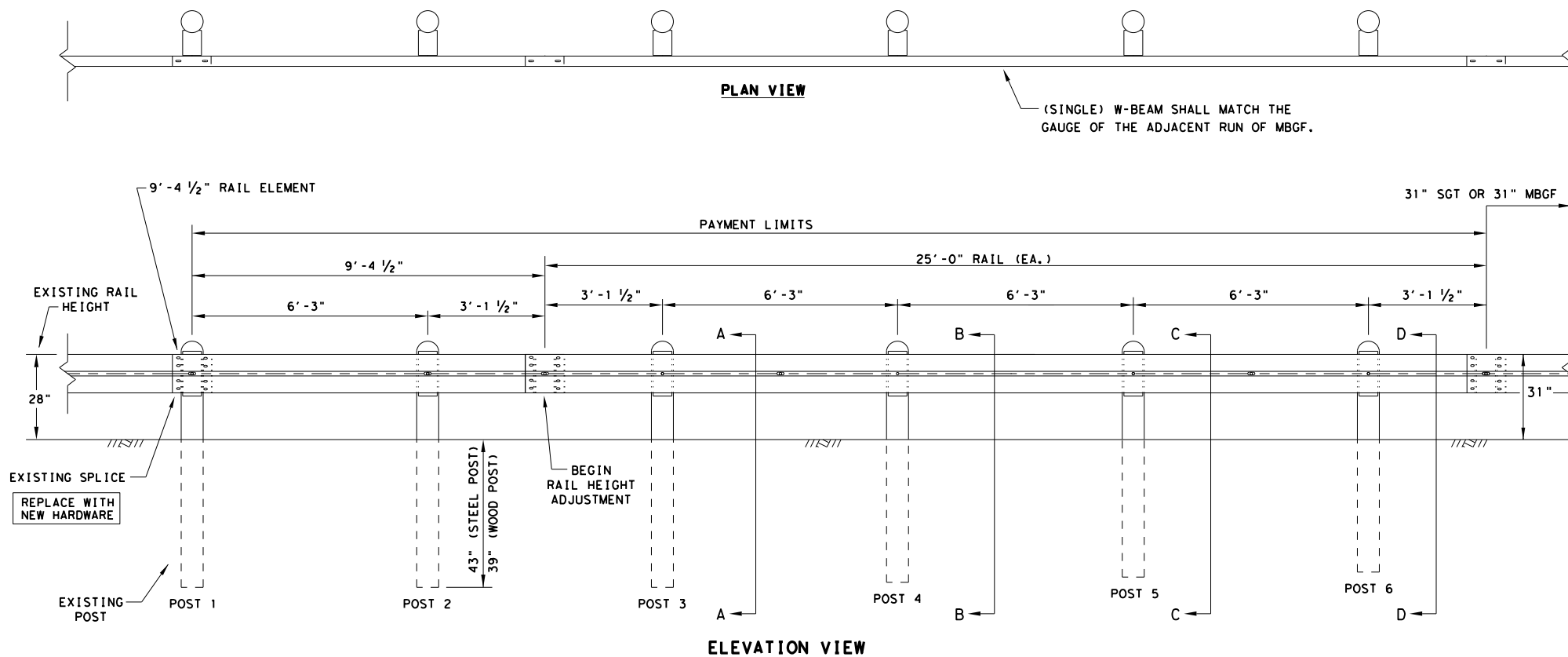
1. **BOLT-THROUGH OPTION:** REQUIRES A 6" MIN. SLAB THICKNESS. 7/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS. NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.
2. **EPOXY ANCHOR OPTION:** THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE 7/8" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS 1/4" MIN. BEYOND NUT.

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

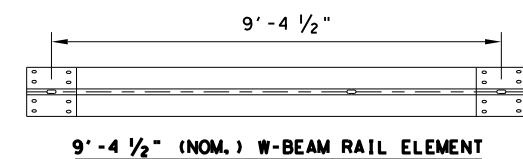
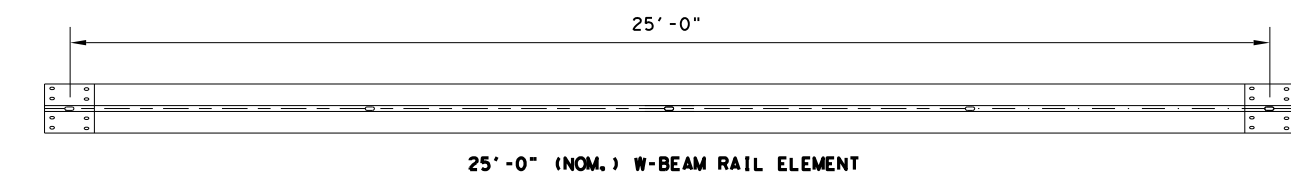
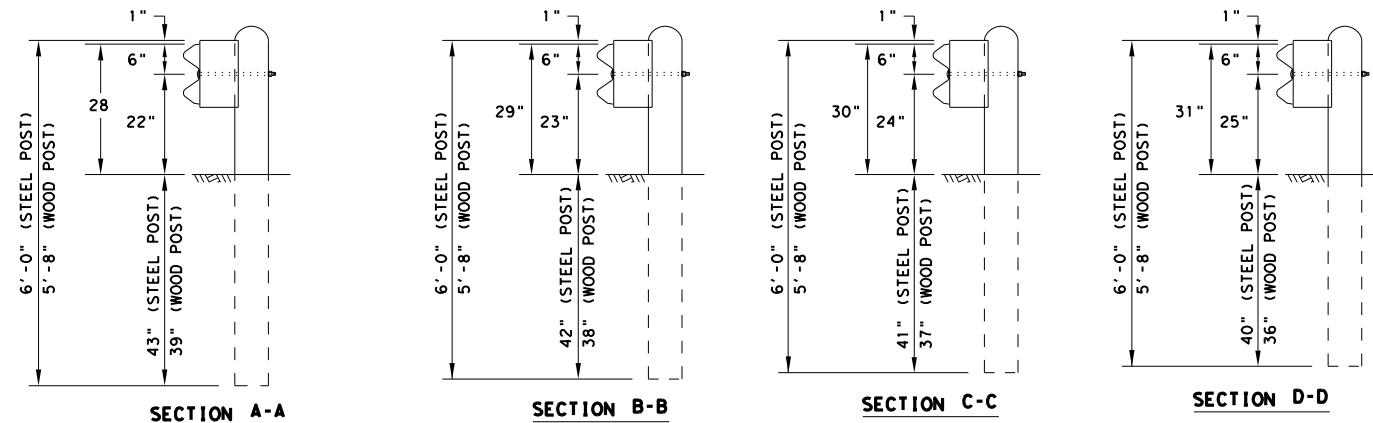
				Design Division Standard
<b>METAL BEAM GUARD FENCE</b> <b>TL-3 MASH COMPLIANT</b> <b>GF(31)-19</b>				
FILE: gf3119.dgn	DN: TXDOT	CK: KM	DW: VP	CK: CGL/AG
© TXDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0197	04	084, ETC.	US 175, ETC
	DIST	COUNTY	SHEET NO.	
	DAL	KAUFMAN, ETC.	50	

**GENERAL NOTES**

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENT SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'-0", OR 12'-6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 1/2" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE TRANSITION SECTIONS OF GUARDRAIL.
3. BUTTON HEAD "POST" BOLTS (ASTM A307) SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT (ASTM A563) AND 3/8" ROUND WASHER (ASTM F436) AND NOT MORE THAN 1" BEYOND IT. BUTTON HEAD "SPLICE" BOLTS (ASTM A307) ARE 5/8" X 1-1/4" WITH 3/8" NUTS (ASTM A563).
4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM REQUIRING CONSTRUCTION OF THE TRANSITION.
5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
8. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. SEE GF(31) STANDARD FOR INSTALLATION GUIDANCE.
9. POSTS SHALL NOT BE SET IN CONCRETE.
10. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TxDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
11. REFER TO STANDARD GF(31) FOR ADDITIONAL DETAILS.
12. RAIL HEIGHT ADJUSTMENT IS ASSESSED AT TL-3 MASH COMPLIANT FOR STEEL POST HEIGHT TRANSITION TO 28" STEEL POST GUARDRAIL.



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



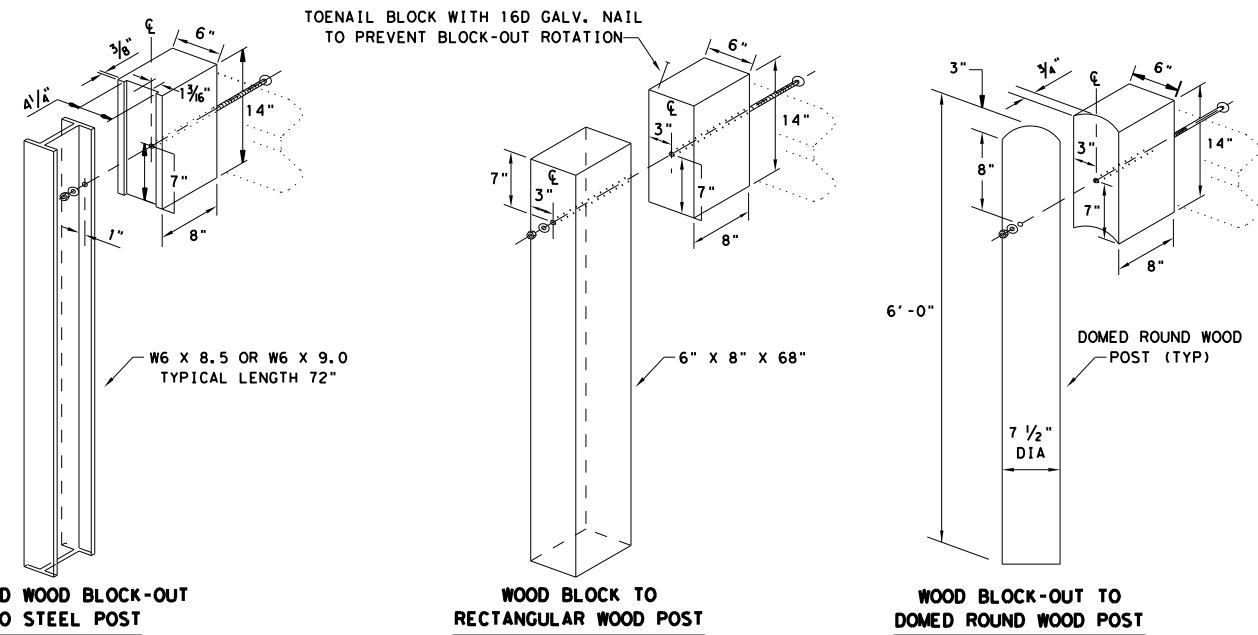
HARDWARE LIST	
QTY	DESCRIPTION
1	9'-4 1/2" W-BEAM RAIL ELEMENT 12GA.
1	25'-0" W-BEAM RAIL ELEMENT 12GA. (TYP)
6	7 1/2" DIA X 6'-0" DOMED ROUND WOOD POSTS (TYP)
6	6" X 8" X 68" RECTANGULAR WOOD POSTS (TYP)
6	W6 X 8.5 OR W6 X 9 X 72" STEEL POSTS (TYP)
6	6" X 8" X 14" WOOD BLOCKS OR COMPOSITE (TYP)
6	5/8" X 18" GUARDRAIL BOLTS WITH NUTS (FBB04)
6	5/8" ROUND WASHERS (ASTM F436) (FWC16a)
6	5/8" X 10" GUARDRAIL BOLTS WITH NUTS (FBB03)
24	5/8" X 1-1/4" GUARDRAIL SPLICE BOLTS WITH DOUBLE RECESSED NUTS (ASTM A563) (FBB01)

POST AND BLOCK-OUT TYPES AVAILABLE

FOR WOOD POST

FOR STEEL POST

NOTE: HARDWARE SHALL MEET THE FOLLOWING REQUIREMENTS.  
 GUARDRAIL POST BOLTS (ASTM A307 GR. A)  
 GUARDRAIL ROUND WASHERS (ASTM F436)  
 GUARDRAIL DOUBLE RECESSED NUTS (ASTM A563)  
 GUARDRAIL SPLICE BOLTS (ASTM A307 GR. A)  
 GUARDRAIL SPLICE NUTS (ASTM A563)



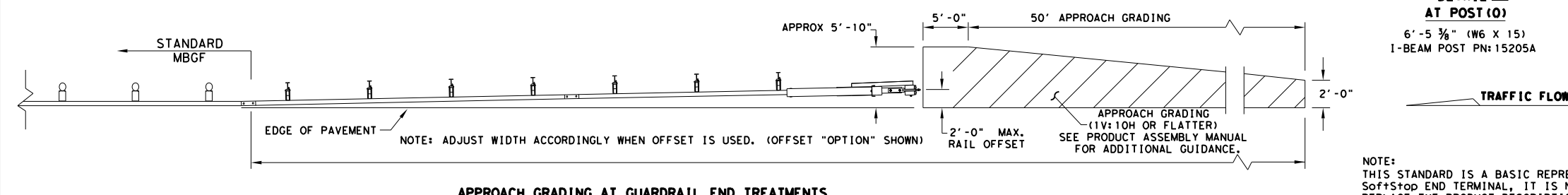
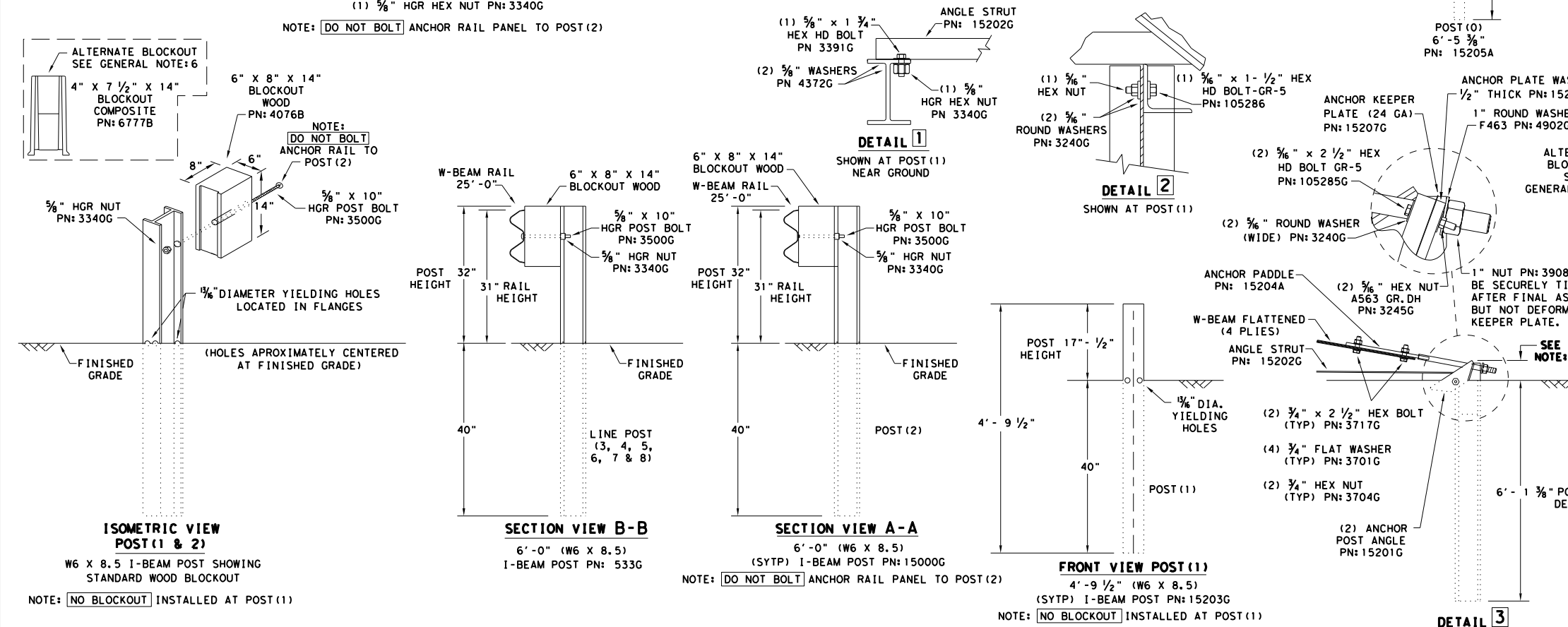
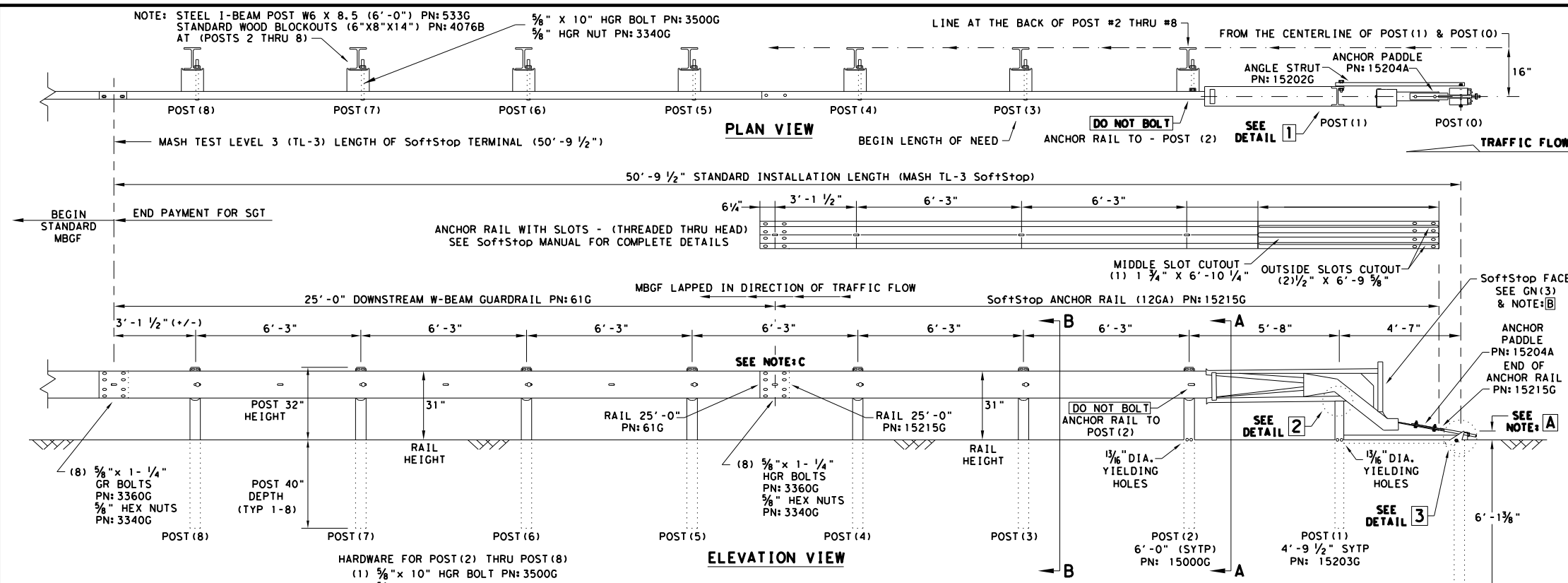
**Texas Department of Transportation**  
 Design Division Standard

**METAL BEAM GUARD FENCE  
 RAIL HEIGHT ADJUSTMENT  
 (28" TO 31")  
 TL-3 MASH COMPLIANT  
 RAIL-ADJ(A)-19**

FILE: railadj019	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
© TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	019704 084, ETC. US 175, ETC.			
DIST	COUNTY		SHEET NO.	
DAL	KAUFMAN, ETC.		51	



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

**NOTE: A** THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-3/4" MIN. TO 4" MAX. ABOVE FINISHED GRADE.

**NOTE: B** PART PN:5852B RIGHT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING) PART PN:5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)

**NOTE: C** W-BEAM SPLICE LOCATED BETWEEN LINE POST(4) AND LINE POST(5) GUARDRAIL PANEL 25'-0" PN:61G ANCHOR RAIL 25'-0" PN:15215G LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

PART	QTY	MAIN SYSTEM COMPONENTS
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25' - 0")
15205A	1	POST #0 - ANCHOR POST (6' - 5 3/8")
15203G	1	POST #1 - (SYTP) (4' - 9 1/2")
15000G	1	POST #2 - (SYTP) (6' - 0")
533G	6	POST #3 THRU #8 - I-BEAM (W6 X 8.5) (6' - 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" X 8" X 14")
6777B	7	BLOCKOUT - COMPOSITE (4" X 7 1/2" X 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (1/2" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT

HARDWARE		
4902G	1	1" ROUND WASHER F436
3908G	1	1" HEAVY HEX NUT A563 GR.DH
3717G	2	3/4" X 2 1/2" HEX BOLT A325
3701G	4	3/4" ROUND WASHER F436
3704G	2	3/4" HEAVY HEX NUT A563 GR.DH
3360G	16	5/8" X 1 1/4" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	5/8" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	5/8" X 10" HGR POST BOLT A307
3391G	1	5/8" X 1 3/4" HEX HD BOLT A325
4489G	1	5/8" X 9" HEX HD BOLT A325
4372G	4	5/8" WASHER F436
105285G	2	5/8" X 2 1/2" HEX HD BOLT GR-5
105286G	1	5/8" X 1 1/2" HEX HD BOLT GR-5
3240G	6	5/8" ROUND WASHER (WIDE)
3245G	3	5/8" HEX NUT A563 GR.DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE: B

Texas Department of Transportation  
Design Division Standard

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

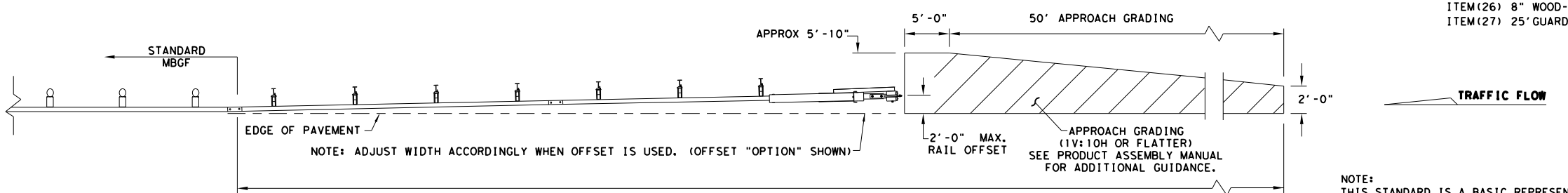
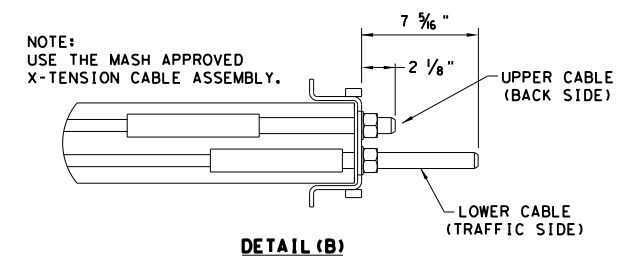
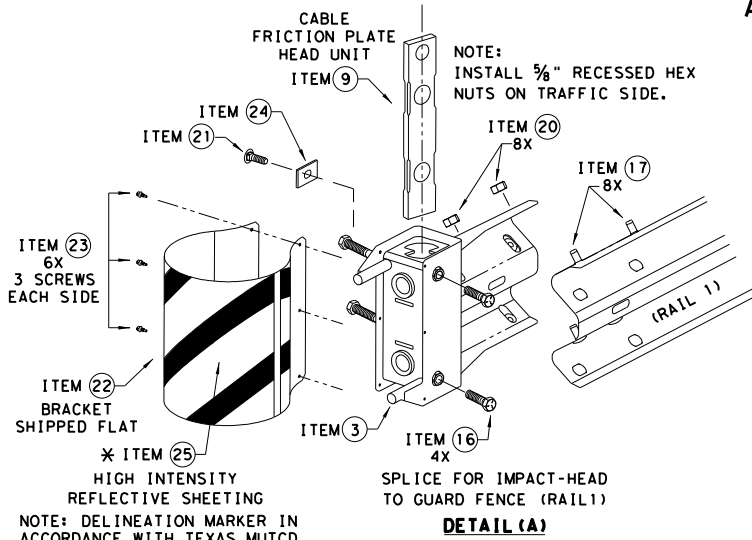
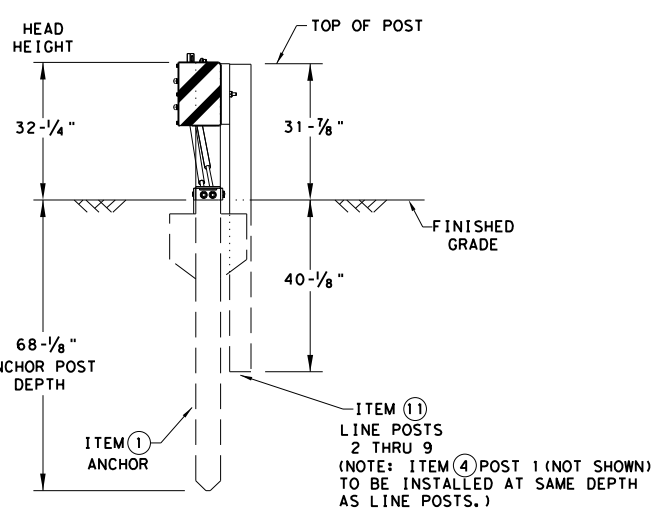
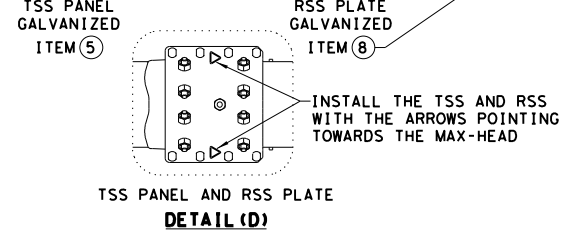
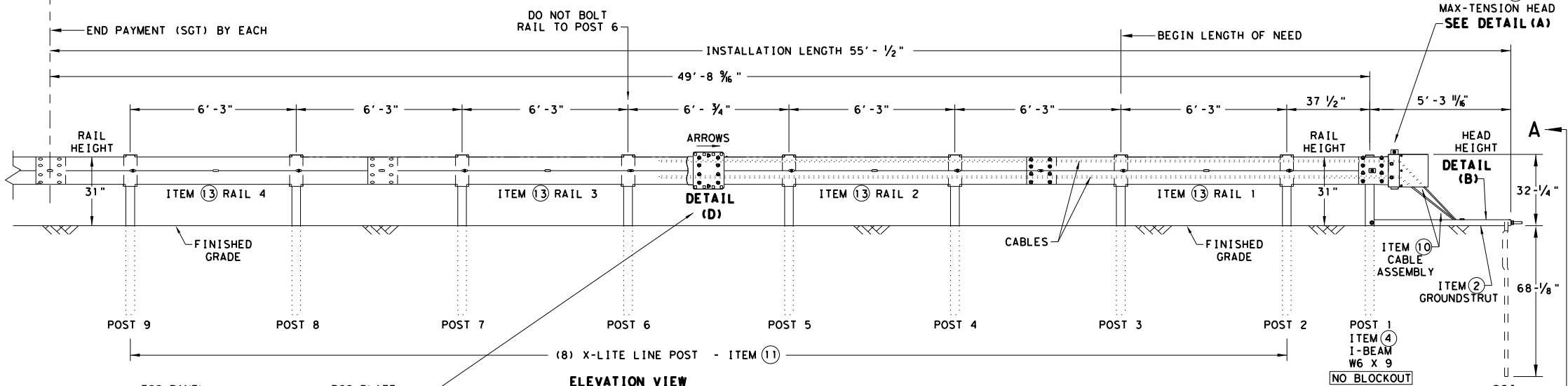
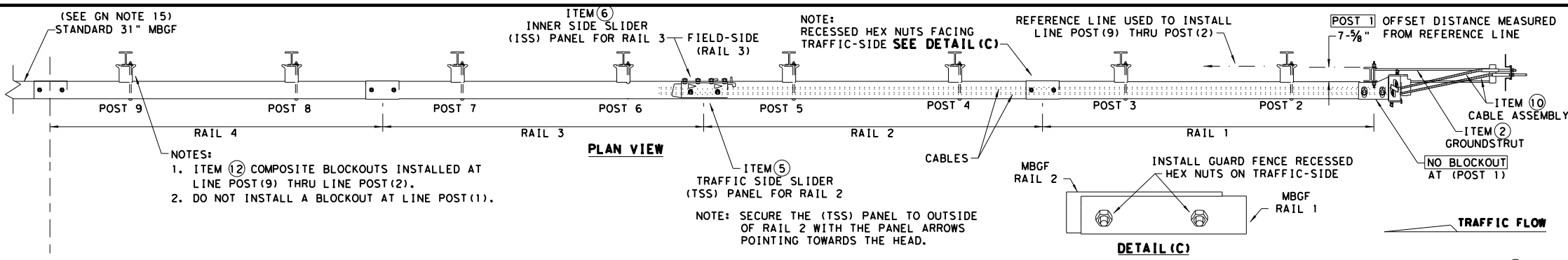
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	DIST	COUNTY	SHEET NO.	
	DAL	KAUFMAN, ETC.	52	

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

DATE:  
FILE:

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

APPROACH GRADING AT GUARDRAIL END TREATMENTS

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

**GENERAL NOTES**

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

ITEM #	PART NUMBER	DESCRIPTION	QTY
1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BSI-1610063-00	W6x9 I-BEAM POST 6FT. -GALVANIZED	1
5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
7	BSI-1610066-00	TOOTH - GEOMET	1
8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BSI-1012078-00	X-LITE LINE POST - GALVANIZED	8
12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BSI-1102027-00	X-LITE SQUARE WASHER	1
15	BSI-2001886	3/8" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	3/4" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	5/8" X 1 1/4" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	5/8" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	5/8" WASHER F436 STRUCTURAL MGAL	2
20	4001116	5/8" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	3/8" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	1/4" X 3/4" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWRO3	1
25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL, 8-SPACE, 12GA.	2
28	MANMAX Rev- (D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

\* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.  
 \*\* ALTERNATIVE ITEMS NOT SHOWN. ITEM (26) 8" WOOD-BLOCKOUTS ITEM (27) 25' GUARD FENCE PANELS

**Texas Department of Transportation** Design Division Standard

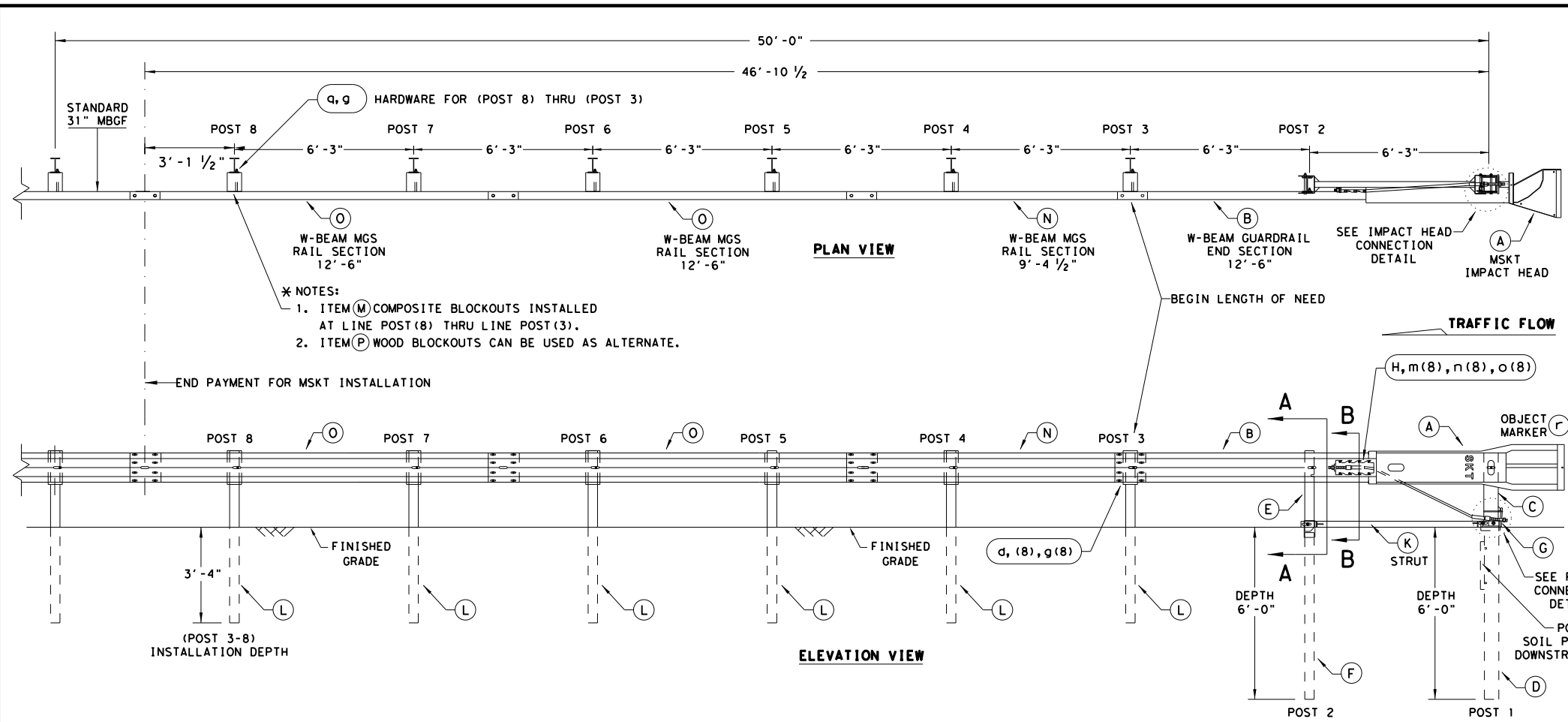
## MAX-TENSION END TERMINAL

### MASH - TL-3

### SGT (11S) 31-18

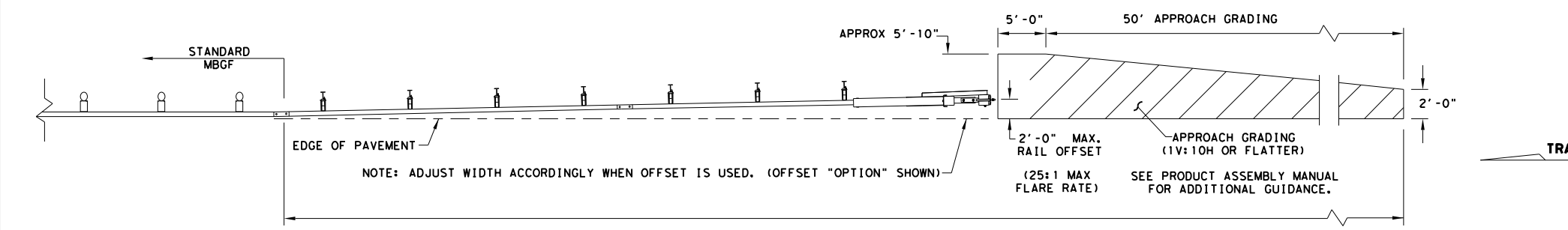
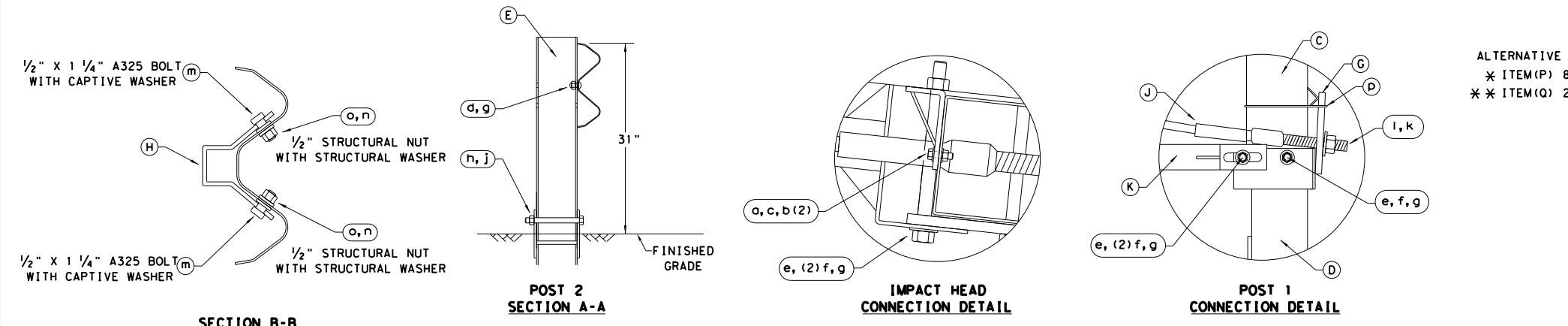
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	DAL	KAUFMAN, ETC.	53	

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



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

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



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

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

Design Division Standard

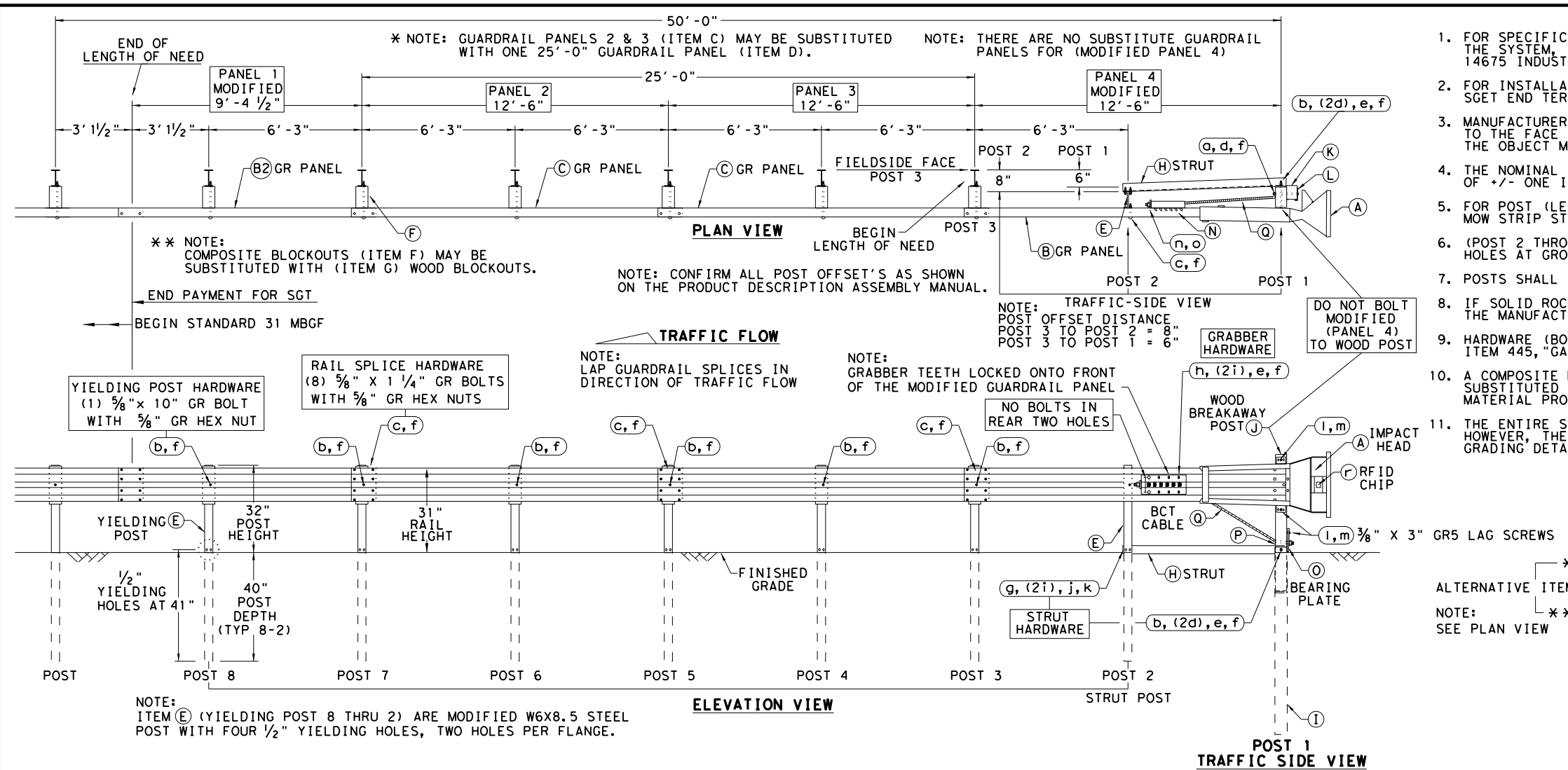
## SINGLE GUARDRAIL TERMINAL

### MSKT-MASH-TL-3

### SGT (12S) 31-18

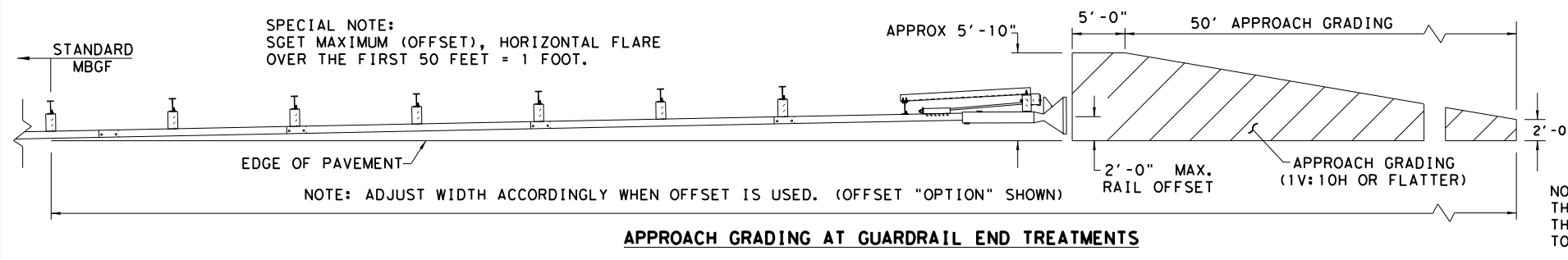
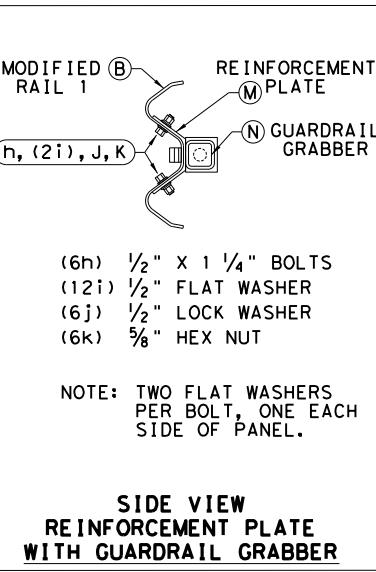
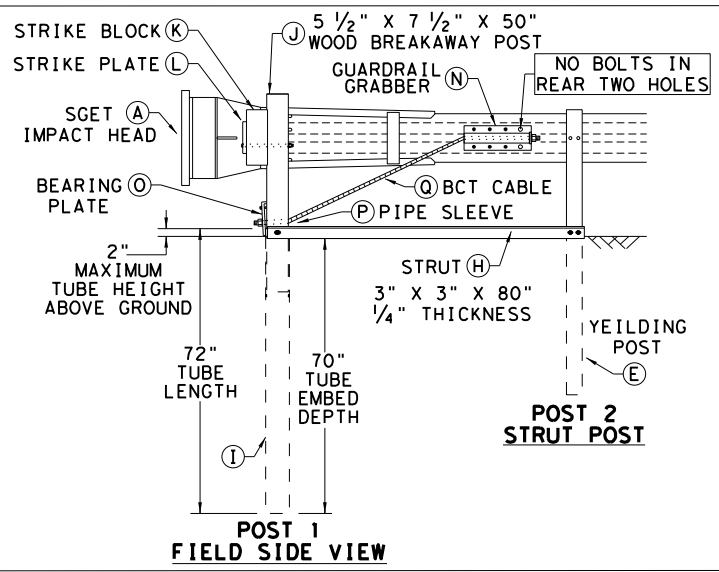
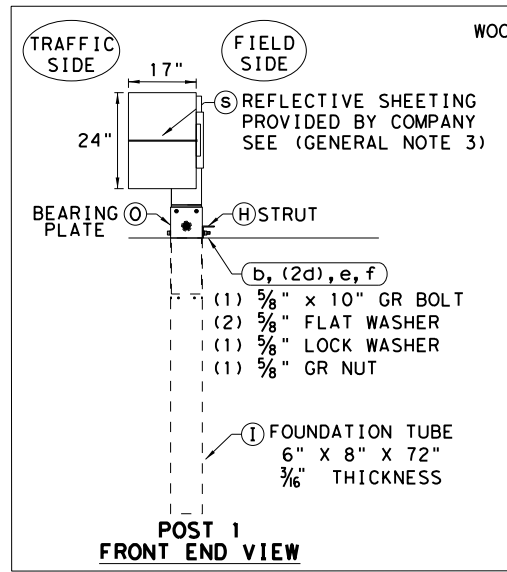
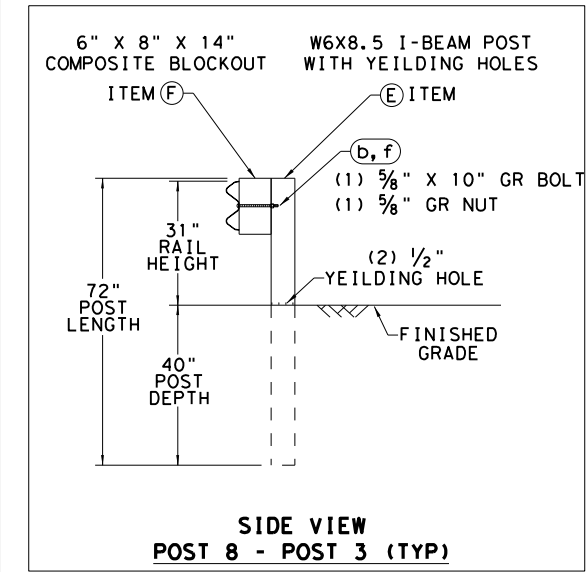
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© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY	
REVISIONS		0197	04	084, ETC.	US 175, ETC.
		DIST	COUNTY	SHEET NO.	
		DAL	KAUFMAN, ETC.	54	

DATE: 1/3/2023  
 FILE: \\txdot.projectwiseonline.com:txdot\Documents\18 - DAL\Design Projects\258801021\4 - Design\Plan Set\3. Roadway\STANDARDS\sgt153120.dgn  
 DISCLAIMER: THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.



- ### GENERAL NOTES
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT 1(267) 644-9510. 14675 INDUSTRIAL PARK RD; BRISTOL, VA 24202
  - FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL.
  - MANUFACTURER WILL APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" TO THE FACE PLATE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. THE OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
  - THE NOMINAL HEIGHT OF THE GUARDRAIL BEAM IS 31 INCHES WITH A TOLERANCE OF +/- ONE INCH.
  - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
  - (POST 2 THROUGH POST 8) ARE MODIFIED STEEL-YIELDING POSTS WITH YIELDING HOLES AT GROUND LEVEL. THERE ARE NO SUBSTITUTE POSTS.
  - POSTS SHALL NOT BE SET IN CONCRETE.
  - IF SOLID ROCK IS ENCOUNTERED FOR ANY OF THE POSTS IN THE SYSTEM, CONTACT THE MANUFACTURER FOR SPECIFIC INSTALLATION GUIDANCE.
  - HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
  - A COMPOSITE MATERIAL BLOCKOUT THAT MEETS DMS-7210 REQUIREMENTS MAY BE SUBSTITUTED FOR AN APPROVED WOOD BLOCKOUT. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
  - THE ENTIRE SYSTEM MUST BE INSTALLED IN A STRAIGHT LINE WITHOUT ANY CURVE. HOWEVER, THE SYSTEM CAN BE OFFSET BY TWO FEET AS SHOWN ON THE APPROACH GRADING DETAIL TO HELP OFF-SET THE IMPACT HEAD FROM SHOULDER OF THE ROAD.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM #
A	1	SGET IMPACT HEAD	SIH1A
B	1	MODIFIED GUARDRAIL PANEL 12'-6" 12GA	126SPZGP
B2	1	MODIFIED GUARDRAIL PANEL 9'-4 1/2" 12GA	GP94
C	2	STANDARD GUARDRAIL PANEL 12'-6" 12GA	GP126
D	1	STANDARD GUARDRAIL PANEL 25'-0" 12GA	GP25
E	7	MODIFIED YIELDING I-BEAM POST W6x8.5	YP6MOD
F	6	COMPOSITE BLOCKOUT 6" X 8" X 14"	CBO8
G	6	WOOD BLOCKOUT 6" X 8" X 14"	WBO8
H	1	STRUT 3" X 3" X 80" X 1/4" A36 ANGLE	STR80
I	1	FOUNDATION TUBE 6" X 8" X 72" X 3/8"	FNDT6
J	1	WOOD BREAKAWAY POST 5 1/2" X 7 1/2" X 50"	WBRK50
K	1	WOOD STRIKE BLOCK	WSBLK14
L	1	STRIKE PLATE 1/4" A36 BENT PLATE	SPLT8
M	1	REINFORCEMENT PLATE 12 GA. GR55	REPLT17
N	1	GUARDRAIL GRABBER 2 1/2" X 2 1/2" X 16 1/2"	GGR17
O	1	BEARING PLATE 8" X 8 5/8" X 5/8" A36	BPLT8
P	1	PIPE SLEEVE 4 1/4" X 2 3/8" O.D. (2 1/8" I.D.)	PSLV4
Q	1	BCT CABLE 3/4" X 81" LENGTH	CBL81
SMALL HARDWARE			
o	1	5/8" X 12" GUARDRAIL BOLT 307A HDG	12GRBLT
b	7	5/8" X 10" GUARDRAIL BOLT 307A HDG	10GRBLT
c	33	5/8" X 1 1/4" GR SPlice BOLTS 307A HDG	1GRBLT
d	3	5/8" FLAT WASHER F436 A325 HDG	58FW436
e	1	5/8" LOCK WASHER HDG	58LW
f	39	5/8" GUARDRAIL HEX NUT HDG	58HN563
g	2	1/2" X 2" STRUT BOLT A325 HDG	2BLT
h	6	1/2" X 1 1/4" PLATE BOLT A325 HDG	125BLT
i	16	1/2" FLAT WASHER F436 A325 HDG	12FWF436
j	8	1/2" LOCK WASHER HDG	12LW
k	8	1/2" HEX NUT A563 HDG	12HN563
l	4	3/8" X 3" HEX LAG SCREW GR5 HDG	38LS
m	4	3/8" FLAT WASHER F436 A325 HDG	38FW844
n	2	1" FLAT WASHER F436 A325 HDG	1FWF436
o	2	1" HEX NUT A563HD HDG	1HN563
p	1	18" TO 24" LONG ZIP TIE RATED 175-200LB	ZPT18
q	1	1 1/2" X 4" SCH-40 PVC PIPE	PSPCR4
r	1	RFID CHIP RATED MIL-STD-810F	RFID810F
s	1	IMPACT HEAD REFLECTIVE SHEETING	RS30M



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

**SPIG INDUSTRY, LLC**  
**SINGLE GUARDRAIL TERMINAL**  
**SGET - TL-3 - MASH**  
**SGT (15) 31-20**

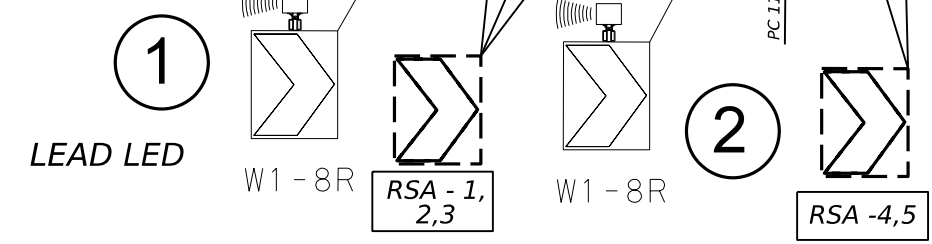
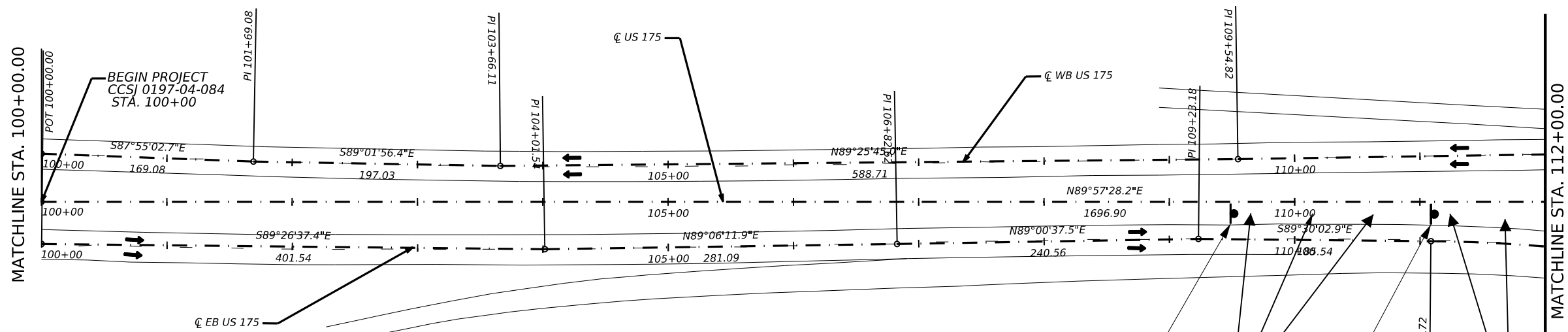
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© TXDOT: APRIL 2020	CONT	SECT	JOB	HS HIGHWAY
REVISIONS	0197	04	084, ETC.	US 175, ETC
	DIST	COUNTY	SHEET NO.	
	DAL	KAUFMAN, ETC.	55	

Design Division Standard

CK: DW: CK: DW:



- LEGEND:**
- # PROPOSED SIGN
  - RSA - # REMOVE SMALL SIGN



*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date



US 175, ETC.  
 SIGN LAYOUT

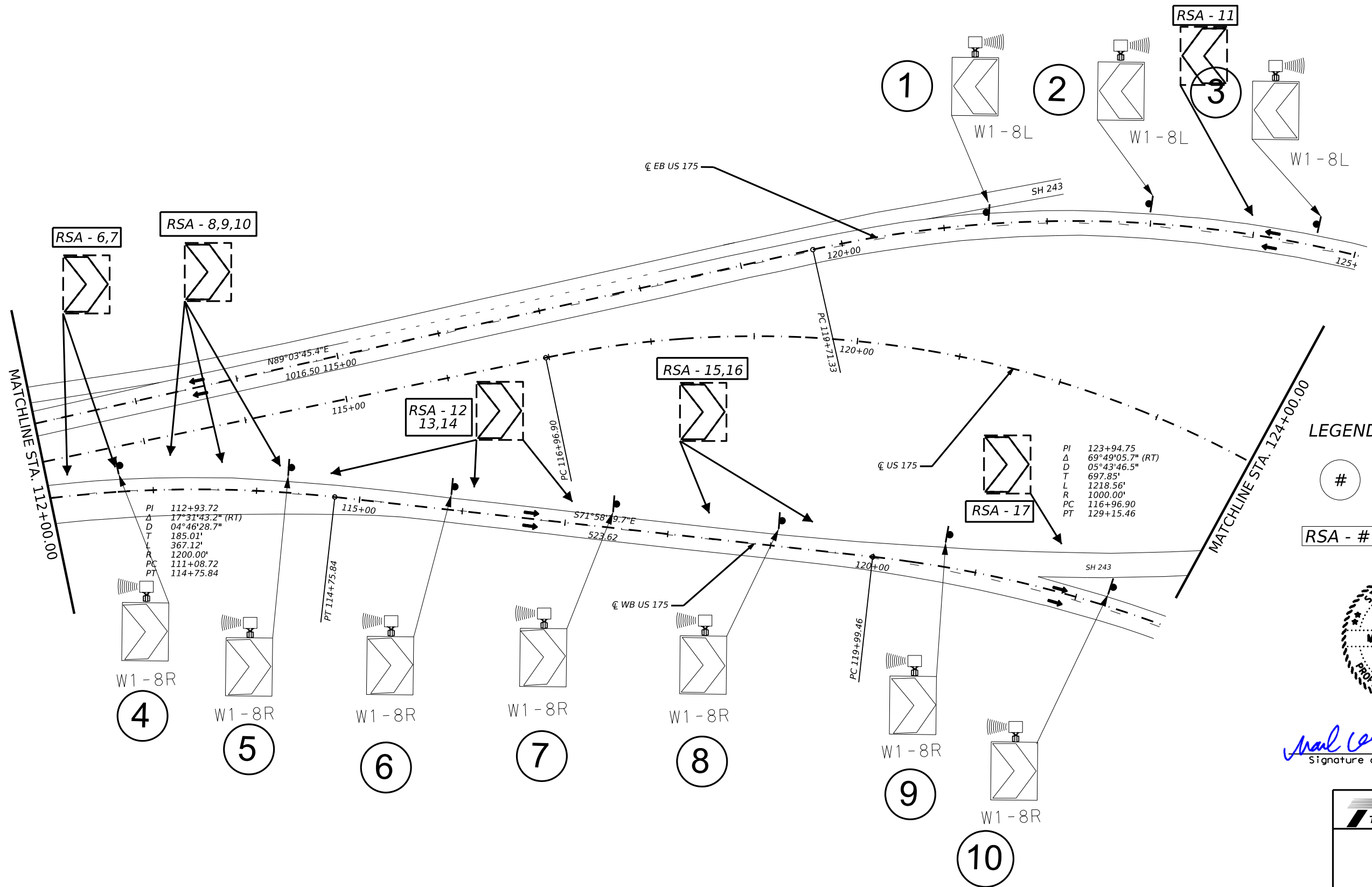
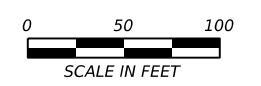
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CONT	SECT	JOB	HIGHWAY
0197	04	084, ETC.	US 175, ETC
DAL		KAUFMAN, ETC.	56

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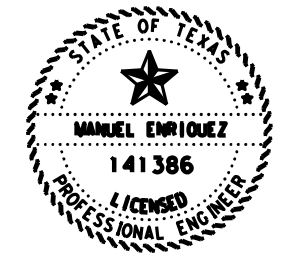
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PI 112+93.72  
 Δ 17°31'43.2" (RT)  
 D 04°46'28.7"  
 T 185.01'  
 L 367.12'  
 R 1200.00'  
 PC 111+08.72  
 PT 114+75.84

PI 123+94.75  
 Δ 69°49'05.7" (RT)  
 D 05°43'46.5"  
 T 697.85'  
 L 1218.56'  
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 PC 116+96.90  
 PT 129+15.46

- LEGEND:**
- # PROPOSED SIGN
  - RSA - # REMOVE SMALL SIGN



*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date



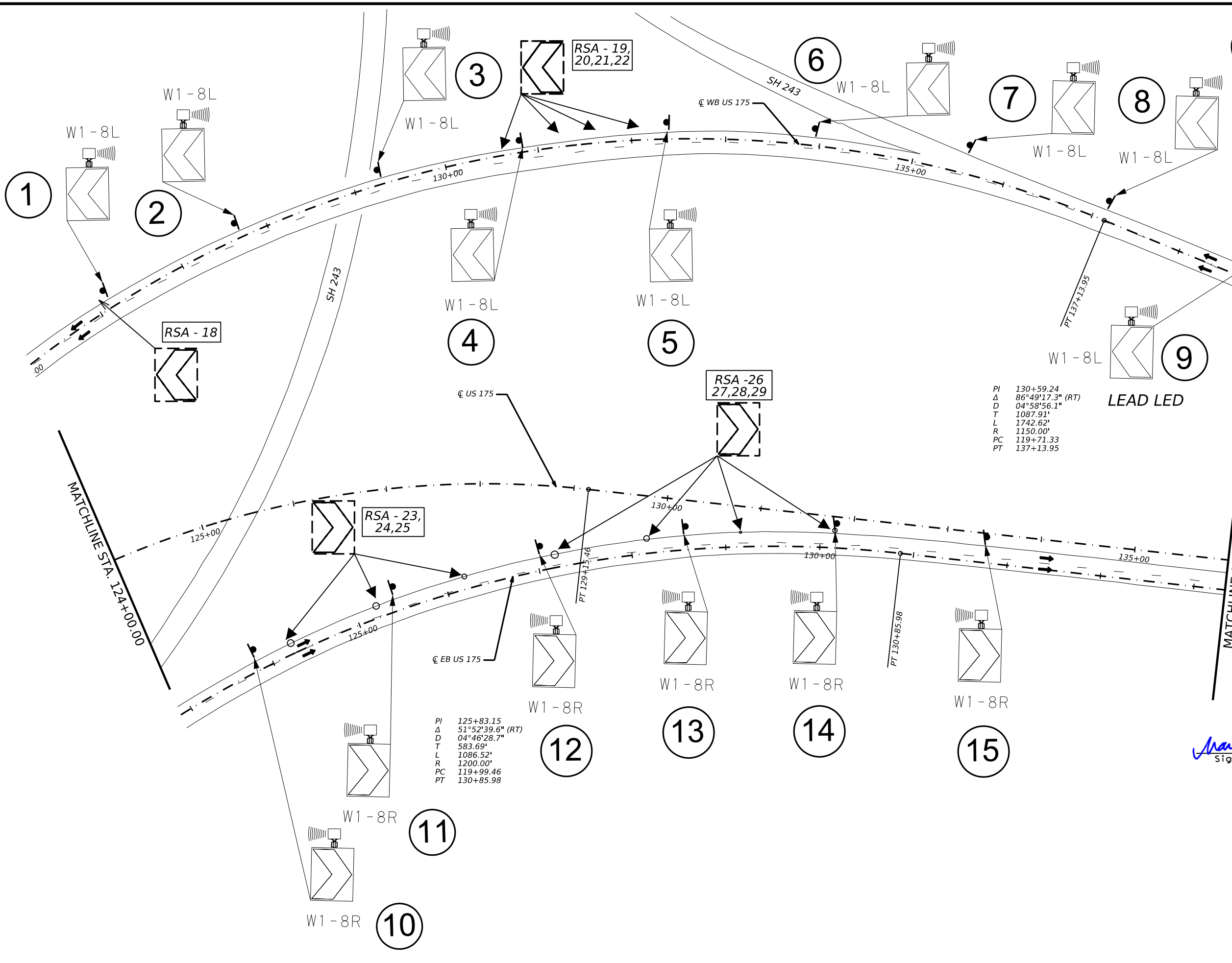
US 175, ETC.  
 SIGN LAYOUT

1" = 100' SHEET 2 OF 7

CONT	SECT	JOB	HIGHWAY
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DAL		KAUFMAN, ETC.	57

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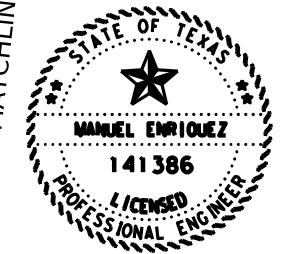
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 PT 137+13.95

PI 125+83.15  
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 D 04°46'28.7"  
 T 583.69'  
 L 1086.52'  
 R 1200.00'  
 PC 119+99.46  
 PT 130+85.98

LEAD LED



*Manuel Enriquez P.E.* P.E. 12-20-22  
 Signature of Registrant & Date

Texas Department of Transportation

US 175, ETC.

SIGN LAYOUT

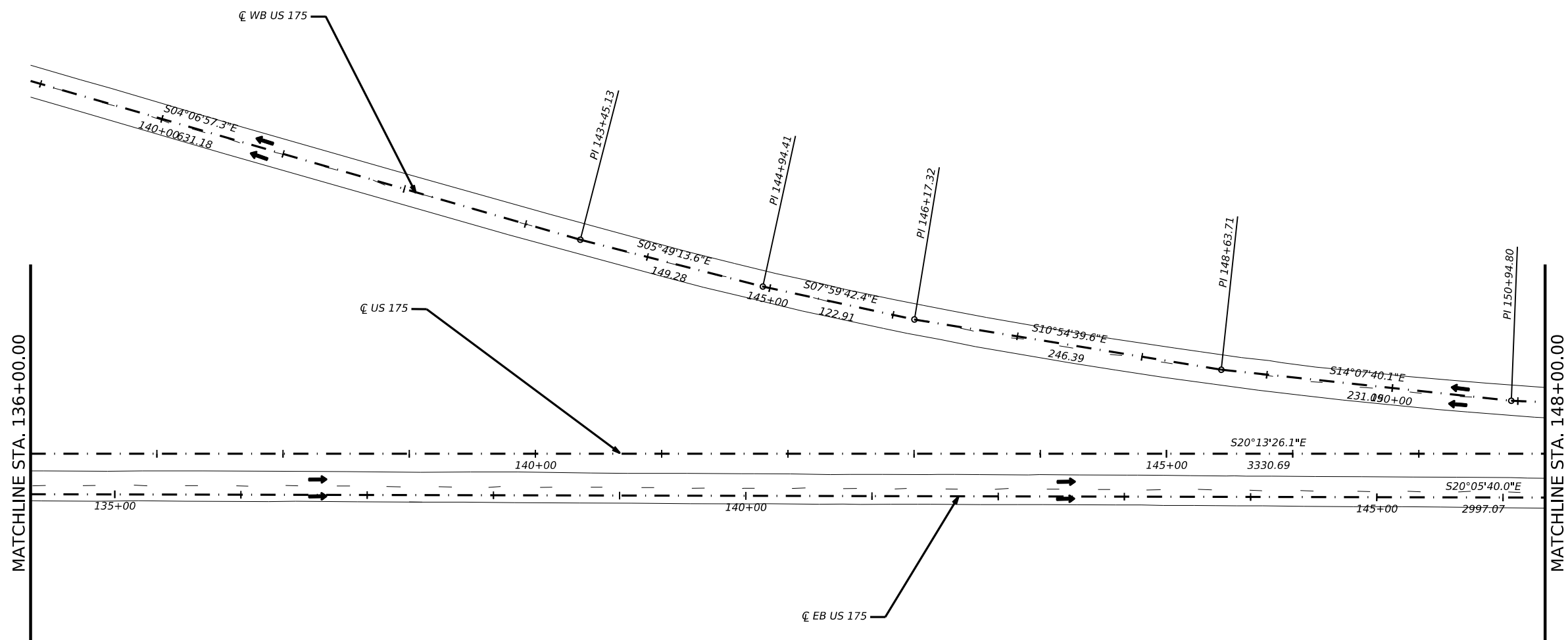
1" = 100' SHEET 3 OF 7

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY	SHEET NO.	
DAL	KAUFMAN, ETC.	58	

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DW:  
CK:  
DW:

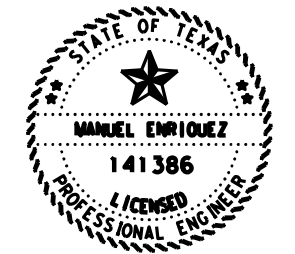


- LEGEND:**
- # PROPOSED SIGN
  - RSA - # REMOVE SMALL SIGN



MATCHLINE STA. 136+00.00

MATCHLINE STA. 148+00.00



*Manuel Enriquez P.E.*, P.E. 12-20-22  
Signature of Registrant & Date

**NO WORK ON THIS SHEET**



US 175, ETC.  
SIGN LAYOUT

1" = 100' SHEET 4 OF 7

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY	SHEET NO.	
DAL	KAUFMAN, ETC.	59	

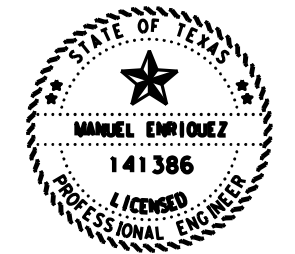
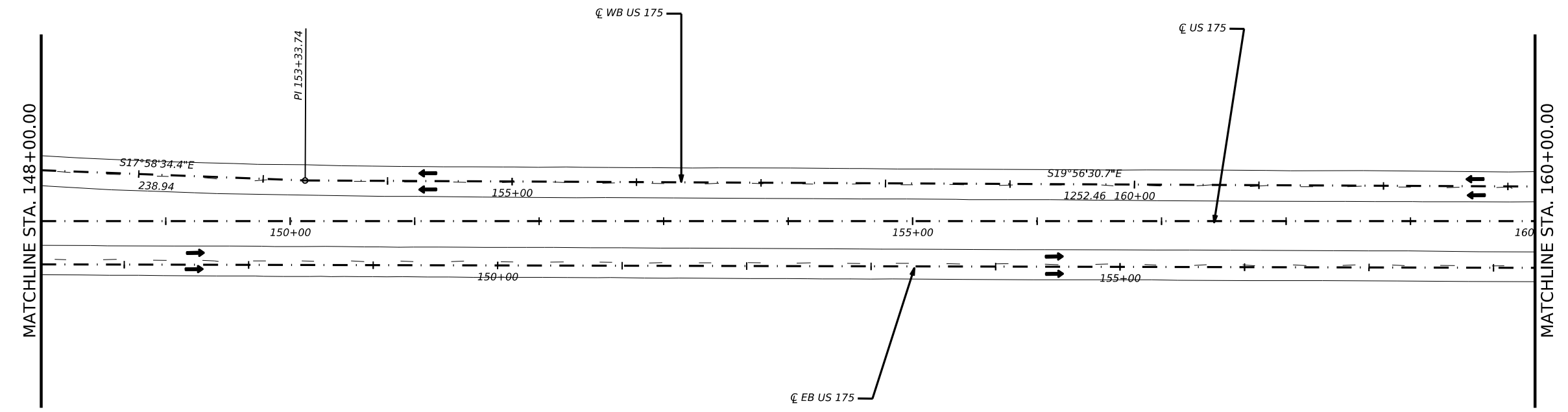
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- LEGEND:**
- # PROPOSED SIGN
  - RSA - # REMOVE SMALL SIGN



*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date

**NO WORK ON THIS SHEET**

US 175, ETC.			
SIGN LAYOUT			
1" = 100'		SHEET 5 OF 7	
CONT	SECT	JOB	HIGHWAY
0197	04	084, ETC.	US 175, ETC.
DIST	COUNTY		SHEET NO.
DAL	KAUFMAN, ETC.		60

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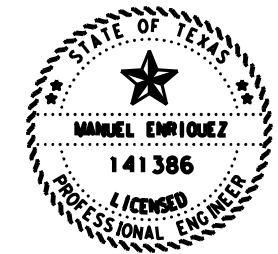
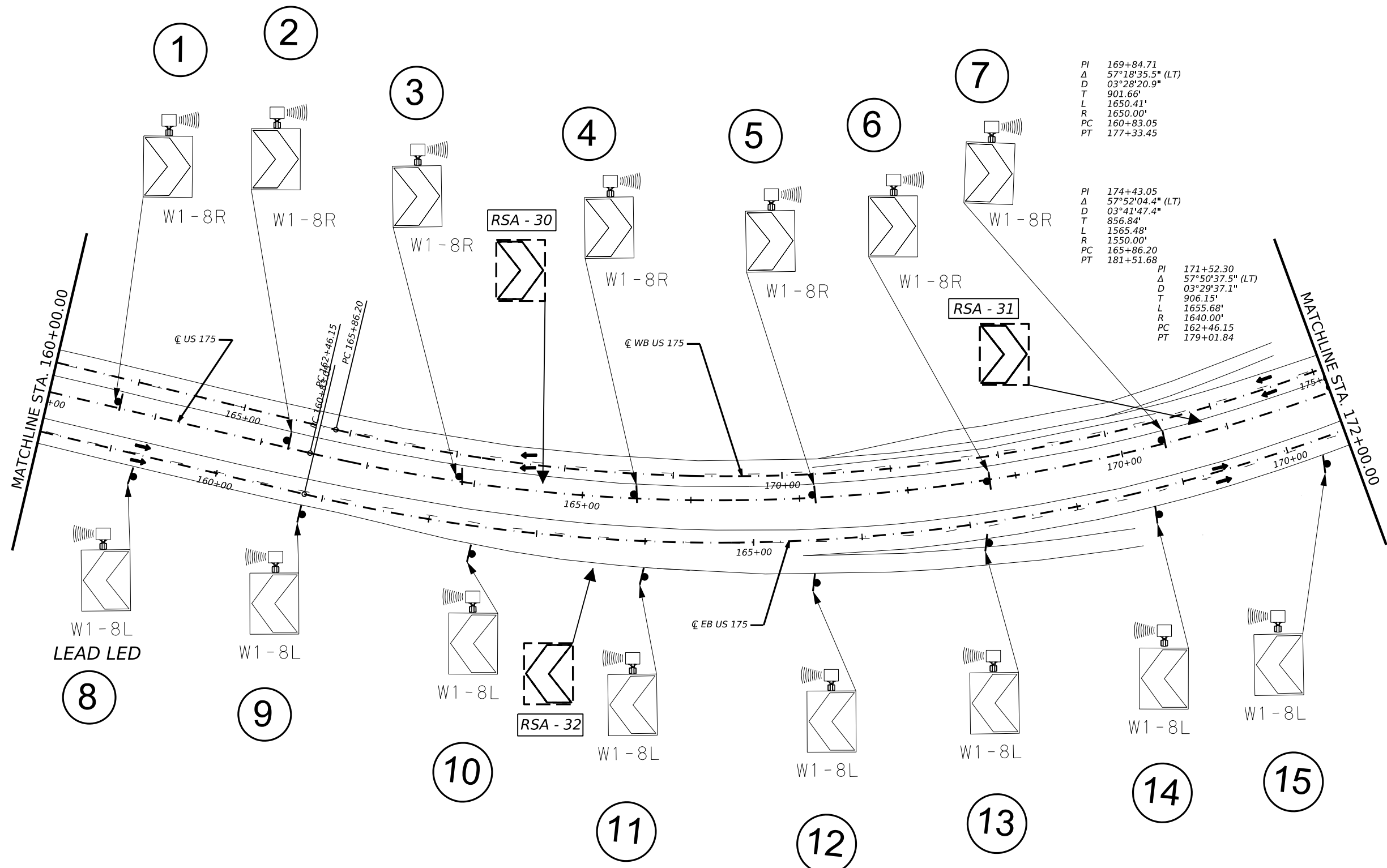


- LEGEND:**
- # PROPOSED SIGN
  - RSA - # REMOVE SMALL SIGN

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 T 901.66'  
 L 1650.41'  
 R 1650.00'  
 PC 160+83.05  
 PT 177+33.45

PI 174+43.05  
 Δ 57°52'04.4" (LT)  
 D 03°41'47.4"  
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 L 1565.48'  
 R 1550.00'  
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 PT 181+51.68

PI 171+52.30  
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 D 03°29'37.1"  
 T 906.15'  
 L 1655.68'  
 R 1640.00'  
 PC 162+46.15  
 PT 179+01.84



*Manuel Enriquez P.E.* P.E. 12-20-22  
 Signature of Registrant & Date

**Texas Department of Transportation**

US 175, ETC.  
 SIGN LAYOUT

1" = 100' SHEET 6 OF 7

CONT	SECT	JOB	HIGHWAY
0197	04	084, ETC.	US 175, ETC
DIST	COUNTY	SHEET NO.	
DAL	KAUFMAN, ETC.	61	

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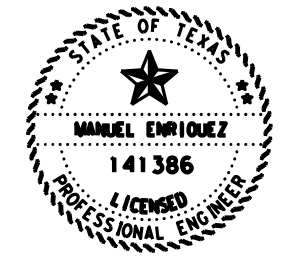
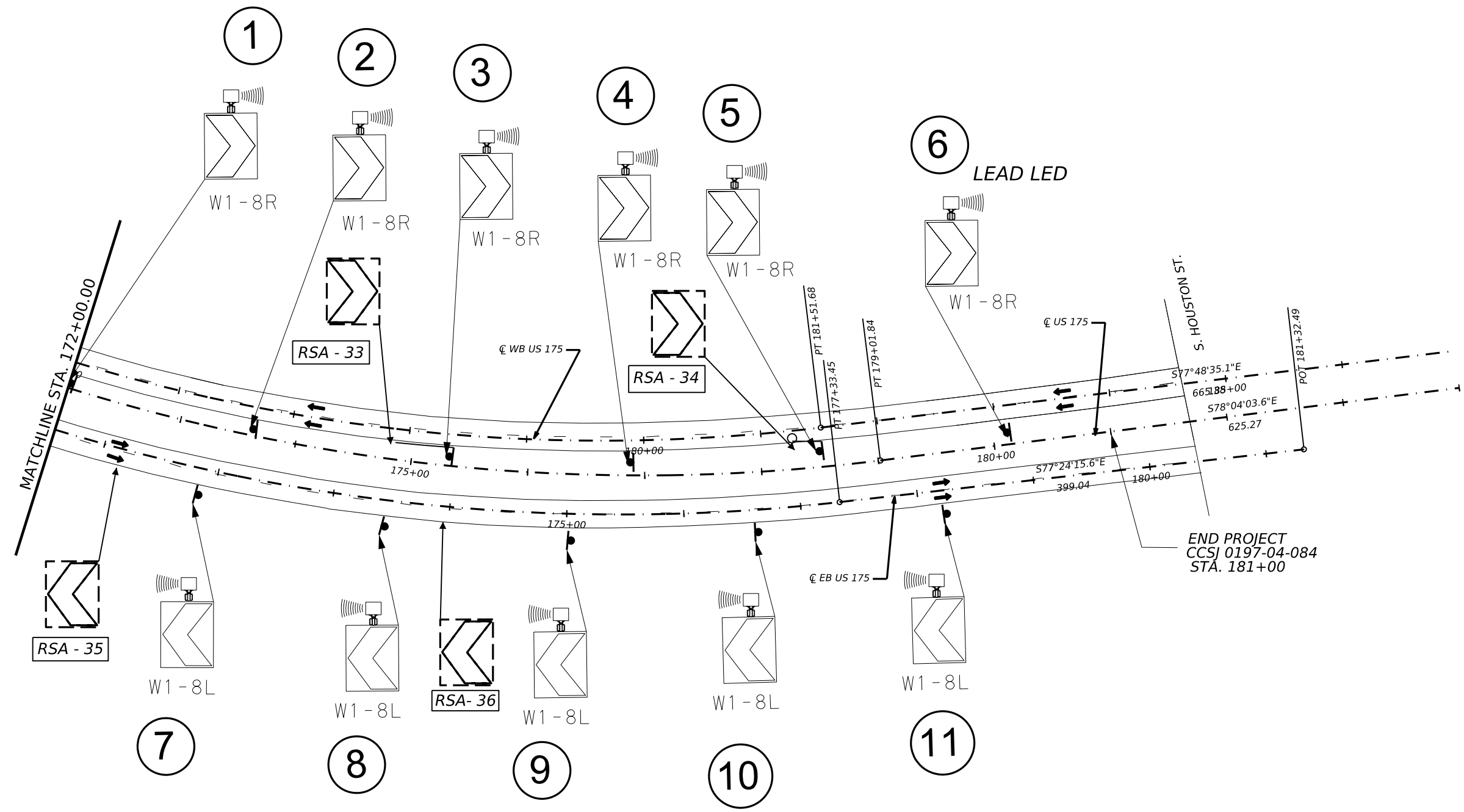
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**LEGEND:**

# PROPOSED SIGN

RSA - # REMOVE SMALL SIGN



*Manuel Enriquez P.E.*, P.E. 12-20-22  
Signature of Registrant & Date



US 175, ETC.  
SIGN LAYOUT

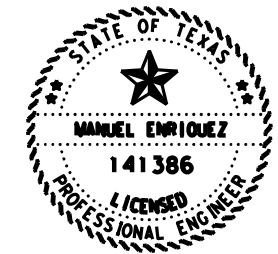
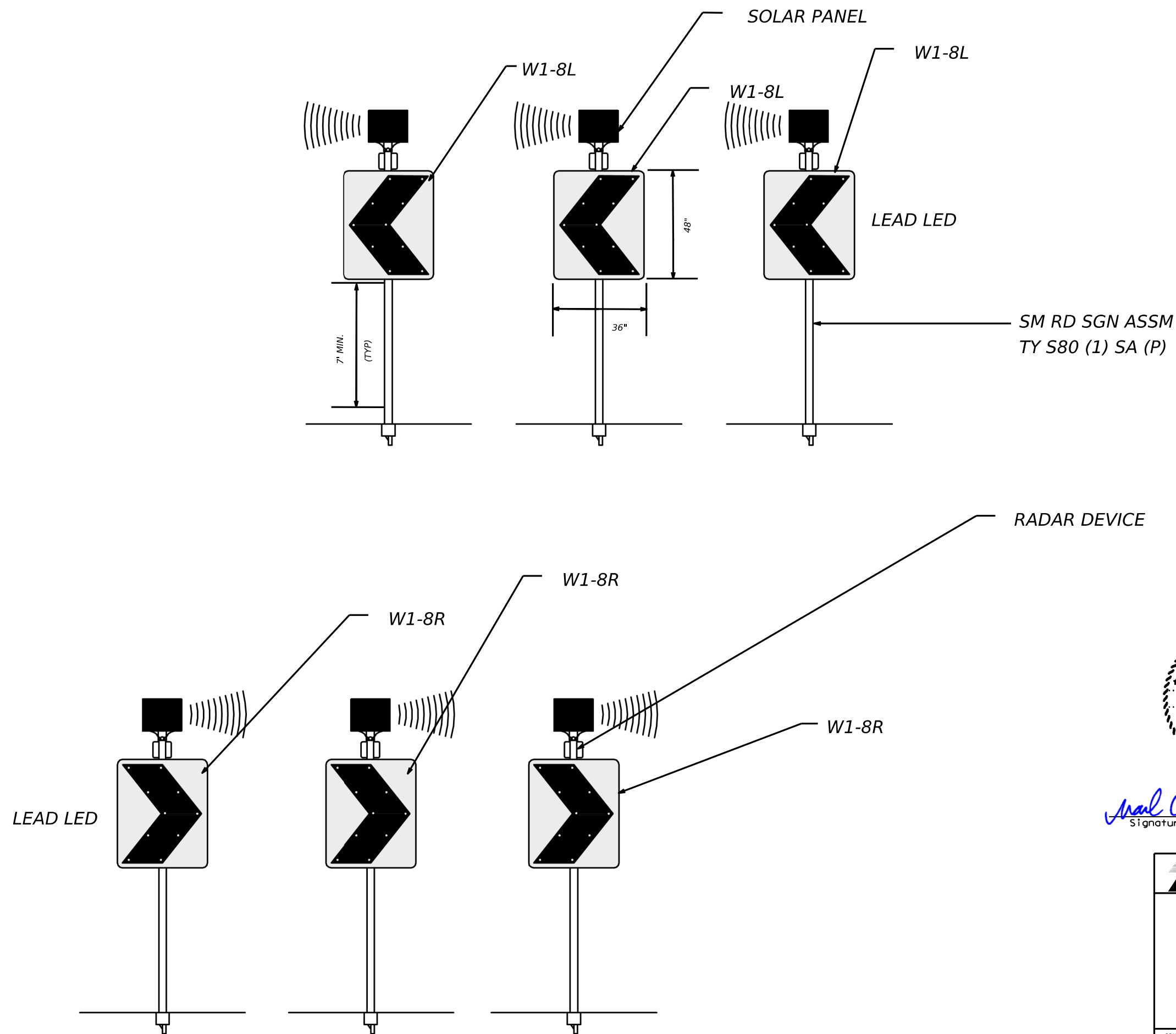
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CONT	SECT	JOB	HIGHWAY
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DATE: 1/3/2023 9:15:32 PM  
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*Manuel Enriquez*, P.E. 12-20-22  
 Signature of Registrant & Date

Texas Department of Transportation

US 175, ETC.  
 SOLAR POWERED LED  
 SIGN DETAIL

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0197	04	084, ETC.	US 175, ETC.
DIST	COUNTY	SHEET NO.	
DAL	KAUFMAN, ETC.	63	

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## SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

### Post Type

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

### Number of Posts (1 or 2)

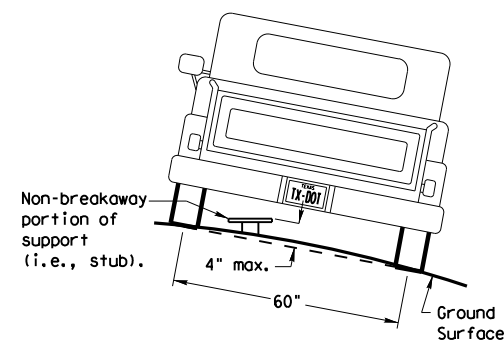
### Anchor Type

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

### Sign Mounting Designation

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

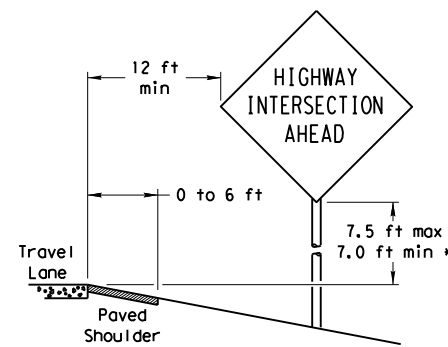
## REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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).

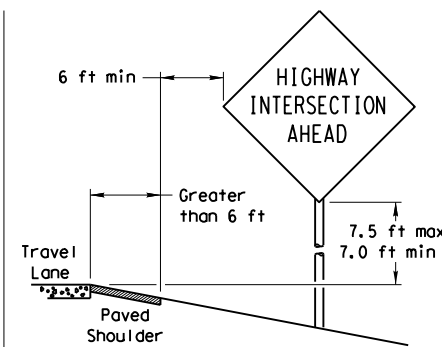
## SIGN LOCATION

### PAVED SHOULDERS



#### LESS THAN 6 FT. WIDE

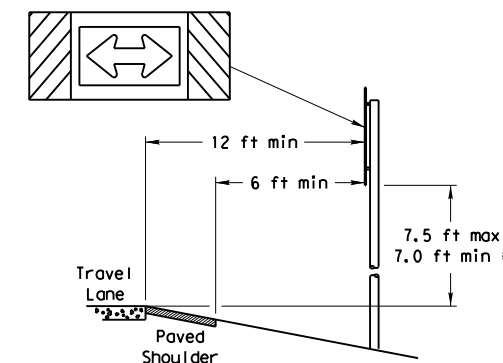
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



#### GREATER THAN 6 FT. WIDE

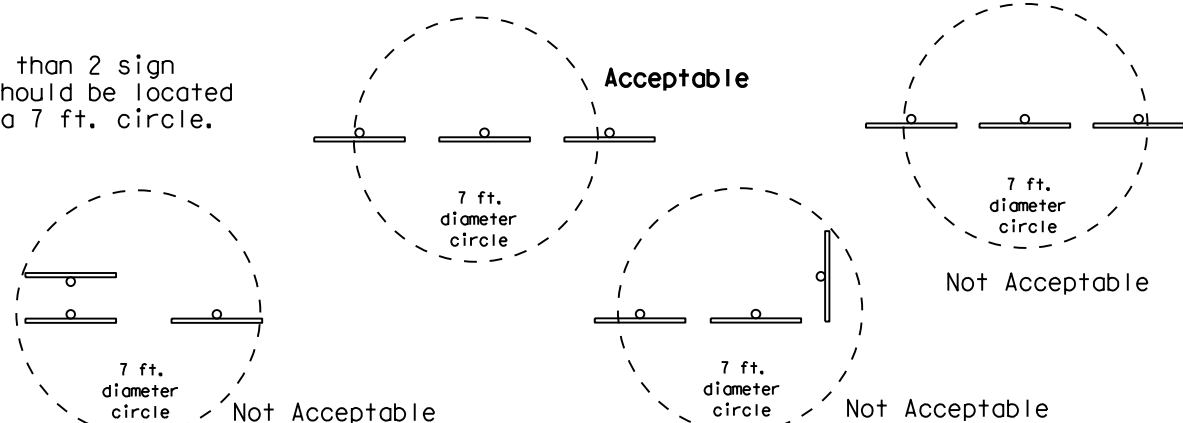
When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

### T-INTERSECTION

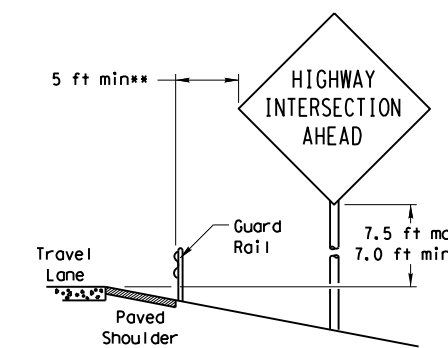


When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.

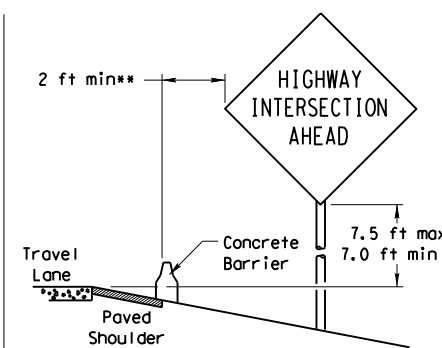
No more than 2 sign posts should be located within a 7 ft. circle.



### BEHIND BARRIER

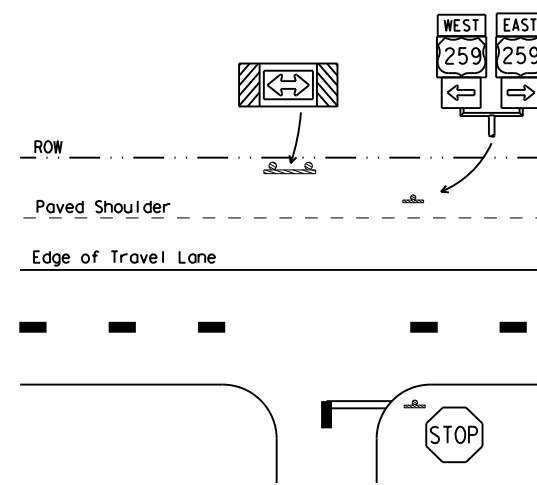


#### BEHIND GUARDRAIL



#### BEHIND CONCRETE BARRIER

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



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

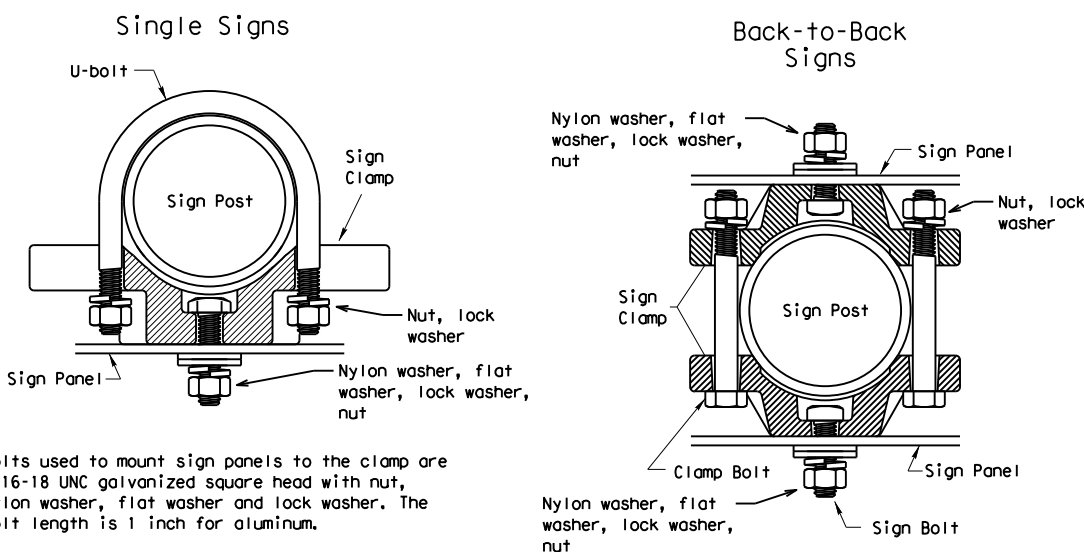
- (1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or
- (2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

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

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

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

## TYPICAL SIGN ATTACHMENT DETAIL



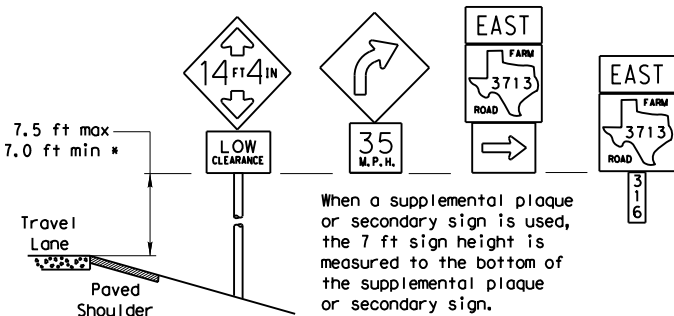
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

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

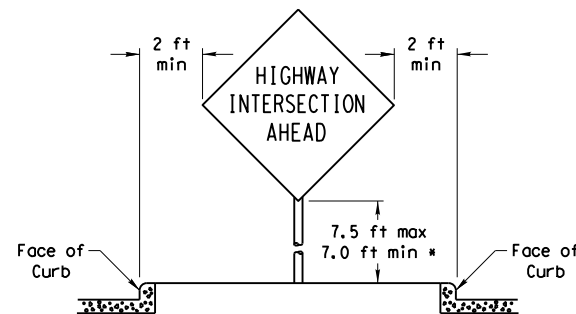
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

### SIGNS WITH PLAQUES

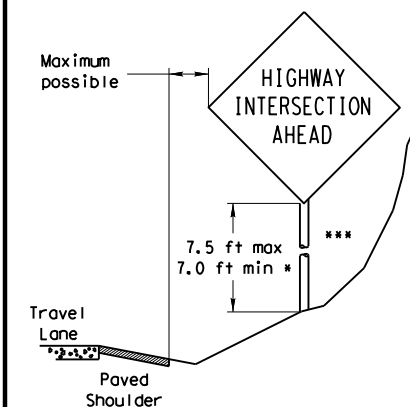


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

### CURB & GUTTER OR RAISED ISLAND



### RESTRICTED RIGHT-OF-WAY (When 6 ft min. is not possible.)



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

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

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

Texas Department of Transportation  
 Traffic Operations Division

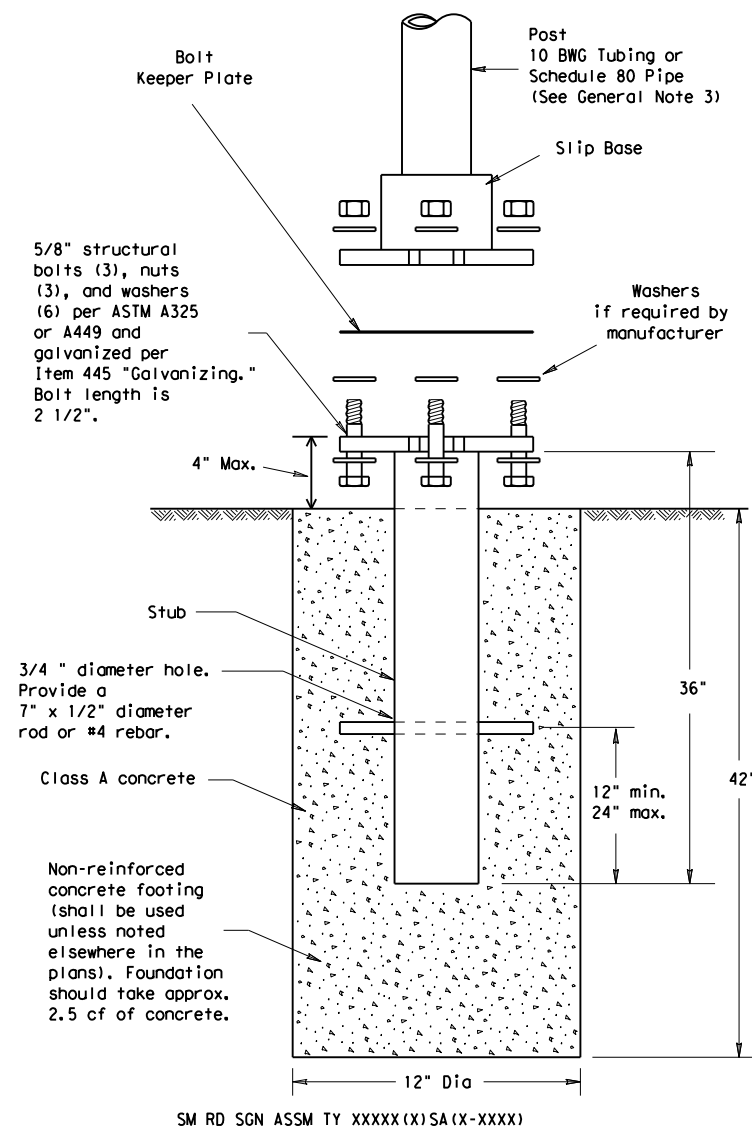
## SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD (GEN) - 08

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9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0197/04		084, ETC.	US 175, ETC
		DIST	COUNTY		SHEET NO.
		DAL	KAUFMAN, ETC.		64

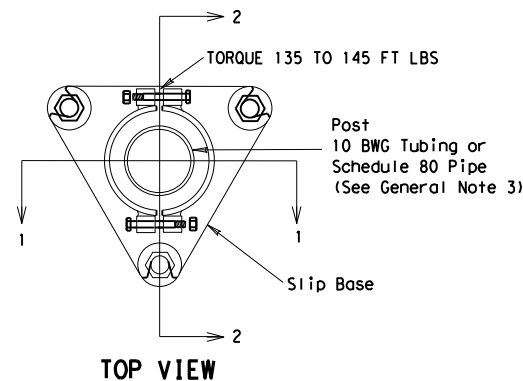
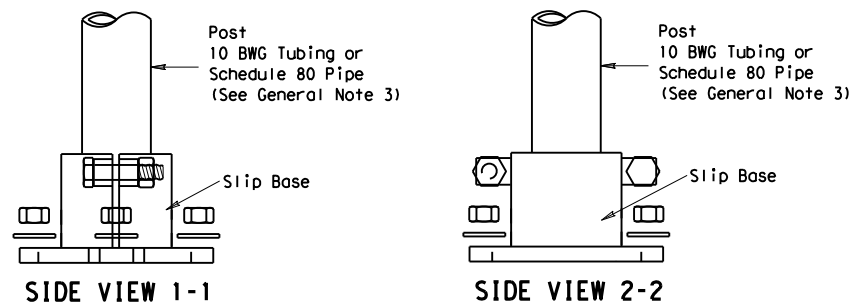
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# TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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.



TOP VIEW

DETAIL A

**GENERAL NOTES:**

- Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
- Material used as post with this system shall conform to the following specifications:
  - 10 BWG Tubing (2.875" outside diameter)
    - 0.134" nominal wall thickness
    - Seamless or electric-resistance welded steel tubing or pipe
    - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
    - Other steels may be used if they meet the following:
      - 55,000 PSI minimum yield strength
      - 70,000 PSI minimum tensile strength
      - 20% minimum elongation in 2"
    - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
    - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
    - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
  - Schedule 80 Pipe (2.875" outside diameter)
    - 0.276" nominal wall thickness
    - Steel tubing per ASTM A500 Gr C
    - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
      - 46,000 PSI minimum yield strength
      - 62,000 PSI minimum tensile strength
      - 21% minimum elongation in 2"
    - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
    - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
    - Galvanization per ASTM A123
- See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: <http://www.txdot.gov/publications/traffic.htm>
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

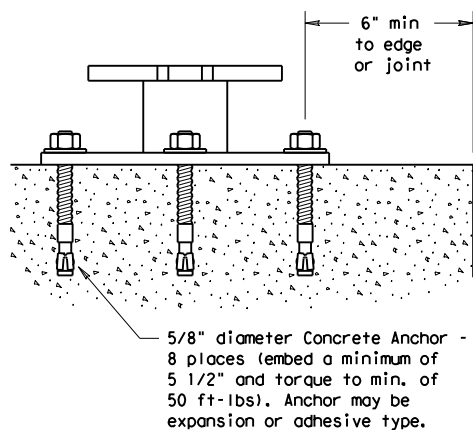
**ASSEMBLY PROCEDURE**

- Foundation**
- Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
  - The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
  - Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
  - Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
  - The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

**Support**

- Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
- Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

**CONCRETE ANCHOR**



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

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



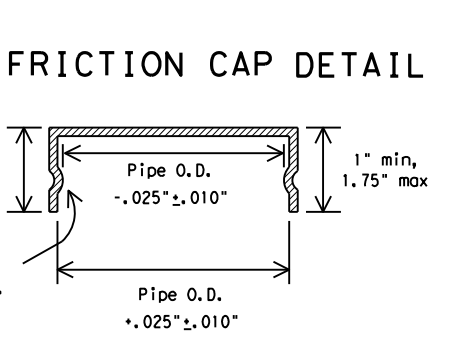
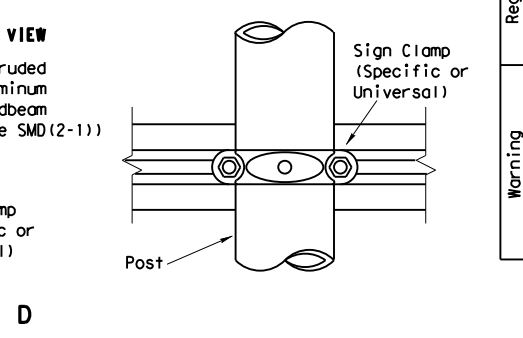
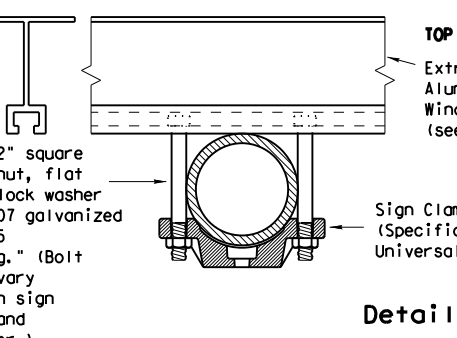
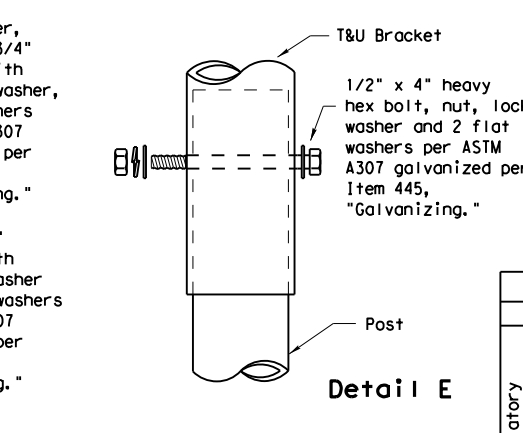
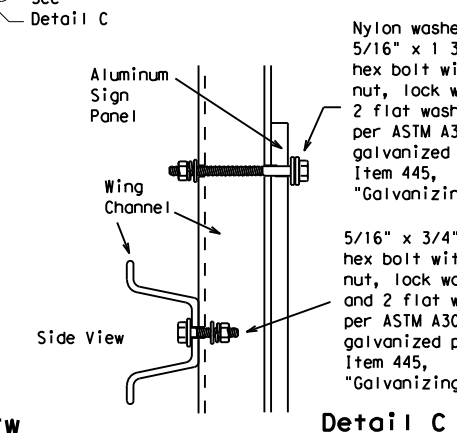
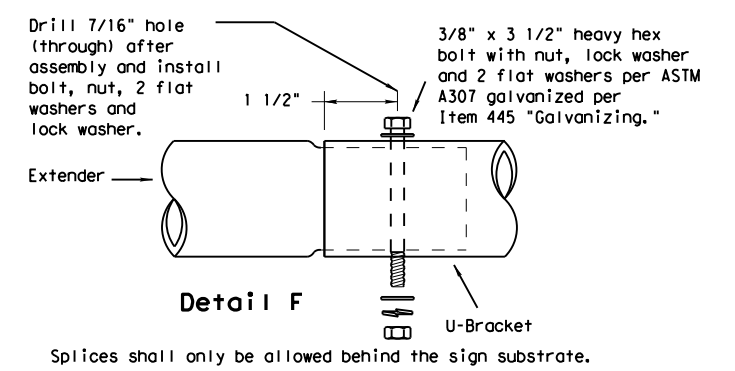
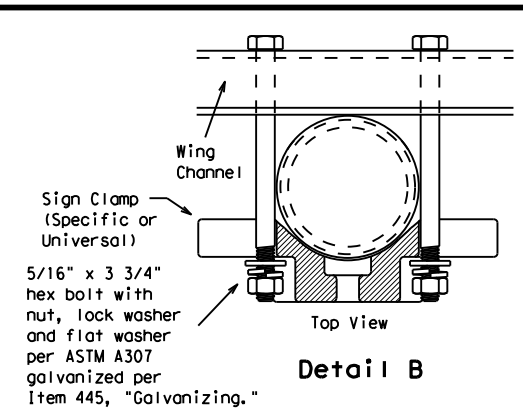
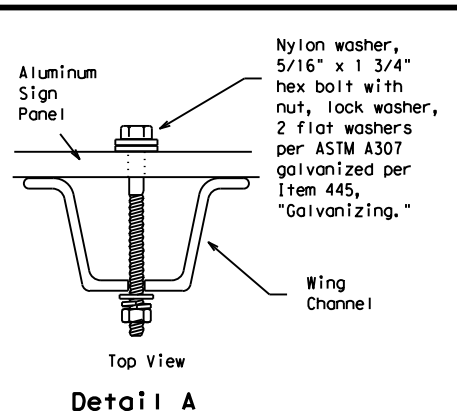
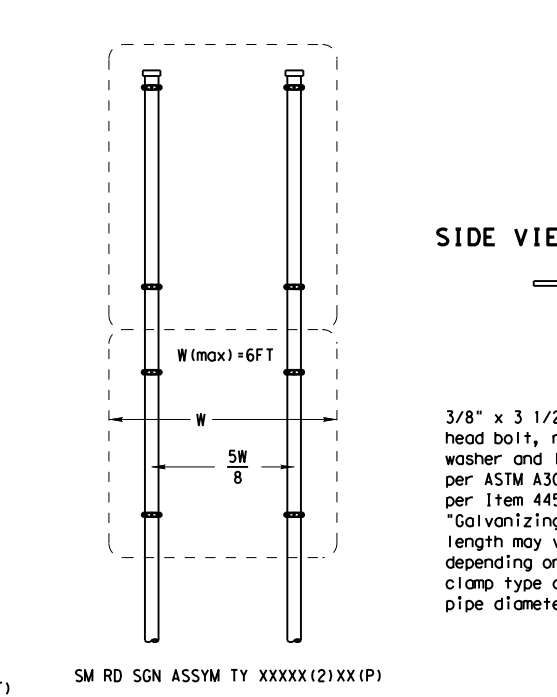
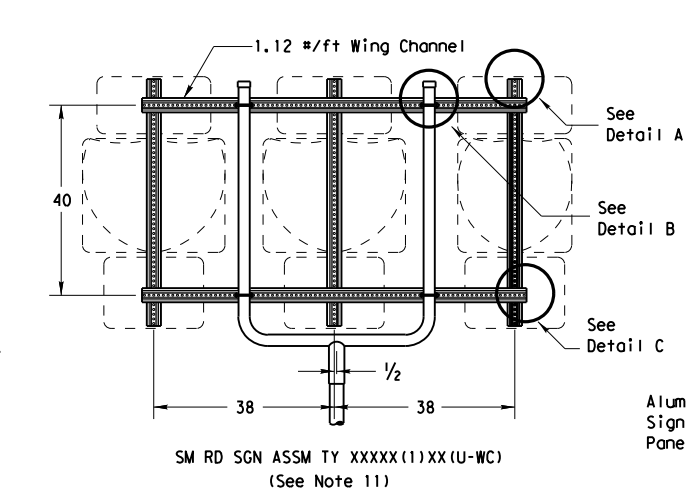
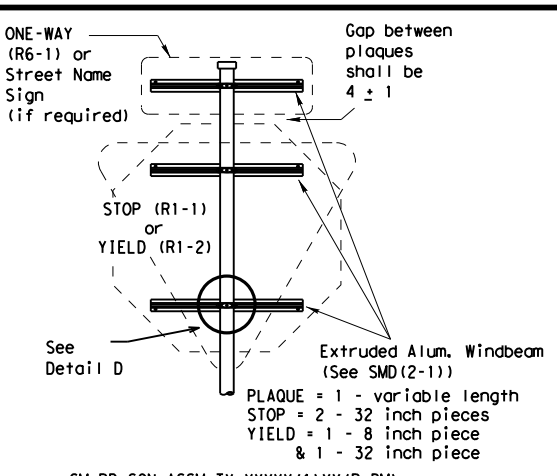
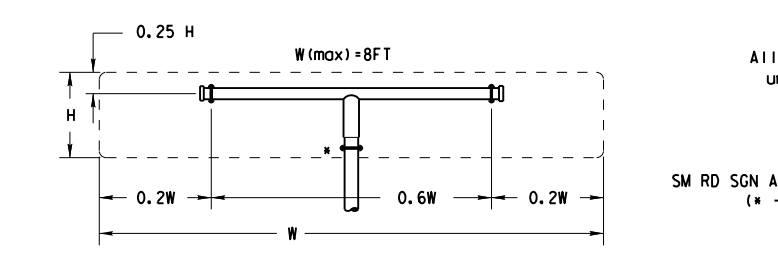
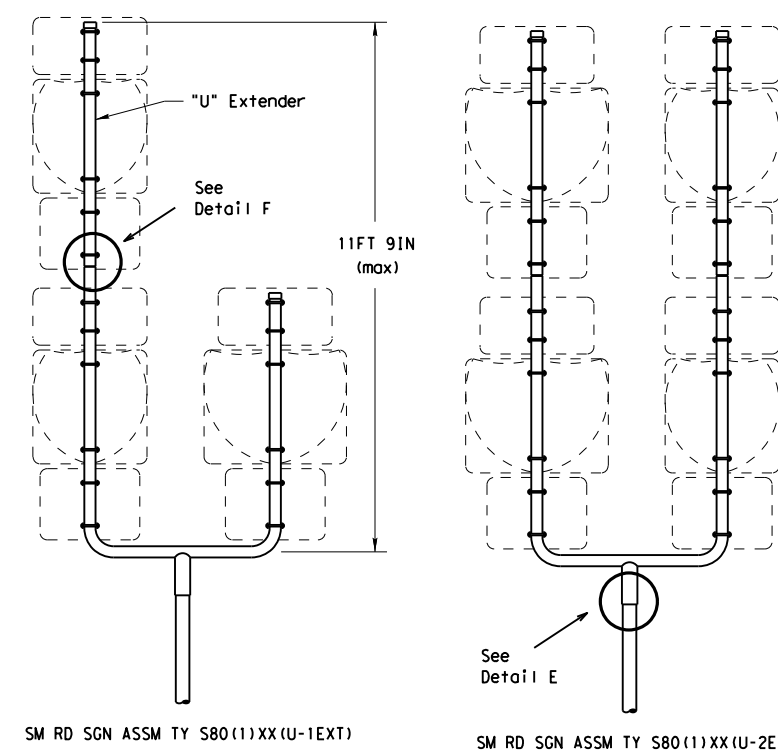
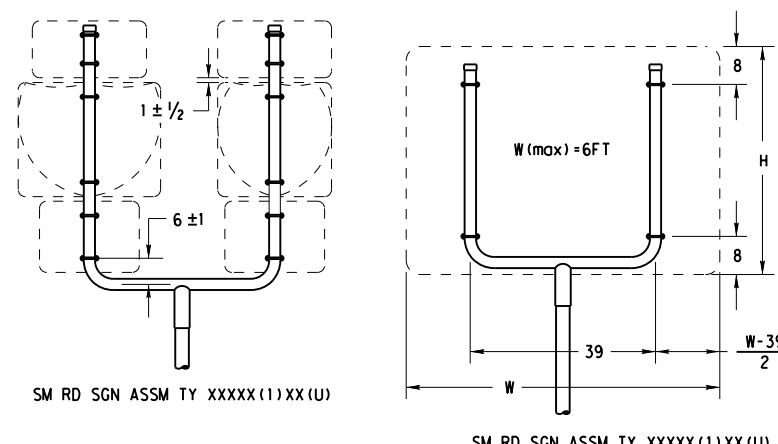
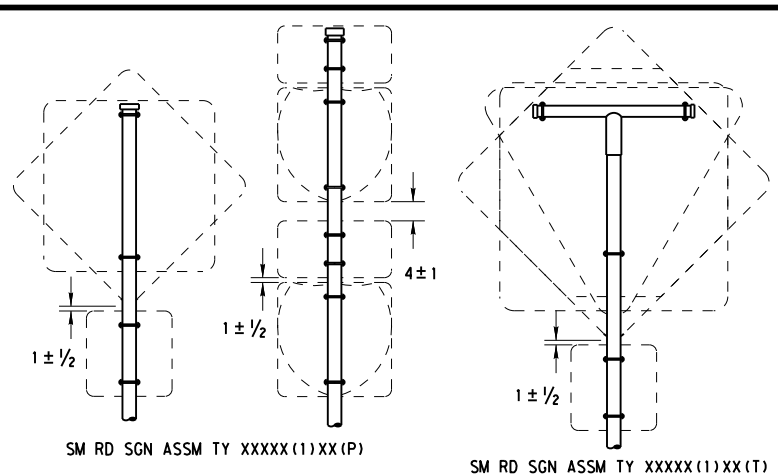
**SIGN MOUNTING DETAILS  
SMALL ROADSIDE SIGNS  
TRIANGULAR SLIPBASE SYSTEM  
SMD(SLIP-1)-08(DAL)**

ADDED DETAIL A FOR CLAMP BASE  
10-2010

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9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
12-10 (DISTRICT)		0197	04	084, ETC.	US 175, ETC
ADDED CLAMP BASE		DIST	COUNTY		SHEET NO.
DETAIL FOR SLIP		DAL	KAUFMAN, ETC.		65
BASE INSTALLATION					

DATE:  
FILE:

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All dimensions are in english unless detailed otherwise.

Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes. The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture. Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

GENERAL NOTES:

1. SIGN SUPPORT # OF POSTS MAX. SIGN AREA
 

10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT		
SIGN DESCRIPTION	SUPPORT	
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
Warning	48x60-inch signs	TY S80(1)XX(T)
	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)	



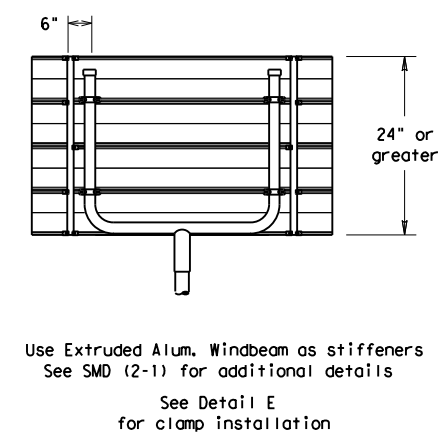
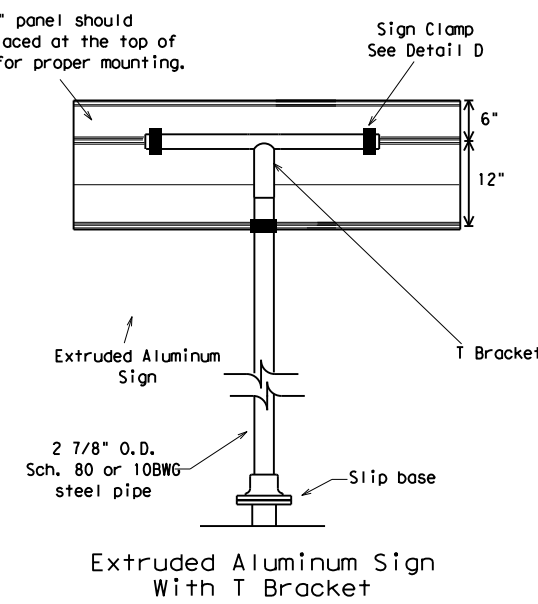
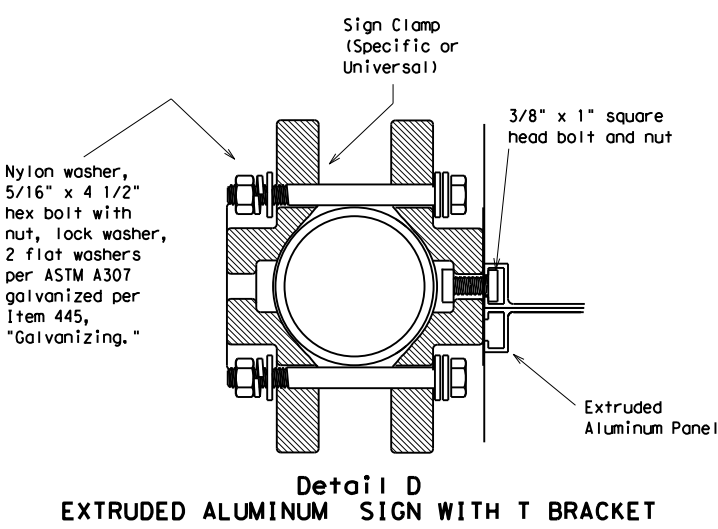
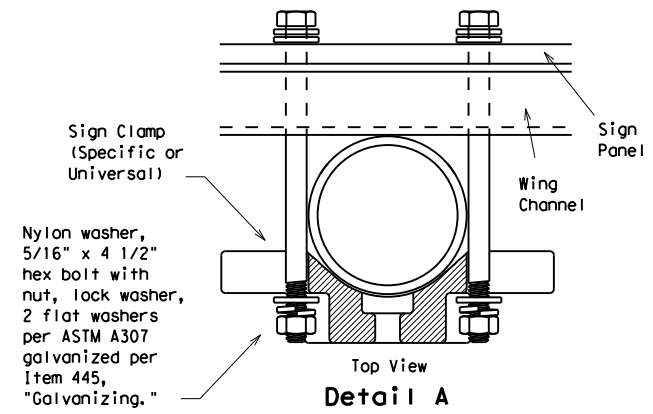
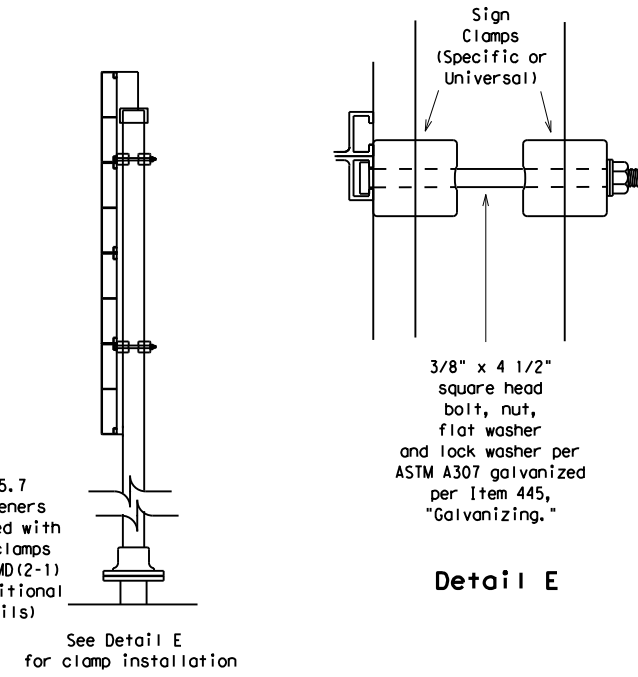
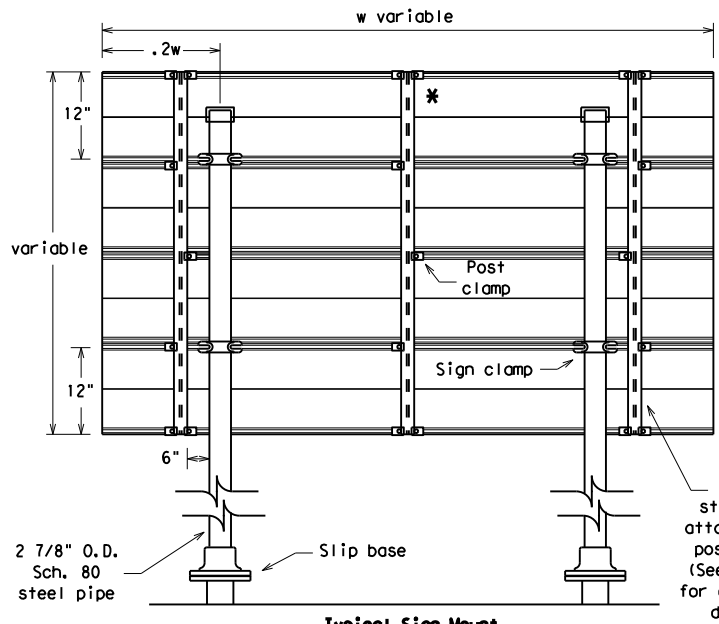
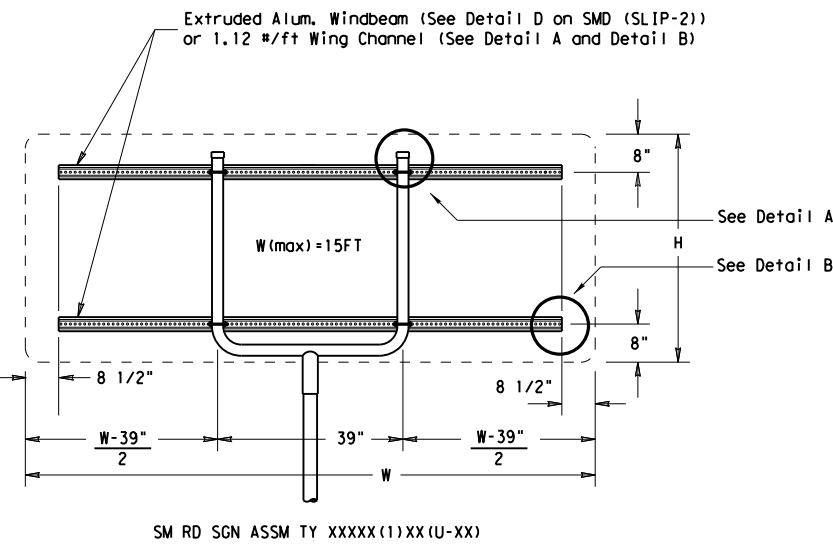
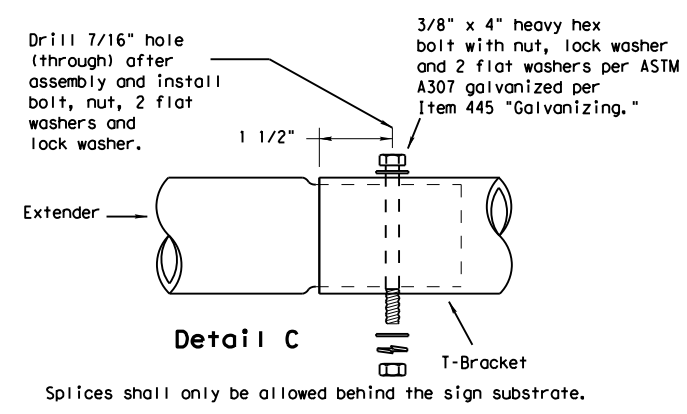
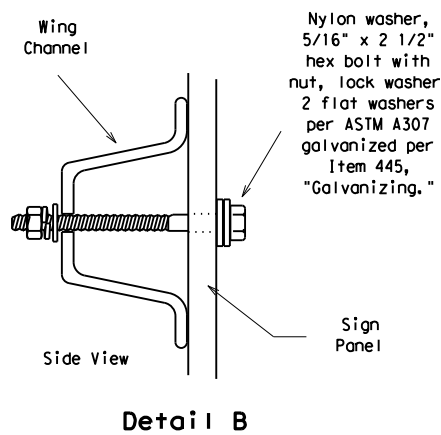
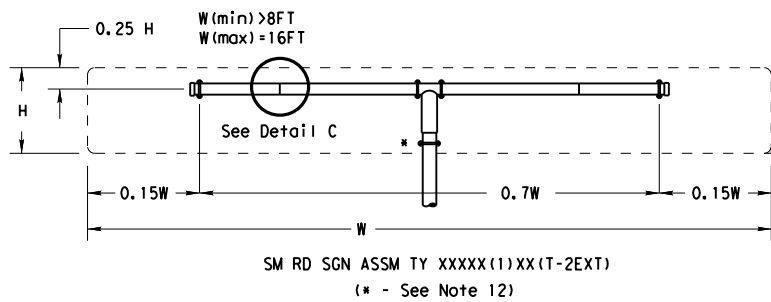
SIGN MOUNTING DETAILS  
SMALL ROADSIDE SIGNS  
TRIANGULAR SLIPBASE SYSTEM  
SMD(SLIP-2)-08

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9-08	CON: 0197	SECT: 04	JOB: 084, ETC.	HIGHWAY: US 175, ETC.
	DIST: DAL	COUNTY: KAUFMAN, ETC.	SHEET NO.: 66	

DATE:  
FILE:

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DATE: 1/3/2023 9:16:23 PM  
 FILE: pw://txdot.projectwiseonline.com:TxDOT15/Documents/18 - DAL/Design Projects/019704084/4 - Design/Plan Set/8. Traffic/TRAFFIC STANDARD, DGN/smds3.dgn



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          |
- 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.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- 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.
- Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
- 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.
- 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.
- Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
- 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."
- Sign blanks shall be the sizes and shapes shown on the plans.
- 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.
- Post open ends shall be fitted with Friction Caps.

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



**SIGN MOUNTING DETAILS  
 SMALL ROADSIDE SIGNS  
 TRIANGULAR SLIPBASE SYSTEM  
 SMD(SLIP-3)-08**

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9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0197	04	084, ETC.	US 175, ETC
		DIST	COUNTY		SHEET NO.
		DAL	KAUFMAN, ETC.		67

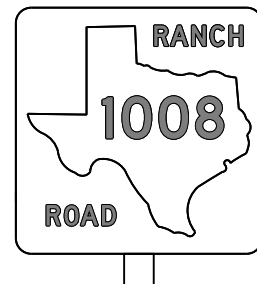
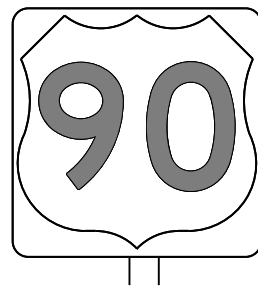


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DATE: FILE:

## REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

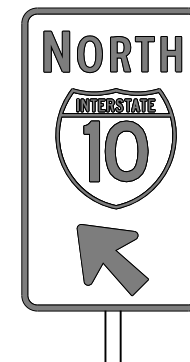
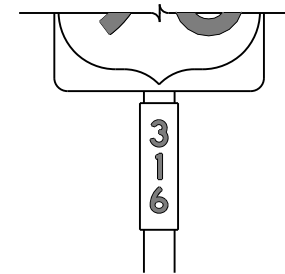
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



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

- 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).
- 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

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



## TYPICAL SIGN REQUIREMENTS

### TSR(3) - 13

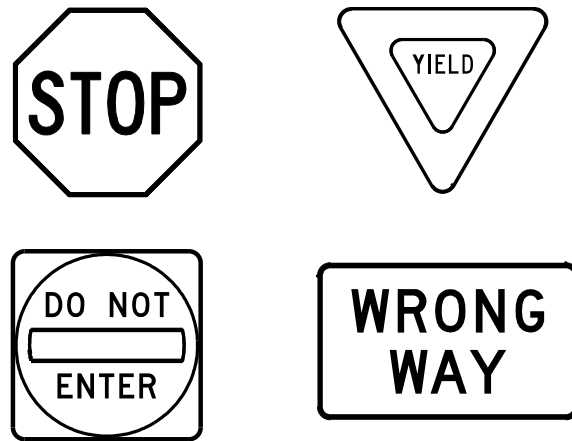
FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0197	04	084, ETC.	US 175, ETC
12-03 7-13	DIST	COUNTY	SHEET NO.	
9-08	DAL	KAUFMAN, ETC.	68	

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DATE: FILE:

### 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

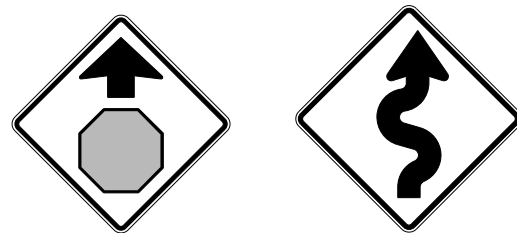
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



#### 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 <sub>FL</sub> OR C <sub>FL</sub> 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 <sub>FL</sub> OR C <sub>FL</sub> SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

### GENERAL NOTES

- 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).
- Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
- 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.
- Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
- 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.
- 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.
- Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
- 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/>



## TYPICAL SIGN REQUIREMENTS

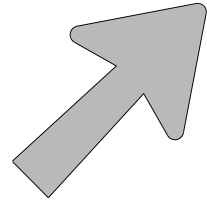
### TSR(4) - 13

FILE:	tsr4-13.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CR:	TxDOT
© TxDOT	October 2003	CONT:	SECT	JOB:	HIGHWAY				
REVISIONS		0197	04	084, ETC.	US 175, ETC				
12-03	7-13	DIST:	COUNTY	SHEET NO.					
9-08		DAL	KAUFMAN, ETC.	69					

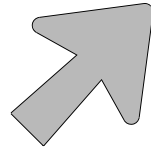
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

## ARROW DETAILS

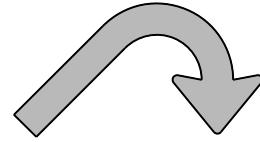
for Large Ground-Mounted and Overhead Guide Signs



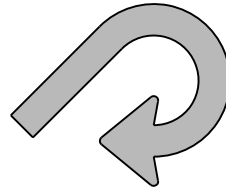
Type A



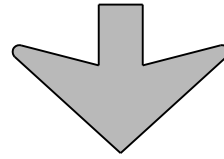
Type B



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	

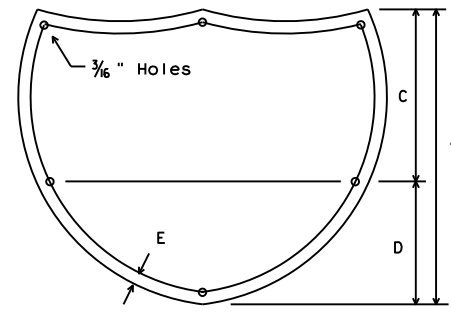
CODE	USED ON SIGN NO.
E-3	E5-1aT
E-4	E5-1bT

**NOTE**

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

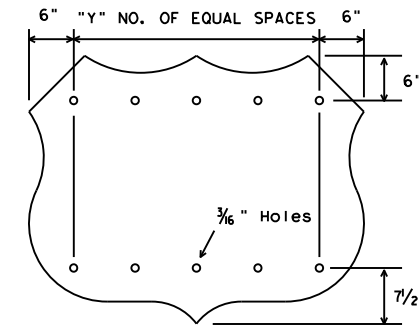
The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:  
<http://www.txdot.gov/>

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



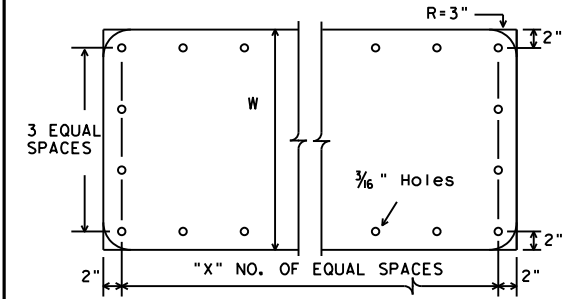
INTERSTATE ROUTE MARKERS

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



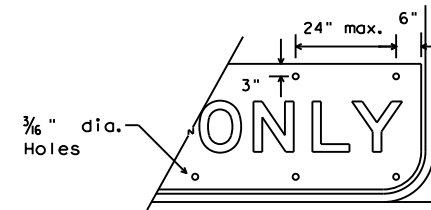
U.S. ROUTE MARKERS

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



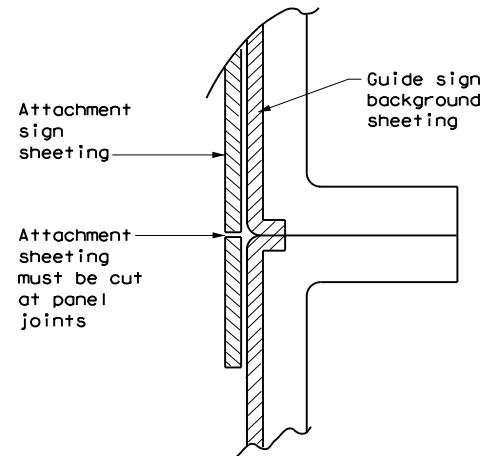
STATE ROUTE MARKERS

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



EXIT ONLY PANEL

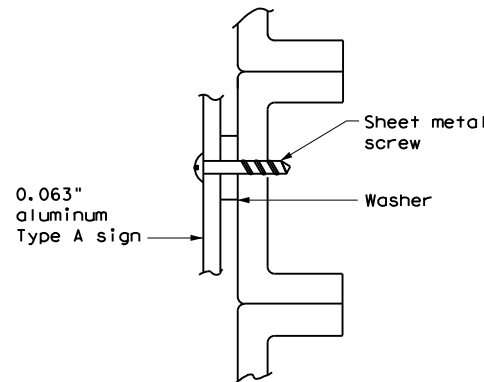
## MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



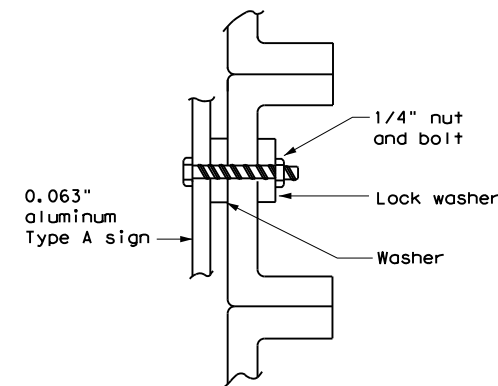
DIRECT APPLIED ATTACHMENT

**NOTE:**

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



SCREW ATTACHMENT

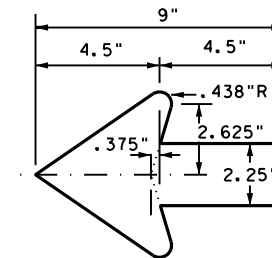


NUT/BOLT ATTACHMENT

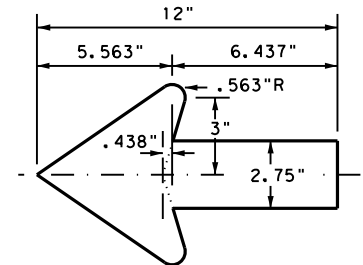
**NOTE:**

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

## ARROW DETAILS for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.

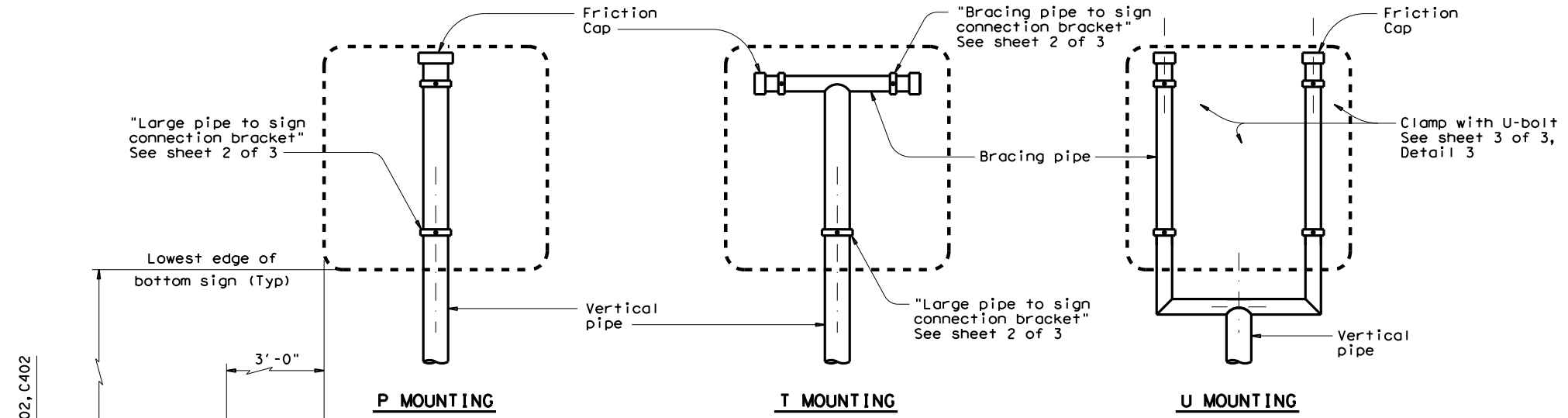
## TYPICAL SIGN REQUIREMENTS

### TSR (5) - 13

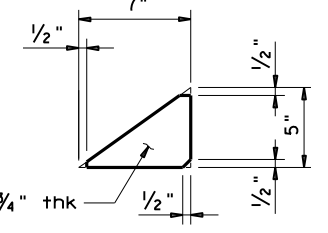
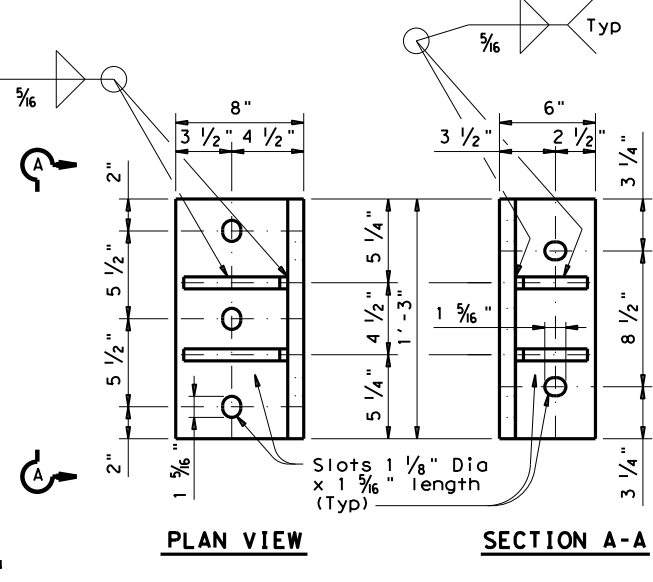
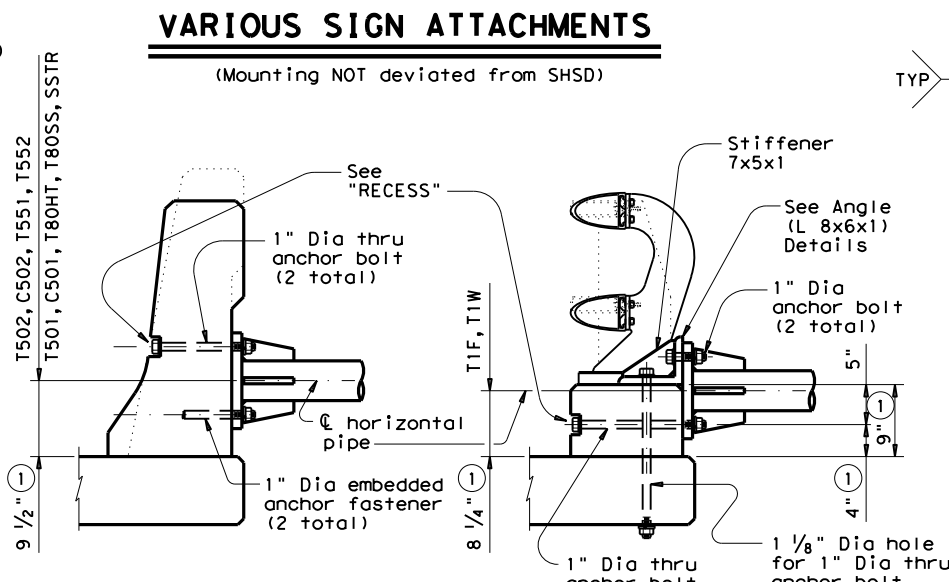
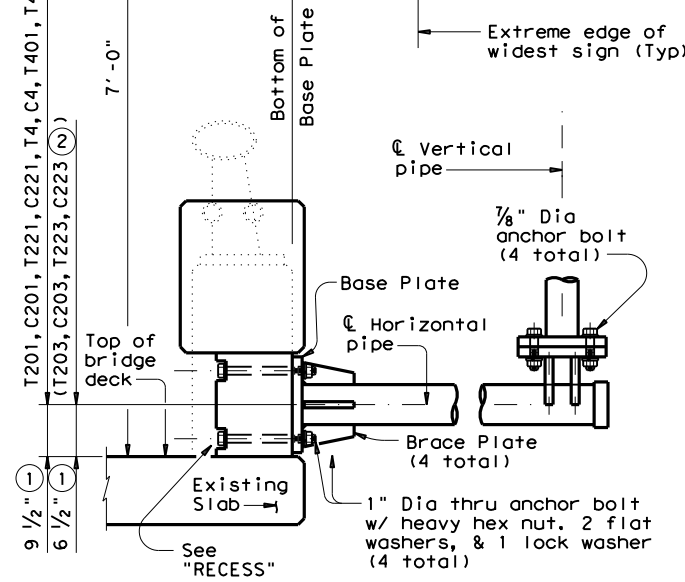
FILE: tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT October 2003	CONT SECT	JOB	HIGHWAY	
REVISIONS	0197 04	084, ETC.	US 175, ETC	
12-03 7-13	DIST	COUNTY	SHEET NO.	
9-08	DAL	KAUFMAN, ETC.	70	

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DATE: FILE:

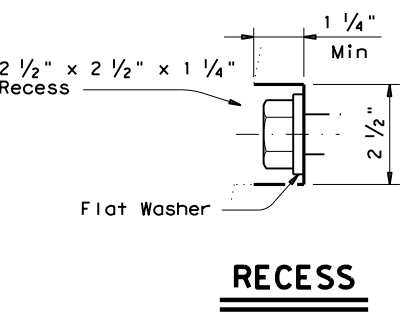


**VARIOUS SIGN ATTACHMENTS**  
(Mounting NOT deviated from SHSD)



**ANGLE (L 8x6x1) DETAILS**

**LONGITUDINAL SECTION THROUGH RAILING & SIGN MOUNT**



- ① Increase 2" for structure with overlay.
- ② Attached at center post.

PIPE SIZE AND THICKNESS			
Pipe Placement Design Wind Speed	Horizontal	Vertical	Bracing
90 mph	5" X-Strong (.375")	4" X-Strong (.337")	2 1/2" Standard (.203")
130 mph	6" X-Strong (.432")	5" X-Strong (.375")	3" X-Strong (.300")

**GENERAL NOTES:**  
Design conforms to 2013 AASHTO Standard Specifications for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design 3-second gust wind speeds of 90 mph and 130 mph with a 1.14 gust factor, and a wind importance factor of 1.0 (50-year mean recurrence interval) for the supporting structures. For mounting connection between sign panel and pipe, wind importance factors of 0.71 and 0.54, for 90 mph and 130 mph winds, respectively, are applied to adjust the wind speeds to a 10-year mean recurrence interval.

See standard sheet WV & IZ (LTS2013) for the boundaries of each design wind zone. All mounting shall be based on 130 mph wind speed design except when located in 90 mph wind zone. Maximum panel area is 30 sq. ft. Maximum design height is 50 ft, with design height defined as the distance between natural ground (average elevation of surrounding terrain) and the center of sign(s) at the mounting location.

Material for pipe shall be ASTM A53 Grade B, or A501. Structural steel plates shall be ASTM A36, A572 Grade 50, or A588. Bolts used to connect pipe and mounting bracket, and wind beam to sign panel shall be ASTM A307. Anchor bolts shall be ASTM A325 or A193 B7. Each anchor bolt shall be provided with 2 flat washers, 1 lock washer, and 1 heavy hex nut. All parts shall be galvanized in accordance with Standard Specifications Item 445, "Galvanizing".

Attach horizontal pipe at least 2'-0" from the edge of any nearby drain slot.

Contractor shall verify applicable field dimensions before fabrication. Holes drilled through the railing parapet wall shall be drilled with rotary (coring or masonry drill) type equipment. Percussion (star) drilling shall not be allowed. Anchorage for pipe attached to rail shall be placed using an anchoring system approved by the engineer. Installation of anchor fasteners including hole depth, diameter and material shall be in accordance with the manufacturers' recommendation.

Each embedded anchor fastener shall resist an allowable design loading (after applying the reduction factors of bolt spacing and bolt edge distance) of:

	130 mph	90 mph
Tension	12.5 kips	7.5 kips
Shear	9.0 kips	5.0 kips

Each anchoring system shall provide a capacity to resist the required tension and shear acting simultaneously.

For sign connection to mounting, shop drill holes on sign blank in accordance with the current Standard Highway Sign Designs for Texas (SHSD). Additional hole(s) needed to meet a stipulated-type mounting may be field drilled. For multi-sign or back-to-back signs mounting, the engineer shall determine the proper type which ensures each individual mounting meets requirements.

Refer to Standard sheets SMD(GEN), SMD(SLIP-2 and SMD(2-1) for details not covered here.

SHEET 1 OF 3

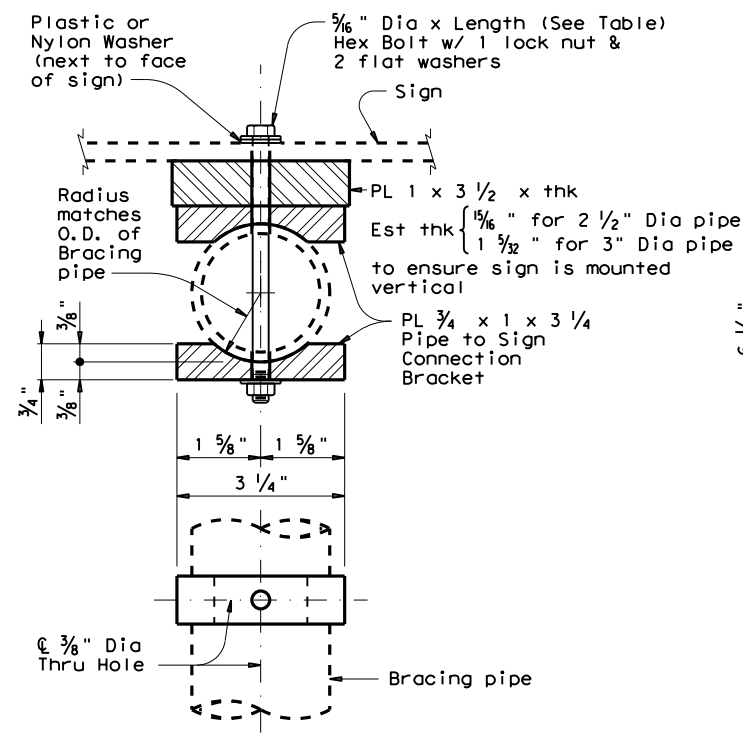
**BRIDGE RAILING SIGN MOUNT DETAILS**

**SMD (BR-1) - 14**

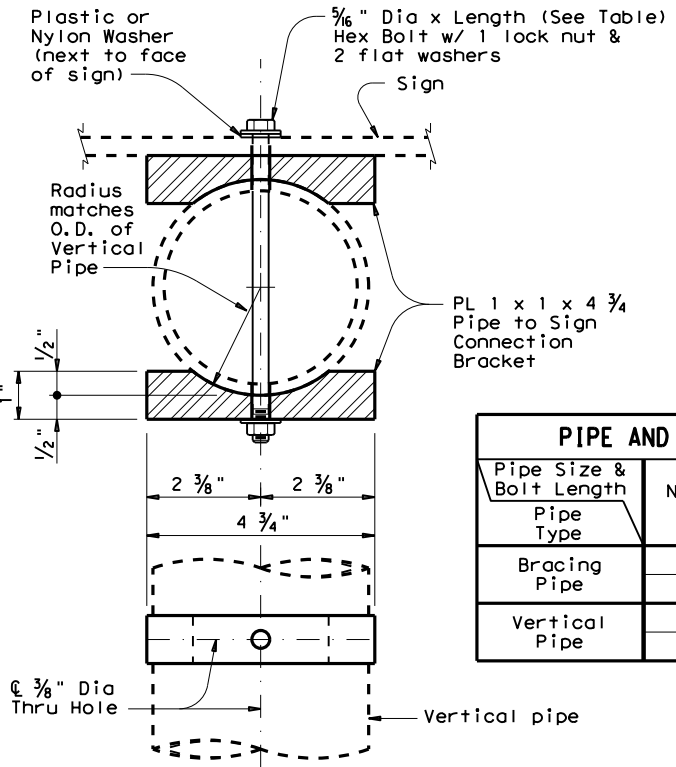
FILE: smdbr-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	019704		084, ETC.	US 175, ETC
	DIST	COUNTY	SHEET NO.	
	DAL	KAUFMAN, ETC.	71	

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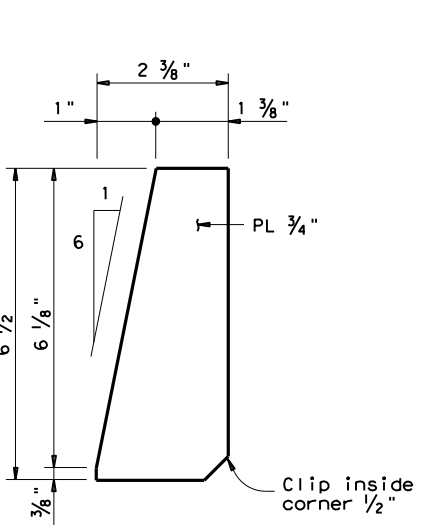
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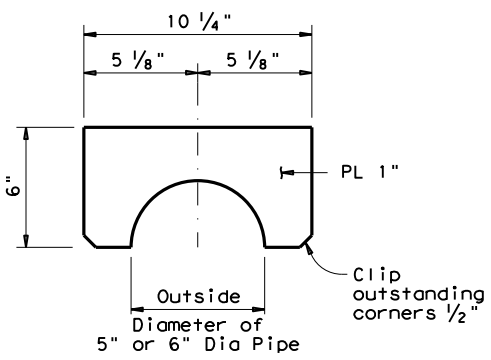
**BRACING PIPE TO SIGN CONNECTION BRACKET DETAILS**  
(Showing T Mounting)



**LARGE PIPE TO SIGN CONNECTION BRACKET DETAILS**  
(Showing P or T Mounting)

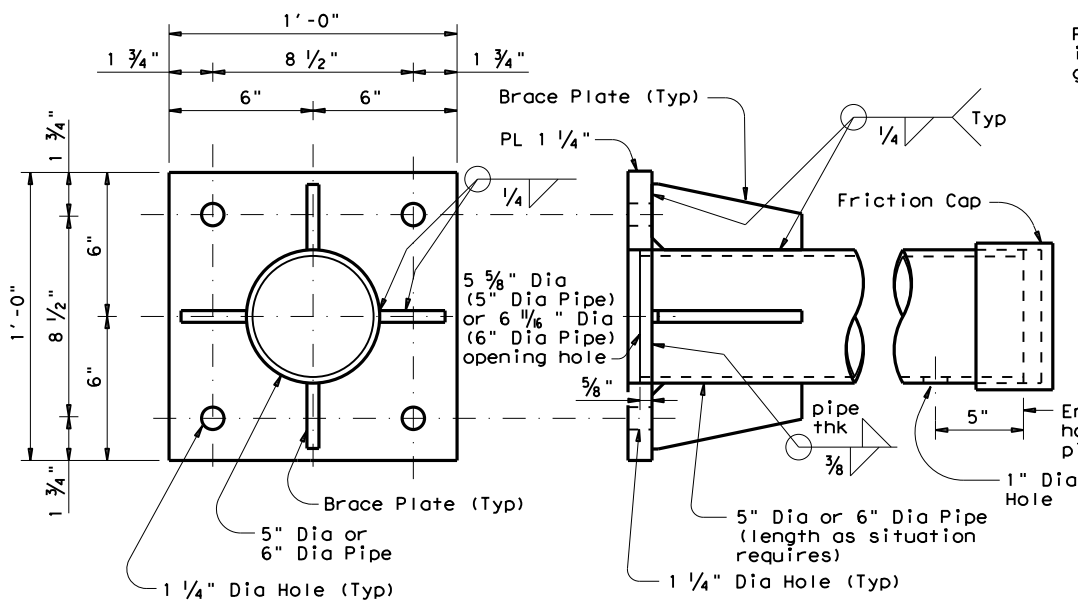


**BRACE PLATE DETAILS**

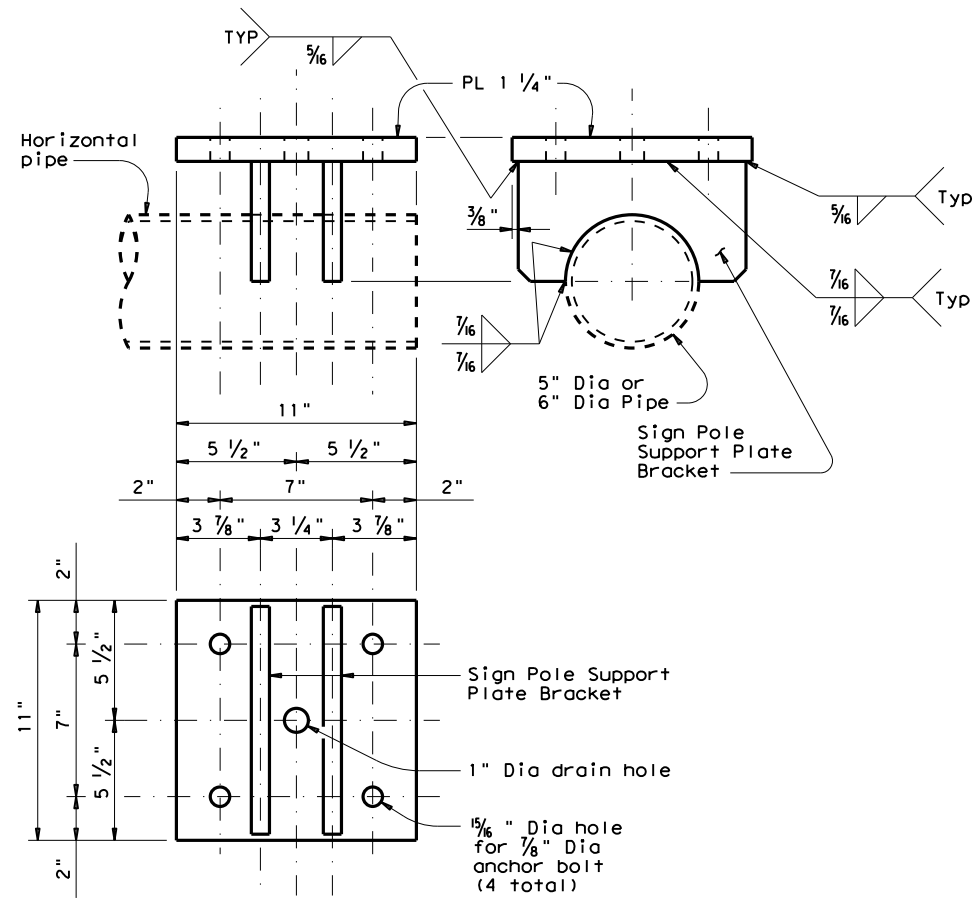


**SIGN POLE SUPPORT PLATE BRACKET DETAILS**

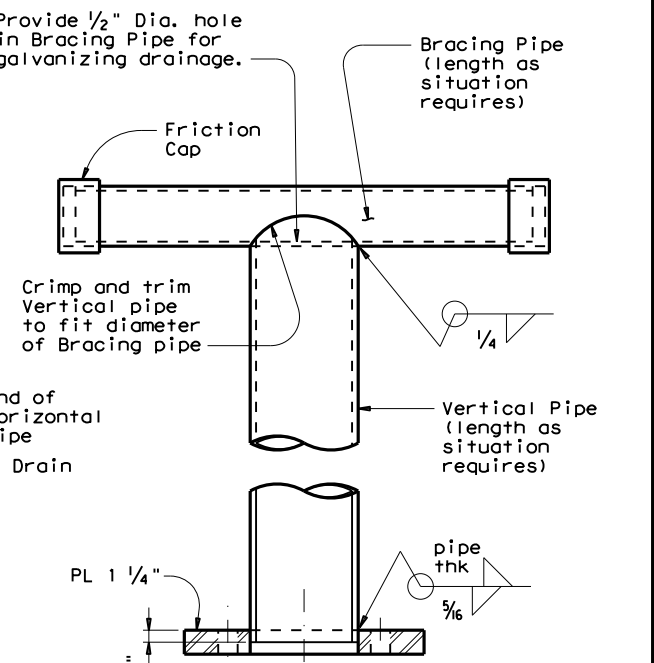
PIPE AND BOLT SPECIFICATIONS		
Pipe Size & Bolt Length	Nominal Pipe Dia (in.)	Bolt Length (in.)
Bracing Pipe	2 1/2	6
Vertical Pipe	3	7
Vertical Pipe	4	7
Vertical Pipe	5	8



**BASE PLATE DETAILS**



**SIGN POLE SUPPORT PLATE DETAILS**



**SIGN POLE & POLE BASE PLATE DETAILS**  
(Showing only T Mounting)

SHEET 2 OF 3



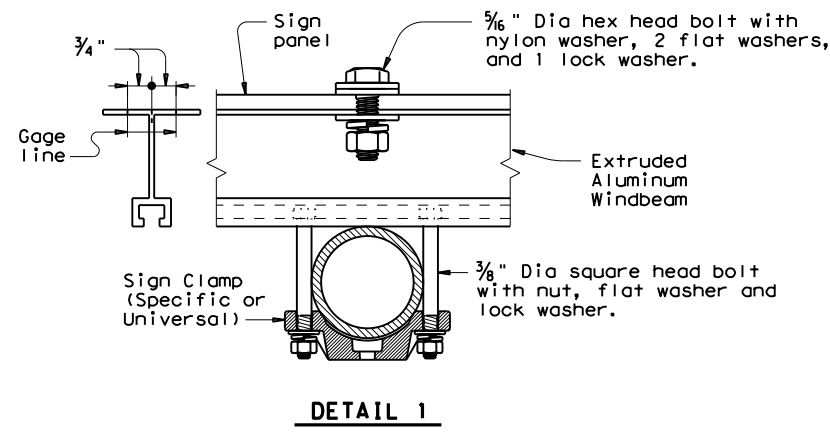
**BRIDGE RAILING SIGN MOUNT DETAILS**

**SMD (BR-2) - 14**

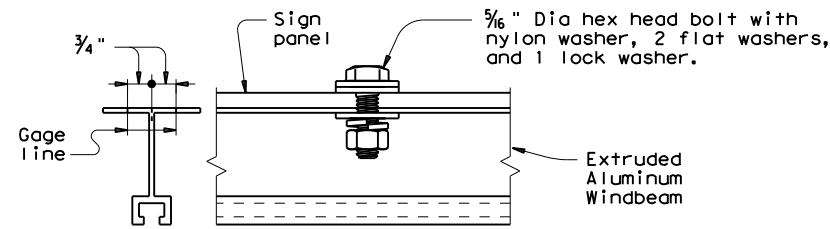
FILE: smdbr-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	019704		084.ETC.	US 175.ETC
	DIST	COUNTY		SHEET NO.
	DAL	KAUFMAN,ETC.		72

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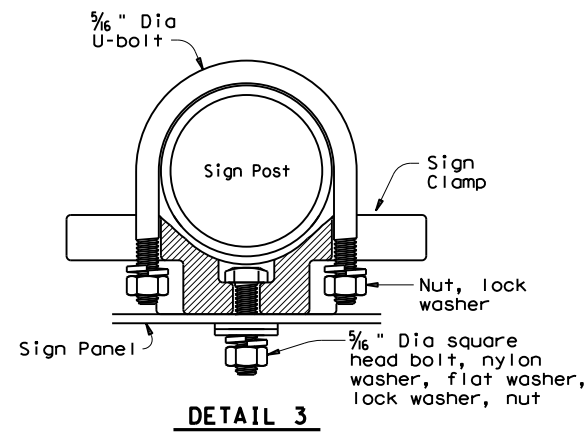
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DETAIL 1



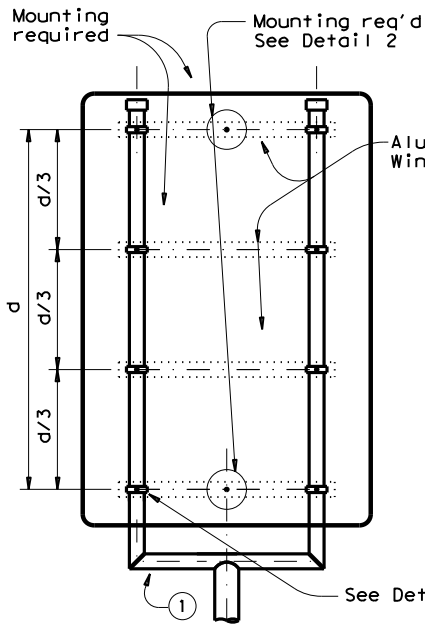
DETAIL 2



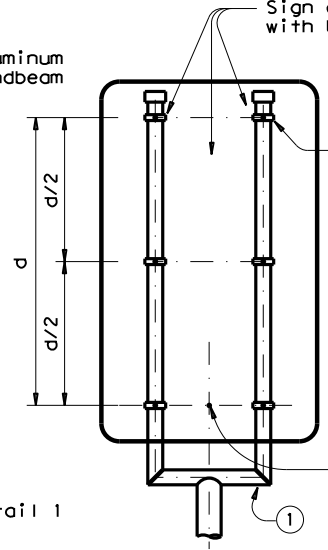
DETAIL 3

SIGN SHAPE	SQUARE			HORIZONTAL RECTANGLE			VERTICAL RECTANGLE			DIAMOND			OCTAGON			EQUILATERAL TRIANGLE			INTERSTATE SHIELD	PENTAGON (SCHOOL)		
	P	T	U	P	T	U	P	T	U	P	T	U	P	T	U	P	T	U	P	P	T	
Type of Sign Mounting on SHSD																						
Design Wind Speed																						
90 mph							(Type 23) 60"x48"	(Type 3) 72"x36" 78"x36"	(Type 23) 72"x30" 84"x24"	(Type 3) 36"x48" 36"x60" 36"x72" 42"x60" 48"x54" 48"x60" 48"x72" 48"x84"	(Type 3) 60"x60"									(Type Special) 45"x36"		
130 mph	(Type 1) 30"x30" 36"x36"	(Type 3) 48"x48"		(Type 1) 36"x24" 36"x30"	(Type 23) 48"x42" 54"x42" 60"x30" 66"x36" 84"x24"	(Type 3) 72"x36" 78"x36"	(Type 1) 30"x36" 30"x42"	(Type 3) 36"x48" 36"x60" 36"x72" 42"x60" 48"x54" 48"x60"	(Type 3) 48"x60"	(Type 1) 36"x36"	(Type 3) 48"x48" 60"x60"					(Type 1) 48"x48"			(Type Special) 36"x36" 45"x36"			

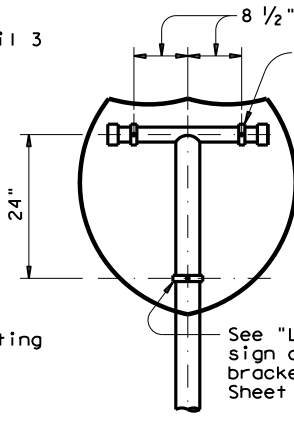
Notes: 1. Drill holes in addition to the hole pattern of the Standard Highway Sign Designs for Texas (SHSD) at specified locations to meet a stipulated-type mounting indicated in the parenthesis ( ).  
 2. "Blank" in the above table indicates all other signs excluded from stipulated mounting shall be mounted in accordance with SHSD.  
 3. In lieu of welding, the Fabricator may bend bracing pipe elbows if the following conditions are met:  
 a. Spacing between vertical bracing pipes is equal to or greater than 2'-6".  
 b. Bending radius is 12".  
 c. The distance between the lowest clamp and centerline of horizontal bent pipe is 13" max.



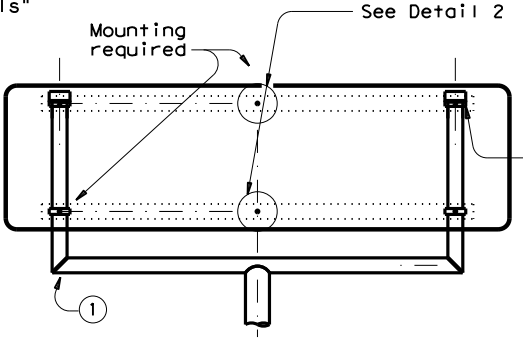
TYPE 4



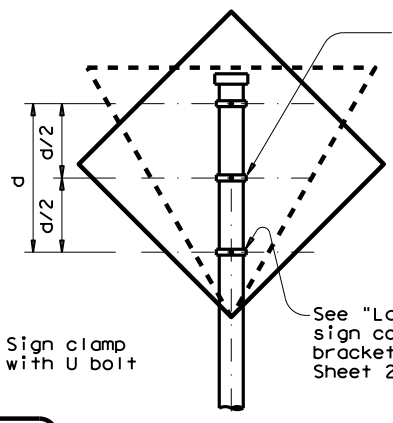
TYPE 32



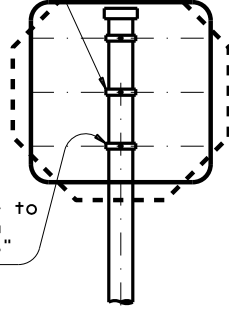
TYPE SPECIAL



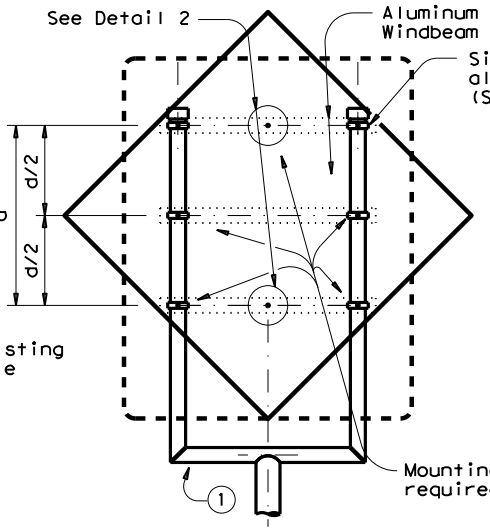
TYPE 23



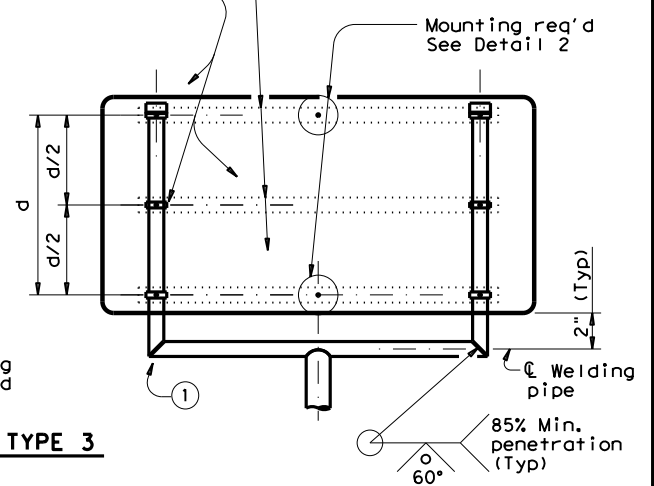
TYPE 1



TYPE 2



TYPE 3



SHEET 3 OF 3

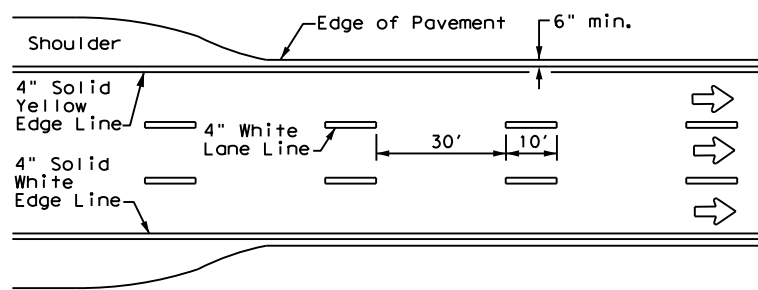
Texas Department of Transportation  
Traffic Operations Division Standard

## BRIDGE RAILING SIGN MOUNT DETAILS

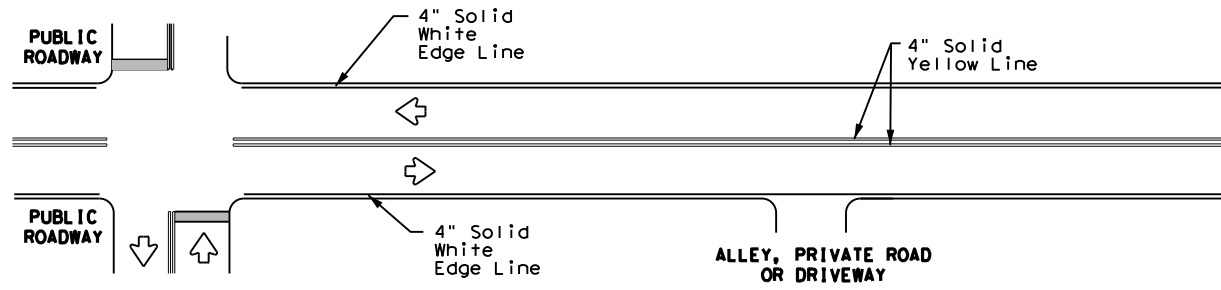
### SMD (BR-3) - 14

FILE: smdbr-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT August 2014	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY	SHEET NO.	
	DAL	KAUFMAN,ETC.	73	

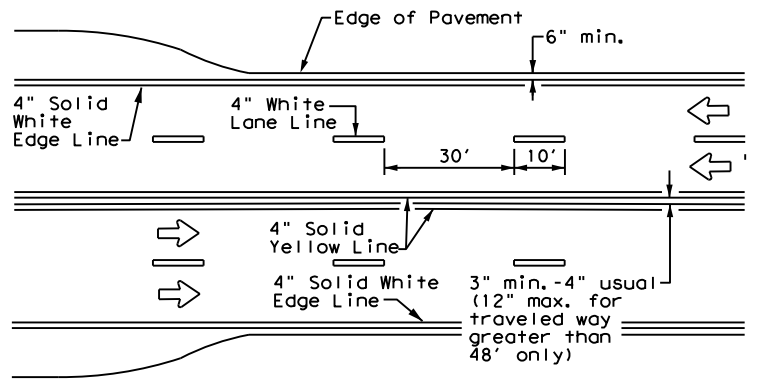
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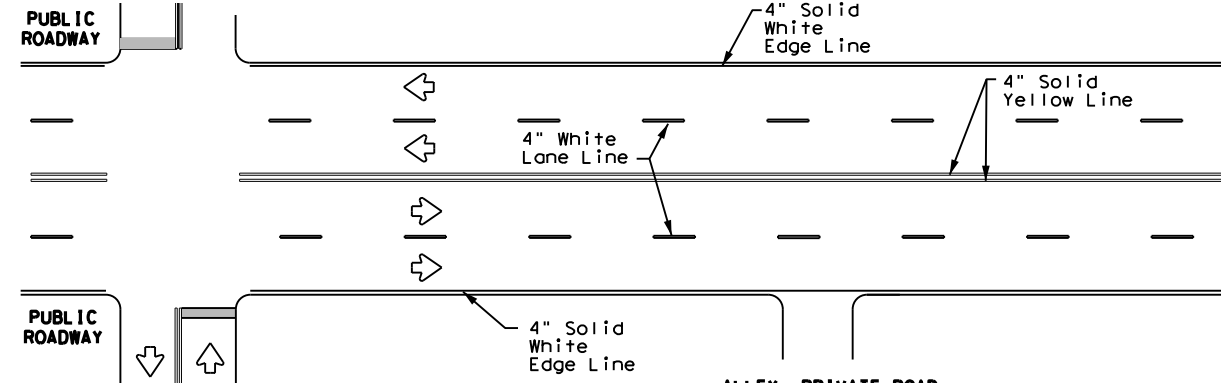
**EDGE LINE AND LANE LINES  
ONE-WAY ROADWAY  
WITH OR WITHOUT SHOULDERS**



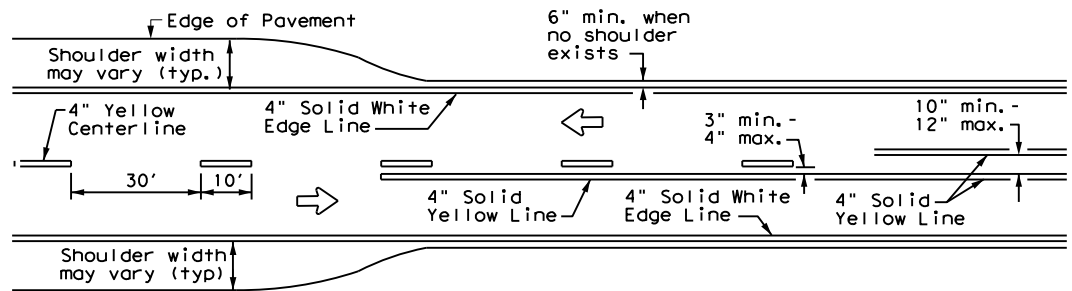
**TYPICAL TWO-LANE, TWO-WAY PAVEMENT  
MARKINGS THROUGH INTERSECTIONS**



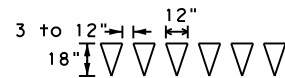
**CENTERLINE AND LANE LINES  
FOUR LANE TWO-WAY ROADWAY  
WITH OR WITHOUT SHOULDERS**



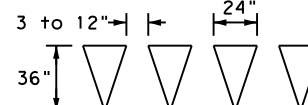
**TYPICAL MULTI-LANE, TWO-WAY PAVEMENT  
MARKINGS THROUGH INTERSECTIONS**



**TWO LANE TWO-WAY ROADWAY  
WITH OR WITHOUT SHOULDERS**

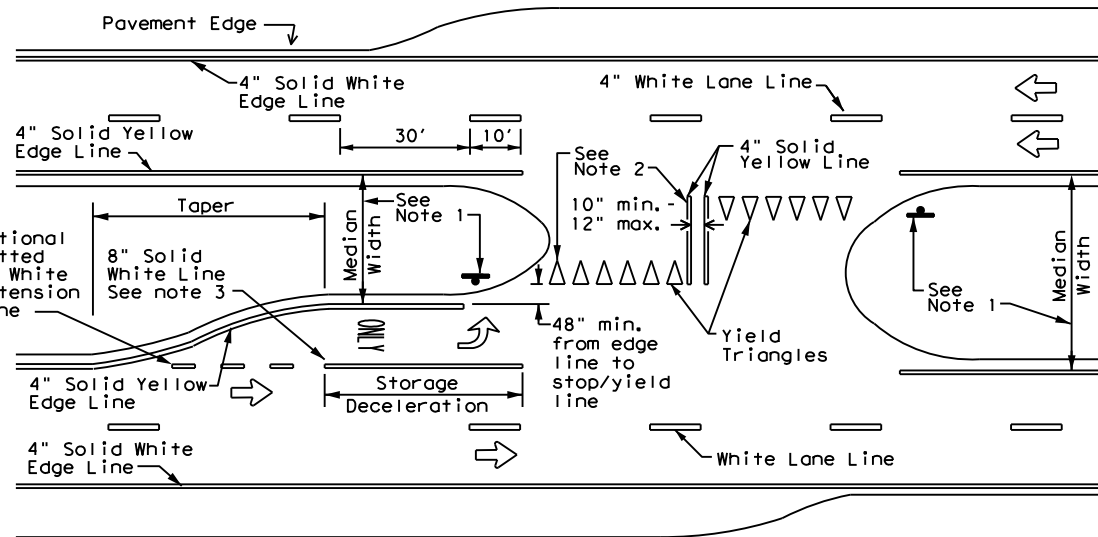


For posted speed on road being marked equal to or less than 40 MPH.



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

**YIELD LINES**



**FOUR LANE DIVIDED ROADWAY CROSSOVERS**

**NOTES**

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

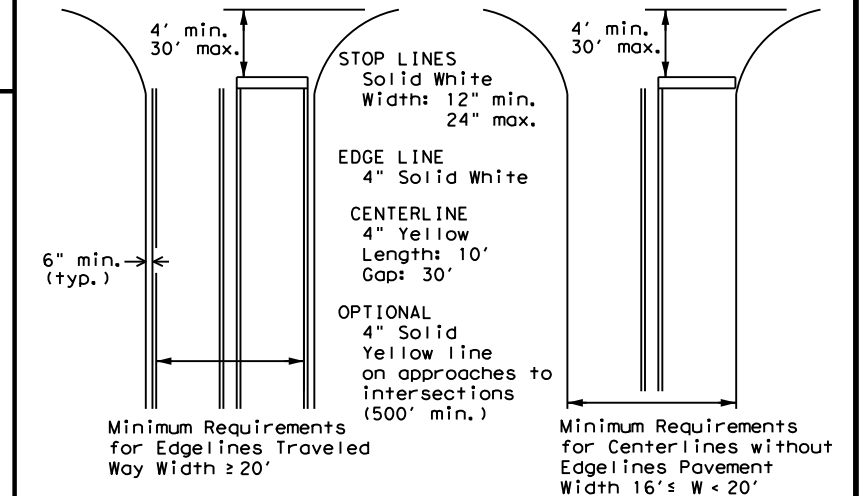
**GENERAL NOTES**

- Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.
- 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 inside of edgeline to the inside of edgeline 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.



**GUIDE FOR PLACEMENT OF STOP LINES,  
EDGE LINE & CENTERLINE**

Based on Traveled Way and Pavement Widths for Undivided Highways



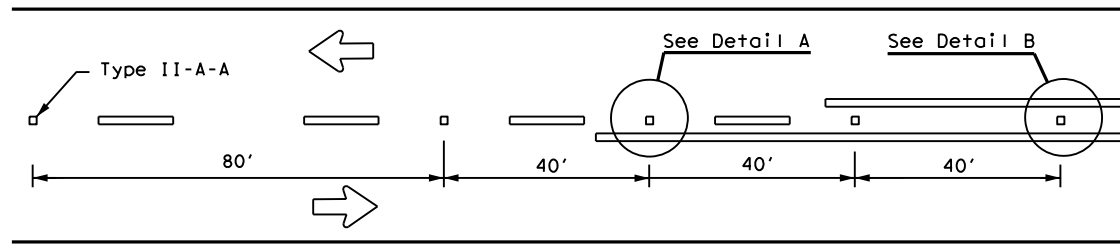
**TYPICAL STANDARD  
PAVEMENT MARKINGS**

**PM(1)-20**

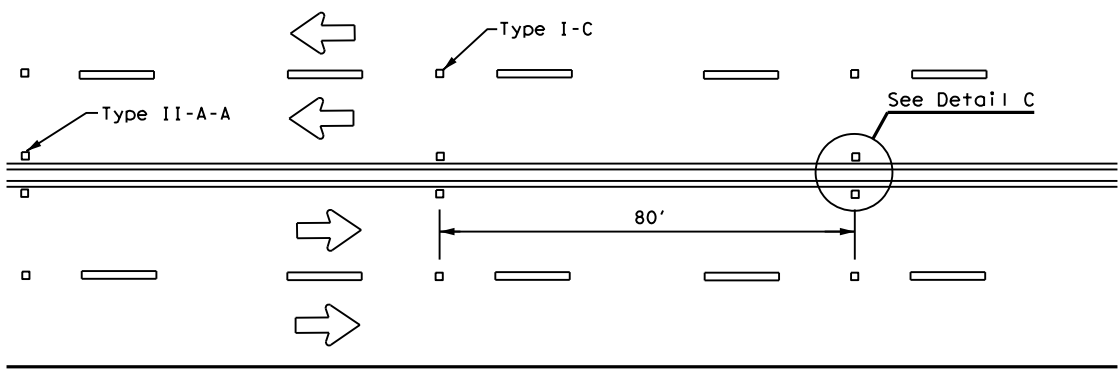
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© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
8-95 3-03 REVISIONS	0197	04	084, ETC.	US 175, ETC
5-00 2-12	DIST	COUNTY	SHEET NO.	
8-00 6-20	DAL	KAUFMAN, ETC.	74	

# REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

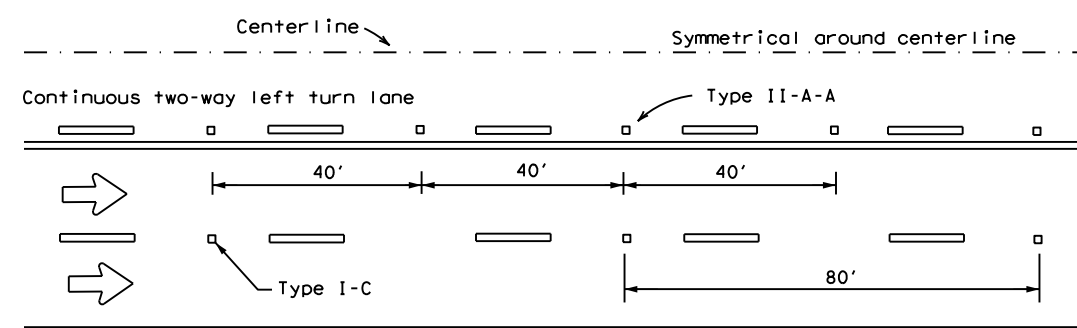
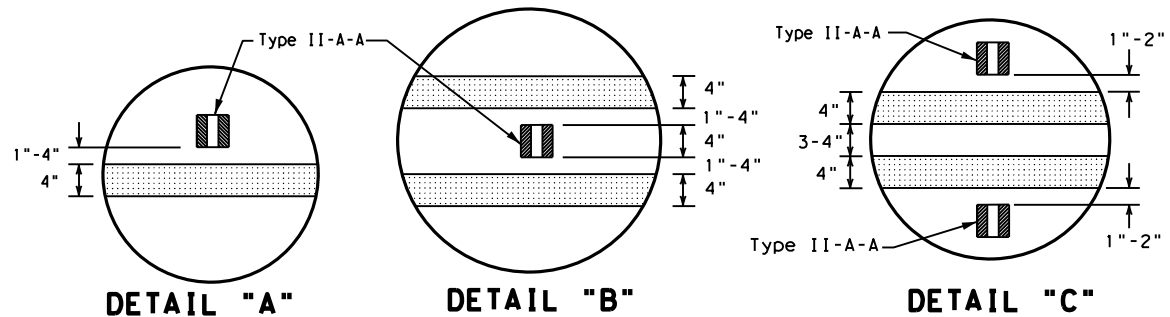
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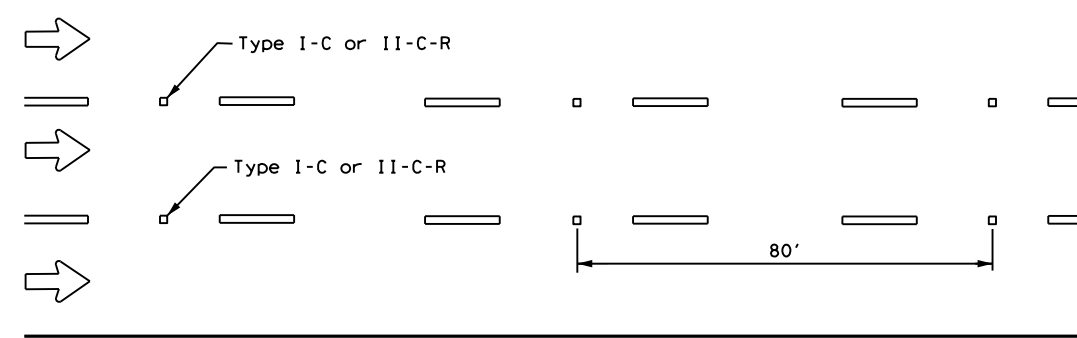
**CENTERLINE FOR ALL TWO LANE ROADWAYS**



**CENTERLINE & LANE LINES  
FOR FOUR LANE TWO-WAY HIGHWAYS**



**CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE**

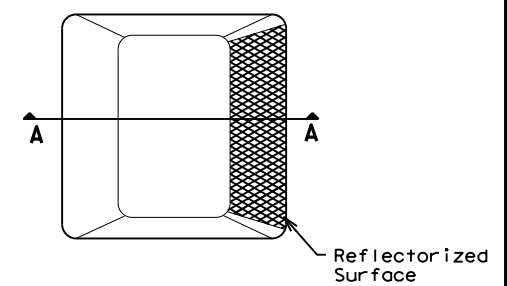


**LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)**

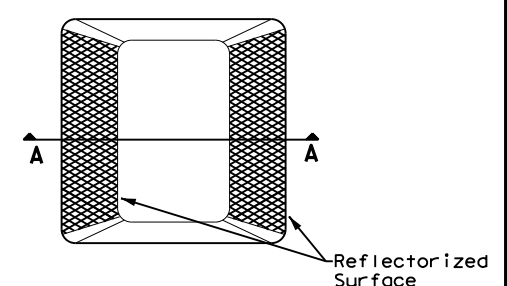
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

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

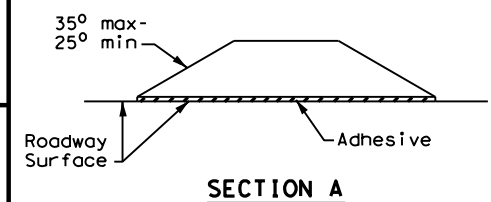
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



**Type I (Top View)**



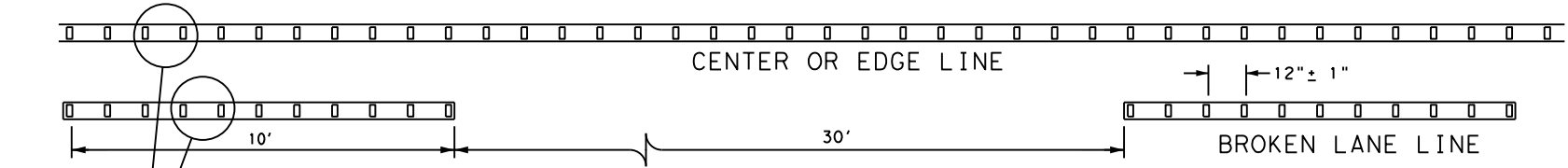
**Type II (Top View)**



**RAISED PAVEMENT MARKERS**

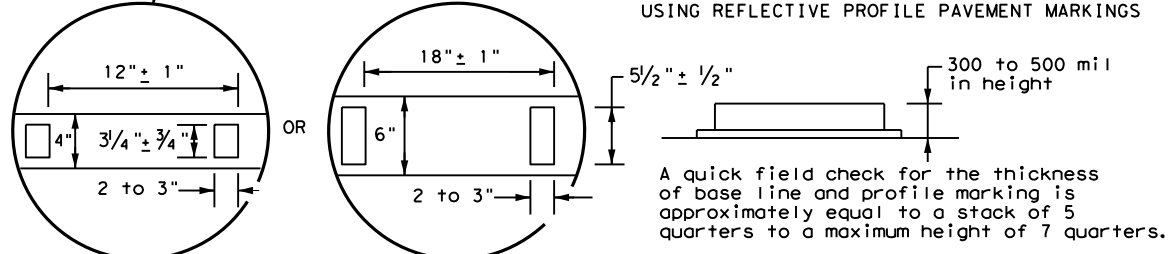
**GENERAL NOTES**

- All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
- On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.



**REFLECTORIZED PROFILE  
PATTERN DETAIL**

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



**NOTE**  
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

Texas Department of Transportation  
 Traffic Safety Division Standard

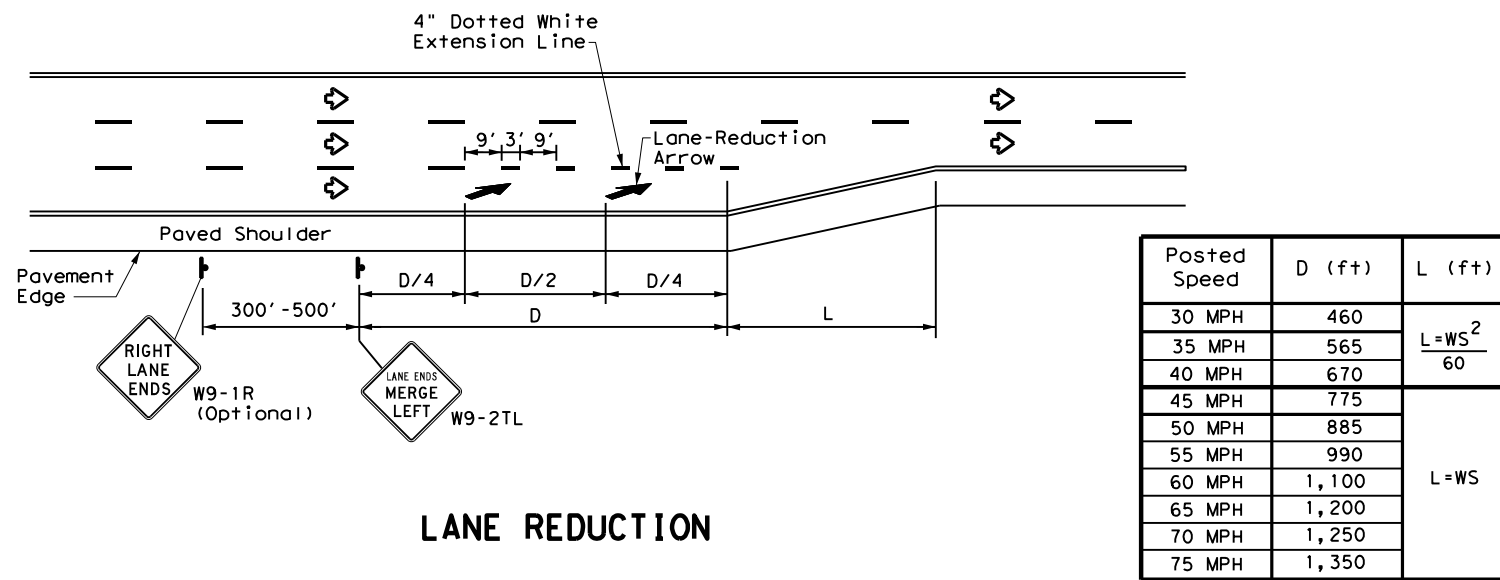
**POSITION GUIDANCE USING  
RAISED MARKERS  
REFLECTORIZED PROFILE  
MARKINGS  
PM(2) - 20**

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
4-92 2-10 REVISIONS	0197	04	084, ETC.	US 175, ETC
5-00 2-12	DIST	COUNTY	SHEET NO.	
8-00 6-20	DAL	KAUFMAN, ETC.	75	



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

**LANE REDUCTION**

**NOTES**

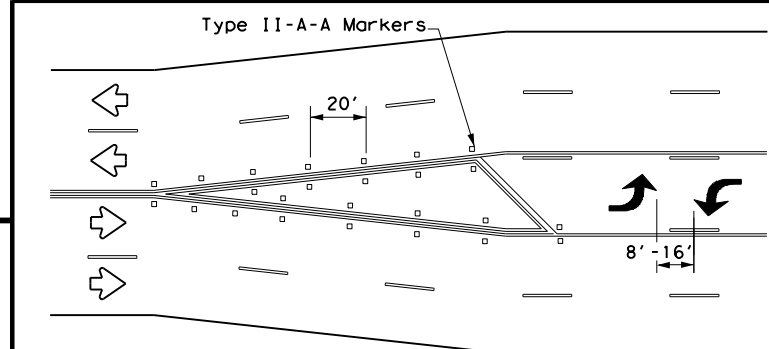
- Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
- On divided highways, an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

**GENERAL NOTES**

- Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
- When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
- 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.
- Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

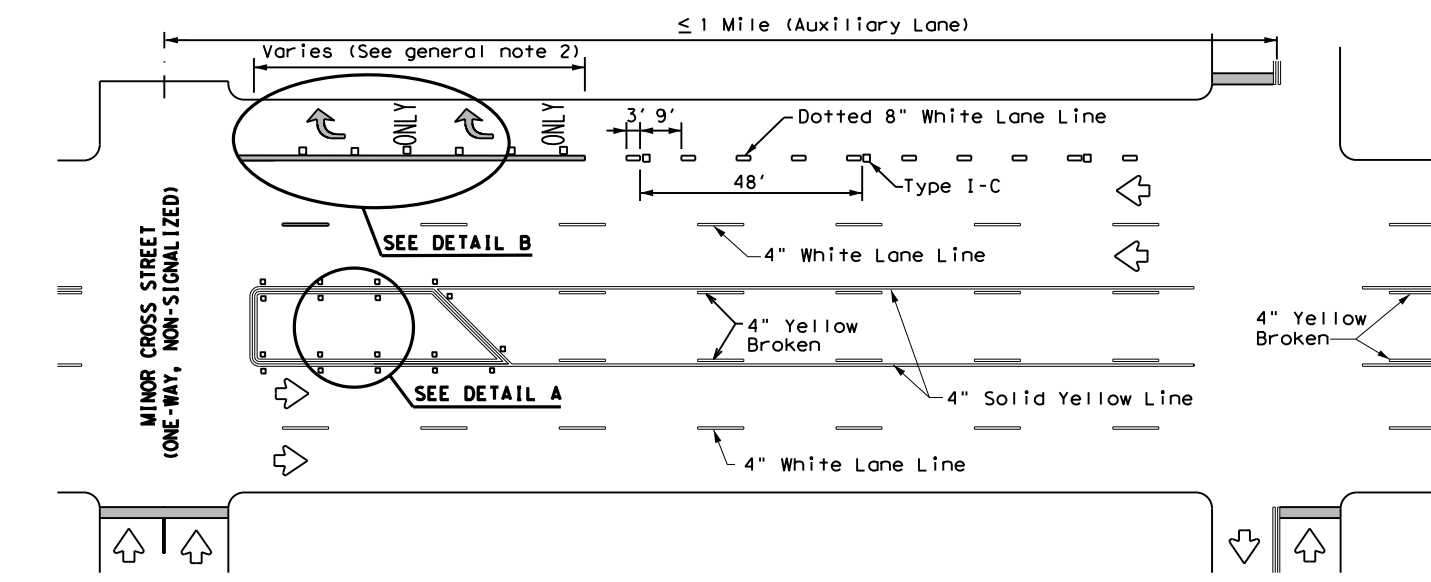
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

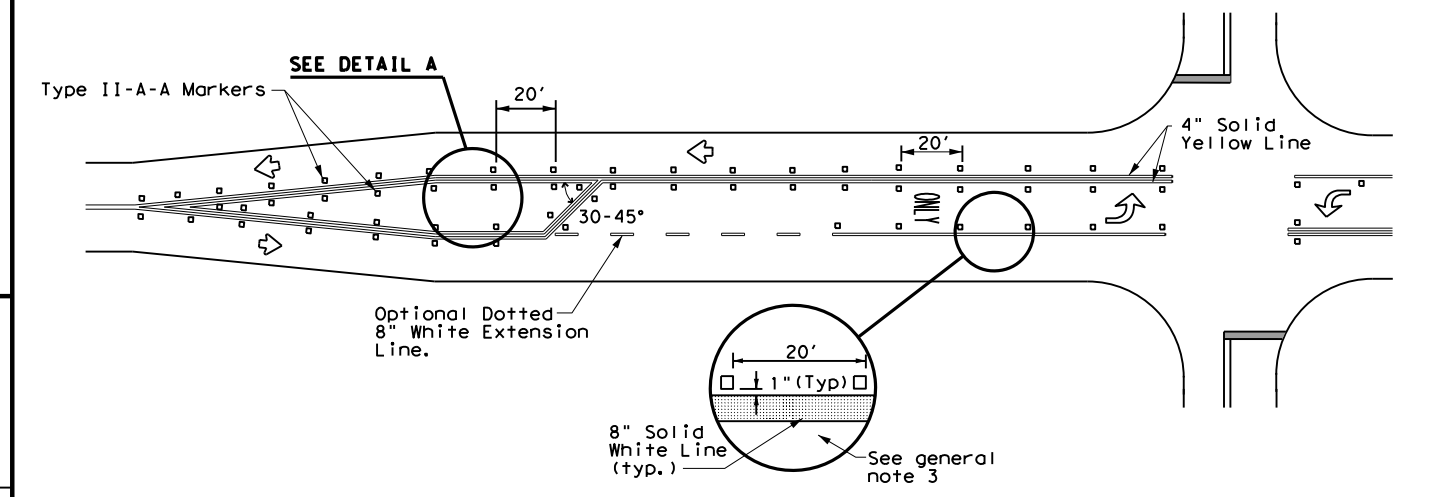


A two-way left-turn (TWLTL) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

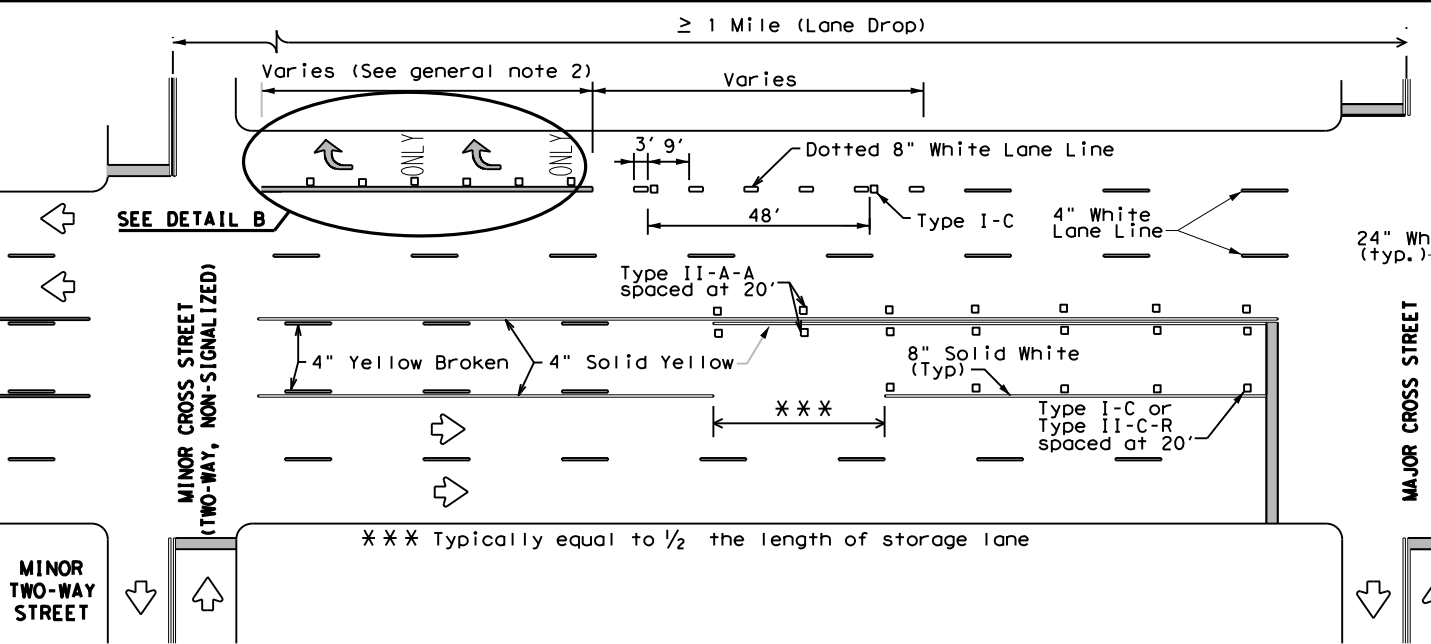
**TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY**



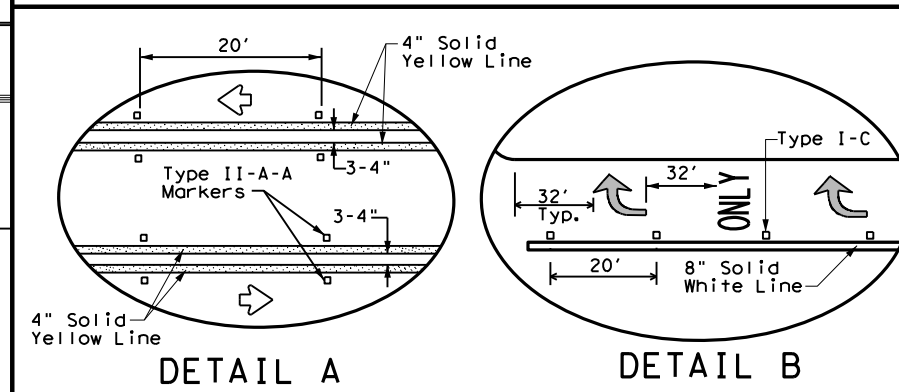
**TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE**



**TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS**



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



DETAIL A

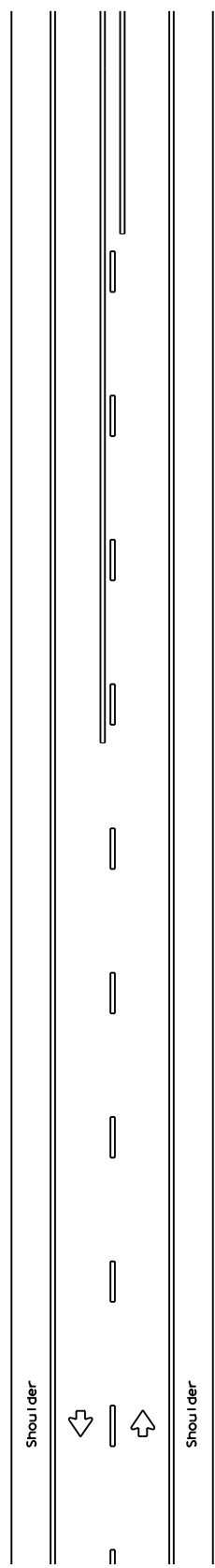
DETAIL B

Texas Department of Transportation  
 Traffic Safety Division Standard

**TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3) - 20**

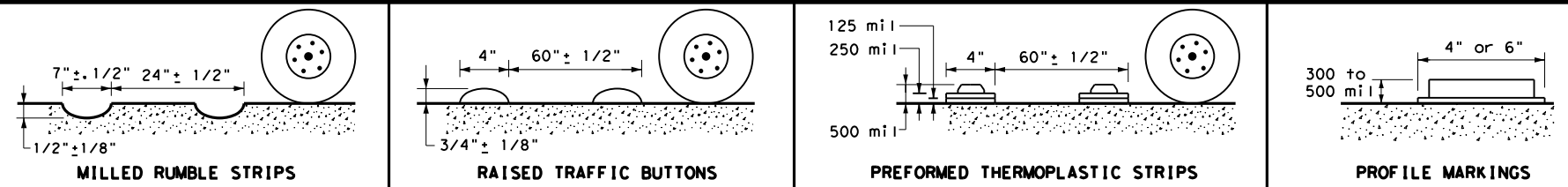
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© TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
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5-00 2-10	DIST	COUNTY	SHEET NO.	
8-00 2-12	DAL	KAUFMAN, ETC.	76	
3-03 6-20				

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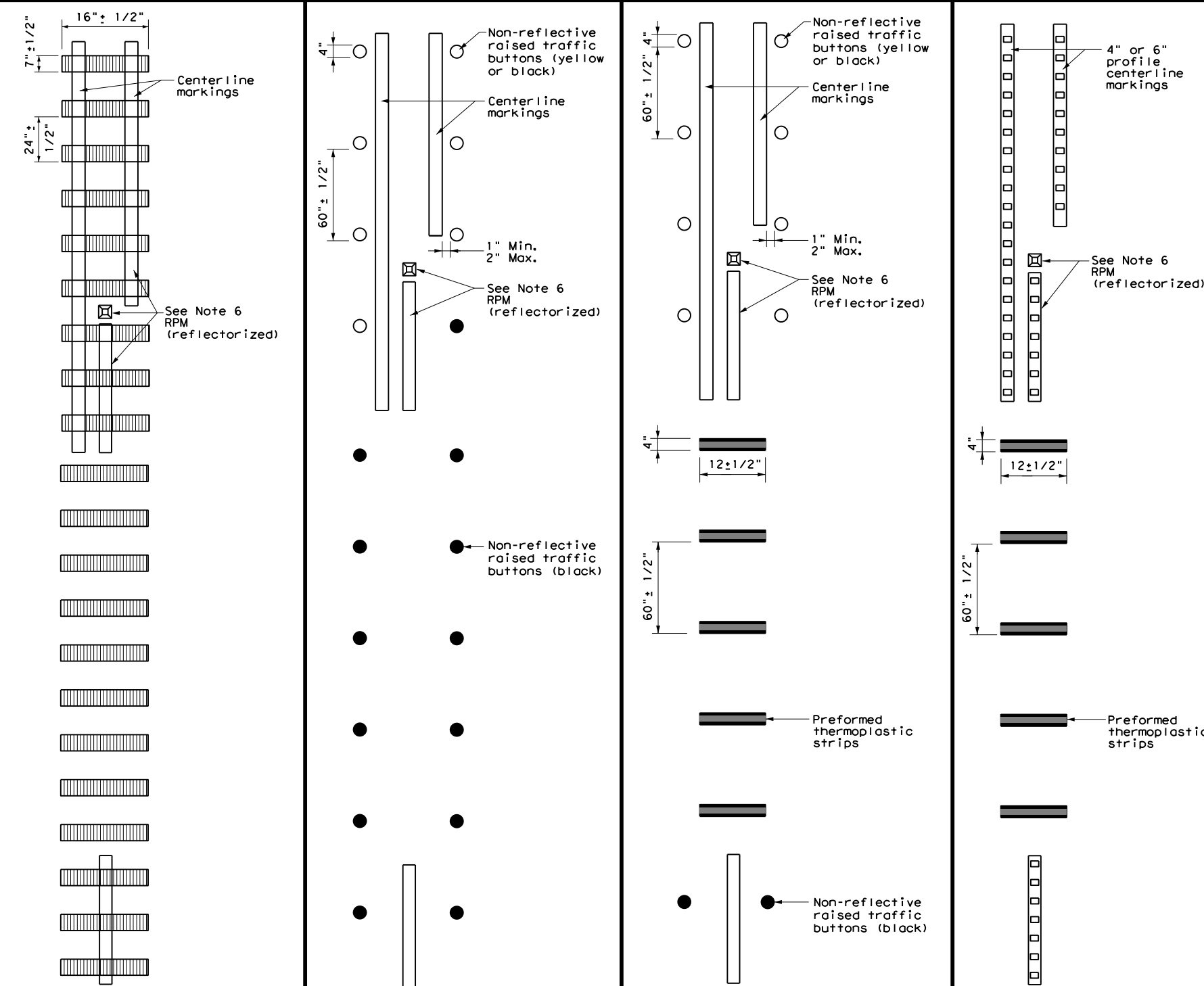


TWO LANE TWO-WAY ROADWAYS

### CENTERLINE RUMBLE STRIPS



#### PROFILE VIEW



PLAN VIEW  
OPTION 1  
MILLED CENTERLINE RUMBLE STRIPS

PLAN VIEW  
OPTION 2  
RAISED CENTERLINE RUMBLE STRIPS

PLAN VIEW  
OPTION 3  
RAISED CENTERLINE RUMBLE STRIPS AND PREFORMED THERMOPLASTIC STRIPS

PLAN VIEW  
OPTION 4  
PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC 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 edgeline 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 Operations 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 and driveways with high usage of large trucks.
6. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, and dimensions pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inch depth of 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.

#### WHEN INSTALLING EDGELINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

12. See standard sheet RS(4).

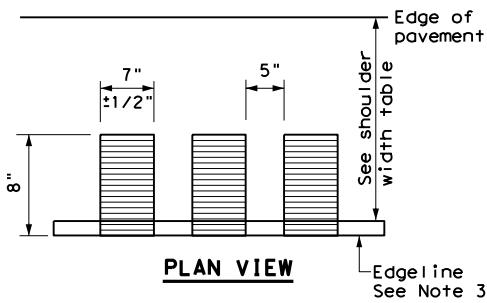


## CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS

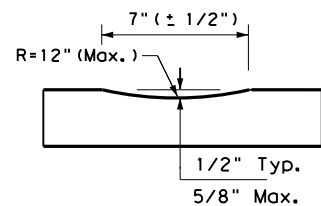
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© TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY	SHEET NO.	
	DAL	KAUFMAN, ETC.	77	

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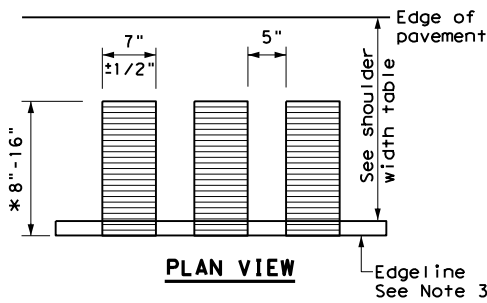


**PLAN VIEW**

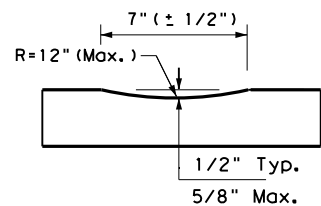


**PROFILE VIEW**  
OPTION 1

**CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)**

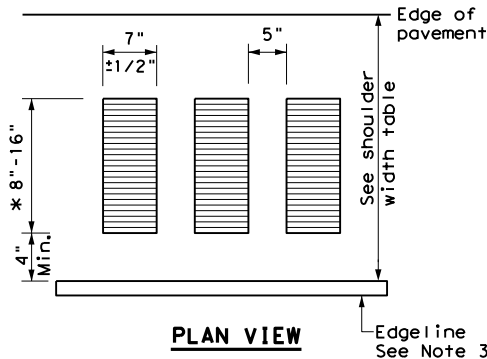


**PLAN VIEW**



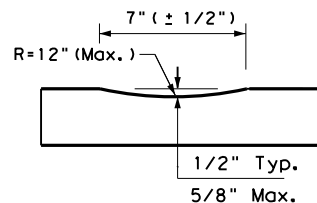
**PROFILE VIEW**  
OPTION 2

**CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)**



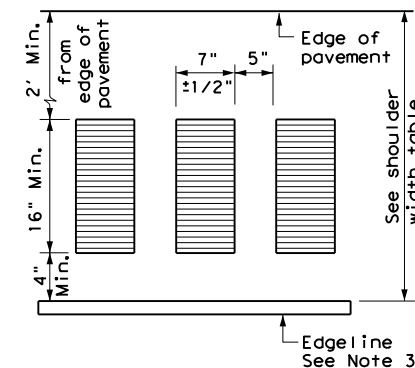
**PLAN VIEW**

\* This distance may vary based on width of shoulder

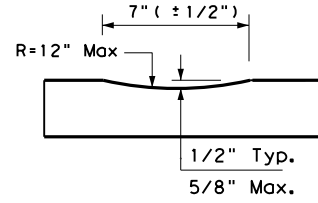


**PROFILE VIEW**  
OPTION 3

**CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)**



**PLAN VIEW**



**PROFILE VIEW**  
OPTION 4

**CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)**

**GENERAL NOTES**

- Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
- 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.
- Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
- See the table below for determining what options may be used for edgeline rumble strips.

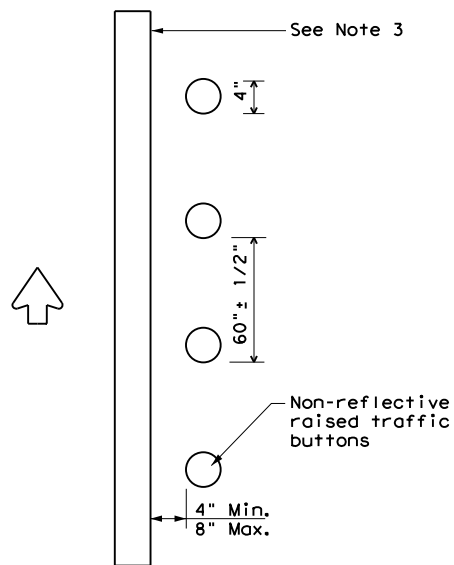
**WHEN INSTALLING MILLED DEPRESSION EDGELINE RUMBLE STRIPS:**

- See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
- Pavement markings can be applied over milled shoulder rumble strips to create an edgeline rumble stripe.
- Breaks in edgeline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks when installed on conventional highways.
- Rumble strips shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
- Consideration should be given to noise levels when edgeline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inches depth of milled rumble strip may be considered in these areas.

- On roadways with high bicycle activity, consideration should be given before the installation of edgeline rumble strips. Things to consider include size of rumble strips, rumble strip material and location of rumble strips on the shoulder. If the designer determines that gaps are needed in the rumble strips due to bicycle use of the road, then follow the requirement shown in FHWA Technical Advisory T5040.39, or latest version. A detail of the spacing shall be included in the plans.

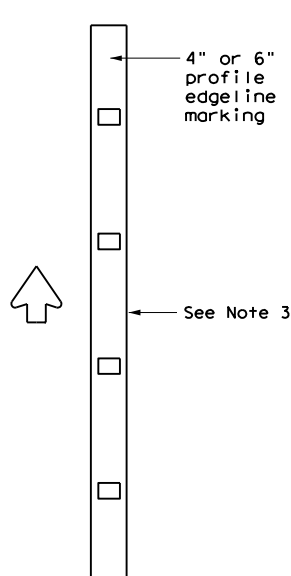
**WHEN INSTALLING RAISED OR PROFILE EDGELINE RUMBLE STRIPS:**

- 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.
- Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edgeline when used as a rumble strip. The color of the button should match the color of the adjacent edgeline 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.
- 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.
- Breaks in edgeline rumble strips using raised traffic buttons shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections and driveways with high usage of large trucks when installed on conventional highways.
- The minimum distance between the edgeline and the buttons should be used if the shoulder is less than 8 feet in width.
- Raised profile thermoplastic markings used as edgelines may substitute for buttons.



**PLAN VIEW**  
OPTION 5

**RAISED EDGELINE RUMBLE STRIPS**



**PLAN VIEW**  
OPTION 6

**PROFILE EDGELINE MARKINGS**

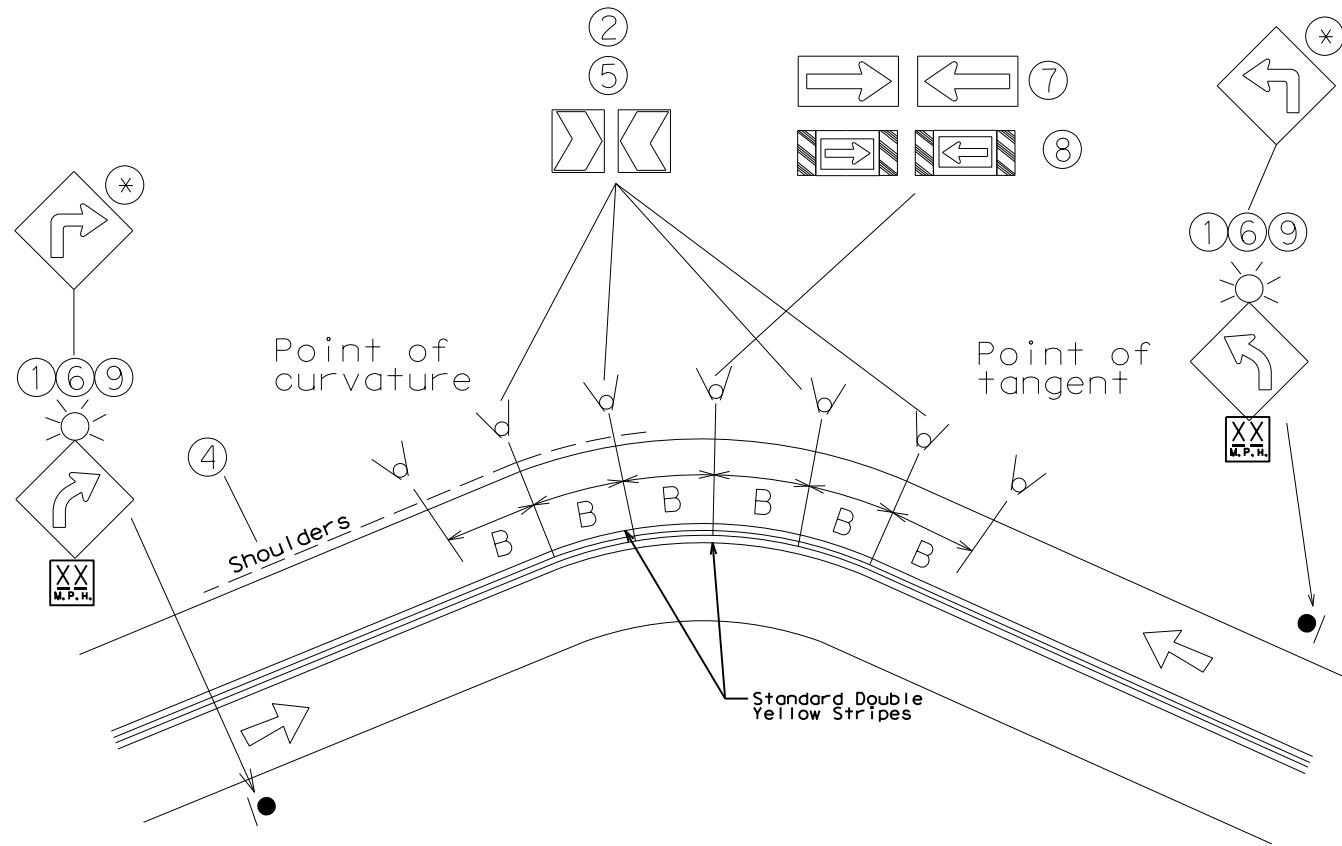
SHOULDER WIDTH TABLE		
EQUAL TO OR LESS THAN 2 FEET	GREATER THAN 2 FEET LESS THAN 4 FEET	EQUAL TO OR GREATER THAN 4 FEET
Option 1, 5 OR 6	Option 1, 2, 3 5 OR 6	Option 2, 4, 5 OR 6

Traffic Operations Division Standard

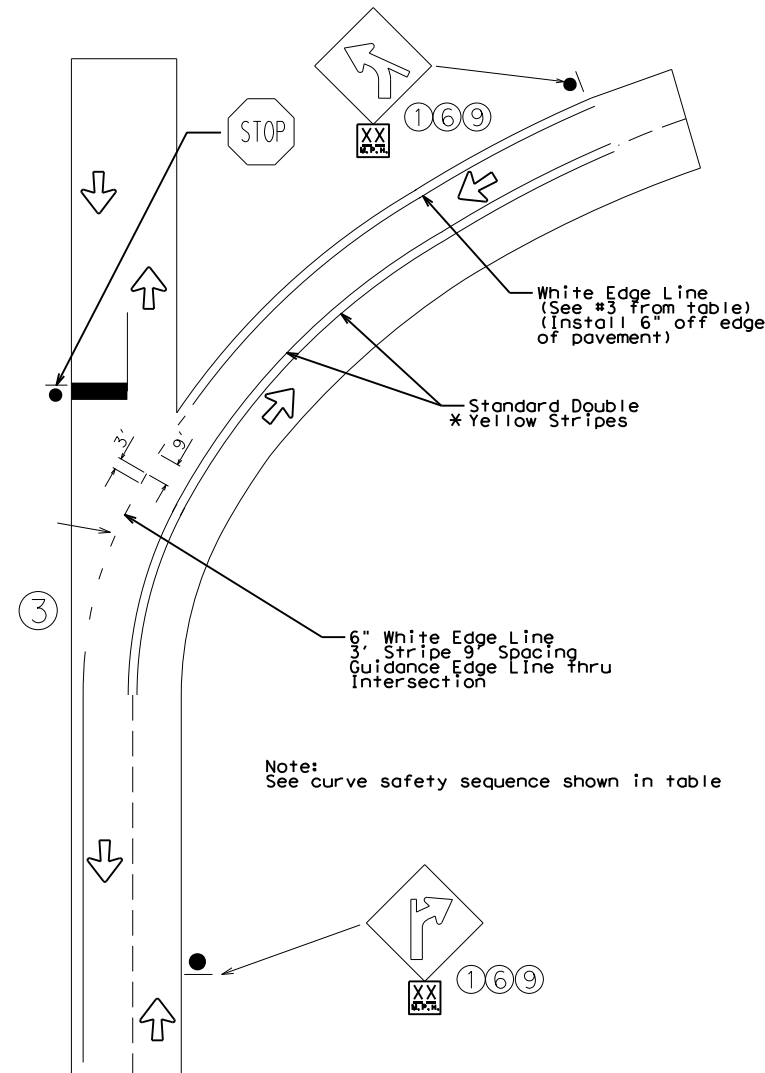
EDGELINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS RS(4)-13

FILE: rs(4)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0197 04	084, ETC.	US 175, ETC	
DIST	COUNTY	SHEET NO.		
DAL	KAUFMAN, ETC.	78		

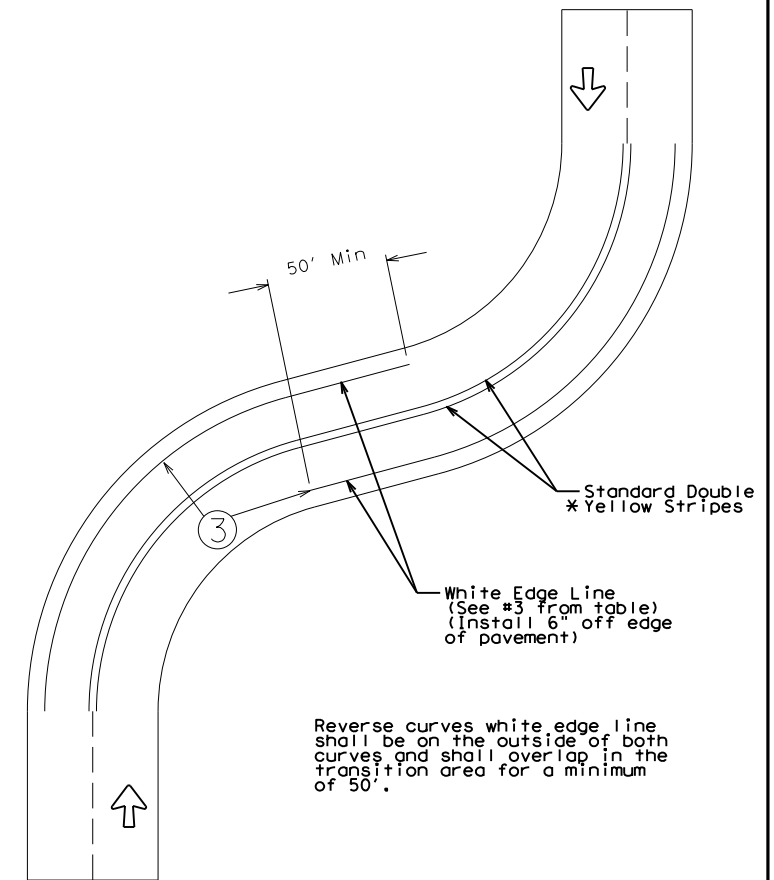
### Dallas District Standard for Two-Lane Highway Curve Signing/Markings



### Typical Curve Treatment with Intersection



### Typical Reverse Curve Edge Line Treatment



Curve Safety Sequence

Applicable Minimum Measures

Advisory Speed 55 mph or higher	Advisory Speed 40-50 mph	Advisory speed 35 mph or less	Curve signing, delineation and pavement markings (listed in order from minimum to maximum level of treatment as needed)
+	+	+	1 Advance warning (36" x 36") and advisory mph (18" x 18")
+	+	+	2 Chevron alignment signs if advisory speed is 15 mph or greater than posted speed
	+	+	3 Edge lines
			3a Pavement width 24' or greater 6" solid white edge line
			3b Pavement width 20' - 24' 4" solid white edge line
			3c Pavement width 20' or less no edge line
			<b>Supplemental Measures</b>
		#	4 Add shoulders and edge line (see #3a)
		#	5 Yellow high intensity fluorescent chevron alignment signs - add reflective sheeting to sign support from bottom edge of sign
#	#	#	6 Large advance warning (48" x 48") and advisory mph (30" x 30")
#	#	#	7 Arrow sign (48" x 24")
		#	8 Large arrow sign with diagonals (96" x 36")
		#	9 Add flashers to advance warning signs
#	#	#	10 Surface treatment to improve friction
		**	** The W1-1R or L sign shall only be used when the advisory speed is 30 mph or less

+ = required  
# = optional

Applications 4 - 10 are additional supplemental applications which may be added as directed by the Area Engineer.

Note:  
"B" - Chevron Spacing referenced from D&OM(3)-15B

Notes:

- Two methods will be used to determine the appropriate advisory speed for curves, the GPS Method (existing curves) and the Design Method (new curves).
- Notify the Traffic Engineering Section for all requests on advisory speeds for existing curves.

\* Standard Double Yellow Stripes shall be dropped through a non-signalized intersection within the city limit. Outside the city limit, the Standard Double Yellow Strip shall be carried through all non-signalized intersections.

OCT-2014 UPDATED NOTES	 Texas Department of Transportation ©2022			
JAN-2016 NOTE ADDED				
SEPT-2016 NOTE ADDED FOR STRIPING IN CURVE	<b>TWO-LANE HIGHWAY CURVE SIGNING &amp; MARKINGS</b> <b>DALLAS DISTRICT STANDARD</b> SCALE: NTS SHEET 1 OF 1			
MAR-2017 REMOVED REFERENCE TO DELINEATORS				
MAY-2019 MODIFIED SIGN SIZE	DESIGN/CK VD	FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. (SEE TITLE SHEET) US 175, ETC	HIGHWAY NO. 175, ETC
	CHECK VD	STATE TEXAS	DISTRICT DALLAS	COUNTY KAUFMAN, ETC.
	CHECK VD	CONTROL 0197	SECTION 04	JOB 084, ETC.
	CHECK ME			SHEET NO. 79

DATE: 1/3/2023 9:18:34 PM  
 FILE: \\txdot.projectwiseonline.com:txdot15\Documents\18 - DAL\Design Projects\180101\180101.dwg  
 PROJECT: 180101 - 180101.dwg  
 DRAWING: 180101.dwg  
 TITLE: REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS  
 AUTHOR: [REDACTED]  
 CHECKED: [REDACTED]  
 APPROVED: [REDACTED]  
 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 units or the use of units other than those specified in this standard.

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS				DELINEATORS				D & OM DESCRIPTIVE CODES		
DEVICE	SIZE 1	SIZE 2	SIZE 3	SIZE 4	SINGLE		DOUBLE		INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX) NUMBER OF REFLECTORS S = Single D = Double COLOR OF REFLECTORS W = White Y = Yellow R = Red REFLECTOR UNIT SIZE 1 or 2 TYPE OF POST OR DELINEATOR WC = Wing Channel Post YFLX = Yellow Flexible Post WFLX = White Flexible Post BRFL = Barrier Reflector TYPE OF MOUNT GND = Embedded (drivable or set in concrete) CTB = Concrete Barrier Mount GF1 or GF2 = Guard Fence Attachment SRF = Surface Mount DIRECTION If Required BI = Bi-Directional BR = Bi-Directional with red on back	
										1-Size 2 reflector unit 1-Size 1 reflector unit 2-Size 2 reflector units 2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C reflective sheeting				Yellow, White or Red Type B or C Reflective Sheeting					
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (fix). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.				POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX	INSTL OM ASSM (OM-XX) (XXXX)XXX(XX) TYPE OF OBJECT MARKER 1, 2, 3, or 4 NUMBER OF REFLECTORS OR DIRECTION X = 3-Size 2 reflector unit (Type 2 only) Y = 1-Size 3 reflector unit (Type 2 only) Z = 3-Size 1 or 1-Size 4 reflector unit(s) (Type 2 only) L = Left Side (Type 3 Object Marker only) R = Right Side (Type 3 Object Marker only) C = Center (Type 3 Object Marker only) TYPE OF POST WC = Wing Channel Post WFLX = White Flexible Post TWT = Thin Walled Tubing TYPE OF MOUNT GND = Embedded (drivable) SRF = Surface Mount WAS = Wedge Anchor Steel WAP = Wedge Anchor Plastic DIRECTION If Required BI = Bi-Directional
MOUNT TYPE	GND				GND, SRF		GND, SRF			

OBJECT MARKERS										
DEVICE	Type 1 (OM-1)		Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)	
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4		
SHEETING	Yellow-Type B <sub>FL</sub> or C <sub>FL</sub> Sheeting		Yellow - Type B or C Sheeting			Alternating acrylic black and retroreflective yellow - Type B <sub>FL</sub> or C <sub>FL</sub> Sheeting			Red -Type B <sub>FL</sub> or C <sub>FL</sub> Sheeting	
POST TYPE	TWT		WC	WC	WFLX	TWT			TWT	
MOUNT TYPE	WAS, WAP		GND	GND	GND, SRF	WAS, WAP			WAS, WAP	

DEPARTMENTAL MATERIAL SPECIFICATIONS	
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)			CHEVRONS				ONE DIRECTION LARGE ARROW		NOTE: Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.
DEVICE	GF1	GF2	CTB	W1-8				W1-6	
SHEETING	Yellow, White, Red			18"x 24" (Conventional)				48" x 24" (Conventional)	
NOTE	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.			24"x 30" (Conventional Oversize)				60" x 30" (Expressway & Freeway)	
				30"x 36" (Expressway)					
				36" x 48" (Freeway)					
				MOUNTING HEIGHT: 4'-0" or 7'-0"				MOUNTING HEIGHT: 7'-0"	
				NOTE: 1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies). 2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).					

Texas Department of Transportation  
 Traffic Safety Division Standard

### DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

#### D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	OW: TXDOT	CR: TXDOT
© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0197	04	084, ETC.	US 175, ETC
10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10 7-20	DAL	KAUFMAN, ETC.	80	

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POST TYPE AND SUPPORT FOUNDATION DETAILS				TYPE OF BARRIER MOUNTS	
WING CHANNEL (WC)	FLEXIBLE POSTS (YFLX, WFLX)		WEDGE ANCHOR SYSTEMS		GUARD FENCE ATTACHMENT
GND	GND	SRF	WAS	WAP	GF 1
			<p style="text-align: center;"><b>NOTE</b></p> <p>1. Install per manufacturer's recommendations.</p>		
	<p style="text-align: center;"><b>EMBEDDED</b></p>		<p style="text-align: center;"><b>SURFACE MOUNT</b></p>		
<p><b>NOTES</b></p> <p>1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.</p> <p>2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.</p>			<p><b>NOTES</b></p> <p>1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.</p> <p>2. Install per manufacturer's recommendations.</p> <p>3. Post length may vary to meet field conditions.</p> <p>4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.</p>		

**CONCRETE TRAFFIC BARRIER (CTB)**

**GENERAL NOTES**

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

**TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS**

**NOTE**

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

**CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN**

**NOTE**

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

**DELINEATORS AND TYPE 2 OBJECT MARKERS**

See general notes 1, 2 and 3.

Texas Department of Transportation

Traffic Safety Division Standard

**DELINEATOR & OBJECT MARKER INSTALLATION**

**D & OM(2)-20**

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© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
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10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10 7-20	DAL	KAUFMAN, ETC.	81	

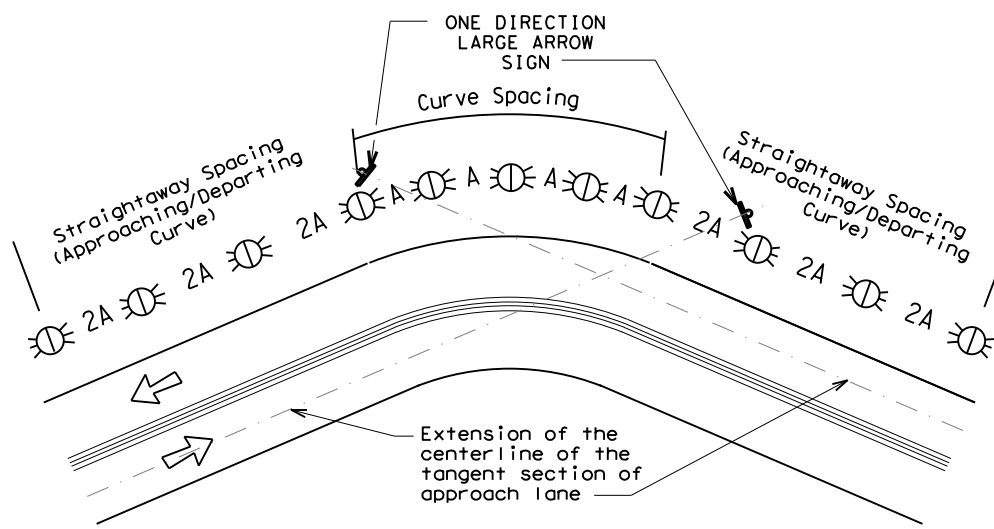
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### MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	● RPMs	● RPMs
15 MPH & 20 MPH	● RPMs and One Direction Large Arrow sign	● RPMs and Chevrons; or ● RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	● RPMs and Chevrons; or ● RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	● RPMs and Chevrons

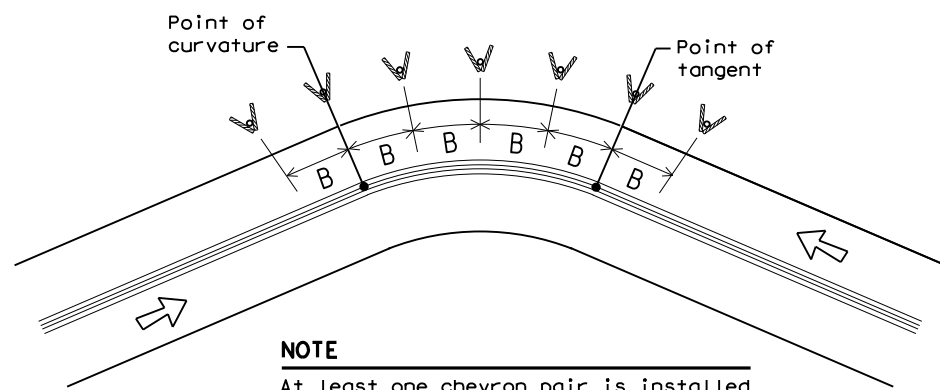
### SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



**NOTE**

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

### SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



**NOTE**

At least one chevron pair is installed beyond the point of tangent in tangent section.

### DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN				
Degree of Curve	FEET			
	Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		A	2A	B
1	5730	225	450	—
2	2865	160	320	—
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

### DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN			
Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

### DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp. Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete) and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100' max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100' max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

**NOTES**

- Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
- Barrier reflectors may be used to replace required delineators.
- Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND	
	Bi-directional Delineator
	Delineator
	Sign

**Texas Department of Transportation**  
Traffic Safety Division Standard

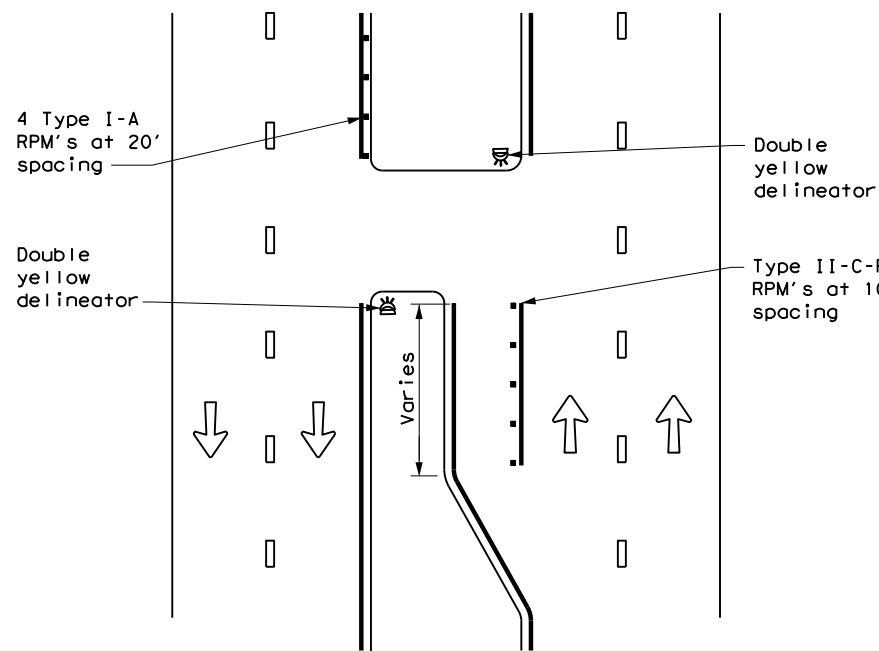
## DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

### D & OM(3)-20

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© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
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3-15 8-15	DIST	COUNTY	SHEET NO.	
8-15 7-20	DAL	KAUFMAN, ETC.	82	

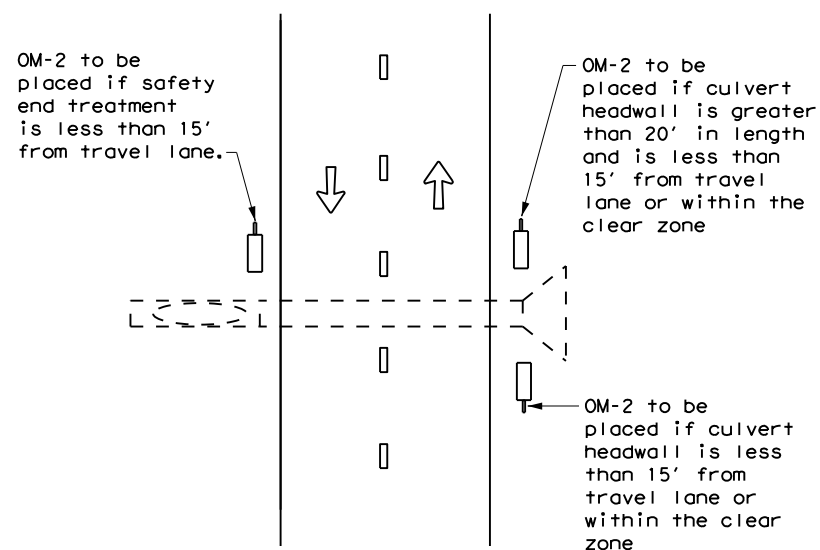
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**CROSSOVERS**



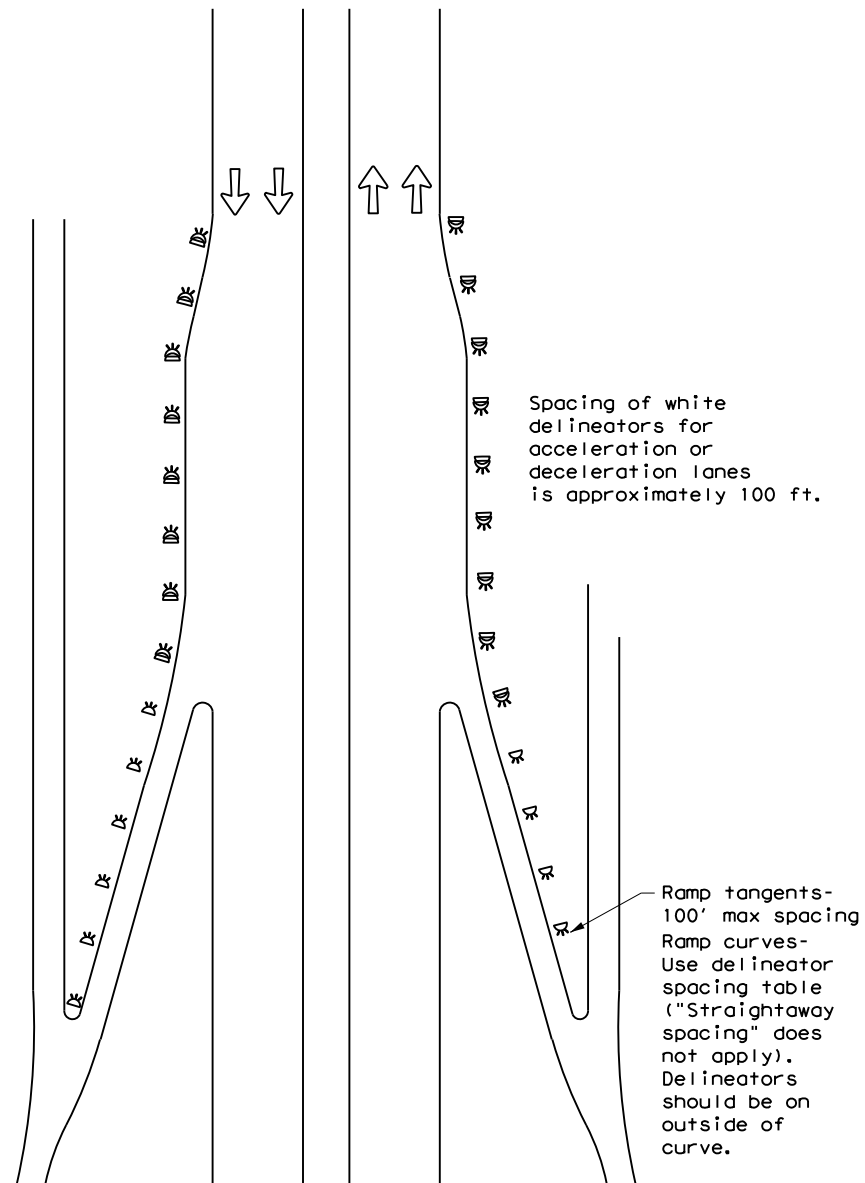
**DETAIL 1**

**FOR CULVERTS WITHOUT MBGF**



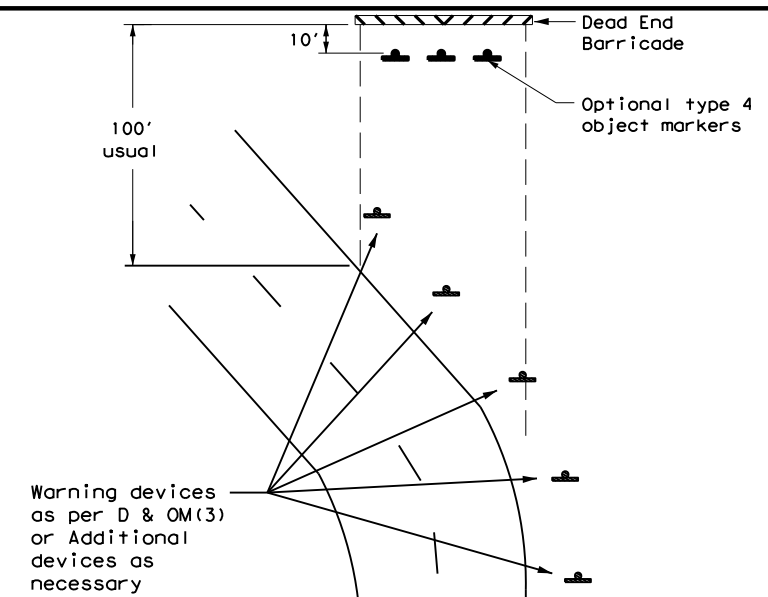
**DETAIL 2**

**FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES**



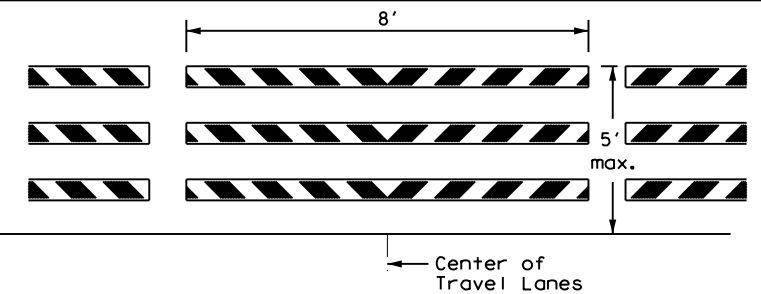
**DETAIL 3**

**TYPICAL APPLICATION OF DEAD END BARRICADE**



**DETAIL 4**

**TYPICAL DEAD END BARRICADE INSTALLATION**



**NOTES**

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

**DETAIL 5**

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



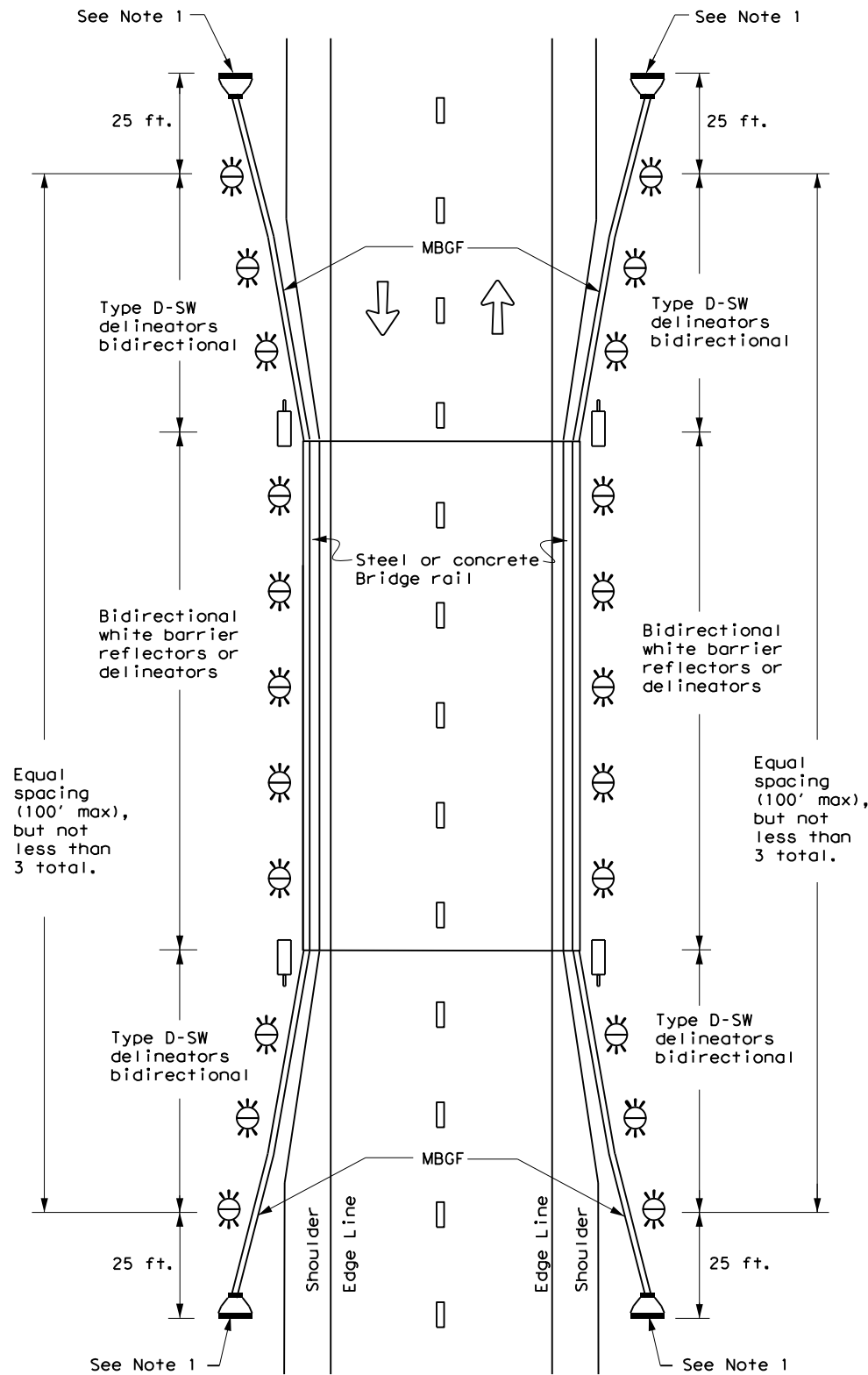
**DELINEATOR & OBJECT MARKER PLACEMENT DETAILS**

**D & OM(4) -20**

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3-15	DIST	COUNTY	SHEET NO.	
7-20	DAL	KAUFMAN, ETC.	83	



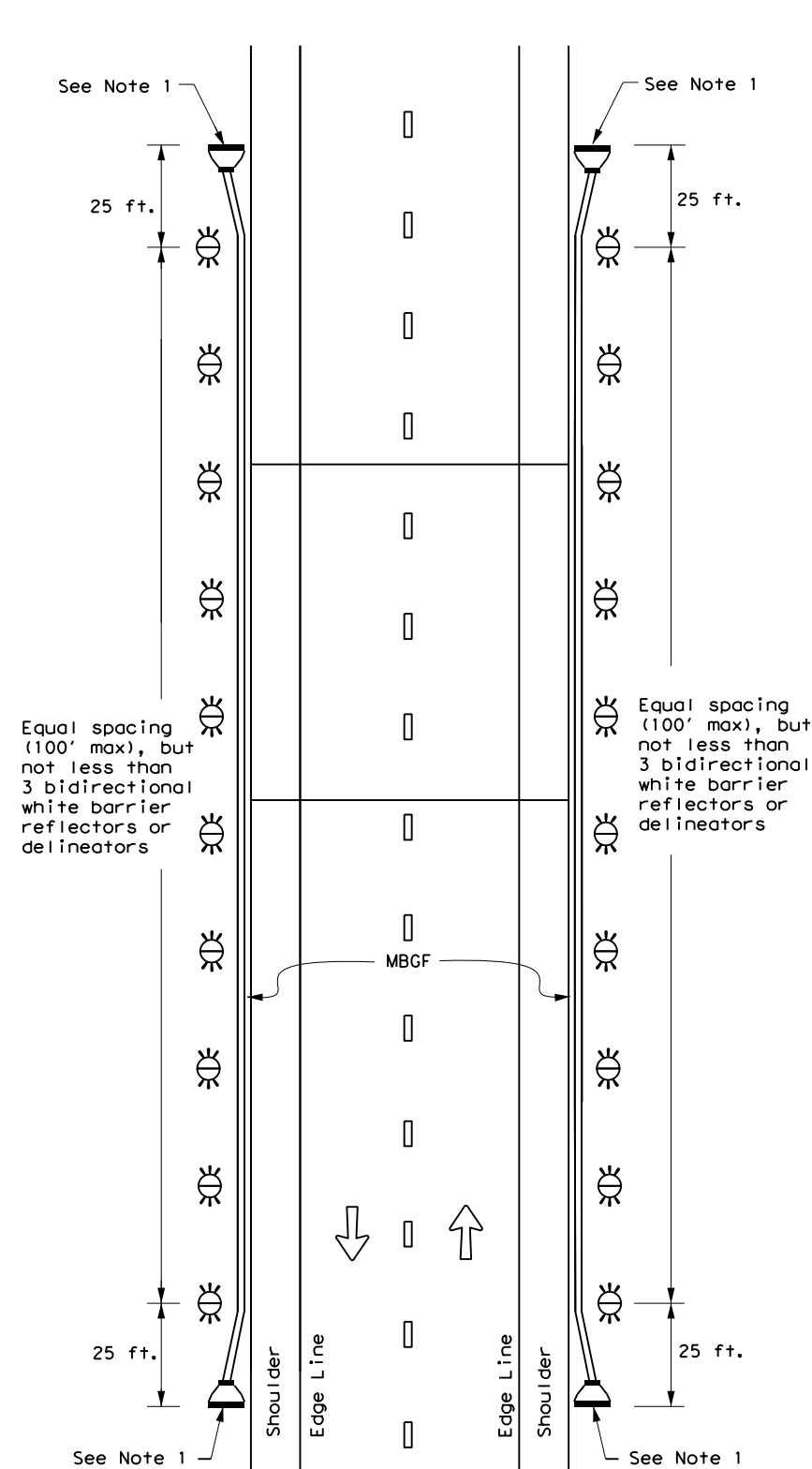
**TWO-WAY, TWO LANE ROADWAY  
WITH REDUCED WIDTH APPROACH RAIL**



**NOTE:**

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

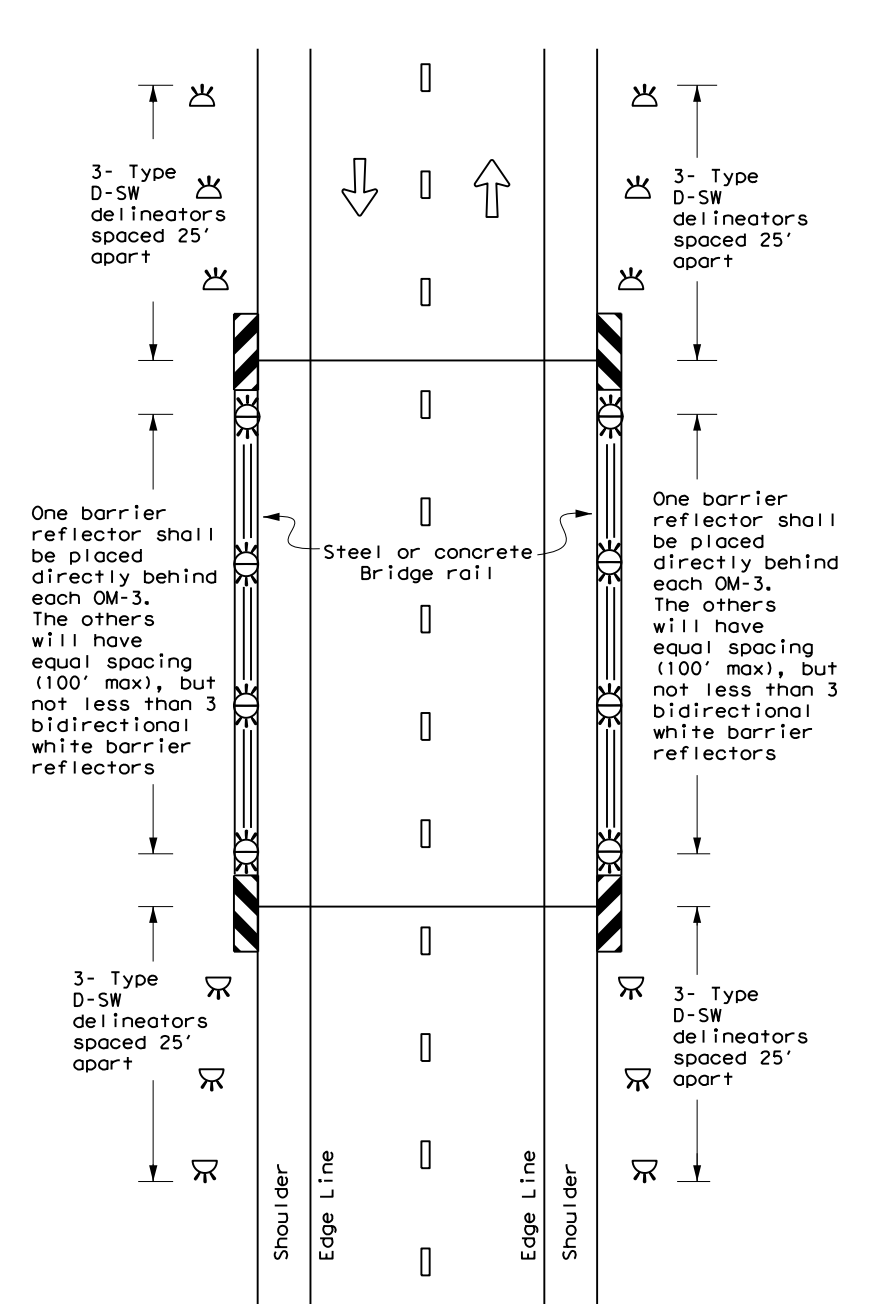
**TWO-WAY, TWO LANE ROADWAY  
WITH METAL BEAM GUARD FENCE (MBGF)**



**NOTE:**

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

**TWO-WAY, TWO LANE ROADWAY  
BRIDGE WITH NO APPROACH RAIL**



**LEGEND**

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



**DELINEATOR &  
OBJECT MARKER  
PLACEMENT DETAILS**

**D & OM(5) - 20**

FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0197	04	084, ETC.	US 175, ETC
7-20	DIST	COUNTY	SHEET NO.	
	DAL	KAUFMAN, ETC.	84	

DATE: 1/3/2023 9:19:07 PM  
 FILE: //txdot.projectwiseonline.com:txdot15/Documents/18 - DAL/Design Projects/0197/04/084, ETC/US 175, ETC/0197-04-084, ETC/US 175, ETC.dgn  
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to any other format or for any errors or omissions that may appear hereon.

**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 any soil disturbing activities, TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office. If no field office is available, then this SWP3 shall be kept in the appropriate TxDOT Area Office.

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):**

0197-04-084

**1.2 PROJECT LIMITS:**

From: W.SH.243

To: SH.34 BUSINESS

**1.3 PROJECT COORDINATES:**

BEGIN: (Lat) 32.5900554, (Long) -96.3312378

END: (Lat) 32.5746463, (Long) -96.3092867

**1.4 TOTAL PROJECT AREA (Acres): 166.20**

**1.5 TOTAL AREA TO BE DISTURBED (Acres): 1.64**

**1.6 NATURE OF CONSTRUCTION ACTIVITY:**

INSTALL/ REPLACE SIGNS

**1.7 MAJOR SOIL TYPES:**

Soil Type	Description
Kaufman clay, 0 to 1 % slopes	100% clay, moderately well drained, and high rate of runoff
Crockett fine sandy loam 2-5% slopes	Fine sandy loam and clay, moderately well drained, high rate of runoff
Kemp loam. frequently flooded.	Loam, sandy clay loam, moderately well drained, and negligible runoff.
Chickasha, loamy, 5 to 12% slopes	Loam and sandy clay loam, well drained, and medium rate of runoff
Axtell fine sandy loam 5 to 12% slopes	Fine sandy loam and clay, moderately well drained, and high rate of runoff
Mabank fine sandy loam, 1 - 3 % slopes	Fine sandy loam and clay, moderately well drained and high rate of runoff
The general area around the project	has an existing vegetation of approximately 90% density of mostly grasses.

**1.8 PROJECT SPECIFIC LOCATIONS (PSLs):**

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

- PSLs determined during preconstruction meeting
- PSLs determined during construction
- No PSLs planned for construction

Type	Sheet #s

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

**1.9 CONSTRUCTION ACTIVITIES:**

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

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

Other: **PLACE LED CHEVRONS**

Other: \_\_\_\_\_

**1.10 POTENTIAL POLLUTANTS AND SOURCES:**

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

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
Kings Creek	Project area drain to Kings Creek 0818C, impaired by bacteria in water (Recreation Use)
Tributary to Kings Creek	Flows to Kings Creek 0818C, impaired by bacteria in water (Recreation Use)

\* Add (\*) for impaired waterbodies with pollutant in ( ).

**1.12 ROLES AND RESPONSIBILITIES: TxDOT**

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

Other: \_\_\_\_\_

Other: \_\_\_\_\_

**1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR**

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

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

MS4 Entity
Kaufman County Phase II MS4 contact Kathy Morris, Public Works Director
Rockwall County Phase II MS4 contact David Davis, Emergency Management Coordinator



*Neal Long P.E.*, P.E. 12-20-22  
Signature of Registrant & Date

**US 175  
STORMWATER POLLUTION  
PREVENTION PLAN (SWP3)**

© 2023 Sheet 1 of 2  
**Texas Department of Transportation**

FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6	(SEE TITLE SHEET)			85
STATE	STATE DIST.	COUNTY		
TEXAS	DAL	KAUFMAN, ETC.		
CONT.	SECT.	JOB	HIGHWAY NO.	
0197	04	084, ETC.	US 175, 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**

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

**2.2 SEDIMENT CONTROL BMPs:**

**T / P**

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

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

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

**T / P**

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

**2.3 PERMANENT CONTROLS:**

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
N/A		

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

**2.4 OFFSITE VEHICLE TRACKING CONTROLS:**

- Excess dirt/mud on road removed daily
- Haul roads dampened for dust control
- Loaded haul trucks to be covered with tarpaulin
- Stabilized construction exit
- Other: Dampen disturbed soil areas as needed for dust control.
- \_\_\_\_\_
- Other: \_\_\_\_\_
- \_\_\_\_\_
- Other: \_\_\_\_\_
- \_\_\_\_\_

**2.5 POLLUTION PREVENTION MEASURES:**

- Chemical Management
- Concrete and Materials Waste Management
- Debris and Trash Management
- Dust Control
- Sanitary Facilities
- Other: Avoid storing portable sanitary units, concrete washouts, or chemical within 50 feet upgradient of rebeiving water or drainage conveyance without adequate pollution controls.
- \_\_\_\_\_
- Other: Maintain roadway free of project sedimentation and loose material.
- \_\_\_\_\_
- \_\_\_\_\_
- Other: \_\_\_\_\_
- \_\_\_\_\_

**2.6 VEGETATED BUFFER ZONES:**

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

Type	Stationing	
	From	To
KINGS CREEK	116+00	117+20

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

**2.7 ALLOWABLE NON-STORMWATER DISCHARGES:**

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

**2.8 INSPECTIONS:**

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

**2.9 MAINTENANCE:**

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



*Neal Corp P.E.* P.E. 12-20-22  
Signature of Registrant & Date

**US 175 STORMWATER POLLUTION PREVENTION PLAN (SWP3)**

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Sheet 2 of 2

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		86
STATE	STATE DIST.	COUNTY	
TEXAS	DAL	KAUFMAN, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0197	04	084, ETC.	US 175, ETC

**STORMWATER POLLUTION PREVENTION PLAN (SWP3):**

This SWP3 has been developed in accordance with TxDOT policy for projects disturbing less than 1 acre of soil, and not part of a larger common plan of development.

For all projects with any soil disturbing activities, TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office. If no field office is available, then this SWP3 shall be kept at the appropriate TxDOT Area Office.

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

**1.0 SITE/PROJECT DESCRIPTION**

**1.1 PROJECT CONTROL SECTION JOB (CSJ):**

2588-01-021, ETC. (FM 548)

**1.2 PROJECT LIMITS:**

From: WINDMILL FARMS BLVD

To: ROCKWALL COUNTY LINE

**1.3 PROJECT COORDINATES:**

BEGIN: (Lat) 32.781237, (Long) -96.401332

END: (Lat) 32.819024, (Long) -96.352183

**1.4 TOTAL PROJECT AREA (Acres):** 35.94 AC

**1.5 TOTAL AREA TO BE DISTURBED (Acres):** 0.474 AC

**1.6 NATURE OF CONSTRUCTION ACTIVITY:**

MILL AND OVERLAY, EDGE BACKFILLING, AND REPLACING METAL BEAM GUARD FENCE.

**1.7 MAJOR SOIL TYPES:**

Soil Type	Description
HOUSTON BLACK CLAY, 1 TO 3% SLOPES	100 % CLAY, MODERATELY WELL DRAINED. VERY HIGH RUNOFF LOW PERMEABILITY.
BURLESON CLAY, 0 TO 1% SLOPES	100 % CLAY, MODERATELY WELL DRAINED. HIGH RUNOFF LOW PERMEABILITY.

SOIL IS WELL DRAINED. GENTLY SLOPING TO MODERATELY STEEP. BLACK CLAYEY SOIL THAT HAVE MODERATE AND VERY SLOW PERMEABILITY. THE GENERAL AREA AROUND THE PROJECT HAS APPROXIMATELY 90% VEGETATION COVER OF MOSTLY GRASSES.

**1.8 PROJECT SPECIFIC LOCATIONS (PSLs):**

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

- PSLs determined during preconstruction meeting
- PSLs determined during construction
- No PSLs planned for construction

Type	Sheet #s

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

**1.9 CONSTRUCTION ACTIVITIES:**

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.3.)

- Mobilization
- Install sediment and erosion controls
  - Blade existing topsoil into windrows, prep ROW, clear and grub
  - Remove existing pavement
  - Grading operations, excavation, and embankment
  - Excavate and prepare subgrade for proposed pavement widening
  - Remove existing culverts, safety end treatments (SETs)
- Remove existing metal beam guard fence (MBGF), bridge rail
  - Install proposed pavement per plans
  - Install culverts, culvert extensions, SETs
- Install mow strip, MBGF, bridge rail
  - Place flex base
  - Rework slopes, grade ditches
  - Blade windrowed material back across slopes
  - Revegetation of unpaved areas
- Achieve site stabilization and remove sediment and erosion control measures
- Other: BLADE AND WINDROW EXISTING VEGETATION ALONG PAVEMENT EDGES ( OVER EXISTING ROADWAY SUB-BASE), THEN RESTORE/BACKFILL & EMULSIFY.

Other: \_\_\_\_\_

**1.10 POTENTIAL POLLUTANTS AND SOURCES:**

- Sediment laden stormwater from stormwater conveyance over disturbed area
- Fuels, oils, and lubricants from construction vehicles, equipment, and storage
- Solvents, paints, adhesives, etc. from various construction activities
- Transported soils from offsite vehicle tracking
- Construction debris and waste from various construction activities
  - Contaminated water from excavation or dewatering pump-out water
  - Sanitary waste from onsite restroom facilities
- Trash from various construction activities/receptacles
- Long-term stockpiles of material and waste
- Other: ROADWAY SURFACE MILLING AND SAW-CUTTING.

Other: CONCRETE POURING AND WASHOUT.

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
TRIBUTARY TO HIGH POINT CREEK	FLOWS TO HIGH POINT CREEK, THEN KINGS CREEK 0818C_01, IMPAIRED BY BACTERIA IN WATER (RECREATION USE)
TRIBUTARY TO BIG BRUSHY CREEK	FLOWS TO KINGS CREEK 0818C_01, IMPAIRED BY BACTERIA IN WATER (RECREATION USE)

\* Add (\*) for impaired waterbodies with pollutant in ( ).

**1.12 ROLES AND RESPONSIBILITIES: TxDOT**

- Development of plans and specifications
- Perform SWP3 inspections
- Maintain SWP3 records and update to reflect daily operations

Other: \_\_\_\_\_

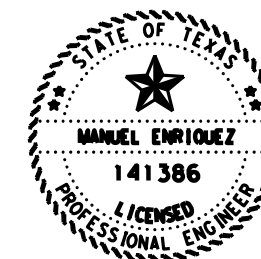
Other: \_\_\_\_\_

**1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR**

- Day To Day Operational Control
- Maintain schedule of major construction activities
- Install, maintain and modify BMPs

Other: \_\_\_\_\_

Other: \_\_\_\_\_



*Manuel Enriquez P.E.* P.E. 12-20-22  
Signature of Registrant & Date

**FM 548  
STORMWATER POLLUTION  
PREVENTION PLAN (SWP3)  
(Less Than 1 Acre)**

FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6	(SEE TITLE SHEET)			87
STATE	STATE DIST.	COUNTY		
TEXAS	DAL	KAUFMAN, ETC.		
CONT.	SECT.	JOB	HIGHWAY NO.	
0197	04	084, ETC.	US 175, 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**

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

**2.2 SEDIMENT CONTROL BMPs:**

**T / P**

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

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

**2.3 PERMANENT CONTROLS:**

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
N/A		

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

**2.4 OFFSITE VEHICLE TRACKING CONTROLS:**

- Excess dirt/mud on road removed daily
- Haul roads dampened for dust control
- Loaded haul trucks to be covered with tarpaulin
- Stabilized construction exit
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

Other: \_\_\_\_\_

Other: \_\_\_\_\_

Other: \_\_\_\_\_

Other: \_\_\_\_\_

Other: \_\_\_\_\_

Other: \_\_\_\_\_

Other: \_\_\_\_\_

Other: \_\_\_\_\_

Other: \_\_\_\_\_

**2.5 POLLUTION PREVENTION MEASURES:**

- Chemical Management
- Concrete and Materials Waste Management
- Debris and Trash Management
- Dust Control
  - Sanitary Facilities
- Other: Avoid storing portable sanitary units, concrete washouts or chemicals within 50 ft upgrade of a receiving water or drainage conveyance without adequate controls.
- Other: Maintain paved surfaces free of project sedimentation and debris.
- Other: Capture concrete slurry for proper disposal.

**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
TRIBUTARY TO BIG BRUSHY CREEK	209+00 277+00 289+50	210+00 279+00 290+50
BIG BRUSHY CREEK	N/A	N/A
TRIBUTARY TO HIGH POINT CREEK	400+00	401+00

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

**2.7 ALLOWABLE NON-STORMWATER DISCHARGES:**

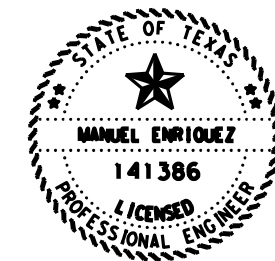
- Fire hydrant flushings
- Irrigation drainage
- Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- Potable water sources
- Springs
- Uncontaminated groundwater
- Water used to wash vehicles or control dust
- Other allowable non-stormwater discharges as allowed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

**2.8 INSPECTIONS:**

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3 .

**2.9 MAINTENANCE:**

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3.



*Manuel Enriquez P.E.*, P.E. 12-20-22  
Signature of Registrant & Date

**FM 548  
STORMWATER POLLUTION PREVENTION PLAN (SWP3)  
(Less Than 1 Acre)**

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		88
STATE	STATE DIST.	COUNTY	
TEXAS	DAL	KAUFMAN, ETC.	
CONT.	SECT.	JOB	HIGHWAY NO.
0197	04	084, ETC.	US 175, ETC

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**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.)

- Kaufman County Phase II MS4 contact Kathy Morris, Public Works Director
- Rockwall County Phase II MS4 contact David Davis, Emergency Management Coordinator

No Action Required       Required Action

Action Number:

- Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000.
- Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
- Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
- When Contractor project specific locations (PSL'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 stream 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.

- 
- 
- 

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
<input type="checkbox"/> Temporary Vegetation	<input type="checkbox"/> Silt Fence	<input type="checkbox"/> Vegetative Filter Strips
<input type="checkbox"/> Blankets/Matting	<input type="checkbox"/> Rock Berm	<input type="checkbox"/> Retention/Irrigation Systems
<input type="checkbox"/> Mulch	<input type="checkbox"/> Triangular Filter Dike	<input type="checkbox"/> Extended Detention Basin
<input type="checkbox"/> Sodding	<input type="checkbox"/> Sand Bag Berm	<input type="checkbox"/> Constructed Wetlands
<input type="checkbox"/> Interceptor Swale	<input type="checkbox"/> Straw Bale Dike	<input type="checkbox"/> Wet Basin
<input type="checkbox"/> Diversion Dike	<input type="checkbox"/> Brush Berms	<input type="checkbox"/> Erosion Control Compost
<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Mulch Filter Berm and Socks
<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks
<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Vegetation Lined Ditches
	<input type="checkbox"/> Stone Outlet Sediment Traps	<input type="checkbox"/> Sand Filter Systems
	<input type="checkbox"/> Sediment Basins	<input type="checkbox"/> 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:

- The following species could occur in the project area: southern crawfish frog, Woodhouse's toad, eastern spotted skunk, long-tailed weasel, eastern box turtle, slender glass lizard, and Texas garter snake. Follow the BMPs and Special Notes listed below to protect these species.
- 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>
  - Minimize impacts to wetland habitats including isolated ephemeral pools
  - Section 2.6.1 Aquatic Amphibian and Reptile BMP (barrier fencing not required)
  - Section 2.6.2 Terrestrial Amphibian and Reptile BMP
  - Section 1.4 Water Quality BMP
  - Section 1.2 Vegetation BMP

**Special Notes:**

- 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.
- 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.
- 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:

- 
- 
- 

**VII. OTHER ENVIRONMENTAL ISSUES**

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

No Action Required       Required Action

Action Number:

- 

**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.



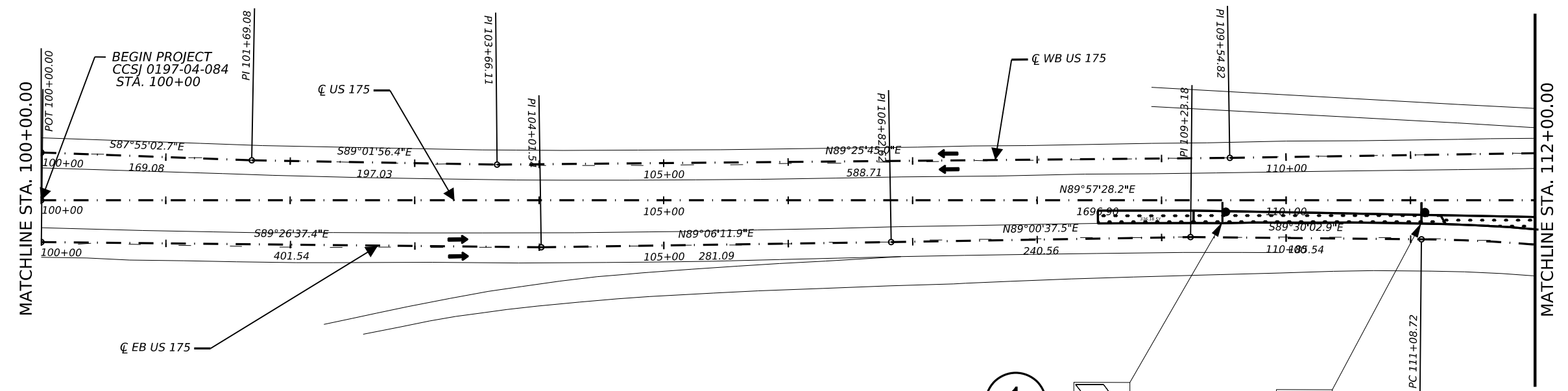
**ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)**

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	US 175, ETC.
STATE	DISTRICT	COUNTY
TEXAS	DALLAS	Kaufman, Rockwall
CONTROL	SECTION	JOB
0197	04	084, etc.
		SHEET NO.
		89

DATE: 1/3/2023 9:21:44 PM  
 FILE: pw://txdot.projectwiseonline.com/TxDOT5/Documents/18 - DAL/Design Projects/019704084/4 - Design/Plan Set/9 - Environmental/US175\_SW3P\_1.dgn



- LEGEND:**
- SEDIMENT CONTROL FENCE
  - EROSION CONTROL LOG
  - DIRECTION OF FLOW
  - BROADCAST SEED (TEMP./PERM.)
  - PROPOSED SIGN



LOCATION	STA 100+00 TO STA 112+00
DATE DISTURBED	
DATE STABILIZED	



- NOTES:**
1. BMP'S SHALL NOT BE INSTALLED ANY SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBANCE OR POTENTIAL POLLUTANT GENERATING ACTIVITIES IN THEIR CONTROL AREA.
  2. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIMEFRAMES.



*Manuel Enriquez*, P.E. 12-20-22  
 Signature of Registrant & Date



US 175, ETC.  
 SW3P SITE  
 MAP

SHEET 1 OF 7

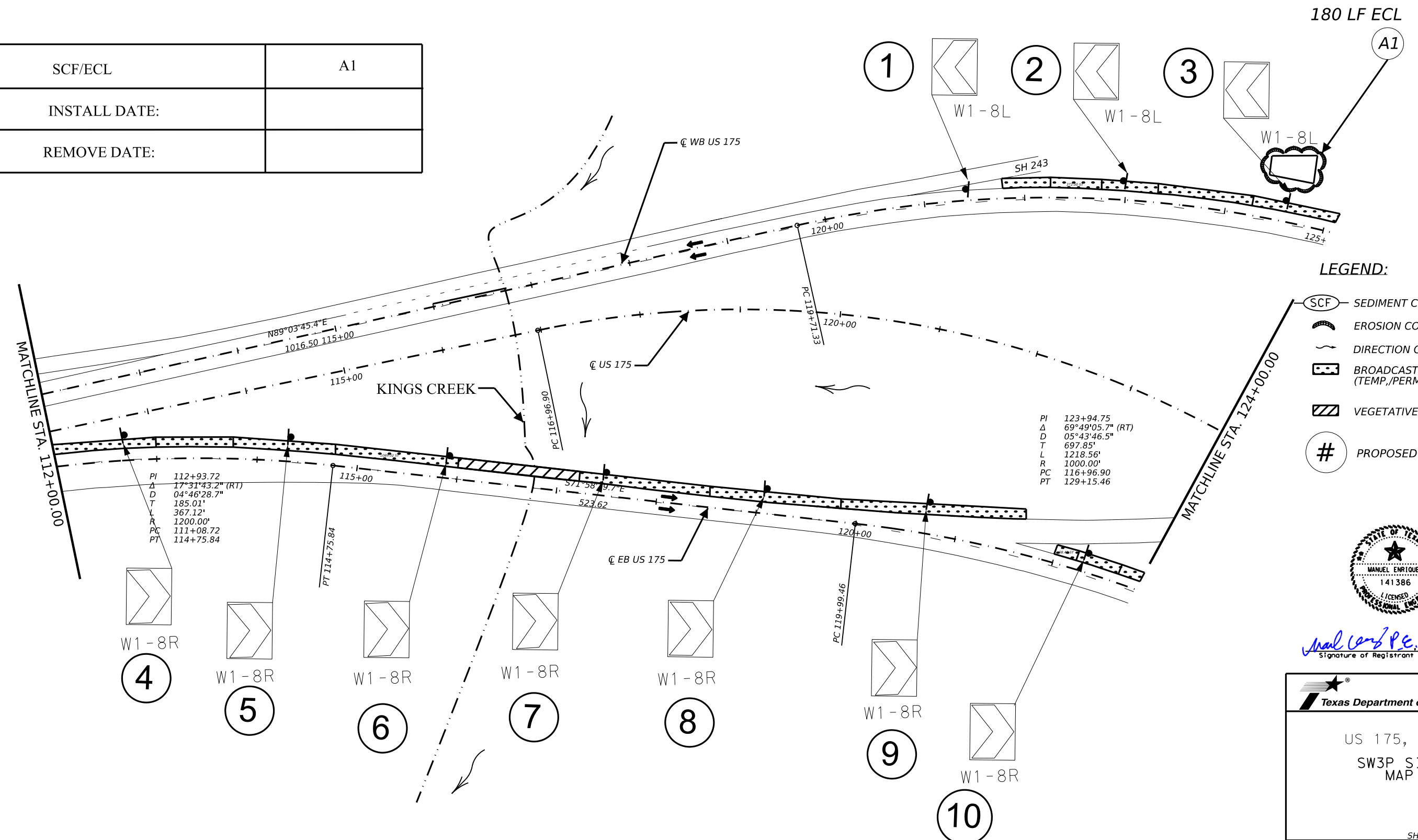
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0197	04	084, ETC.	US 175, ETC.
DIST	COUNTY	SHEET NO.	
DAL	KAUFMAN, ETC.	90	

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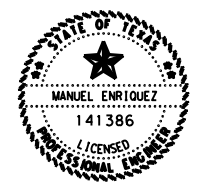
LOCATION	STA 120+00 TO STA 124+00
DATE DISTURBED	
DATE STABILIZED	

SCF/ECL	A1
INSTALL DATE:	
REMOVE DATE:	

- NOTES:
- BMP'S SHALL NOT BE INSTALLED ANY SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBANCE OR POTENTIAL POLLUTANT GENERATING ACTIVITIES IN THEIR CONTROL AREA.
  - SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIMEFRAMES.



- LEGEND:
- SCF - SEDIMENT CONTROL FENCE
  - EROSION CONTROL LOG
  - DIRECTION OF FLOW
  - BROADCAST SEEDING (TEMP./PERM)
  - VEGETATIVE BUFFER
  - # PROPOSED SIGN



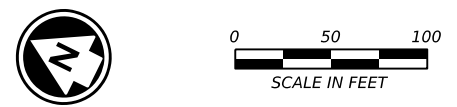
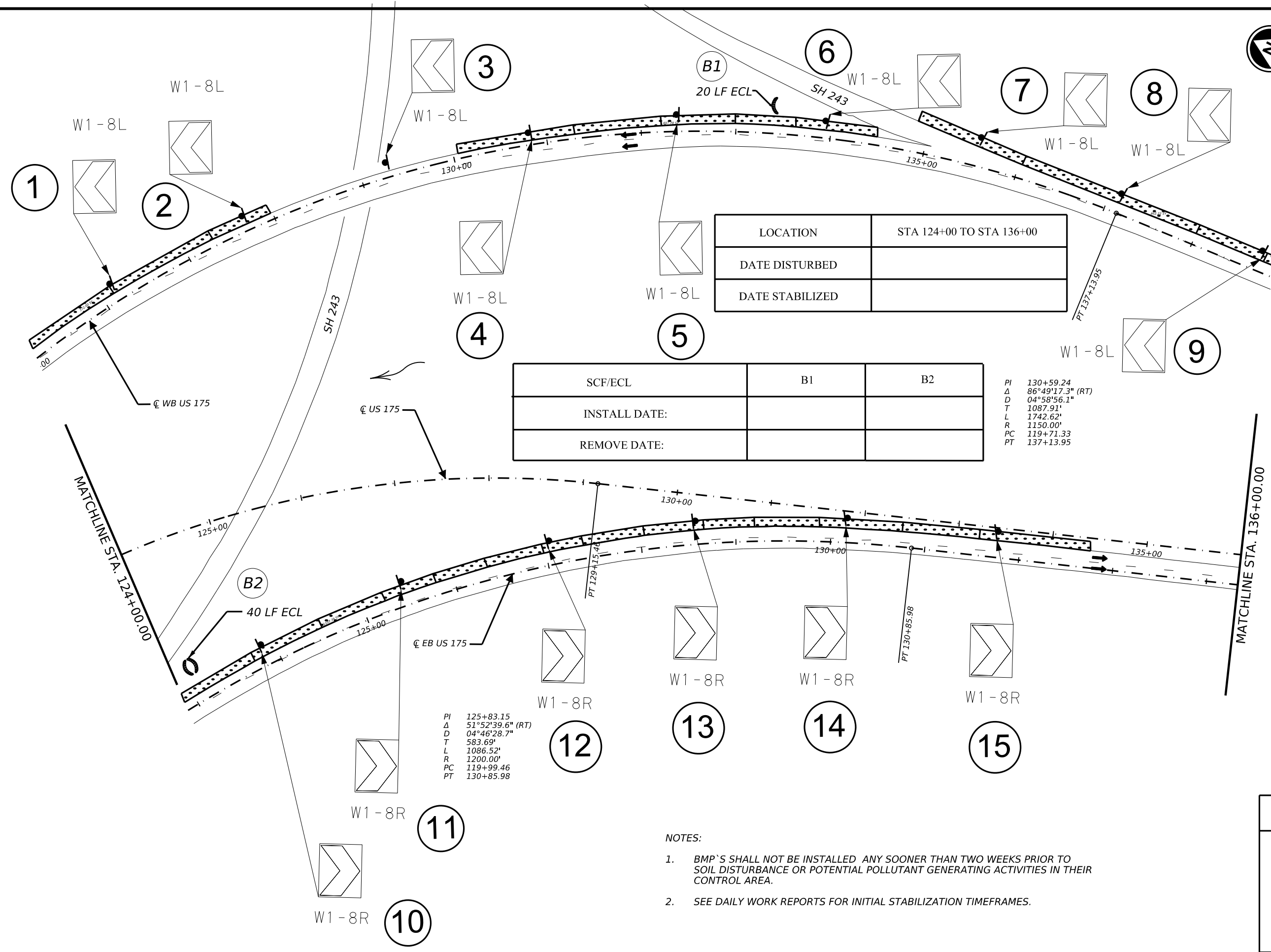
*Manuel Enriquez* P.E. 12-20-22  
 Signature of Registrant & Date



US 175, ETC. SW3P SITE MAP			
SHEET 2 OF 7			
CONT	SECT	JOB	HIGHWAY
0197	04	084, ETC.	US 175, ETC
DIST	COUNTY	SHEET NO.	
DAL	KAUFMAN, ETC.	91	



DATE: 1/3/2023 9:22:08 PM  
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- LEGEND:**
- SEDIMENT CONTROL FENCE
  - EROSION CONTROL LOG
  - DIRECTION OF FLOW
  - BROADCAST SEEDING (TEMP./PERM.)
  - PROPOSED SIGN

LOCATION	STA 124+00 TO STA 136+00
DATE DISTURBED	
DATE STABILIZED	

SCF/ECL	B1	B2
INSTALL DATE:		
REMOVE DATE:		

PI 130+59.24  
 Δ 86°49'17.3" (RT)  
 D 04°58'56.1"  
 T 1087.91'  
 L 1742.62'  
 R 1150.00'  
 PC 119+71.33  
 PT 137+13.95

PI 125+83.15  
 Δ 51°52'39.6" (RT)  
 D 04°46'28.7"  
 T 583.69'  
 L 1086.52'  
 R 1200.00'  
 PC 119+99.46  
 PT 130+85.98



*Manuel Enriquez*, P.E. 12-20-22  
 Signature of Registrant & Date

- NOTES:**
- BMP'S SHALL NOT BE INSTALLED ANY SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBANCE OR POTENTIAL POLLUTANT GENERATING ACTIVITIES IN THEIR CONTROL AREA.
  - SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIMEFRAMES.

**Texas Department of Transportation**

US 175, ETC.  
 SW3P SITE  
 MAP

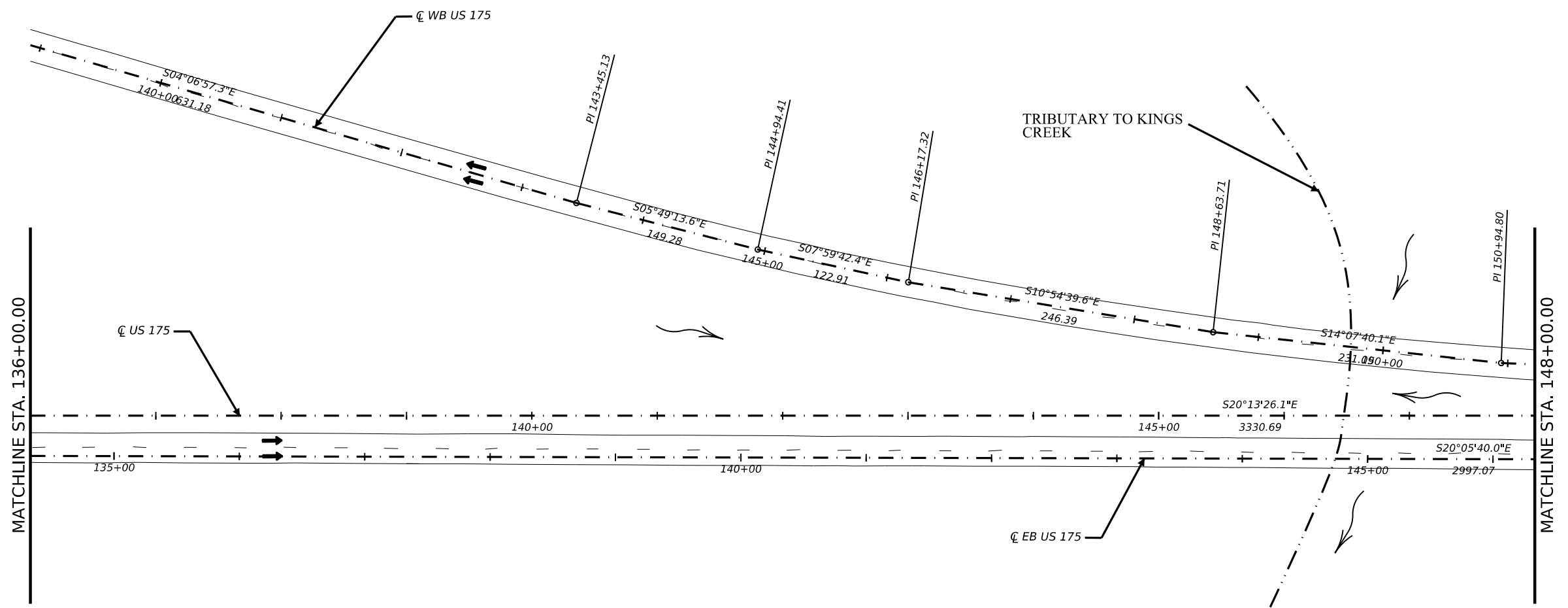
SHEET 3 OF 7

CONT	SECT	JOB	HIGHWAY
0197	04	084,ETC.	US 175,ETC
DIST	COUNTY	SHEET NO.	
DAL	KAUFMAN,ETC.	92	

NO WORK ON THIS SHEET

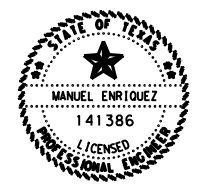


- LEGEND:**
- SEDIMENT CONTROL FENCE
  - EROSION CONTROL LOG
  - DIRECTION OF FLOW
  - BROADCAST SEEDING (TEMP./PERM.)
  - PROPOSED SIGN



LOCATION	STA 136+00 TO STA 148+00
DATE DISTURBED	
DATE STABILIZED	

- NOTES:**
- BMP'S SHALL NOT BE INSTALLED ANY SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBANCE OR POTENTIAL POLLUTANT GENERATING ACTIVITIES IN THEIR CONTROL AREA.
  - SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIMEFRAMES.



*Manuel Enriquez*, P.E. 12-20-22  
Signature of Registrant & Date



US 175, ETC.  
SW3P SITE  
MAP

SHEET 4 OF 7

CONT	SECT	JOB	HIGHWAY
0197	04	084, ETC.	US 175, ETC.
DIST	COUNTY	SHEET NO.	
DAL	KAUFMAN, ETC.	93	

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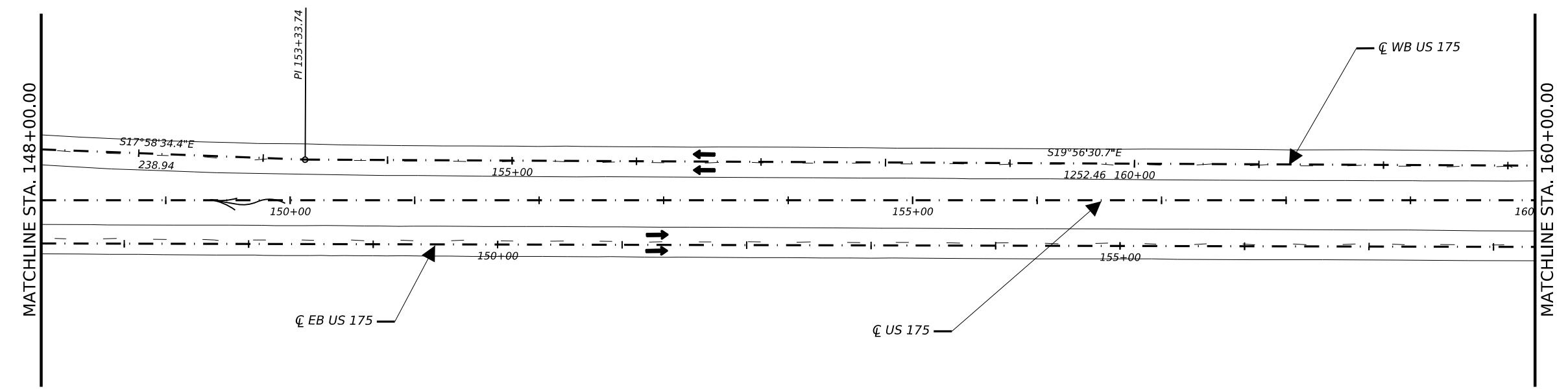
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CK: DW: CK: DW:



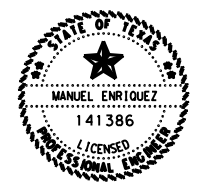
- LEGEND:**
- SEDIMENT CONTROL FENCE
  - EROSION CONTROL LOG
  - DIRECTION OF FLOW
  - BROADCAST SEEDING (TEMP./PERM.)
  - PROPOSED SIGN

NO WORK ON THIS SHEET



LOCATION	STA 148+00 TO STA 160+00
DATE DISTURBED	
DATE STABILIZED	

- NOTES:**
- BMP'S SHALL NOT BE INSTALLED ANY SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBANCE OR POTENTIAL POLLUTANT GENERATING ACTIVITIES IN THEIR CONTROL AREA.
  - SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIMEFRAMES.



*Manuel Enriquez*, P.E. 12-20-22  
Signature of Registrant & Date



US 175, ETC.  
SW3P SITE  
MAP

SHEET 5 OF 7

CONT	SECT	JOB	HIGHWAY
0197	04	084, ETC.	US 175, ETC.
DIST	COUNTY	SHEET NO.	
DAL	KAUFMAN, ETC.	94	

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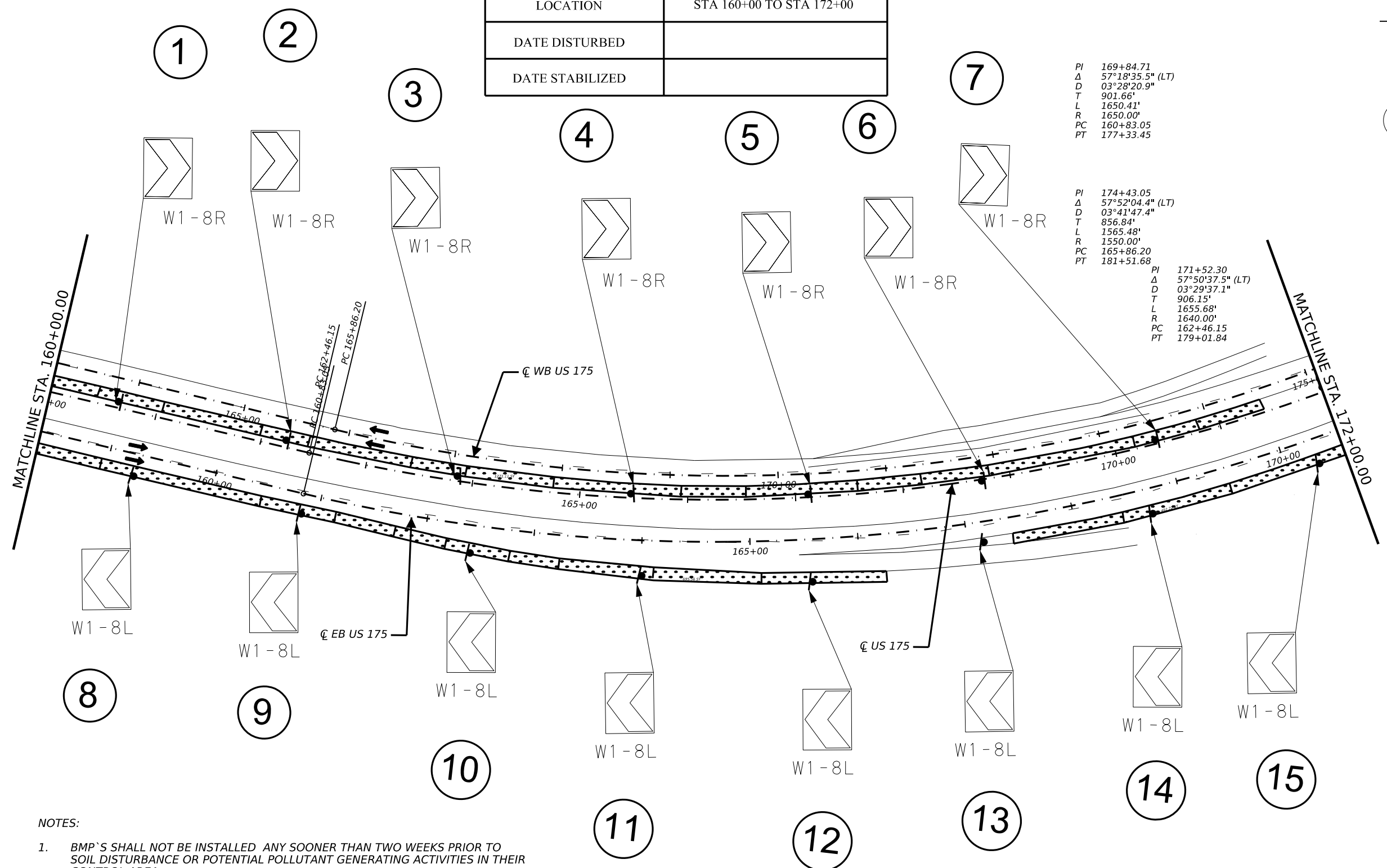
- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG
- DIRECTION OF FLOW
- BROADCAST SEEDING (TEMP./PERM.)
- PROPOSED SIGN

LOCATION	STA 160+00 TO STA 172+00
DATE DISTURBED	
DATE STABILIZED	

PI 169+84.71  
 Δ 57°18'35.5" (LT)  
 D 03°28'20.9"  
 T 901.66'  
 L 1650.41'  
 R 1650.00'  
 PC 160+83.05  
 PT 177+33.45

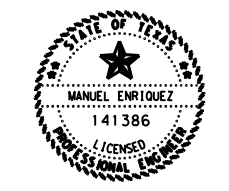
PI 174+43.05  
 Δ 57°52'04.4" (LT)  
 D 03°41'47.4"  
 T 856.84'  
 L 1565.48'  
 R 1550.00'  
 PC 165+86.20  
 PT 181+51.68

PI 171+52.30  
 Δ 57°50'37.5" (LT)  
 D 03°29'37.1"  
 T 906.15'  
 L 1655.68'  
 R 1640.00'  
 PC 162+46.15  
 PT 179+01.84



NOTES:

1. BMP'S SHALL NOT BE INSTALLED ANY SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBANCE OR POTENTIAL POLLUTANT GENERATING ACTIVITIES IN THEIR CONTROL AREA.
2. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIMEFRAMES.



*Manuel Enriquez*, P.E. 12-20-22  
 Signature of Registrant & Date



US 175, ETC.  
 SW3P SITE  
 MAP

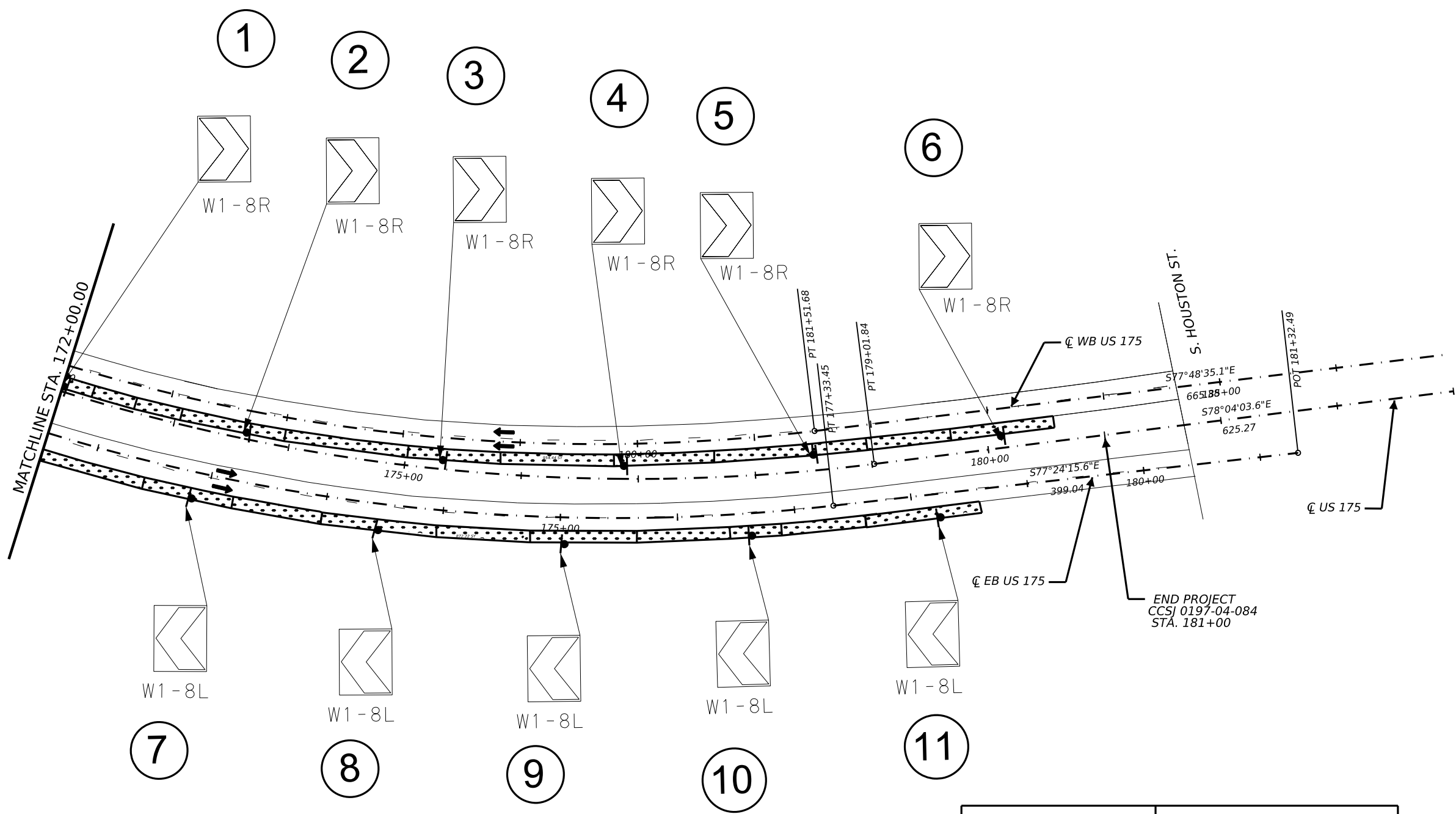
SHEET 6 OF 7

CONT	SECT	JOB	HIGHWAY
0197	04	084, ETC.	US 175, ETC.
DIST	COUNTY	SHEET NO.	
DAL	KAUFMAN, ETC.	95	

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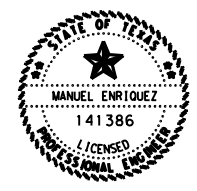
- LEGEND:**
- SEDIMENT CONTROL FENCE
  - EROSION CONTROL LOG
  - DIRECTION OF FLOW
  - BROADCAST SEEDING (TEMP./PERM.)
  - PROPOSED SIGN



**NOTES:**

1. BMP'S SHALL NOT BE INSTALLED ANY SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBANCE OR POTENTIAL POLLUTANT GENERATING ACTIVITIES IN THEIR CONTROL AREA.
2. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIMEFRAMES.

LOCATION	STA 172+00 TO STA 181+00
DATE DISTURBED	
DATE STABILIZED	



*Manuel Enriquez*, P.E. 12-20-22  
 Signature of Registrant & Date

**Texas Department of Transportation**

US 175, ETC.  
SW3P SITE MAP

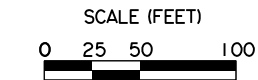
SHEET 7 OF 7

CONT	SECT	JOB	HIGHWAY
0197	04	084, ETC.	US 175, ETC.
DIST	COUNTY	SHEET NO.	
DAL	KAUFMAN, ETC.	96	

DATE: 1/3/2023 9:23:57 PM  
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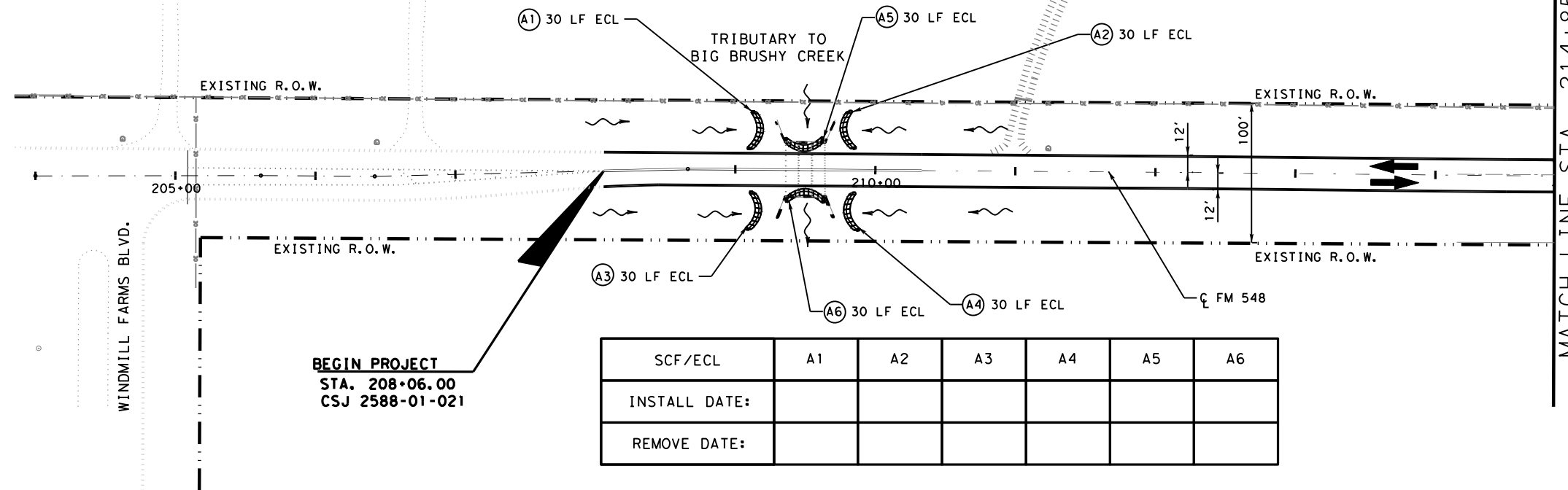
LEGEND:

- TEMP SCF
- EROSION CONTROL LOGS
- WATER FLOW DIRECTION
- DISTURBED AREA
- BMP INSTALLATION
- TRAVEL LANE & DIRECTION



NOTE  
 USE PC STATION AS BEGIN CURVE AND PT STATION  
 AS END CURVE WHEN STRIPING EXISTING SECTIONS.

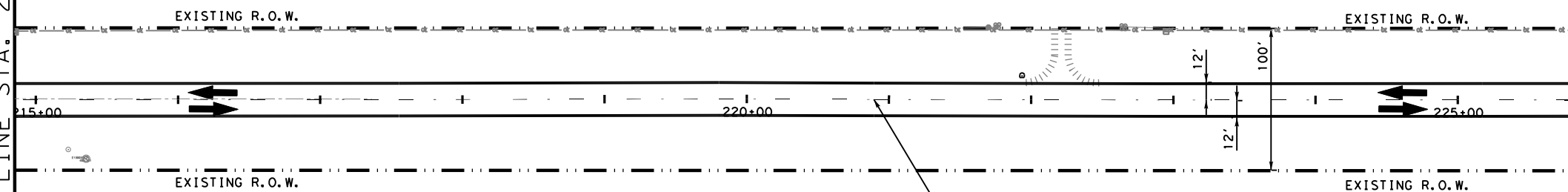
A	STA 208+00 TO 225+85.09
DATE DISTURBED	
DATE STABILIZED	



**BEGIN PROJECT**  
 STA. 208+06.00  
 CSJ 2588-01-021

SCF/ECL	A1	A2	A3	A4	A5	A6
INSTALL DATE:						
REMOVE DATE:						

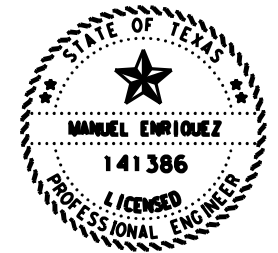
MATCH LINE STA. 214+85



MATCH LINE STA. 225+85

NOTES:

- 1) CONTRACTOR TO PLACE AND MAINTAIN SWPPP MEASURES APPLICABLE TO EACH PHASE OF CONSTRUCTION.
- 2) BMPs SHALL NOT BE INSTALLED IN THEIR CONTROL AREA ANY SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBING ACTIVITIES IN THAT AREA.
- 3) TEMPORARY SEDIMENT CONTROL FENCE LOCATION TO BE DETERMINED BY THE ENGINEER IN THE FIELD.
- 4) REMOVE LITTER & CONSTRUCTION DEBRIS DAILY AND AS NEEDED OR AS DIRECTED BY THE ENGINEER. THIS WORK IS SUBSIDIARY TO VARIOUS EROSION CONTROL ITEMS (ITEM 506)
- 5) REMOVE SEDIMENT FROM BMP WHEN IT REDUCES BMP'S CAPACITY BY 40%. ALWAYS PROVIDE CONSISTENT DRAINAGE.
- 6) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.
- 7) PROTECT TREES AND THEIR ROOTS, IF ALL POSSIBLE, PRESERVE CREEKSIDE VEGETATION TO THE EXTENT PRACTICABLE.



*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date



**FM 548  
 SW3P SITE MAP**

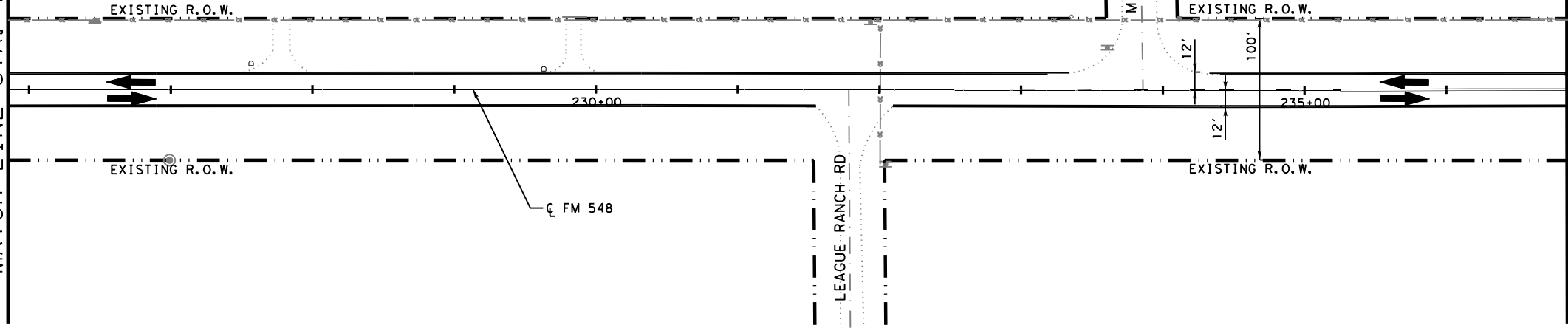
SCALE: 1"=100' SHEET 1 OF 10

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
VD	TEXAS	DAL	KAUFMAN, ETC.	97
CHECK	CONTROL	SECTION	JOB	
ME	FR	0197	04	084, ETC.

DATE: 1/3/2023 9:24:07 PM  
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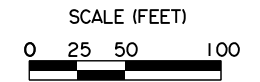
MATCH LINE STA. 225+85



LEGEND:

- TEMP SCF
- EROSION CONTROL LOGS
- WATER FLOW DIRECTION
- DISTURBED AREA
- BMP INSTALLATION

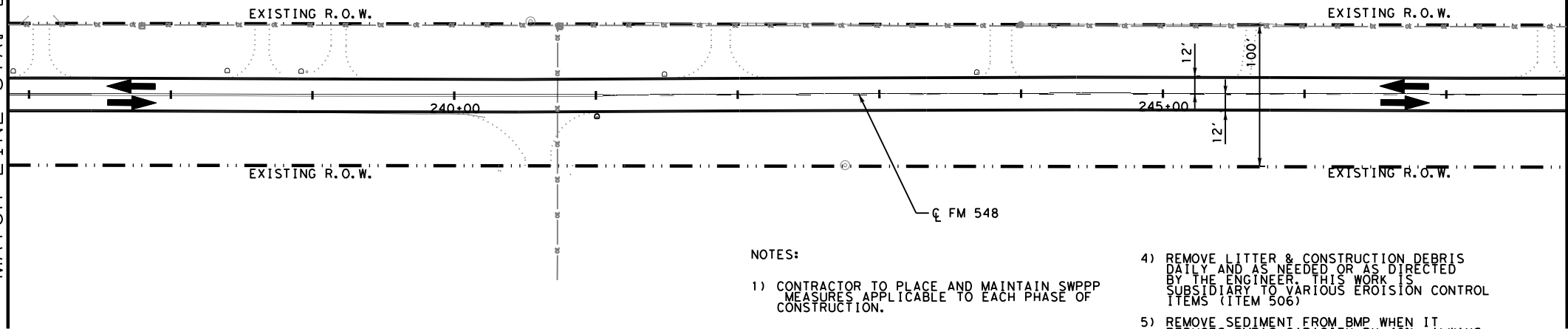
TRAVEL LANE & DIRECTION



NOTE  
 USE PC STATION AS BEGIN CURVE AND PT STATION AS END CURVE WHEN STRIPING EXISTING SECTIONS.

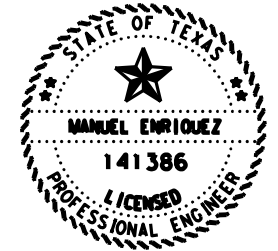


MATCH LINE STA. 236+85



NOTES:

- 1) CONTRACTOR TO PLACE AND MAINTAIN SWPPP MEASURES APPLICABLE TO EACH PHASE OF CONSTRUCTION.
- 2) BMPs SHALL NOT BE INSTALLED IN THEIR CONTROL AREA ANY SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBING ACTIVITIES IN THAT AREA.
- 3) TEMPORARY SEDIMENT CONTROL FENCE LOCATION TO BE DETERMINED BY THE ENGINEER IN THE FIELD.
- 4) REMOVE LITTER & CONSTRUCTION DEBRIS DAILY AND AS NEEDED OR AS DIRECTED BY THE ENGINEER. THIS WORK IS SUBSIDIARY TO VARIOUS EROSION CONTROL ITEMS (ITEM 506)
- 5) REMOVE SEDIMENT FROM BMP WHEN IT REDUCES BMP'S CAPACITY BY 40%. ALWAYS PROVIDE CONSISTENT DRAINAGE.
- 6) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.
- 7) PROTECT TREES AND THEIR ROOTS. IF ALL POSSIBLE, PRESERVE CREEKSIDE VEGETATION TO THE EXTENT PRACTICABLE.



*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date



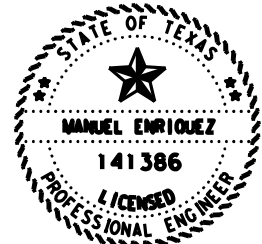
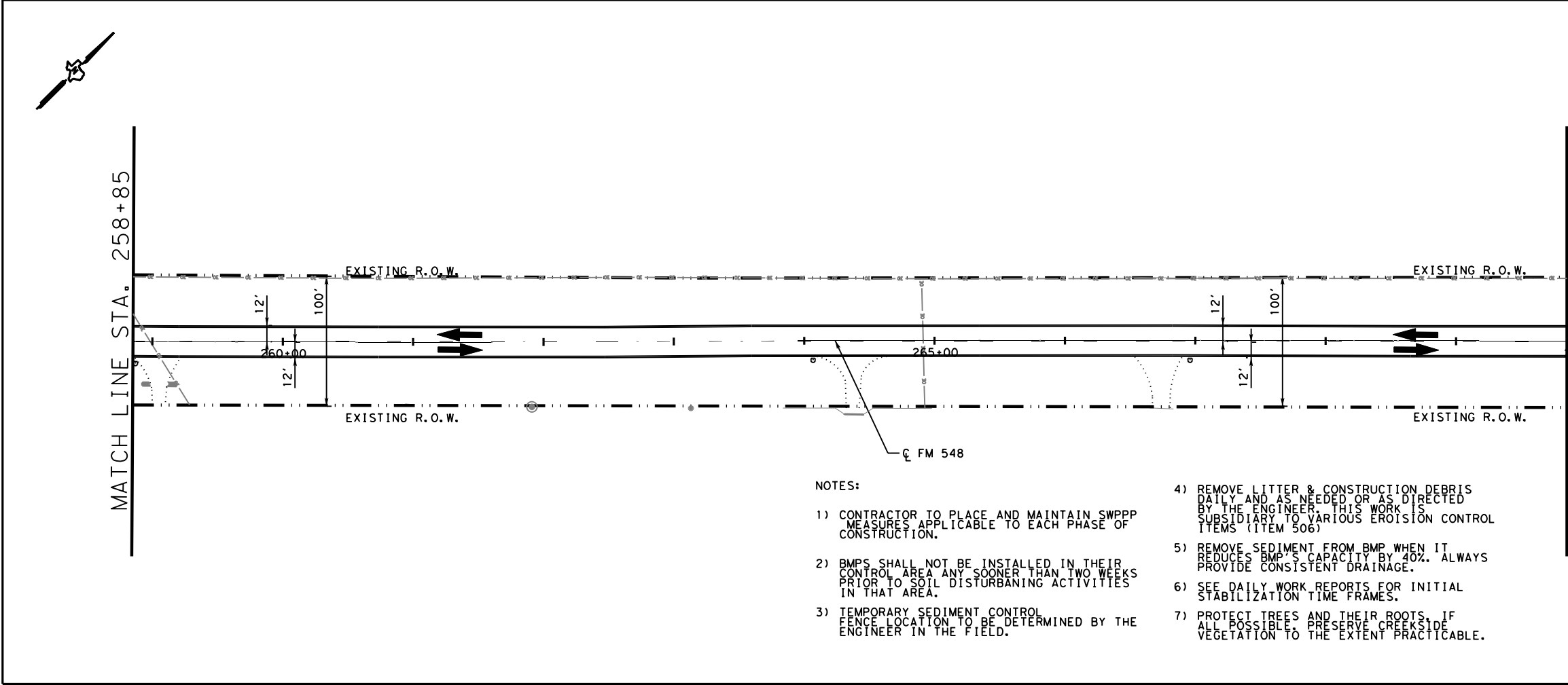
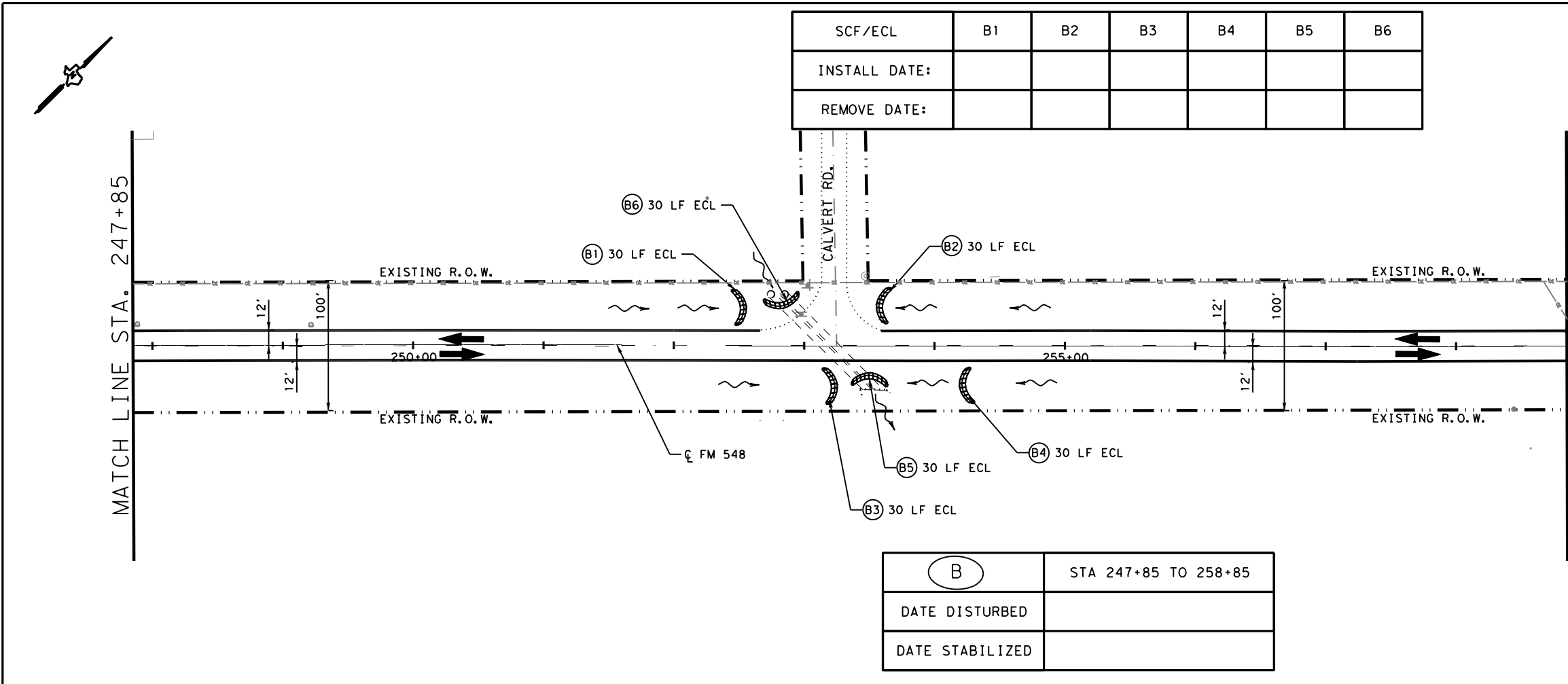
**FM 548  
 SW3P SITE MAP**

SCALE: 1"=100' SHEET 2 OF 10

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	
VD	TEXAS	DAL	KAUFMAN, ETC.	
CHECK	CONTROL	SECTION	JOB	
ME	FR	0197	04	084, ETC.

98

DATE: 1/3/2023 9:24:22 PM  
 FILE: pw://txdot.com/projects/258801021/4 - Design/Plan Set/9. Environmental/3 SW3P LAYOUT.dgn



*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date



**FM 548  
 SW3P SITE MAP**

SCALE: 1"=100' SHEET 3 OF 10

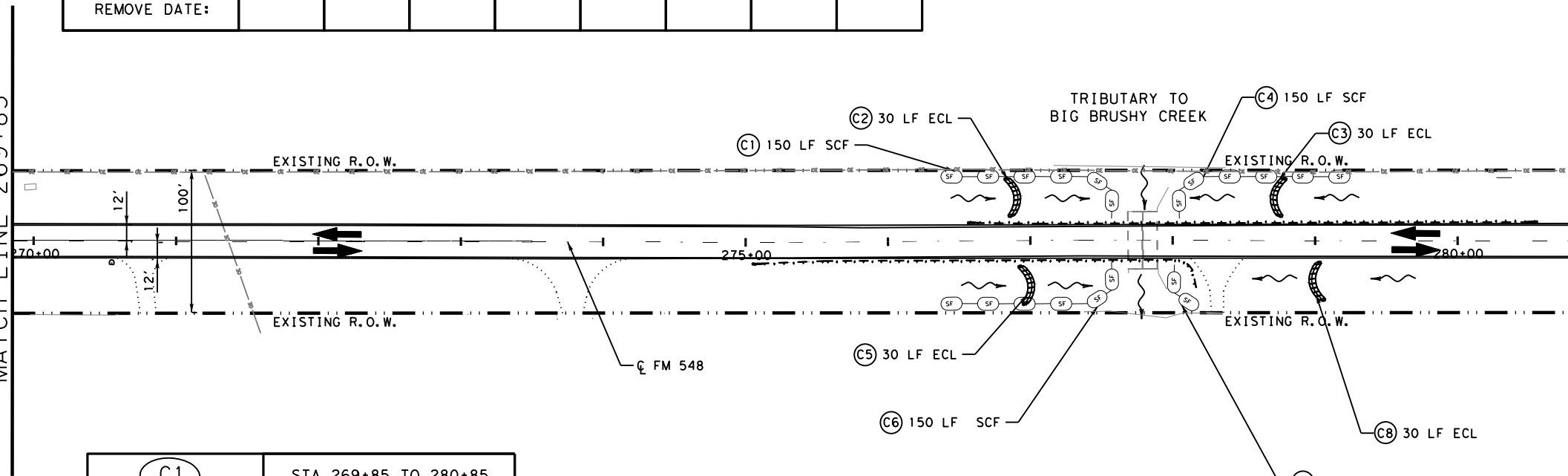
DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US 175, ETC		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
VD	TEXAS	DAL	KAUFMAN, ETC.	99
CHECK	CONTROL	SECTION	JOB	
ME	FR	0197	04	084, ETC.



DATE: 1/3/2023 9:24:30 PM  
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SCF/ECL	C1	C2	C3	C4	C5	C6	C7	C8
INSTALL DATE:								
REMOVE DATE:								

MATCH LINE 269+85

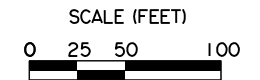


C1	STA 269+85 TO 280+85
DATE DISTURBED	
DATE STABILIZED	

LEGEND:

- TEMP SCF
- EROSION CONTROL LOGS
- WATER FLOW DIRECTION
- DISTURBED AREA
- BMP INSTALLATION

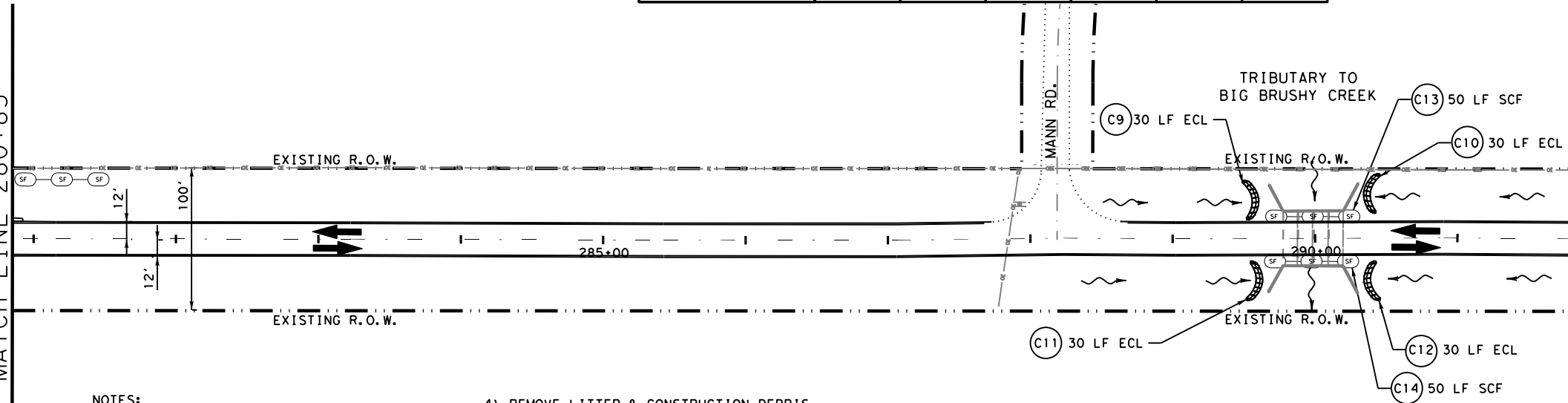
← TRAVEL LANE & DIRECTION



NOTE  
 USE PC STATION AS BEGIN CURVE AND PT STATION AS END CURVE WHEN STRIPING EXISTING SECTIONS.

SCF/ECL	C9	C10	C11	C12	C13	C14
INSTALL DATE:						
REMOVE DATE:						

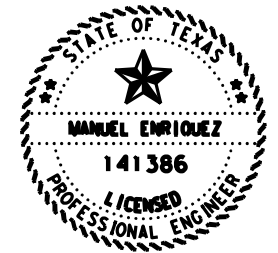
MATCH LINE 280+85



C2	STA 280+85 TO 291+85
DATE DISTURBED	
DATE STABILIZED	

NOTES:

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- 4) REMOVE LITTER & CONSTRUCTION DEBRIS DAILY AND AS NEEDED OR AS DIRECTED BY THE ENGINEER. THIS WORK IS SUBSIDIARY TO VARIOUS EROSION CONTROL ITEMS (ITEM 506)
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- 6) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.
- 7) PROTECT TREES AND THEIR ROOTS, IF ALL POSSIBLE, PRESERVE CREEKSIDE VEGETATION TO THE EXTENT PRACTICABLE.



*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date



**FM 548  
 SW3P SITE MAP**

SCALE: 1"=100' SHEET 4 OF 10

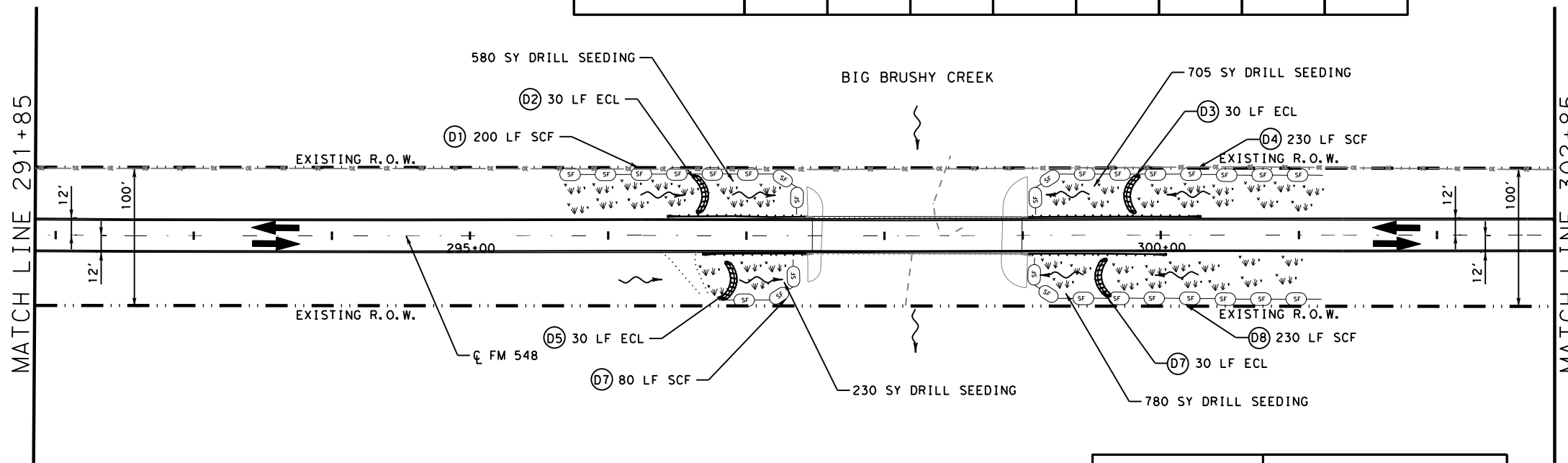
DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US 175, ETC		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
VD	TEXAS	DAL	KAUFMAN, ETC.	
CHECK	CONTROL	SECTION	JOB	100
ME	FR 0197	04	084, ETC.	

DATE: 1/3/2023 9:24:39 PM  
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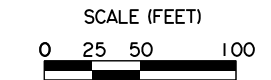
SCF/ECL/RDF	D1	D2	D3	D4	D5	D6	D7	D8
INSTALL DATE:								
REMOVE DATE:								

LEGEND:

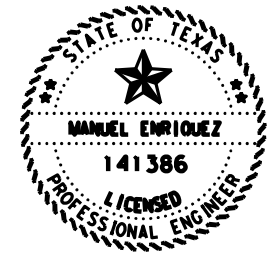
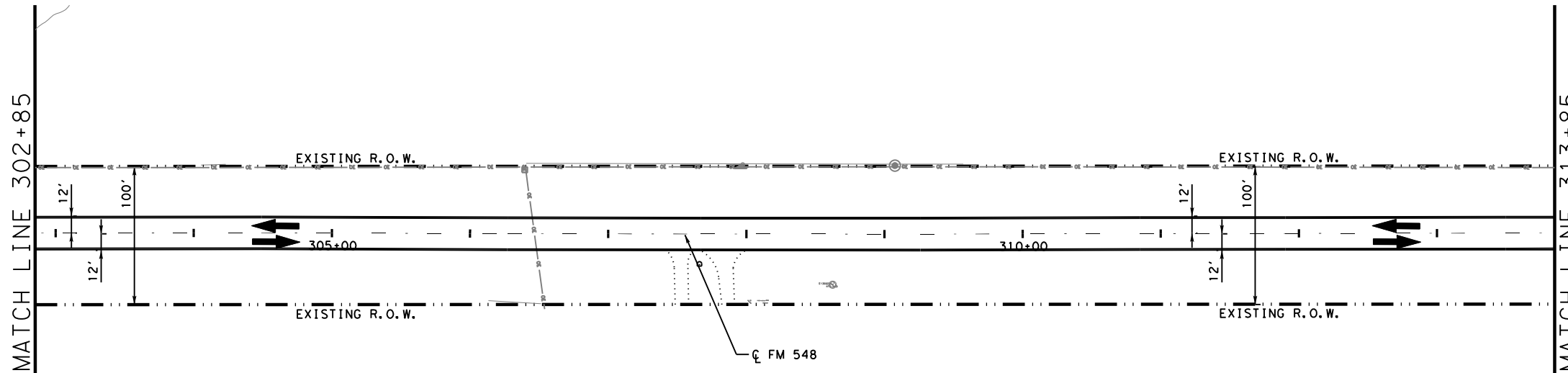
- TEMP SCF
- EROSION CONTROL LOGS
- WATER FLOW DIRECTION
- DISTURBED AREA
- BMP INSTALLATION
- DRILL SEEDING
- TRAVEL LANE & DIRECTION



LOCATION	STA 291+85 TO 302+85
DATE DISTURBED	
DATE STABILIZED	



NOTE  
 USE PC STATION AS BEGIN CURVE AND PT STATION AS END CURVE WHEN STRIPING EXISTING SECTIONS.



*Manuel Enriquez P.E.* P.E. 12-20-22  
 Signature of Registrant & Date

NOTES:

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- 7) PROTECT TREES AND THEIR ROOTS, IF ALL POSSIBLE. PRESERVE CREEKSIDE VEGETATION TO THE EXTENT PRACTICABLE.



**FM 548  
 SW3P SITE MAP**

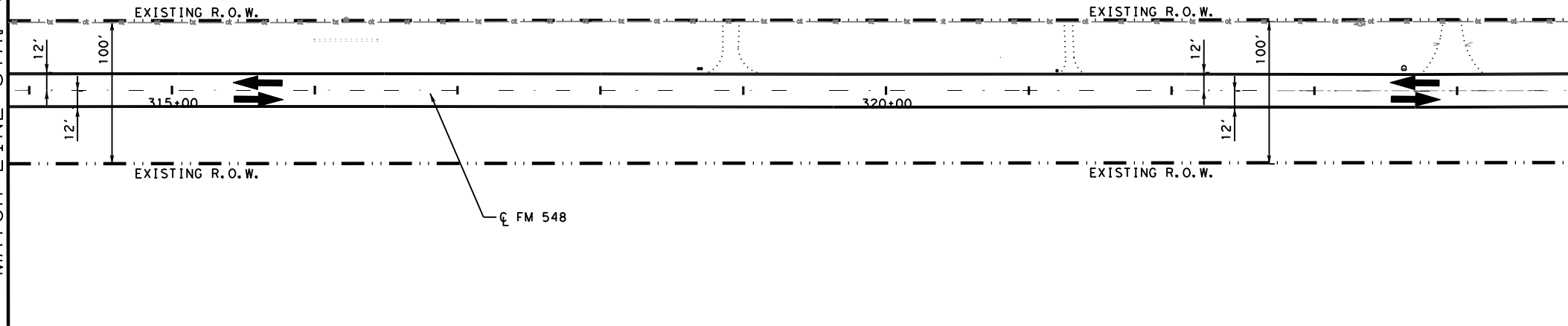
SCALE: 1"=100'		SHEET 5 OF 10	
DESIGN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US	175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY
VD	TEXAS	DAL	KAUFMAN, ETC.
CHECK	CONTROL	SECTION	JOB
ME	0197	04	084, ETC.
CHECK	FR		

101

DATE: 1/3/2023 9:24:47 PM  
 FILE: pw://txdot.com/projects/258801021/4 - Design/Plan Set/9. Environmental/6 SW3P LAYOUT.dgn



MATCH LINE STA. 313+85

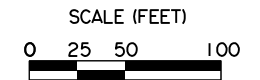


MATCH LINE STA. 324+85

LEGEND:

- TEMP SCF
- EROSION CONTROL LOGS
- WATER FLOW DIRECTION
- DISTURBED AREA
- BMP INSTALLATION

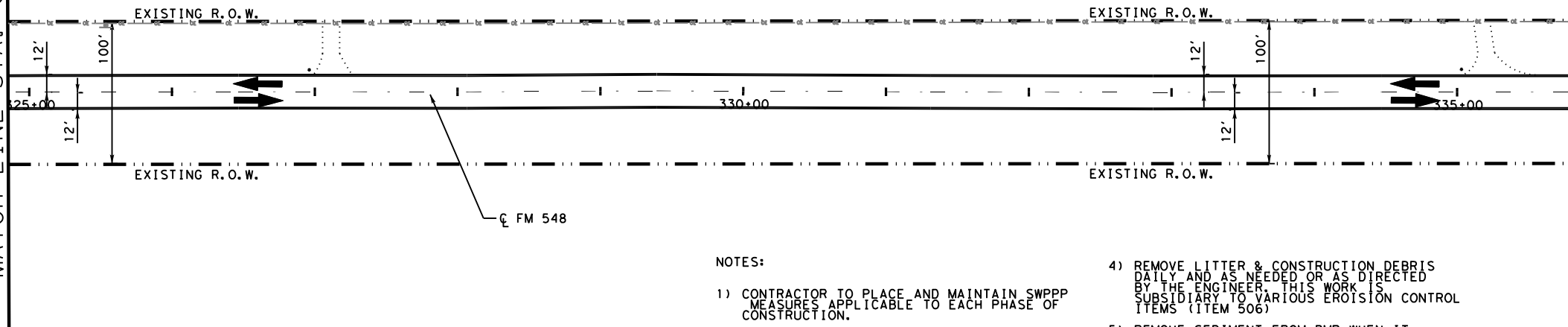
TRAVEL LANE & DIRECTION



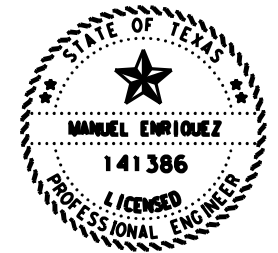
NOTE  
 USE PC STATION AS BEGIN CURVE AND PT STATION AS END CURVE WHEN STRIPING EXISTING SECTIONS.



MATCH LINE STA. 324+85



MATCH LINE STA. 335+85



*Manuel Enriquez P.E.* P.E. 12-20-22  
 Signature of Registrant & Date



**FM 548  
 SW3P SITE MAP**

NOTES:

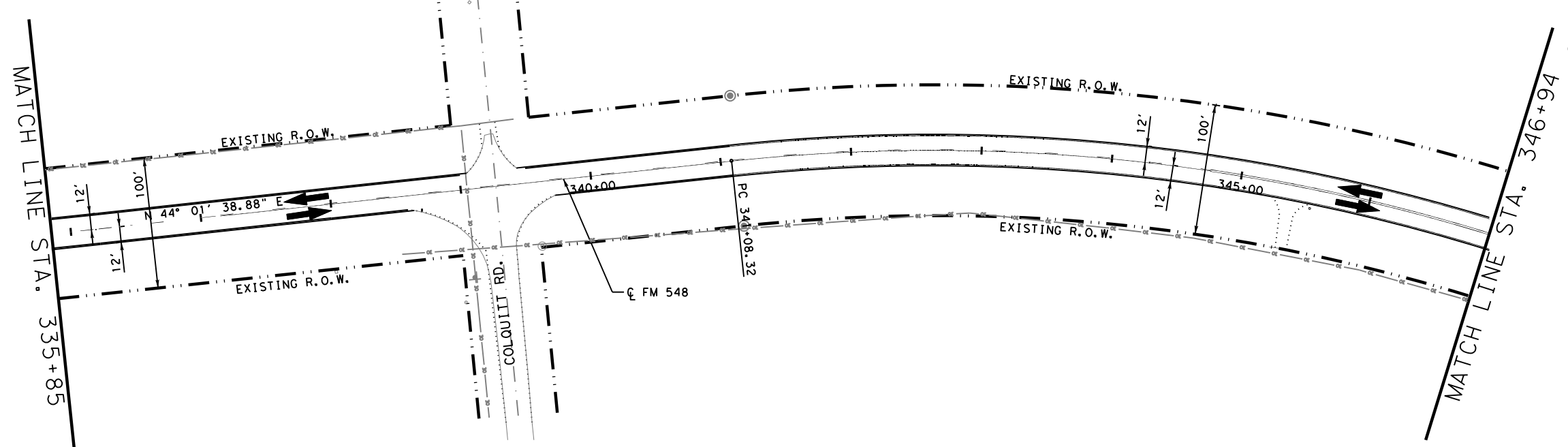
- 1) CONTRACTOR TO PLACE AND MAINTAIN SWPPP MEASURES APPLICABLE TO EACH PHASE OF CONSTRUCTION.
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- 6) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.
- 7) PROTECT TREES AND THEIR ROOTS. IF ALL POSSIBLE, PRESERVE CREEKSIDE VEGETATION TO THE EXTENT PRACTICABLE.

SCALE: 1"=100' SHEET 6 OF 10

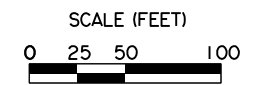
DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	
VD	TEXAS	DAL	KAUFMAN, ETC.	
CHECK	CONTROL	SECTION	JOB	
ME	FR	0197	04	084, ETC.

102

DATE: 1/3/2023 9:24:58 PM  
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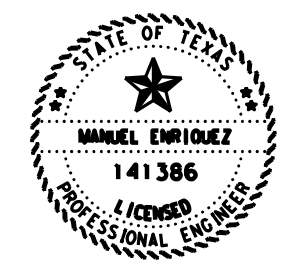
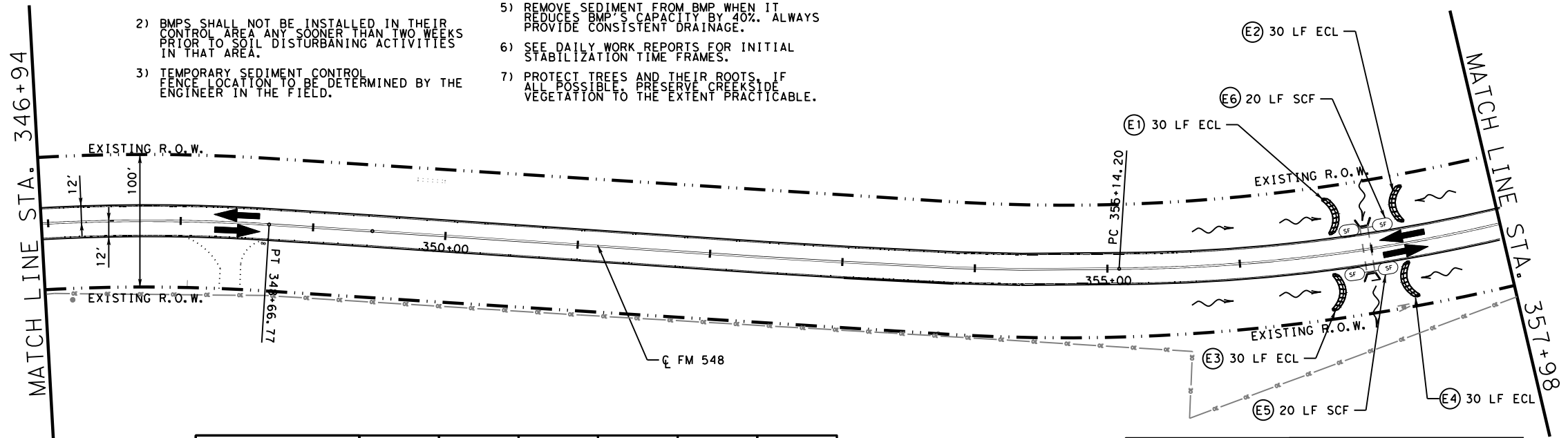
- LEGEND:**
- (SF) TEMP SCF
  - (E) EROSION CONTROL LOGS
  - (W) WATER FLOW DIRECTION
  - (XXX) DISTURBED AREA
  - (XX) BMP INSTALLATION
- ← TRAVEL LANE & DIRECTION



NOTE  
 USE PC STATION AS BEGIN CURVE AND PT STATION AS END CURVE WHEN STRIPING EXISTING SECTIONS.

**NOTES:**

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- 7) PROTECT TREES AND THEIR ROOTS, IF ALL POSSIBLE, PRESERVE CREEKSIDE VEGETATION TO THE EXTENT PRACTICABLE.



*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date



**FM 548  
 SW3P SITE MAP**

SCF/ECL	E1	E2	E3	E4	E5	E6
INSTALL DATE:						
REMOVE DATE:						

LOCATION	STA 346+94 TO 357+98
DATE DISTURBED	
DATE STABILIZED	

SCALE: 1"=100' SHEET 7 OF 10

DESIGN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US	175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY
VD	TEXAS	DAL	KAUFMAN, ETC.
CHECK	CONTROL	SECTION	JOB
ME	0197	04	084, ETC.
CHECK			
FR			

103

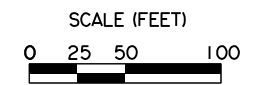
DATE: 1/3/2023 9:25:09 PM  
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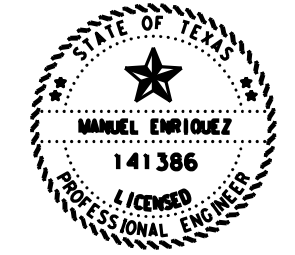
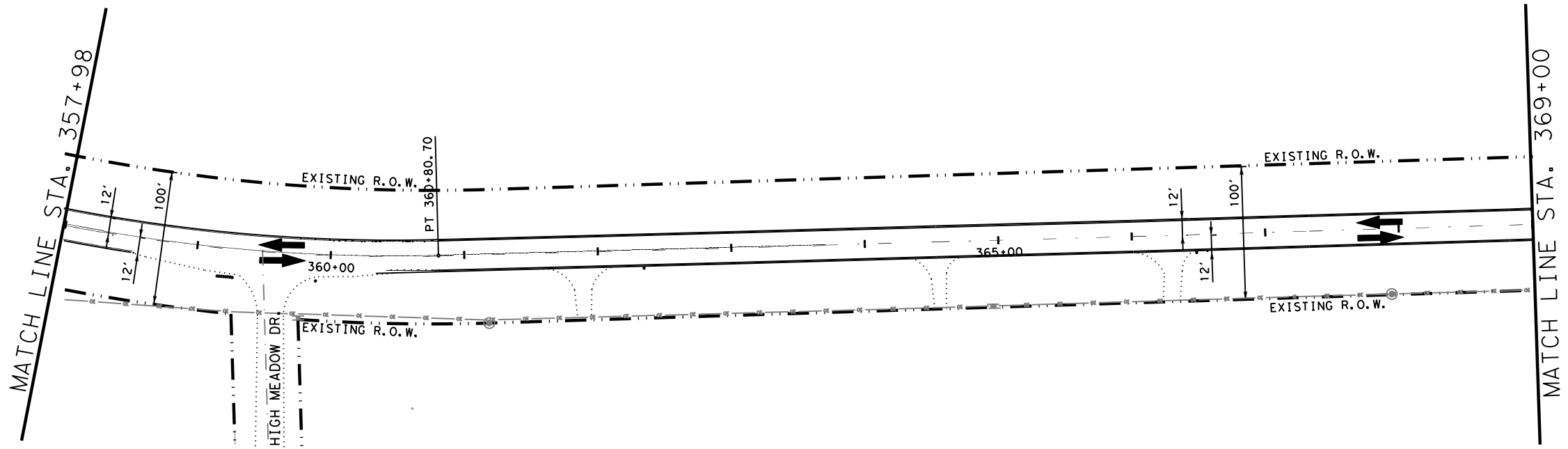
LEGEND:

- TEMP SCF
- EROSION CONTROL LOGS
- WATER FLOW DIRECTION
- DISTURBED AREA
- BMP INSTALLATION

← TRAVEL LANE & DIRECTION



NOTE  
 USE PC STATION AS BEGIN CURVE AND PT STATION AS END CURVE WHEN STRIPING EXISTING SECTIONS.



*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date

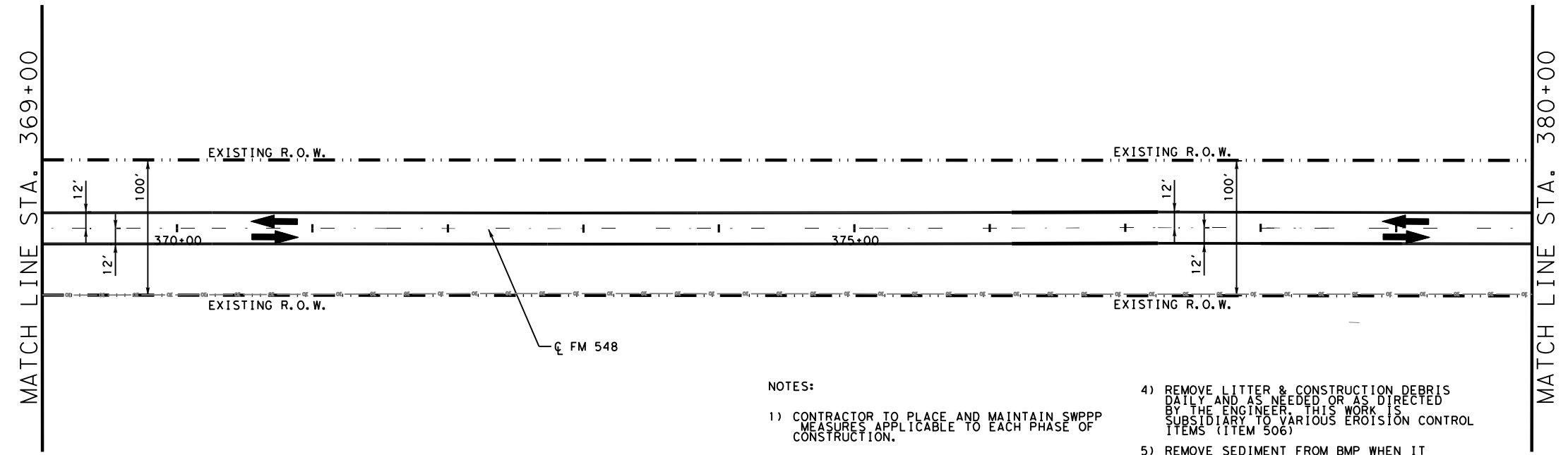


**FM 548  
 SW3P SITE MAP**

SCALE: 1"=100' SHEET 8 OF 10

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	
VD	TEXAS	DAL	KAUFMAN, ETC.	
CHECK	CONTROL	SECTION	JOB	
ME	FR	0197	04	084, ETC.

104



NOTES:

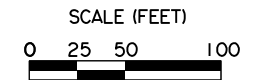
- 1) CONTRACTOR TO PLACE AND MAINTAIN SWPPP MEASURES APPLICABLE TO EACH PHASE OF CONSTRUCTION.
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DATE: 1/3/2023 9:25:20 PM  
 FILE: pw://tcdot.com/xdot5/projects/258801021/4 - Design/Plan Set/9 - Environmental/9 SW3P LAYOUT.dgn

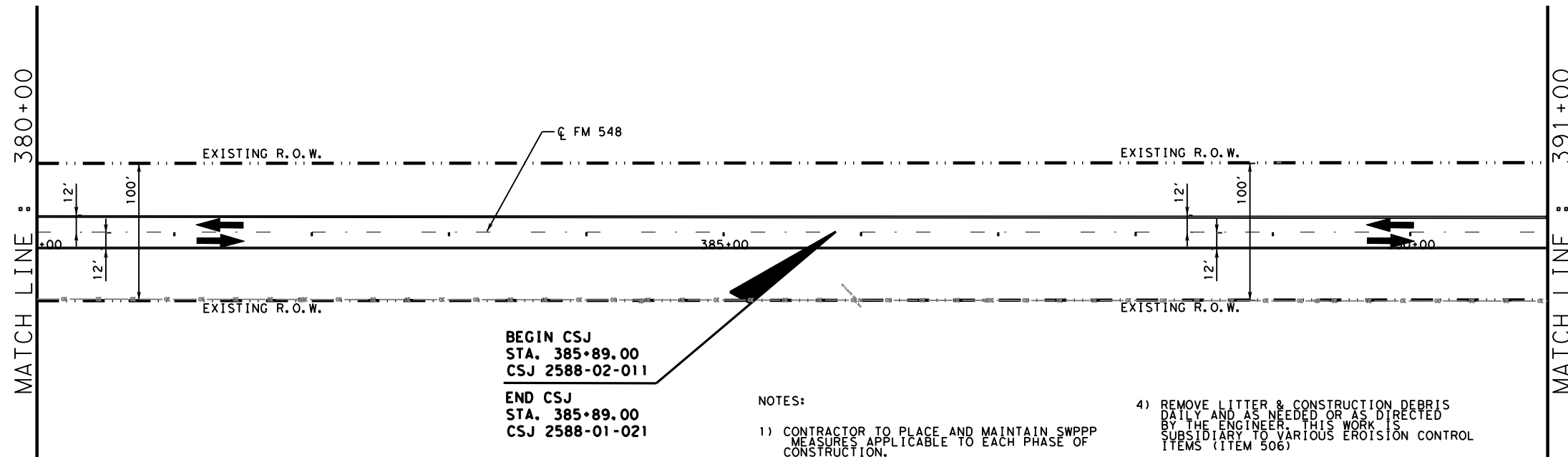
LEGEND:

- TEMP SCF
- EROSION CONTROL LOGS
- WATER FLOW DIRECTION
- DISTURBED AREA
- BMP INSTALLATION

TRAVEL LANE & DIRECTION



NOTE  
 USE PC STATION AS BEGIN CURVE AND PT STATION AS END CURVE WHEN STRIPING EXISTING SECTIONS.

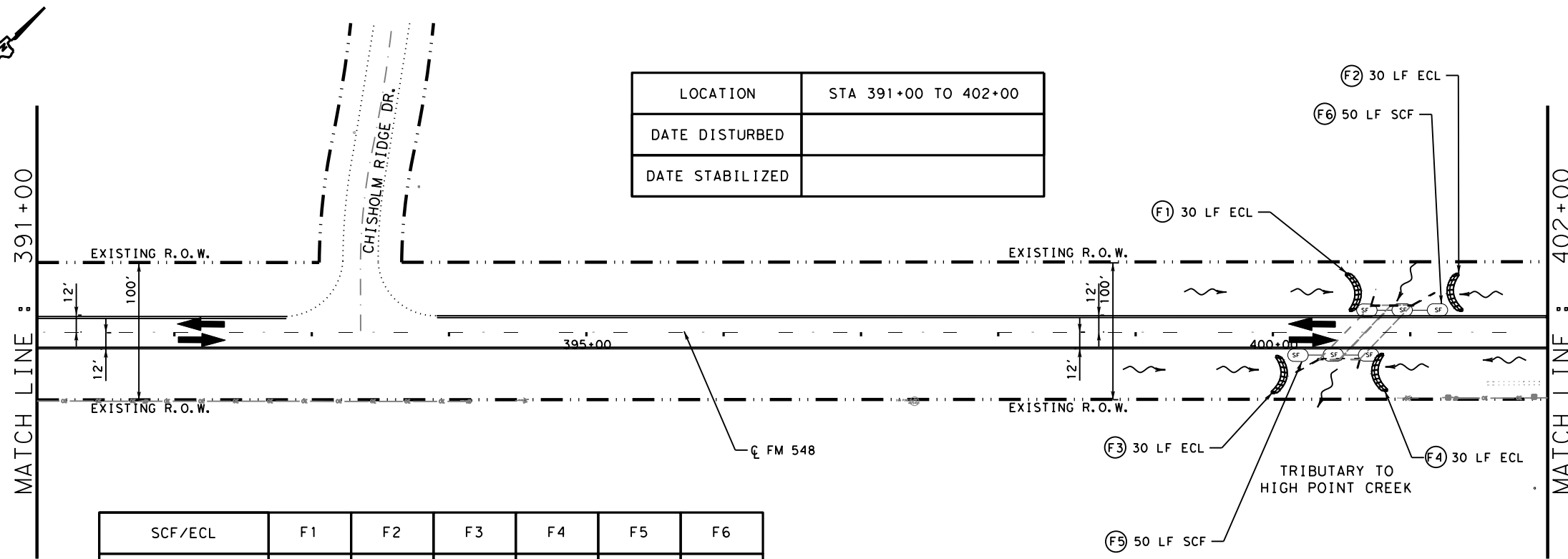


BEGIN CSJ  
 STA. 385+89.00  
 CSJ 2588-02-011

END CSJ  
 STA. 385+89.00  
 CSJ 2588-01-021

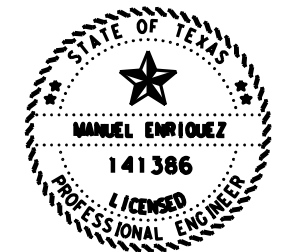
NOTES:

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LOCATION	STA 391+00 TO 402+00
DATE DISTURBED	
DATE STABILIZED	

SCF/ECL	F1	F2	F3	F4	F5	F6
INSTALL DATE:						
REMOVE DATE:						



*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date

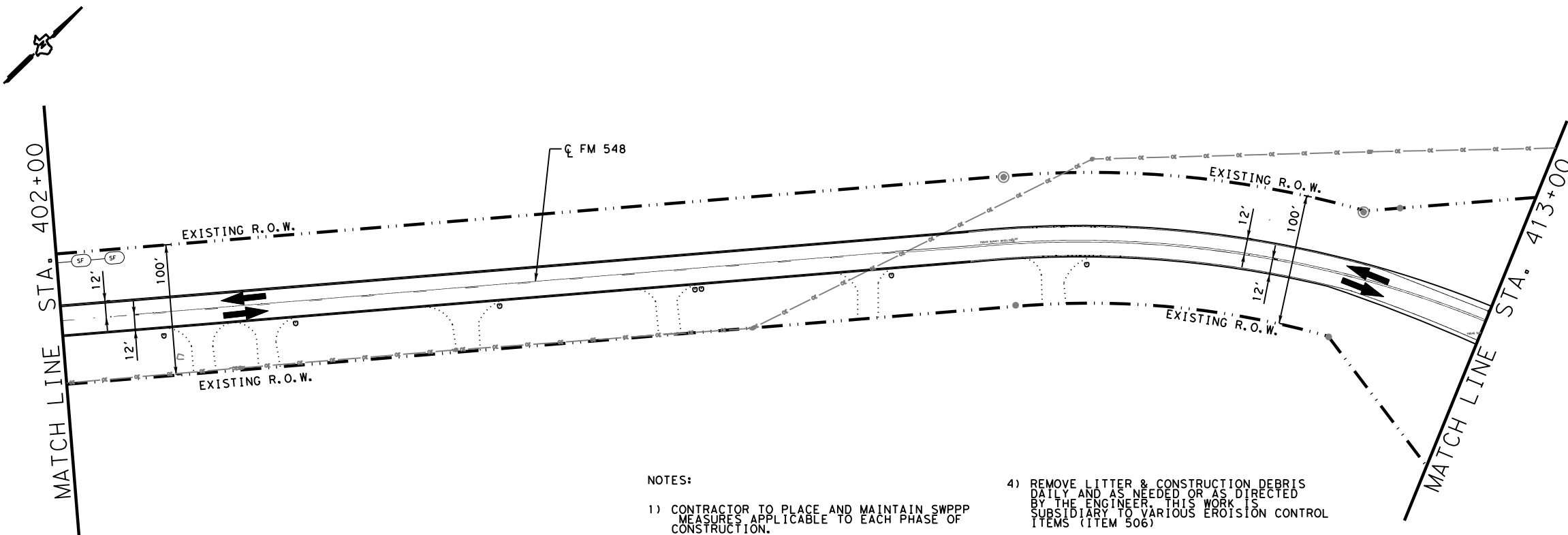


FM 548  
 SW3P SITE MAP

SCALE: 1"=100' SHEET 9 OF 10

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
VD	6	(SEE TITLE SHEET) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
VD	TEXAS	DAL	KAUFMAN, ETC.	105
CHECK	ME	CONTROL	SECTION	
CHECK	FR	0197	04	
				JOB
				084, ETC.

DATE: 1/3/2023 9:25:31 PM  
 FILE: pw://ttdot.projectwiseonline.com:TxDOT5/Documents/18 - DAL/Design Projects/258801021/4 - Design/Plan Set/9. Environmental/10 SW3P LAYOUT.dgn



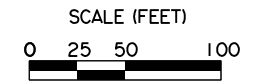
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- 6) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.
- 7) PROTECT TREES AND THEIR ROOTS, IF ALL POSSIBLE, PRESERVE CREEKSIDE VEGETATION TO THE EXTENT PRACTICABLE.

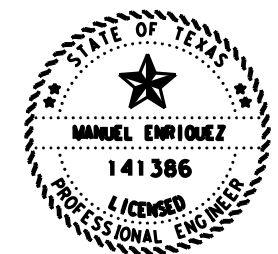
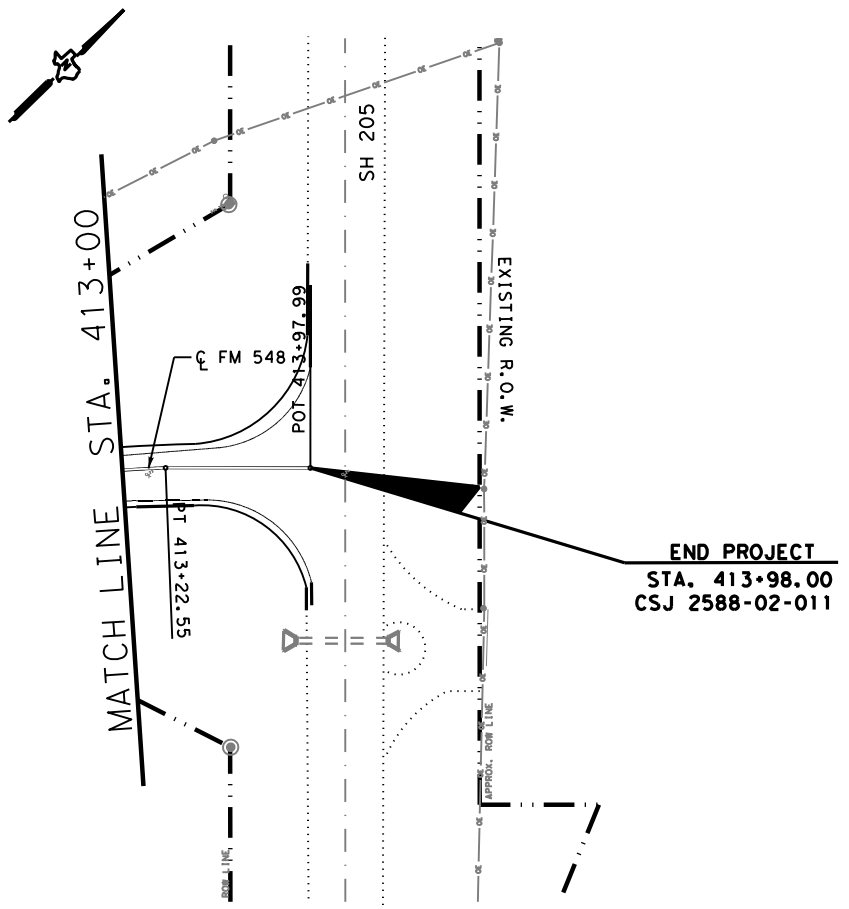
LEGEND:

- TEMP SCF
- EROSION CONTROL LOGS
- WATER FLOW DIRECTION
- DISTURBED AREA
- BMP INSTALLATION

TRAVEL LANE & DIRECTION



NOTE  
 USE PC STATION AS BEGIN CURVE AND PT STATION AS END CURVE WHEN STRIPING EXISTING SECTIONS.



*Manuel Enriquez P.E.*, P.E. 12-20-22  
 Signature of Registrant & Date

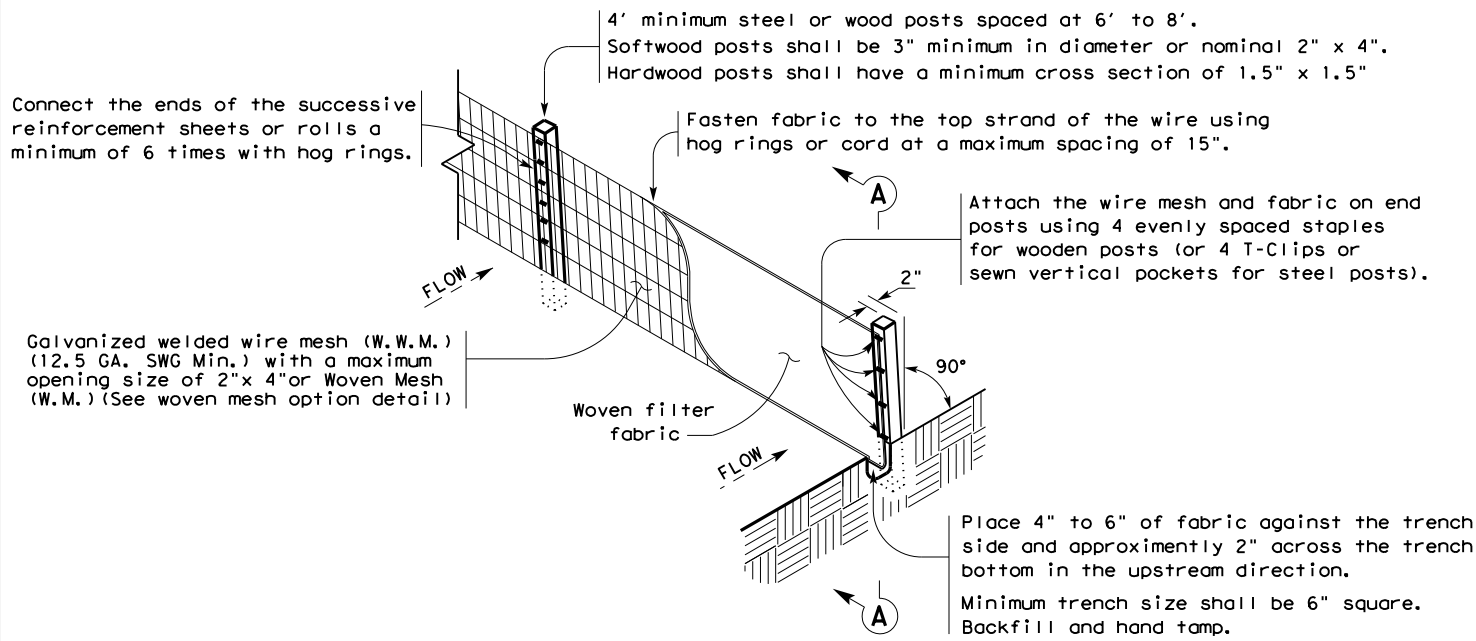


**FM 548  
 SW3P SITE MAP**

SCALE: 1"=100' SHEET 10 OF 10

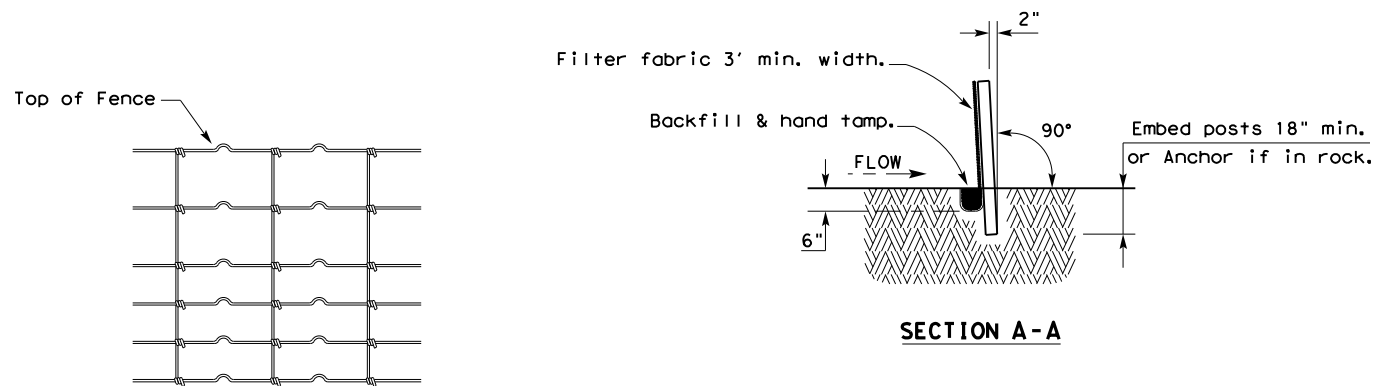
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VD	6	(SEE TITLE SHEET) US		175, ETC
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VD	TEXAS	DAL	KAUFMAN, ETC.	106
CHECK	ME	CONTROL	SECTION	
CHECK	FR	0197	04	
			JOB	
			084, ETC.	

10/17/2023  
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**TEMPORARY SEDIMENT CONTROL FENCE**

SCF



**HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL**

Galvanized hinge joint knot woven mesh (12.5 GA. SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

**SEDIMENT CONTROL FENCE USAGE GUIDELINES**

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT<sup>2</sup>. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

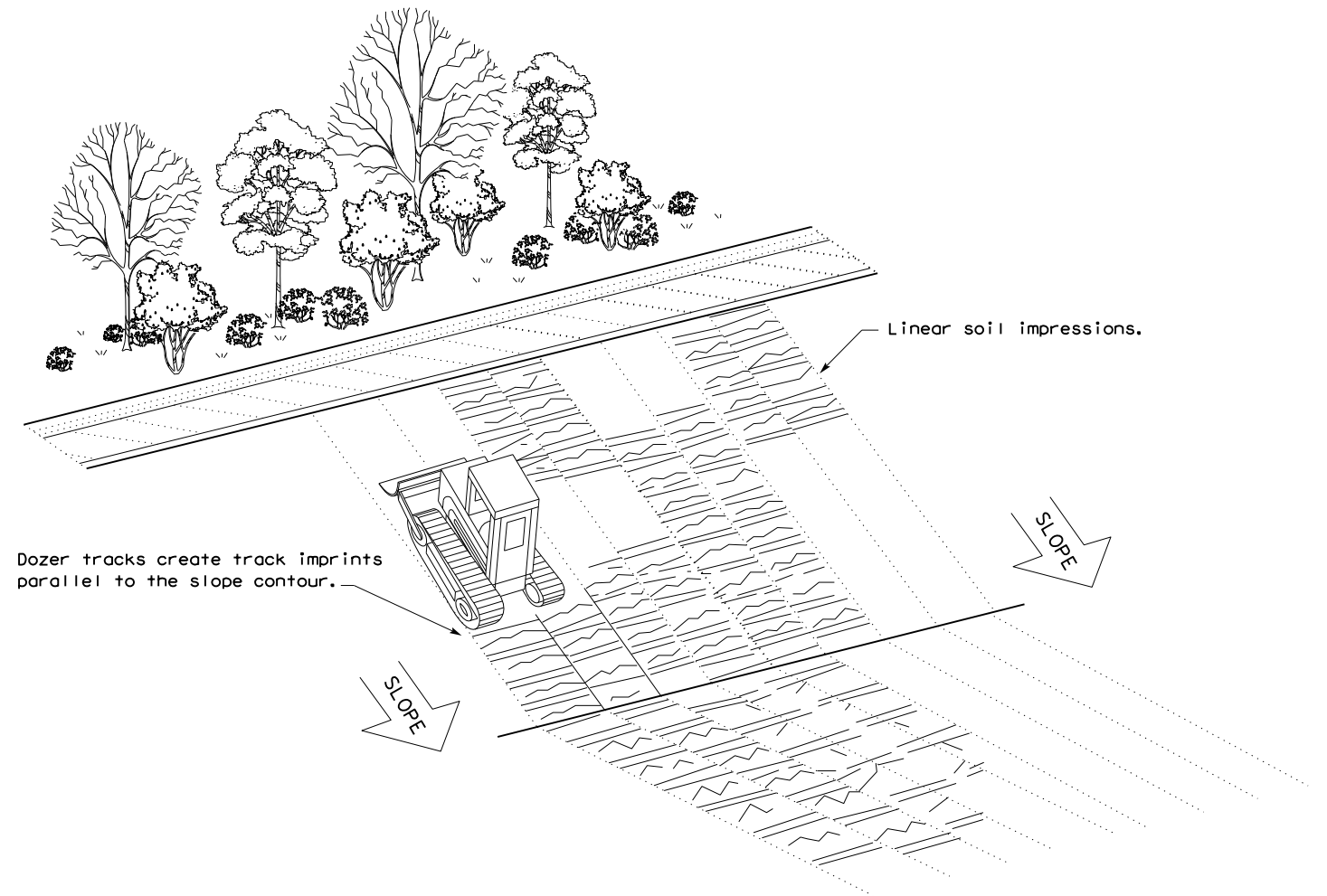
**LEGEND**

Sediment Control Fence

SCF

**GENERAL NOTES**

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continuous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.

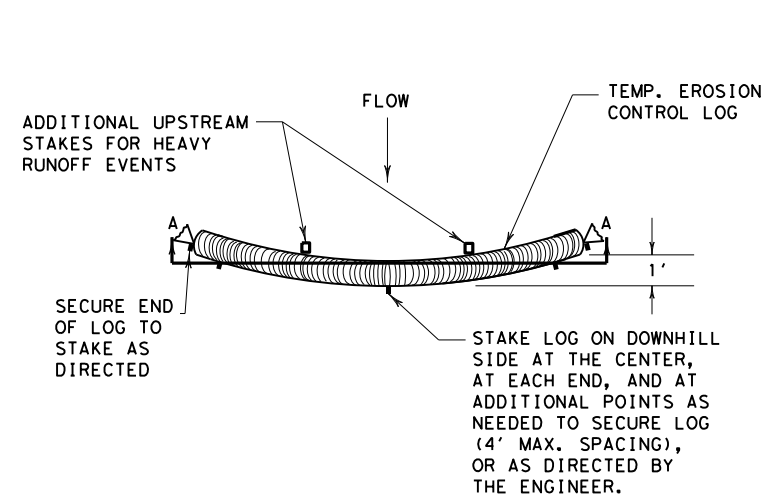


**VERTICAL TRACKING**

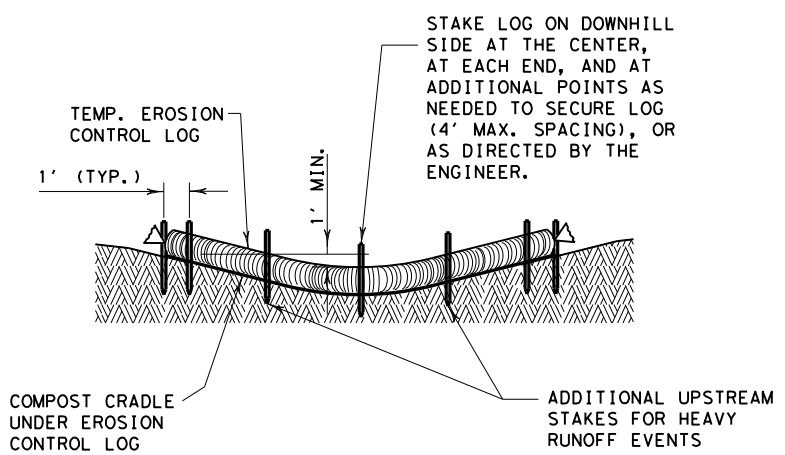
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<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE &amp; VERTICAL TRACKING</b> <b>EC(1) - 16</b>					
FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
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	DAL	KAUFMAN, ETC.	107		



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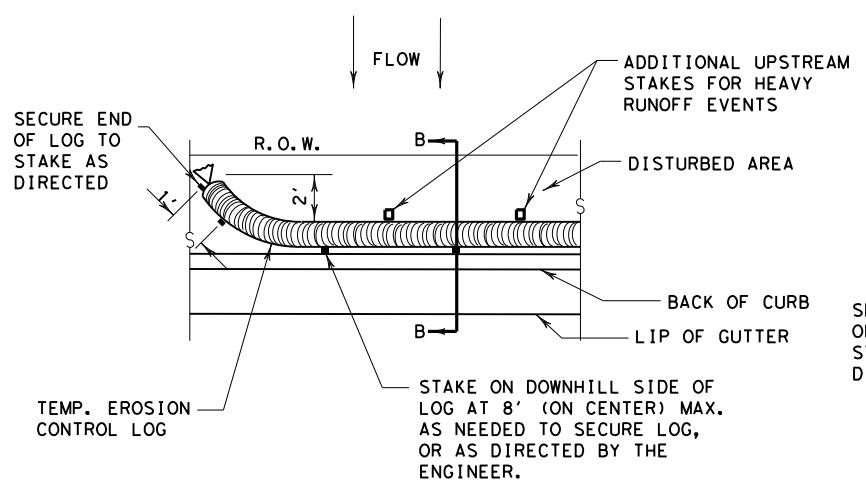


PLAN VIEW

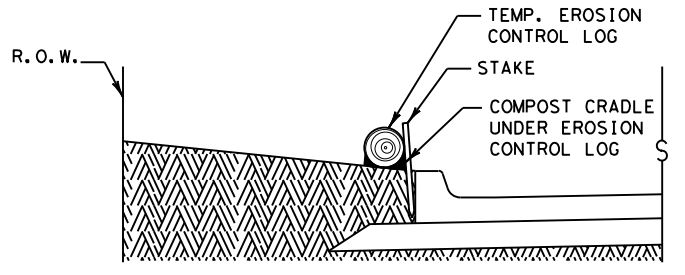


SECTION A-A  
EROSION CONTROL LOG DAM

CL-D

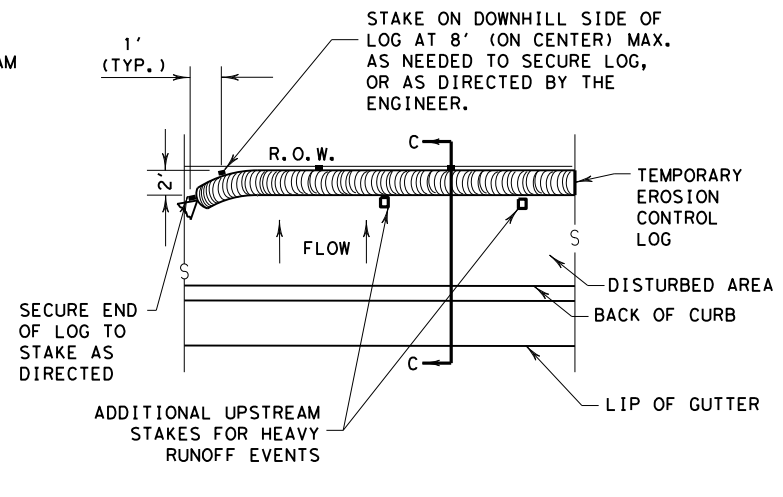


PLAN VIEW

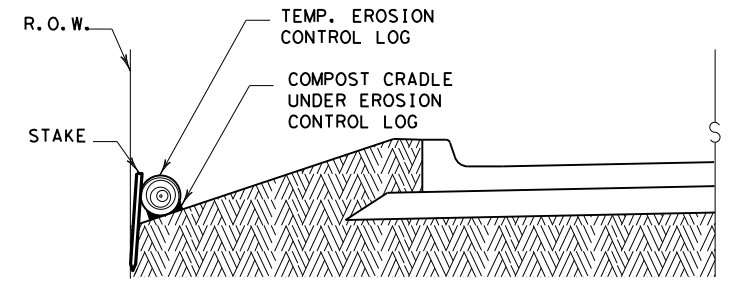


SECTION B-B  
EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



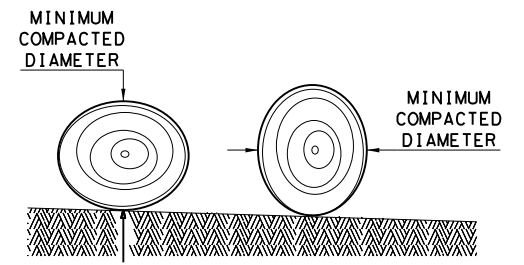
PLAN VIEW



SECTION C-C

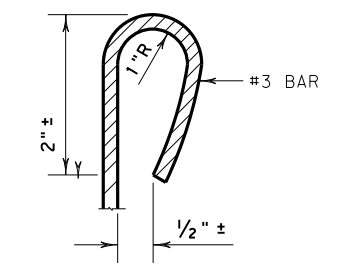
EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

- 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

**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.

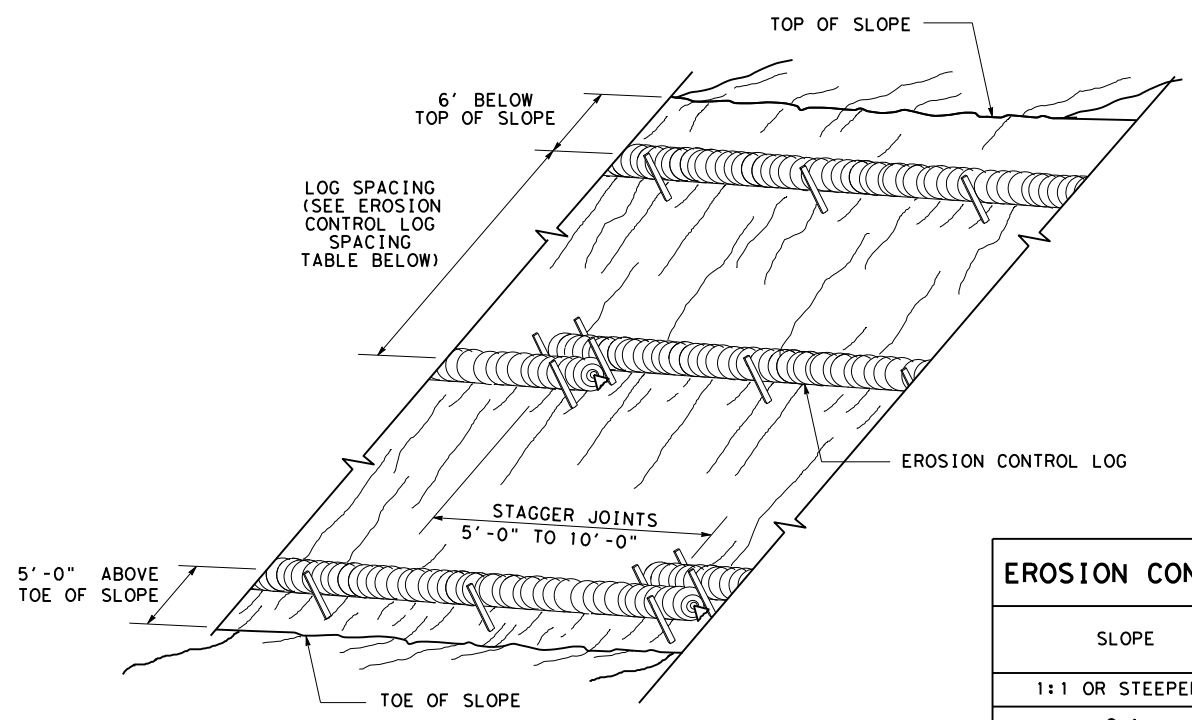
**GENERAL NOTES:**

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'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.

SHEET 1 OF 3

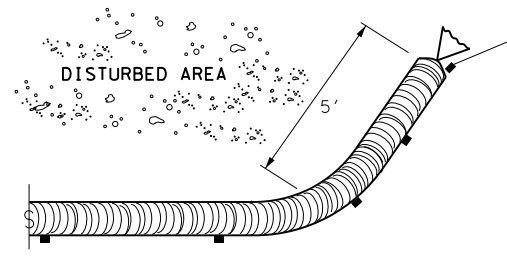
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<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>EROSION CONTROL LOG</b> <b>EC (9) - 16</b>			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
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	DIST	COUNTY	SHEET NO.
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**EROSION CONTROL LOGS ON SLOPES  
STAKE AND TRENCHING ANCHORING**

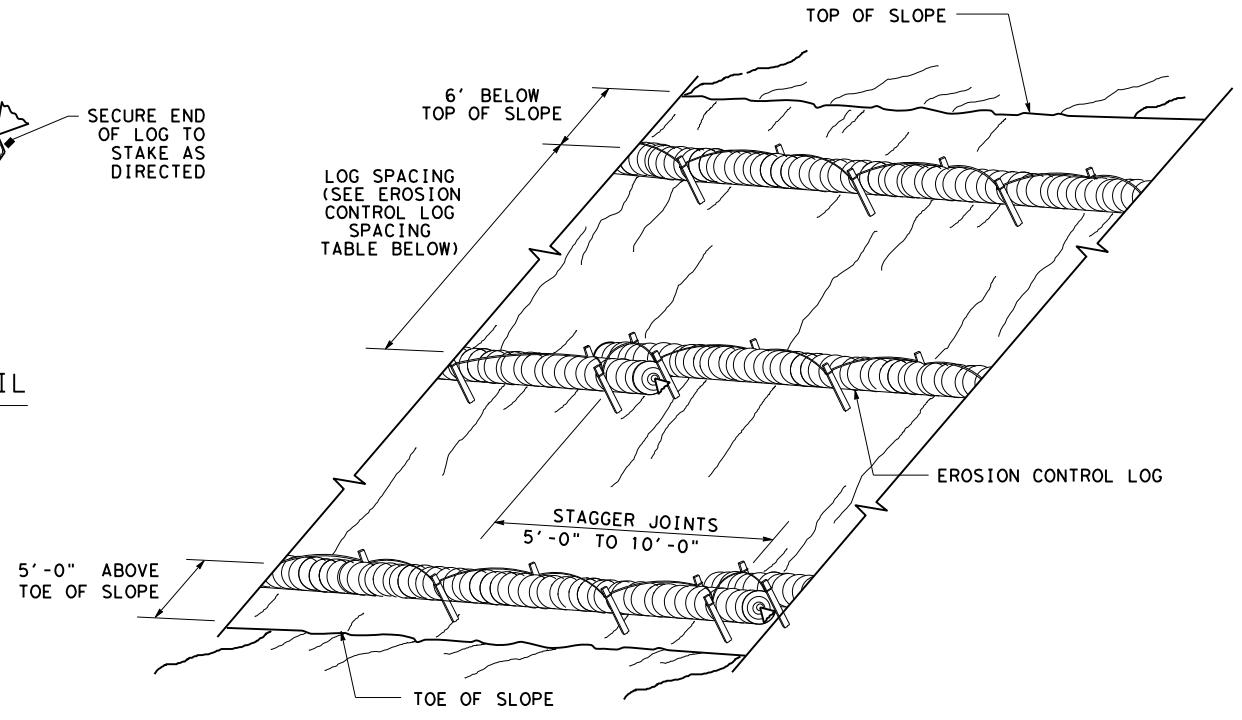
CL-SST



**END SECTION RAP DETAIL**

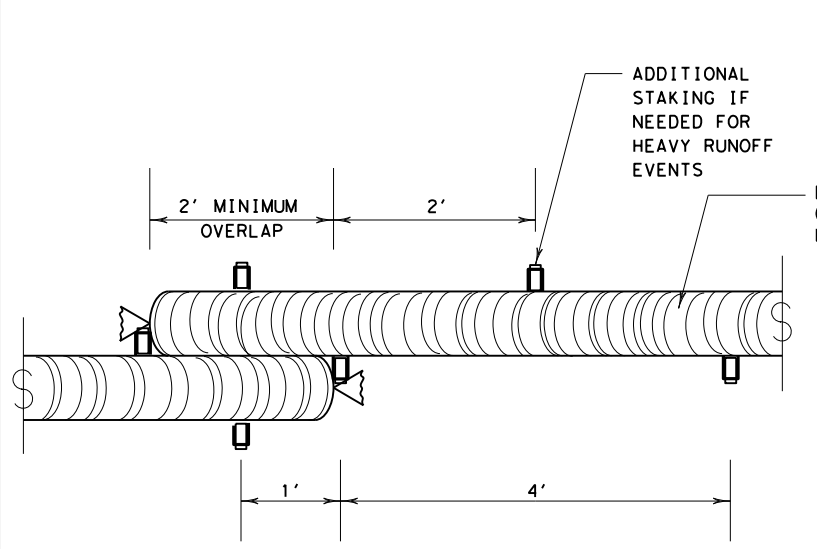
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

\* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:  
 SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;  
 HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



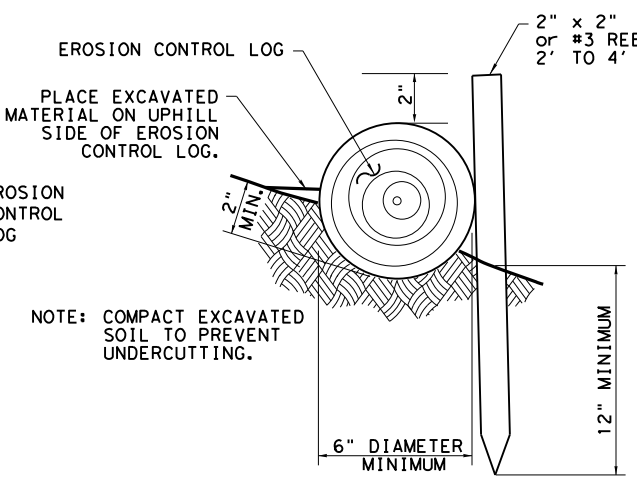
**EROSION CONTROL LOGS ON SLOPES  
STAKE AND LASHING ANCHORING**

CL-SSL



**STAKE AND TRENCHING ANCHORING DETAIL**

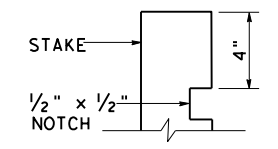
CL-SST



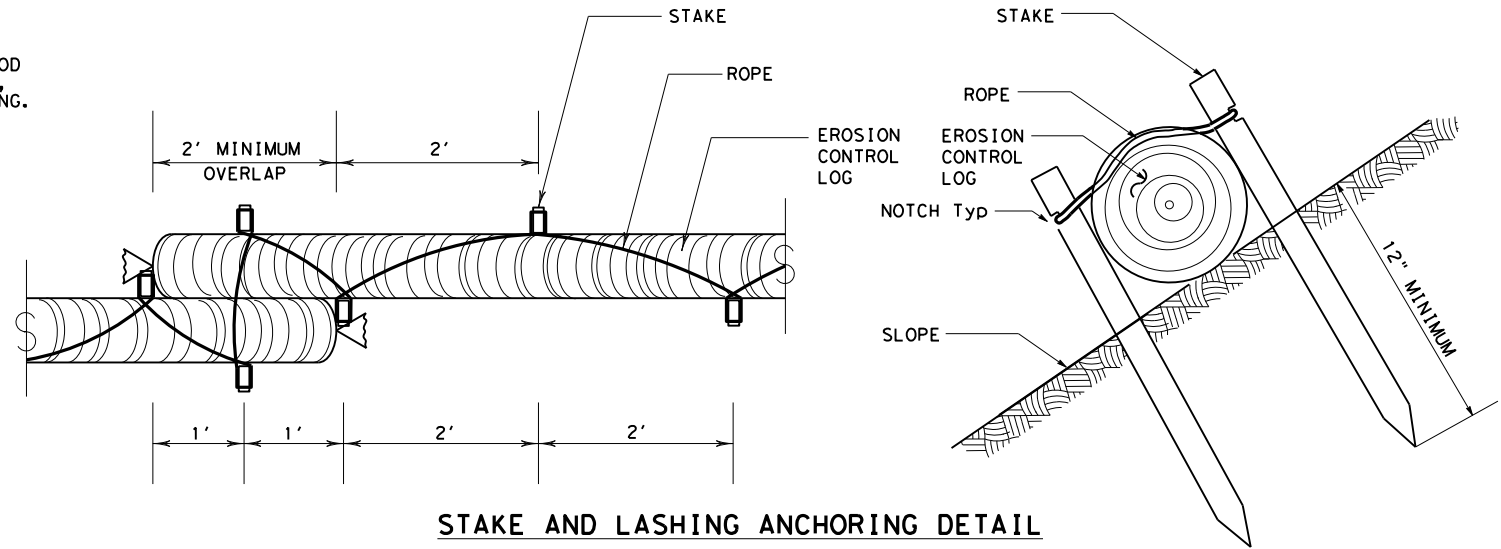
**STAKE AND LASHING ANCHORING DETAIL**

CL-SSL

TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"



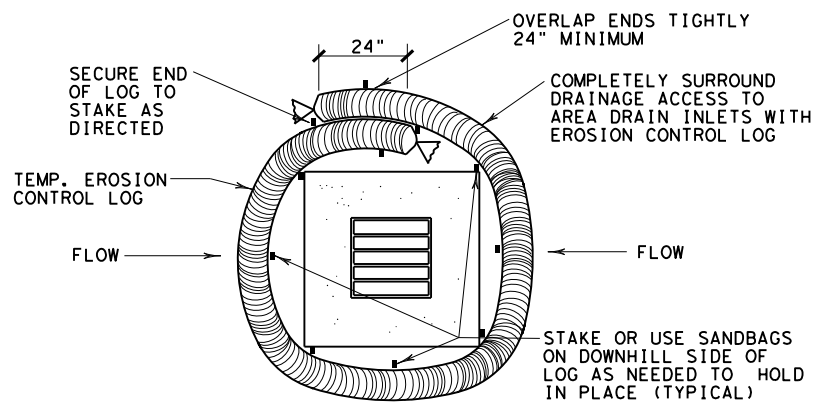
**STAKE NOTCH DETAIL**



SHEET 2 OF 3

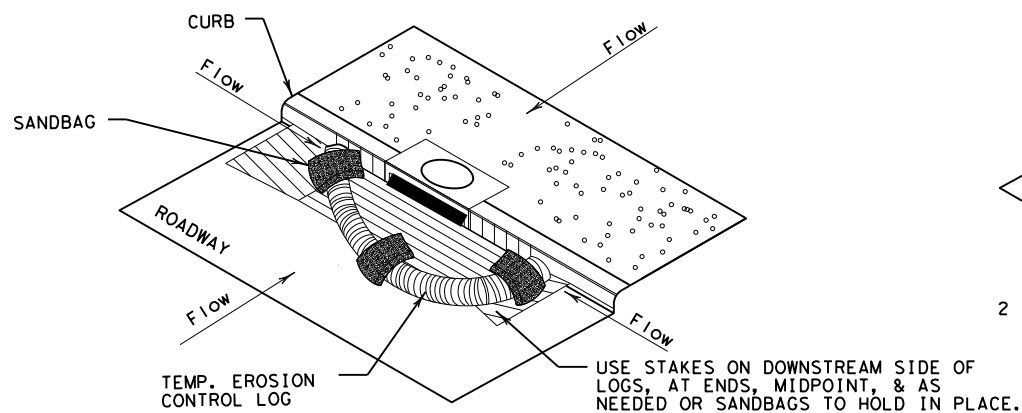
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DAL	KAUFMAN, ETC.	109	

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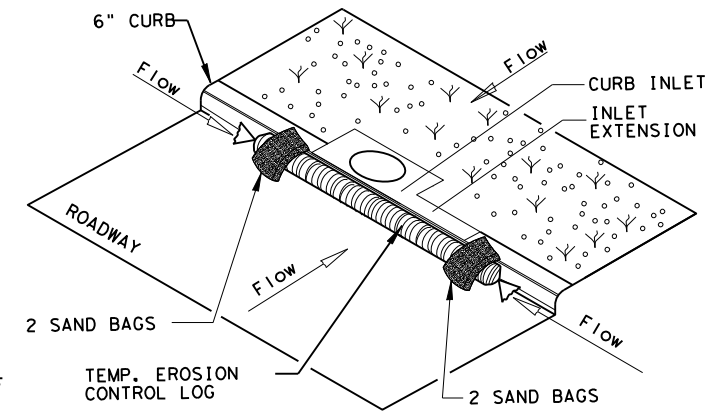
**EROSION CONTROL LOG AT DROP INLET**

CL-DI



**EROSION CONTROL LOG AT CURB INLET**

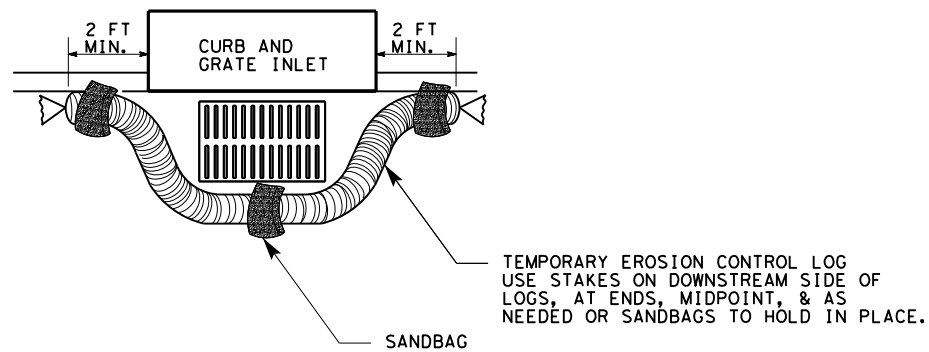
CL-CI



**EROSION CONTROL LOG AT CURB INLET**

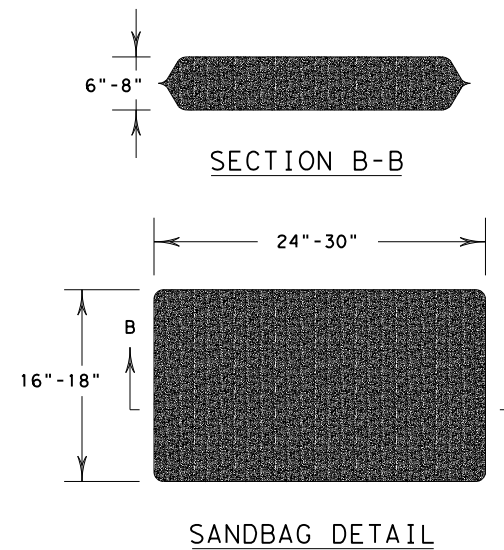
CL-CI

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



SHEET 3 OF 3

		<i>Design Division Standard</i>	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>EROSION CONTROL LOG</b> <b>EC (9) - 16</b>			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
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REVISIONS	0197	04	084, ETC.
DIST	COUNTY	SHEET NO.	
DAL	KAUFMAN, ETC.	110	

USER ID

**SURFACE PREPARATION** ITEM 160\* TOPSOIL SY / ITEM 161\* COMPOST MANUF. TOPSOIL (BOS) (4") SY

**SURFACE PREPARATION**

Prepare planting area surface BEFORE placing Topsoil, Compost, Fertilizer, Seed and/or Sod. Once project area has been completed to final lines, grade and compaction, remove objectionable materials from planting area surface and cultivate existing surface to a depth of 4 inches, unless otherwise specified or directed.

Refer to Items 160 and 161 of TxDOT 2014 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:**

- 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.
- 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.
- Place Topsoil on pre-cultivated surface, spread to a uniform loose cover at thickness specified, and shape per plans. Water and roll the finished surface with a light roller or other suitable equipment per Item 160.3; do not over-compact.

**COMPOST NOTES:**

- 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.
- Contractor shall provide tickets/invoices that document material type, quantity and placement for all compost delivered.
- 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-cultivated 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 AC

**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:**

- Refer to Item 166 of TxDOT 2014 Standard Specifications\* for specifications, dimensions, volumes, and measurements that have been modified or not shown in plans. Materials and construction shall meet all specifications.
- Apply fertilizer BEFORE seeding, or AFTER placing sod.
- 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 lbs Nitrogen per acre without Engineer concurrence.
- 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.
- Apply fertilizer uniformly, as a dry, granular material, essentially dust-free, and do not mix with water for application as a slurry.
- 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 SEEDING AC

RECOMMENDED PLANTING SEASON	PERMANENT RURAL SEED MIX ITEM 164 - DRILL SEEDING (PERM) (RURAL) (CLAY)	PERMANENT URBAN SEED MIX ITEM 164 - DRILL SEEDING (PERM) (URBAN) (CLAY)	TEMPORARY DRILL SEED MIX ITEM 164 - DRILL SEEDING (TEMP) (WARM OR COOL)
<b>WARM SEASON</b> Mar. 15th, April, May, June, July, August, Sept. 15th	Green Sprangletop (Van Horn) - 1.0 lbs/AC Sideoats Grama (Haskell) - 1.0 lbs/AC Texas Grama (Atascosa) - 1.0 lbs/AC Hairy Grama (Chaparral) - 0.4 lbs/AC Shortspike Windmillgrass (Welder) - 0.2 lbs/AC Little Bluestem (OK Select) - 0.8 lbs/AC Purple Prairie Clover (Cuero) - 0.6 lbs/AC Engelmann Daisy (Eldorado) - 0.75 lbs/AC Illinois Bundlesflower - 1.3 lbs/AC Awnless Bushsunflower (Plateau) - 0.2 lbs/AC	Green Sprangletop (Leptochloa dubia) - 0.3 lbs/AC Sideoats Grama (El Reno) (Bouteloua curtipendula) - 3.6 lbs/AC Buffalograss (Texoka) (Buchloe dactyloides) - 1.6 lbs/AC Bermudagrass (Cynodon dactylon) - 2.4 lbs/AC	Foxtail Millet (Setaria italica) - 34 lbs/AC
<b>COOL SEASON</b> Sept 16th, Oct, Nov, Dec, Jan, Feb, Mar 14th			Pure Live Seed Rate** Tall Fescue (Festuca arundinaceae) - 4.5 lbs/AC Western Wheatgrass (Agropyron smithii) - 5.6 lbs/AC Red Winter Wheat (Triticum aestivum) - 34 lbs/AC Cereal Rye - 34 lbs/AC

**SEEDING NOTES:**

- When seeding is specified under Item 164, refer to TxDOT 2014 Standard Specifications\* for specifications, dimensions, volumes, and measurements that have been modified or not shown. Materials and construction shall meet specifications.
- Conduct seeding upon completion of each applicable construction stage (dependent upon planting season requirements), without compensation for additional move-ins.
- Place seed AFTER preparing planting area surface. Refer to Surface Preparation detail in 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.
- 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, cultivate planting area to a depth as described in Item 164.3, before temporary seeding and before permanent seeding.
- 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 1-4 of the TxDOT 2014 Standard Specifications\* for Item 164, unless otherwise specified.
- 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.
- Uniformly plant seed over the designated planting area, along the contour of slopes, and drill seed to a depth as described in Item 164.3.4.
- Hydroseeding may be allowed, when specified or Engineer concurs.
- 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" 2014
- "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 SOD (BERMUDA) SY

BLOCK OR ROLL SOD	COMMON NAME	BOTANICAL NAME
	Common Bermuda Grass	Cynodon dactylon

**SODDING NOTES:**

- Refer to Item 162 of TxDOT 2014 Standard Specifications\* for specifications, dimensions, volumes, and measurements that have been modified or not shown in plans. Materials and construction shall meet all specifications.
- 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.
- Place sod only AFTER soil surface preparation is complete as detailed in this sheet. Dry soil may require pre-watering.
- 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.
- 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.
- Place fertilizer promptly AFTER sodding operation is complete in each area.
- Water sod immediately following placement, and continue Vegetative Watering per Item 168.

**VEGETATIVE WATERING FOR ESTABLISHING SEED AND SOD** ITEM 168\* VEGETATIVE WATERING MG

SEASON (Usual Months)	RATE	TIME SCHEDULE	TOTAL WATER ESTIMATE
SPRING & FALL (March, April, May, 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 the sod is placed and continue for a minimum of 15 consecutive working days.	420,000 gallons/acre (60 working days)
SUMMER (June, July, August, 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 for 15 consecutive working days	15,000 gallons/acre (15 working days)

Notes: 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 MG

**VEGETATIVE WATERING NOTES:**

- Refer to Item 168 of TxDOT 2014 Standard Specifications\* for specifications, dimensions, volumes, and measurements that have been modified or not shown in plans. Materials and construction shall meet all specifications.
- Use clean water free of industrial waste and other substances harmful to vegetation growth, per Item 168.2.
- 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. Delay watering operations for warm season grasses until soil temperature exceeds 70 degrees F.
- For sod, water immediately.
- 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.
- 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.
- Do not water between the hours of 12:00 p.m. and 6:00 p.m. when daytime temperatures exceed 95 degrees F.
- 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.
- 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 rain equals 7,000 gallons of water per acre.)
- 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\* PROJECT MAINTENANCE AC

**MOWING NOTES:**

- During project construction, once seed is established, use mowing to promote permanent grasses by mowing any remaining temporary grasses.
- Also mow established turf and ROW grasses in designated areas of project limits as specified or directed by Engineer.
- Remove litter and debris prior to mowing.
- Do not mow on wet ground when soil rutting can occur.
- Hand-trim around obstructions and stormwater control devices as needed.
- Maintain paved surfaces free of tracked soils and clipped vegetation.

**SEQUENCE OF WORK:**

- CULTIVATE 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.



**VEGETATION ESTABLISHMENT SHEET**  
(DALLAS DISTRICT)

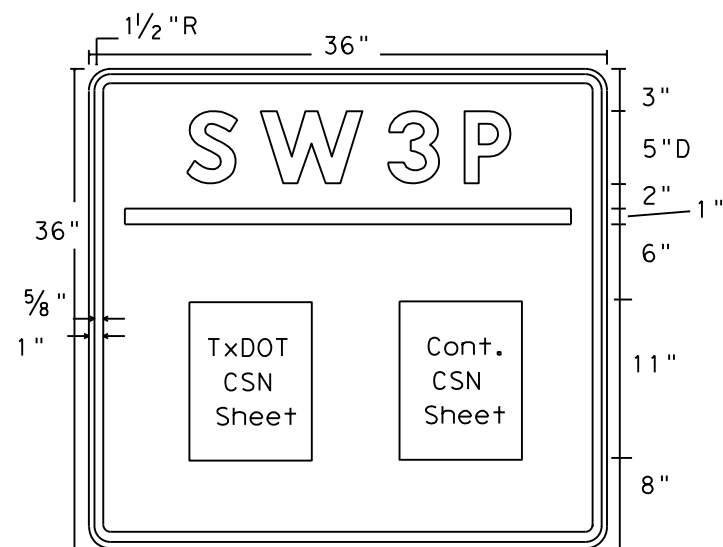
TEMPLATE REVISION DATE: 02/21/19

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
VD	6	(See Title Sheet) US		175, ETC
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
VD	TEXAS	DALLAS	KAUFMAN, ETC.	111
CHECK	CONTROL	SECTION	JOB	
ME	0197	04	084, ETC.	

DATE

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LEVELS DISPLAYED	1
PATH:	



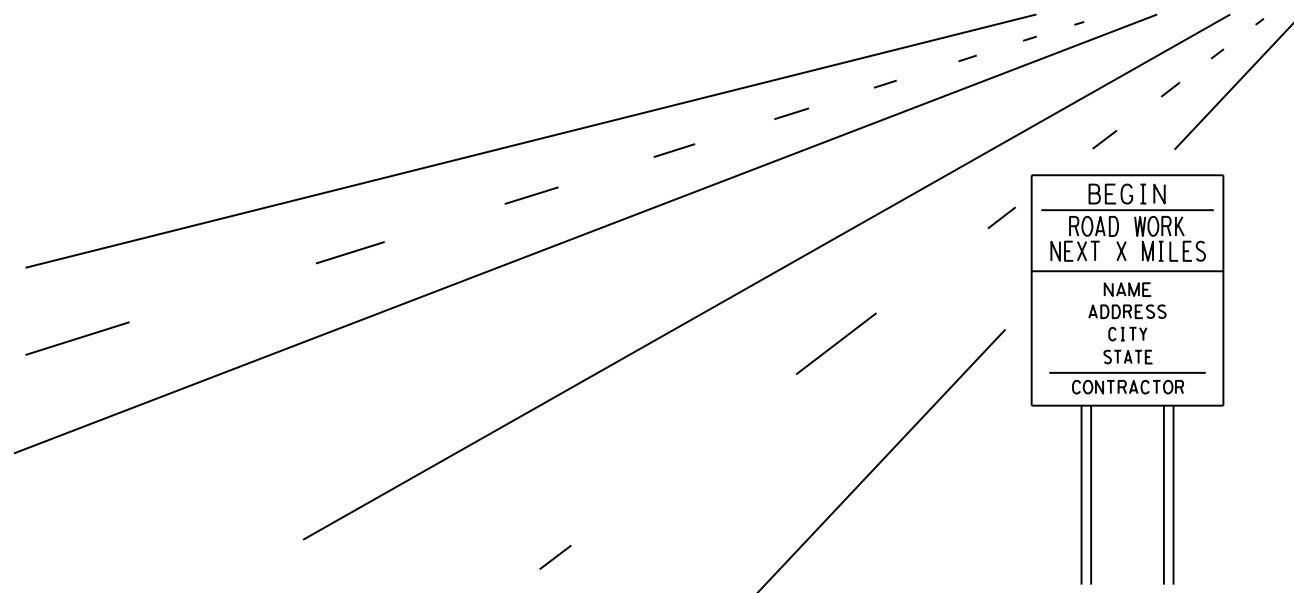
### Sign Dimensions

36" X 36"

- Letters - White
- Numbers - White
- Border - White
- Background - Blue

## SW3P SIGN

TxDOT & Contractor  
Construction Site Note  
(CSN)



### GENERAL NOTES:

- 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.
- 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.
- CSN Sheets will be laminated and attached to the sign with an adhesive. Ensure sheets remain dry. (See Figure 1).
- 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.
- Final location of the signs will be as approved by the Engineer.

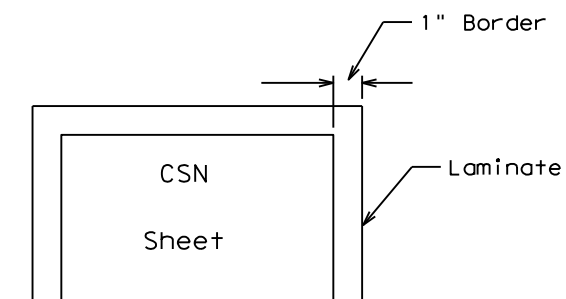


Figure 1

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#	DW# I&DOT	CR#	DW#	CR#
©TxDOT 2016	DISTRICT	FEDERAL AID PROJECT		SHEET
	18	(SEE TITLE SHEET)		112
REVISION DATE: 10-16-15	COUNTY	CONTROL SECT	JOB	HIGHWAY
	KAUFMAN, ETC.	0197	04	084US175