DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
AT	6	NH 2021 (333)		US380, ETC.
GRAPHICS AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DMH	TEXAS	DALLAS	DENTON	1
CHECK DMH	CONTROL 0134	SECTION 09	JOB 067, ETC.	

FINAL PLANS

NAME OF CONTRACTOR: _____

DATE OF LETTING: _____

DATE WORK BEGAN: _____

DATE WORK COMPLETED: _____

DATE WORK ACCEPTED: _____

SUMMARY OF CHANGE ORDERS:

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL -AID PROJECT
NH 2021(333)
CSJ: 0134-09-067, ETC

US 380 DESIGN SPEEDS = N/A
FUNCTIONAL CLASSIFICATION = PRINCIPAL ARTERIAL-OTHER
ADT(2020) = 16,875
ADT(2040) = 23,053

SH 114 DESIGN SPEEDS = N/A
FUNCTIONAL CLASSIFICATION = PRINCIPAL ARTERIAL-OTHER
ADT(2020) = 19,583
ADT(2040) = 25,291

US 380, ETC.
DENTON COUNTY

US 380
CSJ: 0134-09-067

LIMITS: FROM WISE CO LINE TO: FM 156

ROADWAY	=	41,500.00	FT. =	7.860	MI.
BRIDGE	=	0.00	FT. =	0.000	MI.
TOTAL	=	41,500.00	FT. =	7.860	MI.

SH 114
CSJ: 0353-02-079

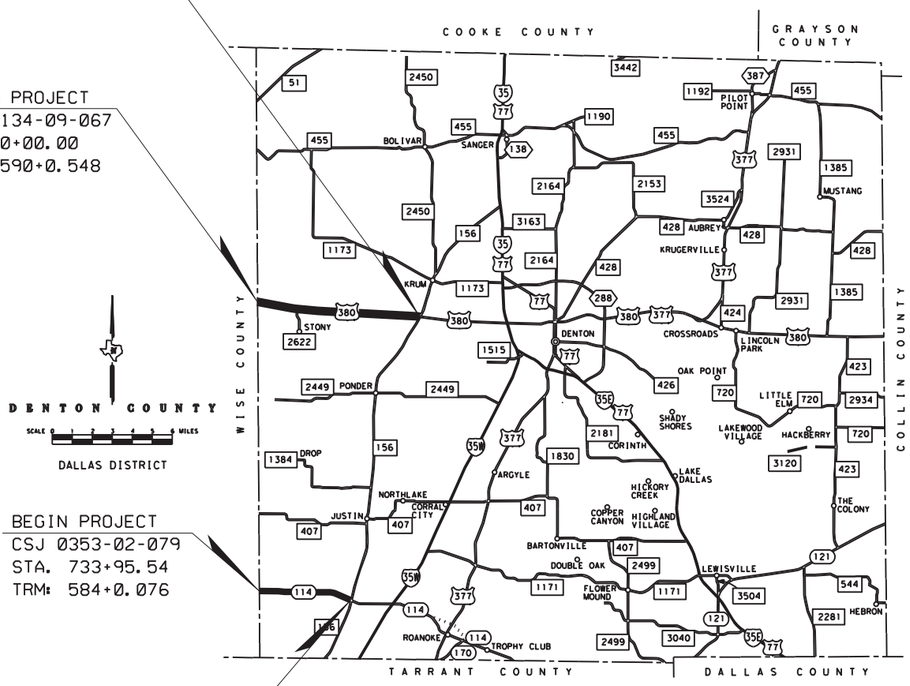
LIMITS: FROM WISE CO LINE TO: FM 156

ROADWAY	=	24,104.46	FT. =	4.565	MI.
BRIDGE	=	0.00	FT. =	0.000	MI.
TOTAL	=	26,928.00	FT. =	4.565	MI.

END PROJECT
CSJ 0134-09-067
STA. 415+00.00
TRM: 600+0.321

FOR THE CONSTRUCTION OF SAFETY IMPROVEMENTS
CONSISTING OF: CABLE BARRIER ISTALLATION

BEGIN PROJECT
CSJ 0134-09-067
STA. 0+00.00
TRM: 590+0.548



BEGIN PROJECT
CSJ 0353-02-079
STA. 733+95.54
TRM: 584+0.076

END PROJECT
CSJ 0353-02-079
STA. 975+00.00
TRM: 584+5.174

US 380	SH 114
EQUATION: NONE	EQUATION: NONE
EXCEPTION: NONE	EXCEPTION: EBML FROM STA 889+59 TO STA 915+09
RAIL ROAD: NONE	RAIL ROAD: NONE

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: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, MAY 1, 2012)

WORK WAS COMPLETED ACCORDING TO THE PLANS AND CONTRACT.

_____, P.E.
Signature of Registrant & Date

TEXAS DEPARTMENT OF TRANSPORTATION

SUBMITTED FOR LETTING 12/1/2020
DocuSigned by: Danny Henderson, P.E.
F759E84E0E2C45C...

RECOMMENDED 12/2/2020
DocuSigned by: , P.E.
CD810F6E0D584EF... NSPORTATION PLANNING & DEVELOPMENT

RECOMMENDED FOR LETTING 12/1/2020
DocuSigned by: Tina Massey, P.E.
67C086181E47414... R

APPROVED FOR LETTING 12/2/2020
DocuSigned by: , P.E.
E2527853E8DE475... NGINEER

DATE:

INDEX OF SHEETS

STATE OF TEXAS
DANNY MICHAEL HENDERSON
119091
LICENSED
PROFESSIONAL ENGINEER

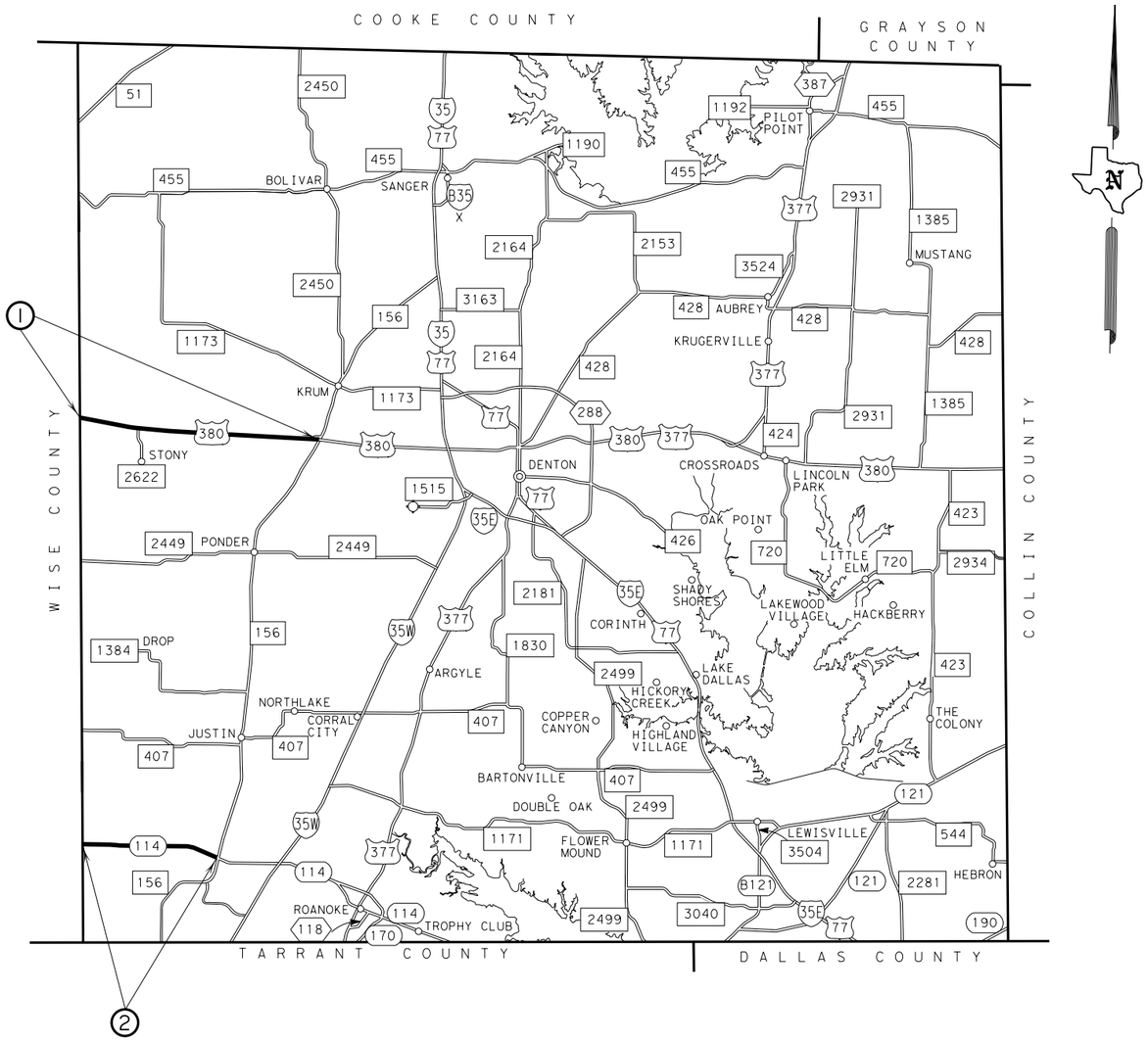
✱ THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

DocuSigned by:
Danny Henderson 12/15/2020
E759E84E0E2C45C... , P.E.
Signature of Registrant & Date

Texas Department of Transportation

INDEX OF SHEETS

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
AT	6	(See Title Sheet)		US380, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AT	TEXAS	DALLAS	DENTON	2
CHECK	CONTROL	SECTION	JOB	
KKD	0134	09	067, ETC.	
CHECK				
KKD				



REF. NO.	HIGHWAY	CSJ	LIMITS	LENGTH IN MILES	STA BEG.	STA END
①	US 380	0134-09-067	FROM: WISE CO LINE TO: FM 156	7.860	0+00.00	415+00.00
②	SH 114	0353-02-079	FROM: WISE CO LINE TO: FM 156	4.565	733+95.54	975+00.00

STATE OF TEXAS
DANNY MICHAEL HENDERSON
119091
LICENSED
PROFESSIONAL ENGINEER

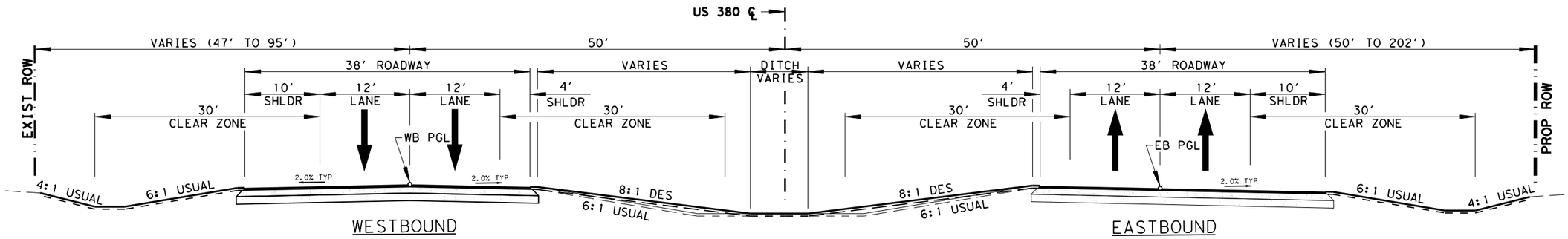
DocuSigned by:
Danny Henderson 12/10/2020
F759E84E0E2C45C...

PROJECT LAYOUT

SCALE: NTS

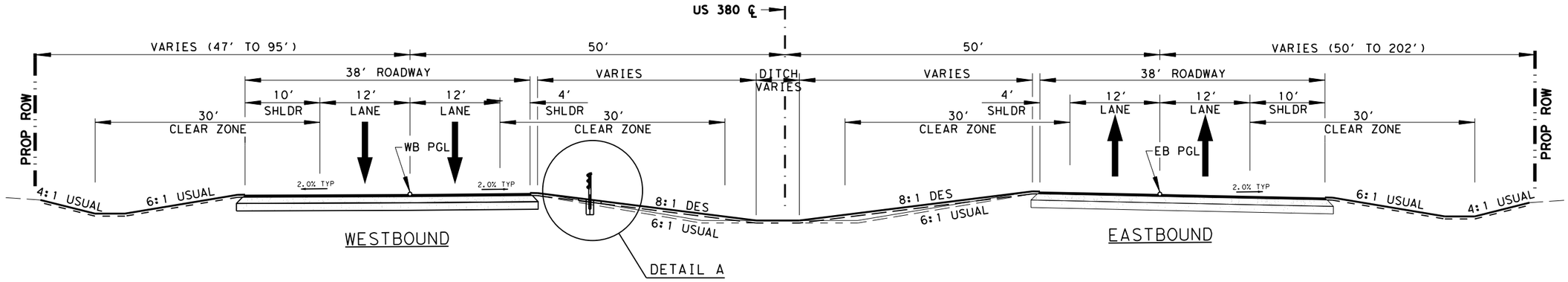
DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET) US380,ETC.		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AT	TEXAS	DALLAS	DENTON	3
CHECK	CONTROL	SECTION	JOB	
DMH	0134	09	067,ETC.	
CHECK				
DMH				

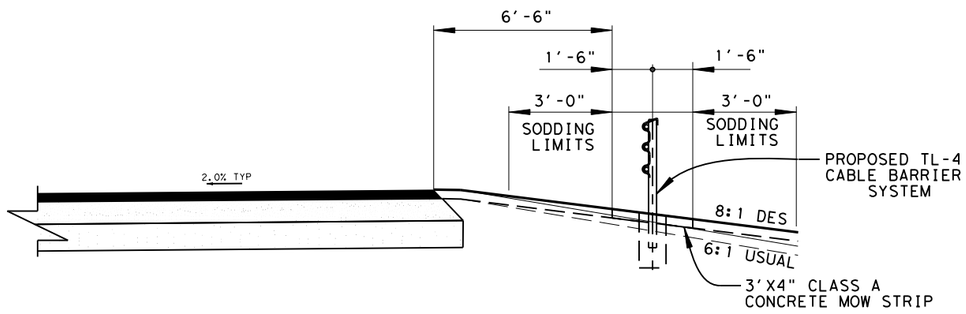
US 380



EXISTING TYPICAL SECTION

STA 000+00.00 TO STA 415+00.00





DETAIL A

*NOTE: INSTALLATION OF CABLE BARRIER IS TYPICAL FOR THE EASTBOUND OR WESTBOUND DIRECTION.

PROPOSED TYPICAL SECTION

STA 1+00 TO 20+15.00 WB
STA 22+17.00 TO STA 40+11.00 EB
STA 41+89.00 TO STA 73+09.00 WB
STA 75+11.00 TO STA 107+45.00 EB
STA 109+23.00 TO STA 132+46.00 WB
STA 134+36.00 TO STA 150+57.00 EB
STA 152+51.00 TO STA 190+77.00 WB
STA 192+55.00 TO STA 212+93.00 EB
STA 214+95.00 TO STA 266+94.00 WB
STA 268+72.00 TO STA 281+07.00 EB
STA 283+09.00 TO STA 298+36.00 WB
STA 300+15.00 TO STA 330+31.00 EB
STA 332+33.00 TO STA 380+00.00 WB
STA 390+00.00 TO STA 402+94.00 EB
STA 404+72.00 TO STA 409+00.00 EB

STATE OF TEXAS
DANNY MICHAEL HENDERSON
119091
LICENSED PROFESSIONAL ENGINEER

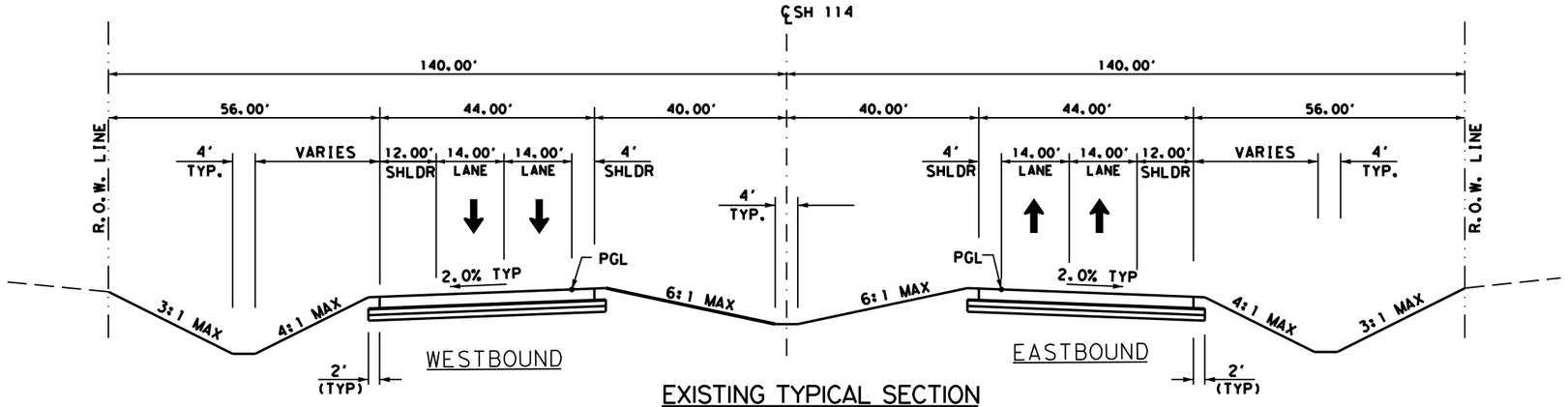
DocuSigned by:
Danny Henderson , P.E.
Signature of Registrant & Date
12/15/2020

Texas Department of Transportation

US 380
TYPICAL SECTIONS

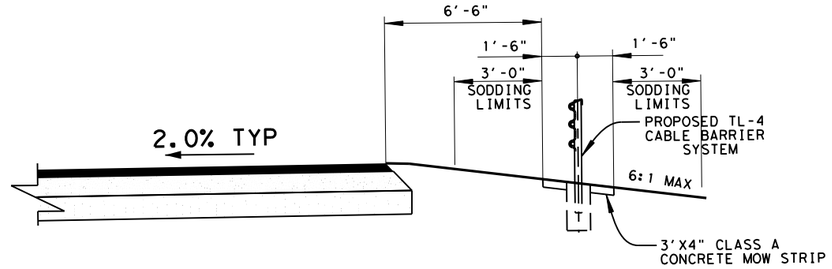
SCALE: NTS

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET) US380,ETC.		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AT	TEXAS	DALLAS	DENTON	4
CHECK	CONTROL	SECTION	JOB	
DMH	0134	09	067,ETC.	
CHECK				
DMH				



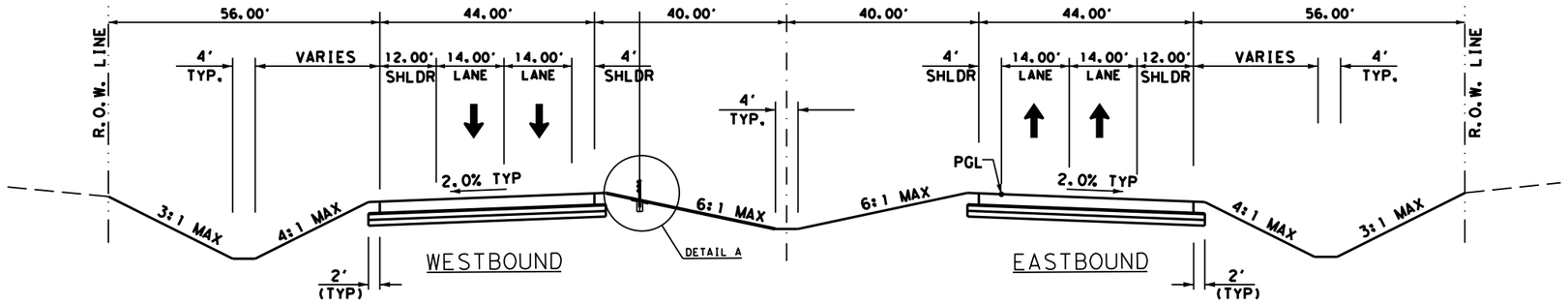
EXISTING TYPICAL SECTION

STA 733+95.54 TO STA 975+00.00



DETAIL A

•NOTE: INSTALLATION OF CABLE BARRIER IS TYPICAL FOR THE EASTBOUND OR WESTBOUND DIRECTION.



PROPOSED TYPICAL SECTION

STA 746+60.00 TO STA 759+58.00 WB
STA 760+87.00 TO STA 776+66.00 EB
STA 777+95.00 TO STA 798+23.00 WB
STA 807+00.00 TO STA 814+60.00 EB
STA 815+89.00 TO STA 834+66.00 WB
STA 835+95.00 TO STA 871+86.00 EB
STA 873+15.00 TO STA 879+10.00 WB
STA 880+64.00 TO STA 897+00.00 WB

STATE OF TEXAS
DANNY MICHAEL HENDERSON
119091
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Danny Henderson, P.E. 12/15/2020
F789F84E0E2C48C...
Signature of Registrant & Date

Texas Department of Transportation

SH 114
TYPICAL SECTIONS

SCALE: N.T.S.

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AT	TEXAS	DAL	DENTON	4A
CHECK	CONTROL	SECTION	JOB	
DMH	0134	09	067,ETC.	
CHECK				
DMH				

Table 1: Basis of Estimate for Permanent Construction					
Item	Description	Thickness	Rate		Quantity
162	Block Sod	N/A	See Specifications		37467 SY
166 *	Fertilizer (12-6-6)	N/A	500	Lbs./Ac	1.94 Ton
168	Vegetative Watering (Warm)**	N/A	12	MG/Ac/Day	5574 MG
*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.					

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 10.47 acres, with US 380 = 5.72 AC & SH 114 = 2.02 AC. 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 as outlined in the plan set Environmental Permits, Issues and Committements (EPIC) Sheet. 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.

The Contractor shall scan all material tickets/invoices sequentially and submit a PDF by the first of the month for payment.

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

CSJ: 0134-09-067,Etc **Sheet 5**

County: Denton

Highway: US380,Etc.

Tina Massey Tina.Massey@txdot.gov
Christopher Rocha Christopher.Rocha@txdot.gov

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

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:
https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/

All questions submitted that generate a response will be posted through this site. The site is organized by District, Project Type (Construction or Maintenance), Letting Date, CCSJ/Project Name.

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

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

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 (noon on December 31 thru 10:00 pm January 1)
- Easter Holiday weekend (noon on Friday thru 10:00 pm Sunday)
- Memorial Day weekend (noon on Friday thru 10:00pm Monday)
- Independence Day (noon on July 3 thru 10:00 pm on July 5)
- Labor Day weekend (noon on Friday thru 10:00 pm Monday)
- Thanksgiving Holiday (noon on Wednesday thru 10:00 pm Sunday)
- Christmas Holiday (noon on December 23 thru 10:00 pm December 26)

Lane and ramp closures during the following key dates and/or special events are prohibited and other dates as directed:

Events		Dates
1	Texas Motor Speedway- NASCAR Series Races	April and November
2	Texas Motor Speedway- INDY Series Races	June and September

Item 8:
This Project will be a Five-Day Workweek in accordance with Article 8.3.1.1.

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 161:
Provide tickets representing quantity of compost delivered to site.

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.

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 440:
Fiber Reinforced Concrete (FRC) can be used as a substitute for Non-Structural Class Reinforced Concrete in Mow-Strip and Rip Rap Items as approved. FRC may also be used for other Non-Structural Class Reinforced Concrete Items as approved.

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.

CSJ: 0134-09-067,Etc **Sheet 5A**

County: Denton

Highway: US380,Etc.

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.

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

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

As approved by the Engineer, provide uniformed off duty police officers and squad cars during lane or ramp closures, night time work or other situations that indicate a need for additional traffic control to protect the traveling public or the construction workforce. Provide documentation such as payroll, log sheets with signatures and badge number, or invoices from the government entity providing the officers for reimbursement. Complete the weekly tracking form provided by the department and submit invoices that agree with the tracking form for payment at the end of each month approved services were provided. Reimbursement will not be made for coordination fees charged by any party.

Limit lane closures along US 380 & SH 114 to the hours between 9:00 am and 3:30 pm. Work in other areas of the project is not restricted to this time frame.

Nighttime work lane closures shall be between 9:00 pm and 6:00 am.

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

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

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

signs, maintenance, and reposting (for replacement or as needed to ensure readability) will be subsidiary to Item 502.

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

Item 543:
Mow strip along cable barrier system shall be constructed in accordance with GF(31)MS-19. Excavate for Mow Strip in accordance with Item 110.

Typical section detail shall superside the standard in case of any conflicts due to width measurements.

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
(1-5) - 18		1

TCP 2 Series	Scenario	Required TMA/TA
(2-6) - 18	All	1

TCP 5 Series	Scenario		Required TMA/TA
(5-1)-18	A	B	1

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.

QUANTITY SHEET

CONTROLLING PROJECT ID 0134-09-067 **DISTRICT** Dallas **COUNTY** Denton
HIGHWAY SH 114, US 380

			CONTROL SECTION JOB		**0134-09-067**		**0353-02-079**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00134269**		**A00134265**			
			COUNTY		**Denton**		**Denton**			
			HIGHWAY		**US 380**		**SH 114**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**		EST.	FINAL	EST.	FINAL		
	110-6003	EXCAVATION (SPECIAL)	CY		1,384.000		600.000		1,984.000	
	161-6017	COMPOST MANUF TOPSOIL (4")	SY		27,667.000		9,800.000		37,467.000	
	162-6002	BLOCK SODDING	SY		27,667.000		9,800.000		37,467.000	
	168-6001	VEGETATIVE WATERING	MG		4,116.000		1,458.000		5,574.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY		1,384.000		600.000		1,984.000	
	500-6001	MOBILIZATION	LS		50.00%		50.00%		100.00%	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO		8.000				8.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY		240.000		240.000		480.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY		240.000		240.000		480.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF		570.000		220.000		790.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF		570.000		220.000		790.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF		1,186.000		672.000		1,858.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF		1,186.000		672.000		1,858.000	
	543-6002	CABLE BARRIER SYSTEM (TL-4)	LF		37,337.000		16,182.000		53,519.000	
	543-6020	CABLE BARRIER TERMINAL SECTION (TL-4)	EA		30.000		16.000		46.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA		2.000				2.000	
	6185-6002	TMA (STATIONARY)	DAY		65.000		65.000		130.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS		1.000				1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS		1.000				1.000	
		CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS		1.000				1.000	
		LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS		1.000				1.000	

SUMMARY OF ROADWAY ITEMS

HWY	CSJ #	LOCATION	110 6003 EXCAVATION (SPECIAL) CY	432 6045 RIPRAP (MOW STRIP)(4 IN) CY	543 6002 CABLE BARRIER SYSTEM (TL-4) LF	543 6020 CABLE BARRIER TERMINAL SECTION (TL-4) EA
US 380	0134-09-067	FROM STA 1+00 TO 20+15.00 WB	71	71	1915	2
		FROM STA 22+17.00 TO STA 40+11.00 EB	66.5	66.5	1794	2
		FROM STA 41+89.00 TO STA 73+09.00 WB	115.6	115.6	3120	2
		FROM STA 75+11.00 TO STA 107+45.00 EB	119.9	119.9	3234	2
		FROM STA 109+23.00 TO STA 132+46.00 WB	86.1	86.1	2323	2
		FROM STA 134+36.00 TO STA 150+57.00 EB	60.1	60.1	1621	2
		FROM STA 152+51.00 TO STA 190+77.00 WB	141.8	141.8	3826	2
		FROM STA 192+55.00 TO STA 212+93.00 EB	75.6	75.6	2038	2
		FROM STA 214+95.00 TO STA 266+94.00 WB	192.6	192.6	5199	2
		FROM STA 268+72.00 TO STA 281+07.00 EB	45.8	45.8	1235	2
		FROM STA 283+09.00 TO STA 298+36.00 WB	56.6	56.6	1527	2
		FROM STA 300+15.00 TO STA 330+31.00 EB	111.8	111.8	3016	2
		FROM STA 332+33.00 TO STA 380+00.00 WB	176.6	176.6	4767	2
		FROM STA 390+00.00 TO STA 402+94.00 EB	48.0	48.0	1294	2
		FROM STA 404+72.00 TO STA 409+00.00 EB	15.9	15.9	428	2
CSJ 0134-09-067 Totals			1384	1384	37337	30
SH 114	0353-02-079	FROM STA 746+60.00 TO STA 759+58.00 WB	48.1	48.1	1298	2
		FROM STA 760+87.00 TO STA 776+66.00 EB	58.6	58.6	1579	2
		FROM STA 777+95.00 TO STA 798+23.00 WB	75.2	75.2	2028	2
		FROM STA 807+00.00 TO STA 814+60.00 EB	28.2	28.2	760	2
		FROM STS 815+89.00 TO STA 834+66.00 WB	69.6	69.6	1877	2
		FROM STA 935+95.00 TO STA 871+86.00 EB	237.4	237.4	6409	2
		FROM STA 873+15.00 TO STA 879+10.00 WB	22.1	22.1	595	2
		FROM STA 880+64.00 TO STA 897+00.00 WB	60.7	60.7	1636	2
CSJ 0353-02-079 Totals			600	600	16182	16
PROJECT TOTALS			**1984**	**1984**	**53519**	**46**

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS

HWY	CSJ #	502 6001 BARRICADES, SIGNS AND TRAFFIC HANDLING MO	6001 6002 PORTABLE CHANGEABLE MESSAGE SIGN EA	6185 6002 TMA (STATIONARY) DAY
US 380	0134-09-067	8	2	84
SH 114	0353-02-079			46
PROJECT TOTALS		**8**	**2**	**130**

SUMMARY OF EROSION CONTROL ITEMS

HWY	CSJ #	161 6017 COMPOST MANUF TOPSOIL (4") SY	162 6002 BLOCK SODDING SY	168 6001 VEGETATIVE WATERING MG	506 6020 CONSTRUCTION EXITS (INSTALL) (TY 1) SY	506 6024 CONSTRUCTION EXITS (REMOVE) SY	506 6038 TEMP SEDMT CONT FENCE (INSTALL) LF	506 6039 TEMP SEDMT CONT FENCE (REMOVE) LF	506 6041 BIODEG EROSN CONT LOGS (INSTL) (12") LF	506 6043 BIODEG EROSN CONT LOGS (REMOVE) LF
US 380	0134-09-067	27667	27667	4116	240	240	570	570	1186	1186
SH 114	0353-02-079	9800	9800	1458	240	240	220	220	672	672
PROJECT TOTALS		**37467**	**37467**	**5574**	**480**	**480**	**790**	**790**	**1858**	**1858**

SUMMARY SHEET

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AT	TEXAS	DAL	DENTON	7
CHECK	CONTROL	SECTION	JOB	
DMH	0134	09	067, ETC.	
CHECK				
DMH				

DATE:
FILE:

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. As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER (see Sign Detail G20-10T) and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. However, the TRAFFIC FINES DOUBLE sign will not be required on projects consisting solely of mobile operation work, such as striping or milling edgeline rumble strips. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.

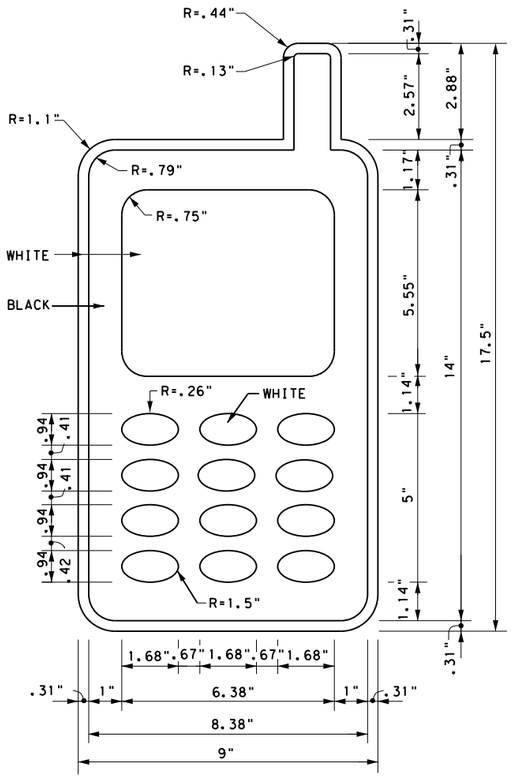
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.

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 APPAREL 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.



3.0" Radius, 1.25" Border, 0.75" Indent, Black on Yellow;
[STAY ALERT] Font: D
3.0" Radius, 1.25" Border, 0.75" Indent, Black on Orange;
[TALK OR TEXT LATER] Font: C specified length;

SIGN DETAIL (G20-10T)

Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation
Traffic Operations Division - TE
Phone (512) 416-3118

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

Texas Department of Transportation | Traffic Operations Division Standard

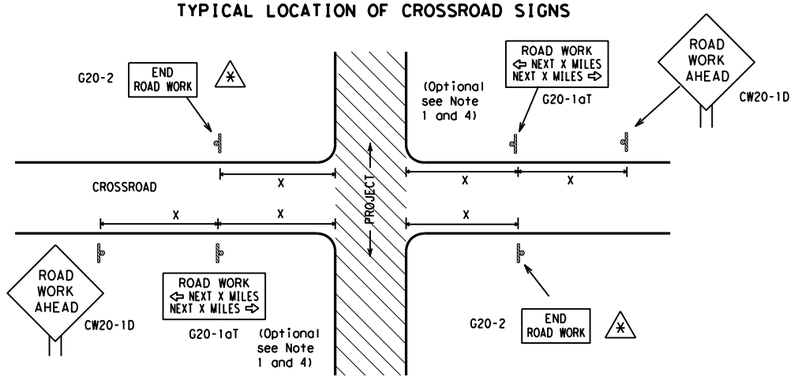
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0134	09	067,ETC.	US380,ETC.
4-03 5-10 8-14	DIST	COUNTY		SHEET NO.
9-07 7-13	DAL	DENTON		8

DATE:
FILE:

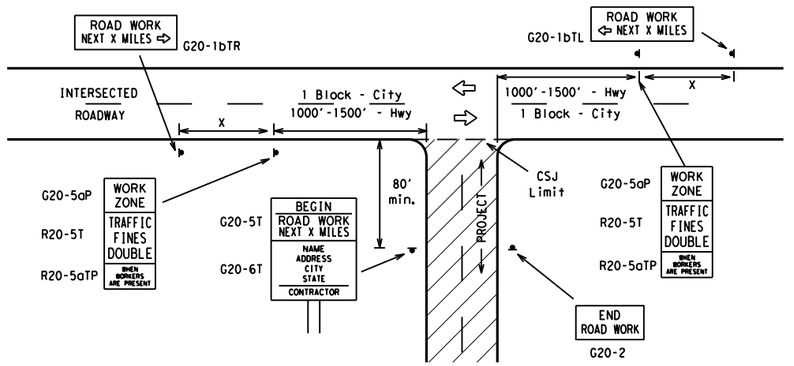
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

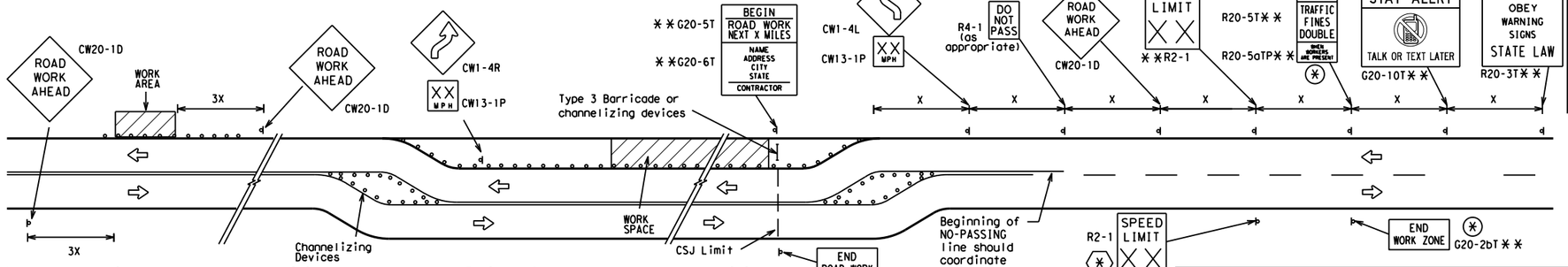
✱ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

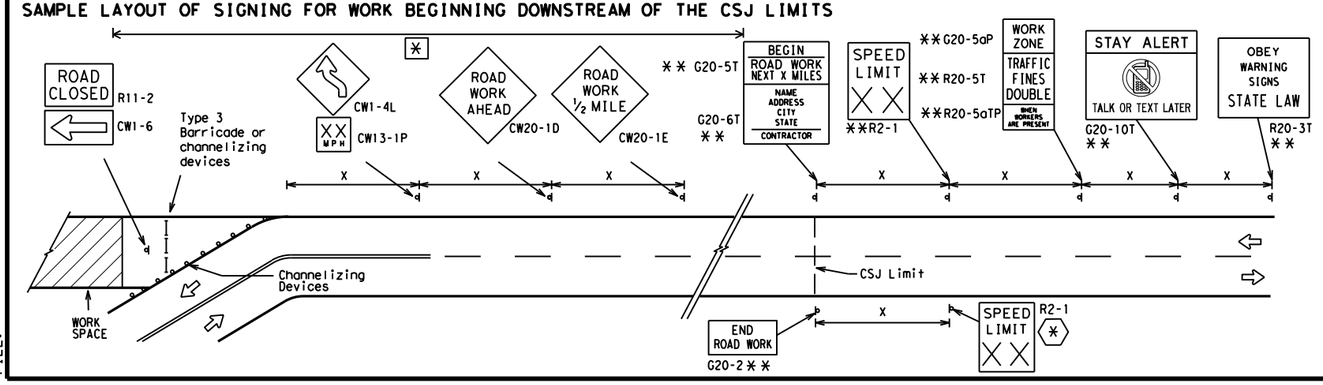
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

✱✱ Required CSJ Limit signing. See Note 10 on BC(1). TRAFFIC FINES DOUBLE signs will not be required on projects consisting solely of mobile operations work.

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

(✱) Contractor will install a regulatory speed limit sign at the end of the work zone.

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0134	09	067, ETC.	US380, ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	DAL	DENTON		9

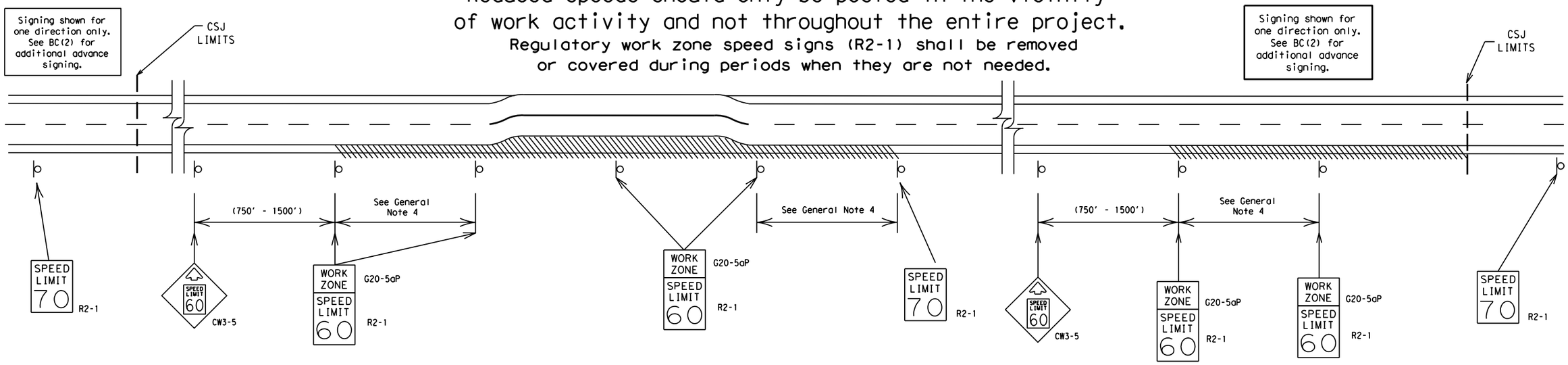
DATE:
FILE:

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

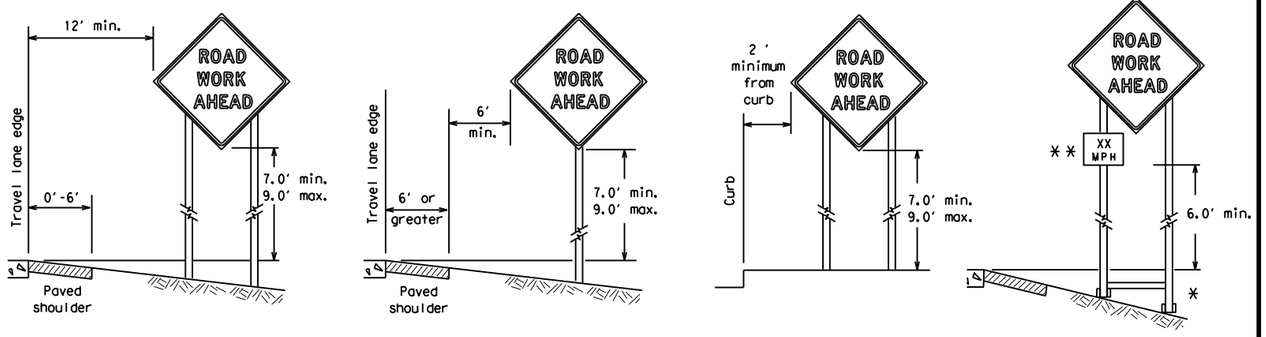
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	0134	09	067, ETC.	US380, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON		10

DATE:
FILE:

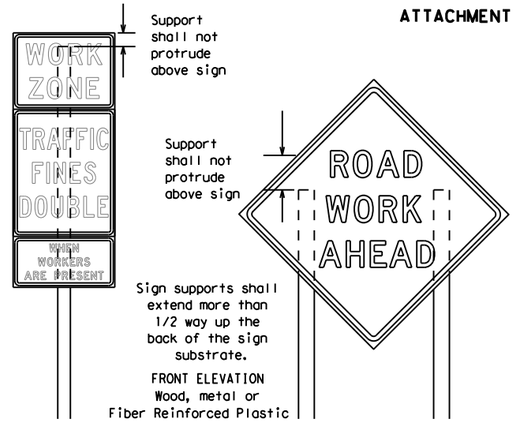
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



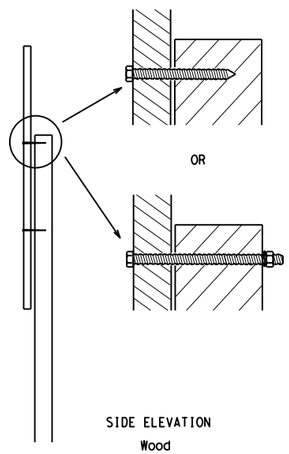
* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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



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

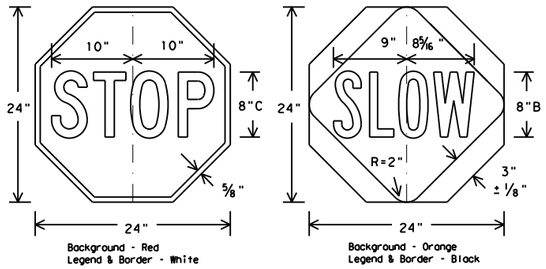


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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.

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" as detailed below.
2. When used at night, the STOP/SLOW paddle shall be retroreflectorized.
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.



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, 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.
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 sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards 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). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
7. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
8. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
9. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-14

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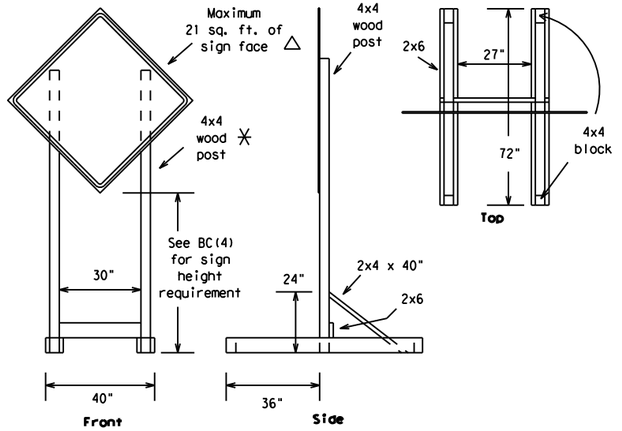
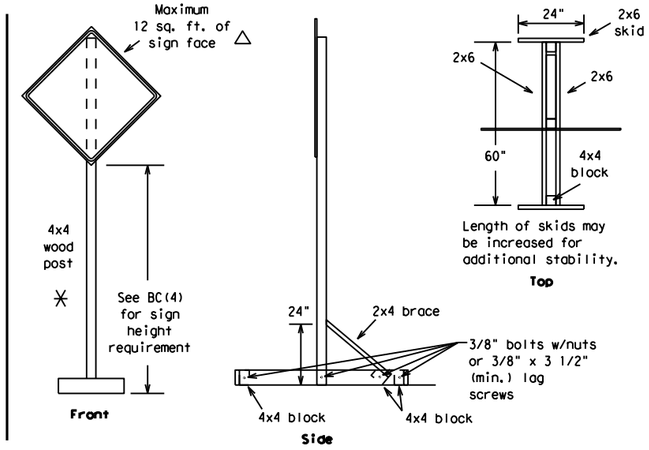
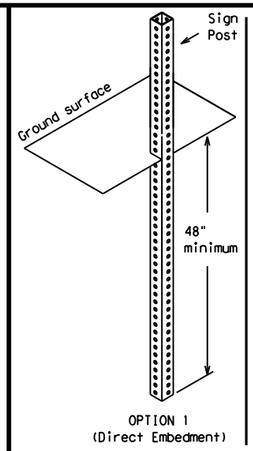
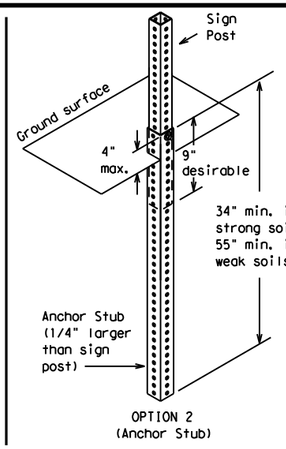


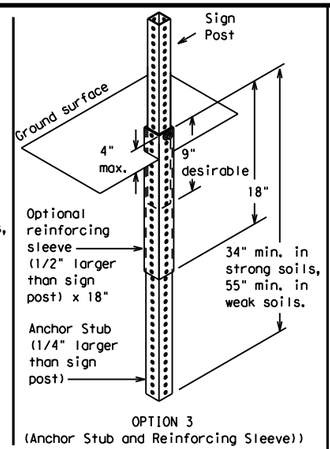


SKID MOUNTED WOOD SIGN SUPPORTS

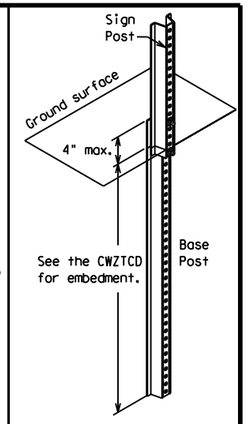
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □







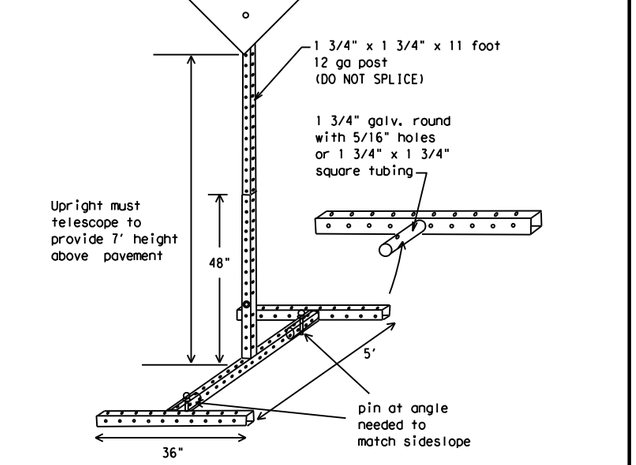
PERFORATED SQUARE METAL TUBING

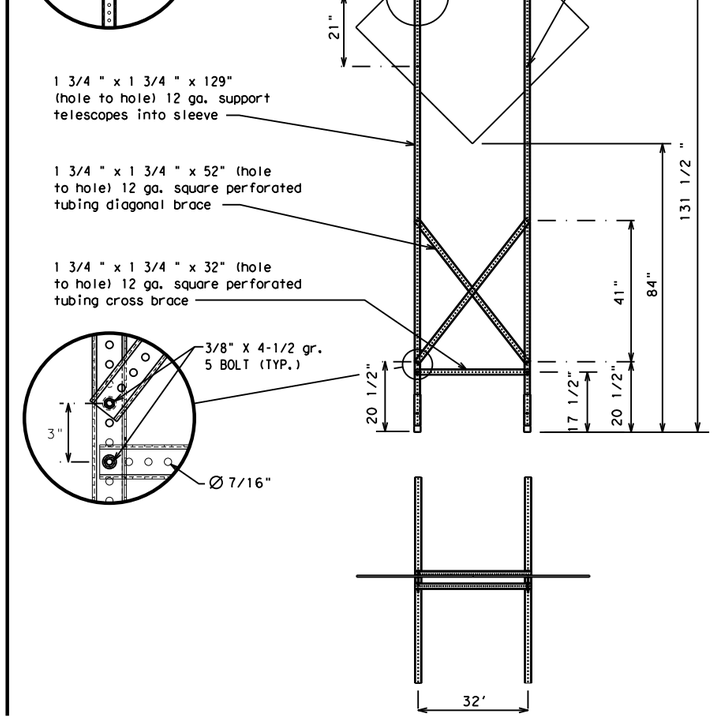


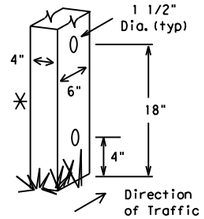
WING CHANNEL
Lap-splice/base bolted anchor

GROUND MOUNTED SIGN SUPPORTS

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

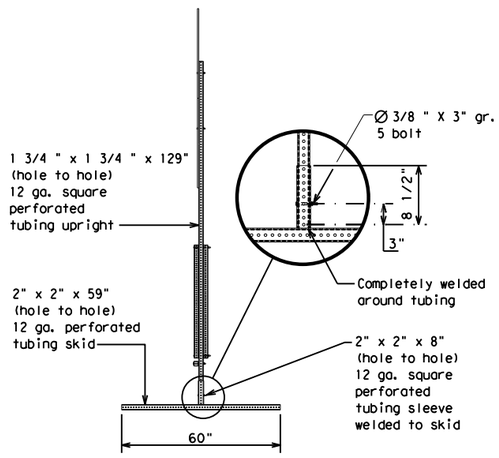






Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation — Traffic Operations Division Standard

SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-14

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-14

FILE:	bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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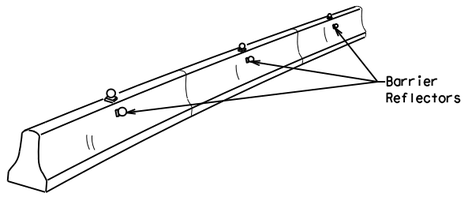
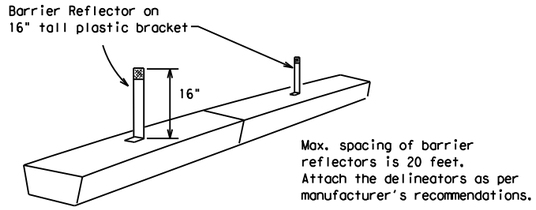
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.

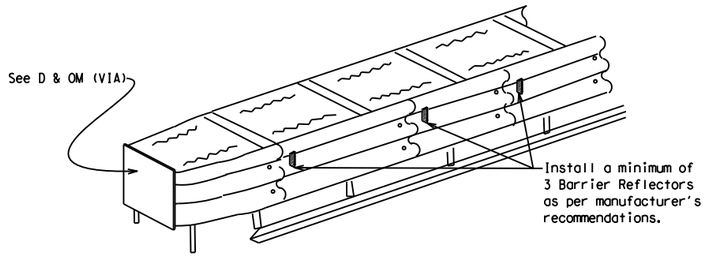


CONCRETE TRAFFIC BARRIER (CTB)

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



LOW PROFILE CONCRETE BARRIER (LPCB)

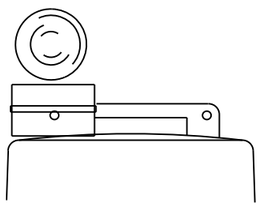


DELINEATION OF END TREATMENTS

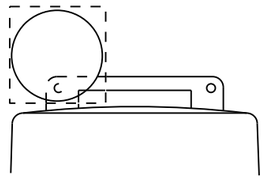
END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

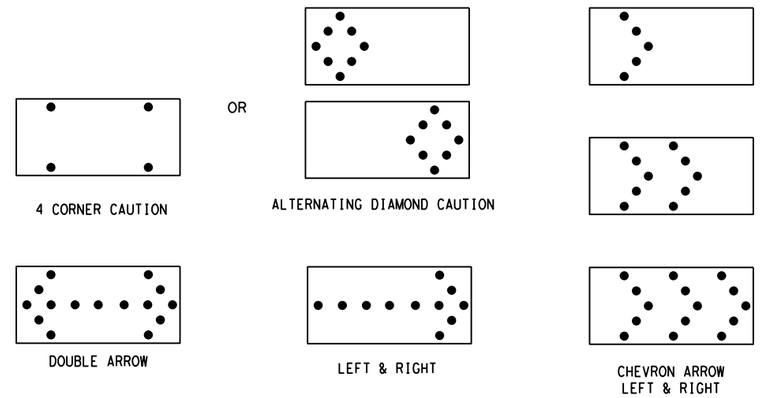
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350) or the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

Texas Department of Transportation

Traffic Operations Division Standard

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

BC(7)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0134	09	067, ETC.	US380, ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	DAL	DENTON		14

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DATE:
FILE:

GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

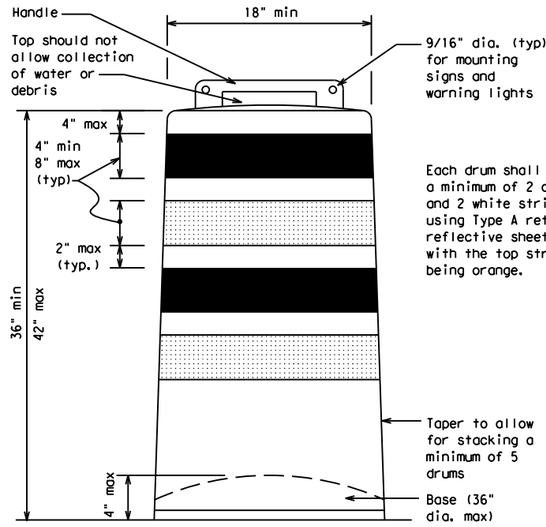
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

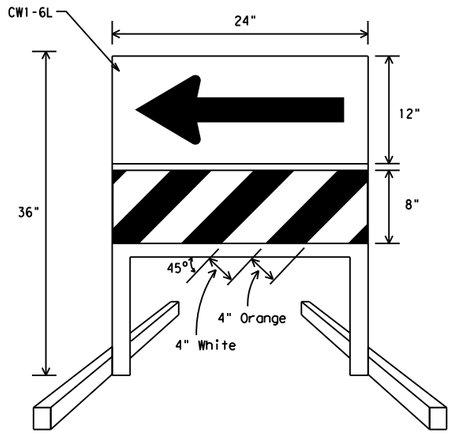
RETROREFLECTIVE SHEETING

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

BALLAST

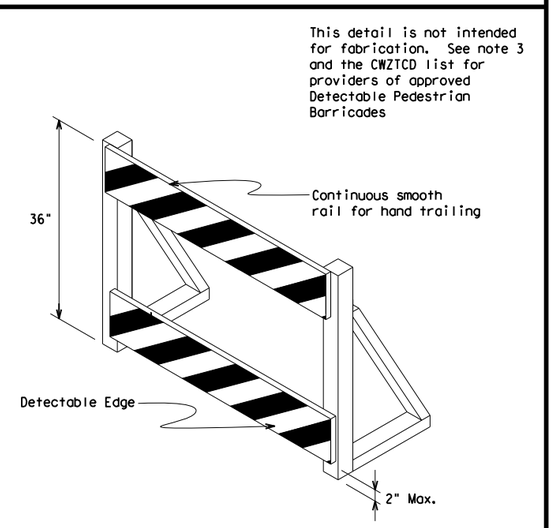
1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other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





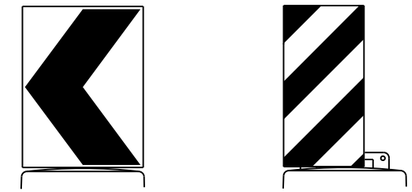
DIRECTION INDICATOR BARRICADE

1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
3. The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CW1-6) sign in the size shown with a black arrow on a background of Type B_{FL} or Type C_{FL} Orange retroreflective sheeting above a rail with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheeting types shall be as per DMS 8300.
4. Double arrows on the Direction Indicator Barricade will not be allowed.
5. Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.



DETECTABLE PEDESTRIAN BARRICADES

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



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

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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

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Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0134	09	067, ETC.	US380, ETC.
4-03 7-13	DIST	COUNTY		SHEET NO.
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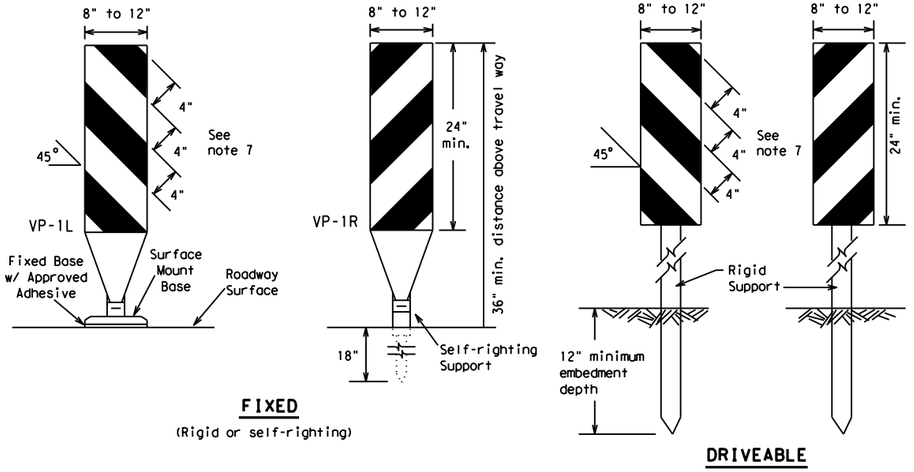
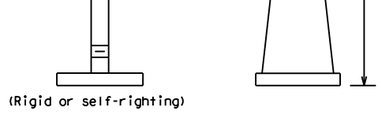


FIXED
(Rigid or self-righting)

DRIVEABLE

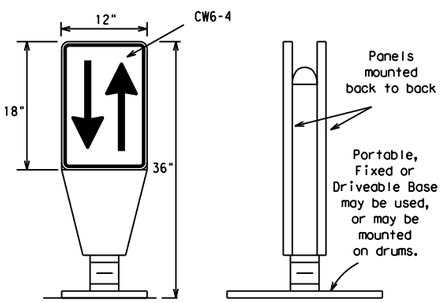


(Rigid or self-righting)

PORTABLE

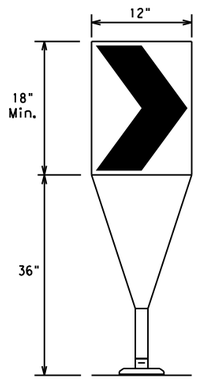
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



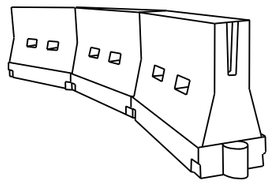
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0134	09	067, ETC.	US380, ETC.
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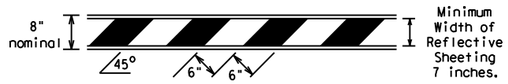
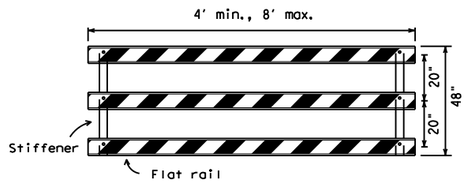
TYPE 3 BARRICADES

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 conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



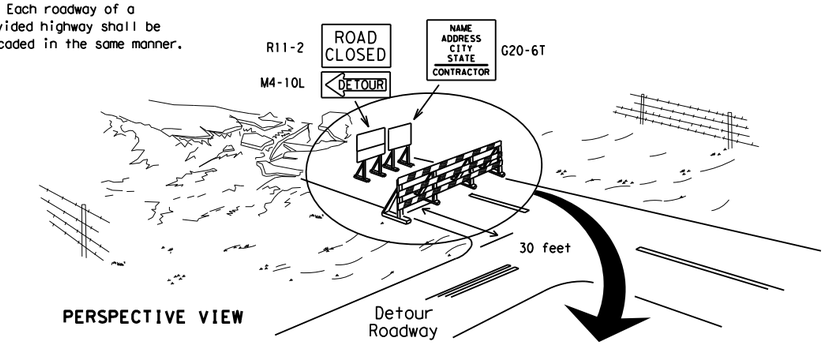
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

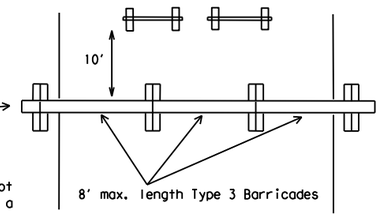
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

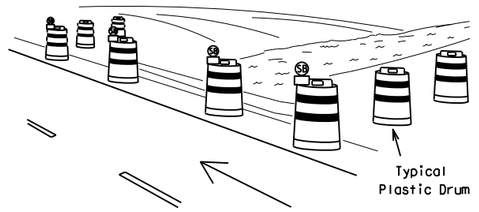
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

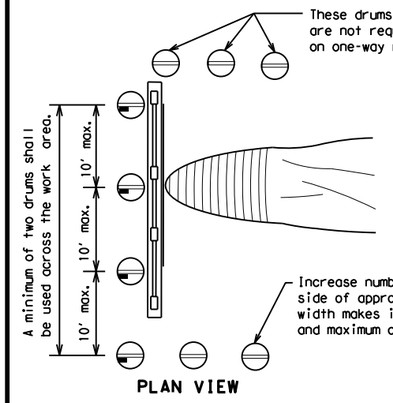
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

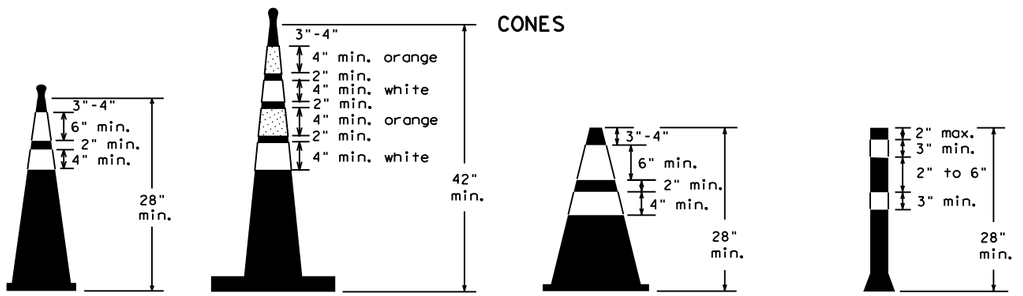
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

PLAN VIEW

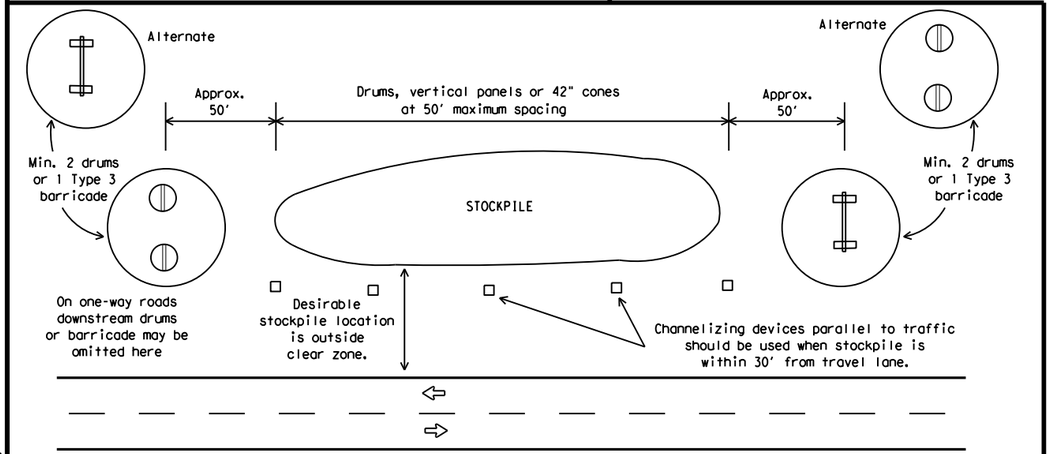
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

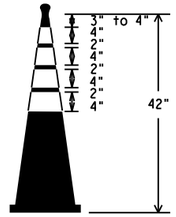
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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 used at night 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.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

THIS DEVICE SHALL NOT BE USED ON PROJECTS LET AFTER MARCH 2014.



EDGELINE CHANNELIZER

1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in transitions or tapers.
2. This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
3. This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
4. The base must weigh a minimum of 30 lbs.

Texas Department of Transportation — Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	0134	09	067, ETC.	US380, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON		17

DATE:
FILE:

DATE:
FILE:

WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

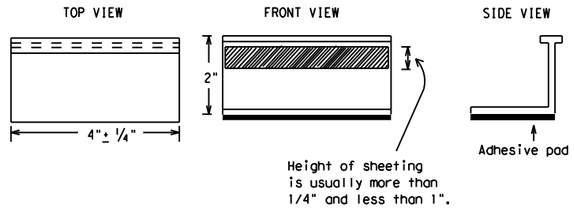
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-14

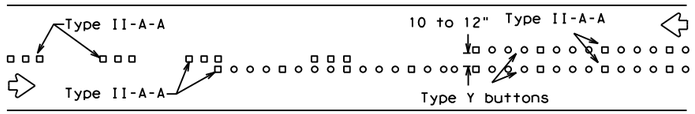
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0134	09	067, ETC.	US380, ETC.
2-98 9-07	DIST	COUNTY		SHEET NO.
1-02 7-13	DAL	DENTON		18
11-02 8-14				

105

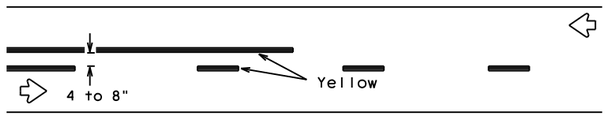
DATE:
FILE:

PAVEMENT MARKING PATTERNS

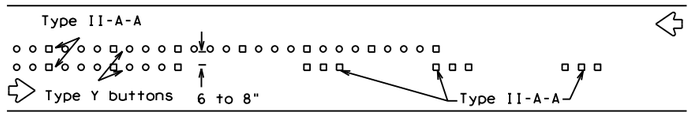
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



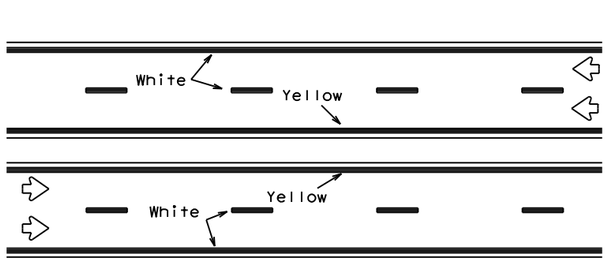
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



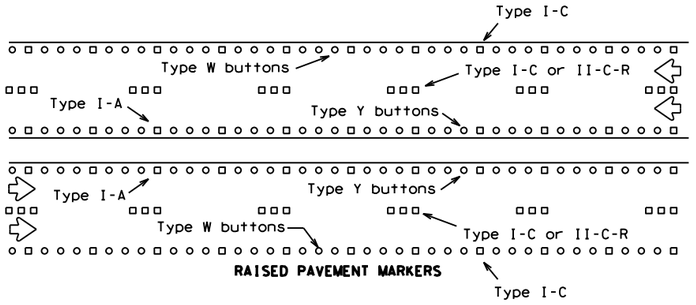
RAISED PAVEMENT MARKERS - PATTERN B

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

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



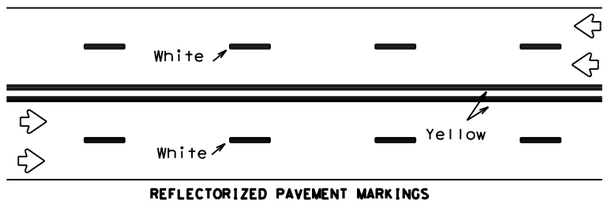
REFLECTORIZED PAVEMENT MARKINGS



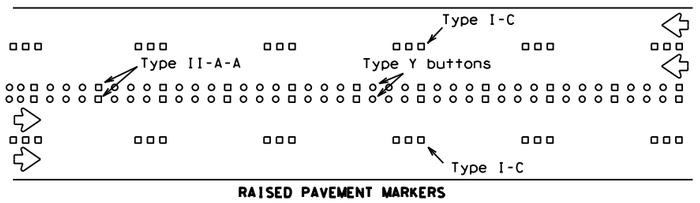
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



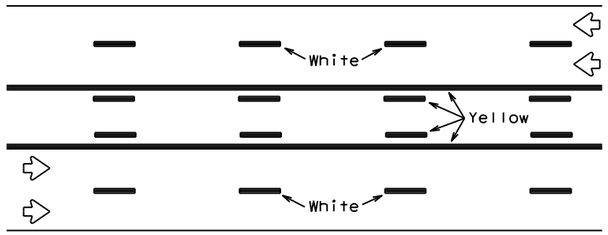
REFLECTORIZED PAVEMENT MARKINGS



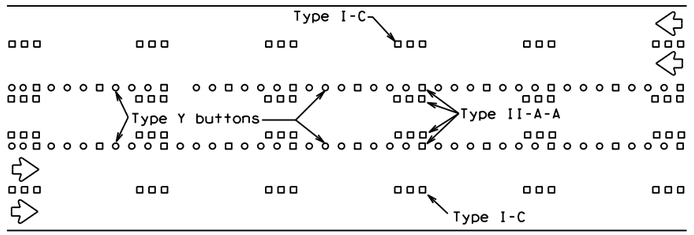
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

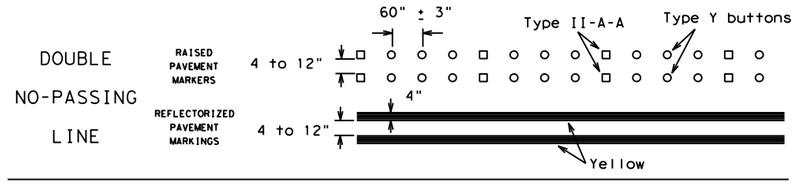
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

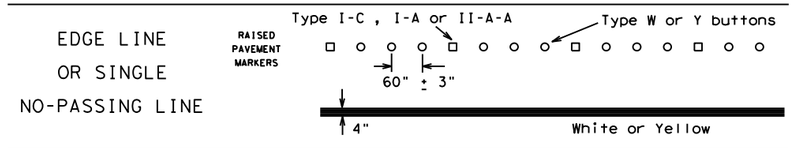
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

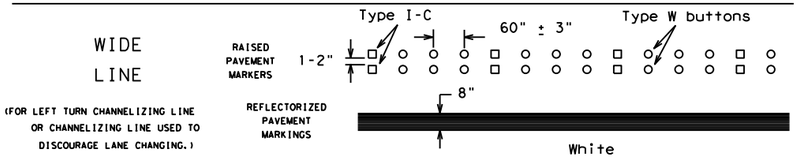


EDGE LINE OR SINGLE NO-PASSING LINE



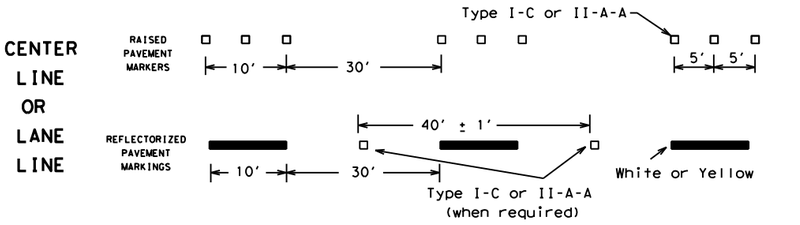
WIDE LINE

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

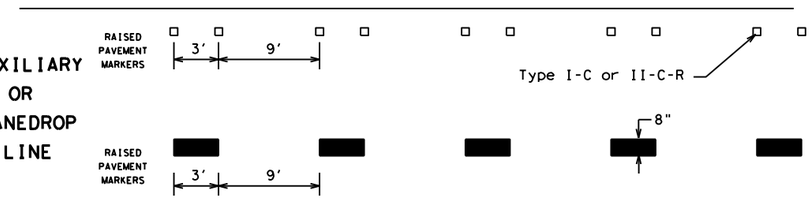


BROKEN LINES

CENTER LINE OR LANE LINE

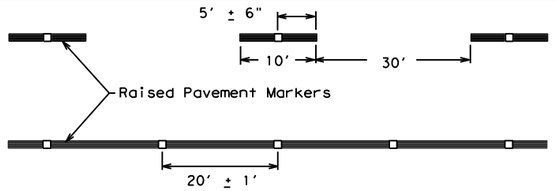


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
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1-97 9-07	DIST	COUNTY		SHEET NO.
2-98 7-13	DAL	DENTON		19
11-02 8-14				

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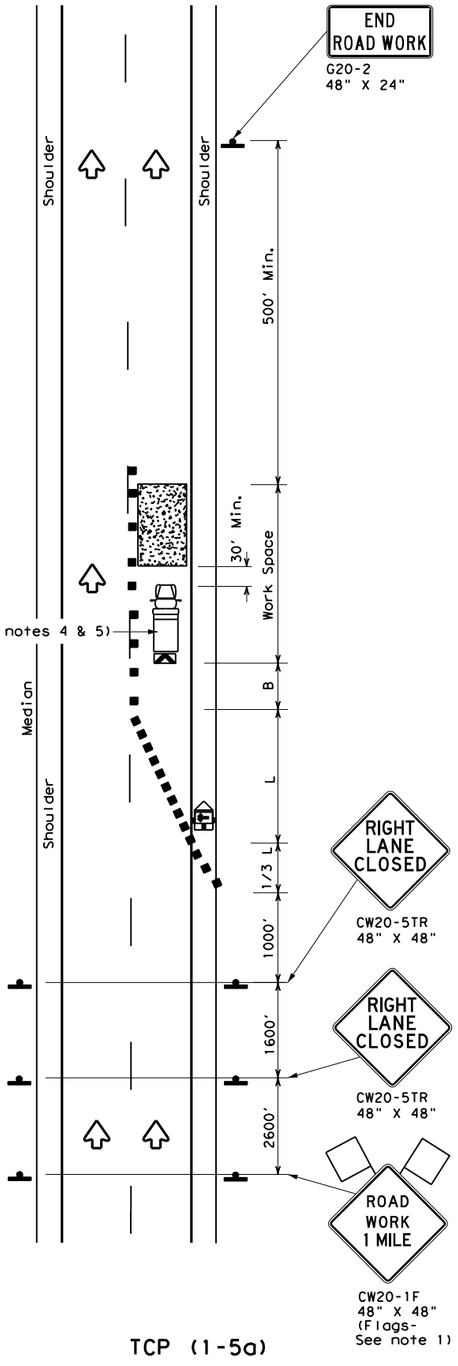
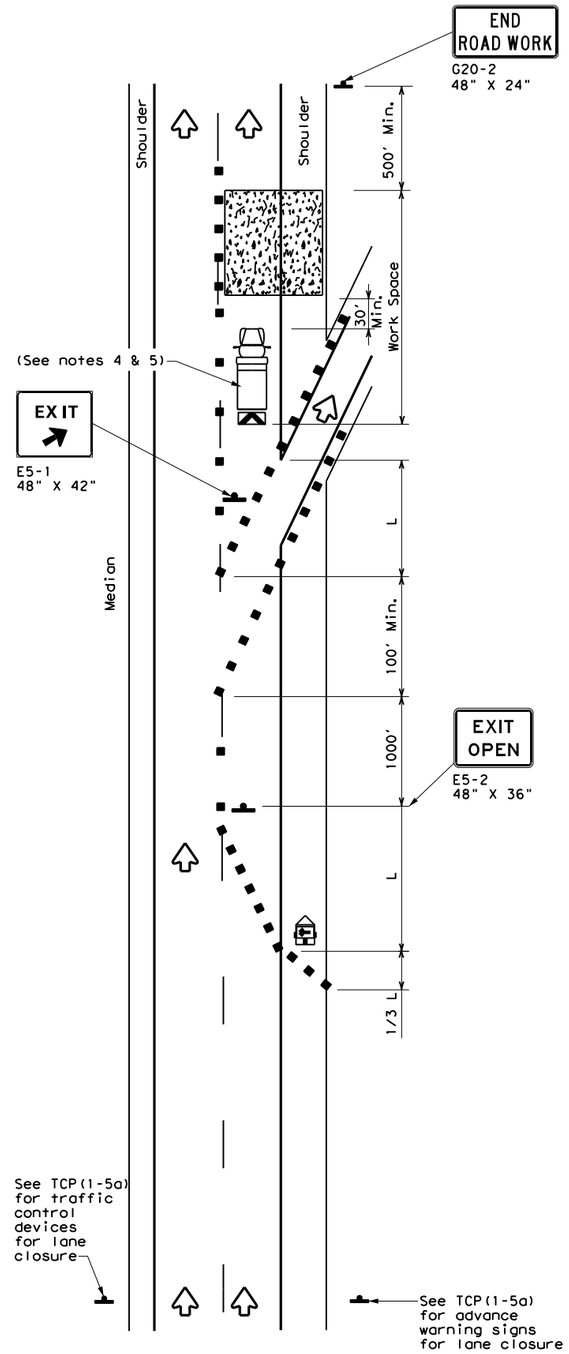


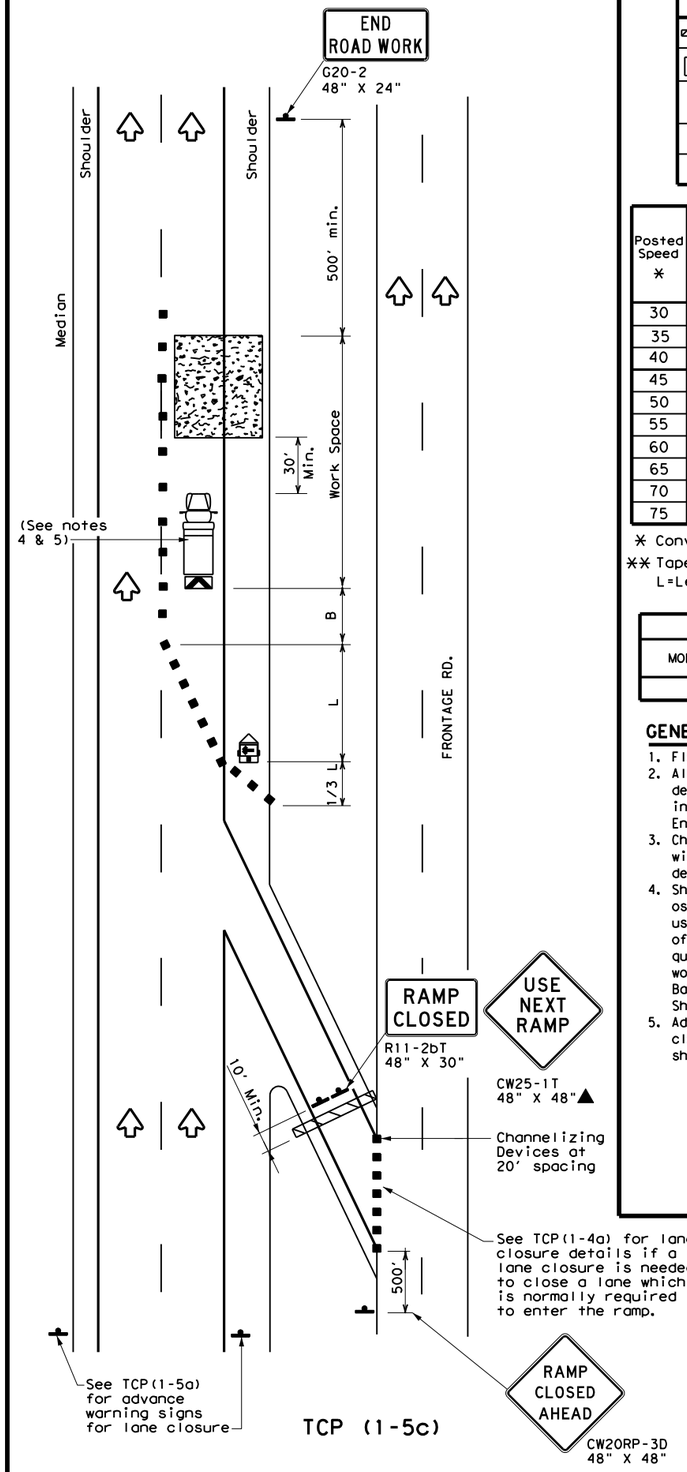
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-18

FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	0134	09	067,ETC.	US380,ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON		20

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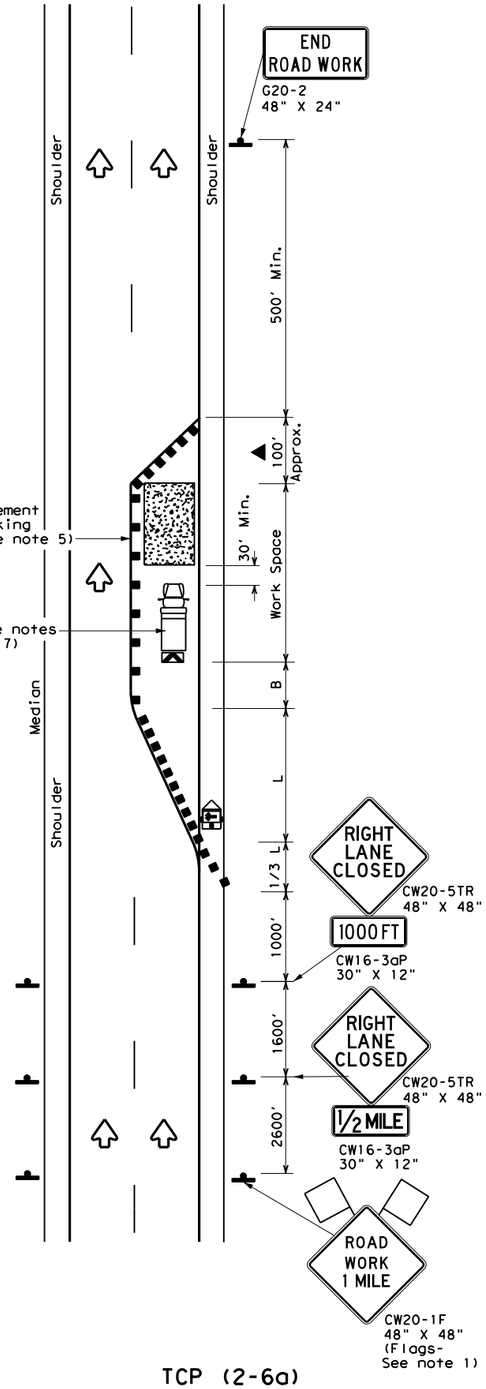
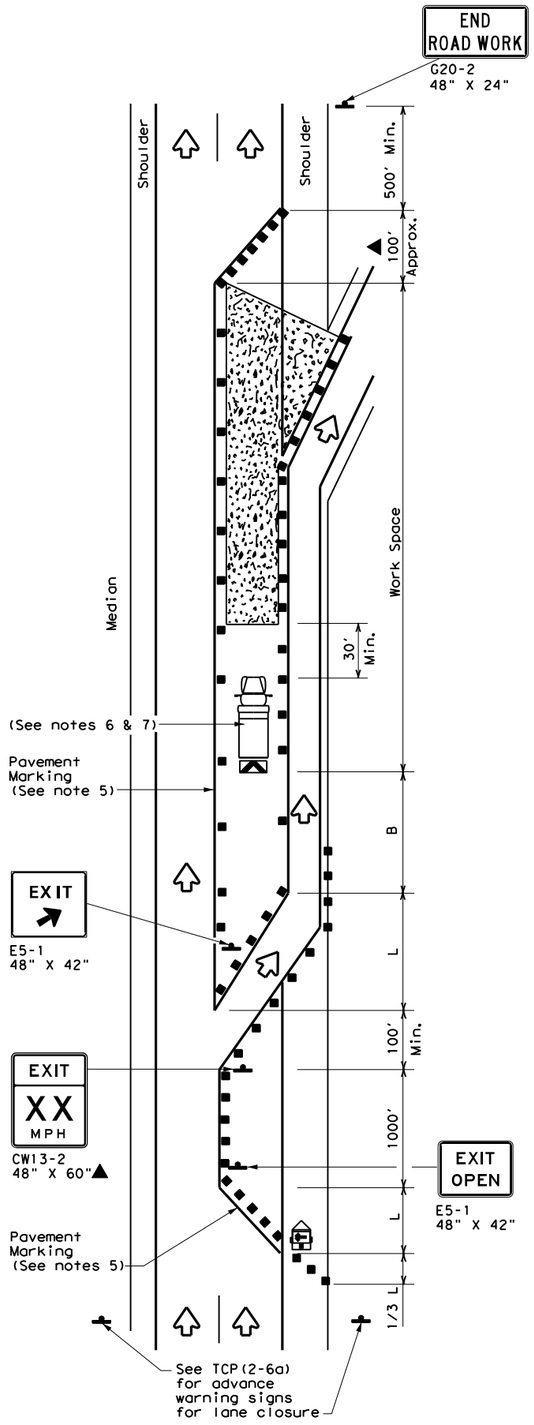


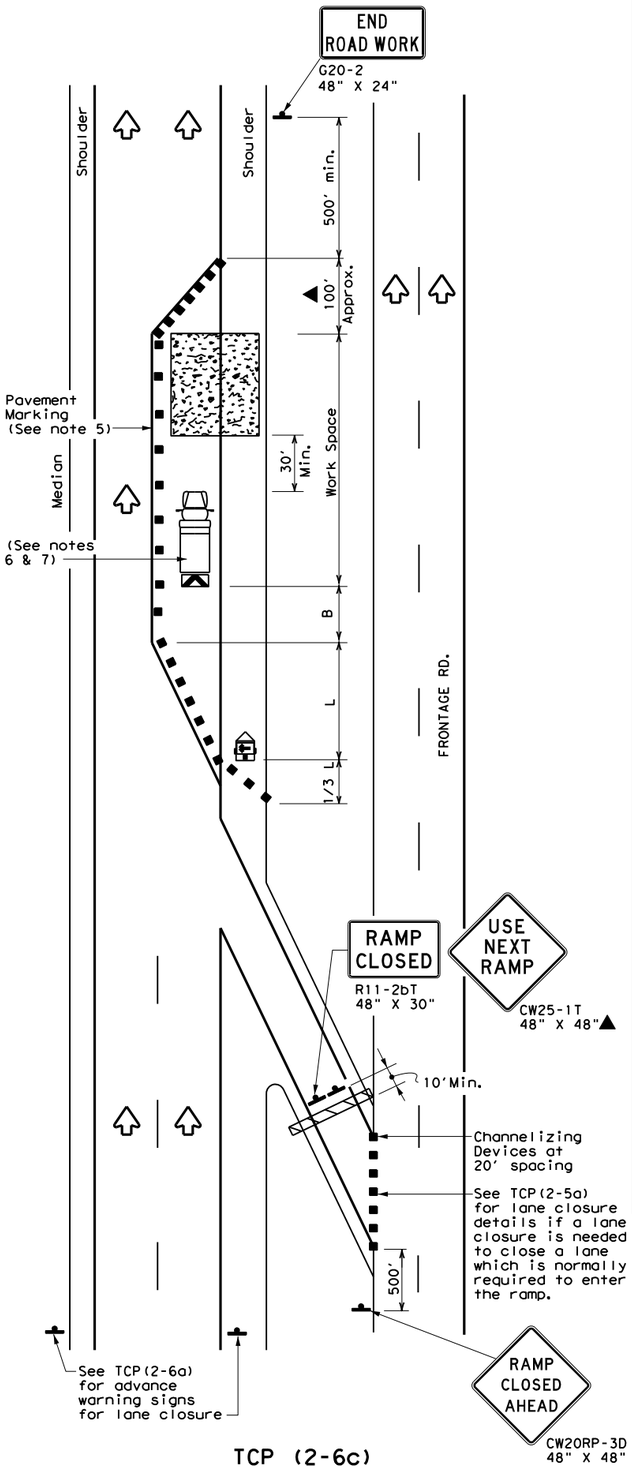
TCP (2-6a)

ONE LANE CLOSURE



TCP (2-6b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (2-6c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

TCP(2-6)-18

FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0134	09	067,ETC.	US380,ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON		21

DATE: 11/30/2020 2:55:06 PM
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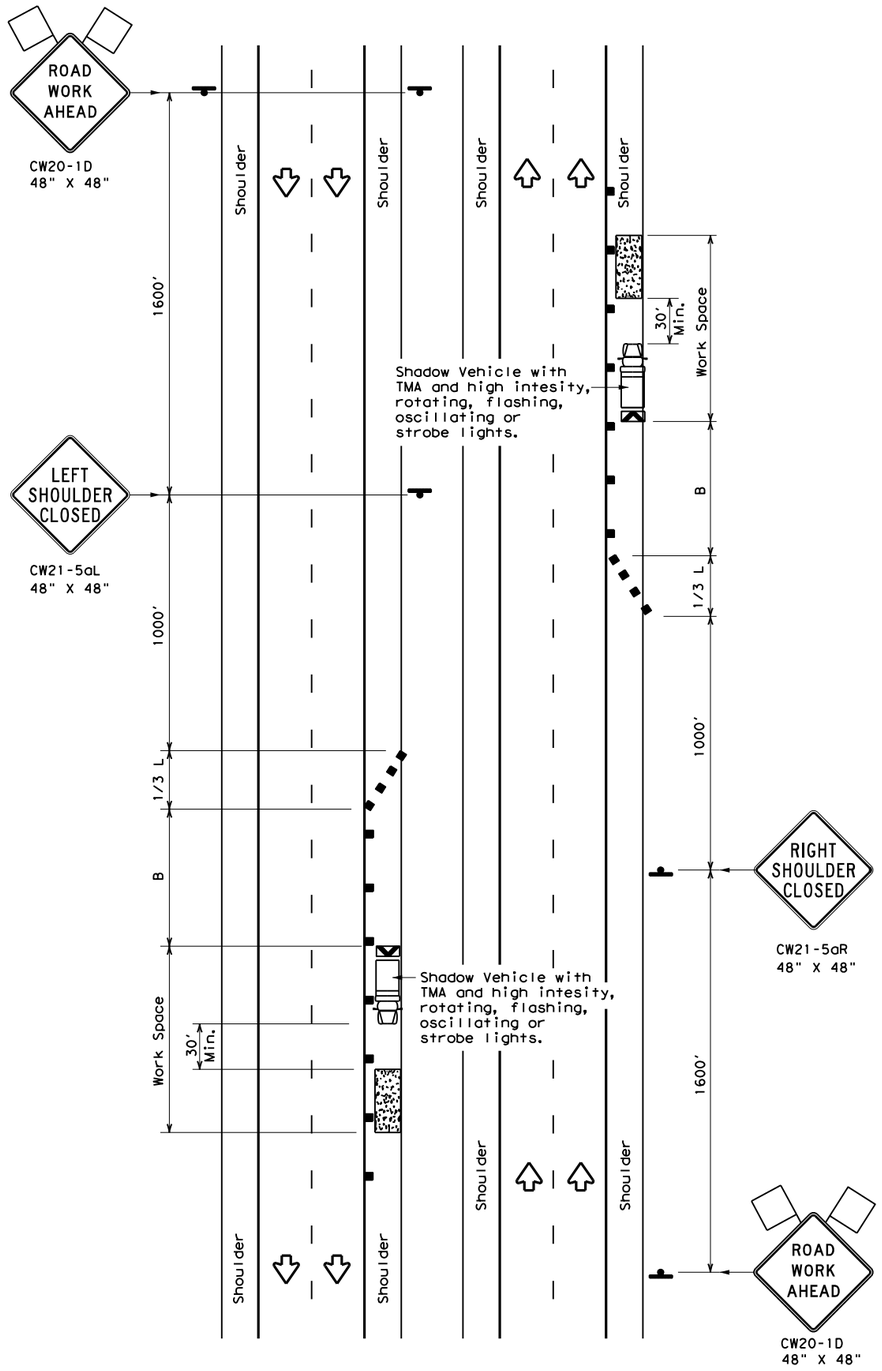
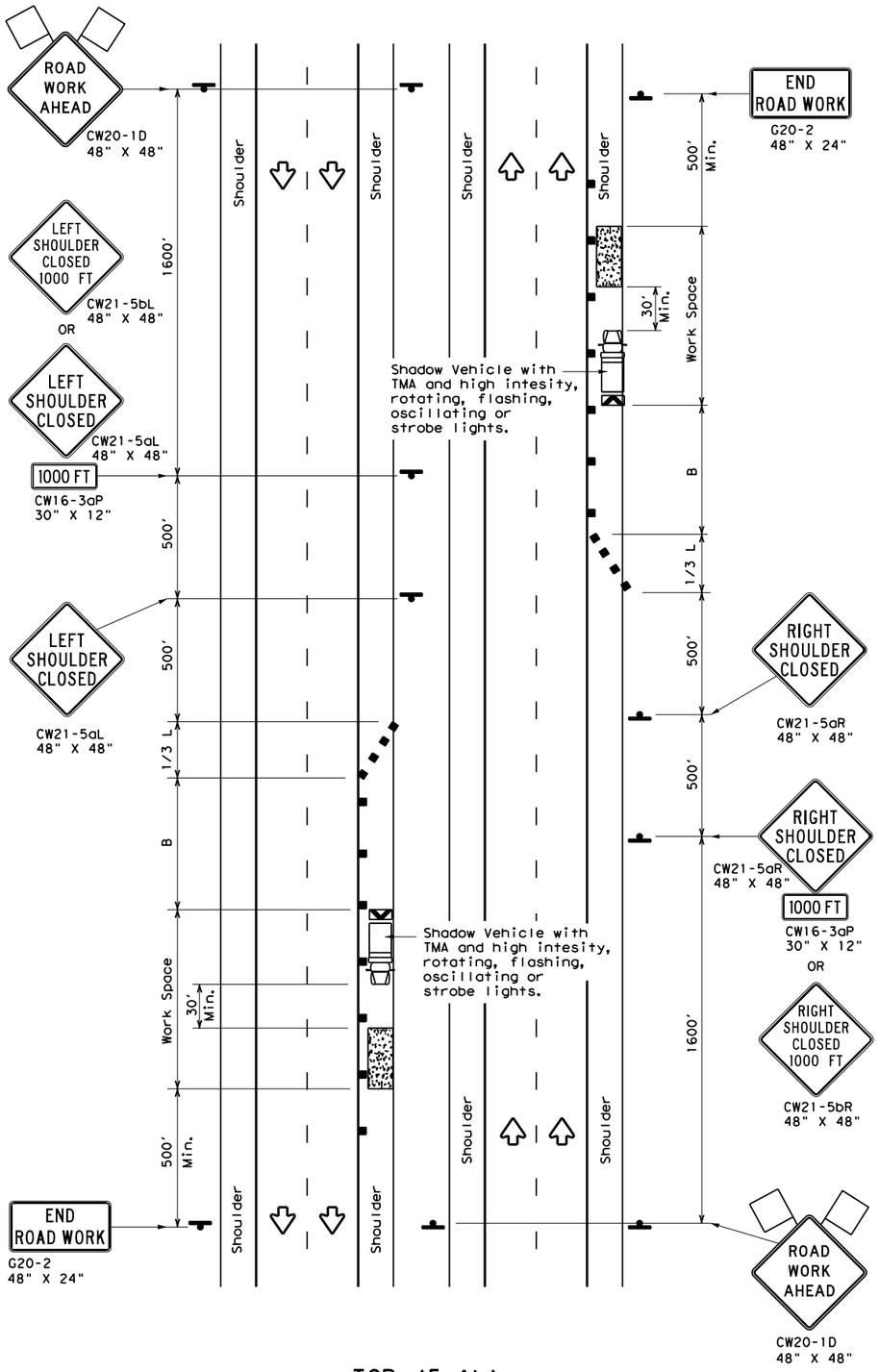


TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	90'
35		205'	225'	245'	35'	70'	120'
40		265'	295'	320'	40'	80'	155'
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

* 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
	TCP(5-1a)	TCP(5-1b)	TCP(5-1b)	

GENERAL NOTES

1. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30' to 100' in advance of the area of crew exposure without adversely effecting the performance or quality of the work. Type 3 barricades or drums may be substituted when workers on foot are no longer present when approved by the Engineer.
2. 28" tall or taller one-piece cones will be allowed only for Short Duration or Short Term stationary operations when workers are present to maintain the devices upright and in proper location. Intermediate Term stationary work areas should use Drums, Vertical Panels or 42" tall two-piece cones.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

TCP(5-1)-18

FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0134	09	067,ETC.	US380,ETC.
2-18	DIST	COUNTY		SHEET NO.
	DAL	DENTON		22

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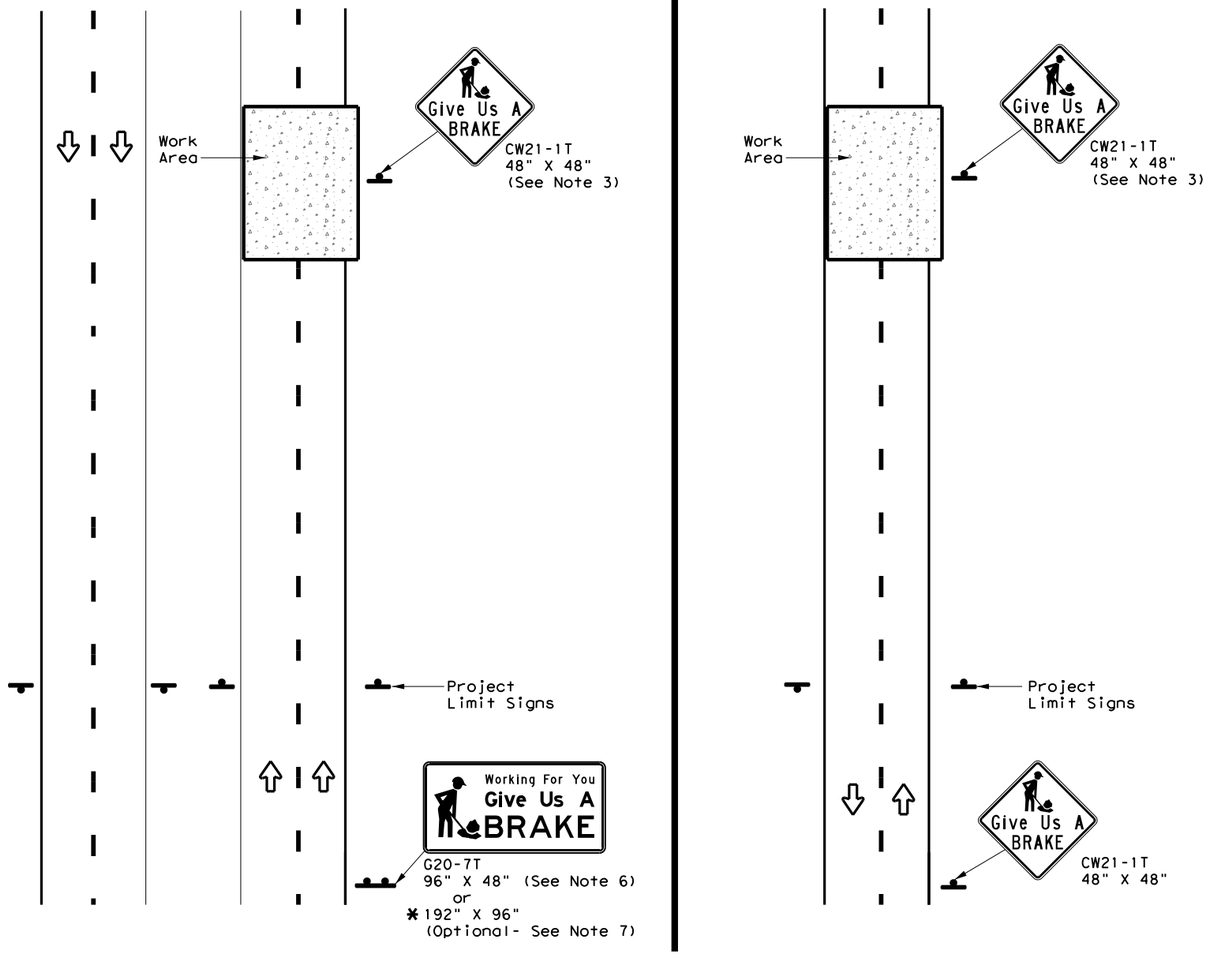


DIVIDED HIGHWAY

UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

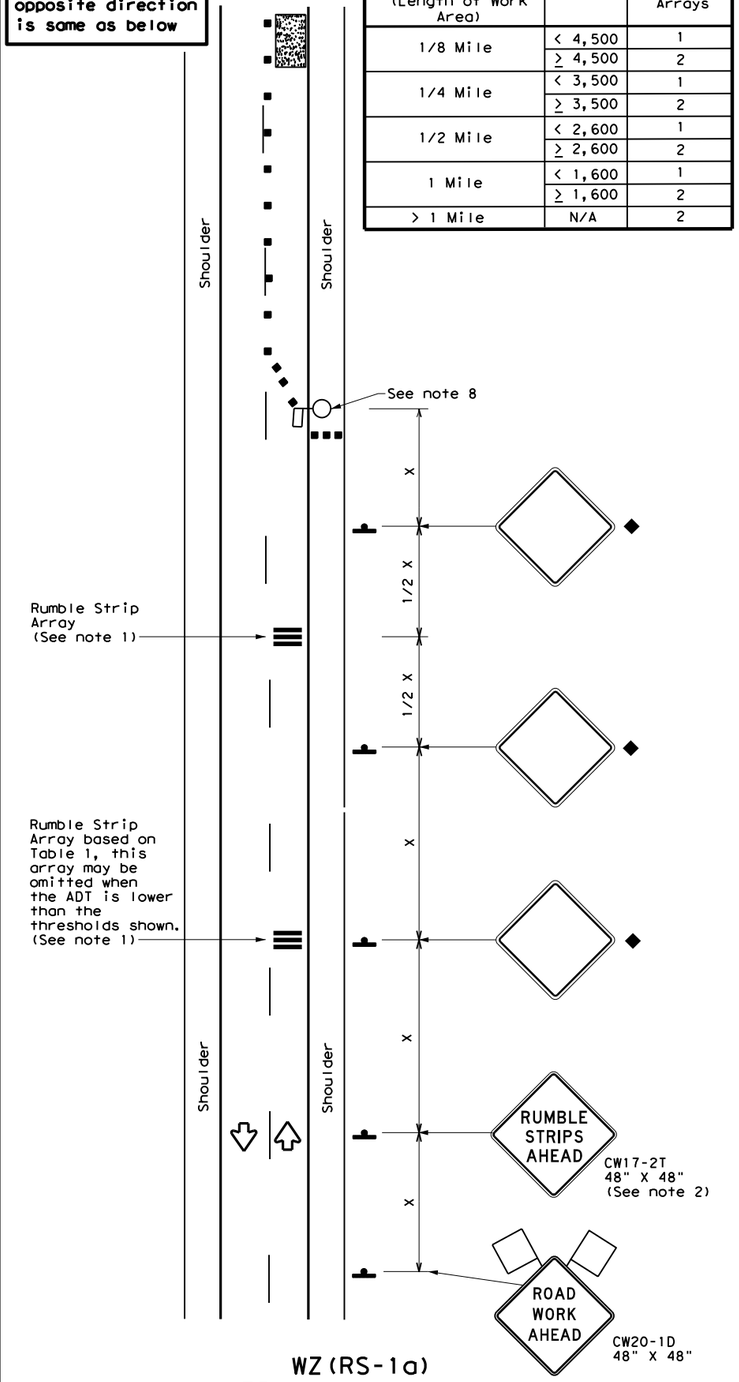
FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0134	09	067, ETC.	US380, ETC.
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	DAL	DENTON		23

116

DATE: 11/30/2020 2:55:14 PM
FILE: r:\designs\projects\us380\0134-09-067etc_median barrier\plans\24-wzrs16.dgn

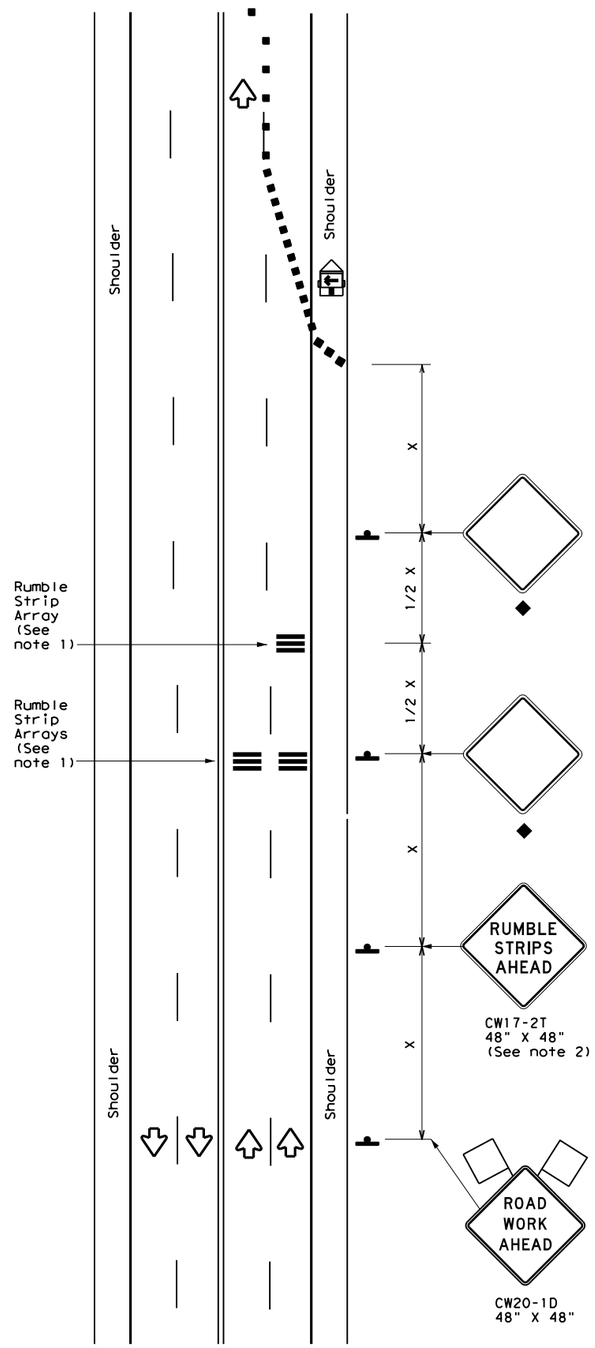
Warning sign and rumble strip sequence in opposite direction is same as below

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



WZ(RS-1a)
75 mph or Less

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)
75 mph or Less

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

* Conventional Roads Only

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

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

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

TABLE 2	
Speed	Approximate distance between strips in an Array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
> 55 MPH	20'

Texas Department of Transportation

Traffic Operations Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-16

FILE: wzrs16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0134	09	067,ETC.	US380,ETC.
2-14	DIST	COUNTY		SHEET NO.
4-16	DAL	DENTON		24

<* 1 Describe Chain US380

Chain US380 contains:
100 CUR US3801 101 CUR US3802 CUR US3803 CUR US3804 CUR US3805 102 CUR US3806 - 103 CUR US3807 CUR US3808 CUR US3809 CUR US38010 CUR US38011 CUR US38012 CUR US-38013 104

Beginning chain US380 description

Point 100 N 7,139,061.5663 E 2,308,055.7755 Sta 0+00.00

Course from 100 to PC US3801 S 80° 07′ 49.18" E Dist 603.9876

Curve Data

Curve US3801 (Chord Definition)
P.I. Station 7+68.17 N 7,138,929.8961 E 2,308,812.5766
Delta = 1° 43′ 04.93" (LT)
Degree = 0° 31′ 23.70"
Tangent = 164.1824
Length = 328.3390
Radius = 10,950.0000
External = 1.2308
Long Chord = 328.3278
Mid. Ord. = 1.2307
P.C. Station 6+03.99 N 7,138,958.0383 E 2,308,650.8241
P.T. Station 9+32.33 N 7,138,906.6162 E 2,308,975.1001
C.C. N 7,149,745.9804 E 2,310,527.7378
Back = S 80° 07′ 49.18" E
Ahead = S 81° 50′ 54.11" E
Chord Bear = S 80° 59′ 21.65" E

Course from PT US3801 to 101 S 81° 50′ 54.11" E Dist 67.6723

Point 101 N 7,138,897.0207 E 2,309,042.0887 Sta 10+00.00

Course from 101 to PC US3802 S 81° 50′ 54.11" E Dist 214.2242

Curve Data

Curve US3802 (Chord Definition)
P.I. Station 13+79.90 N 7,138,843.1525 E 2,309,418.1562
Delta = 1° 43′ 04.93" (RT)
Degree = 0° 31′ 06.66"
Tangent = 165.6818
Length = 331.3376
Radius = 11,050.0000
External = 1.2420
Long Chord = 331.3264
Mid. Ord. = 1.2419
P.C. Station 12+14.22 N 7,138,866.6451 E 2,309,254.1484
P.T. Station 15+45.56 N 7,138,814.7534 E 2,309,581.3859
C.C. N 7,127,928.2913 E 2,307,687.3314
Back = S 81° 50′ 54.11" E
Ahead = S 80° 07′ 49.18" E
Chord Bear = S 80° 59′ 21.64" E

Course from PT US3802 to PC US3803 S 80° 07′ 49.18" E Dist 6,647.0855

Curve Data

Curve US3803 (Chord Definition)
P.I. Station 87+17.17 N 7,137,585.4840 E 2,316,646.8610
Delta = 5° 10′ 41.04" (LT)
Degree = 0° 29′ 38.15"
Tangent = 524.5281
Length = 1,048.3389
Radius = 11,600.0000
External = 11.8530
Long Chord = 1,047.9854
Mid. Ord. = 11.8409
P.C. Station 81+92.65 N 7,137,675.3921 E 2,316,130.0958
P.T. Station 92+40.98 N 7,137,542.5815 E 2,317,169.6316
C.C. N 7,149,103.7143 E 2,318,118.4245
Back = S 80° 07′ 49.18" E
Ahead = S 85° 18′ 30.22" E
Chord Bear = S 82° 43′ 09.70" E

Course from PT US3803 to PC US3804 S 85° 18′ 30.22" E Dist 5,121.1638

Curve Data

Curve US3804 (Chord Definition)
P.I. Station 146+97.61 N 7,137,096.2706 E 2,322,607.9730
Delta = 3° 20′ 30.28" (RT)
Degree = 0° 29′ 53.61"
Tangent = 335.4607
Length = 670.7290
Radius = 11,500.0000
External = 4.8917
Long Chord = 670.6361
Mid. Ord. = 4.8897
P.C. Station 143+62.15 N 7,137,123.7088 E 2,322,273.6363
P.T. Station 150+32.88 N 7,137,049.3901 E 2,322,940.1417
C.C. N 7,125,662.2409 E 2,321,333.0226
Back = S 85° 18′ 30.22" E
Ahead = S 81° 57′ 59.94" E
Chord Bear = S 83° 38′ 15.08" E

Course from PT US3804 to PC US3805 S 81° 57′ 59.94" E Dist 860.0636

Curve Data

Curve US3805 (Chord Definition)
P.I. Station 164+30.50 N 7,136,854.0731 E 2,324,324.0495
Delta = 5° 18′ 23.49" (LT)
Degree = 0° 29′ 38.15"
Tangent = 537.5592
Length = 1,074.3464
Radius = 11,600.0000
External = 12.4489
Long Chord = 1,073.9658
Mid. Ord. = 12.4356
P.C. Station 158+92.94 N 7,136,929.1967 E 2,323,791.7654
P.T. Station 169+67.29 N 7,136,828.4992 E 2,324,861.0000
C.C. N 7,148,415.3646 E 2,325,412.8595
Back = S 81° 57′ 59.94" E
Ahead = S 87° 16′ 23.43" E
Chord Bear = S 84° 37′ 11.69" E

Course from PT US3805 to 102 S 87° 16′ 23.43" E Dist 23,232.7015

Point 102 N 7,135,723.2245 E 2,348,067.3953 Sta 401+99.99

Course from 102 to PC US3806 S 87° 16′ 23.43" E Dist 61.5542

Curve Data

Curve US3806 (Chord Definition)
P.I. Station 405+34.28 N 7,135,707.3210 E 2,348,401.3049
Delta = 2° 43′ 36.57" (LT)
Degree = 0° 30′ 00.01"
Tangent = 272.7339
Length = 545.3631
Radius = 11,459.1559
External = 3.2451
Long Chord = 545.3133
Mid. Ord. = 3.2442
P.C. Station 402+61.54 N 7,135,720.2961 E 2,348,128.8799
P.T. Station 408+06.91 N 7,135,707.3210 E 2,348,674.0388
C.C. N 7,147,166.4769 E 2,348,674.0388
Back = S 87° 16′ 23.43" E
Ahead = Due East
Chord Bear = S 88° 38′ 11.72" E

Course from PT US3806 to 103 Due East Dist 693.0808

Point 103 N 7,135,707.3210 E 2,349,367.1196 Sta 414+99.99

Course from 103 to PC US3807 Due East Dist 276.2245

Curve Data

Curve US3807 (Chord Definition)
P.I. Station 424+43.63 N 7,135,707.3210 E 2,350,310.7614
Delta = 6° 38′ 34.86" (RT)
Degree = 0° 29′ 53.61"
Tangent = 667.4173
Length = 1,333.3347
Radius = 11,500.0000
External = 19.3509
Long Chord = 1,332.5922
Mid. Ord. = 19.3184
P.C. Station 417+76.21 N 7,135,707.3210 E 2,349,643.3441
P.T. Station 431+09.55 N 7,135,630.1122 E 2,350,973.6977
C.C. N 7,124,207.3210 E 2,349,643.3441
Back = Due East
Ahead = S 83° 21′ 25.14" E
Chord Bear = S 86° 40′ 42.57" E

Course from PT US3807 to PC US3808 S 83° 21′ 25.14" E Dist 1,842.8951

Curve Data

Curve US3808 (Chord Definition)
P.I. Station 451+05.96 N 7,135,399.1617 E 2,352,956.7039
Delta = 3° 31′ 01.88" (RT)
Degree = 1° 08′ 45.36"
Tangent = 153.5145
Length = 306.9276
Radius = 5,000.0000
External = 2.3561
Long Chord = 306.8845
Mid. Ord. = 2.3550
P.C. Station 449+52.44 N 7,135,416.9207 E 2,352,804.2200
P.T. Station 452+59.37 N 7,135,372.0816 E 2,353,107.8111
C.C. N 7,130,450.4898 E 2,352,225.8054
Back = S 83° 21′ 25.14" E
Ahead = S 79° 50′ 23.26" E
Chord Bear = S 81° 35′ 54.20" E

Course from PT US3808 to PC US3809 S 79° 50′ 23.26" E Dist 258.9616

Curve Data

Curve US3809 (Chord Definition)
P.I. Station 456+67.29 N 7,135,300.1242 E 2,353,509.3329
Delta = 3° 24′ 46.21" (LT)
Degree = 1° 08′ 45.36"
Tangent = 148.9571
Length = 297.8211
Radius = 5,000.0000
External = 2.2183
Long Chord = 297.7820
Mid. Ord. = 2.2173
P.C. Station 455+18.33 N 7,135,326.4004 E 2,353,362.7117
P.T. Station 458+16.15 N 7,135,282.6230 E 2,353,657.2583
C.C. N 7,140,247.9923 E 2,354,244.7174
Back = S 79° 50′ 23.26" E
Ahead = S 83° 15′ 09.46" E
Chord Bear = S 81° 32′ 46.36" E

Course from PT US3809 to PC US38010 S 83° 15′ 09.46" E Dist 5,762.9492

Curve Data

Curve US38010 (Chord Definition)
P.I. Station 520+48.31 N 7,134,550.3954 E 2,359,846.2513
Delta = 4° 40′ 22.19" (LT)
Degree = 0° 29′ 53.61"
Tangent = 469.2087
Length = 937.8942
Radius = 11,500.0000
External = 9.5681
Long Chord = 937.6373
Mid. Ord. = 9.5601
P.C. Station 515+79.10 N 7,134,605.5235 E 2,359,380.2924
P.T. Station 525+17.00 N 7,134,533.4102 E 2,360,315.1524
C.C. N 7,146,025.8728 E 2,360,731.4484
Back = S 83° 15′ 09.46" E
Ahead = S 87° 55′ 31.65" E
Chord Bear = S 85° 35′ 20.56" E

Course from PT US38010 to PC US38011 S 87° 55′ 31.65" E Dist 11,948.2560

Curve Data

Curve US38011 (Chord Definition)
P.I. Station 645+21.68 N 7,134,098.8447 E 2,372,311.9693
Delta = 1° 07′ 42.47" (LT)
Degree = 0° 59′ 59.78"
Tangent = 56.4291
Length = 112.8532
Radius = 5,730.0000
External = 0.2779
Long Chord = 112.8528
Mid. Ord. = 0.2778
P.C. Station 644+65.25 N 7,134,100.8874 E 2,372,255.5772
P.T. Station 645+78.10 N 7,134,097.9130 E 2,372,368.3908
C.C. N 7,139,827.1319 E 2,372,463.0012
Back = S 87° 55′ 31.65" E
Ahead = S 89° 03′ 14.12" E
Chord Bear = S 88° 29′ 22.89" E

Course from PT US38011 to PC US38012 S 89° 03′ 14.12" E Dist 321.9487

Curve Data

Curve US38012 (Chord Definition)
P.I. Station 649+54.65 N 7,134,091.6956 E 2,372,744.8886
Delta = 3° 07′ 39.36" (RT)
Degree = 2° 51′ 54.31"
Tangent = 54.6005
Length = 109.1624
Radius = 2,000.0000
External = 0.7452
Long Chord = 109.1603
Mid. Ord. = 0.7449
P.C. Station 649+00.05 N 7,134,092.5972 E 2,372,690.2955
P.T. Station 650+09.22 N 7,134,087.8169 E 2,372,799.3511
C.C. N 7,132,092.8698 E 2,372,657.2727
Back = S 89° 03′ 14.12" E
Ahead = S 85° 55′ 34.76" E
Chord Bear = S 87° 29′ 24.44" E

Course from PT US38012 to PC US38013 S 85° 55′ 34.76" E Dist 139.8206

Curve Data

Curve US38013 (Chord Definition)
P.I. Station 652+01.41 N 7,134,074.1634 E 2,372,991.0621
Delta = 3° 00′ 00.87" (LT)
Degree = 2° 51′ 54.31"
Tangent = 52.3761
Length = 104.7173
Radius = 2,000.0000
External = 0.6857
Long Chord = 104.7162
Mid. Ord. = 0.6855
P.C. Station 651+49.04 N 7,134,077.8841 E 2,372,938.8184
P.T. Station 652+53.75 N 7,134,073.1821 E 2,373,043.4290
C.C. N 7,136,072.8312 E 2,373,080.8968
Back = S 85° 55′ 34.76" E
Ahead = S 88° 55′ 35.63" E
Chord Bear = S 87° 25′ 35.20" E

Course from PT US38013 to 104 S 88° 55′ 35.63" E Dist 1,073.9975

Point 104 N 7,134,053.0620 E 2,374,117.2380 Sta 663+27.75

Ending chain US380 description

STATE OF TEXAS
DANNY MICHAEL HENDERSON
119091
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Danny Henderson
F759E84E0E2C45C...
12/10/2020

US 380
HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DMH	TEXAS	DAL	DENTON	25
CHECK DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	

$FILEL$

```
<*       1   Describe Chain SH114

Chain SH114 contains:
 CUR SH1141 CUR SH1142 CUR SH1143 CUR SH1144 CUR SH1145 101 102 CUR SH1146 CUR -
SH1147 CUR SH1148 103

Beginning chain SH114 description
================================================================================

                                    Curve Data
                                   *----------*
Curve SH1141                 (Chord Definition)
P.I.  Station          735+19.01  N      7,062,896.4590  E      2,307,365.2190
Delta         =      0° 37′ 02.45" (RT)
Degree        =      0° 15′ 00.00"
Tangent       =           123.4707
Length        =           246.9388
Radius        =        22,918.3095
External      =             0.3326
Long Chord    =           246.9378
Mid. Ord.     =             0.3326
P.C.  Station          733+95.54  N      7,062,902.6580  E      2,307,241.9040
P.T.  Station          736+42.48  N      7,062,888.9317  E      2,307,488.4600
C.C.                              N      7,040,013.2513  E      2,306,091.2642
Back          = S  87° 07′ 19.89" E
Ahead         = S  86° 30′ 17.43" E
Chord Bear    = S  86° 48′ 48.66" E

                                    Curve Data
                                   *----------*
Curve SH1142                 (Chord Definition)
P.I.  Station          738+65.02  N      7,062,875.3646  E      2,307,710.5892
Delta         =      6° 40′ 00.94" (RT)
Degree        =      1° 29′ 58.67"
Tangent       =           222.5431
Length        =           444.5712
Radius        =         3,820.7676
External      =             6.4756
Long Chord    =           444.3331
Mid. Ord.     =             6.4646
P.C.  Station          736+42.48  N      7,062,888.9317  E      2,307,488.4600
P.T.  Station          740+87.05  N      7,062,836.1005  E      2,307,929.6412
C.C.                              N      7,059,075.2709  E      2,307,255.5301
Back          = S  86° 30′ 17.43" E
Ahead         = S  79° 50′ 16.49" E
Chord Bear    = S  83° 10′ 16.96" E

Course from PT SH1142 to PC SH1143 S 79° 50′ 16.49" E Dist 315.9073

                                    Curve Data
                                   *----------*
Curve SH1143                 (Chord Definition)
P.I.  Station          748+86.18  N      7,062,695.1076  E      2,308,716.2330
Delta         =      9° 38′ 29.76" (LT)
Degree        =      1° 00′ 00.05"
Tangent       =           483.2208
Length        =           964.1476
Radius        =         5,729.5780
External      =            20.3408
Long Chord    =           963.0227
Mid. Ord.     =            20.2689
P.C.  Station          744+02.96  N      7,062,780.3639  E      2,308,240.5927
P.T.  Station          753+67.10  N      7,062,690.7180  E      2,309,199.4338
C.C.                              N      7,068,420.0596  E      2,309,251.4817
Back          = S  79° 50′ 16.49" E
Ahead         = S  89° 28′ 46.25" E
Chord Bear    = S  84° 39′ 31.37" E

Course from PT SH1143 to PC SH1144 S 89° 28′ 46.25" E Dist 5,144.8164

                                    Curve Data
                                   *----------*
Curve SH1144                 (Chord Definition)
P.I.  Station          807+07.59  N      7,062,642.2046  E      2,314,539.7030
Delta         =      2° 04′ 25.05" (RT)
Degree        =      0° 31′ 47.75"
Tangent       =           195.6731
Length        =           391.3021
Radius        =        10,812.0000
External      =             1.7705
Long Chord    =           391.2821
Mid. Ord.     =             1.7702
P.C.  Station          805+11.92  N      7,062,643.9821  E      2,314,344.0379
P.T.  Station          809+03.22  N      7,062,633.3484  E      2,314,735.1755
C.C.                              N      7,051,832.4283  E      2,314,245.8209
Back          = S  89° 28′ 46.25" E
Ahead         = S  87° 24′ 21.20" E
Chord Bear    = S  88° 26′ 33.72" E

Course from PT SH1144 to PC SH1145 S 87° 24′ 21.20" E Dist 374.0454

                                    Curve Data
                                   *----------*
Curve SH1145                 (Chord Definition)
P.I.  Station          815+40.03  N      7,062,604.5263  E      2,315,371.3293
Delta         =      2° 47′ 03.62" (LT)
Degree        =      0° 31′ 47.75"
Tangent       =           262.7609
Length        =           525.4166
Radius        =        10,812.0000
External      =             3.1924
Long Chord    =           525.3667
Mid. Ord.     =             3.1915
P.C.  Station          812+77.27  N      7,062,616.4190  E      2,315,108.8376
P.T.  Station          818+02.69  N      7,062,605.3987  E      2,315,634.0888
C.C.                              N      7,073,417.3391  E      2,315,598.1922
Back          = S  87° 24′ 21.20" E
Ahead         = N  89° 48′ 35.19" E
Chord Bear    = S  88° 47′ 53.01" E

Course from PT SH1145 to 101 N 4° 56′ 18.22" W Dist 76,575.8842

Equation: Sta 1583+78.57 (BK) = Sta 10+00.00 (AH)        End   Region 1
                                                         ---------------
                                                         Begin Region 2

Point 101             N    7,138,897.0207 E    2,309,042.0887 Sta      10+00.00

Course from 101 to 102 S 85° 21′ 02.02" E Dist 39,154.1510

Equation: Sta 401+54.15 (BK) = Sta 401+99.99 (AH)        End   Region 2
                                                         ---------------
                                                         Begin Region 3

Point 102             N    7,135,723.2245 E    2,348,067.3953 Sta     401+99.99

Course from 102 to PC SH1146 S 15° 10′ 37.13" W Dist 75,716.8274

Equation: Sta 1159+16.82 (BK) = Sta 944+13.29 (AH)       End   Region 3
                                                         ---------------
                                                         Begin Region 4

                                    Curve Data
                                   *----------*
Curve SH1146                 (Chord Definition)
P.I.  Station          950+17.20  N      7,062,649.2718  E      2,328,848.5328
Delta         =     23° 15′ 21.76" (RT)
Degree        =      1° 57′ 08.69"
Tangent       =           603.9146
Length        =         1,191.1433
Radius        =         2,934.7547
External      =            61.4926
Long Chord    =         1,183.0406
Mid. Ord.     =            60.2306
P.C.  Station          944+13.29  N      7,062,647.2667  E      2,328,244.6216
P.T.  Station          956+04.43  N      7,062,412.6651  E      2,329,404.1677
C.C.                              N      7,059,712.5282  E      2,328,254.3651
Back          = N  89° 48′ 35.19" E
Ahead         = S  66° 56′ 03.05" E
Chord Bear    = S  78° 33′ 43.93" E

Course from PT SH1146 to PC SH1147 S 66° 56′ 03.05" E Dist 790.0640

                                    Curve Data
                                   *----------*
Curve SH1147                 (Chord Definition)
P.I.  Station          966+60.21  N      7,061,999.0246  E      2,330,375.5397
Delta         =      5° 18′ 37.54" (RT)
Degree        =      1° 00′ 00.05"
Tangent       =           265.7116
Length        =           531.0359
Radius        =         5,729.5780
External      =             6.1579
Long Chord    =           530.8526
Mid. Ord.     =             6.1513
P.C.  Station          963+94.50  N      7,062,103.1273  E      2,330,131.0704
P.T.  Station          969+25.53  N      7,061,872.7427  E      2,330,609.3249
C.C.                              N      7,056,831.5981  E      2,327,886.2887
Back          = S  66° 56′ 03.05" E
Ahead         = S  61° 37′ 25.52" E
Chord Bear    = S  64° 16′ 44.29" E

Course from PT SH1147 to PC SH1148 S 61° 37′ 25.52" E Dist 224.9191

                                    Curve Data
                                   *----------*
Curve SH1148                 (Chord Definition)
P.I.  Station          974+16.16  N      7,061,639.5665  E      2,331,041.0029
Delta         =      5° 18′ 37.44" (LT)
Degree        =      1° 00′ 00.05"
Tangent       =           265.7102
Length        =           531.0332
Radius        =         5,729.5780
External      =             6.1579
Long Chord    =           530.8498
Mid. Ord.     =             6.1513
P.C.  Station          971+50.45  N      7,061,765.8477  E      2,330,807.2190
P.T.  Station          976+81.48  N      7,061,535.4642  E      2,331,285.4710
C.C.                              N      7,066,806.9923  E      2,333,530.2551
Back          = S  61° 37′ 25.52" E
Ahead         = S  66° 56′ 02.95" E
Chord Bear    = S  64° 16′ 44.24" E

Course from PT SH1148 to 103 N 13° 42′ 01.31" E Dist 76,344.0263

Equation: Sta 1740+25.51 (BK) = Sta 414+99.99 (AH)       End   Region 4
                                                         ---------------
                                                         Begin Region 5

Point 103             N    7,135,707.3210 E    2,349,367.1196 Sta     414+99.99

================================================================================
Ending chain SH114 description
```


STATE OF TEXAS
DANNY MICHAEL HENDERSON
119091
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Danny Henderson
F759E84E0E2C45C...

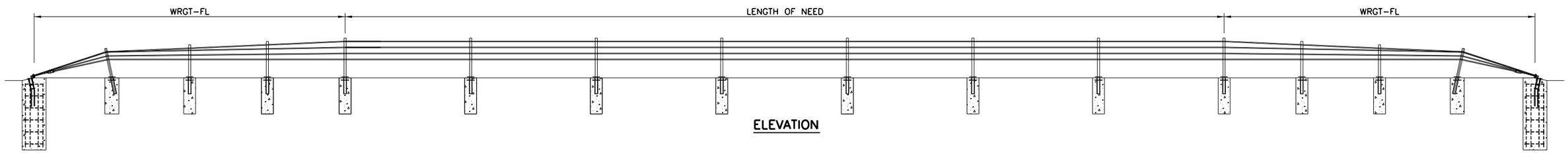
12/10/2020

SH 114
HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AT	TEXAS	DAL	DENTON	26
CHECK	CONTROL	SECTION	JOB	
DMH	0134	09	067, ETC.	
CHECK				
DMH				

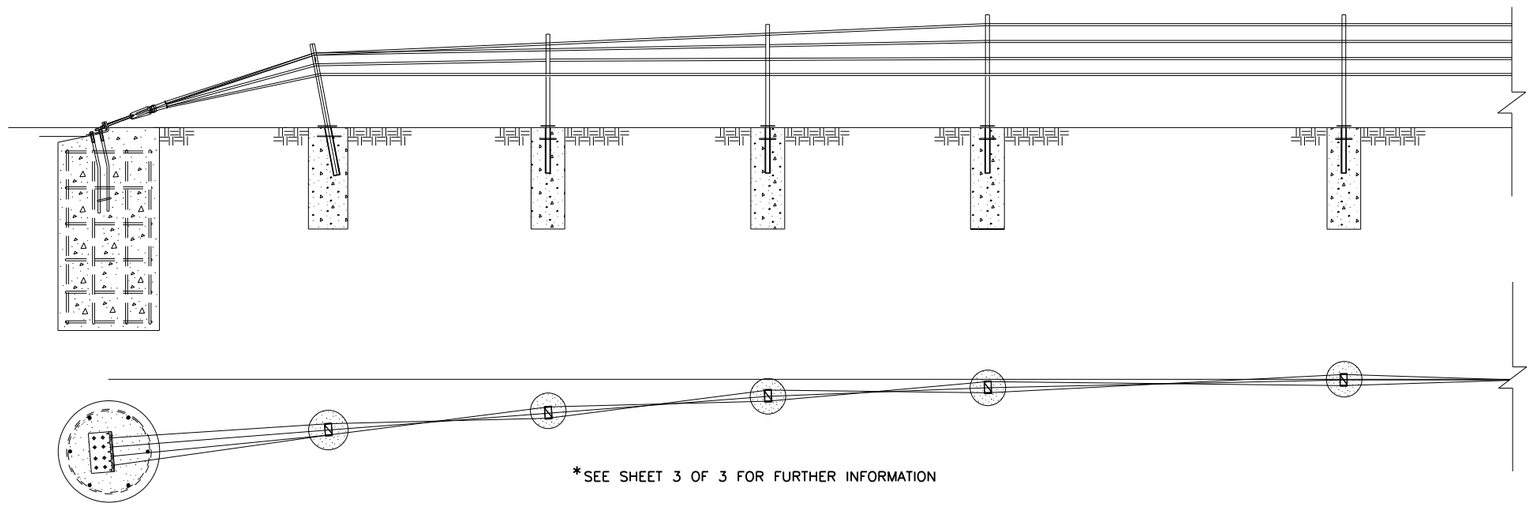
DATE: 12/15/2020
FILE: T:\DENDES\Projects\US380\0134-09-067etc_Median Barrier\PLANS\25-27-brifent1414.dgn



ELEVATION

PLAN

WRGT-FL END ANCHOR



*SEE SHEET 3 OF 3 FOR FURTHER INFORMATION

ROPE TENSION TABLE		
ROPE TEMP (°F)	TENSION (LBS)	TENSION (kN)
0	5700	25.4
5	5550	24.7
10	5400	24.0
15	5250	23.4
20	5100	22.7
25	4950	22.0
30	4800	21.4
35	4650	20.74
40	4500	20.0
45	4350	19.3
50	4200	18.7
55	4050	18.0
60	3900	17.3
65	3750	16.7
70	3600	16.0
75	3450	15.3
80	3300	14.7
85	3150	14.0
90	3000	13.3
95	2850	12.7
100	2700	12.0
105	2550	11.3
110	2400	10.7
115	2250	10.0
120	2100	9.3
125	1950	8.7
130	1800	8.0
135	1650	7.3
140	1500	6.7

*ROPE TENSION: ± 20% AFTER 2-WEEK INTERVAL

GENERAL NOTES:

1. BRIFEN DRAWINGS, SPECIFICATIONS, AND PRODUCT MANUAL SHOULD BE REVIEWED PRIOR TO STARTING AN INSTALLATION. FOR ADDITIONAL INFORMATION OR QUESTIONS, CONTACT BRIFEN USA, INC. AT 1-866-427-4336.

2. THE BRIFEN WRSF HAS BEEN SUCCESSFULLY TESTED TO NCHRP 350 TL-4 CONDITIONS ON SLOPES 6:1 OR FLATTER AND NCHRP 350 TL-3 CONDITIONS ON SLOPES 4:1 TO 6:1.

3. THE POST SPACING SHALL BE DETERMINED BY THE SPECIFYING AGENCY. POST SPACING MAY BE DECREASED TO AVOID OBSTRUCTIONS OR UTILITIES. IN NO EVENT SHALL THE POST SPACING EXCEED 21'-0".

4. BRIFEN WRSF SHALL BE PLACED ON A SMOOTH SURFACE, WITHOUT HUMPS, DROP-OFFS, HOLES, ETC THAT WOULD INTERFERE WITH THE STABILITY OF THE ERRANT VEHICLE. GRADING, FILL AND COMPACT MAY BE REQUIRED TO ASSURE THAT ROPES ARE INSTALLED AT THE DESIGN HEIGHT.

5. THE WRGT-FL END ANCHOR HAS BEEN SUCCESSFULLY TESTED TO NCHRP 350 TL-3 CONDITIONS. THE LENGTH OF NEED BEGINS 31'-0" FROM THE END ANCHOR. POSTS A THROUGH POST B3, SPACED 6'-6" APART, HAVE WEAKENED CUTS AT THE GROUND THAT SHALL FACE THE ANCHOR.

6. ANCHOR AND LINE POST DIMENSIONS AND STEEL REINFORCEMENT WILL BE DETERMINED ON PROJECT SPECIFIC SOIL CLASSIFICATION, PROPERTIES AND TEMPERATURE EXTREMES. CONTACT BRIFEN USA, INC. FOR ADDITIONAL INFORMATION.

7. ALL REINFORCEMENT AND CONCRETE FOR THE ANCHORS AND LINE POSTS PROVIDED BY OTHERS.

8. REINFORCEMENT AND CONCRETE PROPERTIES SHALL MEET AGENCY SPECIFICATIONS.

9. FOR PLACEMENT NEAR GUARDRAIL OR OTHER OBSTACLES CONTACT BRIFEN USA, INC. FOR ADDITIONAL DRAWINGS AND SUPPORT.

10. TAPER RATES FOR THE BRIFEN WRSF ARE AS FOLLOWS:
    HORIZONTAL: 25:1 MAXIMUM, 50:1 PREFERABLE
    VERTICAL: 25:1 MAXIMUM, 50:1 PREFERABLE

Texas Department of Transportation

Design Division Standard

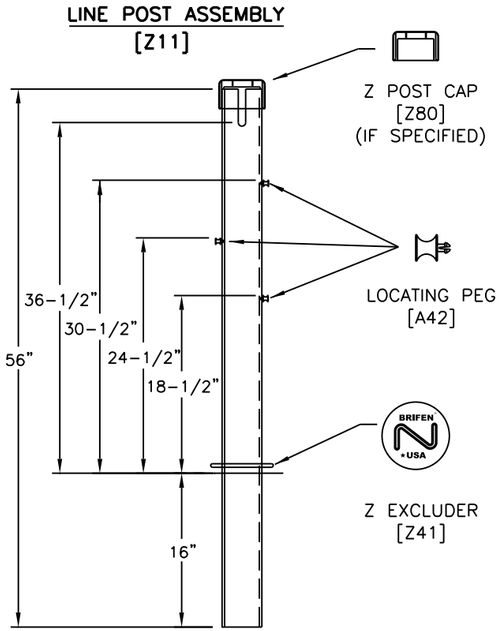
BRIFEN
WIRE ROPE SAFETY FENCE
(TL-4)

BRIFEN(TL4)-14

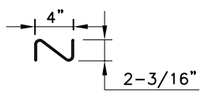
FILE: brifent1414.dgn	DN: TxDOT	CK: RM	DW: VP	CK:
© TxDOT: MARCH 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0134	09	067,ETC.	US380,ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON		27

DATE: 12/15/2020
FILE: T:\DENDES\Projects\US380\0134-09-067etc_Median Barrier\PLANS\25-27-brifent1414.dgn

LINE POST ASSEMBLY
[Z11]



ELEVATION

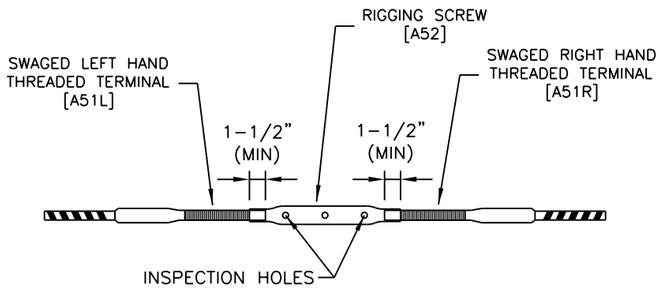


PLAN

NOTES SPECIFIC TO LINE POST ASSEMBLY

1. ROPE HEIGHTS SHALL BE ±1" TO GROUND LINE.
2. POST SHALL BE ±4" FROM VERTICAL PLUMB.
3. POST CAPS SHALL BE USED IF SPECIFIED.
4. REFLECTORS SHALL BE SPACED ACCORDING TO AGENCY SPECIFICATIONS.
5. REFLECTORS CAN BE PLACED ON THE POST CAP OR POST.

ROPE CONNECTION DETAIL

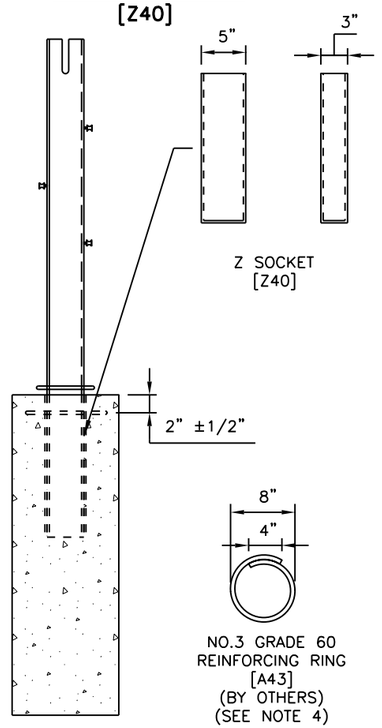


NOTES SPECIFIC TO ROPE CONNECTION DETAIL

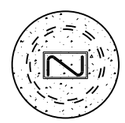
1. THE WIRE ROPE TERMINALS SHALL BE THREADED A MINIMUM OF 1-1/2" INTO RIGGING SCREW.
2. AFTER FINAL TENSIONING, THE TERMINALS SHALL BE VISIBLE IN THE INSPECTION HOLES.

SOCKET ASSEMBLY

CONCRETE FOOTING
[Z40]



ELEVATION

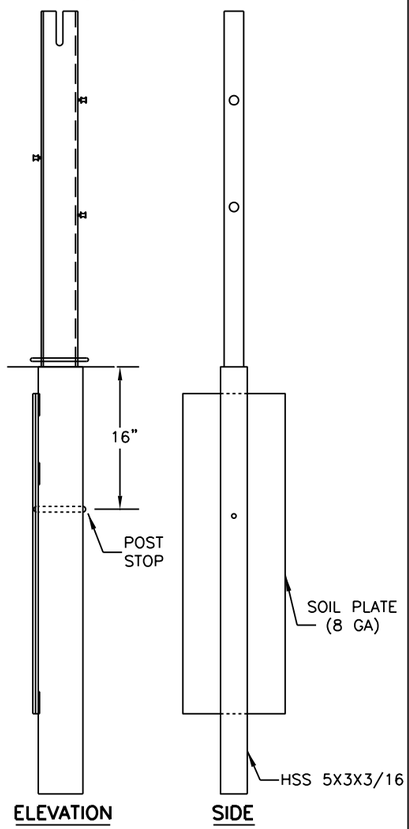


PLAN

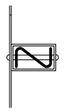
NOTES SPECIFIC TO CONCRETE FOOTING

1. SIZE OF FOOTING WILL BE DETERMINED BY SOIL CONDITIONS, FOUNDATION TYPE AND PROJECT CONDITIONS.
2. CONCRETE BASED ON AGENCY SPECIFICATIONS.
3. CONCRETE BY OTHERS.
4. REINFORCING RING (BY OTHERS) WILL BE USED ACCORDING TO FOUNDATION SIZE AND TYPE. THE REINFORCEING RING MAY BE OMITTED IF THE FOOTING IS PLACED IN A CONTINOUS CONCRETE MOW STRIP.
5. FOOTING SHALL BE FLUSH WITH THE GROUND LINE, TO A MAXIMUM OF 1 INCH BELOW OR ABOVE GROUND LINE.
6. SOCKET SHALL BE ±2° OF VERTICAL PLUMB.

DRIVE SOCKET
[Z44]



ELEVATION SIDE



PLAN

NOTES SPECIFIC TO DRIVE SOCKETS

1. SIZE OF SOIL PLATE WILL BE DETERMINED BY SOIL CONDITIONS AND PROJECT CONDITIONS.
2. THE SOIL PLATE SHALL BE PARALLEL TO ROADWAY AND CAN FACE TOWARD OR AWAY FROM THE TRAVEL LANE.
3. FOOTING SHALL BE FLUSH WITH THE GROUND LINE, TO A MAXIMUM OF 1 INCH BELOW OR ABOVE GROUND LINE.
4. SOCKET SHALL BE ±2° OF VERTICAL PLUM.
5. SOCKETS SHALL BE DRIVEN IN A MANNER TO NOT DISTORT OR DESTROY THE TOP OF SOCKET TO A DEGREE THAT PLACES THE SOCKET OR LINE POST OUT OF CONSTRUCTION TOLERANCES.

GENERAL NOTES:

1. BRIFEN DRAWINGS, SPECIFICATIONS, AND PRODUCT MANUAL SHOULD BE REVIEWED PRIOR TO STARTING AN INSTALLATION. FOR ADDITIONAL INFORMATION OR QUESTIONS, CONTACT BRIFEN USA, INC. 1-866-427-4336.
2. THE BRIFEN WRSF HAS BEEN SUCCESSFULLY TESTED TO NCHRP 350 TL-4 CONDITIONS ON SLOPES 6:1 OR FLATTER AND NCHRP 350 TL-3 CONDITIONS ON SLOPES 4:1 TO 6:1.
3. THE POST SPACING SHALL BE DETERMINED BY THE SPECIFYING AGENCY. POST SPACING MAY BE DECREASED TO AVOID OBSTRUCTIONS OR UTILITIES. IN NO EVENT SHALL THE POST SPACING EXCEED 21'-0".
4. BRIFEN WRSF SHALL BE PLACED ON A SMOOTH SURFACE, WITHOUT HUMPS, DROP-OFFS, HOLES, ETC THAT WOULD INTERFERE WITH THE STABILITY OF THE ERRANT VEHICLE. GRADING, FILL AND COMPACTION MAY BE REQUIRED TO ASSURE THAT ROPES ARE INSTALLED AT THE DESIGN HEIGHT.

Texas Department of Transportation

Design Division Standard

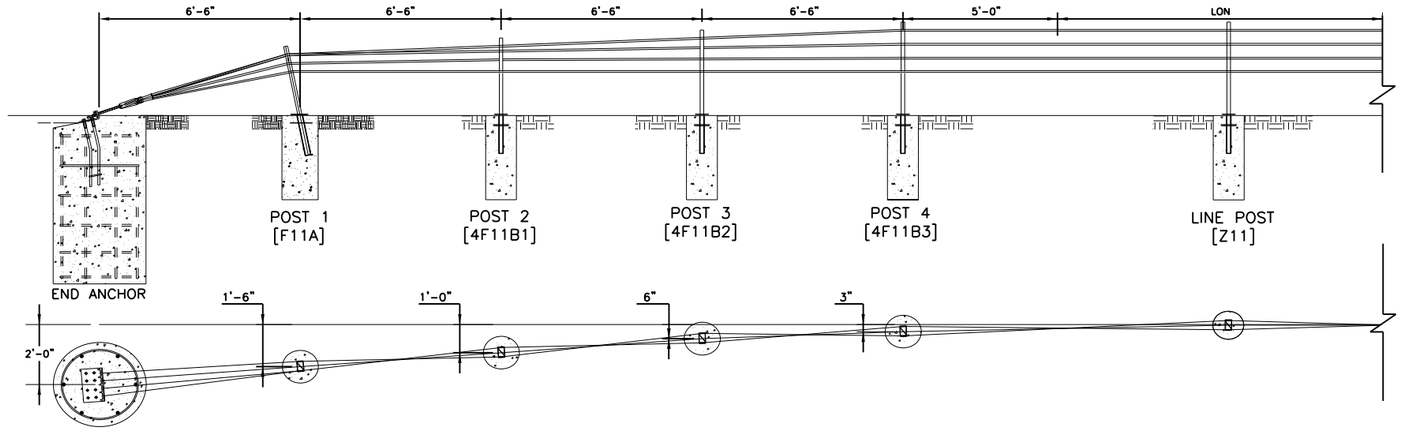
BRIFEN
WIRE ROPE SAFETY FENCE
(TL-4)

BRIFEN(TL4)-14

FILE: brifent1414.dgn	DN: TxDOT	CK: RM	DW: VP	CK:
© TxDOT: MARCH 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0134	09	067,ETC.	US380,ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON		28

DATE: 12/15/2020
FILE: T:\DENDES\Projects\US380\0134-09-067etc_Median Barrier\PLANS\25-27-brifent1414.dgn

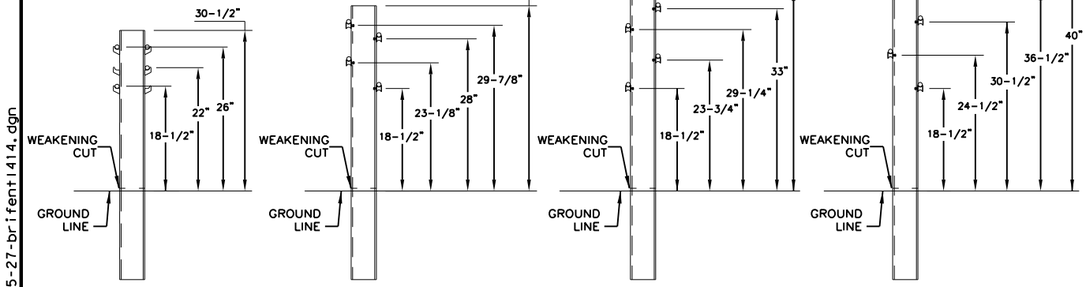
WRGT-FL END ANCHOR LAYOUT



GENERAL NOTES:

1. BRIFEN DRAWINGS, SPECIFICATIONS, AND PRODUCT MANUAL SHOULD BE REVIEWED PRIOR TO STARTING AN INSTALLATION. FOR ADDITIONAL INFORMATION OR QUESTIONS, CONTACT BRIFEN USA, INC. AT 1-866-427-4336.
2. THE WRGT-FL END ANCHOR HAS BEEN SUCCESSFULLY TESTED TO NCHRP 350 TL-3 CONDITIONS. THE LENGTH OF NEED BEGINS 31'-0" FROM THE END ANCHOR. POSTS A THROUGH POST B3, SPACED 6'-6" APART, HAVE WEAKENED CUTS AT THE GROUND THAT SHALL FACE THE ANCHOR.
3. ANCHOR AND LINE POST DIMENSIONS AND STEEL REINFORCEMENT WILL BE DETERMINED ON PROJECT SPECIFIC SOIL CLASSIFICATION, PROPERTIES AND TEMPERATURE EXTREMES. CONTACT BRIFEN USA, INC. FOR ADDITIONAL INFORMATION.
4. ALL REINFORCEMENT AND CONCRETE FOR THE ANCHORS AND LINE POSTS PROVIDED BY OTHERS.
5. REINFORCEMENT AND CONCRETE PROPERTIES SHALL MEET AGENCY SPECIFICATIONS.
6. FOR PLACEMENT NEAR GUARDRAIL OR OTHER OBSTACLES CONTACT BRIFEN USA, INC. FOR ADDITIONAL DRAWINGS AND SUPPORT.

WRGT-FL POST DETAILS

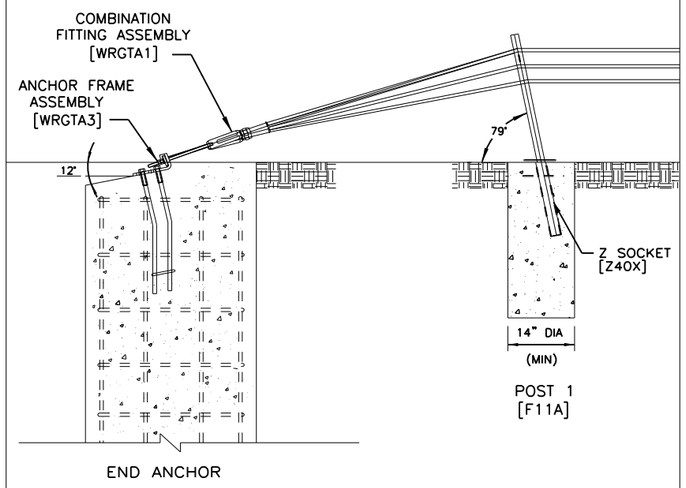


POST 1 [F11AL] | POST 2 [4F11B1L] | POST 3 [4F11B2L] | POST 4 [4F11B3L]

NOTES SPECIFIC TO WRGT-FL POST DETAIL

1. ROPE HEIGHTS SHALL BE ±1" TO GROUND LINE.
2. POST SHALL BE ±4" FROM VERTICAL PLUMB.
3. POST CAPS SHALL BE USED IF SPECIFIED.
4. REFLECTORS SHALL BE SPACED ACCORDING TO AGENCY SPECIFICATIONS.
5. REFLECTORS CAN BE PLACED ON THE POST CAP OR POST.
6. Z EXCLUDER (Z41) SHALL BE USED.
7. POST A & SOCKET SHALL BE PLACED 79° (±4°) TOWARD END ANCHOR FROM THE HORIZONTAL PLANE.
8. POST A SOCKET SHALL BE PLACED IN 14" (MIN) CONCRETE FOUNDATION. DEPTH TO BE DETERMINED FROM SOIL CONDITIONS AND PROJECT CONDITIONS.
9. FOUNDATIONS FOR POST 2 THRU 4 SHALL BE THE SAME AS THE LINE POST ASSEMBLY'S FOR THE PROJECT.
10. WEAKENED CUTS SHALL FACE END ANCHOR.

END ANCHOR DETAILS

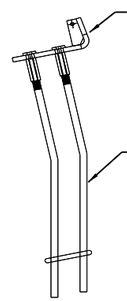


NOTES SPECIFIC TO END ANCHOR DETAIL

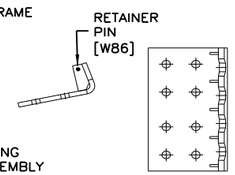
1. THE END ANCHOR ASSEMBLY SHALL BE PLACED 12" (+3", -1") BELOW HORIZONTAL PLANE.
2. POST 1 & SOCKET SHALL BE PLACED 79° (±4°) TOWARD END ANCHOR FROM THE HORIZONTAL PLANE.
3. POST 1 SOCKET SHALL BE PLACED IN 14" (MIN) CONCRETE FOUNDATION. DEPTH TO BE DETERMINED FROM SOIL CONDITIONS AND PROJECT CONDITIONS.

END ANCHOR COMPONENTS

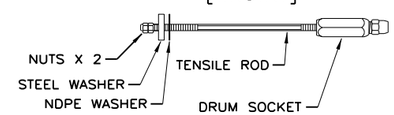
ANCHOR FRAME ASSEMBLY



ANCHOR FRAME [A70]



COMBINATION FITTING [WRGTA1]



SHEET 3 OF 3

Texas Department of Transportation | Design Division Standard

BRIFEN
WIRE ROPE SAFETY FENCE
(TL-4)

BRIFEN(TL4)-14

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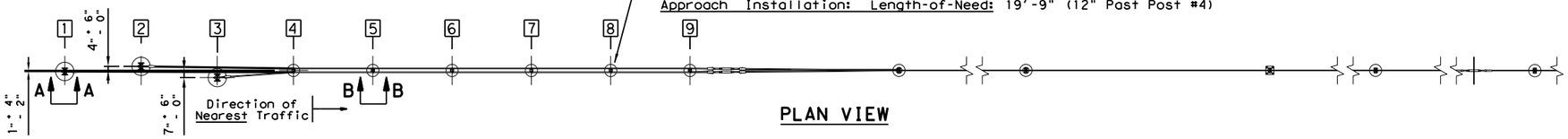
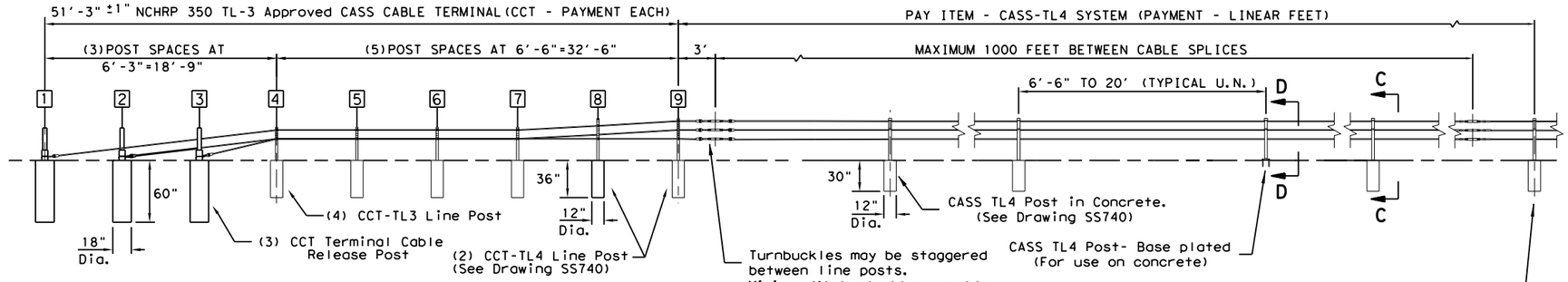
	DAL	DENTON		29

Preferred Installation: Locate post #2 away from nearest traffic.
System has been succesfully tested with opposite installation.

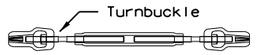
Length-of-Need Cass Cable Terminal (CCT):
Departure Installation: Length-of-Need: 44'-9" (At Post #8)
Approach Installation: Length-of-Need: 19'-9" (12" Past Post #4)



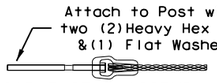
PLAN VIEW



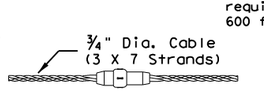
ELEVATION VIEW
(TYPICAL LAY-OUT)



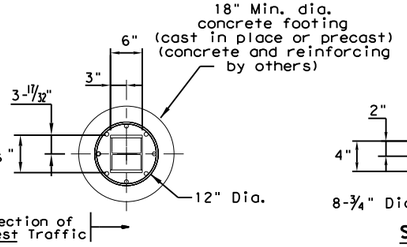
CABLE SPLICE WITH TURNBUCKLE
(OPEN BODY STYLE)



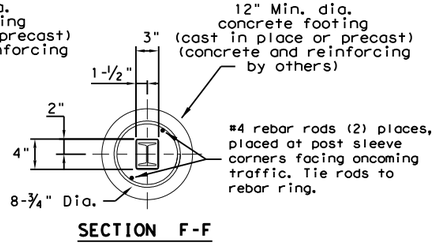
CABLE STUD ASSEMBLY



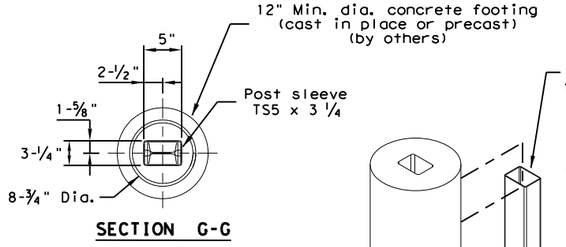
TORPEDO CABLE SPLICE



SECTION E-E

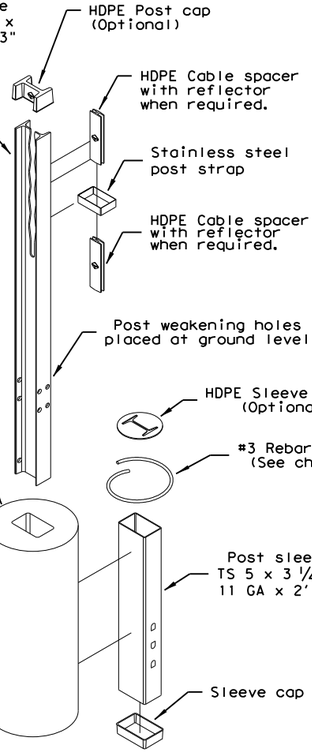


SECTION F-F

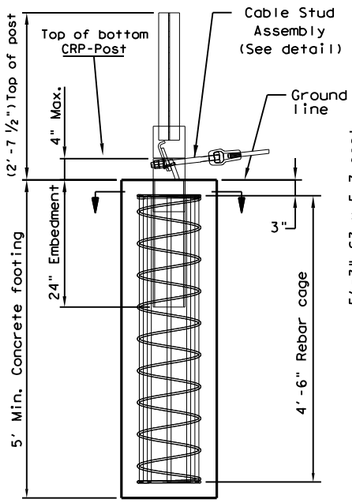


SECTION G-G

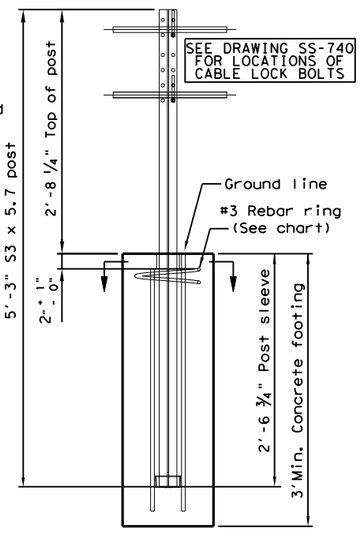
CONCRETE FOOTING
(IN QUALIFYING MOW STRIP SEE CHART)



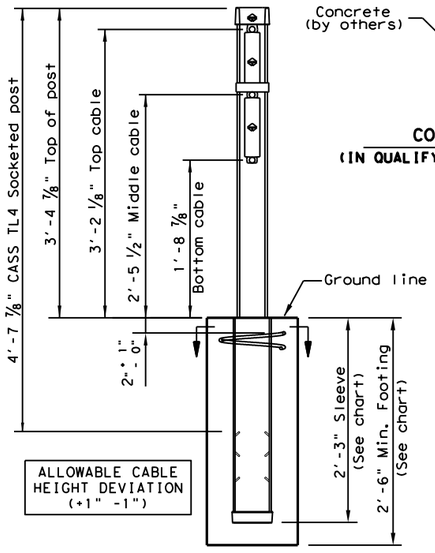
STANDARD POST & CONCRETE FOOTING
(SOCKETED POST)



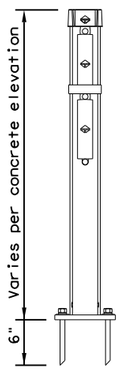
VIEW A-A
(CABLE RELEASE POST 1-3)



VIEW B-B
(TERMINAL LINE POST 4-7)



SECTION C-C
(SOCKETED POST)



SECTION D-D
(BASE PLATED POST)

GENERAL NOTES

1. This drawing is a general overview of CASS TL-4 Barrier System. See SS-740 (latest version) for specific details of CASS cable terminal (CCT) and cable safety system (CASS) requirements, proper installation, options and specification.
2. CASS is designed for bi-directional traffic flows and can be installed on either side of the median. Contact Trinity (800-527-6050) or consult the design, installation, or repair manual(s) for additional information.
3. All concrete for CASS footings shall be TxDOT class A. If class A or stronger concrete is utilized for the mowstrip, please see chart below for allowable footing depth and sleeve deviations.
4. All posts shall be socketed unless otherwise specified. All cables shall be pre-stretched unless otherwise specified.
5. For payment see Special Specification "Cable Barrier System".
6. CASS-TL4 shall be installed on shoulders or medians with slopes of 6:1 or flatter without obstructions, depressions, etc. That may significantly affect the stability of an errant vehicle. Grading of site and/or appropriate fill materials may be required. The designer/installer shall "Flatten" or "Round" various topographical inconsistencies that could interfere with the ability of the installer to consistently maintain the design height (in relation to the terrain) of the cables. Please consult manual(s) and / or TxDOT Memo(s) for installations in "Ditch Sections".
7. CASS TL-4 post spacing may be modified to avoid obstacles that conflict with the installation of cass-tl4 line posts or to reduce deflection on radiuses. No post space can exceed the maximum post TxDOT space limit of 20'. Reducing or increasing post spacing affects deflection. CASS TL-4 may be laterally transferred at a rate not to exceed 30:1.
8. Post foundations may be drilled through existing pavement. Please see line post foundation chart for minimum footing requirements in various applications.
9. For aesthetic purposes Trinity recommends all sleeves, driven posts, and lower cable release posts to be installed reasonably plumb (approximately 1/8" per foot).
10. CASS TL-4 shall be installed in well-drained, compacted, NCHRP Report 350 Standard soil. If soil does not meet this classification, if solid rock/concrete is encountered below grade or if soil is susceptable to severe freeze/thaw cycles, please contact Trinity about alternate footing design(s). Trinity suggests the use of "Mow strips" for erosion prevention and ease of maintenance / installation.
11. See the Texas MUTCD for proper "Barrier" Delineation.

MOW STRIP DETAIL*			CONCRETE FOOTING CHART		
MOW STRIP	DEPTH	WIDTH	FOOTING	TUBE SLEEVE	REBAR RING
NONE			30" Min.	27" Min.	YES
HMA	6" Min.	3' Min.	27" Min.	15" Min.	NO
HMA	8" Min.	3' Min.	24" Min.	15" Min.	NO
RC	3" Min.	3' Min.	24" Min.	15" Min.	NO

Chart does not apply to Terminal Posts 1 thru 9.
* Mow strip or pavement.
HMA = Hot Mix Asphalt (Not Recycled Asphalt Pavement).
RC = Reinforced Concrete (TxDOT Class A Minimum).

CABLE TENSION CHART	
FAHRENHEIT	PRE-STRETCHED
DEGREES	LB / FORCE
-10	7300
0	7000
10	6600
20	6300
30	6000
40	5600
50	5300
60	5000
70	4600
80	4300
90	4000
100	3600
110	3300
120	3000
130	2700
140	2500
150	2300

Allowable deviation from chart in tangent sections: +800, -200 pounds/force. Cable tension readings are typically higher in curved cable sections.

Trinity Highway Products, LLC.
2525 Stemmons Freeway
Dallas, TX 75207
Phone: (800) 644-7976

Product.INFO@TRIN.NET

Texas Department of Transportation — Design Division Standard

TRINITY CABLE SAFETY SYSTEM (TL-4)

CASS(TL4)-14

FILE: casstl414.dgn	DN: TxDOT	CK: RM	DW: VP	CK:
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REVISIONS	0134	09	067,ETC.	US380,ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON		30

DATE: 12/15/2020
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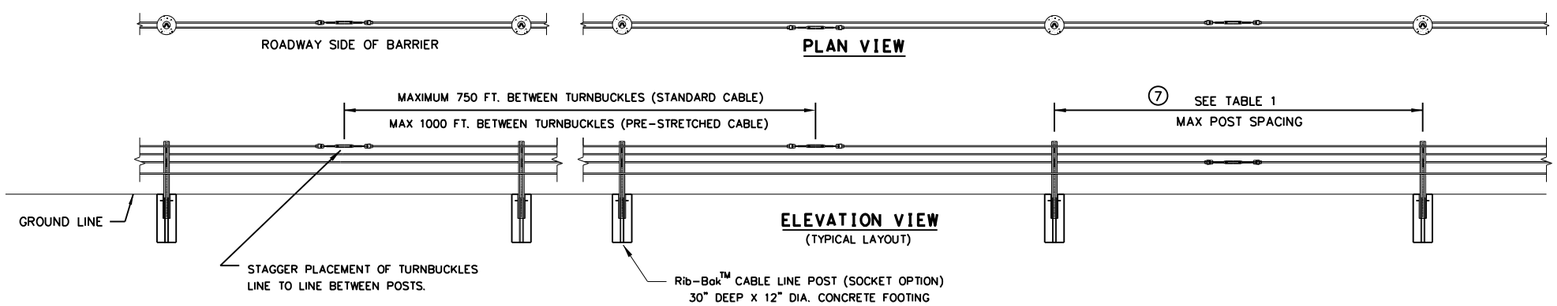
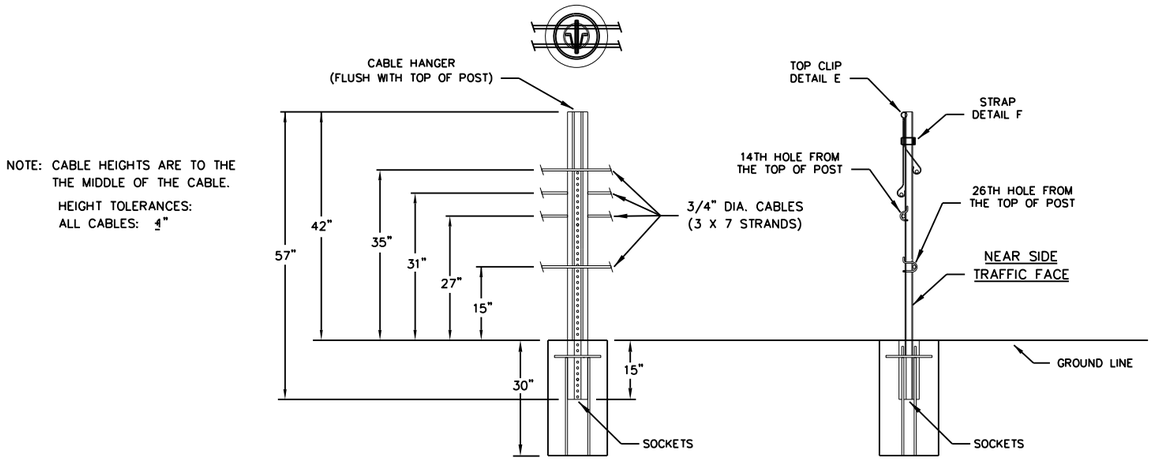
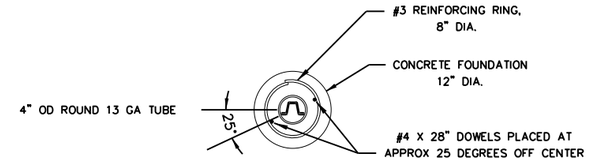
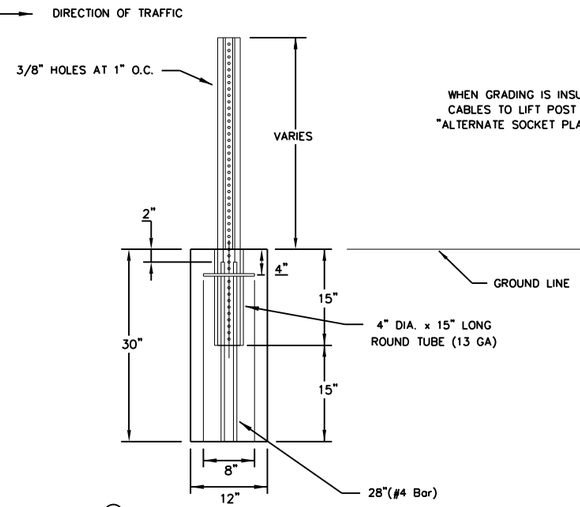




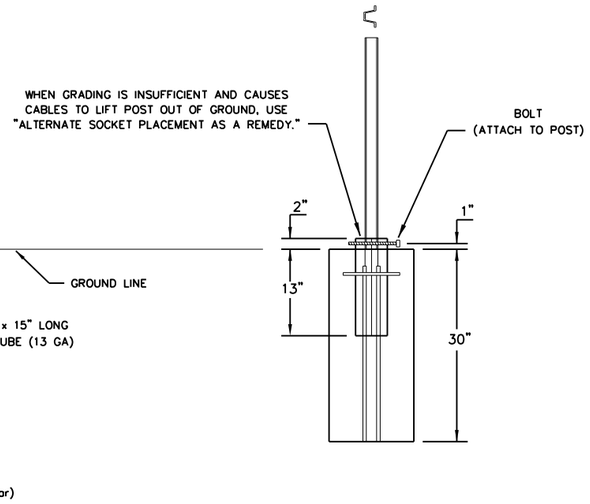
LENGTH OF NEED POSTS
MEDIAN CONFIGURATION

INSTALLATION DETAIL
4 CABLE 6:1

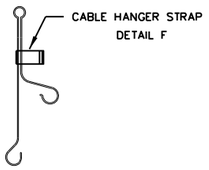




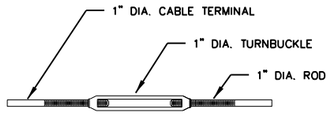
⑪ **SOCKETED POST OPTION**
(TYPE S POST)



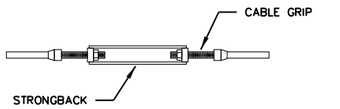
ALTERNATE SOCKET PLACEMENT
(TYPE S POST)



CABLE HANGER BRACKET
DETAIL E
(SUBJECT TO MANUFACTURER'S TOLERANCES)



WEDGED FITTING
TURNBUCKLE DETAIL
(TYPICAL)



STRONGBACK (SELF-SWAGING)
TURNBUCKLE DETAIL
(OPTIONAL)

GENERAL NOTES

1. FOR ADDITIONAL INFORMATION CONTACT YOUR DISTRIBUTOR OR NUCOR STEEL MARION, INC. AT (740) 383-4011.
2. FOR PAYMENT SEE SPECIAL SPECIFICATION "CABLE BARRIER SYSTEM".
3. FOR ADDITIONAL INFORMATION SEE THE MANUFACTURER'S PRODUCT MANUAL.
4. THE NU-CABLE SYSTEM IS DESIGNED FOR BI-DIRECTIONAL TRAFFIC FLOWS. SEE THE MANUFACTURER'S PRODUCT MANUAL FOR PLACEMENT ADJACENT TO GUARDRAIL END TREATMENTS.
5. THE NU-CABLE SYSTEM SHALL BE INSTALLED ON MEDIANS WITH SLOPES OF 6:1 OR FLATTER WITHOUT OBSTRUCTIONS, DEPRESSIONS, ETC; THAT MAY SIGNIFICANTLY AFFECT THE STABILITY OF AN ERRANT VEHICLE.
6. THE NU-CABLE SYSTEM MAY BE INSTALLED ON EITHER SIDE OF THE ROADWAY. Rib-Bak™ CABLE LINE POSTS MAY BE SOCKETED OR DRIVEN DESIGN.
7. THE TL-4 FOR 6:1 SLOPES CAN USE 4# / LF POST. SEE TABLE #1 FOR POST SIZE PER SPACING.
8. SEE (TABLE 2) FOR TENSION AMOUNT AT SPECIFIC CABLE TEMPERATURE FOR INITIAL INSTALLATION.
9. SEE (TABLE 3) FOR TENSION AMOUNT AT SPECIFIC CABLE TEMPERATURE FOR MAINTENANCE.
10. FOURTH (LOWEST) CABLE IS NOT OPTIONAL ON THE TL-4 SYSTEM.
11. CONSULT YOUR PROJECT PLAN SHEETS AND CABLE BARRIER SPECIFICATIONS FOR DESIRED SOCKET MATERIAL.
12. ALL FOUNDATION DESIGNS ARE BASED ON NCHRP 350 STRONG (S1) SOIL. CONSULT THE MANUFACTURER FOR SPECIFIC FOUNDATION DESIGN IF SOIL TYPES DIFFER.

⑦ TABLE 1

POST SIZE TABLE	
POST SPACING	POST SIZE
0' - 17'-6"	4# / LF X 4' OR 6' POST
17'-6" - 20'	5# / LF X 4' POST

POST SPACING IS PER 8 FOOT DEFLECTION REQUIRMENTS.
CONSULT PRODUCT MANUAL IF GREATER DEFLECTION IS PERMISSIBLE.

⑧ TABLE 2

CABLE TENSION CHART	
INITIAL INSTALL	
F	LBF
120	4624
110	4986
100	5350
90	5713
80	6077
70	6440
60	7167
50	7894
40	8619
30	9346
20	10073
10	10800
0	11525
-10	12252
-20	12979
-30	13706

⑨ TABLE 3

CABLE TENSION CHART	
MAINTENANCE	
F	LBF
120	4021
110	4336
100	4652
90	4968
80	5284
70	5600
60	6232
50	6864
40	7495
30	8127
20	8759
10	9391
0	10022
-10	10654
-20	11286
-30	11918

Texas Department of Transportation — Design Division Standard

NU-CABLE BARRIER SYSTEM (TL-4) (4 CABLE)

NU-CABLE(TL4)-14

FILE:	DN:	CK:	DW:	CK:
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	DIST	COUNTY		SHEET NO.
	DAL	DENTON		31

DATE: 12/15/2020
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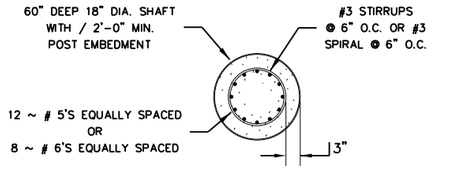
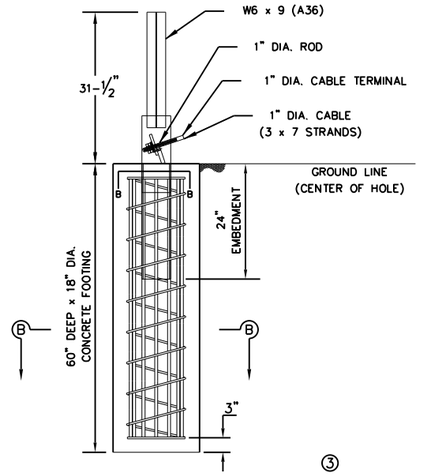
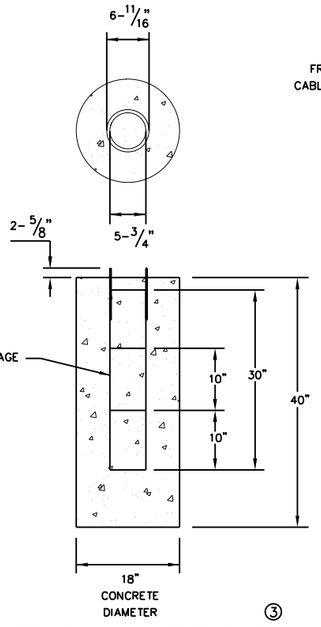


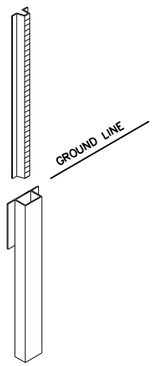
SECTION B-B
(CABLE RELEASE POST)



DETAIL A – CRP IN CONCRETE FOOTING ③
(3000 PSI MIN CONCRETE)

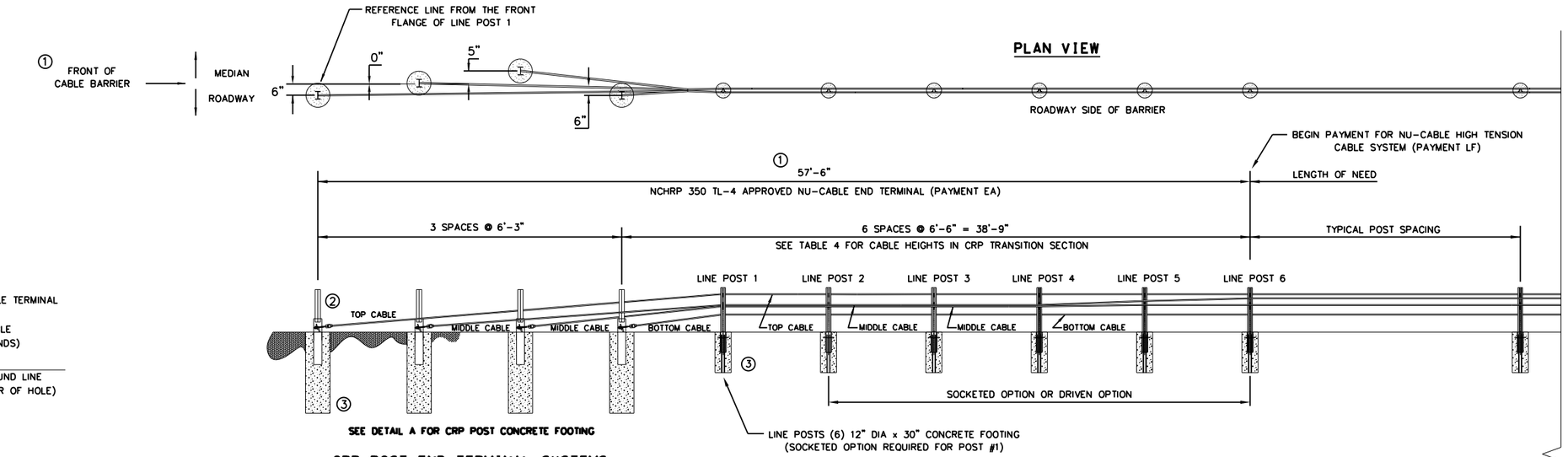


③



DRIVEN SOCKET OPTION

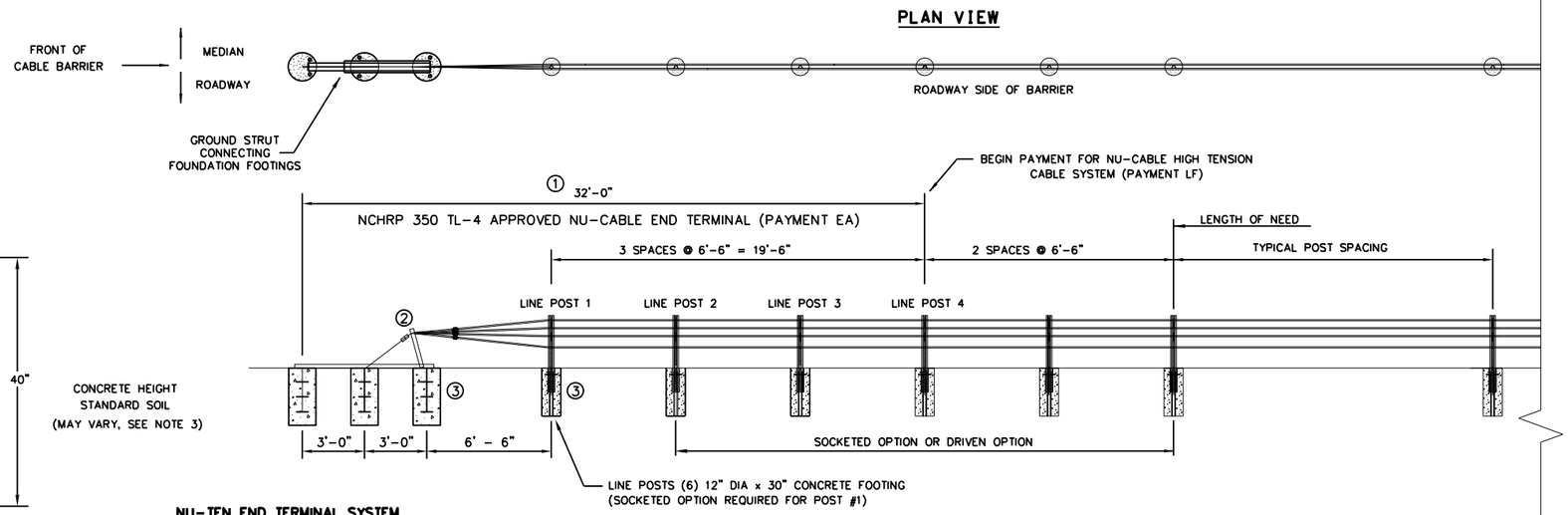
NU-TEN CONCRETE FOOTING DETAIL



CRP POST END TERMINAL SYSTEMS

ELEVATION VIEW

① THE OPPOSING END TREATMENTS ON A PARTICULAR RUN ARE MIRRORED IN THEIR LAYOUT.



NU-TEN END TERMINAL SYSTEM

ELEVATION VIEW

④ **TABLE 4**

CRP END TERMINAL CABLE HEIGHTS - TL-4						
	LP 1	LP 2	LP 3	LP 4	LP 5	LP 6
TOP CABLE	34"	34"	34"	34"	34"	34"
UPPER-MIDDLE CABLE	27"	27"	27"	27"	28"	31"
BOTTOM-MIDDLE CABLE	24"	24"	24"	24"	24"	24"
BOTTOM CABLE	15"	15"	15"	15"	15"	15"

NOTES

1. THE OPPOSING END TREATMENTS ON A PARTICULAR RUN ARE MIRRORED IN THEIR LAYOUT. SYSTEM PAYMENT IS PER EACH (EA). REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL PAYMENT INFORMATION
2. REFER TO INSTALLATION MANUAL FOR CABLE END ASSEMBLY DETAIL.
3. ALL FOUNDATION DESIGNS ARE BASED ON NCHRP 350 STRONG (S1) SOIL. CONSULT THE MANUFACTURER FOR SPECIFIC FOUNDATION DESIGNS IF SOIL TYPES DIFFER.
4. SEE TABLE 4 CABLE HEIGHTS IN CRP TRANSITION SECTION.

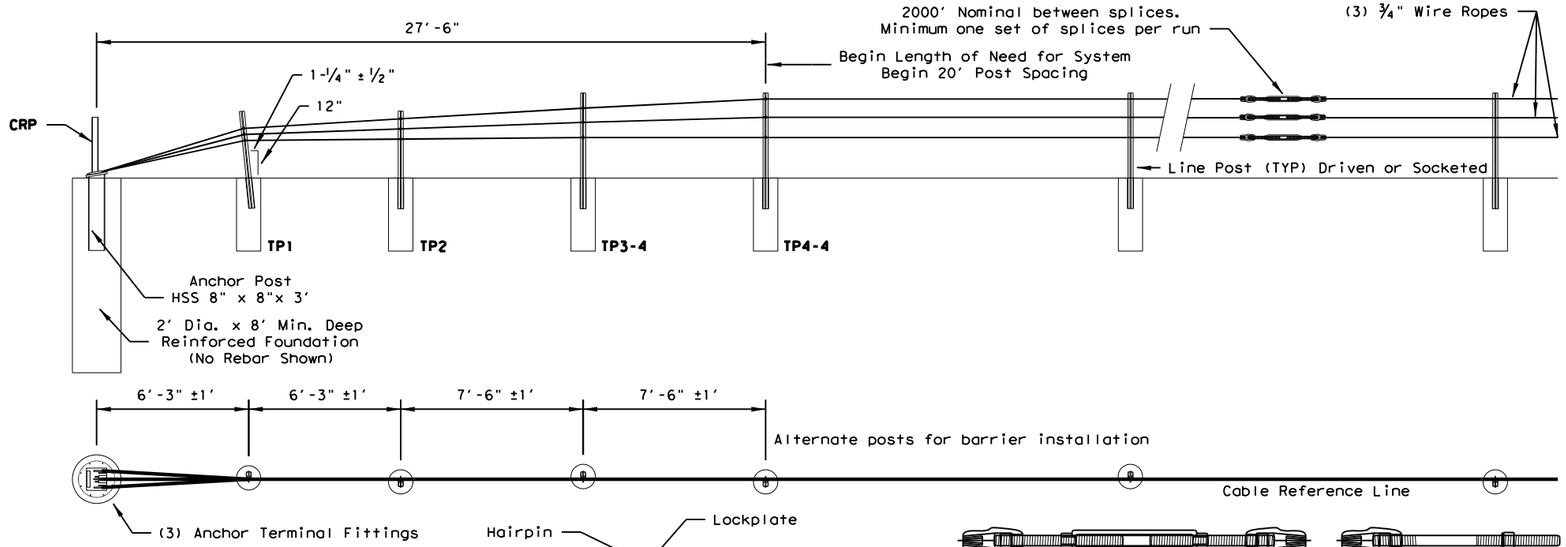
Texas Department of Transportation — Design Division Standard

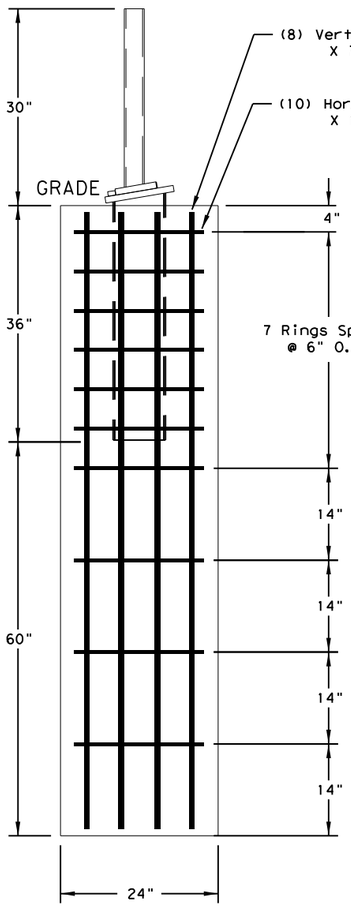
NU-CABLE BARRIER SYSTEM (TL-4) (4 CABLE)

NU-CABLE(TL4)-14

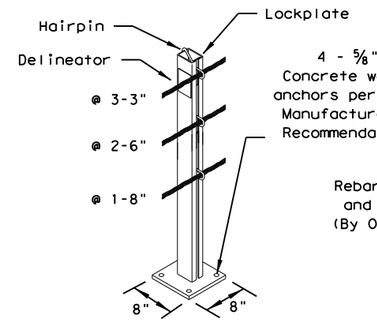
FILE:	DN:	CK:	DW:	CK:
©TxDOT:	CONT	SECT	JOB	HIGHWAY
REVISIONS	0134	09	067,ETC.	US380,ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON		32

DATE: 12/15/2020
FILE: T:\DENDES\Projects\US380\0134-09-067etc_Median Barrier\PLANS\31-gbrltrt1414.dgn

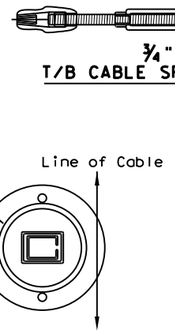




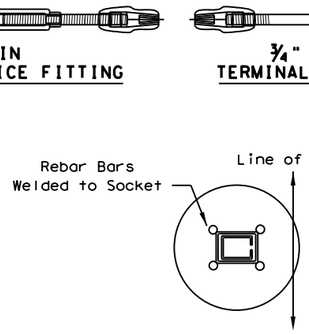
CABLE RELEASE AND ANCHOR POST



LINE POST
(BASE-PLATED OPTION)
Low-Fill Box Culvert Less than 15" Fill



SECTION A

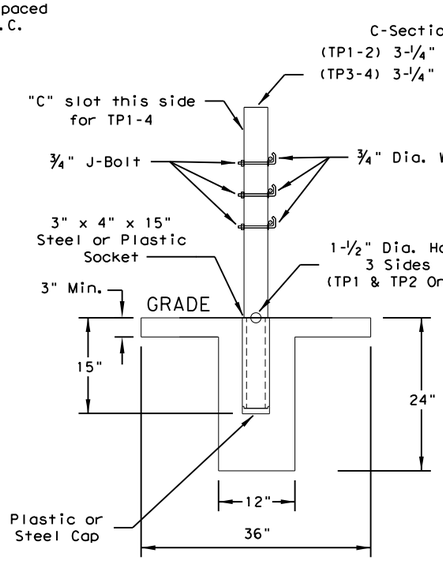


SECTION B

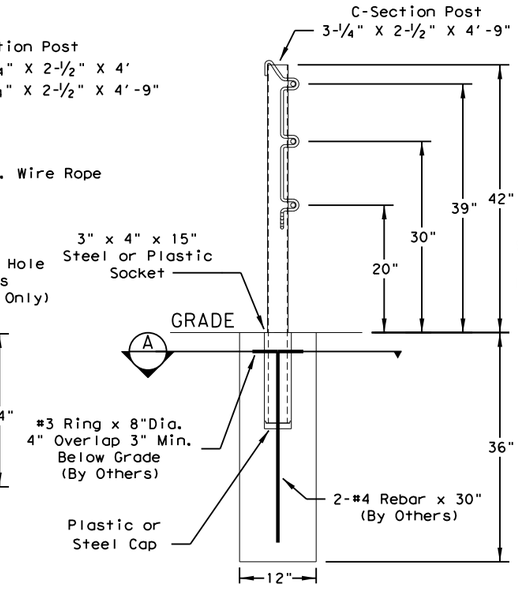
C-SECTION POST

¾" MIN
T/B CABLE SPLICE FITTING

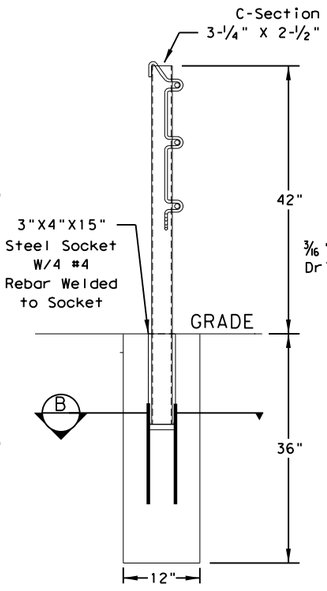
¾" MIN
TERMINAL FITTING



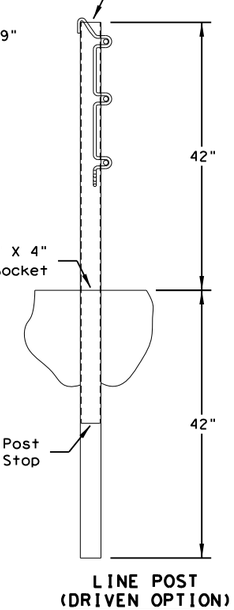
TERMINAL POST
(SHOWN WITH CONCRETE MOWSTRIP)
(Shown with Tube Plate Option)
(See Note 10)



LINE POST SOCKETED
(Shown with Rebar Ring/Bars Socket Option)
(See Note 9)



LINE POST SOCKETED
(Shown with Welded Rebar Socket Option)
(See Note 9)



LINE POST
(DRIVEN OPTION)
(Shown with Driven
Socket Option)
(See Note 9)

GENERAL NOTES

1. For additional information contact Gibraltar, Inc. at 1-800-495-8957, 830-798-5444, or see the manufacturer's product manual.
2. All concrete shall be CLASS A.
3. The Cable Barrier System shall be installed on shoulders or on medians with slopes of 6:1 or flatter. If installed on slopes steeper than 6:1 up to 4:1 the TL-4 system performs as a TL-3 and Gibraltar must be contacted for various guidelines related to placement.
4. The Cable Barrier System is accepted by the FHWA Test Level - 4.
5. See the Texas MUTCD for proper "Barrier" delineation.
6. Rock Clause: Where solid rock is encountered:
   A. For socketed post, continue digging 12" diameter, 15" deep into rock or the required plan depth, whichever comes first.
   B. For driven post, core drill a 4" diameter hole 18" deep into rock or the required plan depth, whichever comes first.
   C. For Anchor post, continue digging 24" diameter, 30" deep into rock or the required plan depth, whichever comes first.
7. Tolerances:
   * LP = 3" out of plumb, at top
   * Cable height = 1"
   * Anchor Post = 5" off of Cable Reference Line
8. The Gibraltar cable barrier system shall be installed in NCHRP Report 350 standard compacted soil. Soil must be well drained.
9. All non-welded rebar by others.
10. Minimum recommended line post foundation.
    A. Without mowstrip, 36" Deep x 12" diameter foundations with #3 rebar ring x 8" diameter with two #4 rebar vertical bars 30" long
    B. With 4" minimum depth hot mix asphalt, 30" deep x 12" diameter foundations with #3 rebar ring x 8" diameter with two #4 rebar vertical bars 30" long.
    C. With 3" minimum depth concrete mowstrip, 24" deep x 12" diameter foundations. (No rebar required)
    D. Direct drive post 42" deep.

CABLE TENSION CHART*	
-10 °F	8000
0 °F	7600
10 °F	7200
20 °F	6800
30 °F	6400
40 °F	6000
50 °F	5600
60 °F	5200
70 °F	4800
80 °F	4400
90 °F	4000
100 °F	3600
110 °F	3200

DEFLECTION	
Deflection	Post Spacing
8'-0"	20 FT
7'-0"	12 FT
6'-8"	10 FT

* Allowable Deviation from Chart +/- 10%

Texas Department of Transportation — Design Division Standard

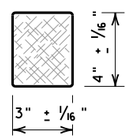
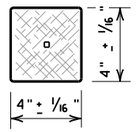
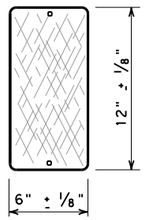
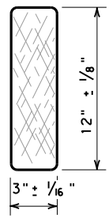
GIBRALTAR CABLE BARRIER SYSTEM (TL-4)

GBRLTR(TL4)-14

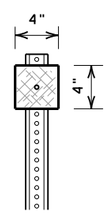
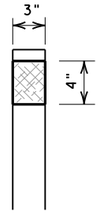
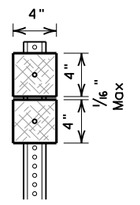
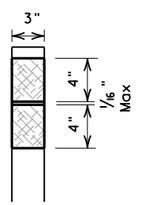
FILE: gbrltrt1414.dgn	DN: TxDOT	CK: RM	DW: VP	CK:
©TxDOT: March 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0134	09	067, ETC.	US380, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON		33

DATE: 12/15/2020 4:01:31 PM
FILE: T:\DENDES\Projects\US380\0134-09-067etc_Median Barrier\PLANS\32-dom1-20.dgn

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

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

DELINEATORS

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

D & OM DESCRIPTIVE CODES

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

NUMBER OF REFLECTORS
S = Single
D = Double

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

REFLECTOR UNIT SIZE
1 or 2

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

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

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

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

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

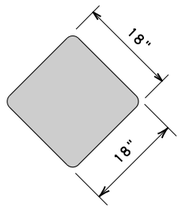
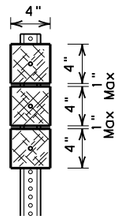
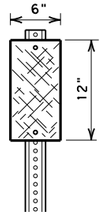
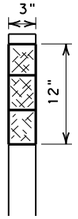
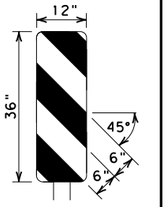
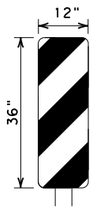
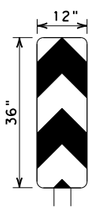
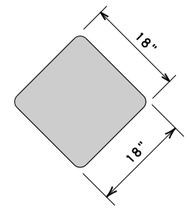
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

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

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

DIRECTION
If Required
BI = Bi-Directional

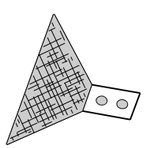
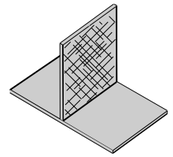
OBJECT MARKERS

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

DEPARTMENTAL MATERIAL SPECIFICATIONS

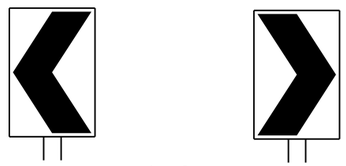
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)

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

CHEVRONS

DEVICE

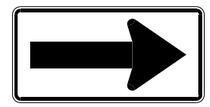


SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

NOTE
1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies).
2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).

ONE DIRECTION LARGE ARROW

DEVICE



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

NOTE:

Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0134	09	067,ETC.	US380,ETC.
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	DAL	DENTON		34

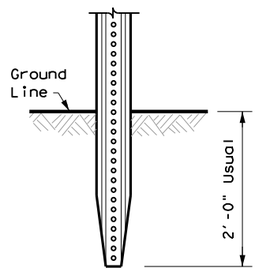
20A

DATE: 12/15/2020 4:01:42 PM
FILE: T:\DENDES\Projects\US380\0134-09-067etc_Median Barrier\PLANS\33-dom2-2018gh

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

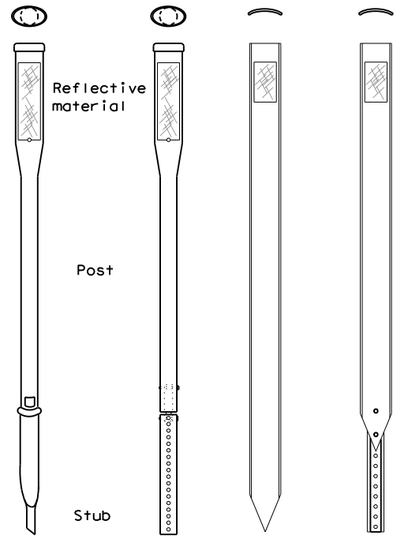


NOTES

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

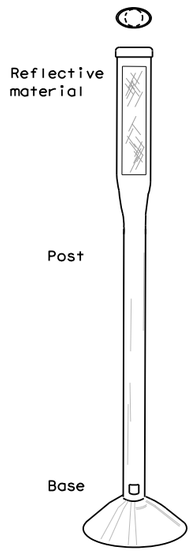
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



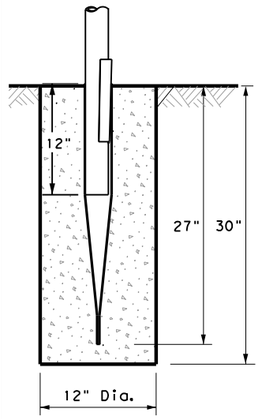
SURFACE MOUNT

NOTES

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

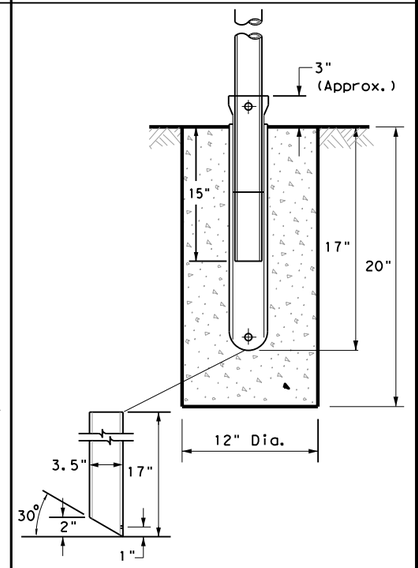
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

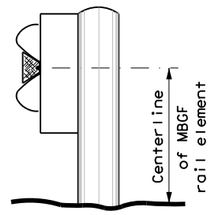
NOTE

1. Install per manufacturer's recommendations.

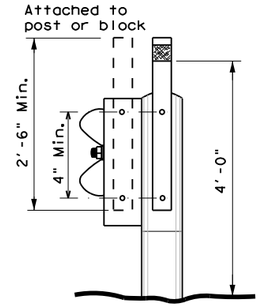
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

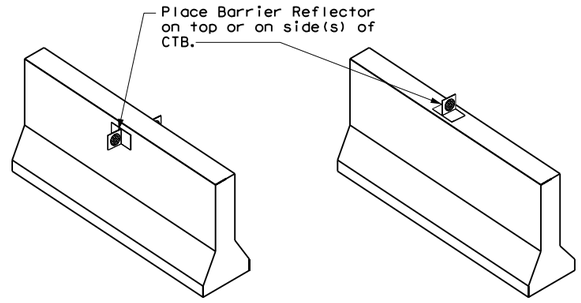
GF1



GF2



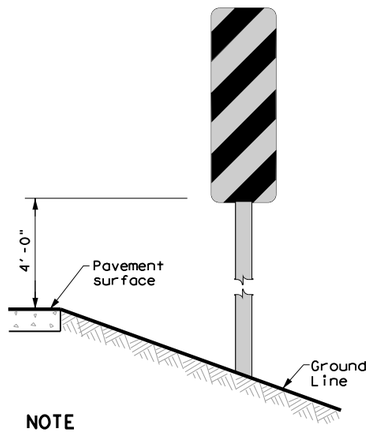
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

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

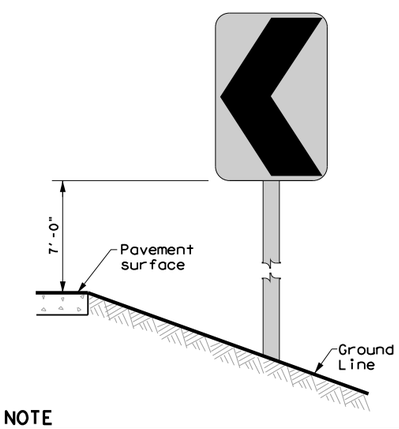
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

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

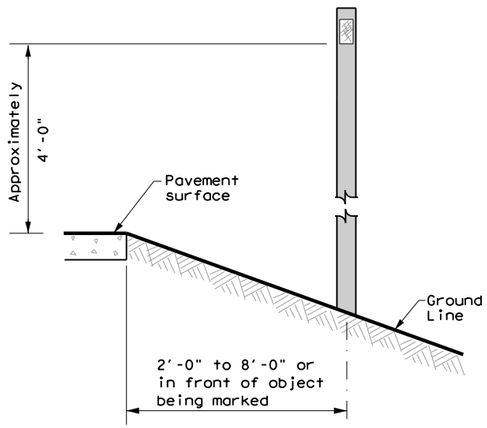
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

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

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation — Traffic Safety Division Standard

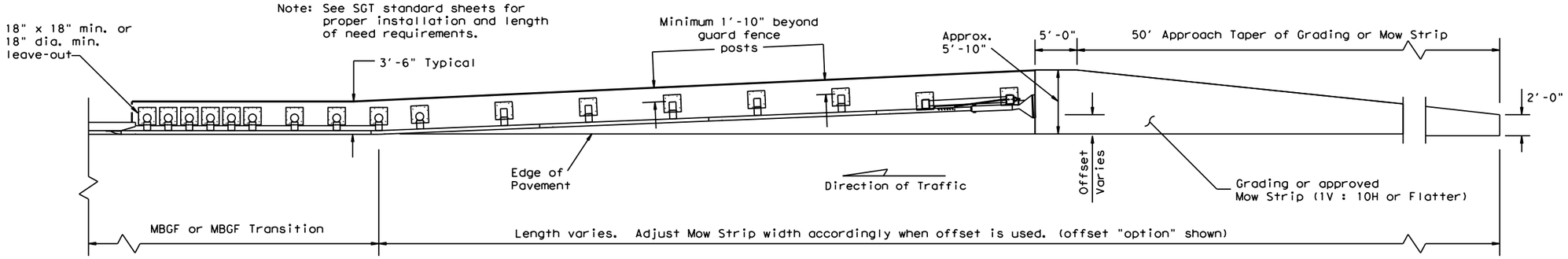
DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

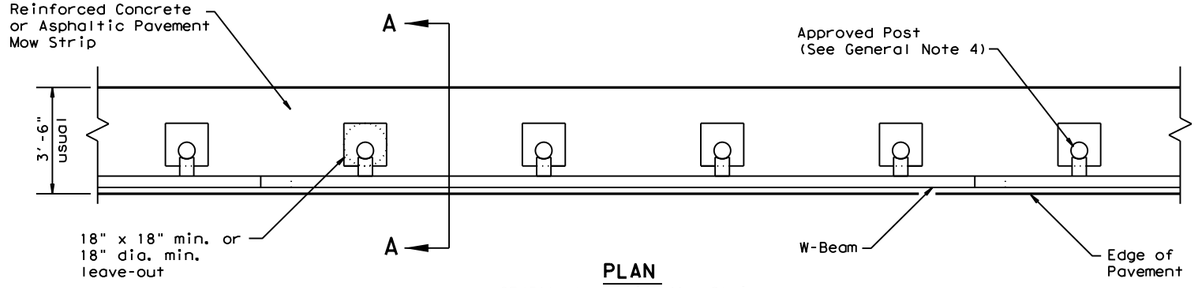
FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0134	09	067,ETC.	US380,ETC.
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	DAL	DENTON		35

20B

DATE: 12/15/2020
FILE: T:\DENDES\Projects\US380\0134-09-067etc_Median Barrier\PLANS\34-gf31ms19.dgn

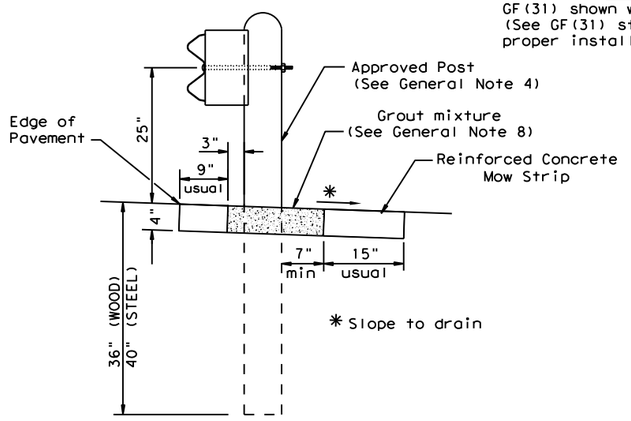


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



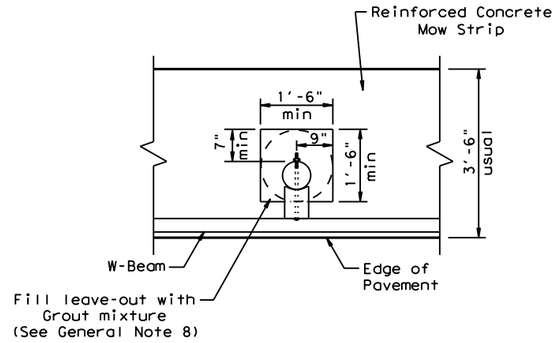
PLAN

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



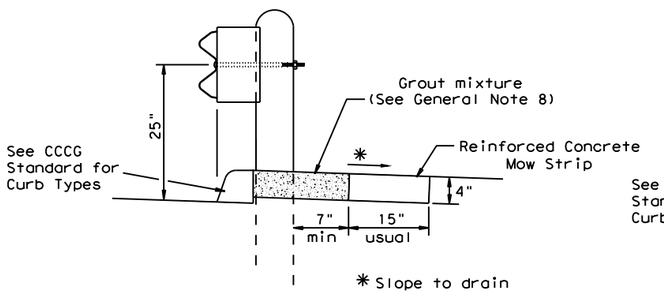
SECTION A-A

Typical



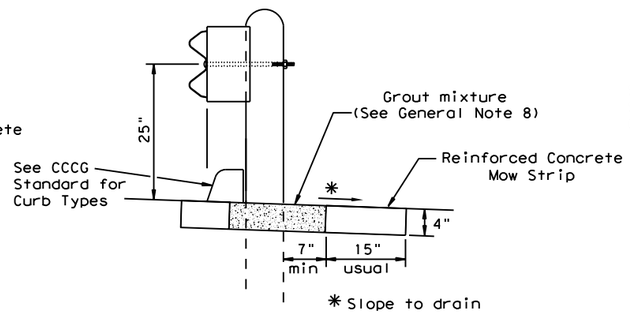
MOW STRIP DETAIL

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



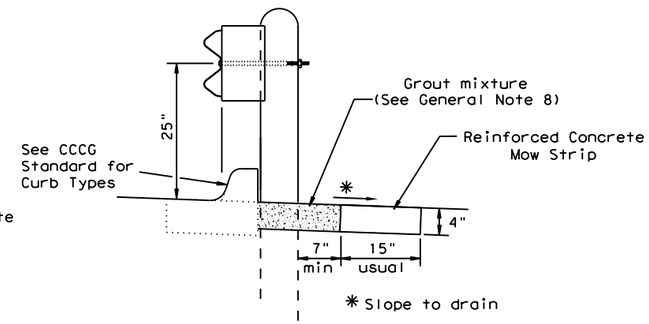
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

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

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

GENERAL NOTES

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

Texas Department of Transportation

Design Division Standard

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

GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0134	09	067,ETC.	US380,ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON		36

A. GENERAL SITE DATA

1. PROJECT LIMITS: *US 380 - FROM WISE COUNTY LINE TO FM 156*

Begin Project Coordinates : Latitude (N): 33.2459329 Longitude (W): -97.3905839
End Project Coordinates : Latitude (N): 33.2351014 Longitude (W): - 97.2501205

SH 114 - FROM WISE COUNTY LINE TO FM 156
Begin Project Coordinates : Latitude (N): 33.0366465 Longitude (W): -97.3970922
End Project Coordinates : Latitude (N): 33.0296465 Longitude (W): - 97.3105938

2. PROJECT SITE MAPS:

- *Project Location Map: The Title Sheet and Plans (SHEETS 1 & 3)*
- *Drainage Patterns: Drainage Area Maps (US 380: SHEETS 39-57; SH 114: SHEETS 58-68)*
- *Slopes Anticipated After Major Gradings or Areas of Soil Disturbance: Typical Sections (SHEETS 4-4A)*
- *Location of Erosion and Sediment Controls: SW3P Site Maps (US380: SHEETS 39-57) (SH114: SHEETS 58-68)*
- *Surface Waters and Discharge Locations: Drainage and Culvert Layouts (US380: SHEETS 39-57) (SH114: SHEETS 58-68)*
- *Project Specific Location(s) (PSL): To be determined by the project Construction Personnel. Location(s) shown on SW3P Site Map (if PSL location(s) is within one mile of project) and information located in project SW3P Binder (Reference Item #10 below).*

3. PROJECT DESCRIPTION: *US 380 & SH114*
INSTALL CABLE BARRIER SYSTEMS AND TERMINALS IN THE CENTER MEDIAN.

4. MAJOR SOIL DISTURBING ACTIVITIES: *US 380 & SH 114*
INSTALL MOW-STRIP FOR CABLE BARRIER SYSTEM AND BACKFILL OUTSIDE EDGE OF MOW-STRIP.

5. EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER:

US 380 EXISTING NATIVE SOILS CONSIST MOSTLY OF LIGHT & DARK CLAYS WITH VARIOUS GRASSES IN GOOD CONDITION COVERING APPROXIMATELY 95%OF THE SITE.

SH 114 EXISTING NATIVE SOILS CONSIST MOSTLY OF DARK CLAYS WITH VARIOUS GRASSES IN GOOD CONDITION COVERING APPROXIMATELY 95%OF THE SITE.

6. TOTAL PROJECT AREA: *415* Acres

US 380 = 142 AC

SH 114 = 273 AC

7. TOTAL AREA TO BE DISTURBED: *7.74* Acres *(1.87%)*

US 380 = 5.72 AC

SH 114 = 2.02 AC

8. WEIGHTED RUNOFF COEFFICIENT *US 380 & SH114*

BEFORE CONSTRUCTION: *0.50*
AFTER CONSTRUCTION: *0.50*

9. NAME OF RECEIVING WATERS:

US 380 project area drains to Burns Branch and multiple tributaries to Denton Creek (Segment 0826A), and to a tributary to Crow Branch and multiple tributaries to South Hickory Creek, which flows to North Hickory Creek and Lewisville Lake (Segment 0823).

SH 114 project area drains to Harriet Creek and multiple unnamed tributaries to Elizabeth creek, which flows to Denton Creek (Segment 0826A).
No water quality impairments.

10. PROJECT SW3P Binder:

A. For projects disturbing one to five acres, TxDOT will maintain a SW3P Binder at the project field office (If there is not a project field office, should be kept at the Area Office) which contains the following: Index Sheet, TCEQ Signature Authority, TxDOT's and Contractor's Small Construction Site Notice, SW3P Inspector Qualification Statements, EPIC Sheet, SW3P Sheet, Site Location Maps, Inspection and Maintenance Reports (Form 2118), Construction Stage Gate Checklist(s) (CSGC), Stored Material Lists specifying associated control measures and the Appendix which contains the TPDES Construction General Permit, TxDOT and Contractor MS4 Operator Notification(s) and the Construction PSL Permits per all applicable requirements.

B. For projects disturbing 5 acres or more, TxDOT will follow the actions listed in (10.A.) above with the addition of the following: TxDOT and Contractor Notice Of Intent (N.O.I.) and Fee Payment Form, TxDOT and Contractor Large Construction Site Notice (to be used instead of Small Site Notice), and TPDES Permit Coverage Notice.

C. For projects disturbing less than one acre, actions described in (10.A.) and (10.B.) above are not required. Acreage is calculated by adding Total Area To Be Disturbed Acres on project (See #7 above) and the PSL(s) acreage located within one mile of project.

B. EROSION AND SEDIMENT CONTROLS

1. SOIL STABILIZATION PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

- ___ TEMPORARY SEEDING
- ___ MULCHING (Hay or Straw)
- ___ BUFFER ZONES
- ___ PLANTING
- ___ SEEDING
- P SODDING
- P PRESERVATION OF NATURAL RESOURCES
- ___ FLEXIBLE CHANNEL LINER
- ___ RIGID CHANNEL LINER
- ___ SOIL RETENTION BLANKET
- P COMPOST MANUFACTURED TOPSOIL
- P VERTICAL TRACKING
- ___ OTHER: *(Specify Practice)*

2. STRUCTURAL PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

- T SILT FENCES
- T EROSION CONTROL LOGS
- ___ EROSION CONTROL COMPOST BERMS (Low Velocity)
- ___ ROCK FILTER DAMS
- ___ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- ___ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- ___ DIVERSION DIKE AND SWALE COMBINATIONS
- ___ PIPE SLOPE DRAINS
- ___ PAVED FLUMES
- T ROCK BEDDING AT CONSTRUCTION EXIT
- ___ TIMBER MATTING AT CONSTRUCTION EXIT
- ___ CHANNEL LINERS
- ___ SEDIMENT TRAPS
- ___ SEDIMENT BASINS
- ___ STORM INLET SEDIMENT TRAP
- ___ STONE OUTLET STRUCTURES
- ___ CURBS AND GUTTERS
- ___ STORM SEWERS
- ___ VELOCITY CONTROL DEVICES
- ___ OTHER: *(Specify Practice)*

NOTE: TOP OF BMP'S SHOULD NOT BE HIGHER THAN ROADWAY ELEVATION AS NOT TO FLOOD ROADWAY UNLESS PRIOR APPROVAL FROM ENGINEER IS OBTAINED.

3. STORM WATER MANAGEMENT: *(Example Below - May be used as applicable, or revised)*

A. Storm water drainage will be provided by ditches, inlets, and storm water systems which carry drainage within the R.O.W. to the lows within the roadway and project site which drains to natural facilities.

B. Other permanent erosion controls include hydraulic design to limit structure outlet velocities and grading design generally consisting of 4 :1 or flatter slopes with permanent vegetative cover.

4. STORM WATER MANAGEMENT ACTIVITIES: (Sequence of Construction)

1. INSTALL SW3P CONTROL DEVICES (BMPS) AS NEEDED TO PROTECT RECIEVING WATERS, DOWNSLOPE PERIMETERS, AND ACTIVE ROADWAYS PRIOR TO SOIL DISTURBANCE AND CONSTRUCTION ACTIVITIES IN THEIR VICINTITY. DO NOT INSTALL BMPS MORE THEN TWO WEEKS PRIOR TO THE ACTIVITIES IN THEIR CONTROL AREA.
2. AVOID STORING PORTABLE SANITARY UNITS, CONCRETE WASHOUTS OR CHEMICALS WITHIN 50 FEET UPGRADIENT OF A RECEIVING WATER OR DRAINAGE CONVEYANCE WITHOUT ADEQUATE POLLUTION CONTROLS.
3. ADJUST BMPS AS APPROPRIATE, AS PROJECT PROGRESSES.
4. USE PROPER CONCRETE WASHOUT PRACTICES. DO NOT DISCHARGE CONCRETE SPOILS OR WASHWATER ON TO THE GROUND.
5. RE-VEGETATE ANY DISTURBED SOILS IN COMPLETED PROJECT AREAS AS SOON AS PRACTICAL OR AS DIRECTED BY THE ENGINEER.
6. WHEN CONSTRUCTION ACTIVITIES ARE COMPLETE, PROJECT AREA IS STABILIZED, AND AS DIRECTED OR AUTHORIZED BY THE ENGINEER, REMOVE ALL TEMPORARY SW3P CONTROLS.

NOTE: SEE CONSTRUCTION PROGRESS SCHEDULE FOR SCHEDULE AND DURATIONS OF RELEVANT SOIL DISTURBANCE AND STABILIZATION ACTIVITIES.

5. NON-STORM WATER DISCHARGES:

Filter non-storm water discharges, or hold in retention basins, before being allowed to mix with storm water. These discharges consist of, but not limited to, non-polluted ground water, spring water, foundation or footing drain water, water used for dust control or pavement washing and vehicle washwater containing no detergents.

C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:

Maintain all erosion and sediment controls in good working order. Perform any necessary cleaning/repairs/replacements at the earliest possible date prior to next rain event, but no later than 7 calendar days. Ensure the surrounding ground has dried sufficiently to prevent damage from equipment. "Too Wet" is the only reason for not adhering to timeframes described. When construction activities permanently or temporarily cease and are not expected to resume for 14 or more days on a disturbed portion of the site, stabilization measures must be initiated immediately.

2. INSPECTION:

A TxDOT Inspector will perform a regularly scheduled SW3P inspection every 7 calendar days. An Inspection and Maintenance Report, signed by the TxDOT Inspector and the Contractor, will be filed for each inspection. Revise/clean/repair/replace each BMP control device in accordance with the current Field Inspection and Maintenance Report (Form 2118) and Item 1 (Maintenance) above.

3. WASTE MATERIALS:

On a daily basis, or as may be directed, collect all waste materials, trash and debris from the construction site and deposit into a metal dumpster having a secure cover and which meets all state and local city solid waste management requirements. Empty the dumpster as required by regulation, or as may be directed, at a local approved landfill site. Do not bury construction waste on the construction project site.

4. HAZARDOUS WASTE & SPILL REPORTING:

As a minimum, any products in the following categories are considered to be hazardous: Paints, Acids, Solvents, Fuels, Asphalt Products, Chemical Additives for Soil Stabilization, and Concrete Curing Compounds or Additives. When storing hazardous material on the project site, or at a Project Specific Location, take all practicable precaution to prevent and/or contain any spillage of these materials. In the event of a spill, contact the spill coordinator immediately.

5. SANITARY WASTE:

Use a licensed sanitary waste management contractor to collect all sanitary waste from portable units as may be required by local regulation, or as directed.

6. CONSTRUCTION VEHICLE TRACKING:

On a regular basis, or as may be directed, dampen haul roads for dust control and construct construction entrances/exits. Provide for a motorized broom or vacuum type sweeper to be available on a daily basis, or as may be directed, to remove sediment from paved roadways on project, abutting and traversing the project site.

7. MANAGEMENT PRACTICES:

A. Construct disposal areas, stockpiles, haul roads and PSL's in a manner that will minimize and control the amount of sediment that may enter receiving waters. Do not locate disposal areas in any wetland, waterbody or streambed.
B. Locate construction staging areas, vehicle maintenance and PSL's areas in a manner to minimize the runoff of pollutants.
C. When working in or near a wetland, install and maintain operating soil erosion and sediment controls at all times during construction and isolate the work from the wetland.
D. Clear all waterways as soon as practicable of temporary embankment, temporary bridges, matting, falsework, piling, debris or other obstructions placed during construction operations that are not a part of the finished work.
E. Procedures and/or practices should be taken to control dust.
F. Sediment to be removed from roadways daily or when work begins after weather events if construction activities have ceased due to weather event.

STATE OF TEXAS
DANNY MICHAEL HENDERSON
119091
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Danny Henderson 12/15/2020
E759E84E0E2C45C... , P.E.
Signature of Registrant & Date

Texas Department of Transportation

DALLAS DISTRICT ENVIRONMENTAL

STORM WATER POLLUTION PREVENTION PLAN (SW3P)

TEMPLATE REVISION DATE: 02/07/18

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
AT	6	(See Title Sheet)		US380, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
PKG	TEXAS	DALLAS	DENTON	37
CHECK	CONTROL	SECTION	JOB	
KD	0134	09	067, ETC.	
CHECK				
DMH				

FILE NAME
DATE
DESIGNER

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

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

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

I. STORMWATER POLLUTION PREVENTION PLAN-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.
List adjacent MS 4 Operator(s) that receive discharges from this project. They need to be notified prior to construction activities.
(Note: Leave blank only if no adjacent MS 4 Operator(s) are affected.)

1. Denton County Phase II MS4 contact Stephen Belknap, Engineer

2.

☐ No Action Required ☒ Required Action

Action Number:

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

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

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

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

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

Required Actions: List Waters of the US Permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.
1.

2.

3.

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

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

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action Number:

1.

2.

3.

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:

1.

2.

3.

4.

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

☒ No Action Required ☐ Required Action

Action Number:
1.

2.

3.

4.

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.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

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

Obtain and keep on-site Safety Data Sheets (SDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act. Maintain an adequate supply of on-site spill response materials, as indicated in the SDS. In the event of a spill, take actions to mitigate the spill as indicated in the SDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:
* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canisters, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

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

☐ Yes ☒ No

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

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☐ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

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

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action Number:

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action Number:

1.

GENERAL NOTE:

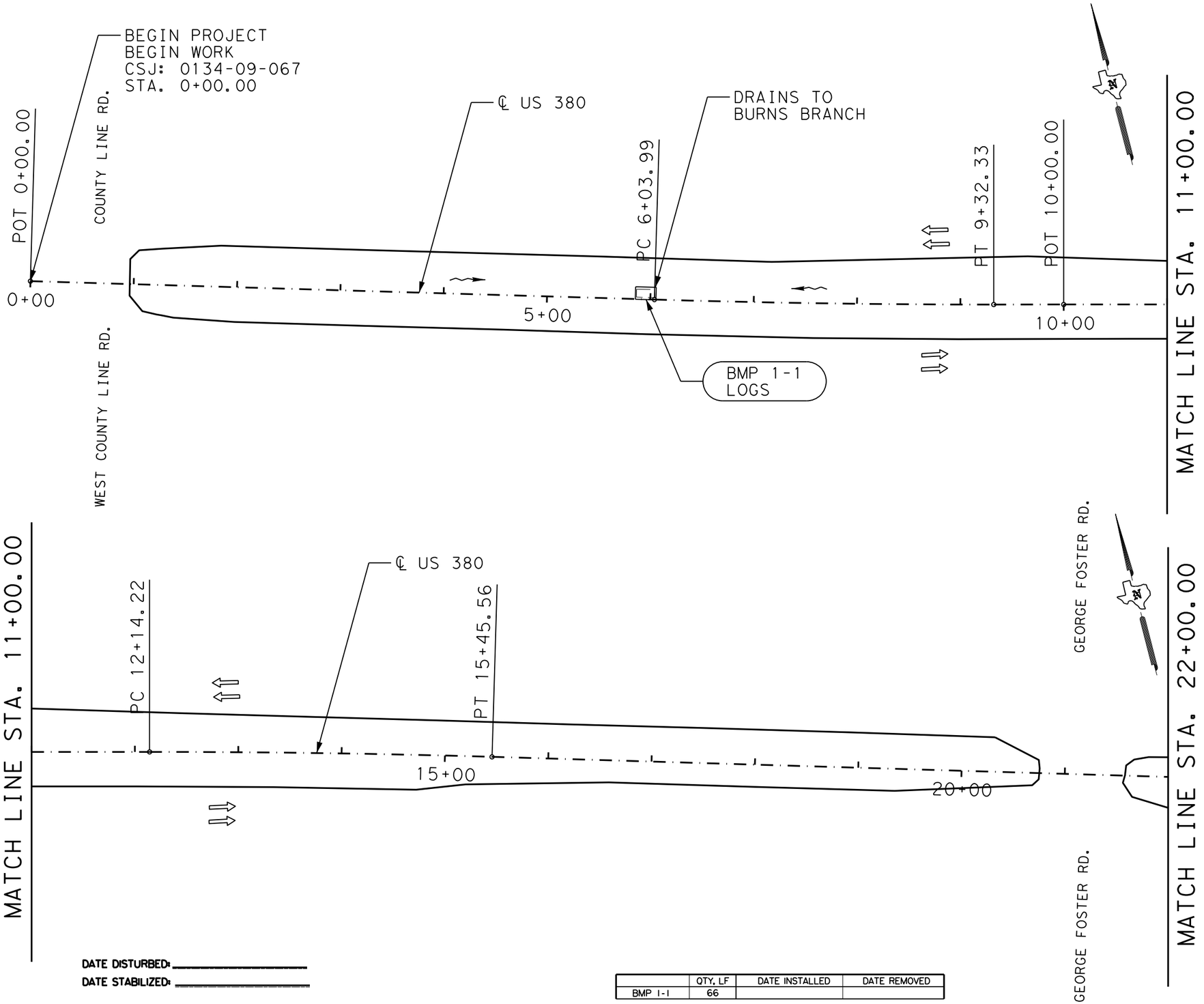
Any change orders and/or deviations from the final design must be reported to the Engineer prior to commencement of construction activities, as additional environmental clearance may be required.

LAST REVISION: 1/15/15

 Texas Department of Transportation
Dallas District

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		US 380
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	Denton	
CONTROL	SECTION	JOB	SHEET NO.
0134	09	067, etc.	38



LEGEND

- ⇨ DIRECTION OF TRAFFIC
- ~→ DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

NOTES:

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4) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY. LF	DATE INSTALLED	DATE REMOVED
BMP 1-1	66		

STATE OF TEXAS
DANNY MICHAEL HENDERSON
119091
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Danny Henderson
F759E84E0E2C45C...

12/15/2020

Texas Department of Transportation

US 380
SW3P LAYOUT

BEGIN OF PROJECT TO STA. 22+00.00

SCALE: 1" = 100'

SHEET 1 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DMH	TEXAS	DAL	DENTON	39
CHECK DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	

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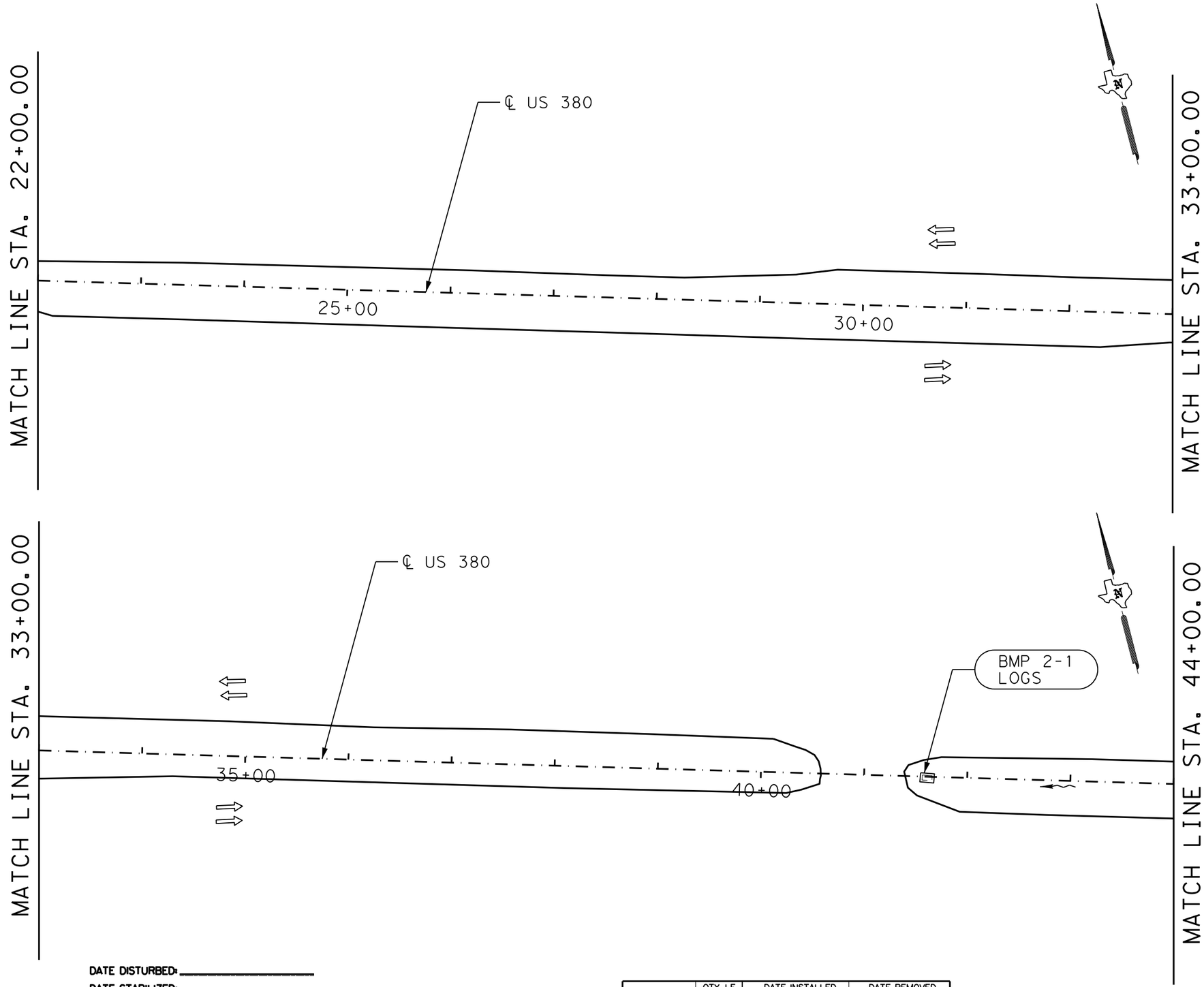

LEGEND

⇨ DIRECTION OF TRAFFIC

~→ DIRECTION OF FLOW

LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS

SCF SEDIMENT FENCE

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DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY. LF	DATE INSTALLED	DATE REMOVED
BMP 2-1	47		

STATE OF TEXAS
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119091
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12/15/2020

Texas Department of Transportation

US 380
SW3P LAYOUT

22+00.00 TO STA. 44+00.00

SCALE: 1" = 100'

SHEET 2 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AT	TEXAS	DAL	DENTON	40
CHECK	CONTROL	SECTION	JOB	
DMH	0134	09	067, ETC.	
CHECK				
DMH				

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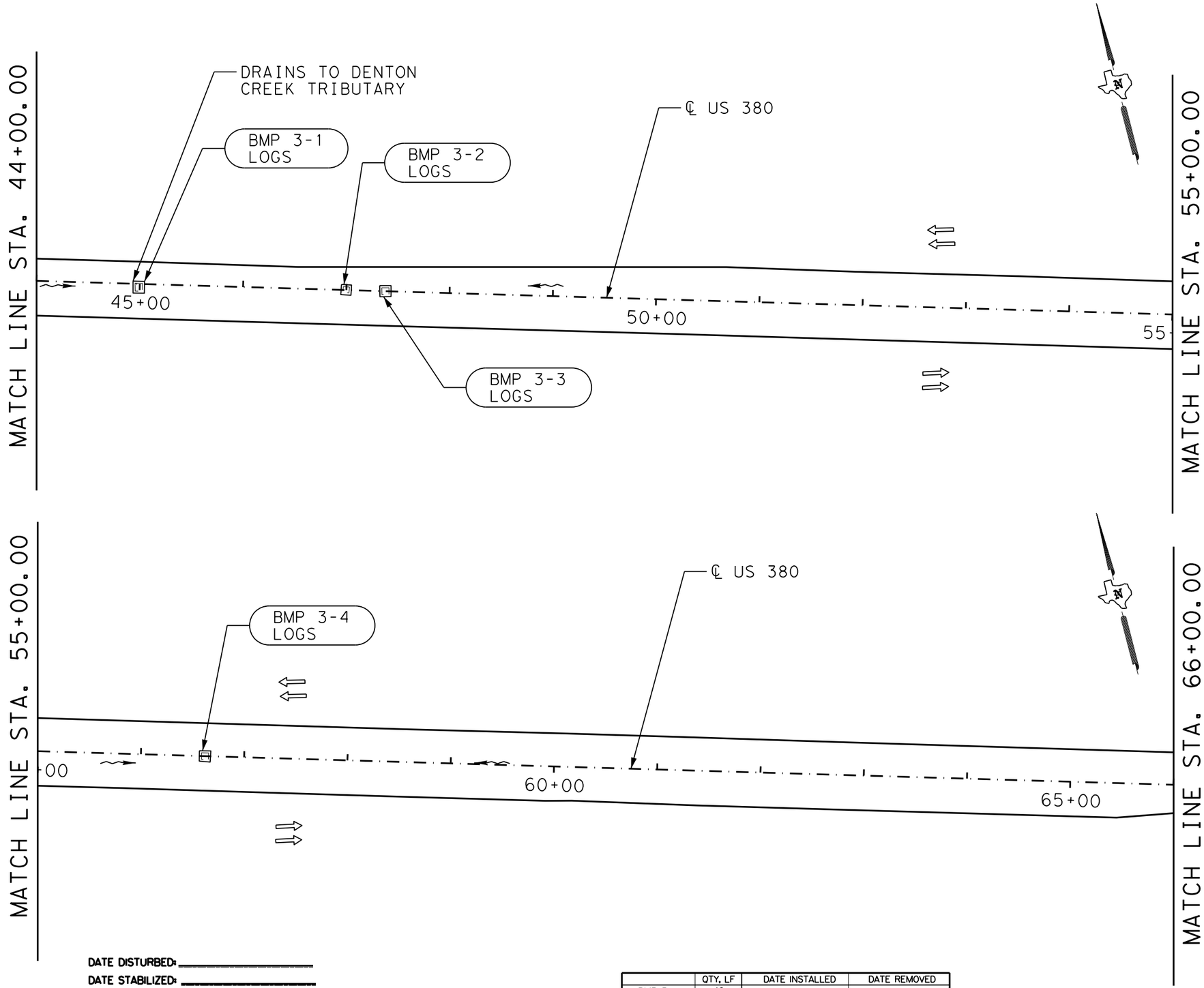

LEGEND

⇨ DIRECTION OF TRAFFIC

~→ DIRECTION OF FLOW

LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS

SCF SEDIMENT FENCE

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DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY, LF	DATE INSTALLED	DATE REMOVED
BMP 3-1	48		
BMP 3-2	42		
BMP 3-3	45		
BMP 3-4	45		

STATE OF TEXAS
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US 380
SW3P LAYOUT

STA. 44+00.00 TO STA. 66+00.00

SCALE: 1" = 100'

SHEET 3 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DMH	TEXAS	DAL	DENTON	41
CHECK DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	

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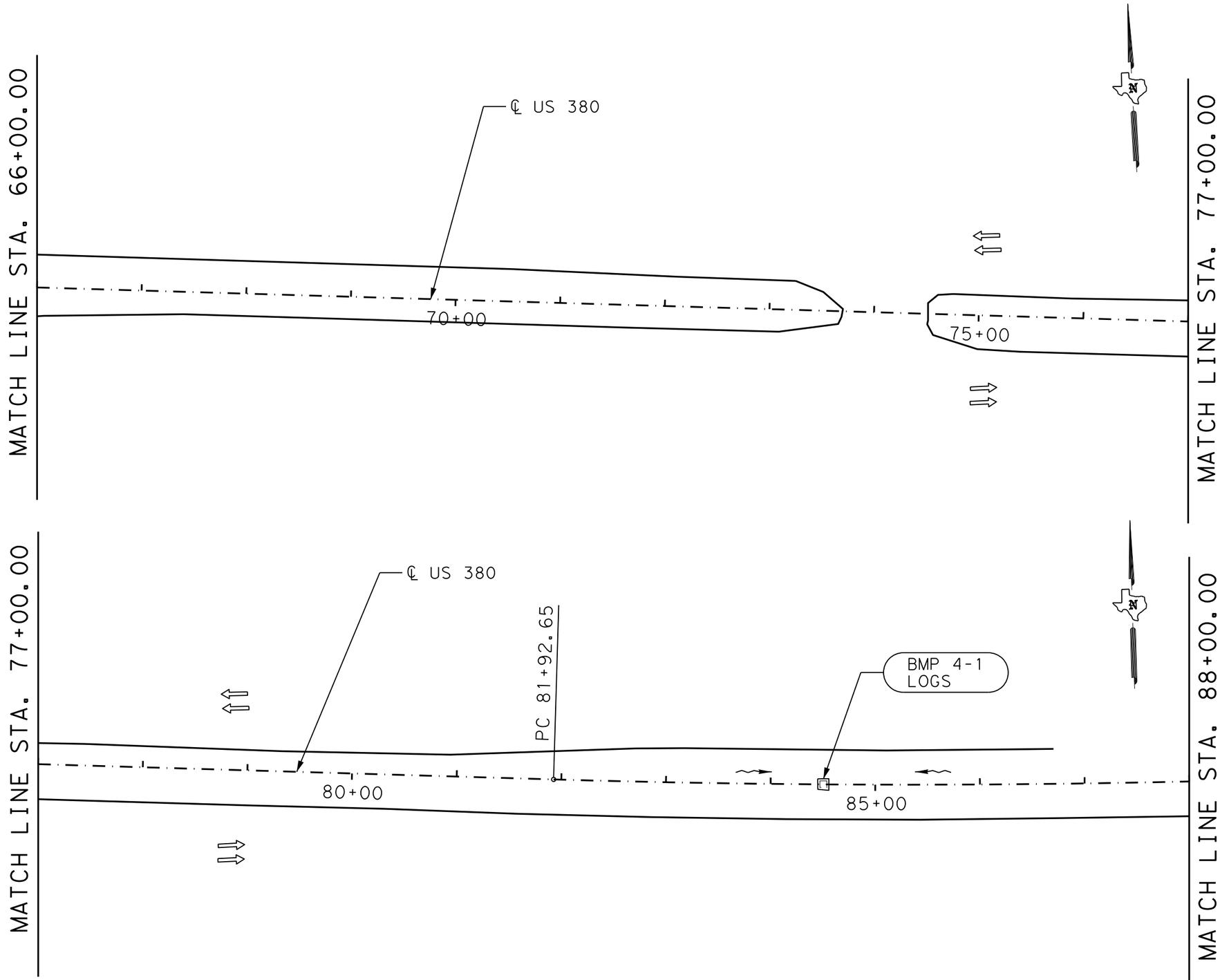

LEGEND

- DIRECTION OF TRAFFIC
- DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

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DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY, LF	DATE INSTALLED	DATE REMOVED
BMP 4-1	45		

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12/15/2020

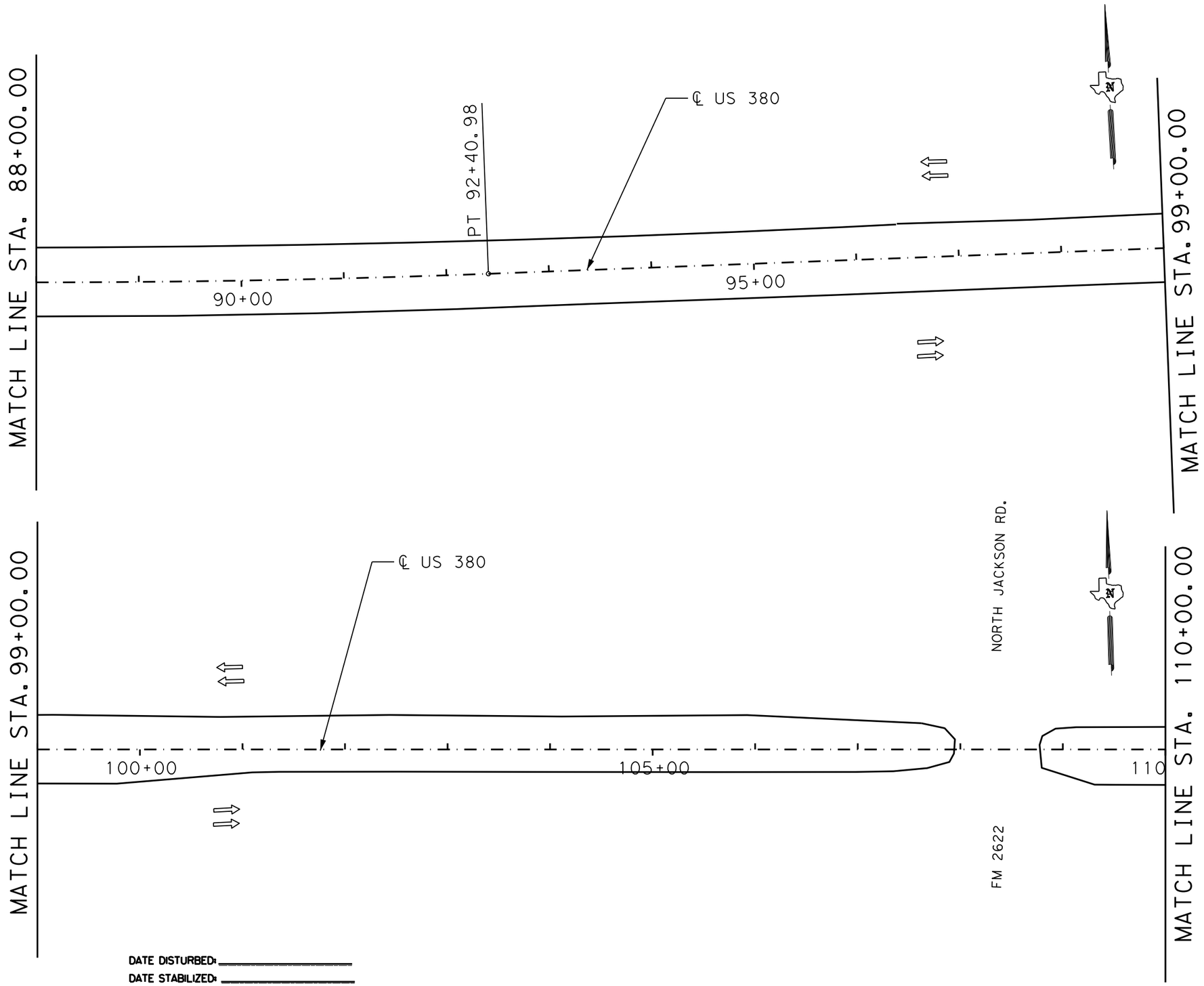
US 380
SW3P LAYOUT

STA. 66+00.00 TO STA. 88+00.00

SCALE: 1" = 100'

SHEET 4 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AT	TEXAS	DAL	DENTON	42
CHECK	CONTROL	SECTION	JOB	
DMH	0134	09	067, ETC.	
CHECK				
DMH				



LEGEND

⇨ DIRECTION OF TRAFFIC

~→ DIRECTION OF FLOW

LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS

SCF SEDIMENT FENCE

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DATE DISTURBED: _____

DATE STABILIZED: _____

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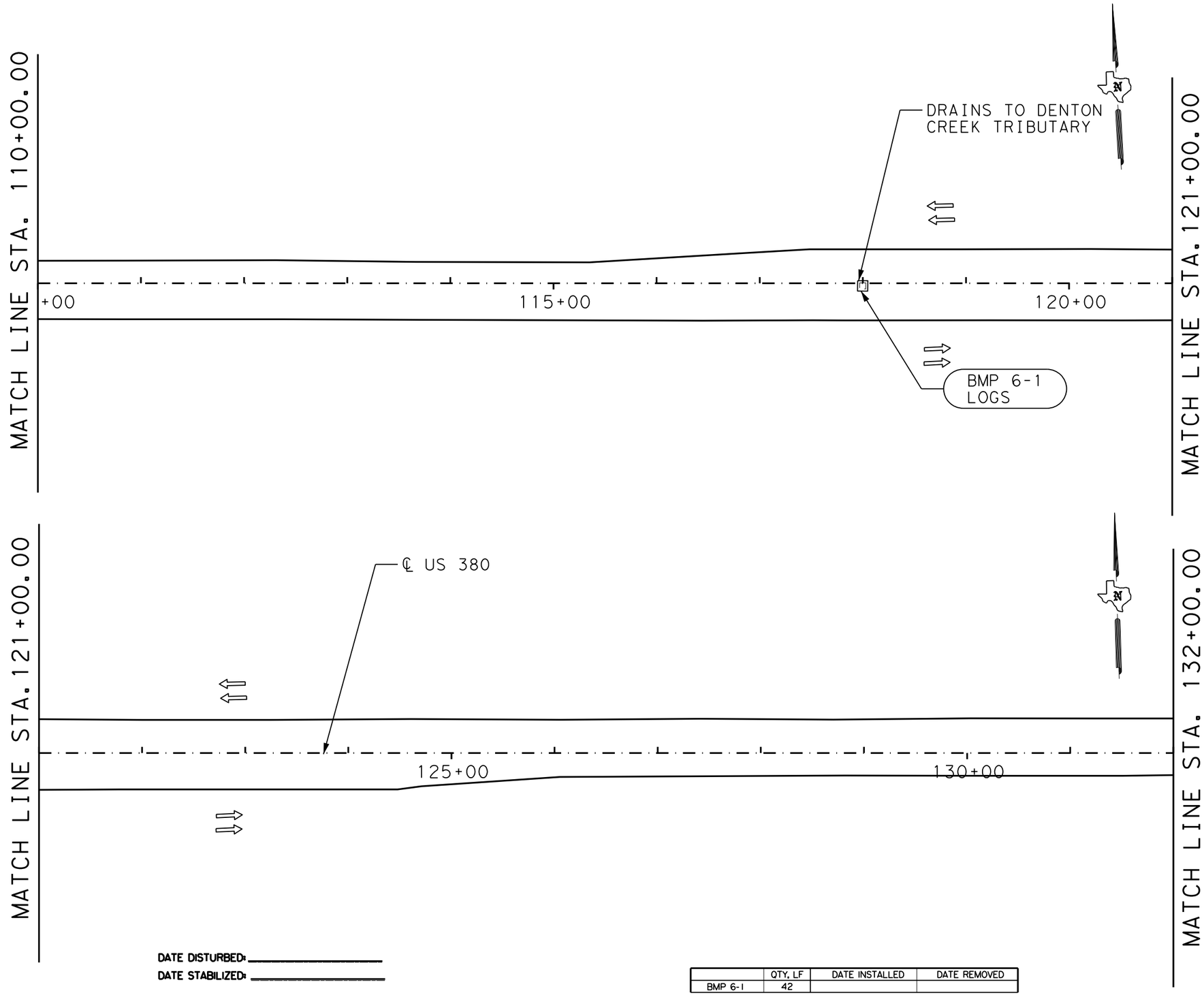
US 380
SW3P LAYOUT

STA. 88+00.00 TO STA. 110+00.00

SCALE: 1" = 100'

SHEET 5 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AT	TEXAS	DAL	DENTON	43
CHECK	CONTROL	SECTION	JOB	
DMH	0134	09	067, ETC.	
CHECK				
DMH				



LEGEND

- ⇨ DIRECTION OF TRAFFIC
- ~~➤ DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

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DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY. LF	DATE INSTALLED	DATE REMOVED
BMP 6-1	42		

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US 380
SW3P LAYOUT

STA. 110+00.00 TO STA. 132+00.00

SCALE: 1" = 100'

SHEET 6 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AT	TEXAS	DAL	DENTON	44
CHECK	CONTROL	SECTION	JOB	
DMH	0134	09	067, ETC.	
CHECK				
DMH				

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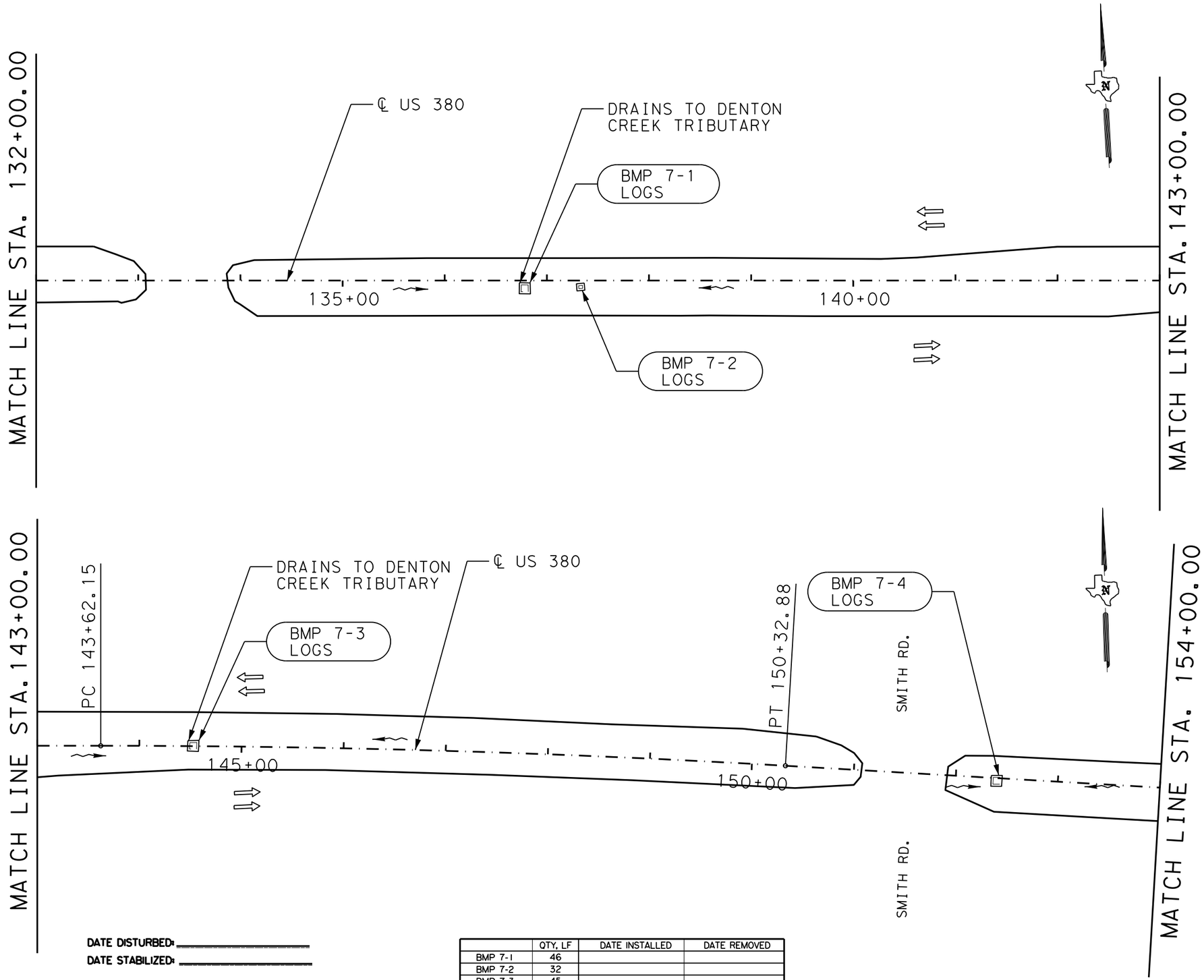

LEGEND

- DIRECTION OF TRAFFIC
- DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

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DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY, LF	DATE INSTALLED	DATE REMOVED
BMP 7-1	46		
BMP 7-2	32		
BMP 7-3	45		
BMP 7-4	45		

STATE OF TEXAS
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12/15/2020

US 380
SW3P LAYOUT

STA. 132+00.00 TO STA. 154+00.00

SCALE: 1" = 100'

SHEET 7 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DMH	TEXAS	DAL	DENTON	45
CHECK DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	

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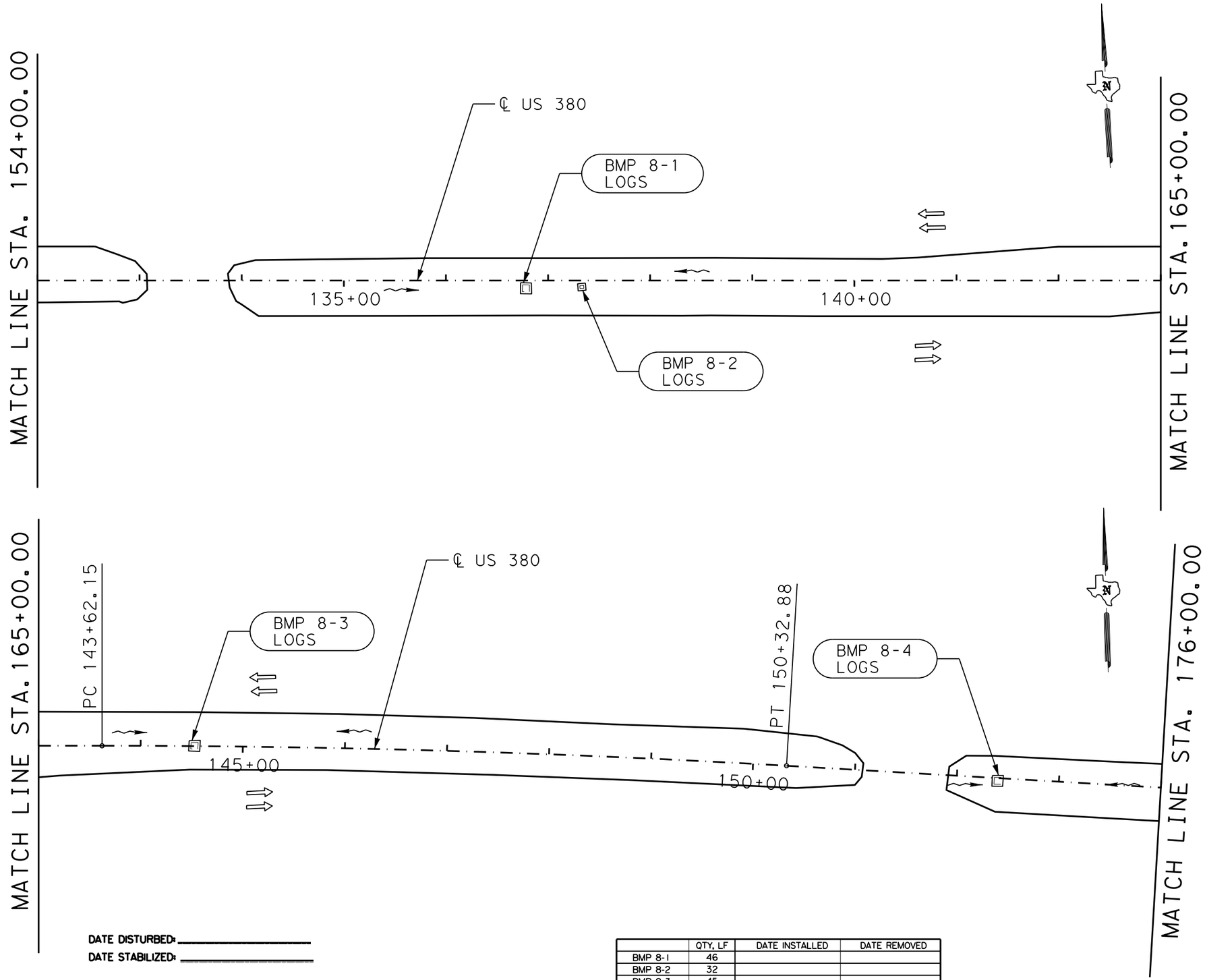

LEGEND

- ⇨ DIRECTION OF TRAFFIC
- ~→ DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

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DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY. LF	DATE INSTALLED	DATE REMOVED
BMP 8-1	46		
BMP 8-2	32		
BMP 8-3	45		
BMP 8-4	45		

STATE OF TEXAS
DANNY MICHAEL HENDERSON
119091
LICENSED
PROFESSIONAL ENGINEER

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F759E84E0E2C45C...

12/15/2020

Texas Department of Transportation

US 380
SW3P LAYOUT

STA. 154+00.00 TO STA. 176+00.00

SCALE: 1" = 100'

SHEET 8 OF 20

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DMH	TEXAS	DAL	DENTON	46
CHECK DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	

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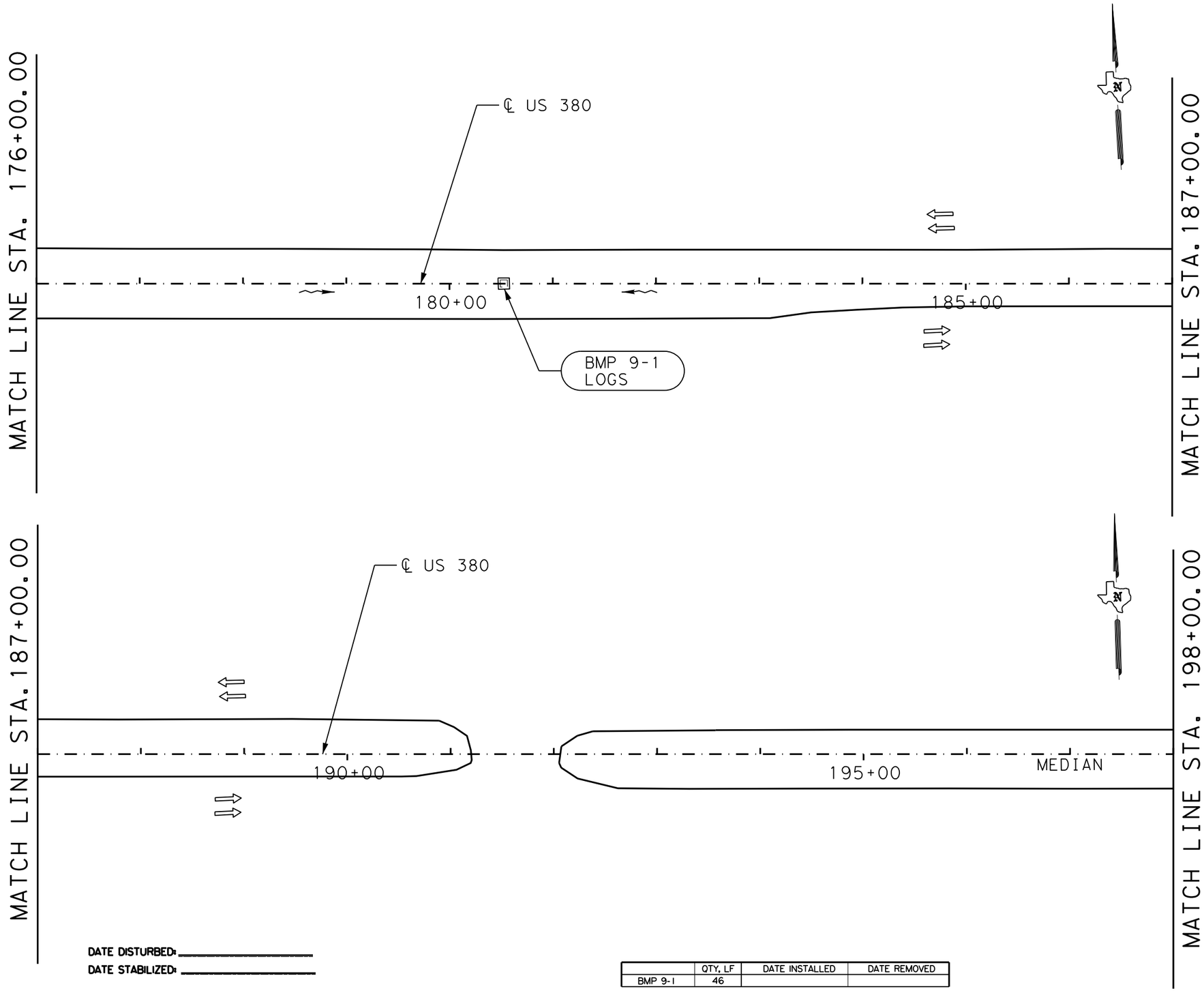

LEGEND

- DIRECTION OF TRAFFIC
- DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

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DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY. LF	DATE INSTALLED	DATE REMOVED
BMP 9-1	46		

STATE OF TEXAS
DANNY MICHAEL HENDERSON
119091
LICENSED
PROFESSIONAL ENGINEER

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F759E84E0E2C45C...
12/15/2020

Texas Department of Transportation

US 380
SW3P LAYOUT

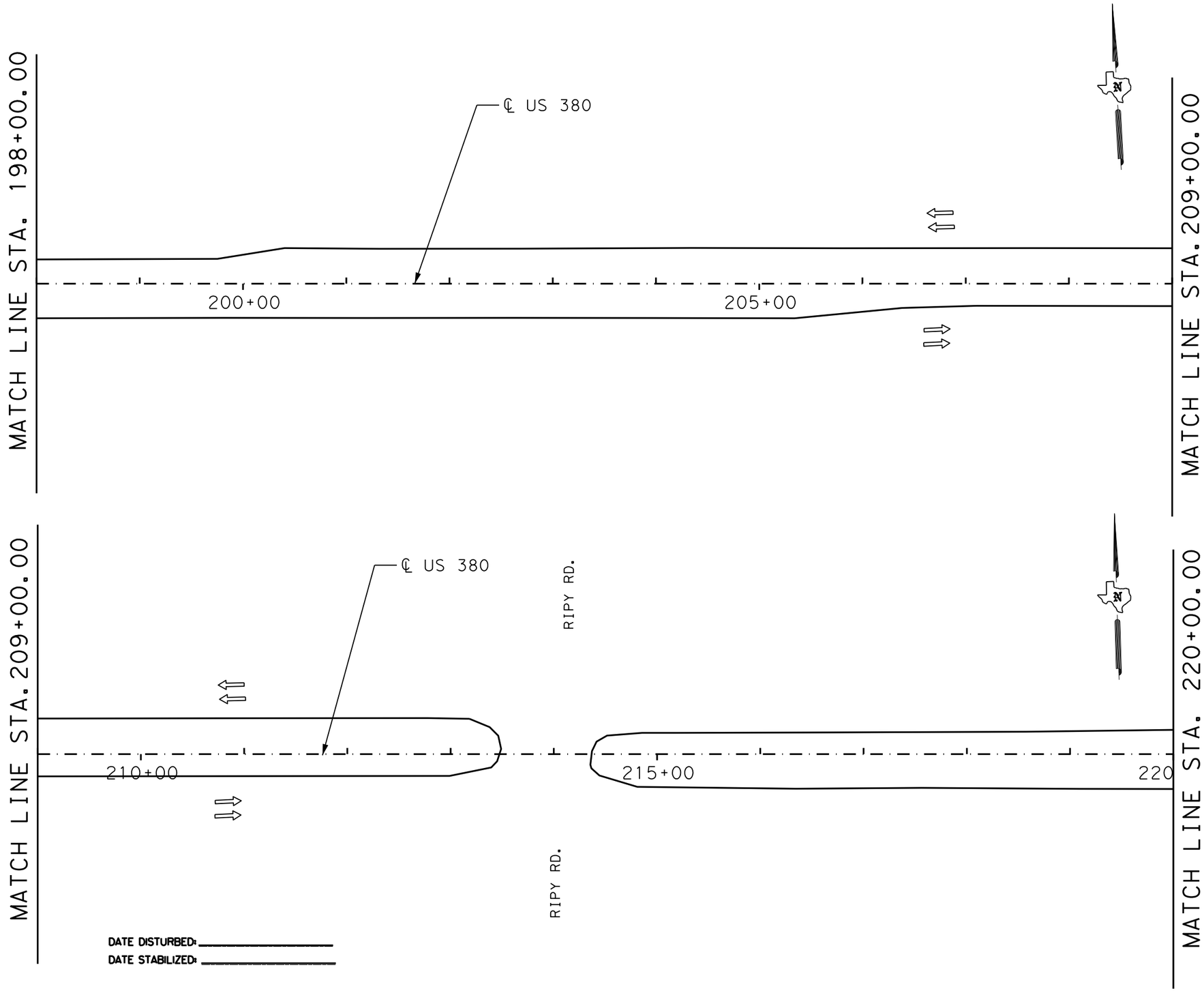
STA. 176+00.00 TO STA. 198+00.00

SCALE: 1" = 100'

SHEET 9 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS: AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK: DMH	TEXAS	DAL	DENTON	47
CHECK: DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	

$FILE$



LEGEND

⇨ DIRECTION OF TRAFFIC

~~~► DIRECTION OF FLOW

LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS

SCF SEDIMENT FENCE

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STATE OF TEXAS
DANNY MICHAEL HENDERSON
119091
LICENSED
PROFESSIONAL ENGINEER

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F759E84E0E2C45C...
12/15/2020

Texas Department of Transportation

US 380
SW3P LAYOUT

STA. 198+00.00 TO STA. 220+00.00

SCALE: 1" = 100'

SHEET 10 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DMH	TEXAS	DAL	DENTON	48
CHECK DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	
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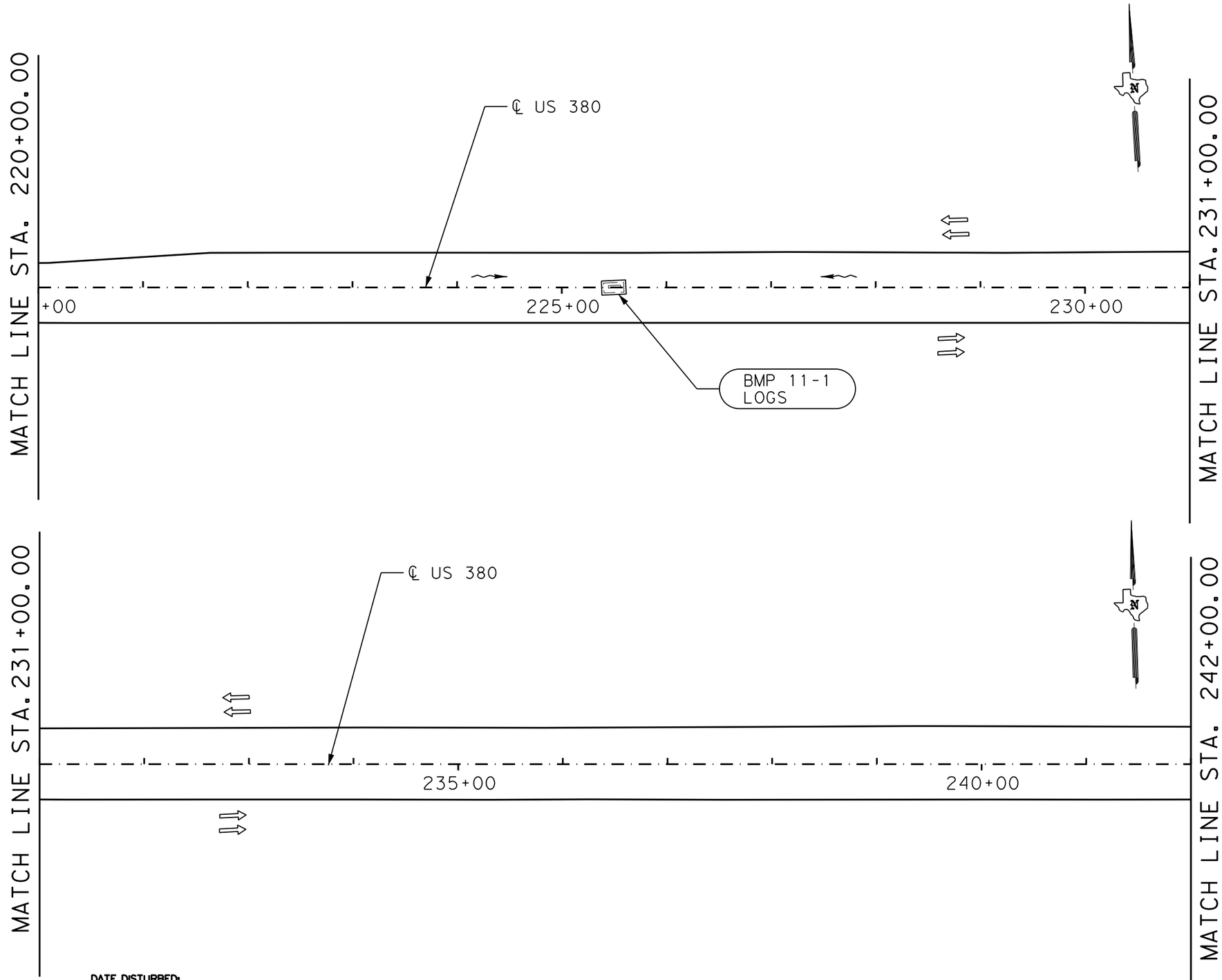

LEGEND

- ⇨ DIRECTION OF TRAFFIC
- ~~► DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

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DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY. LF	DATE INSTALLED	DATE REMOVED
BMP 11-1	76		

STATE OF TEXAS
DANNY MICHAEL HENDERSON
119091
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
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F759E84E0E2C45C...

12/15/2020

Texas Department of Transportation

US 380
SW3P LAYOUT

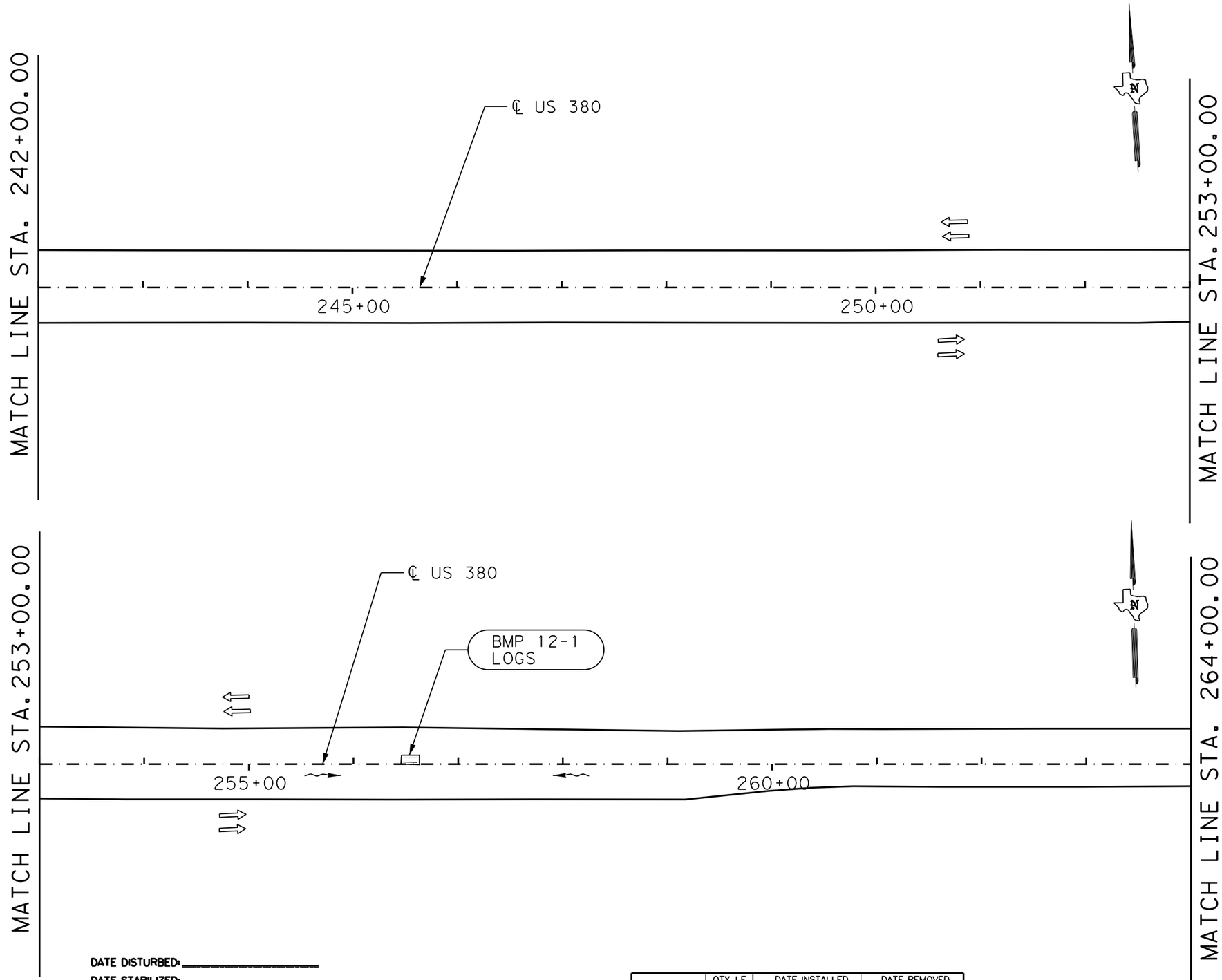
STA. 220+00.00 TO STA. 242+00.00

SCALE: 1" = 100'

SHEET 11 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AT	TEXAS	DAL	DENTON	49
CHECK	CONTROL	SECTION	JOB	
DMH	0134	09	067, ETC.	
CHECK				
DMH				

$FILEL$



LEGEND

⇨ DIRECTION OF TRAFFIC

~→ DIRECTION OF FLOW

LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS

SCF SEDIMENT FENCE

NOTES:

1) CONSTRUCTION EXIT(S) TO BE PLACED AT A LOCATION APPROVED BY THE ENGINEER

2) BMP'S SHALL NOT BE INSTALLED IN THE CONTROL AREA NO SOONER THAN 2 WEEKS PRIOR TO SOIL BEING DISTURBED.

3) EXACT LOCATION OF CONSTRUCTION EXITS, EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCING TO BE DETERMINED BY THE ENGINEER.

4) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY. LF	DATE INSTALLED	DATE REMOVED
BMP 12-1	55		

STATE OF TEXAS
DANNY MICHAEL HENDERSON
119091
LICENSED
PROFESSIONAL ENGINEER

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Danny Henderson
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12/15/2020

Texas Department of Transportation

US 380
SW3P LAYOUT

STA. 242+00.00 TO STA. 264+00.00

SCALE: 1" = 100'

SHEET 12 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DMH	TEXAS	DAL	DENTON	50
CHECK DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	

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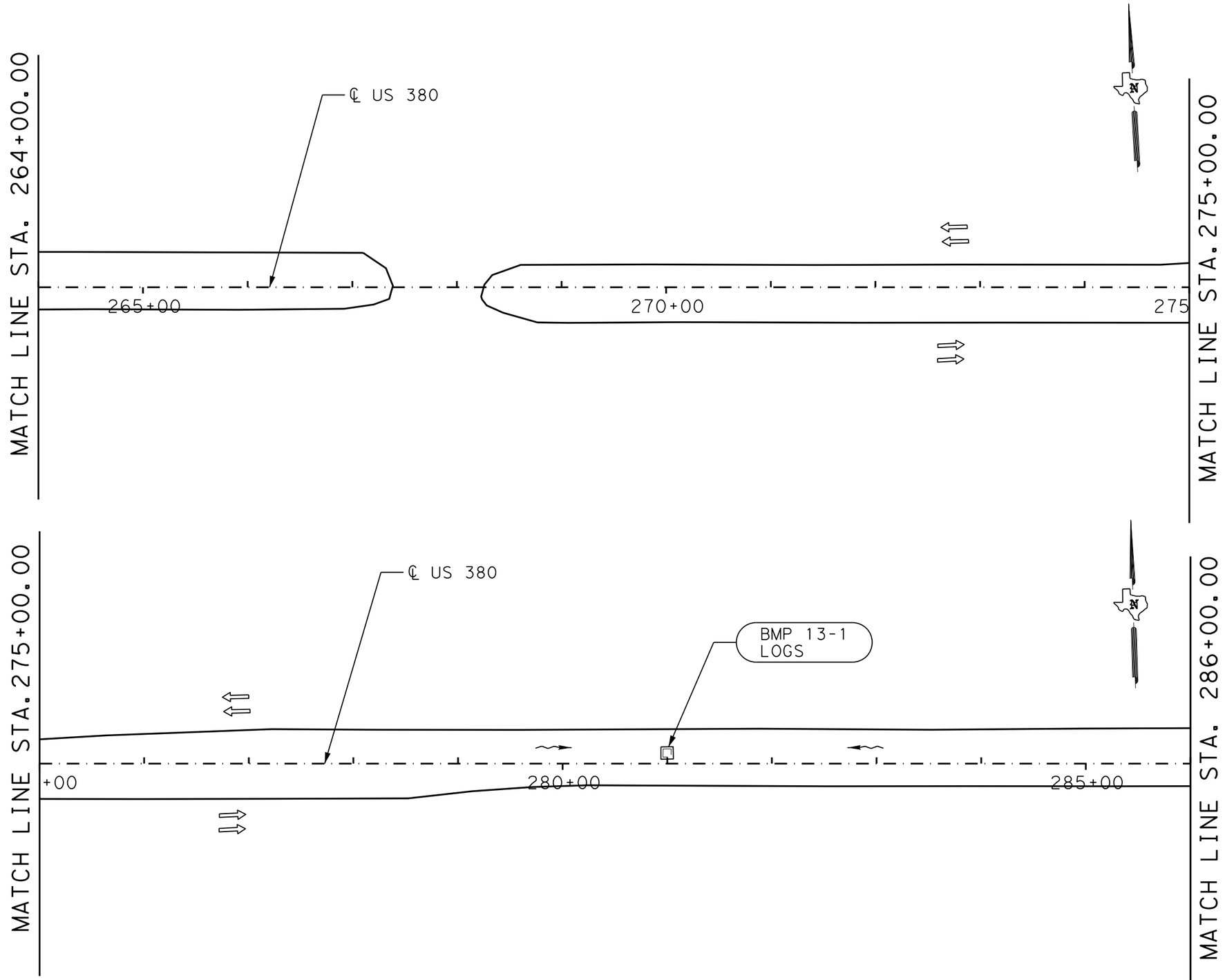

LEGEND

- ⇨ DIRECTION OF TRAFFIC
- ~→ DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

NOTES:

1) CONSTRUCTION EXIT(S) TO BE PLACED AT A LOCATION APPROVED BY THE ENGINEER

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4) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY, LF	DATE INSTALLED	DATE REMOVED
BMP 13-1	49		

STATE OF TEXAS
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119091
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US 380
SW3P LAYOUT

STA. 264+00.00 TO STA. 286+00.00

SCALE: 1" = 100'

SHEET 13 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AT	TEXAS	DAL	DENTON	51
CHECK	CONTROL	SECTION	JOB	
DMH	0134	09	067, ETC.	
CHECK				
DMH				

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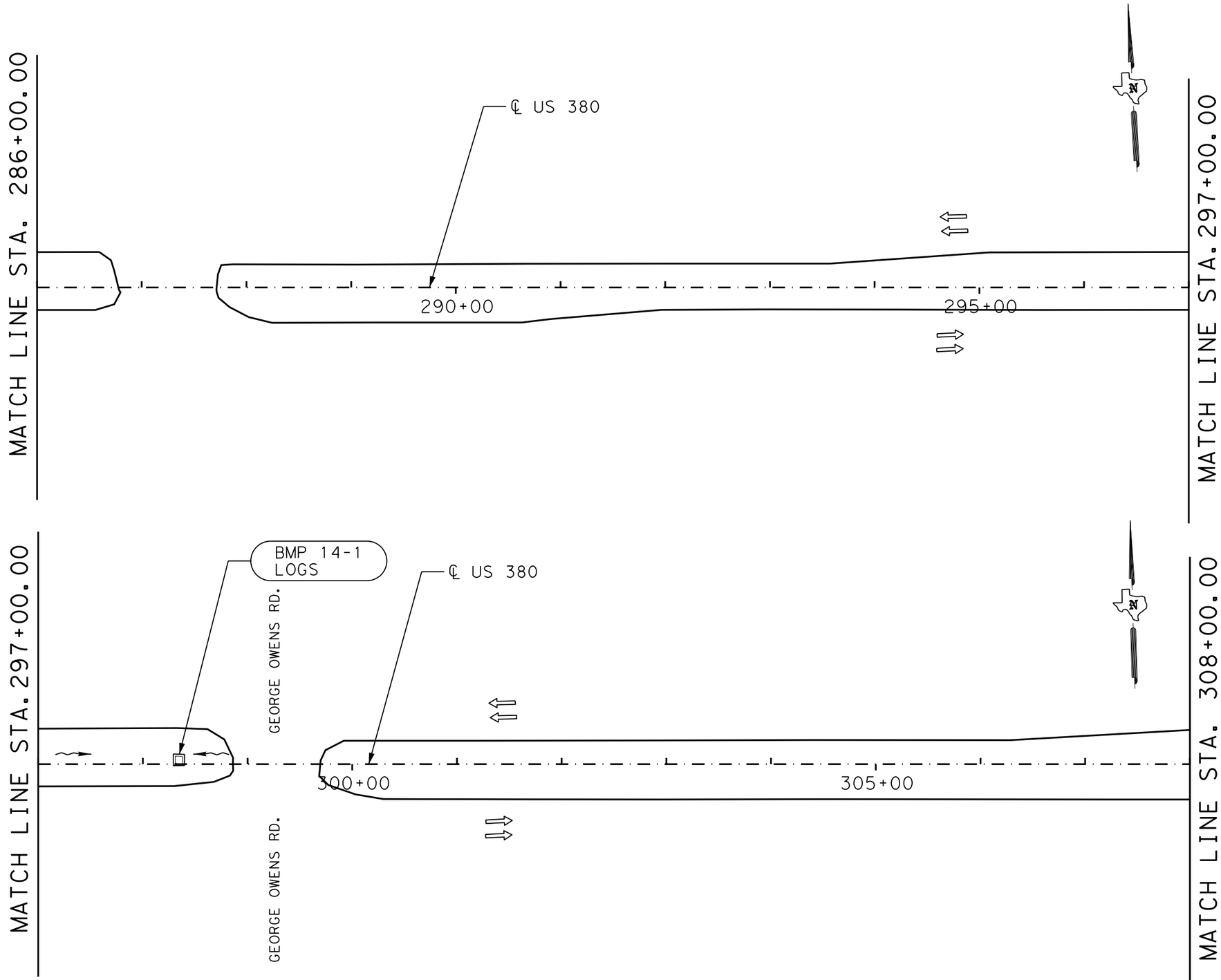

LEGEND

- ⇨ DIRECTION OF TRAFFIC
- ~~► DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

NOTES:

1) CONSTRUCTION EXIT(S) TO BE PLACED AT A LOCATION APPROVED BY THE ENGINEER

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3) EXACT LOCATION OF CONSTRUCTION EXITS, EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCING TO BE DETERMINED BY THE ENGINEER.

4) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY, LF	DATE INSTALLED	DATE REMOVED
BMP 14-1	46		

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119091
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US 380
SW3P LAYOUT

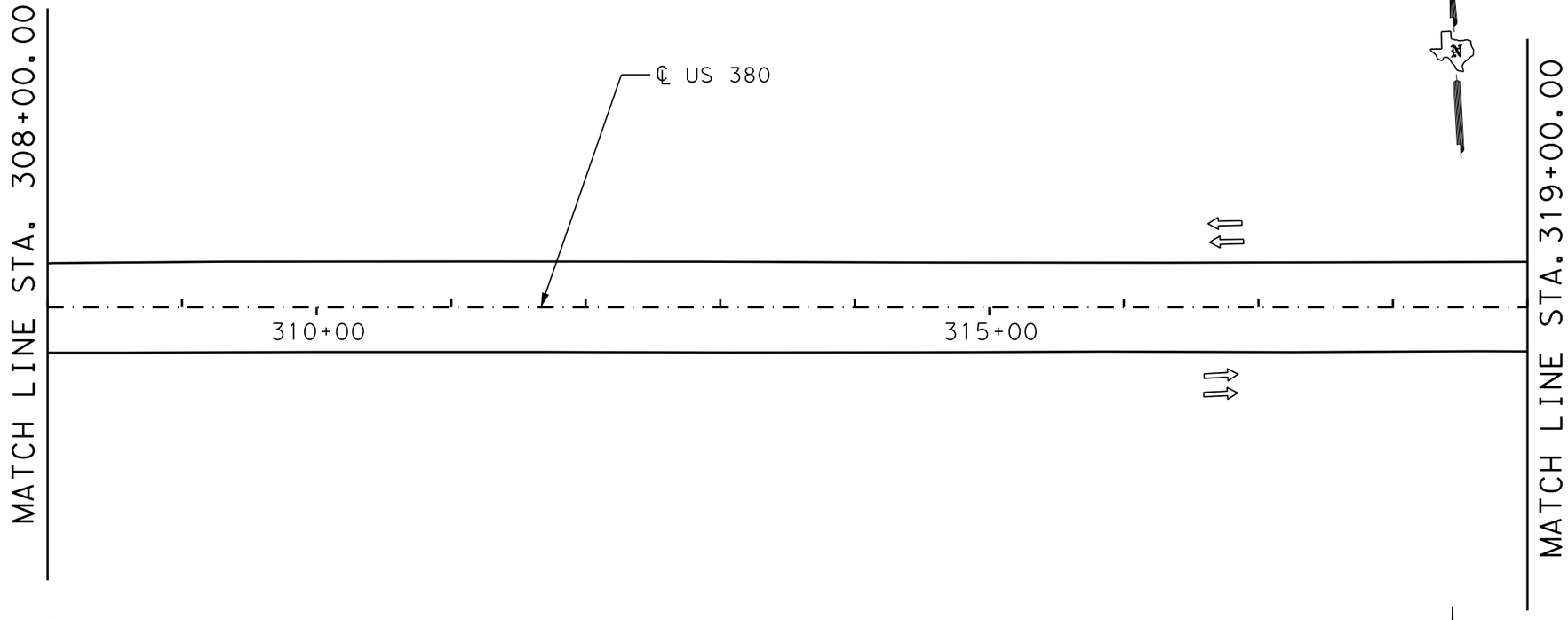
STA. 286+00.00 TO STA. 308+00.00

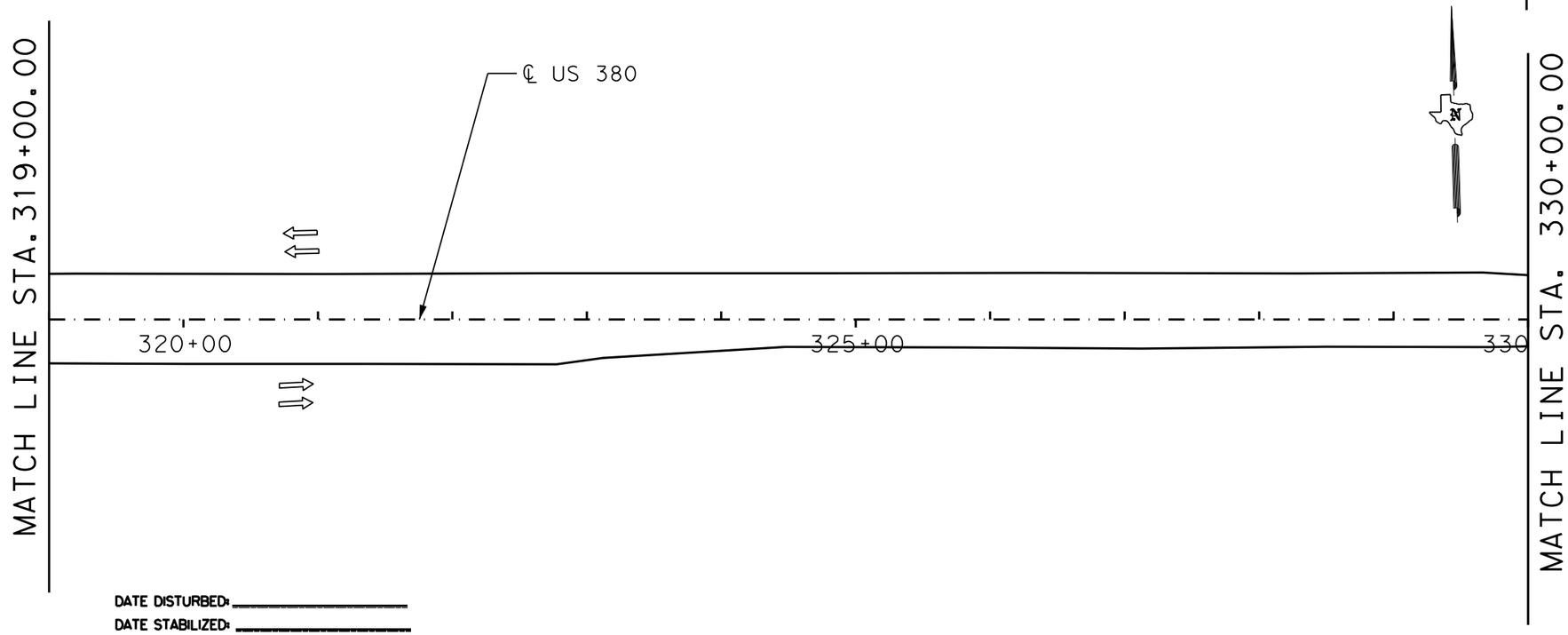
SCALE: 1" = 100'

SHEET 14 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AT	TEXAS	DAL	DENTON	52
CHECK	CONTROL	SECTION	JOB	
DMH	0134	09	067, ETC.	
CHECK				
DMH				

$FILEL$





LEGEND

- DIRECTION OF TRAFFIC
- DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

NOTES:

1) CONSTRUCTION EXIT(S) TO BE PLACED AT A LOCATION APPROVED BY THE ENGINEER

2) BMP'S SHALL NOT BE INSTALLED IN THE CONTROL AREA NO SOONER THAN 2 WEEKS PRIOR TO SOIL BEING DISTURBED.

3) EXACT LOCATION OF CONSTRUCTION EXITS, EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCING TO BE DETERMINED BY THE ENGINEER.

4) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

DATE DISTURBED: _____

DATE STABILIZED: _____

STATE OF TEXAS
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US 380
SW3P LAYOUT

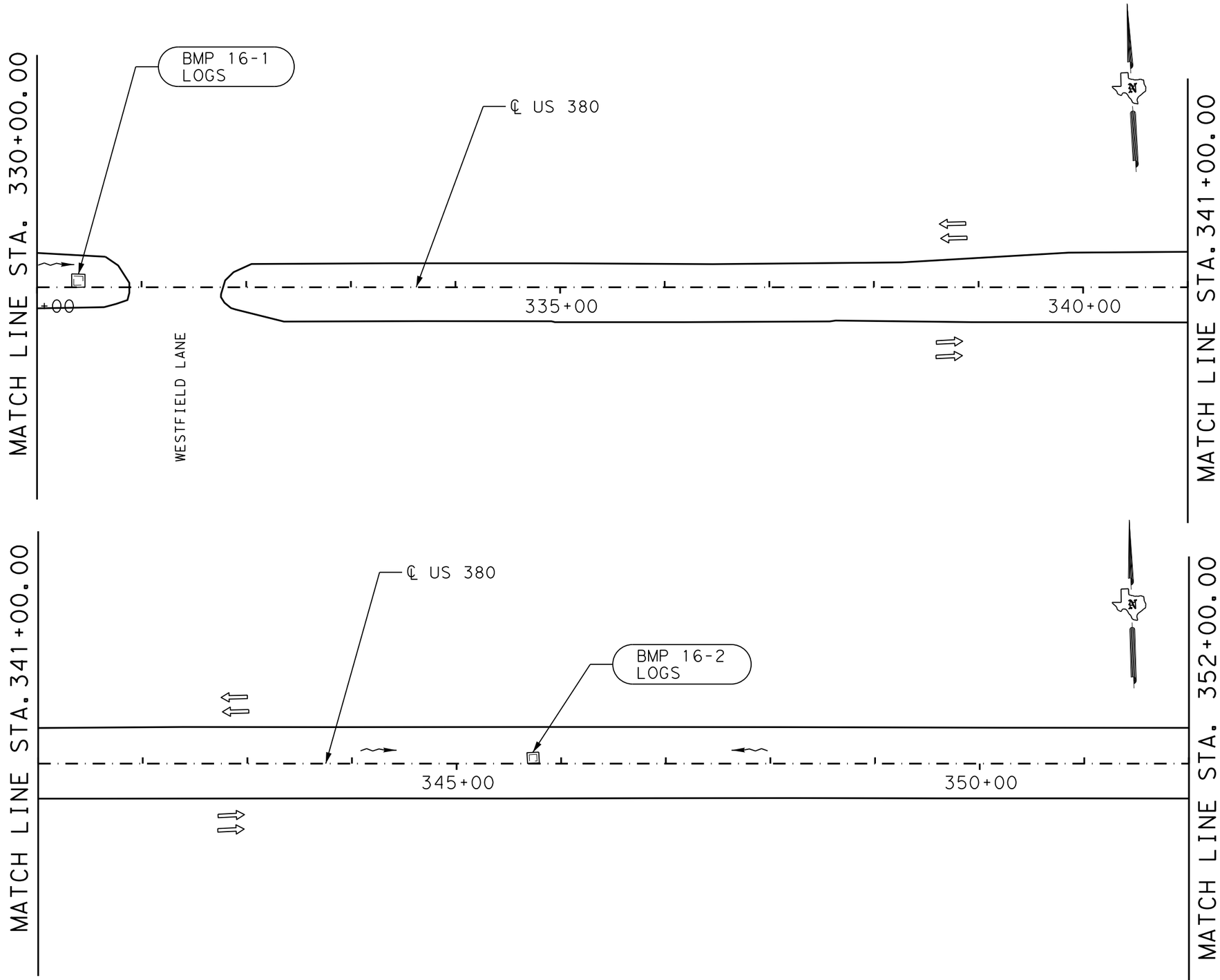
STA. 308+00.00 TO STA. 330+00.00

SCALE: 1" = 100'

SHEET 15 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DMH	TEXAS	DAL	DENTON	53
CHECK DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	

$FILEL$



LEGEND

- ⇨ DIRECTION OF TRAFFIC
- ~→ DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

NOTES:

1) CONSTRUCTION EXIT(S) TO BE PLACED AT A LOCATION APPROVED BY THE ENGINEER
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3) EXACT LOCATION OF CONSTRUCTION EXITS, EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCING TO BE DETERMINED BY THE ENGINEER.
4) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY, LF	DATE INSTALLED	DATE REMOVED
BMP 16-1	53		
BMP 16-2	45		

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US 380
SW3P LAYOUT

STA. 330+00.00 TO STA. 352+00.00

SCALE: 1" = 100'

SHEET 16 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DMH	TEXAS	DAL	DENTON	54
CHECK DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	

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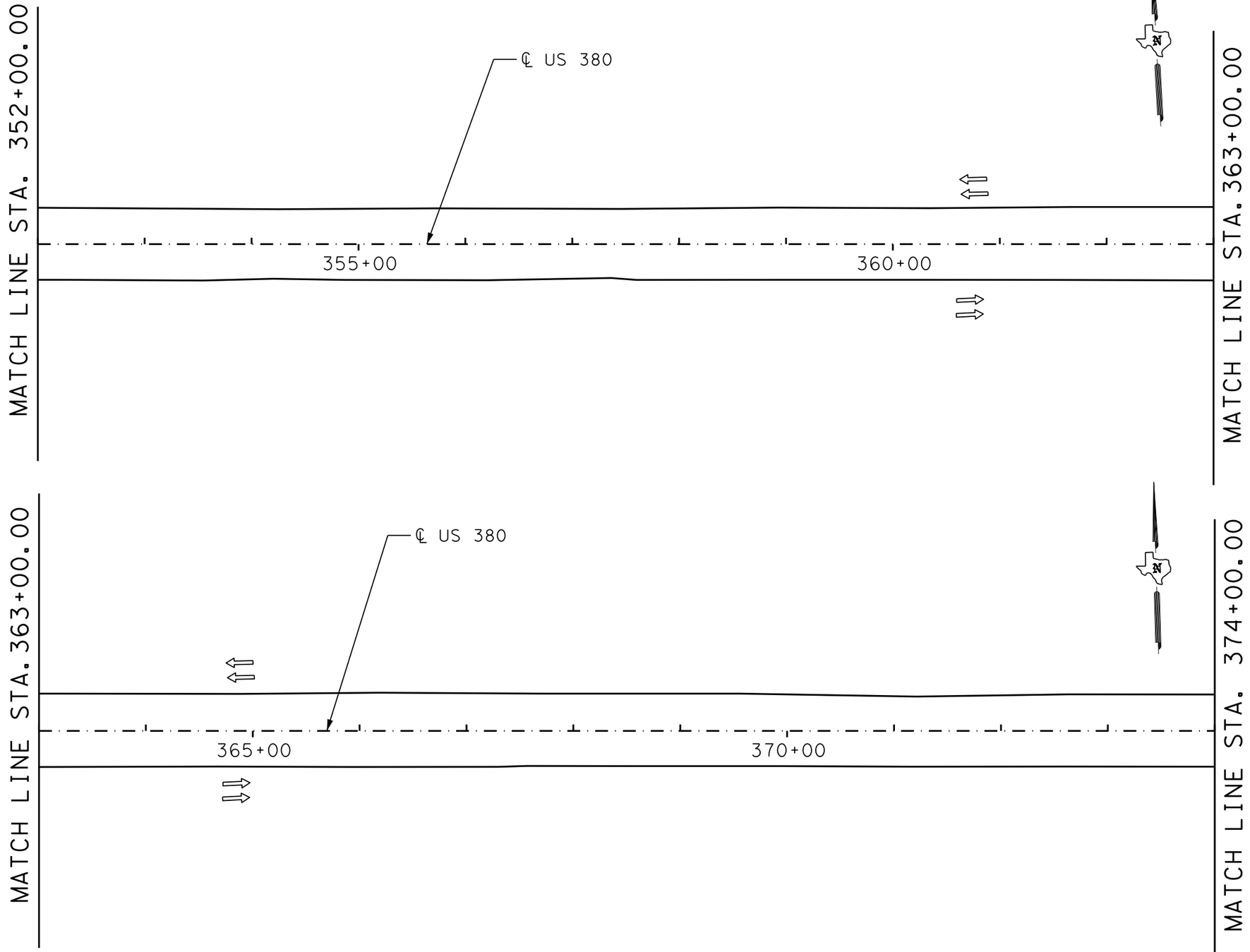

LEGEND

- ⇨ DIRECTION OF TRAFFIC
- ~→ DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

NOTES:

1) CONSTRUCTION EXIT(S) TO BE PLACED AT A LOCATION APPROVED BY THE ENGINEER

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3) EXACT LOCATION OF CONSTRUCTION EXITS, EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCING TO BE DETERMINED BY THE ENGINEER.

4) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

DATE DISTURBED: _____

DATE STABILIZED: _____

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US 380
SW3P LAYOUT

STA. 352+00.00 TO STA. 374+00.00

SCALE: 1" = 100'

SHEET 17 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DMH	TEXAS	DAL	DENTON	55
CHECK DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	

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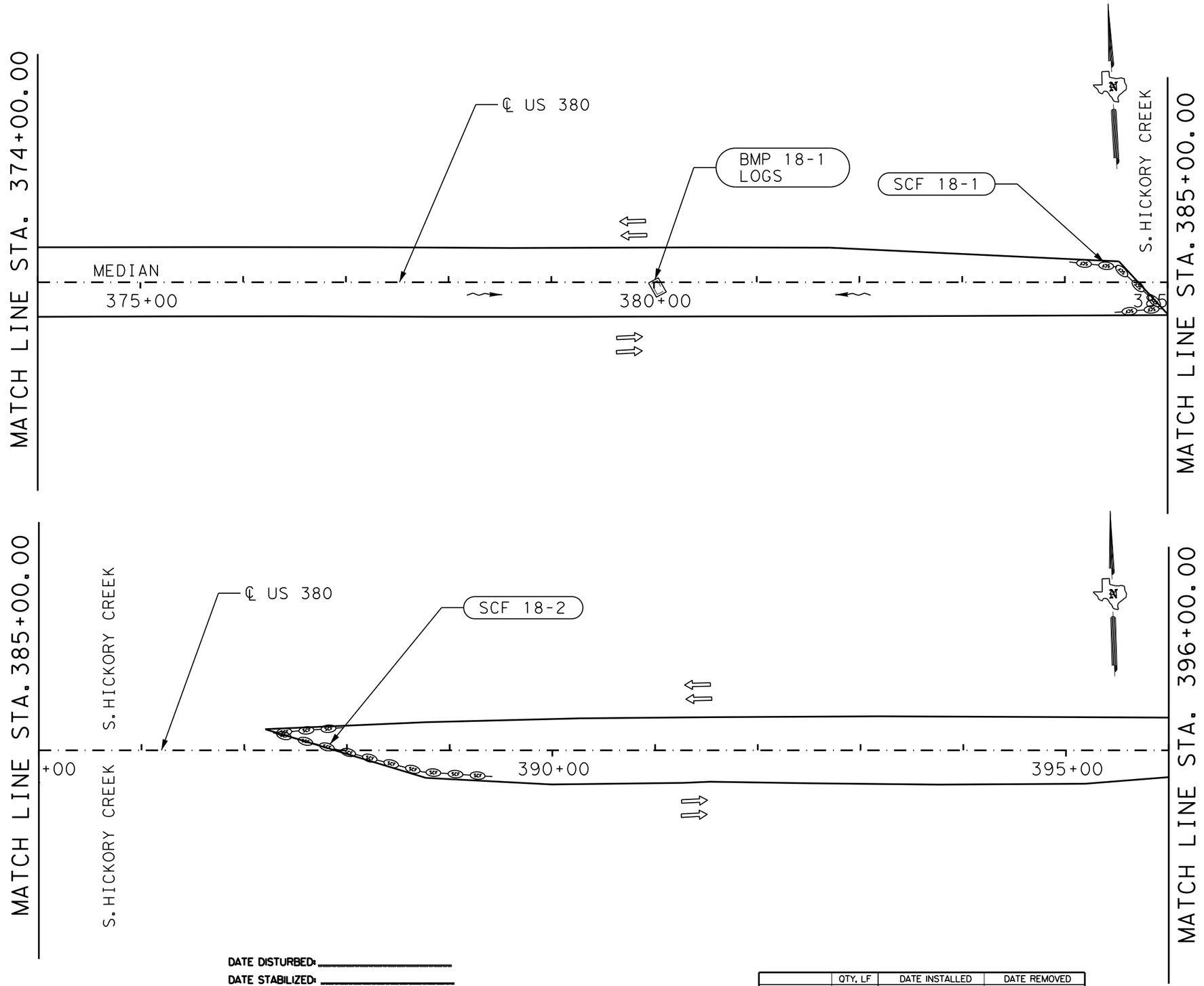

LEGEND

- ⇨ DIRECTION OF TRAFFIC
- ~→ DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

NOTES:

1) CONSTRUCTION EXIT(S) TO BE PLACED AT A LOCATION APPROVED BY THE ENGINEER

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3) EXACT LOCATION OF CONSTRUCTION EXITS, EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCING TO BE DETERMINED BY THE ENGINEER.

4) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY, LF	DATE INSTALLED	DATE REMOVED
BMP 18-1	55		
SCF 18-1	285		
SCF 18-2	285		

STATE OF TEXAS
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Texas Department of Transportation

US 380
SW3P LAYOUT

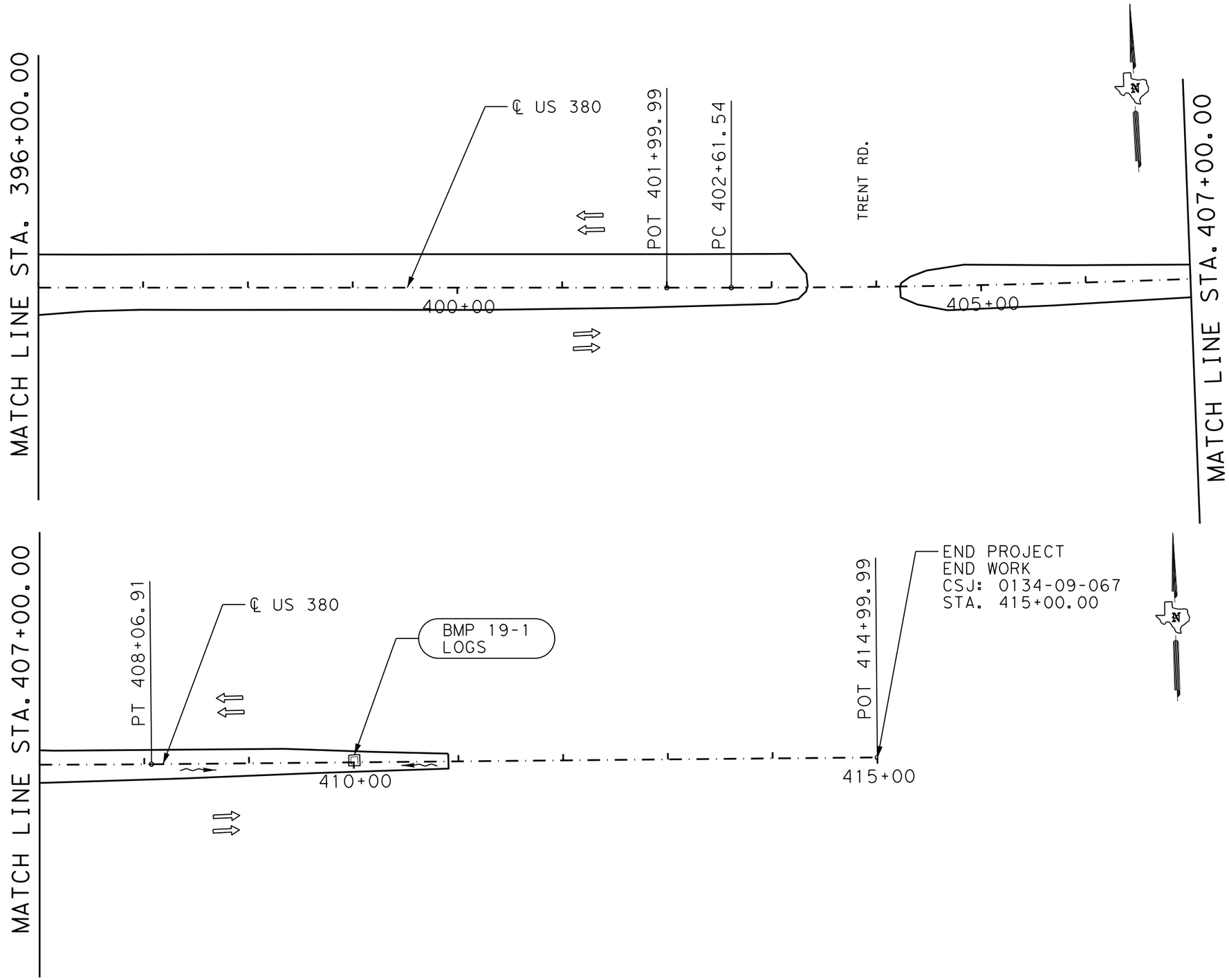
STA. 374+00.00 TO STA. 396+00.00

SCALE: 1" = 100'

SHEET 18 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AT	TEXAS	DAL	DENTON	56
CHECK	CONTROL	SECTION	JOB	
DMH	0134	09	067, ETC.	
CHECK				
DMH				

$FILEL$



LEGEND

- ⇨ DIRECTION OF TRAFFIC
- ~→ DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

NOTES:

1) CONSTRUCTION EXIT(S) TO BE PLACED AT A LOCATION APPROVED BY THE ENGINEER

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3) EXACT LOCATION OF CONSTRUCTION EXITS, EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCING TO BE DETERMINED BY THE ENGINEER.

4) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY. LF	DATE INSTALLED	DATE REMOVED
BMP 19-1	45		

STATE OF TEXAS
DANNY MICHAEL HENDERSON
119091
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PROFESSIONAL ENGINEER

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12/15/2020

US 380
SW3P LAYOUT

STA. 396+00.00 TO STA. 415+00.00

SCALE: 1" = 100'

SHEET 19 OF 19

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DMH	TEXAS	DAL	DENTON	57
CHECK DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	

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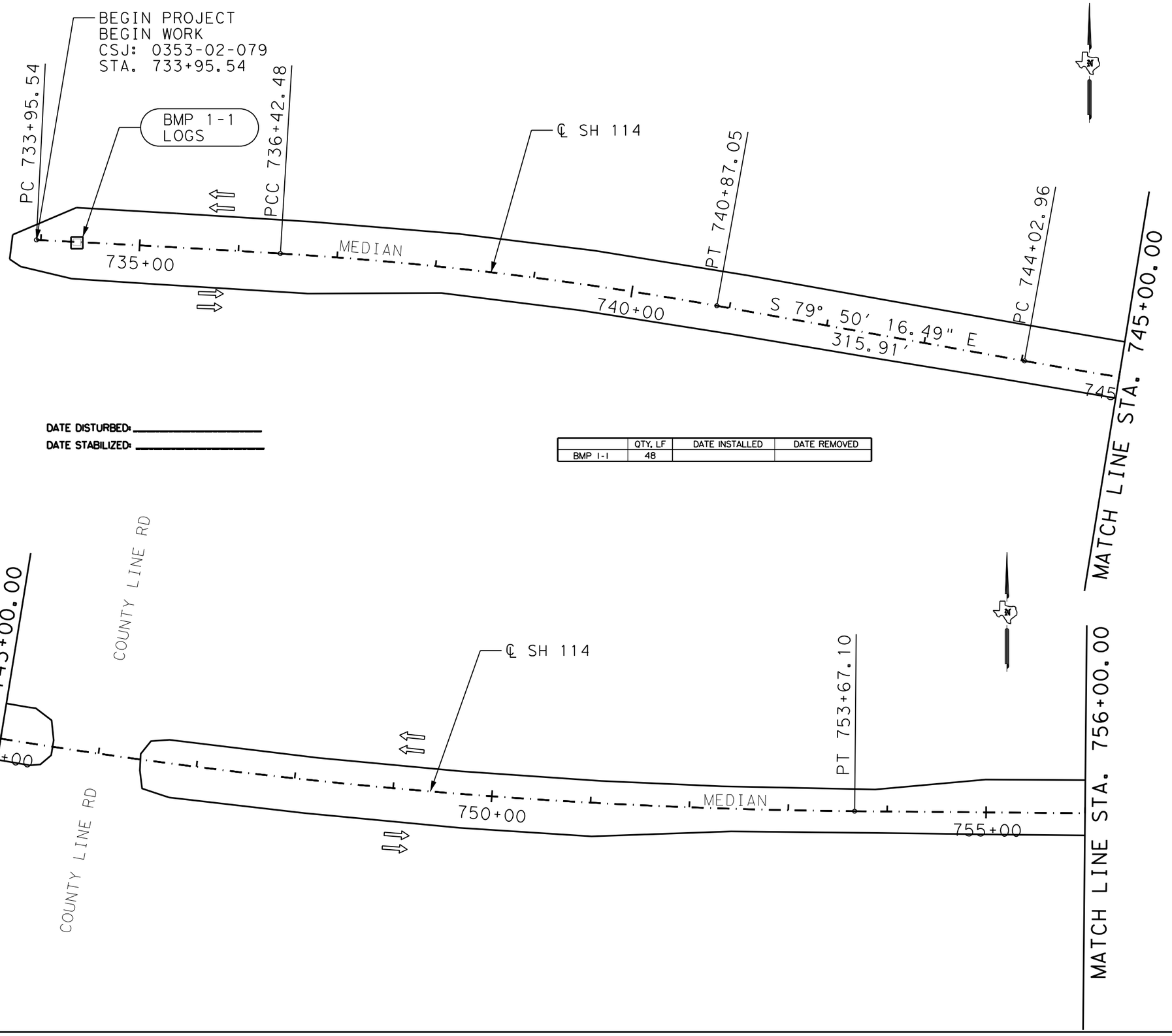

LEGEND

- ⇨ DIRECTION OF TRAFFIC
- ~→ DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

NOTES:

1) CONSTRUCTION EXIT(S) TO BE PLACED AT A LOCATION APPROVED BY THE ENGINEER

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4) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY. LF	DATE INSTALLED	DATE REMOVED
BMP 1-1	48		

STATE OF TEXAS
DANNY MICHAEL HENDERSON
119091
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12/15/2020

Texas Department of Transportation

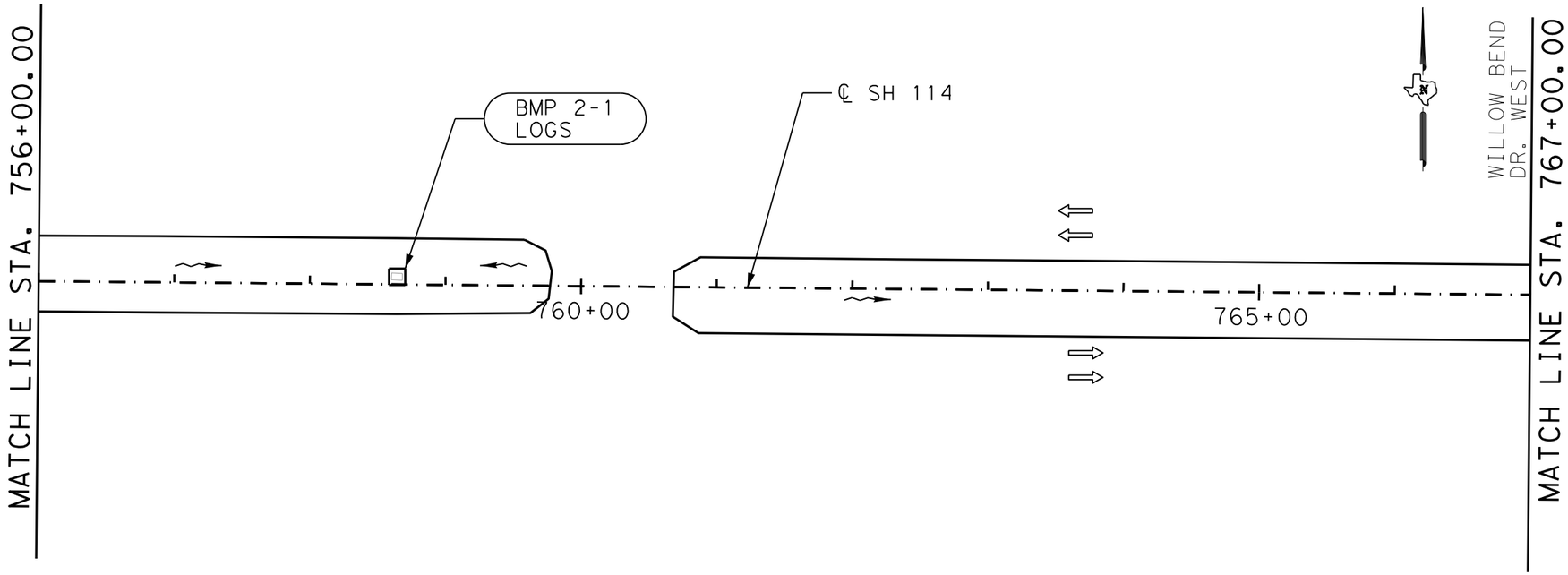
SH 114
SW3P LAYOUT

BEGIN PROJECT TO STA. 756+00.00

SCALE: 1" = 100'

SHEET 1 OF 11

DESIGN	FED. RD. DIV. NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS: AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK: DMH	TEXAS	DAL	DENTON	58
CHECK: DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	



LEGEND

⇨ DIRECTION OF FLOW

LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS

SCF SEDIMENT FENCE

NOTES:

1) CONSTRUCTION EXIT(S) TO BE PLACED AT A LOCATION APPROVED BY THE ENGINEER

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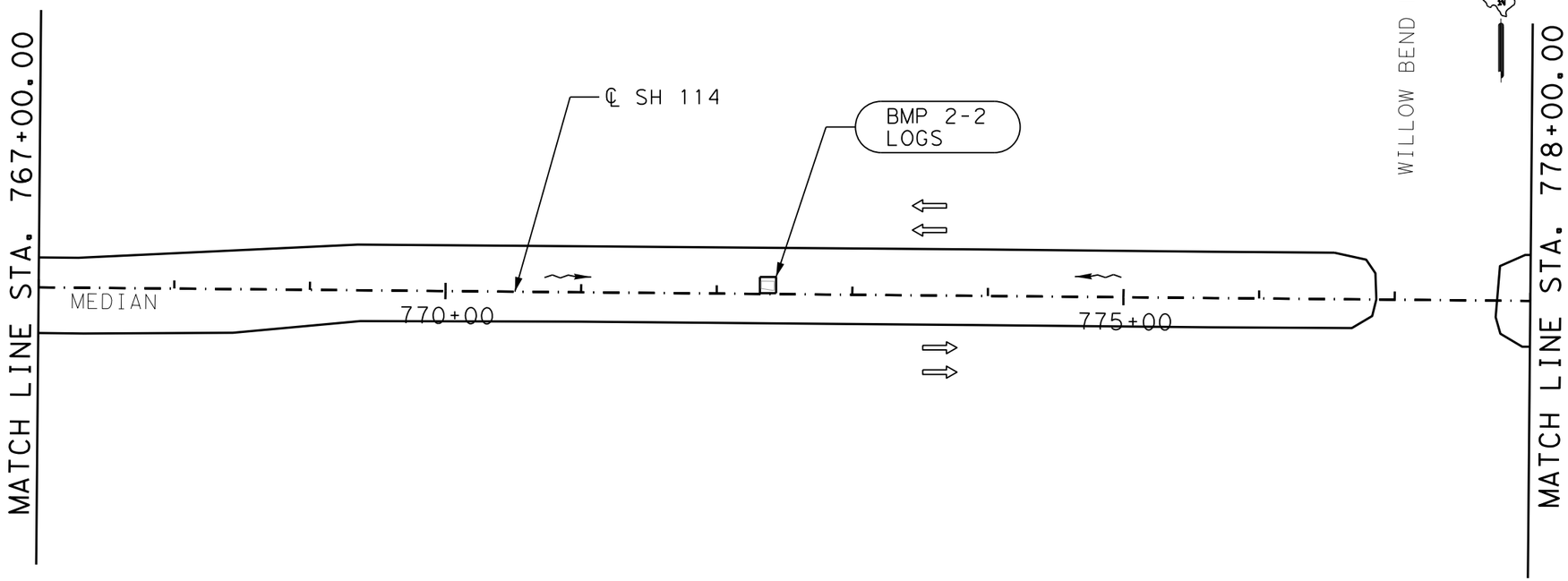
4) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY. LF	DATE INSTALLED	DATE REMOVED
BMP 2-1	48		
BMP 2-2	48		



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SH 114
SW3P LAYOUT

STA. 756+00.00 TO STA. 778+00.00

SCALE: 1" = 100'

SHEET 2 OF 11

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DMH	TEXAS	DAL	DENTON	59
CHECK DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	

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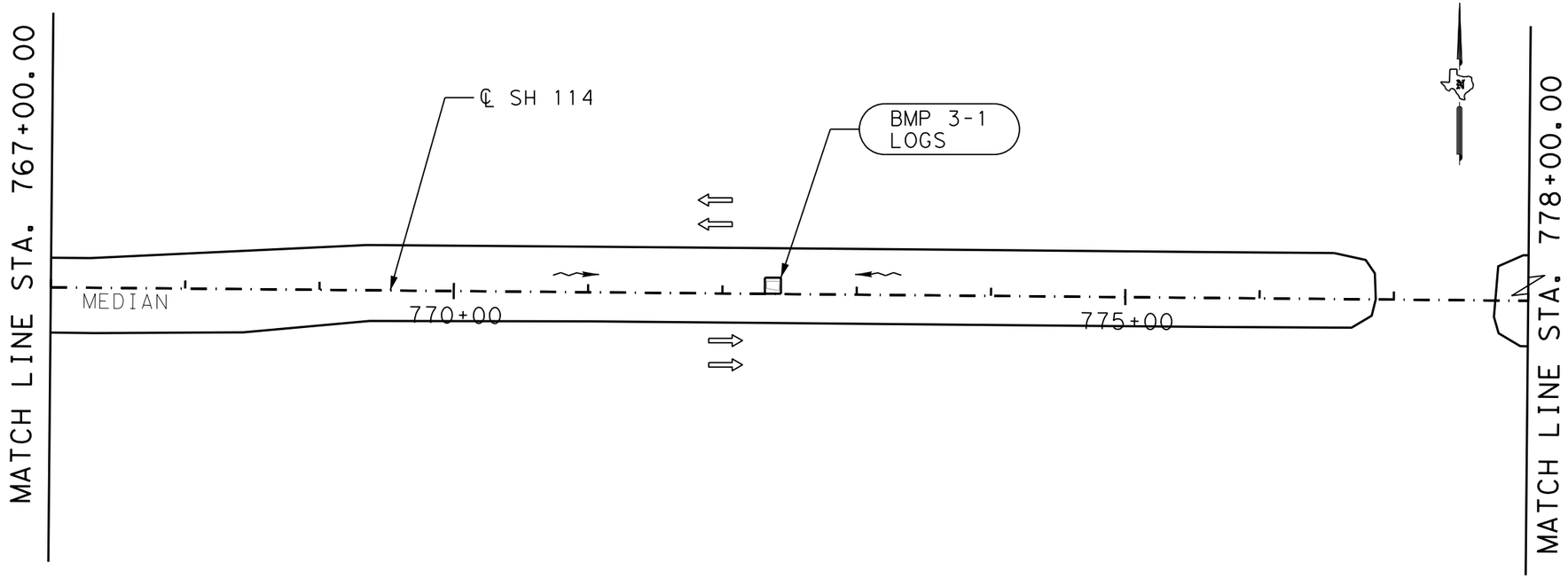

LEGEND

- ⇨ DIRECTION OF TRAFFIC
- ~→ DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

NOTES:

1) CONSTRUCTION EXIT(S) TO BE PLACED AT A LOCATION APPROVED BY THE ENGINEER

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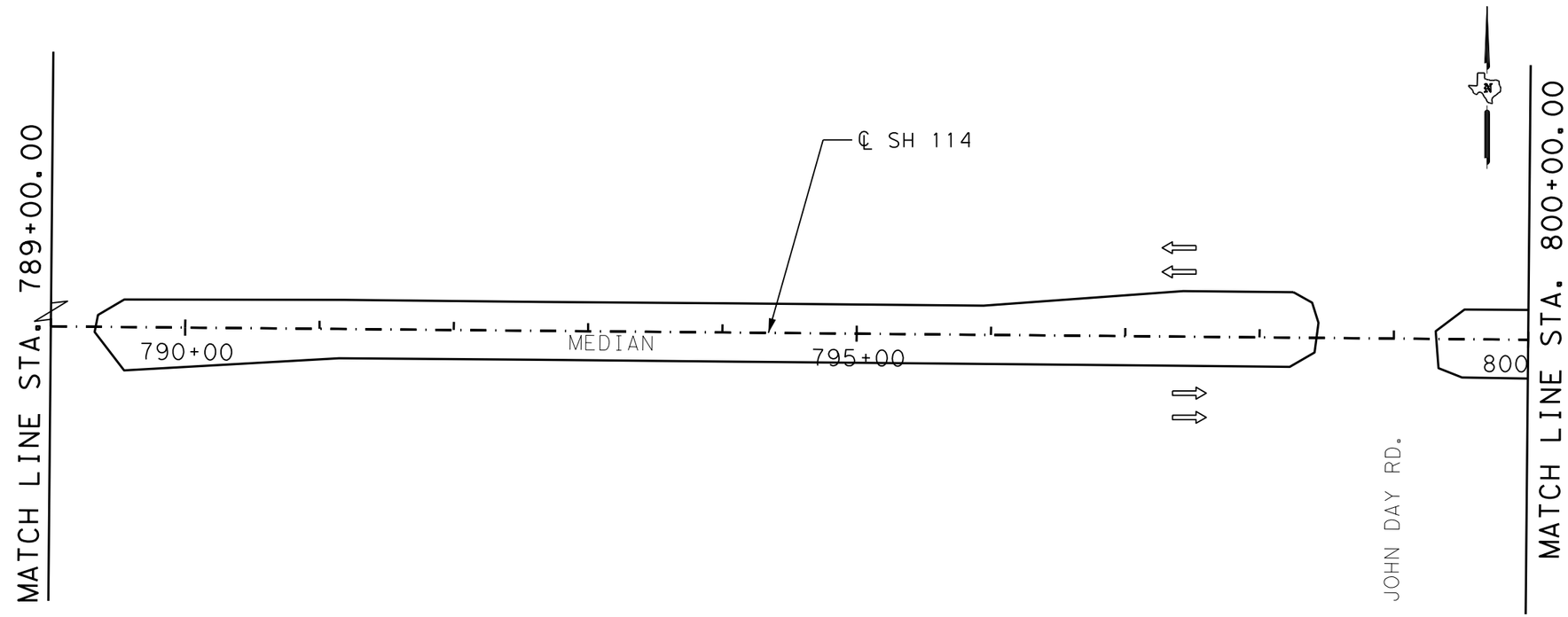
4) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY. LF	DATE INSTALLED	DATE REMOVED
BMP 3-1	48		



STATE OF TEXAS
DANNY MICHAEL HENDERSON
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Texas Department of Transportation

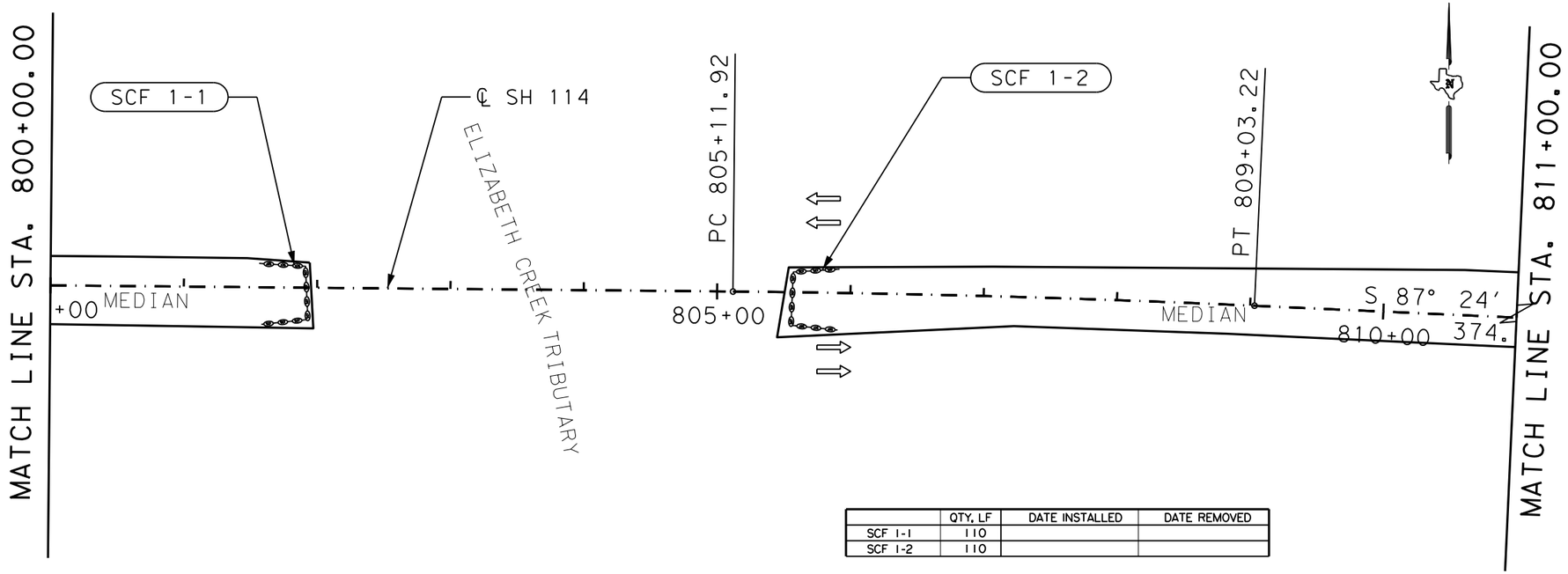
SH 114
SW3P LAYOUT

STA. 756+00.00 TO STA. 778+00.00
STA. 789+00.00 TO STA. 800+00.00

SCALE: 1" = 100'

SHEET 3 OF 11

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DMH	TEXAS	DAL	DENTON	60
CHECK DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	



	QTY, LF	DATE INSTALLED	DATE REMOVED
SCF 1-1	110		
SCF 1-2	110		

DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY, LF	DATE INSTALLED	DATE REMOVED
BMP 4-1	48		
BMP 4-2	48		

LEGEND

- ⇨ DIRECTION OF TRAFFIC
- ⇨ DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

NOTES:

1) CONSTRUCTION EXIT(S) TO BE PLACED AT A LOCATION APPROVED BY THE ENGINEER

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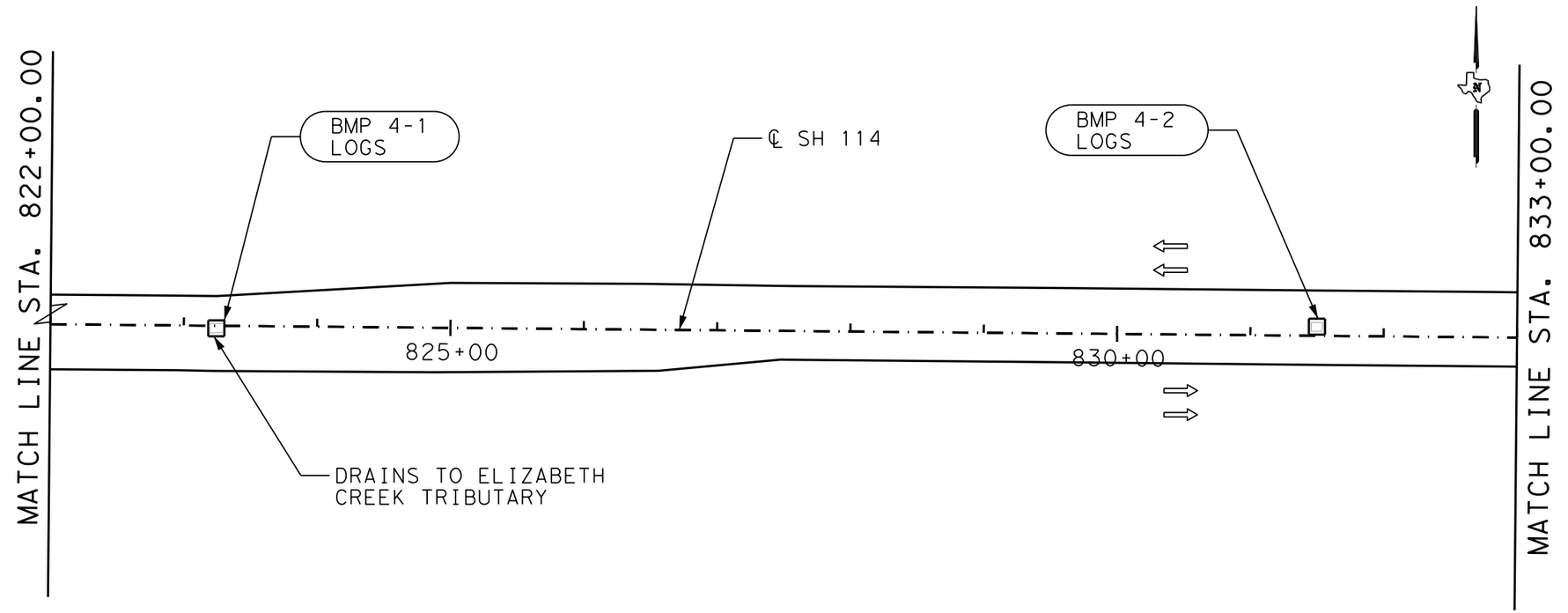
3) EXACT LOCATION OF CONSTRUCTION EXITS, EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCING TO BE DETERMINED BY THE ENGINEER.

4) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.



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12/15/2020

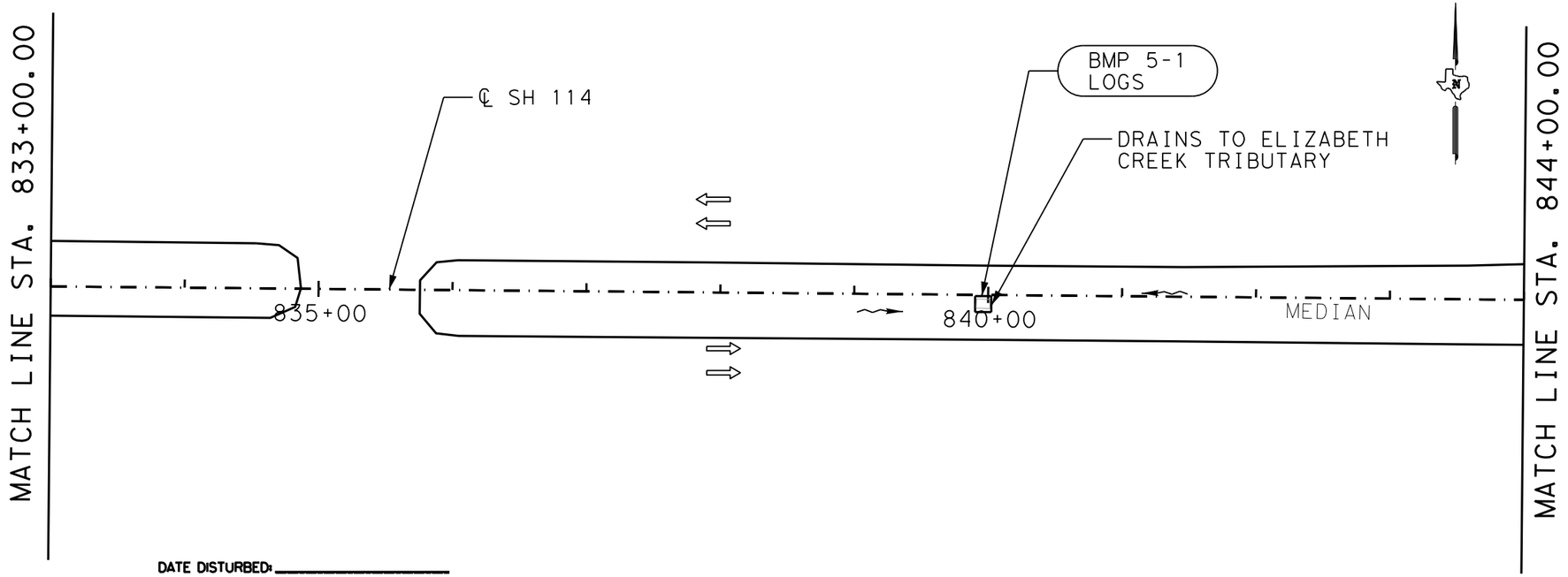
SH 114
SW3P LAYOUT

STA. 800+00.00 TO STA. 811+00.00
STA. 822+00.00 TO STA. 833+00.00

SCALE: 1" = 100'

SHEET 4 OF 11

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DMH	TEXAS	DAL	DENTON	61
CHECK DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	



DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY. LF	DATE INSTALLED	DATE REMOVED
BMP 5-1	48		

LEGEND

⇨ DIRECTION OF TRAFFIC

~→ DIRECTION OF FLOW

LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS

SCF SEDIMENT FENCE

NOTES:

1) CONSTRUCTION EXIT(S) TO BE PLACED AT A LOCATION APPROVED BY THE ENGINEER

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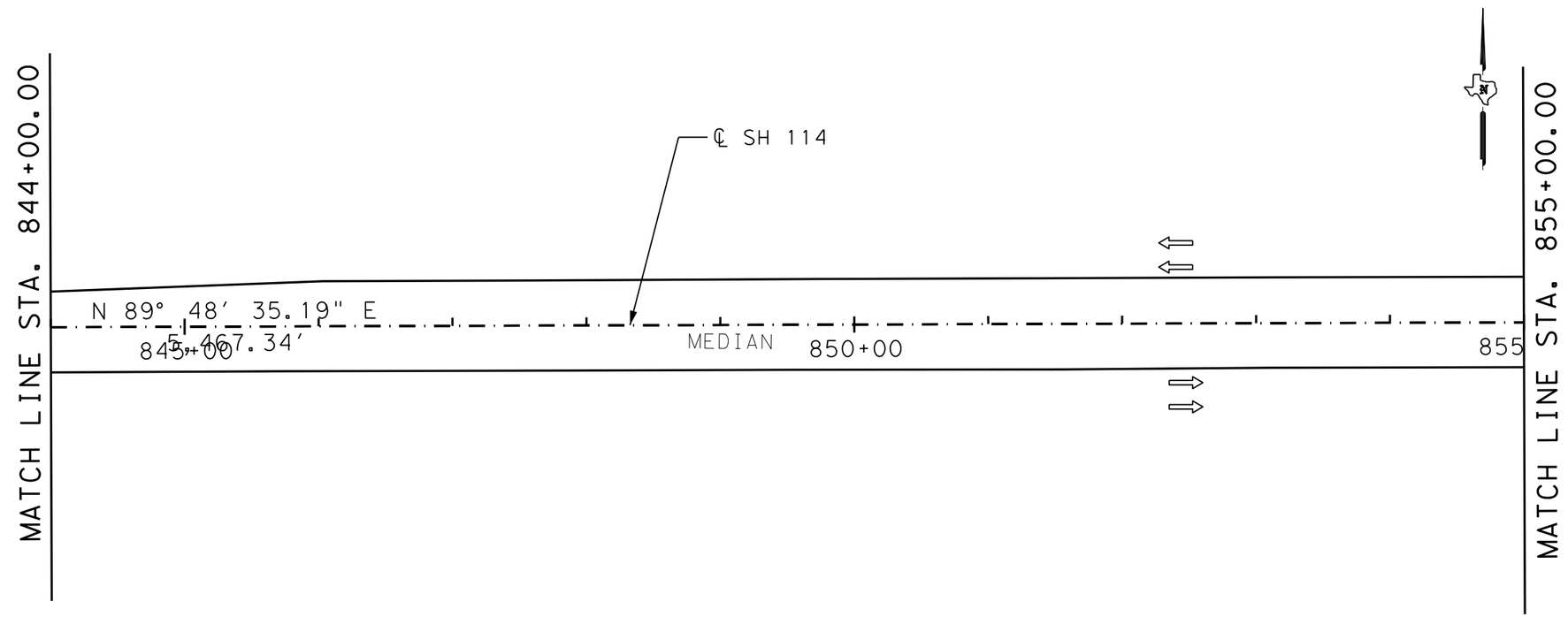
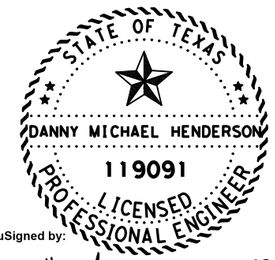
3) EXACT LOCATION OF CONSTRUCTION EXITS, EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCING TO BE DETERMINED BY THE ENGINEER.

4) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.





DocuSigned by:
Danny Henderson
F759E84E0E2C45C...

12/15/2020

Texas Department of Transportation

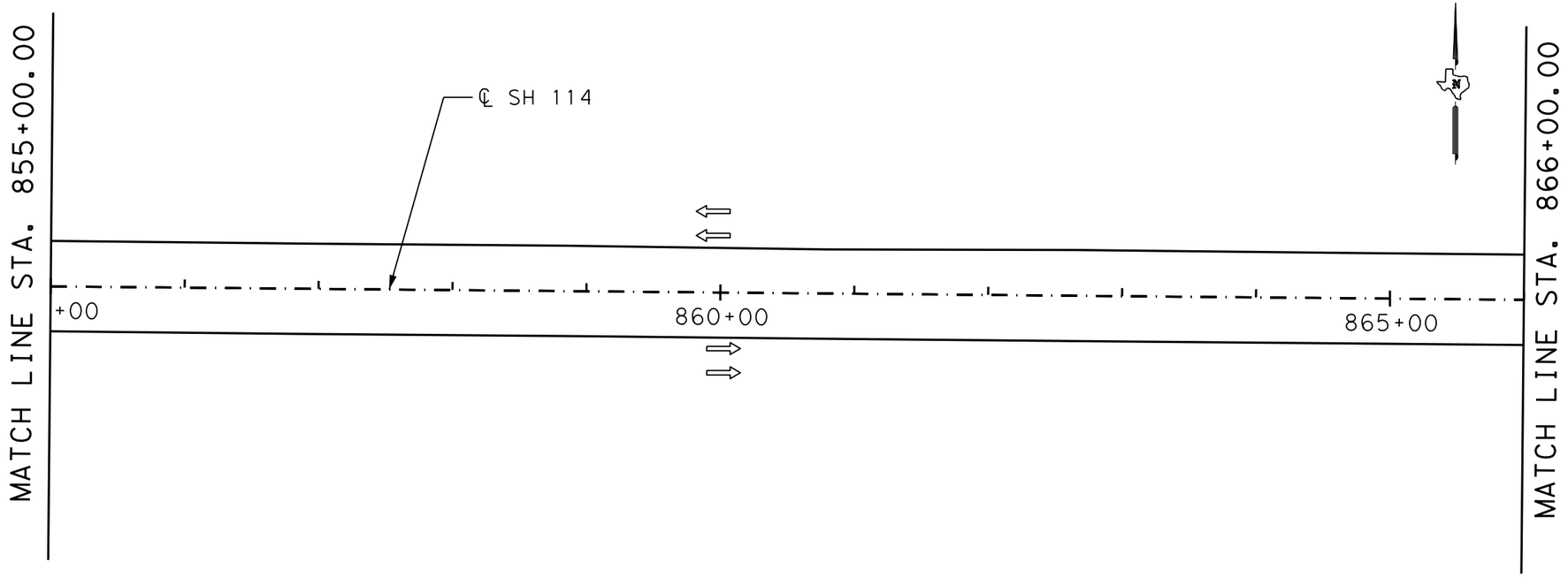
SH 114
SW3P LAYOUT

STA. 833+00.00 TO STA. 855+00.00

SCALE: 1" = 100'

SHEET 5 OF 11

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS: AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK: DMH	TEXAS	DAL	DENTON	62
CHECK: DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	



LEGEND

- ⇨ DIRECTION OF TRAFFIC
- ~→ DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

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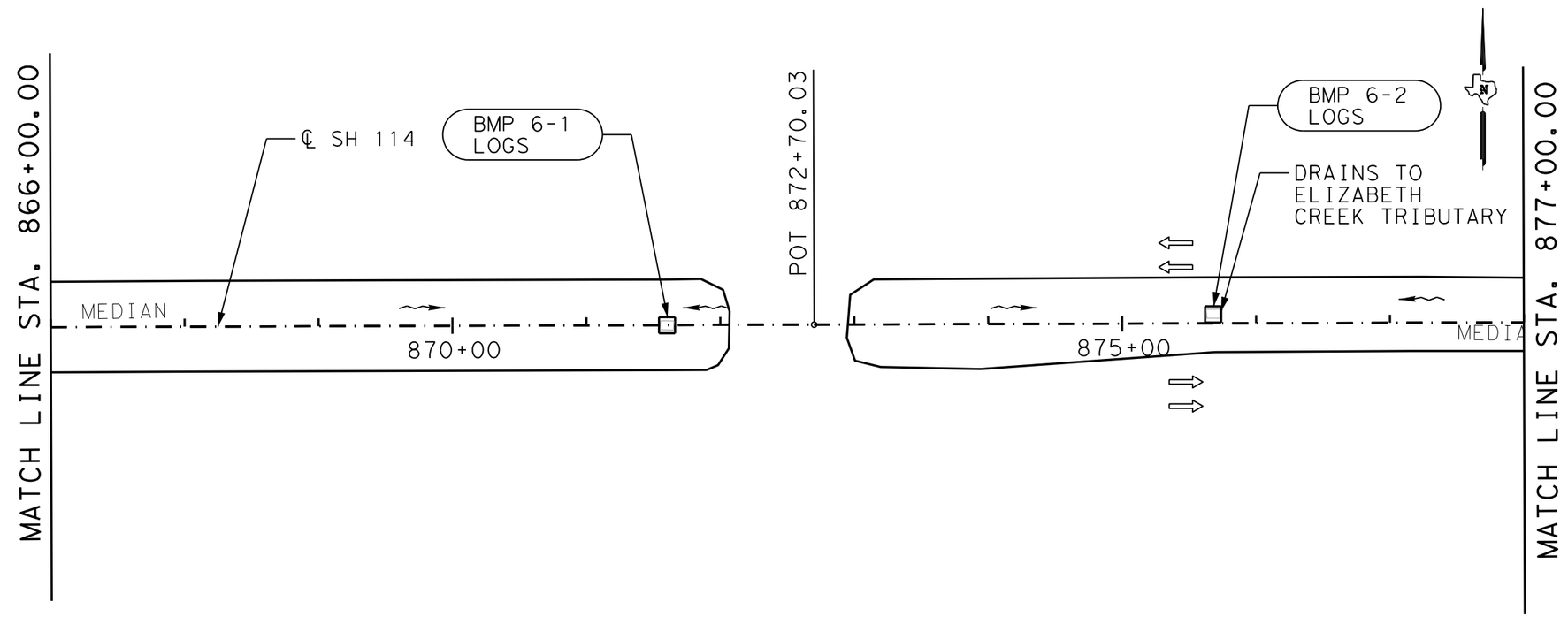
DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY, LF	DATE INSTALLED	DATE REMOVED
BMP 6-1	48		
BMP 6-2	48		



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DANNY MICHAEL HENDERSON
119091
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12/15/2020

Texas Department of Transportation

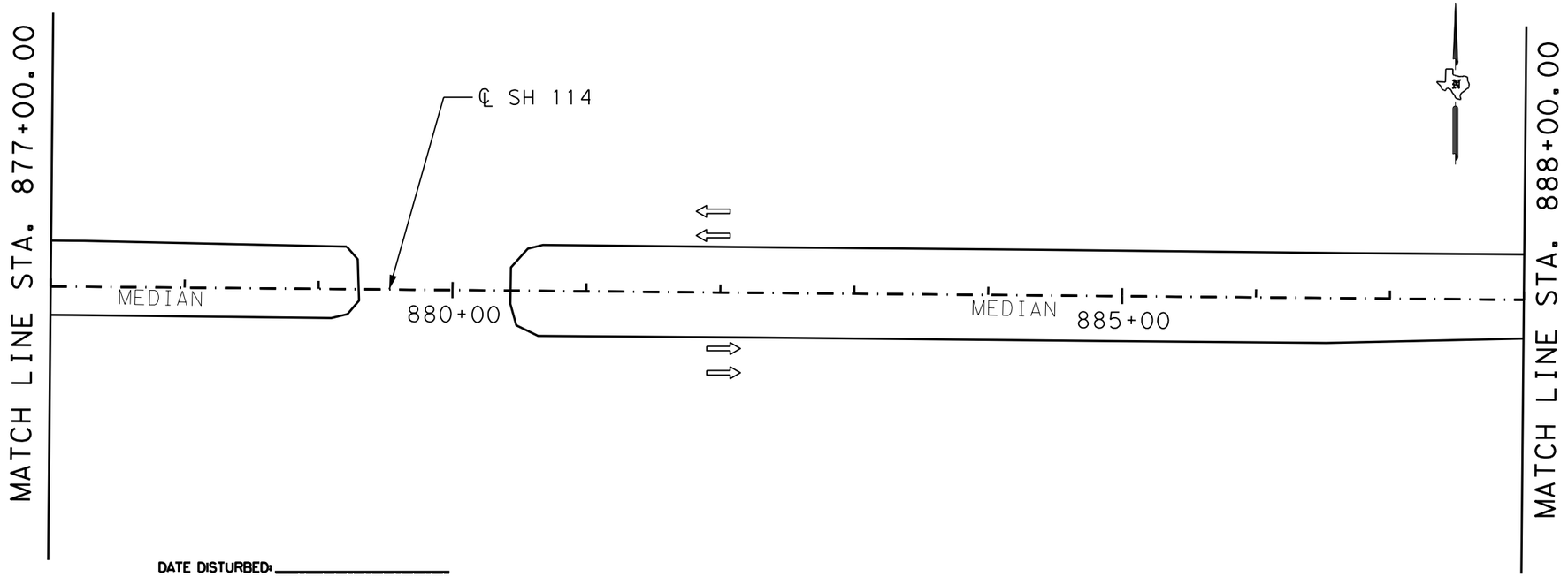
SH 114
SW3P LAYOUT

STA. 855+00.00 TO STA. 877+00.00

SCALE: 1" = 100'

SHEET 6 OF 11

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS: AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK: DMH	TEXAS	DAL	DENTON	63
CHECK: DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	



DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY. LF	DATE INSTALLED	DATE REMOVED
BMP 7-1	48		

LEGEND

⇨ DIRECTION OF TRAFFIC

~→ DIRECTION OF FLOW

LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS

SCF SEDIMENT FENCE

NOTES:

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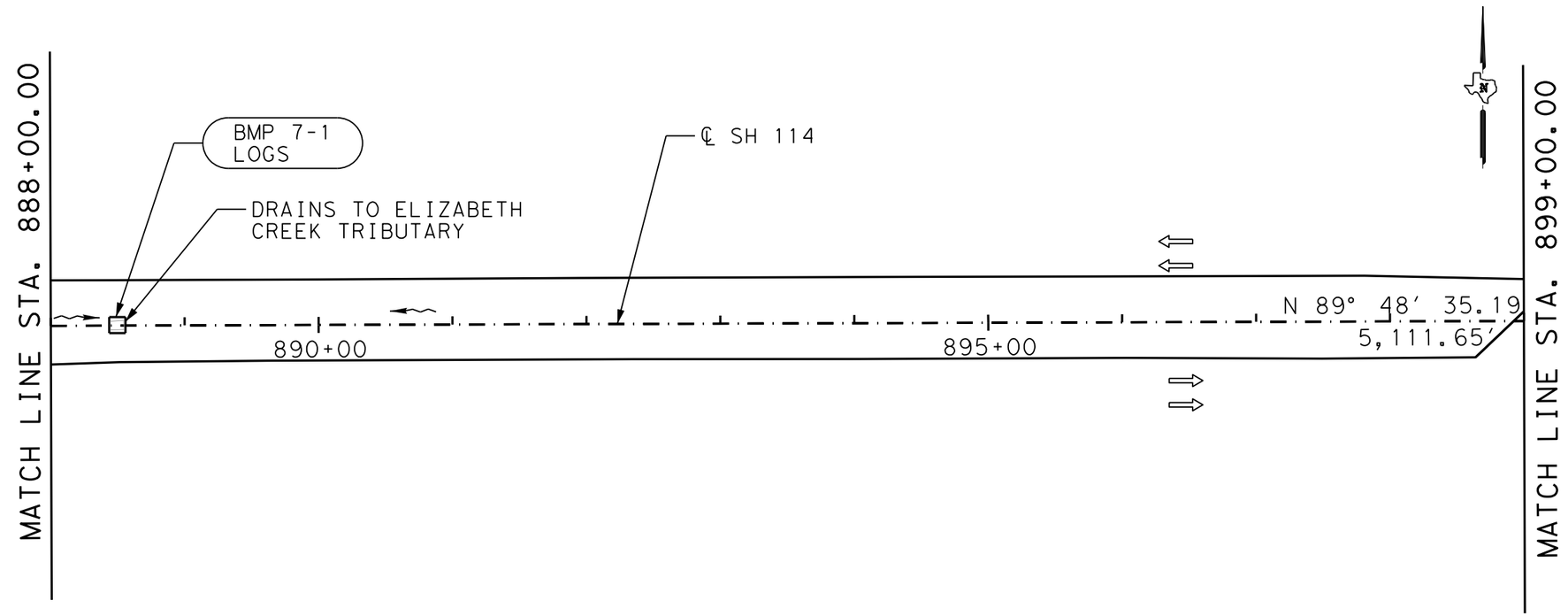

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12/15/2020

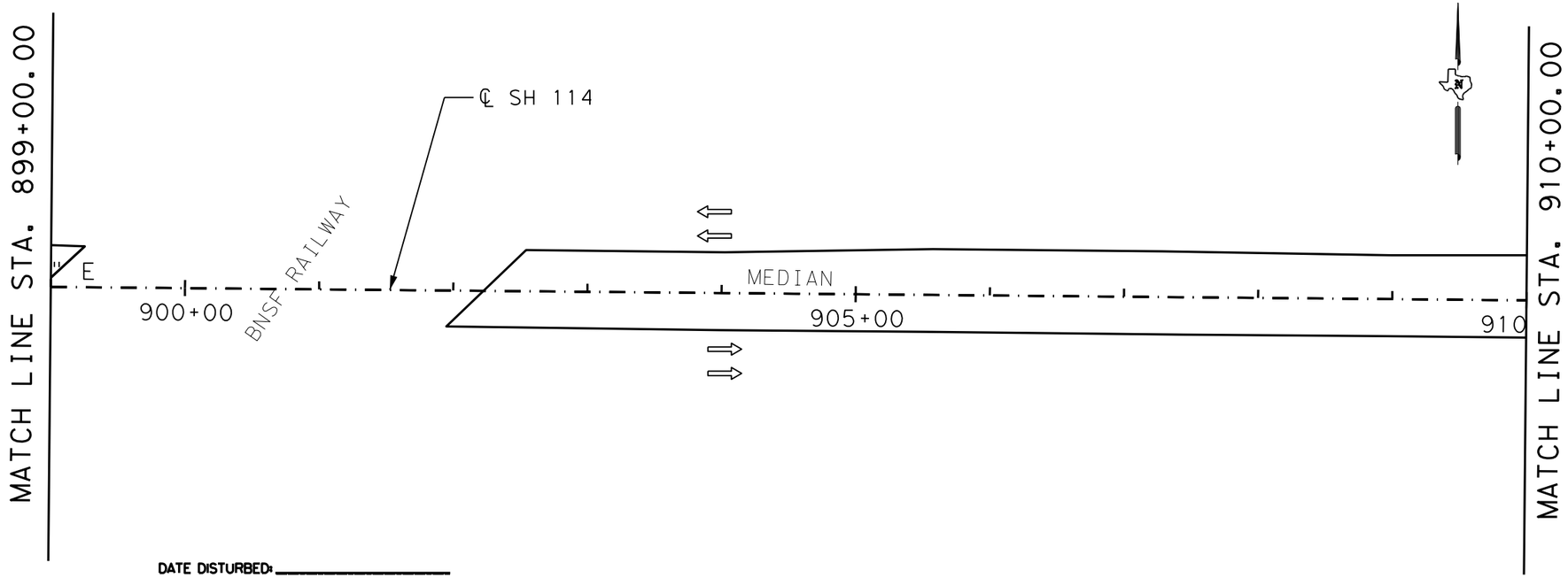
SH 114
SW3P LAYOUT

STA. 877+00.00 TO STA. 899+00.00

SCALE: 1" = 100'

SHEET 7 OF 11

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DMH	TEXAS	DAL	DENTON	64
CHECK DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	



DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY. LF	DATE INSTALLED	DATE REMOVED
BMP 8-1	48		

LEGEND

⇨ DIRECTION OF TRAFFIC

~→ DIRECTION OF FLOW

LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS

SCF SEDIMENT FENCE

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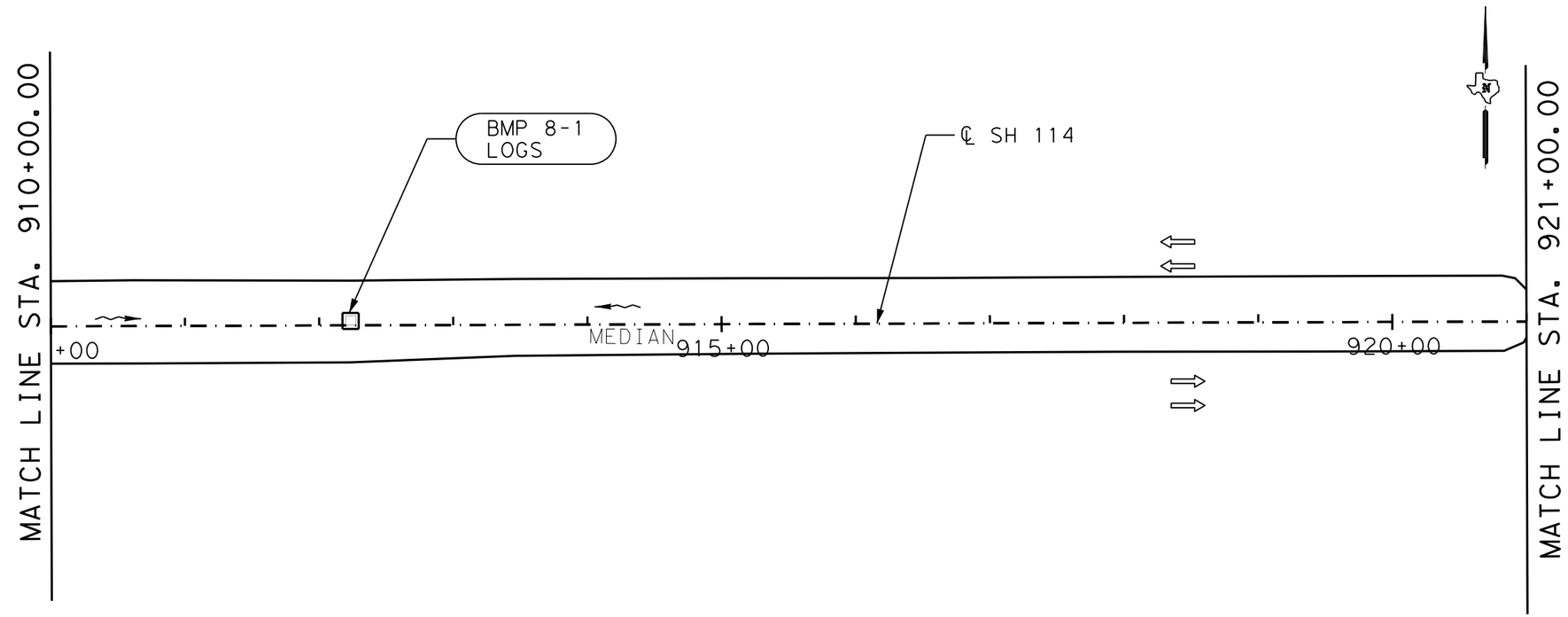

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12/15/2020

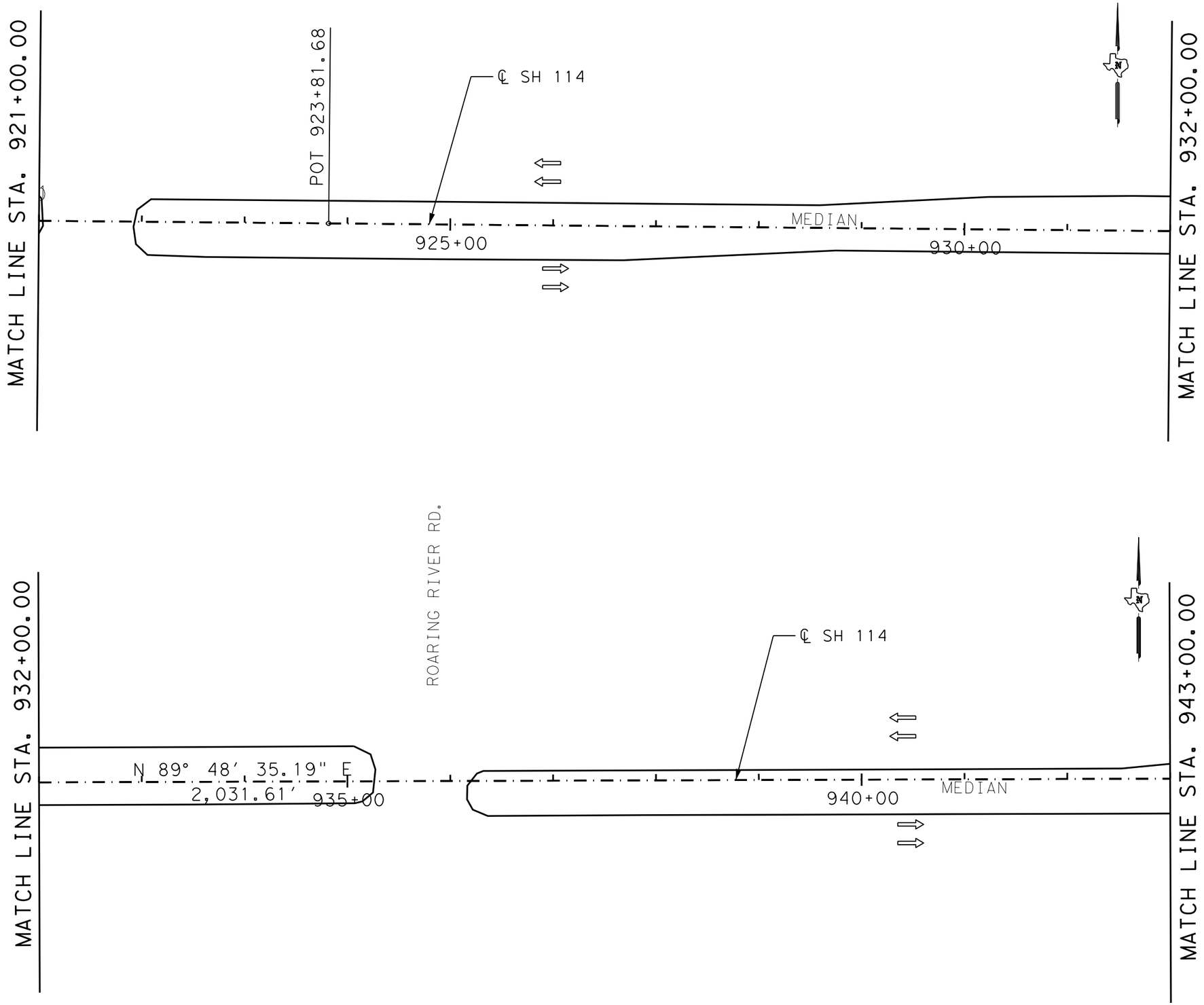
SH 114
SW3P LAYOUT

STA. 899+00.00 TO STA. 921+00.00

SCALE: 1" = 100'

SHEET 8 OF 11

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS: AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK: DMH	TEXAS	DAL	DENTON	65
CHECK: DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	



LEGEND

- ⇨ DIRECTION OF TRAFFIC
- ~→ DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
- SCF SEDIMENT FENCE

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12/15/2020

Texas Department of Transportation

SH 114
SW3P LAYOUT

STA. 921+00.00 TO STA. 943+00.00

SCALE: 1" = 100′ SHEET 9 OF 11

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS: AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK: DMH	TEXAS	DAL	DENTON	66
CHECK: DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	

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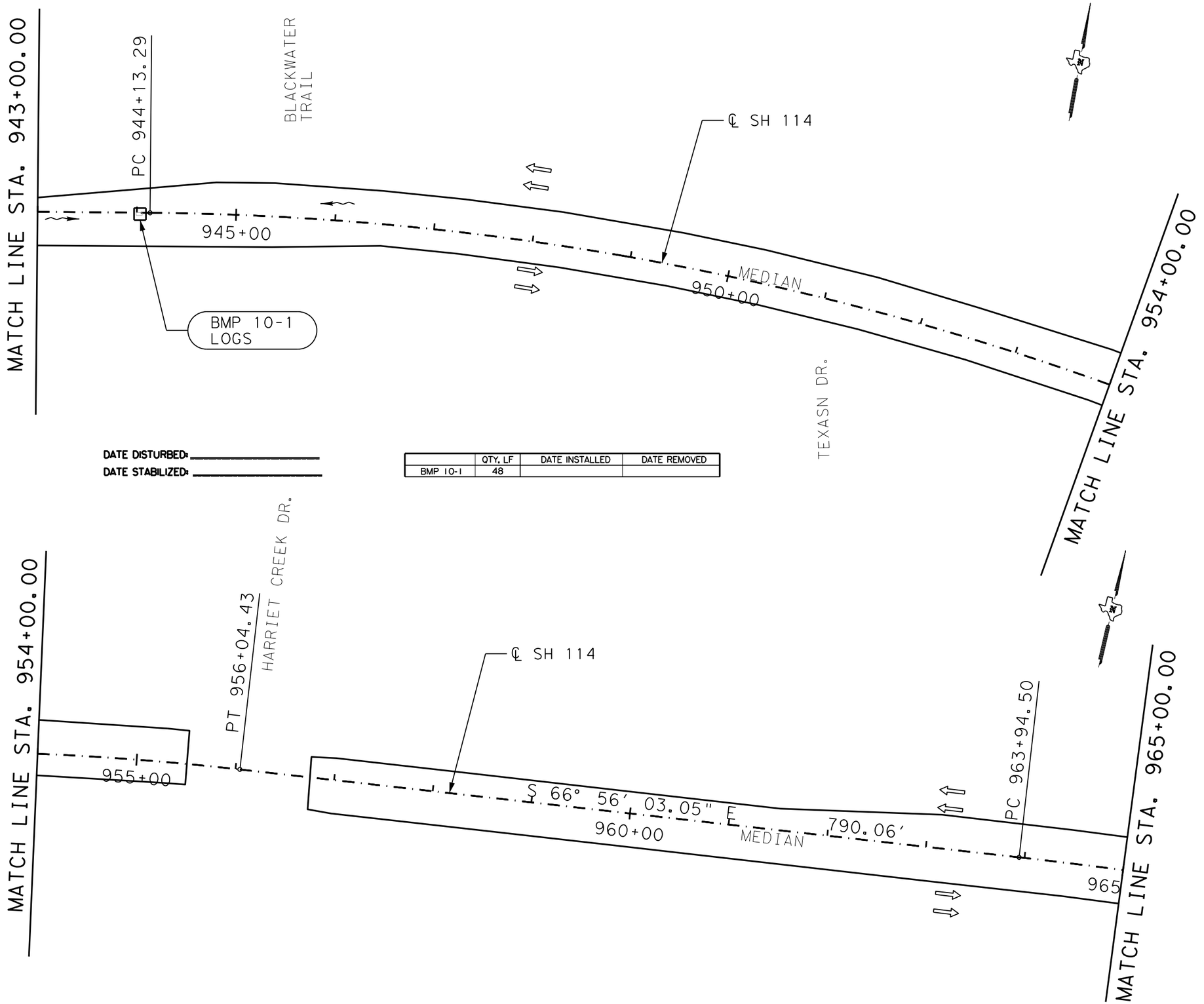

LEGEND

- ⇨ DIRECTION OF TRAFFIC
- ~→ DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
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DATE DISTURBED: _____

DATE STABILIZED: _____

	QTY. LF	DATE INSTALLED	DATE REMOVED
BMP 10-1	48		

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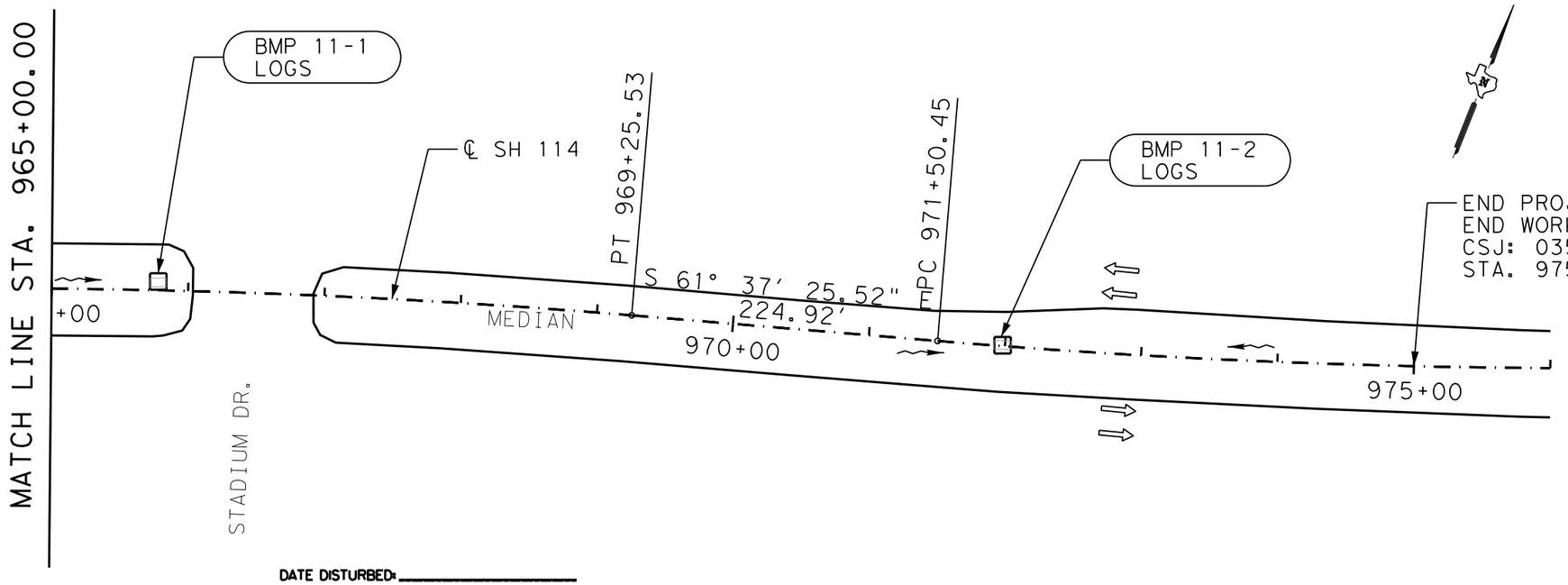
12/15/2020

SH 114
SW3P LAYOUT

STA. 943+00.00 TO STA. 965+00.00

SCALE: 1" = 100′ SHEET 10 OF 11

DESIGN	FED. RD. DIV. NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS: AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK: DMH	TEXAS	DAL	DENTON	67
CHECK: DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	



LEGEND

- ⇨ DIRECTION OF TRAFFIC
- ~~~► DIRECTION OF FLOW
- LOGS BIODEGRADABLE EROSION CONTROL LOGS AT DROP INLETS
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	QTY. LF	DATE INSTALLED	DATE REMOVED
BMP 11-1	48		
BMP 11-2	48		

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12/15/2020

Texas Department of Transportation

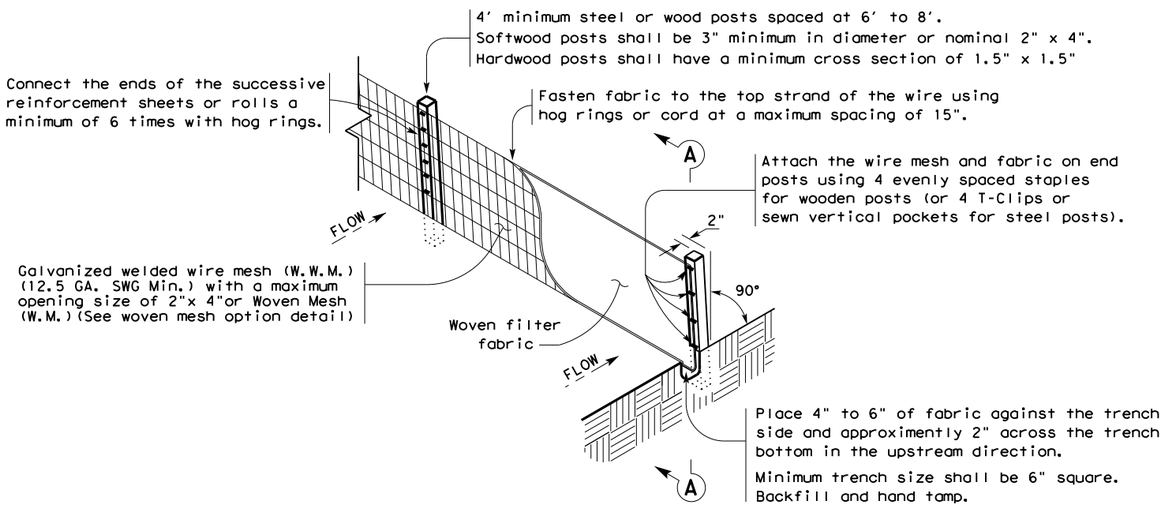
SH 114
SW3P LAYOUT

STA. 965+00.00 TO STA. 982+99.90

SCALE: 1" = 100'

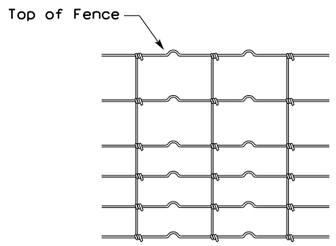
SHEET 11 OF 11

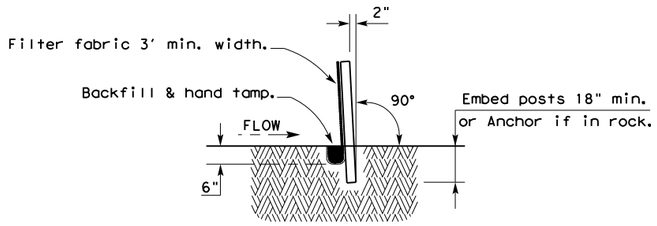
DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
AT	6	(SEE TITLE SHEET)		US380, ETC.
GRAPHICS AT	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DMH	TEXAS	DAL	DENTON	68
CHECK DMH	CONTROL	SECTION	JOB	
	0134	09	067, ETC.	



TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

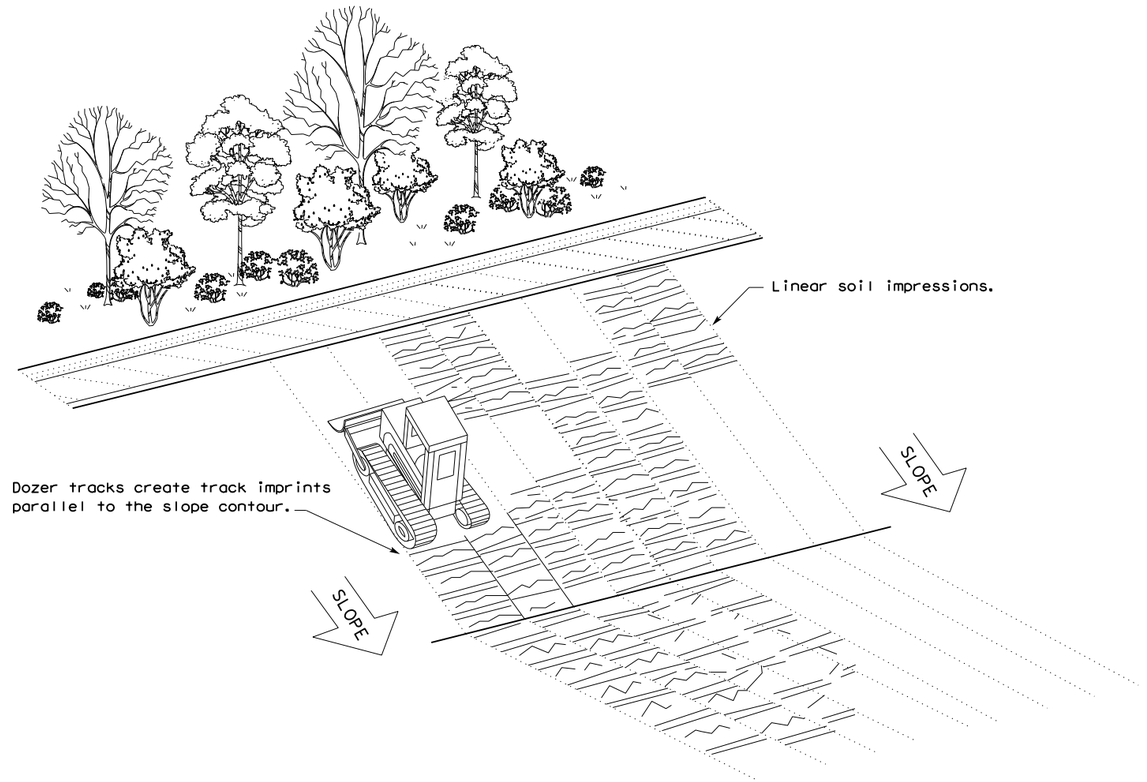
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: VP		DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0134	09	067,ETC.		US380,ETC.		
	DIST	COUNTY				SHEET NO.	
	DAL	DENTON				69	

10/16/2020
I:\DENDES\Projects\US380\0134-09-067etc_Median Barrier\PLANS\68-ec116.dgn

DATE: 12/15/2020
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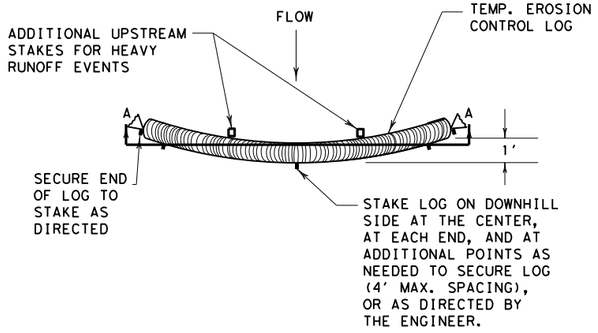
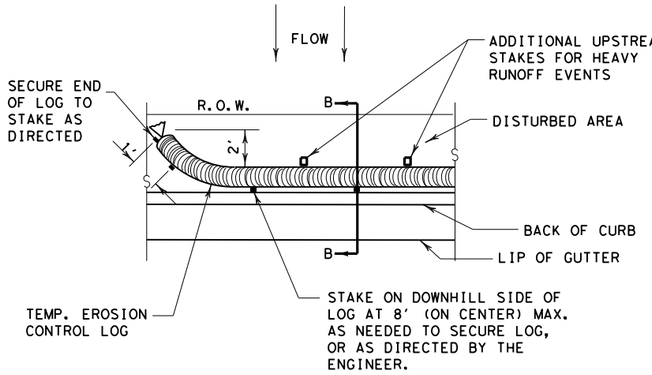
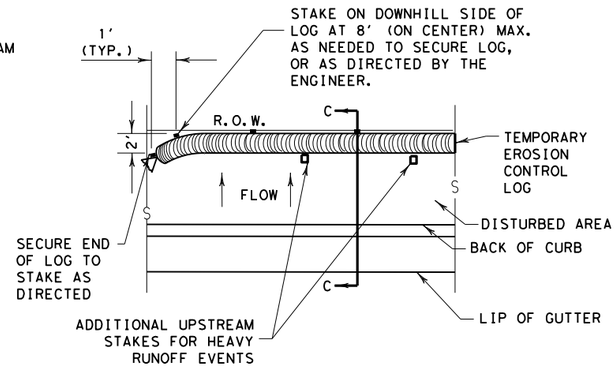


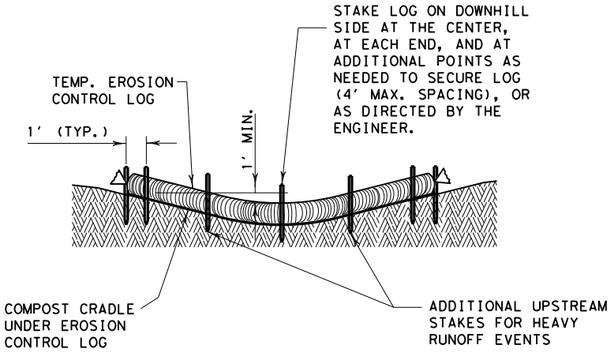
PLAN VIEW



PLAN VIEW



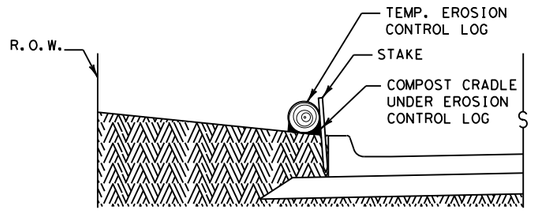
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

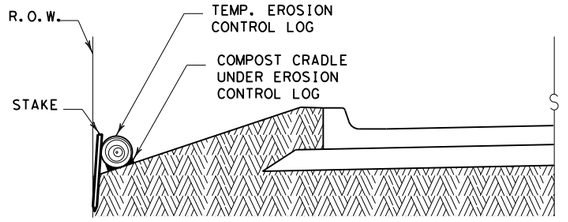
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

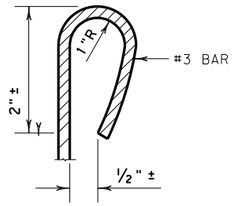
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



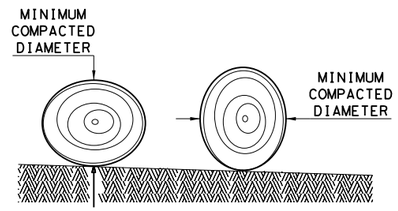
REBAR STAKE DETAIL

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

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

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.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0134	09	067, ETC.	US380, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON		70

DATE: 12/15/2020
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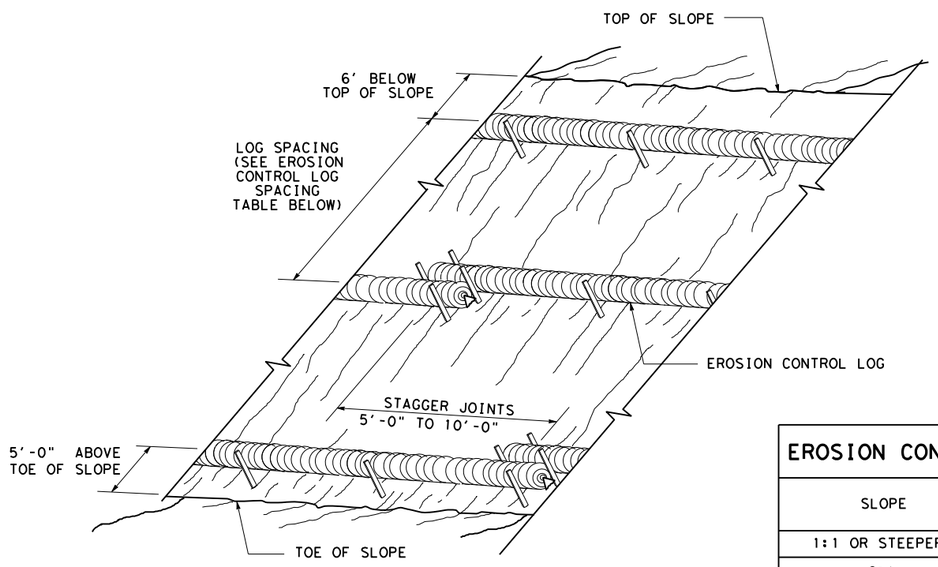
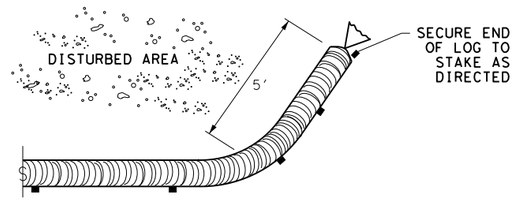


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

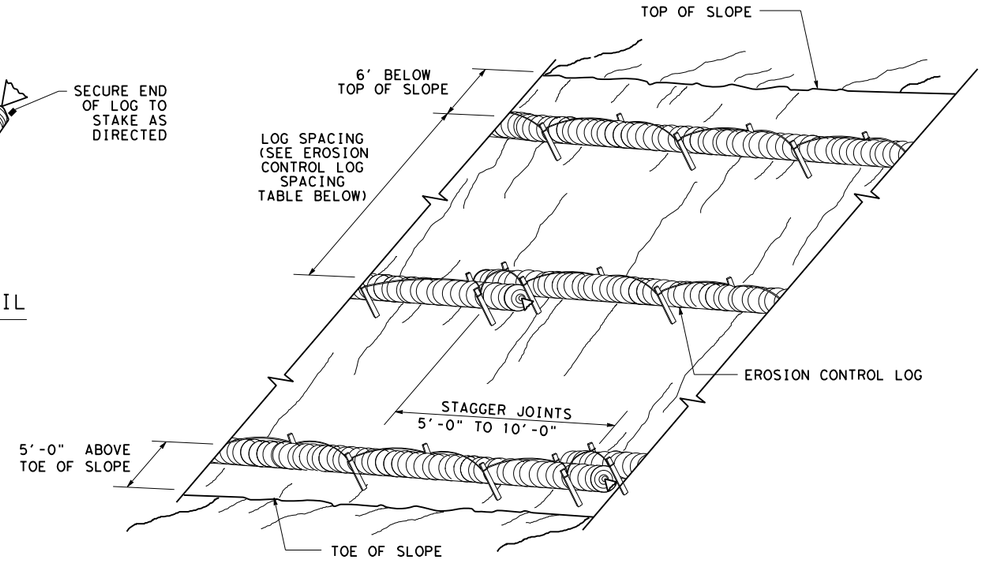
CL-SST



END SECTION RAP DETAIL

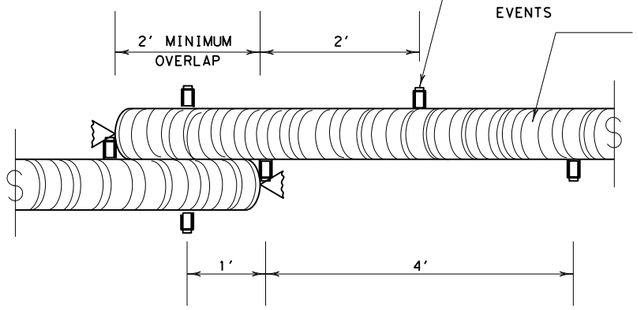
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

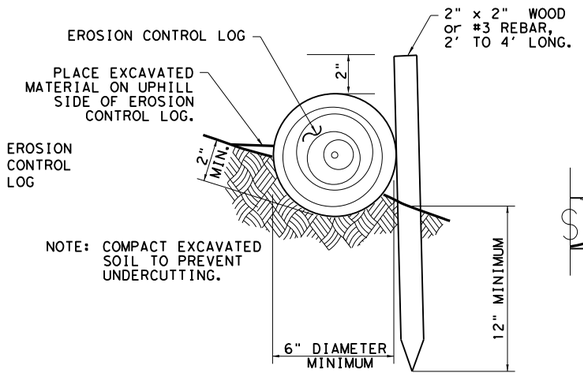
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

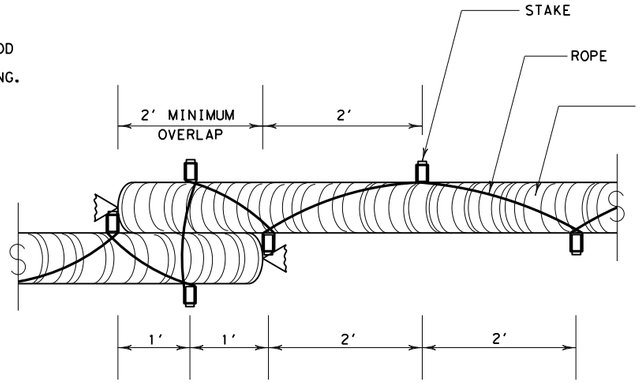


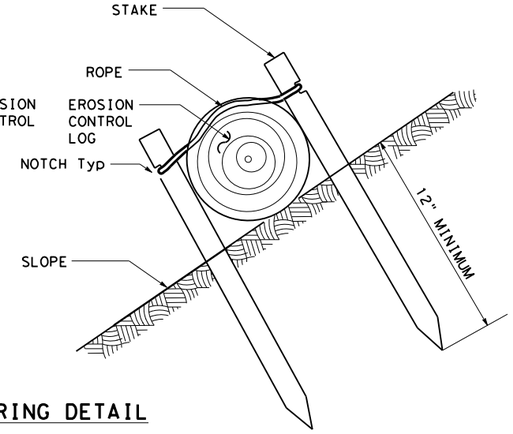


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

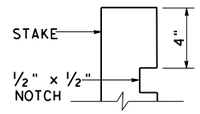
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

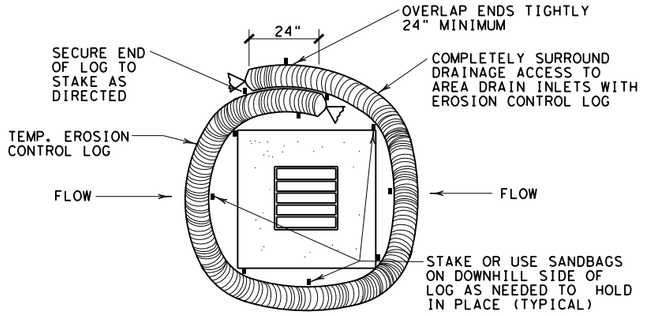
Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

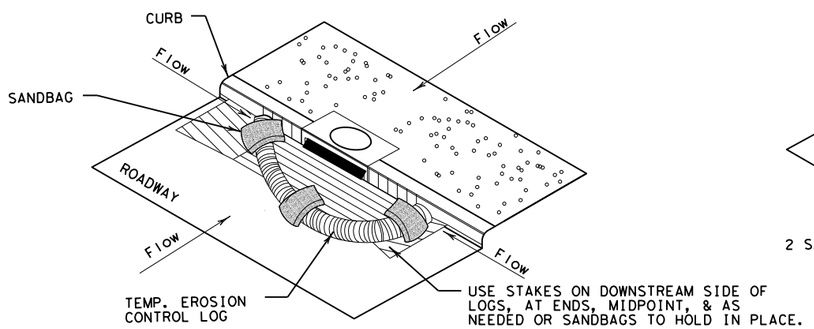
FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0134	09	067,ETC.	US380,ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON		71

DATE: 12/15/2020
FILE: T:\DENDES\Projects\US380\0134-09-067etc_Median Barrier\PLANS\69-71-ec916.dgn



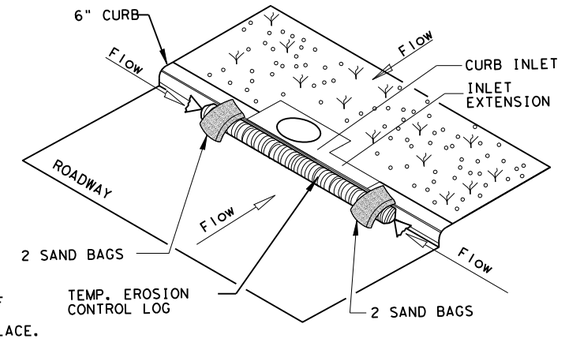
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

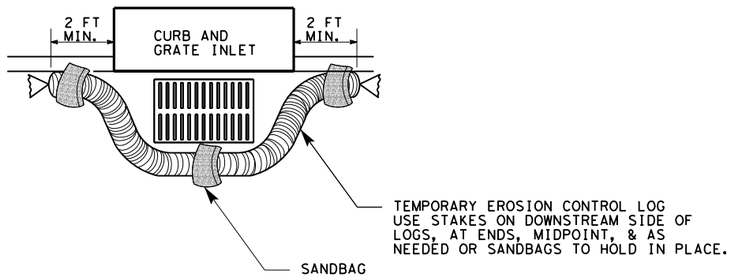
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

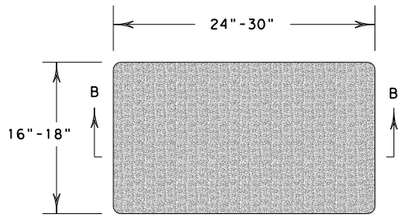
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

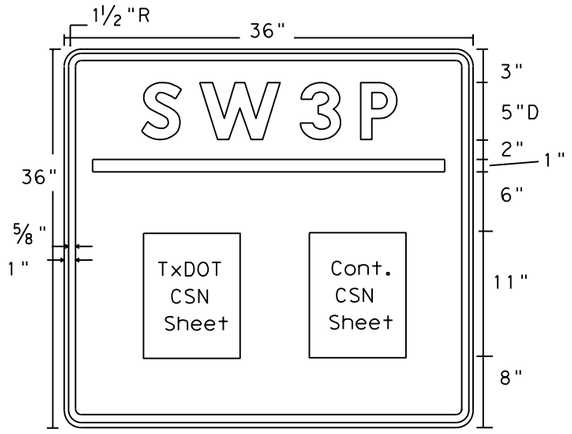
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0134	09	067,ETC.	US380,ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON		72



SW3P SIGN

TxDOT & Contractor Construction Site Note (CSN)

Sign Dimensions

36" X 36"

Letters - White
Numbers - White
Border - White
Background - Blue

GENERAL NOTES:

1. The alphabets and lateral spacing between letters and numerals shall conform with the "Texas Manual on Uniform Traffic Control Devices for Streets and Highways", (TMUTCD) latest edition, and the "Compliant Work Zone Traffic Control Devices List". Lateral spacing of text shall provide a balanced appearance. All materials shall conform to Department Specifications.
2. Legend and border may be applied by reverse screening process with transparent colored ink, cut-out white reflective sheeting applied to colored background or combination thereof. Background shall be reflective sheeting Type C.
3. CSN Sheets will be laminated and attached to the sign with an adhesive. Ensure sheets remain dry. (See Figure 1).
4. SW3P Signs should be placed just inside the ROW line at the project limits at a readable height. It may be placed perpendicular or parallel to ROW line. If the sign cannot be placed outside the clear zone, it will be mounted per TMUTCD requirements.
5. Final location of the signs will be as approved by the Engineer.

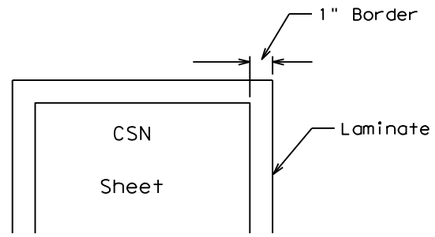
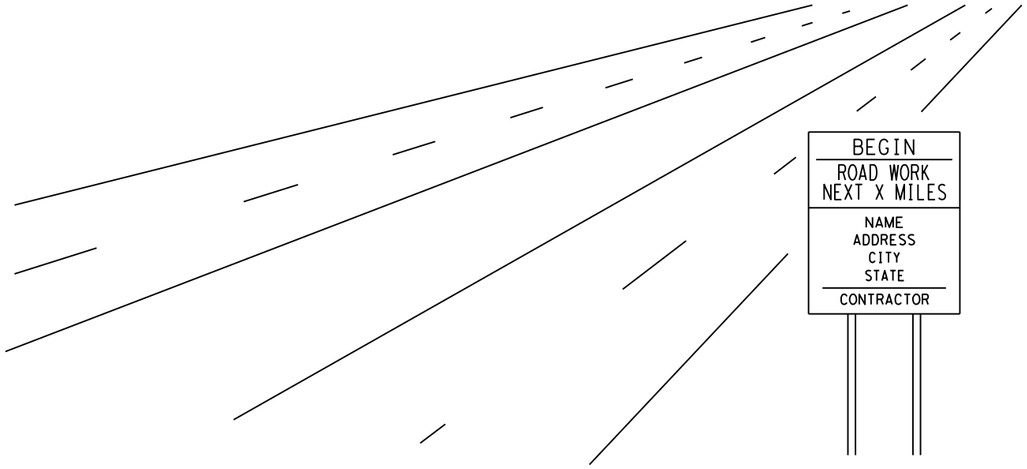
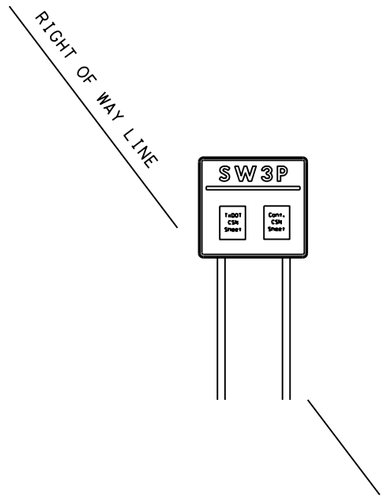


Figure 1





DEPARTMENT MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
FLAT SURFACE REFLECTIVE SHEETING	DMS-8300
VINYL NON-REFLECTIVE DECAL SHEETING	DMS-8320

COLOR	USAGE	REFLECTIVE SHEETING OR OTHER MATERIAL
BLUE	BACKGROUND	TYPE C (FLUORESCENT PRISMATIC)
WHITE	LEGEND & BORDERS	VINYL NON-REFLECTIVE DECAL SHEETING

Texas Department of Transportation
DALLAS DISTRICT STANDARD

SW3P SIGN SHEET

FILE:	DN: TxDOT	CK:	DW:	CK:
© TxDOT 2016	DISTRICT	FEDERAL AID PROJECT NO.		SHEET
REVISION DATE: 10-16-15	18	(SEET TITLE SHEET)		73
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	DENTON	0134	09		US380,ETC.

LEVELS DISPLAYED
PATH:

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:
1. When Topsoil is specified under Item 160, use suitable material salvaged from the project ROW in accordance with Item 160 specifications, and/or secure additional good material from approved sources.
2. Topsoil shall include only the top 6 inches of its native surface, and be easily cultivated, fertile, erosion-resistant and free of objectionable materials.
3. Topsoil obtained from sites outside of the ROW must come from approved sources and have a pH between 5.5 and 8.5 su.
4. 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:
1. When Compost Manufactured Topsoil (4") is specified under Item 161, use compost meeting all requirements of Item 161.2 and Table 1. Provide quality control (QC) documentation and obtain Engineer approval prior to compost delivery.
2. Contractor shall provide tickets/invoices that document material type, quantity and placement for all compost delivered.
3. Additional topsoil may be required to be imported to achieve the compost/topsoil mix ratio. Topsoil must meet Item 160 specifications.

APPLICATION OF COMPOST MANUFACTURED TOPSOIL (4")

AFTER Surface Preparation, uniformly spread a 1-inch layer of compost on-grade with 3 inches topsoil over pre-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:
1. 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.
2. Apply fertilizer BEFORE seeding, or AFTER placing sod.
3. Use fertilizer containing nitrogen (N), phosphoric acid (P) and potash (K) nutrients, unless otherwise specified. At least 50% of the Nitrogen component shall be a slow-release sulfur-coated urea as described in Item 166.3. Do not apply more than 60 lbs Nitrogen per acre without Engineer concurrence.
4. Deliver fertilizer in bags, clearly labeled to show contents, unless otherwise specified or approved prior to delivery. When non-bagged, loose fertilizer is approved, provide documentation for each load of material delivered, to validate authenticity of the material.
5. Apply fertilizer uniformly, as a dry, granular material, essentially dust-free, and do not mix with water for application as a slurry.
6. When both temporary and permanent seeding are specified for the same area, apply half of the required fertilizer before the temporary seeding operation and the other half before the permanent seeding operation.

SEEDING FOR EROSION CONTROL ITEM 164* DRILL SEEDING AC

RECOMMENDED PLANTING SEASON	PERMANENT RURAL SEED MIX ITEM 164 - DRILL SEEDING (PERM) (RURAL)(CLAY)	Pure Live Seed Rate**	PERMANENT URBAN SEED MIX ITEM 164 - DRILL SEEDING (PERM) (URBAN)(CLAY)	Pure Live Seed Rate**	TEMPORARY DRILL SEED MIX ITEM 164 - DRILL SEEDING (TEMP) (WARM OR COOL)	Pure Live Seed Rate**
WARM SEASON Mar.15th, April, May, June, July, August, Sept. 15th	Green Sprangletop (Van Horn)	- 1.0 lbs/AC	Green Sprangletop (Leptochloa dubia)	- 0.3 lbs/AC	Foxtail Millet (Setaria italica)	- 34 lbs/AC
	Sideoats Grama (Haskell)	- 1.0 lbs/AC	Sideoats Grama (El Reno)(Bouteloua curtipendula)	- 3.6 lbs/AC		
	Texas Grama (Atascosa)	- 1.0 lbs/AC	Buffalograss (Texoka)(Buchloe dactyloides)	- 1.6 lbs/AC		
	Hairy Grama (Chaparral)	- 0.4 lbs/AC	Bermudagrass (Cynodon dactylon)	- 2.4 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)	- 0.75lbs/AC				
	Illinois Bundleflower	- 1.3 lbs/AC				
	Awnless Bushsunflower (Plateau)	- 0.2 lbs/AC				
COOL SEASON Sept 16th, Oct, Nov, Dec, Jan, Feb, Mar 14th					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:
1. 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.
2. Conduct seeding upon completion of each applicable construction stage (dependent upon planting season requirements), without compensation for additional move-ins.
3. Place seed AFTER preparing planting area surface. Refer to Surface Preparation detail this sheet, as well as Topsoil Item 160 and Compost Manufactured Topsoil Item 161 when specified. Apply fertilizer per Item 166 BEFORE seeding, per specifications and this sheet, to help drill the fertilizer into the soil.
4. When temporary grasses are well-established and more than 2 inches tall, mow planting area before seeding permanent grasses; mowing for this purpose will be subsidiary. When vegetation is not already well-established, cultivate planting area to a depth as described in Item 164.3, before temporary seeding and before permanent seeding.
5. Seed material must be appropriate to the location, soil type and season. Use the seed mix species and pure live seed rates designated in Tables 1-4 of the TxDOT 2014 Standard Specifications* for Item 164, unless otherwise specified.
6. All seed shall meet labeling, delivery, analysis, and testing requirements described in Item 164.2.1. Deliver seed in labeled, unopened bags or containers to Engineer prior to planting.
7. Uniformly plant seed over the designated planting area, along the contour of slopes, and drill seed to a depth as described in Item 164.3.4.
8. Hydroseeding may be allowed, when specified or Engineer concurs.
9. Implement and continue Vegetative Watering per the schedule, rate and volume specified under Item 168.

TXDOT REFERENCE MATERIALS:
- * "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES" 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:
1. 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.
2. Place sod between the average date of the last freeze in the Spring and 6 weeks before the average date of the first freeze in the Fall, per the Texas Almanac for the project area.
3. Place sod only AFTER soil surface preparation is complete as detailed in this sheet. Dry soil may require pre-watering.
4. Place all sod (blocks or rolls) within 24 hours of delivery to the site, and keep moist from the time it is dug up until it is planted. Sod with dried roots will not be accepted.
5. Place sod with joints alternating on each row to prevent all joints from lining up, and place blocks firmly against adjacent blocks. Roll, tamp and trim sod per Item 162.3.
6. Place fertilizer promptly AFTER sodding operation is complete in each area.
7. Water sod immediately following placement, and continue Vegetative Watering per Item 168.

VEGETATIVE WATERING FOR ESTABLISHING SEED AND SOD ITEM 168* VEGETATIVE WATERING MG

WATERING SCHEDULE

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:
1. 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.
2. Use clean water free of industrial waste and other substances harmful to vegetation growth, per Item 168.2.
3. 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.
4. For sod, water immediately.
5. All water distribution equipment shall be furnished and operated to provide water at a uniform and controllable rate. Use a metering device on all watering equipment.
6. Evenly distribute water over entire area designated for seeding and/or sodding, using even spray patterns that do not disturb seed bed and/or dislodge seed from seed bed.
7. Do not water between the hours of 12:00 p.m. and 6:00 p.m. when daytime temperatures exceed 95 degrees F.
8. After initial establishment period, continue intermittent watering of newly established seed or sod at a rate of approximately 1-inch water/week, during summer months until end of contract.
9. If 1/4-inch or more of rainfall occurs on site on any given working day, no vegetative watering will be needed on that working day. (Note: 1/4-inch rain equals 7,000 gallons of water per acre.)
10. Should the Contractor fail to apply the specified amount of water within the time allowed, any seed or sod in poor condition shall be replaced, fertilized, and watered at Contractor's expense.

**Note: The amount of Pure Live Seed (PLS) in one pound of bulk seed is based on three factors: % Purity, % Germination, and % Dormant. Use the following formula to calculate PLS in bulk seed: PLS = % Purity X (% Germination + % Dormant) Ensure that the specified amount of pure live seed is placed.

ROADSIDE MOWING ITEM 730* PROJECT MAINTENANCE AC

MOWING NOTES:
1. During project construction, once seed is established, use mowing to promote permanent grasses by mowing any remaining temporary grasses.
2. Also mow established turf and ROW grasses in designated areas of project limits as specified or directed by Engineer.
3. Remove litter and debris prior to mowing.
4. Do not mow on wet ground when soil rutting can occur.
5. Hand-trim around obstructions and stormwater control devices as needed.
6. Maintain paved surfaces free of tracked soils and clipped vegetation.

SEQUENCE OF WORK:
- 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.
CPB	6	(See Title Sheet)		US380,ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	DALLAS	DENTON	74
CHECK	CONTROL	SECTION	JOB	
	0134	09	067,ETC.	

DATE