FED.RD. DIV.NO	STATE PROJECT NO.			SHEET NO.
6	C 0168-7-50, ETC			1
STATE	STATE DIST.	COUNTY		
TEXAS	AMA	DEAF SMITH		
CONT.	SECT.	JOB	HIGHWAY NO.	
0168	07	050, ETC	US60	

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

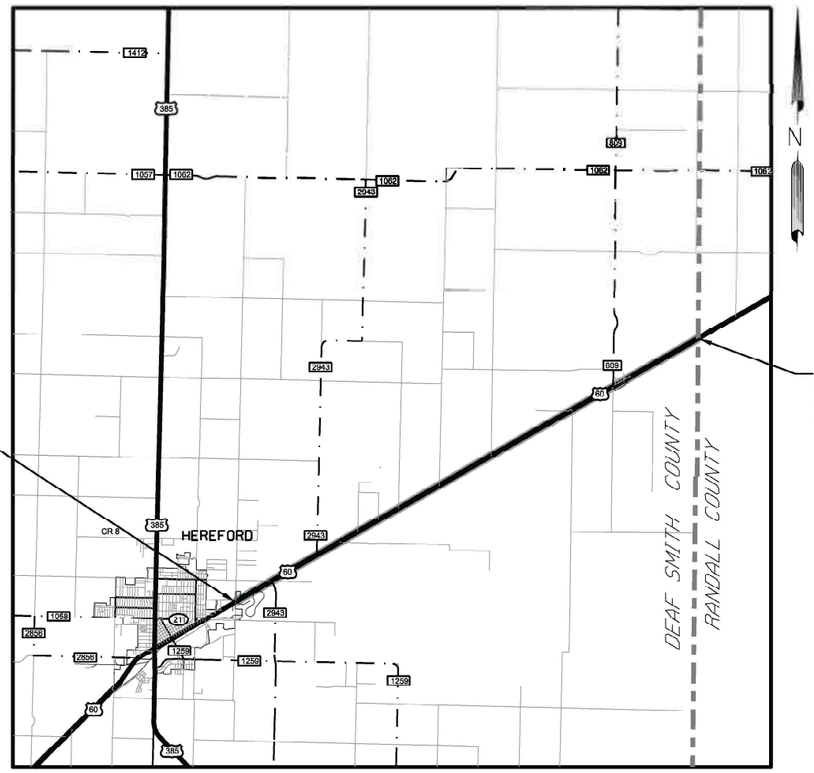
PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT
STATE PROJECT: C 0168-7-50, ETC
HIGHWAY - US60
DEAF SMITH COUNTY

CONTROL: 0168 - 07 - 050, ETC

FOR THE CONSTRUCTION OF REHABILITATION OF EXISTING ROAD.
CONSISTING OF FULL-DEPTH RECLAMATION & ACP OVERLAY ON EB LANES
REINFORCED FABRIC AND ACP OVERLAY ON WB LANES

PROJECT LIMITS FROM: EAST OF HEREFORD
TO: RANDALL COUNTY LINE

ROADWAY LENGTH = 69,185 FT. = 13.103 MILES
BRIDGE LENGTH = 0 FT. = 0.000 MILES
TOTAL LENGTH = 69,185 FT. = 13.103 MILES



STA. 691+85
END CSJ: 0168-07-050
END CSJ: 0168-07-051
RM: 278+0.983

STA. 00+00.00
BEGIN CSJ: 0168-07-050
BEGIN CSJ: 0168-07-051
RM: 292+0.087

EXCEPTIONS:
NONE

RAILROADS:

DOT# 014730P (BNSF)	RR MP: 592.700	PRIVATE ROAD
DOT# 014728N (BNSF)	RR MP: 1.2 MILES EAST OF 014728N	PRIVATE ROAD
DOT# 014722X (BNSF)	RR MP: 584.940	PRIVATE ROAD

EQUATIONS:
NONE

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

DESIGN SPEED = 50
2022 ADT = 10,695
2042 ADT = 15,187
PRINCIPAL ARTERIAL

FINAL PLANS

LETTING DATE: _____

DATE CONTRACTOR BEGAN WORK: _____

DATE WORK WAS COMPLETED & ACCEPTED: _____

FINAL CONTRACT COST: $ _____

CONTRACTOR : _____

AREA ENGINEER: _____

Texas Department of Transportation

RECOMMENDED FOR LETTING: DATE: 10/31/2022

DocuSigned by: Doe Crappell 2A500C249D094BA...

AREA ENGINEER

DATE: 11/2/2022

DocuSigned by: Clint Hamm 165D6A82BD4D488...

FOR, DISTRICT DIRECTOR OF TRANSPORTATION PLANNING AND DEVELOPMENT

APPROVED FOR LETTING: DATE: 11/2/2022

DocuSigned by: Blair Johnson 8B80E3AEB2BC43A...

DISTRICT ENGINEER

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
	GENERAL
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4-4E	GENERAL NOTES
5-5A	ESTIMATE & QUANTITY
6-7	PROJECT SUMMARY
	TRAFFIC CONTROL PLAN
8	TRAFFIC CONTROL NARRATIVE
	TRAFFIC CONTROL PLAN STANDARDS
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21-25	TCP (1-1)-18 THRU TCP (1-5)-18
26-31	TCP (2-1)-18 THRU (2-6)-18
32-33	TCP (3-1)-13 THRU (3-2)-13
34	TCP (3-3)-14
35	TCP (3-4)-13
36	WZ (RS)-22
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39	WZ (UL)-13
	ROADWAY DETAILS
40	DRIVEWAY REMOVAL LAYOUT
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52-56	INTERSECTION AND DRIVEWAY DETAILS
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57	TE (HMAC)-11
	DRAINAGE DETAILS
58-67	CULVERT LAYOUT
68	CONCRETE COLLAR DETAIL
	DRAINAGE DETAILS STANDARDS
69	SETP-PD
70	PSET-RP
71	PSET-SP
72	PSET-RR
	PAVEMENT MARKINGS & DELINEATION STANDARDS
73-75	PM (1)-20 THRU PM (3)-20
76	RS (1)-13
	RAIL ROAD COORDINATION
77-78	RAIL ROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS
79-80	RAIL ROAD SCOPE OF WORK
81-83	RAIL ROAD EXHIBIT 1 THRU 3
	ENVIRONMENTAL ISSUES
84	STORMWATER POLLUTION PREVENTION PLAN (SW3P)
85	ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS
86-87	EROSION CONTROL LAYOUT
88	VEGETATION SPECIFICATION SHEET
	ENVIRONMENTAL ISSUES STANDARDS
89-91	EC (9)-16

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

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED PROFESSIONAL ENGINEER

Casey B. Stripling

11-02-2022

US 60

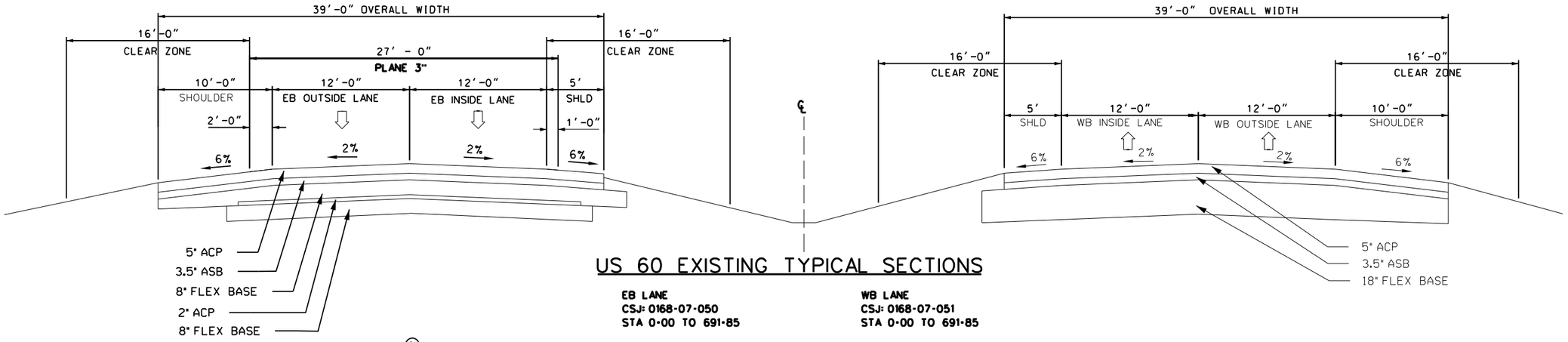
INDEX OF SHEETS

Texas Department of Transportation

SHEET 1 OF 1

DSN	CK	CONT	SECT	JOB	HIGHWAY
AM	AM	0168	07	050, ETC	US60
DRWN	CK	DIST	COUNTY		SHEET NO.
AM	CH	AMA	DEAF SMITH		2

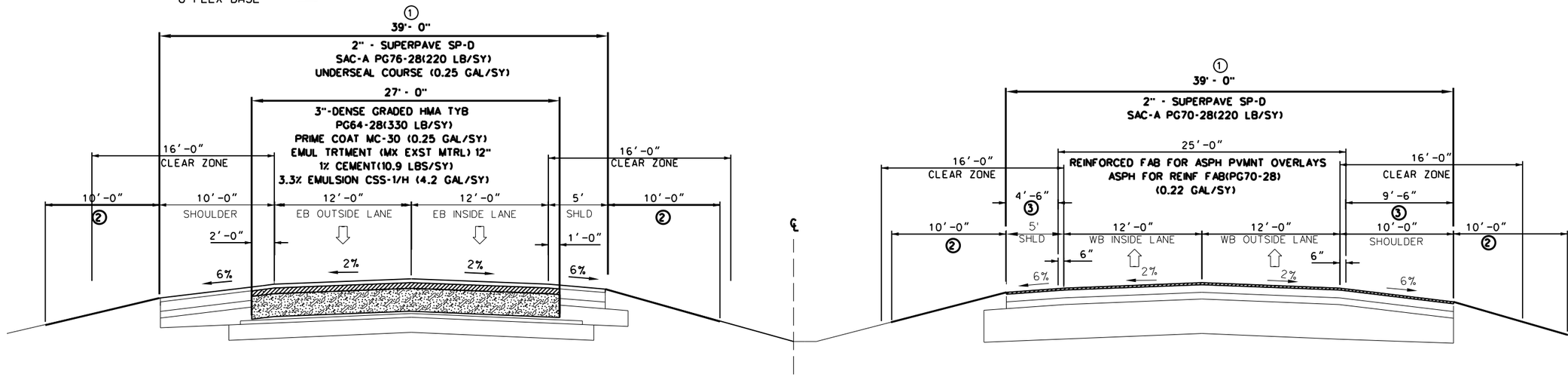
DATE: 11/2/2022 11:41:27 AM
FILE: T:\AMA\PD\construction Projects\0168-07\050 US 60 HEREFORD TO CANYON\4 - Design\Plan Set\1, General\050_INDEX.dgn



US 60 EXISTING TYPICAL SECTIONS

EB LANE
CSJ: 0168-07-050
STA 0+00 TO 691+85

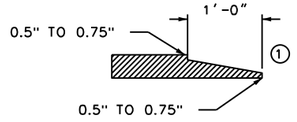
WB LANE
CSJ: 0168-07-051
STA 0+00 TO 691+85



US 60 PROPOSED TYPICAL SECTIONS

EB LANE
CSJ: 0168-07-050
STA 0+00 TO 691+85

WB LANE
CSJ: 0168-07-051
STA 0+00 TO 691+85



NOTE:

① NOTCHED WEDGE LONGITUDINAL JOINT WILL BE REQUIRED AT ALL LONGITUDINAL HOTMIX JOINTS. VARIANCE TO THE DIMENSIONS SHOWN WILL BE ALLOWED ONLY AS APPROVED BY THE ENGINEER.

② PREP RIGHT OF WAY, AND PAVEMENT EDGE BACKFILL SEE ENVIRONMENTAL SHEETS FOR MORE INFORMATION ON SEEDING & EMULSION.

③ APPLY TACK COAT BEFORE FINAL OVERLAY APPLICATION AT A RATE OF (0.13 GAL/SY)

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED PROFESSIONAL ENGINEER

Casey B. Stripling

11-02-2022

US 60

TYPICAL SECTIONS

SCALE: H: 1" = 10'
V: 1" = 5'

2022 Texas Department of Transportation

SHEET 1 OF 1

DSN	CK	CONT	SECT	JOB	HIGHWAY
AM	AM	0168	07	050. ETC	US60
DRWN	CK	DIST	COUNTY		SHEET NO.
AM	CH	AMA	DEAF SMITH		3

DATE: 10/31/2022 3:44:00 PM
FILE: T:*AMATPD*Construction Projects*0168-07*050 US 60 HERFORD TO CANYON*4 - Design*Plan Set*1. General*050_TYPICAL SECTIONS.dgn

GENERAL NOTES

CSJ: 0168-07-050, ETC

BASIS OF ESTIMATE FOR CONSTRUCTION

Item	Description	Unit	Rate	
164	SEEDING		SEE PLAN SHEETS	
166	FERTILIZER		SEE PLAN SHEETS	
310	PRIME COAT (MC-30)	GAL	0.25 GAL/SY	
314	EMULSION ASPHALT (MULTI) (MS-2 OR SS-1)	GAL	SEE NOTE 2	
3032	ASPH FOR REINF FAB	GAL	0.22 GAL/SY	
3076(1)	D-GR HMA	TON	3”	330 LB/SY/2000
3077(3)	TACK COAT (TRAIL)	GAL	0.13 GAL / SY	
3077(1)	SUPERPAVE MIXTURES	TON	2”	220 LB/SY/2000
3085	UNDERSEAL COARSE	GAL	SEE GENERAL NOTE FOR RATE INFORMATION	
3089	CEMENT TREAT (12")	SY	1% Cement at 10.9 LBS/SY	
3089	EMULSION	GAL	4.2 GAL/SY	

NOTE:

(1)	D-GR HMA TY-B & SP-D SAC-A PG70-28 Weight Based On 110Lbs/SY/In
(2)	40% Emulsified Asphalt 60% Water Mixture Applied At 0.25 Gal/Sy. Paid using 0.1 Gal/Sy.
(3)	The TRAIL hot asphalt type options will only be allowed.

General

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

TO:	Amarillo Area Engineer	Joe.Chappell@txdot.gov
CC:	Assistant Area Engineer	CC.Sysombath@txdot.gov
	Director of Construction	Kenneth.Petr@txdot.gov
	Construction Manager	Thomas.Nagel@txdot.gov

Contractor questions will be accepted through email, phone, or 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 responses will be posted through this site. The site is organized by District, Project Type (Construction or Maintenance), Letting Date, CCSJ/Project Name.

Verify all survey control prior to beginning construction. Notify Engineer of any discrepancies in control prior to beginning construction.
There are approximately 12 "reference markers" within the project limits. If a marker needs to be moved for any reason during construction operations, the Contractor is to remove it, install it in a temporary location and then reinstall it in its correct permanent location. Both the temporary and permanent locations are to be on a line that is perpendicular to the original "station" along the roadway. The temporary location is to be at or near the right-of-way. The permanent location is to be directed by the Engineer.

See Railroad Scope of Work sheet for insurance and/or other requirements.

The Contractor is advised that a construction speed zone will be applicable for this project and is to be limited to the actual work areas under construction. The approved construction speed limit will be made available upon request to the Engineer.

If portions of the right-of-way is used to store materials, equipment, and other uses with the approval of the Engineer, materials, equipment, etc., must either be located outside the *30* feet traffic safety clearance zone or be adequately protected.

Contractor facilities, such as asphalt plants, concrete plants, rock crushers, etc. are not allowed to be located within Department right of way.

The slopes indicated on the typical sections may be varied when fixed features required slopes are re-established as directed by the Engineer.

Any work necessary to provide temporary ingress and egress during construction (such as building gravel ramps, etc.) Will not be paid for directly, but will be considered as subsidiary work to the various bid items.

Verify all existing grades, elevations, and cross slopes that will connect to any proposed grades and elevations. If adjustments are warranted, the Contractor is to submit proposed changes to the Engineer for verification.

Item 7 Legal Relations and Responsibilities

No significant traffic generator events identified.

The total area disturbed for this project is approximately 45.3 acres. The disturbed area in this project, all project locations in the Contract, and the Contractor Project Specific Locations (PSLs), within 1 mile of the project limits, for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the ROW. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the ROW to the Engineer and to the local government that operates a separate storm sewer system.

Item 8 Prosecution and Progress

Create, maintain, and submit for approval, a Critical Path Method (CPM) project schedule and a Project Schedule Summary Report (PSSR) using computer software that is fully compatible with the latest version of Primavera Systems, Inc. or Primavera P6.

Item 100 Preparing Right Of Way

Preparing right of way will consist exclusively of mowing the vegetation to the width shown in the plans for Backfilling Pavement Edges. Set mower cutting height to cut as low as practical but no higher than 6 inches. Payment for Preparing Right Of Way will be made only in the case where mowing is actually used.

Item 132 Embankment

The plasticity index for *TY B* will not exceed 25.

Item 134 Backfilling Pavement Edges

Mow according to Item 100 just prior to backfill pavement edge operations.

Do not overlay any roadway unless the pavement edges can be backfilled within 24 hours. Preferably, both edges of all roadways should be completely backfilled at the end of each day's overlay operations. Damage to delineators, signs, or other roadside features will be repaired or replaced at the expense of the Contractor.

Item 164 Seeding for Erosion Control

Perform planting operations in accordance with the recommendations contained in the latest version of the TxDOT manual "A Guide to Roadside Vegetation Establishment" developed by the Vegetation Management Section of the Maintenance Division.

Seeding may require more than one mobilization, depending upon the Contractor's sequence of work.

Item 166 Fertilizer

Fertilize all areas of project to be seeded or sodded in accordance with the Amarillo District Vegetation Specification Sheet.

Item 314 Emulsified Asphalt Treatment

A *10* foot wide strip of finished material adjacent to each shoulder is to be treated with an emulsified asphalt mixture. The mixture may be placed in one or more applications at a total rate of 0.25 gallons per square yard, unless directed otherwise by the Engineer. The homogeneous mixture may be composed of approximately 40% asphalt (MS-2 or SS-1) and 60% water, unless directed otherwise by the Engineer.

Item 320 Equipment for Asphalt Concrete Pavement

A self-propelled, wheel mounted material transfer vehicle (MTV) capable of receiving hot mix from the haul trucks separate from the paver is required on all courses and all types of hot mix for this project. The MTV is to have a minimum storage capacity of approximately 25 tons, and equipped with a pivoting discharge conveyor and a means of completely remixing the hot mix prior to placement. The paver hopper is to be equipped with a separate surge storage insert with a minimum capacity of approximately 20 tons.

If used, the IR bar read out screen must be visible at all times to the Engineer.

When performing any scheduled work during night time hours (sunset to sunrise) all work areas will be fully illuminated using devices designed to not incumber or distract oncoming traffic. All illumination equipment must be approved by the Engineer in writing 48 hours before any scheduled night time work can begin. All associated equipment and labor is considered subsidiary to the item of work and will not be paid for directly.

Item 354 Planing and Texturing Pavement

The material planed from existing roadway is estimated at *21,300* CY for this project.

13,000 CY of this material will be available for the Contractor for use as RAP.

The material planed and not utilized as RAP, is to remain the property of the state.

The maximum size of the planed material is to be 2 in. The Contractor is to salvage and stockpile the material within the right-of-way at the following location:

- US 385 Deaf Smith Co. approximately 1 mile south of Oldham County Line

The stockpile(s) will be shaped as directed by the Engineer so that adequate measurement can be done. The excess material is not to be compacted by the equipment used in the stockpiling operation.

Item 421 Hydraulic Cement Concrete

The sand equivalent value of fine aggregate is not to be less than 85 when subjected to test method tex-203-F.

Item 460 Corrugated Metal Pipe

Bedding for pipe culverts is to be 6 inches of sand. The excavation required to place the sand will not be paid for directly but will be considered subsidiary to this item.

Item 464 Reinforced Concrete Pipe

Joint material for all pipes will be cold applied plastic asphalt sewer joint compound.

Backfill pipe up to the springline with granular material. The ponding method of backfilling will be allowed for the granular material only.

Item 467 Safety End Treatment

Pre-cast Safety End Treatments are allowed; however, a cast-in-place concrete apron will be required as shown on the plans & will be subsidiary to the Safety End Treatment.

Item 502 Barricades, Signs, and Traffic Handling

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.

Temporary rumble strips will be required as shown on WZ(RS)-22 regardless of loose gravel, and/or soft or bleeding asphalt. Adjust the traffic control setup such that rumble strips are not placed in areas of heavily rutted pavements, unpaved surfaces, or horizontal curves. Temporary rumble strips will not be allowed on interstate highway.

The Contractor is to have the option of using either plastic drums, vertical panels, grabber cones or a combination where drums are shown as channelizing devices, as approved by the Engineer. Plastic drums are to be used in all transition areas in accordance with BC(8)-21 and WZ(TD)-17.

Furnish and install "soft shoulder" signs as directed by the Engineer. This work will not be paid for directly, but will be considered as subsidiary to item 502, "Barricades, Signs and Traffic Handling".

Provide a 3:1 backfill "safety slope" at the end of the day for any drop off exceeding 2" that is adjacent to a travel lane.

Lane closures are to be limited to a maximum of: 5 miles.

If more than one lane closure location is desired a minimum of 2 miles passing zone is required between each location.

Notify the Engineer 24 hours prior to any lane closure.

Contractor is to use the Texas Manual on Uniform Traffic Control Devices to ensure that no traffic will be stopped within the Rail Road Right of Way. Contractor is to insure all TCP and construction remain out of the Rail Road Right of Way.

Item 504 Field Office and Laboratory

The following buildings will be required for this project:

One Type (D) structure, asphalt mix control laboratory

Each building is to be provided before work is begun on the pertinent construction items for which it is needed.

Any laboratory furnished is to be a minimum of 10 ft in width.

Chain link security fence will be required to be placed around the perimeter of all field offices. The dimensions of the fence will be as directed by the Engineer.

The Type D structures are to be equipped with the following in addition to requirements specified under item 504:

a. Safety equipment
   (1) One eye wash station
   (2) One fire extinguisher
   (3) One first aid kit

Furnish a Type D structure for the asphalt mix control laboratory for the Engineer's exclusive use. In addition to requirements of item 504, this structure is to have a minimum height of 8 feet and provide a minimum 400 square feet gross floor area for permanently located plants or 200 square feet for temporary located plants serving one project. The floor area will be partitioned into a minimum of two interconnected rooms, each room furnished with an exterior door and a minimum of two windows. The floor is to have sufficient strength to support the testing equipment and have an impervious covering.

The Type D structures are to be adequately air conditioned and be furnished with a minimum of one desk, three chairs, one file cabinet, a telephone and one built-in equipment storage cabinet for the storage of nuclear equipment. The cabinet is to be a minimum of 3 feet wide by 2 feet deep by 3 feet high and have provisions for locking security. The structure is to be provided with a 240-volt electrical service entrance. The service is to consist of a minimum of 4 - 120 volt circuits with 20 amp breakers and no more than two grounded convenience outlets per circuit and provisions for a minimum of two 220-volt ovens with vents to the outside. The structure is to have a minimum of 2 convenience outlets per wall, and a utility sink with an adequate clean potable water supply for testing. The state building is to be equipped with at minimum a hot water dispenser or hot water heater capable of generating 1 gallon of water per use at 140^0 F with adequate water pressure. Space heaters for heating the structure are unacceptable. Portable structures are to be support blocked for stability and are to be tied down.

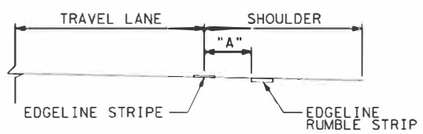
If needed, each building is to be moved to a new location as directed by the Engineer. Any building that is no longer required on the job after completion of the pertinent construction items may be released to the Contractor upon consent of the Engineer.

Item 506 Temporary Erosion, Sedimentation, and Environmental Controls

Erosion control devices are to be installed as needed in coordination with the work progress, or as directed by the Engineer.

Item 533 Milled Rumble Stripes

Use the applicable option in the table below for installation of the continuous milled depressions, as shown on the Depressed Shoulder Texturing Standard Sheet RS(1)-13.



EDGELINE RUMBLE STRIP DETAIL

NTS

(MIRROR FOR INSIDE SHOULDER)

SHOULDER WIDTH (SW)	RUMBLE STRIP WIDTH (RS)	PLACEMENT "A"	OPTION (SEE RS(1)-13 or RS(4)-13)
SW ≤ 2'	8" RS	SEE RS(1)-13*	Option 1
2' < SW ≤ 8'	8" RS	4" OFF EDGELINE*	Option 3
SW ≥ 8'	16" RS	24" OFF EDGELINE*	Option 4

Item 585 Ride Quality for Pavement Surfaces

Use Surface Test Type B pay adjustment schedule *1* to evaluate ride quality of the EB travel lanes in accordance with Item 585, "Ride Quality for Pavement Surfaces."

Use Surface Test Type B pay adjustment schedule *2* to evaluate ride quality of the WB travel lanes in accordance with Item 585, "Ride Quality for Pavement Surfaces."

Item 666 Reflectorized Pavement Markings

Retroreflectivity Requirements:

All Type I markings must meet the minimum retroreflectivity values for edgeline markings, centerline or no passing barrier-line, and lane lines when measured any time after 3 days, but not later than 10 days after application:

- White markings: 250 millicandelas per square meter per lux (mcd/m^2/lx)
- Yellow markings: 175 mcd/m^2/lx

Retroreflectivity Measurements: Mobile or portable retroreflectometers may be used at the Contractor's discretion.

All Type I markings must meet the minimum retroreflectivity values for edgeline markings, centerline or no passing barrier-line, and lane lines when measured any time after 3 days, but not later than 10 days after application.

Item 3076 Dense Graded Hot Mix Asphalt

Use aggregate that meets the SAC requirement of class A.

Use of RAS is not allowed.

Only fractionated RAP is allowed.

Provide a laboratory mixture design with the minimum target asphalt binder content shown below:

D-GR HMA TY B 4.6%

When laying ACP on a roadway that has two or more lanes and the work is being done under traffic, then the adjacent lane or lanes are to be overlaid by the end of the following day.

Make a smooth, clean, minimum 1 inch deep butt joint where each end of the new pavement joins the existing pavement. Any method approved by the Engineer can be used to make the joint.

The District Lab will perform a maximum of 2(two) design verification tests. If additional verification tests are needed, the Contractor will be billed $3,500.00 per each additional verification test required to obtain an approved asphaltic concrete pavement mix design.

If lime is not used as an antistrip agent, then the production and placement testing frequency for the Boil test (TEX-530-C) shown in the table below.

Description	Test Method	Minimum Contractor Testing Frequency	Minimum Engineer Testing Frequency
Boil test	Tex-530-C	1 per lot	1 per 12 sublots

If used, the IR bar read out screen must be visible at all times to the Engineer.

Item 3032 Reinforced Paving Mat for Asphalt Pavement Overlays

Contractor to furnish tack coat either AC-20-5TR or PG70-28 in accordance with Item 3096.

Item 3077 Superpave Mixtures

Use aggregate that meets the SAC requirement of class A.

Only fractionated RAP is allowed.

Use of RAS is not allowed.

All SP-D on this project is considered surface mix. A substitution PG binder is not allowed, as shown in Table 5.

When laying ACP on a roadway that has two or more lanes and the work is being done under traffic, then the adjacent lane or lanes are to be overlaid by the end of the following day.

Make a smooth, clean, minimum 1 inch deep butt joint where each end of the new pavement joins the existing pavement. Any method approved by the Engineer can be used to make the joint.

The District Lab will perform a maximum of 2(two) design verification tests. If additional verification tests are needed, the Contractor will be billed $3,500.00 per each additional verification test required to obtain an approved asphaltic concrete pavement mix design.

Provide a Hot Asphalt type Tracking Resistant Asphalt Interlayer (TRAIL) for tack coat found on the TxDOT Material Producer List. The Emulsified Asphalt options will not be allowed.

If lime is not used as an antistrip agent, then the production and placement testing frequency for the Boil test (TEX-530-C) shown in the table below.

Description	Test Method	Minimum Contractor Testing Frequency	Minimum Engineer Testing Frequency
Boil test	Tex-530-C	1 per lot	1 per 12 sublots

If used, the IR bar read out screen must be visible at all times to the Engineer.

Item 3085 Underseal Course

For estimating purposes the Underseal Course is applied at a rate of 0.25 Gal/SY.

Item	Option	Material	Application Rate	Conversion Rate
316	Seal Coat	AGGR[4]	110 SY/CY	0.66[1]
		ASPH[5]	0.38 Gal/SY	
3002	Spray Applied Underseal Membrane	ASPH	0.25 Gal/SY	1.0[2]
3019	TRAIL-Ultrafuse and Jebro	ASPH	0.15 Gal/SY	1.67[3]

1. Aggregate is considered subsidiary to the asphalt. For estimating purposes 0.66 Gallons of Seal Coat Asphalt is equivalent to 1.0 Gallons of Underseal Course. Refer to Item 316 in these General notes for more information on this option.
2. For estimating purposes 1.0 Gallon of Spray Applied Underseal Membrane is equivalent to 1.0 Gallon of Underseal Course. Refer to Special Specification SS3002 for more information on this item.
3. For estimating purposes 1.67 Gallons of TRAIL is equivalent to 1.0 Gallons of Underseal Course. Refer to Special Specification SS3085 for more information on this item.
4. Use GR4 TY B SAC B in accordance with Item 316
5. Use AC-10 or other equivalent as approved by the Engineer.

Example: If TRAIL Option Is Selected For Use.
A conversion rate of 1.67 will be applied to every one gallon of oil that is used.
If the NET gallons determined after strapping the tank is 1,000 gallons. Then the 1,000 gallons will be multiplied by the 1.67 conversion rate in the table above.
1,000 GAL * 1.67 CR = 1670 gallons for payment.

Ultrafuse and Jebro is the only allowed "seal" for the TRAIL option. None of the "tack" options are allowed.

If the Spray Applied Underseal Membrane or TRAIL options are used, the use of tack is not required.

Item 3096 Asphalts, Oils, and Emulsions

Asphalt from different sources is not to be blended.

The "Open" seasons for applying asphaltic materials and mixtures for the listed items are to be as follows, unless authorized otherwise in writing by the Engineer:

ITEMS	OPEN SEASON
310, 314	All Year
3076, 3077	From April 15th through October 31st

Item 6001 Portable Changeable Message Sign

Supply 2 Portable Changeable Message Signs (Type II – Lamp Matrix) for this project.
No payment will be made for removing and replacing damaged PCMS.

If the Contractor chooses to have more than one lane closure set-up at a time, provide additional PCMS in accordance with TCP at no additional charge to the department.

Item 6185 Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

In addition to the shadow vehicles with truck mounted attenuator (TMA) that are specified as being required on the traffic control plan for this project, provide 0 additional shadow vehicle(s) with TMA for TCP (1-1)-18, (1-2)-18, (1-3)-18, (1-4)-18, (1-5)-18, (2-1)-18, (2-2)-18, (2-3)-18, (2-4)-18, (2-5)-18, (2-6)-18, (3-1)-13, (3-2)-13, (3-3)-14, (3-4)-13 as detailed on the General Notes of this standard sheets.

Therefore, 2 total shadow vehicles with TMA will be required for this type of work. 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 needed for the project.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0168-07-050 **DISTRICT** Amarillo **COUNTY** Deaf Smith
HIGHWAY US 60

			CONTROL SECTION JOB	**0168-07-050**		**0168-07-051**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00182362**		**A00182363**			
			COUNTY	**Deaf Smith**		**Deaf Smith**			
			HIGHWAY	**US 60**		**US 60**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL		
	100-6001	PREPARING ROW	AC	32.000		32.000		64.000	
	105-6020	REMOVING STAB BASE & ASPH PAV (12")	SY			312.000		312.000	
	132-6001	EMBANKMENT (FINAL)(ORD COMP)(TY A)	CY			150.000		150.000	
	134-6001	BACKFILL (TY A)	STA	692.000		692.000		1,384.000	
	150-6002	BLADING	HR			2.000		2.000	
	164-6036	DRILL SEEDING (PERM) (RURAL) (CLAY)	AC	32.000		35.000		67.000	
	164-6053	DRILL SEEDING (TEMP)(WARM OR COOL)	AC	32.000		35.000		67.000	
	310-6009	PRIME COAT (MC-30)	GAL	51,889.000				51,889.000	
	314-6009	EMULS ASPH (EROSN CONT)(MULTI)	GAL	15,377.000		16,914.000		32,291.000	
	351-6027	FLEX PAVEMENT STRUCTURE REPAIR (2.5")	SY			5,000.000		5,000.000	
	354-6021	PLANE ASPH CONC PAV(0" TO 2")	SY	2,886.000		1,980.000		4,866.000	
	354-6048	PLANE ASPH CONC PAV (3")	SY	207,555.000				207,555.000	
	420-6071	CL C CONC (COLLAR)	EA			21.000		21.000	
	460-6005	CMP (GAL STL 36 IN)	LF			4.000		4.000	
	464-6005	RC PIPE (CL III)(24 IN)	LF			68.000		68.000	
	464-6007	RC PIPE (CL III)(30 IN)	LF			12.000		12.000	
	467-6395	SET (TY II) (24 IN) (RCP) (6: 1) (P)	EA			29.000		29.000	
	467-6423	SET (TY II) (30 IN) (RCP) (6: 1) (P)	EA			3.000		3.000	
	467-6444	SET (TY II) (36 IN) (CMP) (6: 1) (P)	EA			1.000		1.000	
	496-6006	REMOV STR (HEADWALL)	EA			7.000		7.000	
	496-6007	REMOV STR (PIPE)	LF			48.000		48.000	
	500-6001	MOBILIZATION	LS	0.500		0.500		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO			12.000		12.000	
	506-6040	BIODEG EROSN CONT LOGS (INSTL) (8")	LF	2,100.000		2,100.000		4,200.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	2,100.000		2,100.000		4,200.000	
	533-6001	RUMBLE STRIPS (SHOULDER)	LF	137,130.000		131,535.000		268,665.000	
	662-6005	WK ZN PAV MRK NON-REMOV (W)6"(BRK)	LF			69,185.000		69,185.000	
	662-6008	WK ZN PAV MRK NON-REMOV (W)6"(SLD)	LF	69,185.000		138,370.000		207,555.000	
	662-6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	69,185.000		138,370.000		207,555.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	8,564.000		8,564.000		17,128.000	
	662-6110	WK ZN PAV MRK SHT TERM (TAB)TY Y	EA	3,375.000		3,375.000		6,750.000	
	666-6035	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	LF	11,500.000		5,500.000		17,000.000	
	666-6047	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	LF	120.000		240.000		360.000	
	666-6101	REF PAV MRK TY I(W)36"(YLD TRI)(090MIL)	EA	210.000		210.000		420.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	1,910.000		1,910.000		3,820.000	
	3032-6001	REINFORCED FAB FOR ASPH PVMNT OVERLAYS	SY			192,181.000		192,181.000	
	3032-6003	ASPH FOR REINF FAB (PG70-28)	GAL			42,280.000		42,280.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0168-07-050 **DISTRICT** Amarillo **COUNTY** Deaf Smith
HIGHWAY US 60

			CONTROL SECTION JOB	**0168-07-050**		**0168-07-051**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00182362**		**A00182363**			
			COUNTY	**Deaf Smith**		**Deaf Smith**			
			HIGHWAY	**US 60**		**US 60**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL		
	3076-6005	D-GR HMA TY-B PG64-28	TON	34,247.000				34,247.000	
	3077-6058	SP MIXESSP-DSAC-A PG70-28	TON	36,468.000		36,145.000		72,613.000	
	3077-6075	TACK COAT	GAL	2,827.000		17,556.000		20,383.000	
	3085-6001	UNDERSEAL COURSE	GAL	77,451.000		345.000		77,796.000	
	3089-6001	EMUL TRTMENT (MX EXST MTRL) 12"	SY	207,555.000				207,555.000	
	3089-6002	CEMENT	TON	1,214.000				1,214.000	
	3089-6003	EMULSION	GAL	871,731.000				871,731.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA			2.000		2.000	
	6024-6008	HPPM W/RET REQ TY I(W)6"(BRK)(090MIL)	LF	17,300.000		17,300.000		34,600.000	
	6024-6011	HPPM W/RET REQ TY I(W)6"(SLD)(090MIL)	LF	69,185.000		69,185.000		138,370.000	
	6024-6023	HPPM W/RET REQ TY I(Y)6"(SLD)(090MIL)	LF	69,185.000		69,185.000		138,370.000	
	6185-6002	TMA (STATIONARY)	DAY			229.000		229.000	
	6185-6003	TMA (MOBILE OPERATION)	HR			120.000		120.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS			1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS			1.000		1.000	

DIST: AMA
CNT: 0168
SECT: 07
JOB: 050, ETC

SUMMARY OF ROADWAY ITEMS (CONC.)

LOCATION	3077 6058 SP MIXES SP-D SAC-A PG70-28 (220 LBS/SY)	3077 6075 TACK COAT (0.13 GAL/SY)	3085 6001 UNDERSEAL COURSE (0.25 GAL/SY)	3089 6001 EMUL TRTMENT (MX EXST MTRL) 12"	3089 6002 CEMENT (11.7 LBS/SY)	3089 6003 EMULSION (4.2 GAL/SY)
	TON	GAL	GAL	SY	TON	GAL
CSJ: 0168-07-050						
TYPICAL SECTIONS	32,978		74,951	207,555	1,214	871,731
ADDITIONAL AREA SHEET 1	99	117				
ADDITIONAL AREA SHEET 2	273		620			
ADDITIONAL AREA SHEET 3	416		946			
ADDITIONAL AREA SHEET 4	55		125			
ADDITIONAL AREA SHEET 5	155		353			
ADDITIONAL AREA SHEET 6	200		456			
ADDITIONAL AREA SHEET 7	119	141				
ADDITIONAL AREA SHEET 10	1,990	2,352				
INTERSECTION AND DRIVEWAY DETAILS SHEET 1	151	179				
INTERSECTION AND DRIVEWAY DETAILS SHEET 3	32	38				
INTERSECTION AND DRIVEWAY DETAILS SHEET 4						
CSJ: 0168-07-050 TOTALS	**36,468**	**2,827**	**77,451**	**207,555**	**1,214**	**871,731**
CSJ: 0168-07-051						
TYPICAL SECTIONS	32,978	13,991				
ADDITIONAL AREA SHEET 1	99	117				
ADDITIONAL AREA SHEET 4	151		345			
ADDITIONAL AREA SHEET 7	119	141				
ADDITIONAL AREA SHEET 9	1,302	1,538				
ADDITIONAL AREA SHEET 10	683	807				
INTERSECTION AND DRIVEWAY DETAILS SHEET 2	548	647				
INTERSECTION AND DRIVEWAY DETAILS SHEET 3	71	85				
INTERSECTION AND DRIVEWAY DETAILS SHEET 4	85	101				
INTERSECTION AND DRIVEWAY DETAILS SHEET 5	109	129				
CSJ: 0168-07-051 TOTALS	**36,145**	**17,556**	**345**			
PROJECT TOTALS:	**72,613**	**20,383**	**77,796**	**207,555**	**1,214**	**871,731**

SUMMARY OF DRAINAGE ITEMS

LOCATION	0105 6020 REMOVING STAB BASE & ASPH PAV (12")	0132 6001 EMBANKMENT (FINAL) (ORD COMP) (TY A)	0150 6002 BLADING	0420 6071 CL C CONC (COLLAR)	0460 6005 CMP (GAL STL 36 IN)	0464 6005 RC PIPE (CL III)(24 IN)	0464 6007 RC PIPE (CL III)(30 IN)	0467 6395 SET (TY II) (24 IN) (RCP) (6: 1) (P)	0467 6423 SET (TY II) (30 IN) (RCP) (6: 1) (P)	0467 6444 SET (TY II) (36 IN) (CMP) (6: 1) (P)	0496 6006 REMOV STR (HEADWALL)	0496 6007 REMOV STR (PIPE)
	SY	CY	HR	EA	LF	LF	LF	EA	EA	EA	EA	EA
CSJ: 0168-07-051												
CULVERT LAYOUT SHEET 1		20		3		12		4				
CULVERT LAYOUT SHEET 2		15		3		12		3			1	
CULVERT LAYOUT SHEET 3		10		2	4	4		1		1		4
CULVERT LAYOUT SHEET 4		20		4		16		4			2	4
CULVERT LAYOUT SHEET 5		20		2		8		4				
CULVERT LAYOUT SHEET 6		20		1		4		4				
CULVERT LAYOUT SHEET 7		20		3		12		4				4
CULVERT LAYOUT SHEET 8		15		3			12	3	3			
CULVERT LAYOUT SHEET 9		10						2			2	
DRIVEWAY REMOVAL LAYOUT	312		2								2	36
PROJECT TOTALS:	**312**	**150**	**2**	**21**	**4**	**68**	**12**	**29**	**3**	**1**	**7**	**48**

SUMMARY OF PAVEMENT MARKINGS

LOCATION	0666 6035 REFL PAV MRK TY I (W) 8" (SLD) (090MIL)	0666 6047 REFL PAV MRK TY I (W) 24" (SLD) (090MIL)	0666 6101 REFL PAV MRK TY I (W) 36" (YLD TRI) (090MIL)	0672 6010 REFL PAV MRKR TY II-C-R	6024 6008 HPPM W/RET REQ TY I (W) 6" (BRK) (090 MIL)	6024 6011 HPPM W/RET REQ TY I (W) 6" (SLD) (090 MIL)	6024 6023 HPPM W/RET REQ TY I (Y) 6" (SLD) (090 MIL)
	EA	EA	LF	EA	EA	EA	LF
CSJ: 0168-07-050	11,500	120	210	1,910	17,300	69,185	69,185
CSJ: 0168-07-051	5,500	240	210	1,910	17,300	69,185	69,185
PROJECT TOTALS:	**17,000**	**360**	**420**	**3,820**	**34,600**	**138,370**	**138,370**

Texas Department of Transportation

US60

SUMMARY SHEET

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		6

DATE: 10/31/2022 3:44:04 PM
FILE: T:\AMA\PD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\3. Roadway\050_Roadway_ADDITIONAL100.dgn

SUMMARY OF WORKZONE ITEMS				
LOCATION	0662 6034 WK ZN PAV MARK NON-REMOVE (Y) 4'(SLD)	0662 6008 WK ZN PAV MARK NON-REMOVE (W) 4'(SLD)	0662 6109 WK ZON PAV MRK SHT TERM (TAB) TY W	0662 6110 WK ZON PAV MRK SHT TERM (TAB) TY Y
	LF	LF		
CSJ: 0168-07-050	69,185	69,185	8,564	3,375
CSJ: 0168-07-051	69,185	69,185	8,564	3,375
PROJECT TOTALS:	**138,370**	**138,370**	**17,128**	**6,750**

SUMMARY OF EROSION CONTROL ITEMS					
LOCATION	0164 6036 DRILL SEEDING (PERM) (RURAL) (CLAY)	0164 6053 DRILL SEEDING (TEMP) (WARM OR COOL)	0314 6009 EMULS ASPH (EROSN CONT) (MULTI) (0.1 GAL/SY)	0506 6040 BIODEG EROSN CONT LOGS (INSTL) (8")	0506 6043 BIODEG EROSN CONT LOGS (REMOVE)
	AC	AC	GAL	LF	LF
CSJ:0168-07-050	32	32	15,377	2,100	2,100
CSJ:0168-07-051	35	35	16,914	2,100	2,100
PROJECT TOTALS:	**67**	**67**	**32,291**	**4,200**	**4,200**

SUMMARY OF ROADWAY ITEMS										
LOCATION	0100 6001 PREPARING ROW	0134 6001 BACKFILL (TY A)	0310 6009 PRIME COAT (MC-30) (0.25 GAL/SY)	03516027 FLEX PAVEMENT STRUCTURE REPAIR (2.5")	0354 6021 PLANE ASPH CONC PAV (0" TO 2")	0354 6048 PLANE ASPH CONC PAV (3")	0533 6001 RUMBLE STRIPS (SHOULDER)	3032 6001 REINFORCED FAB FOR ASPH PVMNT OVERLAYS	3032 6003 ASPH FOR REINF FAB (PG70-28) (0.22 GAL/SY)	3076 6005 D-GR HMA TY-B PG64-28 (330 LBS/SY)
	AC	STA	GAL	SY	SY	SY	LF	SY	GAL	TON
CSJ: 0168-07-050										
TYPICAL SECTIONS	32	692	51,889			207,555	137,130			34,247
ADDITIONAL AREA SHEET 1					899					
ADDITIONAL AREA SHEET 2					453					
ADDITIONAL AREA SHEET 3					453					
ADDITIONAL AREA SHEET 7					1,081					
CSJ: 0168-07-050 TOTALS	**32**	**692**	**51,889**		**2,886**	**207,555**	**137,130**			**34,247**
CSJ: 0168-07-051										
TYPICAL SECTIONS	32	692					131,535	192,181	42,280	
ADDITIONAL AREA SHEET 1					899					
ADDITIONAL AREA SHEET 4										
ADDITIONAL AREA SHEET 7					1,081					
PAVEMENT REPAIR DETAIL				5,000						
CSJ: 0168-07-051 TOTALS	**32**	**692**		**5,000**	**1,980**		**131,535**	**192,181**	**42,280**	
PROJECT TOTALS:	**64**	**1,384**	**51,889**	**5,000**	**4,866**	**207,555**	**268,665**	**192,181**	**42,280**	**34,247**

Texas Department of Transportation

US60

QUANTITIY SUMMARY

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		7

DATE: 10/31/2022 3:44:05 PM
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DN: 31 CK: $C1$ DW: $S2$ CK: $C2$

US 60 TRAFFIC CONTROL PLAN NARRATIVE

TRAFFIC CONTROL GENERAL NOTES

1. THE FOLLOWING NARRATIVE IS A SUPPLEMENT TO THE TRAFFIC CONTROL PLAN (TCP) STANDARDS.
2. CONTRACTOR SHALL PLACE ALL TEMPORARY PAVEMENT MARKINGS, SIGNS, AND OTHER TEMPORARY TRAFFIC CONTROL DEVICES ACCORDING TO THE MOST CURRENT TXDOT STANDARDS AND THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TUMCD).
3. SUBMIT CONTRACTOR-PROPOSED TCP CHANGES, SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER, FOR APPROVAL. CHANGES MUST CONFORM TO GUIDELINES ESTABLISHED IN THE TMUTCD USING APPROVED PRODUCTS FROM THE DEPARTMENT'S COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICE LIST, PAYMENT SHALL BE SUBSIDIARY TO ITEM 502.
4. THE ENGINEER WILL GIVE AT LEAST 7 CALENDAR DAYS NOTICE TO THE TRAVELING PUBLIC OF THE INTENDED START OF CONSTRUCTION. PAYMENT WILL BE SUBSIDIARY TO ITEM 502.
5. PLACE ADVANCED WARNING SIGNS PER BC STANDARDS PRIOR TO COMMENCING WORK. THE ADVANCED WARNING SIGNS WILL REMAIN IN PLACE FOR THE DURATION OF THE PROJECT.
6. EXISTING SIGNS TO BE REMOVED MUST REMAIN IN PLACE UNTIL NEW SIGNS HAVE BEEN INSTALLED. EXISTING SIGNS THAT CONFLICT WITH THE TCP SHALL BE COVERED TO AVOID CONFUSION FOR THE TRAVELING PUBLIC. PAYMENT SHALL BE SUBSIDIARY TO ITEM 502.
7. THE CONTRACTOR WILL ENSURE THAT ALL SIGNS, BOTH TEMPORARY AND PERMANENT, ARE CLEARLY VISIBLE AND FREE OF OBSTRUCTIONS AT ALL TIMES.
8. USE BARRELS IN TAPERS. CHANNELIZING DEVICES ON TANGENT AND TAPERS SHOULD BE SPACED ACCORDING TO THE POSTED SPEED AS SPECIFIED IN THE TMUTCD OR TXDOT BC STANDARDS.
9. THE CONTRACTOR TO MEET CURRENT FIELD CONDITIONS AND MAINTAIN POSITIVE DRAINAGE AT ALL TIMES.
10. TRAFFIC MANAGEMENT FOR THE US 60 MAINLINE IS TO MAINTAIN AT ALL TIMES AT LEAST ONE OPEN LANE OF TRAFFIC IN BOTH THE EASTBOUND AND WESTBOUND DIRECTIONS.
11. PUBLIC ROADS, CROSSOVER, DRIVEWAYS AND INTERSECTIONS WILL BE CONSTRUCTED IN SUCH A MANNER THAT ACCESS IS MAINTAINED AT ALL TIMES.
12. TRAFFIC CONTROL & LANE CLOSURE WILL BE IN ACCORDANCE WITH THE PLANS, BC, TCP, AND WZ STANDARDS, AND AS DIRECTED BE THE ENGINEER.
13. ALL PAVEMENT EDGE DROP-OFFS TO BE LESS THAN 3" AND SHALL BE BACKFILLED BY A SUITABLE MATERIAL TO FORM A STABLE 3:1 SLOPE AT THE END OF EACH WORKDAY.
14. REFER TO STANDARD WZ(UL)-13 FOR SIGNING OF EDGE CONDITIONS/UNEVEN LANES.
15. REFER TO BC STANDARDS FOR TYPICAL LOCATIONS OF CROSSROAD SIGNS.
16. CONTRACTOR TO REFER TO TXDOT BC-14 STANDARDS FOR MORE INFORMATION NOT INCLUDING IN THE TRAFFIC CONTROL GENERAL NOTES.

TRAFFIC CONTROL PLAN SEQUENCING

FULL DEPTH RECLAMATION PHASE 1 - STAGE 1

US 60 WILL OPERATE WITH ONE LANE OF TRAFFIC IN THE EASTBOUND OUTSIDE LANE. PUBLIC ROADS, CROSSOVER, DRIVEWAYS AND INTERSECTIONS ACCESS WILL BE MAINTAINED OPENED AT ALL TIMES.

1. CLOSE THE US 60 EASTBOUND INSIDE LANE TO TRAFFIC, TO COMMENCE CONSTRUCTION. INSTALL WORK ZONE DEVICES, SIGNS, AND STRIPING. USE THE APPLICABLE TCP STANDARDS FOR LANE CLOSURES.
2. PERFORM WORK AS SHOWN ON THE EASTBOUND US 60 TYPICAL SECTIONS IN THE INSIDE LANE.
   - STEP A) MILL 3 INCHES.
   - STEP B) 12 INCH FULL DEPTH REHABILTATION (TREAT EXISTING MATERIAL WITH EMULSION AND CEMENT).
   - STEP C) PRIME TREATED MATERIAL.
   - STEP D) PLACE 3 INCHES OF D-GR HMA TY-B ON TREATED MATERIAL, BRING THE DRIVING SURFACE BACK TO EXISTING.
3. PREPARE FOR TRAFFIC SWITCH, PLACE WORK ZONE STRIPING FOR STAGE 2.

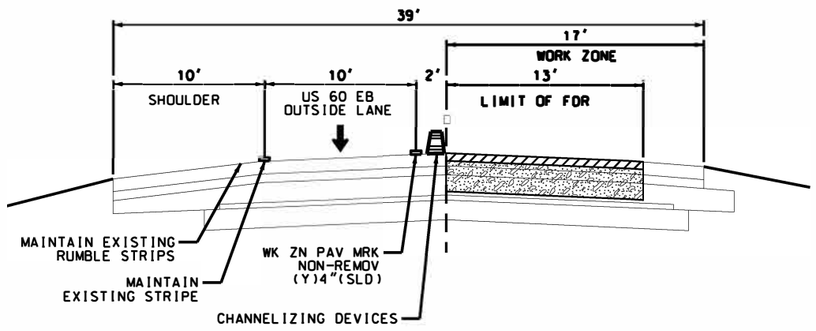
FULL DEPTH RECLAMATION PHASE 1 - STAGE 2

US 60 WILL OPERATE WITH ONE LANE OF TRAFFIC IN THE EASTBOUND INSIDE LANE. PUBLIC ROADS, CROSSOVER, DRIVEWAYS AND INTERSECTIONS ACCESS WILL BE MAINTAINED OPENED AT ALL TIMES.

1. CLOSE THE US 60 EASTBOUND OUTSIDE LANE TO TRAFFIC, TO COMMENCE CONSTRUCTION. INSTALL WORK ZONE DEVICES, SIGNS, AND STRIPING. USE THE APPLICABLE TCP STANDARDS FOR LANE CLOSURES.
2. PERFORM WORK AS SHOWN ON THE EASTBOUND US 60 TYPICAL SECTIONS IN THE OUTSIDE LANE.
   - STEP A) MILL 3 INCHES.
   - STEP B) 12 INCH FULL DEPTH REHABILTATION (TREAT EXISTING MATERIAL WITH EMULSION AND CEMENT).
   - STEP C) PRIME TREATED MATERIAL.
   - STEP D) PLACE 3 INCHES OF D-GR HMA TY-B ON TREATED MATERIAL, BRING THE DRIVING SURFACE BACK TO EXISTING.
3. PLACE WORK ZONE STRIPING TO OPEN BOTH EASTBOUND LANES TO TRAFFIC AND OPEN THE EASTBOUND DIRECTION TO TRAFFIC.

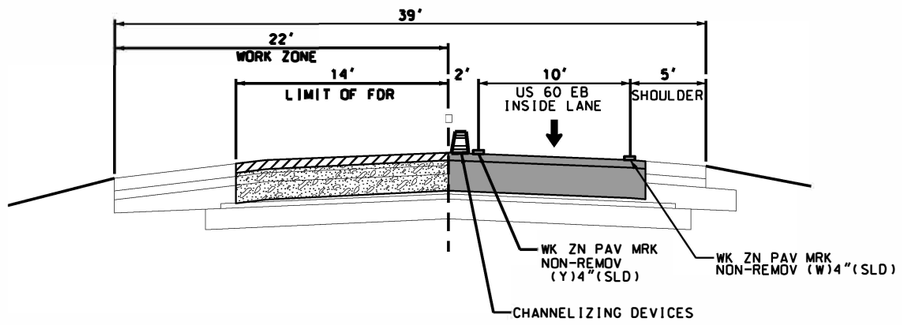
FINAL OVERLAY PHASE 2

1. PERFOM FINAL OVERLAY AS SHOWN ON THE TYPICAL SECTIONS IN ACCORDING TO APPLICABLE BC, TCP, AND WZ STANDARDS AND PERFORM FINAL STRIPING.
2. PERFORM ALL OTHER REMAIN WORK AS SHOWN IN THE PLAN: SAFETY TREAT CULVERT, SEEDING, FINAL STRIPING, AND ETC. USE THE APPLICABLE TCP STANDARDS.



PHASE 1 - STAGE 1

EB PAVEMENT SHOWN



PHASE 1 - STAGE 2

EB PAVEMENT SHOWN

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED
PROFESSIONAL ENGINEER

Casey B. Stripling

11-02-2022

US60 TRAFFIC CONTROL NARRATIVE

SCALE: 1"= 10'

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SHEET 1 OF 1

DSN	CK	CONT	SECT	JOB	HIGHWAY
AM	AM	0168	07	050, ETC	US60
DRWN	CK	DIST	COUNTY		SHEET NO.
AM	CH	AMA	DEAF SMITH		8

DATE: 10/31/2022 3:44:05 PM
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DATE: 10/31/2022 3:44:06 PM
FILE: T:*AMATPD*Construction Projects*0168-07*050 US 60 HERFORD TO CANYON*4 - Design*Plan Set*1. General*ALL STANDARDS*BARRICADE AND CONSTRUCTION STANDARDS*bc-21.dgn

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	AMA	DEAF SMITH		9
5-10 5-21				

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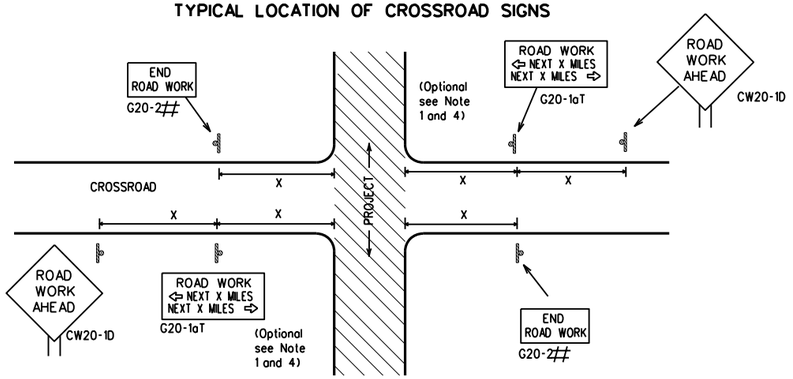
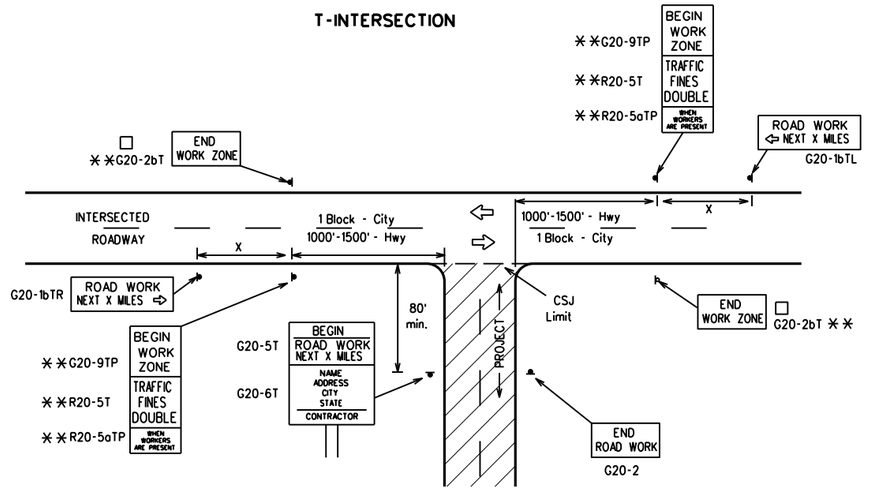
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING

1.5.6

SIZE

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

SPACING

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

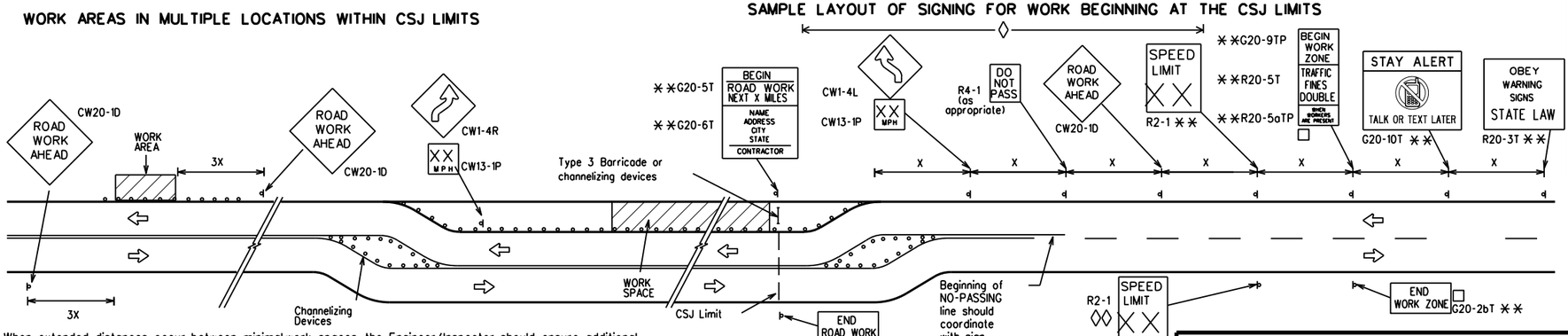
✳ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

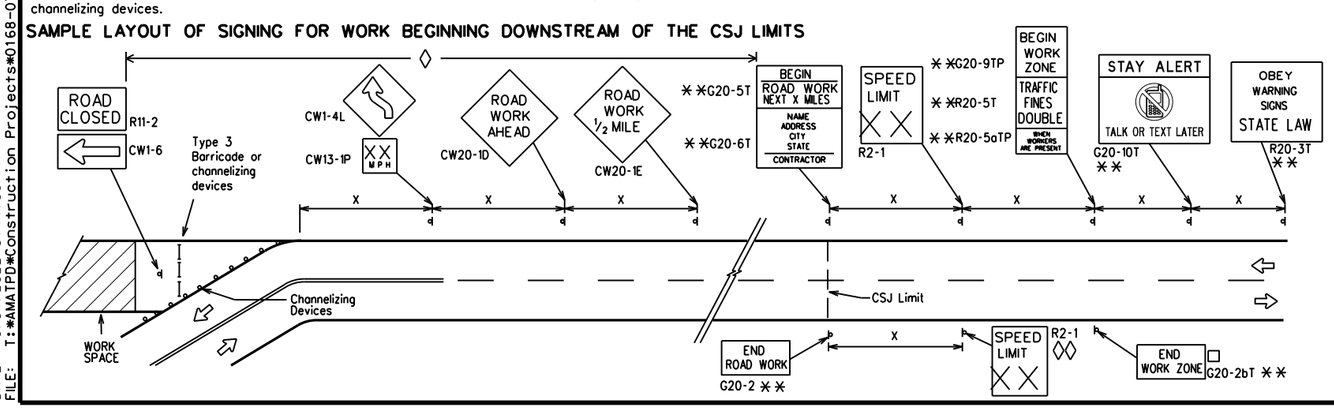
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0168	07	050, ETC	US60
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	AMA	DEAF SMITH		10

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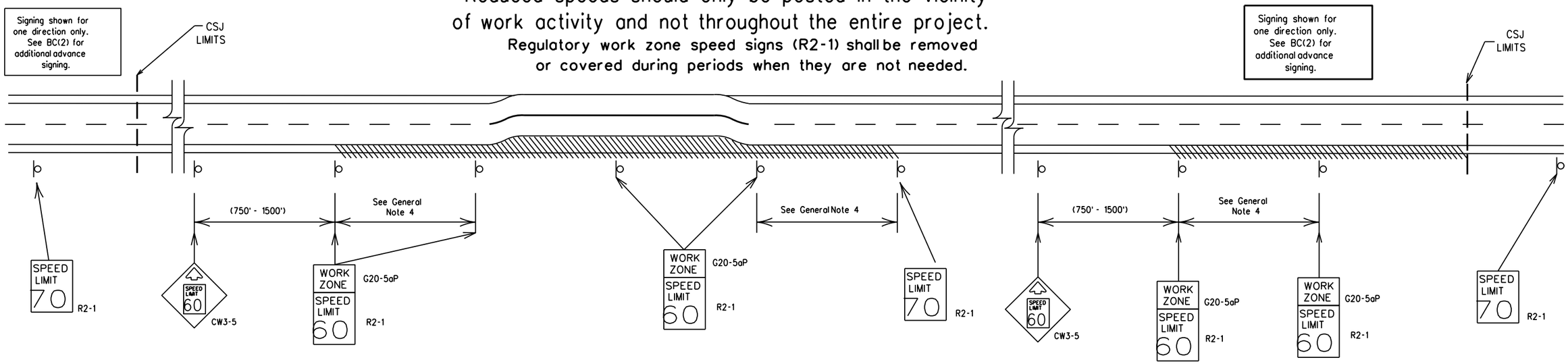
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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REVISIONS	0168	07	050, ETC	US60
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	AMA	DEAF SMITH		11

DATE: 10/31/2022 3:44:07 PM
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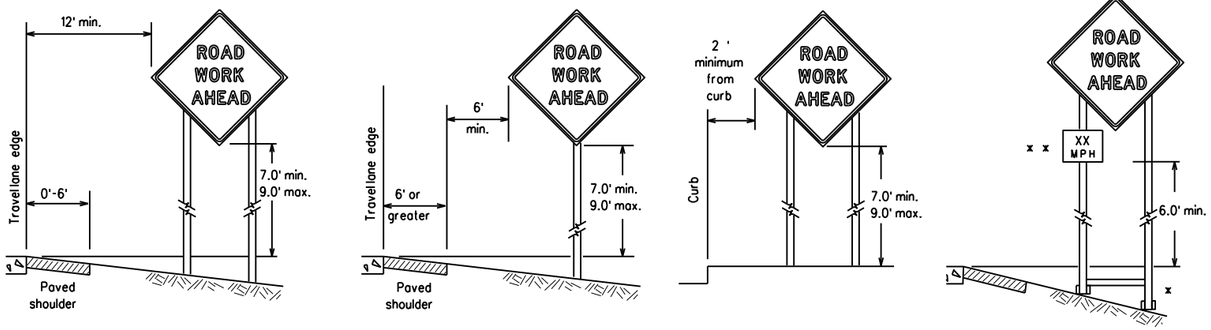
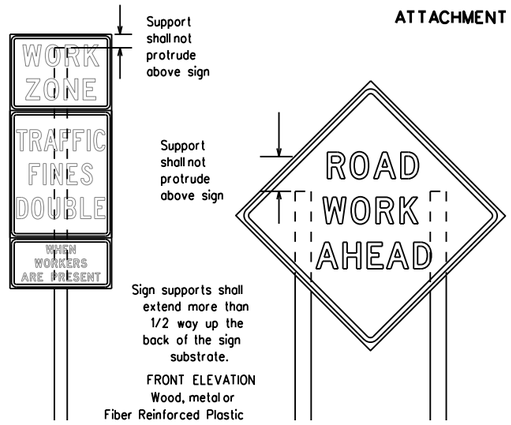
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



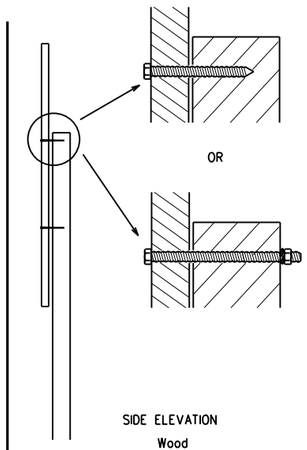
x When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

x x 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



FRONT ELEVATION
Wood, metal or
Fiber Reinforced Plastic



SIDE ELEVATION
Wood

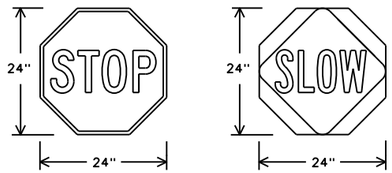
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



Background - Red
Legend & Border - White

Background - Orange
Legend & Border - Black

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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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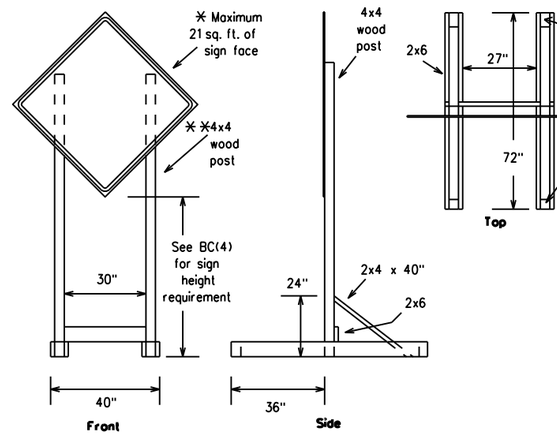
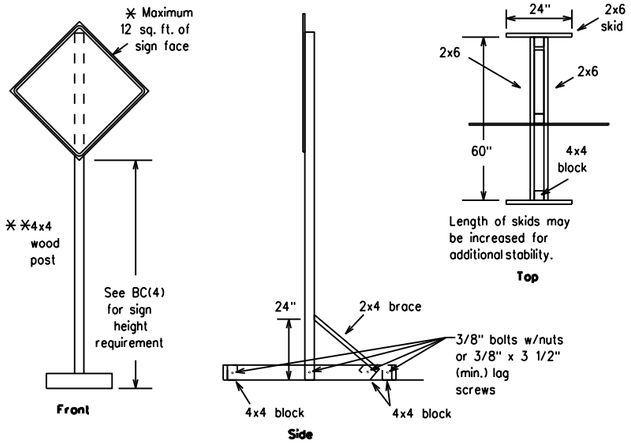
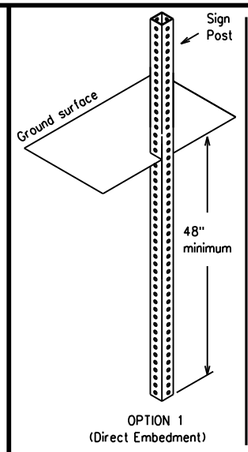
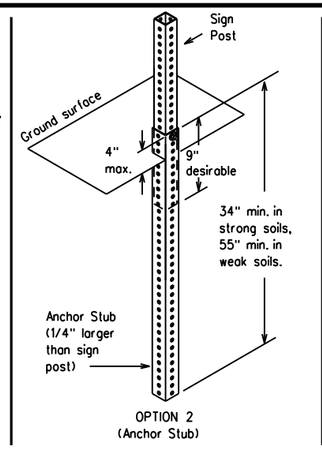


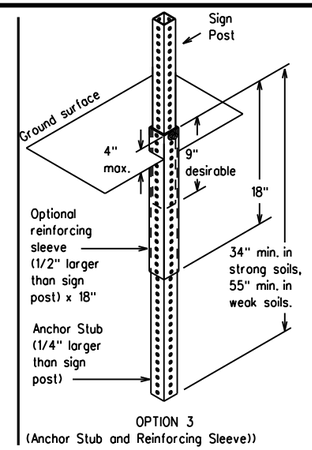


SKID MOUNTED WOOD SIGN SUPPORTS

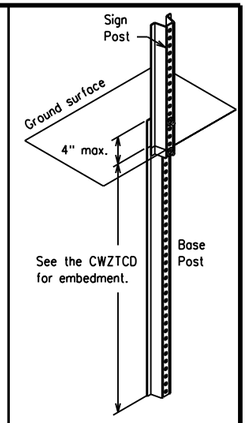
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS







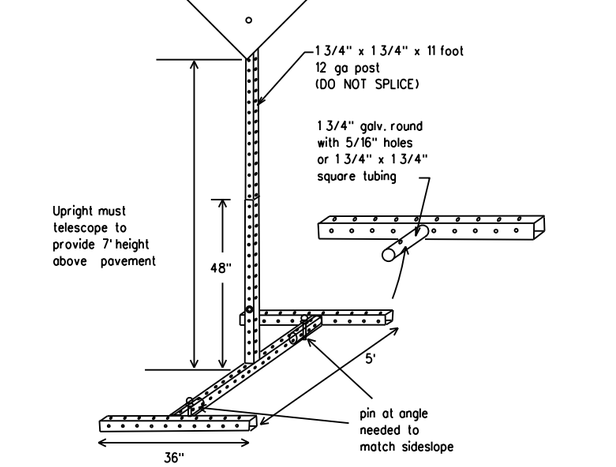
PERFORATED SQUARE METAL TUBING

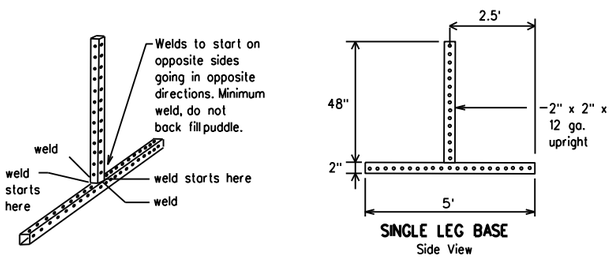


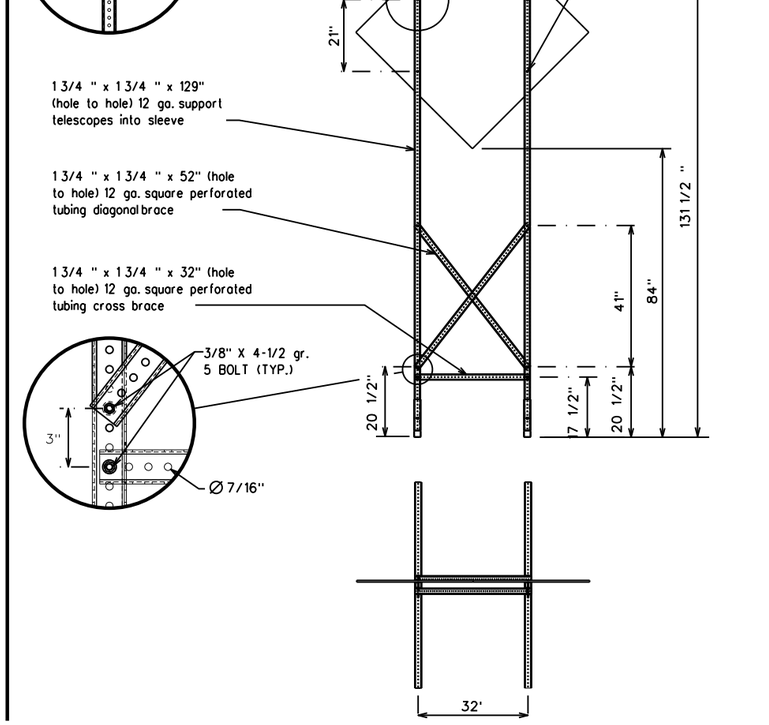
WING CHANNEL
Lap-splice/base bolted anchor

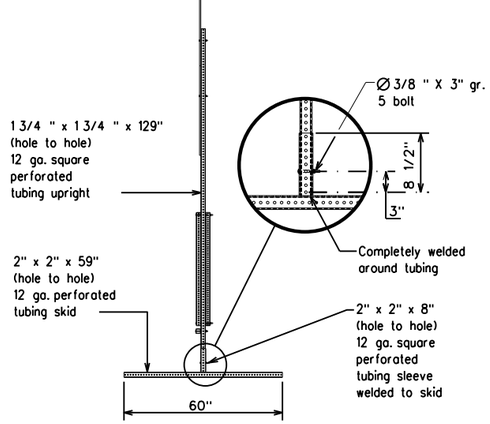
GROUND MOUNTED SIGN SUPPORTS

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









SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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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 x

x 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 x	

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

x x 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

x x See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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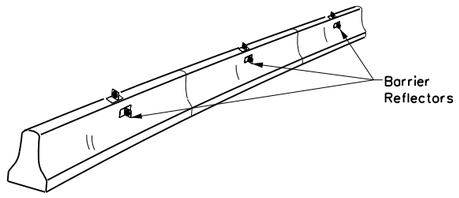
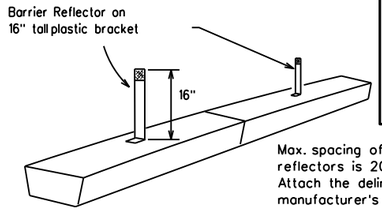
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



CONCRETE TRAFFIC BARRIER (CTB)

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

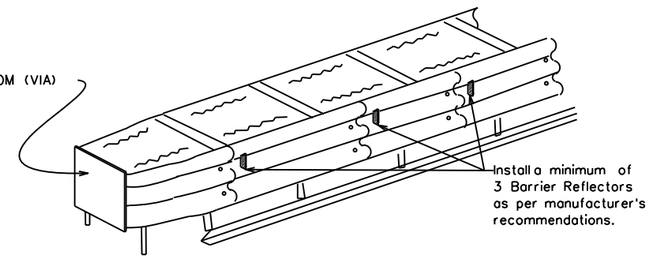


Max. spacing of barrier reflectors is 20 feet.
Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

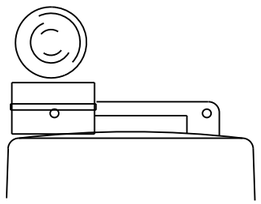
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

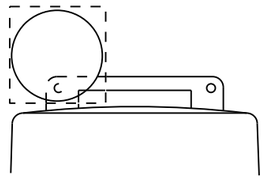
1. Warning lights shall meet the requirements of the TMUTCD.
2. Warning lights shall NOT be installed on barricades.
3. Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this 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 or C 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.



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

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.



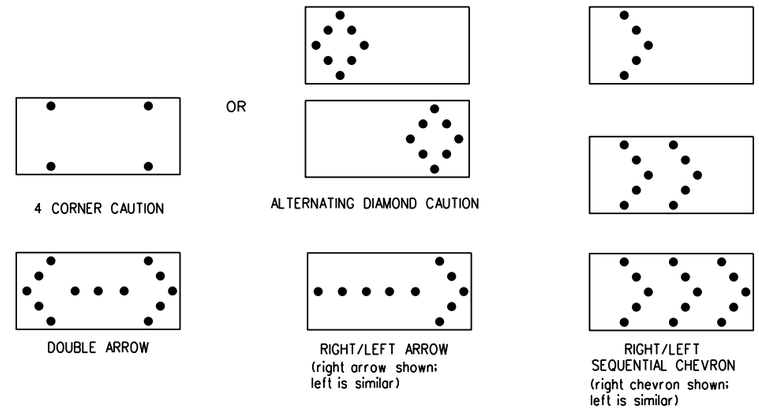
Warning reflector may be round or square.Must have a yellow reflective surface area of at least 30 square inches

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	AMA	DEAF SMITH		15

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

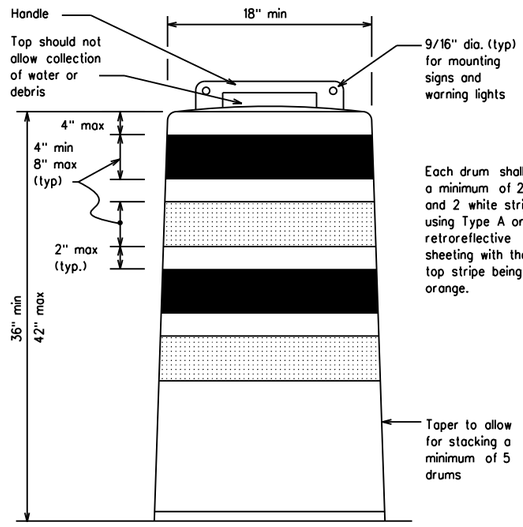
1. Plastic drums shall be a two-piece design: the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

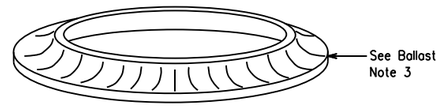
RETROREFLECTIVE SHEETING

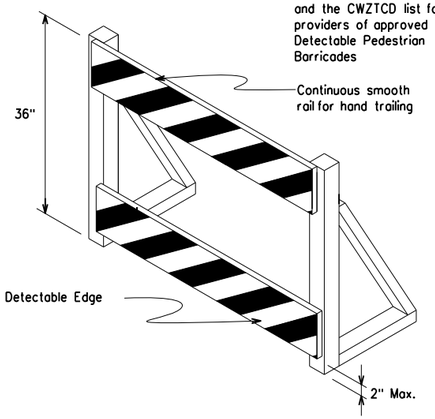
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

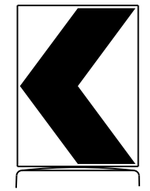




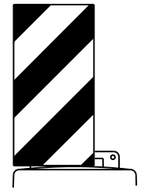


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	AMA	DEAF SMITH		16
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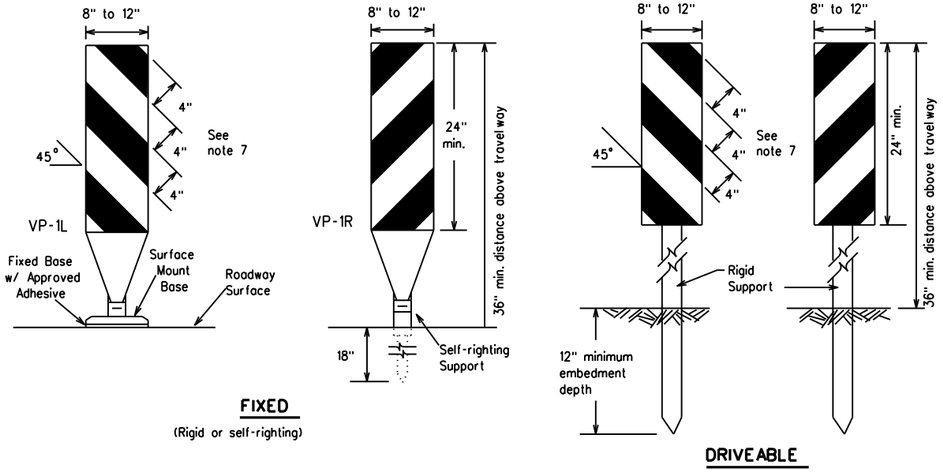
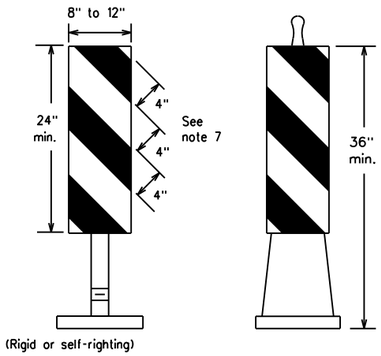


FIXED
(Rigid or self-righting)

DRIVEABLE

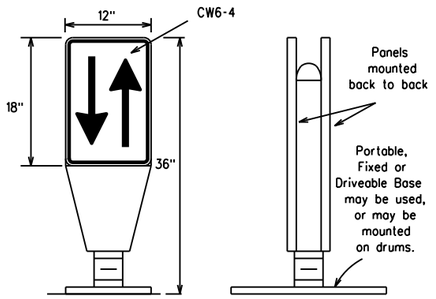


(Rigid or self-righting)

PORTABLE

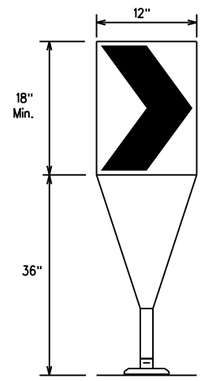
VERTICAL PANELS (VPs)

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



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 or Type C conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

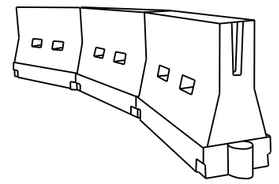
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



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 or Type C 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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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.

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	AMA	DEAF SMITH		17

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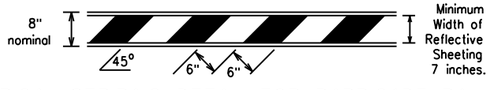
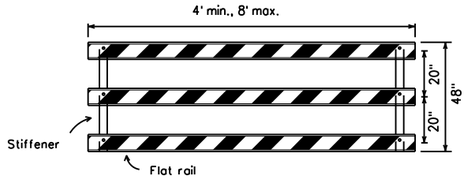
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



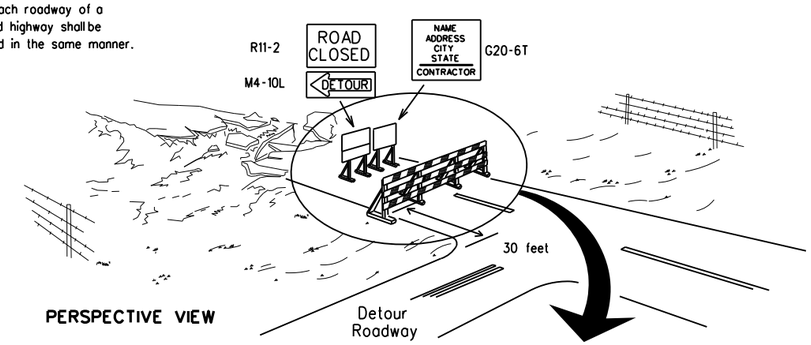
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

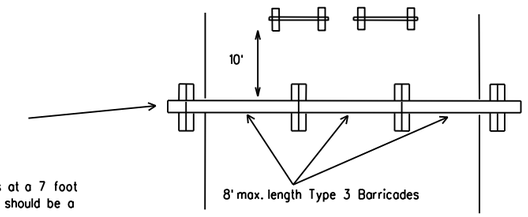
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

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

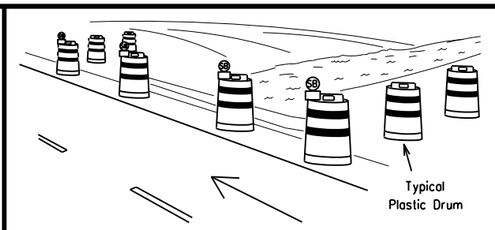
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

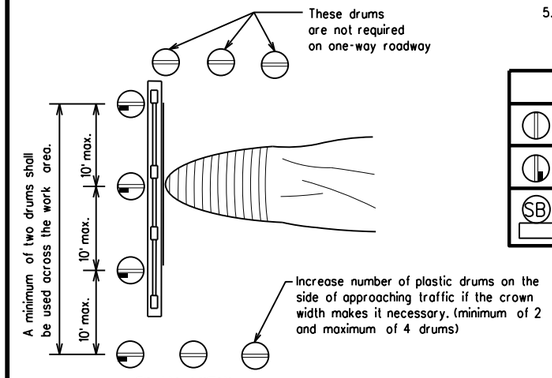
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

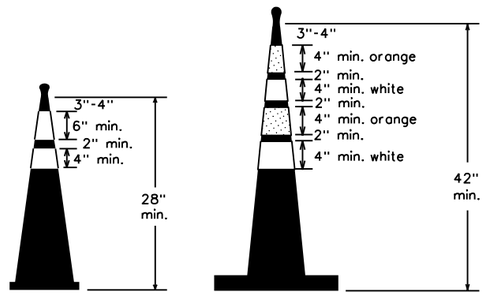
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



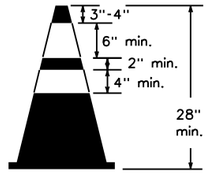
PLAN VIEW

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

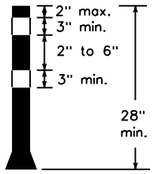
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

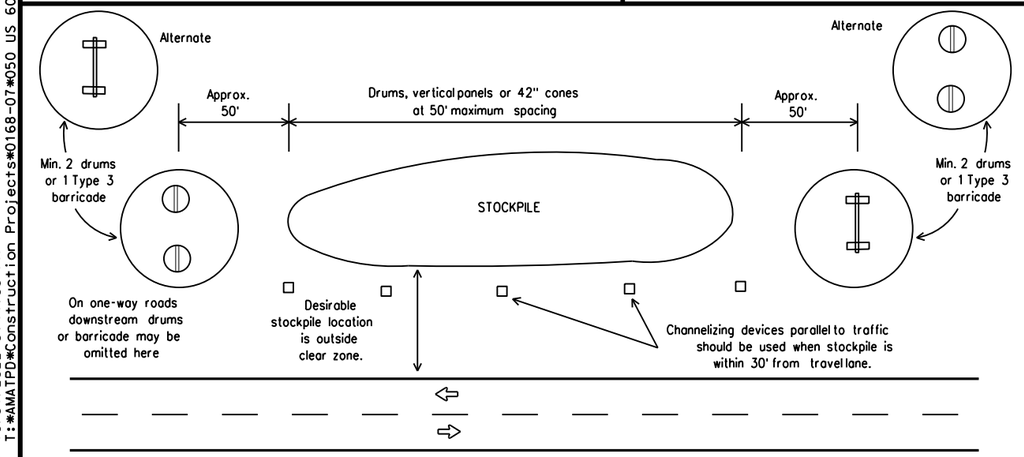


Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	AMA	DEAF SMITH		18

DATE: 10/31/2022 3:44:09 PM
FILE: T:*AMATPD*Construction Projects*0168-07*050 US 60 HERFORD TO CANYON*4 - Design*Plan Set*1. General*ALL STANDARDS*BARRICADE AND CONSTRUCTION STANDARDS*bc-21.dgn

WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

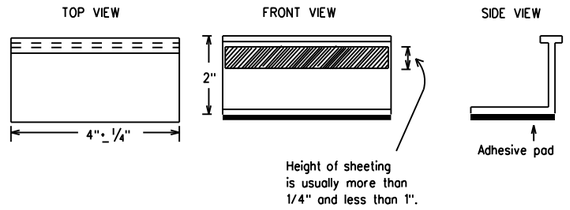
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	AMA	DEAF SMITH		19
11-02 8-14				

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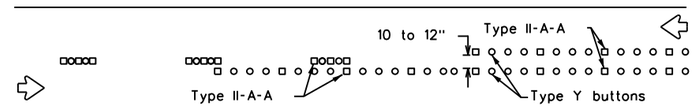
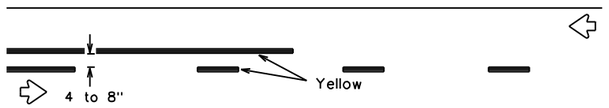
FILE: T:*AMA\PD*Construction Projects*0168-07*050 US 60 HEREFORD TO CANYON*#4 - Design*Plan Set*\. General*ALL STANDARDS*BARRICADE AND CONSTRUCTION STANDARDS*bc-21.dgn

PAVEMENT MARKING PATTERNS

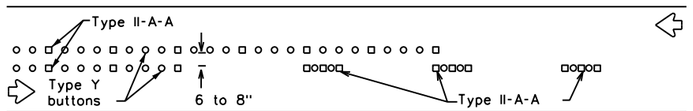
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



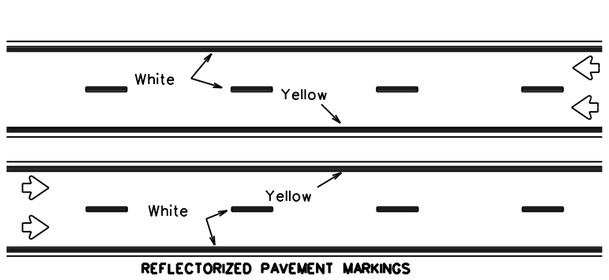
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



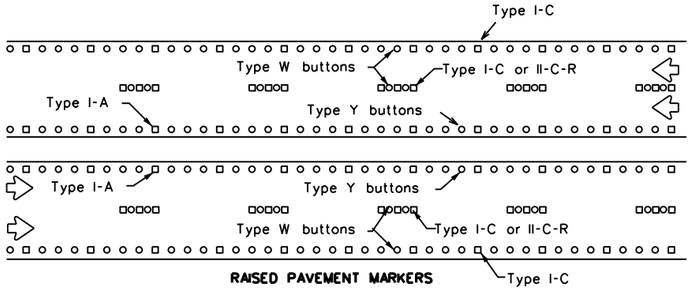
RAISED PAVEMENT MARKERS - PATTERN B

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

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



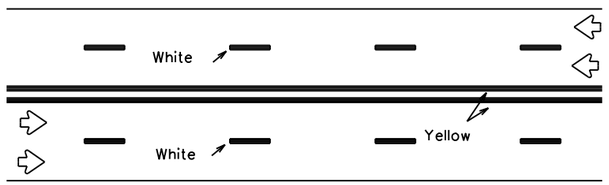
REFLECTORIZED PAVEMENT MARKINGS



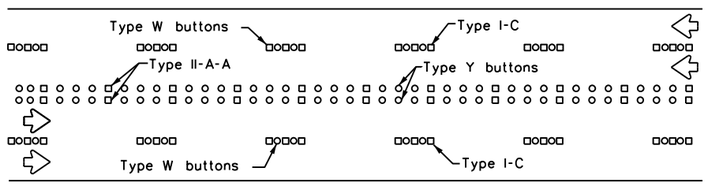
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



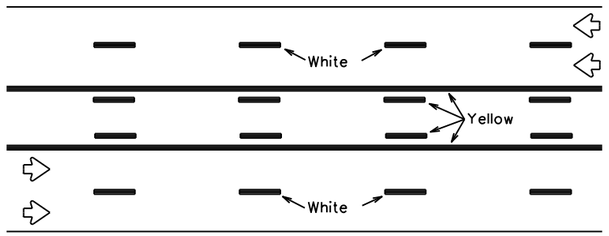
REFLECTORIZED PAVEMENT MARKINGS



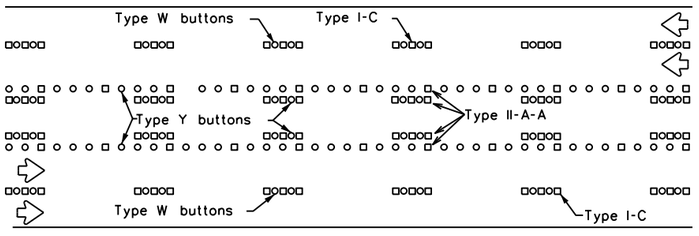
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

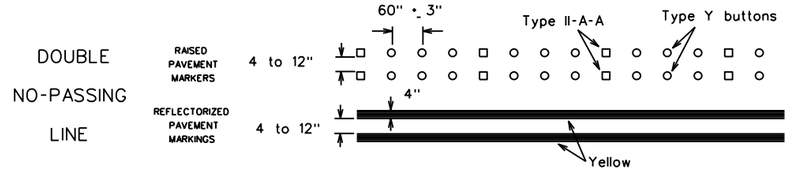
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

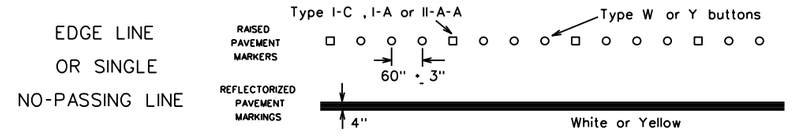
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

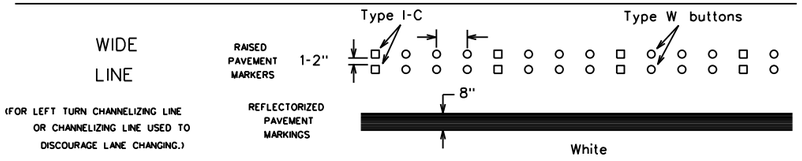


EDGE LINE OR SINGLE NO-PASSING LINE



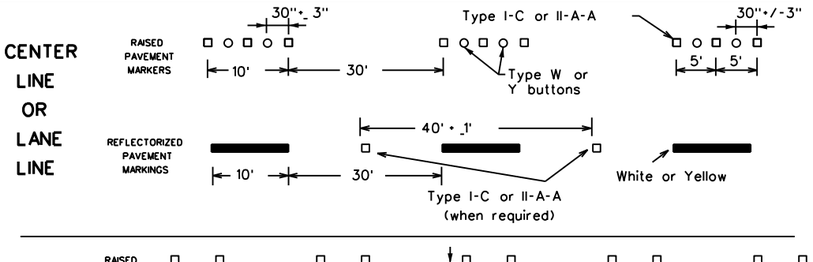
WIDE LINE

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

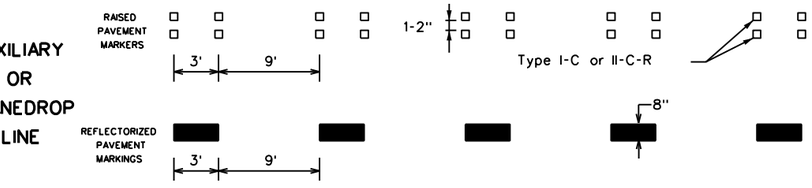


BROKEN LINES

CENTER LINE OR LANE LINE

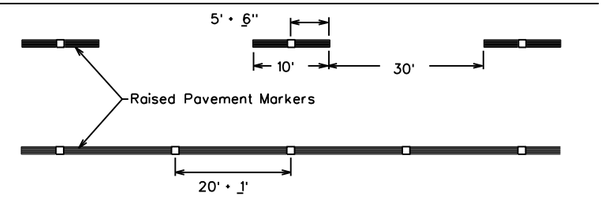


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0168	07	050, ETC	US60
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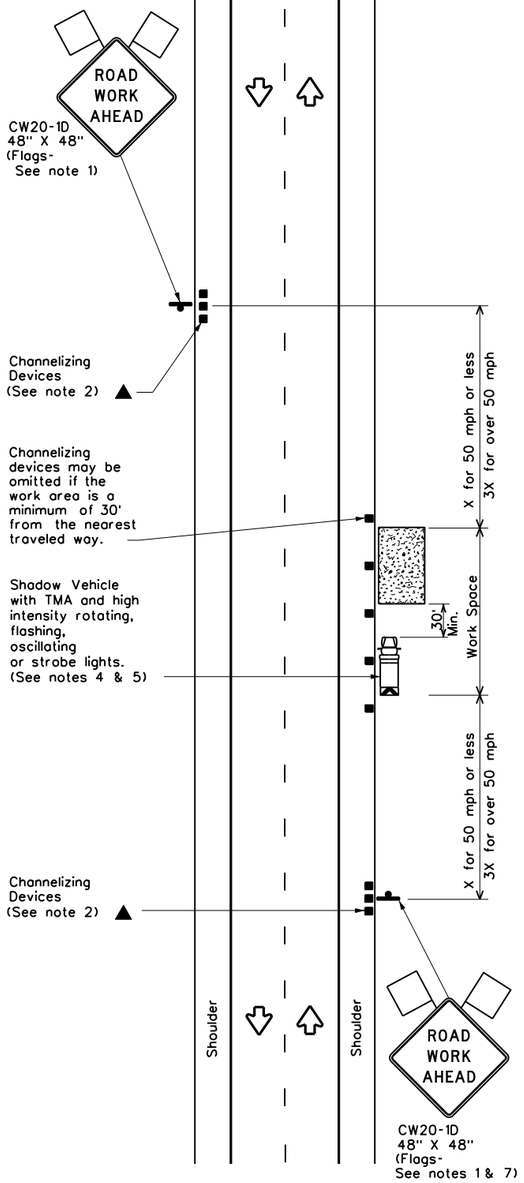
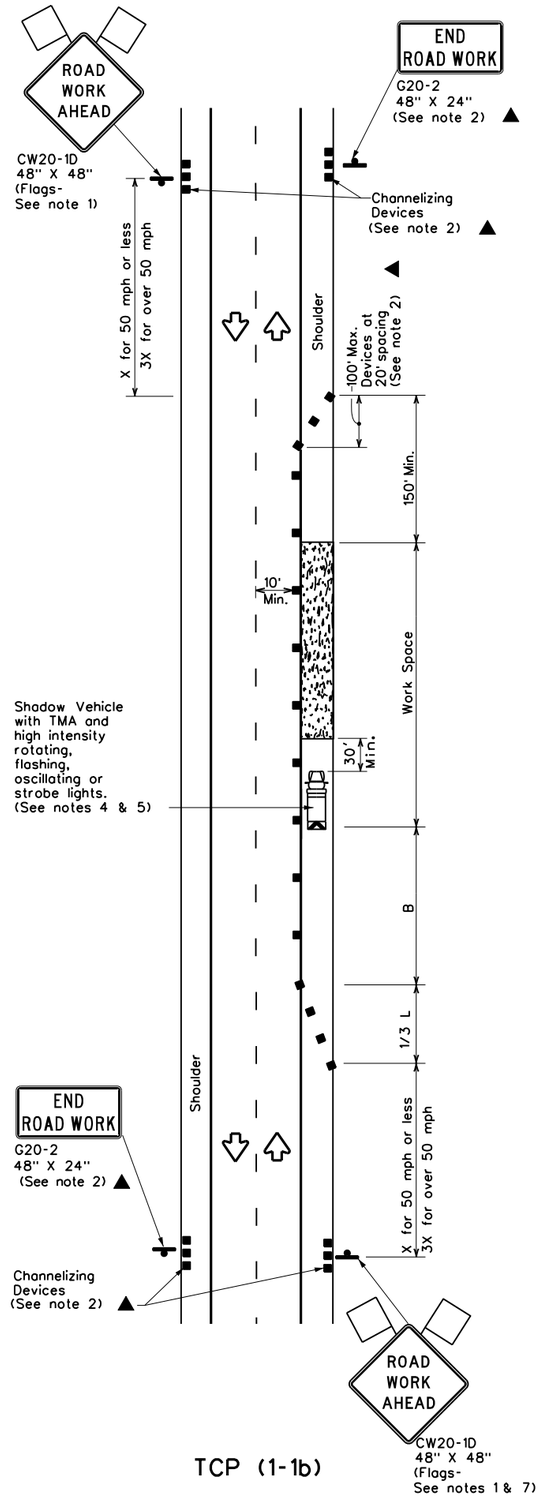


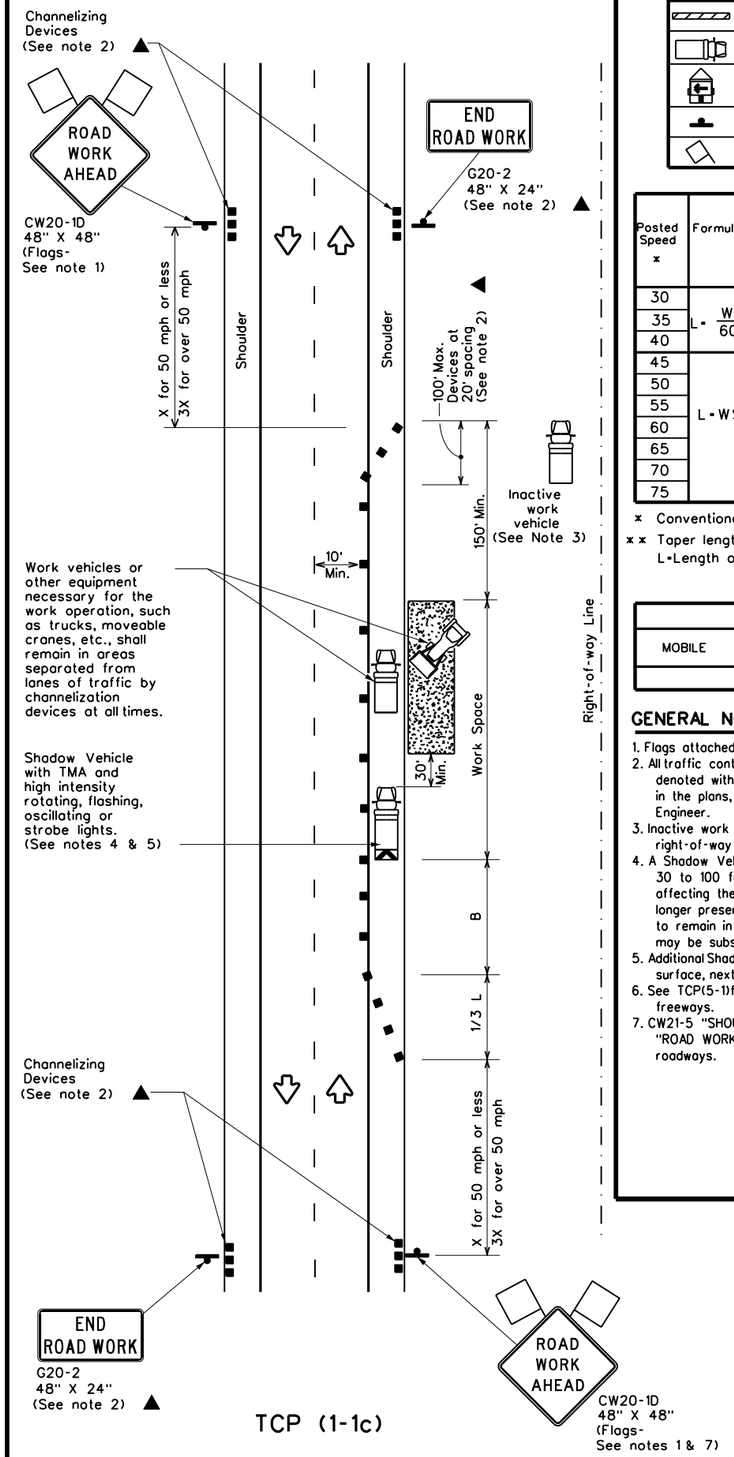
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	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. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
6. See TCP(5-1)for shoulder work on divided highways, expressways and freeways.
7. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	AMA	DEAF SMITH		21
1-97 2-18				

151

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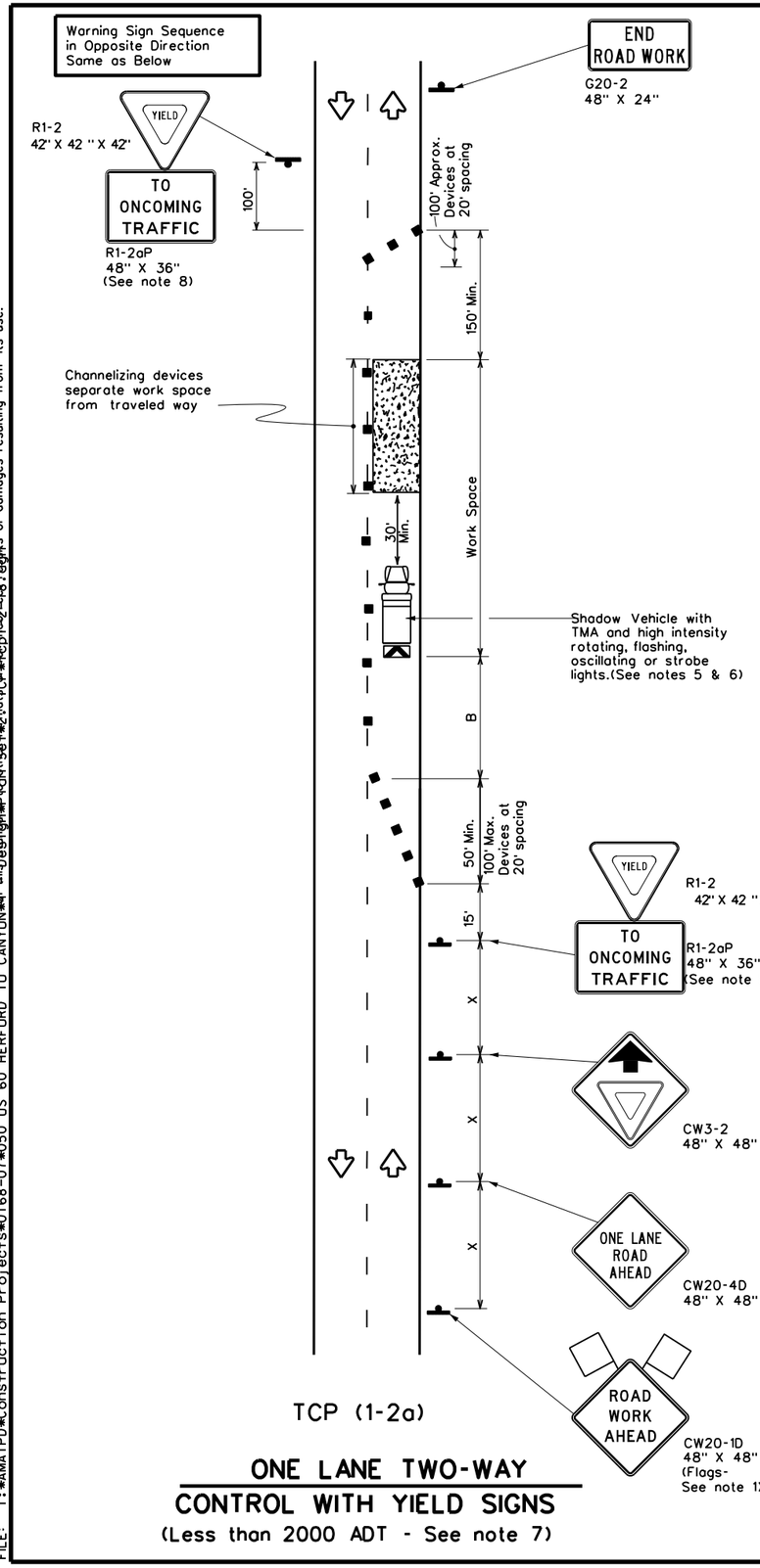
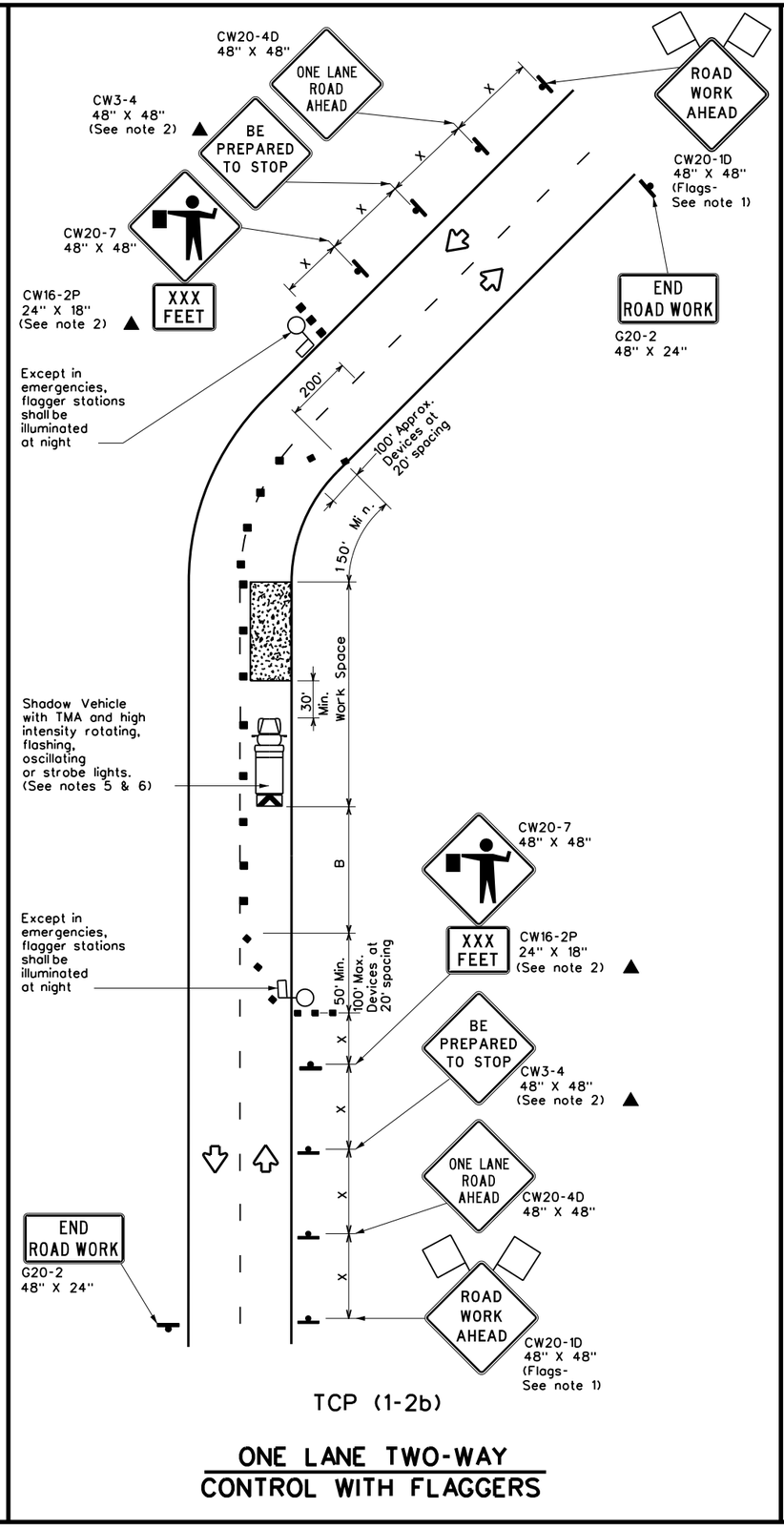


TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY CONTROL WITH FLAGGERS

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths * * 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
5. 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.
6. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-2a)

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

TCP (1-2b)

9. Flaggers should use two-way radios or other methods of communication to control traffic.
10. Length of work space should be based on the ability of flaggers to communicate.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
12. Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
13. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
4-90 4-98	DIST	COUNTY		SHEET NO.
2-94 2-12	AMA	DEAF SMITH		22
1-97 2-18				

DATE: 10/31/2022 3:44:10 PM
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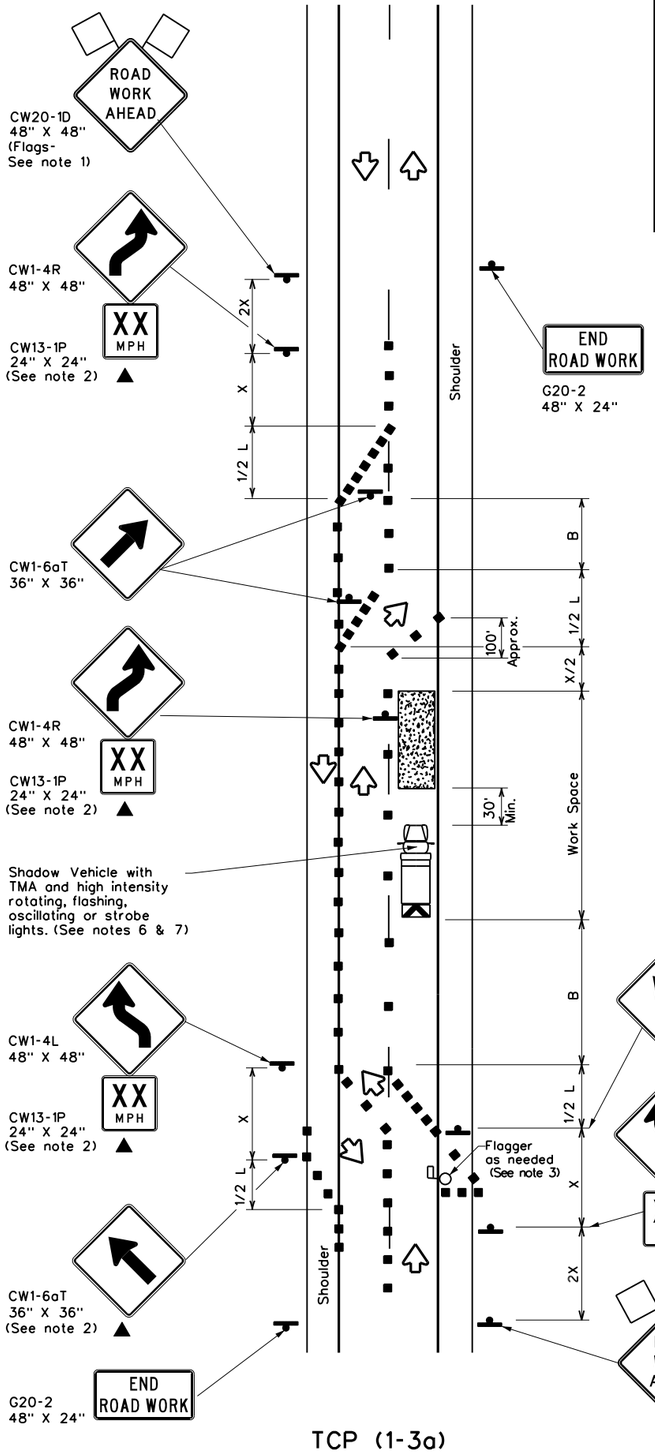
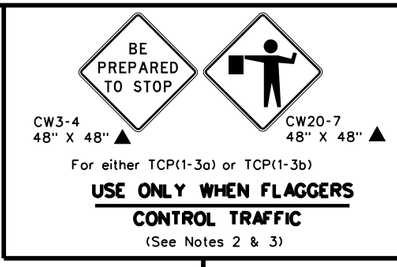


TCP (1-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

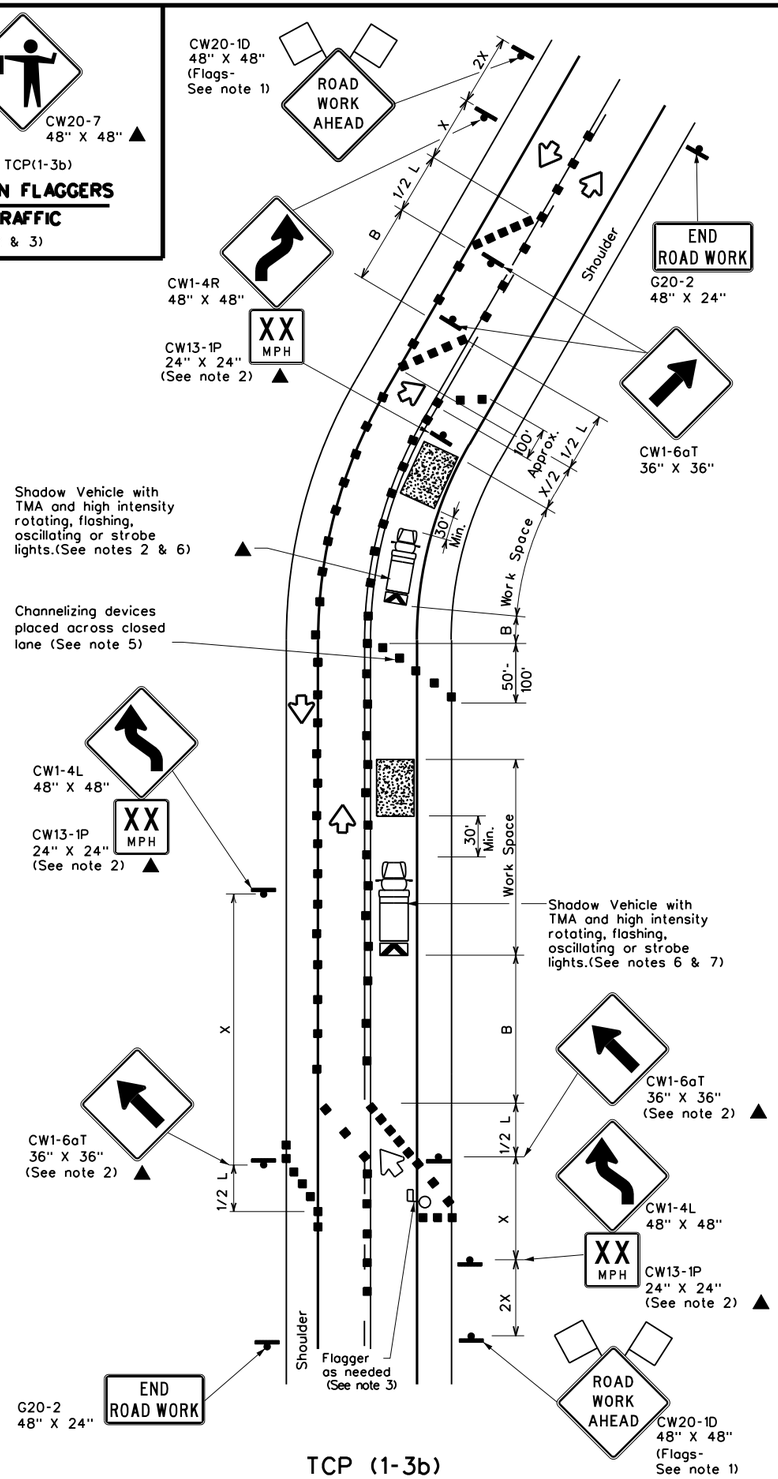
ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



For either TCP(1-3a) or TCP(1-3b)

USE ONLY WHEN FLAGGERS CONTROL TRAFFIC

(See Notes 2 & 3)



TCP (1-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Additional flaggers may be positioned in advance of traffic queues to alert traffic to reduce speed.
4. DO NOT PASS, PASS WITH CARE and construction regulatory speed zone signs may be installed downstream of the ROAD WORK AHEAD signs.
5. When the work zone is made up of several work spaces, channelizing devices should be placed laterally across the closed lane to re-emphasize closure. Laterally placed channelizing devices should be repeated every 500 to 1000 feet in urban areas and every 1/4 to 1/2 mile in rural areas.
6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
8. Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20', or 15' if posted speed are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the area of conflicting markings not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

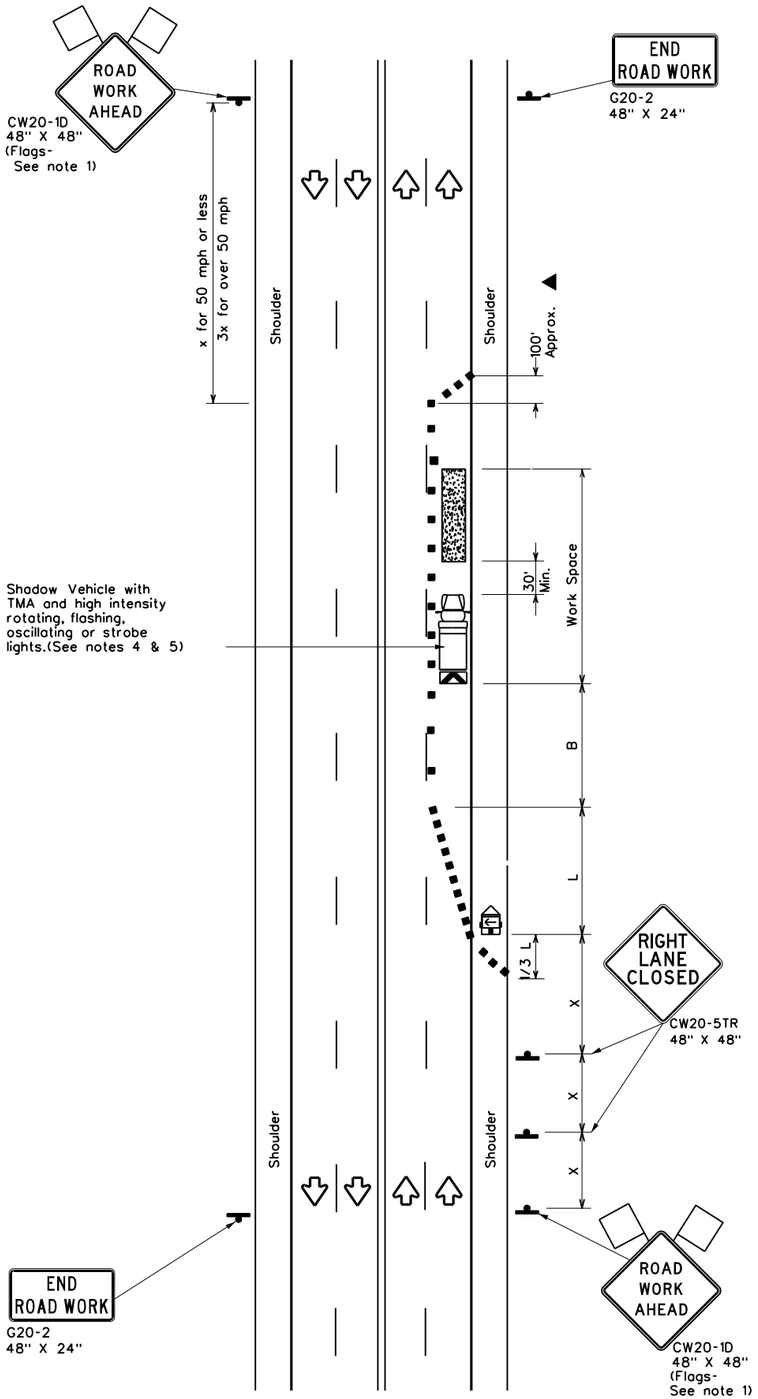
TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

FILE: tcp1-3-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	AMA	DEAF SMITH		23
1-97 2-18				

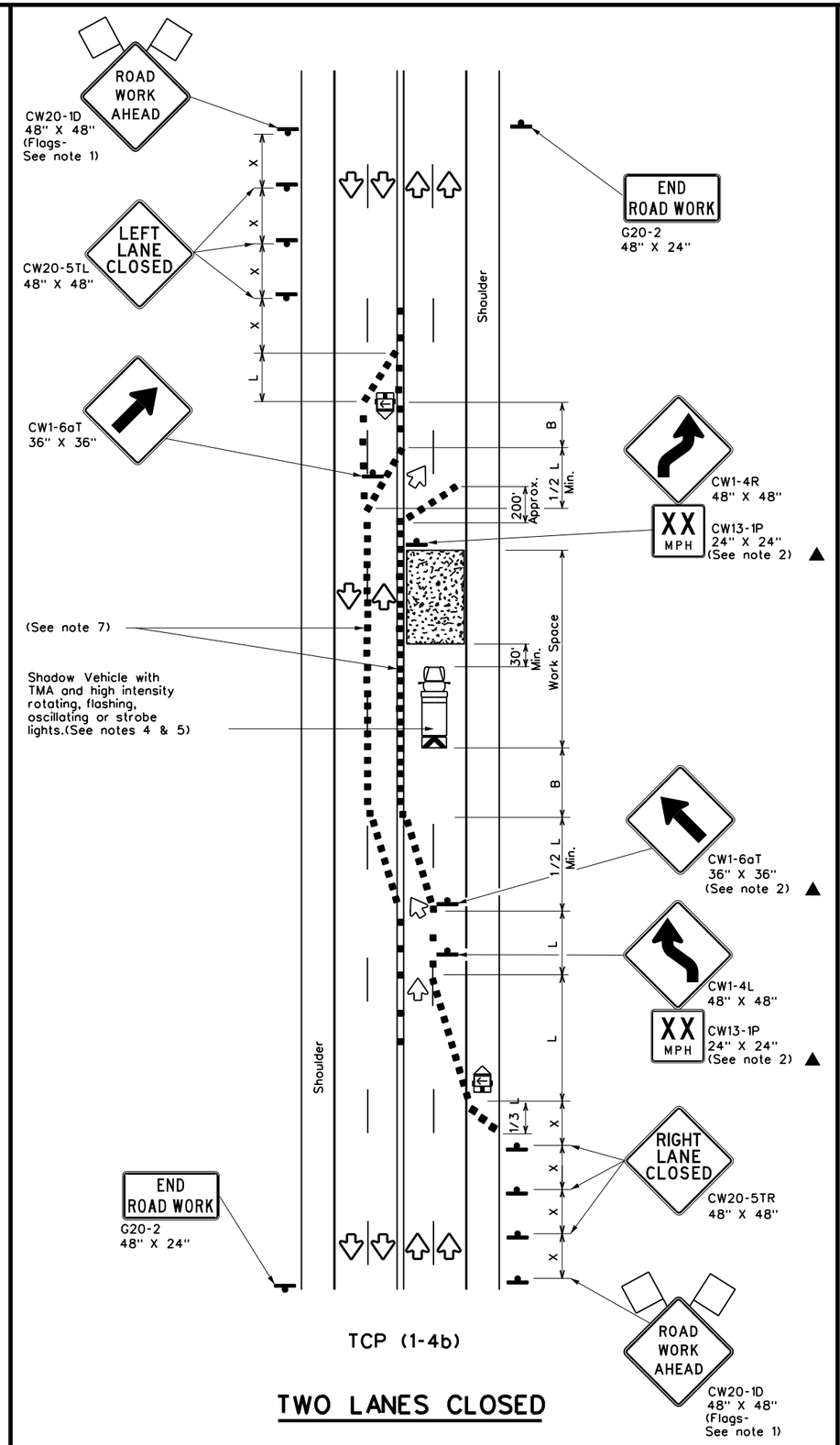
15.3

DATE: 10/31/2022 3:44:11 PM
FILE: T:*AMATPD*Construction Projects*0168-07*050 US 60 HERFORD TO CANYON*4 - Design*Plan Set*2. TCP*tcp1-4-18.dgn



TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

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

Posted Speed x	Formula	Minimum Desirable Taper Lengths x x 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'

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-4a)

6. If this TCP is used for a left lane closure , CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

TCP (1-4b)

7. Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-18

FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	AMA	DEAF SMITH		24
1-97 2-18				

DATE: 10/31/2022 3:44:11 PM
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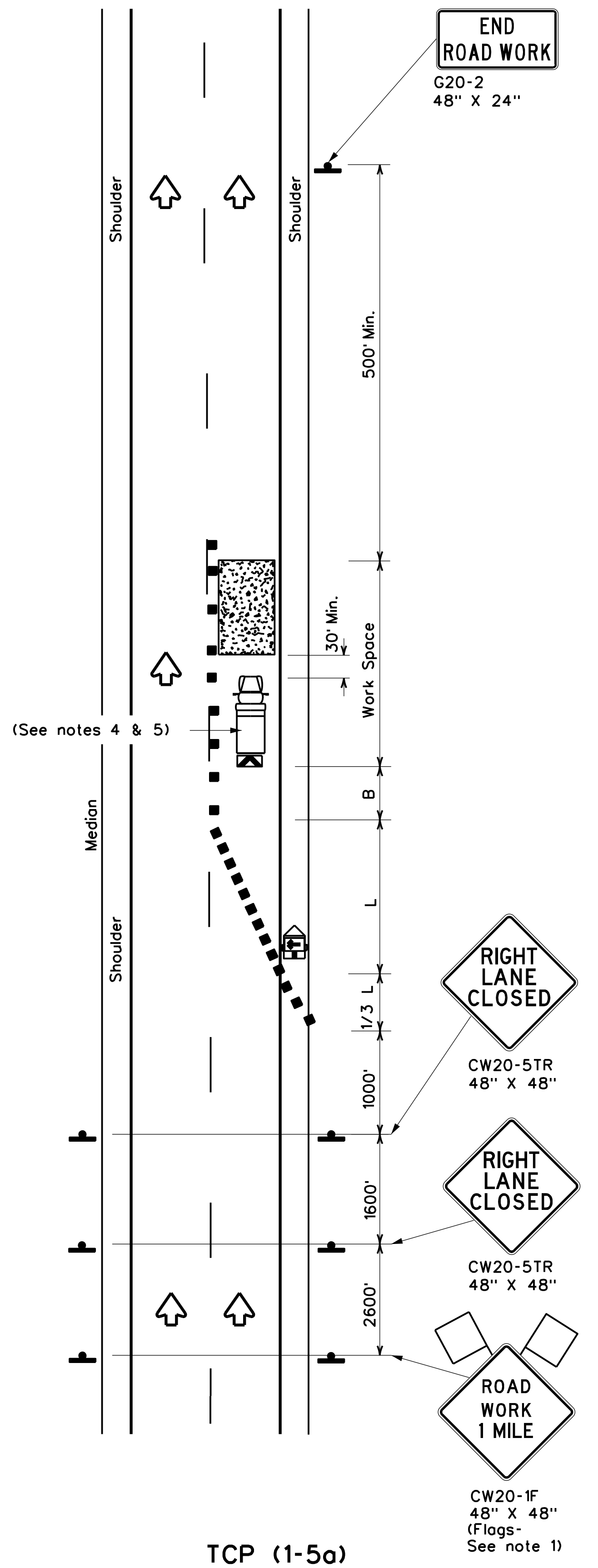
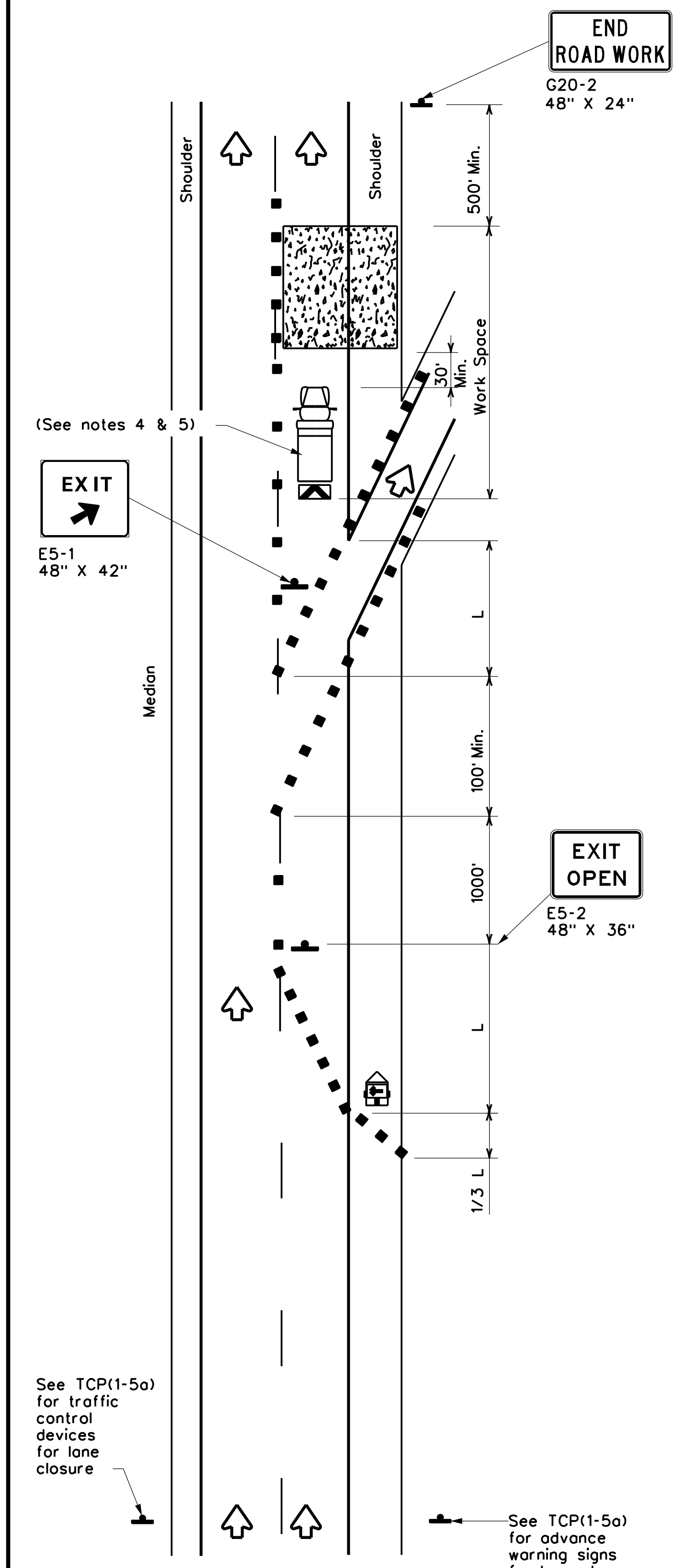


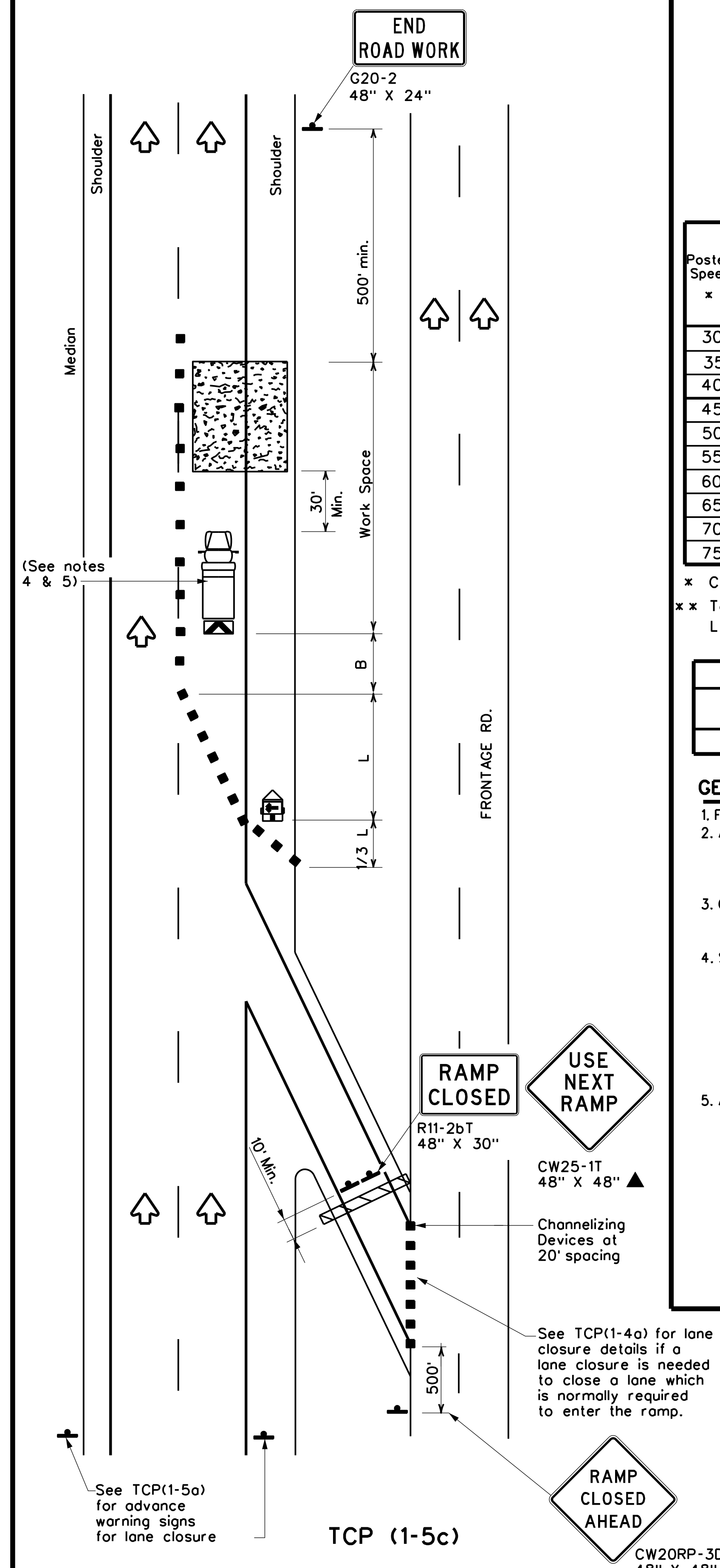
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 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 0168	SECT 07	JOB 050, ETC	HIGHWAY US60
REVISIONS 2-18	DIST AMA		COUNTY DEAF SMITH	SHEET NO. 25

DATE: 10/31/2022 3:44:12 PM
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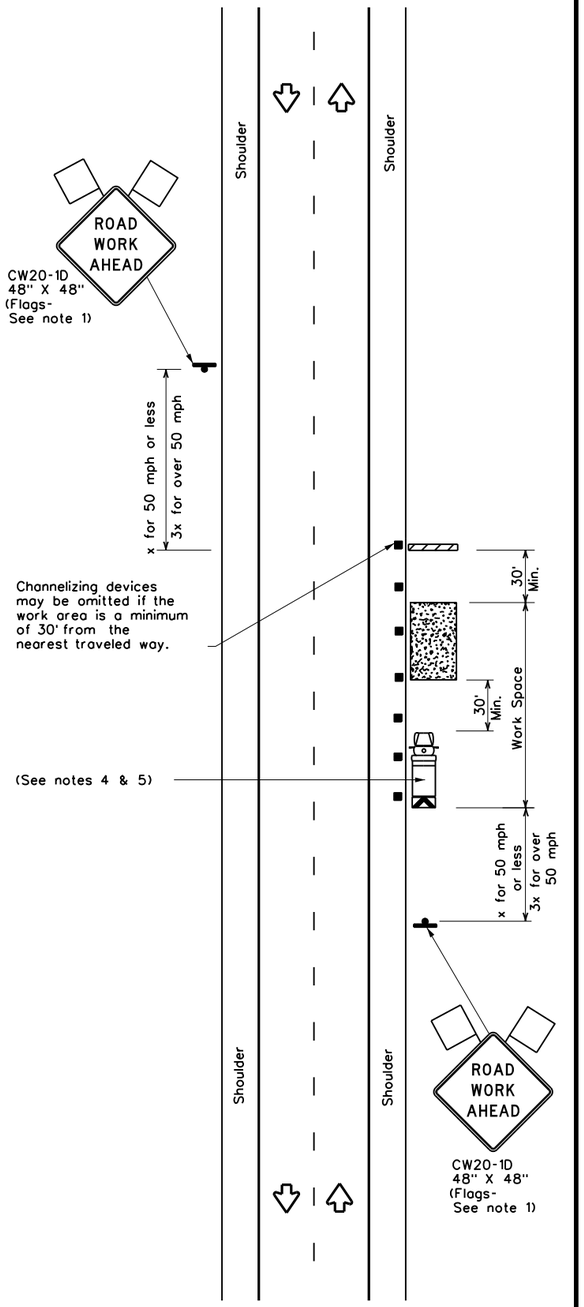
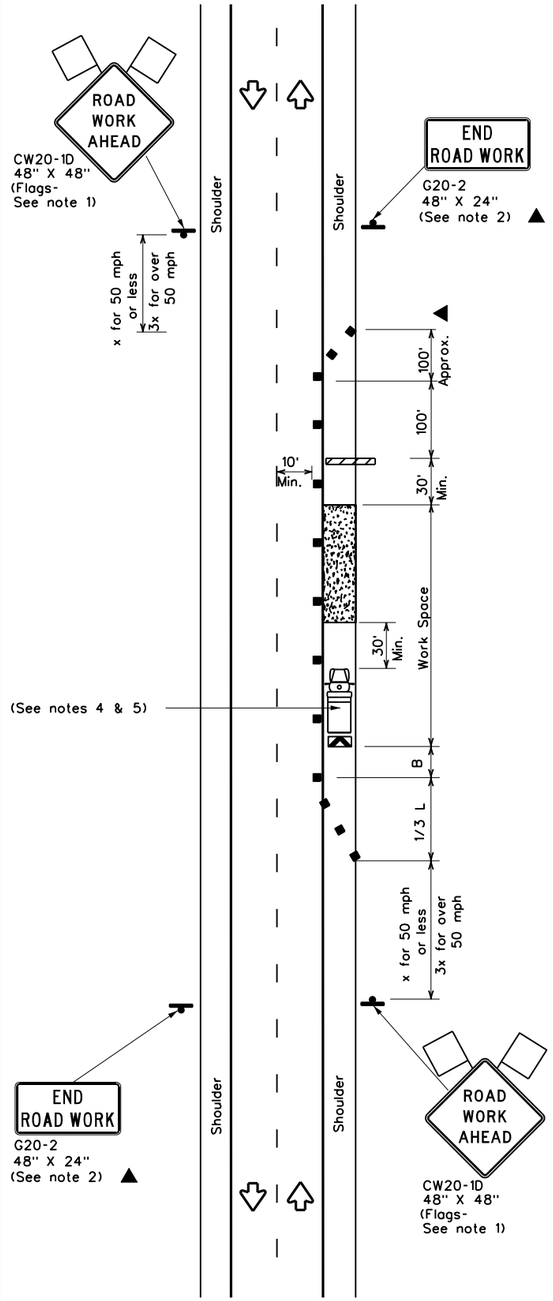


TCP (2-1a)

WORK SPACE NEAR SHOULDER

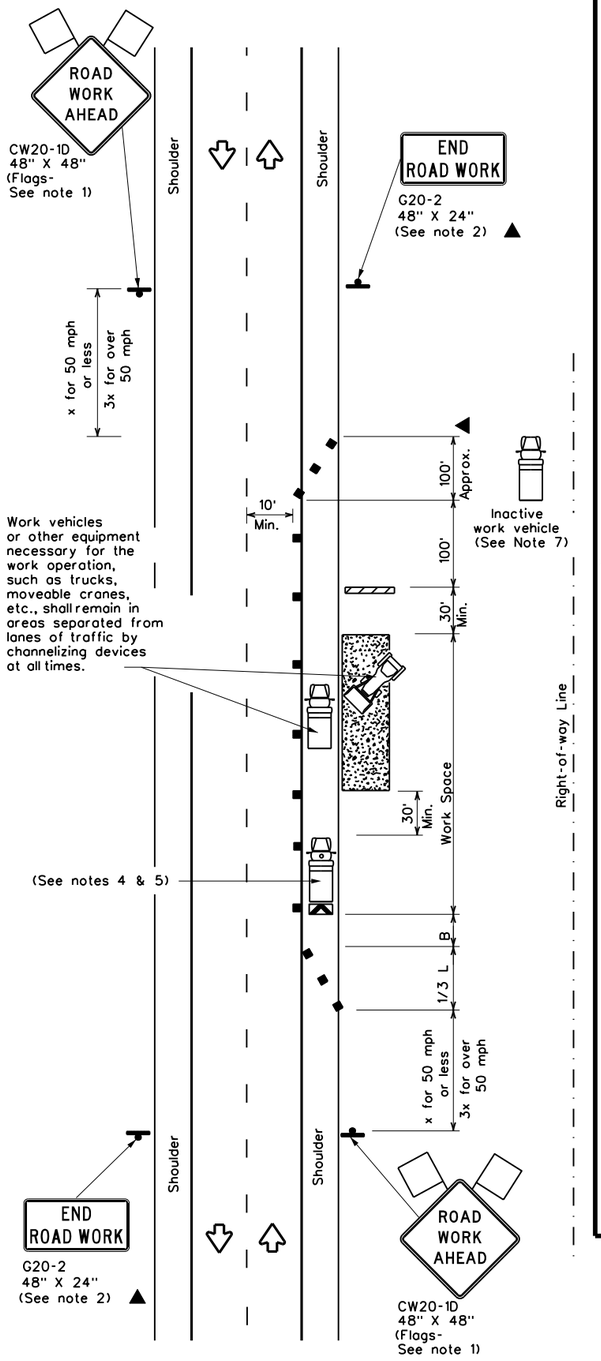
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER

Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER

Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	AMA	DEAF SMITH		26
1-97 2-18				

161

DATE: 10/31/2022 3:44:12 PM
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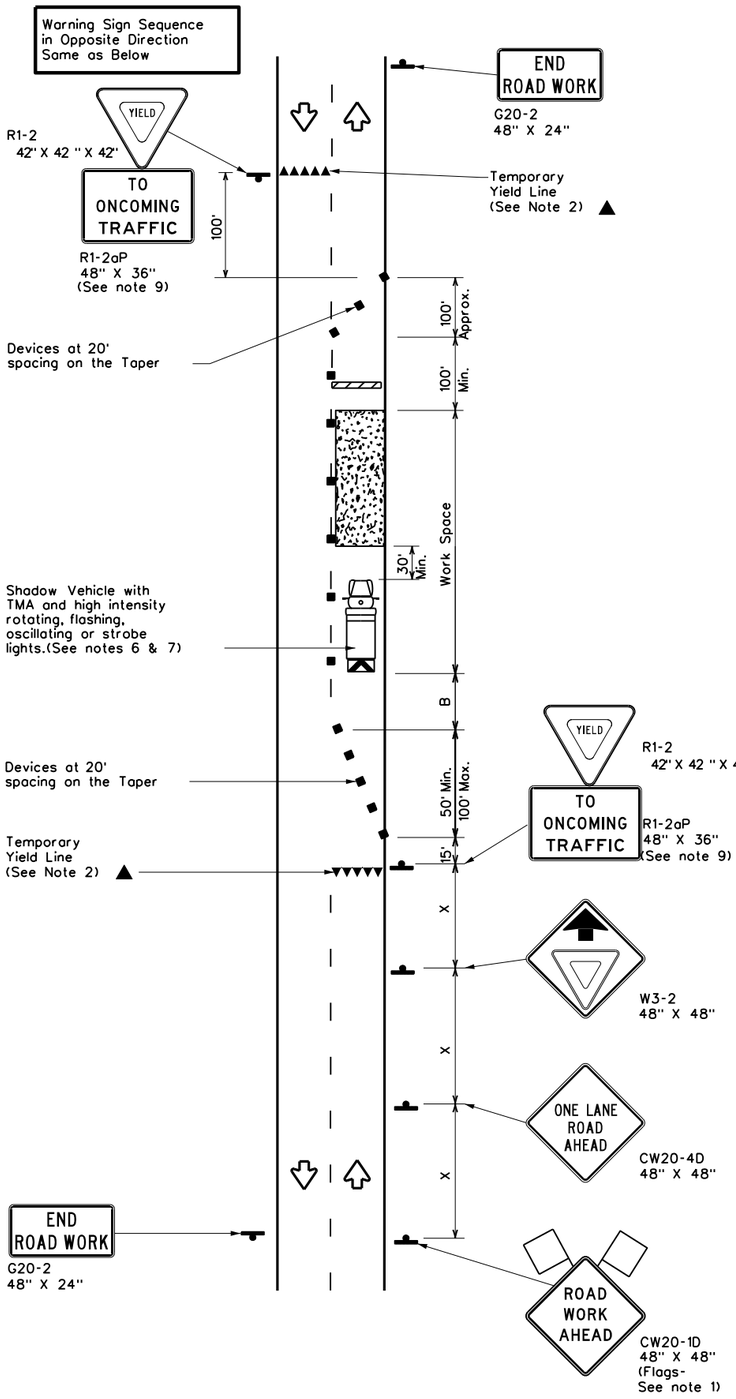
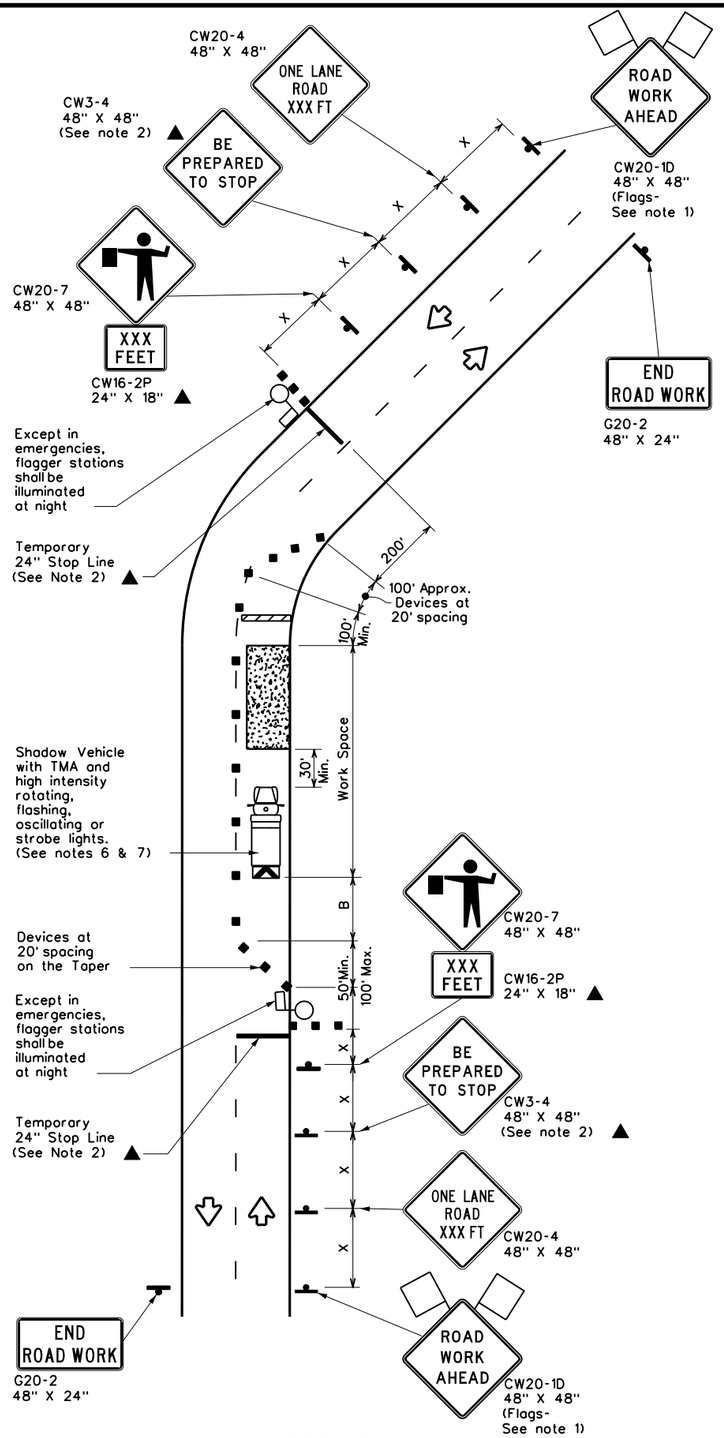


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-2a)

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

TCP (2-2b)

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0168	07	050, ETC	US60
	DIST	COUNTY		SHEET NO.
	AMA	DEAF SMITH		27

DATE: 10/31/2022 3:44:13 PM
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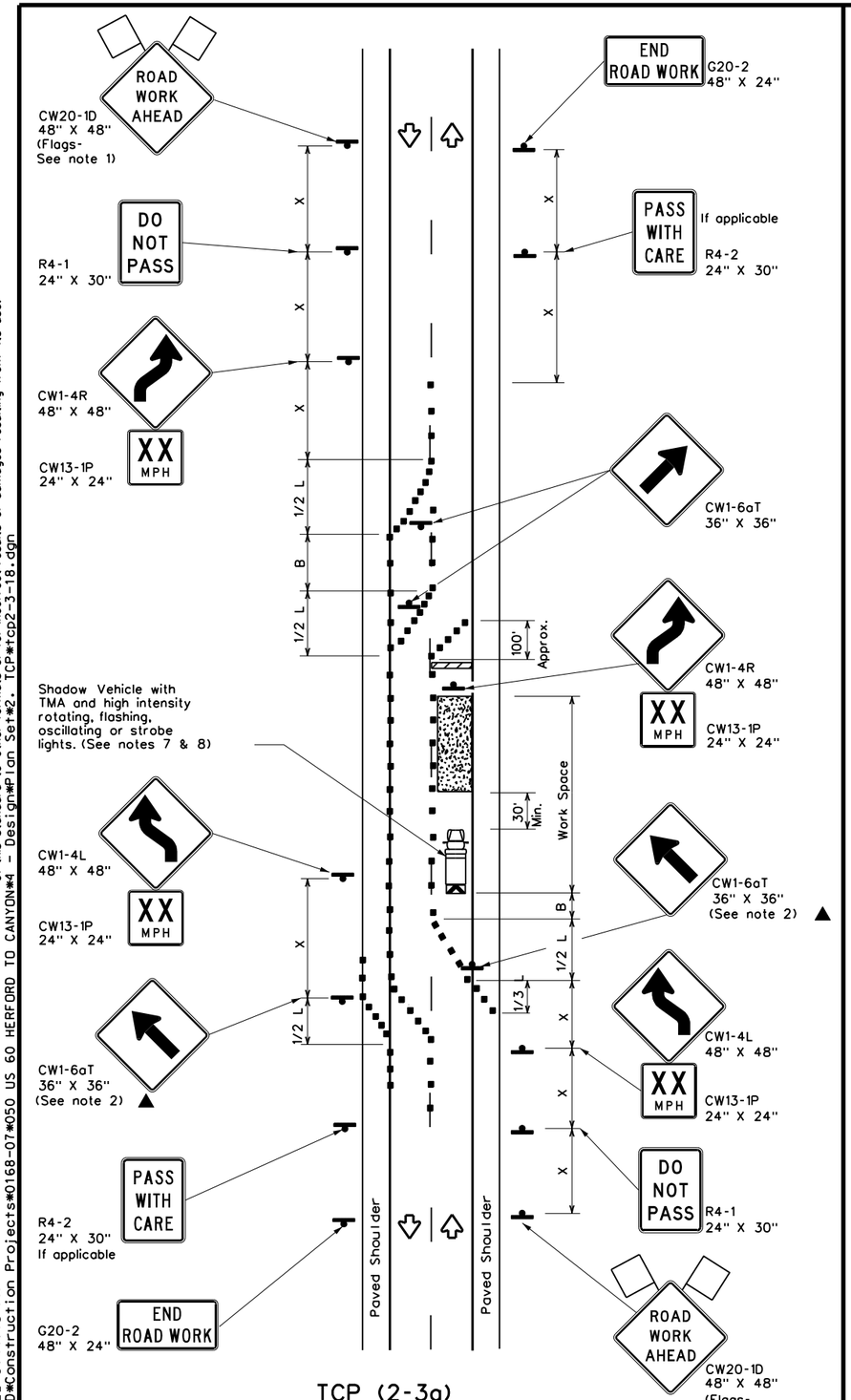
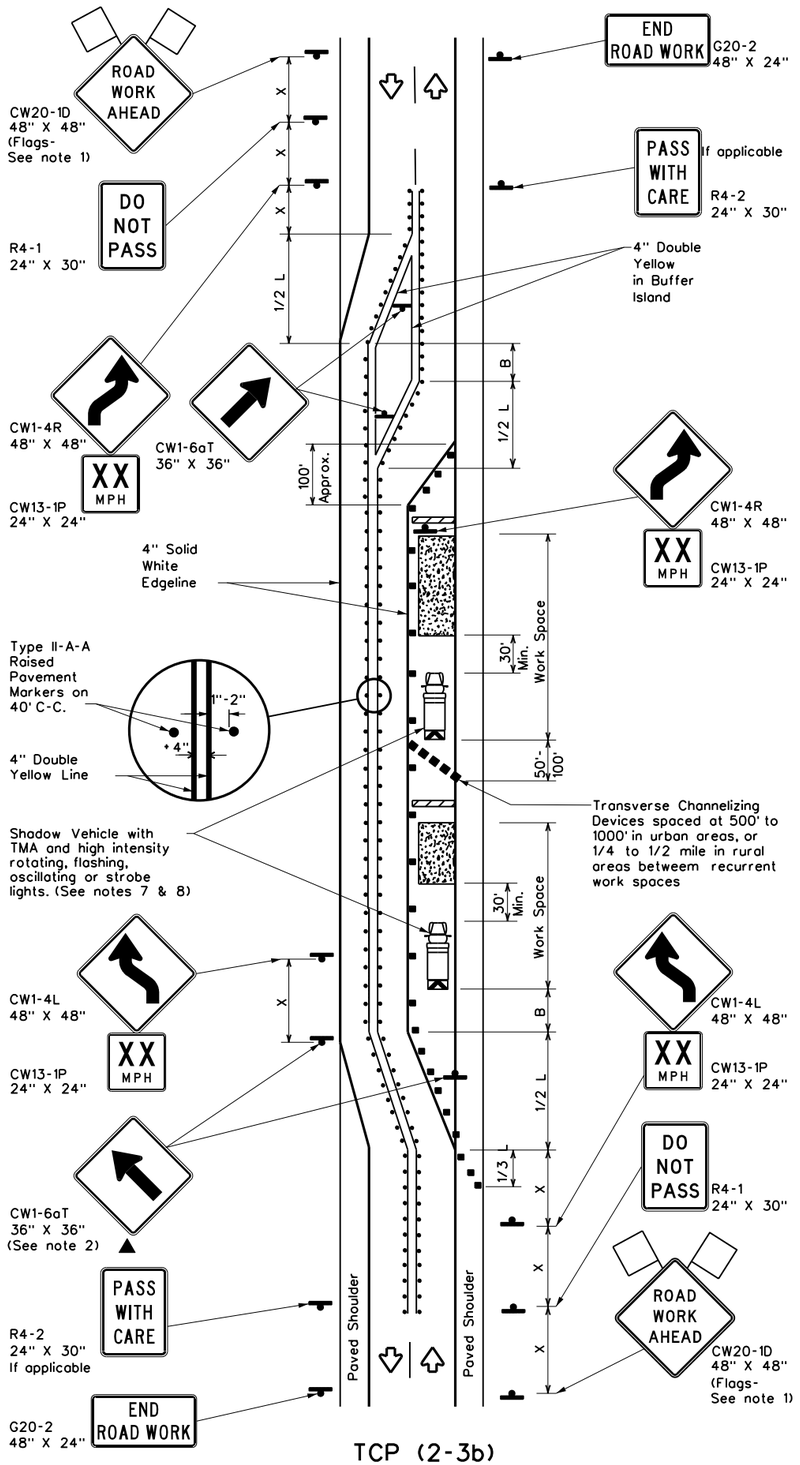


TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS
ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



TCP (2-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS
ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Raised Pavement Markers Ty II-AA
	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
				TCP(2-3b)ONLY
			✓	✓

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. When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
4. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
5. The R4-1 "DO NOT PASS," R4-2 " PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
6. Conflicting pavement marking shall be removed for long term projects.
7. 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.
8. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-3a)

9. Conflicting pavement markings shall be removed for long-term projects. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter device spacing is intended for the area of the conflicting markings, not the entire work zone.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-18

FILE: tcp(2-3)-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0168	07	050, ETC	US60
	DIST	COUNTY		SHEET NO.
	AMA	DEAF SMITH		28

16.3

DATE: 10/31/2022 3:44:13 PM
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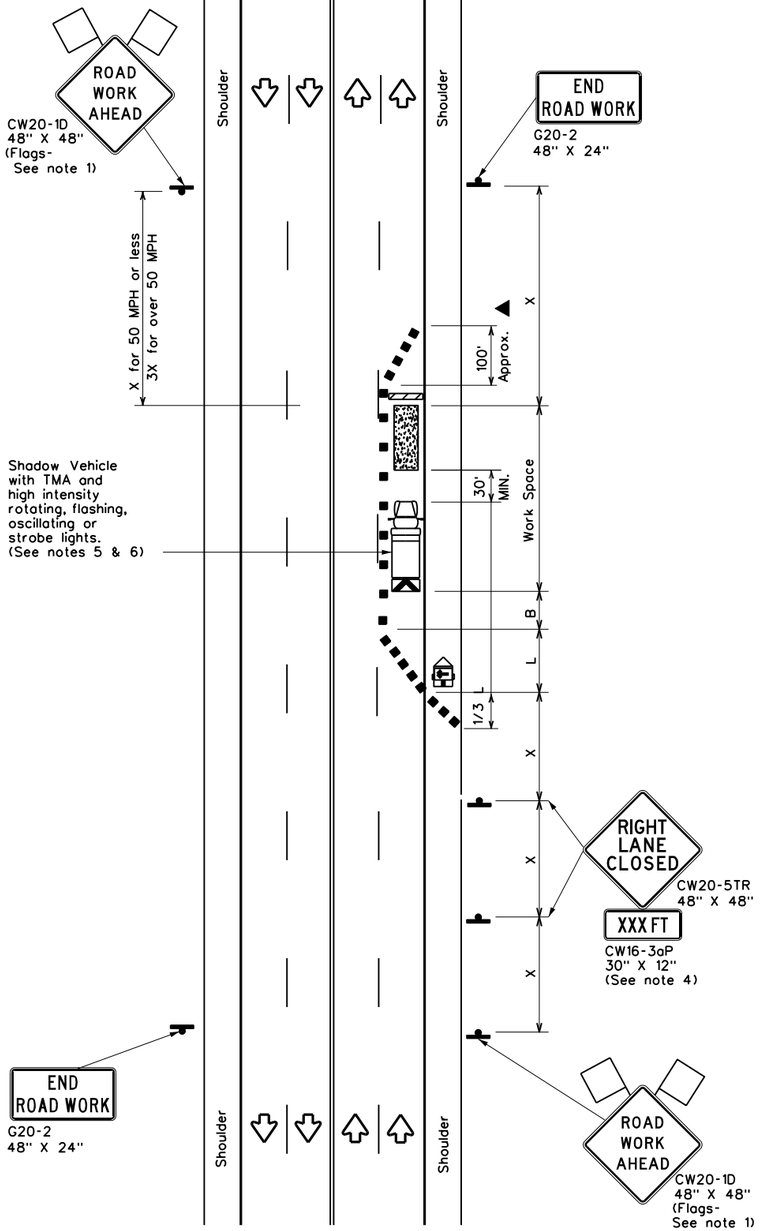
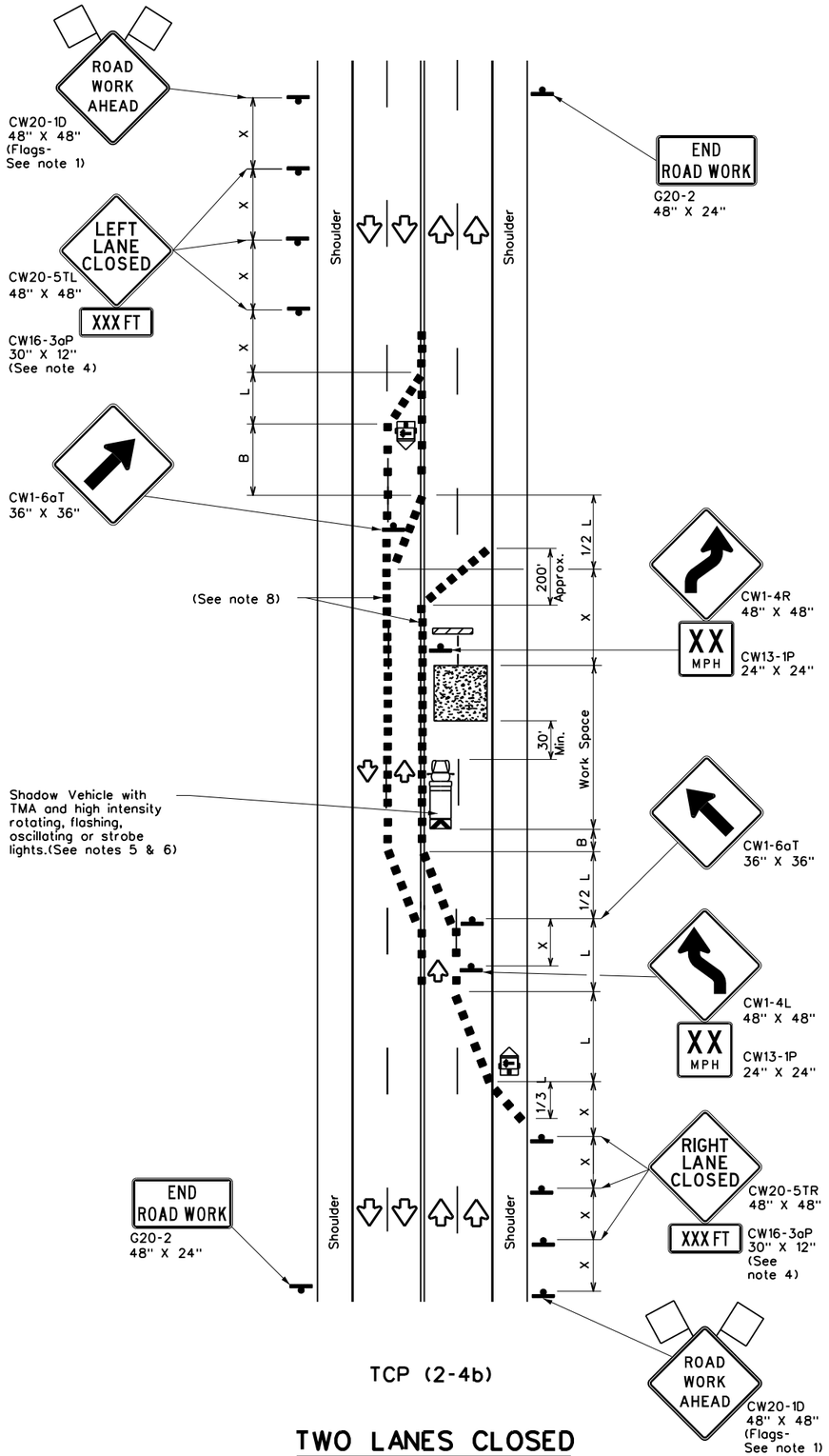


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 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. The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
5. 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.
6. 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.

TCP (2-4a)

7. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED"signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-4b)

8. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter devices spacing is intended for the area of conflicting markings, not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0168	07	050, ETC	US60
	DIST	COUNTY		SHEET NO.
	AMA	DEAF SMITH		29

164

DATE: 10/31/2022 3:44:13 PM
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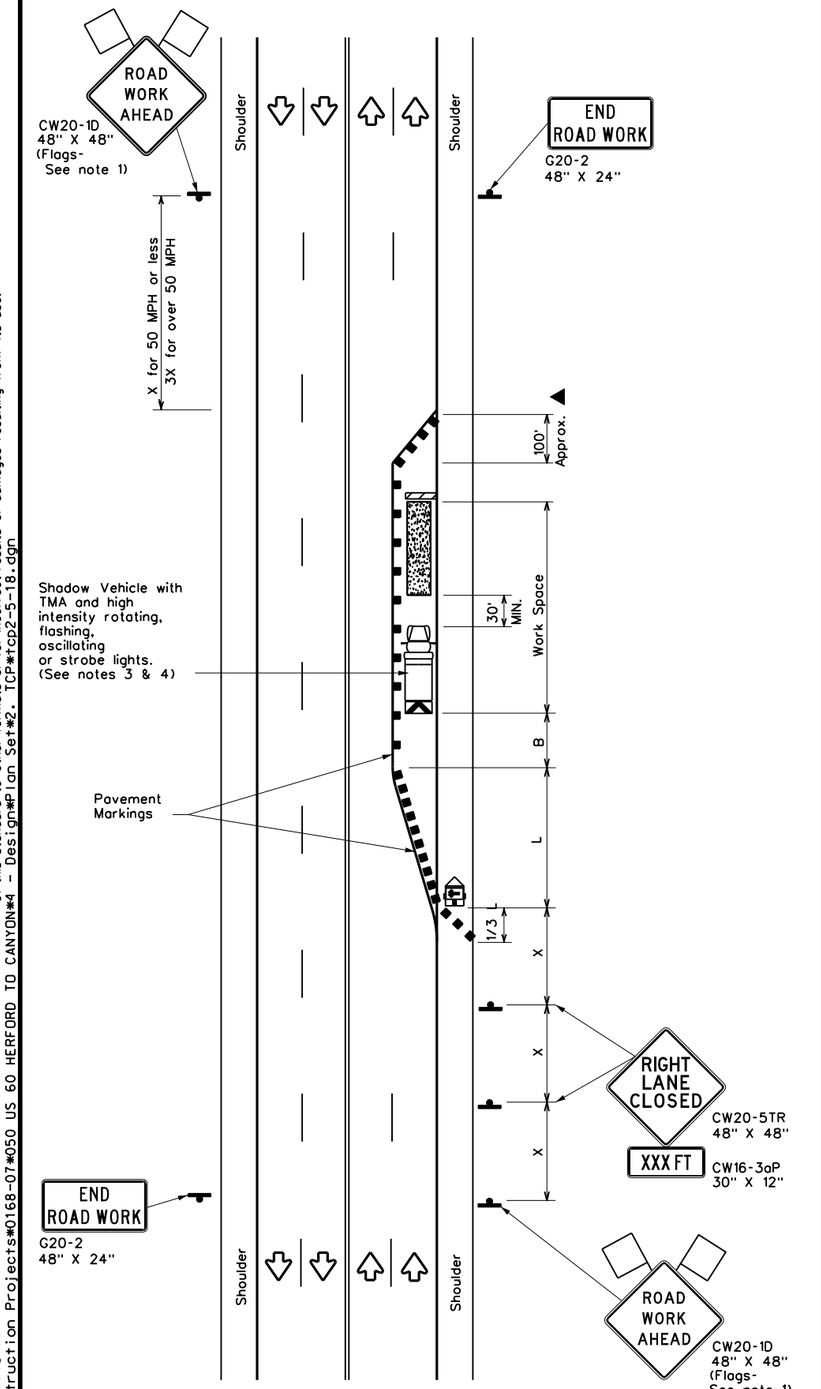
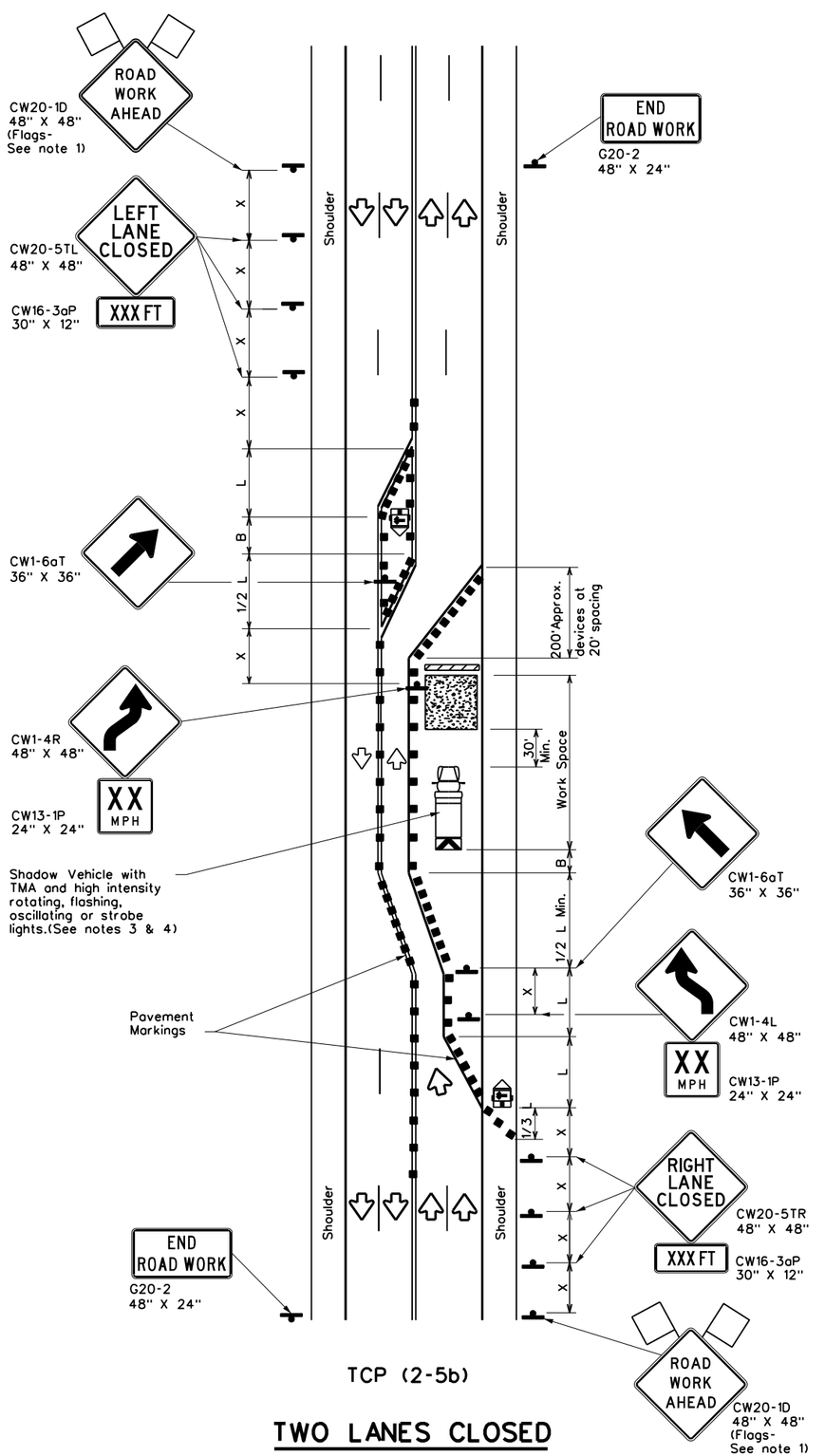


TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths * * 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. 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 eposure 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 substitutued for the Shadow Vehicle and TMA.
4. 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.
5. The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

6. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic, with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-5b)

7. Conflicting pavement markings shall be removed for long-term projects.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
8-95 2-12	DIST	COUNTY		SHEET NO.
1-97 3-03	AMA	DEAF SMITH		30
4-98 2-18				

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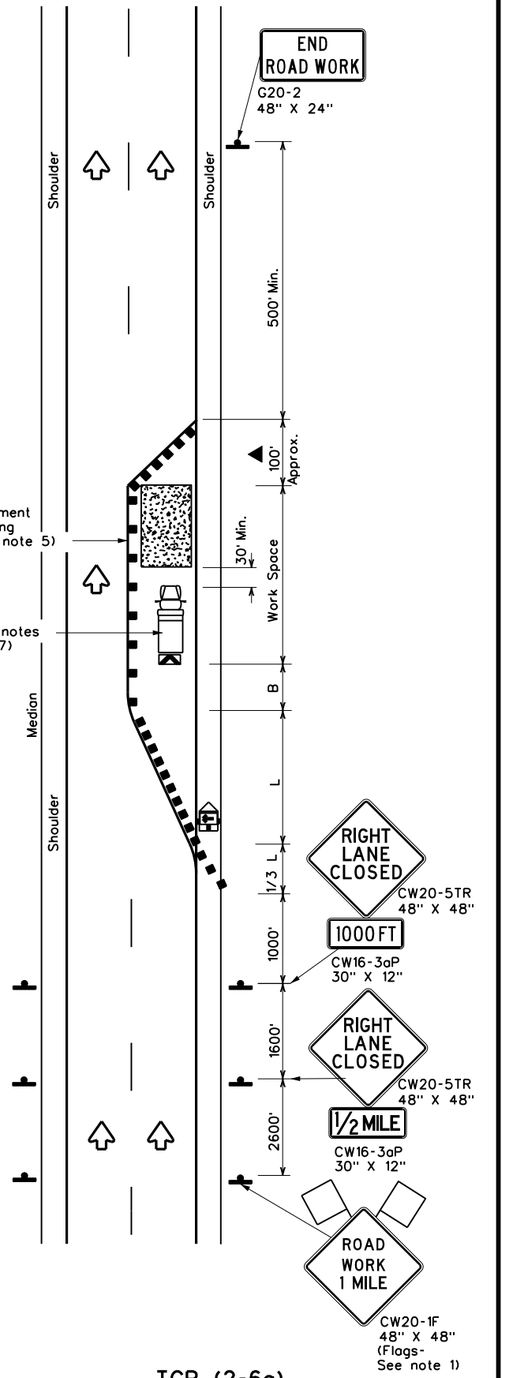
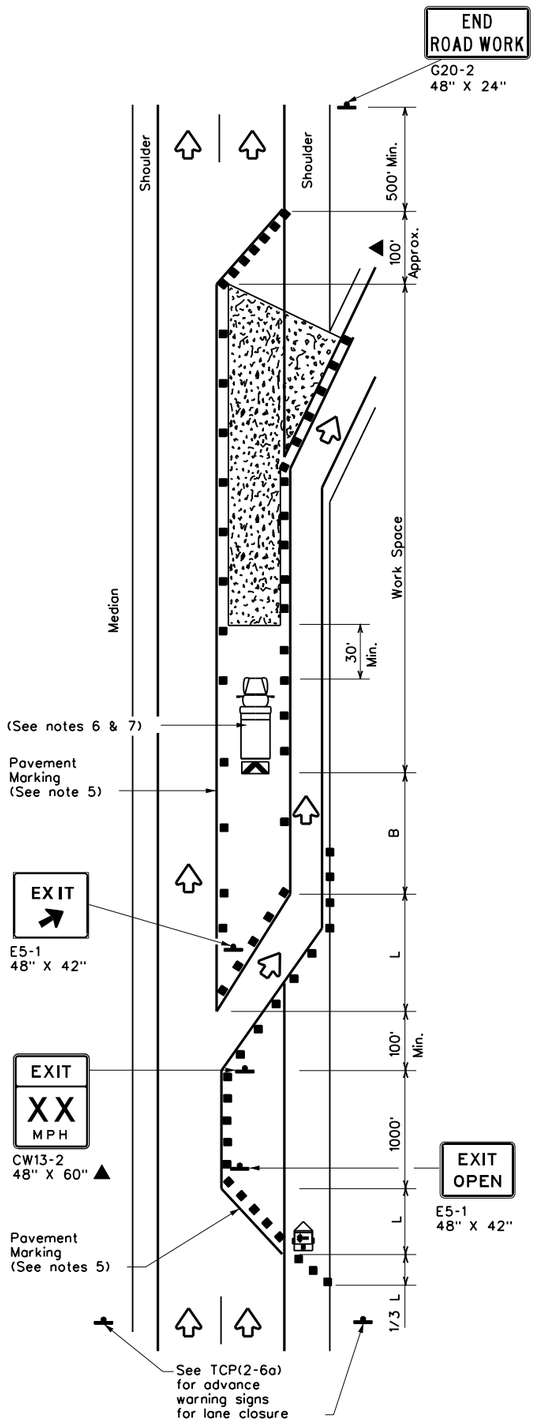


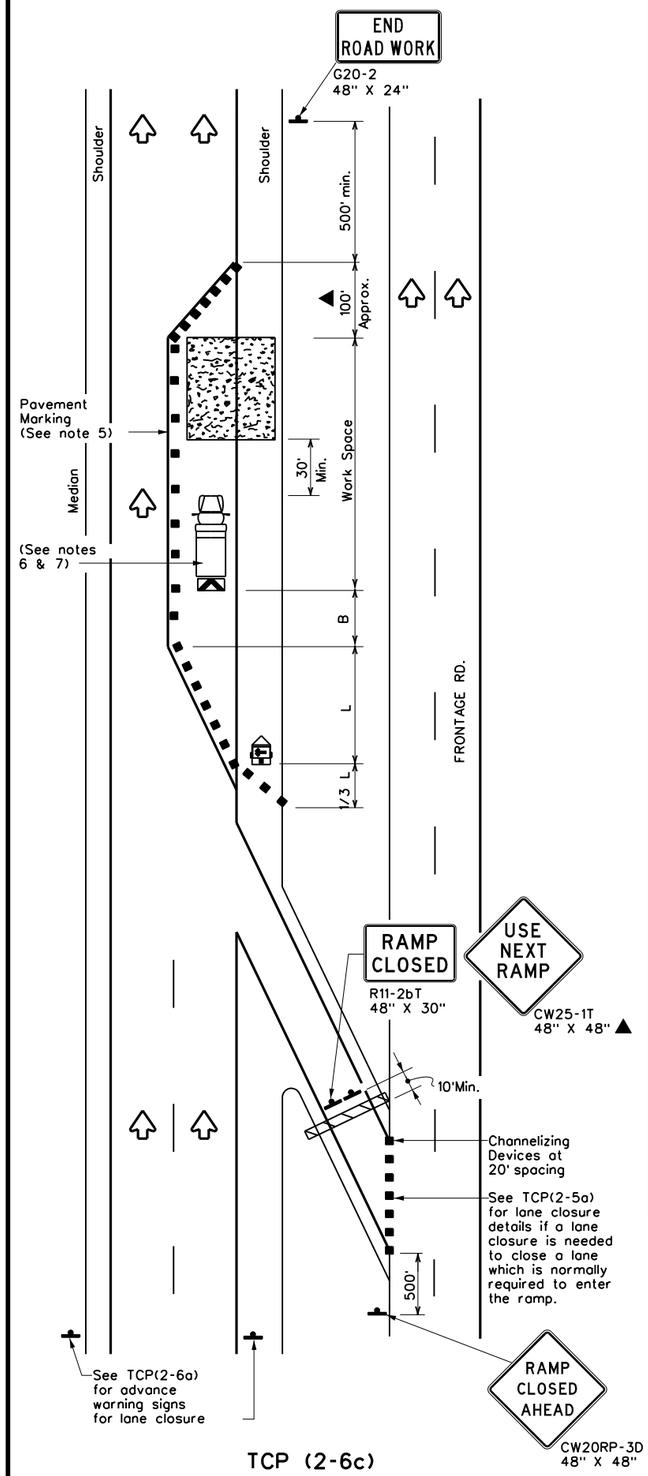
TCP (2-6a)

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	0168	07	050, ETC	US60
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	AMA	DEAF SMITH		31
1-97 2-18				

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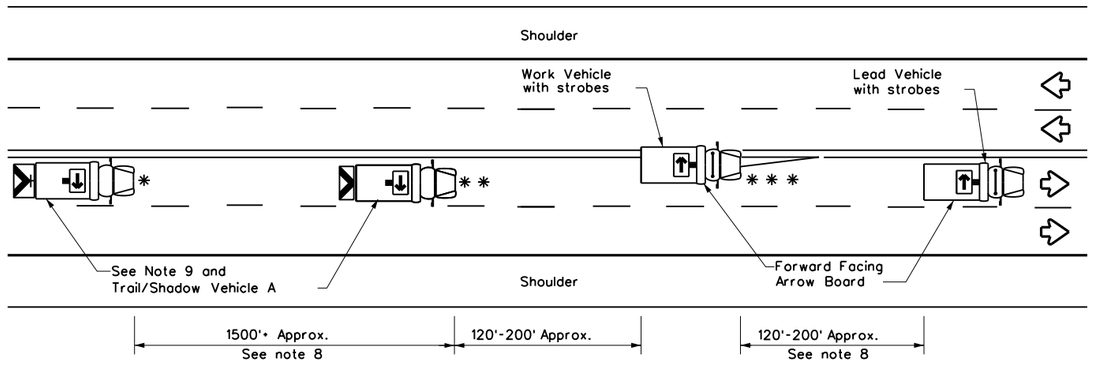
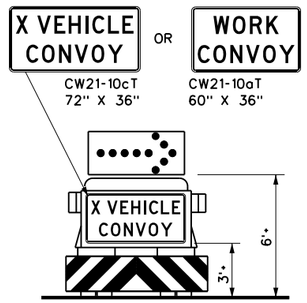


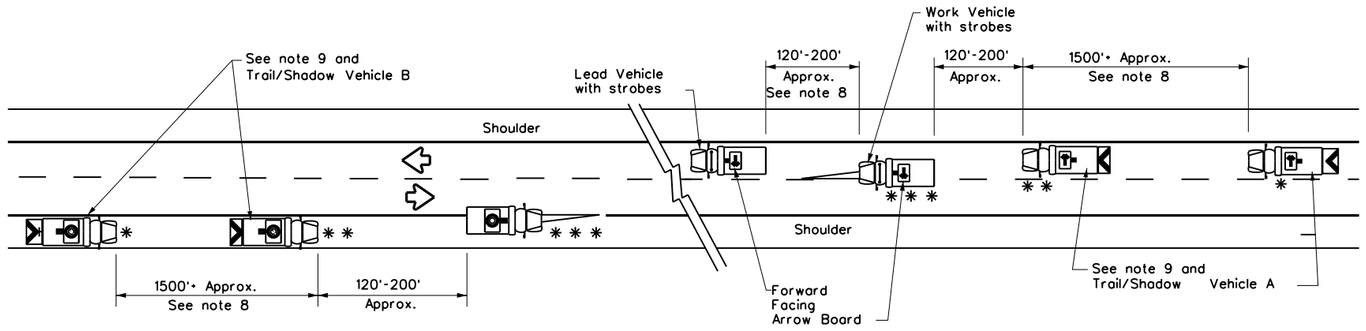
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

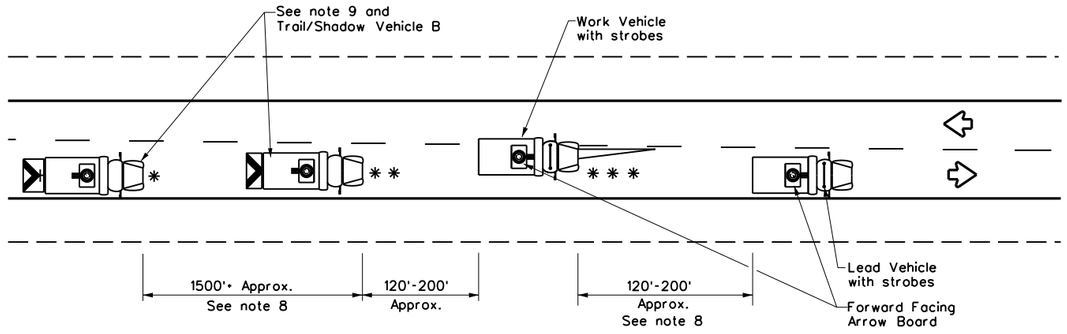


WORK ON SHOULDER

WORK ON TRAVEL LANE

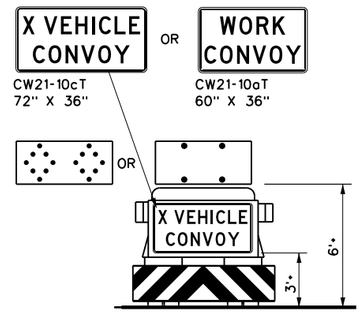
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

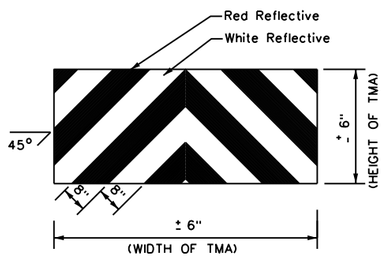
with Flashing Arrow Board in CAUTION display

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
2-94 4-98 8-95 7-13 1-97	DIST	COUNTY		SHEET NO.
	AMA	DEAF SMITH		32

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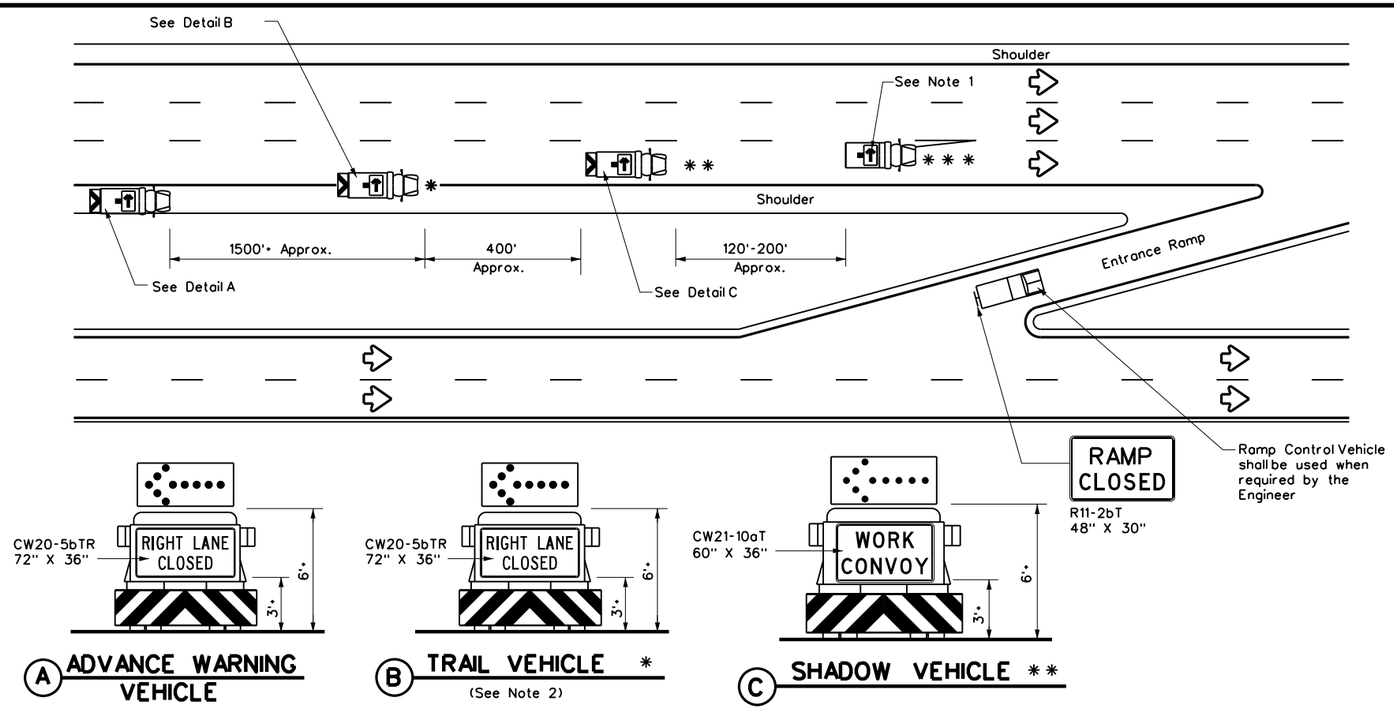
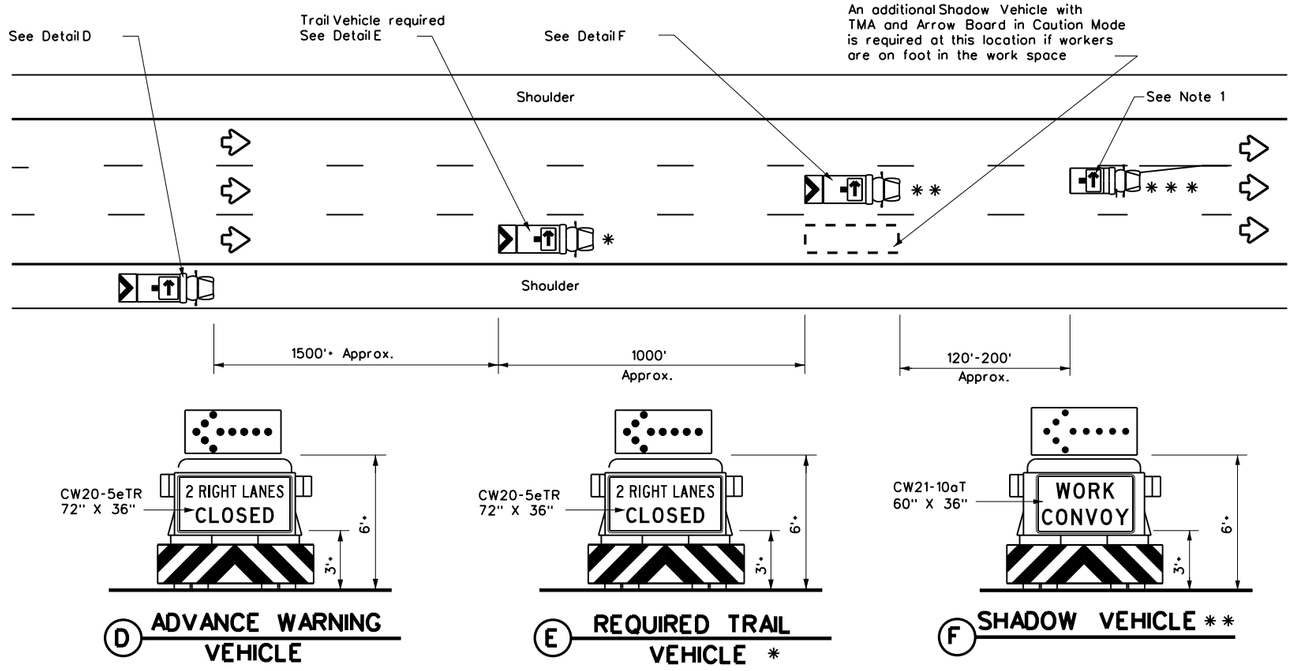


RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



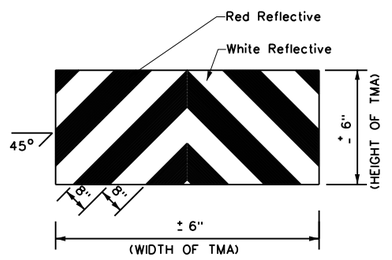
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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

GENERAL NOTES

1. ADVANCE WARNING, TRAIL and SHADOW vehicles shall be equipped with Type B or Type C flashing arrow boards as per the Barricade and Construction (BC) standards. Arrow boards on WORK vehicles will be optional based on the type of work being performed. The arrow boards shall be operated from inside the vehicle.
2. For TCP(3-2a) the Engineer will determine if the TRAIL VEHICLE is required based on prevailing roadway conditions, traffic volume, and sight distance restrictions. All other vehicles shown for both TCP(3-2a) and TCP(3-2b) are required.
3. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
4. The use of truck mounted attenuators (TMA) on the ADVANCE WARNING, SHADOW, and TRAIL vehicles are required.
5. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DMS 8300, Type A.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE may vary according to terrain, work activity and other factors.
9. Standard 48" X 48" diamond shaped warning signs with the same message as those shown may be used where adequate mounting space exists.
10. The signs shown should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or a truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board, must be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
12. The principles on this sheet may be used to close lanes from the left side of the roadway considering the number of lanes, shoulder width, sight distance, and ramp frequency.
13. Signs and flashing arrow board modes shall be appropriately altered when implementing left lane closures or interior closures which close the left lanes.
14. The Advance Warning Vehicle may straddle the edgeline when shoulder width makes it necessary.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	AMA	DEAF SMITH		33
1-97				

176

DATE: 10/31/2022 3:44:15 PM
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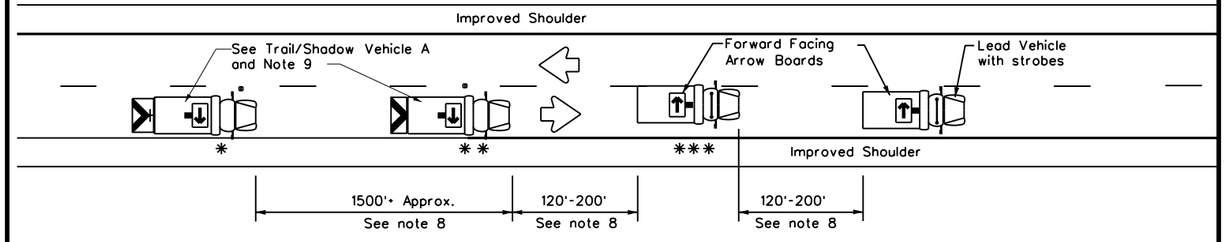
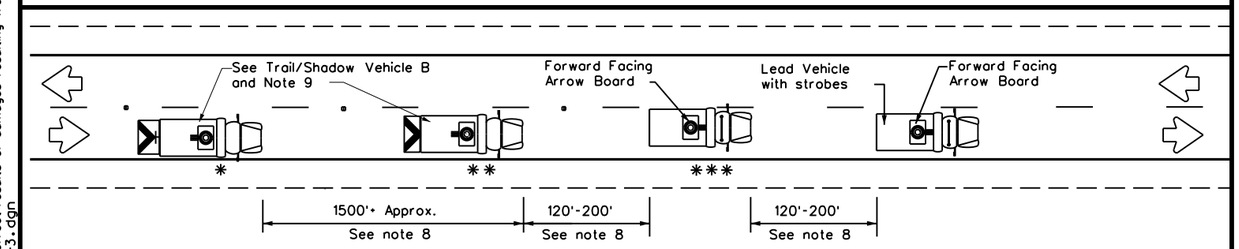


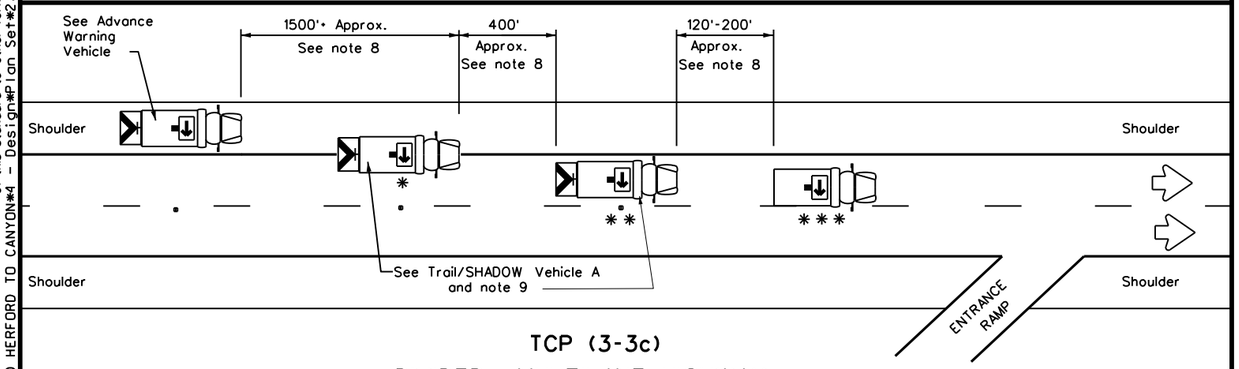
TCP (3-3a)

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



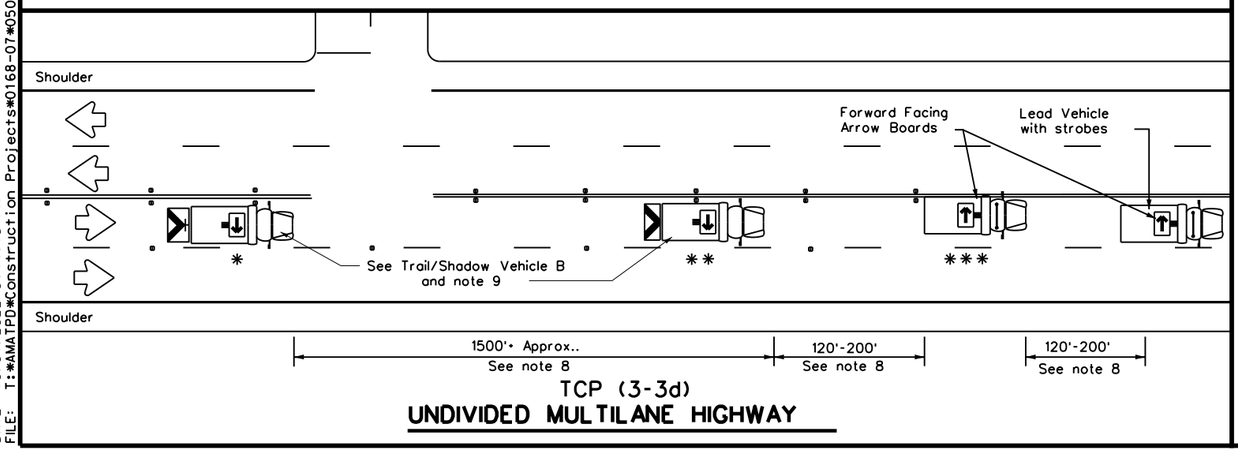
TCP (3-3b)

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



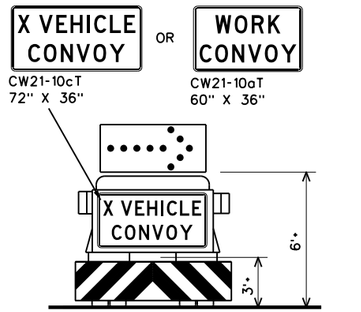
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



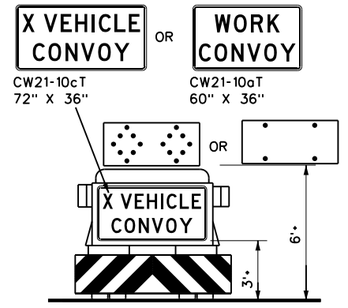
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



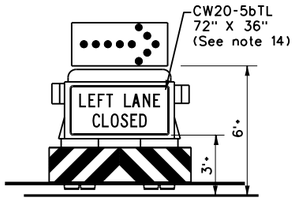
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

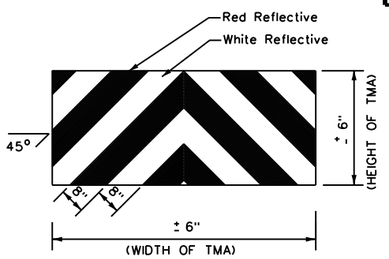


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

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

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	AMA	DEAF SMITH		34
1-97 7-14				

DATE: 10/31/2022 3:44:15 PM
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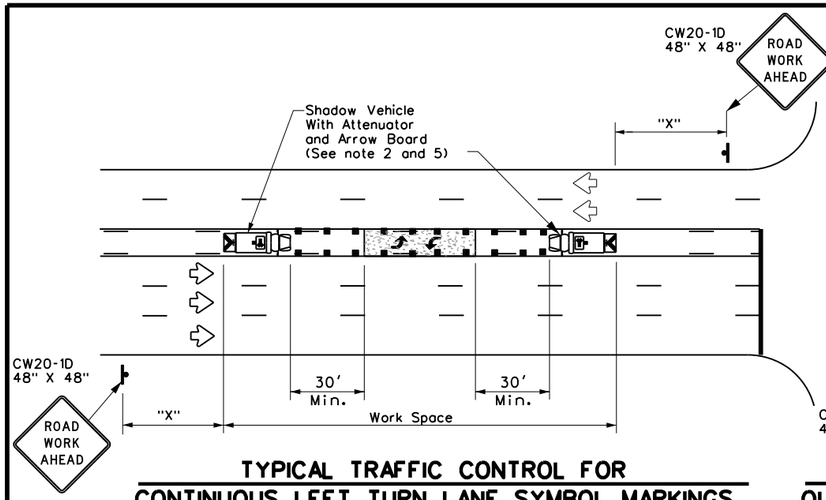
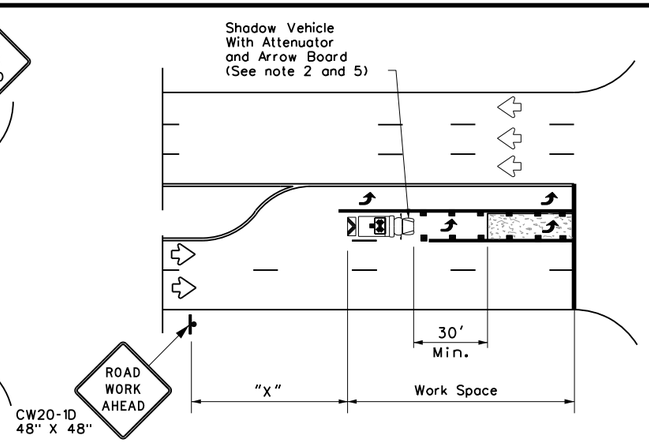
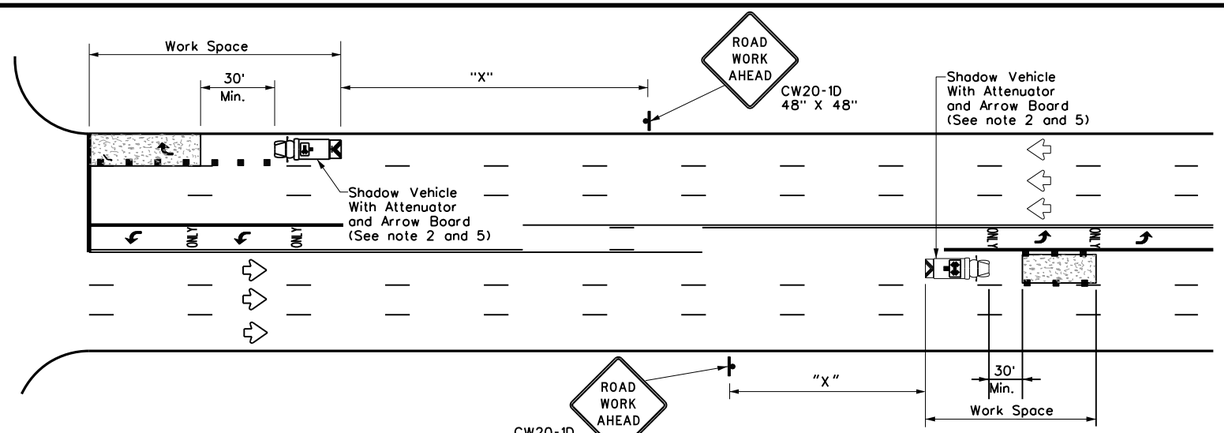


TYPICAL TRAFFIC CONTROL FOR
CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

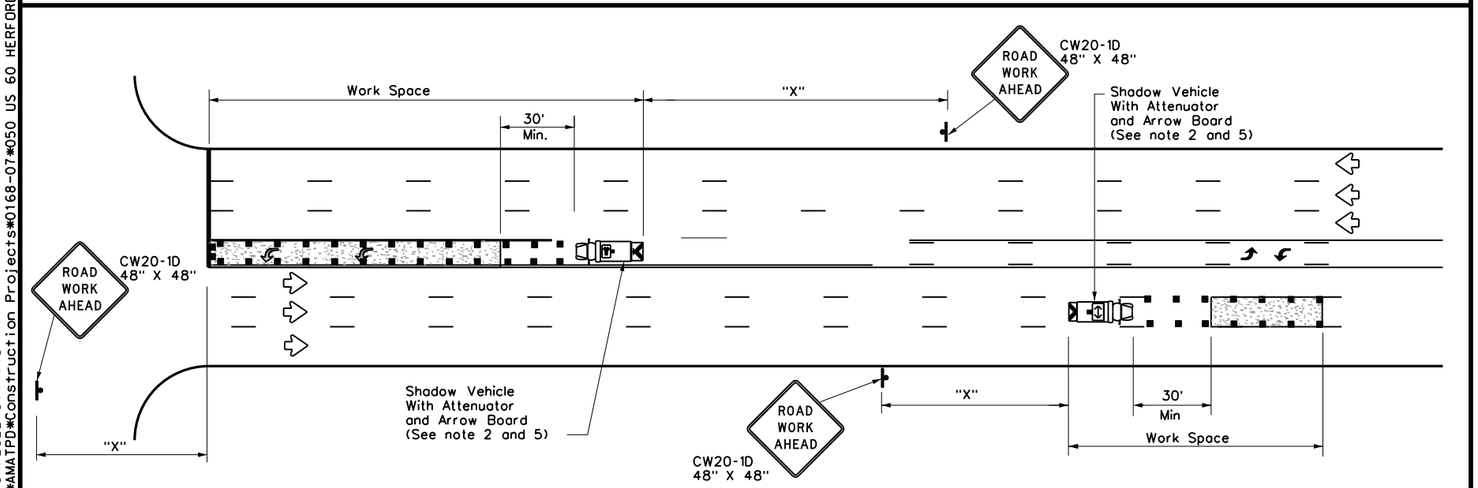


TYPICAL TRAFFIC CONTROL FOR
OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



TYPICAL TRAFFIC CONTROL FOR
OUTSIDE LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR
INSIDE LANE MARKINGS



TYPICAL TRAFFIC CONTROL FOR
LEFT TURN LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR
CENTER LANE MARKINGS

LEGEND

*	Trail Vehicle	ARROW BOARD DISPLAY	
* *	Shadow Vehicle		
* * *	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		Channelizing Devices

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

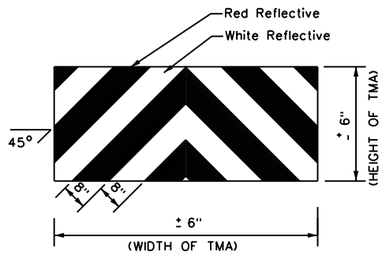
1. This traffic control plan is for use on conventional roads posted at 45 mph or less and is intended for mobile operations that move continuously or intermittently (stopping up to approximately 15 minutes) such as short-line striping and in-lane rumble strips. When activities are anticipated to take longer amounts of time or traffic conditions warrant, a short duration or short-term stationary traffic control plan should be used.

2. A Truck Mounted Attenuator shall be used on Shadow Vehicle. Striping on the back panel of all truck mounted attenuators shall be 8" red and white reflective sheeting placed in an inverted "V" design. Reflective sheeting shall meet or exceed the reflectivity and color requirements of departmental material specification DMS-8300, Type A.

3. All traffic control devices shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD), latest edition.

4. The use of yellow rotating beacons or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the drivers side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.

5. Flashing arrow board shall be used on Shadow Vehicle. Flashing arrow board shall be Type B or Type C as per BC Standards. The arrow board operation shall be controlled from inside the truck.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

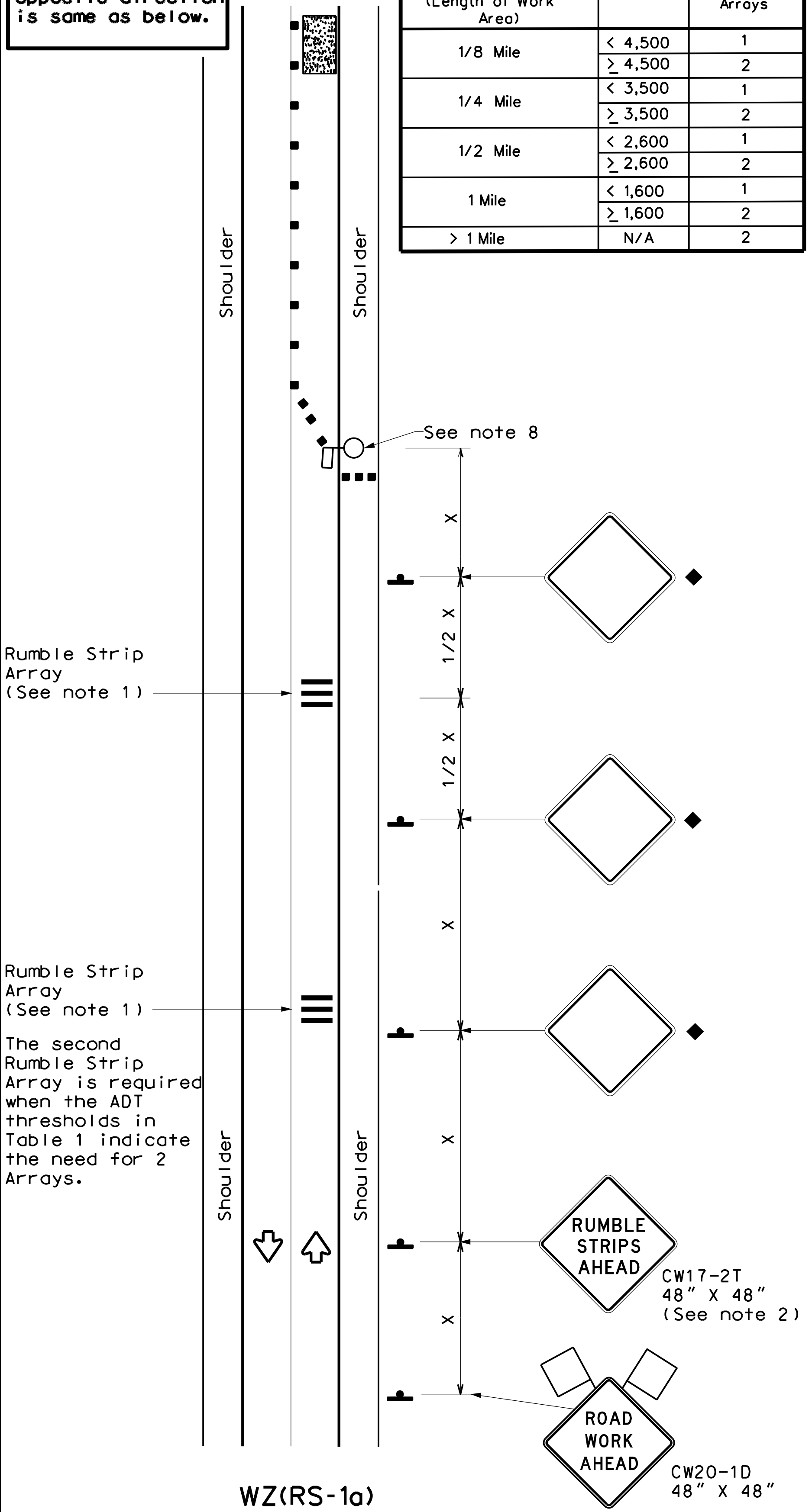
TRAFFIC CONTROL PLAN MOBILE OPERATIONS FOR ISOLATED WORK AREAS UNDIVIDED HIGHWAYS

TCP(3-4)-13

FILE: tcp3-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT July, 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
	DIST	COUNTY		SHEET NO.
	AMA	DEAF SMITH		35

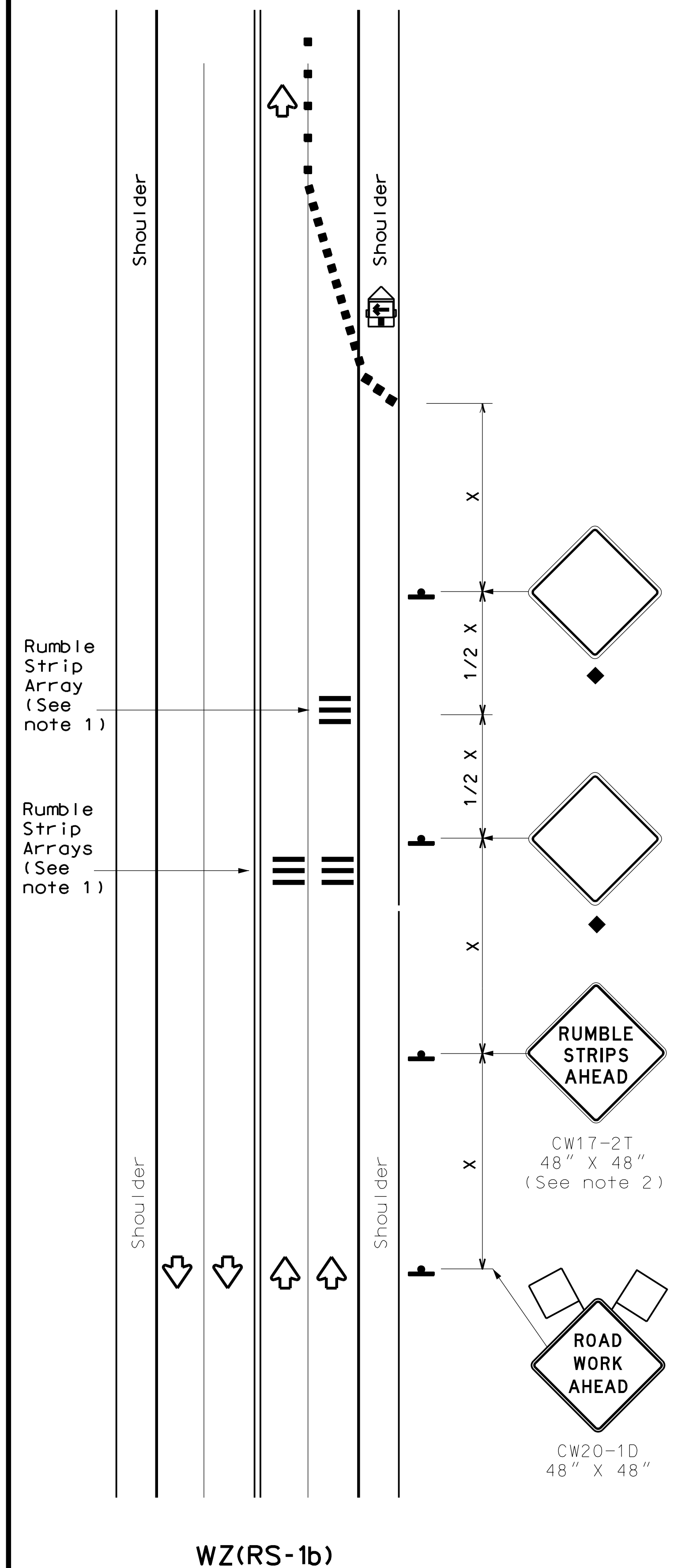
Warning sign and rumble strip sequence in opposite direction is same as below.

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



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

* Conventional Roads Only

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

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

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

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

TABLE 2	
Speed	Approximate distance between strips in an array
✳ 40 MPH	10'
₡ 40 MPH & ✳ 55 MPH	15'
= 60 MPH	20'
₡ 65 MPH	✳ 35'+

Texas Department of Transportation

Traffic Safety Division Standard

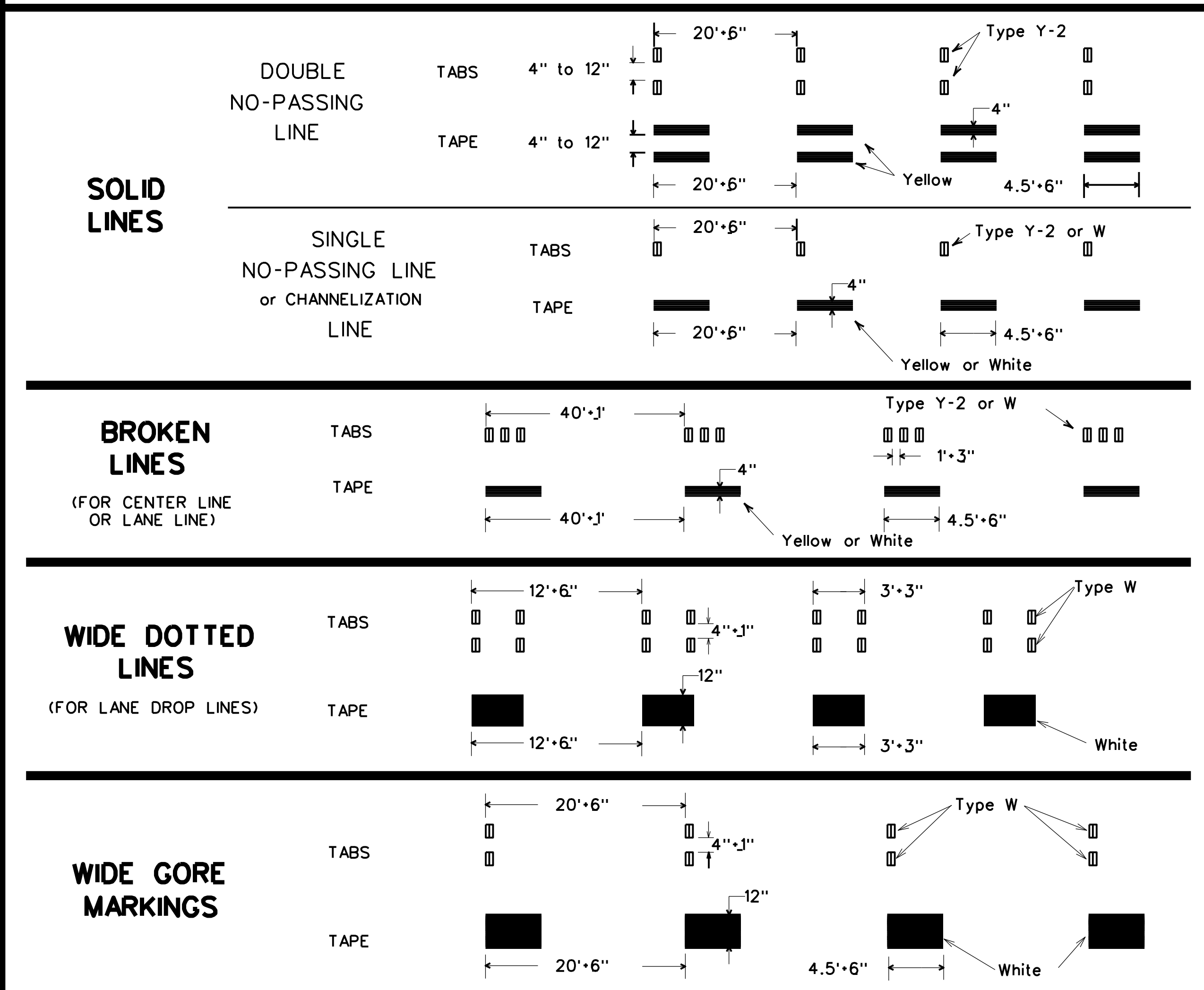
TEMPORARY RUMBLE STRIPS

WZ(RS)-22

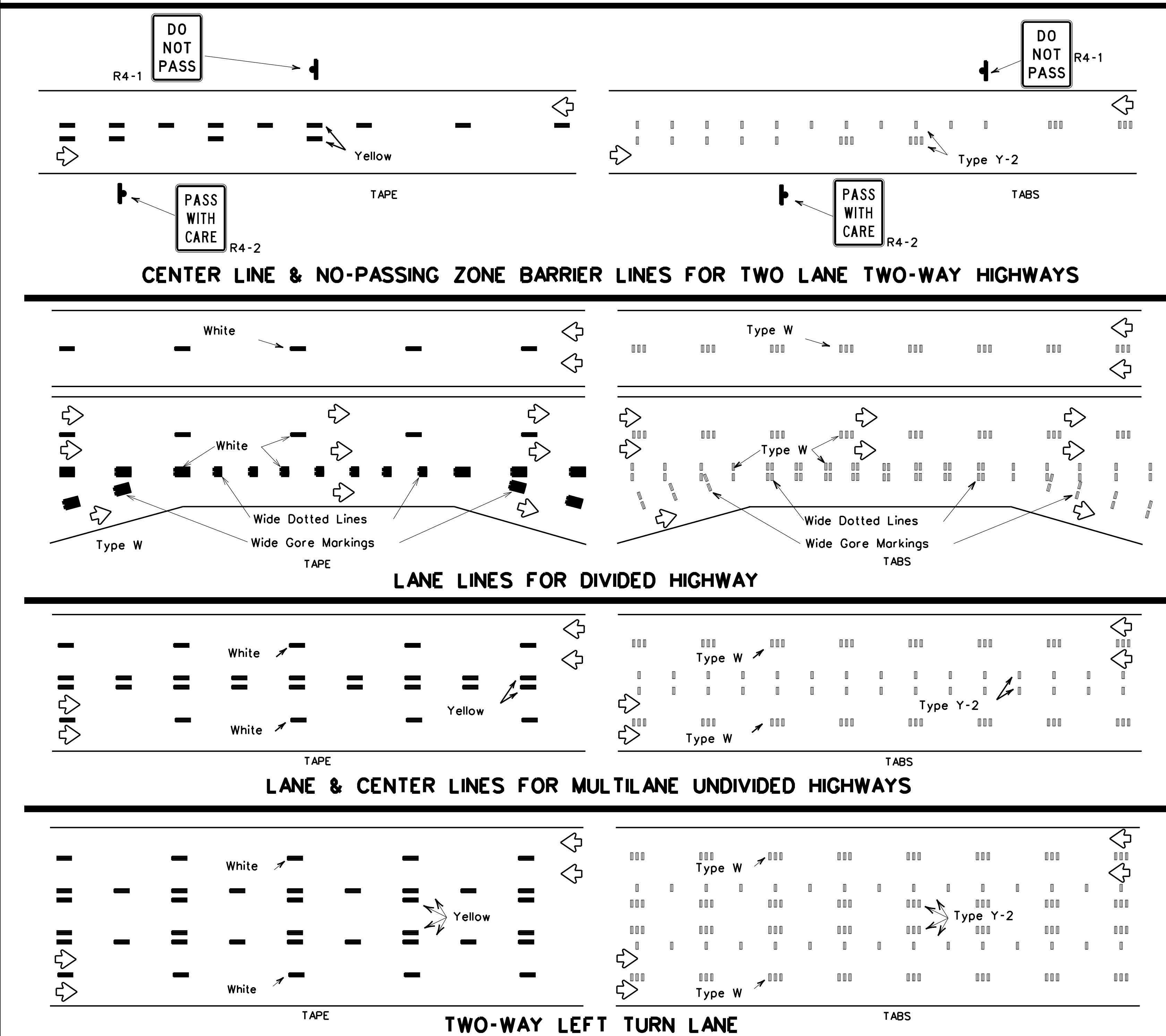
FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
2-14 1-22 4-16	DIST	COUNTY		SHEET NO.
	AMA	DEAF SMITH		36

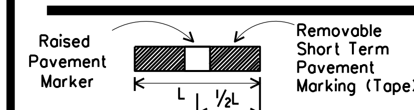
117

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS





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

NOTES:

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

TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:
http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation
Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

FILE: wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
1-97 3-03 7-13	DIST		COUNTY	SHEET NO.
	AMA		DEAF SMITH	37

DATE: 10/31/2022 3:44:16 PM
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DATE: 10/31/2022 3:44:17 PM
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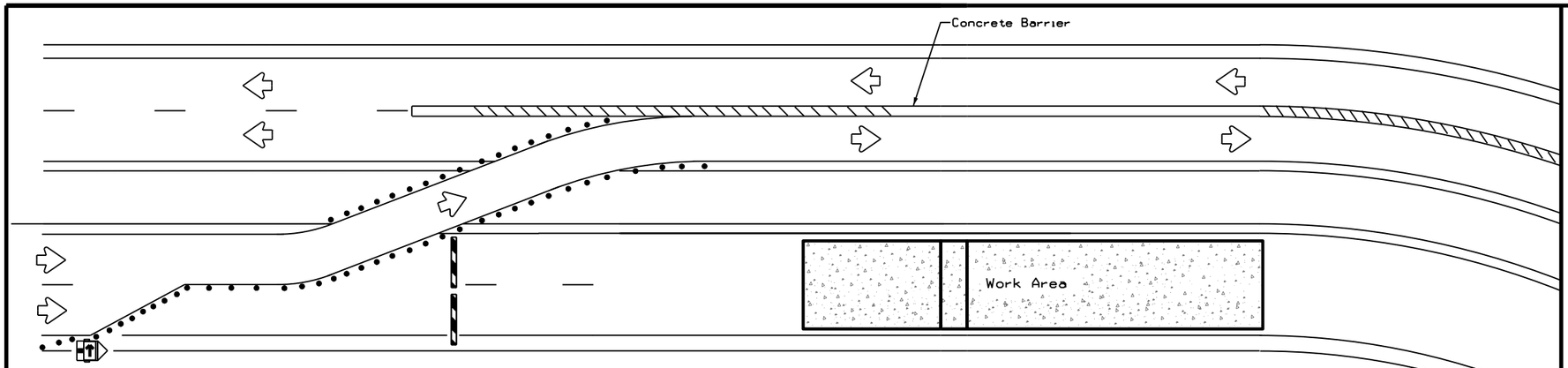


NOTES:

1. Length of Safety Glare screen will be specified elsewhere in the plans.
2. The cumulative nominal length of the modular safety glare screen units shall equal the length of the individual sections of temporary concrete traffic barrier on which they are installed so the joint between barrier sections will not be spanned by any one safety glare screen unit.
3. Screen Panel/blades will be designed such that reflective sheeting conforming with Departmental Material Specification DMS-8300, Sign Face Materials, Type B or C Yellow, minimum size of 2 inches by 12 inches can be attached to the edge of the panel/blade. The sheeting shall be attached to one glare screen panel/blade per section of concrete barrier not to exceed a spacing of 30 feet. Barrier reflectors are not necessary when panel/blades are installed with reflective sheeting as described.
4. Payment for these devices will be under statewide Special Specification "Modular Glare Screens for Headlight Barrier."
5. This detail is only intended to show types of locations where Glare Screens would be appropriate. Required signing and other devices shall be as shown elsewhere in the plans.

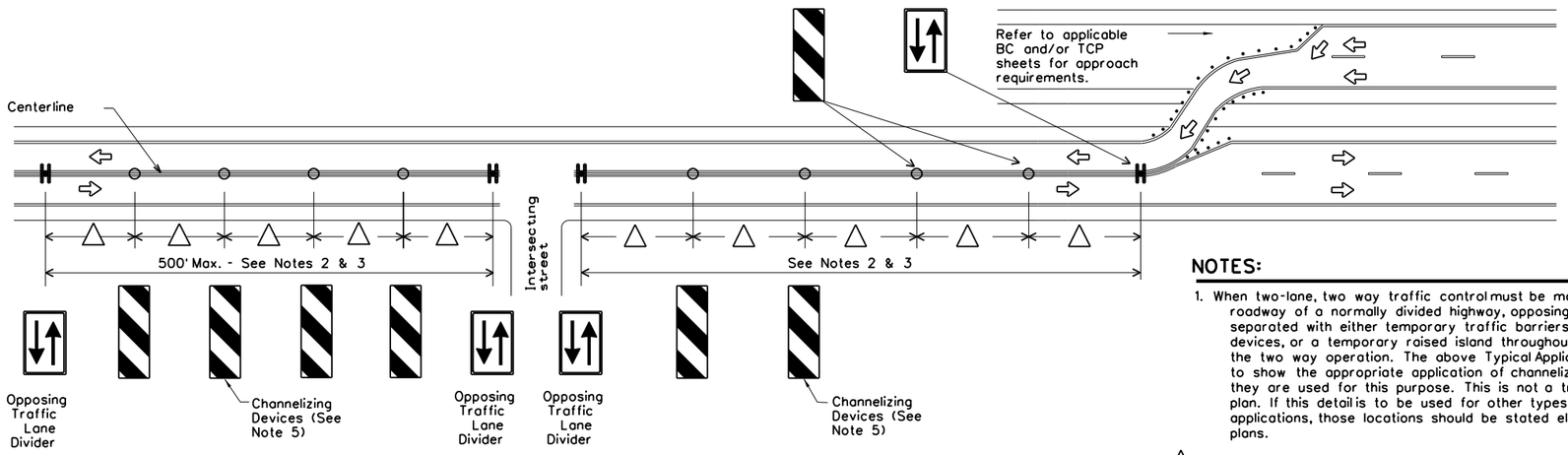
BARRIER DELINEATION WITH MODULAR GLARE SCREENS

LEGEND	
	Type 3 Barricade
• • •	Channelizing Devices
	Trailer Mounted Flashing Arrow Board
	Sign
\\\\	Safety glare screen

DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600
MODULAR GLARE SCREENS FOR HEADLIGHT BARRIER	DMS-8610

Only pre-qualified products shall be used. A copy of the Compliant Work Zone Traffic Control Devices List" CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:

http://www.txdot.gov/business/resources/producer-list.html



VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS (OTLD) SEPARATING TWO-WAY TRAFFIC ON NORMALLY DIVIDED HIGHWAYS

NOTES:

1. When two-lane, two way traffic control must be maintained on one roadway of a normally divided highway, opposing traffic shall be separated with either temporary traffic barriers, channelizing devices, or a temporary raised island throughout the length of the two way operation. The above Typical Application is intended to show the appropriate application of channelizing devices when they are used for this purpose. This is not a traffic control plan. If this detail is to be used for other types of roads or applications, those locations should be stated elsewhere in the plans.

△2. Space devices according to the Tangent Spacing shown on the Device Spacing table on BC(9) but not exceeding 100'.

3. Every fifth device should be an OTLD except when spaced closer to accommodate an intersection. An OTLD should be the first device on each side of intersecting streets or roads.
4. Locations where surface mount bases with adhesives or self-righting devices will be required in order to maintain them in their proper position should be noted elsewhere in the plans.
5. Channelizing devices are to be vertical panels, 42" cones or tubular markers that are at least 36" tall. Tubular markers used to separate traffic should have a rubber base weighing at least 30 pounds. Tubular markers that are 42" tall or more shall have four bands of reflective material as detailed for 42" cones on BC(10). Tubular markers less than 42" but at least 36" tall shall have three bands of 3" wide white reflective material spaced 2" apart. Reflective material shall meet DMS-8300, Type A.

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Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD)-17

FILE: wztd-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 2-17 3-03 7-13	0168	07	050, ETC	US60
	DIST	COUNTY		SHEET NO.
	AMA	DEAF SMITH		38

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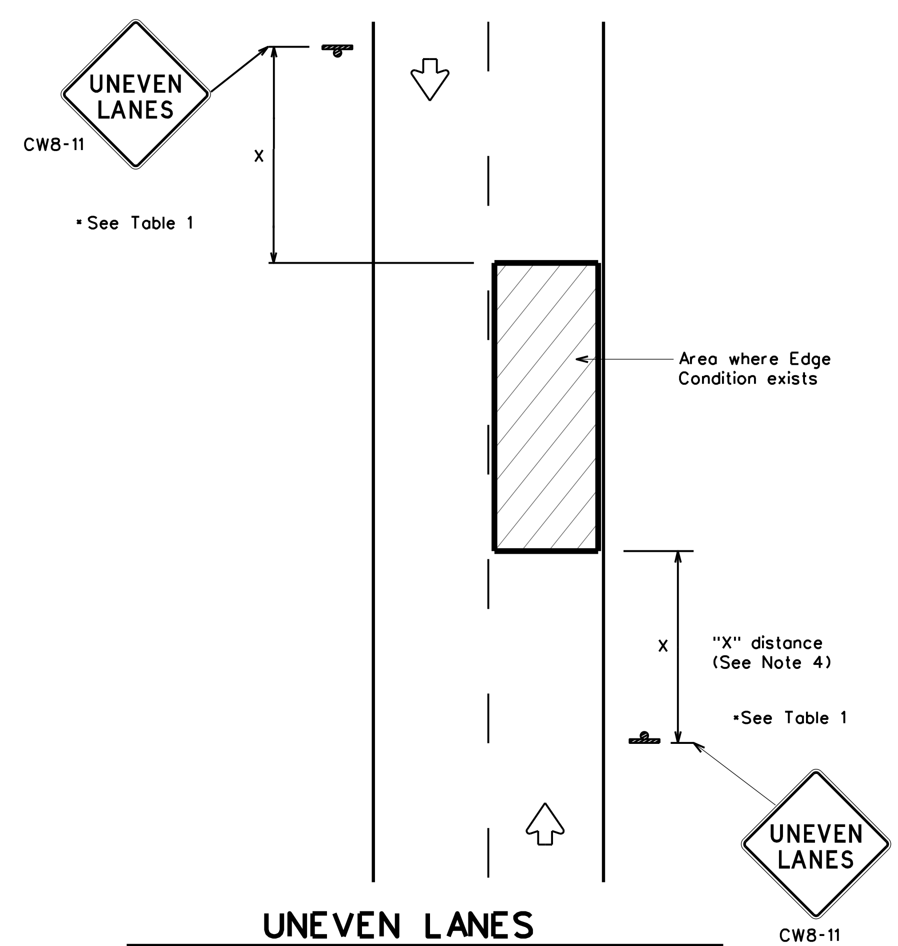
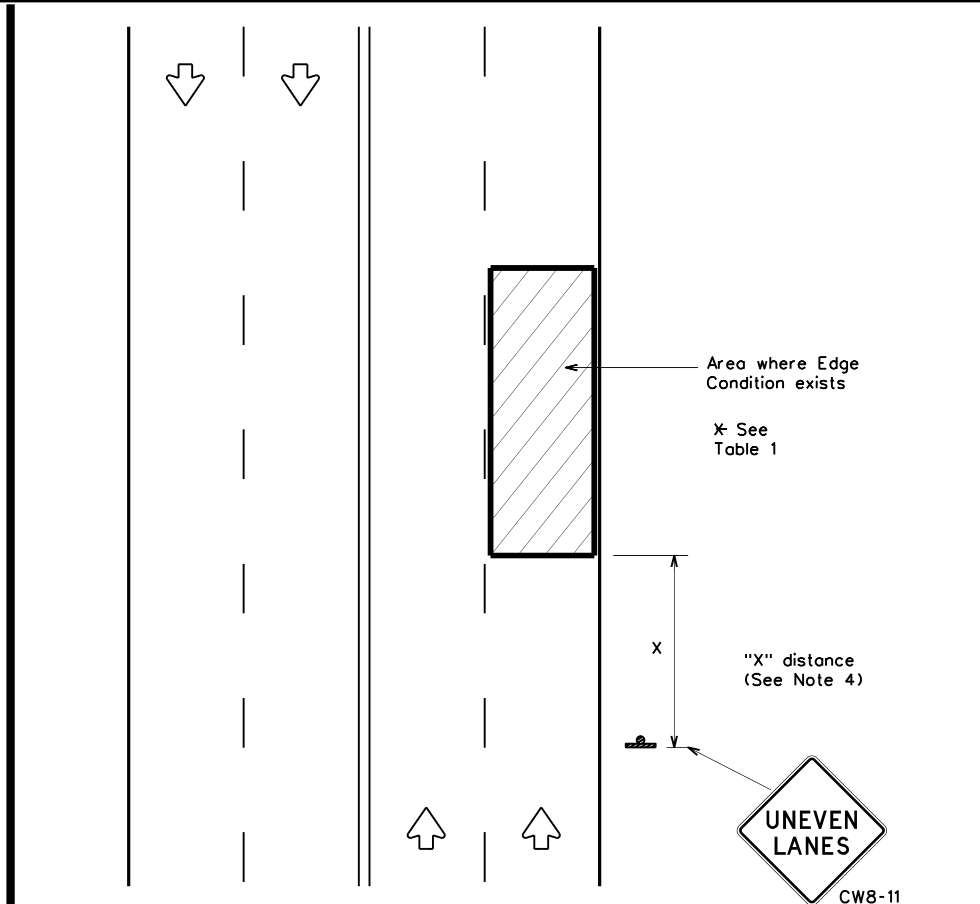
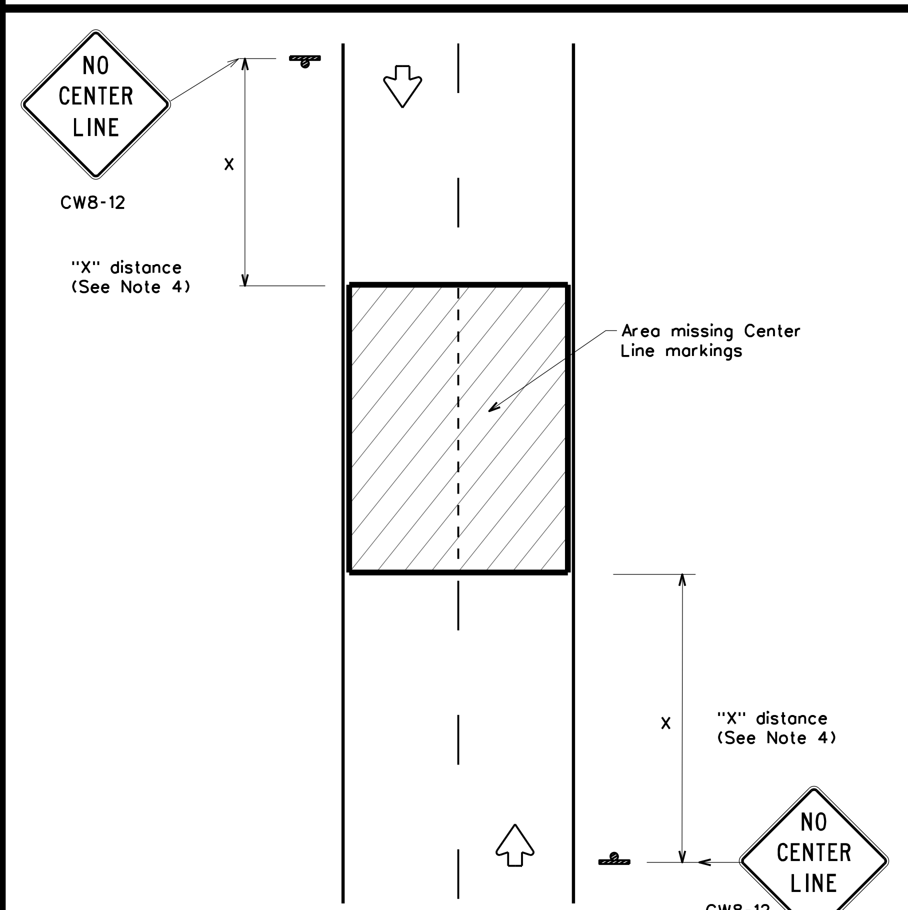


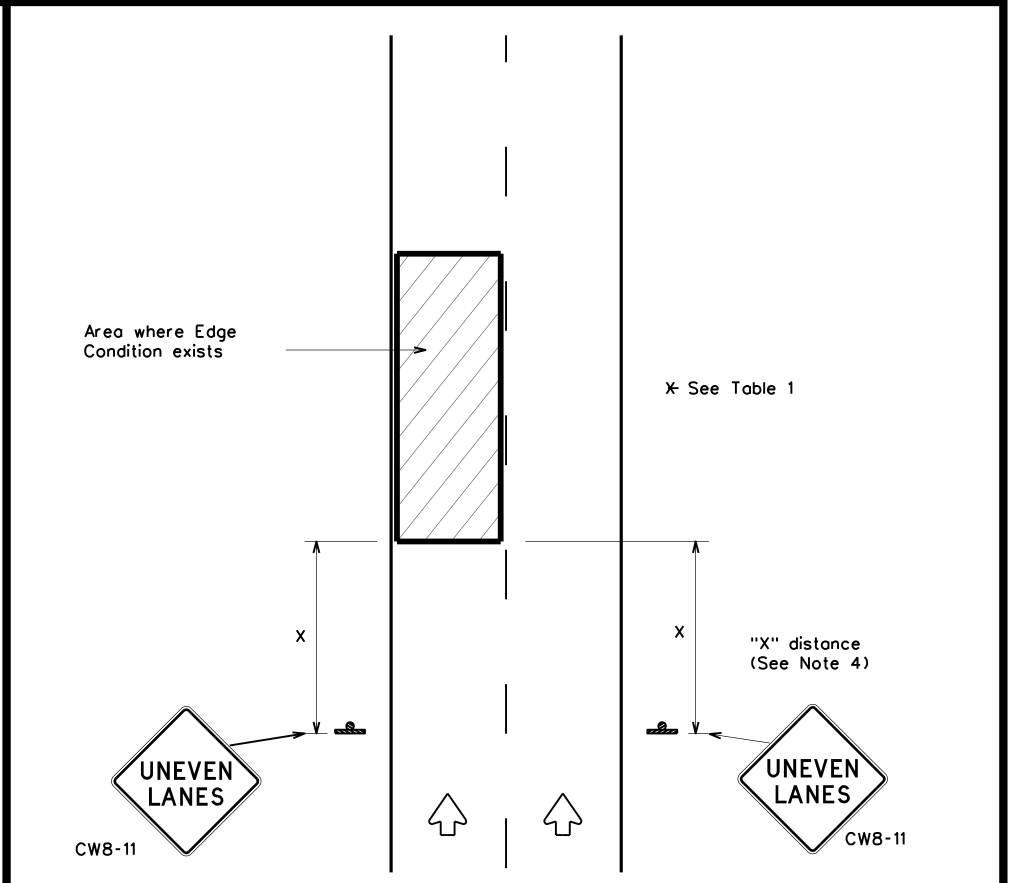
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

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

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

GENERAL NOTES

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

TABLE 1		
Edge Condition	Edge Height (D)	* Warning Devices
① D	Less than or equal to: 1¼" (maximum-planing) 1½" (typical-overlay)	Sign: CW8-11
	Distance "D" may be a maximum of 1 1/4 " for planing operations and 2" for overlay operations if uneven lanes with edge condition 1 are open to traffic after work operations cease.	
② >3 1 D	Less than or equal to 3"	Sign: CW8-11
③ 0" to 3/4" D 12" Notched Wedge Joint	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

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

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

Texas Department of Transportation

Traffic Operations Division Standard

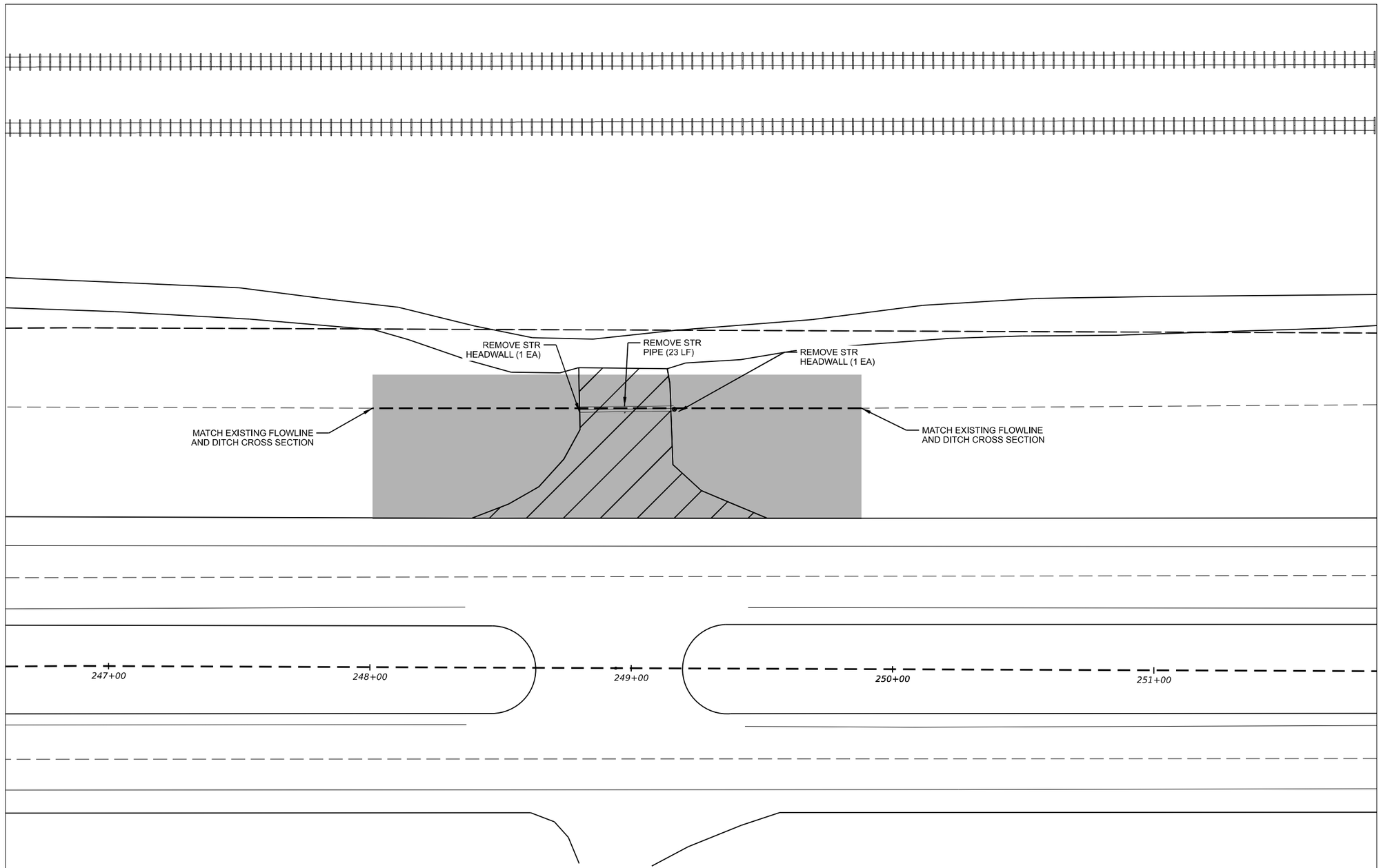
SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
8-95 2-98 7-13 1-97 3-03	DIST		COUNTY	SHEET NO.
	AMA		DEAF SMITH	39

112

DW: SD1S
DC: SC1S
DW: SS2S
DC: SC2S



LEGEND

REMOVE STAB BASE & ASPH PAV (12")

BLADING

STATION AND OFFSET		DESCRIPTION	105 6020 REMOVING STAB BASE & ASPH PAV (12")	150 6002 BLADING	496 6006 REMOV STR (HEADWALL)	496 6007 REMOV STR (PIPE)
			SY	HR	EA	LF
249+00	59.27RT	PRIVATE DRIVEWAY	312	2	2	36

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CASEY B. STRIPLING
136887
LICENSED
PROFESSIONAL ENGINEER

Casey B. Stripling

11-02-2022

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DRIVEWAY
REMOVAL LAYOUT

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO
AMA	DEAF SMITH		40

DATE: 11/2/2022 11:41:37 AM
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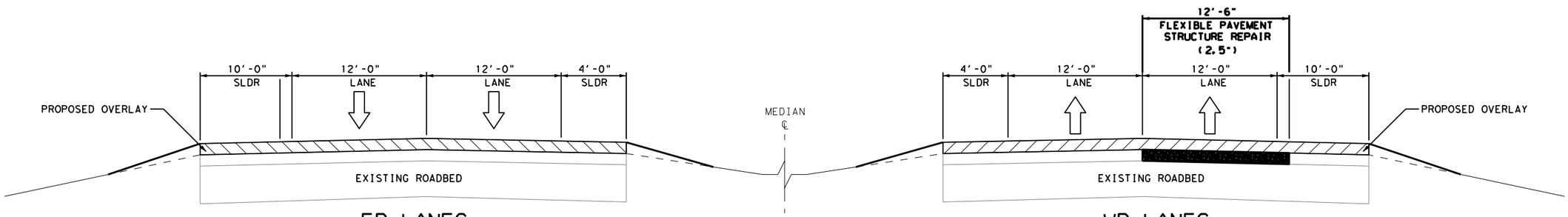
LEGEND

SUPERPAVE MIXTURE SP-C SAC-A PG70-28 OVERLAY
SEE TYPICAL SECTIONS FOR DETAILS

3" FLEXIBLE PAVEMENT STRUCTURE REPAIR

NOTES

1. QUANTITIES CARRIED TO PROJECT SUMMARY.
2. CONTRACTOR WILL NOT REMOVE MORE MATERIAL THAN CAN BE REPLACED IN A SINGLE WORK DAY.
3. LOCATIONS OF PAVEMENT REPAIR TO VARY AS DIRECTED BY THE ENGINEER.
4. PAVEMENT REPAIR AREA WILL BE A MINIMUM 20'-0" IN LENGTH.
5. EXTEND REPAIR WIDTH TO INCLUDE INTERIOR EXISTING PAVEMENT JOINTS, WHERE INSTRUCTED BY THE ENGINEER. PAVEMENT REPAIR ON OUTSIDE EDGE OF TRAVEL LANE WILL INCLUDE AN OVERLAP OF 6" ONTO SHOULDER.
6. FLEX BASE TO NOT BE EXPOSED DURING THE PAVEMENT REPAIR OPERATION. IF CONTRACTOR EXPOSES BASE, INTENTIONALLY OR OTHERWISE, THE BASE WILL BE PRIMED PRIOR TO PLACING ACP. PAYMENT WILL BE CONSIDERED SUBSIDIARY TO ITEM 351.
7. HOT MIX TO BE USED FOR FLEXIBLE PAVEMENT REPAIR WILL BE SP-C SAC-A PG 70-28 OR APPROVED ALTERNATE, BY THE ENGINEER.
8. TRACKLESS TACK COAT WILL BE USED FOR ALL REPAIR AREAS.



EB LANES

NO WORK PROPOSED
CSJ: 0168-07-050

WB LANES

AS DETERMINED BY THE ENGINEER
CSJ: 0168-07-051

PAVEMENT REPAIR DETAIL

PAVEMENT REPAIR ITEMS			
LOCATION	0344 ①	0351	0354 ①
	6139	6027	6048
	SUPERPAVE MIXTURES SP-D SAC-A PG 76-28 (330 LB/SY)	FLEXIBLE PAVEMENT STRUCTURE REPAIR (2.5")	PLANE ASPH CONC PAV (2.5")
	TON	SY	SY
TYPICAL SECTION "A"	825	5,000	5,000
CSJ: 0168-07-051 TOTALS:	825	5,000	5,000

① FOR CONTRACTOR'S INFORMATION ONLY. ALL ITEMS LISTED AS "FOR CONTRACTOR'S INFORMATION ONLY" WILL BE COMPLETED IN ACCORDANCE WITH THE APPLICABLE TXDOT STANDARD SPECIFICATIONS, AND ARE CONSIDERED SUBSIDIARY TO ITEM 351 FLEXIBLE PAVEMENT STRUCTURE REPAIR.

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PAVEMENT REPAIR DETAIL

SCALE: 1" = N.T.S.

2022 Texas Department of Transportation

SHEET 1 OF 1

DSN	CK	CONT	SECT	JOB	HIGHWAY
AM	AM	0168	07	050, ETC	US60
DRWN	CK	DIST	COUNTY		SHEET NO.
AM	CH	AMA	DEAF SMITH		41

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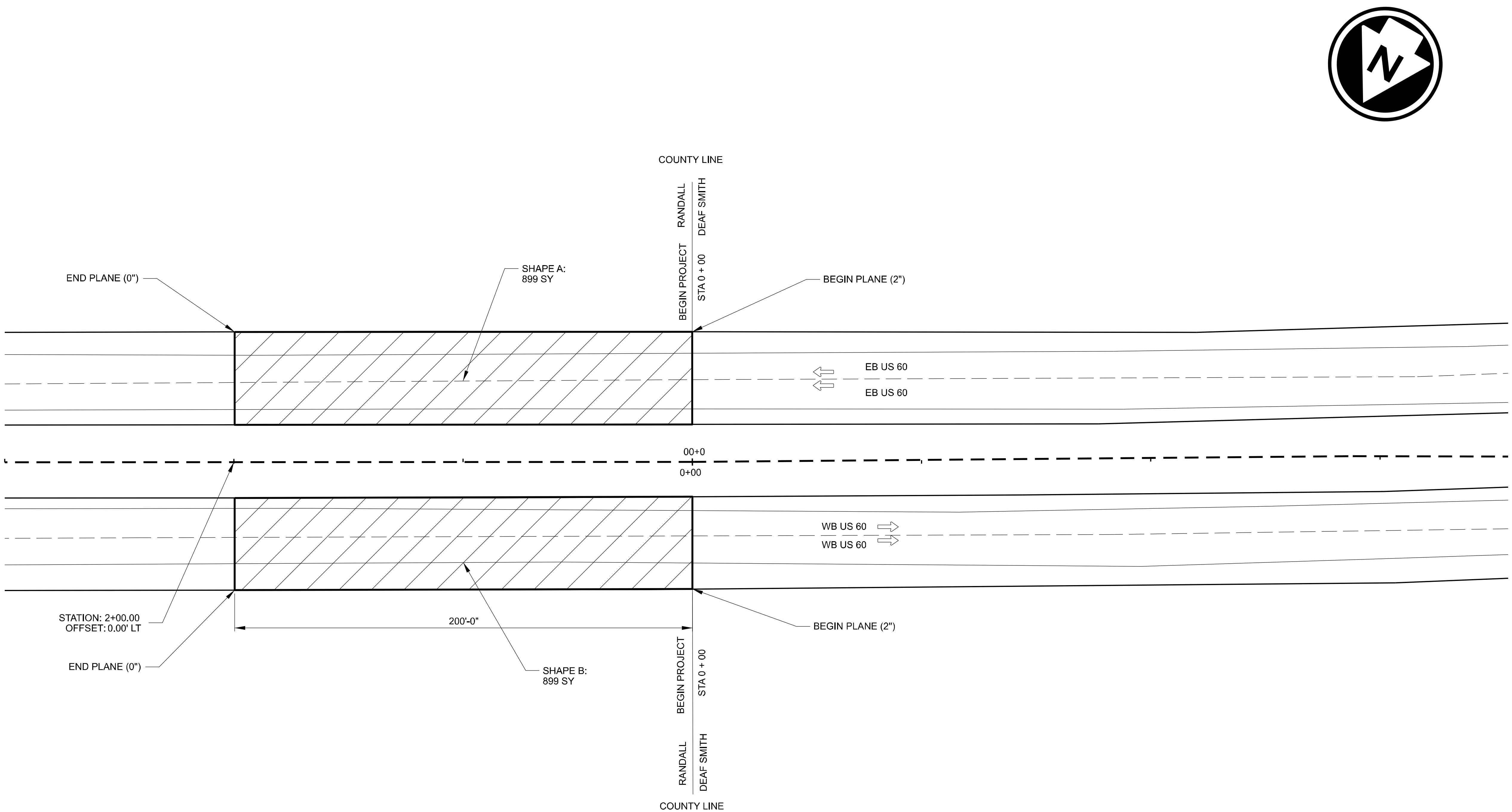
LEGEND:

(0"-2") PLANE
(2") SUPERPAVE MIXTURE
SP-D SAC-A-PG70-28 (220 LB/SY)
AND TACK COAT (0.13 GAL/SY)



ADDITIONAL AREA SHAPE	LOCATION DETAILS	354 6021 PLANE ASPH CONC PAV (0" TO 2")	3077 6058 SUPERPAVE MIXTURES SP-D SAC-A PG70-28 (220 LB/SY)	3077 6075 TACK COAT (0.13 GAL/SY)	TOTAL AREA (SY)
		SY	TON	GAL	
A	EB END PROJECT TIE IN	899	99	117	899
B	WB END PROJECT TIE IN	899	99	117	899

* QUANTITIES CALCULATED GRAPHICALLY

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ADDITIONAL AREAS

SHEET 1 OF 10

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		42

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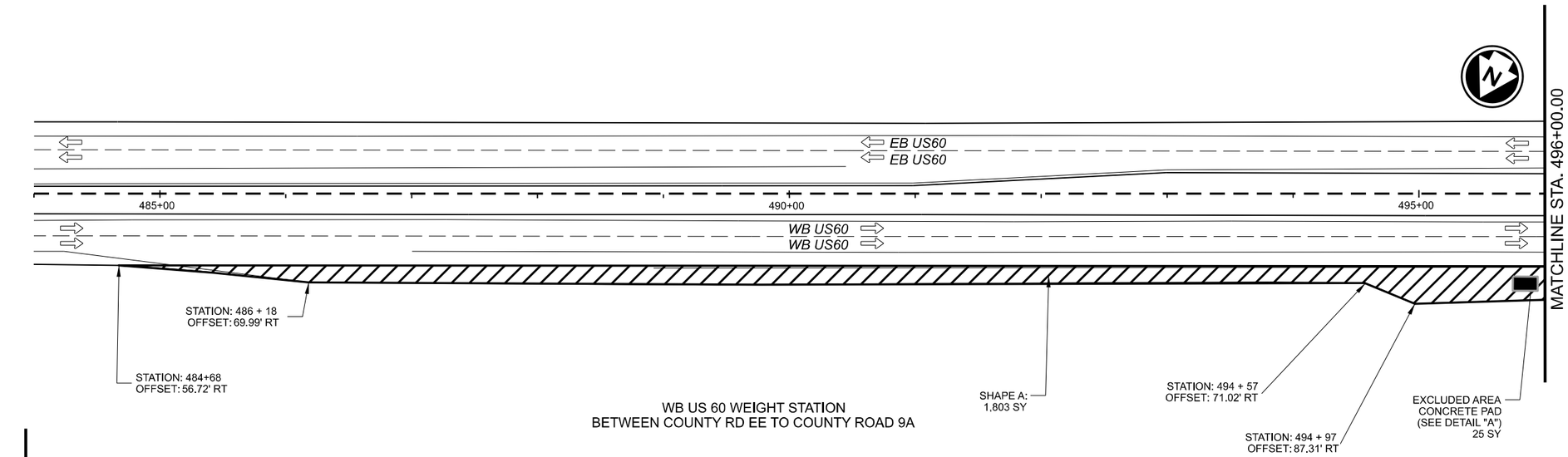
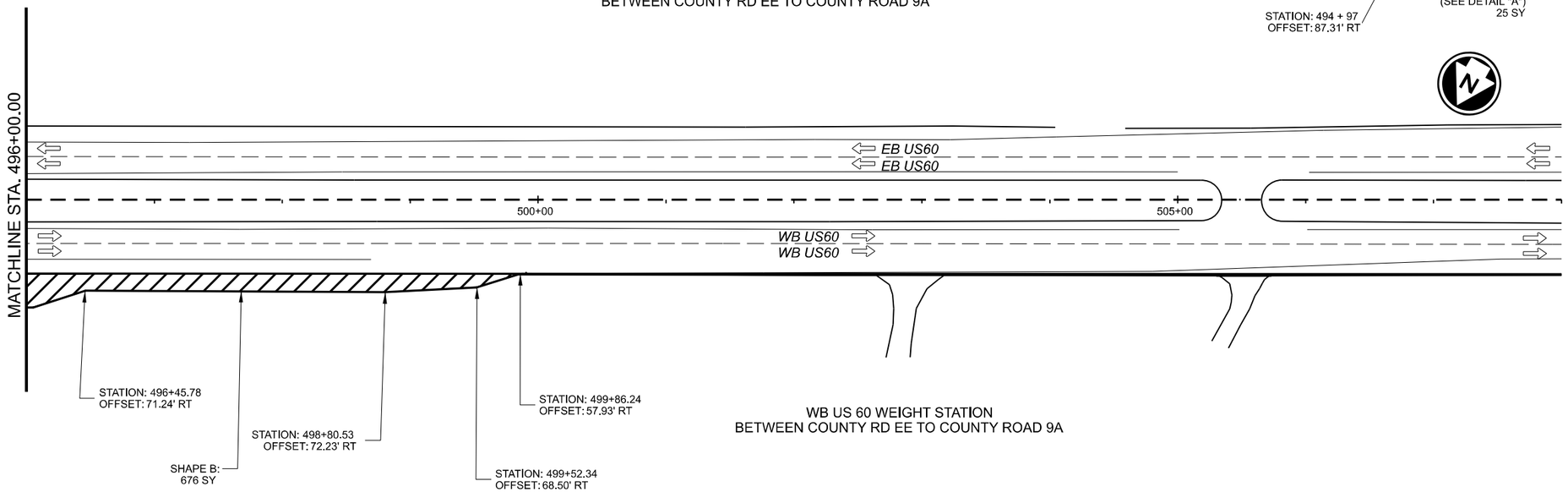


WB US 60 WEIGHT STATION
BETWEEN COUNTY RD EE TO COUNTY ROAD 9A

LEGEND:

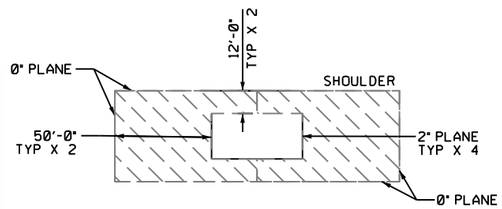
(2") SUPERPAVE MIXTURE
SP-D SAC-A-PG70-28 (220 LB/SY)
AND UNDERSEAL COURSE (0.25 GAL/SY)



WB US 60 WEIGHT STATION
BETWEEN COUNTY RD EE TO COUNTY ROAD 9A

ADDITIONAL AREA SHAPE	LOCATION DETAILS	3085 6001 UNDERSEAL COURSE (0.25 GAL/SY)	3077 6058 SUPERPAVE MIXTURES SP-D SAC-A PG70-28 (220 LB/SY)	354 6021 PLANE ASPH CONC PAV (0" TO 2")	TOTAL AREA (SY)
		GAL	TON	SY	
A	WB US 60 WEIGHT STATION	451	198	453	1,803
B	WB US 60 WEIGHT STATION	169	74	0	676
SHEET TOTAL		620	273	453	2,479

* QUANTITIES CALCULATED GRAPHICALLY



DETAIL "A"
PLANING AT 20'x12' CONC. PAD

0'-2"
PLANING

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11-02-2022

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ADDITIONAL AREAS

SHEET 2 OF 10

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		43

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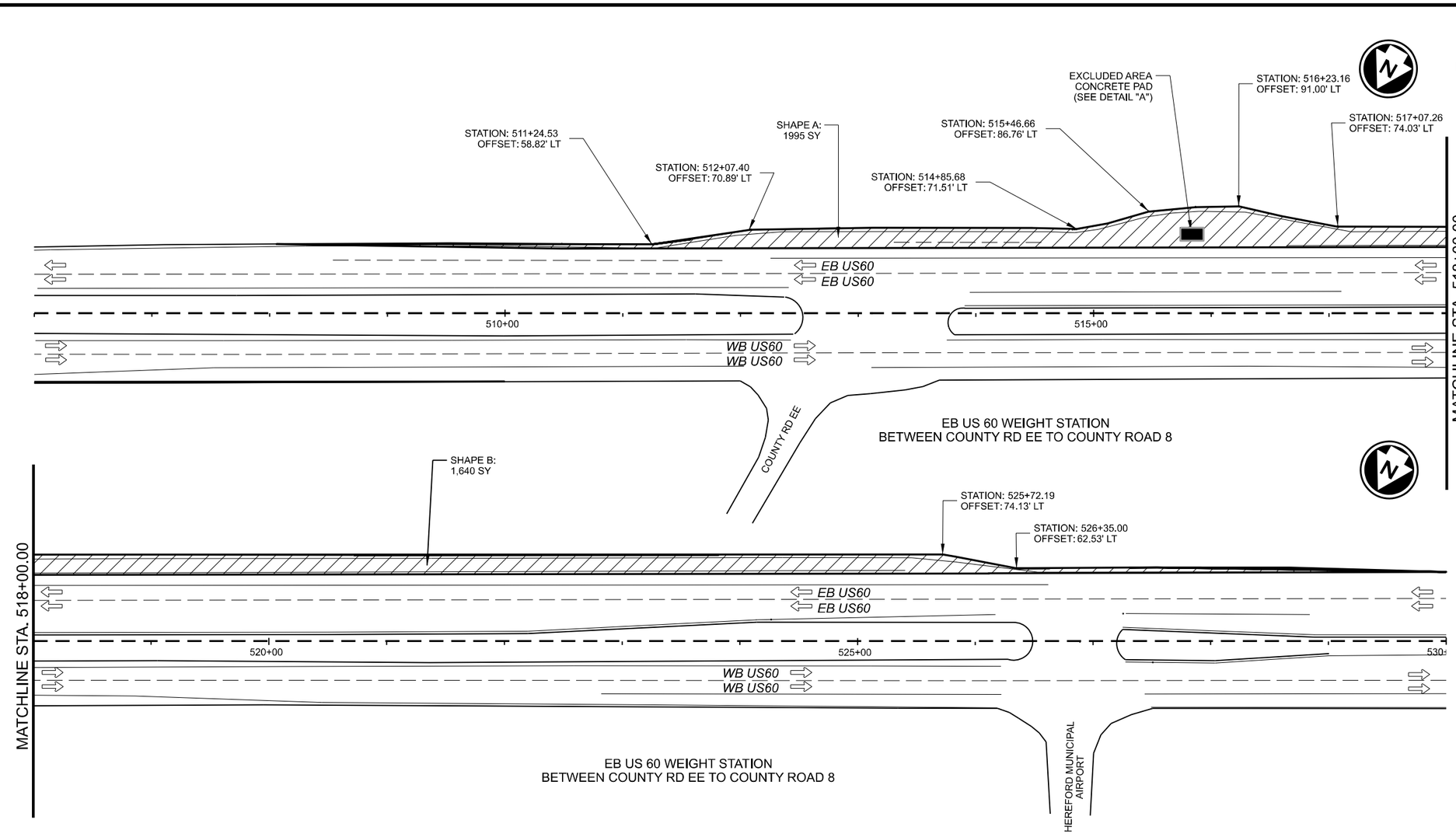
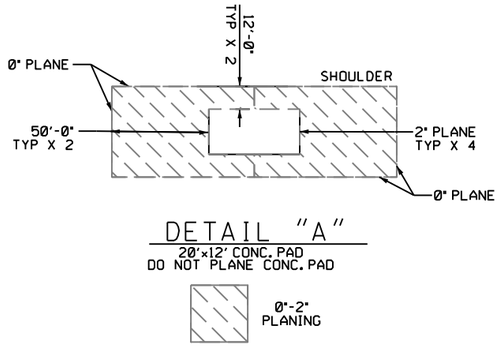


LEGEND:

(2") SUPERPAVE MIXTURE
SP-D SAC-A-PG70-28 (220 LB/SY)
AND UNDERSEAL COURSE (0.25 GAL/SY)

ADDITIONAL AREA SHAPE	LOCATION DETAILS	3085 6001 UNDERSEAL COURSE (0.25 GAL/SY)	3077 6058 SUPERPAVE MIXTURES SP-D SAC-A PG70-28 (220 LB/SY)	354 6021 PLANE ASPH CONC PAV (0" TO 2")	TOTAL AREA (SY)
		GAL	TON	SY	
A	EB US 60 WEIGHT STATION	499	219	453	1,995
B	EB US 60 WEIGHT STATION	448	197	0	1,790
SHEET TOTAL		946	416	453	3,785

* QUANTITIES ARE CALCULATED GRAPHICALLY



DETAIL "A"
20'x12' CONC. PAD
DO NOT PLANE CONC. PAD

0"-2"
PLANING

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ADDITIONAL AREAS

SHEET 3 OF 10

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		44

DATE: 10/31/2022 3:44:23 PM
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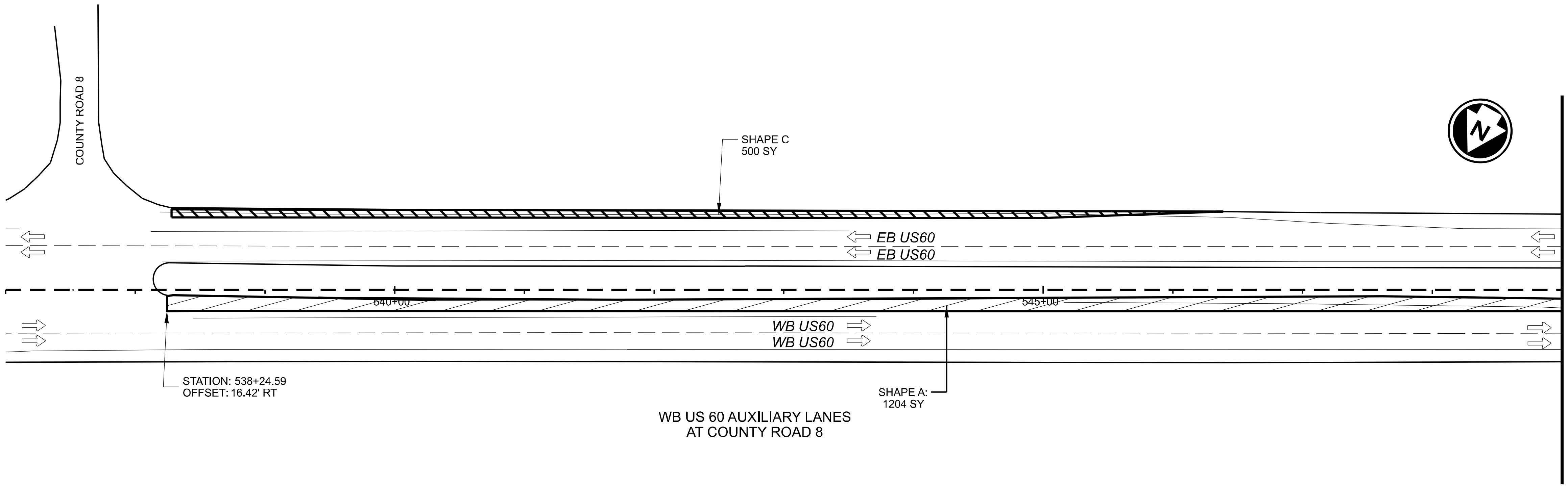
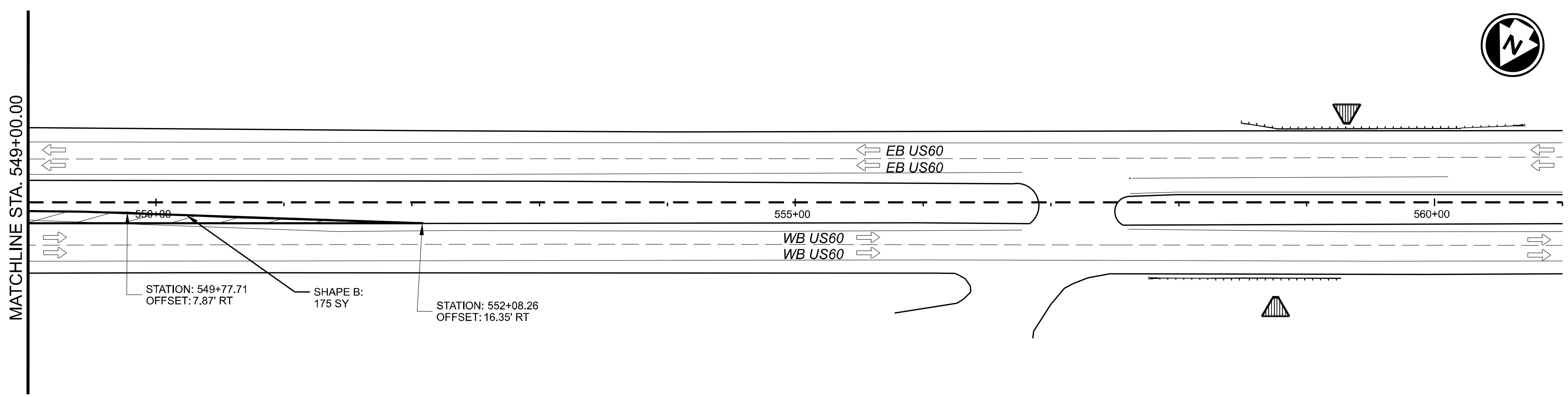
DN: 31 CK: $c1$ DW: $c2$ CK: $c2$

LEGEND:
(2") SUPERPAVE MIXTURE SP-D SAC-A-PG70-28 (220 LB/SY) AND UNDERSEAL COURSE (0.25 GAL/SY)



WB US 60 AUXILIARY LANES
AT COUNTY ROAD 8



WB US 60 AUXILIARY LANES
AT COUNTY ROAD 8

ADDITIONAL AREA SHAPE	LOCATION DETAILS	3085 6001 UNDERSEAL COURSE (0.25 GAL/SY)	3077 6058 SUPERPAVE MIXTURES SP-D SAC-A PG70-28 (220 LB/SY)	TOTAL AREA (SY)
		GAL	TON	
A	WB ACCELERATION LANE	301	132	1,204
B	WB ACCELERATION LANE	44	19	175
C	RIGHT TURN LANE TO CR 8 S	125	55	500
SHEET TOTAL		470	207	1,379

* QUANTITIES ARE CALCULATED GRAPHICALLY

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ADDITIONAL AREAS

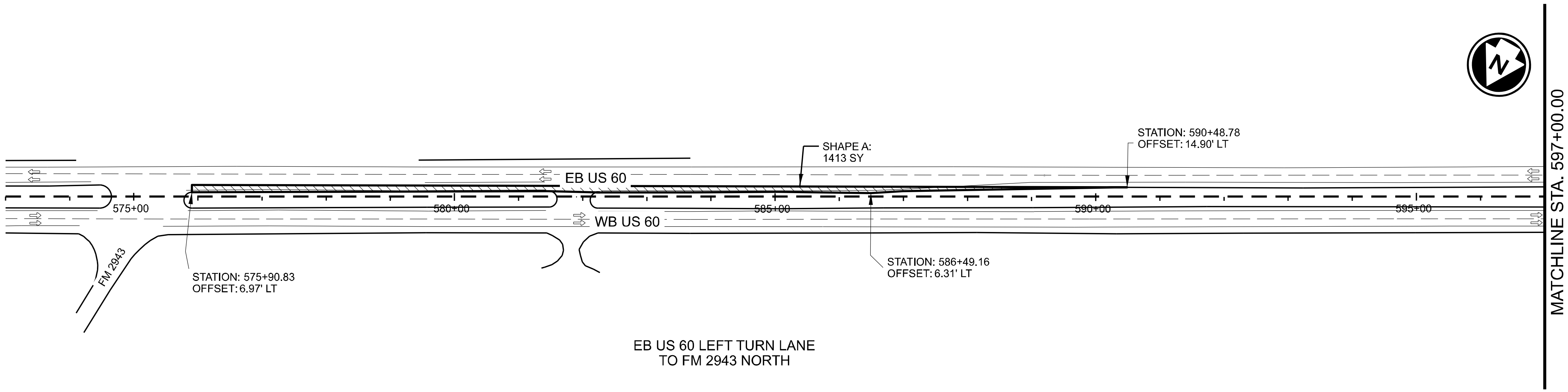
SHEET 4 OF 10

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		45

DATE: 10/31/2022 3:44:23 PM
FILE: T:\AMATPD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\3. Roadway\050_Roadway_ADDITIONAL100.dgn

DN: $D1$ CK:$C1$ DW: $D2$ CK:$C2$

LEGEND:
(2") SUPERPAVE MIXTURE
SP-D SAC-A-PG70-28 (220 LB/SY)
AND UNDERSEAL COURSE (0.25 GAL/SY)



ADDITIONAL AREA SHAPE	LOCATION DETAILS	3085 / 6001 UNDERSEAL COURSE (0.25 GAL/SY)	3077 / 6058 SUPERPAVE MIXTURES SP-D SAC-A PG70-28 (220 LB/SY)	TOTAL AREA (SY)
		GAL	TON	
A	RIGHT TURN/ACC LANE TO N 2943	353	155	1,413
SHEET TOTAL		**353**	**155**	**1,413**

*QUANTATIES CALCULATED GRAPHICALLY

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED
PROFESSIONAL ENGINEER
Casey B. Stripling
11-02-2022

Texas Department of Transportation

US60

ADDITIONAL AREAS

SHEET 5 OF 10

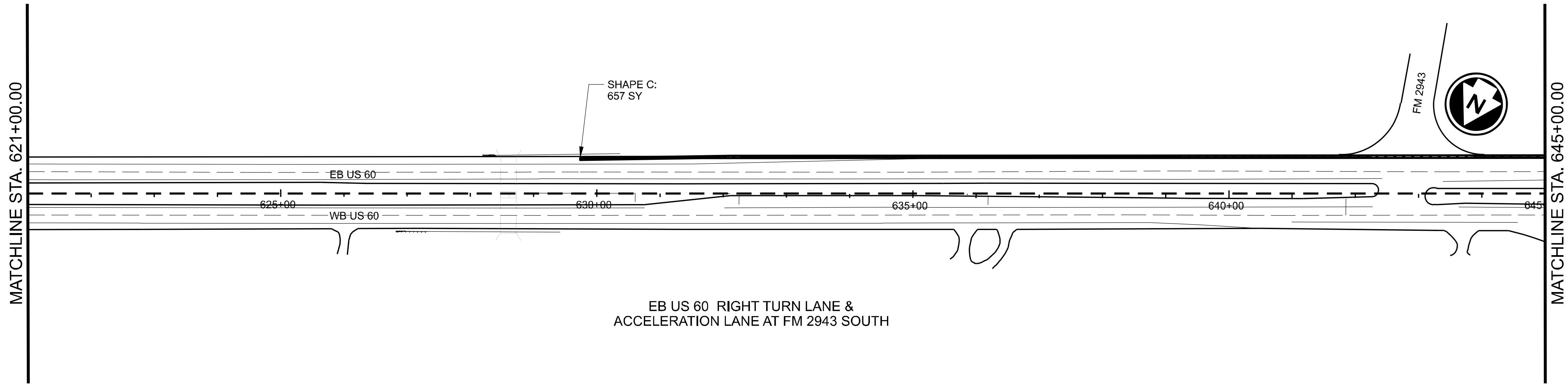
CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		46

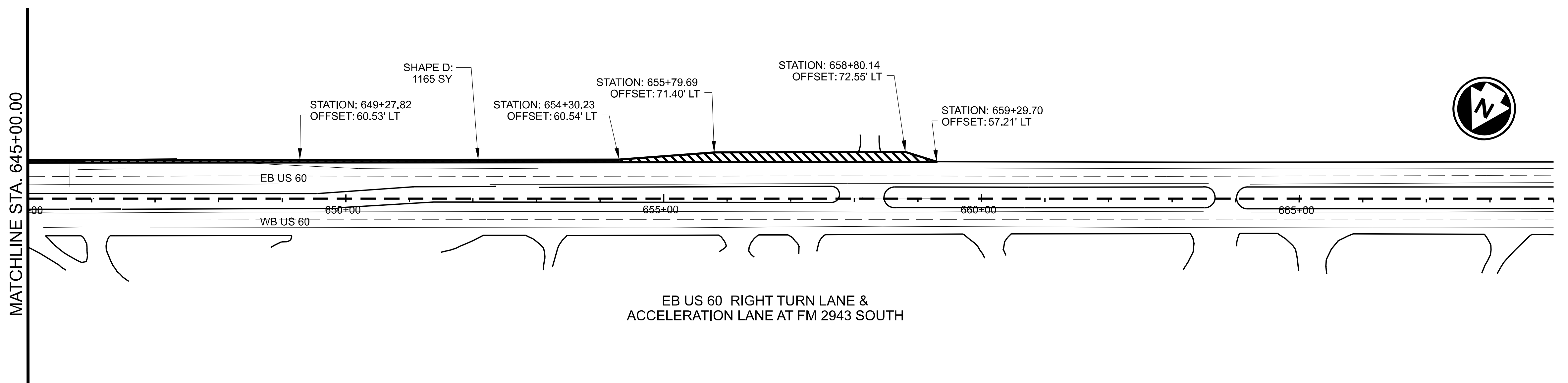
DATE: 10/31/2022 3:44:24 PM
FILE: T:\AMATPD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\3. Roadway\050_Roadway_ADDITIONAL100.dgn

DN: $D1$ CK: $C1$ DW: $D2$ CK: $C2$

LEGEND:

(2") SUPERPAVE MIXTURE
SP-D SAC-A-PG70-28 (220 LB/SY)
AND UNDERSEAL COURSE (0.25 GAL/SY)





ADDITIONAL AREA SHAPE	LOCATION DETAILS	3085 6001 UNDERSEAL COURSE (0.25 GAL/SY)	3077 6058 SUPERPAVE MIXTURES SP-D SAC-A PG70-28 (220 LB/SY)	TOTAL AREA (SY)
		GAL	TON	
C	EB US 60 WEST OF 2943	164	72	657
D	EB US 60 WEST OF 2943	291	128	1,165
SHEET TOTAL		456	200	1,822

*QUANTITIES CALCULATED GRAPHICALLY

STATE OF TEXAS
CASEY B. STRIPLING
136887
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PROFESSIONAL ENGINEER

Casey B. Stripling

11-02-2022

Texas Department of Transportation

US60

ADDITIONAL AREAS

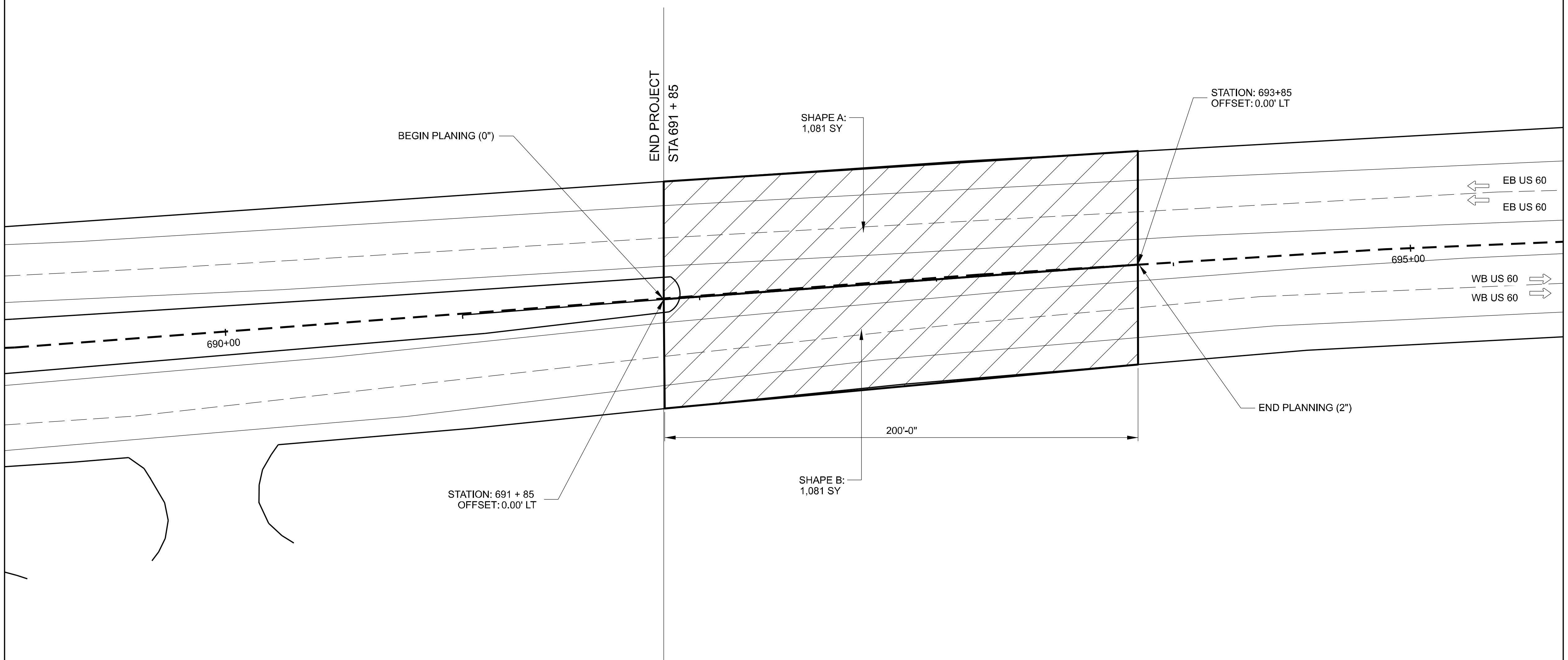
SHEET 6 OF 10

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		47

DATE: 10/31/2022 3:44:25 PM
FILE: T:\AMATPD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\3. Roadway\050_Roadway_ADDITIONAL100.dgn

LEGEND:

(0"-2") PLANE
(2") SUPERPAVE MIXTURE
SP-D SAC-A-PG70-28 (220 LB/SY)
AND TACK COAT (0.13 GAL/SY)



ADDITIONAL AREA SHAPE	LOCATION DETAILS	354 6021 PLANE ASPH CONC PAV (0" TO 2")	3077 6058 SUPERPAVE MIXTURES SP-D SAC-A PG70-28 (220 LB/SY)	3077 6075 TACK COAT (0.13 GAL/SY)	TOTAL AREA (SY)
		SY	TON	GAL	
A	EB END PROJECT TIE IN	1,081	119	141	1,081
B	WB END PROJECT TIE IN	1,081	119	141	1,081

*QUANTATIES CALCULATED GRAPHICALLY

STATE OF TEXAS
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LICENSED
PROFESSIONAL ENGINEER
Casey B. Stripling
11-02-2022

Texas Department of Transportation

US60

ADDITIONAL AREAS

SHEET 7 OF 10

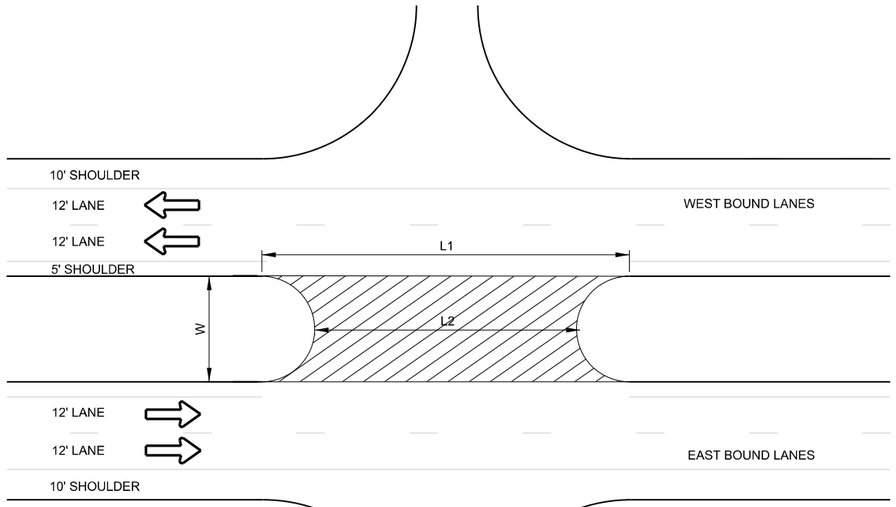
CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		48

DATE: 10/31/2022 3:44:26 PM
FILE: T:\AMATPD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\3. Roadway\050 Roadway ADDITIONAL100.dgn

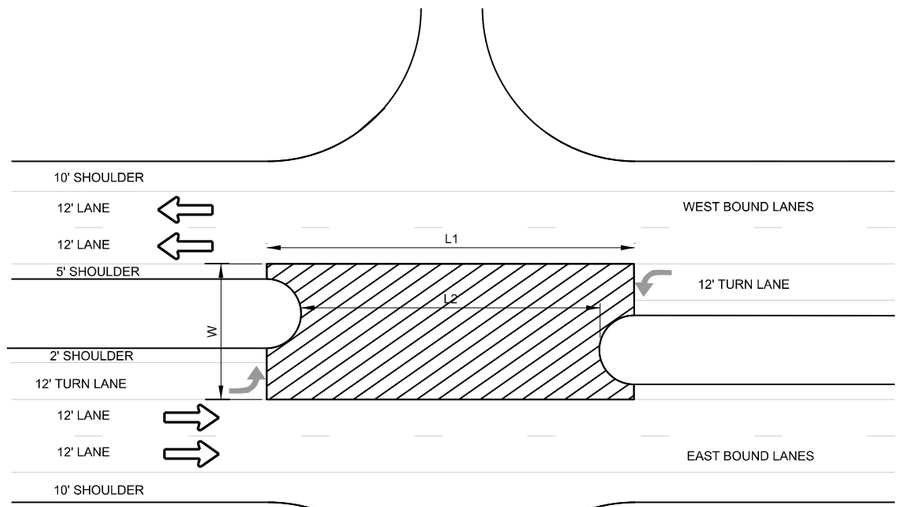
DN: DS CK:CS DW: DS CK:CS

LEGEND:

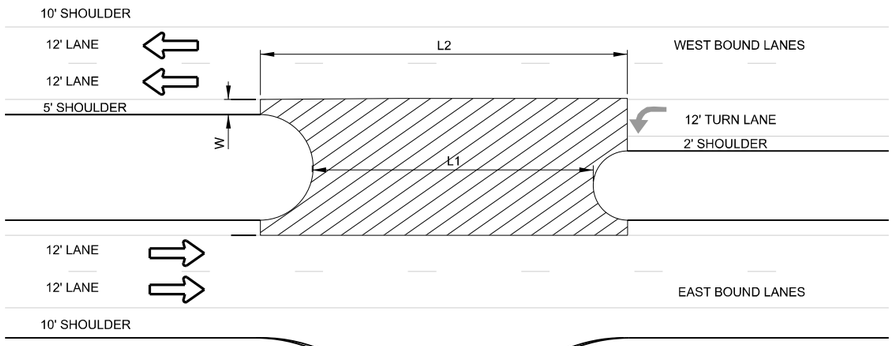
ADDITIONAL AREA



CROSSOVER LAYOUT
TYPE A



CROSSOVER LAYOUT
TYPE B



CROSSOVER LAYOUT
TYPE C

STATE OF TEXAS
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11-02-2022

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US60

ADDITIONAL AREAS

SHEET 8 OF 10

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		49

DATE: 10/31/2022 3:44:26 PM
FILE: T:\AMA\PDI\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\3. Roadway\050_Roadway_ADDITIONAL100.dgn

0168-07-051 CROSSOVERS							
LOCATION	TYPE	L1	L2	W	AREA	3077 6075 TACK COAT (0.13 GAL/SY)	3077 6058 SUPERPAVE MIXTURES SP-D SAC-A PG70-28 (220 LB/SY)
STATION	A/B/C	LF	LF	LF	SY	GAL	TON
22+77.00	A	92	56	36.5	256	33	28
63+40.00	A	72	37	35	169	22	19
99+45.00	B	99	53	45	352	46	39
109+00.00	C	97	75	45	403	52	44
116+70.00	A	72	42	45	266	35	29
125+53.00	C	114	90	44	494	64	54
151+90.00	A	78	39	36	187	24	21
188+38.00	A	120	96	48	488	63	54
226+04.00	A	82	50	32	199	26	22
248+96.00	A	90	57	34	239	31	26
281+46.00	A	77	45	34	192	25	21
310+82.00	A	150	118	46	658	86	72
348+07.00	A	83	50	33	203	26	22
354+48.00	A	87	52	32	206	27	23
389+29.00	A	137	108	33	609	79	67
432+21.00	A	72	37	33	164	21	18
442+00.00	A	69	33	37	160	21	18
451+19.00	A	155	128	45	675	88	74
459+26.00	A	88	52	36	237	31	26
481+88.00	A	119	92	30	478	62	53
505+52.00	A	64	31	32	134	17	15
513+06.00	A	154	127	44	644	84	71
526+84.00	B	93	72	45	401	52	44
537+54.00	B	142	125	43	633	82	70
557+21.00	A	92	62	45	338	44	37
575+22.00	B	142	114	45	618	80	68
581+86.00	B	78	53	45	154	20	17
608+32.00	A	114	85	47	509	66	56
618+51.00	A	67	37	33	161	21	18
642+88.00	B	112	80	45	468	61	51
658+12.00	B	109	71	41	365	47	40
663+83.00	A	72	34	33	153	20	17
669+85.00	A	71	38	33	160	21	18
674+95.00	A	69	38	32	158	21	17
679+98.00	A	67	35	32	146	19	16
684+94.00	A	65	40	32	156	20	17
SHEET TOTAL						**1,538**	**1,302**

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED
PROFESSIONAL ENGINEER

Casey B. Stripling

11-02-2022

Texas Department of Transportation

US60

ADDITIONAL AREAS

SHEET 9 OF 10

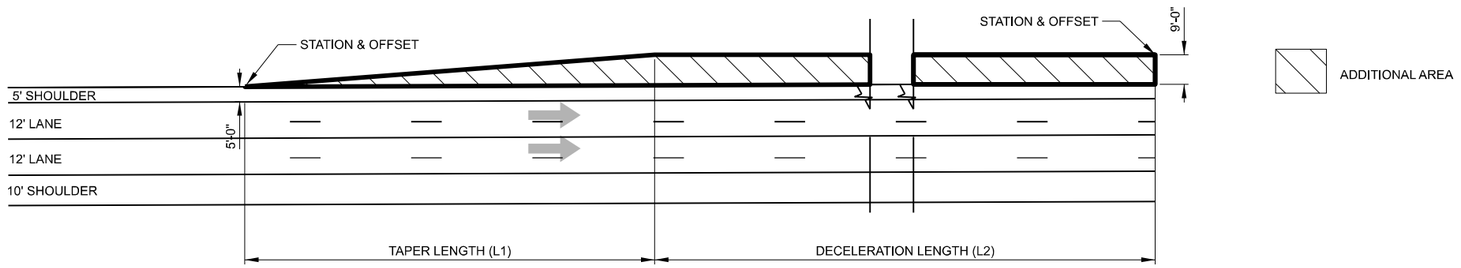
CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		50

DATE: 10/31/2022 3:44:27 PM
FILE: T:\AMA\PD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\3. Roadway\050_Roadway_ADDITIONAL100.dgn

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

CSJ: 0168-07-050 US 60 EB LEFT TURN LANES										
LOCATION		LOCATION DETAILS	DECEL LANE AREA	DECEL LANE LENGTH	DECEL LANE WIDTH	TAPER AREA	TAPER WIDTH	TAPER LENGTH	3077 6075 TACK COAT (0.13 GAL/SY)	3077 6058 SUPERPAVE MIXTURES SP-D SAC-A PG70-28 (220 LB/SY)
BEGINNING STATION	ENDING STATION		SY	LF	LF	SY	LF	LF	GAL	TON
99+85.54	104+76.86	US 60 TO PRIVATE DRIVEWAY	700	700	9	75	0-9	150	101	85
109+50.00	115+00.00	US 60 TO GRAND	700	700	9	75	0-9	150	101	85
117+04.79	122+00.04	PRIVATE DRIVEWAY	700	700	9	75	0-9	150	101	85
126+11.74	136+52.24	US 60 TO FM 809	830	830	9	75	0-9	150	118	100
188+90.00	198+70.00	US 60 TO COUNTY ROAD BB	830	830	9	75	0-9	150	118	100
311+50.00	321+30.00	US 60 TO COUNTY ROAD CC	830	830	9	75	0-9	150	118	100
390+00.00	399+80.00	US 60 TO COUNTY ROAD DD	830	830	9	75	0-9	150	118	100
451+75.00	458+55.00	US 60 TO COUNTY ROAD E	830	830	9	75	0-9	150	118	100
482+25.00	492+05.00	US 60 TO COUNTY ROAD 9A	830	830	9	75	0-9	150	118	100
513+60.00	523+40.00	US 60 TO COUNTY ROAD EE	830	830	9	75	0-9	150	118	100
527+25.00	536+90.00	US 60 TO HEREFORD MUNICIPAL AIRPORT	830	830	9	75	0-9	150	118	100
557+50.00	567+30.00	US 60 TO FEED LOT	830	830	9	75	0-9	150	118	100
575+84.00	581+46.00	US 60 TO FM 2943	700	700	9	75	0-9	150	101	85
582+22.00	588+81.00	US 60 TO PRIVATE DRIVEWAY	700	700	9	75	0-9	150	101	85
643+16.00	651+15.00	US 60 TO COUNTY ROAD 7	700	700	9	75	0-9	150	101	85
TOTAL			**11670**	**11670**				**2250**	**2,352**	**1,990**

CSJ: 0168-07-051 US 60 WB LEFT TURN LANES										
LOCATION		LOCATION DETAILS	DECEL LANE AREA	DECEL LANE LENGTH	DECEL LANE WIDTH	TAPER AREA	TAPER WIDTH	TAPER LENGTH	3077 6075 TACK COAT (0.13 GAL/SY)	3077 6058 SUPERPAVE MIXTURES SP-D SAC-A PG70-28 (220 LB/SY)
BEGINNING STATION	ENDING STATION		SY	LF	LF	SY	LF	LF	GAL	TON
101+54.93	108+50.50	US 60 TO PRIVATE DRIVEWAY	830	830	9	75	0-9	150	118	100
116+40.00	124+90.00	US 60 TO CO B	700	700	9	75	0-9	150	101	85
177+95.00	187+75.00	US 60 TO COUNTY ROAD 11	830	830	9	75	0-9	150	118	100
527+25.00	536+90.00	US 60 TO COUNTY ROAD 8	830	830	9	75	0-9	150	118	100
597+95.00	607+75.00	US 60 TO FEED LOT	830	830	9	75	0-9	150	118	100
650+21.00	657+96.00	US 60 TO PRIVATE DRIVEWAY	830	830	9	75	0-9	150	118	100
630+61.00	642+35.00	US 60 TO 2943	830	830	9	75	0-9	150	118	100
TOTAL			5680	5680				1050	807	683



TYPICAL LEFT TURN LANE PLAN VIEW
N.T.S

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED
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Casey B. Stripling

11-02-2022

Texas Department of Transportation

US60

ADDITIONAL AREAS

SHEET10 OF 10

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		51

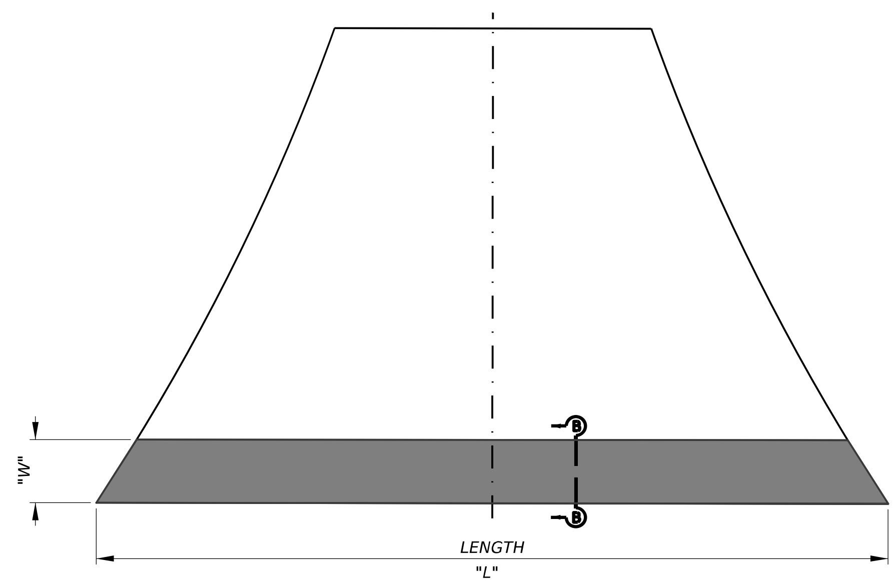
DATE: 10/31/2022 3:44:28 PM
FILE: T:\AMA\PDI\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\3. Roadway\050_Roadway_ADDITIONAL100.dgn

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

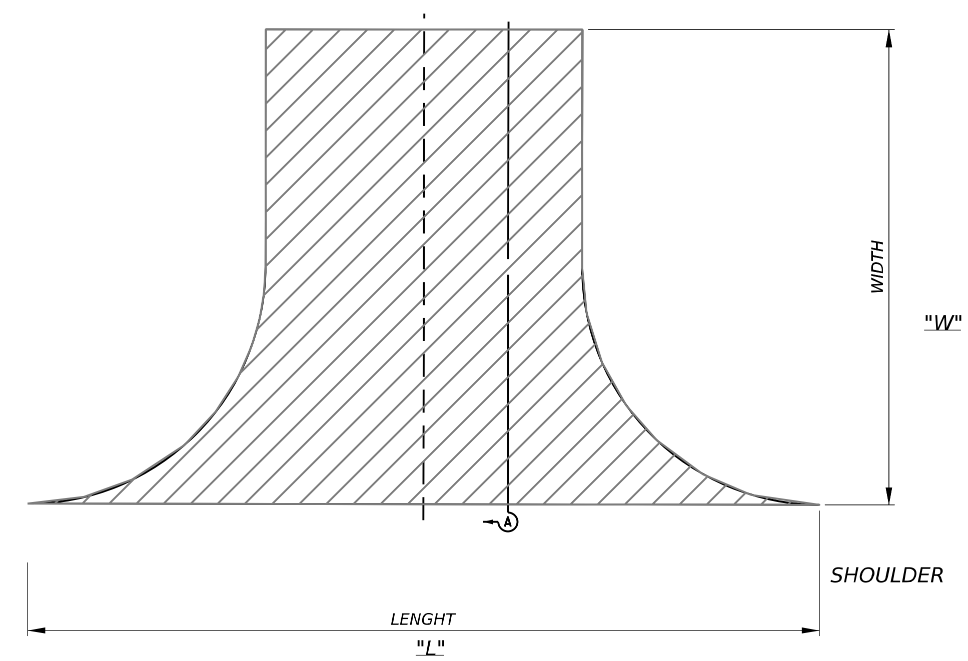
LEGEND

SUPERPAVE SP-D
SAC-A PG70-28 (2")
AND TACK COAT (0.13 GAL/SY)

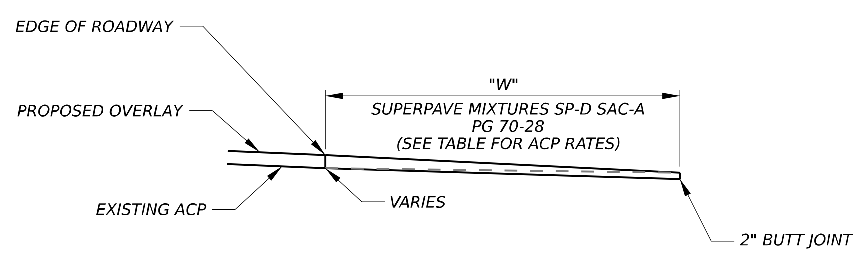
SUPERPAVE SP-D
SAC-A PG70-28 (2")
AND TACK COAT (0.13 GAL/SY)



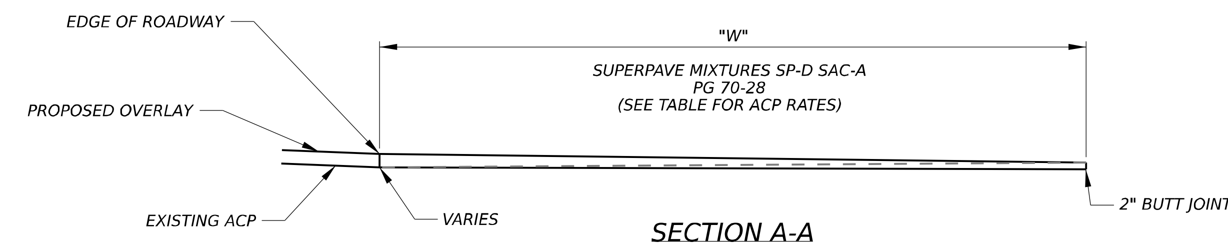
TYPICAL DRIVEWAY APRON



TYPICAL ROADWAY INTERSECTION



SECTION B-B



SECTION A-A

0168-07-050 COUNTY ROAD INTERSECTIONS AND DRIVEWAYS						3077	3077
						6075	6058
						TACK COAT (0.13 GAL/SY)	SUPERPAVE MIXTURES SP-D SAC-A PG70-28 (220 LB/SY)
STATION	DESCRIPTION	TYPE	L (FT)	W(FT)		GAL	TONS
22+76	RAILROAD CROSSING	APRON	60	4	EB	3	3
109+46	DRIVEWAY	APRON	87	4	EB	5	4
125+94	CR B	INTERSECTION	43	4	EB	2	2
128+24	CR B	INTERSECTION	69	30	EB	30	25
188+30	CR BB	INTERSECTION	109	30	EB	47	40
248+95	DRIVEWAY	APRON	114	4	EB	7	6
311+31	CR CC	INTERSECTION	66	4	EB	4	3
354+51	DRIVEWAY	APRON	73	4	EB	4	4
432+23	RAILROAD CROSSING	APRON	75	4	EB	4	4
537+57	CR 8	INTERSECTION	142	30	EB	62	52
608+43	DRIVEWAY	APRON	137	4	EB	8	7
658+24	DRIVEWAY	APRON	35	4	EB	2	2
TOTAL CSJ: 0168-07-050						179	151

11-02-2022

Texas Department of Transportation

US60

INTERSECTION AND DRIVEWAY DETAILS

SHEET 1 OF 5

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		52

DN: $D1$ CK: $C1$ DW: $D2$ CK: $C2$

DATE: 10/31/2022 4:31:04 PM
FILE: T:\AMATPD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\3. Roadway\050 Roadway ADDITIONAL100.dgn

0168-07-051 COUNTY ROAD INTERSECTIONS AND DRIVEWAYS						3077 6075 TACK COAT (0.13 GAL/SY)	3077 6058 SUPERPAVE MIXTURES SP-D SAC-A PG70-28 (220 LB/SY)
STATION	DESCRIPTION	TYPE	L (FT)	W(FT)		GAL	TONS
88+62	DRIVEWAY	APRON	25	4	WB	1	1
99+39	US 60 FRONTAGE	INTERSECTION	106	45	WB	69	58
108+57	ADILENE DR	INTERSECTION	112	45	WB	73	62
116+70	FRY DR	INTERSECTION	99	45	WB	64	54
188+32	CR 11	INTERSECTION	72	30	WB	31	26
226+02	DRIVEWAY	APRON	52	4	WB	3	3
249+09	DRIVEWAY	APRON	96	4	WB	6	5
281+47	DRIVEWAY	APRON	72	4	WB	4	4
310+23	CR CC	INTERSECTION	110	30	WB	48	40
347+88	DRIVEWAY	APRON	69	4	WB	4	3
388+73	CR DD	INTERSECTION	117	30	WB	51	43
441+92	DRIVEWAY	APRON	80	4	WB	5	4
450+71	CR E	INTERSECTION	131	30	WB	57	48
458+92	DRIVEWAY	APRON	71	4	WB	4	3
468+26	DRIVEWAY	APRON	50	4	WB	3	2
469+28	DRIVEWAY	APRON	50	4	WB	3	2
480+15	DRIVEWAY	APRON	60	4	WB	3	3
481+51	DRIVEWAY	APRON	78	4	WB	5	4
502+91	DRIVEWAY	APRON	53	4	WB	3	3
505+52	DRIVEWAY	APRON	42	4	WB	2	2
512+84	CR EE	INTERSECTION	170	30	WB	74	62
526+85	HEREFORD AIRPORT	APRON	133	4	WB	8	7
556+86	FEED LOT	APRON	120	4	WB	7	6
581+84	DRIVEWAY	APRON	80	4	WB	5	4
616+78	DRIVEWAY	APRON	68	4	WB	4	3
617+43	DRIVEWAY	APRON	34	4	WB	2	2
618+53	DRIVEWAY	APRON	61	4	WB	4	3
626+01	DRIVEWAY	APRON	43	4	WB	2	2
635+84	DRIVEWAY	APRON	38	4	WB	2	2
636+48	DRIVEWAY	APRON	33	4	WB	2	2
643+68	DRIVEWAY	APRON	55	4	WB	3	3
650+51	DRIVEWAY	APRON	302	4	WB	17	15
653+16	DRIVEWAY	APRON	66	4	WB	4	3
656+18	DRIVEWAY	APRON	62	4	WB	4	3
657+25	DRIVEWAY	APRON	60	4	WB	3	3
660+09	DRIVEWAY	APRON	76	4	WB	4	4
663+67	DRIVEWAY	APRON	79	4	WB	5	4
665+25	DRIVEWAY	APRON	120	4	WB	7	6
668+28	DRIVEWAY	APRON	75	4	WB	4	4
669+97	DRIVEWAY	APRON	98	4	WB	6	5
672+77	DRIVEWAY	APRON	62	4	WB	4	3
674+96	DRIVEWAY	APRON	100	4	WB	6	5
676+56	DRIVEWAY	APRON	97	4	WB	6	5
680+17	DRIVEWAY	APRON	76	4	WB	4	4
683+21	DRIVEWAY	APRON	45	4	WB	3	2
684+49	DRIVEWAY	APRON	66	4	WB	4	3
685+48	DRIVEWAY	APRON	87	4	WB	5	4
686+59	DRIVEWAY	APRON	87	4	WB	5	4
688+78	DRIVEWAY	APRON	52	4	WB	3	3
689+87	DRIVEWAY	APRON	64	4	WB	4	3
TOTAL CSJ: 0168-07-051						647	548

DN: 31 CK: 21 DW: $23 CK: $25

DATE: 10/31/2022 3:44:29 PM
FILE: T:\AMA\PD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\3. Roadway\050_Roadway_ADDITIONAL100.dgn

STATE OF TEXAS
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136887
LICENSED
PROFESSIONAL ENGINEER

Casey B. Stripling

11-02-2022

Texas Department of Transportation

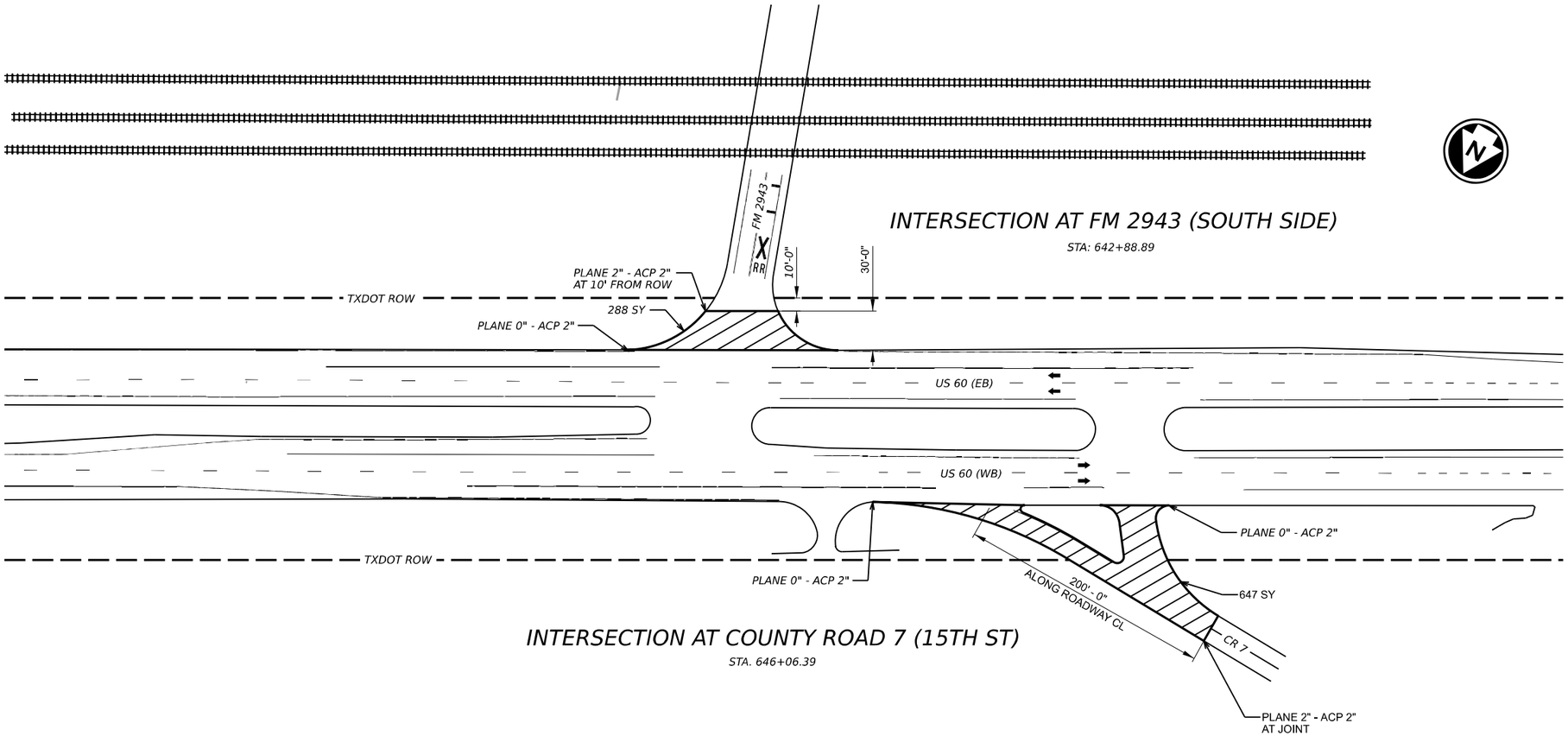
US60

INTERSECTION AND DRIVEWAY DETAILS

SHEET 2 OF 5

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		53

CK: SG23
DW: SG23
CK: SC1S
DW: SD1S



INTERSECTION DETAILS SUMMARY - 0168-07-050 & 0168-07-051					
LOCATION				3077 6075 TACK COAT (0.13 GAL.SY)	3077 6058 SUPERPAVE MIXTURES SP-D SAC-A PG70-28 (220 LB/SY)
STATION	DESCRIPTION	TYPE	DIRECTION	GAL	TONS
642+88.89	FM 2943	INTERSECTION	EB	38	32
646+06.39	CR 7	INTERSECTION	WB	85	71
			SHEET TOTALS:	123	103

STATE OF TEXAS
CASEY B. STRIPLING
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LICENSED
PROFESSIONAL ENGINEER

Casey B. Stripling

11-02-2022

Texas Department of Transportation

US60

INTERSECTION
AND DRIVEWAY
DETAILS

SHEET 3 OF 5

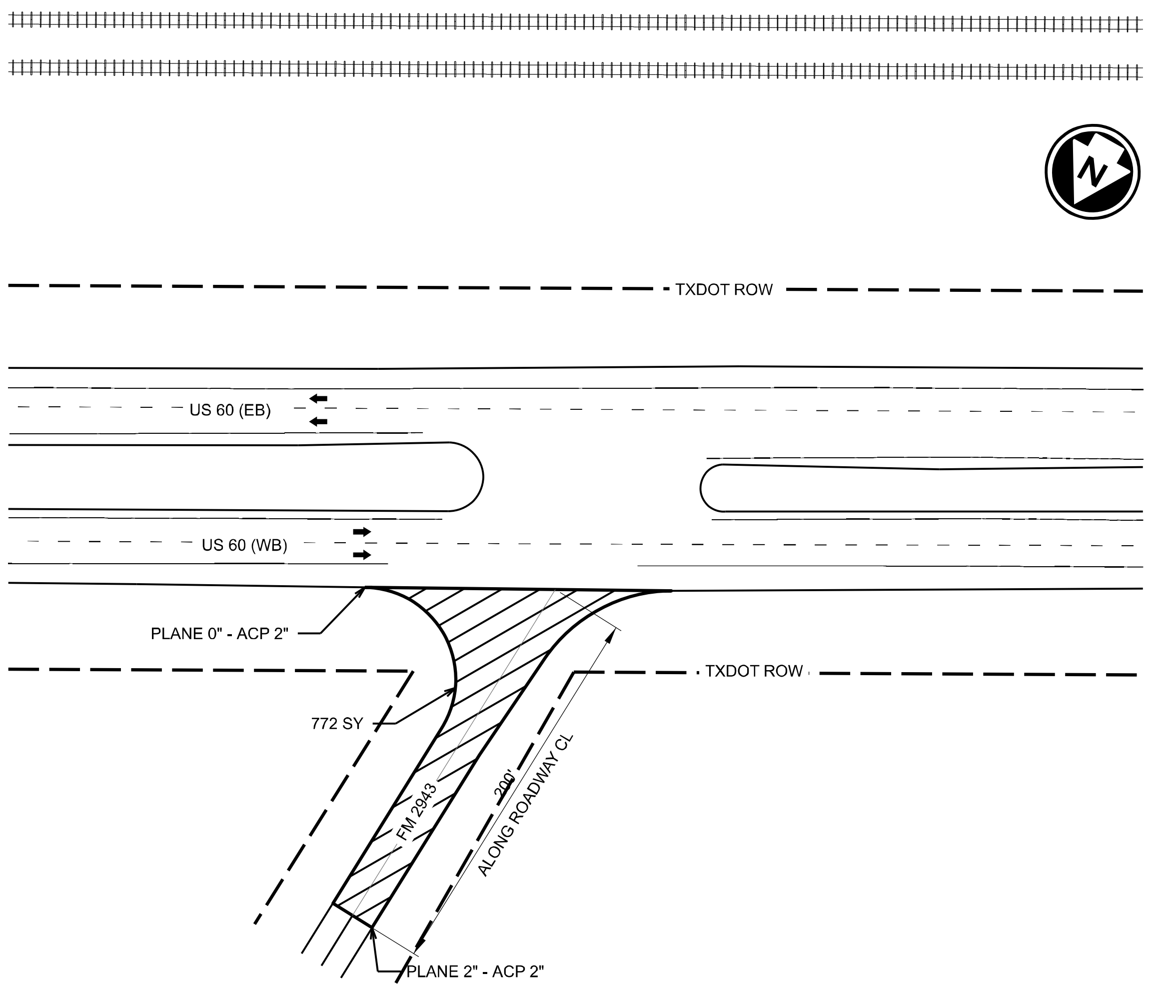
CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		54

DATE: 11/2/2022 11:41:39 AM
FILE: T:\AMA\PDI\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\3. Roadway\050 Roadway ADDITIONAL100.dgn

LEGEND

0"-2" PLANING

2" SP-D SAC-A
PG-70-28
(220 LBS/SY)



INTERSECTION AT FM 2943 (NORTH SIDE)

STA: 574+81.01

INTERSECTION DETAILS SUMMARY - 0168-07-051					
LOCATION				3077 6075 TACK COAT (0.13 GAL.SY)	3077 6058 SUPERPAVE MIXTURES SP-D SAC-A PG70-28 (220 LB/SY)
STATION	DESCRIPTION	TYPE	DIRECTION	GAL	TONS
574+81.01	FM 2943	INTERSECTION	WB	101	85
			SHEET TOTALS:	**101**	**85**

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INTERSECTION AND DRIVEWAY DETAILS

SHEET 4 OF 5

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		55

DATE: 10/31/2022 3:44:31 PM
FILE: T:\AMATPD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\3. Roadway\050_Roadway_ADDITIONAL100.dgn

DN: $D1$ CK: $C1$ DW: $D2$ CK: $C2$

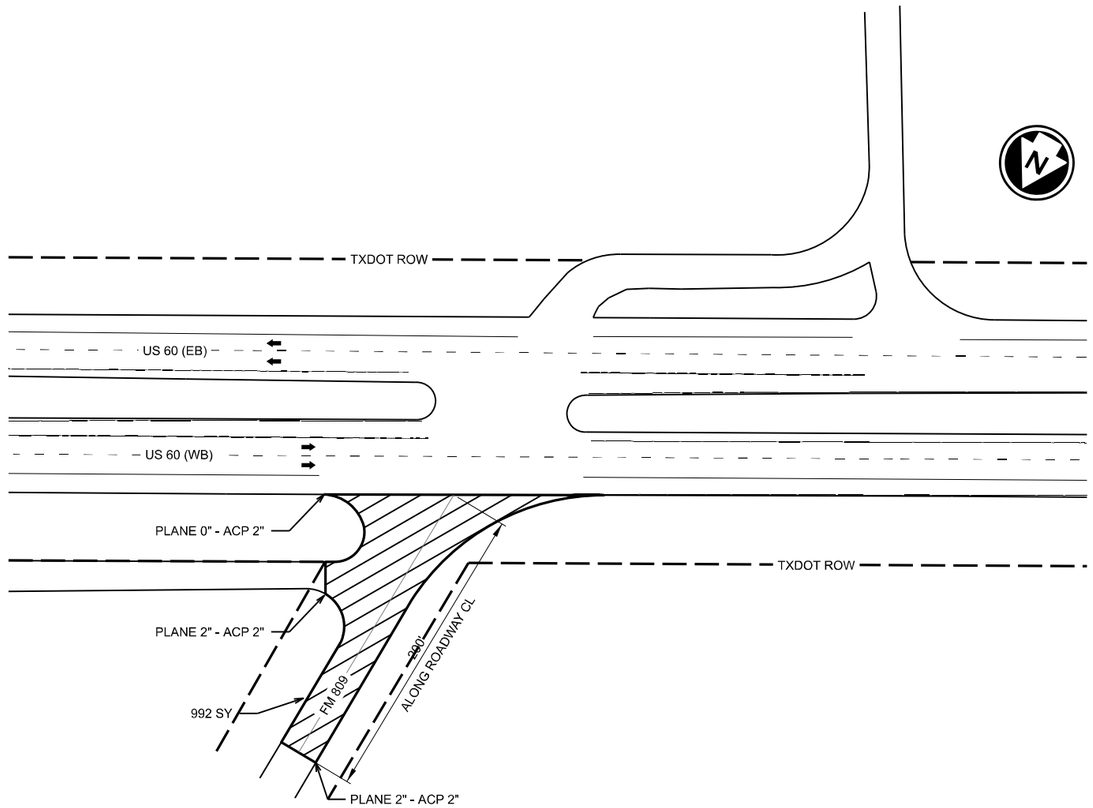
DN: SD1S CK: SC1S DW: SS2S CK: SC2S

DATE: 10/27/2022 3:44:31 PM
FILE: T:\DAL\PROJECTS\Intersection Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\3. Roadway\050_Roadway_ADDITIONAL100.dgn

LEGEND

0"-2" PLANING

2" SP-D SAC-A
PG-70-28
(220 LBS/SY)



INTERSECTION AT FM 809

STA: 125+12.45

INTERSECTION DETAILS SUMMARY - 0168-07-051

LOCATION				3077 6075 TACK COAT (0.13 GAL.SY)	3077 6058 SUPERPAVE MIXTURES SP-D SAC-A PG70-28 (220 LB/SY)
STATION	DESCRIPTION	TYPE	DIRECTION	GAL	TONS
125+12.45	FM 809	INTERSECTION	WB	129	109
			SHEET TOTALS:	**129**	**109**

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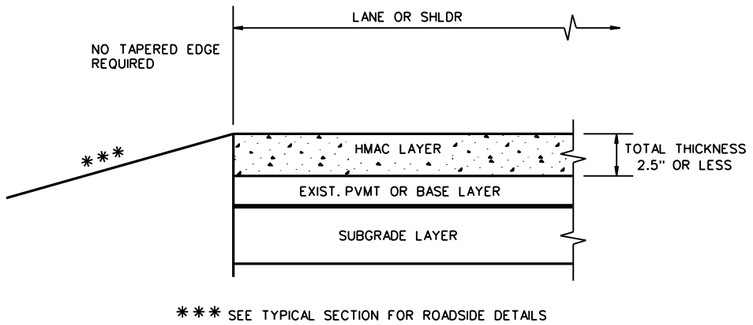
INTERSECTION
AND DRIVEWAY
DETAILS

SHEET 5 OF 5

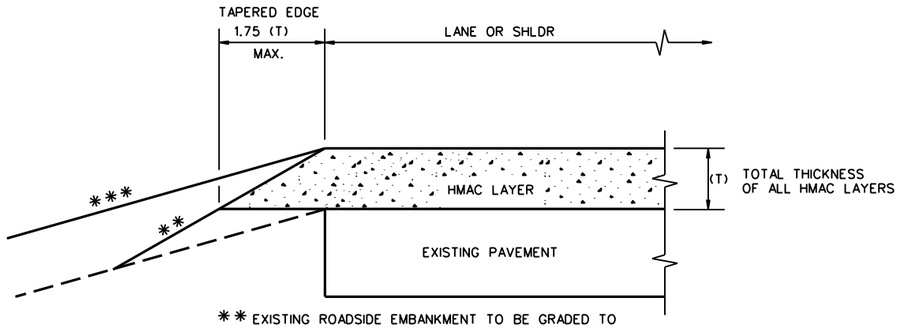
CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		56

DATE: 10/31/2022
FILE: T:#AMATPD#Construction Projects#0168-07#050 US 60 HEREFORD TO CANYON#4 - Design#Plan Set#3. Roadway#tehmac11.dgn



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

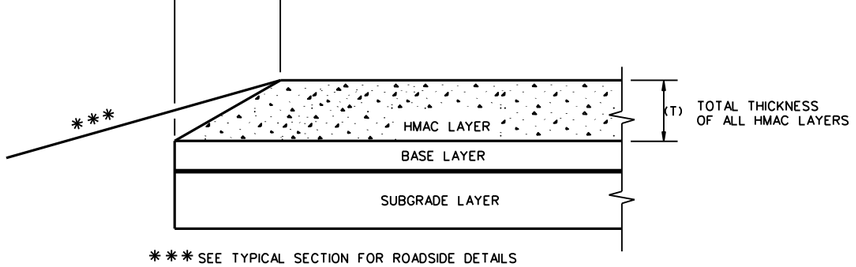
CONDITION - 1
THIN HMAC SURFACES OR HMAC OVERLAY WITH THICKNESS OF 2.5" OR LESS



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

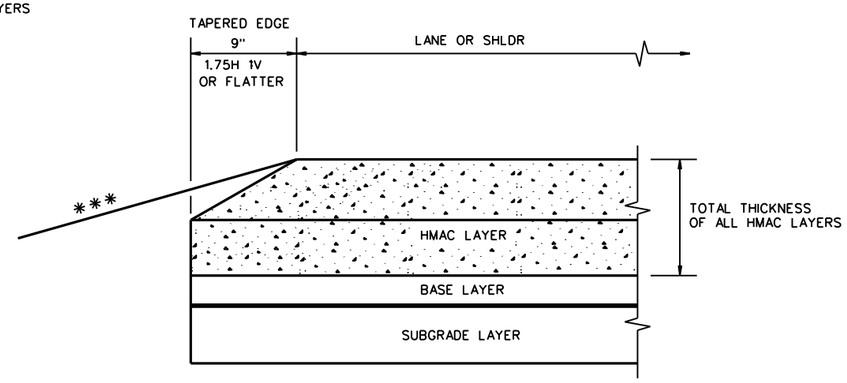
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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

(NOT TO SCALE)

GENERAL NOTES

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

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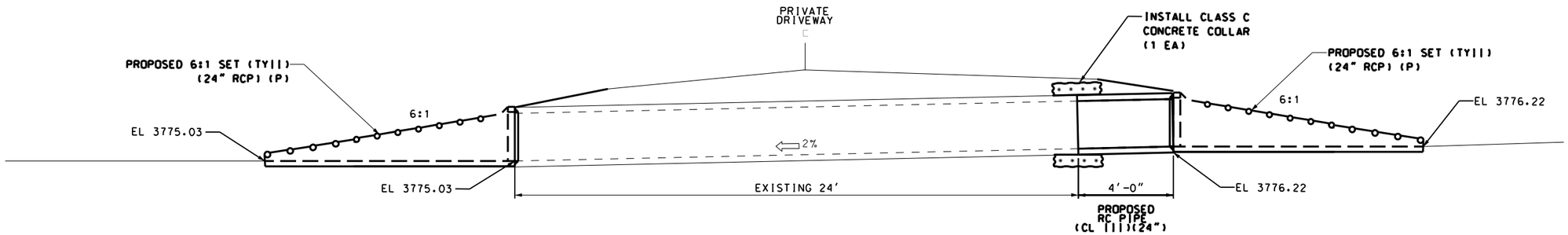
Design Division Standard

TAPERED EDGE DETAILS HMAC PAVEMENT

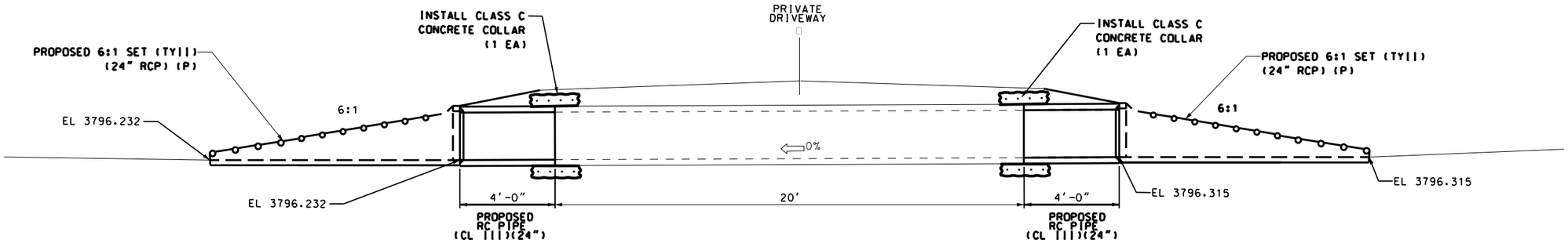
TE(HMAC)-11

FILE: tehmac11.dgn	DN: TxDOT	CK: RL	DW: KB	CK:
© TxDOT January 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
	DIST	COUNTY		SHEET NO.
	AMA	DEAF SMITH		57



STA 22+76

LOCATION: US 60 CL OFFSET 98.82 LT (PARRALLEL DRAINAGE)
EXISTING: 1-24" RCP X 24'
PROPOSED: 1-24" RCP X 28'
(INSTALL: EXTEND 4' RT.
TYPE II 24" SETP-PD RT & LT)



STA 88+61

LOCATION: US 60 CL OFFSET 78.07 RT (PARRALLEL DRAINAGE)
EXISTING: 1- 24" RCP X 20'
PROPOSED: 1- 24" RCP X 28'
INSTALL: (EXTEND 4' RT, 4' LT,
TYPE II 24" SETP-PD RT & LT)

STATION AND OFFSET		DESCRIPTION	132 6001 EMBANKMENT (FINAL)(ORD COMP)(TY A) CY	420 6071 CLASS C CONC (COLLAR) EA	464 6005 RC PIPE (CL III)(24 IN) LF	467 6395 SET (TY II) (24 IN) (RCP)(6: 1) (P) EA
22 + 76	98.82 LT	PRIVATE RAIL ROAD CROSSING	10	1	4	2
88 + 61	78.07 RT	PRIVATE DRIVEWAY	10	2	8	2

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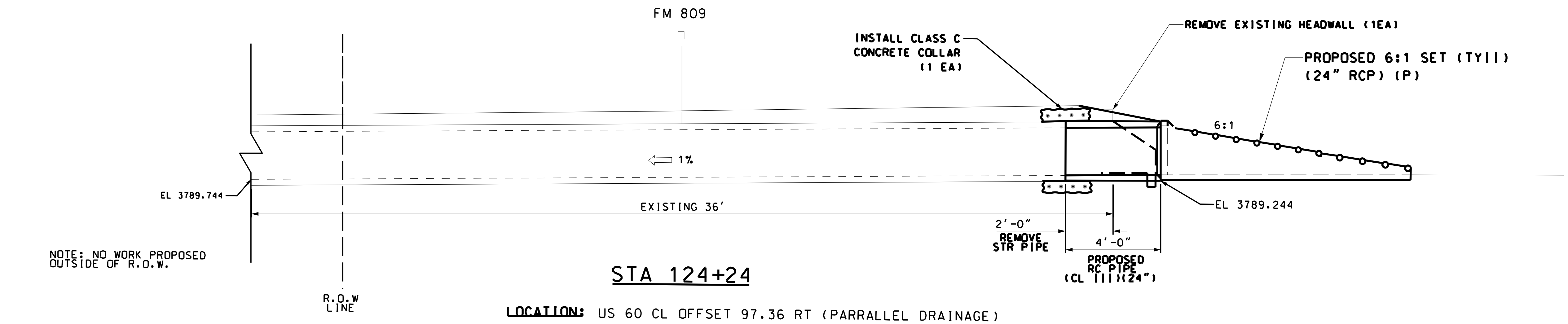
SHEET 1 OF 10

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		58

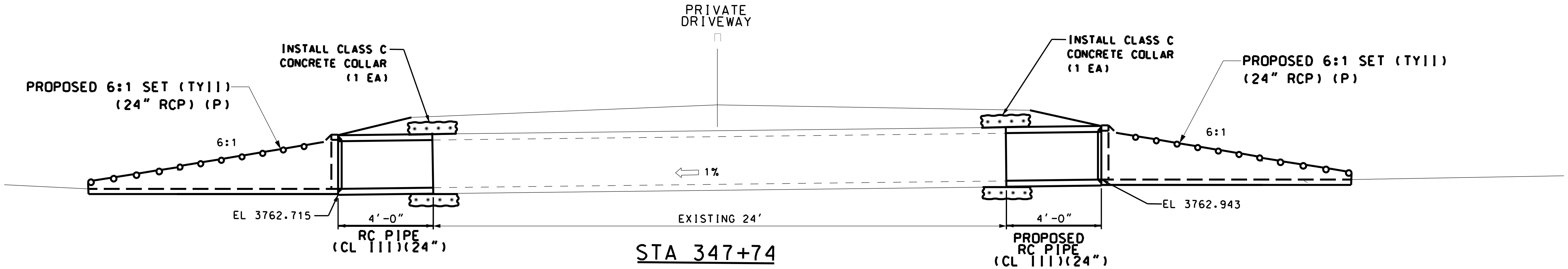
DATE: 10/31/2022 3:44:44 PM
FILE: T:\AMA\PD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\5. Drainage\049_Drainage_sheets90corrected%.dgn

DN: SD15 CK: SC2S DW: SD2S CK: SC1S



STA 124+24

LOCATION: US 60 CL OFFSET 97.36 RT (PARRALLEL DRAINAGE)
EXISTING: 1- 24" RCP X 36'
PROPOSED: 1- 24" RCP X 38'
INSTALL: (EXTEND 2'
TYPE II 24" SETP-PD RT)



STA 347+74

LOCATION: US 60 CL OFFSET 101.24 RT (PARRALLEL DRAINAGE)
EXISTING: 1-24" RCP X 24'
PROPOSED: 1-24" RCP X 32'
INSTALL: (EXTEND 4' RT & LT
TYPE II 24" SETP-PD RT & LT)

STATION AND OFFSET		DESCRIPTION	132 6001 EMBANKMENT (FINAL)(ORD COMP)(TY A)	420 6071 CLASS C CONC (COLLAR)	464 6005 RC PIPE (CL III)(24 IN)	467 6395 SET (TY II) (24 IN) (RCP) (6: 1) (P)	496 6006 REMOV STR (HEADWALL)	496 6007 REMOV STR (PIPE)
			CY	EA	LF	EA	EA	LF
124 + 24	97.36 RT	FM 809	5	1	4	1	1	2
347 + 74	101.24 RT	PRIVATE DRIVEWAY	10	2	8	2	0	0

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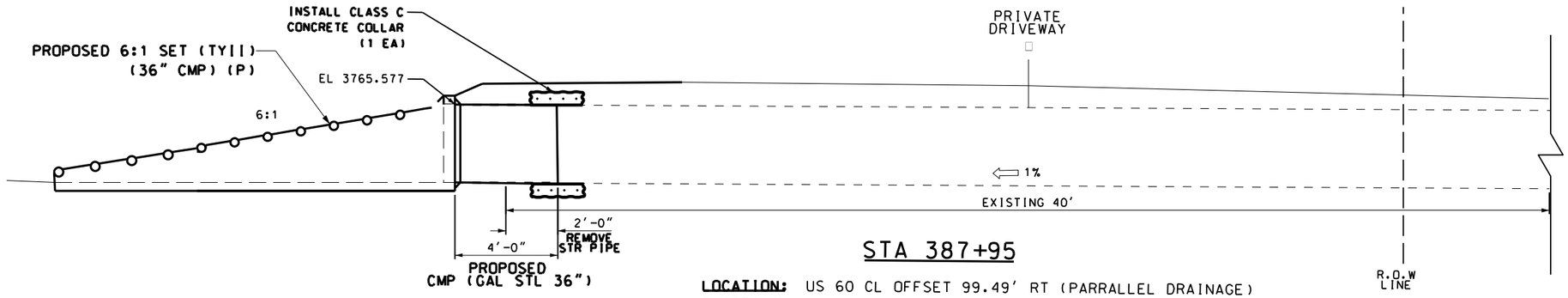
SHEET 2 OF 10

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		59

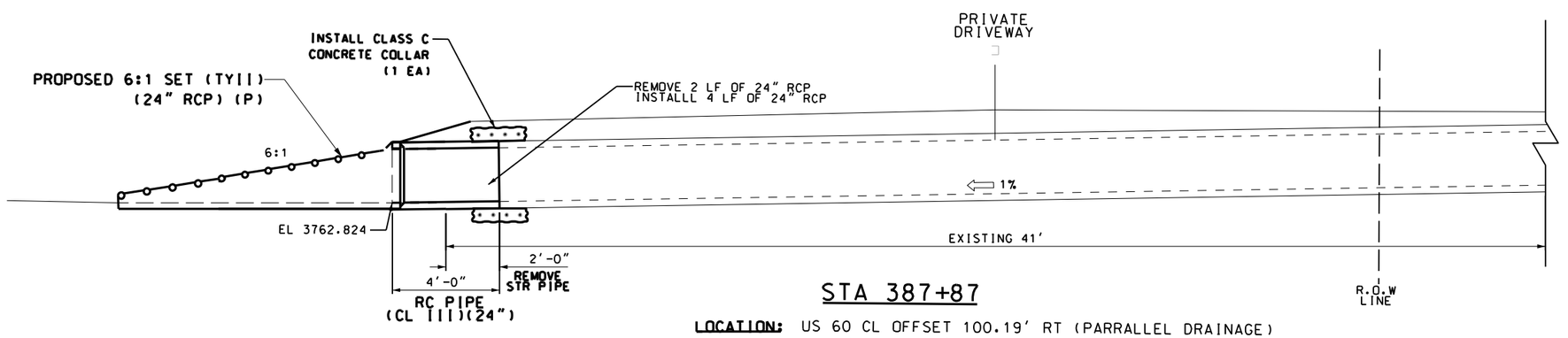
DATE: 10/31/2022 3:44:45 PM
FILE: T:\AMATPD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\5. Drainage\049_Drainage_sheets90corrected%.dgn

DN: SD1S CK: SC2S DW: SD2S CK: SC1S



STA 387+95

LOCATION: US 60 CL OFFSET 99.49' RT (PARRALLEL DRAINAGE)
EXISTING: 1-36" CMP X 40'
PROPOSED: 1-36" CMP X 42'
INSTALL:(EXTEND 2' LT
TYPE II 36" CMP 6:1 SETP-PD LT)



STA 387+87

LOCATION: US 60 CL OFFSET 100.19' RT (PARRALLEL DRAINAGE)
EXISTING: 1-14" RCP X 41'
PROPOSED: 1-14" RCP X 43'
INSTALL: (EXTEND 2' LT
TYPE II 24" RCP 6:1 SETP-PD LT)

STATION AND OFFSET		DESCRIPTION	132 6001 EMBANKMENT (FINAL)(ORD COMP)(TY A)	420 6071 CLASS C CONC (COLLAR)	460 6005 CMP (GAL STL 36 IN)	464 6005 RC PIPE (CL III)(24 IN)	467 6395 SET (TY II) (24 IN) (RCP) (6: 1) (P)	467 6444 SET (TY II) (36 IN) (CMP) (6: 1) (P)	496 6007 REMOV STR (PIPE)
			CY	EA	LF	LF	EA	EA	LF
387 + 95	99.49 RT	PRIVATE DRIVEWAY	5	1	4	0	0	1	2
387 + 87	100.19 RT	PRIVATE DRIVEWAY	5	1	0	4	1	0	2

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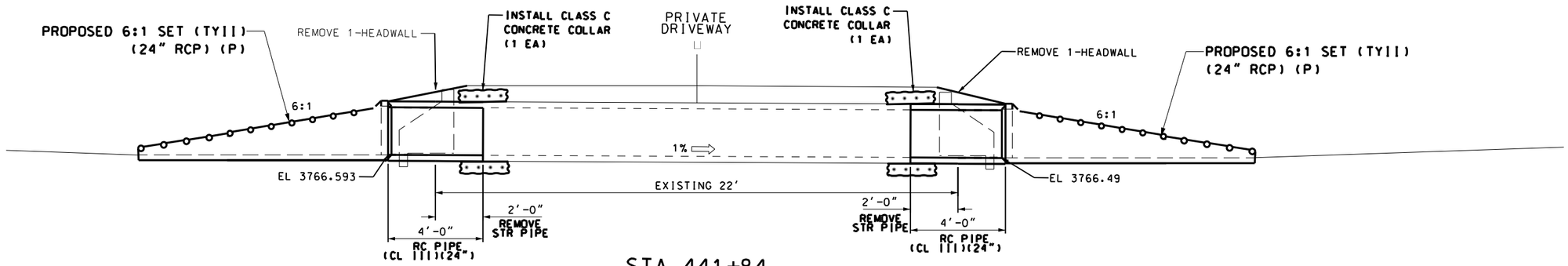
SHEET 3 OF 10

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		60

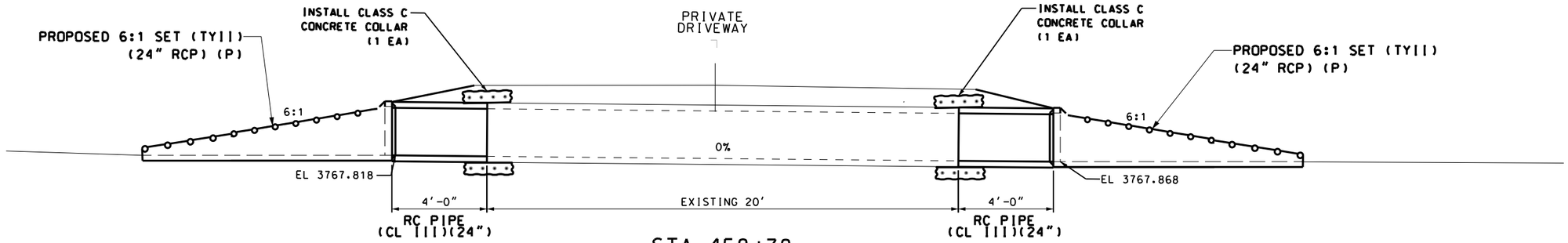
DATE: 10/31/2022 3:44:45 PM
FILE: T:\AMA\PD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\5. Drainage\049 Drainage sheets90corrected%.dgn

DN: SD1S CK: RC26 DW: SD3S CK: SC1S



STA 441+84

LOCATION: US 60 OFFSET 92.97' RT (PARRALLEL DRAINAGE)
EXISTING: 1-24" RCP X 22'
PROPOSED: 1-24" RCP X 22'
INSTALL: (EXTEND 2' LT, 2' RT,
TYPE II 24" RCP 6:1 SETP-PD RT & LT)



STA 458+78

LOCATION: US 60 CL OFFSET 84.73' RT (PARRALLEL DRAINAGE)
EXISTING: 1-24" RCP X 20'
PROPOSED: 1-24" RCP X 28'
INSTALL: (EXTEND 4' LT, 4' RT,
TYPE II 24" RCP 6:1 SETP-PD RT & LT)

STATION AND OFFSET		DESCRIPTION	132 6001 EMBANKMENT (FINAL)(ORD COMP)(TY A)	420 6071 CLASSC CONC (COLLAR)	464 6005 RC PIPE (CL III)(24 IN)	467 6395 SET (TY II) (24 IN) (RCP) (6: 1) (P)	496 6006 REMOV STR (HEADWALL)	496 6007 REMOV STR (PIPE)
			CY	EA	LF	EA	EA	LF
441 + 84	92.97 RT	PRIVATE DRIVEWAY	10	2	8	2	2	4
458 + 78	84.73 RT	PRIVATE DRIVEWAY	10	2	8	2	0	0

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SHEET 4 OF 10

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		61

DATE: 10/31/2022 3:44:45 PM
FILE: T:\AMA\PD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\5. Drainage\049_Drainage_sheets90corrected%.dgn

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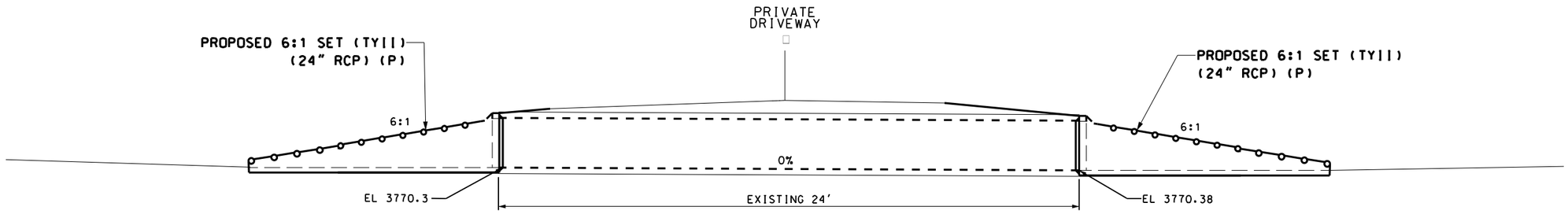
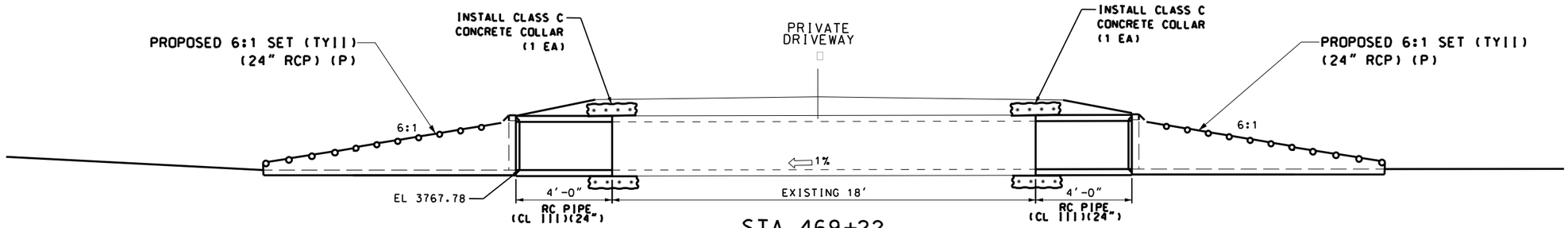


STA 468+25

LOCATION: US 60 CL OFFSET 84.93' RT (PARRALLEL DRAINAGE)
EXISTING: 1 24" RCP X 24'
PROPOSED: 1 24" RCP X 24'
INSTALL: (TYPE II 24" RCP 6:1 SETP-PD RT & LT)



STA 469+22

LOCATION: US 60 OFFSET 84.90' RT (PARRALLEL DRAINAGE)
EXISTING: 1- 24" RCP X 18'
PROPOSED: 1- 24" RCP X 26'
INSTALL: (EXTEND 4' LT, 4' RT,
TYPE II 24" RCP 6:1 SETP-PD RT & LT)

STATION AND OFFSET		DESCRIPTION	132 6001 EMBANKMENT (FINAL)(ORD COMP)(TY A)	420 6071 CLASS C CONC (COLLAR)	464 6005 RC PIPE (CL III)(24 IN)	467 6395 SET (TY II) (24 IN) (RCP) (6: 1) (P)
			CY	EA	LF	EA
468 + 25	84.93 RT	PRIVATE DRIVEWAY	10	0	0	2
469 + 22	84.90 RT	PRIVATE DRIVEWAY	10	2	8	2

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SHEET 5 OF 10

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
ABL	DEAF SMITH		62

DATE: 10/31/2022 3:44:46 PM
FILE: T:\AMA\PD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\5. Drainage\049 Drainage sheets90corrected%.dgn

DW: SDS
CK: SCS
DW: SDS
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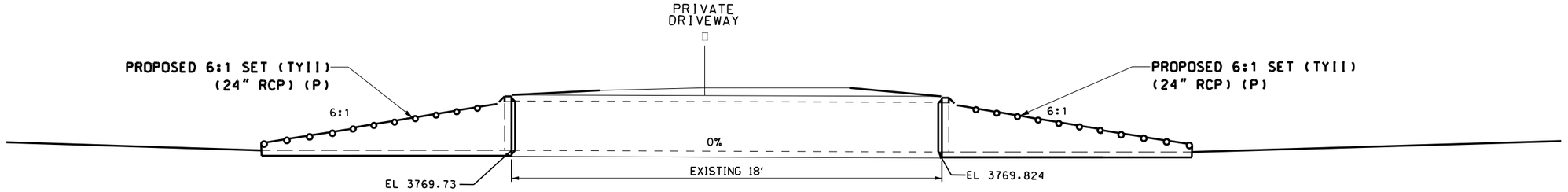
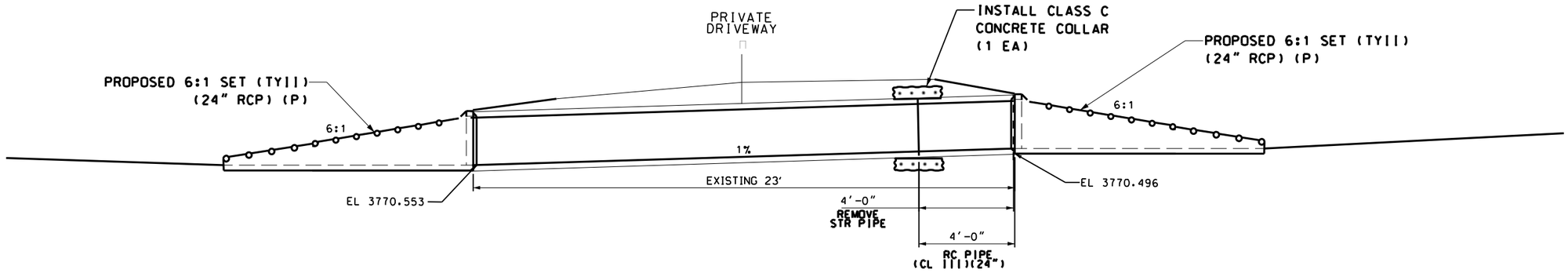
DW: SDS



STA 480+15

LOCATION: US 60 CL OFFSET 85.77' RT (PARRALLEL DRAINAGE)
EXISTING: 1-24" RCP X 18'
PROPOSED: 1-24" RCP X 18'
INSTALL: (TYPE II 24" RCP 6:1 SETP-PD RT & LT)



STA 480+15

LOCATION: US 60 CL OFFSET 56.97' RT (PARRALLEL DRAINAGE)
EXISTING: 1-24" RCP X 23'
PROPOSED: 1-24" RCP X 23'
INSTALL:(TYPE II 24" RCP 6:1 SETP-PD RT & LT)

STATION AND OFFSET		DESCRIPTION	132 6001 EMBANKMENT (FINAL)(ORD COMP)(TY A)	420 6071 CLASS C CONC (COLLAR)	464 6005 RC PIPE (CL III)(24 IN)	467 6395 SET (TY II) (24 IN) (RCP) (6: 1) (P)	496 6007 REMOV STR (PIPE)
			CY	EA	LF	EA	LF
480 + 15	85.77 RT	PRIVATE DRIVEWAY	10	0	0	2	0
480 + 15	56.97 RT	PRIVATE DRIVEWAY	10	1	4	2	4

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SHEET 6 OF 10

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		63

DATE: 10/31/2022 3:44:46 PM
FILE: T:\AMA\PD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\5. Drainage\049 Drainage sheets90corrected%.dgn

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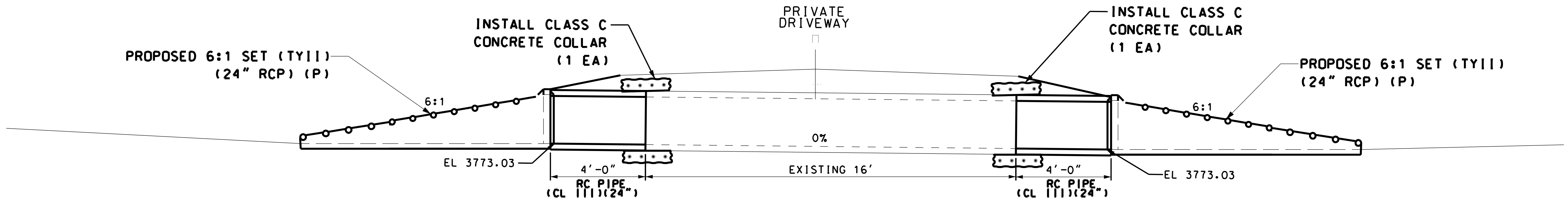
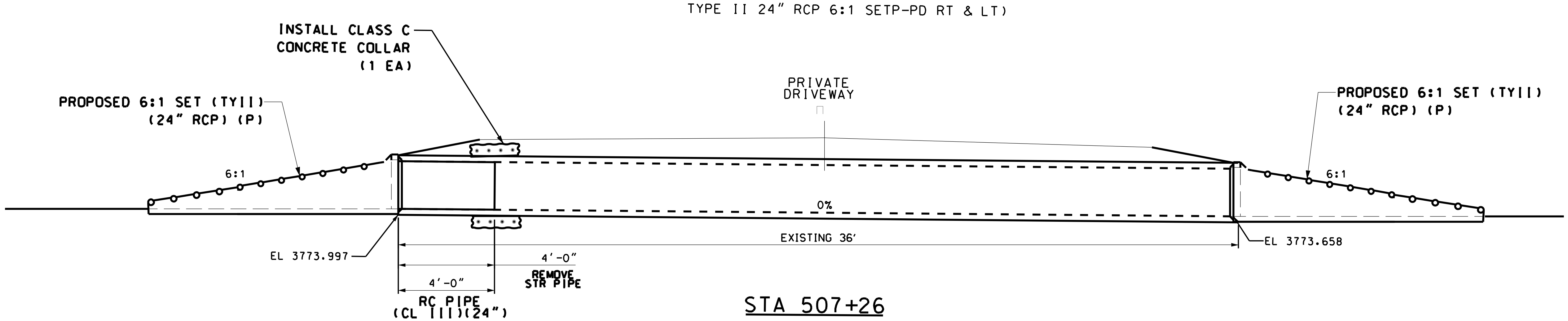


STA 505+25

LOCATION: US 60 CL OFFSET 59.27' RT (PARRALLEL DRAINAGE)
EXISTING: 1-24" RCP X 16'
PROPOSED: 1-24" RCP X 24'
INSTALL: (EXTEND 4' LT, 4' RT,
TYPE II 24" RCP 6:1 SETP-PD RT & LT)



STA 507+26

LOCATION: US 60 CL OFFSET 83.92' RT (PARRALLEL DRAINAGE)
EXISTING: 1-24" RCP X 36'
PROPOSED: 1-24" RCP X 36'
INSTALL: (TYPE II 24" RCP 6:1 SETP-PD RT & LT)

STATION AND OFFSET		DESCRIPTION	132 / 6001 EMBANKMENT (FINAL)(ORD COMP)(TY A)	420 / 6071 CLASS C CONC (COLLAR)	464 / 6005 RC PIPE (CL III)(24 IN)	467 / 6395 SET (TY II) (24 IN) (RCP)(6: 1) (P)	496 / 6007 REMOV STR (PIPE)
			CY	EA	LF	EA	LF
505 + 25	59.27 RT	PRIVATE DRIVEWAY	10	2	8	2	0
507 + 26	83.92 RT	PRIVATE DRIVEWAY	10	1	4	2	4

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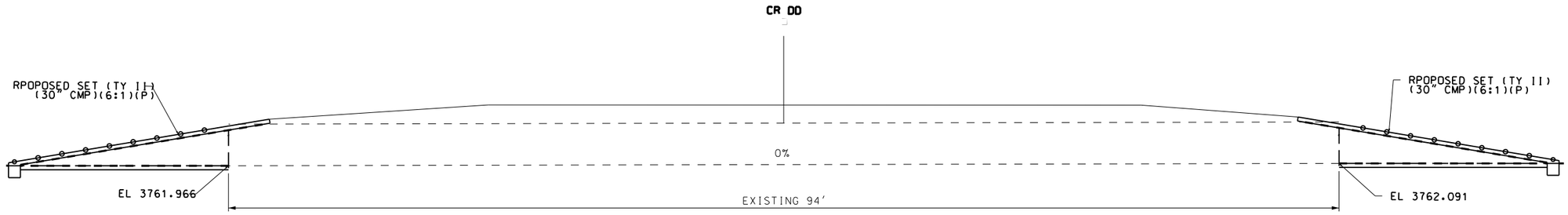
SHEET 7 OF 10

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		64

DATE: 10/31/2022 3:44:46 PM
FILE: T:\AMATPD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\Plan Set\5. Drainage\049_Drainage_sheets90corrected%.dgn



STA 388+09

LOCATION: US 60 CL OFFSET 88.31' RT (PARRALLEL DRAINAGE)
EXISTING: 3- 36" CMP X 94'
PROPOSED: 3- 36" CMP X 94'
INSTALL: (TYPE II 36" RCP 6:1 SETP-PD RT & LT)

STATION AND OFFSET		DESCRIPTION	132	467
			6001	6444
			EMBANKMENT (FINAL)(ORD COMP)(TY A)	SET (TY II) (36 IN) (CMP) (6: 1) (P)
			CY	EA
388 + 09	88.31 RT	PRIVATE DRIVEWAY	5	6

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Casey B. Stripling

11-02-2022

Texas Department of Transportation

US60

CULVERT LAYOUT

SHEET 8 OF 10

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		65

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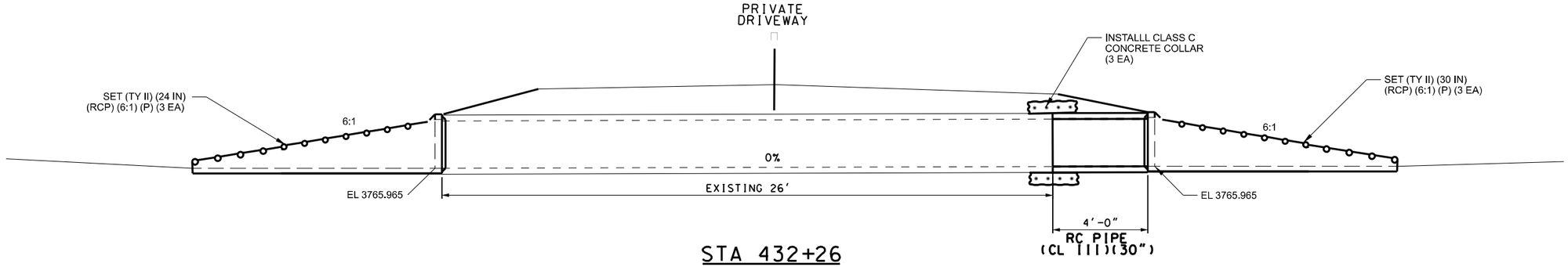
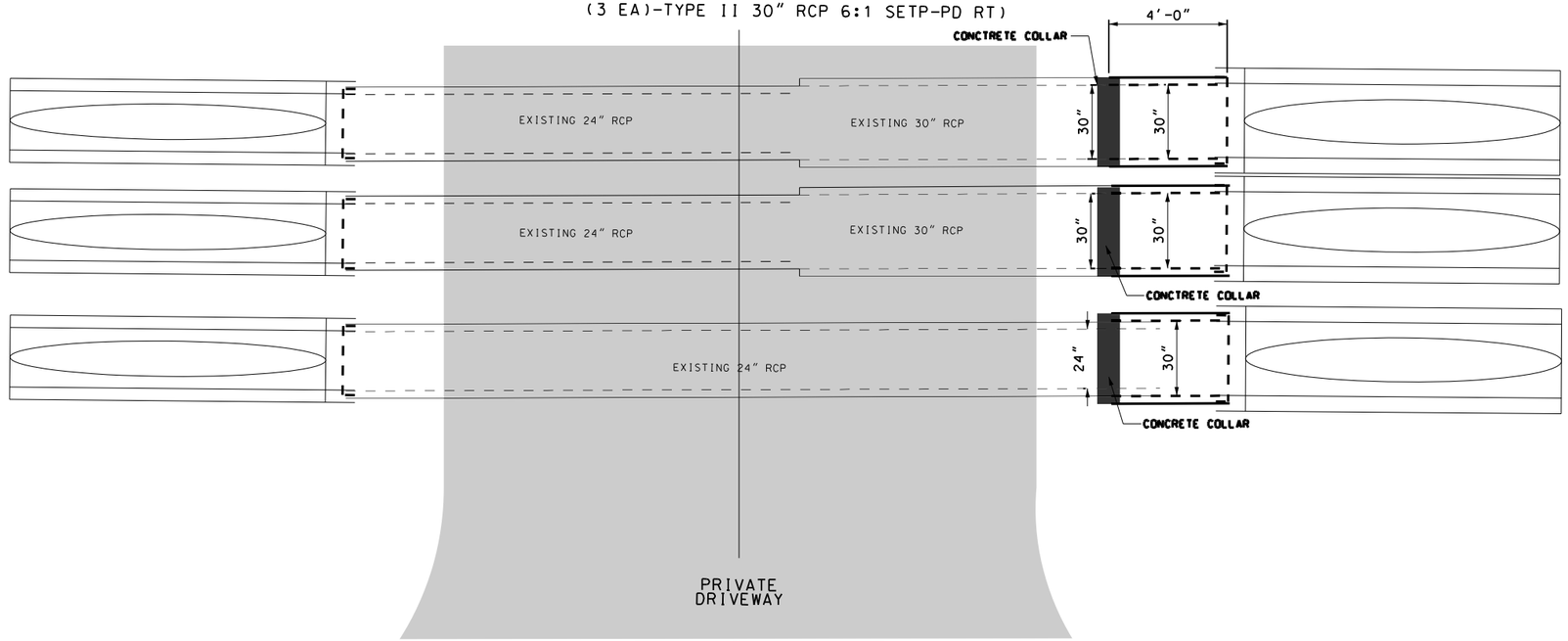


STA 432+26

LOCATION: US 60 CL OFFSET 99.34' LT (PARRALLEL DRAINAGE)
EXISTING: 2- 24" / 30" RCP X 26'
1- 24" RCP X 25'-9"
PROPOSED: 2- 24" / 30" RCP X 30'
1- 24" RCP X 29'-9"
INSTALL: (EXTEND 4' RT,
(3 EA)-TYPE II 24" RCP 6:1 SETP-PD LT,
(3 EA)-TYPE II 30" RCP 6:1 SETP-PD RT)



STATION AND OFFSET		DESCRIPTION	132 6001 EMBANKMENT (FINAL)(ORD COMP)(TY A)	420 6071 CLASS C CONC (COLLAR)	464 6007 RC PIPE (CL III)(30 IN)	467 6395 SET (TY II) (24 IN) (RCP) (6: 1) (P)	467 6410 SET (TY II) (30 IN) (CMP) (6: 1) (P)
			CY	EA	LF	EA	EA
432+26	99.34 LT	PRIVATE DRIVEWAY	20	3	12	3	3

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US60

CULVERT LAYOUT

SHEET 9 OF 10

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		66

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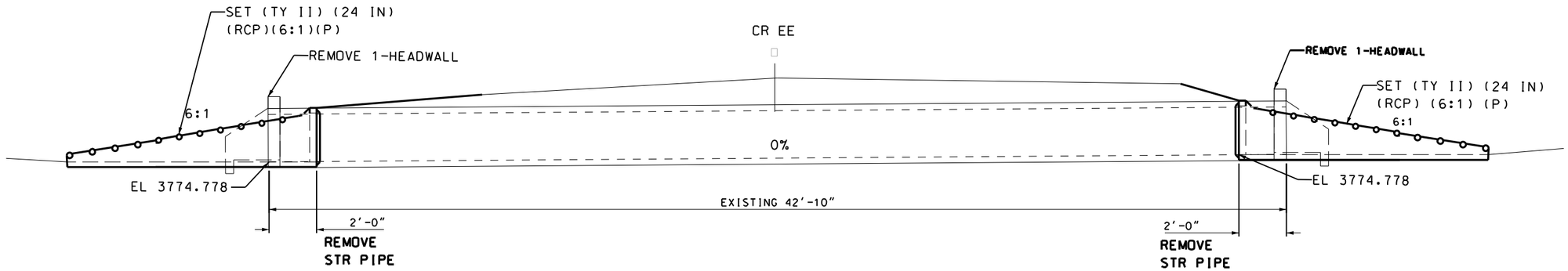

STA 512+15

LOCATION: WB US 60 CL OFFSET 141.79' RT (PARRALLEL DRAINAGE)
EXISTING: 1-24" RCP X 43'
PROPOSED: 1-24" RCP X 39'
INSTALL:(TYPE II 24" RCP 6:1 SETP-PD RT & LT)

STATION AND OFFSET		DESCRIPTION	132	467	496	496
			6001	6395	6006	6007
			EMBANKMENT (FINAL)(ORD COMP)(TY A)	SET (TY II) (24 IN) (RCP)(6: 1) (P)	REMOV STR (HEADWALL)	REMOV STR (PIPE)
			CY	EA	EA	LF
512 + 15	141.79 RT	COUNTY RD EE	10	2	2	4

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US60

CULVERT LAYOUT

SHEET10 OF 10

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		67

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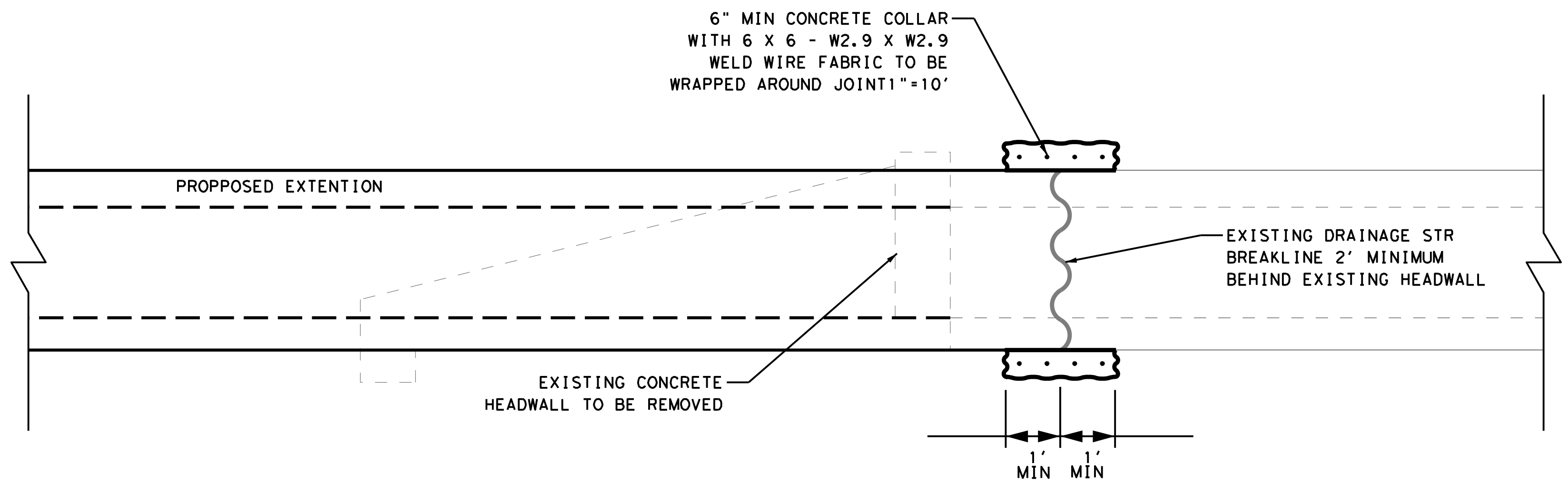

MISCELLANEOUS CONCRETE COLLAR DETAILS

NTS

DETAILS NOTE:
CONCRETE COLLAR TO BE USED FOR ALL
CONCRETE CULVERTS AND WILL BE PAID
FOR UNDER ITEM 420-6071.

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11-02-2022

Texas Department of Transportation

US60

CONCRETE COLLAR DETAIL

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		68

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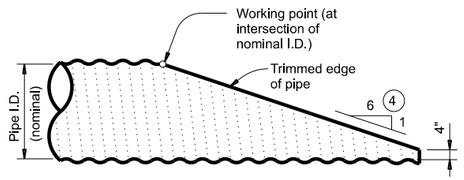
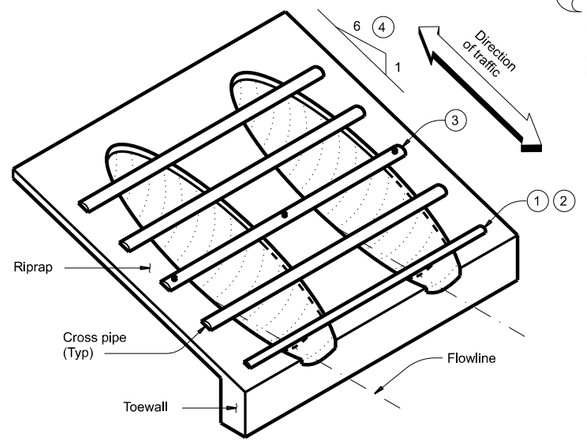


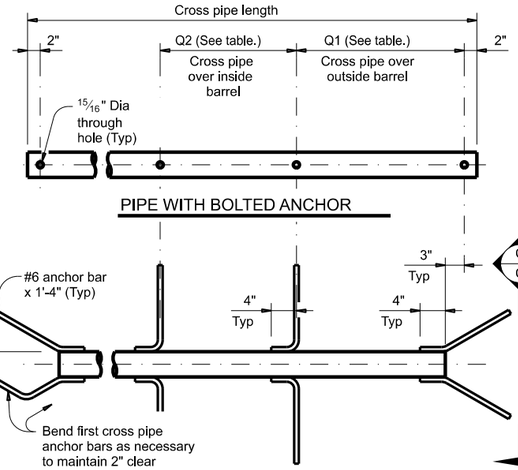
NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert Details at reinforced concrete pipe (RCP) culvert are similar.)

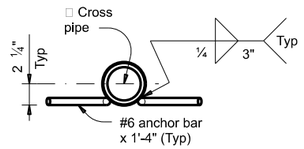


ISOMETRIC VIEW OF TYPICAL INSTALLATION



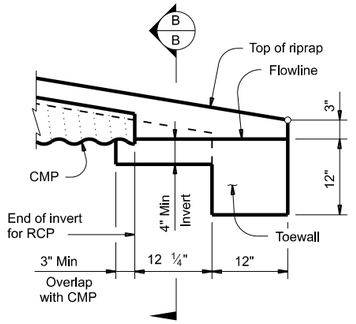
PIPE WITH BOLTED ANCHOR

PIPE WITH ANCHOR BARS



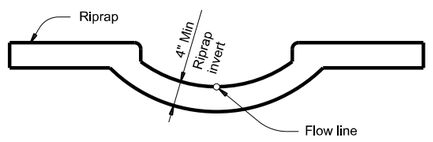
SECTION C-C

CROSS PIPE DETAILS



DETAIL "A"

(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)



SECTION B-B

(Cross pipes not shown for clarity.)

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES (2)

Nominal Culvert I.D.	Conc Riprap (CY) (6)	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
12"	0.6	0' - 9"	N/A	2' - 1"	1' - 9"	3 or more pipe culverts	3" Std (3.500" O.D.)
15"	0.7	0' - 11"	N/A	2' - 5"	2' - 2"		
18"	0.8	1' - 2"	N/A	2' - 10"	2' - 8"		
21"	0.9	1' - 4"	N/A	3' - 2"	3' - 1"		
24"	0.9	1' - 7"	N/A	3' - 6"	3' - 7"		
27"	1.0	1' - 8"	N/A	3' - 10"	3' - 11"	3 or more pipe culverts	3 1/2" Std (4.000" O.D.)
30"	1.1	1' - 10"	N/A	4' - 2"	4' - 4"	2 or more pipe culverts	
33"	1.2	1' - 11"	4' - 2"	4' - 5"	4' - 8"	All pipe culverts	
36"	1.3	2' - 1"	4' - 5"	4' - 9"	5' - 1"	All pipe culverts	4" Std (4.500" O.D.)
42"	1.5	2' - 4"	4' - 11"	5' - 5"	5' - 10"		
48"	1.7	2' - 7"	5' - 5"	6' - 0"	6' - 7"	All pipe culverts	5" Std (5.563" O.D.)
54"	2.0	3' - 0"	5' - 11"	6' - 9"	7' - 6"		
60"	2.2	3' - 3"	6' - 5"	7' - 4"	8' - 3"		
66"	2.4	3' - 3"	6' - 11"	7' - 10"	8' - 9"		
72"	2.7	3' - 4"	7' - 5"	8' - 5"	9' - 4"		

(1) The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.

(2) Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1#2" standard pipe (4" O.D.) for the first bottom pipe.

(3) Install the third cross pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.

(4) Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.

(5) Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".

(6) Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for contractor's information only.

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 (Gr B), or API 5LX52.

Provide ASTM A307 bolts and nuts.

Galvanize all steel components, except concrete reinforcing, after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

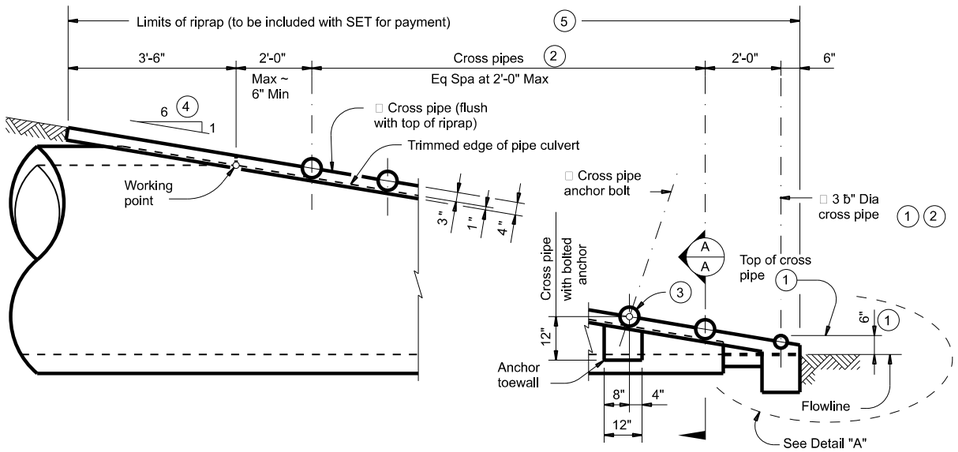
GENERAL NOTES:

Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the cross pipes.

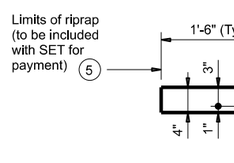
Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap".

Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.

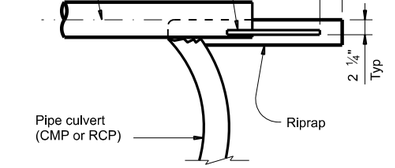


SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

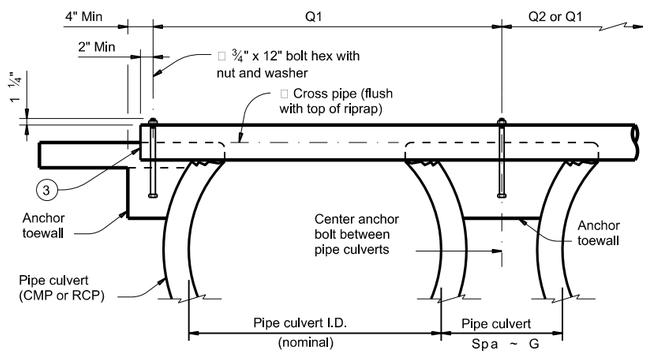
(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)



SHOWING TYPICAL PIPE CULVERT AND RIPRAP



SHOWING CROSS PIPE WITH ANCHOR BAR



SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A

Texas Department of Transportation

Bridge Division Standard

SAFETY END TREATMENT

FOR 12" DIA TO 72" DIA PIPE CULVERTS TYPE II ~ PARALLEL DRAINAGE

SETP-PD

FILE: setppdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	AMA	DEAF SMITH		69

DATE: 10/31/2022 3:44:48 PM
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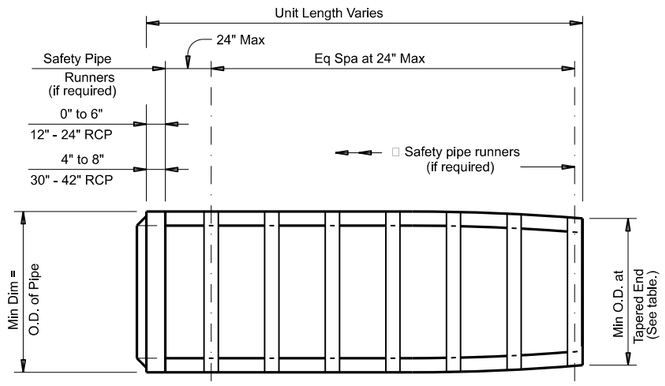
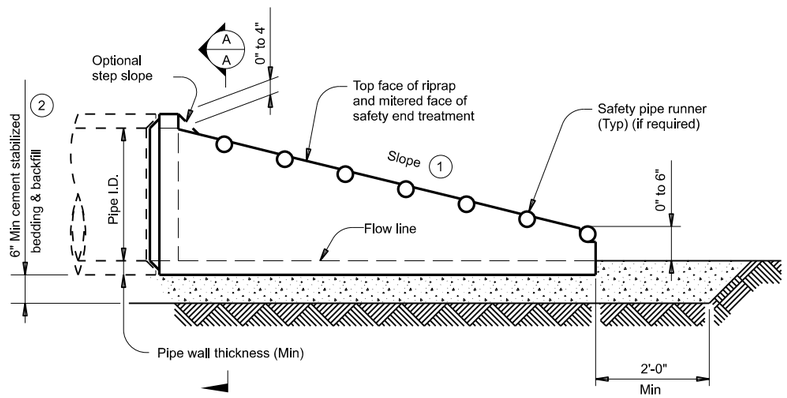


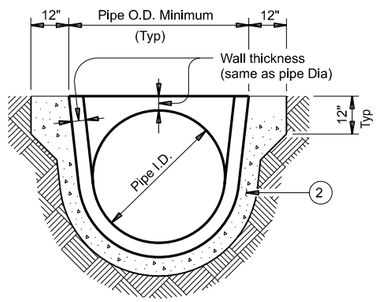
PLAN VIEW - 12" THRU 24"

(Showing spigot end connection.)

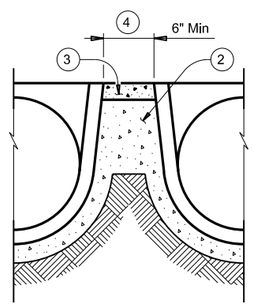


LONGITUDINAL ELEVATION - 12" THRU 24"

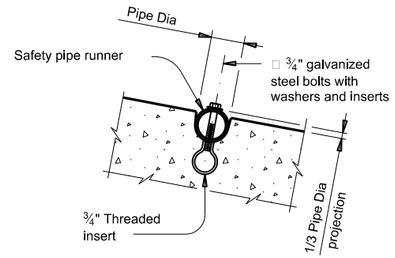
(Showing spigot end connection.)



SECTION A-A

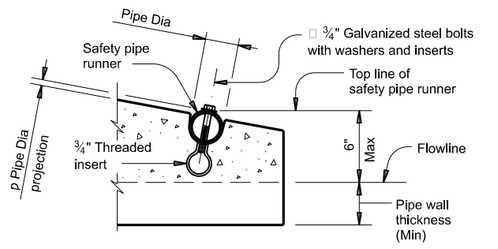


MULTIPLE PIPE INSTALLATION

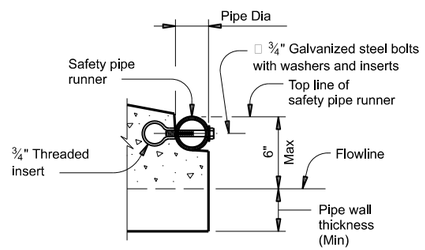


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



OPTION A



OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)

1. Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.
2. Provide cement stabilized bedding and backfill in accordance with the Item, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.
3. Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".
4. Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.
5. Safety pipe runners are required for multiple pipe culverts with more than two pipes.

REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	Min Wall Thickness	Min O.D.	Min O.D. at Tapered End	Min Reinf Requirements (sq. in. per ft. of Pipe)	Max Slope	Min Length of Unit	Pipe Runner Requirements		Required Pipe Runner Sizes		
							Single Pipe	Multiple Pipe	Nominal Dia	O.D.	I.D.
12"	2"	16"	16"	0.07 Circ.	6:1	4' - 0"	No	(5)	3" STD	3.500"	3.068"
15"	2 ¼"	19 ½"	19"	0.07 Circ.	6:1	5' - 8"	No	(5)	3" STD	3.500"	3.068"
18"	2 ½"	23"	21 ½"	0.07 Circ.	6:1	7' - 3"	No	(5)	3" STD	3.500"	3.068"
24"	3"	30"	27"	0.07 Circ.	6:1	10' - 6"	No	(5)	3" STD	3.500"	3.068"
30"	3 ½"	37"	31"	0.18 Circ.	6:1	12' - 1"	No	Yes	4" STD	4.500"	4.026"
36"	4"	44"	36"	0.19 Ellip.	6:1	15' - 4"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 ½"	51"	41 ½"	0.23 Ellip.	6:1	18' - 7"	Yes	Yes	4" STD	4.500"	4.026"

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.

Galvanize steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP) may be used for TYPE II end treatment as specified in Item 467, "Safety End Treatment".

When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.

Manufacture precast concrete end sections in accordance with Item 464, "Reinforced Concrete Pipe" and in accordance with ASTM Specification C-76, Class III, Wall B for circular pipe.

Provide precast concrete end sections with a spigot or bell end for compatibility to upstream or downstream end conditions with sufficient annular space to allow for grout, mortar, cold applied asphalt joint compound or pre-formed plastic gasket material.

Methods of lifting shall be provided by the manufacturer for ease of loading, unloading and installation.

Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Texas Department of Transportation

Bridge Division Standard

PRECAST SAFETY END TREATMENT

TYPE II ~ PARALLEL DRAINAGE

PSET-RP

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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	AMA	DEAF SMITH		70

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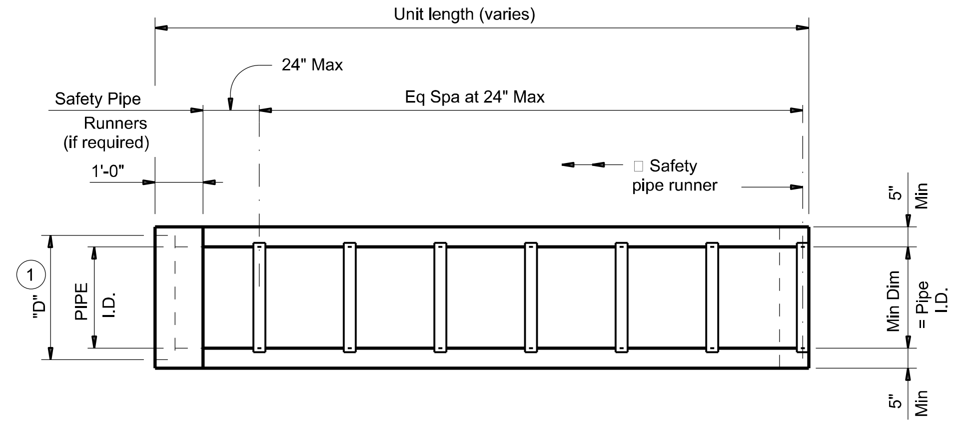
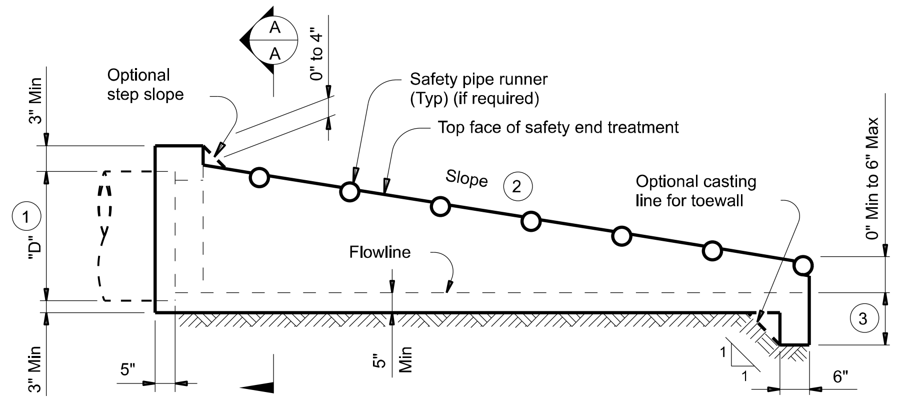


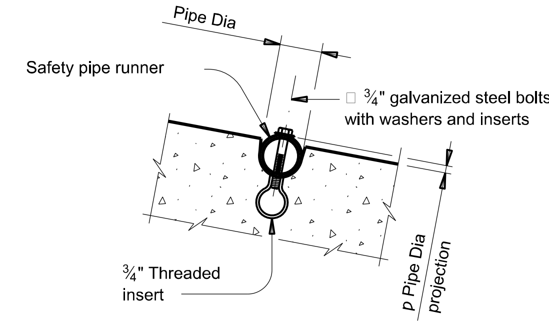
PLAN

(Showing bell end connection.)



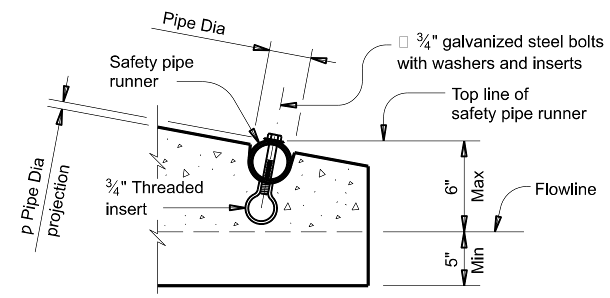
LONGITUDINAL ELEVATION

(Showing bell end connection.)

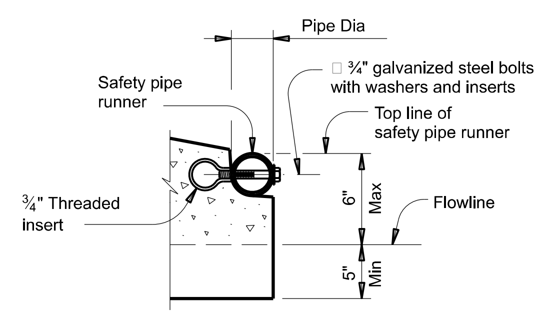


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



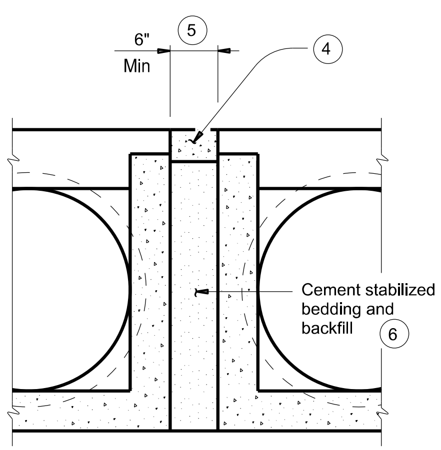
OPTION A



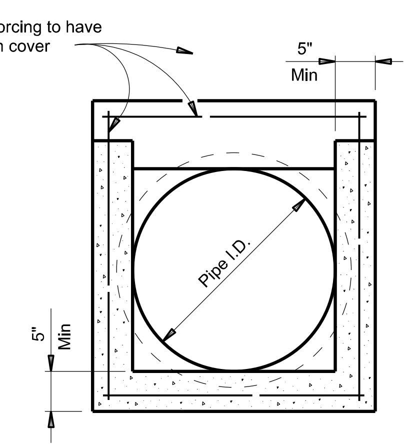
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

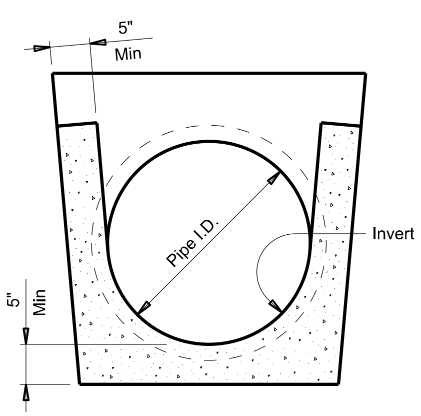
(If required)



MULTIPLE PIPE INSTALLATION

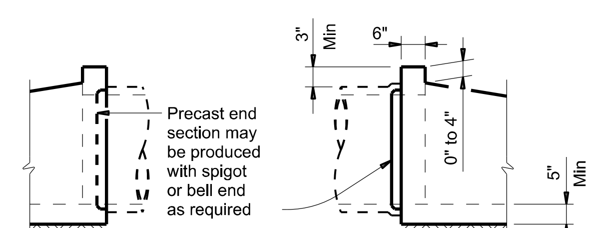


OPTION WITH SQUARE BOTTOM



OPTION WITH INVERT BOTTOM

SECTION A-A



OPTIONAL JOINT FOR RCP

(Showing joint between RCP and precast safety end treatment.)

REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (7)	"D" (1)	Slope	Min Length	Pipe Runners Required		Required Pipe Runner Size		
						Single Pipe	Multiple Pipe	Nominal Dia.	O.D.	I.D.
12"	2"	1.15"	17.00"	6:1	4' - 9"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
15"	2 ¼"	1.30"	20.50"	6:1	6' - 5"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
18"	2 ½"	1.60"	24.00"	6:1	8' - 0"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
24"	3"	1.95"	31.00"	6:1	11' - 3"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
30"	3 ½"	2.65"	38.50"	6:1	14' - 8"	No	Yes	4" STD	4.500"	4.026"
36"	4"	2.75"	45.50"	6:1	17' - 11"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 ½"	2.7"	52.50"	6:1	21' - 2"	Yes	Yes	4" STD	4.500"	4.026"

(1) Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C-76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.

(2) Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.

(3) Toewall to be used only when dimension is shown elsewhere in the plans.

(4) Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".

(5) Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.

(6) Provide cement stabilized bedding and backfill in accordance with the Item 400, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.

(7) Thermoplastic pipe wall thickness may vary. Adjust accordingly. Thermoplastic pipe requires the safety end treatments to have a bell end for grouted connections.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP), and thermoplastic pipe (TP) may be used for TYPE II end treatment as specified in Item "Safety End Treatment".

When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Manufacture this product in accordance with Item 467, "Safety End Treatment" except as noted below :

A. Provide minimum reinforcing of #4 at 6" (Grade 40) or #4 at 9" (Grade 60) each way or 6"x6" - D12 x D12 or 5"x5" - D10 x D10 welded wire reinforcement (WWR).

B. For precast (steel formed) sections, provide Class "C" concrete (f'c = 3,600 psi).

At the option and expense of the Contractor the next larger size of safety end treatment may be furnished; as long as the "D" dimension cast is that of the required size of pipe.

Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Galvanize all steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

Connect RCP using the Optional Joint for RCP detail shown or in accordance with Item 464, "Reinforced Concrete Pipe". Connect TP by grouting. See Pipe and Box Grouted Connections (PBGC) standard for grouted connections with TP and precast safety end treatment.

Texas Department of Transportation

Bridge Division Standard

PRECAST SAFETY END TREATMENT

TYPE II ~ PARALLEL DRAINAGE

PSET-SP

FILE: psetspss-21.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-21: Added 42" TP	0168	07	050, ETC	US60
	DIST	COUNTY		SHEET NO.
	AMA	DEAF SMITH		71

DATE: 10/31/2022 3:44:49 PM
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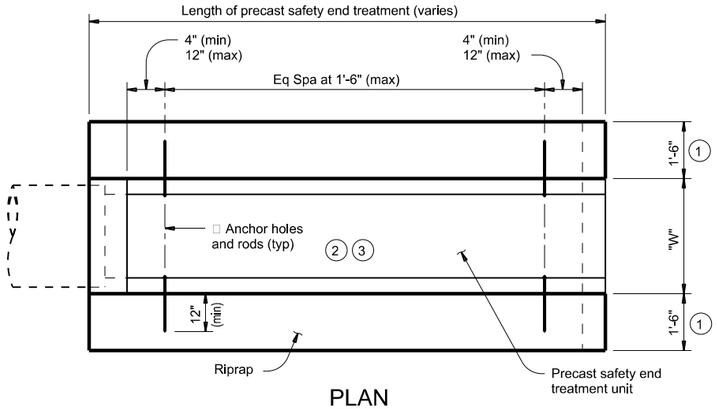
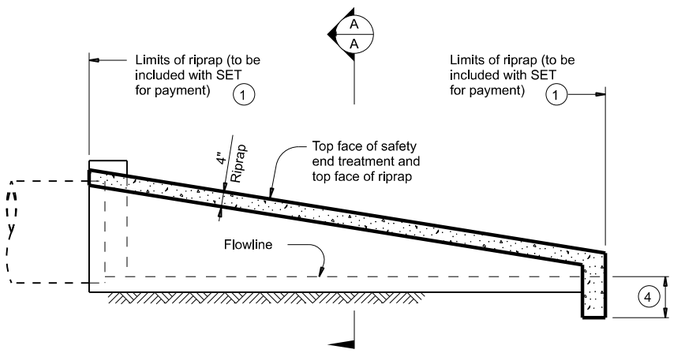
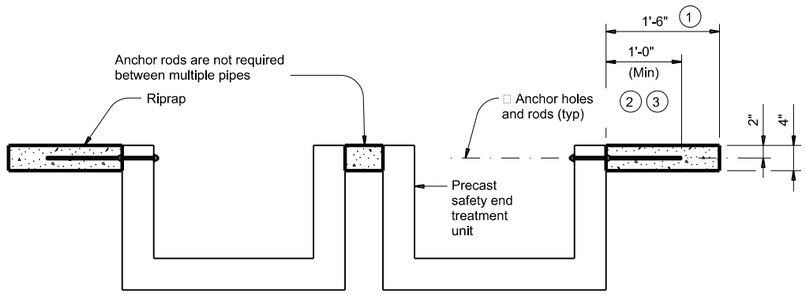


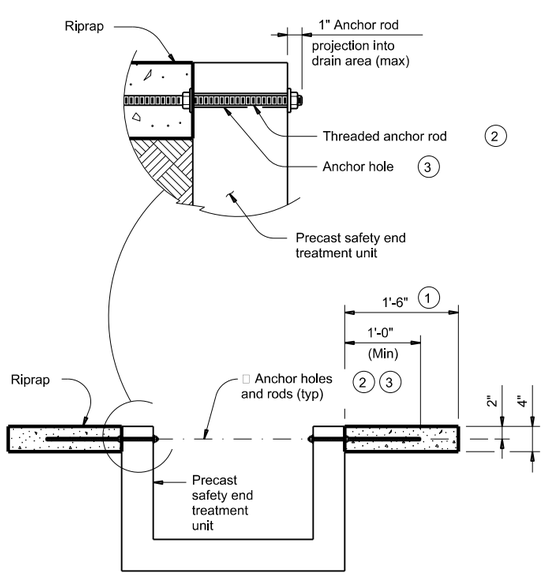
PLAN



LONGITUDINAL ELEVATION



MULTIPLE PIPE INSTALLATION



SINGLE PIPE INSTALLATION

SECTION A-A

ESTIMATED CONCRETE RIPRAP QUANTITIES (CY)

5

Nominal Culvert (Pipe) I.D.	PSET-SC and PSET-SP Standards				PSET-RC and PSET-RP Standards			
	Unit Width "W"	Side Slope			Unit Width "W"	Side Slope		
		3:1	4:1	6:1		3:1	4:1	6:1
12"	23.0"	0.1	0.2	0.2	16.0"	0.1	0.1	0.2
15"	26.5"	0.2	0.2	0.3	19.5"	0.1	0.2	0.2
18"	30.0"	0.2	0.2	0.3	23.0"	0.2	0.2	0.3
24"	37.0"	0.3	0.3	0.5	30.0"	0.2	0.3	0.4
30"	44.5"	0.3	0.4	0.6	37.0"	0.3	0.3	0.5
36"	51.5"	0.4	0.5	0.7	44.0"	0.3	0.4	0.6
42"	58.5"	0.5	0.6	0.8	51.0"	0.4	0.5	0.7

(1) Riprap placed beyond the limits shown will be paid as concrete riprap in accordance with Item 432, "Riprap". When riprap is cast integrally with the precast safety end treatment, this dimension is 1'-0" minimum.

(2) 1#2" Dia ASTM A307 Gr A threaded anchor rod with 2 nuts and 2 washers. Galvanize all components in accordance with Item 445, "Galvanizing". Repair galvanizing that is damaged during transport or construction in accordance with the specifications.

(3) 3#4" through holes in walls of safety end treatment for riprap anchor rods may be drilled with rotary (coring or masonry) type drilling equipment or may be formed. Do not use percussive (star) type drilling equipment. If holes are drilled, patch spalls in the inside face of the wall exceeding 1#2" from the holes.

(4) Provide riprap toe wall when dimension is shown elsewhere in the plans or when field conditions require a toe wall.

(5) Quantities shown are for one end of one reinforced concrete pipe culvert. For multiple pipe culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only. Quantities are based on the minimum unit lengths shown on the Precast Saftey End Treatment (SET) standard sheets.

MATERIAL NOTES:

Provide Class "B" riprap in accordance with Item 432, "Riprap".
Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise. The anchor rods shown are always required.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe may be used for TYPE II end treatment as specified in Item 467, "Safety End Treatment".
Refer to PSET-SC or PSET-SP standard sheets for details of square safety end treatments not shown. Refer to PSET-RC or PSET-RP standard sheets for details of round safety end treatments not shown.
For precast units with integrally cast riprap, substitute reinforcing steel in the amount on 0.26 in./ft. minimum for the threaded anchor rods shown. When requested, submit sealed engineering drawings for approval prior to construction. Shop drawings will not be required. Note that a proprietary precast unit with integral riprap is available from L&R Precast Concrete Works, Inc. (956) 583-6293 or www.lrprecast.com.
Payment for riprap and toewalls is included in the price bid for each safety end treatment.

These riprap details are only applicable when notes that require placement of riprap with precast safety end treatments are shown elsewhere in the plans.

Precast units with integrally cast riprap are permitted unless noted otherwise on the plans.

Texas Department of Transportation

Bridge Division Standard

PRECAST SAFETY END TREATMENT
TYPE II
RIPRAP DETAILS

PSET-RR

FILE: psetrrse-20.dgn	DN: GAF	CK: TxDOT	DW: JRP	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
	DIST	COUNTY		SHEET NO.
	AMA	DEAF SMITH		72

DATE: 10/31/2022 3:44:50 PM
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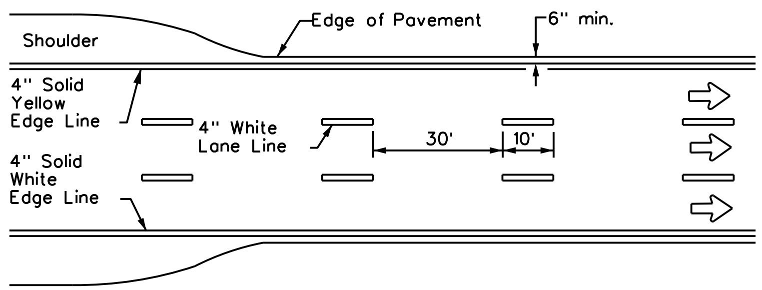
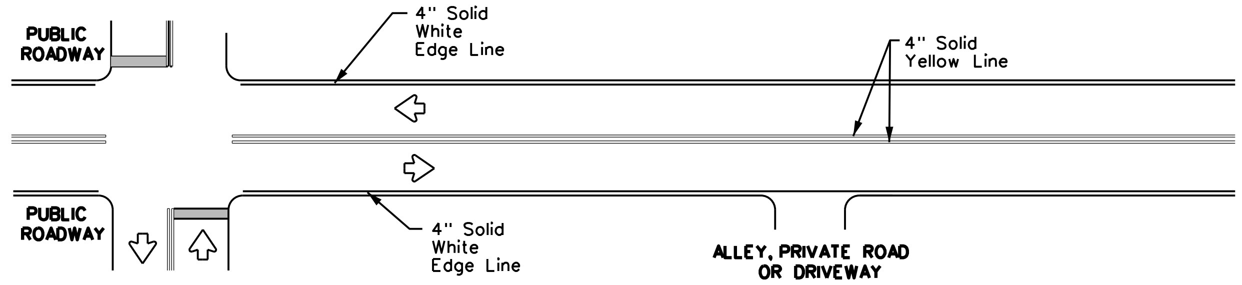


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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

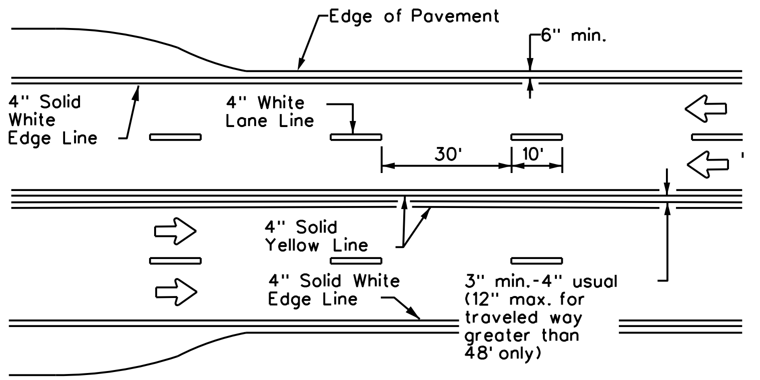
GENERAL NOTES

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

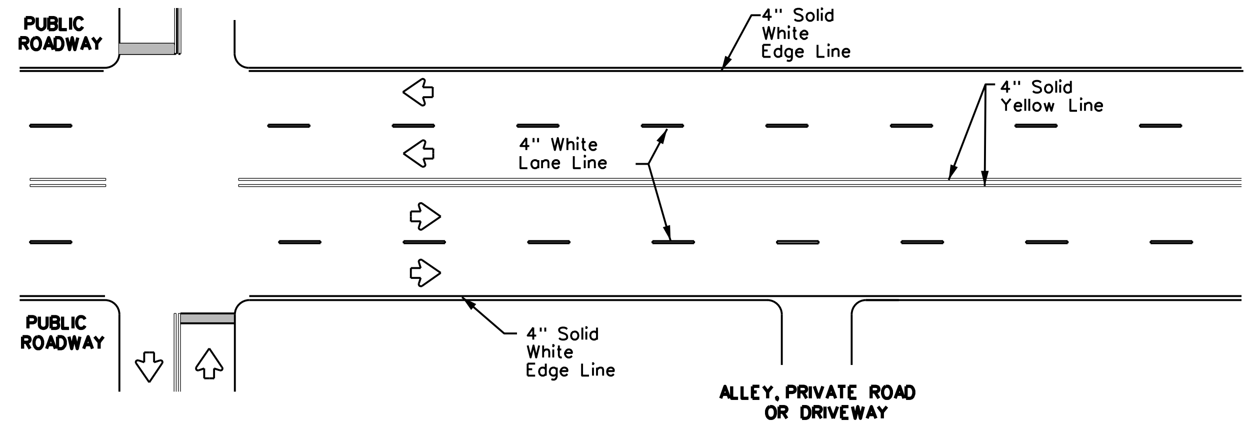
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

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

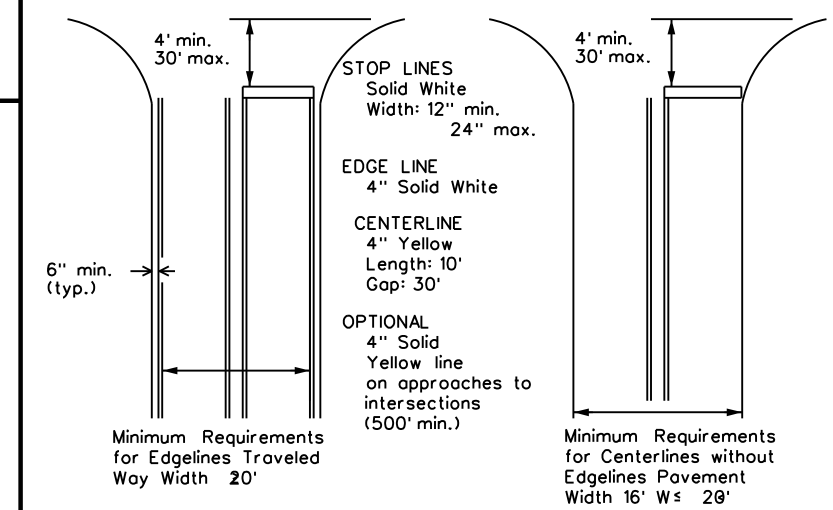
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



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

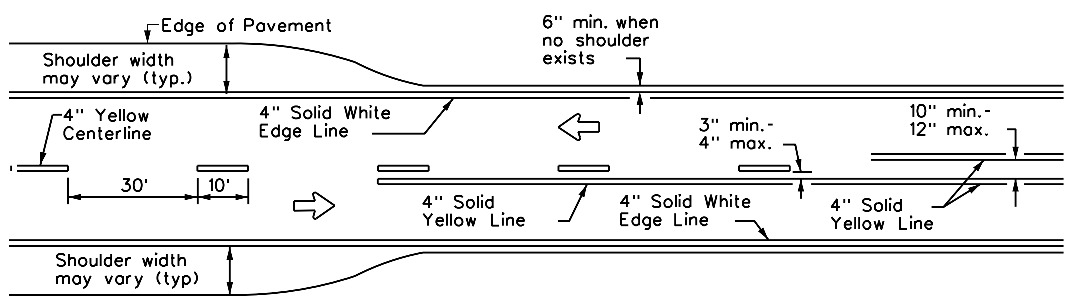


TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

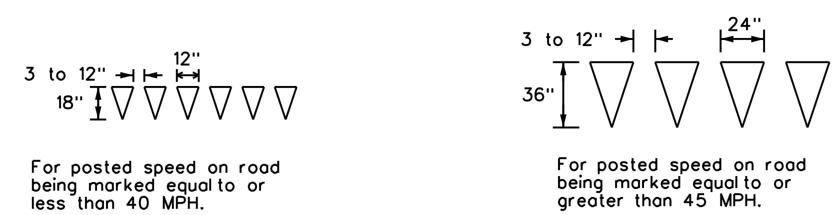


GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

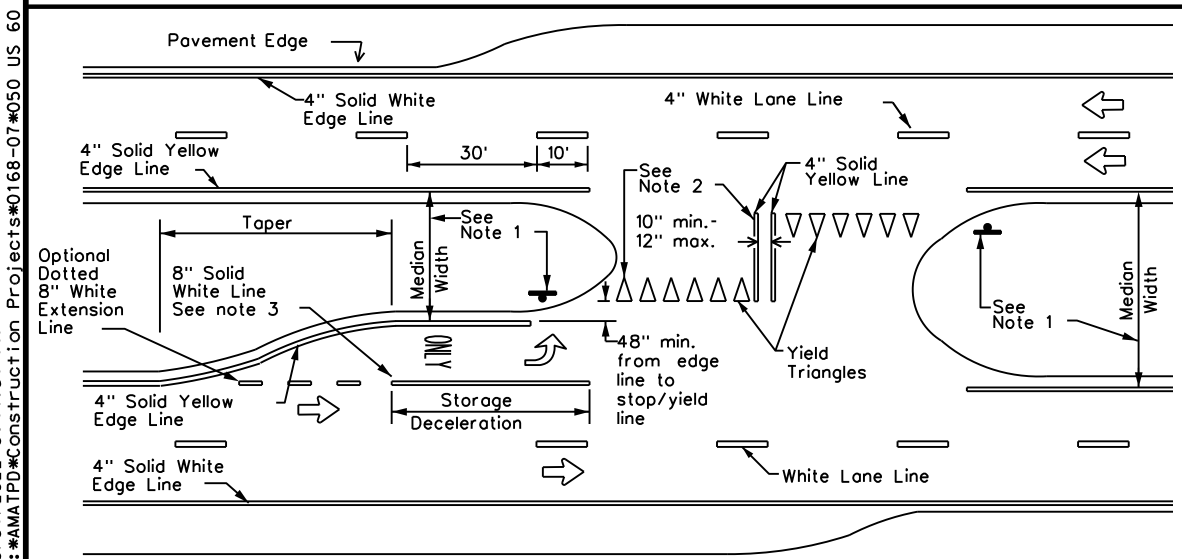
Based on Traveled Way and Pavement Widths for Undivided Highways



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.

2. Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield traingles shall only be used with yield signs.

3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

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Texas Department of Transportation — Traffic Safety Division Standard

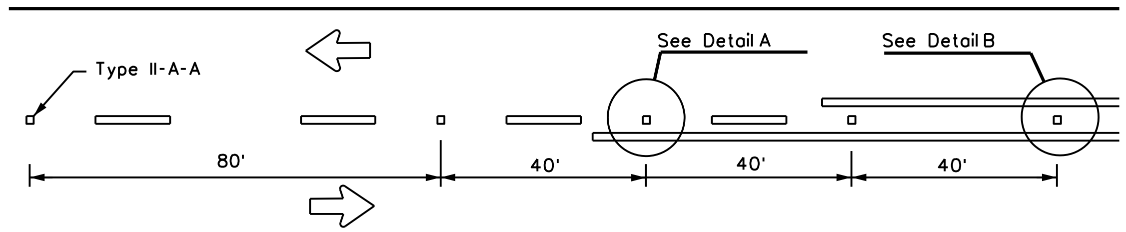
TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-20

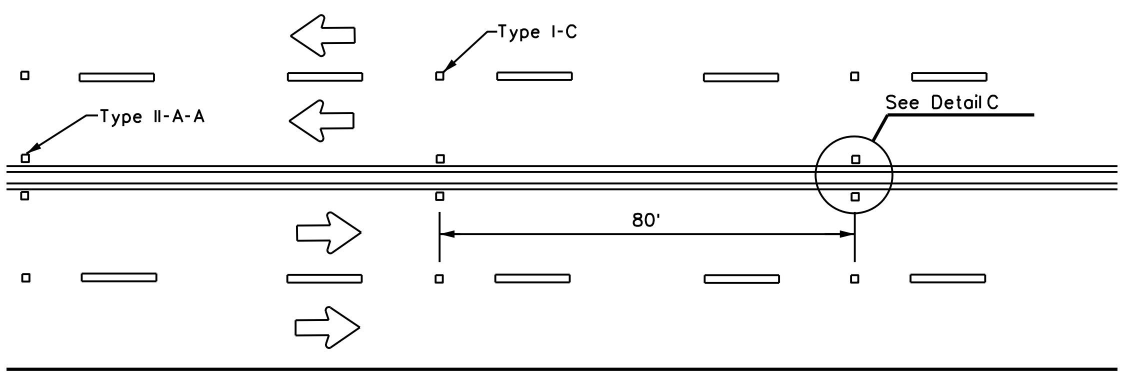
FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0168	07	050, ETC	US60
5-00 2-12	DIST		COUNTY	SHEET NO.
8-00 6-20	AMA		DEAF SMITH	73

22A

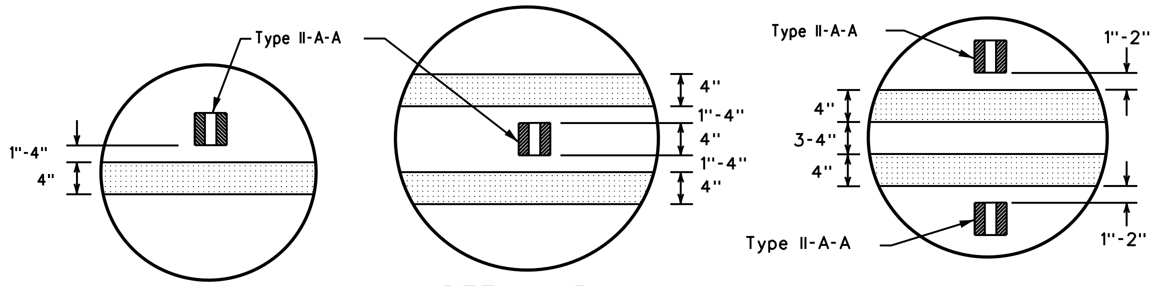
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



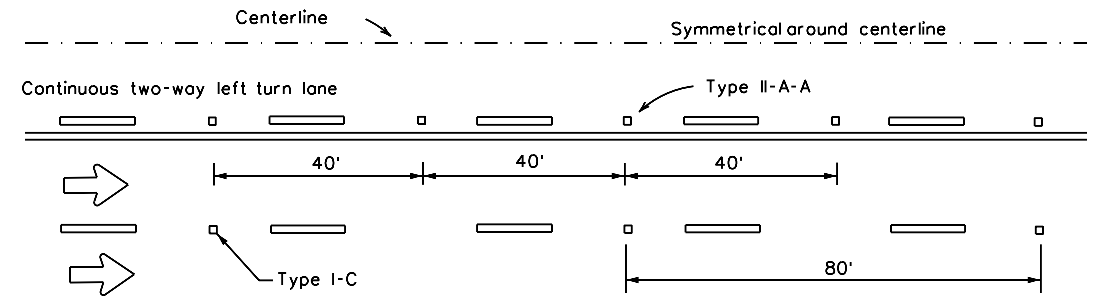
CENTERLINE FOR ALL TWO LANE ROADWAYS



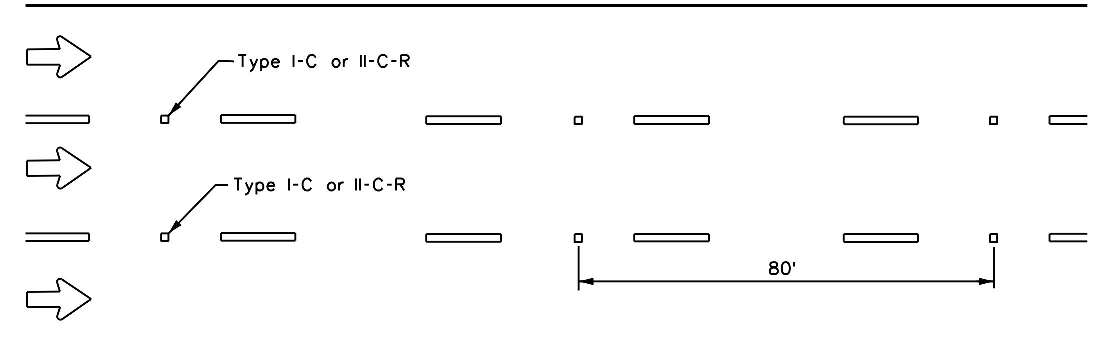
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



DETAIL "A" DETAIL "B" DETAIL "C"

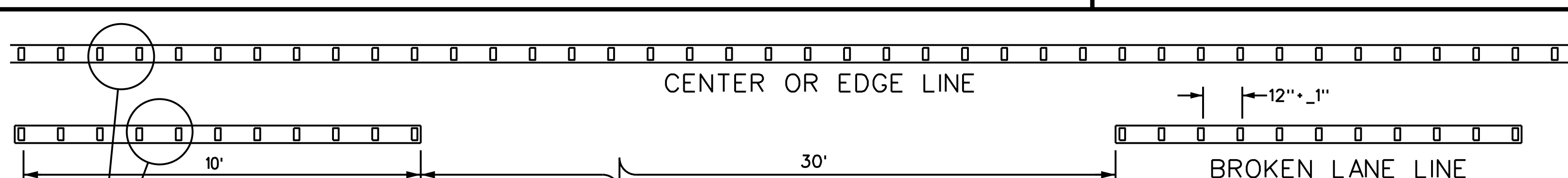


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



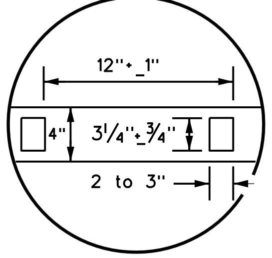
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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



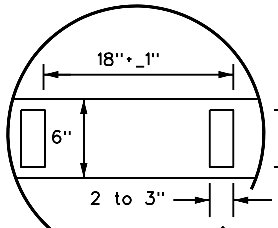
REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



4" EDGE LINE, CENTER LINE OR LANE LINE

OR



OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

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

NOTE

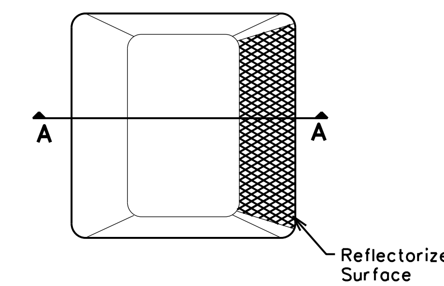
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

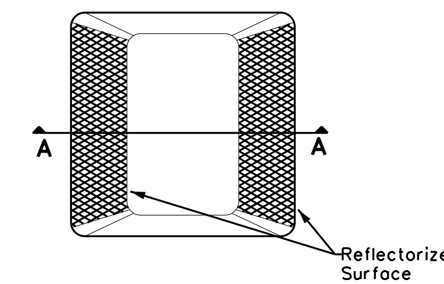
1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

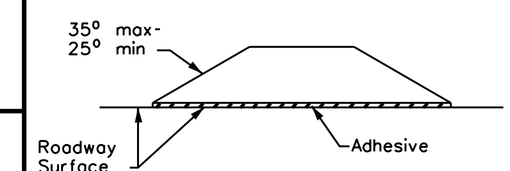
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation

Traffic Safety Division Standard

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

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© TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10 5-00 2-12 8-00 6-20	0168	07	050, ETC	US60
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	AMA	DEAF SMITH		74

22B

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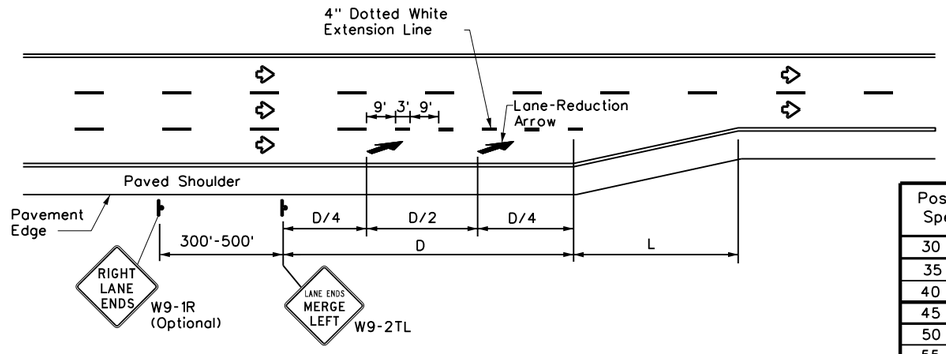
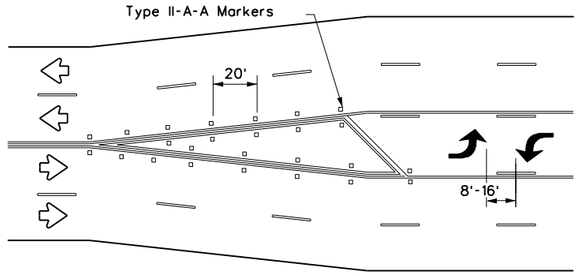


LANE REDUCTION

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

NOTES

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



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

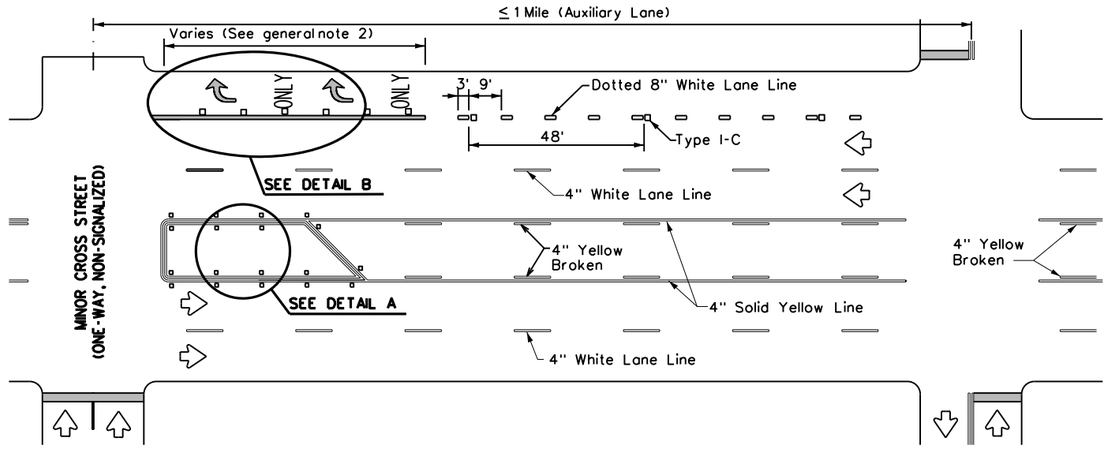
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

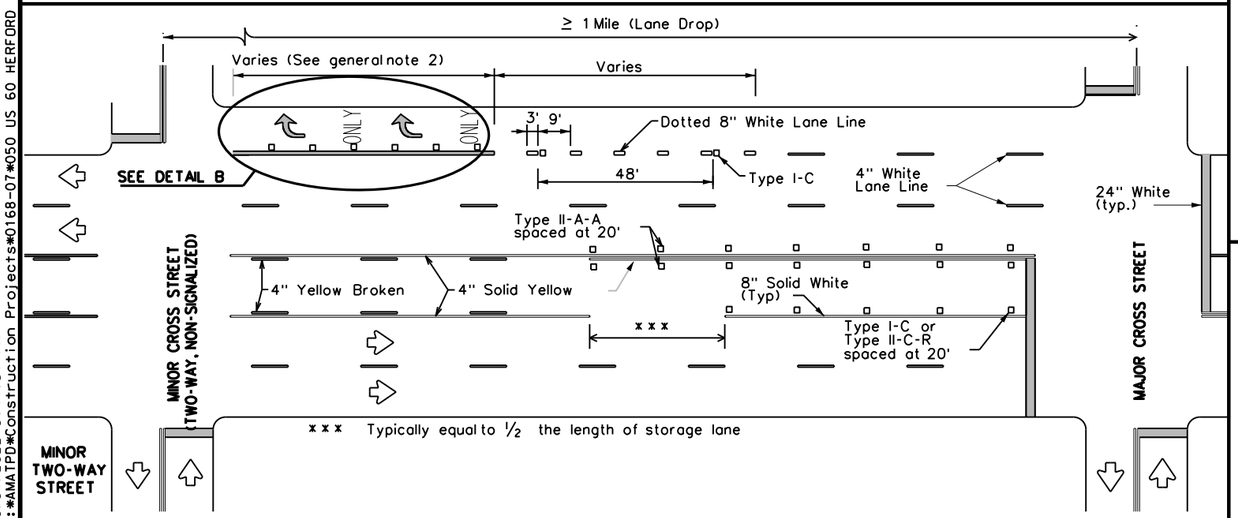
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn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

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

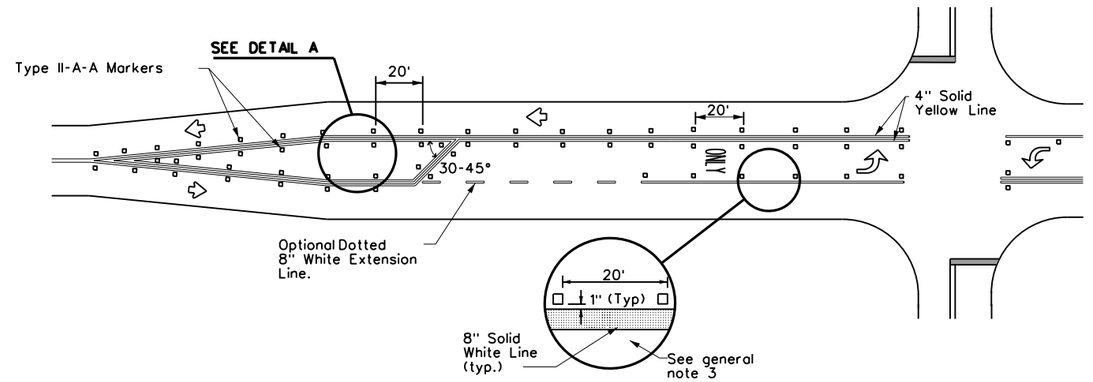
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



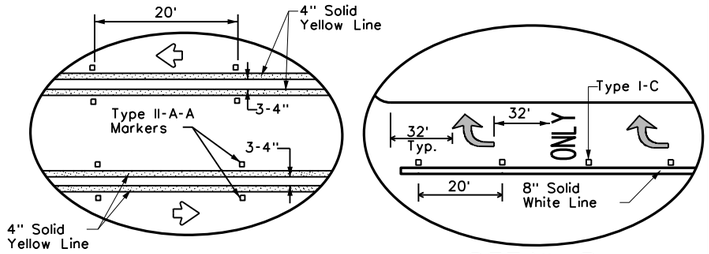
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



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



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A DETAIL B

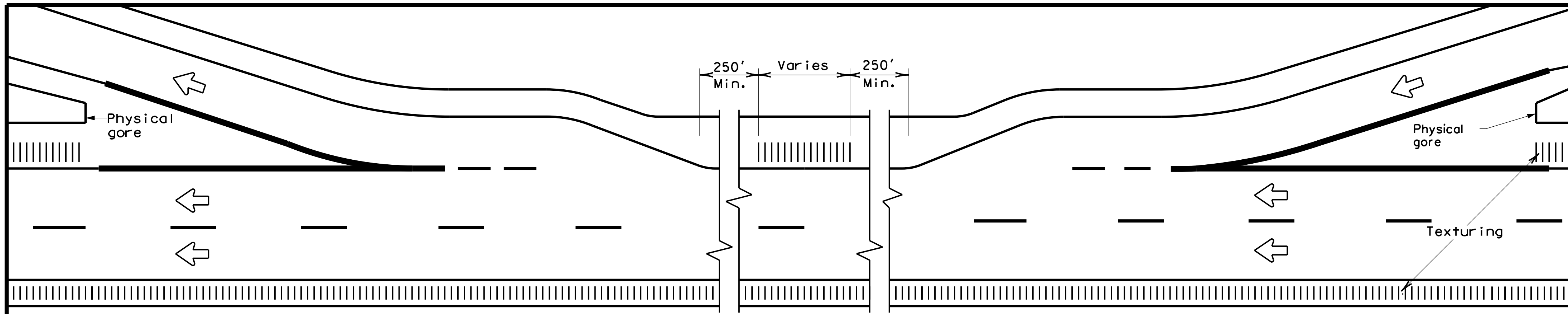
Texas Department of Transportation

Traffic Safety Division Standard

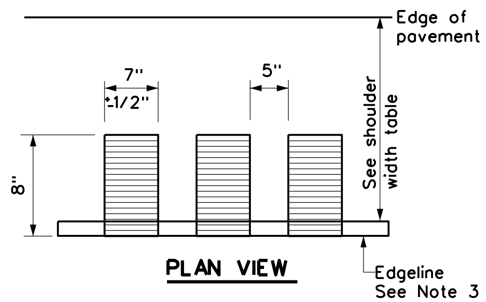
TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-20

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
5-00 2-10	DIST	COUNTY		SHEET NO.
8-00 2-12	AMA	DEAF SMITH		75
3-03 6-20				

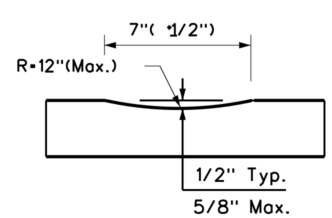
22C



TYPICAL RUMBLE STRIP PLACEMENT AT EXIT AND ENTRANCE RAMPS



PLAN VIEW

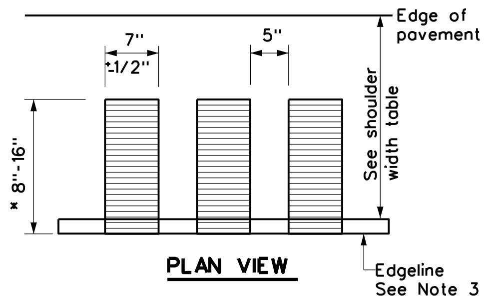


PROFILE VIEW

OPTION 1

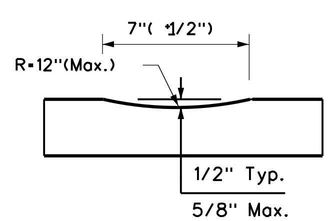
CONTINUOUS MILLED DEPRESSIONS

(Rumble Stripes)



PLAN VIEW

* This distance may vary based on width of shoulder

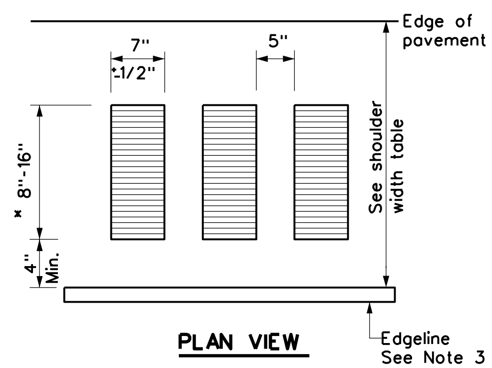


PROFILE VIEW

OPTION 2

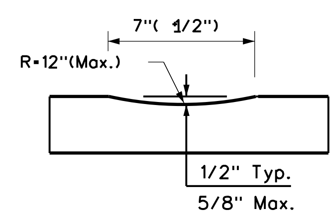
CONTINUOUS MILLED DEPRESSIONS

(Rumble Stripes)



PLAN VIEW

* This distance may vary based on width of shoulder

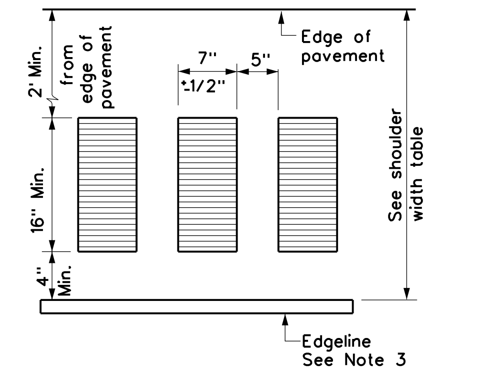


PROFILE VIEW

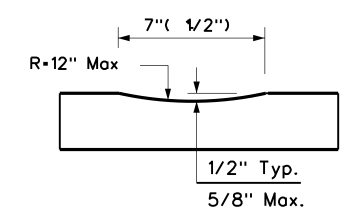
OPTION 3

CONTINUOUS MILLED DEPRESSIONS

(Rumble Strips)



PLAN VIEW



PROFILE VIEW

OPTION 4

CONTINUOUS MILLED DEPRESSIONS

(Rumble Strips)

GENERAL NOTES

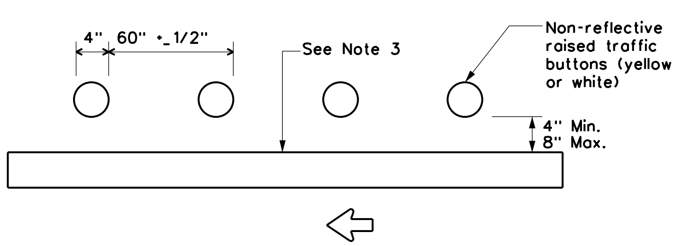
1. Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
2. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
3. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
4. See the table below for determining what options may be used for edgeline rumble strips.

WHEN INSTALLING MILLED DEPRESSION EDGELINE RUMBLE STRIPS:

5. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
6. Pavement markings can be applied over milled shoulder rumble strips to create an edgeline rumble stripe.
7. Breaks in edgeline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks when installed on conventional highways.
8. Rumble strips shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
9. Consideration should be given to noise levels when edgeline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inches depth of milled rumble strip may be considered in these areas.
10. On roadways with high bicycle activity, consideration should be given before the installation of edgeline rumble strips. Things to consider include size of rumble strips, rumble strip material and location of rumble strips on the shoulder. If the designer determines that gaps are needed in the rumble strips due to bicycle use of the road, then follow the requirement shown in FHWA Technical Advisory T5040.39, or latest version. A detail of the spacing shall be included in the plans.

WHEN INSTALLING RAISED OR PROFILE EDGELINE RUMBLE STRIPS:

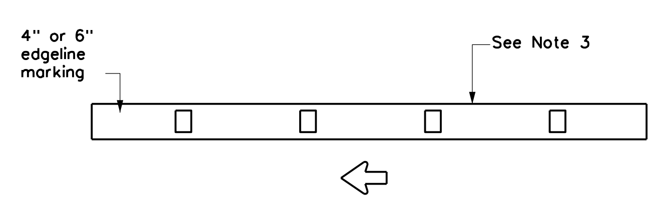
11. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per the manufacturer's recommendations.
12. Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edgeline when used as a rumble strip. The color of the button should match the color of the adjacent edgeline marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
13. Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
14. Breaks in edgeline rumble strips using raised traffic buttons shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections and driveways with high usage of large trucks when installed on conventional highways.
15. The minimum distance between the edgeline and the buttons should be used if the shoulder is less than 8 feet in width.
16. Raised profile thermoplastic markings used as edgelines may substitute for buttons.



PLAN VIEW

OPTION 5

RAISED EDGELINE RUMBLE STRIPS



PLAN VIEW

OPTION 6

PROFILE EDGELINE MARKINGS

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

Texas Department of Transportation

Traffic Operations Division Standard

EDGELINE RUMBLE STRIPS ON FREEWAYS AND DIVIDED HIGHWAYS

RS(1)-13

FILE: rs(1)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-10 10-13	0168	07	050, ETC	US60
	DIST		COUNTY	SHEET NO.
	AMA		DEAF SMITH	76

90

DATE: 10/31/2022 3:44:52 PM
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PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

3.05 RAILROAD SAFETY ORIENTATION

A. Complete the railroad course "Orientation for Contractor's Safety",and maintain current registration prior to working on railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR,BNSF,KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR)and 14'-0" (KCS) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0168	07	050, ETC	US60
	DIST	COUNTY		SHEET NO.
	AMA	DEAF SMITH		77

3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
1. Pre-construction meetings.
2. Pile driving/drilling of caissons or drilled shafts.
3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
4. Erection of precast concrete or steel bridge superstructure.
5. Placement of waterproofing (prior to placing ballast on bridge deck).
6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

3.13 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

UPRR 1-800-336-9193
7:00 AM to 9:00 PM CST Monday-Friday except holidays,
staffed 24 hrs/day for emergencies
48 hrs notice required

BNSF 1-800-533-2891
24 hour number
5 working days notice required

KCS 1-800-344-8377
Texas One Call, a 24 hour number
48 hrs notice required, excluding weekends and holidays

If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of $\frac{1}{4}$ inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.15 RAILROAD FLAGGING

Per the Right of Entry Agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

3.16 CLEANING OF RIGHT-OF-WAY

When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the right of Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.

SHEET 2 OF 2

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0168	07	050, ETC	US60
	DIST	COUNTY		SHEET NO.
	AMA	DEAF SMITH		78

DATE: 10/31/2022 3:44:52 PM
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I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

DOT #: 014730P
Crossing Type:** PRIVATE
RR Company Owning Track at Crossing: BNSF
Operating RR Company at Track: BNSF
RR MP: 592.700
RR Subdivision: HEREFORD
City: HEREFORD
County: DEAF SMITH
CSJ at this Crossing: 0168-07-050
Highway/Roadway name crossing the railroad:
# of regularly scheduled trains per day at this crossing: 88
# of switching movements per day at this crossing:
% of estimated contract cost of work within railroad ROW:

Scope of Work at this Crossing to Be Performed by State Contractor:
WORK WILL CONSIST OF THE REMOVAL OF EXISTING DRIVEWAY AND PARALLEL DRAINAGE ITEMS. REGRADING OF THE DITCH TO MATCH EXISTING FLOWLINE.

Scope of Work at this Crossing to Be Performed by Railroad Company:

** Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

DOT #: 1.2 MILES EAST OF 014728N
Crossing Type:** PRIVATE
RR Company Owning Track at Crossing: BNSF
Operating RR Company at Track: BNSF
RR MP: 590.410
RR Subdivision: HEREFORD
City: HEREFORD
County: DEAF SMITH
CSJ at this Crossing: 0168-07-050
Highway/Roadway name crossing the railroad:
# of regularly scheduled trains per day at this crossing: 88
# of switching movements per day at this crossing:
% of estimated contract cost of work within railroad ROW:

Scope of Work at this Crossing to Be Performed by State Contractor:
ADDITION OF SAFETY END TREATMENTS TO THE END OF THE EXISTING PARALLEL DRAINAGE PIPE WILL BE PERFORMED.REGRADING AROUND THE AREA TO MEET 6:1 SLOPE REQUIREMENTS.

Scope of Work at this Crossing to Be Performed by Railroad Company:

** Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

DOT #: 014722X
Crossing Type:** PRIVATE
RR Company Owning Track at Crossing: BNSF
Operating RR Company at Track: BNSF
RR MP: 584.940
RR Subdivision: HEREFORD
City: HEREFORD
County: DEAF SMITH
CSJ at this Crossing: 0168-07-050
Highway/Roadway name crossing the railroad:
# of regularly scheduled trains per day at this crossing: 88
# of switching movements per day at this crossing:
% of estimated contract cost of work within railroad ROW:

Scope of Work at this Crossing to Be Performed by State Contractor:
EXTENDING EXISTING DRAINAGE CULVERTS AND ADDING SAFETY END TREATMENTS TO THE END OF THE EXISTING PARALLEL DRAINAGE PIPE WILL BE PERFORMED.REGRADING AROUND THE AREA TO MEET 6:1 SLOPE REQUIREMENTS.

Scope of Work at this Crossing to Be Performed by Railroad Company:

** Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

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FILE: T:*AMATPD*Construction Projects*0168-07*050 US 60 HERFORD TO CANYON*4 Design*RR*RR SCOPE OF WORK FILLED.dgn

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
© TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
9/2021	DIST	COUNTY		SHEET NO.
	AMA	DEAF SMITH		79

III. FLAGGING & INSPECTION

* of Days of Railroad Flagging Expected: 0

On this project, night or weekend flagging is:

- ☐ Expected
- ☒ Not Expected

Flagging services will be provided by:

- ☐ Railroad Company: TxDOT will pay flagging invoices
- ☐ Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30 day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

- ☐ UPRR - UP.info@railpros.com
  Call Center 877-315-0513, Select #1 for flagging
  - UP.request@nrssinc.net
  Call Center 877-984-6777
- ☒ BNSF - BNSF.info@railpros.com
  Call Center 877-315-0513, Select #1 for flagging
- ☐ KCS - KCS.info@railpros.com
  Call Center 877-315-0513, Select #1 for flagging
  - Bottom Line On-Track Safety Services
  bottomline076@aol.com, 903-767-7630
- ☐ OTHERS ______________________

Contractor must incorporate Construction Inspection into anticipated construction schedule.

- ☒ Not Required
- ☐ Required: Contact Information for Construction Inspection: ______________________

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:

- ☐ Required
- ☒ Not Required

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

V. RAILROAD INSURANCE REQUIREMENTS

Railroad reference number shall be provided by TxDOT CST or DO.

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000 combined single limit

Railroad Protective Liability		
☐	Not Required	
☒	Non - Bridge Projects	$2,000,000 / $6,000,000
☐	Bridge Projects	$5,000,000 / $10,000,000
☐	Other	

VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT

On this project, an ROE agreement is:

- ☒ Not Required
- ☐ Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)
- ☐ Required: UPRR Maintenance Consent Letter. TxDOT CST to assist.
- ☐ Required: Contractor to obtain (see Item 5, Article 8.4)
  With the following railroad companies: ______________________

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

http://www.txdot.gov/inside-txdot/division/rail/samples.html

Approved ROE Agreement templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed ROE agreement between the Contractor and the Railroad if required on project.

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

- ☒ Not Required
- ☐ Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call BNSF
Railroad Emergency Line at 1 800-832-5452
Location: DOT 014730P
RR Milepost 597.700
Subdivision HEREFORD

In Case of Railroad Emergency
Call BNSF
Railroad Emergency Line at 1 800-832-5452
Location: DOT 1.2 MILES EAST OF 014728N
RR Milepost 590.410
Subdivision HEREFORD

In Case of Railroad Emergency
Call BNSF
Railroad Emergency Line at 1 800-832-5452
Location: DOT 014722X
RR Milepost 584.940
Subdivision HEREFORD

Texas Department of Transportation | Rail Division

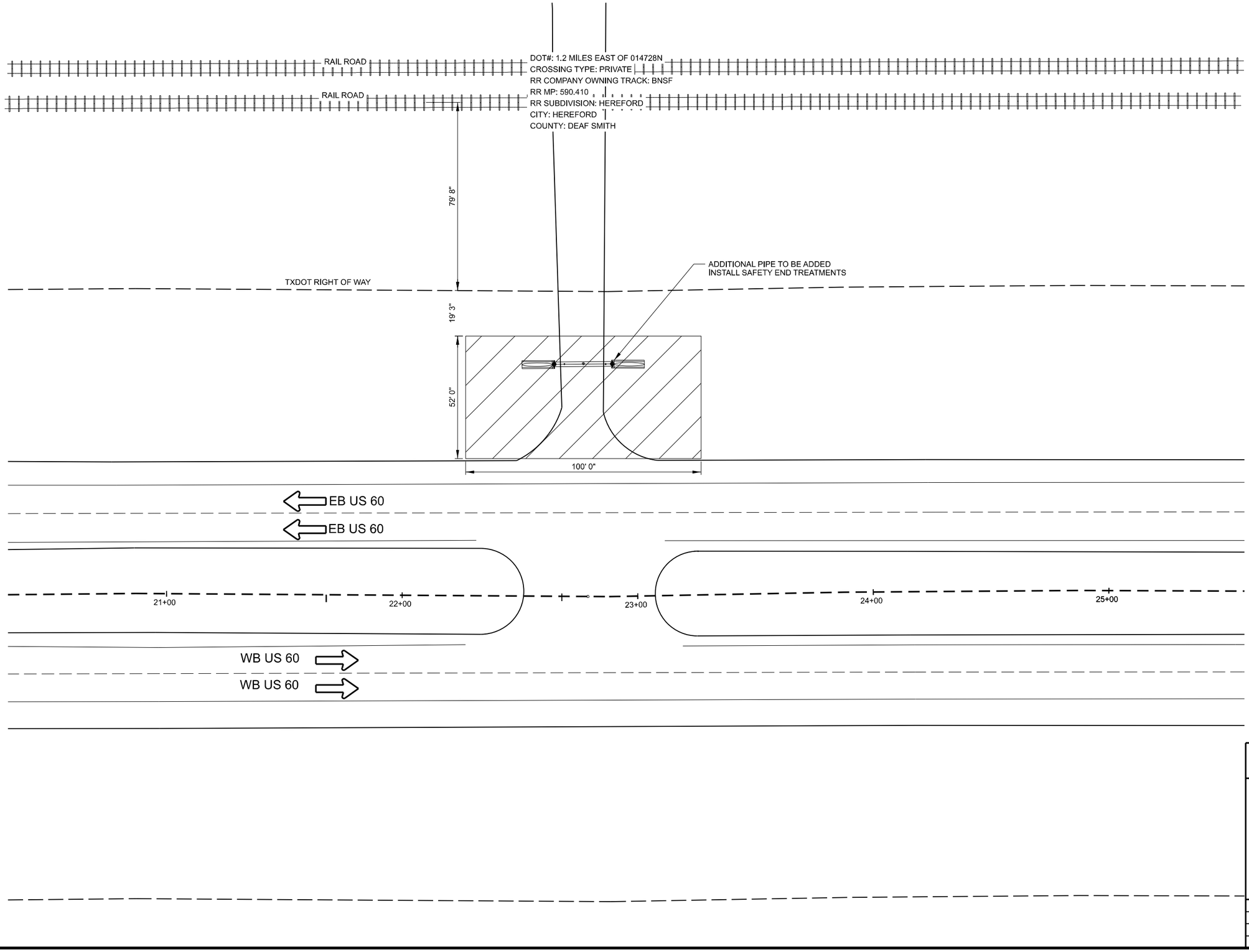
RAILROAD SCOPE OF WORK

PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
© TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
9/2021	DIST		COUNTY	SHEET NO.
	AMA		DEAF SMITH	80

DATE: 10/31/2022 3:44:53 PM
FILE: T:\AMATPD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\...

DN: $315 CK: $315 DW: $523 CK: $525



WORKZONE

NOTES:

1. CONTRACTOR EQUIPTMENT SHALL REMAIN ON TXDOT RIGHT OF WAY AT ALL TIMES
2. WORK WILL CONSIST OF EXTENDING EXISTING PIPES AND INSTALLING SAFETY END TREATMENTS ON THE ENDS OF DRAINAGE PIPES.

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED PROFESSIONAL ENGINEER

Casey B. Stripling

11-02-2022

Texas Department of Transportation

US60

BNSF RR MP 590.410

RAILROAD EXHIBIT 1

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
0168	07	050,ETC	US60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		81

DATE: 10/31/2022 3:44:54 PM
FILE: T:\AMA\PD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\RailRoad\050_Roadway.dgn

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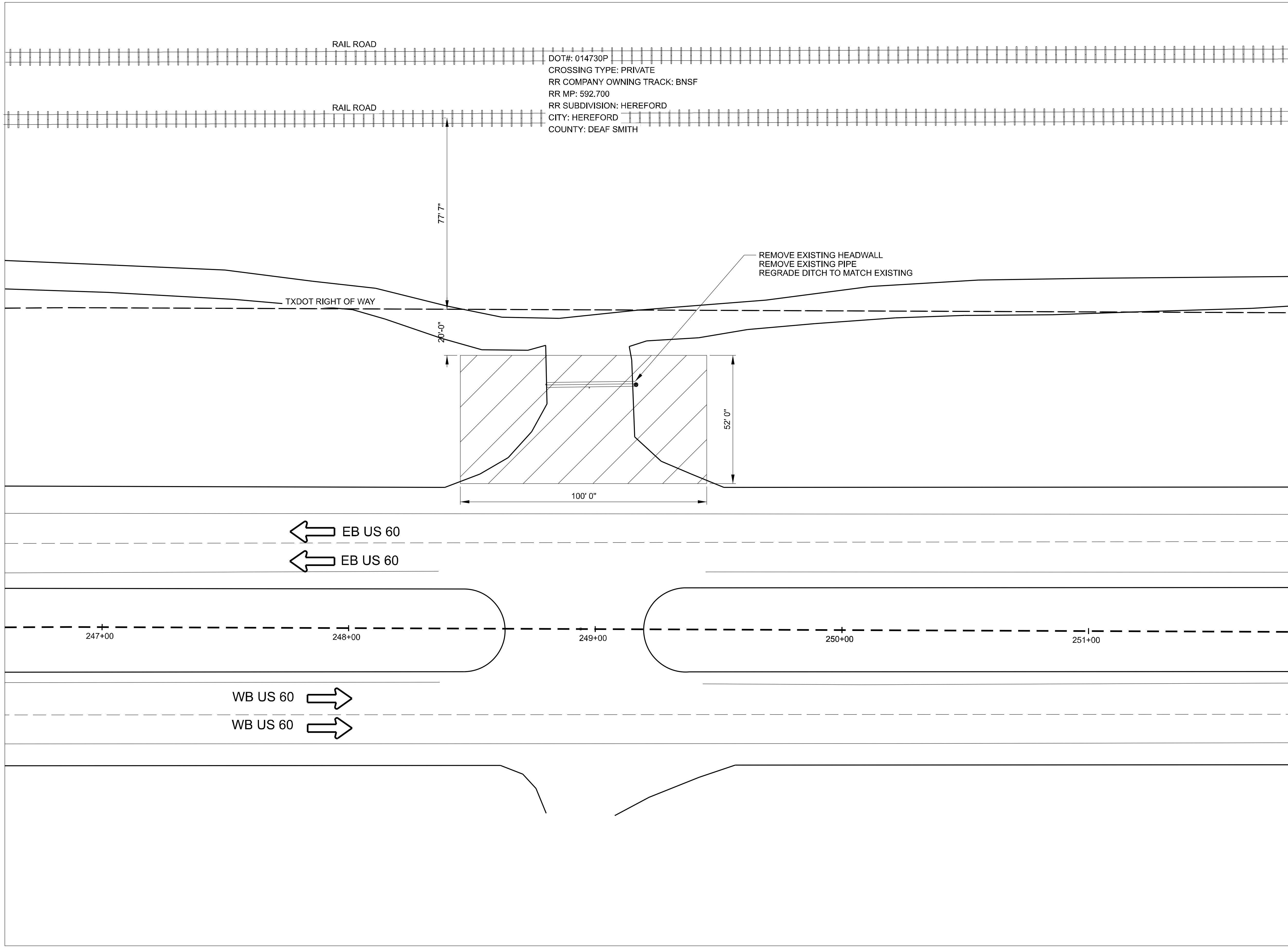


WORKZONE

NOTES:

1. CONTRACTOR EQUIPTMENT SHALL REMAIN ON TXDOT RIGHT OF WAY AT ALL TIMES
2. WORK WILL CONSIST OF EXTENDING EXISTING PIPES AND INSTALLING SAFETY END TREATMENTS ON THE ENDS OF DRAINAGE PIPES.

Casey B. Stripling

11-02-2022

Texas Department of Transportation

US 60

BNSF RR MP 592.700

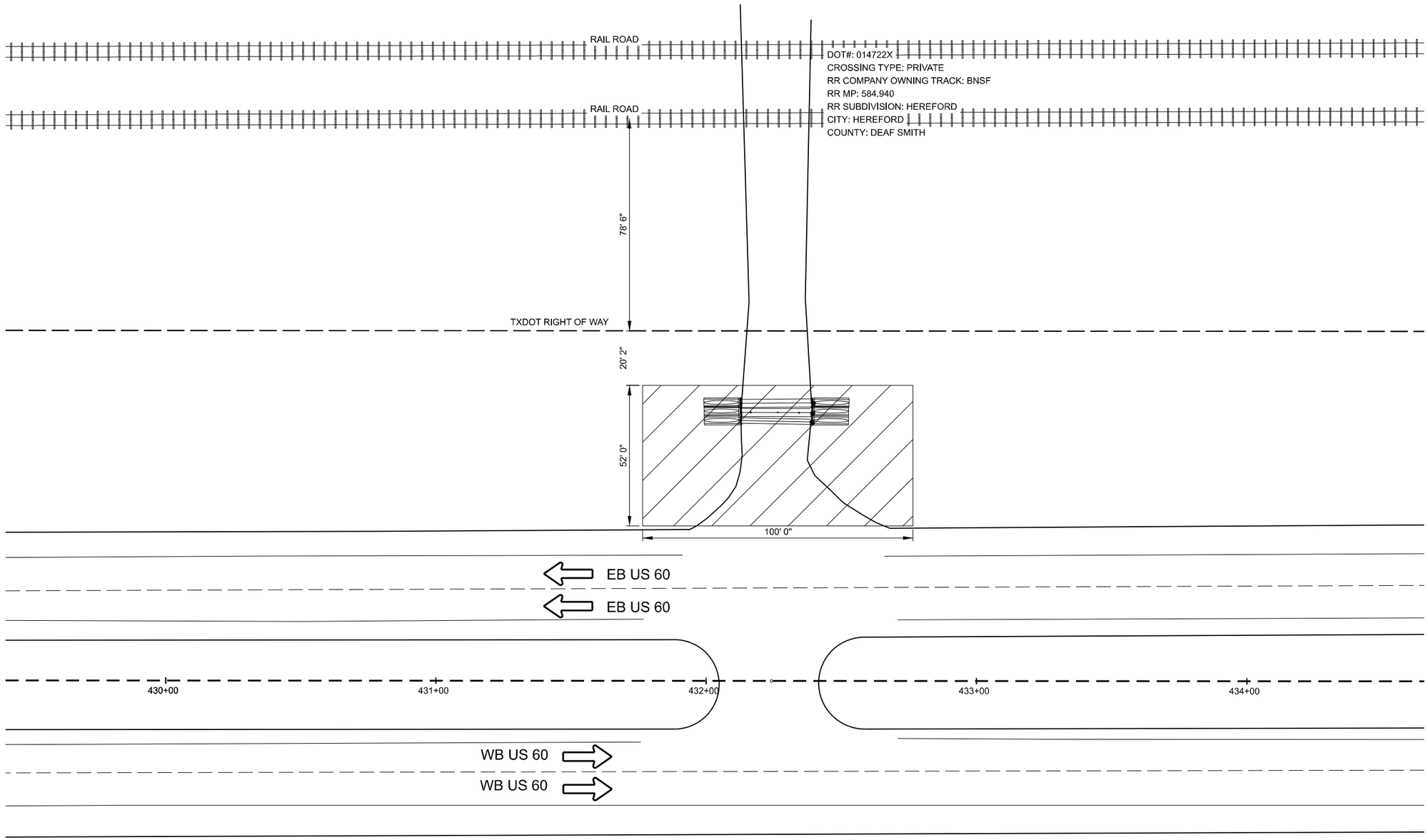
RAILROAD EXHIBIT 2

SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
0168	07	050,ETC	US 60
DIST	COUNTY		SHEET NO.
AMA	DEAF SMITH		82

DATE: 10/31/2022 3:44:55 PM
FILE: T:\AMATPD\Construction Projects\0168-07\050 US 60 HERFORD TO CANYON\4 - Design\RailRoad\050_Roadway.dgn

DN: $315 CK: $315 DW: $323 CK: $325



WORKZONE

NOTES:

1. CONTRACTOR EQUIPTMENT SHALL REMAIN ON TXDOT RIGHT OF WAY AT ALL TIMES
2. WORK WILL CONSIST OF EXTENDING EXISTING PIPES AND INSTALLING SAFETY END TREATMENTS ON THE ENDS OF DRAINAGE PIPES.

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED PROFESSIONAL ENGINEER

Casey B. Stripling

11-02-2022

Texas Department of Transportation

US 60

BNSF RR MP 584.940

RAILROAD EXHIBIT 3

SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
0168	07	050, ETC	US 60
DIST	COUNTY		SHEET NO.
4	DEAF SMITH		83

DATE: 10/31/2022 3:44:55 PM
FILE: T:\AMA\TPD\Construction Projects\0168-07\050 US 60 HEREFORD TO CANYON\4 - Design\RailRoad\050_Roadway.dgn

SITE DESCRIPTION

PROJECT LIMITS: FROM EAST OF HEREFORD TO RANDALL COUNTY LINE

PROJECT DESCRIPTION: FOR THE CONSTRUCTION AND REHABILITATION OF EXISTING ROAD CONSISTING OF FULL-DEPTH RECLAMATION ON EB LANES & ACP OVERLAY.

MAJOR SOIL DISTURBING ACTIVITIES: FULL DEPTH RECLAMATION AND CULVERT SET INSTALLATION.

TOTAL PROJECT AREA: APPROX. 400 ACRES

TOTAL AREA TO BE DISTURBED: APPROX. 45.3 ACRES

WEIGHTED RUNOFF COEFFICIENT

(BEFORE CONSTRUCTION): 0.41

(AFTER CONSTRUCTION): 0.41

EXPLANATION OF THE TECHNICAL BASIS USED TO SELECT THE PRACTICES TO CONTROL POLLUTION WHERE FLOWS EXCEED PRE-DEVELOPMENT LEVELS:

EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER: 90% GRASS AND NATIVE VEGETATION

NAME OF RECEIVING WATERS: TIERRA BLANCA CREEK

EROSION AND SEDIMENT CONTROLS

SOIL STABILIZATION PRACTICES:

X	TEMPORARY SEEDING
X	PERMANENT PLANTING, SODDING, OR SEEDING
	MULCHING
	SOIL RETENTION BLANKET
	BUFFER ZONES
X	PRESERVATION OF NATURAL RESOURCES

OTHER:

EROSION AND SEDIMENT CONTROLS (CONT.)

STRUCTURAL PRACTICES:

Permanent	Temporary	
		SILT FENCES
		HAY BALES
		ROCK BERMS
		DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
		DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
		DIVERSION DIKE AND SWALE COMBINATIONS
		PIPE SLOPE DRAINS
		PAVED FLUMES
		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
	X	EROSION CONTROL LOGS

OTHER:

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES:

THE ORDER OF ACTIVITIES ARE AS FOLLOWS:

1. INSTALL CONTROL DEVICES AS SHOWN ON PLANS AND DIRECTED BY THE ENGINEER.
2. MAINTAIN AND UPGRADE DEVICES AS NEEDED.
3. WHEN CONSTRUCTION ACTIVITY IS COMPLETED TEMPORARY CONTROLS SHALL BE REMOVED AS APPROVED BY THE ENGINEER.

STORM WATER MANAGEMENT: CARE SHOULD BE TAKEN TO DISTURB AS LITTLE OF THE NATURAL AREA AS POSSIBLE.

STORM WATER DRAINAGE WILL BE PROVIDED BY EXISTING DITCHES AND CULVERTS. STORM WATER SHALL BE FILTERED THROUGH SEDIMENT CONTOL DEVICES BEFORE LEAVING THE PROJECT.

DESCRIPTION OF ANY MEASURES INSTALLED DURING THE CONSTRUCTION PROCESS TO CONTROL STORM WATER DISCHARGES AFTER CONSTRUCTION OPERATIONS HAVE BEEN COMPLETED:

ALL DISTURBED AREAS SHALL BE SEEDED BEFORE CONSTUCTION COMPLETION.

OTHER EROSION AND SEDIMENT CONTROLS:

MAINTENANCE: ALL EROSION AND SEDIMENT CONTROLS WILL BE MAINTAINED IN GOOD WORKING ORDER. IF A REPAIR IS NECESSARY, IT WILL BE DONE AT THE EARLIEST DATE POSSIBLE, BUT NO LATER THAN 7 CALENDAR DAYS AFTER THE SURROUNDING EXPOSED GROUND HAS DRIED SUFFICIENTLY TO PREVENT FURTHER DAMAGE FROM HEAVY EQUIPMENT.

INSPECTION: AN INSPECTION WILL BE PERFORMED BY A TXDOT INSPECTOR OF THE CONSTRUCTION SITE AT LEAST ONCE EVERY 7 CALENDAR DAYS REGARDLESS OF RAINFALL. AN INSPECTION AND MAINTENANCE REPORT WILL BE MADE PER EACH INSPECTION. BASED ON THE INSPECTION RESULTS, THE CONTROLS SHALL BE REVISED PER THE INSPECTION REPORT.

WASTE MATERIALS: ALL WASTE MATERIALS WILL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER. THE DUMPSTER WILL MEET ALL STATE AND LOCAL CITY SOLID WASTE MANAGEMENT REGULATIONS. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER WILL BE EMPTIED AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION, AND THE TRASH WILL BE HAULED TO A PERMITTED LANDFILL. NO CONSTRUCTION WASTE MATERIAL WILL BE BURIED ON SITE.

HAZARDOUS WASTE (INCLUDING SPILL REPORTING): AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATAGORIES ARE CONSIDERED TO BE HAZARDOUS: PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, OR CONCRETE CURING COMPOUNDS AND ADDITIVES. IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS, THE SPILL COORDINATOR SHOULD BE CONTACTED IMMEDIATELY AT (806) 356-3299.

SANITARY WASTE: ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

OFF SITE VEHICLE TRACKING:

	HAUL ROADS DAMPENED FOR DUST CONTROL
X	LOADED HAUL TRUCKS TO BE COVERED WITH TARPAULIN
X	EXCESS DIRT ON ROAD REMOVED DAILY
	STABILIZED CONSTRUCTION ENTRANCE

OTHER:

REMARKS: DISPOSAL AREAS, STOCKPILES, AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL THE AMOUNT OF SEDIMENT THAT MAY ENTER RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WETLAND, WATERBODY OR STREAMBED. CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED BY THE CONTRACTOR IN A MANNER TO MINIMIZE THE RUNOFF OF POLLUTANTS. ALL WATERWAYS SHALL BE CLEARED 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.

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED PROFESSIONAL ENGINEER

Casey B. Stripling

11-02-2022

US60

TxDOT STORM WATER POLLUTION PREVENTION PLAN (SW3P)

2022 Texas Department of Transportation

SHEET 1 OF 1

DSN	CK	CONT	SECT	JOB	HIGHWAY
AM	AM	0168	07	050, ETC	US60
DRWN	CK	DIST	COUNTY		SHEET NO.
AM	CH	AMA	DEAF SMITH		84

DATE: 10/31/2022 3:44:56 PM
FILE: I:\AMA\PD\Construction Projects\0168-07\050 US 60 HEREFORD TO CANYON\4 - Design\Plan Set\9. Environmental\SW3P.dgn

DATE: 10/31/2022
FILE: T:*AMATPD*Construction Projects*0168-07*050 US 60 HEREFORD TO CANYON*4 - Design*Plan Set*9. Environmental*EPIC.dgn

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1. N/A

☐ No Action Required ☒ Required Action

Action No.

1. Comply with project SW3P and Construction General Permit and post a large construction site notice.
2. submit an NOI to TCEQ.

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

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

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

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

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

1.

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.

III. CULTURAL RESOURCES

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

☐ No Action Required ☒ Required Action

Action No.

1. In the event that unanticipated archeological deposits are encountered during construction, work in the immediate area will cease and TxDOT archeological staff will be contacted to initiate post-review discovery procedures.

Best Management Practices:

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

IV. VEGETATION RESOURCES

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

☐ No Action Required ☒ Required Action

Action No.

1. Comply with Executive Order 13112 on Invasive Species and the intent of the Executive Order Memorandum on Beneficial Landscapes for re-vegetating the project area. The proposed seed mixture (both grasses and forbs) would be in accordance with Item 164, Seeding for Erosion Control in TxDOT's Standard Specifications for the construction of Highways, Streets, and Bridges.

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

☐ No Action Required ☒ Required Action

Action No.

1. If any species on the Deaf Smith County Threatened & Endangered list is sighted in the project area during construction, stop construction and notify the Area engineer.
2. Eastern Spotted Skunk, Swift Fox: Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered, and to avoid unnecessary impacts to dens.
3. Woodhouse5*32s Toad, Texas Horned Lizard, Western Box Turtle, Western Hognose Snake, Prairie Rattlesnake: Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered. For the Texas Horned Lizard, avoidance should include avoiding harvester ant beds in the selection of Project Specific Locations (PSL's).
4. Bird BMP's: a) Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season; b) avoid the removal of unoccupied, inactive nests, as practicable; c) Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.
5. The Migratory Bird Treaty Act of 1918 states that it is unlawful to kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, young, feather, egg in part or in whole, without a Federal permit issued in accordance within the Act's policies and regulations. In the event that migratory birds are encountered on-site during project construction, adverse impacts on protected birds, active nests, eggs, and/or young would be avoided.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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

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

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

Contact the Engineer if any of the following are detected:

- Dead or distressed vegetation (not identified as normal)
- Trash piles, drums, canister, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of substances

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

☐ Yes ☒ No

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

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

☐ Yes ☒ No

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

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

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

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

☐ No Action Required ☐ Required Action

Action No.

1. Lead-Based Paint (LBP) has been detected in the gray paint on metal girders and cross beams on the abandoned railroad bridge that is to be demolished north of the SH 136 split. All girder and cross beam removal will be carried out without torch-cutting to avoid potential lead-based paint exposure. If torch-cutting is planned, LBP mitigation will be carried out at the contractor's 5/32s expense prior to the torch-cutting taking place.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

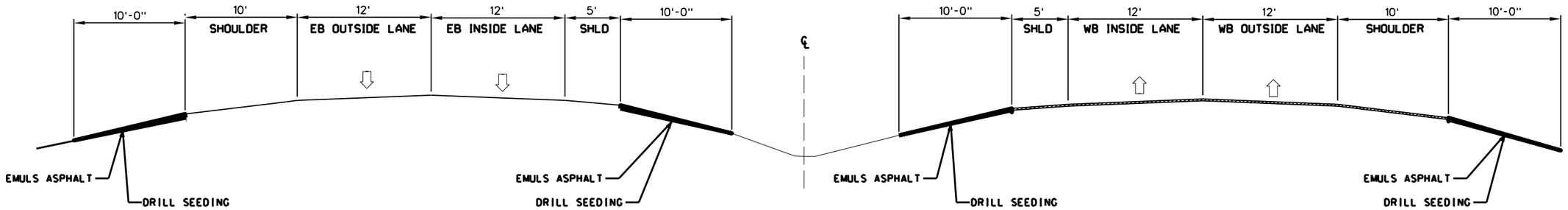
Action No.

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
© TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
12-12-2011 (DS)	DIST	COUNTY		SHEET NO.
05-07-14 ADDED NOTE SECTION IV.	AMA	DEAF SMITH		85
01-23-2015 SECTION I CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.				



US 60 SEEDING TYPICAL SECTION

STA 0+00 TO 691+85

EB LANE
CSJ: 0168-07-050

WB LANE
CSJ: 0168-07-051

SUMMARY OF EROSION CONTROL ITEMS					
LOCATION	164 6036 DRILL SEEDING (PERM) (RURAL) (CLAY) AC	164 6044 DRILL SEEDING (TEMP) (COOL) AC	314 6009 EMULS ASPH (EROSN CONT) (MULTI) 0.13 GAL/SY GAL	506 6040 BIODEG EROSN CONT LOGS (INSTL) (8") LF	506 6043 BIODEG EROSN CONT LOGS (REMOVE) LF
CSJ:0168-07-050	32	32	19,987	2,094	2,094
CSJ:0168-07-051	35	35	19,987	2,094	2,094
PROJECTTOTAL	67	67	39,974	4,188	4,188

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED
PROFESSIONAL ENGINEER

Casey B. Stripling

11-02-2022

US 60

EROSION CONTROL LAYOUT

2022 Texas Department of Transportation

SHEET 1 OF 2

DSN	CK	CONT	SECT	JOB	HIGHWAY
AM	AM	0168	07	050, ETC	US60
DRWN	CK	DIST	COUNTY		SHEET NO.
AM	CH	AMA	DEAF SMITH		86

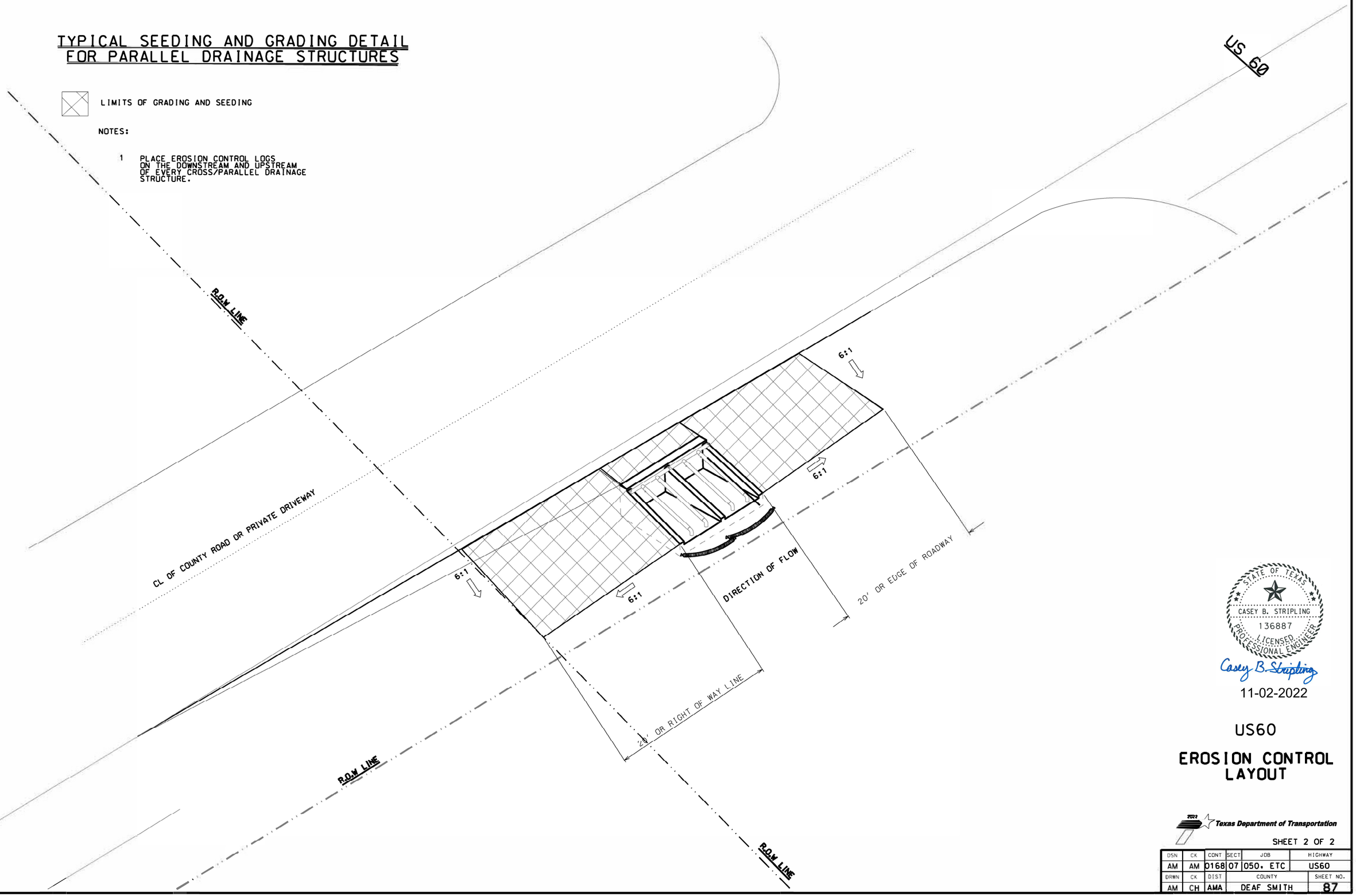
DATE: 10/31/2022 3:44:57 PM
FILE: I:*AMA\PD*Construction Projects*0168-07-050 US 60 HEREFORD TO CANYON*4 - Design*Plan Set*9. Environmental*seeding.dgn

TYPICAL SEEDING AND GRADING DETAIL FOR PARALLEL DRAINAGE STRUCTURES

LIMITS OF GRADING AND SEEDING

NOTES:

1 PLACE EROSION CONTROL LOGS ON THE DOWNSTREAM AND UPSTREAM OF EVERY CROSS/PARALLEL DRAINAGE STRUCTURE.



STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED PROFESSIONAL ENGINEER

Casey B. Stripling

11-02-2022

US60

EROSION CONTROL LAYOUT

Texas Department of Transportation

SHEET 2 OF 2

DSN	CK	CONT	SECT	JOB	HIGHWAY
AM	AM	0168	07	050, ETC	US60
DRWN	CK	DIST	COUNTY		SHEET NO.
AM	CH	AMA	DEAF SMITH		87

DATE: 10/31/2022 3:44:57 PM
FILE: T:\AMATPD\Construction Projects\0168-07\050 US 60 HEREFORD TO CANYON\4 - Design\Plan Set\9. Environmental\seeding.dgn

ITEM 164 SEEDING FOR EROSION CONTROL

SEED (PERM) (RURAL or URBAN) (SAND or CLAY)

"WARM SEASON" PLANTING DATES	SEED MIXTURE	PURE LIVE SEED RATE & PLANT DEPTH
PERMANENT: EARLY SPRING SEED FROM FEBRUARY 15th THROUGH May 15th. AS AREAS OF THE ROW ARE PREPARED AND DETERMINED READY FOR DRILL SEEDING.	NEW CROP SEED: TYPE: BUFFALO GRASS (Texoka) "Fluffy" WESTERN WHEATGRASS (ARRIBA) "Hard" BERMUDA GRASS (BLACK JACK) "Hard Tiny Seed" 100% "Unhulled"	3.0 LBS PLS / ACRE 6.0 LBS PLS / ACRE 5.0 LBS PLS / ACRE @ 1/4" -1/2" Soil Depth
PERMANENT and TEMP. LATE SPRING SEED FROM MAY 15th THROUGH AUGUST 1st AS AREAS OF THE ROW THAT ARE LAID BY BUT DETERMINED TO BE OUT OF SEASON FOR PERMANENT DRILL SEEDING.	TYPE: MILLET (BROWN TOP) "Hard Shell, Small Seed" - Nurse crop BERMUDA GRASS (BLACK JACK) "Hard Tiny Seed" 100% "Unhulled"	30. LBS PLS / ACRE @ 1/4" Soil Depth 5.0 LBS PLS / ACRE
SOIL PREPARATION EQUIPMENT AND PRACTICES: RIPPER --- DISK --- HARROW --- CULTI-PACKER.		

NOTES:

1. ALL SEED MIXTURE TYPES SHALL BE PURCHASED IN PRE- MIXED BAGS. "BY TYPE" BLENDED BY THE GROWER SHIPPER.
2. SOILS THAT ARE COMPACTED. HAVE CLODS. SHALL BE REWORKED UNTIL READY FOR SEEDING. AS DIRECTED.
3. ALL SOIL SURFACES SHALL BE LEVEL WITH NATURAL FLOWING SMOOTH GRADES. NO TIRE RUTS OR FURTHER TRAFFIC ALLOWED.
4. SOIL SURFACE SHALL BE FIRM BUT NOT COMPACTED. ALLOWING 1/4" DEPRESSION UNDER NORMAL FOOT TRAFFIC.
5. SEED 100% OF THE BED AREA. NO SKIPS OR VOID AREAS ALLOWED. EXAMPLE:AREAS AROUND SIGN POSTS AND INLETS.
6. SEED UP TO THE FIRST 6" OF THE EDGE OF PAVEMENT. AS DIRECTED. HAND RAKE ISOLATED SEEDED AREAS.
7. WEIGH ALL CALIBRATED SEED SAMPLES FOR ACCURACY AND PRESENT DOCUMENTATION TO ENGINEER.

FOR DRILL SEEDING
1. USE ONLY PROFESSIONAL NATIVE GRASS OR TURF GRASS (MULTI- 3 BIN) DRILL SEEDERS.
2. CALIBRATE DRILL SEEDER FOR SPECIFIED (PLS) PER ACRE BEFORE DRILL SEEDING.
3. DRILL SEEDER MUST BE EQUIPPED WITH THE LARGE FRONT CUTTING COULTERS DURING THE INSPECTION OF DRILL SEEDER.

FOR BROADCAST SEEDING
1. USE ONLY COMMERCIAL TYPE CYCLONE TYPE SPREADERS.
2. CALIBRATE CYCLONE SPREADER FOR 1000 Sq. Ft. (PLS) PER ACRE BEFORE SEEDING.
3. TO PREVENT SEED SEPARATION IN SPREADERS. SPREAD ALL SEED TYPES INDEPENDENTLY IN A SEPARATE APPLICATION.
4. IMMEDIATELY AFTER SEEDING. IN ONE OR TWO OPERATIONS. CULTI-PACK THE SEEDED SOILS AND FIRM SEED INTO SURFACE.
5. DISCONTINUE SEEDING IF WIND EXCEEDS 10 MPH.

ITEM 164 SEEDING FOR EROSION CONTROL

SEED (TEMPORARY) COOL SEASON SEEDING

"COOL SEASON" PLANTING DATES	SEED MIXTURE	PURE LIVE SEED RATE & PLANT DEPTH
TEMPORARY: EARLY FALL SEED FROM AUGUST 1st THROUGH DECEMBER 1st. AS AREAS OF THE ROW ARE PREPARED AND DETERMINED READY FOR DRILL SEEDING.	NEW CROP SEED: TYPE: WESTERN WHEATGRASS "Hard Shell" RED WINTER WHEAT. VAR:TAM III "Hard Shell"	6.0 LBS PLS / ACRE 34. LBS PLS / ACRE @ 1" Soil Depth
TEMPORARY: LATE FALL SEED FROM DECEMBER 1st THROUGH DECEMBER 31ST. AS AREAS OF THE ROW ARE PREPARED AND DETERMINED READY FOR DRILL SEEDING.	NEW CROP SEED: TYPE: RED WINTER WHEAT. VAR:TAM III "Hard Shell"	34. LBS ACRE / PLS @ 1" Soil Depth
SOIL PREPARATION EQUIPMENT AND PRACTICES: RIPPER --- DISK --- HARROW --- CULTI-PACKER.		

ITEM 314 EMULSIFIED ASPHALT TREATMENT

TIME SCHEDULE:

IMMEDIATELY AFTER SOIL PREPARATION OR WITHIN 24 HOURS AFTER SEEDING. APPLY THE TACK COAT TO DESIGNATED SOIL SURFACES.

FUNCTIONAL USE:

SOIL EROSION CONTROL.OR MOISTURE RETENTION BARRIER.

NOTES:

1. ALL TRUCK APPLICATIONS SHALL BE COMPLETED IN ONE PASS OF THE DISTRIBUTOR. ALL TOUCH UP WORK WILL BE FINISHED BY HAND AND HOSE PROCEDURES. APPLY FROM EDGE OF PAVEMENT THROUGH THE FULL SPECIFIED AREAS.
2. ENGINEER WILL INSPECT FOR ACCURACY THE OVERALL DEPTH OF THE APPLIED TACK COAT MATERIALS.
3. FURTHER VEHICULAR TRAFFIC IS NOT ALLOWED ON LAID BY TACK COAT SURFACES. AT THE CONTRACTORS EXPENSE ALL DAMAGES TO TACK COAT SURFACES WILL BE RE -SHOT AS DIRECTED BY THE ENGINEER.

ITEM 166 FERTILIZER

TIME SCHEDULE:

AFTER TOPSOIL PLOWING PEPARATIONS ARE COMPLETED. FERTILIZE R.O.W. SOIL SURFACES AND HARROW 2" TO 4" DEEP INTO PLACE.

FUNCTIONAL USE:

PLANT NUTRIENTS FOR PLANT AND ROOT DEVELOPMENT.

FERTILIZER SHALL BE EVENLY DISTRIBUTED AT A RATE OF 28 LBS OF NITROGEN PER ACRE.
THE BREAK DOWN OF THE NITROGEN ELEMENT SHALL BE IN A 50% SLOW RELEASE FORM.
ANALYSIS OF THE (NPK) IS: 1-5-0 A HIGH PHOSPHATE BLEND. AS DIRECTED BY THE VEGETATION MANAGER.

ITEM 166 NOTES:

1. BROADCAST SPECIFIED FERTILIZER FROM THE EDGE OF PAVEMENT. THROUGH THE ENTIRE ROW SEED BED AREA. APPLICATIONS FOR EDGE OF PAVEMENT. CULVERTS. SIGN POST AREAS. GUARD RAILS AND ISOLATED AREAS SHALL BE APPLIED BY WALK BEHIND SPREADERS AND BY HAND. NO FERTILIZER ALLOWED ON PAVEMENT SURFACES.

2. ALL SPREADERS SHALL BE CALIBRATED BY THE CONTRACTOR AND THE ENGINEER FOR ACCURACY AND PERFORMANCE. SHALL USE UNOPENED 50# BAGS OF SPECIFIED FERTILIZER FOR DAILY CALIBRATIONS. APPLICATION SHALL BE A EVEN DISTRIBUTION OF PRODUCT ON DESIGNATED SOIL SURFACES.

3. FERTILIZER SHALL BE DELIVERED IN 50# BAGS UNLESS OTHERWISE SPECIFIED OR APPROVED PRIOR TO DELIVERY. BAGS SHALL BE CLEARLY LABELED SHOWING CONTENTS. IF BULK FERTILIZER IS APPROVED.DOCUMENTATION WILL BE REQUIRED FOR EACH LOAD OF MATERIAL DELIVERED VERIFYING AUTHENTICITY OF THE MATERIAL. CULTURAL PROCEDURES ARE UNDER THE DIRECTION OF THE TXDOT VEGETATION MANAGER.

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED PROFESSIONAL ENGINEER

Casey B. Stripling

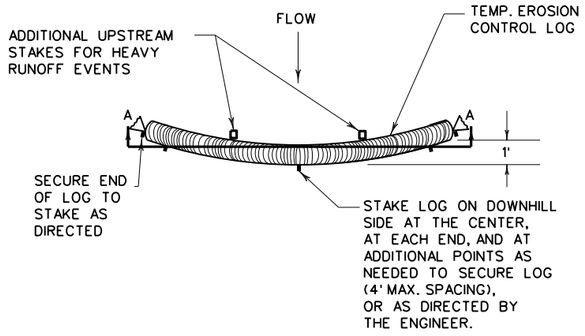
11-02-2022

VEGETATION SPECIFICATION SHEET

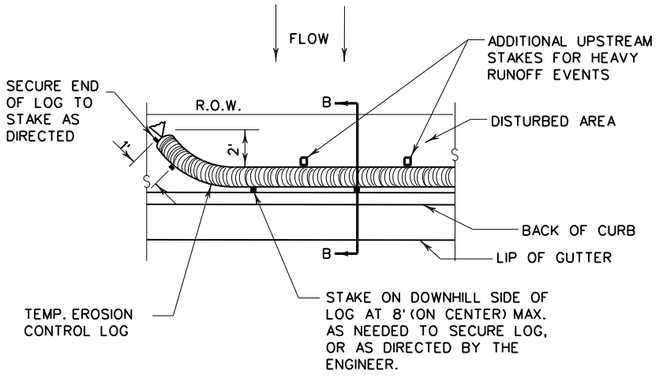
FED. RD. DIV. NO.	CONT	SECT	JOB	HIGHWAY
6	0168	07	050, ETC	US60
FEDERAL AID PROJECT NO.	DIST	COUNTY		SHEET NO.
SEE TITLE SHEET	AMA	DEAF SMITH		88

DATE: 10/31/2022 3:44:57 PM
FILE: T:\AMATPD\Construction Projects\0168-07\050 US 60 HEREFORD TO CANYON\4 - Design\Plan Set\9. Environmental\Vegetation Specs.dgn

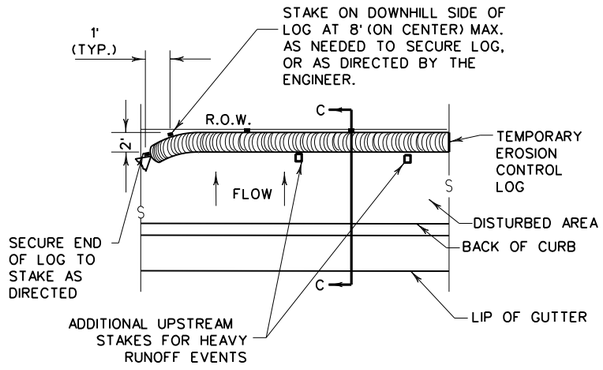
DATE: 10/31/2022
FILE: T:*AMATPD*Construction Projects*0168-07*050 US 60 HERFORD TO CANYON*4 - Design*Plan Set*9. Environmental*Standards*ec916.dgn



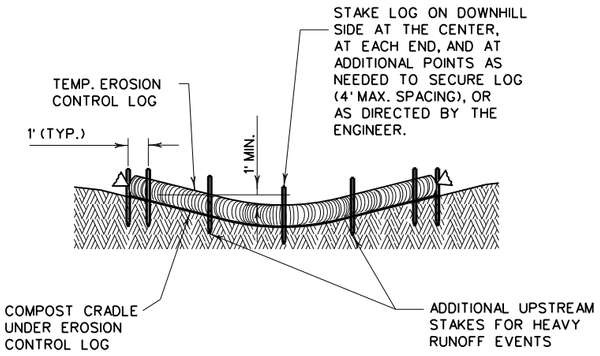
PLAN VIEW



PLAN VIEW



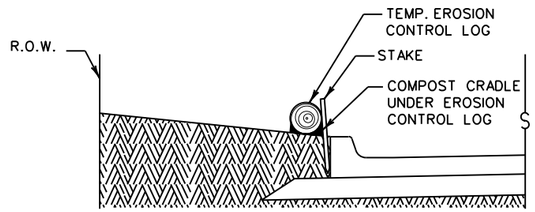
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

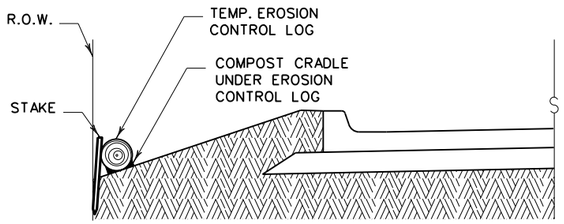
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

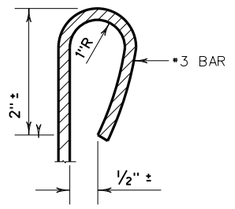
CL-BOC



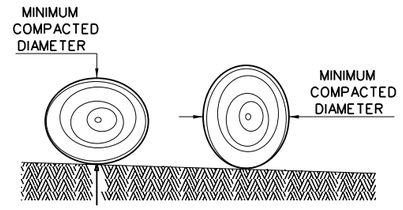
SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

LEGEND

- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET

GENERAL NOTES:

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

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

Texas Department of Transportation

Design Division Standard

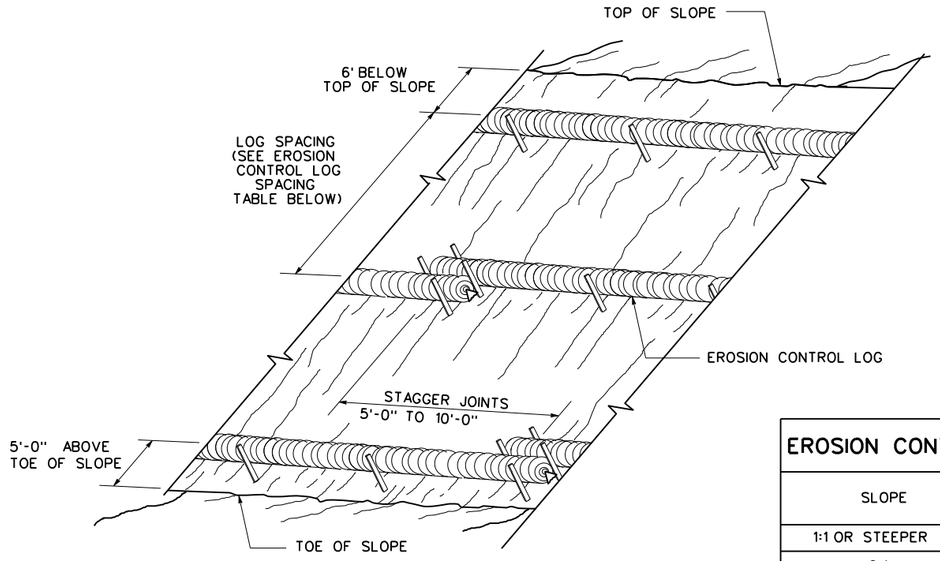
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

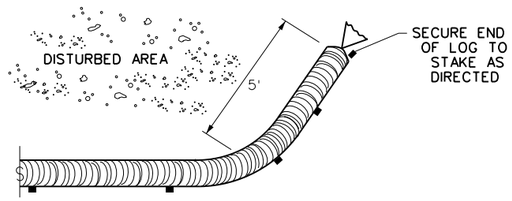
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
	DIST	COUNTY		SHEET NO.
	AMA	DEAF SMITH		89

DATE: 10/31/2022
FILE: T:*AMATPD*Construction Projects*0168-07*050 US 60 HERFORD TO CANYON*#4 - Design*Plan Set*#9. Environmental*Standards*ec916.dgn



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

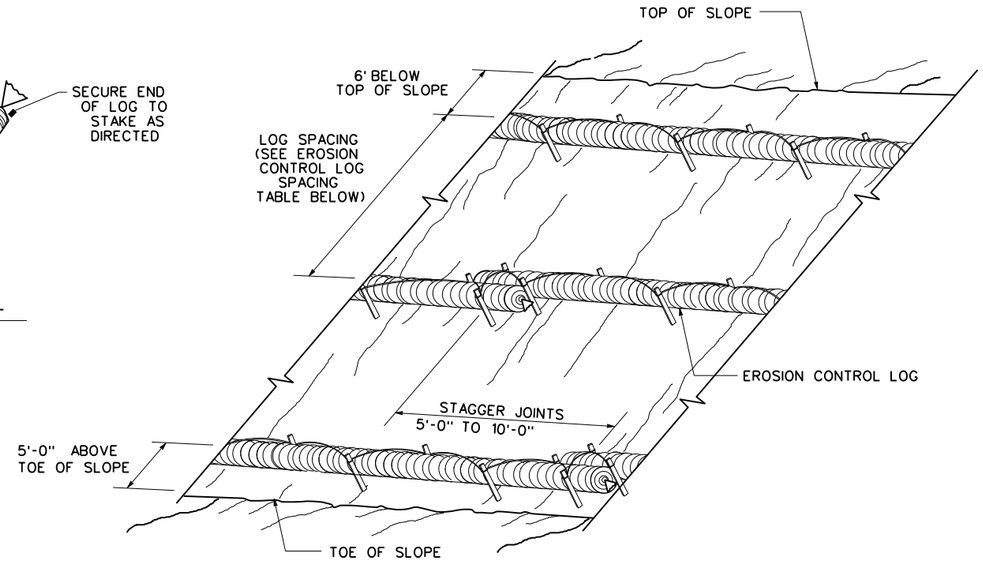
CL-SST



END SECTION RAP DETAIL

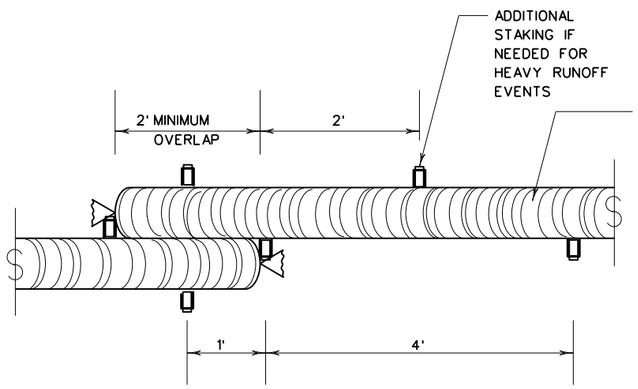
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

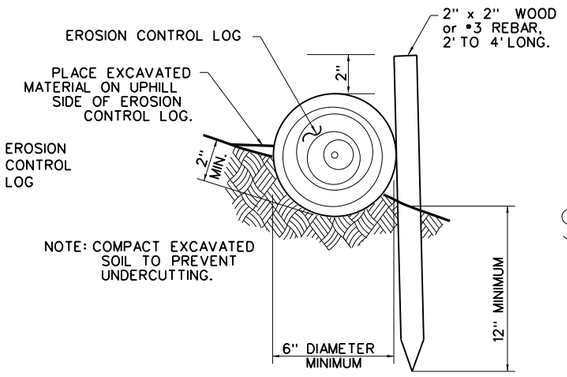
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

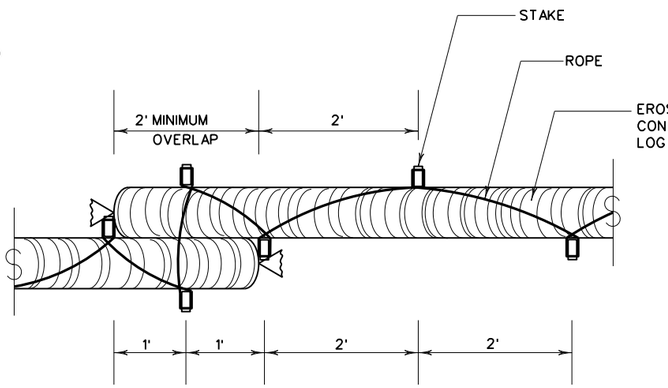


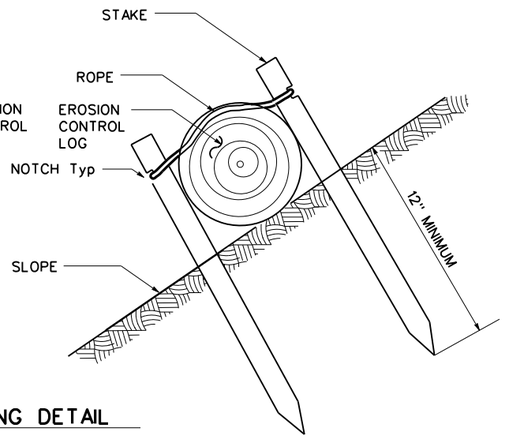


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

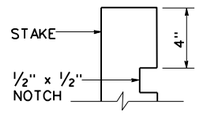
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

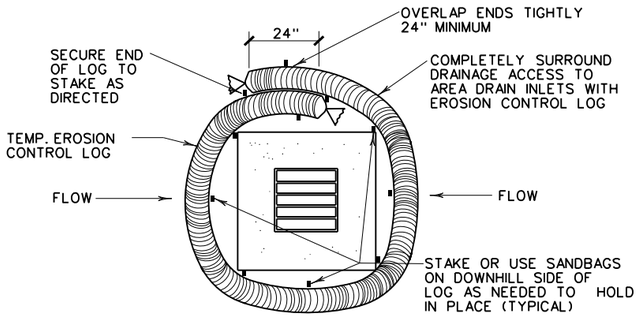
Texas Department of Transportation

Design Division Standard

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

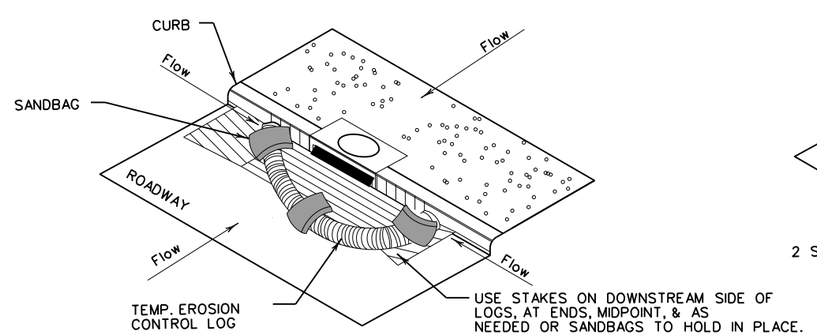
FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0168	07	050, ETC	US60
	DIST	COUNTY		SHEET NO.
	AMA	DEAF SMITH		90

DATE: 10/31/2022
FILE: T:*AMATPD*Construction Projects*0168-07*050 US 60 HERFORD TO CANYON*4 - Design*Plan Set*9. Environmental*Standards*ec916.dgn



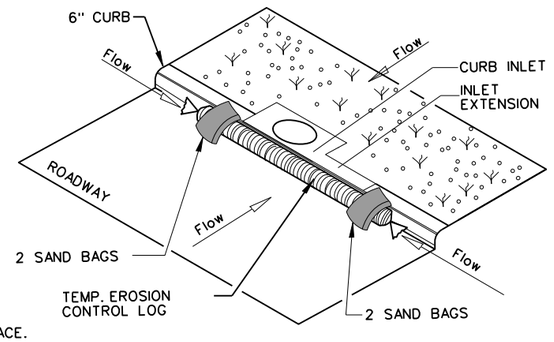
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

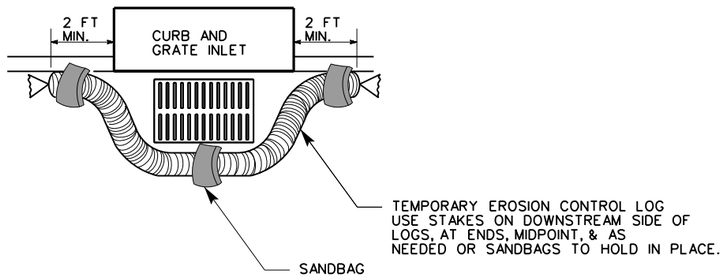
CL-CI



EROSION CONTROL LOG AT CURB INLET

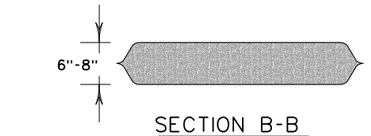
CL-CI

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

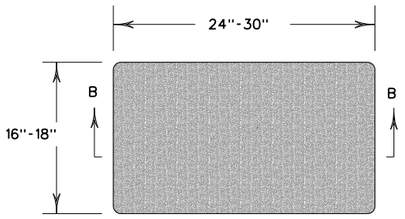


EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI



SECTION B-B



SANDBAG DETAIL

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	0168	07	050, ETC		US60		
	DIST	COUNTY				SHEET NO.	
	AMA	DEAF SMITH				91	