INDEX OF SHEETS

SEE SHEET NO. 2

FINAL PLANS

Letting Date: _____

Name of Contractor: _____

Date Work Began: _____

Date Work Completed: _____

Date Work Accepted: _____

Final Contract Cost: _____

Project was built according to the Plans & Specifications. These final plans reflect the work done and the quantities shown thereon and on the Final Estimate are Final Quantities.

Area Engineer Date

Summary of Change Orders:

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

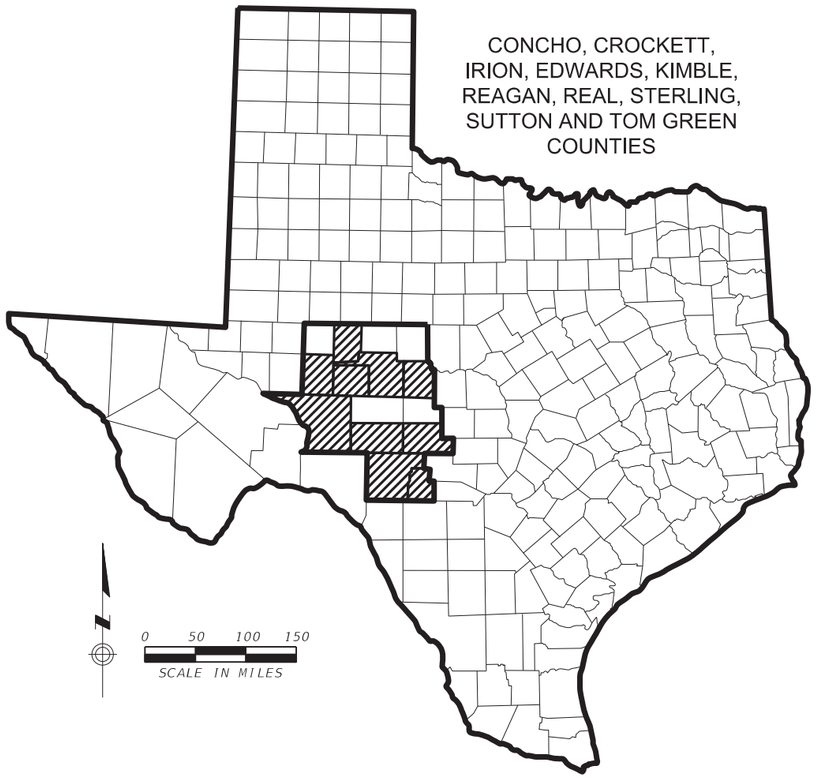
STATE PROJECT C 36-5-44

US 83, ETC
REAL, ETC

NET LENGTH OF PROJECT 1,026,977 FT = 194.503 MI

LIMITS: VARIOUS LOCATIONS IN SAN ANGELO DISTRICT

FOR THE CONSTRUCTION OF SEAL COAT



EXCEPTIONS
NONE

EQUATIONS
NONE

RAILROAD CROSSING
Texas Pacifico Transportation Ltd.
DOT # 018833D

FUNCTIONAL CLASS = MAJOR COLLECTOR AND GREATER

FEDERAL-AID PROJECT NUMBER			
C 36-5-44			
CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		1

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).

2023 Texas Department of Transportation

SUBMITTED FOR LETTING: 10/13/2023

DocuSigned by:
Nicholas Greenly
DDF89C6522AF49E...
District Design Engineer

RECOMMENDED FOR LETTING: 10/13/2023

DocuSigned by:
John R. Barker, P.E.
826185212F51427...
District Director of TP&D

APPROVED FOR LETTING: 10/13/2023

DocuSigned by:
BC10B17FA709437...
District Engineer

DATE: 10/13/2023 10:34:57 AM
FILE: pw://txdot.projectwiseonline.com:TxDOT2/Documents/07 - SJT/Design Projects/0036050444/4 - Design/Plan Set/1. General/TITLE SHEET.dgn

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	GENERAL
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4	LOCATION MAP SAN ANGELO AREA
5- 5C	GENERAL NOTES
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10-12	QUANTITY SUMMARY
13	RAILROAD SCOPE OF WORK
14-15	RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS
	TRAFFIC CONTROL PLAN
16	TRAFFIC CONTROL PLAN GENERAL REQUIREMENTS
17	SL 481 DETOUR LAYOUT
	TRAFFIC CONTROL PLAN STANDARDS
# 18-29	BC (1)-21 THRU BC (12)-21
# 30	TCP(SC-1)-21
# 31	TCP(SC-2)-21
# 32	TCP(SC-3)-21
# 33	TCP(SC-4)-21
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# 36	TCP(SC-7)-21
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54	SEAL COAT SITE 11
55-56	SEAL COAT SITE 12
57	SEAL COAT SITE 13
58	SEAL COAT SITE 14
59-60	SEAL COAT SITE 15
61	SEAL COAT SITE 16
62-63	SEAL COAT SITE 17
64-66	SEAL COAT SITE 18
67-68	SEAL COAT SITE 19

No.	Title
	TRAFFIC DETAILS
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	TRAFFIC STANDARDS
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# 71	PM(2)-22
# 72	PM(3)-22
# 73	PM(4)-22A
# 74	PM(5)-22
# 75	PM(AP)-21
# 76	RS(5)-23
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# 78	TS2(PL-2)-23
# 79	RCD(1)-22
# 80	RCD(2)-22
	ENVIRONMENTAL ISSUES
81	ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

10/05/2023

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE BY A # HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

Texas Department of Transportation | San Angelo District

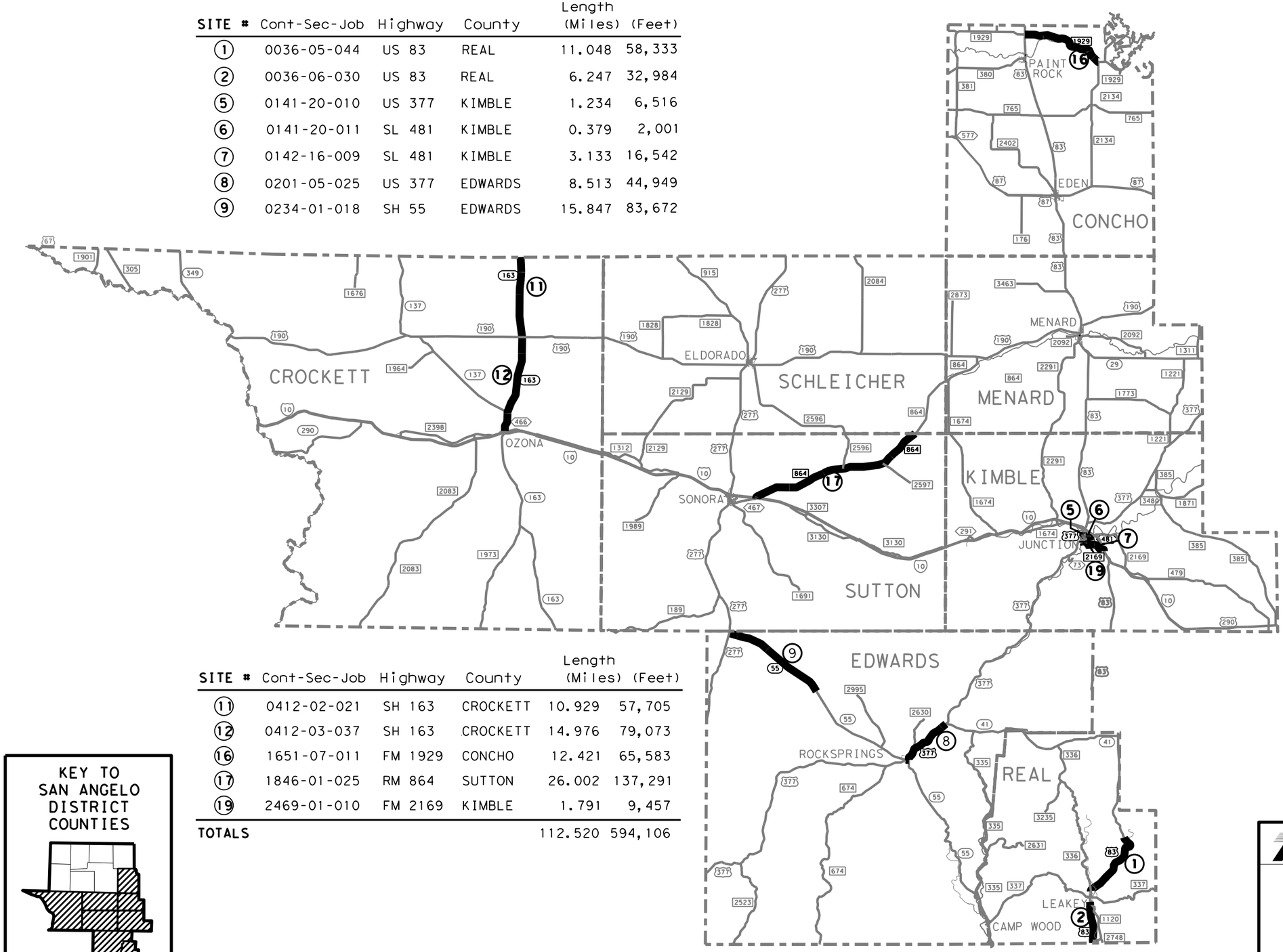
INDEX OF SHEETS

SHEET 1 OF 1 NOT TO SCALE

SHEET ISSUED OR LAST REVISED

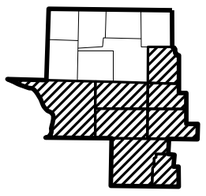
CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		2

SITE #	Cont-Sec-Job	Highway	County	Length (Miles)	(Feet)
(1)	0036-05-044	US 83	REAL	11.048	58,333
(2)	0036-06-030	US 83	REAL	6.247	32,984
(5)	0141-20-010	US 377	KIMBLE	1.234	6,516
(6)	0141-20-011	SL 481	KIMBLE	0.379	2,001
(7)	0142-16-009	SL 481	KIMBLE	3.133	16,542
(8)	0201-05-025	US 377	EDWARDS	8.513	44,949
(9)	0234-01-018	SH 55	EDWARDS	15.847	83,672



SITE #	Cont-Sec-Job	Highway	County	Length (Miles)	(Feet)
(11)	0412-02-021	SH 163	CROCKETT	10.929	57,705
(12)	0412-03-037	SH 163	CROCKETT	14.976	79,073
(16)	1651-07-011	FM 1929	CONCHO	12.421	65,583
(17)	1846-01-025	RM 864	SUTTON	26.002	137,291
(19)	2469-01-010	FM 2169	KIMBLE	1.791	9,457
TOTALS				112.520	594,106

KEY TO SAN ANGELO DISTRICT COUNTIES



STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation

San Angelo District

LOCATION MAP JUNCTION AREA

SHEET 1 OF 1 SCALE 1"=15 MILES

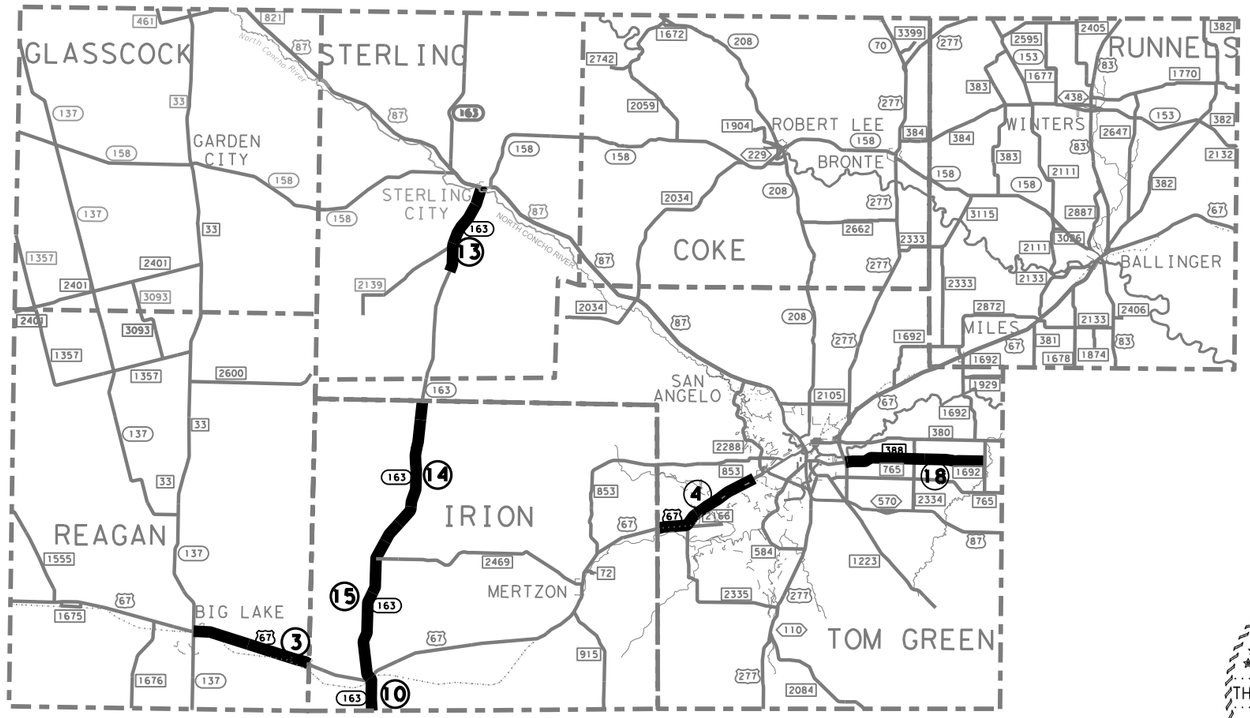
© TxDOT 2023

SHEET ISSUED OR LAST REVISED

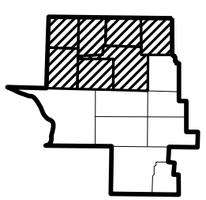
CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		3

DATE: 9/25/2023 9:57:34 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050444/4 - Design/Plan Set/1. General/LOCATION MAP JUNCTION AREA.dgn

SITE#	Cont-Sec-Job	Highway	County	Length (Miles)	(Feet)
③	0077-01-031	US 67	REAGAN	9.904	52,293
④	0077-06-103	US 67	TOM GREEN	11.162	58,936
⑩	0412-01-025	SH 163	IRION	8.848	46,718
⑬	1648-01-014	SH 163	STERLING	9.053	47,800
⑭	1648-04-016	SH 163	IRION	15.308	80,826
⑮	1648-05-015	SH 163	IRION	13.758	72,642
⑱	2284-01-033	FM 388	TOM GREEN	13.950	73,656
TOTALS				81.983	432,871



KEY TO SAN ANGELO DISTRICT COUNTIES



STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation | San Angelo District

LOCATION MAP SAN ANGELO AREA

SHEET 1 OF 1 SCALE 1"=15 MILES

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		4

DATE: 9/25/2023 9:57:48 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050441/4 - Design/Plan Set/1. General/LOCATION MAP SAN ANGELO AREA.dgn

BASIS OF ESTIMATE

Item No.	Description	Usage	Area or Length	Rate	Estimated Quantity
316	Surface Treatment	ASPH (TIER I)	3,151,588 SY	0.45 GAL/SY	1,418,215 GAL
316	Surface Treatment	AGGR(TY-PD GR-3 SAC-B)	3,151,588 SY	110 SY/CY	28,651 CY
316	Surface Treatment	ASPH (TIER I)	755,014 SY	0.40 GAL/SY	302,006 GAL
316	Surface Treatment	AGGR(TY-PD GR-4 SAC-A)	755,014 SY	130 SY/CY	5,808 CY

County: REAL, ETC. **Sheet:** 5

Highway: US 83, ETC. **Control:** 0036-05-044, ETC.

GENERAL NOTES

The following Standard Sheets have been modified: **None.**

Locate the project bulletin board at an approved location within the project limits such as at a field office, staging area, or stockpile, and make accessible to the public at all times. Do not remove the bulletin board from the project until approved. If a construction site notice is required for the project, post a copy at each geographically separated work location.

In those instances where fixed features require, vary the governing slopes indicated in these plans from within the limits to the extent determined.

If Contractor elects to establish a pit within 200 ft. of a public road, construct a barrier or other device in accordance with Natural Resources Code, Chapter 133, and Section 133.041.

Do not use salt water with solids in excess of 10,000 parts per million, as determined by evaporation.

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

Jesus Garcia, P.E.; email Jesus.Garcia@txdot.gov and Randy Baiza, P.E.; email Randy.Baiza@txdot.gov

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

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

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

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

Questions may be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following address: https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors

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

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

Item 5, "Control of the Work"

Responsibility for construction surveying shall conform to Section 5.9.3., "Method C."

Item 6, "Control of Materials"

When allowed store materials and equipment in approved areas within the right of way.

Access the work area from the right of way.

Item 7, "Legal Relations and Responsibilities"

Railroad protective liability coverage is required.

No significant traffic generator events have been identified.

Item 8, "Prosecution and Progress"

Submit the sequence of work and estimated progress schedule on paper or as a Portable Document Format (PDF) electronic file compatible with Adobe Systems Incorporated "Acrobat Reader XI".

Charges for working days shall conform to Section 8.3.1.2., "Six-Day Workweek."

Seal coat season is May 1 to August 31.

The Engineer may consider extending working days beyond the end of the seal coat season.

Failure to complete work within the seal coat season established by the plans will result in liquidated damages as described in Section 8.6, "Failure to Complete Work on Time." This includes any seal coat work carried over to the next year.

Item 9, "Measurement and Payment"

The progress payment period shall end on the 28th of each month. Deliver invoices to be paid as material on hand on or before the end of the progress payment period.

For projects that include a disadvantaged business enterprises (DBE) goal, provide a conversion rate for units of payment for work subcontracted to DBE if units of payments differ from those shown on the plans.

Item 302, "Aggregates for Surface Treatments"

Stockpile aggregates separately and label stockpiles with project number, material type, and grade. Leave stockpile sites within the State right of way in same condition as they

County: REAL, ETC. **Sheet:** 5A

Highway: US 83, ETC. **Control:** 0036-05-044, ETC.

were prior to construction, without litter and without fence damage. Level smooth any excess rock that was not hauled away.

The target value for the desired percent by weight of residual bitumen coating for virgin limestone aggregate is 1.2%. If using aggregate other than virgin limestone, notify the Engineer prior to pre-coating. The Engineer will determine the target value for the percent residual bitumen coating for non-limestone aggregate.

Pre-coat limestone rock asphalt with 0.6% flux oil.

Item 316, "Seal Coat"

Cover or protect the following, as applicable: railings, bridge joints, utility covers, railroad crossings, and exposed concrete such as curbs, bridge approach slabs, bridge decks, sidewalks, mow strips, and concrete pavement.

Do not place wet aggregate.

Use medium pneumatic rollers that meet the requirements of Item 210, "Rolling." If traprock aggregate is used, the Engineer may require steel wheel rollers.

Furnish nozzles that apply 22 percent to 32 percent less volume of asphalt in the wheel paths of the travel lanes, or as directed.

Engineer will witness the Transverse Distribution Test, Tex-922-K, Part III.

Furnish similar color aggregate from a common source for individual roadways.

Provide a minimum of five rollers.

Provide a minimum of four rotary, self-propelled brooms. Sweep the pavement prior to surface treatment operations, and sweep the pavement prior to pavement marking operations.

The Contractor is required to bring in a minimum of 3 bags (100 lbs. total) of aggregate sample for each type and source used for determining placement rates and quality control purposes. The State will not buy excess aggregate remaining on the project due to rate changes made in the field.

Stockpiled aggregate not removed from the State right of way within 30 calendar days of final acceptance will become the property of the State.

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.

One-way traffic control will be included in payment for this item.

Provide flaggers at such times and locations as directed to ensure the safe passage of traffic through construction areas. When flaggers are used to control traffic, furnish and install signs CW20-7 “FLAGGER SYMBOL”, CW20-7aD “FLAGGER AHEAD”, and CW3-4 “BE PREPARED TO STOP”. Flaggers shall use 24 in. STOP/SLOW paddles.

Use portable changeable message signs instead of static message boards. These shall be measured and paid for as item 6001, “Portable Changeable Message Sign.”

Remove Type III barricades and plastic drums upon depletion of a stockpile. At Contractor’s option, place these items near the fence line.

Prior to each workday, make provisions to exclude vehicles from parking within work areas.

Item 504, “Field Office and Laboratory”

Omit advance warning signs and furnish and install reduced signs CW20-1 “ROAD WORK AHEAD” mounted back to back with reduced size signs G20-2 “END ROAD WORK” signs at intersecting city streets and county roads.

Furnish and install signs CW20-1D “ROAD WORK AHEAD”, G20-1aT “ROAD WORK ←NEXT X MILES, NEXT X MILES→”, and G20-2 “END ROAD WORK” at intersecting state highways.

In addition to providing a Contractor’s Responsible Person and phone number for emergency contact, have employee(s) available to respond on the project for emergencies and for taking corrective measures within 30 minutes.

Cones may be used as the typical channelizing device.

Item 662, “Work Zone Pavement Markings”

Do not use temporary flexible-reflective roadway marker tabs to delineate words, symbols, shapes, or diagonal or transverse lines.

Paint and beads are allowed for nonremovable markings.

Use the temporary flexible-reflective roadway marker tab configuration shown on Standard Sheet TCP(SC-6)-22 and TCP(SC-7)-22.

County: REAL, ETC. **Sheet:** 5B

Highway: US 83, ETC. **Control:** 0036-05-044, ETC.

Item 666, “Retroreflectorized Pavement Markings”

Place glass beads for pavement markings in accordance with the following table:

Marking Types	Glass Bead (Double Drop) Types	Glass Bead Rates	
		Surface Treatment	Asphalt Concrete Pavement, Microsurfacing, Concrete Pavement
TY I markings	Type II	12 LB per 100 SF	6 LB per 100 SF
	Type III	12 LB per 100 SF	6 LB per 100 SF
TY II markings	Type II	12 LB per GAL	6 LB per GAL
	Type III	12 LB per GAL	6 LB per GAL

Apply TY II marking material at a rate of 25 gallons per mile.

The striper speed shall not exceed 5 MPH during application. Convert to gravity-flow beaders (if not in use) to obtain optimum bead application, when directed.

Clean striper tanks before use if there is a build-up of dry paint, as directed. Flush lines and guns before use.

Reference existing markings before performing work that disturbs the markings, so that the markings can be re-established.

Provide a double-drop of Type II and Type III glass beads.

For the purposes of this project, existing no-passing zone markings were not evaluated for adherence to current standards, but were re-established in their existing locations.

Item 668, “Prefabricated Pavement Markings”

When applying Type C specialty markings (symbols, words, etc.) over existing thermoplastic markings, first apply heat to the surface of the existing markings and roughen the surface with a shovel. Remove existing Type A, B, or C prefabricated markings prior to placing the new Type C markings.

Gore markings for aerial view will be measured and paid for as a quantity of one for each exit gore marked. Three numbers are required for each exit gore.

County: REAL, ETC. **Sheet:** 5C

Highway: US 83, ETC. **Control:** 0036-05-044, ETC.

Item 677, “Eliminating Existing Pavement Markings and Markers”

Use the following method: **Mechanical.**

For work on profile markings, only the elimination of the profile bars (raised portion of the profile markings) is required.

Item 678, “Pavement Surface Preparation for Markings”

Some stop bars on existing pavement are covered in material from adjacent unpaved roads. Provide cleaning tools. Locations of these stop bars are referenced in the plans.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0036-05-044 **DISTRICT** San Angelo **COUNTY** Concho, Crockett, Edwards, Irion, Kimble, Reagan, Real, Sterling, Sutton, Tom Green
HIGHWAY FM 1929, FM 2169, FM 388, RM 864, SH 163, SH 55, SL 481, US 377, US 67, US 83

			CONTROL SECTION JOB		**0036-05-044**		**0036-06-030**		**0077-01-031**		**0077-06-103**		**0141-20-010**		**0141-20-011**	
			PROJECT ID		**A00189190**		**A00189194**		**A00189226**		**A00189266**		**A00189273**		**A00189276**	
			COUNTY		**Real**		**Real**		**Reagan**		**Tom Green**		**Kimble**		**Kimble**	
			HIGHWAY		**US 83**		**US 83**		**US 67**		**US 67**		**US 377**		**SL 481**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-6004	ASPH (TIER I)	GAL	131,599.000		69,603.000		118,984.000		130,020.000		16,640.000		4,995.000	
	316-6142	AGGR(TY-PD GR-4 SAC-A)	CY					2,289.000		2,501.000		320.000		96.000	
	316-6238	AGGR(TY-PD GR-3 SAC-B)	CY	2,658.000		1,407.000									
	500-6001	MOBILIZATION	LS	1.000											
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	5.000											
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	603.000		129.000		738.000		457.000		325.000		86.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	1,474.000		834.000		1,284.000		1,502.000		152.000		45.000	
	666-6171	REFL PAV MRK TY II (W) 6" (BRK)	LF	6,030.000		1,280.000		7,380.000		4,570.000		3,250.000		860.000	
	666-6172	REFL PAV MRK TY II (W) 6" (DOT)	LF					637.000		693.000					
	666-6174	REFL PAV MRK TY II (W) 6" (SLD)	LF	115,900.000		65,523.000		98,571.000		116,630.000					
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	412.000				3,002.000		4,450.000				162.000	
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF									276.000		106.000	
	666-6208	REFL PAV MRK TY II (Y) 6" (BRK)	LF	9,830.000		5,860.000		7,110.000		6,960.000					
	666-6210	REFL PAV MRK TY II (Y) 6" (SLD)	LF	54,206.000		37,207.000		90,718.000		86,254.000		11,658.000		3,324.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA					4.000		8.000					
	668-6083	PREFAB PAV MRK TY C (W) (LNDP ARROW)	EA					2.000		6.000					
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA					4.000		6.000					
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)	EA												
	668-6092	PREFAB PAV MRK TY C (W) (36")(YLD TRI)	EA					4.000							
	668-6113	PRE PM TY C(ACC PRK)(BL&WH)(W/BORDR)LG	EA												
	672-6007	REFL PAV MRKR TY I-C	EA	302.000		65.000		370.000		452.000		163.000		45.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	1,179.000		765.000		2,452.000		2,730.000		152.000		45.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA												
	677-6028	ELIM EXT PV MRK & MRKS (RUMBLE STRIP)	LF	54,508.000											
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	7.000		5.000		7.000		7.000		4.000		1.000	
	6056-6001	PREFORMED IN-LANE(TRANS) RUMBLE STRIP	LF												
	6185-6005	TMA (MOBILE OPERATION)	DAY	4.000		2.000		5.000		5.000		1.000		1.000	
	08	CONTRACTOR FORCE ACCOUNT SAFETY CONTINGENCY (NON-PARTICIPATING)	LS	1.000											
		CONTRACTOR FORCE ACCOUNT EROSION CONTROL MAINTENANCE (NON-PARTICIPATING)	LS	1.000											
		CONTRACTOR FORCE ACCOUNT RAILROAD FLAGGING (NON-PARTICIPATING)	LS	1.000											

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0036-05-044 **DISTRICT** San Angelo **COUNTY** Concho, Crockett, Edwards, Irion, Kimble, Reagan, Real, Sterling, Sutton, Tom Green
HIGHWAY FM 1929, FM 2169, FM 388, RM 864, SH 163, SH 55, SL 481, US 377, US 67, US 83

		CONTROL SECTION JOB		**0142-16-009**		**0201-05-025**		**0234-01-018**		**0412-01-025**		**0412-02-021**		**0412-03-037**	
		PROJECT ID		**A00189278**		**A00189279**		**A00186646**		**A00189280**		**A00189281**		**A00189284**	
		COUNTY		**Kimble**		**Edwards**		**Edwards**		**Irion**		**Crockett**		**Crockett**	
		HIGHWAY		**SL 481**		**US 377**		**SH 55**		**SH 163**		**SH 163**		**SH 163**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-6004	ASPH (TIER I)	GAL	39,464.000		72,340.000		152,736.000		33,235.000		109,642.000		181,854.000	
	316-6142	AGGR(TY-PD GR-4 SAC-A)	CY	80.000											
	316-6238	AGGR(TY-PD GR-3 SAC-B)	CY	713.000		1,462.000		3,086.000		672.000		2,215.000		3,674.000	
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	252.000										264.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	428.000		1,088.000		2,126.000		448.000		1,450.000		2,012.000	
	666-6171	REFL PAV MRK TY II (W) 6" (BRK)	LF	2,520.000										2,640.000	
	666-6172	REFL PAV MRK TY II (W) 6" (DOT)	LF												
	666-6174	REFL PAV MRK TY II (W) 6" (SLD)	LF	29,094.000		89,897.000		165,800.000		34,984.000		115,412.000		147,560.000	
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF			175.000								840.000	
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF			262.000				58.000				590.000	
	666-6208	REFL PAV MRK TY II (Y) 6" (BRK)	LF	480.000		7,900.000		57,007.000		3,640.000		14,500.000		16,720.000	
	666-6210	REFL PAV MRK TY II (Y) 6" (SLD)	LF	31,673.000		40,904.000		36,567.000		15,158.000		5,925.000		45,666.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA											8.000	
	668-6083	PREFAB PAV MRK TY C (W) (LNDP ARROW)	EA												
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA											8.000	
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)	EA							1.000					
	668-6092	PREFAB PAV MRK TY C (W) (36")(YLD TRI)	EA												
	668-6113	PRE PM TY C(ACC PRK)(BL&WH)(W/BORDR)LG	EA											1.000	
	672-6007	REFL PAV MRKR TY I-C	EA	126.000										132.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	424.000		916.000		1,045.000		380.000		802.000		1,420.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA												
	677-6028	ELIM EXT PV MRK & MRKS (RUMBLE STRIP)	LF							53,782.000		135,837.000		209,446.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	1.000		5.000				4.000		6.000		8.000	
	6056-6001	PREFORMED IN-LANE(TRANS) RUMBLE STRIP	LF												
	6185-6005	TMA (MOBILE OPERATION)	DAY	2.000		3.000		6.000		2.000		3.000		5.000	
	18	RAILROAD FLAGGING: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS												
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS												
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS												

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0036-05-044 **DISTRICT** San Angelo **COUNTY** Concho, Crockett, Edwards, Irion, Kimble, Reagan, Real, Sterling, Sutton, Tom Green
HIGHWAY FM 1929, FM 2169, FM 388, RM 864, SH 163, SH 55, SL 481, US 377, US 67, US 83

				1648-01-014		1648-04-016		1648-05-015		1651-07-011		1846-01-025		2284-01-033	
		CONTROL SECTION JOB													
		PROJECT ID		A00189286		A00189287		A00189289		A00189290		A00189292		A00189294	
		COUNTY		Sterling		Irion		Irion		Concho		Sutton		Tom Green	
		HIGHWAY		SH 163		SH 163		SH 163		FM 1929		RM 864		FM 388	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-6004	ASPH (TIER I)	GAL	58,973.000		100,835.000		88,872.000		85,828.000		175,388.000		133,854.000	
	316-6142	AGGR(TY-PD GR-4 SAC-A)	CY												
	316-6238	AGGR(TY-PD GR-3 SAC-B)	CY	1,192.000		2,038.000		1,796.000		1,734.000		3,544.000		2,705.000	
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA												
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	1,202.000		2,043.000		1,828.000		1,658.000		3,480.000		1,863.000	
	666-6171	REFL PAV MRK TY II (W) 6" (BRK)	LF												
	666-6172	REFL PAV MRK TY II (W) 6" (DOT)	LF												
	666-6174	REFL PAV MRK TY II (W) 6" (SLD)	LF	95,555.000		161,652.000		145,024.000		131,102.000		276,161.000		145,912.000	
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF					320.000		80.000		135.000		175.000	
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	192.000				24.000		12.000		20.000		100.000	
	666-6208	REFL PAV MRK TY II (Y) 6" (BRK)	LF	11,650.000		17,360.000		14,490.000		10,020.000		33,020.000		16,700.000	
	666-6210	REFL PAV MRK TY II (Y) 6" (SLD)	LF	27,364.000		50,287.000		50,868.000		76,744.000		56,443.000		17,286.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA									1.000		2.000	
	668-6083	PREFAB PAV MRK TY C (W) (LNDP ARROW)	EA												
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA									1.000		2.000	
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)	EA					1.000							
	668-6092	PREFAB PAV MRK TY C (W) (36")(YLD TRI)	EA							5.000		4.000			
	668-6113	PRE PM TY C(ACC PRK)(BL&WH)(W/BORDR)LG	EA												
	672-6007	REFL PAV MRKR TY I-C	EA					28.000		7.000		14.000		9.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	933.000		1,510.000		1,369.000		1,401.000		1,840.000		1,057.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA					16.000		4.000					
	677-6028	ELIM EXT PV MRK & MRKS (RUMBLE STRIP)	LF	133,969.000		229,299.000		210,382.000							
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY					6.000						7.000	
	6056-6001	PREFORMED IN-LANE(TRANS) RUMBLE STRIP	LF											240.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	3.000		5.000		5.000		5.000		8.000		4.000	
	18	RAILROAD FLAGGING: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS												
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS												
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS												

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0036-05-044

DISTRICT San Angelo

COUNTY Concho, Crockett, Edwards, Irion, Kimble, Reagan, Real, Sterling, Sutton, Tom Green

HIGHWAY FM 1929, FM 2169, FM 388, RM 864, SH 163, SH 55, SL 481, US 377, US 67, US 83

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**2469-01-010**			
		PROJECT ID		**A00189296**			
		COUNTY		**Kimble**			
		HIGHWAY		**FM 2169**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	316-6004	ASPH (TIER I)	GAL	18,760.000		1,723,622.000	
	316-6142	AGGR(TY-PD GR-4 SAC-A)	CY			5,286.000	
	316-6238	AGGR(TY-PD GR-3 SAC-B)	CY	379.000		29,275.000	
	500-6001	MOBILIZATION	LS			1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO			5.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA			2,854.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	235.000		25,152.000	
	666-6171	REFL PAV MRK TY II (W) 6" (BRK)	LF			28,530.000	
	666-6172	REFL PAV MRK TY II (W) 6" (DOT)	LF			1,330.000	
	666-6174	REFL PAV MRK TY II (W) 6" (SLD)	LF	18,340.000		1,953,117.000	
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	200.000		9,951.000	
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	222.000		1,862.000	
	666-6208	REFL PAV MRK TY II (Y) 6" (BRK)	LF	1,370.000		234,617.000	
	666-6210	REFL PAV MRK TY II (Y) 6" (SLD)	LF	12,093.000		750,345.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA			23.000	
	668-6083	PREFAB PAV MRK TY C (W) (LNDP ARROW)	EA			8.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA			21.000	
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)	EA			2.000	
	668-6092	PREFAB PAV MRK TY C (W) (36")(YLD TRI)	EA	12.000		25.000	
	668-6113	PRE PM TY C(ACC PRK)(BL&WH)(W/BORDR)LG	EA			1.000	
	672-6007	REFL PAV MRKR TY I-C	EA	13.000		1,726.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	221.000		20,641.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	6.000		26.000	
	677-6028	ELIM EXT PV MRK & MRKS (RUMBLE STRIP)	LF			1,027,223.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY			68.000	
	6056-6001	PREFORMED IN-LANE(TRANS) RUMBLE STRIP	LF			240.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	1.000		70.000	
	08	CONTRACTOR FORCE ACCOUNT SAFETY CONTINGENCY (NON-PARTICIPATING)	LS			1.000	
		CONTRACTOR FORCE ACCOUNT EROSION CONTROL MAINTENANCE (NON-PARTICIPATING)	LS			1.000	
		CONTRACTOR FORCE ACCOUNT RAILROAD FLAGGING (NON-PARTICIPATING)	LS			1.000	

SITE No.	C-S-J	HIGHWAY	COUNTY	PLAN SHEET NO.	AREA SY	0316 6004	0316 6142	0316 6238	0500 6001	0502 6001	0662 6109	0662 6111	0666 6171	0666 6172
						ASPH (TIER I)	AGGR(TY-PD GR-4 SAC-A)	AGGR(TY-PD GR-3 SAC-B)	MOBILIZATION	BARRICADES, SIGNS AND TRAFFIC HANDLING	WK ZN PAV MRK SHT TERM (TAB)TY W	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	REFL PAV MRK TY II (W) 6" (BRK)	REFL PAV MRK TY II (W) 6" (DOT)
						GAL	CY	CY	LS	MO	EA	EA	LF	LF
1	0036-05-044	US 83	REAL	41	292,443	131,599		2,658	1	5	603	1,474	6,030	
2	0036-06-030	US 83	REAL	42	154,673	69,603		1,407			129	834	1,280	
3	0077-01-031	US 67	REAGAN	43	297,459	118,984	2,289				738	1,284	7,380	637
4	0077-06-103	US 67	TOM GREEN	44	325,049	130,020	2,501				457	1,502	4,570	693
5	0141-20-010	US377	KIMBLE	45	41,599	16,640	320				325	152	3,250	
6	0141-20-011	SL481	KIMBLE	46	12,488	4,995	96				86	45	860	
7	0142-16-009	SL481	KIMBLE	47	88,856	39,464	80	713			252	428	2,520	
8	0201-05-025	US 377	EDWARDS	48	160,756	72,340		1,462				1,088		
9	0234-01-018	SH 55	EDWARDS	49-50	339,414	152,736		3,086				2,126		
10	0412-01-025	SH 163	IRION	51	73,855	33,235		672				448		
11	0412-02-021	SH 163	CROCKETT	52	243,648	109,642		2,215				1,450		
12	0412-03-037	SH 163	CROCKETT	53	404,119	181,854		3,674			264	2,012	2,640	
13	1648-01-014	SH 163	STERLING	54	131,051	58,973		1,192				1,202		
14	1648-04-016	SH 163	IRION	55	224,077	100,835		2,038				2,043		
15	1648-05-015	SH 163	IRION	56-57	197,494	88,872		1,796				1,828		
16	1651-07-011	FM 1929	CONCHO	58	190,728	85,828		1,734				1,658		
17	1846-01-025	RM 864	SUTTON	59-60	389,750	175,388		3,544				3,480		
18	2284-01-033	FM 388	TOM GREEN	61-63	297,454	133,854		2,705				1,863		
19	2469-01-010	FM 2169	KIMBLE	64-65	41,689	18,760		379				235		
PROJECT TOTALS					3,906,602	1,723,620	5,286	29,275	1	5	2,854	25,152	28,530	1,330

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Texas Department of Transportation | San Angelo District

QUANTITY SUMMARY

SHEET 1 OF 3 NOT TO SCALE

REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		10

SITE No.	C-S-J	HIGHWAY	COUNTY	PLAN SHEET NO.	0666 6174	0666 6178	0666 6182	0666 6208	0666 6210	0668 6077	0668 6083	0668 6085	0668 6089	0668 6092
					REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	PREFAB PAV MRK TY C (W) (ARROW)	PREFAB PAV MRK TY C (W) (LNDP ARROW)	PREFAB PAV MRK TY C (W) (WORD)	PREFAB PAV MRK TY C (W) (RR XING)	PREFAB PAV MRK TY C (W) (36") (YLD TRI)
					LF	LF	LF	LF	LF	EA	EA	EA	EA	EA
1	0036-05-044	US 83	REAL	41	115,900	412		9,830	54,206					
2	0036-06-030	US 83	REAL	42	65,523			5,860	37,207					
3	0077-01-031	US 67	REAGAN	43	98,571	3,002		7,110	90,718	4	2	4		4
4	0077-06-103	US 67	TOM GREEN	44	116,630	4,450		6,960	86,254	8	6	6		
5	0141-20-010	US377	KIMBLE	45			276		11,658					
6	0141-20-011	SL481	KIMBLE	46		162	106		3,324					
7	0142-16-009	SL481	KIMBLE	47	29,094			480	31,673					
8	0201-05-025	US 377	EDWARDS	48	89,897	175	262	7,900	40,904					
9	0234-01-018	SH 55	EDWARDS	49-50	165,800			57,007	36,567					
10	0412-01-025	SH 163	IRION	51	34,984		58	3,640	15,158				1	
11	0412-02-021	SH 163	CROCKETT	52	115,412			14,500	5,925					
12	0412-03-037	SH 163	CROCKETT	53	147,560	840	590	16,720	45,666	8		8		
13	1648-01-014	SH 163	STERLING	54	95,555		192	11,650	27,364					
14	1648-04-016	SH 163	IRION	55	161,652			17,360	50,287					
15	1648-05-015	SH 163	IRION	56-57	145,024	320	24	14,490	50,868				1	
16	1651-07-011	FM 1929	CONCHO	58	131,102	80	12	10,020	76,744					5
17	1846-01-025	RM 864	SUTTON	59-60	276,161	135	20	33,020	56,443	1		1		4
18	2284-01-033	FM 388	TOM GREEN	61-63	145,912	175	100	16,700	17,286	2		2		
19	2469-01-010	FM 2169	KIMBLE	64-65	18,340	200	222	1,370	12,093					12
PROJECT TOTALS					1,953,117	9,951	1,862	234,617	750,345	23	8	21	2	25

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Texas Department of Transportation

San Angelo District

QUANTITY SUMMARY

SHEET 2 OF 3 NOT TO SCALE

REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		11

SITE No.	C-S-J	HIGHWAY	COUNTY	PLAN SHEET NO.	0668 6113	0672 6007	0672 6009	0672 6010	0677 6028	6001 6001	6056 6001	6185 6005
					PRE PM TY C(ACC PRK)(BL&WH)(W/BORDR)LG	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	ELIM EXT PV MRK & MRKS (RUMBLE STRIP)	PORTABLE CHANGEABLE MESSAGE SIGN	PREFORMED IN-LANE(TRANS) RUMBLE STRIP	TMA (MOBILE OPERATION)
					EA	EA	EA	EA	LF	DAY	LF	DAY
1	0036-05-044	US 83	REAL	41		302	1,179		54,508	7		4
2	0036-06-030	US 83	REAL	42		65	765			5		2
3	0077-01-031	US 67	REAGAN	43		370	2,452			7		5
4	0077-06-103	US 67	TOM GREEN	44		452	2,730			7		5
5	0141-20-010	US377	KIMBLE	45		163	152			4		1
6	0141-20-011	SL481	KIMBLE	46		45	45			1		1
7	0142-16-009	SL481	KIMBLE	47		126	424			1		2
8	0201-05-025	US 377	EDWARDS	48			916			5		3
9	0234-01-018	SH 55	EDWARDS	49-50			1,045					6
10	0412-01-025	SH 163	IRION	51			380		53,782	4		2
11	0412-02-021	SH 163	CROCKETT	52			802		135,837	6		3
12	0412-03-037	SH 163	CROCKETT	53	1	132	1,420		209,446	8		5
13	1648-01-014	SH 163	STERLING	54			933		133,969			3
14	1648-04-016	SH 163	IRION	55			1,510		229,299			5
15	1648-05-015	SH 163	IRION	56-57		28	1,369	16	210,382	6		5
16	1651-07-011	FM 1929	CONCHO	58		7	1,401	4				5
17	1846-01-025	RM 864	SUTTON	59-60		14	1,840					8
18	2284-01-033	FM 388	TOM GREEN	61-63		9	1,057			7	240	4
19	2469-01-010	FM 2169	KIMBLE	64-65		13	221	6				1
PROJECT TOTALS					1	1,725	20,641	26	1,027,223	68	240	70

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Texas Department of Transportation

San Angelo District

QUANTITY SUMMARY

SHEET 3 OF 3 NOT TO SCALE

REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		12

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

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 018833D
Crossing Type: At Grade
RR Company Operating Track at Crossing: Texas Pacifico Transportation Ltd.
RR Company Owning Track at Crossing: Texas Pacifico Transportation Ltd.
RR MP: 0771.56
RR Subdivision: San Angelo
City: Barnhart
County: Irion
CSJ at this Crossing: 0412-01-025
Latitude: 31.127553
Longitude: -101.1702808

Scope of Work, including any TCP, to be performed by State Contractor:

Add surface treatment to road on both sides of the concrete at the railroad crossings.

Scope of Work to be performed by Railroad Company:

N/A

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 1

On this project, night or weekend flagging is:

☐ Expected
☑ Not Expected

Flagging services will be provided by:

☑ Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☐ 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** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** 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:

Texas Pacifico Transportation Ltd.
Phone: 325-942-8164
Fax: 325-277-4905

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

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.

IV. RAILROAD INSURANCE REQUIREMENTS

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

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

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.

Escalated Limits

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

Railroad Protective Liability Limits

☐ Not Required	
☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☐ Other: _____	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☑ Not Required
☐ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☐ Required: Contractor to obtain
- ☐ BNSF: _____
  https://bnsf.railpermitting.com
- ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

To view previously approved CROE templates agreed upon between the State and Railroad, see: https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html

Approved CROE 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 CROE between the Contractor and the Railroad if required on project.

VI. RAILROAD COORDINATION MEETING

A Railroad Coordination Meeting is required. See item 5, Article 8.1, of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges Manual for more details.

VII. RAILROAD SAFETY ORIENTATION

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

UPRR, BNSF, CPKCR will not accept on-track safety training certificates from other Railroads. Refer to each Railroad's specific contractor right of entry for training information.

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

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call: Texas Pacifico Transportation Ltd.
Railroad Emergency Line at: 800-742-8905
Location: DOT 018833D
RR Milepost: 771.560
Subdivision: San Angelo

RRD Review Only
Initials: KB
Date: 7/26/23

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf	DN: TxDOT	CK:	DW:	CK:		
© TxDOT June 2014	CONT	SECT	JOB	HIGHWAY		
REVISIONS	0036	05	044	VA		
6/2023	DIST	COUNTY			SHEET NO.	
	SJT	IRION			13	

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	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		14

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.

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	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		15

GENERAL NOTES

1. When a contractor force account "Safety Contingency" has been established for the project, it is for work zone enhancements that were unforeseen in the project planning and design stage, but would improve the effectiveness of the traffic control plan. 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 doing so does not slow implementation of work zone enhancements.
2. Shadow, lead, trail, and ramp control vehicles shown on the plans are required.
3. Use high level warning flags on advance warning signs during daytime operations.
4. Provide flaggers at such times and locations as directed to ensure the safe passage of traffic through construction areas. When flaggers are used to control traffic, furnish and install signs CW20-7 "FLAGGER SYMBOL", CW20-7aD "FLAGGER AHEAD", and CW3-4 "BE PREPARED TO STOP". Flaggers shall use 24 in. STOP/SLOW paddles.
5. Temporarily relocate existing mailbox assemblies on portable mailbox stands as shown on the plans, or as directed. Use materials conforming to the Compliant Work Zone Traffic Control Device List (CWZTCDL).
6. Prior to each work day, make provisions to exclude vehicles from parking within work areas.
7. Temporarily relocate existing permanent sign assemblies to temporary supports as shown on the plans, or as directed.
8. Omit advance warning signs and furnish and install reduced size signs CW20-1 "ROAD WORK AHEAD" mounted back to back with reduced size signs G20-2 "END ROAD WORK" signs at intersecting city streets and county roads.
9. Furnish and install signs CW20-1D "ROAD WORK AHEAD", G20-1aT "ROAD WORK ←NEXT X MILES, NEXT X MILES→", and G20-2 "END ROAD WORK" at intersecting state highways.
10. Sign and buffer spacing may be altered to fit field conditions, as directed.
11. In addition to providing a Contractor's Responsible Person and a phone number for emergency contact, have employee(s) available to respond on the project for emergencies and for taking corrective measures within 30 minutes.
12. Cones may be used as the typical channelizing device for freeway surfacing projects.
13. 28 in. tall cones will be allowed only for short duration or short term stationary operations when workers are present to maintain the devices upright and in proper location. Intermediate term stationary work areas should use drums, vertical panels, or 42 in. tall two-piece cones.
14. All construction signs and barricades placed during any phase of work shall remain in place until removal is approved by the Engineer.
15. The Engineer may direct the Contractor to furnish additional signs and barricades as required to maintain traffic flow, detours and motorist safety during construction.
16. Warning signs for long term stationary work should be mounted at 7 ft. to the bottom of the sign.
17. For long term stationary work at night, floodlights should be used to illuminate the work area and equipment crossings. Floodlights shall not produce a disabling glare condition for road users or workers.
18. All motor vehicle equipment having an obstructed view to the rear shall have a reverse signal alarm audible above the surrounding noise level.
19. Traffic control devices denoted with the triangle symbol on the plans may be omitted.
20. When sheet WZ(RS) is included in the plans, furnish and install temporary rumble strips for daytime lane closures. Do not use temporary rumble strips on freeways or expressways.
21. When sheet WZ(BRK) is included in the plans, furnish and install signs CW21-1T "GIVE US A BRAKE".
22. Flags attached to signs shown in the plans are required.
23. Signs END ROAD WORK (G20-2) may be omitted when conflicting with G20-2 signs already in place on the project.
24. The Engineer will determine advisory speeds to be shown on plaques CW13-1P.
25. Temporary work zone devices (including portable barriers) manufactured after December 31, 2019 must have been successfully tested to the 2016 edition of Manual for Assessing Safety Hardware (MASH). Such devices manufactured on or before this date, and successfully tested to either National Cooperative Highway Research Program (NCHRP) Report 350 or the 2009 edition of MASH, may continue to be used.

TRUCK MOUNTED ATTENUATOR REQUIREMENTS

Provide the number of vehicles with truck mounted attenuators listed in the table below. The Contractor shall determine if multiple operations will occur at the same time, to determine the total number of truck mounted attenuators needed for the project.

WZ(BTS-1)	0	TCP(2-3)	0	TCP(6-1)	0
TCP(1-1)	0	TCP(2-4)	0	TCP(6-2)	0
TCP(1-2)	0	TCP(2-5)	0	TCP(6-3)	0
TCP(1-3)	0	TCP(2-6)	0	TCP(6-4)	0
TCP(1-4)	0	TCP(3-1)	2	TCP(6-5)	0
TCP(1-5)	0	TCP(3-2)	3	TCP(6-6)	0
TCP(1-6)	0	TCP(3-3)	3	TCP(6-7)	0
TCP(2-1)	0	TCP(3-4)	1	TCP(6-8)	0
TCP(2-2)	0	TCP(5-1)	0	TCP(6-9)	0
TRAFFIC CONTROL PLAN PILOT VEHICLE OPERATION					0
TRAFFIC CONTROL PLAN TWO LANE CLOSURES ON FOUR LANE UNDIVIDED HIGHWAYS					0
TRAFFIC CONTROL PLAN LANE CLOSURES WITH BARRIER					0
TRAFFIC CONTROL PLAN SHOULDER CLOSURES WITH BARRIER					0
TRAFFIC CONTROL PLAN WORK SPACE NEAR SHOULDER					0
TRAFFIC CONTROL PLAN CROSSOVER CLOSURE					0
TRAFFIC CONTROL PLAN TURNAROUND CLOSURE					0
TRAFFIC CONTROL PLAN LANE CLOSURES WITH TRAFFIC SIGNAL AND BARRIER					0
TRAFFIC CONTROL PLAN LANE CLOSURES WITH TRAFFIC SIGNAL					0
TRAFFIC CONTROL PLAN FREEWAY CLOSURE					0

PORTABLE CHANGEABLE MESSAGE SIGN REQUIREMENTS

Provide the portable changeable message signs listed in the table below. The Contractor shall determine if multiple operations will occur at the same time, to determine the total number of portable changeable message signs needed for the project.

TCP(6-1)	0	TCP(6-4)	0	TCP(6-8)	0
TCP(6-2)	0	TCP(6-6)	0	TCP(6-9)	0
TCP(6-3)	0	TCP(6-7)	0		
TRAFFIC CONTROL PLAN LANE CLOSURES WITH BARRIER					0
TRAFFIC CONTROL PLAN SHOULDER CLOSURES WITH BARRIER					0
TRAFFIC CONTROL PLAN LANE CLOSURES WITH TRAFFIC SIGNAL AND BARRIER					0
TRAFFIC CONTROL PLAN LANE CLOSURES WITH TRAFFIC SIGNAL					0
TRAFFIC CONTROL PLAN FREEWAY CLOSURE					0

TYPICAL USAGE

MOBILE
Work that moves continuously or intermittently (stopping for up to approximately 15 minutes).

SHORT DURATION
Work that occupies a location up to 1 hour.

SHORT TERM STATIONARY
Daytime work that occupies a location for more than 1 hour in a single daylight period.

INTERMEDIATE TERM STATIONARY
Work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than 1 hour.

LONG TERM STATIONARY
Work that occupies a location more than 3 days.

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

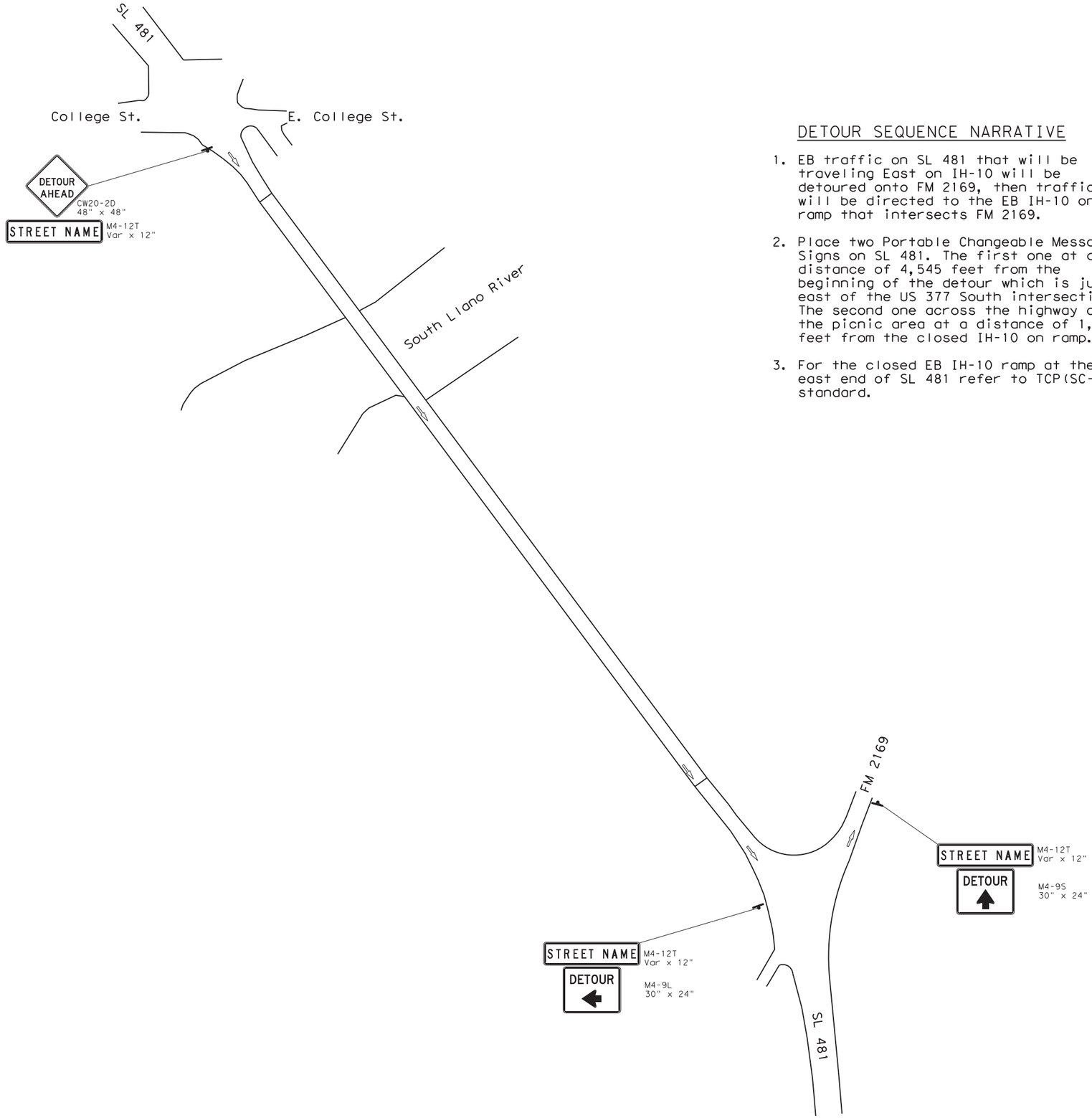
Texas Department of Transportation | San Angelo District

TRAFFIC CONTROL PLAN GENERAL REQUIREMENTS

SHEET 1 OF 1 NOT TO SCALE

SHEET ISSUED OR LAST REVISED	CONT	SECT	JOB	HIGHWAY
11-19	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		16

DATE: 9/25/2023 10:00:23 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050044/4 - Design/Plan Set/2. TCP/TRAFFIC CONTROL PLAN GENERAL REQUIREMENTS.dgn



DETOUR SEQUENCE NARRATIVE

1. EB traffic on SL 481 that will be traveling East on IH-10 will be detoured onto FM 2169, then traffic will be directed to the EB IH-10 on ramp that intersects FM 2169.

2. Place two Portable Changeable Message Signs on SL 481. The first one at a distance of 4,545 feet from the beginning of the detour which is just east of the US 377 South intersection. The second one across the highway of the picnic area at a distance of 1,625 feet from the closed IH-10 on ramp.

3. For the closed EB IH-10 ramp at the east end of SL 481 refer to TCP(SC-5c)-22 standard.

0 100 200
SCALE IN FEET

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

10/12/2023

Texas Department of Transportation

San Angelo District

SL 481
DETOUR LAYOUT

SHEET 1 OF 1 SCALE 1"=200'

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC

DIST	COUNTY	SHEET NO.
SJT	REAL, ETC	17

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FILE: pw://txdot.projectwiseonline.com:TxDOT2/Documents/07 - SJT/Design Projects/0036050441/4 - Design/Plan Set/2. TCP/SL 481 DETOUR LAYOUT.dgn

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

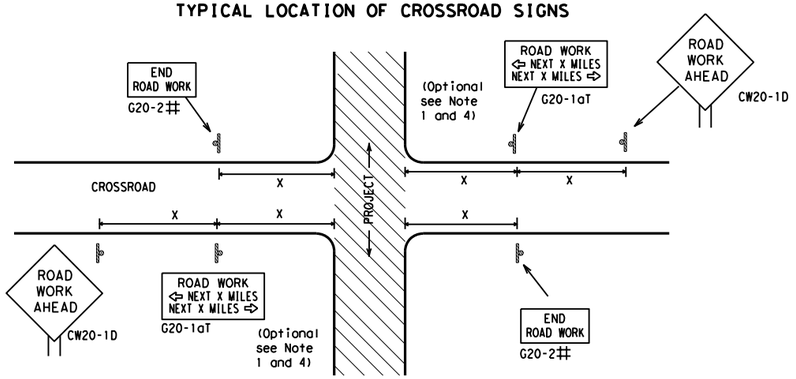
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13	0036	05	044, ETC	US 83, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
5-10 5-21	SJT	REAL, ETC		18

DATE: 9/25/2023 10:01:01 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036504/4 - Design/Plan Set/2. TCP/BC(1)-21.dgn

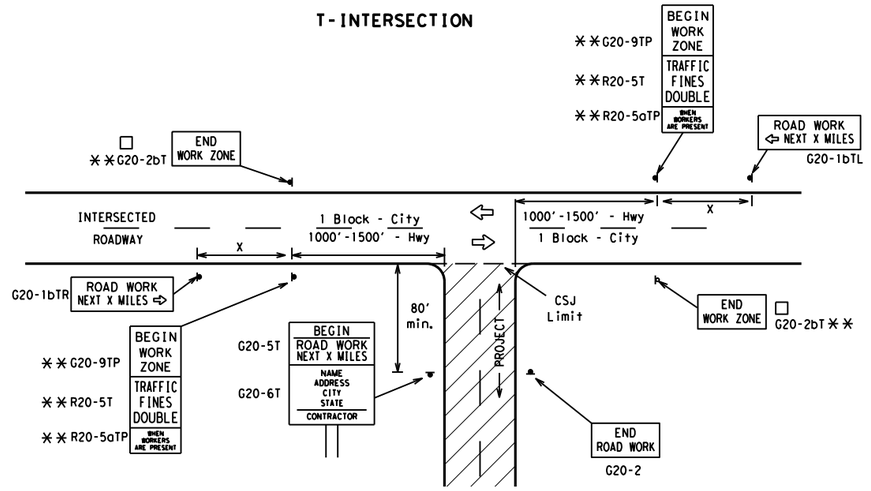
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

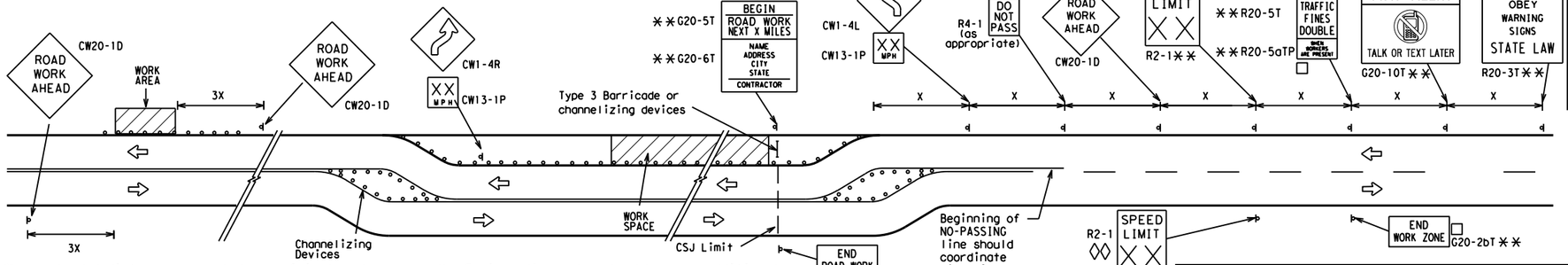
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

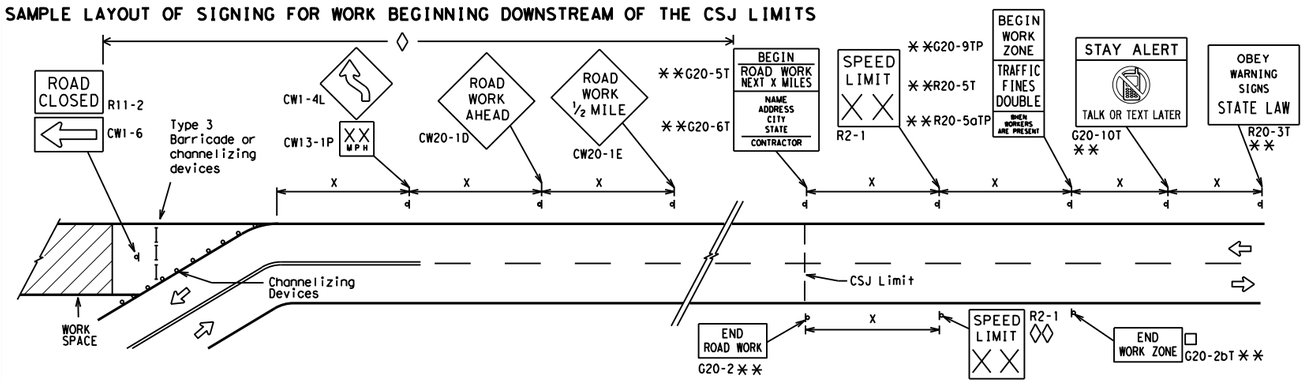
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

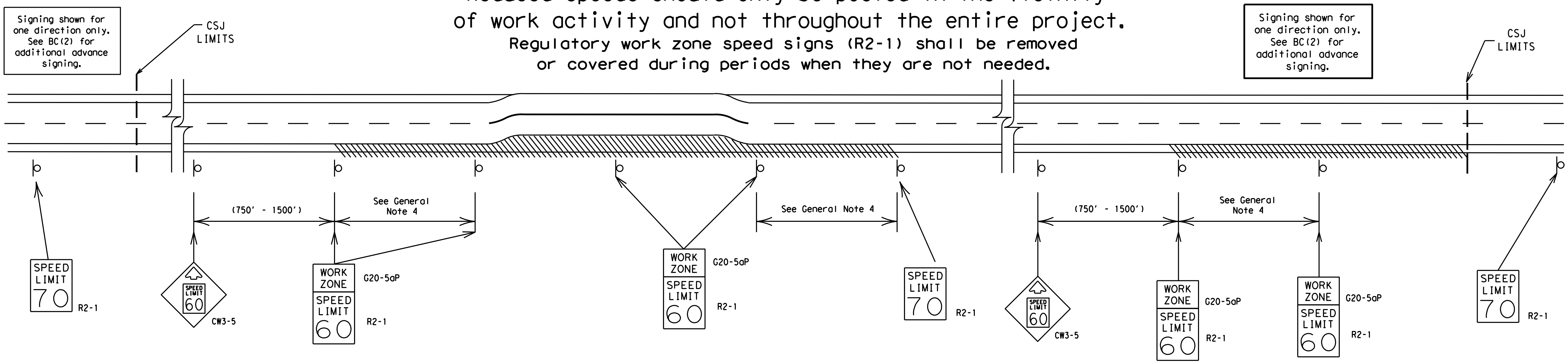
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0036	05	044, ETC	US 83, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SJT	REAL, ETC		19

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	0036	05	044, ETC	US 83, ETC
	DIST		COUNTY	SHEET NO.
	SJT		REAL, ETC	20

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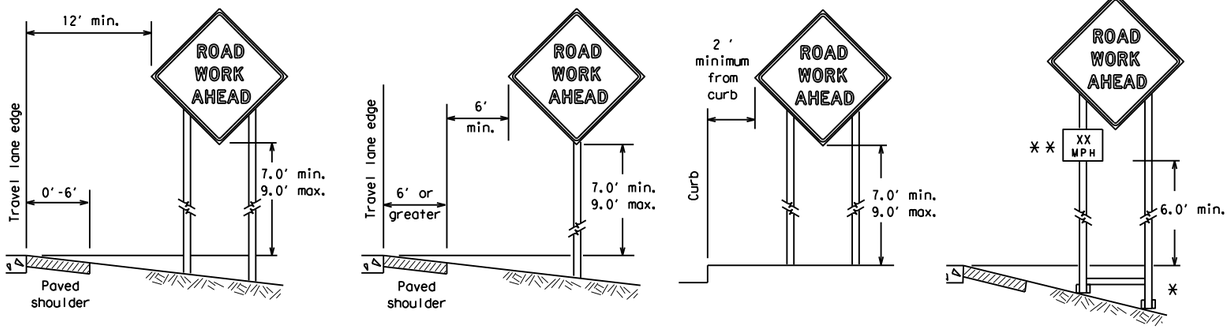
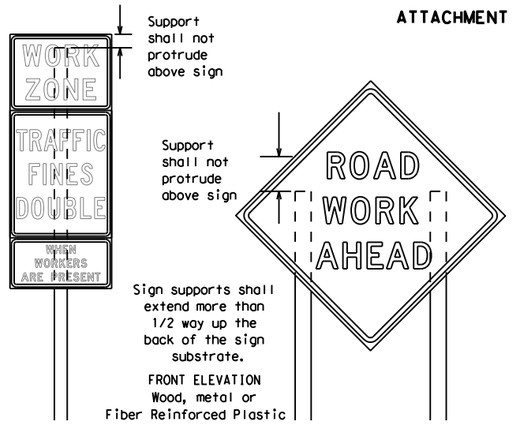
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

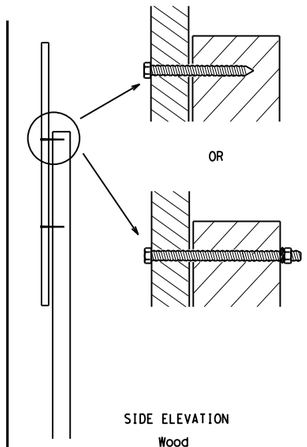


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





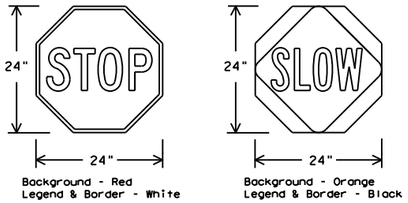
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be 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_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0036	05	044, ETC	US 83, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SJT	REAL, ETC		21

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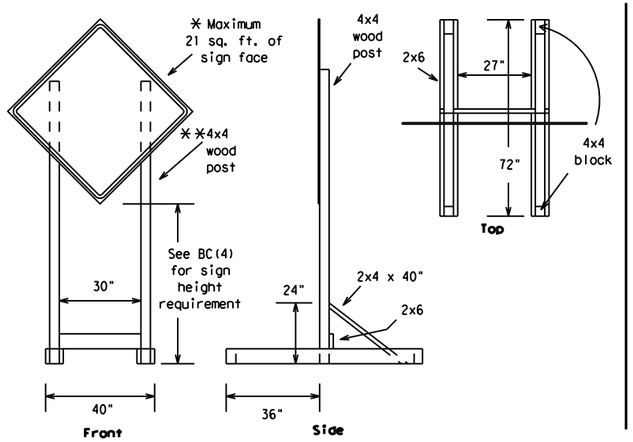
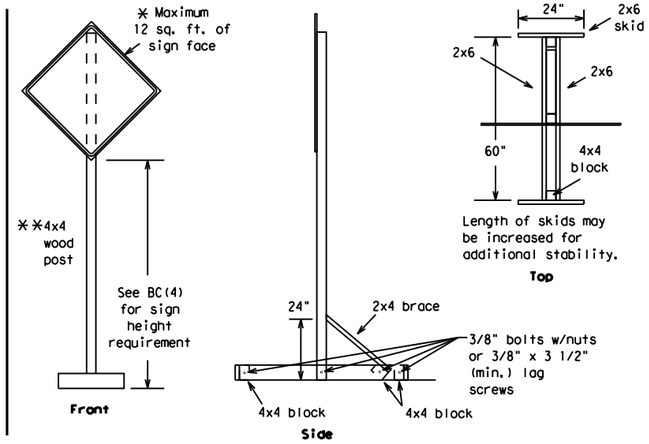
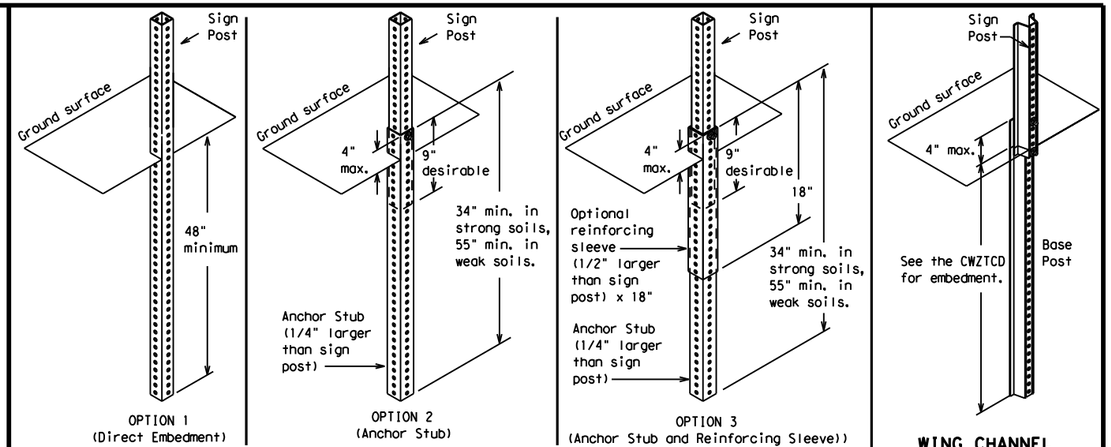




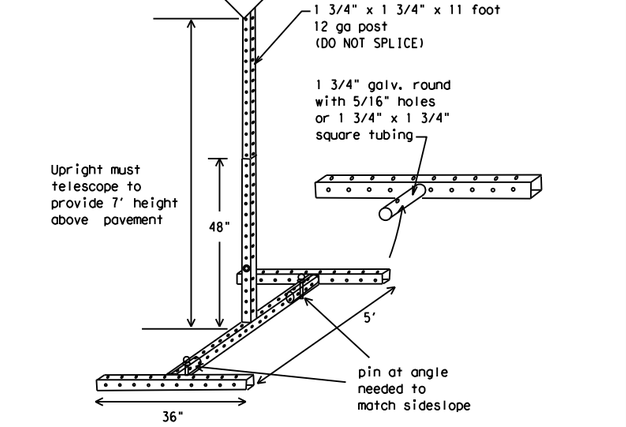
SKID MOUNTED WOOD SIGN SUPPORTS

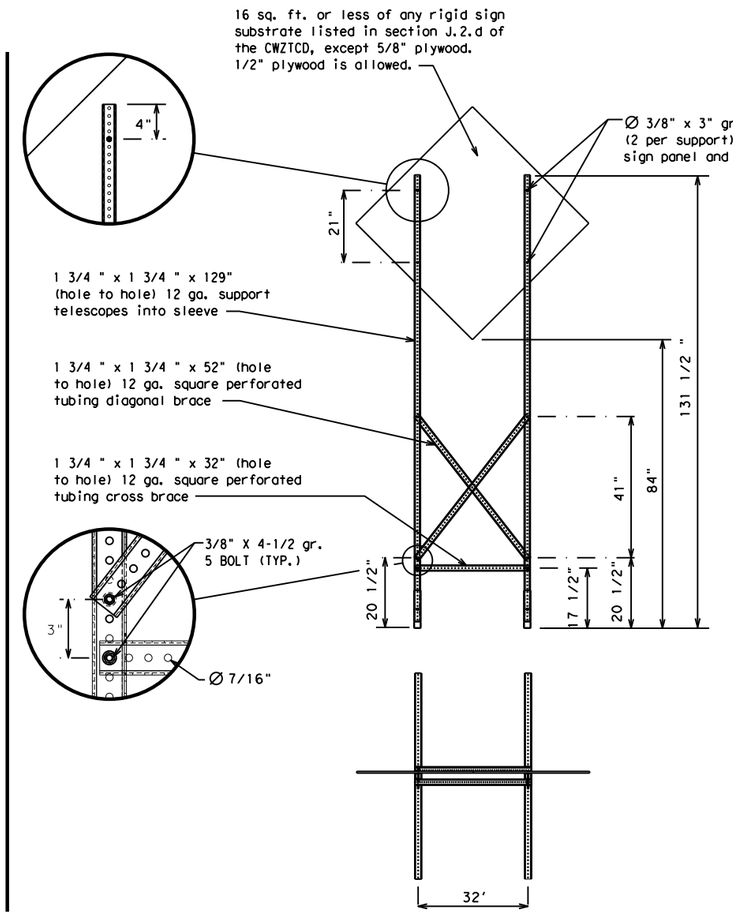
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

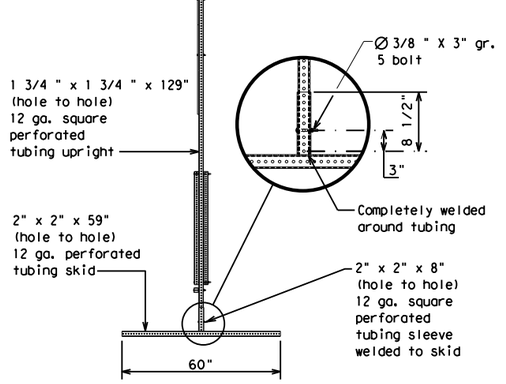


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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REVISIONS	0036	05	044, ETC	US 83, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SJT	REAL, ETC		22

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

* See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0036	05	044, ETC	US 83, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SJT	REAL, ETC		23

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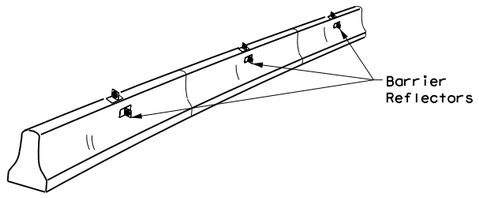
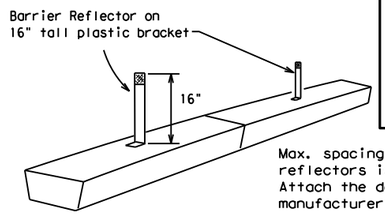
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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

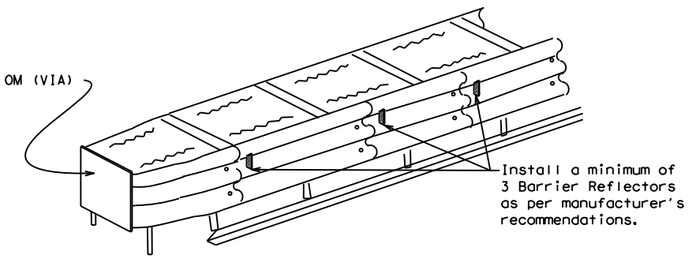


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

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)

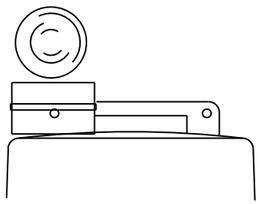


DELINEATION OF END TREATMENTS

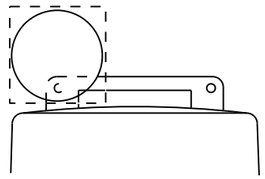
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

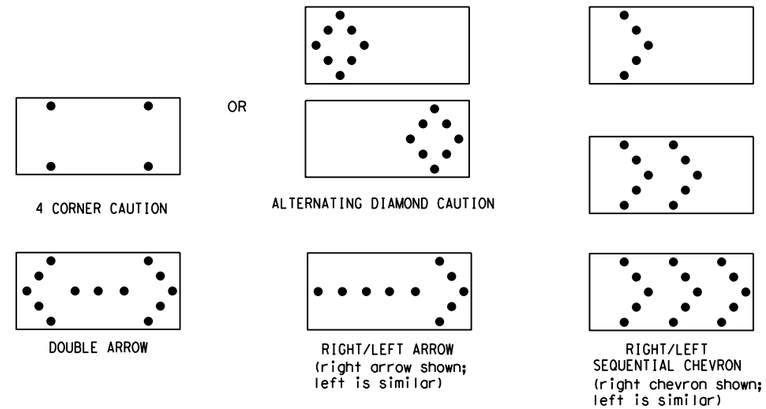
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is 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
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REVISIONS	0036	05	044, ETC	US 83, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SJT	REAL, ETC		24

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

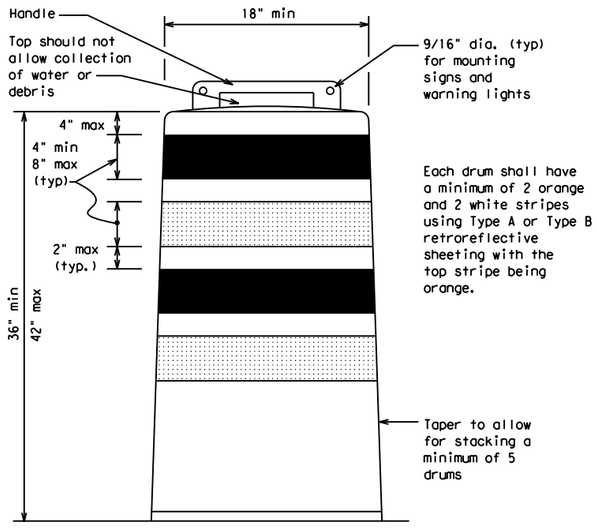
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

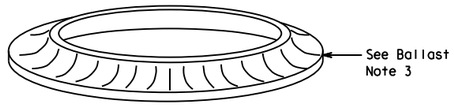
RETROREFLECTIVE SHEETING

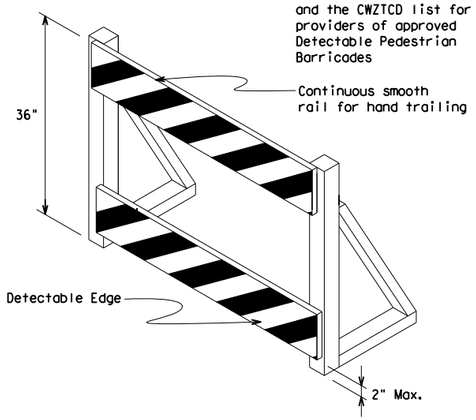
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

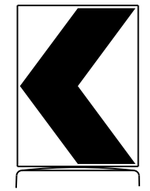




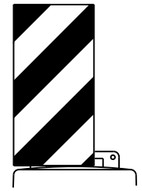


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0036	05	044, ETC	US 83, ETC
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	SJT	REAL, ETC		25
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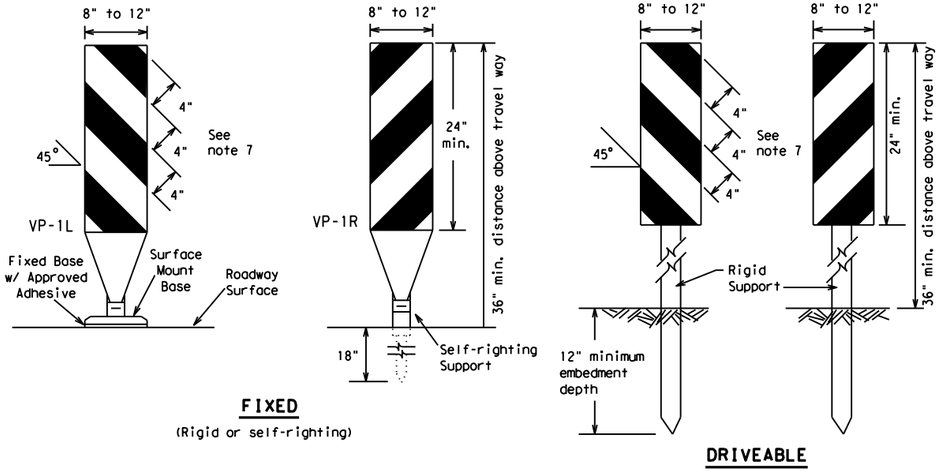
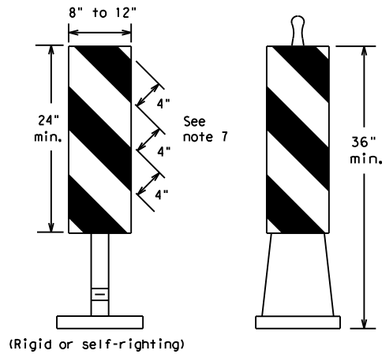


FIXED
(Rigid or self-righting)

DRIVEABLE

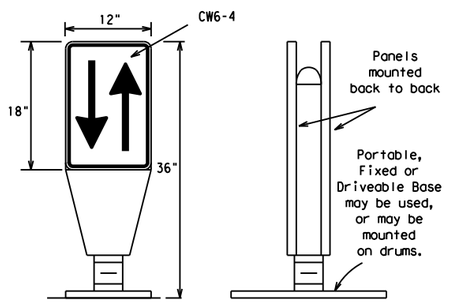


(Rigid or self-righting)

PORTABLE

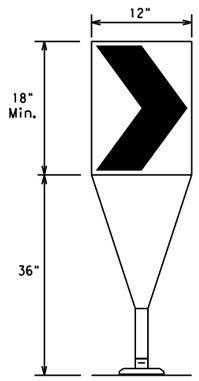
VERTICAL PANELS (VPs)

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_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



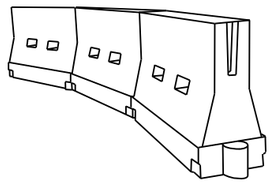
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0036	05	044, ETC	US 83, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
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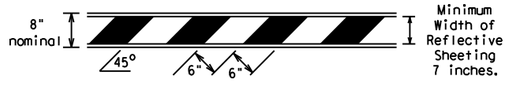
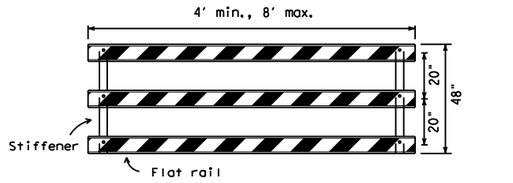
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



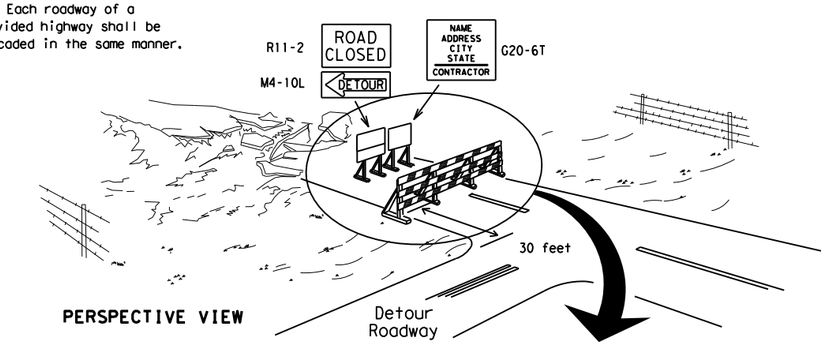
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

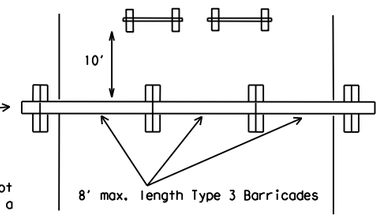
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

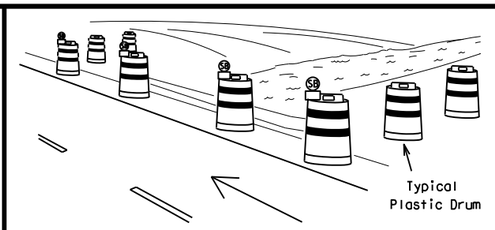
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

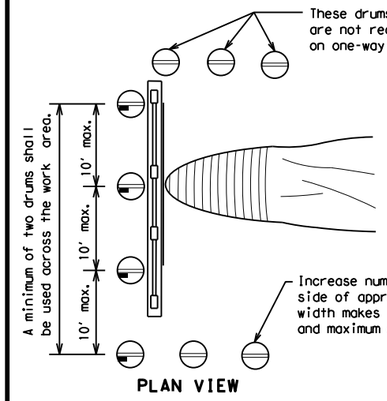
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

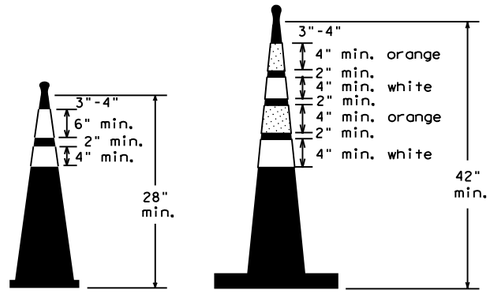
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

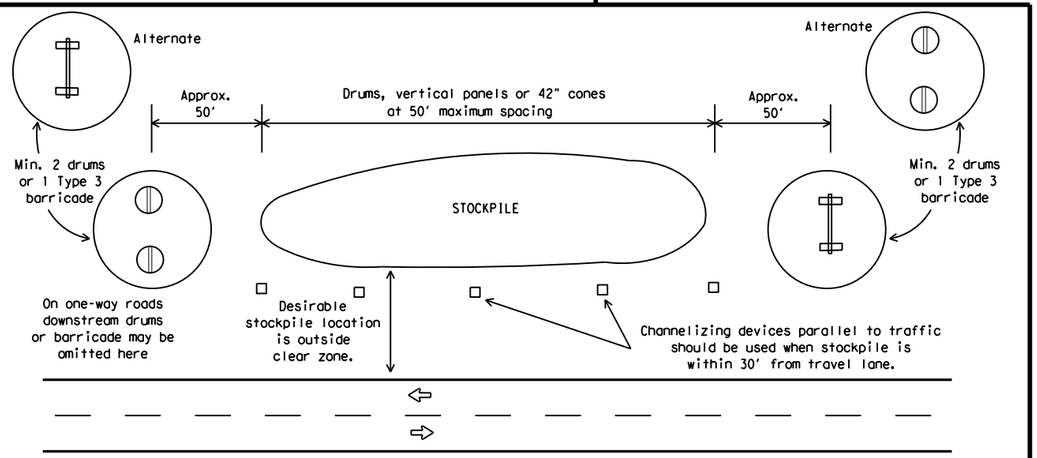
PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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 9-07 8-14 7-13 5-21	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		27

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.

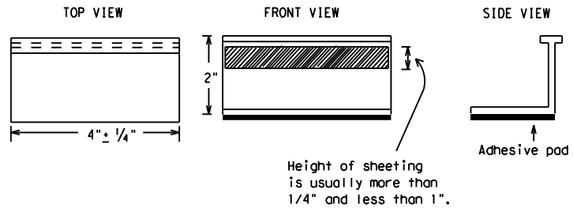
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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	0036	05	044, ETC	US 83, ETC
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	SJT	REAL, ETC		28
11-02 8-14				

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DATE: 9/25/2023 10:01:05 AM
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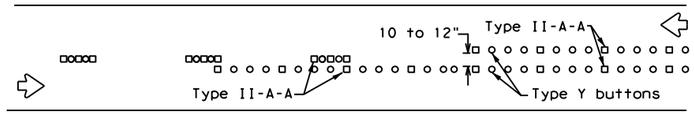
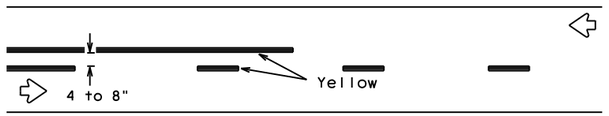
PAVEMENT MARKING PATTERNS

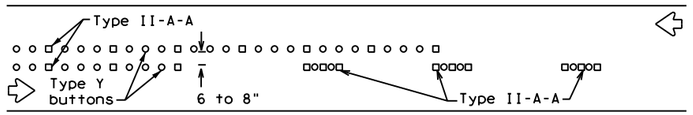
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



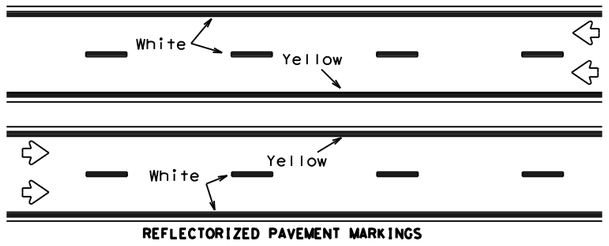
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



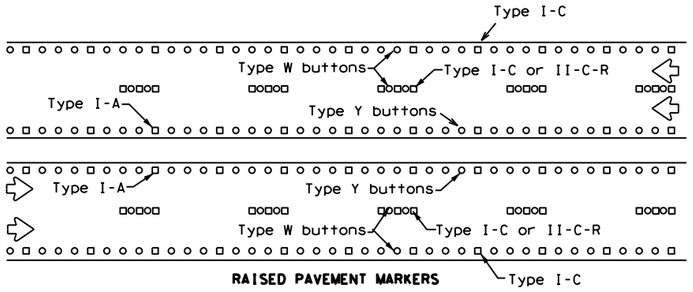
RAISED PAVEMENT MARKERS - PATTERN B

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

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



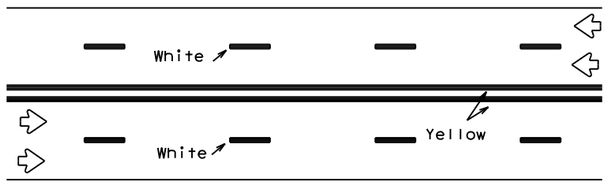
REFLECTORIZED PAVEMENT MARKINGS



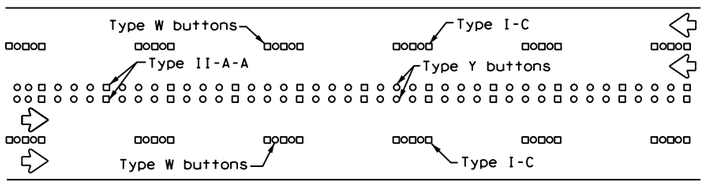
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



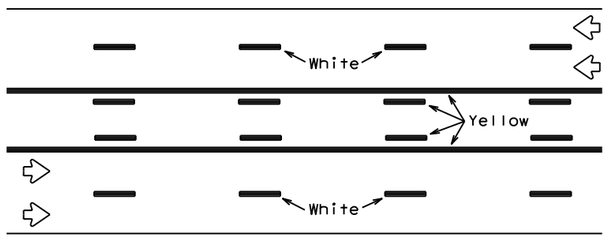
REFLECTORIZED PAVEMENT MARKINGS



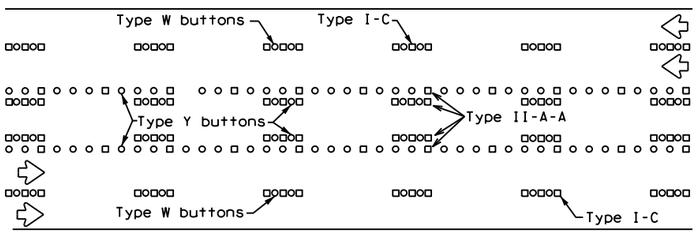
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

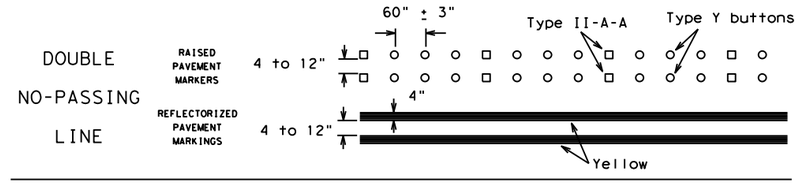
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

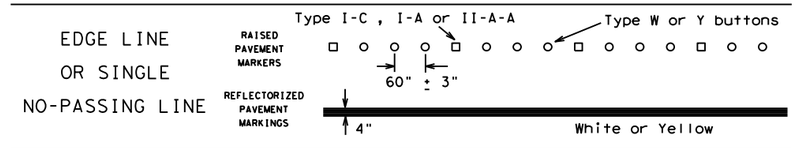
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

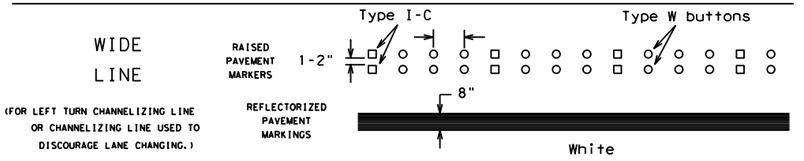


EDGE LINE OR SINGLE NO-PASSING LINE



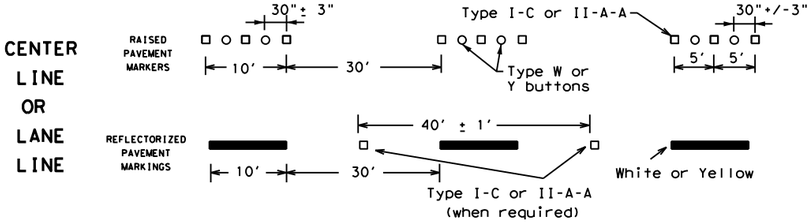
WIDE LINE

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

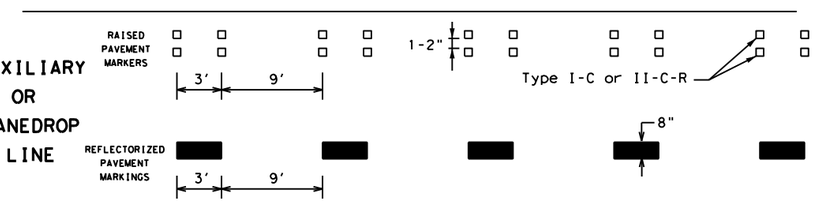


BROKEN LINES

CENTER LINE OR LANE LINE

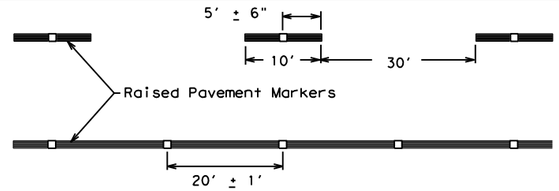


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

SHEET 12 OF 12

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	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		29

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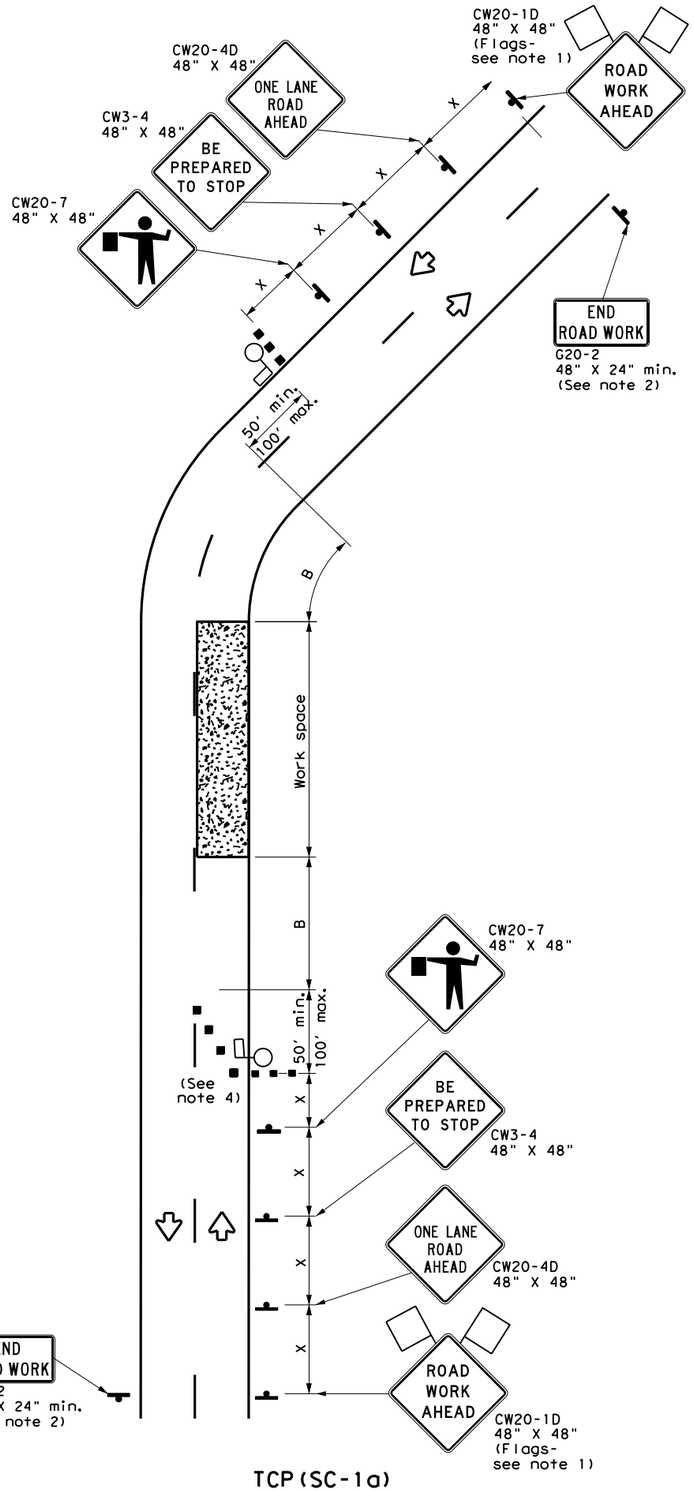
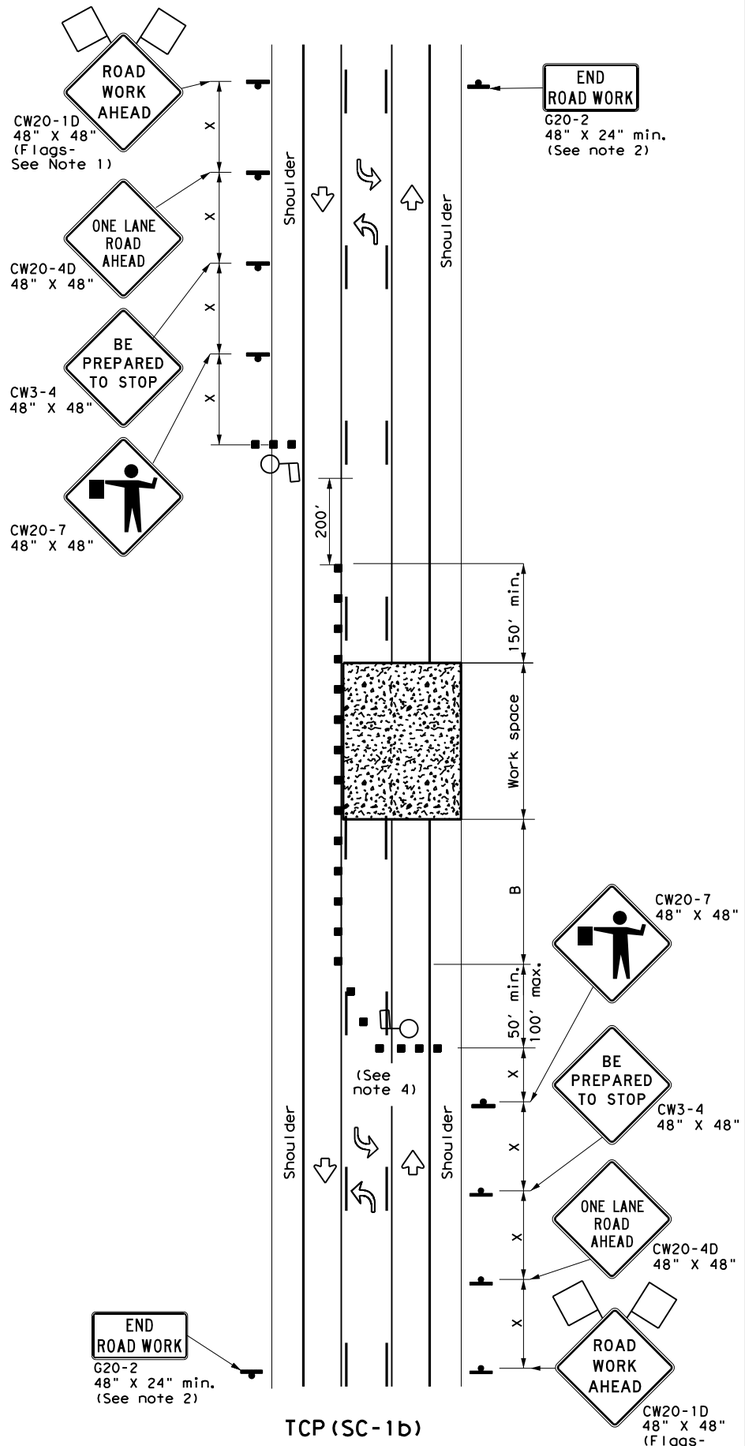


TCP(SC-1a)

ONE LANE TWO-WAY (TWO LANES)
CONTROL WITH PILOT VEHICLE



TCP(SC-1b)

ONE LANE TWO-WAY (THREE LANES)
CONTROL WITH PILOT VEHICLE AND CHANNELIZING DEVICES

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 Distance "X"	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: if project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.
3. Sign spacing may be increased or an additional ROAD WORK AHEAD (CW20-1D) sign may be used if advance warning ahead of the flagger sign is less than 1500 feet.
4. Flaggers should use two-way radios or other methods of communication at all times for traffic control coordination.
5. Flaggers should use 24" STOP (CW20-8) / SLOW (CW20-8aT) paddles to control traffic. Flags should be limited to emergency situations.
6. 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).
7. If the seal coat operation crosses intersections, traffic in these areas must be controlled. Care must be taken to prevent vehicles from crossing the asphalt before the aggregate is placed. This may require positioning additional traffic control personnel (flaggers) at the intersection.
8. Temporary rumble strips are not required on seal coat operations.
9. The pilot car is used to guide vehicles through traffic control zone. The pilot car shall have an identification name displayed and PILOT CAR, FOLLOW ME (G20-4) sign or message board mounted in a conspicuous position on rear.

TCP (SC-1a)

1. Channelizing devices on the centerline are not required when a pilot car is leading traffic, unless directed by the Engineer.

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS ONE-LANE TWO-WAY

TCP(SC-1)-22

FILE: tcpsc-1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
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4-21	DIST	COUNTY		SHEET NO.
10-22	SJT	REAL, ETC		30

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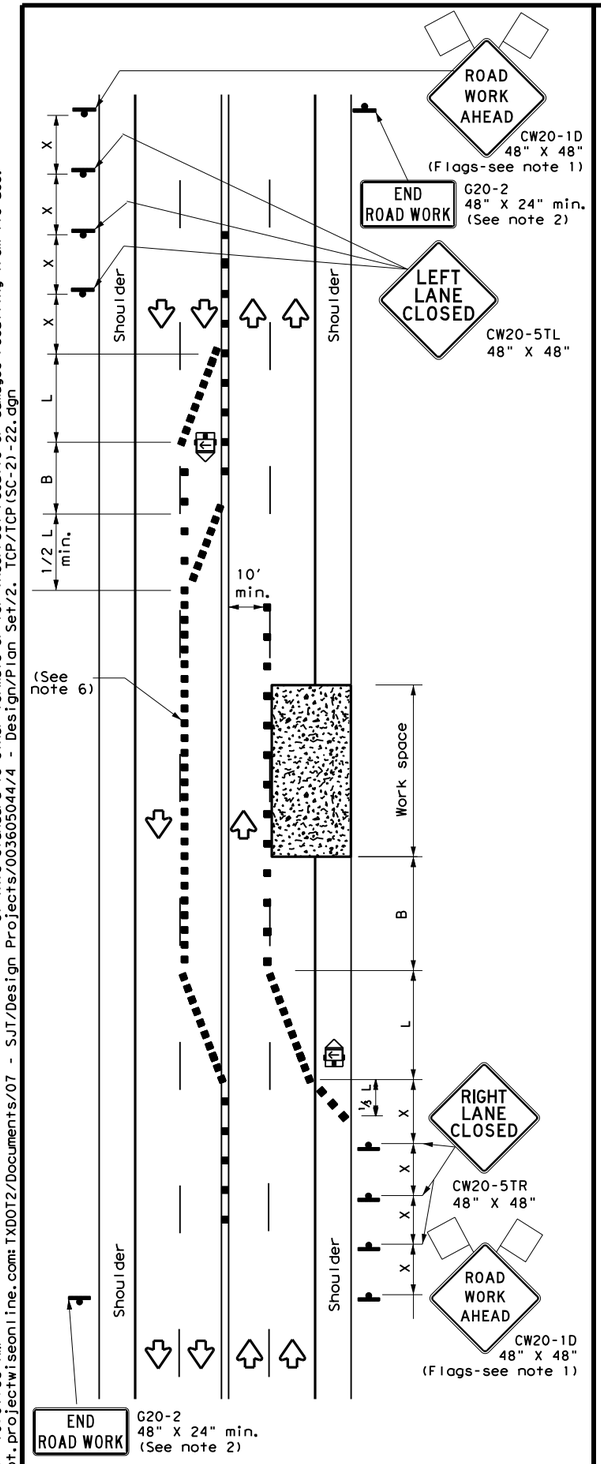
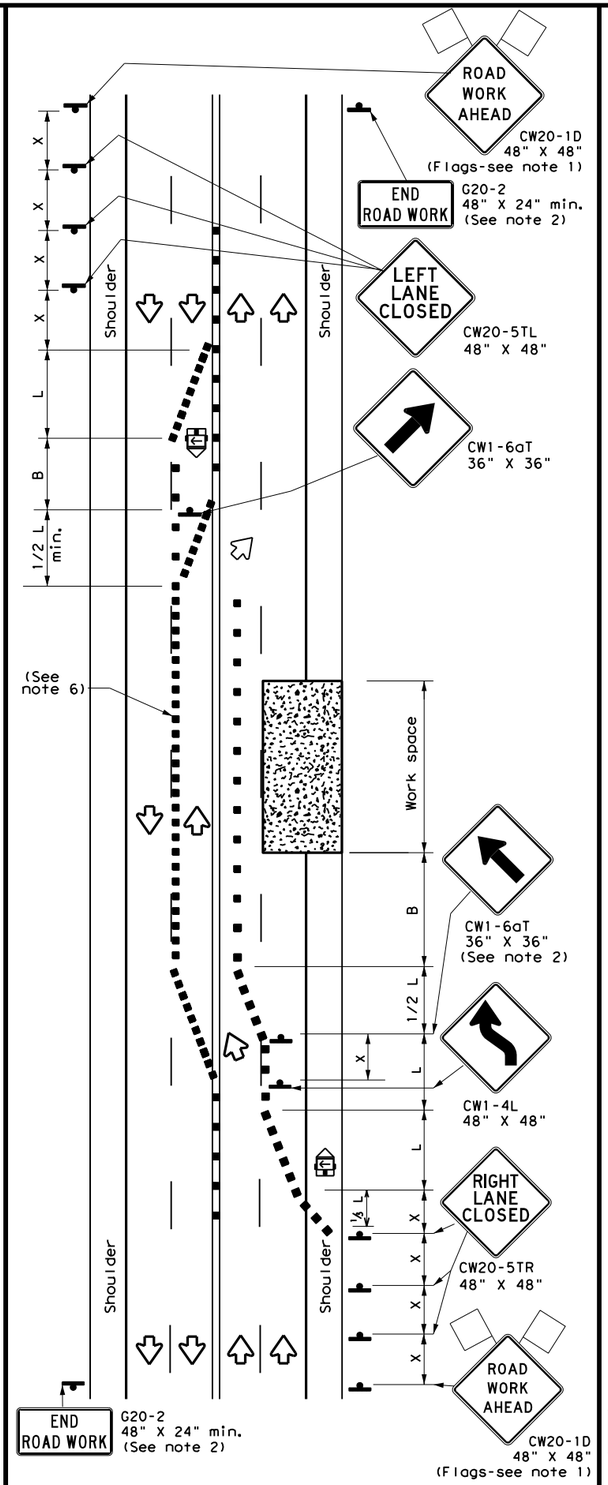


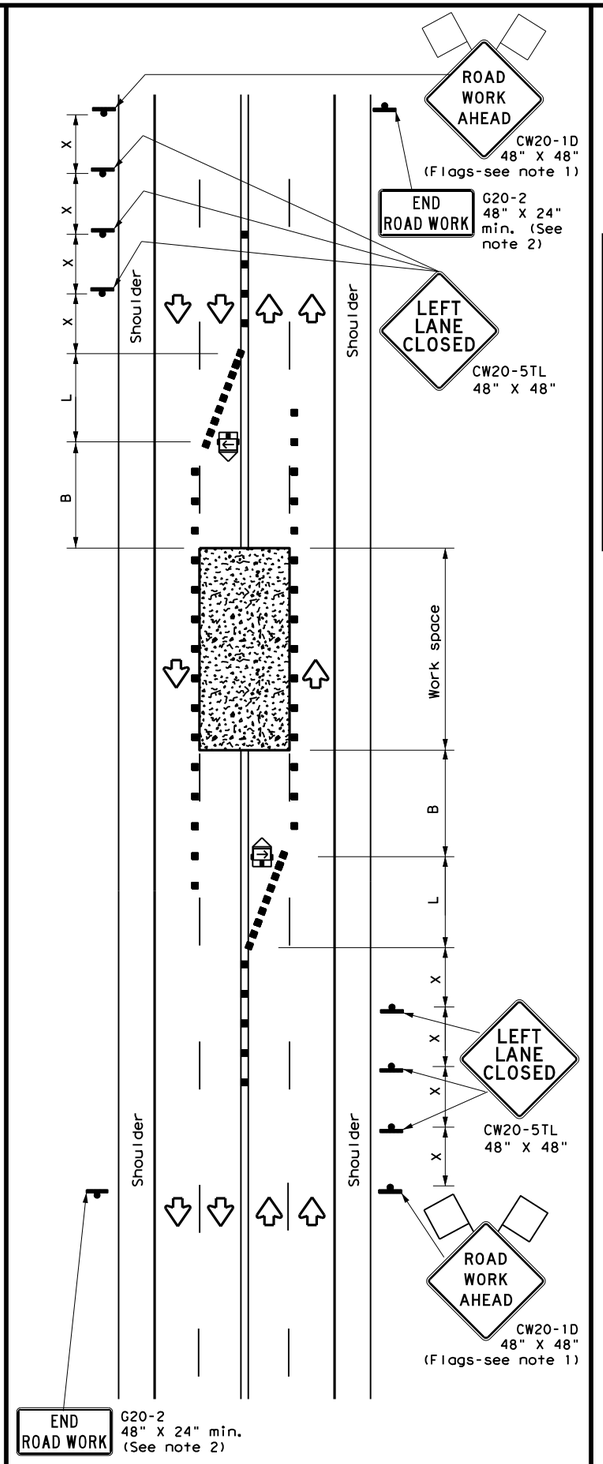
TCP (SC-2a)

ONE LANE CLOSED EACH DIRECTION
CONTROL W/ CHANNELIZING DEVICES



TCP (SC-2b)

ONE LANE CLOSED EACH DIRECTION
CONTROL W/ CHANNELIZING DEVICES



TCP (SC-2c)

CENTER LANES CLOSED
CONTROL W/ CHANNELIZING DEVICES

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 Distance "X"	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: if project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.
3. The ROAD WORK AHEAD (CW20-1D) sign may be repeated if the visibility of the work zone is less than 1500 feet.
4. If the seal coat operation crosses intersections, traffic in these areas must be controlled. Care must be taken to prevent vehicles from crossing the asphalt before the aggregate is placed. This may require positioning additional traffic control personnel (flaggers) at the intersection.
5. Temporary rumble strips are not required on seal coat operations.

TCP (SC-2a) and (SC-2b)

6. Channelizing devices which separate two-way traffic shall be spaced on tapers at:
   a.) 20 feet;
   b.) 15 feet when posted speeds are 35 mph or slower; or
   c.) at 1/2(S) for tangent sections.
   This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

Texas Department of Transportation — Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEALCOAT OPERATIONS MULTILANE ROADS (UNDIVIDED)
TCP(SC-2)-22

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4-21		DIST	COUNTY		SHEET NO.
10-22		SJT	REAL, ETC		31

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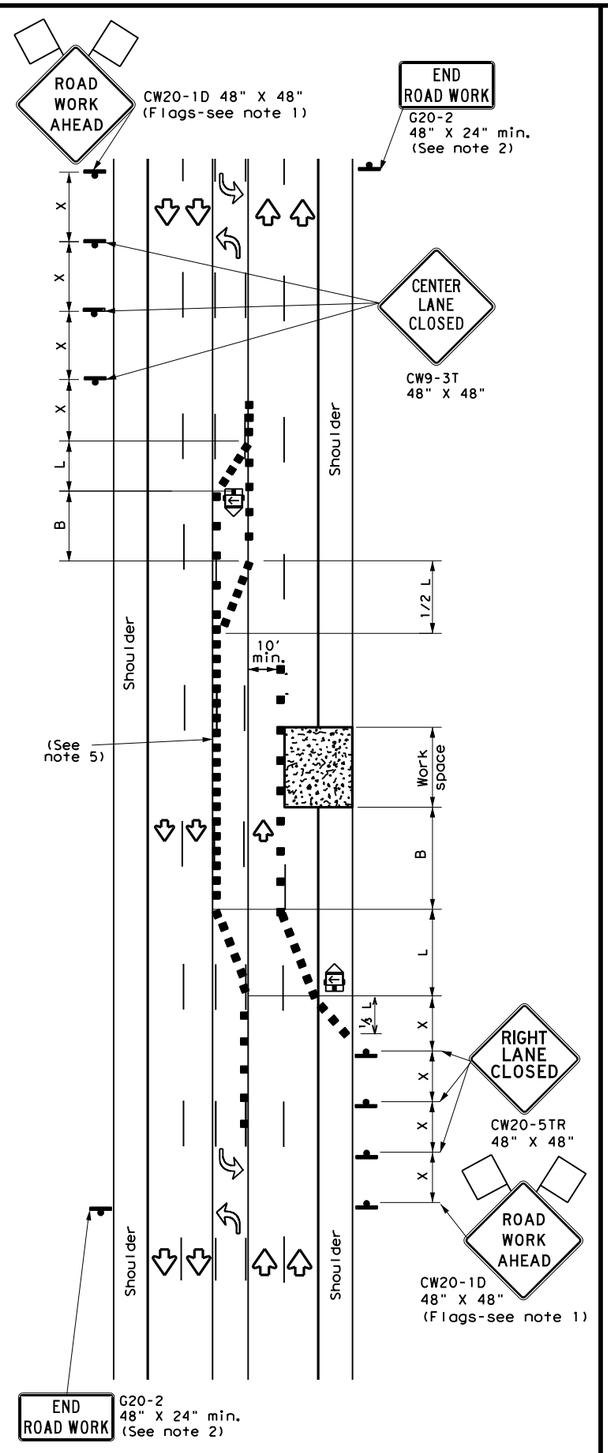
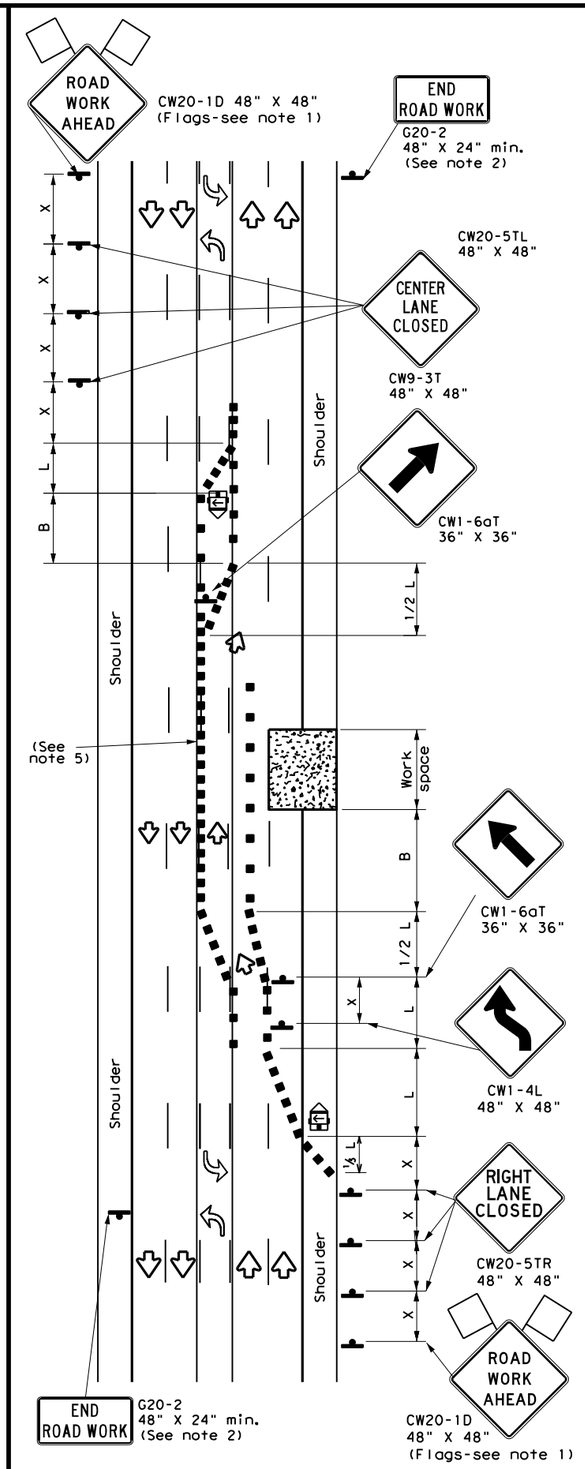


TCP(SC-3a)

ONE LANE CLOSED

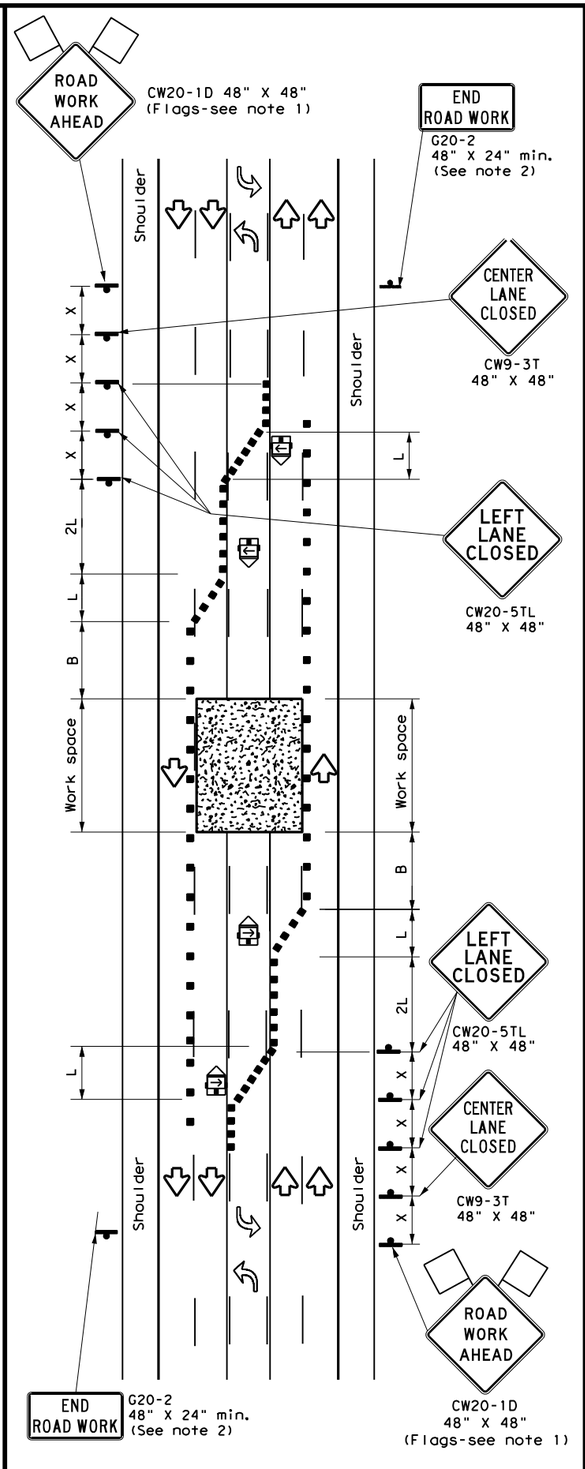
CONTROL W/ CHANNELIZING DEVICES



TCP(SC-3b)

TWO LANES CLOSED

CONTROL W/ CHANNELIZING DEVICES



TCP(SC-3c)

CENTER LANES CLOSED

CONTROL W/ CHANNELIZING DEVICES

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 Distance "X"	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: if project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.
3. If the seal coat operation crosses intersections, traffic in these areas must be controlled. Care must be taken to prevent vehicles from crossing the asphalt before the aggregate is placed. This may require positioning additional traffic control personal (flaggers) at the intersection.
4. Temporary rumble strips are not required on seal coat operations.

TCP (SC-3a) and (SC-3b)

5. Channelizing devices which separate two-way traffic shall be spaced on tapers at:
   a.) 20 feet;
   b.) 15 feet when posted speeds are 35 mph or slower; or
   c.) at 1/2(S) for tangent sections.
   This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

Texas Department of Transportation — Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS MULTILANE ROADS (W/ CENTER LEFT TURN LANE) TCP(SC-3)-22

FILE: tcpsc-3-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		32

DATE: 9/25/2023 10:02:02 AM
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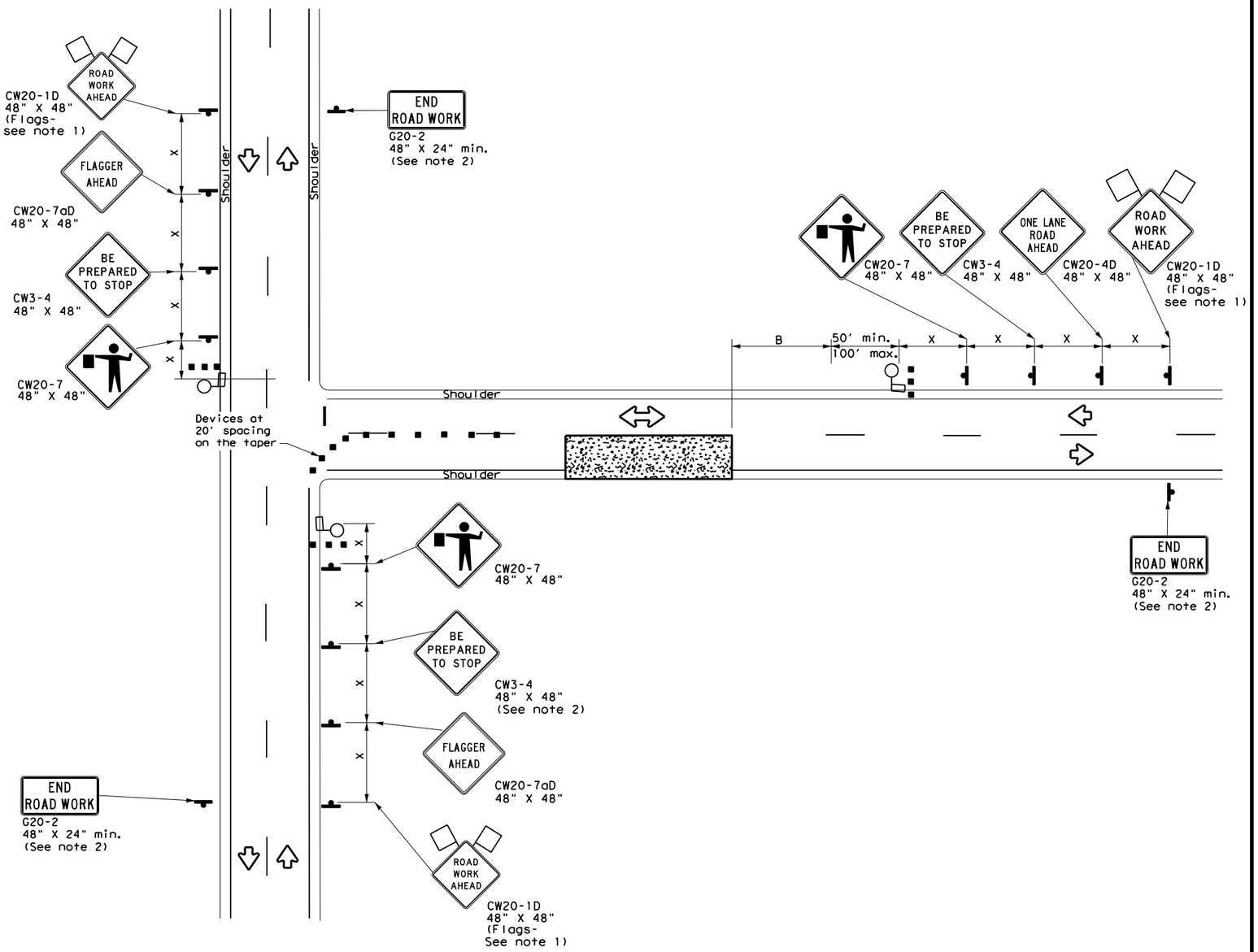

ONE LANE TWO-WAY (T-INTERSECTION) CONTROL WITH PILOT VEHICLE

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 Distance "X"	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: if project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.
3. Flaggers should use two-way radios or other methods of communication at all times for traffic control coordination.
4. Flaggers should use 24" STOP (CW20-8) / SLOW (CW20-8aT) paddles to control traffic. Flags should be limited to emergency situations.
5. 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).
6. Temporary rumble strips are not required on seal coat operations.
7. The pilot car is used to guide vehicles through traffic control zone. The pilot car shall have an identification name displayed and PILOT CAR, FOLLOW ME (G20-4) sign or message board mounted in a conspicuous position on rear.

Texas Department of Transportation | Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS NEAR INTERSECTION

TCP(SC-4)-22

FILE: tcpsc-4-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-21 10-22	0036	05	044, ETC	US 83, ETC
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	SJT	REAL, ETC		33

220

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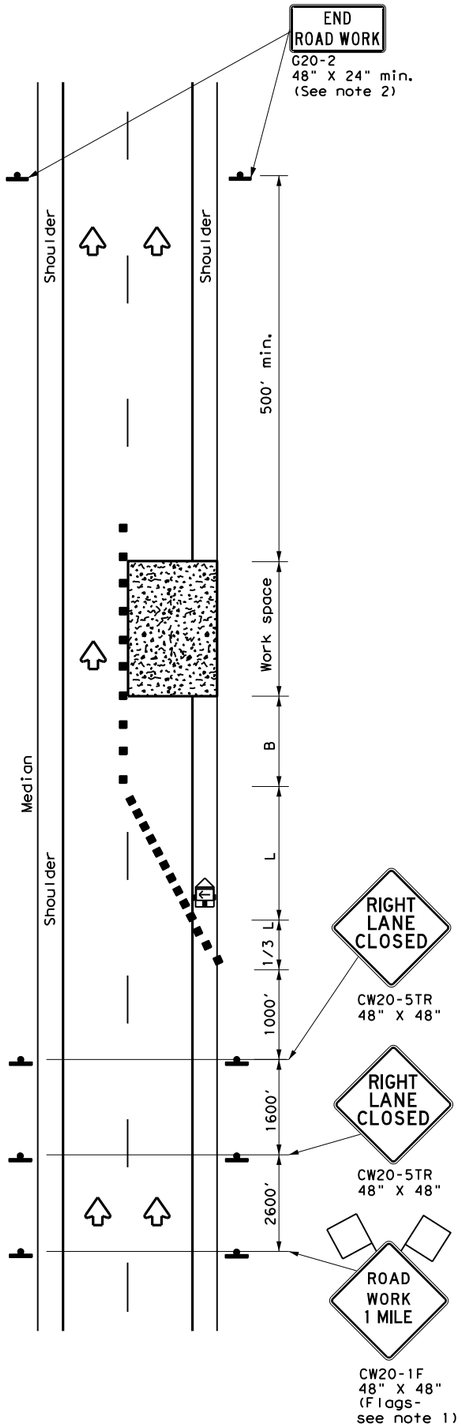
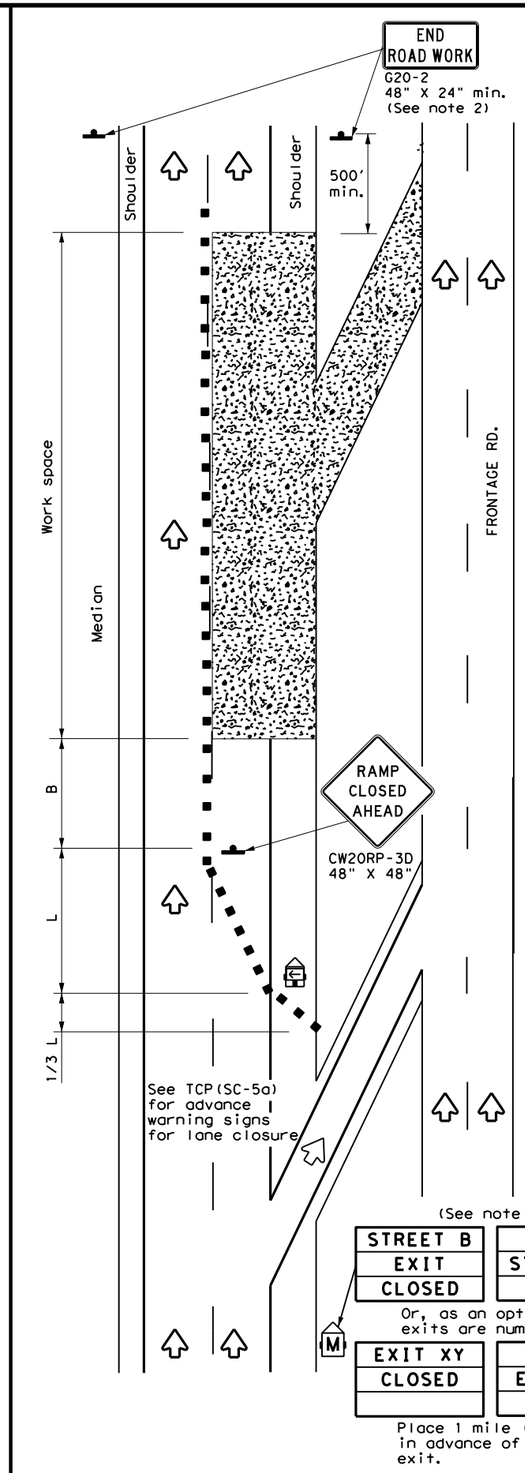


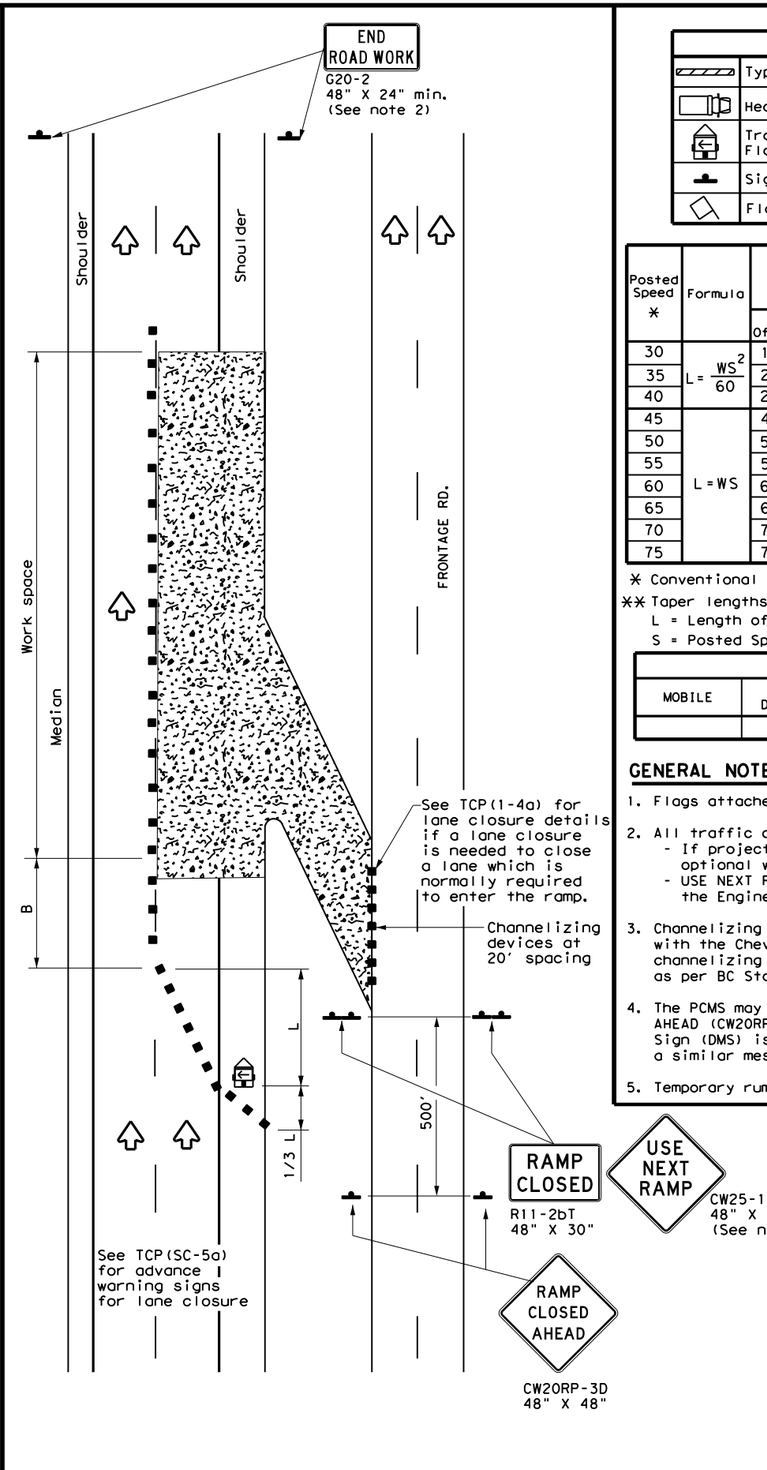
TCP (SC-5a)

ONE LANE CLOSURE



TCP (SC-5b)

LANE AND RAMP CLOSURE AT EXIT RAMPS



TCP (SC-5c)

LANE AND RAMP CLOSURE AT 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 Distance "X"	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:
   - If project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.
   - USE NEXT RAMP (CW25-1T) sign is optional with approval 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. The PCMS may be omitted if: it is replaced with a RAMP CLOSED AHEAD (CW20RP-3D) sign or when a permanent Dynamic Message Sign (DMS) is available in the appropriate location to display a similar message as called for on the PCMS.
5. Temporary rumble strips are not required on seal coat operations.

Texas Department of Transportation — Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS DIVIDED HIGHWAYS

TCP(SC-5)-22

FILE: tcpsc-5-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-21 10-22	0036	05	044, ETC	US 83, ETC
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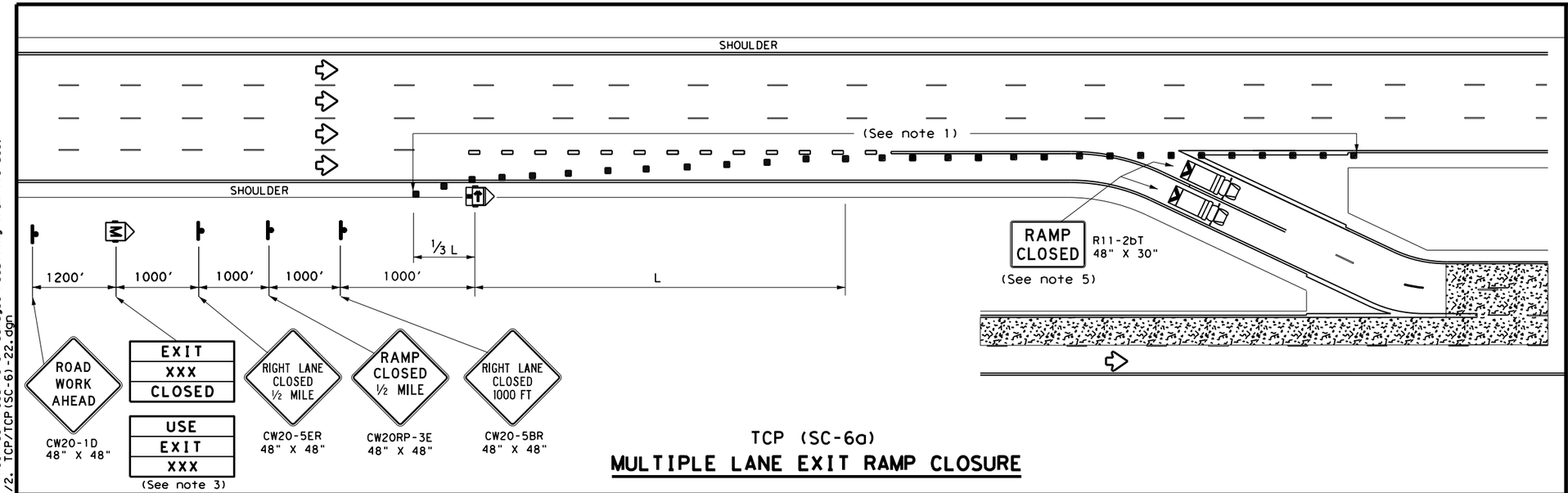
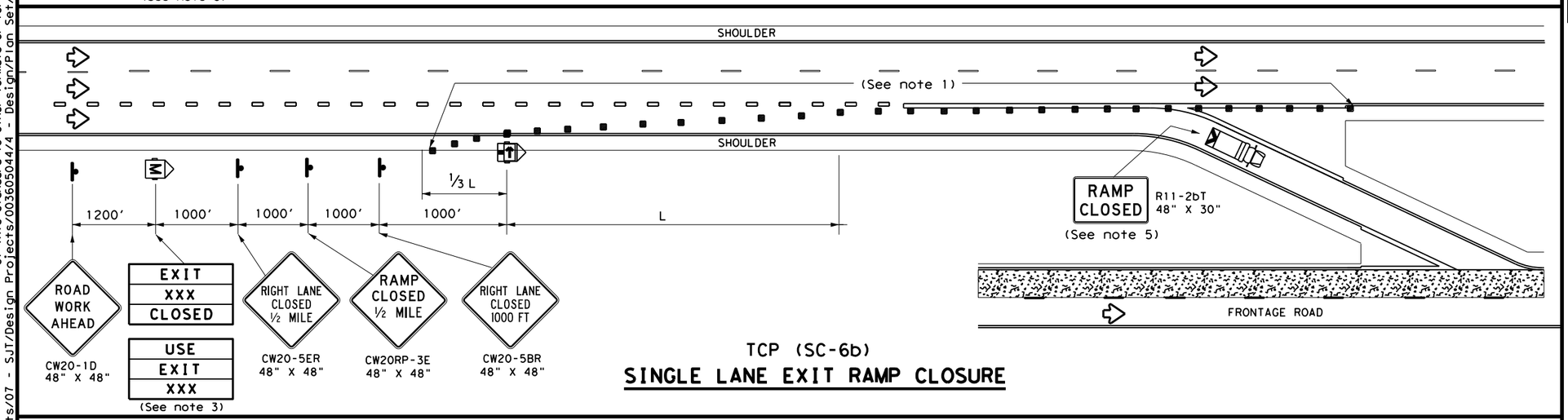


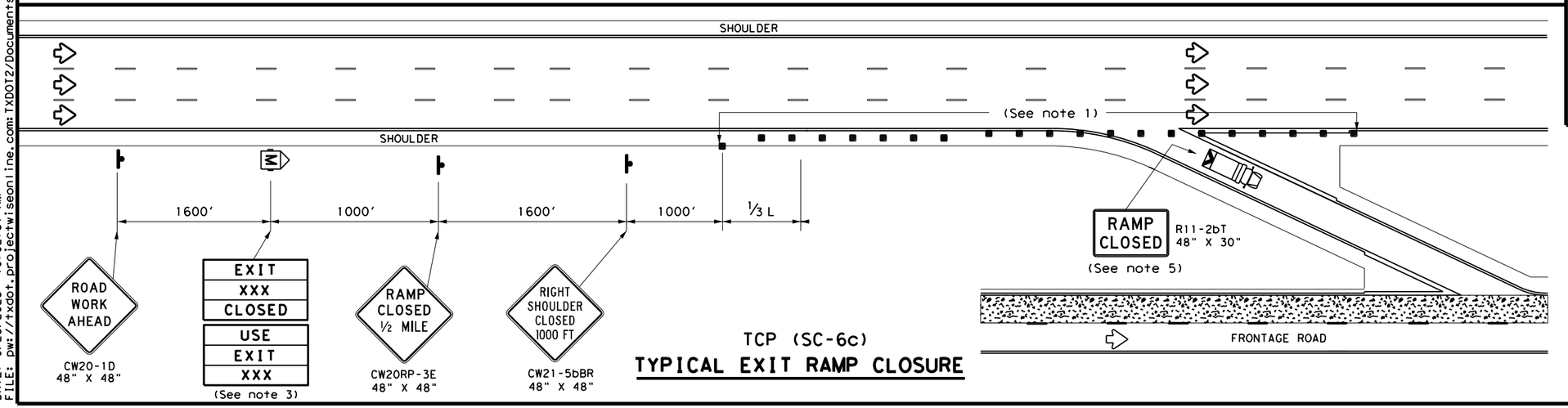
TCP (SC-6a)

MULTIPLE LANE EXIT RAMP CLOSURE



TCP (SC-6b)

SINGLE LANE EXIT RAMP CLOSURE



TCP (SC-6c)

TYPICAL EXIT RAMP CLOSURE

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'
85		850'	935'	1020'	85'	170'	695'

** 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. Place channelizing devices at 20' spacings. Tighter spacing allowed as necessary to address field conditions or observed driver behavior.
2. See the Standard Highway Sign Design for Texas (SHSD) for sign details.
3. The PCMS may be omitted if replaced with a RAMP CLOSED AHEAD (CW20RP-3D) sign or when a permanent Dynamic Message Sign (DMS) is available in an appropriate location to display a similar message as called for on the PCMS.
4. When it is determined that a through lane should be closed in addition to the exit ramp, refer to TCP(6-4) for traffic control details.
5. A Truck Mounted Attenuator (TMA), where shown, is REQUIRED and shall have a RAMP CLOSED (R11-2bT) sign mounted on the rear of the truck.

Texas Department of Transportation — Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS DIVIDED HIGHWAYS

TCP(SC-6)-22

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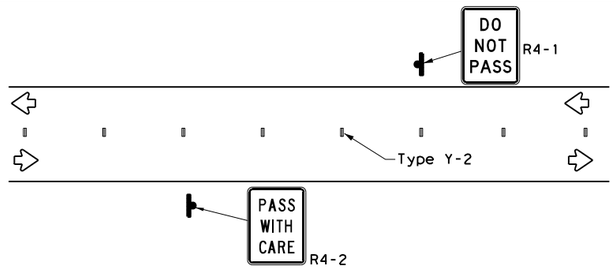
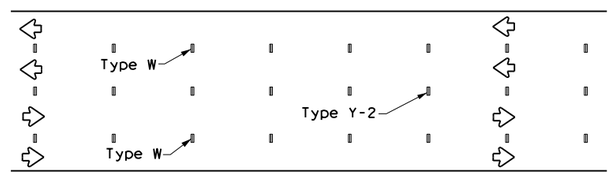
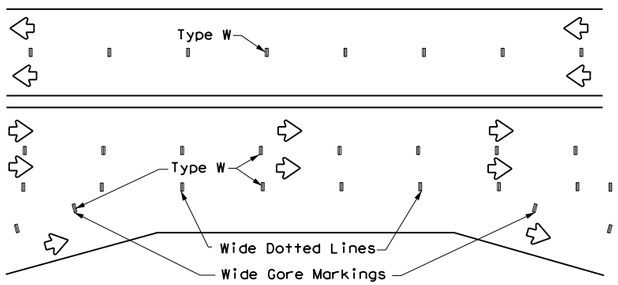
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS (TABS)



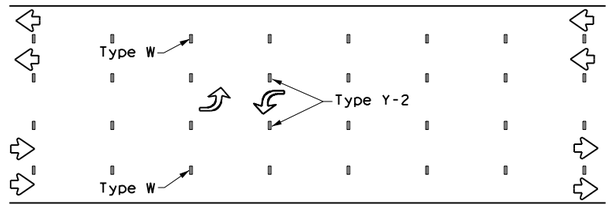
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS

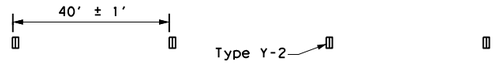


LANE LINES FOR DIVIDED HIGHWAY

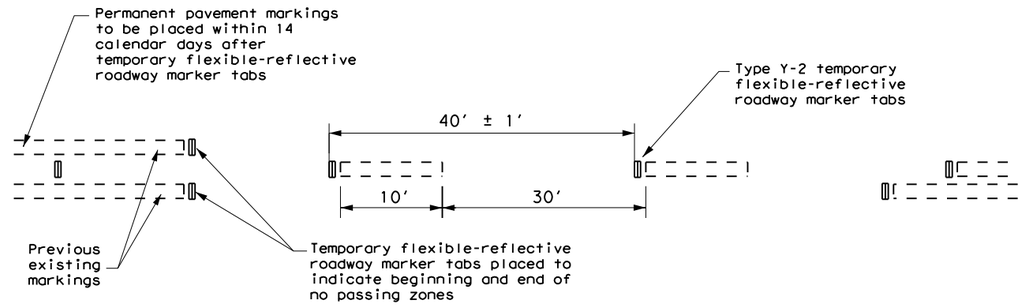


TWO-WAY LEFT TURN LANE

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS (TABS)

SOLID LINES	DOUBLE NO-PASSING LINE	
	SINGLE NO-PASSING LINE or CHANNELIZATION LINE	
	8" WIDE SOLID LINE	
BROKEN LINES (FOR CENTER LINE OR LANE LINE)		
WIDE DOTTED LINES (FOR LANE DROP LINES)		
WIDE GORE MARKINGS		

TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS



TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS

1. Temporary markings for surfacing projects shall be Temporary Flexible-Reflective Roadway Marker Tabs with protective cover unless otherwise approved by the Engineer. Tabs are to be installed to provide true alignment for striping crews or as directed by the Engineer. Tabs will be placed at the spacing indicated. Tabs should be applied to the pavement no more than two days before the surfacing is applied. After the surfacing is rolled and swept, the protective cover over the reflective strip shall be removed.
2. Temporary Flexible-Reflective Roadway Marker Tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with a 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).
3. Temporary Flexible-Reflective Roadway Marker Tabs will require normal maintenance replacement when used on roadways with an Average Daily Traffic (ADT) per lane of up to 7500 vehicles with no more than 10% truck mix. When roadway volumes exceed these values, additional maintenance replacement of these devices should be planned for.
4. 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.
5. 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 4.
6. Tabs shall meet requirements of Departmental Material Specification DMS-8242.
7. Tabs shall NOT be used to simulate edge lines.

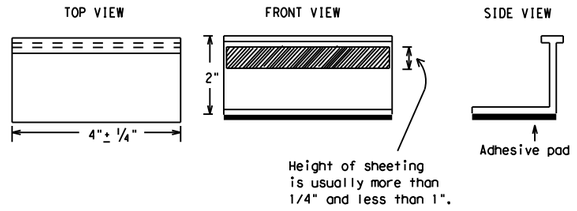
NOTES:

1. 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.
2. 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 acceptable.
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.

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

1. DMSs referenced above may be found along with embedded links to their respective MPLs at the following website: http://www.txdot.gov

TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS



Texas Department of Transportation

Traffic Safety Division Standard

TEMPORARY PAVEMENT MARKINGS FOR SEAL COAT OPERATIONS

TCP(SC-7)-22

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©TxDOT	October 2022	CONT	SECT	JOB	HIGHWAY
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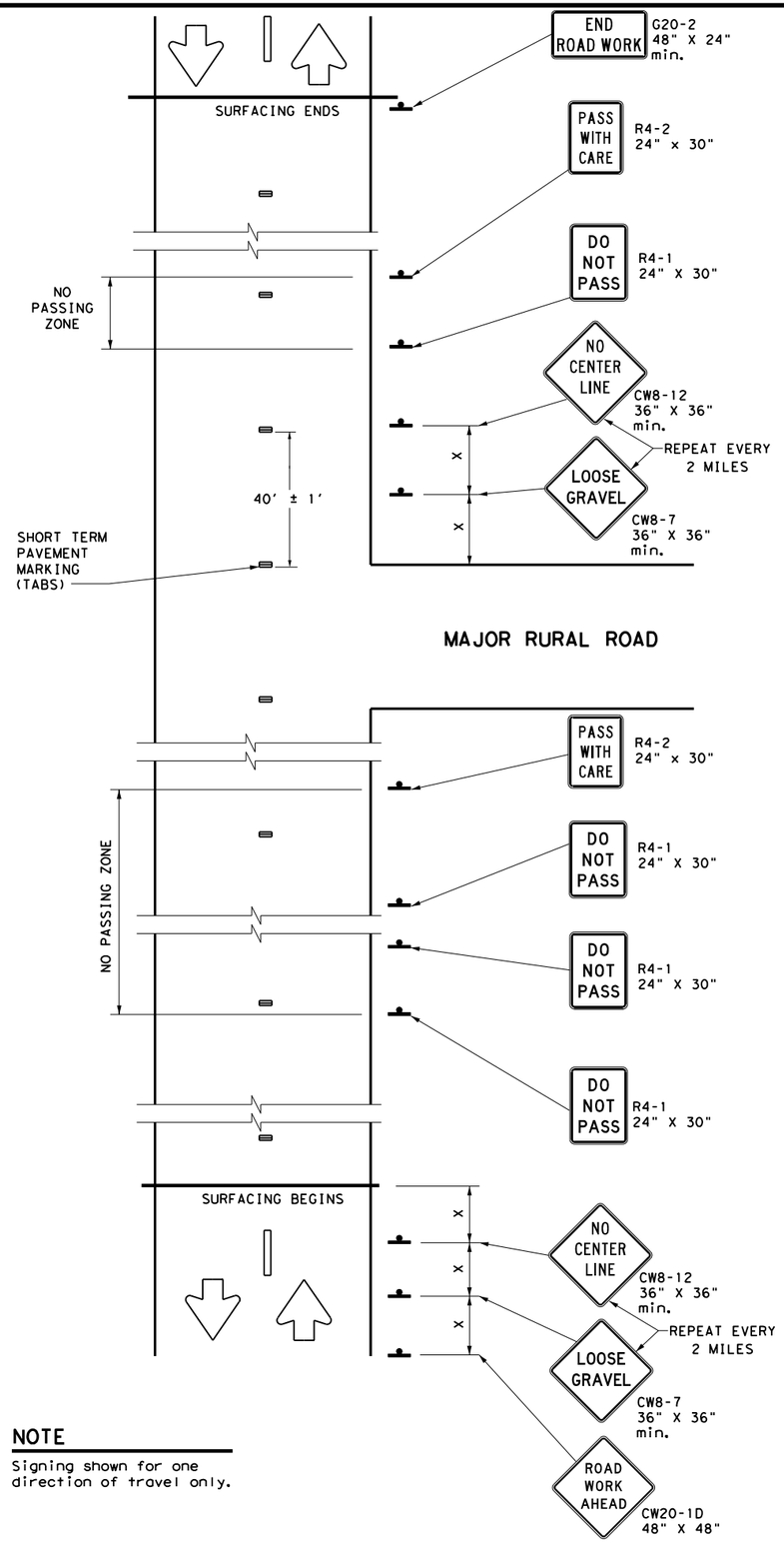
4-21		DIST	COUNTY		SHEET NO.
10-22		SJT	REAL, ETC		36



NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS

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

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

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

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

D. DO NOT PASS and PASS WITH CARE signs are to remain in place until permanent pavement markings are installed.

NO CENTER LINE (CW8-12) SIGN

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

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

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

LOOSE GRAVEL (CW8-7) SIGN

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

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

COORDINATION OF SIGN LOCATIONS

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

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

LOOSE GRAVEL and NO CENTER LINE sign placements will then be repeated as described above.

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

* Conventional Roads Only

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

GENERAL NOTES

1. Surfacing operations that cover or obliterate existing pavement markings must first have the passing zones clearly marked with tabs as well as having any of the traffic control devices detailed on this sheet furnished and erected as directed by the Engineer.
2. The devices shown on this sheet are to be used to supplement those required by the BC Standards or others required elsewhere in the plans.
3. Signs shall be erected as detailed on the BC Standards or the Compliant Work Zone Traffic Control Devices List (CWZTCD) on supports approved for Short Duration / Short Term Stationary Work Zone Sign Supports.
4. When surfacing operations take place on divided highways, freeways or expressways, the size of diamond shaped construction warning signs shall be 48" x 48".
5. Signs on divided highways, freeways and expressways should be placed on both right and left sides of the roadway based on roadway conditions as directed by the Engineer.

Texas Department of Transportation | Traffic Safety Division Standard

TRAFFIC CONTROL DETAILS FOR SEAL COAT OPERATIONS

TCP(SC-8)-22

FILE: tcpsc-8-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0036	05	044, ETC	US 83, ETC
4-21	DIST	COUNTY		SHEET NO.
10-22	SJT	REAL, ETC		37

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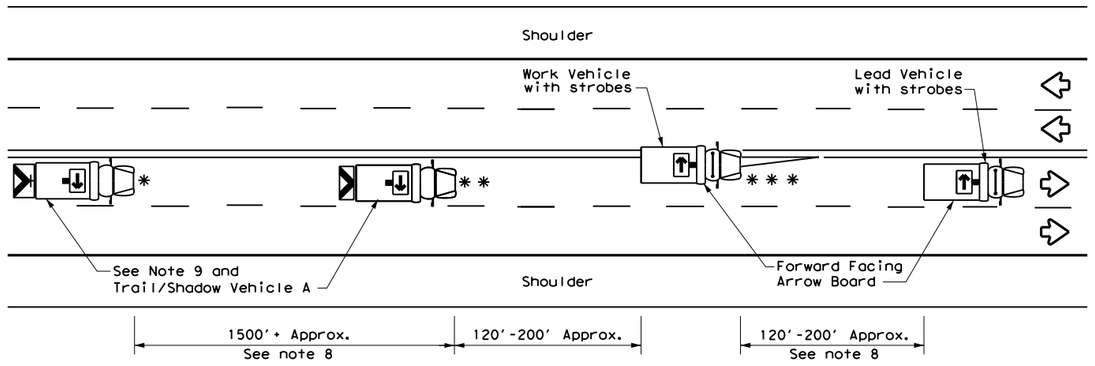
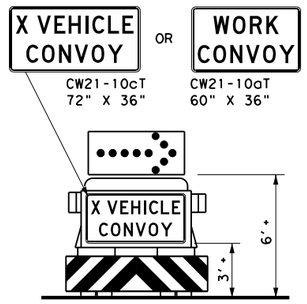


TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

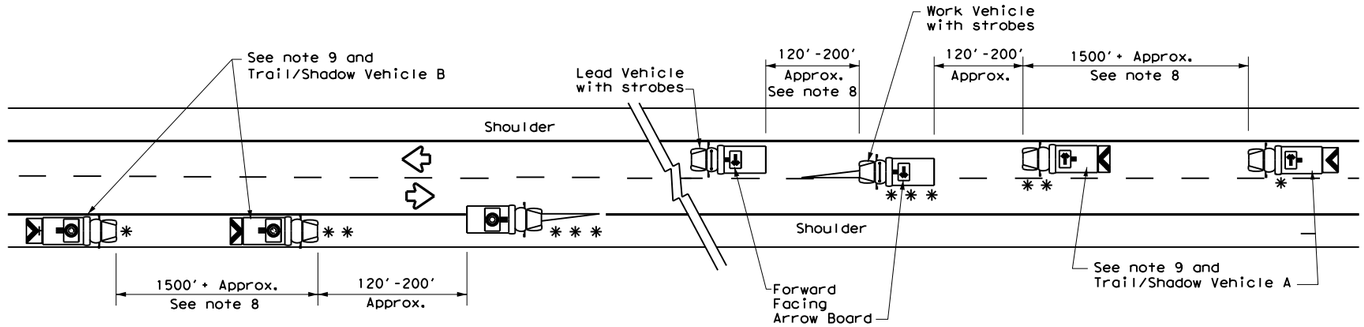
with RIGHT Directional display Flashing Arrow Board

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.

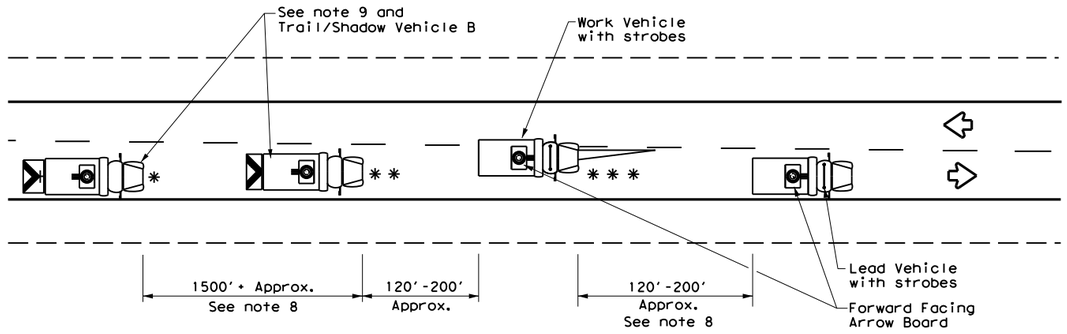


WORK ON SHOULDER

WORK ON TRAVEL LANE

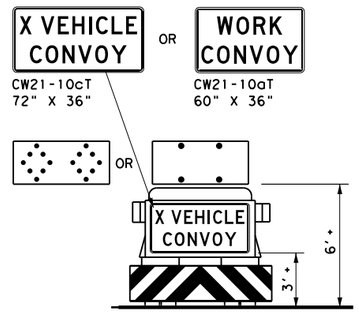
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



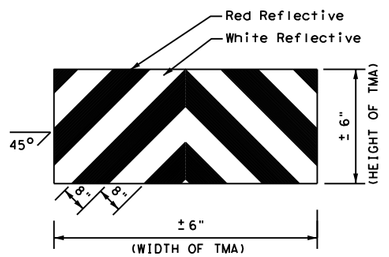
TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in CAUTION display



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	SJT	REAL, ETC		38
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175

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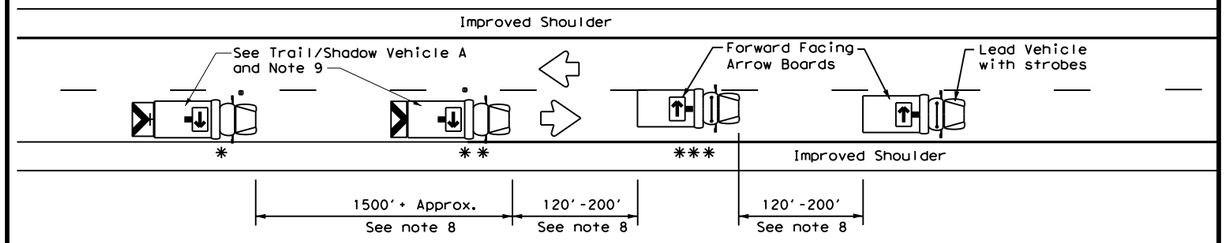
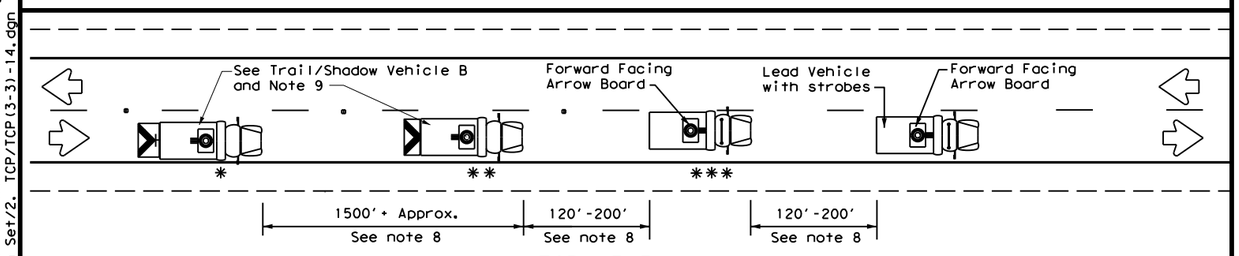


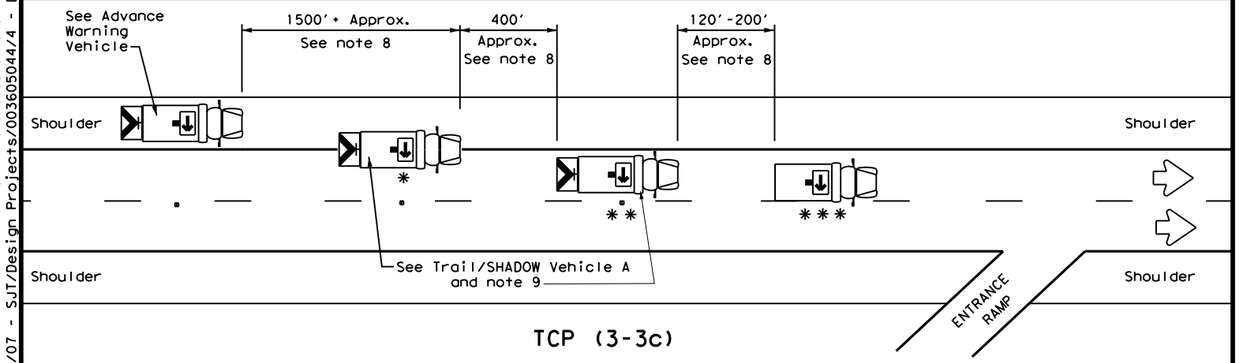
TCP (3-3a)

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



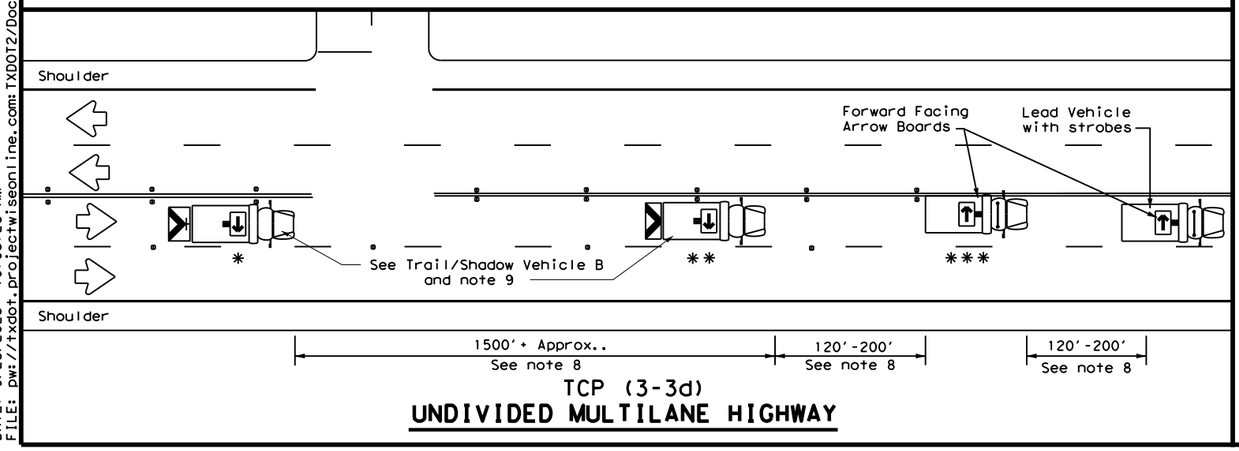
TCP (3-3b)

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



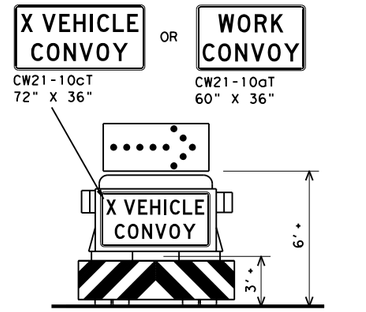
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



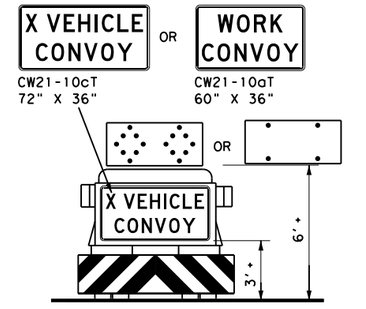
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



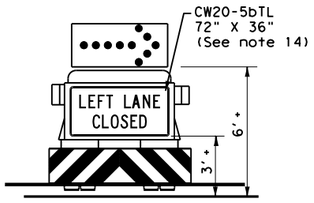
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

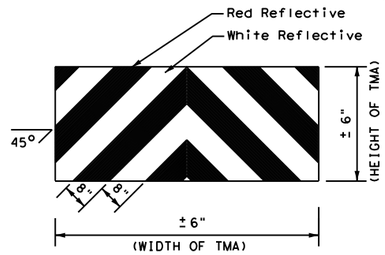


TRAIL/SHADOW VEHICLE B

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

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©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	SJT	REAL, ETC		39
1-97 7-14				

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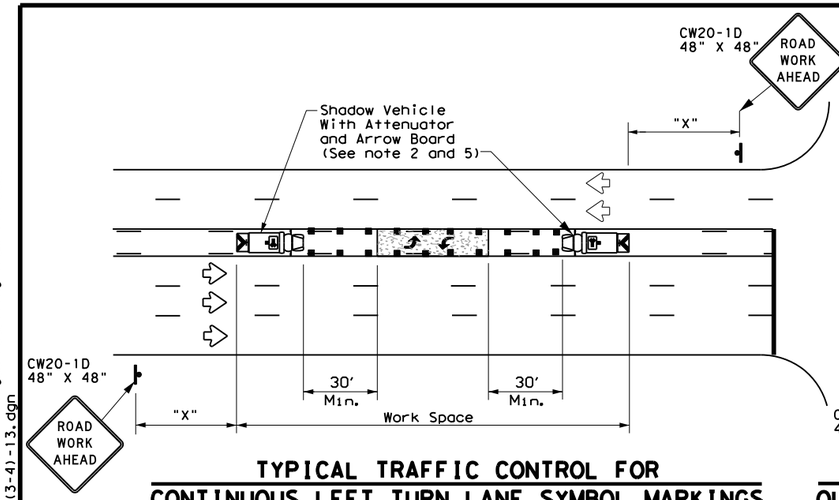
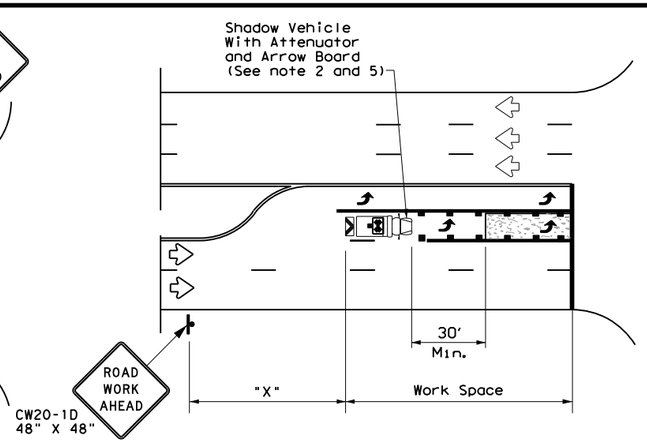
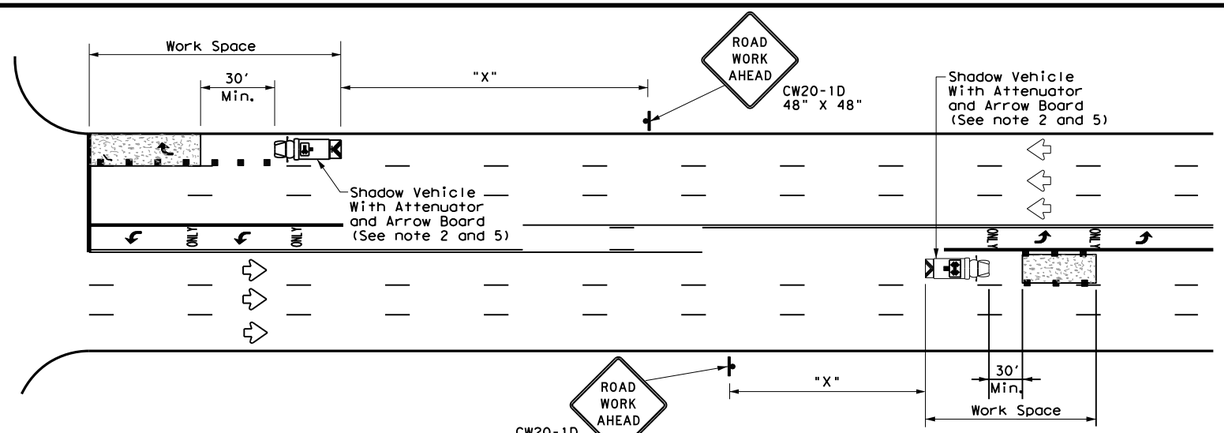


TYPICAL TRAFFIC CONTROL FOR CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

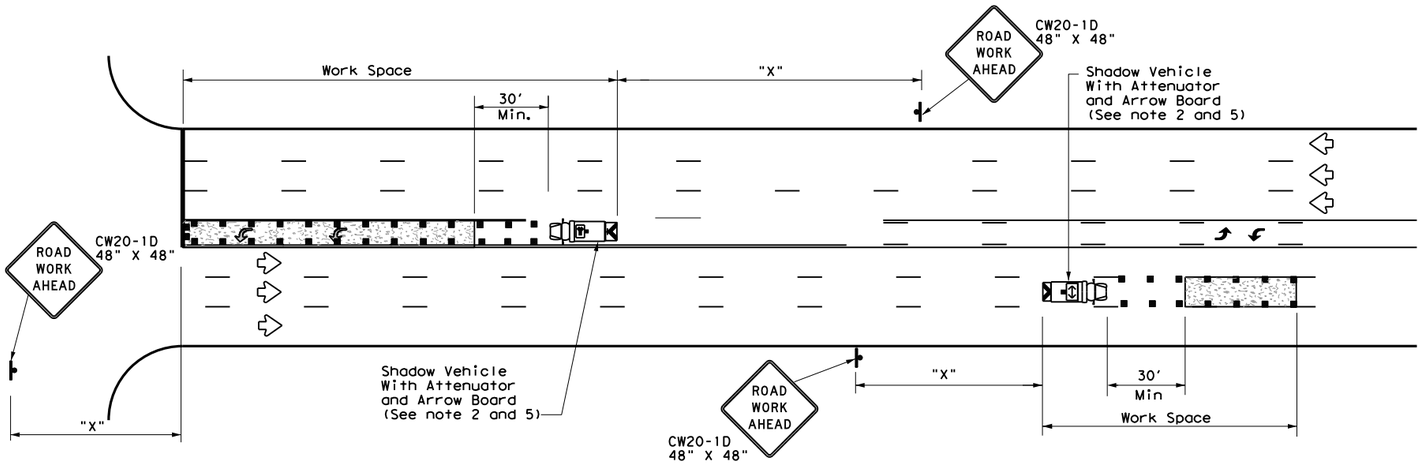


TYPICAL TRAFFIC CONTROL FOR OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



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'

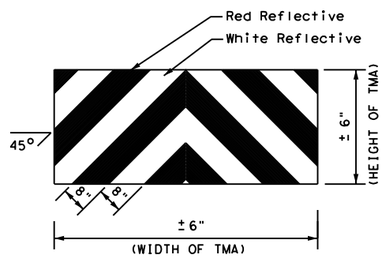
* Conventional Roads Only

** 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	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		40

SEAL COAT MATERIAL SELECTION TABLE

TIER I: HEAVY USE - USE ONLY THE SELECTED MATERIALS.

TYPE	ASPHALT RUBBER (A-R) ☐ A-R ONLY	ASPHALT CEMENT (AC) ☒ AC ONLY
ASPHALT	☐ A-R TY II ☐ A-R TY III ☐ SP 300-	☒ AC-20-5TR ☒ AC-20XP ☐ AC-15P ☐ SP 300-

TIER II: MODERATE USE - USE THESE MATERIALS OR ANY SELECTED TIER I MATERIAL COMBINATIONS OF THE ALLOWED TYPES.

TYPE	ASPHALT CEMENT (AC) ☐ AC ONLY	ASPHALT EMULSION ☐ EMULSION ONLY
ASPHALT	☐ AC-10-2TR ☐ AC-15P ☐ AC-20XP ☐ AC-10 W/2%SBR ☐ AC-5 W/2%SBR ☐ SP 300-	☐ CHFRS-2P ☐ HFRS-2P ☐ CRS-2P ☐ SP 300-

TIER III: LIGHT USE - USE THESE MATERIALS OR ANY SELECTED TIER I OR TIER II MATERIAL COMBINATIONS OF THE ALLOWED TYPES.

TYPE	ASPHALT CEMENT (AC) ☐ AC ONLY	ASPHALT EMULSION ☐ EMULSION ONLY
ASPHALT	☐ AC-10 ☐ AC-5 ☐ SP 300-	☐ CRS-2 ☐ CRS-2H ☐ HFRS-2 ☐ SP 300-

DISTRICTWIDE SEAL COAT PROJECT SEASONS: REFER TO ITEM 316 FOR TEMPERATURE AND WEATHER RESTRICTIONS.

SEASON 1: AMA, CHS, LBB	MAY 15 TO AUG 31
SEASON 2: ABL, ATL, BWD, DAL, FTW, LFK, ODA, PAR, SJT, TYL, WAC, WFS	MAY 1 TO AUG 31
SEASON 3: AUS, BMT, BRY, ELP, HOU, SAT, YKM	MAY 1 TO SEP 15
SEASON 4: CRP, LRD, PHR	APR 1 TO SEPT 30

NOTE: SEAL COATS ON ROUTINE MAINTENANCE CONTRACTS MUST BE COMPLETED BY AUGUST 31 UNLESS OTHERWISE SHOWN ON THE PLANS.

INSTRUCTIONS TO THE CONTRACTOR:

1. PROVIDE MATERIALS ACCORDING TO THE ALTERNATES SELECTED FOR THE ROADWAY TIER DESIGNATIONS SPECIFIED AT VARIOUS ROADWAY LOCATIONS SHOWN ON THE PLANS;
2. ALTERNATELY, SUPPLY SELECTED BINDERS FROM A HIGHER TIER, BUT ONLY IF THE TYPE OF MATERIAL IS ALLOWED FOR THE DESIGNATED TIER; PAYMENT WILL ONLY BE MADE FOR THE TIER DESIGNATED FOR THE PAVEMENT;
3. SUPPLY THE AGGREGATE TYPE, GRADE AND SURFACE AGGREGATE CLASS SHOWN ON THE PLANS; AND
4. ADHERE TO THE APPLICATION SEASON SELECTED.

THERE ARE 96 WORKING DAYS ALLOWED FOR THIS PROJECT.
THE LATEST ROADWAY START WORK DATE IS MAY 15, 2024.

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

SEAL COAT MATERIAL SELECTION TABLE

SCTABLE

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© TxDOT: March 2014	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		41

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DATA FOR FINAL PLANS

Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

SITE INFORMATION

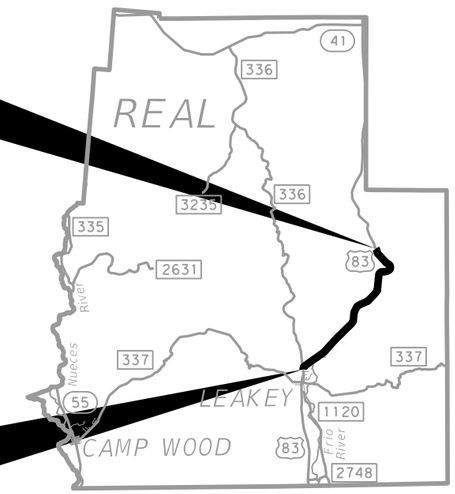
County	Real
Ctl-Sec-Job	0036-05-044
Highway	US 83
Length (MI)	11.048
Funct. Class	Minor Arterial
Limits From	15.886 miles south of Kerr CL
Limits To	Beginning of RCC at RM 336 in Leakey
Current ADT	2563 (2022)

GENERAL NOTES

1. Seal coat full roadway width. 12 LF lanes with varied shoulder widths.
2. See Summary of Surfacing table.
3. End seal coat at the beginning of RCC (at RM 336 in Leakey).

BEGIN CONSTRUCTION
TRM 530+0.067
DFO 506.157
MILE POINT 15.895
LATITUDE 29.851633°
LONGITUDE -99.680315°

END CONSTRUCTION
TRM 540+1.182
DFO 517.196
MILE POINT 26.934
LATITUDE 29.73639°
LONGITUDE -99.76141°



SITE LOCATION

(0+00 = TRM 530+0.067)

SUMMARY OF SURFACING

STATION		LENGTH	WIDTH	AREA	0316 6004 ASPH (TIER I) GAL	0316 6238 AGGR(TY-PD GR-3 CY
FROM	TO	LF	LF	SY	0.45 GAL/SY	110 SY/CY
0+00	107+98	10798	62	74,386	33,474	676
107+98	145+47	3749	52	21,661	9,747	197
145+47	587+36	44189	40	196,396	88,378	1,785
TOTALS				292,443	131,599	2,658

SUMMARY OF TCP

6001 6001	6185 6005
PORTABLE CHANGEABLE MESSAGE SIGN	TMA (MOBILE OPERATION)
DAY	DAY
7	4

PAVEMENT MARKINGS QUANTITY SUMMARY

0662 6109	0662 6111	0666 6171	0666 6174	0666 6178	0666 6208	0666 6210	0672 6007	0672 6009	0677 6028
WK ZN PAV MRK SHT TERM (TAB)TY W	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	REFL PAV MRK TY II (W) 6" (BRK)	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	ELIM EXT PV MRK & MRKS (RUMBLE STRIP)
EA	EA	LF	LF	LF	LF	LF	EA	EA	LF
603	1,474	6,030	115,900	412	9,830	54,206	302	1,179	54,508

0 5 10
SCALE IN MILES

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation

San Angelo District

SEAL COAT SITE 1
US 83

SHEET 1 OF 1 SCALE: 1"=10 MILES

REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		42

DATE: 9/25/2023 10:04:13 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050442/4 - Design/Plan Set/3. Roadway/SEAL COAT SITE 01.dgn

DATA FOR FINAL PLANS

Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

SITE INFORMATION

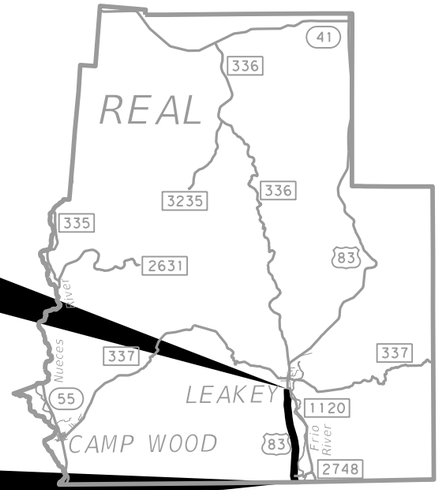
County	Real
Ctl-Sec-Job	0036-06-030
Highway	US 83
Length (MI)	6.247
Funct. Class	Minor Arterial
Limits From	End of RCC at FM 1120 in Leakey
Limits To	Uvalde CL
Current ADT	4,830 (2022)

GENERAL NOTES

1. Seal coat full roadway width. 12 LF lanes with 8 LF shoulders typical.
2. See Summary of Surfacing Table.
3. End seal coat at Uvalde County Line.

BEGIN CONSTRUCTION
TRM 542+0.648
DFO 518.716
MILE POINT 0.701
LATITUDE 29.714734°
LONGITUDE -99.763260°

END CONSTRUCTION
TRM 550+0.004
DFO 524.963
MILE POINT 6.948
LATITUDE 29.625048°
LONGITUDE -99.755430°



SITE LOCATION

(0+00 = TRM 542+0.648)

SUMMARY OF SURFACING

STATION		LENGTH	WIDTH		AREA	0316 6004 ASPH (TIER I)		0316 6238 AGGR(TY-PD GR-3 SAC-B)	
FROM	TO	LF	* AVG	LF	SY	GAL	0.45 GAL/SY	CY	110 SY/CY
0+00	210+62	21062		40	93,609	42,124		851	
210+62	212+15	153	*	46	783	352		7	
212+15	233+32	2117		56	13,174	5,928		120	
233+32	249+53	1621	*	48	8,645	3,890		79	
249+53	336+07	8654		40	38,462	17,308		350	
TOTALS					154,673	69,603		1,407	

SUMMARY OF TCP

6001 6001	6185 6005
PORTABLE CHANGEABLE MESSAGE SIGN	TMA (MOBILE OPERATION)
DAY	DAY
5	2

PAVEMENT MARKINGS QUANTITY SUMMARY

0662 6109	0662 6111	0666 6171	0666 6174	0666 6208	0666 6210	0672 6007	0672 6009
WK ZN PAV MRK SHT TERM (TAB)TY W	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	REFL PAV MRK TY II (W) 6" (BRK)	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A
EA	EA	LF	LF	LF	LF	EA	EA
129	834	1,280	65,523	5,860	37,207	65	765

0 5 10
SCALE IN MILES

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation

San Angelo District

SEAL COAT SITE 2
US 83

SHEET 1 OF 1 SCALE: 1"=10 MILES

REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		43

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FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050442/4 - Design/Plan Set/3. Roadway/SEAL COAT SITE 02.dgn

DATA FOR FINAL PLANS

Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

SITE INFORMATION

County	Reagan
Ctl-Sec-Job	0077-01-031
Highway	US 67
Length (MI)	9.903
Funct. Class	Principal Arterial - Other
Limits From	Irion County Line
Limits To	C&G begins at TRM 740+1.919
Current ADT	6,052 (2022)

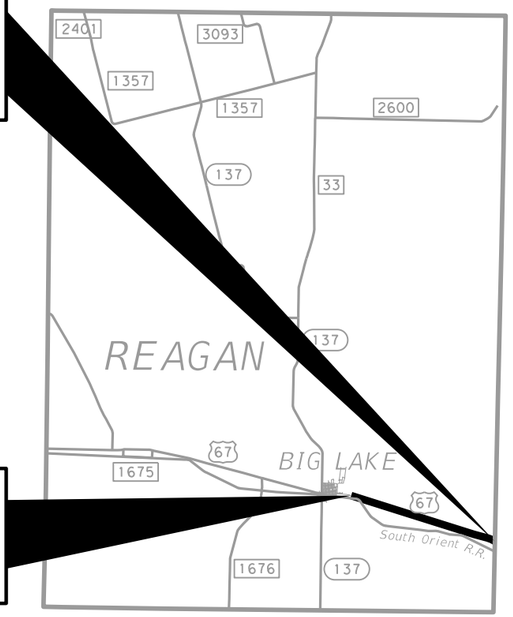
GENERAL NOTES

1. Seal coat full roadway width. 12 LF lanes with varying shoulder widths.
2. See Summary of Surfacing table.

NOT TO SCALE

BEGIN CONSTRUCTION
TRM 730+1.352
DFO 498.051
MILE POINT 0.000
LATITUDE 31.1469848°
LONGITUDE -101.2739505°

END CONSTRUCTION
TRM 740+1.92
DFO 507.955
MILE POINT 9.903
LATITUDE 31.189432°
LONGITUDE -101.433526°



SITE LOCATION

(0+00 = TRM 730+1.353)

SUMMARY OF SURFACING

STATION FROM	STATION TO	LENGTH LF	WIDTH * AVG	WIDTH LF	AREA SY	0316 6004 ASPH (TIER I) GAL (0.40 GAL/SY)	0316 6142 AGGR(TY-PD GR-4 SAC-A) CY (130 SY/CY)
0+00	15+42	1542		74	12,679	5,072	98
15+42	16+90	148	*	66	1,085	434	8
16+90	84+90	6800		58	43,822	17,529	337
84+90	88+44	354	*	52	2,045	818	16
88+44	223+71	13527		46	69,138	27,655	532
223+71	234+80	1109	*	52	6,408	2,563	49
234+80	326+62	9182		58	59,173	23,669	455
326+62	334+49	787	*	52	4,547	1,819	35
334+49	411+00	7651		46	39,105	15,642	301
411+00	416+28	528	*	51	2,992	1,197	23
416+28	430+16	1388		56	8,636	3,454	66
430+16	434+39	423	*	51	2,397	959	18
434+39	517+60	8321		46	42,530	17,012	327
517+60	522+93	533	*	49	2,902	1,161	22
TOTALS					297,459	118,984	2,289

SUMMARY OF TCP

6001 6001	6185 6005
PORTABLE CHANGEABLE MESSAGE SIGN	TMA (MOBILE OPERATION)
DAY	DAY
7	5

PAVEMENT MARKINGS QUANTITY SUMMARY

0662 6109	0662 6111	0666 6171	0666 6172	0666 6174	0666 6178	0666 6208	0666 6210	0668 6077	0668 6083	0668 6085	0668 6092	0672 6007	0672 6009
WK ZN PAV MRK SHT TERM (TAB)TY W	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	REFL PAV MRK TY II (W) 6" (BRK)	REFL PAV MRK TY II (W) 6" (DOT)	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	PREFAB PAV MRK TY C (W) (ARROW)	PREFAB PAV MRK TY C (W) (LNDP ARROW)	PREFAB PAV MRK TY C (W) (WORD)	PREFAB PAV MRK TY C (W) (36")(YLD TRI)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A
EA	EA	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA
738	1,284	7,380	637	98,571	3,002	7,110	90,718	4	2	4	4	370	2,452

SEAL AREA

0 5 10
SCALE IN MILES

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED PROFESSIONAL ENGINEER

09/26/2023

Texas Department of Transportation | San Angelo District

SEAL COAT SITE 3
US 67

SHEET 1 OF 1 SCALE: 1"=10 MILES

© TxDOT 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		44

DATE: 9/25/2023 10:04:43 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050444/4 - Design/Plan Set/3. Roadway/SEAL COAT SITE 03.dgn

DATA FOR FINAL PLANS

Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

SITE INFORMATION

County	Tom Green
Ctl-Sec-Job	0077-06-103
Highway	US 67
Length (MI)	11.153
Funct. Class	Principal Arterial (Other)
Limits From	Chapel Hill Drive
Limits To	Irion County Line
Current ADT	5,935 (2022)

GENERAL NOTES

1. Seal coat full roadway width. 12 LF lanes with varying shoulder widths.
2. See Summary of Surfacing.
3. End seal coat at Irion County Line.

(0+00 = TRM 676+0.807)

SUMMARY OF SURFACING

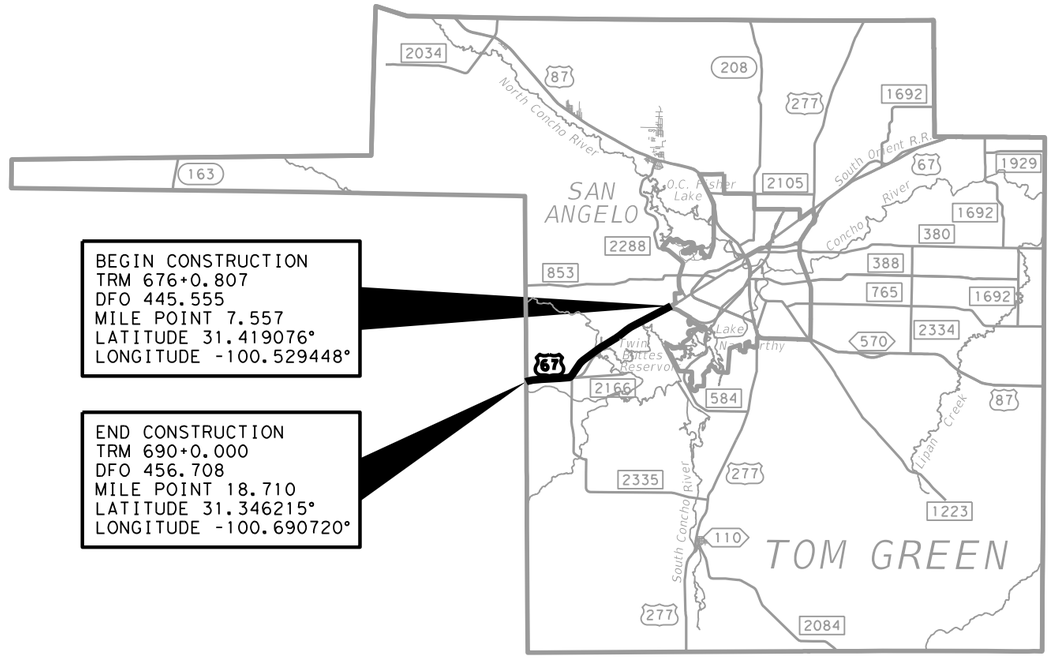
STATION		LENGTH	WIDTH		AREA	0316 6004 ASPH (TIER I)		0316 6142 AGGR(TY-PD GR-4 SAC-A)	
FROM	TO	LF	* AVG	LF	SY	GAL	0.40 GAL/SY	CY	130 SY/CY
0+00	100+58	10058		46	51,408	20,563		395	
100+58	109+51	893	*	55	5,457	2,183		42	
109+51	121+65	1214		64	8,633	3,453		66	
121+65	124+66	301	*	58	1,940	776		15	
124+66	199+69	7503		52	43,351	17,340		333	
199+69	210+57	1088	*	49	5,924	2,370		46	
210+57	342+94	13237		46	67,656	27,062		520	
342+94	352+12	918	*	49	4,998	1,999		38	
352+12	413+95	6183		52	35,724	14,290		275	
413+95	421+30	735	*	58	4,737	1,895		36	
421+30	425+60	430		64	3,058	1,223		24	
425+60	435+50	990	*	55	6,050	2,420		47	
435+50	446+64	1114		46	5,694	2,278		44	
446+64	451+92	528	*	49	2,875	1,150		22	
451+92	509+15	5723		52	33,066	13,226		254	
509+15	528+15	1900	*	55	11,611	4,644		89	
528+15	536+71	856		58	5,516	2,206		42	
536+71	547+01	1030	*	52	5,951	2,380		46	
547+01	588+88	4187		46	21,400	8,560		165	
TOTALS					325,049	130,020		2,501	

SUMMARY OF TCP

6001 6001	6185 6005
PORTABLE CHANGEABLE MESSAGE SIGN	TMA (MOBILE OPERATION)
DAY	DAY
7	5

PAVEMENT MARKINGS QUANTITY SUMMARY

0662 6109	0662 6111	0666 6171	0666 6172	0666 6174	0666 6178	0666 6208	0666 6210	0668 6077	0668 6083	0668 6085	0672 6007	0672 6009
WK ZN PAV MRK SHT TERM (TAB)TY W	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	REFL PAV MRK TY II (W) 6" (BRK)	REFL PAV MRK TY II (W) 6" (DOT)	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	PREFAB PAV MRK TY C (W) (ARROW)	PREFAB PAV MRK TY C (W) (LNDP ARROW)	PREFAB PAV MRK TY C (W) (WORD)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A
EA	EA	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA
457	1,502	4,570	693	116,630	4,450	6,960	86,254	8	6	6	452	2,730



BEGIN CONSTRUCTION
TRM 676+0.807
DFO 445.555
MILE POINT 7.557
LATITUDE 31.419076°
LONGITUDE -100.529448°

END CONSTRUCTION
TRM 690+0.000
DFO 456.708
MILE POINT 18.710
LATITUDE 31.346215°
LONGITUDE -100.690720°

SITE LOCATION

SCALE IN MILES 0 5 10

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation

San Angelo District

SEAL COAT SITE 4
US 67

SHEET 1 OF 1 SCALE: 1"=10 MILES

© TxDOT 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		45

DATE: 9/25/2023 10:04:59 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050444 - Design/Plan Set/3. Roadway/SEAL COAT SITE 04.dgn

DATA FOR FINAL PLANS

Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

SITE INFORMATION

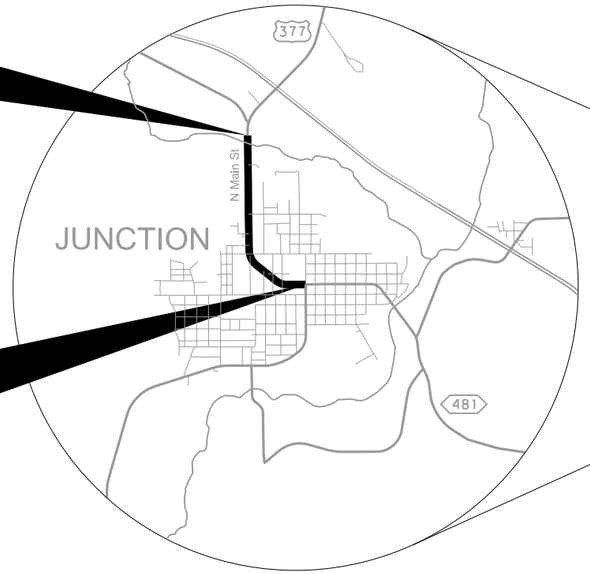
County	Kimble
Ctl-Sec-Job	0141-20-010
Highway	US 377
Length (MI)	1.234
Funct. Class	Major Collector
Limits From	0.32 Miles South of IH 10
Limits To	1.556 Miles South of IH 10
Current ADT	4,491 (2022)

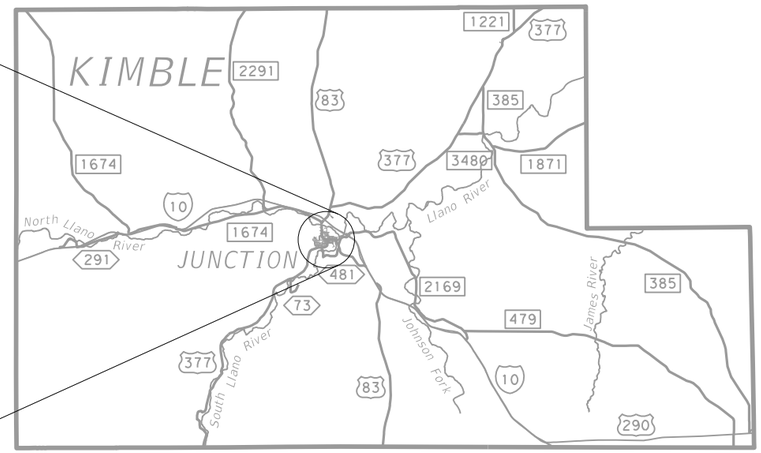
GENERAL NOTES

1. Seal coat full roadway width. 12 LF lanes with varying shoulder widths.
2. See Summary of Surfacing.
3. End seal coat at N 11th St. in Junction.

BEGIN CONSTRUCTION
TRM 546+0.257
DFO 333.592
MILE POINT 0.035
LATITUDE 30.503599°
LONGITUDE -99.778257°

END CONSTRUCTION
TRM 546+1.491
DFO 334.826
MILE POINT 1.269
LATITUDE 30.489301°
LONGITUDE -99.771976°





SITE LOCATION

(0+00 = TRM 546+0.252)

SUMMARY OF SURFACING

STATION		LENGTH	WIDTH		AREA	0316 6004 ASPH (TIER I)	0316 6142 AGGR(TY-PD GR-4 SAC-A)
FROM	TO	LF	* AVG	LF	SY	GAL 0.40 GAL/SY	CY 130 SY/CY
0+00	7+40	740		52	4,276	1,710	33
7+40	9+45	205	*	55	1,253	501	10
9+45	65+42	5597		58	36,070	14,428	277
TOTALS					41,599	16,640	320

SUMMARY OF TCP

6001 6001	6185 6005
PORTABLE CHANGEABLE MESSAGE SIGN	TMA (MOBILE OPERATION)
DAY	DAY
4	1

PAVEMENT MARKINGS QUANTITY SUMMARY

0662 6109	0662 6111	0666 6171	0666 6182	0666 6210	0672 6007	0672 6009
WK ZN PAV MRK SHT TERM (TAB)TY W	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	REFL PAV MRK TY II (W) 6" (BRK)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (Y) 6" (SLD)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A
EA	EA	LF	LF	LF	EA	EA
325	152	3,250	276	11,658	163	152

0 5 10
SCALE IN MILES

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

09/26/2023

Texas Department of Transportation
San Angelo District

SEAL COAT SITE 5
US 377

SHEET 1 OF 1 SCALE: 1"=10 MILES

REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		46

DATE: 9/25/2023 10:05:15 AM
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DATA FOR FINAL PLANS

Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

SITE INFORMATION

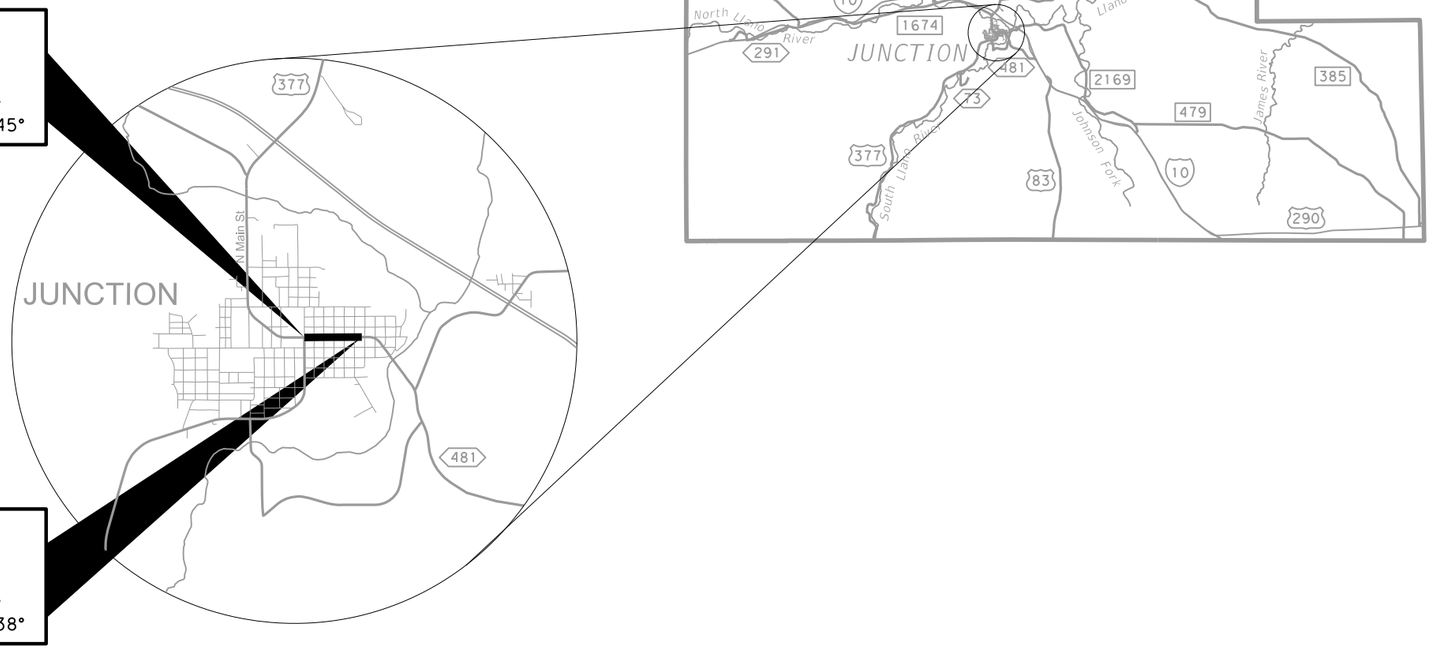
County	Kimble
Ctl-Sec-Job	0141-20-011
Highway	SL 481
Length (MI)	0.379
Funct. Class	Major Collector
Limits From	1.556 Miles South of IH 10
Limits To	1.899 Miles South of IH 10
Current ADT	3,340 (2022)

GENERAL NOTES

1. Seal coat full roadway width. 12 LF lanes with varying shoulder widths.
2. See Summary of Surfacing.
3. End seal coat at TRM 416+0.343.

BEGIN CONSTRUCTION
TRM 416-0.035
DFO 0.000
MILE POINT 1.271
LATITUDE 30.489293°
LONGITUDE -99.771945°

END CONSTRUCTION
TRM 416+0.343
DFO 0.379
MILE POINT 1.65
LATITUDE 30.489225°
LONGITUDE -99.765538°



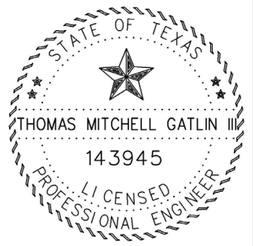
(0+00 = TRM 416-0.032)

SUMMARY OF SURFACING						
STATION		LENGTH	WIDTH	AREA	0316 6004 ASPH (TIER I)	0316 6142 AGGR(TY-PD GR-4 SAC-A)
FROM	TO	LF	LF	SY	GAL 0.40 GAL/SY	CY 130 SY/CY
0+00	20+07	2,007	56	12,488	4,995	96
TOTALS				12,488	4,995	96

SUMMARY OF TCP	
6001 6001	6185 6005
PORTABLE CHANGEABLE MESSAGE SIGN	TMA (MOBILE OPERATION)
DAY	DAY
1	1

PAVEMENT MARKINGS QUANTITY SUMMARY							
0662 6109	0662 6111	0666 6171	0666 6178	0666 6182	0666 6210	0672 6007	0672 6009
WK ZN PAV MRK SHT TERM (TAB)TY W	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	REFL PAV MRK TY II (W) 6" (BRK)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (Y) 6" (SLD)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A
EA	EA	LF	LF	LF	LF	EA	EA
86	45	860	162	106	3,324	45	45

0 5 10
SCALE IN MILES



09/26/2023

Texas Department of Transportation | San Angelo District

SEAL COAT SITE 6
SL 481

SHEET 1 OF 1 SCALE: 1"=10 MILES

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REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		47

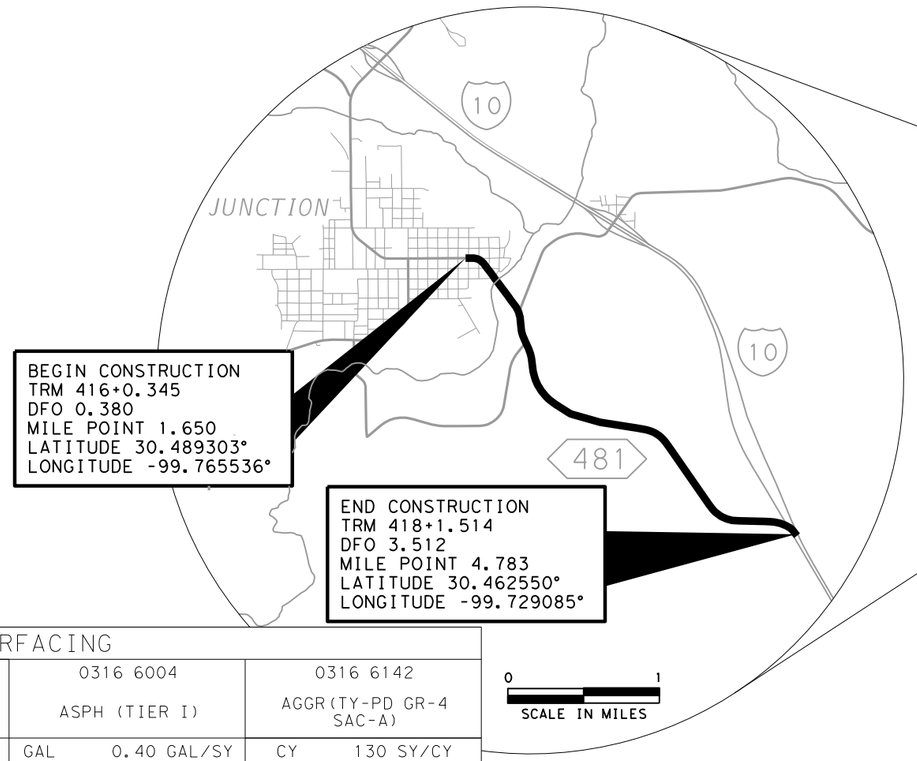
DATE: 9/25/2023 10:05:30 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050044/4 - Design/Plan Set/3. Roadway/SEAL COAT SITE 06.dgn

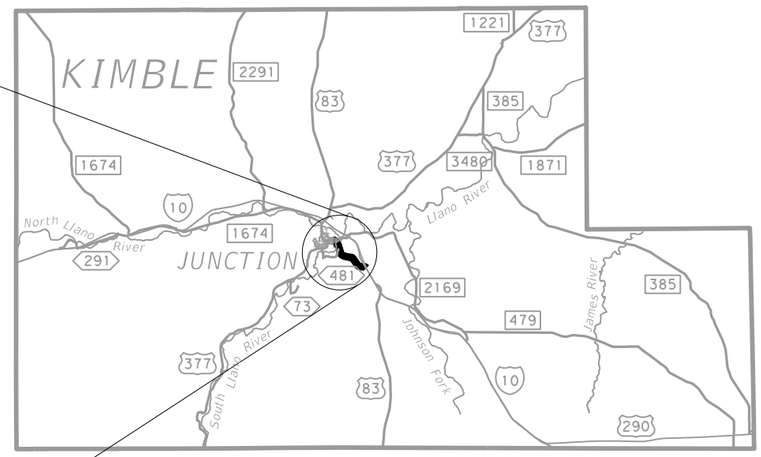
DATA FOR FINAL PLANS

Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

SITE INFORMATION

County	Kimble
Ctl-Sec-Job	0142-16-009
Highway	SL 481
Length (MI)	3.133
Funct. Class	Major Collector
Limits From	1.899 Miles South of IH 10
Limits To	IH 10
Current ADT	1,863 (2022)





SITE LOCATION

(0+00 = TRM 416+.344)

SUMMARY OF SURFACING

STATION		LENGTH	WIDTH	AREA	0316 6004 ASPH (TIER I)		0316 6142 AGGR (TY-PD GR-4 SAC-A)	
FROM	TO	LF	LF	SY	GAL	0.40 GAL/SY	CY	130 SY/CY
0+00	9+62	962	56	5,986	2,394		46	
9+62	10+88	126	41	574	230		4	
10+88	24+30	1342	26	3,877	1,551		30	
TOTALS				10,437	4,175		80	

SUMMARY OF SURFACING

STATION		LENGTH	WIDTH	AREA	0316 6004 ASPH (TIER I)		0316 6238 AGGR (TY-PD GR-3 SAC-B)	
FROM	TO	LF	LF	SY	GAL	0.45 GAL/SY	CY	110 SY/CY
24+30	25+63	133	26	384	173		3	
25+63	29+63	400	39	1,733	780		16	
29+63	116+38	8675	52	50,122	22,555		456	
116+38	118+39	201	46	1,025	461		9	
118+39	151+33	3295	40	14,643	6,589		133	
Ramp To IH-10			24	2,720	1,224		25	
Ramp From IH-10			24	7,792	3,506		71	
TOTALS				78,419	35,289		713	

PAVEMENT MARKINGS QUANTITY SUMMARY

0662 6109	0662 6111	0666 6171	0666 6174	0666 6208	0666 6210	0672 6007	0672 6009
WK ZN PAV MRK SHT TERM (TAB) TY W	WK ZN PAV MRK SHT TERM (TAB) TY Y-2	REFL PAV MRK TY II (W) 6" (BRK)	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A
EA	EA	LF	LF	LF	LF	EA	EA
252	428	2,520	29,094	480	31,673	126	424

SUMMARY OF TCP

6001 6001	6185 6005
PORTABLE CHANGEABLE MESSAGE SIGN	TMA (MOBILE OPERATION)
DAY	DAY
1	2

GENERAL NOTES

1. Seal coat full roadway width which includes 12 LF lanes and varying shoulder widths.
2. Seal GR-4 Aggregate in Junction including the bridge over South Llano River. Seal GR-3 after the bridge and to end of job. See Summary of Surfacing tables.
3. End seal coat at IH 10, sealing both ramps to and from IH 10.

USE TCP (SC-6c) TO CLOSE SINGLE LANE RAMPS ATIH-10 DURING THE SURFACE TREATMENT OF THE RAMPS.

0 5 10
SCALE IN MILES

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

09/26/2023

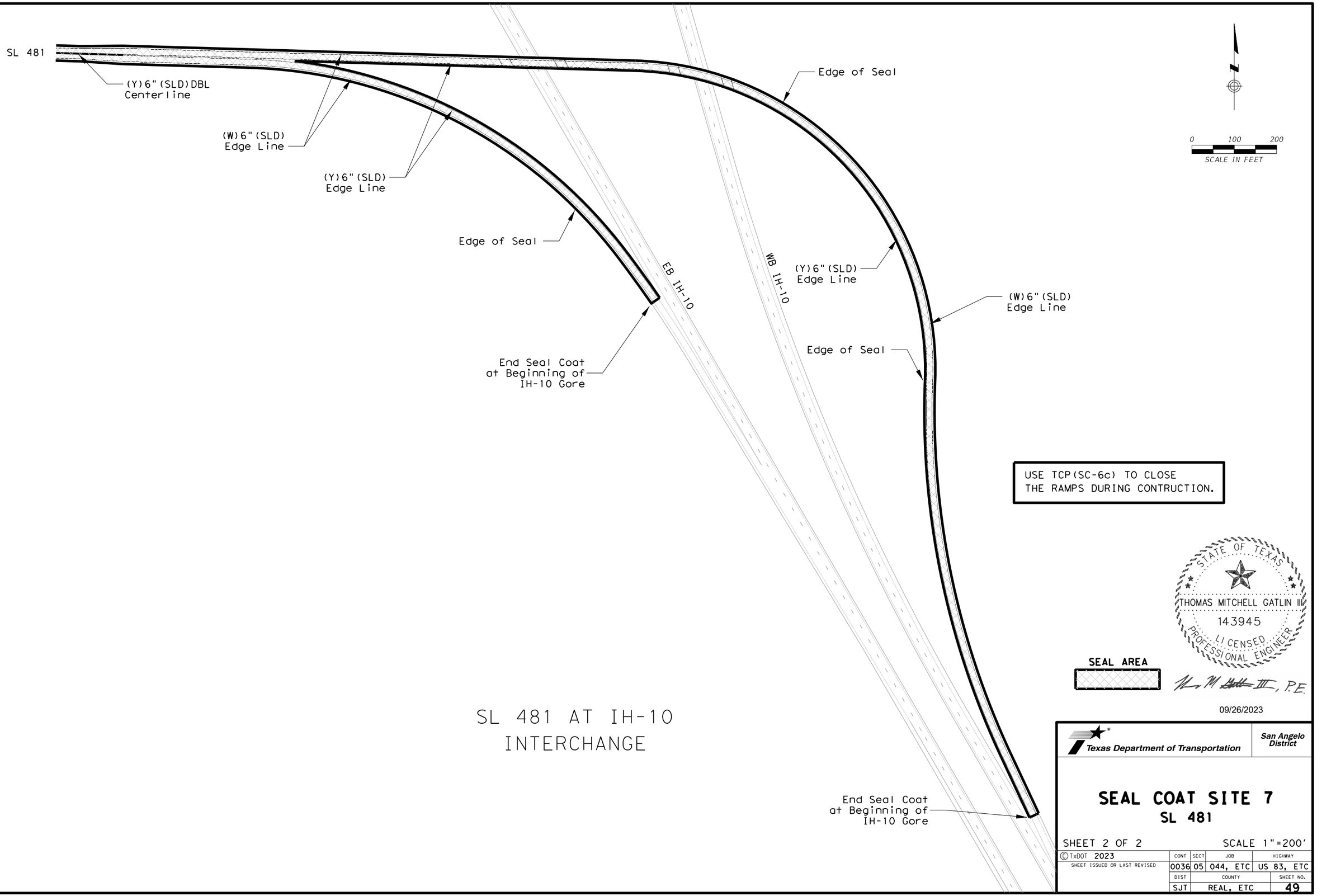
Texas Department of Transportation | San Angelo District

SEAL COAT SITE 7
SL 481

SHEET 1 OF 1 SCALE: VARIES

REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		48



USE TCP(SC-6c) TO CLOSE
THE RAMPS DURING CONTRUCTION.

SEAL AREA

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

SL 481 AT IH-10 INTERCHANGE

Texas Department of Transportation

San Angelo District

SEAL COAT SITE 7
SL 481

SHEET 2 OF 2 SCALE 1"=200'

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC

DIST	COUNTY	SHEET NO.
SJT	REAL, ETC	49

DATE: 9/25/2023 10:06:01 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050441/4 - Design/Plan Set/3. Roadway/SEAL COAT SITE 07 (2 of 2).dgn

DATA FOR FINAL PLANS

Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

SITE INFORMATION

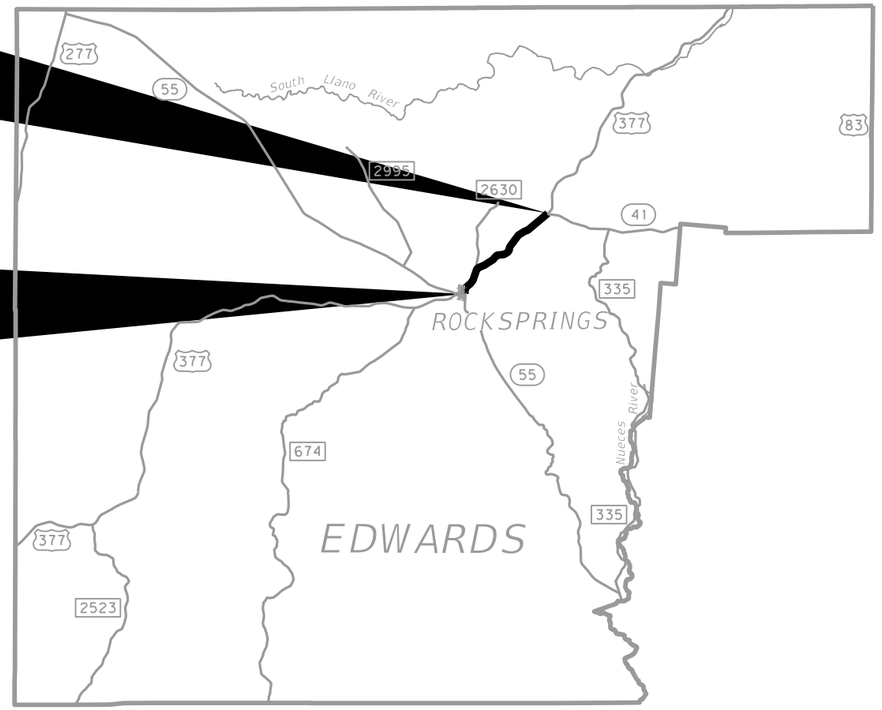
County	Edwards
Ctl-Sec-Job	0201-05-025
Highway	US 377
Length (MI)	8.513
Funct. Class	Major Collector
Limits From	SH 41
Limits To	SH 55
Current ADT	2,591 (2022)

GENERAL NOTES

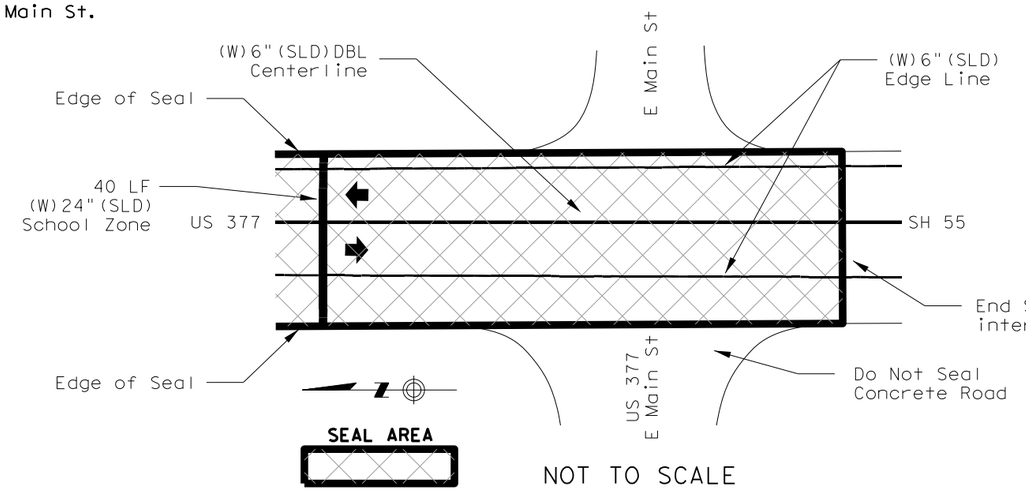
1. Seal coat full roadway width. 12 LF lanes with 4 LF shoulders.
2. See Summary of Surfacing table.
3. End seal at concrete joint at Main St. in Rocksprings.

BEGIN CONSTRUCTION
TRM 586+1.395
DFO 373.419
MILE POINT 9.785
LATITUDE 30.092803°
LONGITUDE -100.114188°

END CONSTRUCTION
TRM 594+1.908
DFO 381.932
MILE POINT 18.298
LATITUDE 30.015751°
LONGITUDE -100.213604°



SITE LOCATION



NOT TO SCALE

(0+00 = TRM 586+1.395)

SUMMARY OF SURFACING

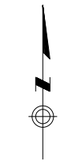
STATION		LENGTH	WIDTH	AREA	0316 6004 ASPH (TIER I)		0316 6238 AGGR(TY-PD GR-3 SAC-B)	
FROM	TO	LF	LF	SY	GAL	0.45 GAL/SY	CY	110 SY/CY
0+00	439+00	43900	32	156,089	70,240		1,419	
439+00	449+50	1050	40	4,667	2,100		42	
TOTALS				160,756	72,340		1,462	

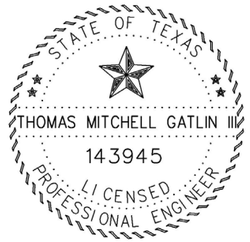
PAVEMENT MARKINGS QUANTITY SUMMARY

0662 6111	0666 6174	0666 6178	0666 6182	0666 6208	0666 6210	0672 6009
WK ZN PAV MRK SHT TERM (TAB)TY Y-2	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	REFL PAV MRKR TY II-A-A
EA	LF	LF	LF	LF	LF	EA
1,088	89,897	175	262	7,900	40,904	916

SUMMARY OF TCP

6001 6001	6185 6005
PORTABLE CHANGEABLE MESSAGE SIGN	TMA (MOBILE OPERATION)
DAY	DAY
5	3





0 5 10
SCALE IN MILES

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation | San Angelo District

SEAL COAT SITE 8
US 377

SHEET 1 OF 1 SCALE: 1"=10 MILES

REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		50

DATE: 9/25/2023 10:06:17 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050442/4 - Design/Plan Set/3. Roadway/SEAL COAT SITE 08.dgn

DATA FOR FINAL PLANS

Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

SITE INFORMATION

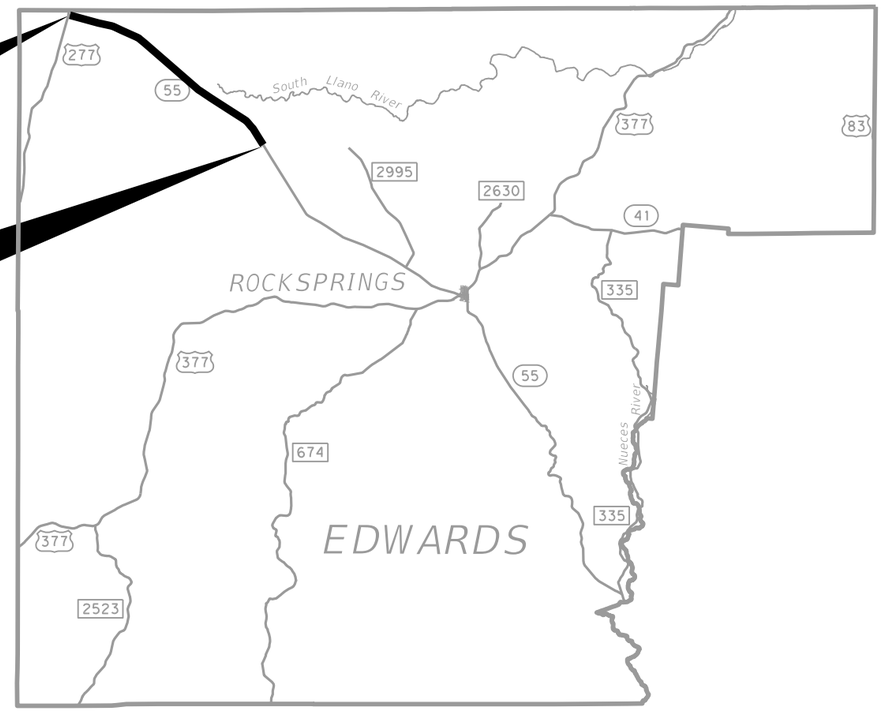
County	Edwards
Ctl-Sec-Job	0234-01-018
Highway	SH 55
Length (MI)	15.847
Funct. Class	Major Collector
Limits From	US 277
Limits To	15.84 Miles South of US 277
Current ADT	397 (2022)

GENERAL NOTES

1. Seal coat full roadway width. 12 LF lanes with 6 LF shoulder widths typical.
2. See Summary of Surfacing.
3. Begin seal coat at ACP joint past intersection with US 277.
4. End seal at County Road 890.

BEGIN CONSTRUCTION
TRM 442+0.000
DFO 0.171
MILE POINT 1.17
LATITUDE 30.283476°
LONGITUDE -100.643967°

END CONSTRUCTION
TRM 458+0.290
DFO 15.847
MILE POINT 16.844
LATITUDE 30.159542°
LONGITUDE -100.430571°



SITE LOCATION

(0+00 = TRM 442+0.171)

SUMMARY OF SURFACING						
STATION		LENGTH	WIDTH	AREA	0316 6004 ASPH (TIER I)	0316 6238 AGGR(TY-PD GR-3 SAC-B)
FROM	TO	LF	LF	SY	GAL 0.45 GAL/SY	CY 110 SY/CY
0+00	730+39	73039	36	292,155	131,470	2,656
730+39	836+72	10633	40	47,259	21,267	430
TOTALS				339,414	152,736	3,086

PAVEMENT MARKINGS QUANTITY SUMMARY					
0662 6111	0666 6174	0666 6208	0666 6210	0672 6009	6185 6005
WK ZN PAV MRK SHT TERM (TAB)TY Y-2	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	REFL PAV MRKR TY II-A-A	TMA (MOBILE OPERATION)
EA	LF	LF	LF	EA	DAY
2,126	165,800	57,007	36,567	1,045	6

0 5 10
SCALE IN MILES

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation | San Angelo District

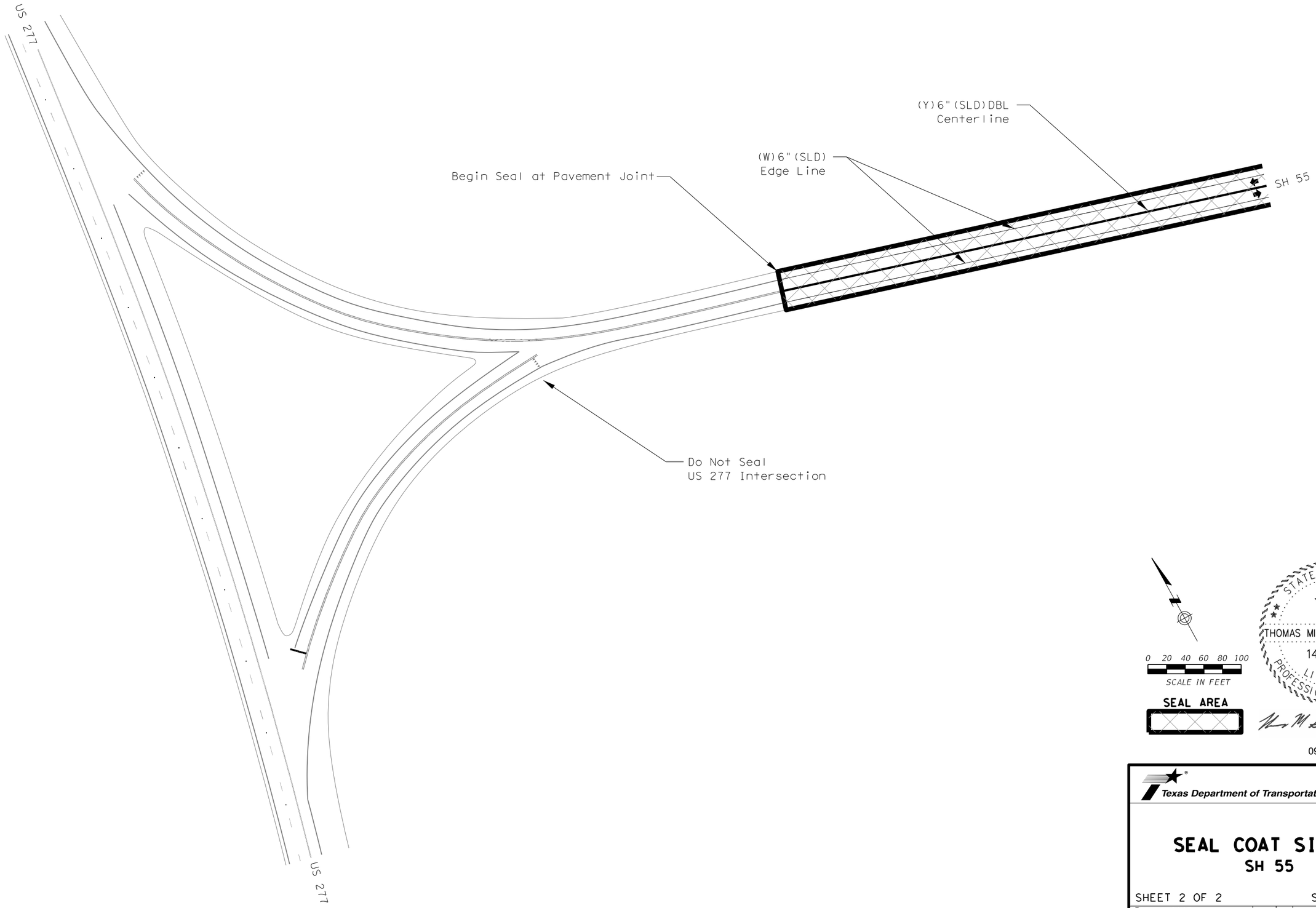
SEAL COAT SITE 9
SH 55

SHEET 1 OF 2 SCALE: 1"=10 MILES

REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		51

DATE: 9/25/2023 10:06:34 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050442/4 - Design/Plan Set/3. Roadway/SEAL COAT SITE 09 (1 of 2).dgn



0 20 40 60 80 100

SCALE IN FEET

SEAL AREA

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation

San Angelo District

SEAL COAT SITE 9
SH 55

SHEET 2 OF 2 SCALE 1"=100'

© TxDOT 2023	CONT	SECT	JOB	HIGHWAY
SHEET ISSUED OR LAST REVISED	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		52

DATE: 9/25/2023 10:06:49 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/003605044/4 - Design/Plan Set/3. Roadway/SEAL COAT SITE 09 (2 of 2).dgn

DATA FOR FINAL PLANS

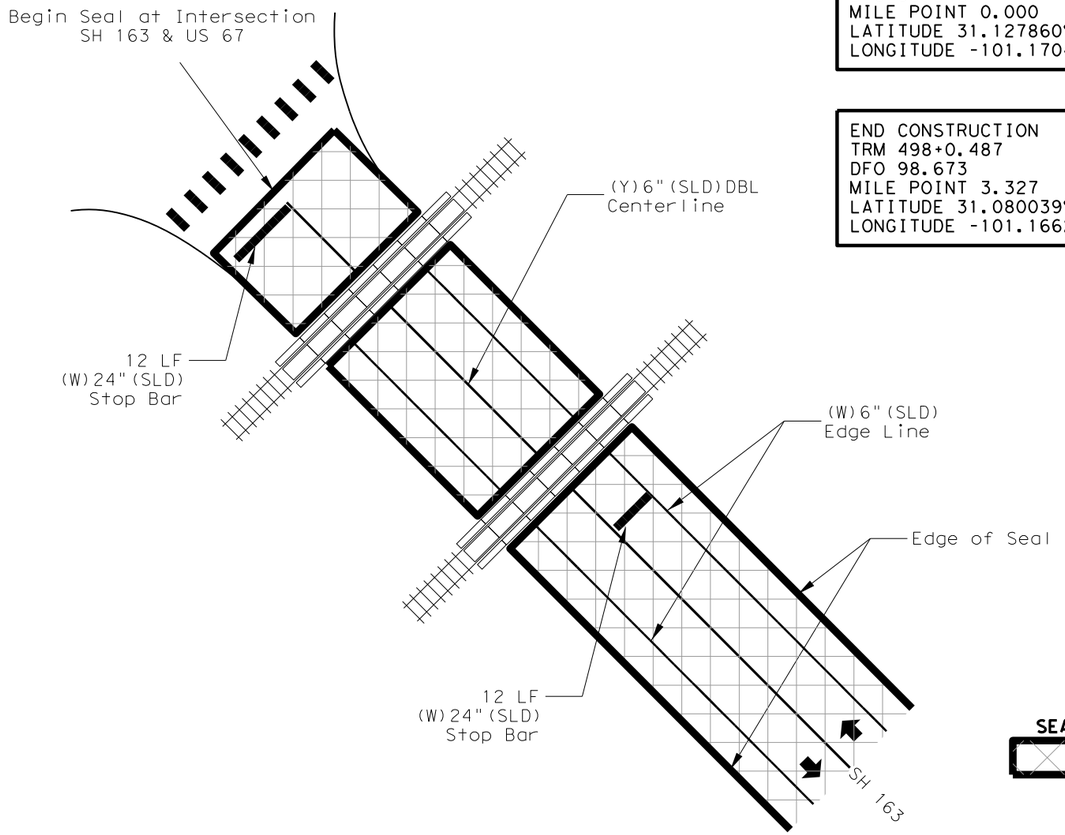
Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

SITE INFORMATION

County	Irion
Ctl-Sec-Job	0412-01-025
Highway	SH 163
Length (MI)	3.327
Funct. Class	Major Collector
Limits From	US 67
Limits To	Crockett CL
Current ADT	1,542 (2022)

GENERAL NOTES

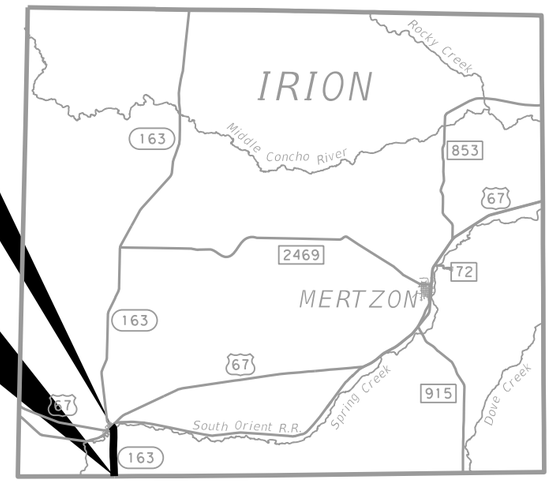
1. Seal coat full roadway width. 12 LF lanes with 7 LF shoulders.
2. See Summary of Surfacing table.
3. End seal coat at Crockett County Line.
4. Seal up to concrete at railroad crossings.



NOT TO SCALE

BEGIN CONSTRUCTION
TRM 494+1.138
DFO 95.346
MILE POINT 0.000
LATITUDE 31.127860°
LONGITUDE -101.170402°

END CONSTRUCTION
TRM 498+0.487
DFO 98.673
MILE POINT 3.327
LATITUDE 31.080039°
LONGITUDE -101.166240°



SITE LOCATION

SEAL AREA

(0+00 = TRM 494+1.138)

SUMMARY OF SURFACING								
STATION		LENGTH	WIDTH	AREA	0316 6004 ASPH (TIER I)		0316 6238 AGGR(TY-PD GR-3 SAC-B)	
FROM	TO	LF	LF	SY	GAL	0.45 GAL/SY	CY	110 SY/CY
0+00	174+92	17492	38	73,855	33,235		672	
TOTALS				73,855	33,235		672	

PAVEMENT MARKINGS QUANTITY SUMMARY							
0662 6111	0666 6174	0666 6182	0666 6208	0666 6210	0668 6089	0672 6009	0677 6028
WK ZN PAV MRK SHT TERM (TAB)TY Y-2	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	PREFAB PAV MRK TY C (W) (RR XING)	REFL PAV MRKR TY II-A-A	ELIM EXT PV MRK & MRKS (RUMBLE STRIP)
EA	LF	LF	LF	LF	EA	EA	LF
448	34,984	58	3,640	15,158	1	380	53,782

SUMMARY OF TCP	
6001 6001	6185 6005
PORTABLE CHANGEABLE MESSAGE SIGN	TMA (MOBILE OPERATION)
DAY	DAY
4	2

0 5 10
SCALE IN MILES

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation | San Angelo District

SEAL COAT SITE 10
SH 163

SHEET 1 OF 1 SCALE: 1"=10 MILES

REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		53

DATE: 9/25/2023 10:07:04 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050442/4 - Design/Plan Set/3. Roadway/SEAL COAT SITE 10.dgn

DATA FOR FINAL PLANS

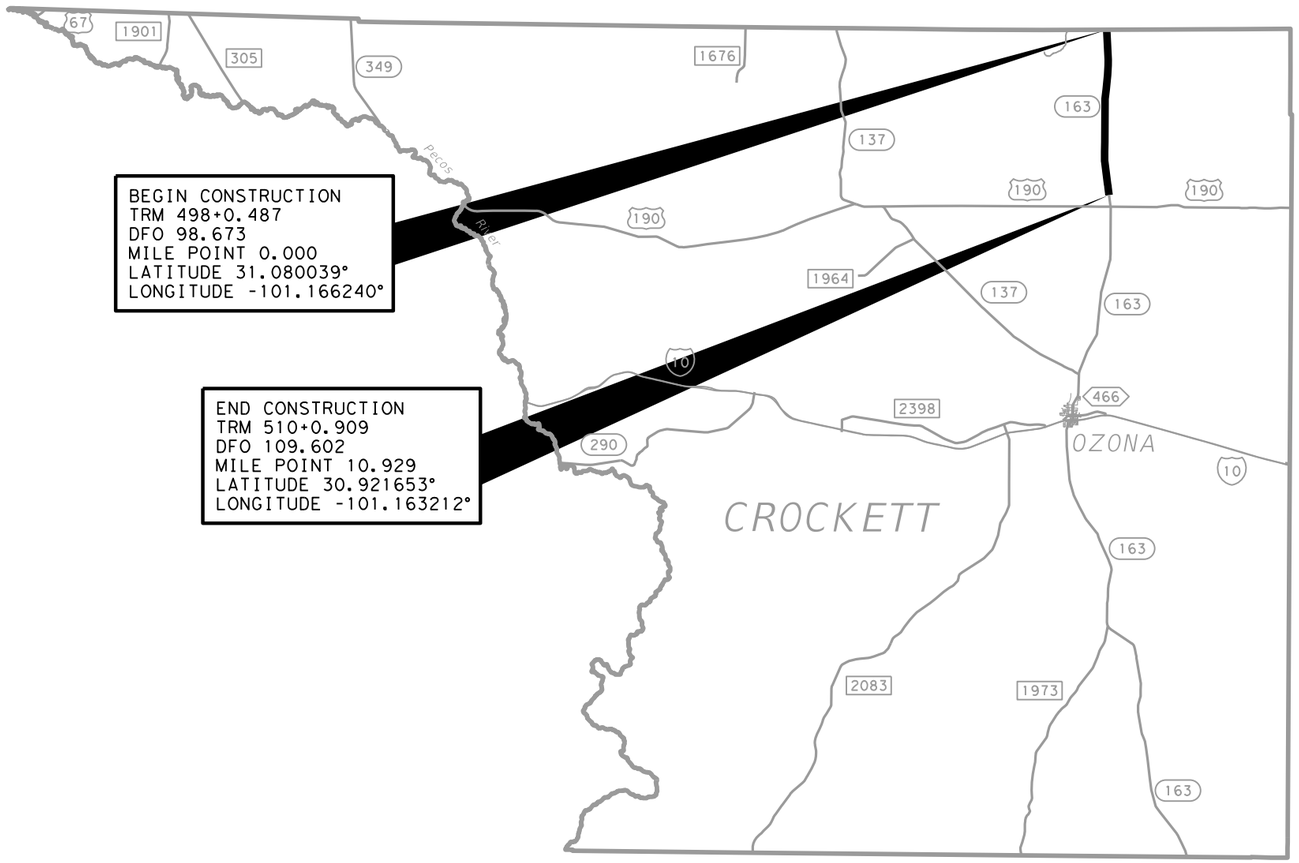
Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

SITE INFORMATION

County	Crockett
Ctl-Sec-Job	0412-02-021
Highway	SH 163
Length (MI)	10.929
Funct. Class	Major Collector
Limits From	Irion CL
Limits To	10.92 Miles South of Irion CL
Current ADT	1,160 (2022)

GENERAL NOTES

1. Seal coat full roadway width. 12 LF lanes with 7 LF shoulders.
2. See Summary of Surfacing table.
3. End seal coat at TRM 510+0.909.



SITE LOCATION

(0+00 = TRM 498+0.487)

SUMMARY OF SURFACING

STATION		LENGTH	WIDTH	AREA	0316 6004 ASPH (TIER I)		0316 6238 AGGR(TY-PD GR-3 SAC-B)	
FROM	TO	LF	LF	SY	GAL	0.45 GAL/SY	CY	110 SY/CY
0+00	577+06	57706	38	243,648	109,642		2,215	
TOTALS				243,648	109,642		2,215	

PAVEMENT MARKINGS QUANTITY SUMMARY

0662 6111	0666 6174	0666 6208	0666 6210	0672 6009	0677 6028
WK ZN PAV MRK SHT TERM (TAB) TY Y-2	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	REFL PAV MRKR TY II-A-A	ELIM EXT PV MRK & MRKS (RUMBLE STRIP)
EA	LF	LF	LF	EA	LF
1,450	115,412	14,500	5,925	802	135,837

SUMMARY OF TCP

6001 6001	6185 6005
PORTABLE CHANGEABLE MESSAGE SIGN	TMA (MOBILE OPERATION)
DAY	DAY
6	3

0 5 10
SCALE IN MILES

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation — San Angelo District

SEAL COAT SITE 11
SH 163

SHEET 1 OF 1 SCALE: 1"=10 MILES

REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		54

DATE: 9/25/2023 10:07:19 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050444/4 - Design/Plan Set/3. Roadway/SEAL COAT SITE 11.dgn

DATA FOR FINAL PLANS

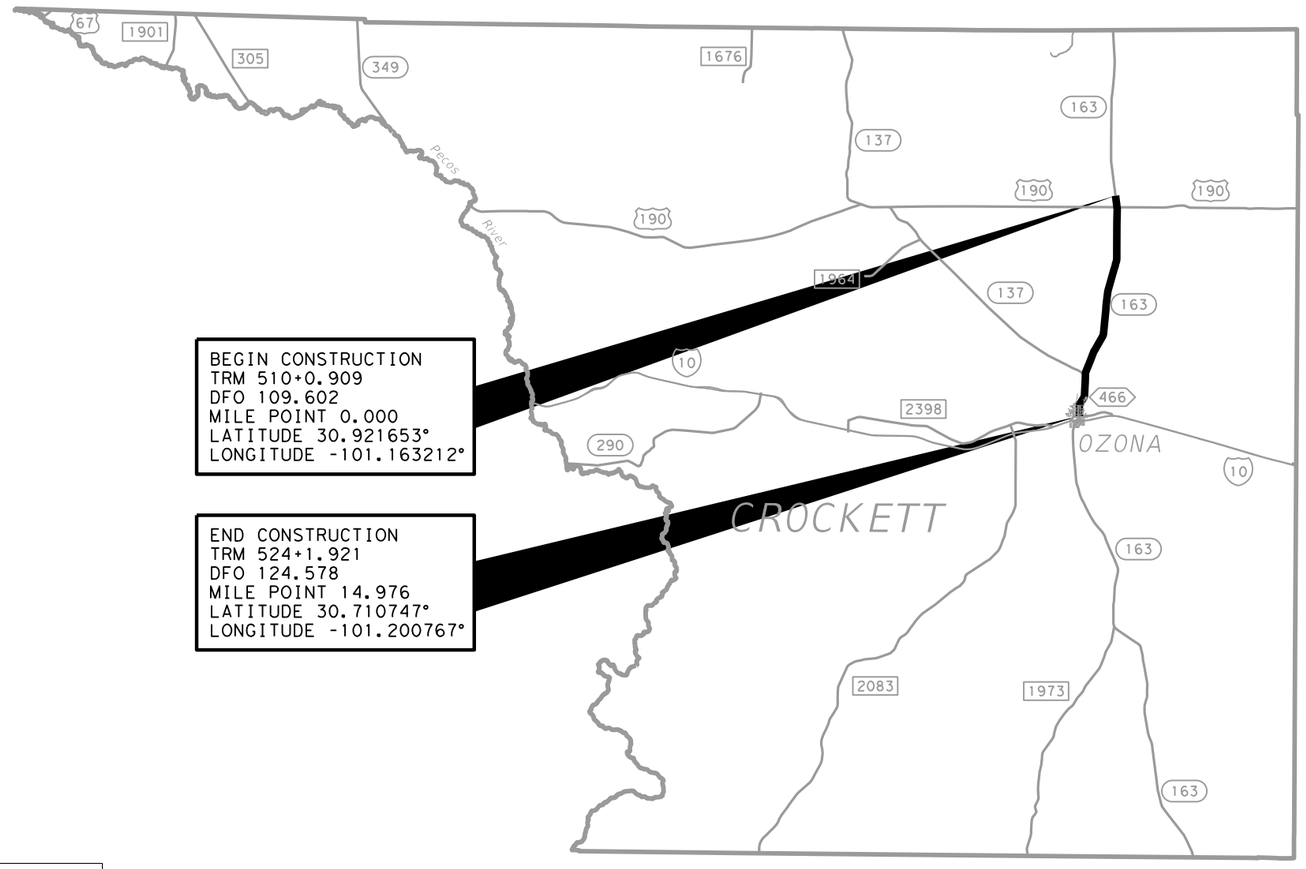
Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

SITE INFORMATION

County	Crockett
Ctl-Sec-Job	0412-03-037
Highway	SH 163
Length (MI)	14.976
Funct. Class	Major Collector
Limits From	10.92 Miles South of Irion CL
Limits To	SL 466
Current ADT	5,958 (2022)

GENERAL NOTES

1. Seal coat full roadway width. 12 LF lanes with 10 LF shoulders.
2. In Ozona Seal the full width of the road up to the concrete joint just before the curb and gutter. See Summary of Surfacing table.
3. End seal coat at SL 466 in Ozona.



SITE LOCATION

(0+00 = TRM 510+0.909)

SUMMARY OF SURFACING

STATION FROM	STATION TO	LENGTH LF	WIDTH LF	AREA SY	0316 6004 ASPH (TIER I) GAL (0.45 GAL/SY)	0316 6238 AGGR(TY-PD GR-3 SAC-B) CY (110 SY/CY)
0+00	636+40	63640	44	311,128	140,008	2,828
636+40	639+99	359	56	2,234	1,005	20
639+99	645+74	576	68	4,348	1,957	40
645+74	653+51	776	58	5,002	2,251	45
653+51	725+05	7154	48	38,157	17,171	347
725+05	730+49	544	54	3,263	1,468	30
730+49	790+47	5998	60	39,987	17,994	364
TOTALS				404,119	181,854	3,674

SUMMARY OF TCP

6001 6001	6185 6005
PORTABLE CHANGEABLE MESSAGE SIGN	TMA (MOBILE OPERATION)
DAY	DAY
8	5

PAVEMENT MARKINGS QUANTITY SUMMARY

0662 6109	0662 6111	0666 6171	0666 6174	0666 6178	0666 6182	0666 6208	0666 6210	0668 6077	0668 6085	0668 6113	0672 6007	0672 6009	0677 6028
WK ZN PAV MRK SHT TERM (TAB)TY W	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	REFL PAV MRK TY II (W) 6" (BRK)	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	PREFAB PAV MRK TY C (W) (ARROW)	PREFAB PAV MRK TY C (W) (WORD)	PRE PM TY C(ACC PRK)(BL&WH)(W/BORDR)LG	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	ELIM EXT PV MRK & MRKS (RUMBLE STRIP)
EA	EA	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	LF
264	2,012	2,640	147,560	840	590	16,720	45,666	8	8	1	132	1,420	209,446

SCALE IN MILES 0 5 10

THOMAS MITCHELL GATLIN III
143945
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

09/26/2023

Texas Department of Transportation | San Angelo District

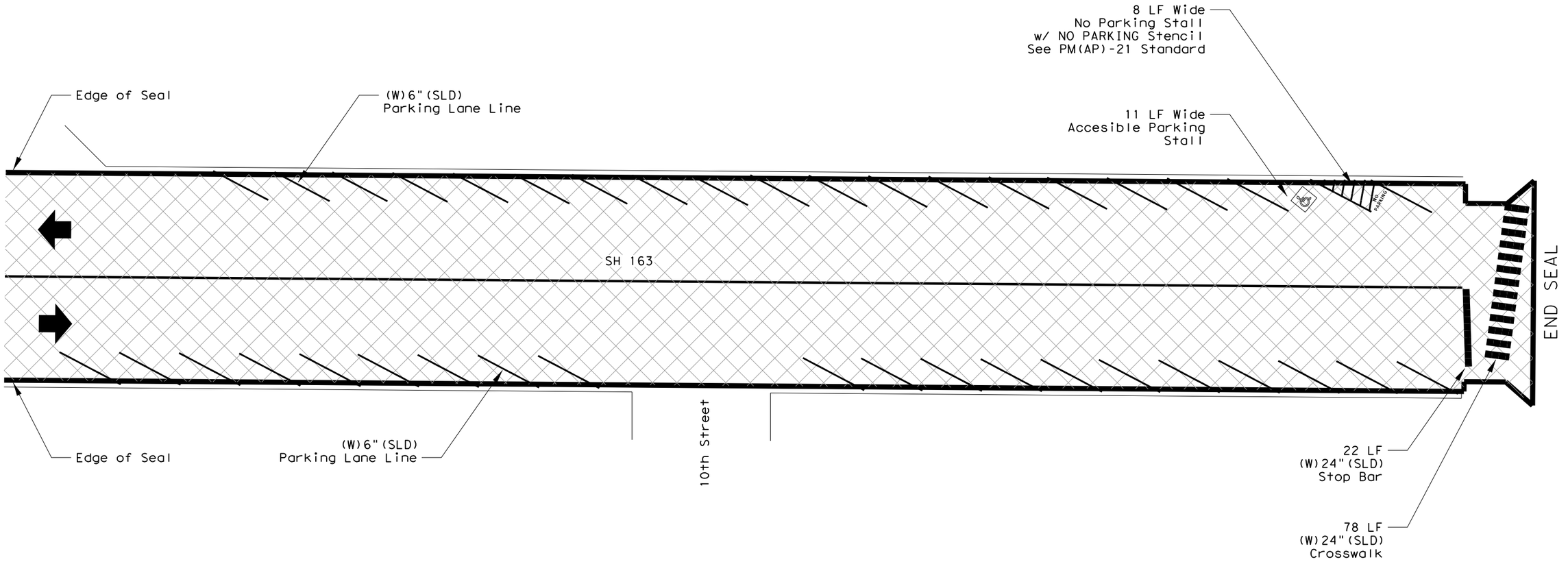
SEAL COAT SITE 12
SH 163

SHEET 1 OF 2 SCALE: 1"=10 MILES

REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		55

DATE: 9/25/2023 10:07:35 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050442 - Design/Plan Set/3. Roadway/SEAL COAT SITE 12 (1 of 2).dgn



0 10 20 30
SCALE IN FEET

SEAL AREA

SEAL THE WIDTH OF THE ROAD UP TO THE CONCRETE.

8 FEET WIDE PARKING STALLS EXCEPT FOR THE ACCESSIBLE PARKING WHICH WILL BE 11 FEET WIDE.

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation | San Angelo District

SEAL COAT SITE 12
SH 163

SHEET 2 OF 2 | SCALE 1"=30'

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		56

DATE: 9/25/2023 10:07:50 AM
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DATA FOR FINAL PLANS

Asphalt Supplier	_____
Asphalt Type	_____
Asphalt Rate (GAL/SY)	_____
Aggregate Source	_____
Aggregate Rate (SY/CY)	_____

SITE INFORMATION

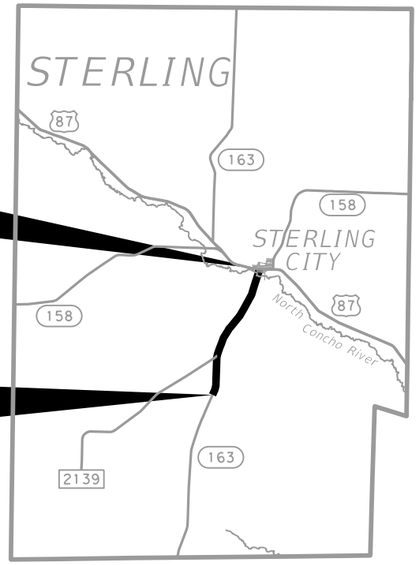
County	Sterling
Ctl-Sec-Job	1648-01-014
Highway	SH 163
Length (MI)	9.053
Funct. Class	Major Collector
Limits From	US 87
Limits To	9.053 Miles South of US 87
Current ADT	723 (2022)

GENERAL NOTES

1. Seal coat full roadway width. 12 LF lanes with varying shoulder widths.
2. See Summary of Surfacing table.
3. End seal coat at TRM 450+0.722.

BEGIN CONSTRUCTION
TRM 442-0.329
DFO 43.927
MILE POINT 0.000
LATITUDE 31.835859°
LONGITUDE -100.991768°

END CONSTRUCTION
TRM 450+0.722
DFO 52.980
MILE POINT 9.053
LATITUDE 31.712449°
LONGITUDE -101.041129°



SITE LOCATION

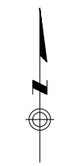
(0+00 = TRM 676+0.807)

SUMMARY OF SURFACING

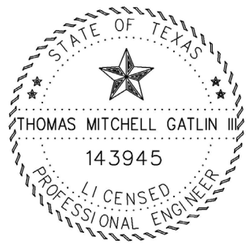
STATION		LENGTH	WIDTH	AREA	0316 6004 ASPH (TIER I)		0316 6238 AGGR(TY-PD GR-3 SAC-B)	
FROM	TO	LF	LF	SY	GAL	0.45 GAL/SY	CY	110 SY/CY
0+00	12+00	1200	44	5,867	2,640		53	
12+00	19+60	760	34	2,871	1,292		26	
19+60	478+27	45867	24	122,313	55,041		1,112	
TOTALS				131,051	58,973		1,192	

PAVEMENT MARKINGS QUANTITY SUMMARY

0662 6111	0666 6174	0666 6182	0666 6208	0666 6210	0672 6009	0677 6028	6185 6005
WK ZN PAV MRK SHT TERM (TAB) TY Y-2	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	REFL PAV MRKR TY II-A-A	ELIM EXT PV MRK & MRKS (RUMBLE STRIP)	TMA (MOBILE OPERATION)
EA	LF	LF	LF	LF	EA	LF	DAY
1,202	95,555	192	11,650	27,364	933	133,969	3



0 5 10
SCALE IN MILES



09/26/2023

Texas Department of Transportation | San Angelo District

SEAL COAT SITE 13
SH 163

SHEET 1 OF 1 SCALE: 1"=10 MILES

REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		57

DATE: 9/25/2023 10:08:06 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050442/4 - Design/Plan Set/3. Roadway/SEAL COAT SITE 13.dgn

DATA FOR FINAL PLANS

Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

SITE INFORMATION

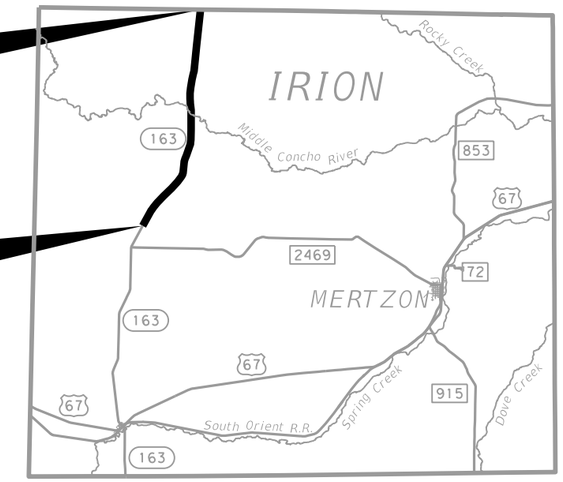
County	Irion
Ctl-Sec-Job	1648-04-016
Highway	SH 163
Length (MI)	15.308
Funct. Class	Major Collector
Limits From	Tom Green CL
Limits To	15.4 Miles South of Tom Green CL
Current ADT	457 (2022)

GENERAL NOTES

1. Seal coat full roadway width. 12 LF lanes.
2. See Summary of Surfacing table.
3. End seal coat at TRM 480+1.370.

BEGIN CONSTRUCTION
TRM 466+0.012
DFO 66.280
MILE POINT 0.000
LATITUDE 31.526780°
LONGITUDE -101.087424°

END CONSTRUCTION
TRM 480+1.370
DFO 81.588
MILE POINT 15.308
LATITUDE 31.320179°
LONGITUDE -101.150323°



(0+00 = TRM 466+0.012)

SUMMARY OF SURFACING

STATION FROM	STATION TO	LENGTH LF	WIDTH LF	AREA SY	0316 6004 ASPH (TIER I) GAL 0.45 GAL/SY	0316 6238 AGGR(TY-PD GR-3 SAC-B) CY 110 SY/CY
0+00	806+68	80668	25	224,077	100,835	2,037
TOTALS				224,077	100,835	2,038

PAVEMENT MARKINGS QUANTITY SUMMARY

0662 6111	0666 6174	0666 6208	0666 6210	0672 6009	0677 6028	6185 6005
WK ZN PAV MRK SHT TERM (TAB)TY Y-2	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	REFL PAV MRKR TY II-A-A	ELIM EXT PV MRK & MRKS (RUMBLE STRIP)	TMA (MOBILE OPERATION)
EA	LF	LF	LF	EA	LF	DAY
2,043	161,652	17,360	50,287	1,510	229,299	5

0 5 10
SCALE IN MILES

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation
San Angelo District

SEAL COAT SITE 14
SH 163

SHEET 1 OF 1 SCALE: 1"=10 MILES

REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		58

DATE: 9/25/2023 10:08:21 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050444 - Design/Plan Set/3. Roadway/SEAL COAT SITE 14.dgn

DATA FOR FINAL PLANS

Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

SITE INFORMATION

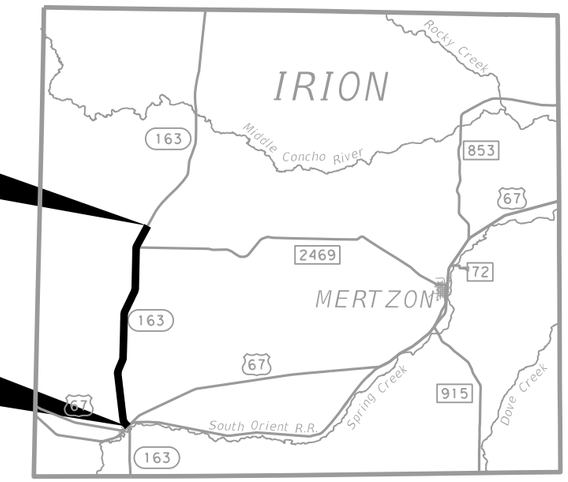
County	Irion
Ctl-Sec-Job	1648-05-015
Highway	SH 163
Length (MI)	13.758
Funct. Class	Major Collector
Limits From	15.4 Miles South of Tom Green CL
Limits To	US 67
Current ADT	924 (2022)

GENERAL NOTES

1. Seal coat full roadway width. 12 LF lanes.
2. See Summary of Surfacing table.
3. End seal coat at US 67 in Barnhart.
4. For items REFL PAV MRKR TY I-C and REFL PAV MRKR TY II-C-R they are used for the gores at RM 2469. See sheet 2 of 2.

BEGIN CONSTRUCTION
TRM 480+1.370
DFO 81.588
MILE POINT 15.139
LATITUDE 31.320179°
LONGITUDE -101.150323°

END CONSTRUCTION
TRM 494+1.138
DFO 95.346
MILE POINT 28.897
LATITUDE31.127903°
LONGITUDE -101.170688°



SITE LOCATION

(0+00 = TRM 676+0.807)

SUMMARY OF SURFACING

STATION		LENGTH	WIDTH	AREA	0316 6004 ASPH (TIER I)	0316 6238 AGGR(TY-PD GR-3 SAC-B)
FROM	TO	LF	LF	SY	GAL 0.45 GAL/SY	CY 110 SY/CY
0+00	712+06	71206	24	189,883	85,447	1,726
712+06	725+76	1370	50	7,611	3,425	69
TOTALS				197,494	88,872	1,796

SUMMARY OF TCP

6001 6001	6185 6005
PORTABLE CHANGEABLE MESSAGE SIGN	TMA (MOBILE OPERATION)
DAY	DAY
6	5

PAVEMENT MARKINGS QUANTITY SUMMARY

0662 6111	0666 6174	0666 6178	0666 6182	0666 6208	0666 6210	0668 6089	0672 6007	0672 6009	0672 6010	0677 6028
WK ZN PAV MRK SHT TERM (TAB) TY Y-2	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	PREFAB PAV MRK TY C (W) (RR XING)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	ELIM EXT PV MRK & MRKS (RUMBLE STRIP)
EA	LF	LF	LF	LF	LF	EA	EA	EA	EA	LF
1,828	145,024	320	24	14,490	50,868	1	28	1,369	16	210,382

0 5 10
SCALE IN MILES

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

09/26/2023

Texas Department of Transportation | San Angelo District

SEAL COAT SITE 15
SH 163

SHEET 1 OF 2 SCALE: 1"=10 MILES

REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		59

DATE: 9/25/2023 10:08:35 AM
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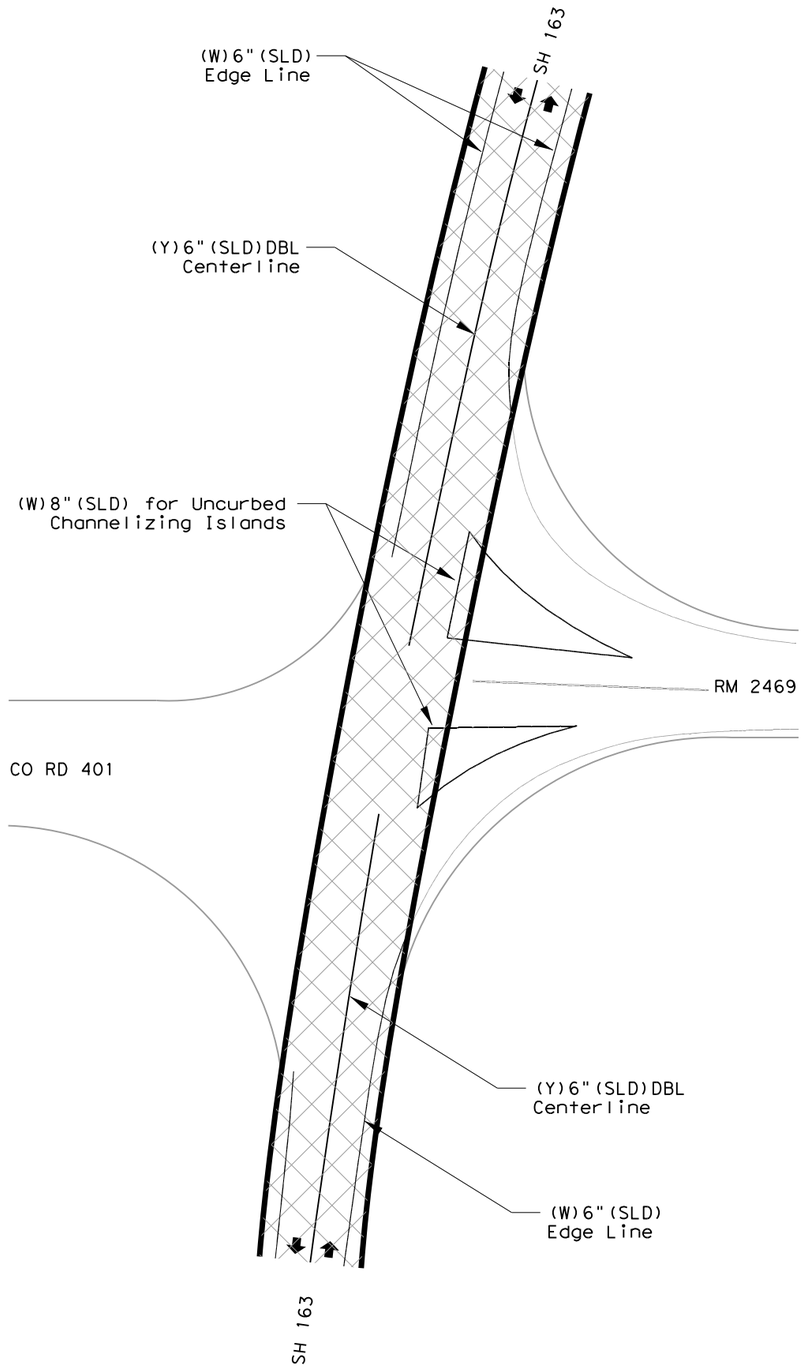


0 25 50
SCALE IN FEET

SEAL AREA

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation | San Angelo District

SEAL COAT SITE 15
SH 163

SHEET 2 OF 2 SCALE: 1"= 50'

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		60

DATE: 9/25/2023 10:08:50 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050444/4 - Design/Plan Set/3. Roadway/SEAL COAT SITE 15 (2 of 2).dgn

DATA FOR FINAL PLANS

Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

SITE INFORMATION

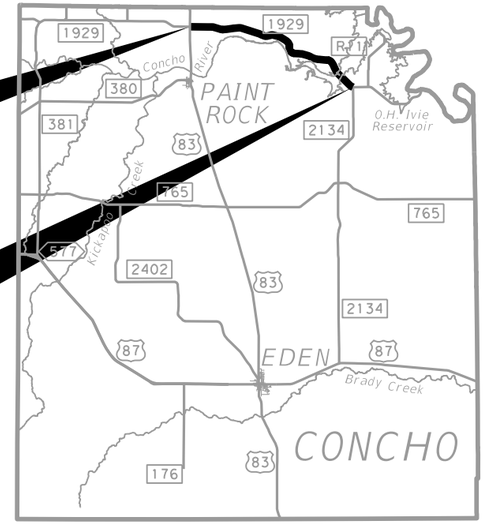
County	Irion
Ctl-Sec-Job	1651-07-011
Highway	FM 1929
Length (MI)	12.421
Funct. Class	Major Collector
Limits From	US 83
Limits To	FM 2134
Current ADT	459 (2022)

GENERAL NOTES

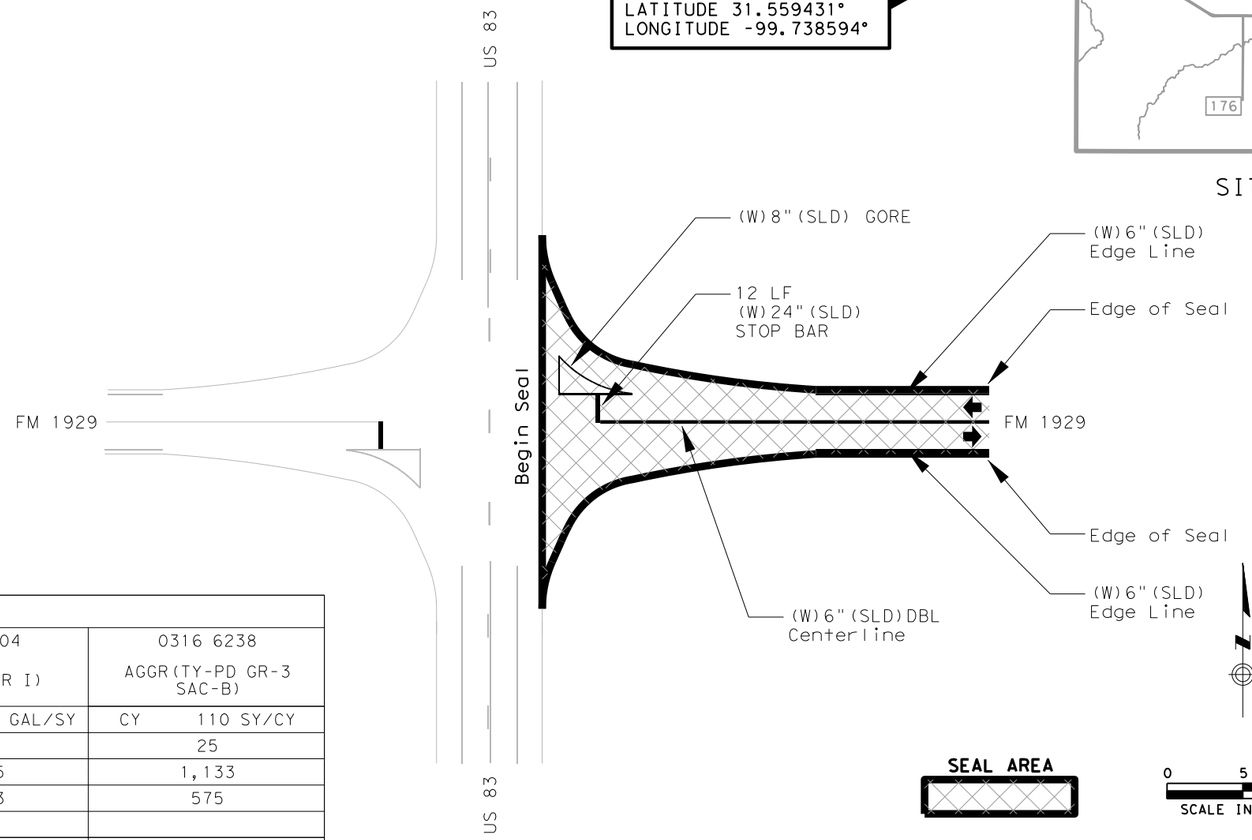
1. Seal coat full roadway width. 11 LF lanes typical with varying shoulder widths.
2. For items REFL PAV MRKR TY I-C and REFL PAV MRKR TY II-C-R they are used for the gore at the beginning of job at US 83.
3. See Summary of Surfacing table.
4. End seal coat at FM 2134.

BEGIN CONSTRUCTION
TRM 402+1.380
DFO 15.371
MILE POINT 8.431
LATITUDE 31.559431°
LONGITUDE -99.920722°

END CONSTRUCTION
TRM 416+0.172
DFO 27.792
MILE POINT 20.852
LATITUDE 31.559431°
LONGITUDE -99.738594°



SITE LOCATION



FM 1929 AT US 83
NOT TO SCALE

(0+00 = TRM 402+1.380)

SUMMARY OF SURFACING									
STATION		LENGTH	WIDTH		AREA	0316 6004 ASPH (TIER I)		0316 6238 AGGR(TY-PD GR-3 SAC-B)	
FROM	TO	LF	* AVG	LF	SY	GAL	0.45 GAL/SY	CY	110 SY/CY
Taper From US 83 Interchange					2,800	1,260		25	
10+25	520+29	51004		22	124,677	56,105		1,133	
520+29	655+83	13554	*	42	63,251	28,463		575	
TOTALS					190,728	85,828		1,734	

PAVEMENT MARKINGS QUANTITY SUMMARY										
0662 6111	0666 6174	0666 6178	0666 6182	0666 6208	0666 6210	0668 6092	0672 6007	0672 6009	0672 6010	6185 6005
WK ZN PAV MRK SHT TERM (TAB)TY Y-2	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	PREFAB PAV MRK TY C (W) (36")(YLD TRI)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	TMA (MOBILE OPERATION)
EA	LF	LF	LF	LF	LF	EA	EA	EA	EA	DAY
1,658	131,102	80	12	10,020	76,744	5	7	1,401	4	5

THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

09/26/2023

Texas Department of Transportation
San Angelo District

SEAL COAT SITE 16
FM 1929

SHEET 1 OF 1 SCALE: 1"=10 MILES

REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		61

DATE: 9/25/2023 10:09:06 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050044/4 - Design/Plan Set/3. Roadway/SEAL COAT SITE 16.dgn

DATA FOR FINAL PLANS

Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

SITE INFORMATION

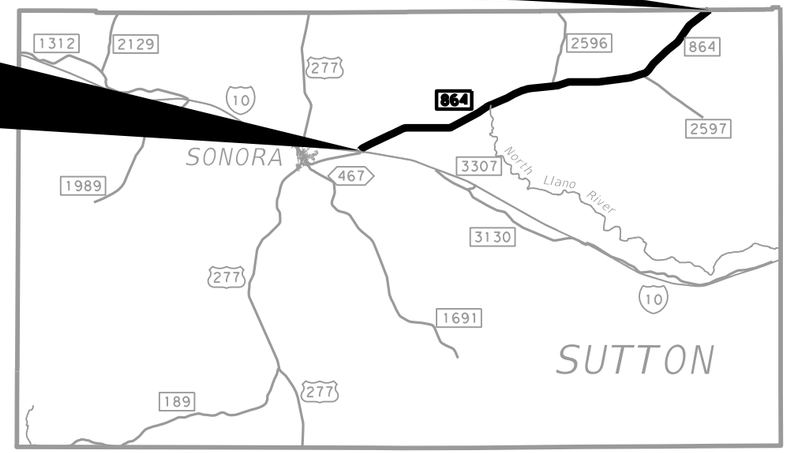
County	Sutton
Ctl-Sec-Job	1846-01-025
Highway	RM 864
Length (MI)	26.002
Funct. Class	Major Collector
Limits From	IH 10
Limits To	Schleicher CL
Current ADT	365 (2022)

GENERAL NOTES

1. Seal coat full roadway width. 12 LF lanes with varying shoulder widths.
2. See Summary of Surfacing table.
3. Begin seal coat across bridge over IH 10 at intersection with SL 467. See Sheet 2 of 2.
4. End seal at Schleicher County Line.

END CONSTRUCTION
TRM 414+1.387
DFO 2.127
MILE POINT 5.460
LATITUDE 30.481161°
LONGITUDE -99.758959°

BEGIN CONSTRUCTION
TRM 414-0.402
DFO 0.336
MILE POINT 3.669
LATITUDE 30.477019°
LONGITUDE -99.776749°



SITE LOCATION

(0+00 = TRM 676+0.807)

SUMMARY OF SURFACING

STATION		LENGTH	WIDTH	AREA	0316 6004 ASPH (TIER I)		0316 6238 AGGR(TY-PD GR-3 SAC-B)	
FROM	TO	LF	LF	SY	GAL	0.45 GAL/SY	CY	110 SY/CY
Taper From SL 467				625	281		6	
0+00	7+76	776	32	2,759	1,242		25	
7+76	1077+70	106994	26	309,094	139,092		2,810	
1077+70	1380+07	30237	23	77,272	34,772		702	
TOTALS				389,750	175,388		3,544	

PAVEMENT MARKINGS QUANTITY SUMMARY

0662 6111	0666 6174	0666 6178	0666 6182	0666 6208	0666 6210	0668 6077	0668 6085	0668 6092	0672 6007	0672 6009	6185 6005
WK ZN PAV MRK SHT TERM (TAB) TY Y-2	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	PREFAB PAV MRK TY C (W) (ARROW)	PREFAB PAV MRK TY C (W) (WORD)	PREFAB PAV MRK TY C (W) (36") (YLD TRI)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	TMA (MOBILE OPERATION)
EA	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	DAY
3,480	276,161	135	20	33,020	56,443	1	1	4	14	1,840	8

0 5 10
SCALE IN MILES

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation | San Angelo District

SEAL COAT SITE 17
RM 864

SHEET 1 OF 2 SCALE: 1"=10 MILES

© TxDOT 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		62

DATE: 9/25/2023 10:09:21 AM
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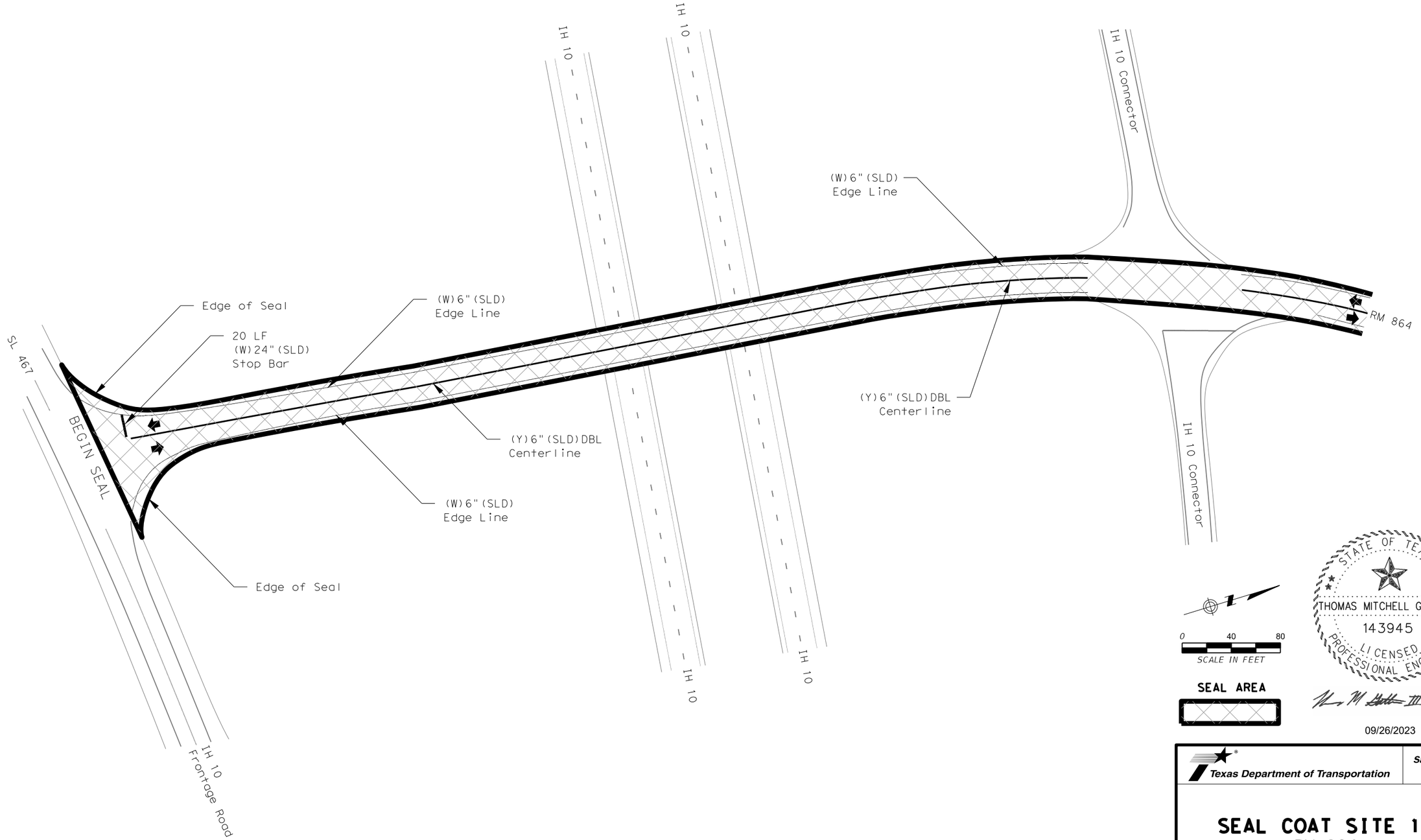

0 40 80
SCALE IN FEET

SEAL AREA

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation | San Angelo District

SEAL COAT SITE 17
RM 864

SHEET 2 of 2 SCALE 1"=80'

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SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		63

DATE: 9/25/2023 10:09:36 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050441/4 - Design/Plan Set/3. Roadway/SEAL COAT SITE 17 (2 of 2).dgn

DATA FOR FINAL PLANS

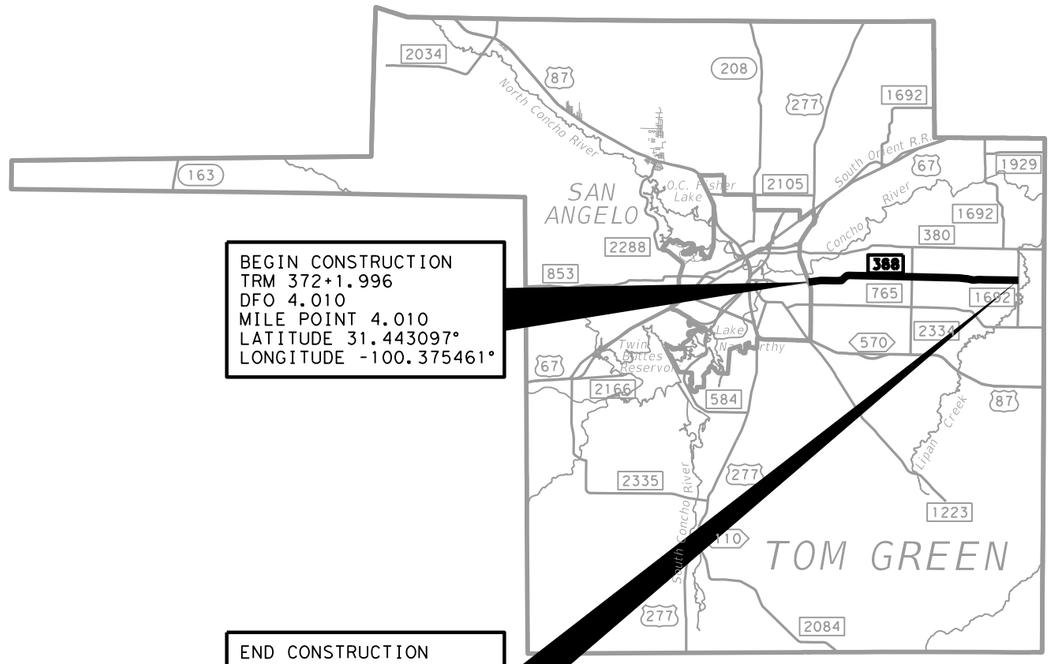
Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

SITE INFORMATION

County	Tom Green
Ctl-Sec-Job	2284-01-033
Highway	FM 388
Length (MI)	13.950
Funct. Class	Major Collector
Limits From	SL 306
Limits To	FM 1692
Current ADT	1,084 (2022)

GENERAL NOTES

1. Seal coat full roadway width. 12 LF lanes with 2 LF shoulder widths.
2. See Summary of Surfacing table.
3. Install preformed in-lane rumble strips at both the west end and the east end of FM 388 according to RS(5)-23 standard.
4. End seal coat at FM 1692.



BEGIN CONSTRUCTION
TRM 372+1.996
DFO 4.010
MILE POINT 4.010
LATITUDE 31.443097°
LONGITUDE -100.375461°

END CONSTRUCTION
TRM 386+2.158
DFO 17.960
MILE POINT 17.960
LATITUDE 31.444604°
LONGITUDE -100.141195°

SITE LOCATION

(0+00 = TRM 372+1.996)

SUMMARY OF SURFACING

STATION FROM	STATION TO	LENGTH LF	WIDTH LF	AREA SY	0316 6004 ASPH (TIER I) GAL	0.45 GAL/SY	0316 6238 AGGR(TY-PD GR-3 SAC-B) CY	110 SY/CY
Transition from SL 306				3,215	1,447		29	
5+97	365+01	35904	28	111,701	50,265		1,015	
Transition to FM 2334				755	340		7	
Transition from FM 2334				755	340		7	
366+91	947+34	58043	28	180,578	81,260		1,642	
Transition to FM 1692				450	203		4	
TOTALS				297,454	133,854		2,705	

SUMMARY OF TCP

6001 6001	6185 6005
PORTABLE CHANGEABLE MESSAGE SIGN	TMA (MOBILE OPERATION)
DAY	DAY
7	4

PAVEMENT MARKINGS QUANTITY SUMMARY

0662 6111	0666 6174	0666 6178	0666 6182	0666 6208	0666 6210	0668 6077	0668 6085	0672 6007	0672 6009	6056 6001
WK ZN PAV MRK SHT TERM (TAB)TY Y-2	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	PREFAB PAV MRK TY C (W) (ARROW)	PREFAB PAV MRK TY C (W) (WORD)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	PREFORMED IN-LANE(TRANS) RUMBLE STRIP
EA	LF	LF	LF	LF	LF	EA	EA	EA	EA	LF
1,863	145,912	175	100	16,700	17,286	2	2	9	1,057	240

0 5 10
SCALE IN MILES

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

10/06/2023

Texas Department of Transportation

San Angelo District

SEAL COAT SITE 18
FM 388

SHEET 1 OF 3 SCALE: 1"=10 MILES

REVISIONS

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC
DIST	COUNTY		SHEET NO.
SJT	REAL, ETC		64

DATE: 10/6/2023 8:50:52 AM
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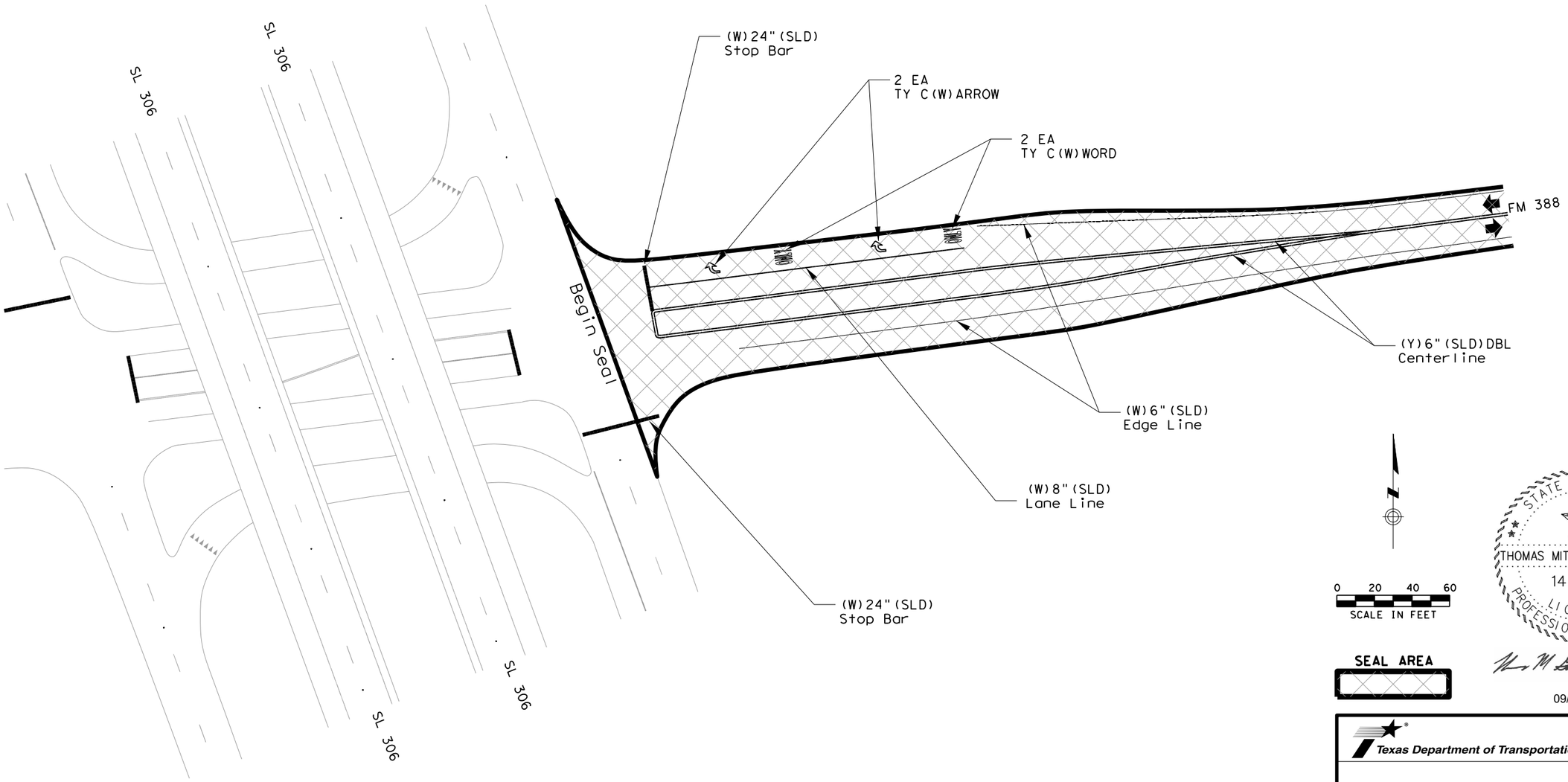


0 20 40 60
SCALE IN FEET

SEAL AREA

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation

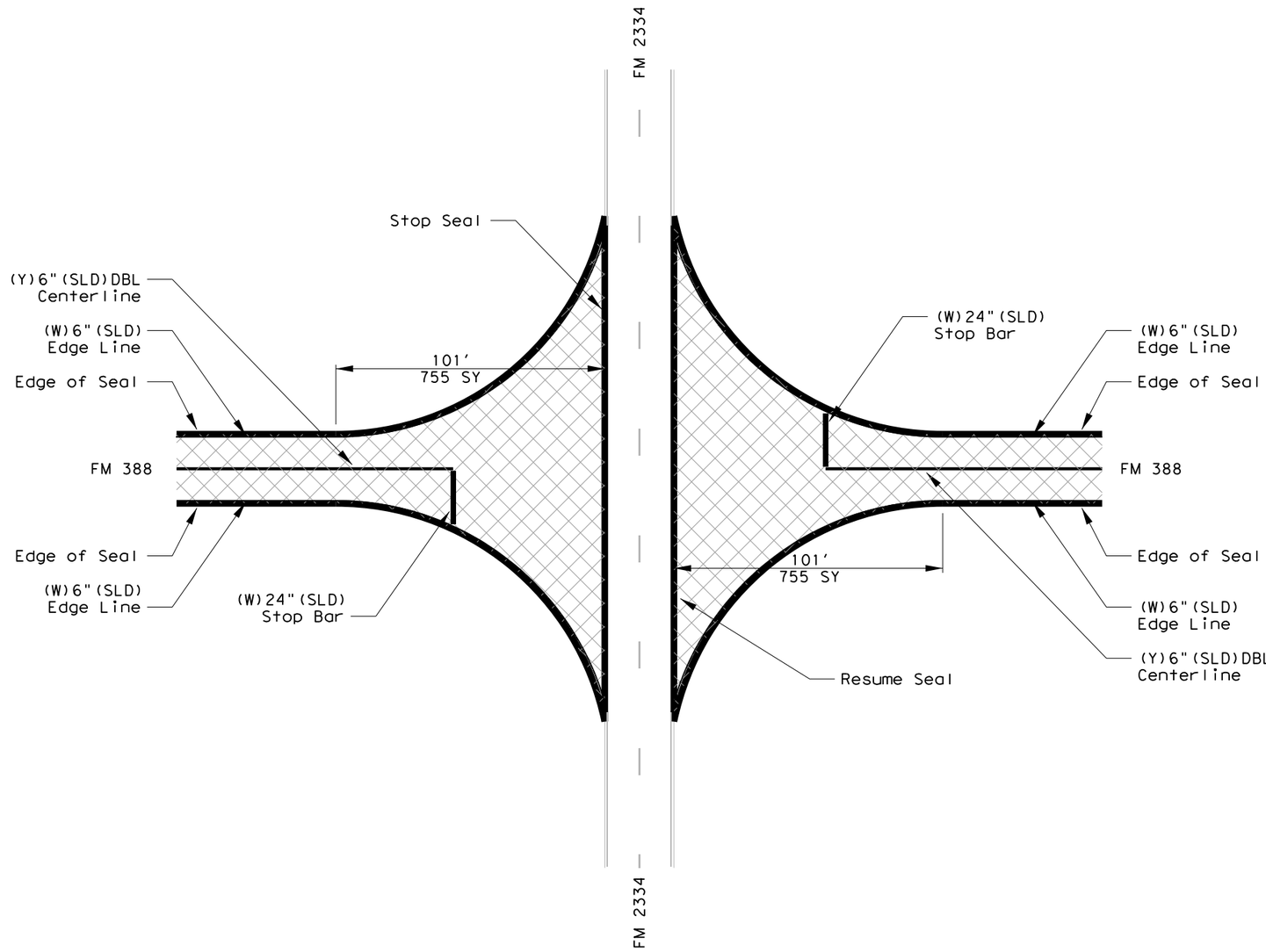
San Angelo District

SEAL COAT SITE 18
FM 388

SHEET 2 OF 3 SCALE: 1"= 60'

© TxDOT 2023	CONT	SECT	JOB	HIGHWAY
SHEET ISSUED OR LAST REVISED	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		65

DATE: 9/25/2023 10:10:07 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/00360504/4 - Design/Plan Set/3. Roadway/SEAL COAT SITE 18 (2 of 3).dgn



FM 388 AT FM 2334
INTERSECTION

0 25 50
SCALE IN FEET

SEAL AREA

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation | San Angelo District

SEAL COAT SITE 18
FM 388

SHEET 3 OF 3 SCALE: 1"= 50'

© TxDOT 2023	CONT	SECT	JOB	HIGHWAY
SHEET ISSUED OR LAST REVISED	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		66

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FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/00360504/4 - Design/Plan Set/3. Roadway/SEAL COAT SITE 18 (3 of 3).dgn

DATA FOR FINAL PLANS

Asphalt Supplier	
Asphalt Type	
Asphalt Rate (GAL/SY)	
Aggregate Source	
Aggregate Rate (SY/CY)	

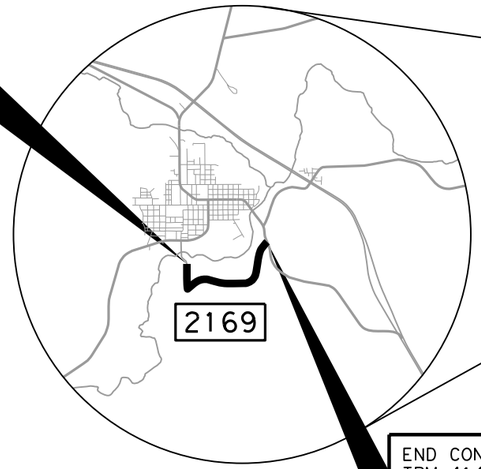
SITE INFORMATION

County	Kimble
Ctl-Sec-Job	2469-01-010
Highway	FM 2169
Length (MI)	1.791
Funct. Class	Major Collector
Limits From	0.336 MI South of US 377
Limits To	SL 481
Current ADT	278 (2022)

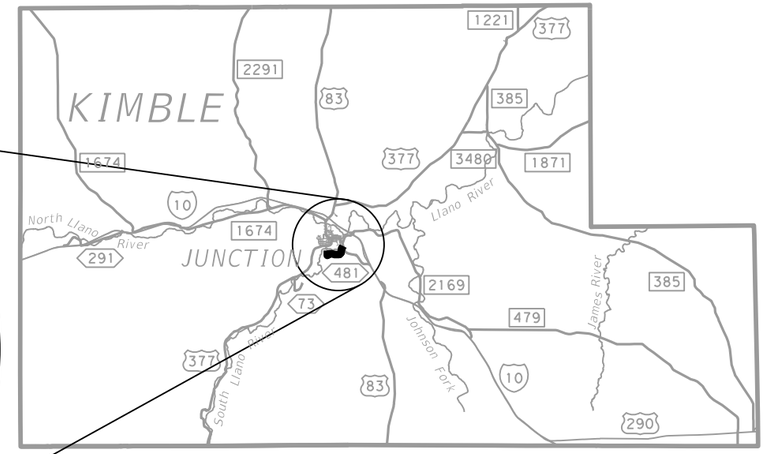
GENERAL NOTES

1. Seal coat full roadway width. 12 LF lanes with varying shoulder widths.
2. See Summary of Surfacing table.
3. End seal coat at SL 481.

BEGIN CONSTRUCTION
TRM 414-0.402
DFO 0.336
MILE POINT 3.669
LATITUDE 30.477019°
LONGITUDE -99.776749°



END CONSTRUCTION
TRM 414+1.387
DFO 2.127
MILE POINT 5.460
LATITUDE 30.481161°
LONGITUDE -99.758959°



SITE LOCATION

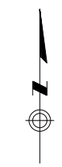
(0+00 = TRM 414+0.402)

SUMMARY OF SURFACING

STATION		LENGTH	WIDTH	AREA	0316 6004 ASPH (TIER I)		0316 6238 AGGR(TY-PD GR-3 SAC-B)	
FROM	TO	LF	LF	SY	GAL	0.45 GAL/SY	CY	110 SY/CY
0+00	15+95	1595	38	6,733	3,030		61	
Intersection with Red Raider Ln and Kc 180				1,380	621		13	
18+90	110+77	9187	32	32,666	14,700		297	
Taper to SL 481				910	410		8	
TOTALS				41,689	18,760		379	

PAVEMENT MARKINGS QUANTITY SUMMARY

0662 6111	0666 6174	0666 6178	0666 6182	0666 6208	0666 6210	0668 6092	0672 6007	0672 6009	0672 6010	6185 6005
WK ZN PAV MRK SHT TERM (TAB) TY Y-2	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)	PREFAB PAV MRK TY C (W) (36") (YLD TRI)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	TMA (MOBILE OPERATION)
EA	LF	LF	LF	LF	LF	EA	EA	EA	EA	DAY
235	18,340	200	222	1,370	12,093	12	13	221	6	1



0 5 10
SCALE IN MILES

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation

San Angelo District

SEAL COAT SITE 19
FM 2169

SHEET 1 OF 2 SCALE: 1"=10 MILES

© TxDOT 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		67

DATE: 9/25/2023 10:10:37 AM
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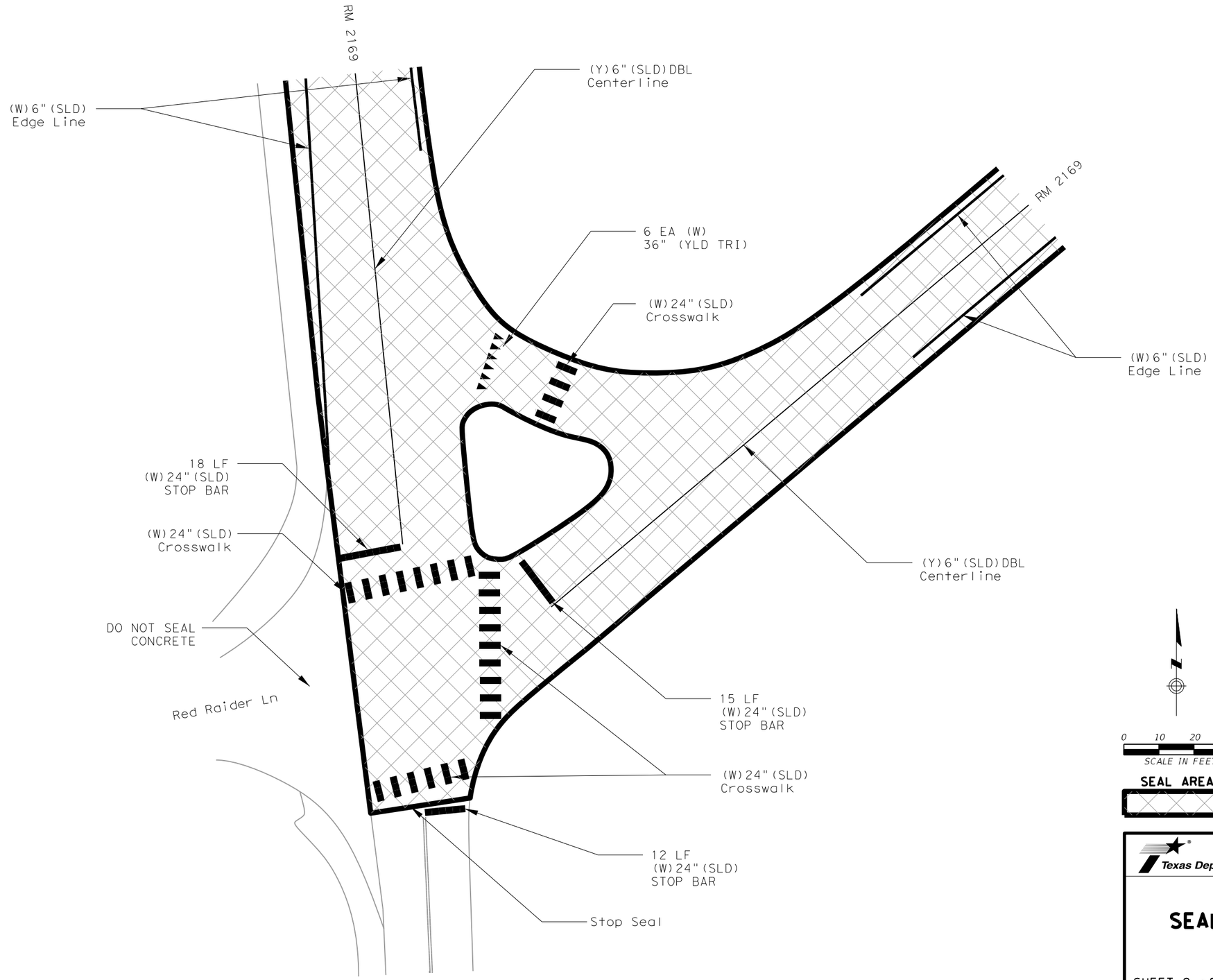

0 10 20 30
SCALE IN FEET

SEAL AREA

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation

San Angelo District

SEAL COAT SITE 19
RM 2169

SHEET 2 of 2 SCALE 1"=30'

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC

DIST	COUNTY	SHEET NO.
SJT	REAL, ETC	68

DATE: 9/25/2023 10:10:52 AM
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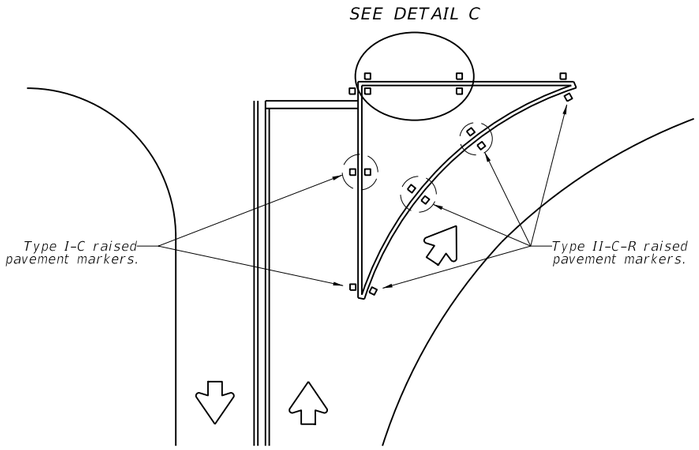
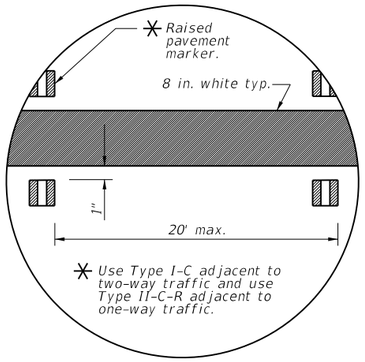


DETAILS FOR TYPICAL INTERSECTION WITH UNCURBED CHANNELIZING ISLAND



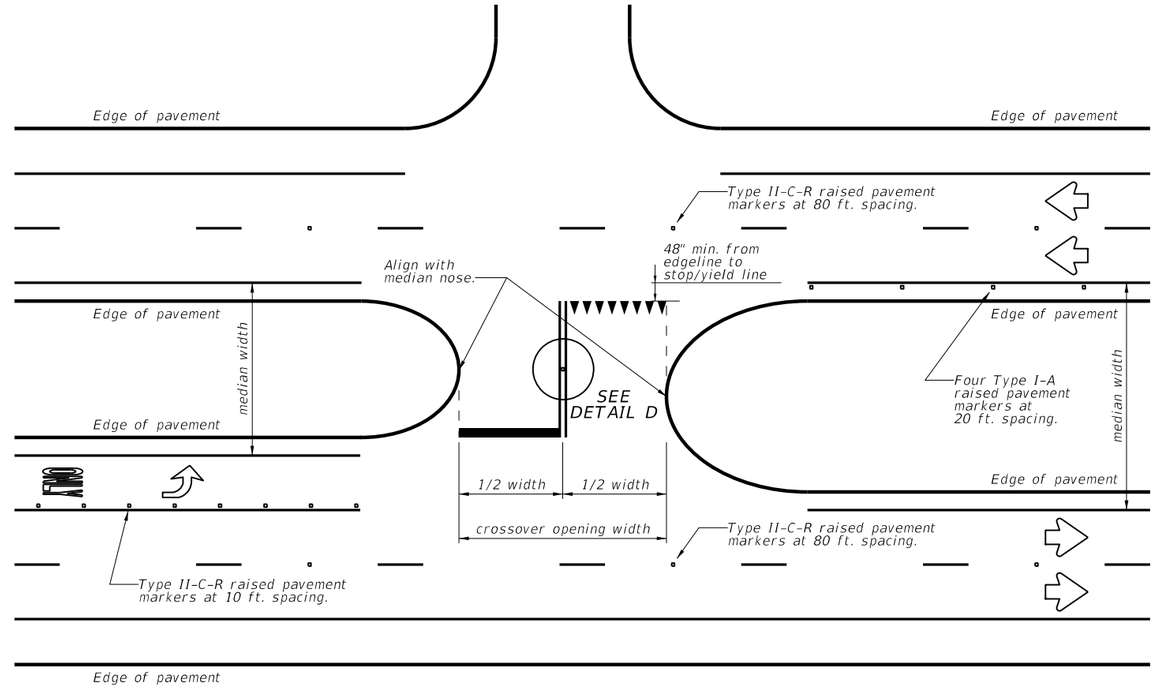
DETAIL C

GENERAL NOTES

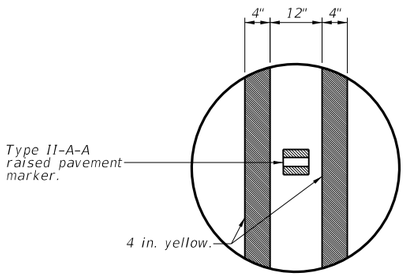
1. Lane-use word and arrow markings should be used in bays serving public road intersections.
2. When lane-use word and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane-use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane. See Standard Sheet PM(3) for more details.
3. Use 36 in. yield triangles or 24 in. stop bars, double yellow pavement markings, and Type II-A-A raised pavement markers at crossovers having narrower median width of at least 30 ft. Place one Type II-A-A raised pavement marker centered in the median, between the double yellow pavement markings.
4. The stop bar widths or number of yield triangles at each location is determined by the crossover opening width.
5. Spacing between yield triangles shall be 12 in.

PROJECT QUANTITIES OF WORDS AND ARROWS

ONLY	STOP	AHEAD				
25	0	0	8	11	4	2
0	0	0	0	8	0	0



CROSSOVER DETAILS



DETAIL D

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

09/26/2023

Texas Department of Transportation | San Angelo District

PAVEMENT MARKING DETAILS (RURAL)

SHEET 1 OF 1 NOT TO SCALE

SHEET ISSUED OR LAST REVISED 09-20

CONT	SECT	JOB	HIGHWAY
0036	05	044, ETC	US 83, ETC

DIST	COUNTY	SHEET NO.
SJT	REAL, ETC	69

DATE: 9/25/2023 10:11:07 AM
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DATE: 9/25/2023 10:11:21 AM
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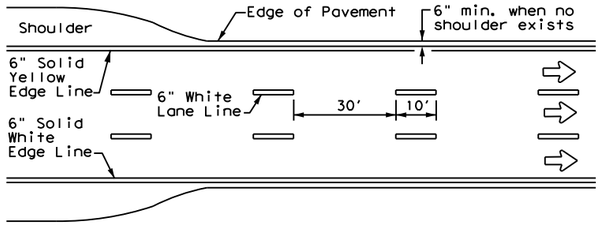
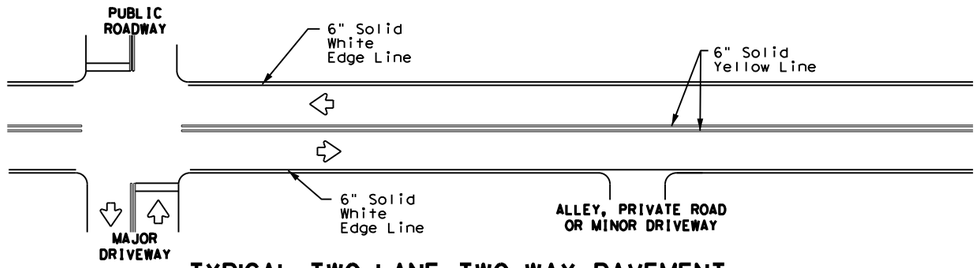
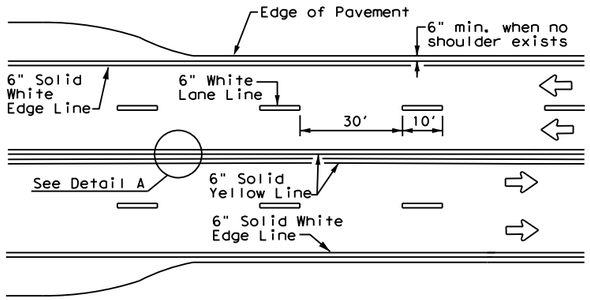
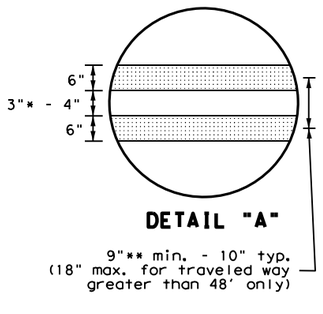


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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





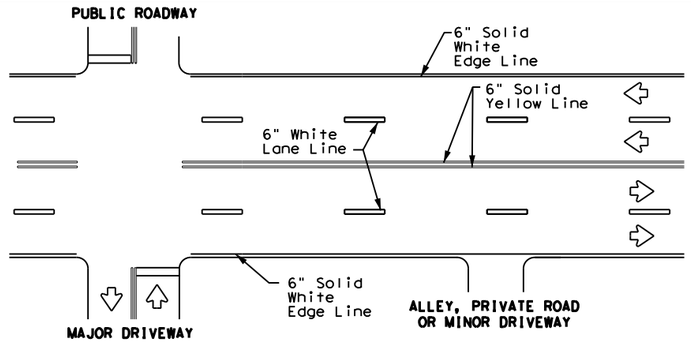
DETAIL "A"

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

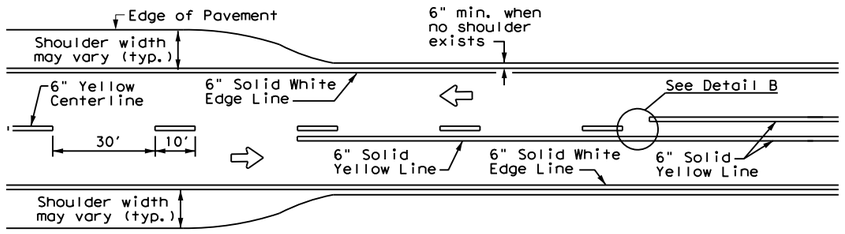
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

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

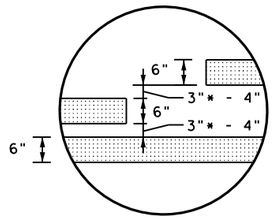
** 8" minimum for restripe projects when approved by the Engineer.



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



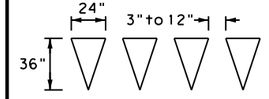
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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

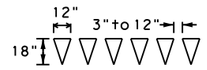
DETAIL "B"

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

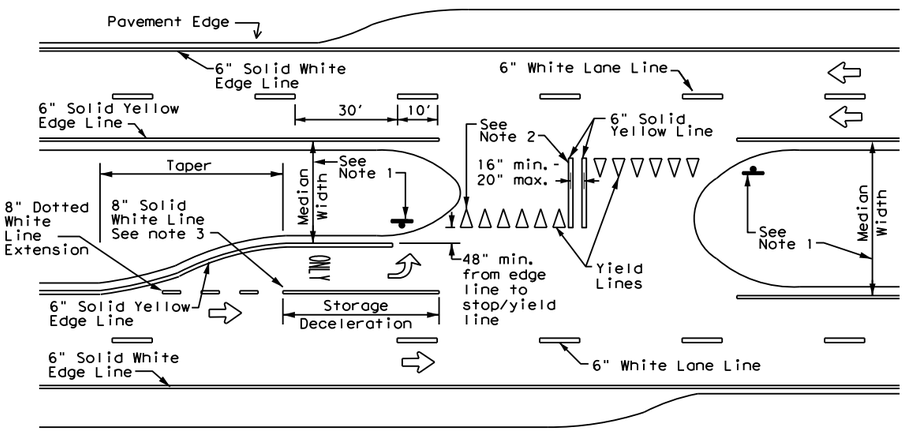


For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



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



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

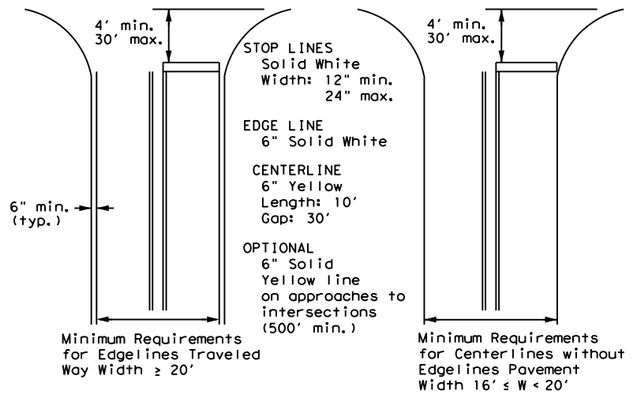
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

GENERAL NOTES

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

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

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



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

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

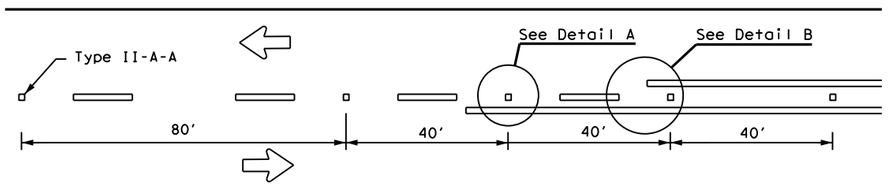
TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

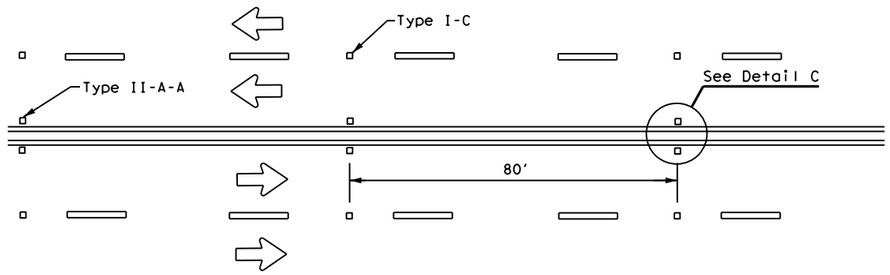
FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20 8-95 3-03 12-22 5-00 2-12	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		70

22A

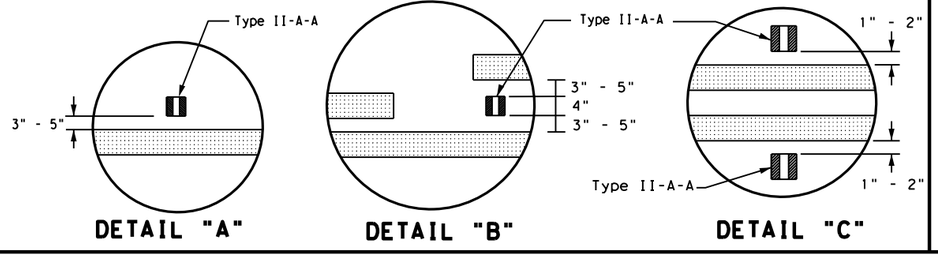
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

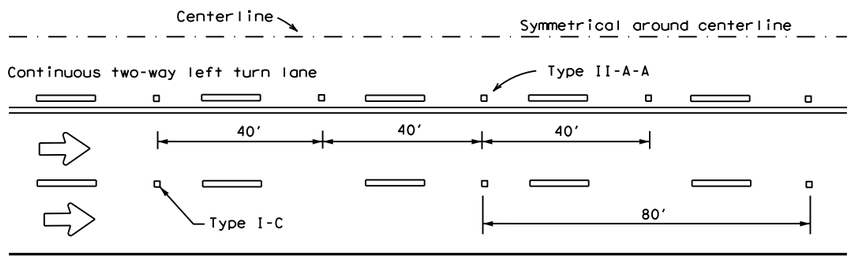


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

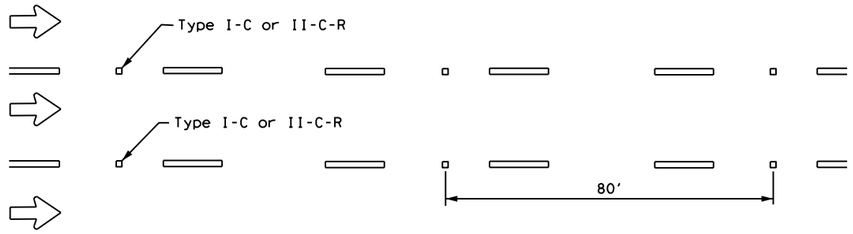


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



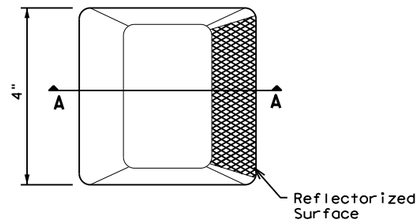
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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

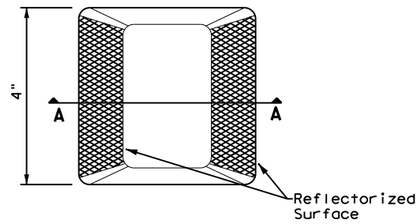
See Note 3.

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

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



Type I (Top View)



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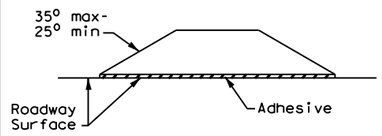
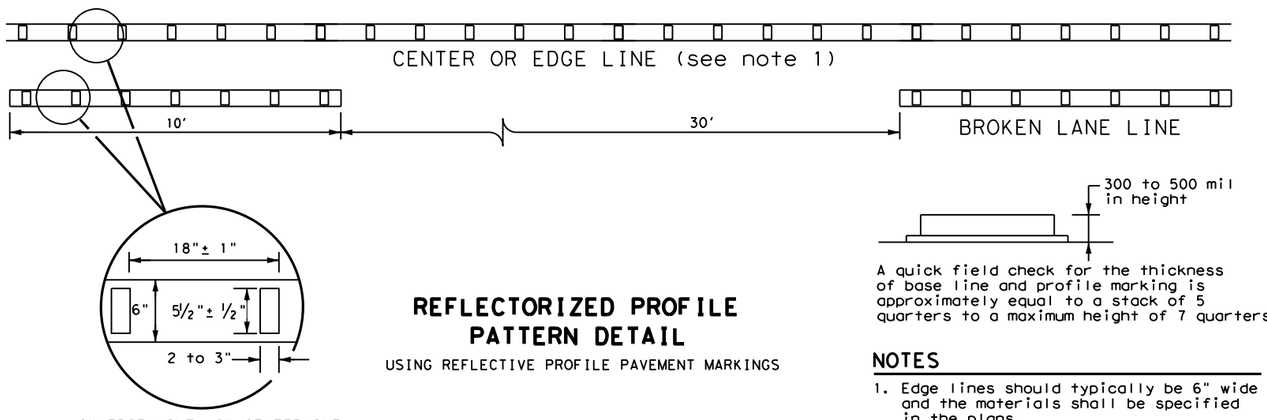


SECTION A

RAISED PAVEMENT MARKERS



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

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

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

NOTES

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

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

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-77 8-00 6-20 4-92 2-10 12-22 5-00 2-12	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		71

22B

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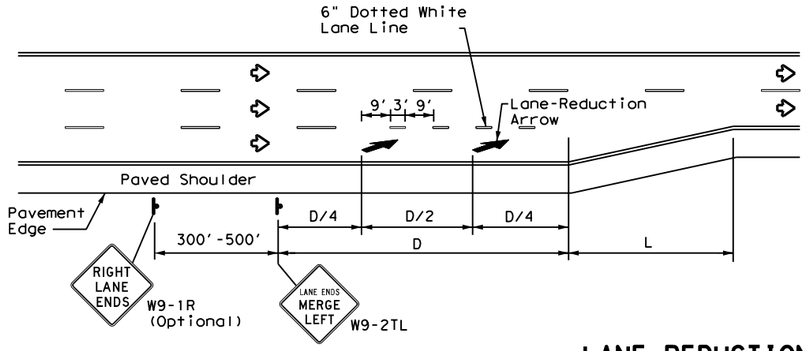
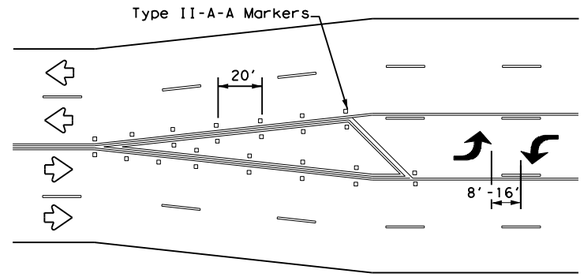


LANE REDUCTION

NOTES

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

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



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

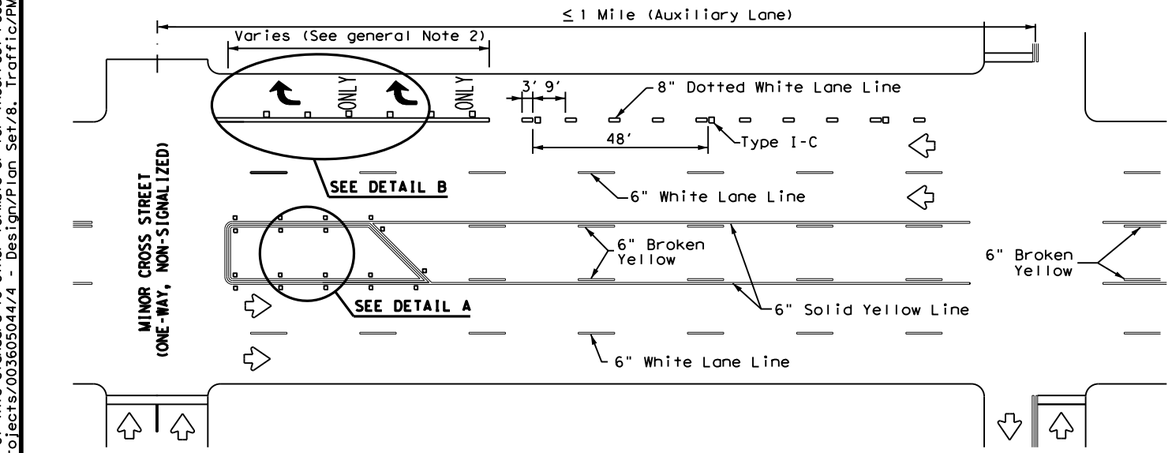
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

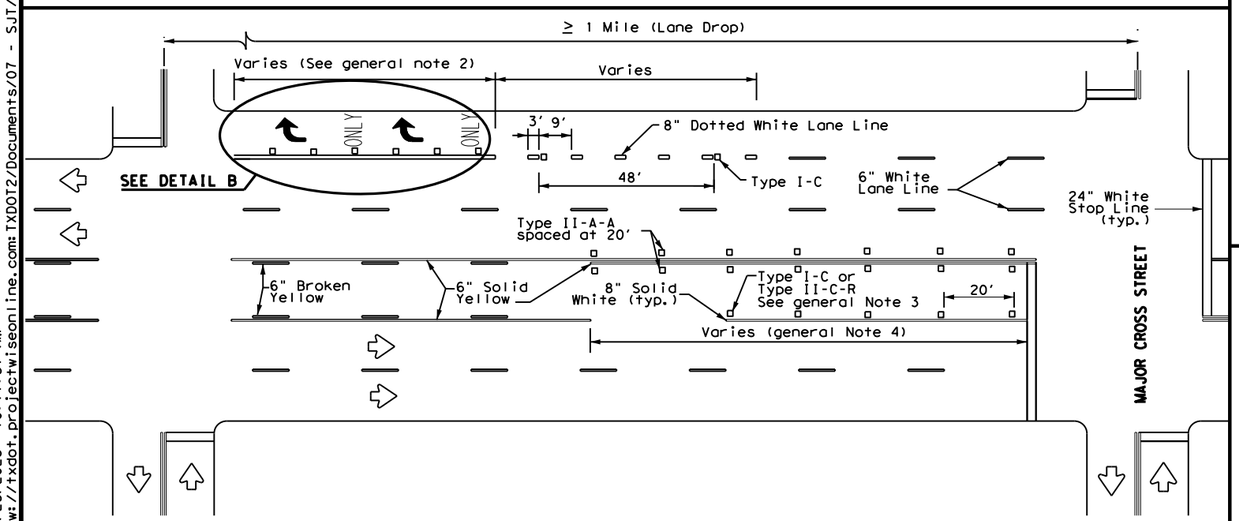
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn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

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

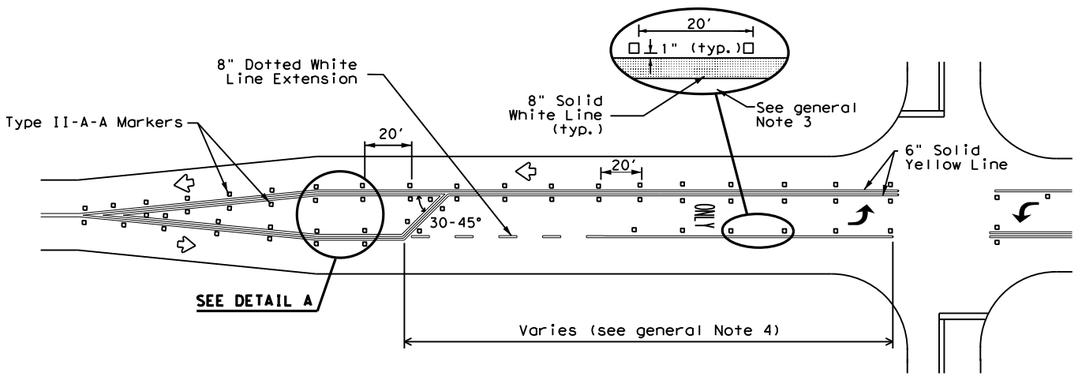
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



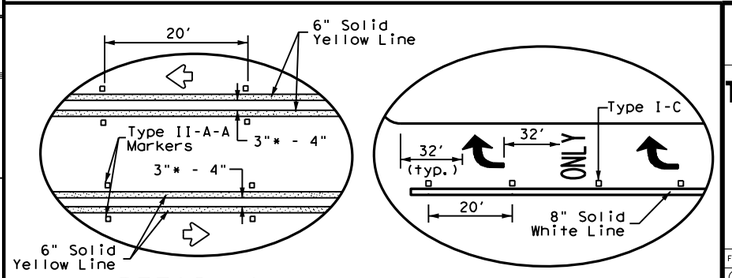
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



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



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



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

Texas Department of Transportation

Traffic Safety Division Standard

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

PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20 5-00 2-10 12-22 8-00 2-12	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		72

22C

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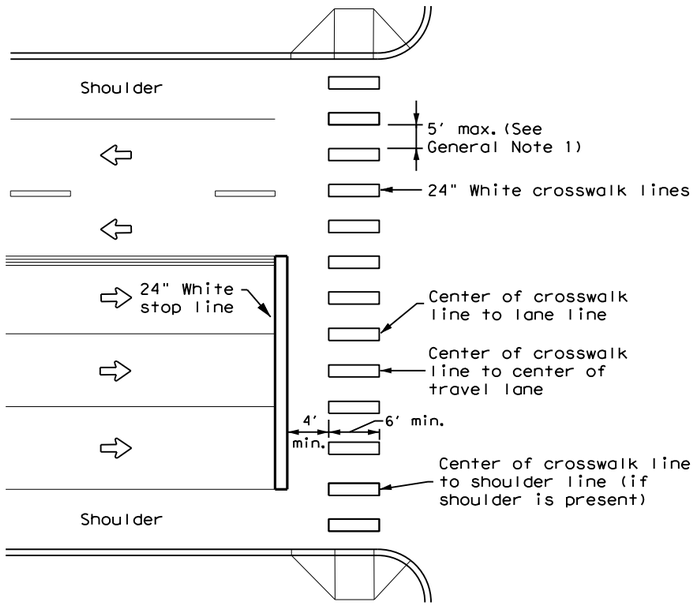


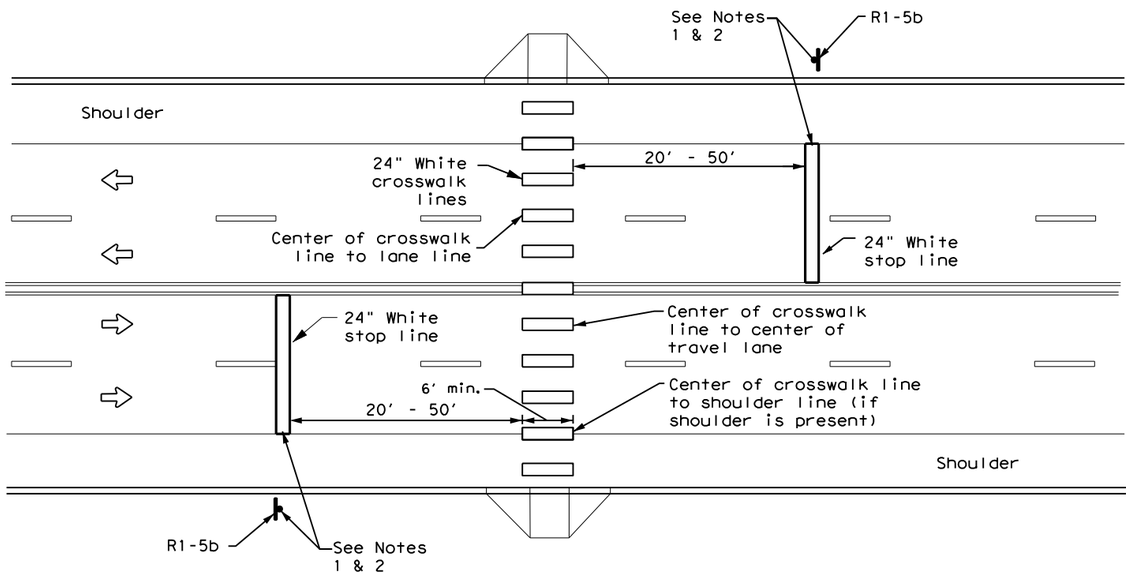
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

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

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

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



UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

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

Texas Department of Transportation

Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-22A

FILE: pm4-22a.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0036	05	044, ETC	US 83, ETC
6-20	DIST	COUNTY		SHEET NO.
6-22	SJT	REAL, ETC		73
12-22				

22D

DATE: 9/25/2023 10:12:22 AM
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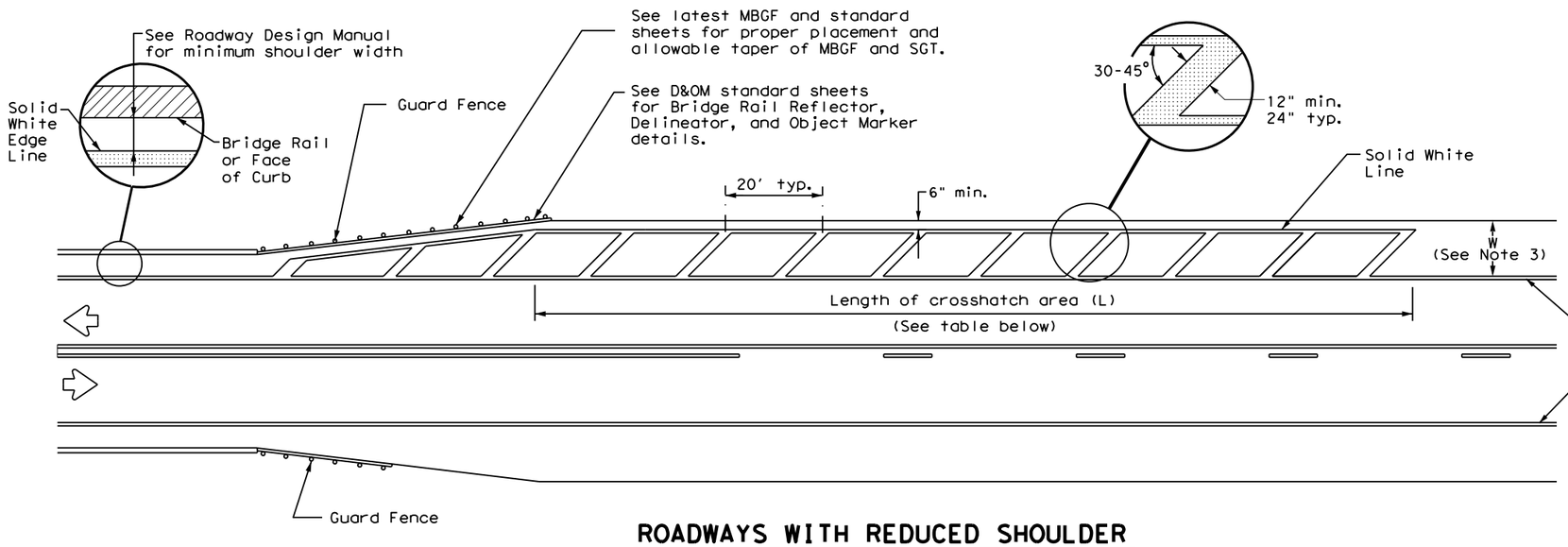

ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT

CROSSHATCH LENGTH (L)	
Posted Speed (MPH)	L (ft)
30	300 ft
35	
40	
45	
50	500 ft
55	
60	
65	
70	
75	

NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 4 inches from the bridge rail or face of curb or 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions.
2. No-passing zone on bridge approach is optional. If used, the no-passing zone shall be a minimum 500 feet long from the beginning of the bridge.
3. The crosshatching should be required if the shoulder width in advance of the bridge is 4 feet or wider and a reduction of at least 3 feet in shoulder width across the bridge occurs.
4. On divided highways, review both the right and left shoulder widths for the need for narrow bridge pavement markings.

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

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

Texas Department of Transportation

Traffic Safety Division Standard

PAVEMENT MARKINGS FOR ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT
PM(5)-22

FILE: pm5-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		74

22E

DATE: 9/25/2023 10:12:36 AM
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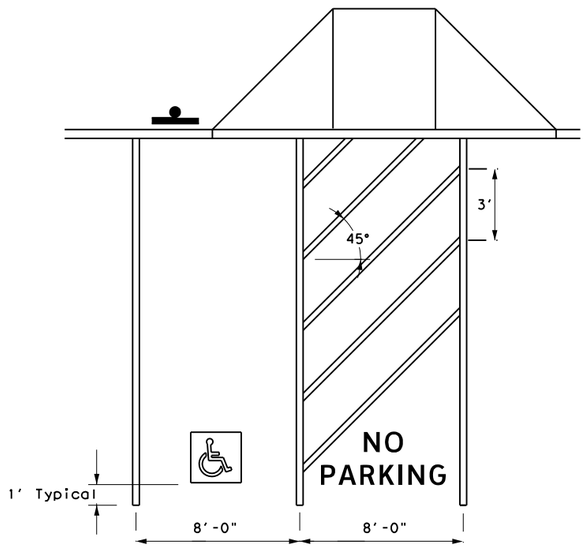

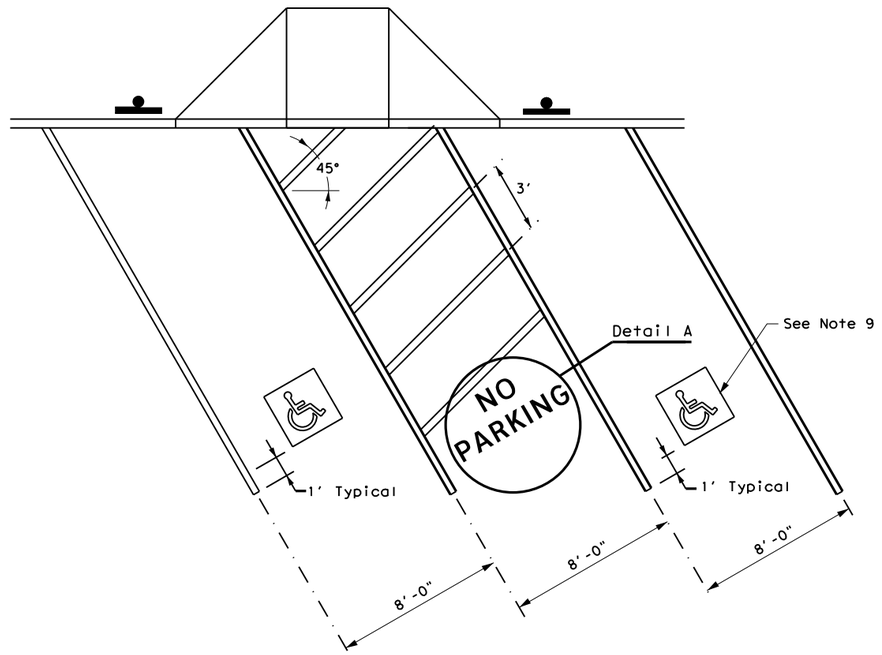

PERPENDICULAR OR ANGLED ACCESSIBLE PARKING SPACE DIMENSIONS

R7-8T

R7-8P

R7-8aPT

ACCESSIBLE PARKING SIGNS

Detail A

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

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
SIGN FACE MATERIALS	DMS-8300

GENERAL NOTES:

1. All paved accessible parking space limit lines shall be 4" solid white lines.

2. Paved accessible parking spaces must include a white International Symbol of Accessibility applied conspicuously on the surface in a color that contrasts the pavement. A blue background with white border may supplement the symbol for additional contrast.

3. The words "NO PARKING" must be applied on any access aisle adjacent to the parking space. The words must be white, applied:
   a) in all capital letters.
   b) centered within each access aisle adjacent to the parking space.

4. RESERVED PARKING (R7-8T) sign including the International Symbol of Accessibility.
   a) shall be REQUIRED for each accessible parking space.
   b) shall NOT be placed between two accessible parking spaces.
   c) shall NOT be placed in a location that restricts movement of wheelchairs within the adjacent sidewalk.
   d) shall have a mounting height of 7 feet to the bottom of the sign.

5. A sign identifying the consequences of parking illegally in a paved accessible parking space. Must:
   a) at a minimum state "VIOLATORS SUBJECT TO FINE AND TOWING" (Plaque)(R7-8aPT).
   b) be mounted on a pole, post, wall or freestanding board.
   c) be no more than eight inches (8") below sign R7-8T a sign required by the Texas Accessibility Standards, 502.6.
   d) be installed so that the bottom edge of the sign is no lower than 48 inches and no higher than 80 inches above the ground level.

6. Signs identifying van parking spaces shall contain the designation "VAN ACCESSIBLE" (R7-8P) Signs shall be 60 inches minimum above the ground level measured to the bottom of the sign.

7. Perpendicular or angled parking spaces shall be 8 feet wide minimum with an access aisle 8 feet minimum wide (van accessible). Two parking spaces are permitted to share a common access aisle.

8. Access aisles shall be at street level, extend the full length of the parking space they serve, follow ADA surface requirements, and marked to discourage parking in the access aisle. Curb ramps shall connect the access aisle to the adjacent pedestrian access route. Curb ramps shall not be located within the access aisle.

9. International Symbol of Accessibility Parking Space Marking and sign details can be found in The Standard Highway Sign Designs for Texas (SHSD) at the following website. http://www.txdot.gov/

Texas Department of Transportation

Traffic Safety Division Standard

PAVEMENT MARKINGS AND SIGNING FOR ACCESSIBLE PARKING

PM(AP)-21

FILE: pm(ap)-21	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT July 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		75

22F

DATE: 10/2/2023 4:54:55 PM
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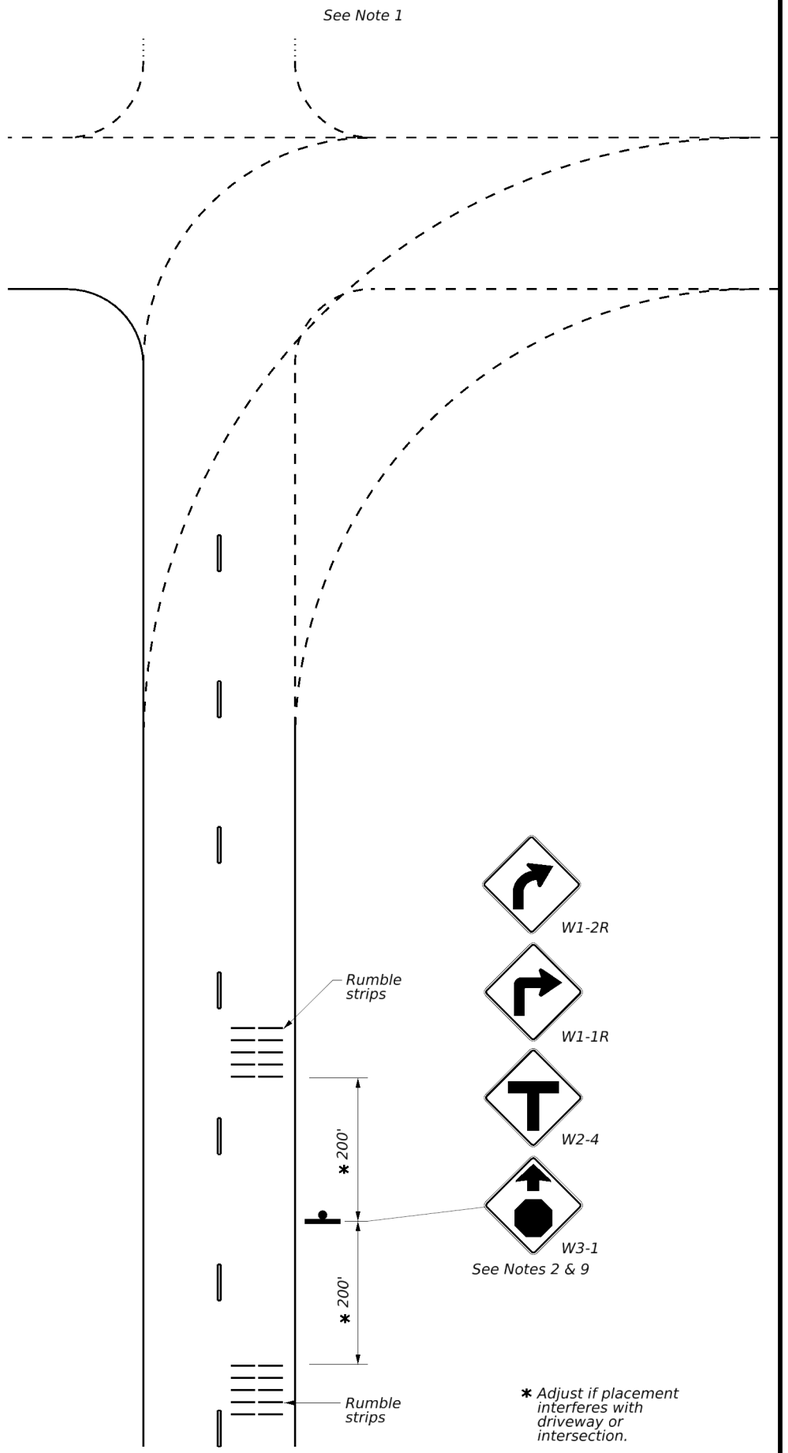
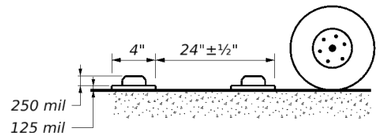
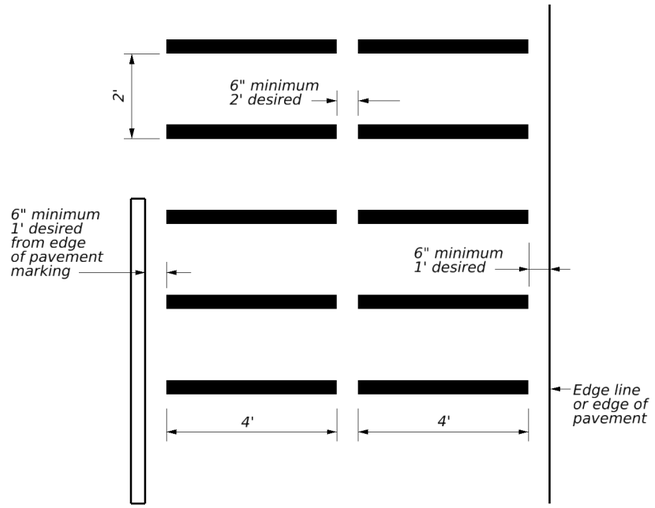
RUMBLE STRIP TYPICAL APPLICATION





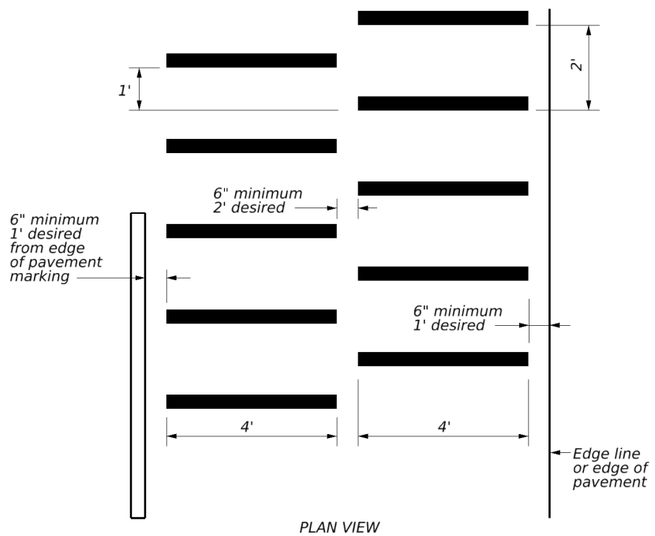
PROFILE VIEW

RUMBLE STRIP STANDARD PATTERN



PLAN VIEW

RUMBLE STRIP ALTERNATIVE PATTERN



PLAN VIEW

GENERAL NOTES

1. Transverse or in-lane rumble strips should only be used at high incident and special geometric locations. These special geometric locations may include: approaches to rural, high speed signalized or stop-controlled intersections with sight restrictions and/or high crash rates, approaches to unexpected urban intersections, approaches to newly installed stop or signalized controlled intersections, approaches to toll plazas, approaches to hazardous horizontal curves, and approaches to railroad grade crossings.
2. When used, the rumble strips shall be placed 200 feet upstream and downstream of the warning sign.
3. The use of rumble strips should not be widespread or indiscriminate.
4. Preformed black raised rumble strips should be used. They should be installed in accordance with the manufacturer's recommendations.
5. Please reference the TxDOT Material Producers List for approved rumble strips (transverse): http://www.txdot.gov/
6. Consideration should be given to noise levels when in-lane or transverse rumble strips are to be installed near residential areas, schools, churches, etc.
7. The RUMBLE STRIPS AHEAD (W17-2T) sign may be used in advance of in-lane or transverse rumble strips, based on engineering judgement. This sign is typically not necessary for rumble strip installations built to the guidelines on this standard sheet. When used, this sign should be spaced in advance of the rumble strips based on the Guidelines for Advance Placement of Warning Signs table of the Texas Manual on Uniform Traffic Control Devices.

W17-2T

8. Consideration shall be given to bicyclists. See RS(6).
9. Other signs can be used as conditions warrant.

Texas Department of Transportation

Traffic Safety Division Standard

TRANSVERSE OR IN-LANE RUMBLE STRIPS

RS(5)-23

FILE: rs(5)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-06 1-12 2-10 10-13	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		76

DATE: 10/2/2023 4:55:15 PM
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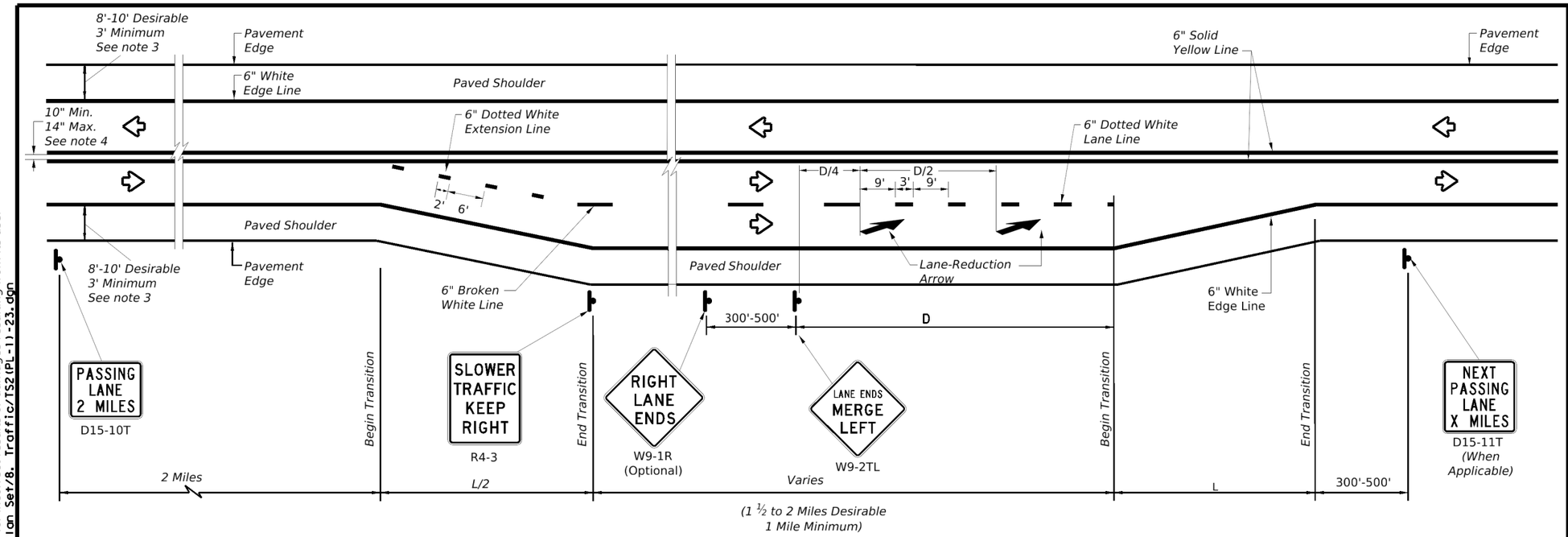

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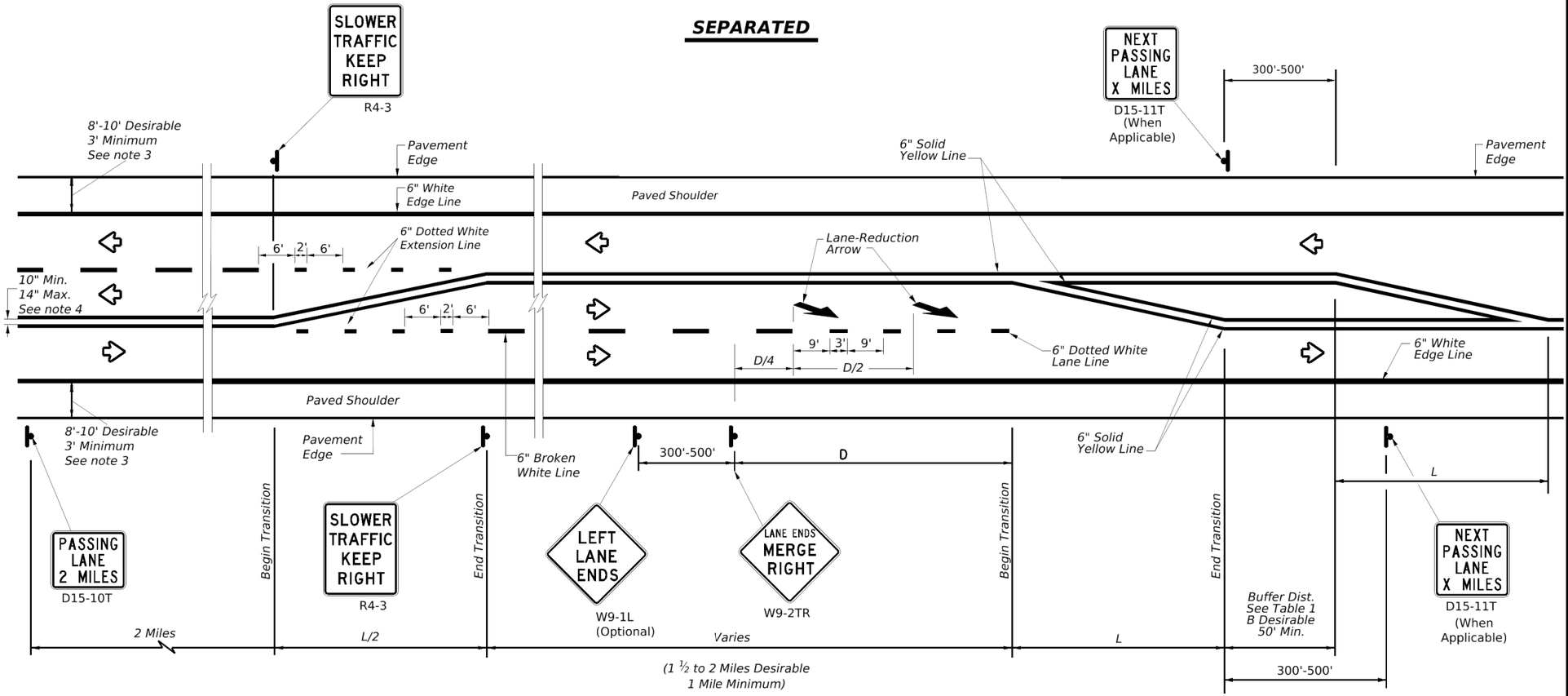


ALTERNATING

LEGEND	
	Sign
	Traffic Flow

TYPICAL TAPER LENGTH (L)	
Formula *	L = WS

* *Transition length should be rounded up to nearest 5 foot increment.*

L=Length of Transition (FT)
W=Width of Offset (FT)
S=Posted Speed (MPH)

EXAMPLE

A 12 foot lane is added on a 70 mph roadway. The length of the transition should be:

L=12x70=840 ft

TABLE 1
ADVANCE WARNING SIGN DISTANCE (D) AND BUFFER DISTANCE (B)

Posted Speed	D (FT)	B (FT)
40	670	305
45	775	360
50	885	425
55	990	495
60	1100	570
65	1200	645
70	1250	730
75	1350	820

GENERAL NOTES

1. *For minimum and desirable design details, see the Roadway Design Manual, Chapter 4, Section 6, Super 2 Highways.*
2. *For Raised Pavement Markers (RPM) details, see Pavement Markings Standard sheet, PM(2) - Centerline for All Two Lane Two-Way Roadways. Note that RPMs are not recommended on the 6" dotted white extension lines.*
3. *For rumble strip options available for the designed shoulder width, see Rumble Strip Standard sheet RS(2).*
4. *For pavement marking details, see Pavement Marking Standard sheet PM(1).*

Texas Department of Transportation

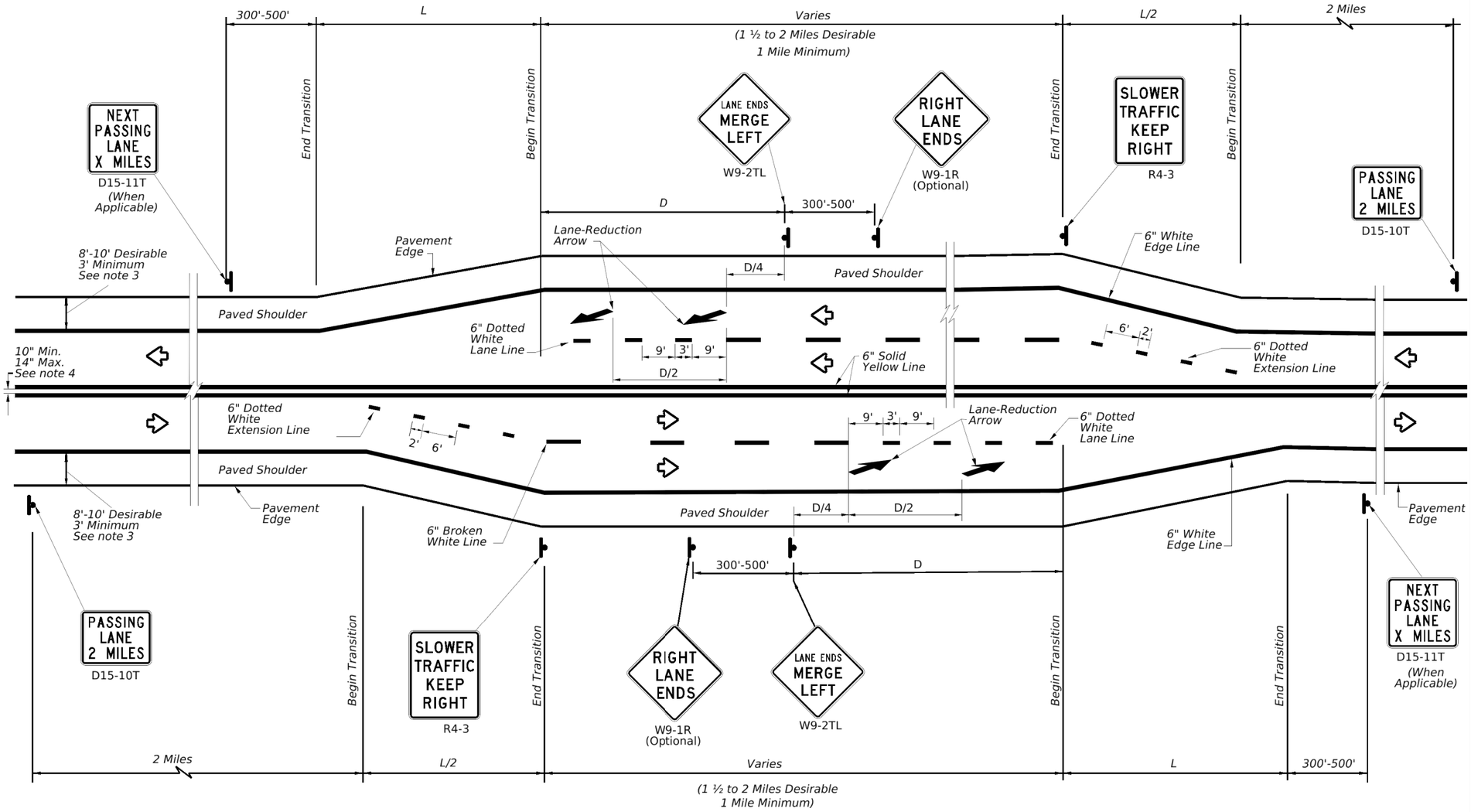
Traffic Safety Division Standard

TEXAS SUPER 2 PASSING LANES

TS2(PL-1)-23

FILE: ts2-1-23.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0036	05	044, ETC	US 83, ETC
5-10 3-18 2-12 2-23 3-12	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		77

25



SIDE BY SIDE PASSING LANES

LEGEND	
	Sign
	Traffic Flow

TYPICAL TAPER LENGTH (L)	
Formula *	L = WS

* Transition length should be rounded up to nearest 5 foot increment.

L=Length of Transition (FT)
W=Width of Offset (FT)
S=Posted Speed (MPH)

EXAMPLE

A 12 foot lane is added on a 70 mph roadway. The length of the transition should be:

L=12x70=840 ft

TABLE 1
ADVANCE WARNING SIGN DISTANCE (D)

Posted Speed	D (FT)
40	670
45	775
50	885
55	990
60	1100
65	1200
70	1250
75	1350

GENERAL NOTES

1. For minimum and desirable design details, see the Roadway Design Manual, Chapter 4, Section 6, Super 2 Highways.
2. For Raised Pavement Markers (RPM) details, see Pavement Markings Standard sheet, PM(2) - Centerline for All Two Lane Two-Way Roadways. Note that RPMs are not recommended on the 6" dotted white extension lines.
3. For rumble strip options available for the designed shoulder width, see Rumble Strip Standard sheet RS(2).
4. For pavement marking details, see Pavement Marking Standard sheet PM(1).

Texas Department of Transportation

Traffic Safety Division Standard

TEXAS SUPER 2 PASSING LANES

TS2(PL-2)-23

FILE: ts2-2-23.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0036	05	044, ETC	US 83, ETC
5-10 3-18 2-12 2-23 3-12	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		78

25

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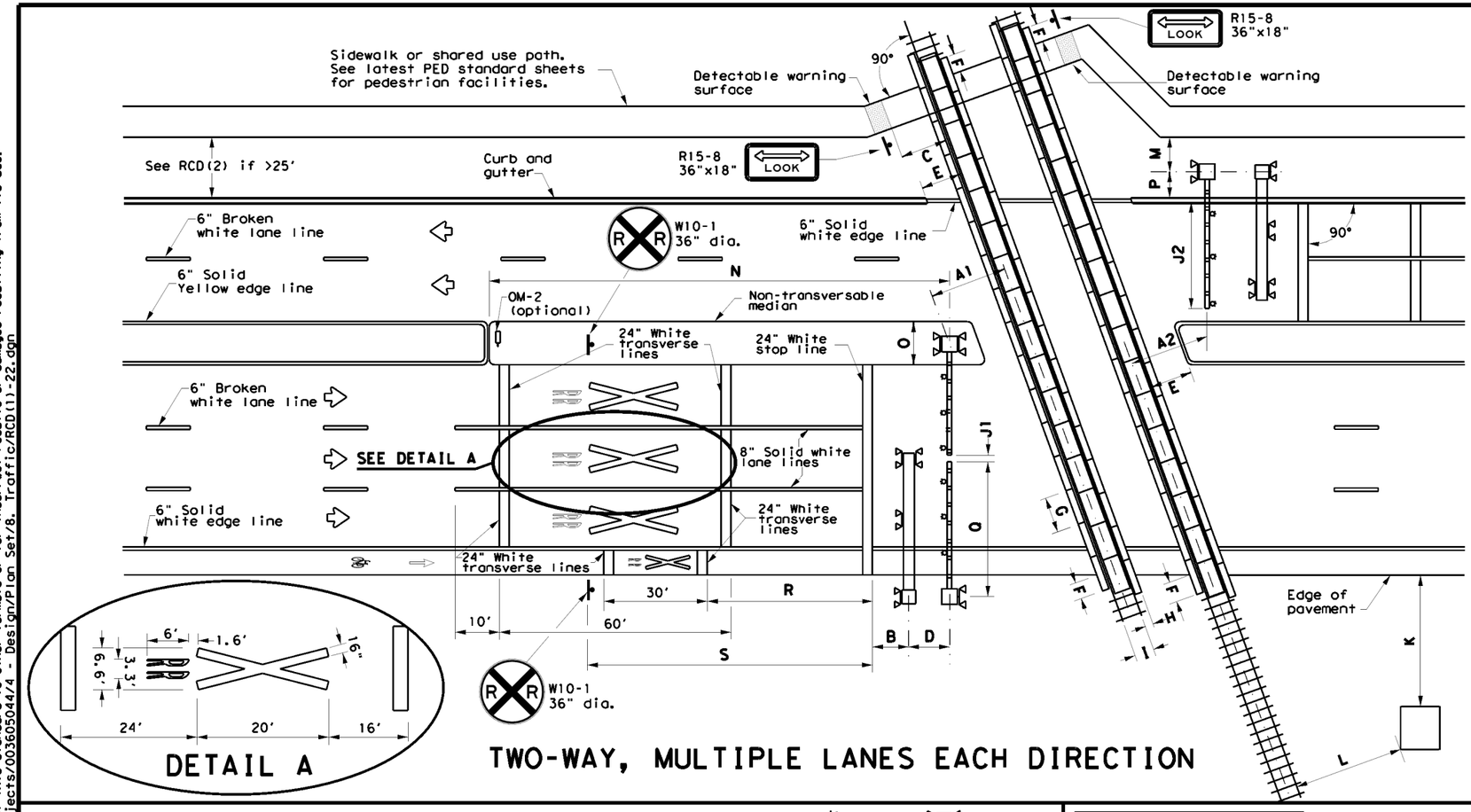
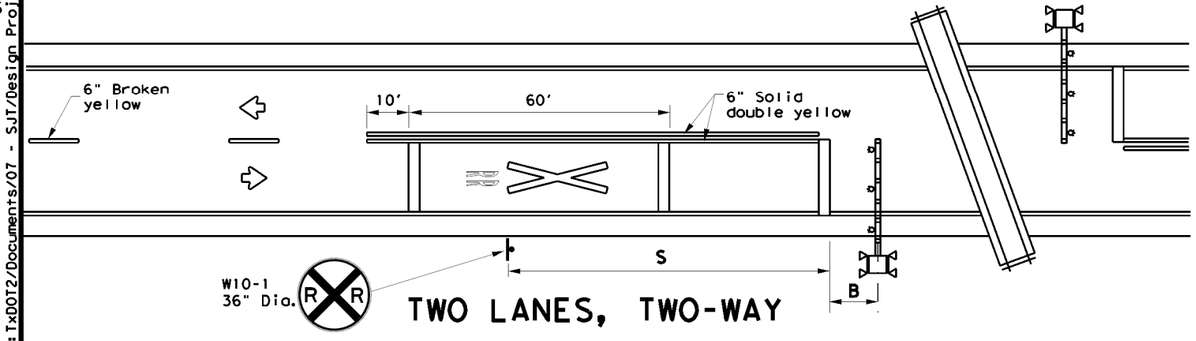
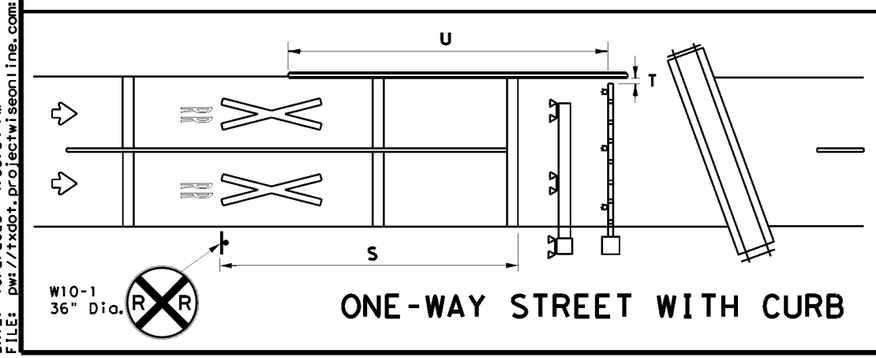






NOTES

T: Tip of gate to edge of curb: 1' maximum for Quiet Zone SSM, 90% of traveled way covered by gates for all other locations.

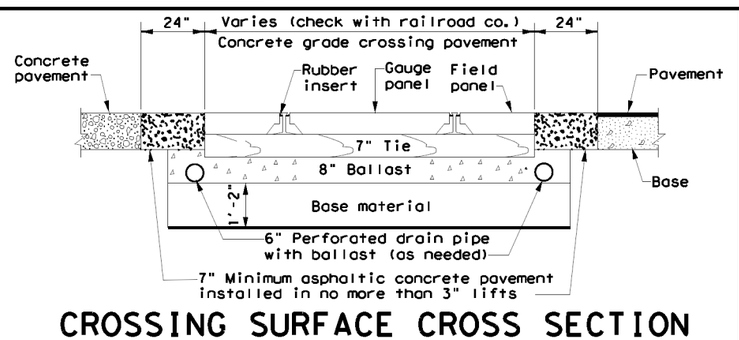
U: Non-traversable curb length from gate: 100' minimum for a Quiet Zone SSM, 10' minimum for all other locations.

TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

LEGEND	
	Sign
	Object Marker
	Traffic Flow
	Cantilever
	Gate Assembly
	Mast Flasher Pair

GENERAL NOTES

1. Medians and curbs must be non-traversable to qualify as a Quiet Zone Supplementary Safety Measure (SSM). Non-traversable curbs in Quiet Zones are 6" tall minimum and used on roadways where speed does not exceed 40 mph.
2. Raised pavement markers may be used to supplement striping. See PM(2) and PM(3) standard sheets.
3. Medians preferred whenever possible to prevent vehicles from driving around gates.
4. Longitudinal edge striping may be continued thru crossing as needed. Illumination may also be considered for nighttime visibility.
5. See SMD standard sheets for sign mounting details.
6. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.



NOTES

A1: Center of RR mast to center of rail: 12' minimum, 15' typical.

A2: Tip of gate to center of rail: 12' minimum, 15' typical.

B: Center of mast (cantilever, gate, or mast flasher) of nearest active traffic control device to stop line: 8' (NOTE: Stop line may be moved as needed, but should be at least 8' back from gates, if present).

C: Near edge of detectable warning surface to nearest rail: 12' minimum.

D: Center of gate mast to center of cantilever mast: 6' typical. NOTE: Cantilever may be located in front or behind gates.

E: Edge of median or curb to nearest rail: 10' typical. NOTE: Design median edge to be parallel with rail.

F: Edge of planking panel from edge of pavement or sidewalk: 3' minimum. NOTE: Field panels need not be in line with gauge panels.

G: Length of panels along rail: 8' typical.

H: Width of field panel: 2' typical (check with railroad company).

I: Distance between rails: 4'- 8'1/2".

J1: Tip of gate to tip of gate: 2' maximum.

J2: 90% of traveled roadway to be covered by gate.

K: Nearest edge of RR cabinet from edge of pavement: 30' typical. NOTE: Cabinet not required to be parallel to edge of pavement.

L: Nearest edge of RR cabinet from nearest rail: 25' typical.

M: Center of RR mast to edge of sidewalk: 6' minimum.

N: Center of gate mast to leading edge of non-traversable median: 100' minimum to qualify as a Quiet Zone SSM. NOTE: 60'will suffice if there is a street intersection within the 100' and all street intersections within 60' are closed.

O: Width of median for RR gate assembly: 8'-6" minimum, 10' typical when using median gates. NOTE: Center of gate mast minimum 4'-3" from face of curb.

P: Center of RR mast to face of curb: 5'-3" minimum. Center of RR mast to edge of pavement (with shoulder): 7' minimum. Center of RR mast to edge of pavement (no shoulder): 9'-3" minimum. NOTE: Final location determined by the railroad company.

Q: Gate length: 28' or less typical, but railroad company may allow up to 32' under special circumstances.

R: Stop line to first RR Crossing transverse line (bike lane): 50' typical.

S: Stop line to GRADE CROSSING ADVANCE WARNING (W10-1) sign and adjacent RR Crossing pavement markings. See Table 1. See RCD(2) for other signs.

Texas Department of Transportation

Traffic Safety Division Standard

RAILROAD CROSSING DETAILS SIGNING, STRIPING, AND DEVICE PLACEMENT RCD(1)-22

FILE: rcd1-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2022	CONT	SECT	JOB	HIGHWAY
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2-16	DIST	COUNTY		SHEET NO.
11-22	SJT	REAL, ETC		79

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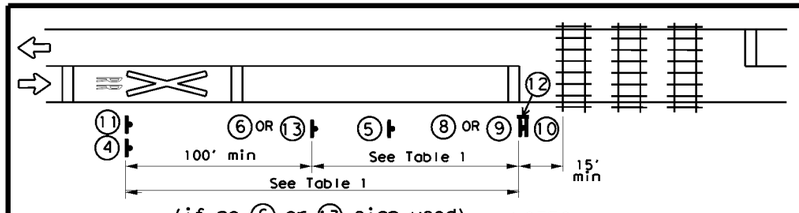
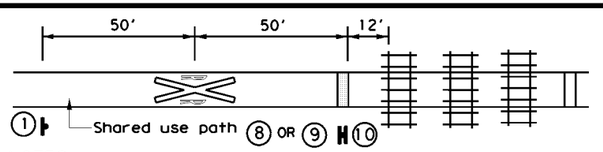


PASSIVE CROSSING

NOTES

1. STOP or YIELD sign may also be installed to the left of the crossbuck sign, rather than below it.
2. A 2" white retroreflective strip shall be installed on front and back of crossbuck sign post.
3. See the Crossbuck Assemblies with YIELD or STOP Signs at Passive Grade Crossings section of the TMUTCD for further details about sign mounting arrangements.



NOTES

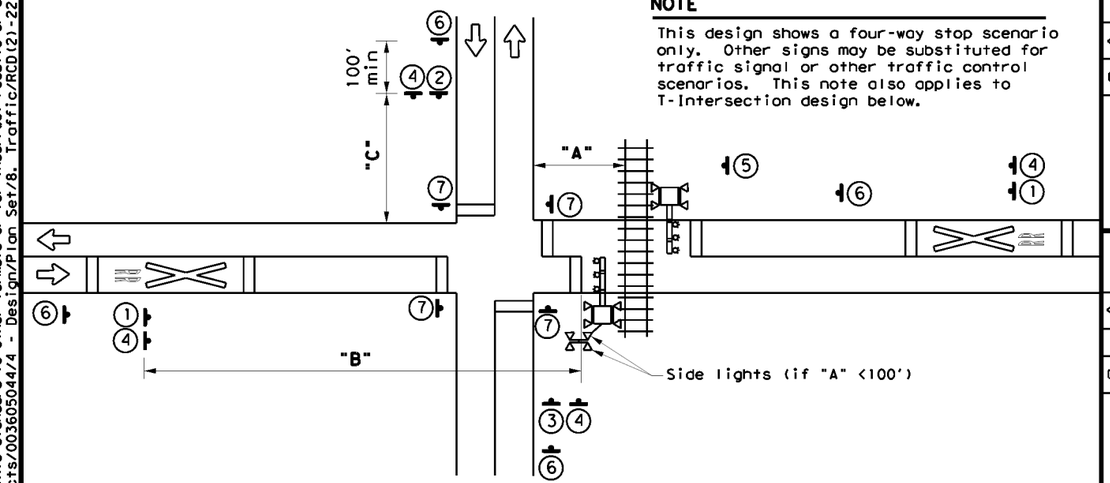
1. A shared use path is considered a separate pathway crossing when more than 25' from traveled way of adjacent roadway.
2. Detectable warning used at stop bar.
3. Smaller signs preferred. See the Design of Bicycle Signs section within the TMUTCD for sizing details.

PATHWAY CROSSING

TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

GENERAL NOTES

1. Railroad company to provide active traffic control devices, CROSSBUCK (R15-1), NUMBER OF TRACKS (R15-2P) plaque (if more than 1 track), and EMERGENCY NOTIFICATION (I-13) signs.
2. LOW GROUND CLEARANCE (W10-5) signs may be relocated further upstream of crossing to provide advance warning of alternate route.
3. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2) signs may be modified as needed to fit roadway geometry.
4. Table 1 placement distances may vary per the Placement of Warning Signs section of the TMUTCD.
5. See Table 1 to determine placement of STOP AHEAD (W3-1) and YIELD AHEAD (W3-2) signs unless shown otherwise.
6. DO NOT STOP ON TRACKS (R8-8) signs installed when potential for vehicles stopping on tracks is significant as determined by sealing engineer. Install so sign does not block view of RR mast.
7. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.

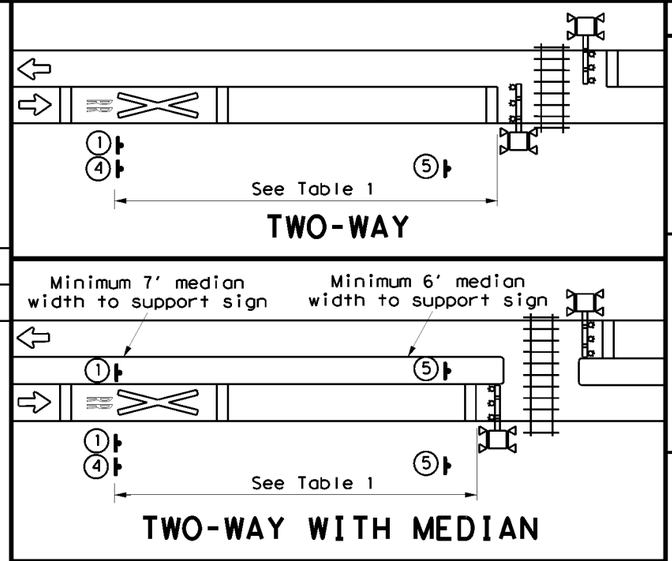


NOTE

This design shows a four-way stop scenario only. Other signs may be substituted for traffic signal or other traffic control scenarios. This note also applies to T-Intersection design below.

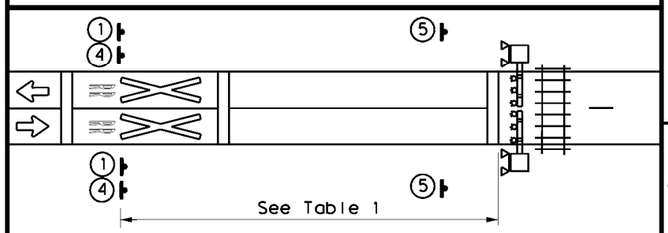
	"A" <100'	"A" ≥100'
"B"	See Table 1. Place pavement markings and signs on opposite side of intersection from rail if spacing from Table 1 would put markings within intersection.	See Table 1. Place pavement markings and signs between rail and intersection if spacing from Table 1 would put markings within intersection.
"C"	See Table 1.	GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2, W10-3, W10-4) signs should only be installed if W10-1 sign is not between intersection and railroad crossing. If needed, see Table 1.

GRADE CROSSING NEAR A PARALLEL STREET

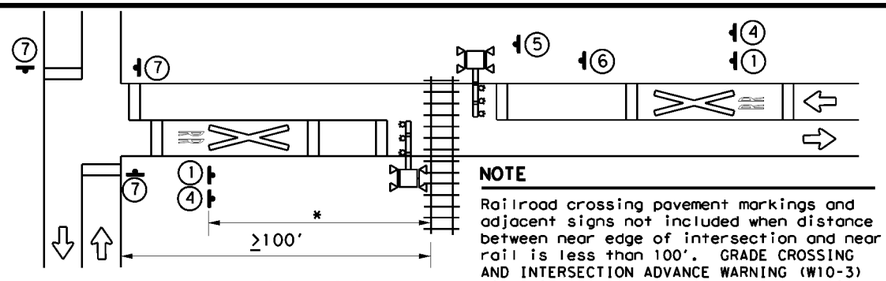


TWO-WAY

TWO-WAY WITH MEDIAN



ONE-WAY

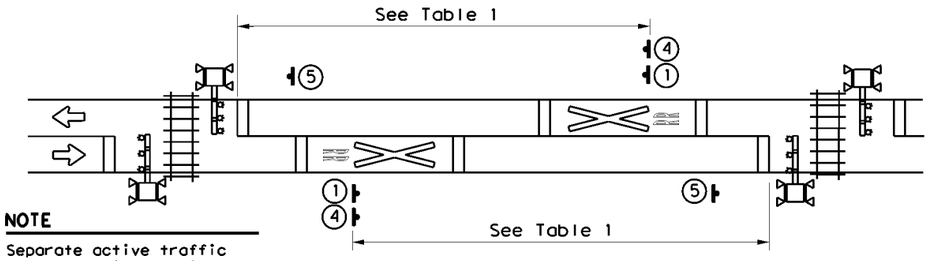


*Use Table 1 if sufficient space exists.

NOTE

Railroad crossing pavement markings and adjacent signs not included when distance between near edge of intersection and near rail is less than 100'. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-3) signs installed on roadway parallel with rail in this case.

T-INTERSECTION



NOTE

Separate active traffic control devices, railroad crossing pavement markings, and adjacent signs required when tracks are more than 100' apart.

TWO ADJACENT CROSSINGS

SIGNS

** ① W10-1 36" Dia.	** ② W10-2L 36" X 36"	** ③ W10-2R 36" X 36"	IF NEEDED ④ W10-5 36" X 36"; LOW GROUND CLEARANCE W10-5P 30" X 24"
IF NEEDED ⑤ R8-8 DO NOT STOP ON TRACKS 24" X 30"	IF NEEDED ⑥ W3-1 30" X 30"	⑦ R1-1 STOP 36" X 36"; ALL WAY R1-3P 18" X 6"	R15-1 RAIL CROSSING ROAD 48" X 9"; 3 TRACKS R15-2P 27" X 18"; ⑧ R1-1 STOP 36" X 36"
R15-1 RAIL CROSSING ROAD 48" X 9"; 3 TRACKS R15-2P 27" X 18"; ⑨ R1-2 YIELD 48" X 48" X 48"	R15-1 RAIL CROSSING ROAD 48" X 9"; 3 TRACKS R15-2P 27" X 18"; ⑩	⑪ ** W10-1 36" Dia.; NO GATES OR LIGHTS W10-13P 30" X 24"	REPORT EMERGENCY OR PROBLEM 1-800-555-5555 CROSSING 836 597 H; Sign may be placed perpend. to travel lanes. ⑫ I-13 15" X 9"
IF NEEDED ⑬ W3-2 30" X 30"			

** Includes a NO TRAIN HORN (W10-9P) plaque if crossing is in a Quiet Zone. If needed, is mounted below W10-2/W10-3/W10-4 signs.

NO TRAIN HORN W10-9P 30" X 24"

Texas Department of Transportation — Traffic Safety Division Standard

RAILROAD CROSSING DETAILS SIGNING & STRIPING

RCD(2)-22

FILE: rcd2-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2022	CONT	SECT	JOB	HIGHWAY
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2-16 11-22	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		80

DATE: 10/4/2023 10:52:44 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Design Projects/0036050442/4 - Design/Plan Set/9. Environmental/ENVIRONMENTAL PERMITS ISSUES AND COMMITMENTS.dgn

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or CGP 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 that may receive discharges from this project. The MS4 Operator may need to be notified prior to construction activities.

1. N/A

☑ NO ACTION REQUIRED ☐ ACTION REQUIRED

1.

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.

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#

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.

Required Actions: List waters of the U.S. that the permit applies to, the location in project, and check BMP's planned to control erosion, sedimentation and post-construction TSS.

1. N/A

BEST MANAGEMENT PRACTICES

EROSION

- ☐ SEEDING OR SODDING
- ☐ MULCHING
- ☐ SOIL RETENTION BLANKETS
- ☐ BIODEGRADABLE EROSION CONTROL LOGS
- ☐ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- ☐ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- ☐ TOPSOIL OR COMPOST
- ☐ FLEXIBLE CHANNEL LINERS
- ☐ GROUND COVER

SEDIMENTATION

- ☐ ROCK FILTER DAMS
- ☐ TEMPORARY SEDIMENT CONTROL FENCES
- ☐ TRIANGULAR FILTER DIKES
- ☐ TOPSOIL OR COMPOST
- ☐ BIODEGRADABLE EROSION CONTROL LOGS
- ☐ SEDIMENT BASINS
- ☐ SAND BAG BERMS
- ☐ STRAW BALE DIKES
- ☐ BRUSH BERMS
- ☐ STORM INLET SEDIMENT TRAPS

POST-CONSTRUCTION TSS

- ☐ VEGETATIVE FILTER STRIPS
- ☐ RETENTION/IRRIGATION SYSTEMS
- ☐ EXTENDED DETENTION BASINS
- ☐ CONSTRUCTED WETLANDS
- ☐ WET BASINS
- ☐ TOPSOIL OR COMPOST
- ☐ BIODEGRADABLE EROSION CONTROL LOGS
- ☐ VEGETATION LINED DITCHES
- ☐ SAND FILTER SYSTEMS
- ☐ GRASSY SWALES

III. CULTURAL RESOURCES

Refer to the 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 ☐ ACTION REQUIRED

1. N/A

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.

Adhere to specification requirements of Items 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 ☐ ACTION REQUIRED

1.

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

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.

☐ NO ACTION REQUIRED ☑ ACTION REQUIRED

1. 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, or egg in part or in whole, without a federal permit issued in accordance with the Act's policies and regulations. Migration patterns would not be affected by the proposed project. Remove non-active migratory bird nests from structures where work would be performed from September 1 through the end of February. Prevent migratory birds from building nests from March 1 to August 31. In the event that migratory birds are encountered on-site during project construction, avoid adverse impacts on protected birds, active nests, eggs, and/or young.

ABBREVIATIONS USED

BMP – Best Management Practice
CGP – Construction General Permit
CSN – Construction Site Notice
DSHS – Texas Department of State Health Services
EPA – U.S. Environmental Protection Agency
MS4 – Municipal Separate Stormwater Sewer System
MSDS – Material Safety Data Sheet
NOI – Notice of Intent
NWP – Nationwide Permit
PCN – Pre-Construction Notification
PSL – Project Specific Location
SW3P – Storm Water Pollution Prevention Plan
TCEQ – Texas Commission on Environmental Quality
TPDES – Texas Pollutant Discharge Elimination System
TSS – Total Suspended Solids
USACE – U.S. Army Corps of Engineers

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 MSDS for all hazardous products used on the project, which may include, but are not limited to the following categories: paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labeling 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 TxDOT 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 ☐ ACTION REQUIRED

1. N/A

VII. OTHER ENVIRONMENTAL ISSUES

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

☑ NO ACTION REQUIRED ☐ ACTION REQUIRED

1. N/A

STATE OF TEXAS
THOMAS MITCHELL GATLIN III
143945
LICENSED
PROFESSIONAL ENGINEER

T. M. Gatlin III, P.E.

10/05/2023

Texas Department of Transportation
San Angelo District

ENVIRONMENTAL PERMITS ISSUES AND COMMITMENTS

SHEET 1 OF 1 NOT TO SCALE

© TxDOT 2023	CONT	SECT	JOB	HIGHWAY
SHEET ISSUED OR LAST REVISED 11-19	0036	05	044, ETC	US 83, ETC
	DIST	COUNTY		SHEET NO.
	SJT	REAL, ETC		81