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FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6	F 2022(034), ETC			1
STATE	STATE DIST.	COUNTY		
TEXAS	SAT	KENDALL, ETC.		
CONT.	SECT.	JOB	HIGHWAY NO.	
0072	05	090,Etc.	IH 10,Etc.	

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT:
PROJECT NO.: F 2022(034), ETC.
CSJ: 0072-05-090, ETC.

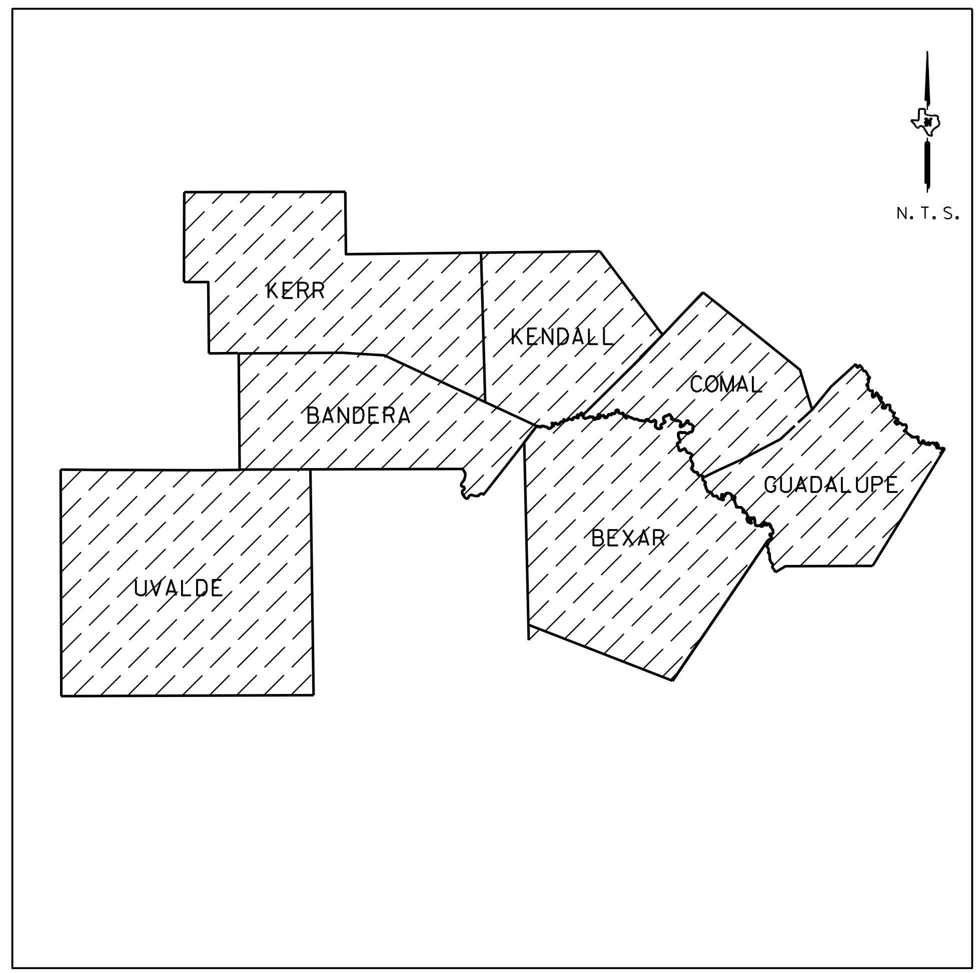
KENDALL COUNTY, ETC.
ROADWAY: IH 10, ETC.

FROM US 87B TO IH 10 WBML, ETC.

NET LENGTH OF ROADWAY = 863,047.68 FT = 163.456 MI
NET LENGTH OF BRIDGE = 0.00 FT = 0.000 MI

NET LENGTH OF PROJECT = 863,047.68 FT = 163.456 MI

FOR THE CONSTRUCTION OF SEAL COAT AND PAVEMENT MARKINGS



INDEX OF SHEETS

SEE SHEET 2 FOR INDEX OF SHEETS

DESIGN SPEED = N/A
AREA OF DISTURBED SOIL = <1 ACRE
ADT: N/A

FINAL PLANS

LETTING DATE: ____________

DATE CONTRACTOR BEGAN WORK: ____________

DATE WORK WAS ACCEPTED: ____________

FINAL CONTRACT COST: $ ____________

CONTRACTOR: ____________

FINAL PLANS STATEMENT:

THE CONSTRUCTION WORK WAS PERFORMED
IN ACCORDANCE WITH THE PLANS.

____________ P.E. ____________
AREA ENGINEER DATE

TEXAS DEPARTMENT OF TRANSPORTATION

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, MAY, 2012)

EXCEPTIONS: SEE PROJECT INDEX
EQUATIONS: NONE
RR X-ING'S: SEE PROJECT INDEX

SUBMITTED FOR LETTING: 8/2/2021
DocuSigned by: Christen Longo
71AA0B38A52C443...
TRANSPORTATION ENGINEER SUPERVISOR

RECOMMENDED FOR LETTING: 8/4/2021
DocuSigned by: Clayton Ripps, P.E.
74F5...
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

RECOMMENDED FOR LETTING: 8/4/2021
DocuSigned by: Gregg Granato, P.E.
0D08C7F3B58C45C...
DESIGN ENGINEER

APPROVED FOR LETTING: 8/4/2021
DocuSigned by: Gina Gallegos, P.E.
124372CCDF604F5...
DISTRICT ENGINEER

FILE LOCATION AND NAME
T:\Engdata\Standards\Design\TITLESHEET-2014Specs.DGN

LEVELS DISPLAYED

COUNTY ____
HWY. NO. ____
DATE ACCEPTED ____
PROJ. NO. ____
LETTING DATE ____

* STATE STANDARDS
** SAN ANTONIO DISTRICT STANDARDS
THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE (*, **) HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

STATE OF TEXAS
CHRISTEN D. LONGORIA
107506
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Christen Longoria P.E. 8/2/2021
CHRISTEN D. LONGORIA DATE

Texas Department of Transportation

DISTRICT SEAL COAT
INDEX OF SHEETS

SHEET 1 of 1

DESIGN:	DRAFT:	CHECK:	
FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		2
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

2021
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RDWY REF NO	COUNTY	HIGHWAY	CSJ	LENGTH IN CENTERLANE MILES (MI)	LIMITS FROM	RM FROM	OFFSET	LIMITS TO	RM TO	OFFSET	RAILROAD CROSSING
1	BANDERA	RM 187	0678-02-040	14.498	0.1 MILES E OF LOST MAPLES ENTRANCE	478	1.947	BANDERA/UVALDE COUNTY LINE	496	0.005	-
2	BANDERA	FM 470	0792-04-050	17.098	RM 187	428	-0.096	FM 462	444	1.223	-
3	BANDERA	FM 462	0848-03-014	2.438	FM 470	482	-0.050	BANDERA/MEDINA COUNTY LINE	486	0.043	-
4	BEXAR	FM 2538	2442-01-009	6.275	IH 10	510	-0.148	BEXAR/GUADALUPE COUNTY LINE	516	0.280	-
5	COMAL	PR 31	0477-01-006	2.779	PARK ENTRANCE	468	0.000	SH 46	470	0.789	-
6	COMAL	FM 1101	1272-01-020	4.502	0.6 MLES EAST OF FM 306	516	0.460	COMAL/GUADALUPE COUNTY LINE	520	0.991	-
7	COMAL	FM 3424	1728-01-008	1.352	RM 32	462	-0.053	FM 306	462	1.300	-
8	COMAL	RM 2722	2666-01-014	7.763	FM 2673	470	-0.056	SH 46	476	1.734	-
9	GUADALUPE	FM 467	0851-01-024	13.117	FM 775	514	-0.034	FM 725	526	1.165	-
10	GUADALUPE	FM 758	0987-02-015	6.619	SH 46	518	-0.083	SH 123	524	0.856	-
11	GUADALUPE	FM 1101	1272-02-011	3.270	COMAL/GUADALUPE COUNTY LINE	520	0.993	SH 123	524	1.255	-
12	GUADALUPE	FM 2538	2442-02-009	1.563	BEXAR/GUADALUPE COUNTY LINE	516	0.286	FM 775	518	0.012	-
13	KENDALL	IH 10 WB Frt Rd	0072-05-090	0.253	US 87B	537	0.826	IH 10 WESTBOUND MAINLANE	538	0.078	-
14	KENDALL	IH 10 WB Frt Rd	0072-05-091	2.100	FM 289	524	1.017	US 87B	527	0.066	-
15	KENDALL	IH 10 WB Frt Rd	0072-05-092	3.457	SOUTH OF GUADALUPE RIVER	524	1.016	JOSHUA RANCH ROAD	528	0.420	-
16	KENDALL	IH 10 EB Frt Rd	0072-05-093	0.550	SOUTH OF GUADALUPE RIVER	524	0.471	US 87 (COMFORT)	524	1.017	-
17	KENDALL	IH 10 EB Frt Rd	0072-05-094	2.108	US 87 (COMFORT)	524	1.017	FM 289	527	0.077	-
18	KENDALL	SH 46	1042-02-023	6.612	BANDERA/KENDALL COUNTY LINE	472	0.400	0.5 MILES WEST OF IH 10	480	0.598	-
19	KERR	RM 479	0829-02-020	10.536	KERR/KIMBLE COUNTY LINE	444	0.101	SH 27	455	0.024	-
20	UVALDE	SH 55	0235-04-031	16.607	UVALDE/REAL COUNTY LINE	51	0.000	NUECES RIVER	526	0.645	-
21	UVALDE	SH 127	0369-01-041	21.122	US 83	416	-0.162	US 90	436	1.292	742816G
22	UVALDE	FM 1052	1167-01-012	4.419	US 83	514	-0.028	US 90	518	0.027	-
23	UVALDE	RM 1022	1230-01-019	7.768	US 90	512	-0.043	7.8 MI SW OF US 90	518	1.738	742998V

Texas Department of Transportation

DISTRICT SEAL COAT PROJECT ROADWAY INDEX

SHEET 1 of 1

DESIGN:	DRAFT:	CHECK:	
FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		3
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

2021
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LEGEND

— *REFERENCE* — HIGHWAY

— *1* — RM 187

— *2* — FM 470

— *3* — FM 462

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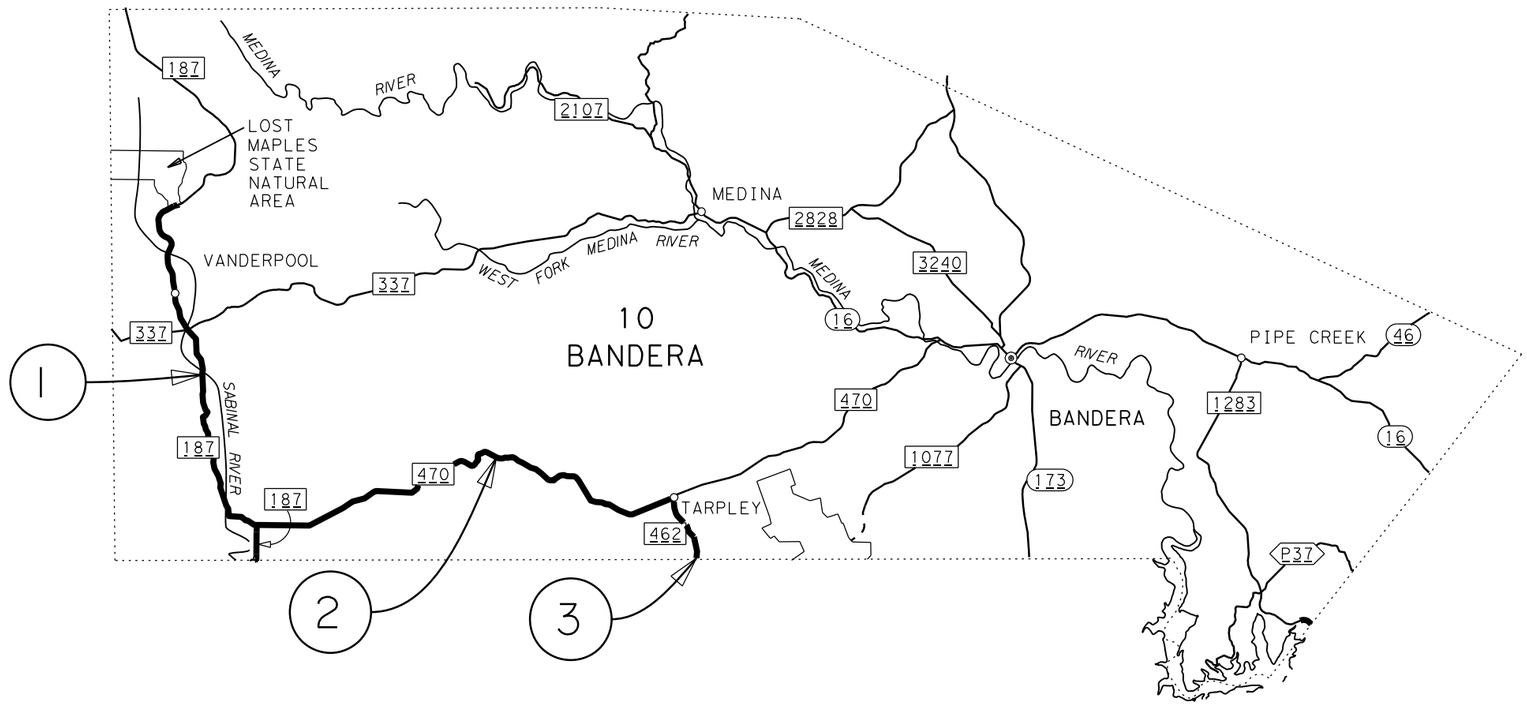

BANDERA COUNTY

Texas Department of Transportation

DISTRICT SEAL COAT LOCATION MAP

SHEET 1 of 7

DESIGN:	DRAFT:	CHECK:	
FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		4
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

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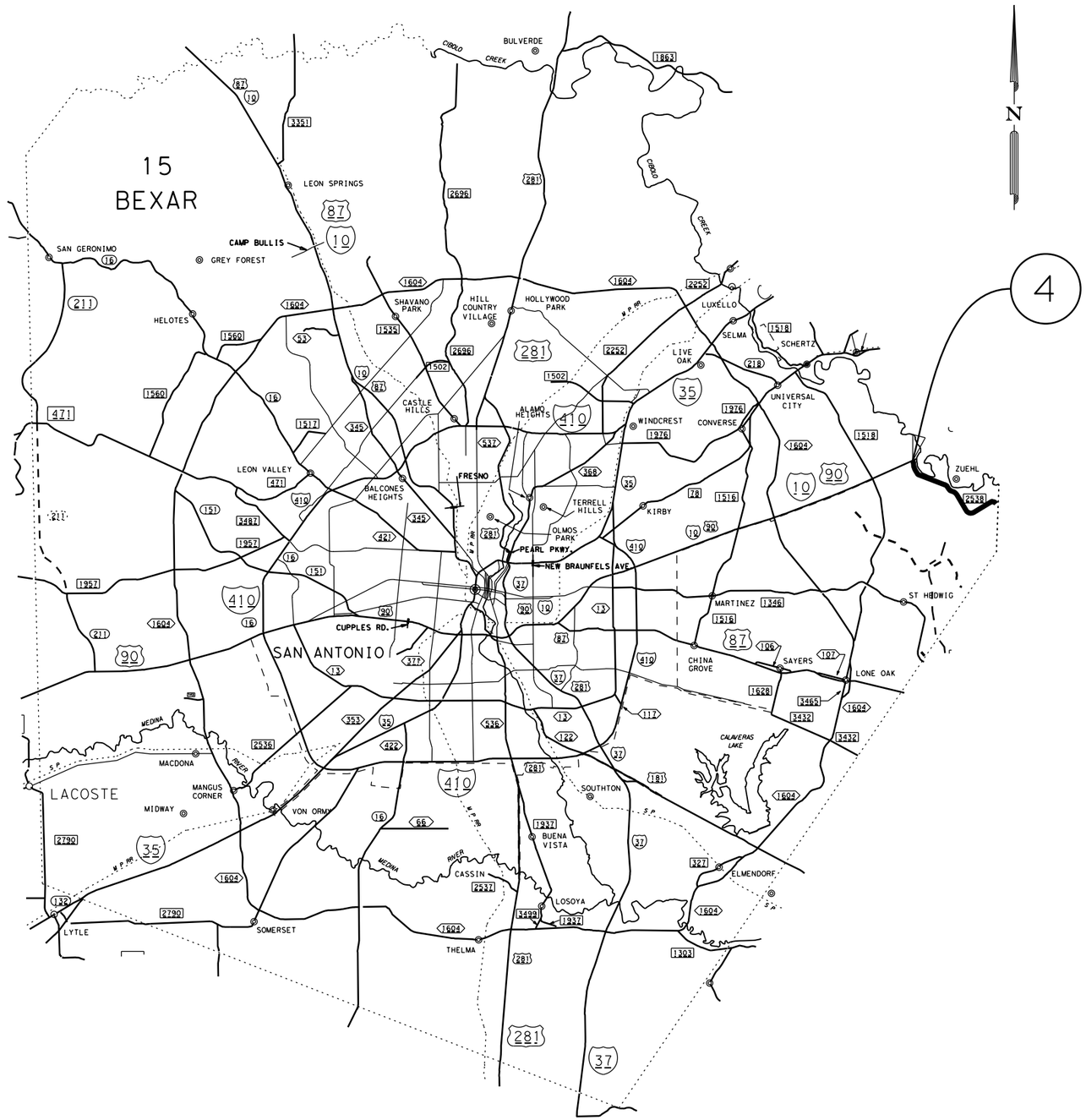

LEGEND

— *REFERENCE* — HIGHWAY

—— *4* —— FM 2538

BEXAR COUNTY

SCALE: NTS

Texas Department of Transportation
© 2021 TxDOT

DISTRICT SEAL COAT LOCATION MAP

SHEET 2 OF 7

DESIGN:	DRAFT:	CHECK:

FED.RD. DIV.NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	5

STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

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LEGEND

— *REFERENCE* — HIGHWAY
—— 5 —— PR 31
—— 6 —— FM 1101
—— 7 —— FM 3424
—— 8 —— RM 2722

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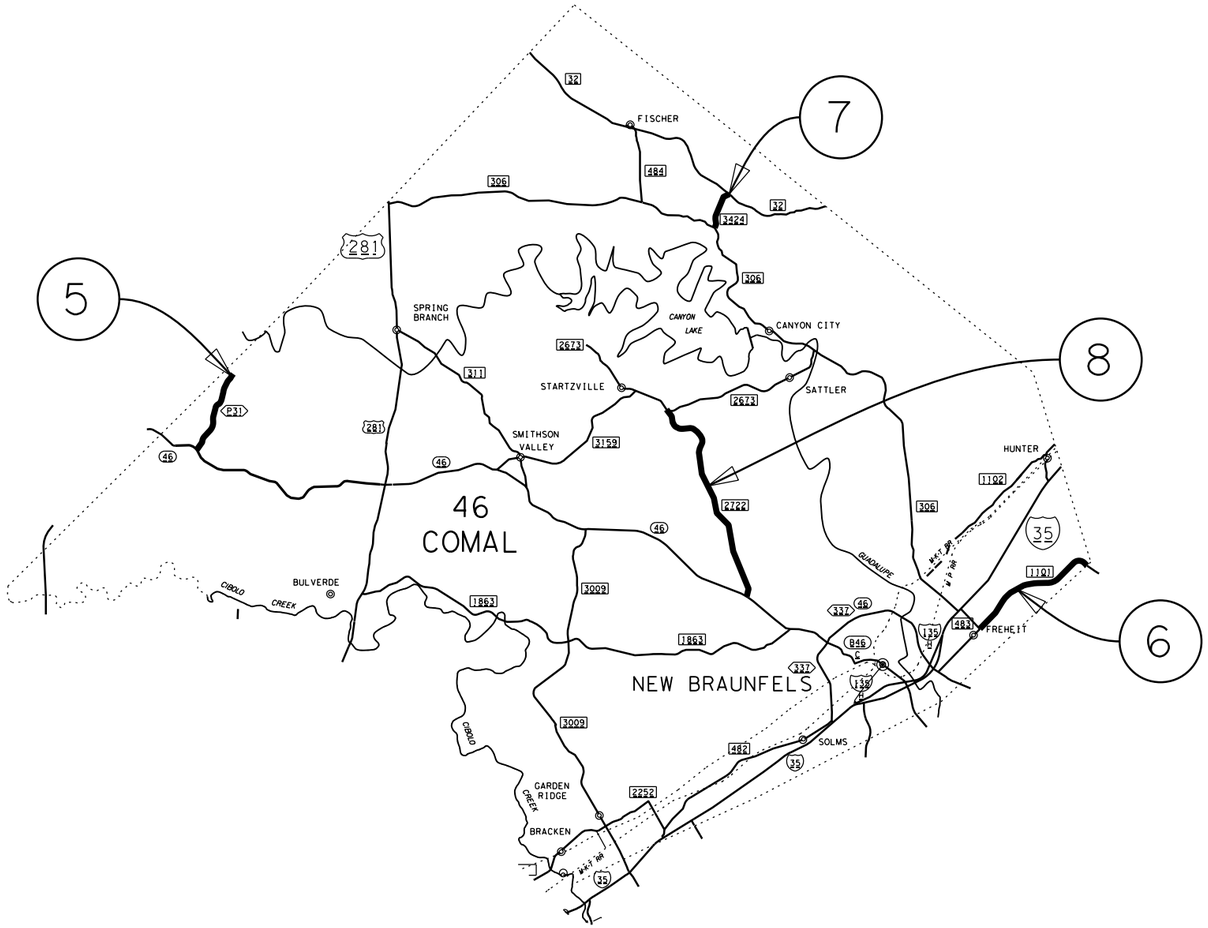

COMAL COUNTY

DISTRICT SEAL COAT LOCATION MAP

SHEET 3 of 7

DESIGN:	DRAFT:	CHECK:	
FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		6
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

2021
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LEGEND

— *REFERENCE* — HIGHWAY

—— *9* —— FM 467

—— *10* —— FM 758

—— *11* —— FM 1101

—— *12* —— FM 2538

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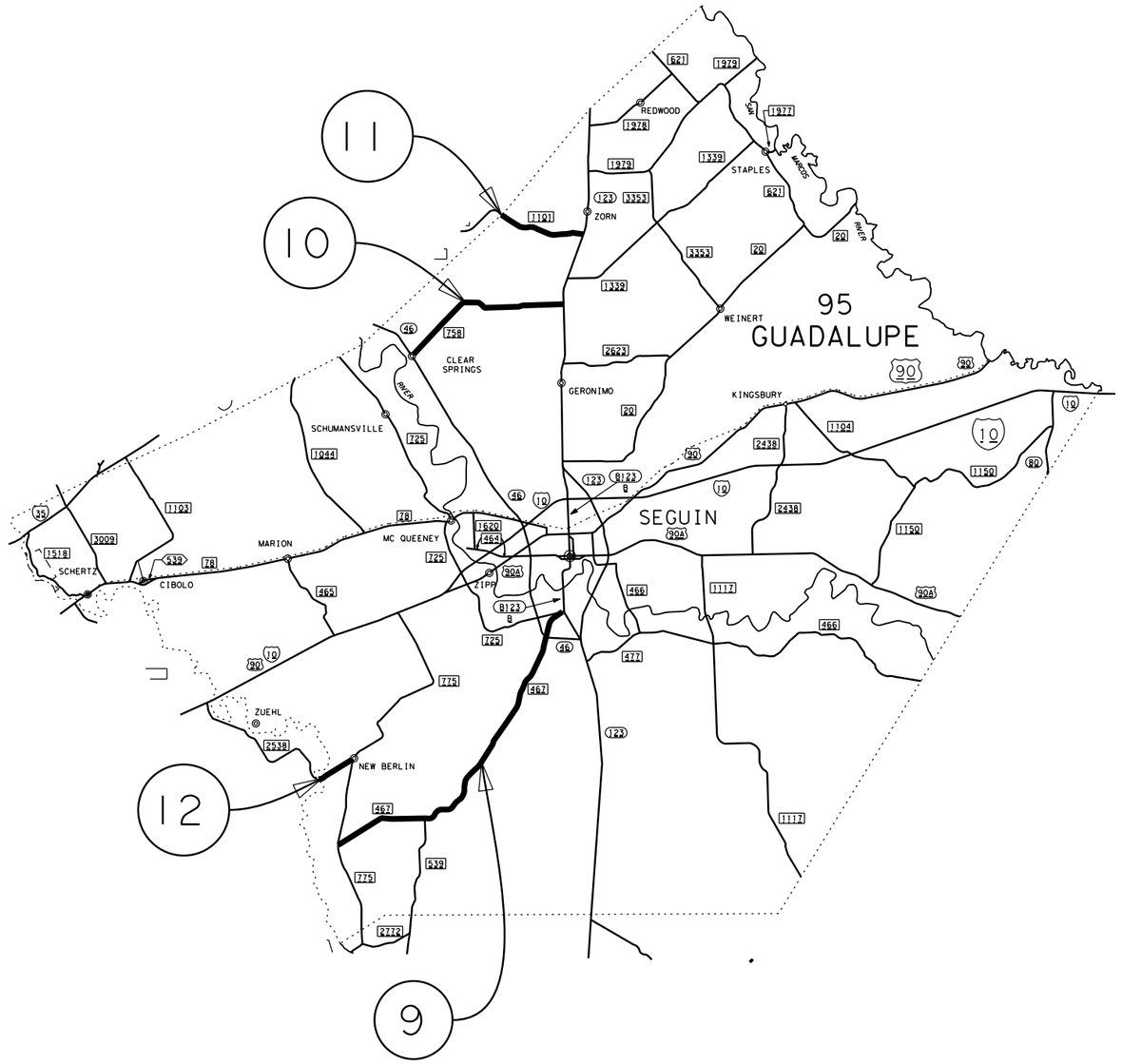

GUADALUPE COUNTY

Texas Department of Transportation

DISTRICT SEAL COAT LOCATION MAP

SHEET 4 of 7

DESIGN:	DRAFT:	CHECK:

FED.RD. DIV.NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	7

STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

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LEGEND

— *REFERENCE* — HIGHWAY

—— *13* —— IH 10 WBFR

—— *14* —— IH 10 WBFR

—— *15* —— IH 10 WBFR

—— *16* —— IH 10 EBFR

—— *17* —— IH 10 EBFR

—— *18* —— SH 46

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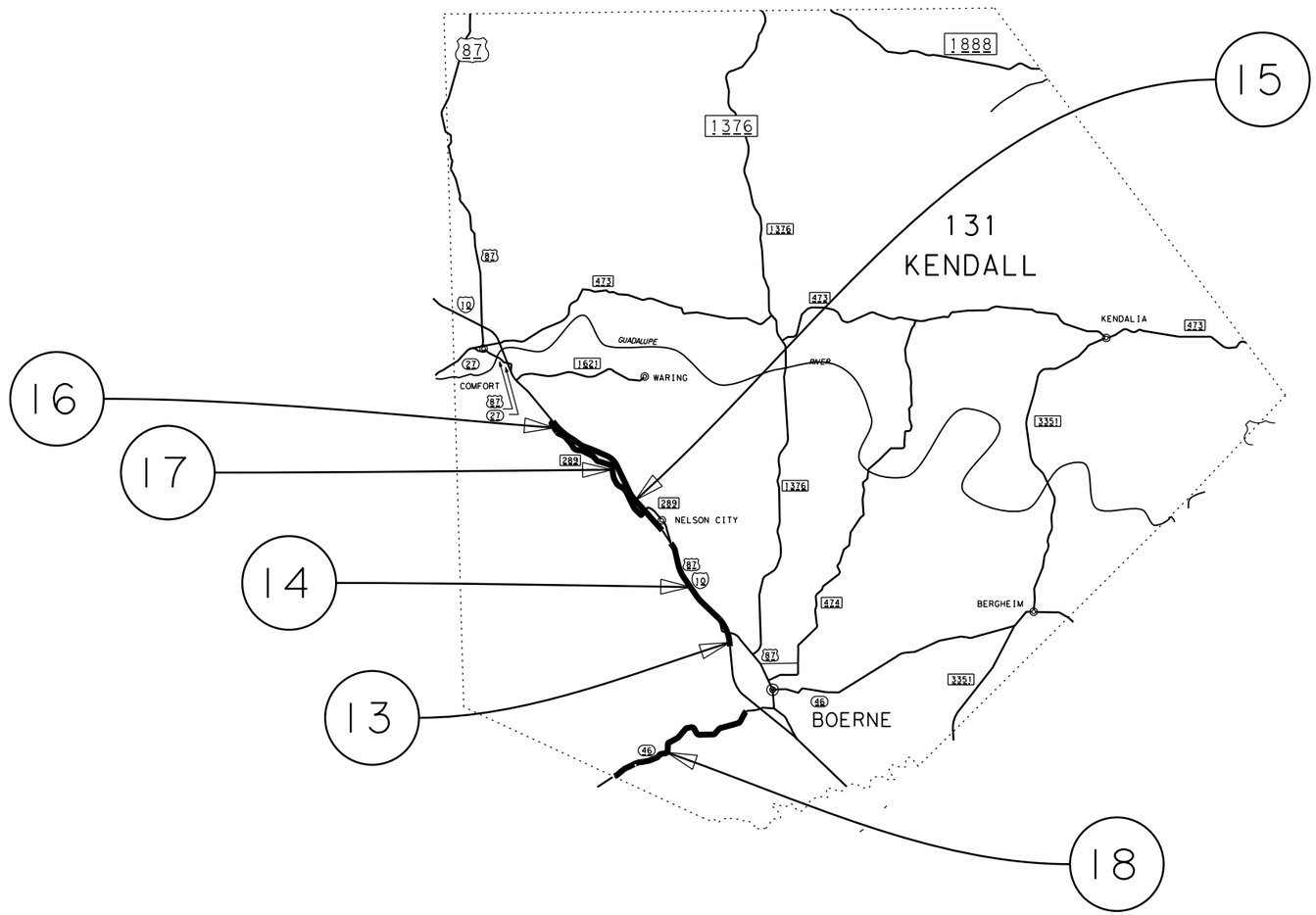

KENDALL COUNTY

DISTRICT SEAL COAT LOCATION MAP

SHEET 5 of 7

DESIGN:	DRAFT:	CHECK:	
FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		8
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

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LEGEND

— *REFERENCE* — HIGHWAY

—— *19* —— RM 479

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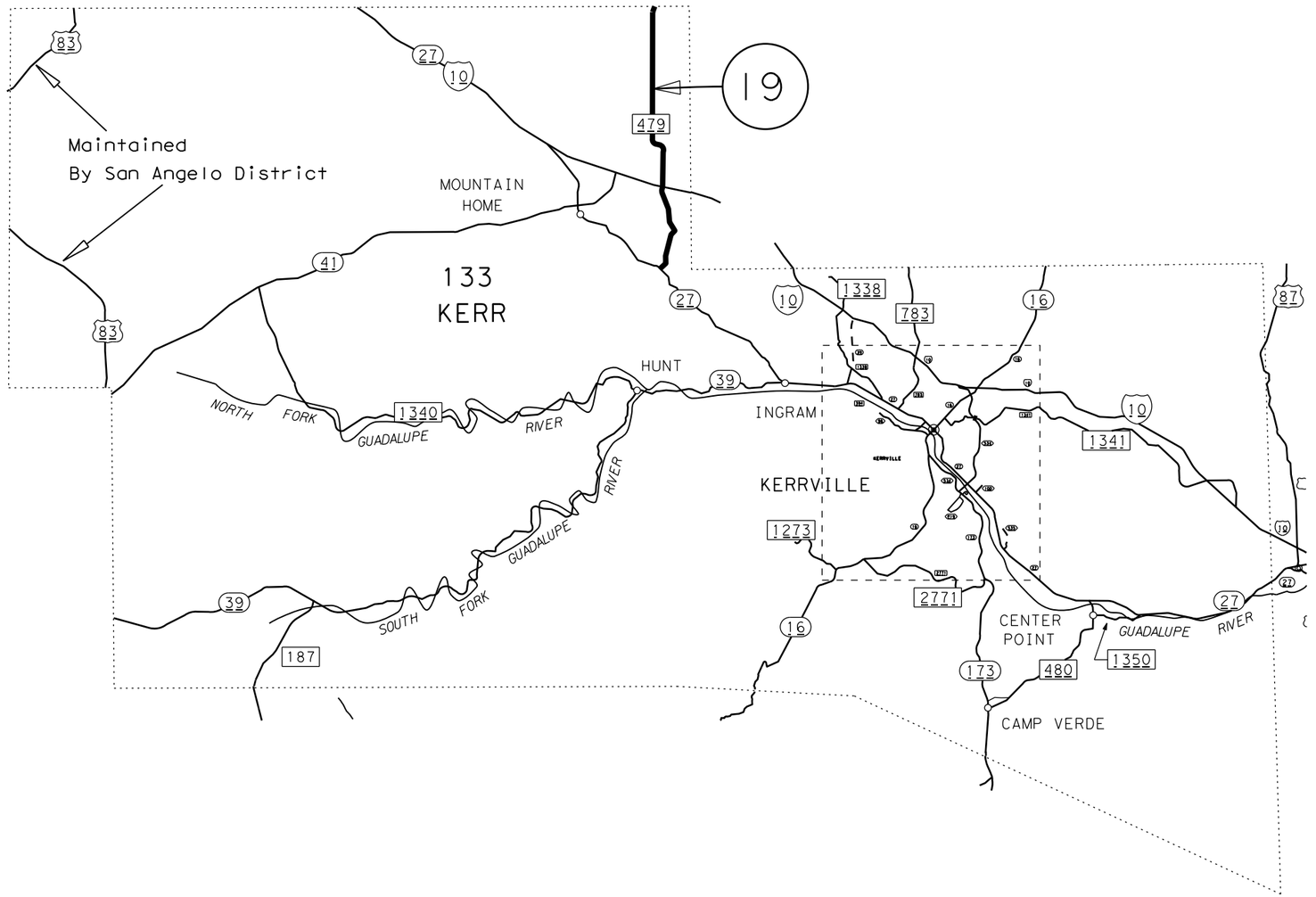

KERR COUNTY

Texas Department of Transportation

DISTRICT SEAL COAT LOCATION MAP

SHEET 6 of 7

DESIGN:	DRAFT:	CHECK:	
FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		9
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

LEGEND

— *REFERENCE* — HIGHWAY

20 — SH 55

21 — SH 127

22 — FM 1052

23 — RM 1022

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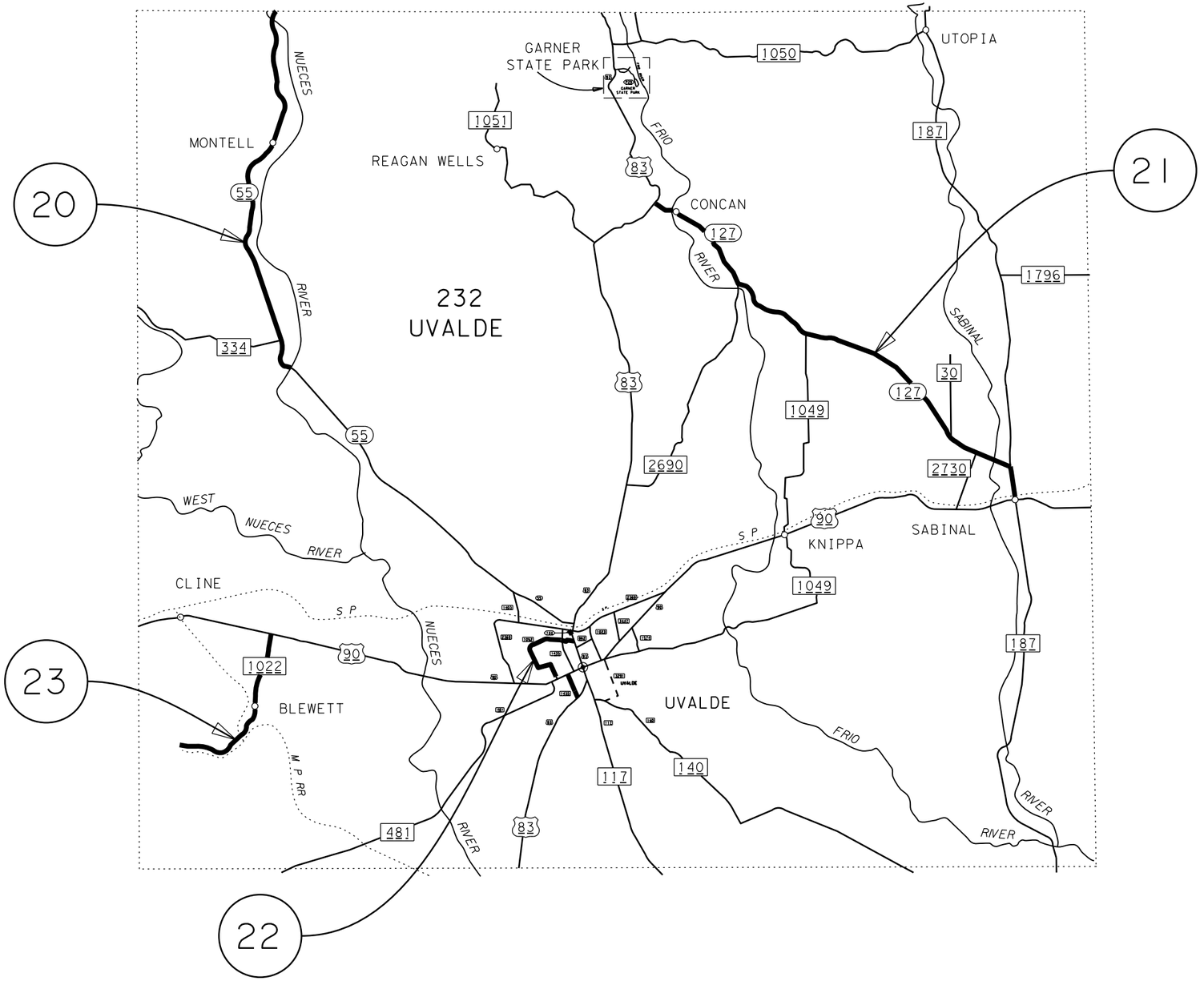

UVALDE COUNTY

2021
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Texas Department of Transportation

DISTRICT SEAL COAT LOCATION MAP

SHEET 7 of 7

DESIGN:	DRAFT:	CHECK:

FED.RD. DIV.NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	10

STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

**********GENERAL NOTES**********
2014 Specification Book

Remove existing raised pavement markings as the work progresses or as approved. This work is subsidiary to the various bid items. Properly dispose materials removed.

Hurricane Evacuation

Hurricane Season is from June 1 thru November 30. As the closest metropolitan city inland from the Texas Coast, the City of San Antonio is a major shelter destination during mandatory hurricane evacuations. As such, planned work zone lane or road closures may be restricted and/or suspended during mandatory hurricane evacuation operations. The District will coordinate these restrictions at a minimum H-120 from any projected impact to the Texas Coast.

No time charges will be made if the Engineer determines that work on the project was impacted by the hurricane.

The Engineer may order changes in the Traffic Control Plan to accommodate evacuation traffic, and may suspend the work, all or in part, to ensure timely completion of this work. All work to implement changes in the Traffic Control Plan will be paid through existing bid prices or through Item 9.5, Force Account. However, the Department will not entertain any request for delay damages, loss of efficiency that may be attributed to the restriction or suspension of road or lane closures, or to changes in the Traffic Control Plan.

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

Marshall Heap II, P.E., Marshall.Heap@txdot.gov
Jose Mendez, P.E., Jose.C.Mendez@txdot.gov

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

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

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

Control: 0072-05-090, etc.

County: Kendall, etc.

Highway: IH 10, etc.

--Item 5--
Reference all existing striping and other pavement markings to allow these markings to be re-established. Ensure the markings (lane lines, edge lines, ramp gores, etc.) are in line with signs, TMS arrows, etc. located on overhead sign supports.

When a bridge deck is milled, seal coated and overlaid, remove excess material. Do not just broom to the sides of the bridge, under guardrail, etc. Cover or protect all sealed expansion joints and rails on bridges and all railroad tracks encountered as approved. Clean all of these features if they weren't properly protected. This work is subsidiary work to applicable bid items.

Prevention of Migratory Bird Nesting

It is anticipated that migratory birds, a protected group of species, may try to nest on bridges, culverts, vegetation, or gravel substrate, at any time of the year. The preferred nesting season for migratory birds is from February 15 through October 1. Nests containing migratory birds must be avoided and no work will be performed in the nesting areas until the young birds have fledged.

No extension of time or compensation payment will be granted for a delay or suspension of work caused by nesting swallows. This work is subsidiary to the various bid items.

--Item 6--
Show the stockpile lot and/or sub lot numbers on all tickets for all materials.

--Item 7--
The total disturbed areas within the project is anticipated at less than one (1) acre. Due to this type of construction, the project qualifies for exclusion under the Construction General Permit (CGP) issued by the Texas Commission on Environmental Quality (TCEQ). However; should the sum of the Engineer's anticipated disturbances and the Contractor's (On ROW and off ROW) PSL's equal or exceed the one (1) acre threshold; both TxDOT and the Contractor have project responsibilities under the CGP that reverts to non-exclusion status. Obtain approval for all non-depicted areas of disturbance that increases the initial soil and vegetation disturbed area estimates before work starts at these locations.

Notify the Engineer of the disturbed acreage within one (1) mile of the project limits. Obtain authorization from the TCEQ for Contractor PSL's for construction support activities on or off ROW.

Roadway closures during the following key dates and/or special event are prohibited.
See the TCP Narrative for these dates.

Control: 0072-05-090, etc.

County: Kendall, etc.

Highway: IH 10, etc.

--Item 8--
Working days will be computed and charged in accordance with Article 8.3.1.2.: Six-Day work week.

The Start Work Date is May 3, 2022. See the Seal Coat season note under Item 316 for additional information.

Time charges will start when the contractor begins Phase 1. Once Phase 1 work is completed, time charges may be suspended until crews begin the application of seal coat for Phase 2. Time charges will continue until all seal coat punch list items are completed including the cleanup of stockpile locations, etc. Removal of excess aggregate will be completed by October 30, 2022. If excess aggregate is not removed by October 30, 2022, the aggregate shall become the property of TxDOT and taken into the maintenance section's inventory at no charge.

Create and maintain a bar chart schedule.

Submit a schedule 2 weeks prior to the beginning of work. The schedule may consist of a bar chart. The bar chart, at a minimum, shall include all seal coat operations, taking into account all time and day restrictions. Schedule updates are required if the contractor deviates from the schedule sequence more than three days from the original sequence.

--Item 9--
When approved, provide uniformed, off-duty law enforcement officers with marked vehicles during work that requires a lane closure. The officer in marked vehicles shall be located as approved to monitor or direct traffic during the closure. The method used to direct traffic at signalized intersections shall be as approved. Additional officers and vehicles may be provided when approved or directed.

Complete the daily tracking form provided by the department and submit invoices that agree with the tracking form for payment at the end of each month approved services were provided.

Show proof of certification by the Texas Commission on Law Enforcement Standards.

All law enforcement personnel used in Work Zone Traffic Control shall be trained for performing duties in work zones and are required to take "Safe and Effective Use of Law Enforcement Personnel in Work Zones" (Course #133119) which can be found online at the following site: www.nhi.fhwa.dot.gov

Certificates of completion should be available to all who finish the course. These should be kept by the officers in order to substantiate completion when reporting to the work site.

Minimums, scheduling fees, etc. will not be paid; TxDOT will consider paying cancellation fees on a case by case basis.

--Item 316--
Seal coat season begins May 1st and ends September 15th. Any seal coat work that occurs outside this timeframe must be approved by the Engineer.

--Item 500--
"Materials on Hand" payments will not be considered in determining percentages for mobilization payments.

--Item 502--
Place standard markings no later than 14 days after surface treatment operations are completed.

When advanced warning flashing arrow panels and/or changeable message sign is specified, have one standby unit in good condition at the job site. Standby time shall be considered subsidiary to the bid item.

After written notification, the time frame is provided on the Form 599 to provide properly maintained signs and barricades before considered in non-compliance. Failure to make corrections as noted may result in payment for this item being withheld.

For closures not listed in the TCP; limit the lane closures for references with schools or school zones within the project limits between the hours of 7:00 A.M. to 9:00 A.M. and 3:30 P.M. to 5:00 P.M. when school is in session. No lane closure will be allowed during these times in school zones unless approved by the Engineer.

Avoid placing stockpiles within the roadway's horizontal clear zone. If a stockpile is placed within the clear zone, address in accordance with the TMUTCD.

Do not place barricades, signs, or any other traffic control devices where they interfere with sight distance at driveways or side streets.

In addition to providing a Contractor's Responsible Person and a phone number for emergency contact, have an employee available to respond on the project for emergencies and for taking corrective measures within 2 hours or within a reasonable time frame as specified by the Engineer.

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.

--Item 506--
It is not anticipated that erosion control devices will be needed. However; in the event devices are needed, the SW3P shall consist of the control measures approved. Depending on the type and amount of work, payment will be handled with the Force Account Procedure, or by individual pay items.

Failure to address items noted on the SW3P inspection report within two report cycles may result in the Department stopping all construction operations, exclusive of time charges, or withholding that month's estimate until the SW3P deficiencies are corrected unless the Engineer determines that the area is too wet to correct SW3P deficiencies.

--Item 510--
The length of the one-way traffic control section is limited to 2 miles.

--Item 666--
Failure to provide the retroreflectometer testing data within the time specified in the specifications will result in non-payment of the bid item.

--Item 672--
Place all adhesive material directly from the heated dispenser to the pavement. Do not use portable or non-heated containers. Use adhesive of sufficient thickness so that when the marker is pressed into the adhesive, 1/8" or more adhesive will remain under 100% of the marker. The adhesive should extend not less than 1/2" but not more than 1 1/2" beyond the perimeter of the marker.

--Item 6185--
2 shadow vehicles with TMA will be required for this project. The TMA's will be measured and paid for by the DAY for each TMA/TA set up and operational on the worksite. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMA's needed for the project. See TMA and TA Summary sheet in the plans.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0072-05-090 **DISTRICT** San Antonio **COUNTY** Bandera, Bexar, Comal, Guadalupe, Kendall, Kerr, Uvalde
HIGHWAY FM 1052, FM 1101, FM 2538, FM 3424, FM 462, FM 467, FM 470, FM 758, IH 10, PR 31, RM 1022, RM 187, RM 2722, RM 479, SH 127, SH 46, SH 55

				0072-05-090		0072-05-091		0072-05-092		0072-05-093		0072-05-094		0235-04-031	
		CONTROL SECTION JOB													
		PROJECT ID		A00130115		A00130123		A00130125		A00130229		A00130275		A00130226	
		COUNTY		Kendall		Kendall		Kendall		Kendall		Kendall		Uvalde	
		HIGHWAY		IH 10		IH 10		IH 10		IH 10		IH 10		SH 55	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-6242	AGGR(TY-PD GR-5 SAC-B)	CY												
	316-6446	AGGR (TY-PD GR-4 OR GR-4S SAC-A)	CY												
	316-6447	AGGR (TY-PD GR-4 OR GR-4S SAC-B)	CY	64.000		523.000		344.000		50.000		296.000		2,736.000	
	316-6521	ASPH (AC-20-5TR OR AC-20XP)	TON	11.400		92.500		60.800		8.600		52.400		485.200	
	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												
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	74.000		613.000		458.000		72.000		313.000		2,200.000	
	666-6045	REFL PAV MRK TY I (W)18"(SLD)(100MIL)	LF												
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	12.000		12.000		12.000		12.000		24.000		30.000	
	666-6147	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	LF	25.000											
	666-6156	REFL PAV MRK TY I(Y)(MED NOSE)(100MIL)	EA											1.000	
	666-6168	REFL PAV MRK TY II (W) 4" (DOT)	LF	33.000											
	666-6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	2,650.000		650.000						4,700.000		176,000.000	
	666-6174	REFL PAV MRK TY II (W) 6" (SLD)	LF												
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	180.000				75.000						150.000	
	666-6181	REFL PAV MRK TY II (W) 18" (SLD)	LF												
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	12.000		12.000		12.000		12.000		24.000		30.000	
	666-6205	REFL PAV MRK TY II (Y) 4" (BRK)	LF			1,770.000		770.000				1,770.000		15,850.000	
	666-6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	5,860.000		40,350.000		68,750.000		9,283.000		40,310.000		78,490.000	
	666-6214	REFL PAV MRK TY II (Y) 24" (SLD)	LF	25.000											
	666-6217	REFL PAV MRK TY II (Y) (MED NOSE)	EA											1.000	
	666-6231	PAVEMENT SEALER (ARROW)	EA	2.000										2.000	
	666-6232	PAVEMENT SEALER (WORD)	EA	2.000										2.000	
	666-6242	PAVEMENT SEALER (RR XING)	EA	2.000				2.000							
	666-6243	PAVEMENT SEALER (YLD TRI)	EA	5.000		10.000		15.000		15.000		11.000			
	666-6248	PAVEMENT SEALER (NUMBER)	EA												
	666-6307	RE PM W/RET REQ TY I (W)6"(SLD)(060MIL)	LF												
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	2.000										2.000	
	668-6084	PREFAB PAV MRK TY C (W) (NUMBER)	EA												
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	2.000										2.000	
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)	EA	2.000				2.000							
	668-6092	PREFAB PAV MRK TY C (W) (36")(YLD TRI)	EA	5.000		10.000		15.000		15.000		11.000			
	672-6007	REFL PAV MRKR TY I-C	EA	9.000				4.000						8.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	70.000		491.000		456.000		88.000		250.000		1,094.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF												
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	208.000											

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			CONTROL SECTION JOB	**0072-05-090**		**0072-05-091**		**0072-05-092**		**0072-05-093**		**0072-05-094**		**0235-04-031**	
			PROJECT ID	**A00130115**		**A00130123**		**A00130125**		**A00130229**		**A00130275**		**A00130226**	
			COUNTY	**Kendall**		**Kendall**		**Kendall**		**Kendall**		**Kendall**		**Uvalde**	
			HIGHWAY	**IH 10**		**IH 10**		**IH 10**		**IH 10**		**IH 10**		**SH 55**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	6056-6001	PREFORMED IN-LANE(TRANS) RUMBLE STRIP	LF												
	6185-6005	TMA (MOBILE OPERATION)	DAY	4.000		8.000		10.000		8.000		8.000		22.000	
	08	RAILROAD FLAGGING: CONTRACTOR FORCE ACCOUNT WORK (NON-PARTICIPATING)	LS	1.000											
	18	LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000											
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000											
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000											

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				0369-01-041		0477-01-006		0678-02-040		0792-04-050		0829-02-020		0848-03-014	
		CONTROL SECTION JOB													
		PROJECT ID		A00130228		A00130224		A00130105		A00130220		A00130214		A00130103	
		COUNTY		Uvalde		Comal		Bandera		Bandera		Kerr		Bandera	
		HIGHWAY		SH 127		PR 31		RM 187		FM 470		RM 479		FM 462	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-6242	AGGR(TY-PD GR-5 SAC-B)	CY					729.000							
	316-6446	AGGR (TY-PD GR-4 OR GR-4S SAC-A)	CY	1,642.000											
	316-6447	AGGR (TY-PD GR-4 OR GR-4S SAC-B)	CY	2,339.000		334.000		1,588.000		2,393.000		1,328.000		294.000	
	316-6521	ASPH (AC-20-5TR OR AC-20XP)	TON	633.200		59.100		394.700		424.500		235.300		51.900	
	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	2,795.000		375.000		1,893.000		2,235.000		1,413.000		325.000	
	666-6045	REFL PAV MRK TY I (W)18"(SLD)(100MIL)	LF	84.000											
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	635.000				48.000				20.000		12.000	
	666-6147	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	LF												
	666-6156	REFL PAV MRK TY I(Y)(MED NOSE)(100MIL)	EA	5.000											
	666-6168	REFL PAV MRK TY II (W) 4" (DOT)	LF	30.000											
	666-6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	222,172.000		31,950.000						112,850.000		26,390.000	
	666-6174	REFL PAV MRK TY II (W) 6" (SLD)	LF					155,310.000		178,710.000					
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	2,060.000				330.000							
	666-6181	REFL PAV MRK TY II (W) 18" (SLD)	LF	84.000											
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	635.000				48.000				20.000		12.000	
	666-6205	REFL PAV MRK TY II (Y) 4" (BRK)	LF	19,730.000		2,040.000		5,440.000		8,200.000		3,280.000		150.000	
	666-6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	107,550.000		22,100.000		125,642.000		150,470.000		95,950.000		25,220.000	
	666-6214	REFL PAV MRK TY II (Y) 24" (SLD)	LF												
	666-6217	REFL PAV MRK TY II (Y) (MED NOSE)	EA	5.000											
	666-6231	PAVEMENT SEALER (ARROW)	EA	9.000											
	666-6232	PAVEMENT SEALER (WORD)	EA	9.000						51.000					
	666-6242	PAVEMENT SEALER (RR XING)	EA	2.000											
	666-6243	PAVEMENT SEALER (YLD TRI)	EA					22.000							
	666-6248	PAVEMENT SEALER (NUMBER)	EA							14.000					
	666-6307	RE PM W/RET REQ TY I (W)6"(SLD)(060MIL)	LF							178,710.000					
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	9.000											
	668-6084	PREFAB PAV MRK TY C (W) (NUMBER)	EA							14.000					
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	9.000						51.000					
	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					22.000							
	672-6007	REFL PAV MRKR TY I-C	EA	82.000				17.000							
	672-6009	REFL PAV MRKR TY II-A-A	EA	1,982.000		378.000		1,893.000		2,235.000		1,410.000		325.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF							178,710.000					
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY												

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			CONTROL SECTION JOB	**0369-01-041**		**0477-01-006**		**0678-02-040**		**0792-04-050**		**0829-02-020**		**0848-03-014**	
			PROJECT ID	**A00130228**		**A00130224**		**A00130105**		**A00130220**		**A00130214**		**A00130103**	
			COUNTY	**Uvalde**		**Comal**		**Bandera**		**Bandera**		**Kerr**		**Bandera**	
			HIGHWAY	**SH 127**		**PR 31**		**RM 187**		**FM 470**		**RM 479**		**FM 462**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	6056-6001	PREFORMED IN-LANE(TRANS) RUMBLE STRIP	LF	160.000													
	6185-6005	TMA (MOBILE OPERATION)	DAY	30.000		10.000		22.000		54.000		12.000		16.000	
	08	RAILROAD FLAGGING: CONTRACTOR FORCE ACCOUNT WORK (NON-PARTICIPATING)	LS														
	18	LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS														
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS														
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS														

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				0851-01-024		0987-02-015		1042-02-023		1167-01-012		1230-01-019		1272-01-020	
		CONTROL SECTION JOB													
		PROJECT ID		A00130202		A00130215		A00130213		A00130110		A00130276		A00130209	
		COUNTY		Guadalupe		Guadalupe		Kendall		Uvalde		Uvalde		Comal	
		HIGHWAY		FM 467		FM 758		SH 46		FM 1052		RM 1022		FM 1101	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-6242	AGGR(TY-PD GR-5 SAC-B)	CY					336.000							
	316-6446	AGGR (TY-PD GR-4 OR GR-4S SAC-A)	CY												
	316-6447	AGGR (TY-PD GR-4 OR GR-4S SAC-B)	CY	1,767.000		974.000		736.000		629.000		941.000		645.000	
	316-6521	ASPH (AC-20-5TR OR AC-20XP)	TON	313.400		172.500		182.500		111.600		166.800		114.200	
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	5.000										45.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	1,735.000		875.000		843.000		590.000		1,030.000		678.000	
	666-6045	REFL PAV MRK TY I (W)18"(SLD)(100MIL)	LF							80.000					
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	84.000		24.000				200.000		80.000		36.000	
	666-6147	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	LF					240.000							
	666-6156	REFL PAV MRK TY I(Y)(MED NOSE)(100MIL)	EA			1.000		2.000						2.000	
	666-6168	REFL PAV MRK TY II (W) 4" (DOT)	LF											66.000	
	666-6170	REFL PAV MRK TY II (W) 4" (SLD)	LF			70,200.000				39,600.000		82,250.000			
	666-6174	REFL PAV MRK TY II (W) 6" (SLD)	LF	139,650.000				71,200.000						54,050.000	
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	200.000		425.000		1,225.000		140.000				1,800.000	
	666-6181	REFL PAV MRK TY II (W) 18" (SLD)	LF							80.000					
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	84.000		24.000				200.000		80.000		36.000	
	666-6205	REFL PAV MRK TY II (Y) 4" (BRK)	LF	8,200.000		5,400.000		1,050.000		1,170.000		3,180.000		24,500.000	
	666-6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	99,100.000		34,600.000		68,150.000		37,250.000		56,750.000		42,500.000	
	666-6214	REFL PAV MRK TY II (Y) 24" (SLD)	LF					240.000							
	666-6217	REFL PAV MRK TY II (Y) (MED NOSE)	EA			1.000		2.000						2.000	
	666-6231	PAVEMENT SEALER (ARROW)	EA	2.000		3.000		9.000						15.000	
	666-6232	PAVEMENT SEALER (WORD)	EA	4.000		3.000		9.000						15.000	
	666-6242	PAVEMENT SEALER (RR XING)	EA									2.000			
	666-6243	PAVEMENT SEALER (YLD TRI)	EA	24.000		14.000				10.000					
	666-6248	PAVEMENT SEALER (NUMBER)	EA												
	666-6307	RE PM W/RET REQ TY I (W)6"(SLD)(060MIL)	LF					71,200.000						54,050.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	2.000		3.000		9.000						15.000	
	668-6084	PREFAB PAV MRK TY C (W) (NUMBER)	EA												
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	4.000		3.000		9.000						15.000	
	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	24.000		14.000				10.000					
	672-6007	REFL PAV MRKR TY I-C	EA	10.000		21.000		61.000		7.000				90.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	1,388.000		875.000		843.000		588.000		1,030.000		452.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF					71,200.000						54,050.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY												

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		CONTROL SECTION JOB		**0851-01-024**		**0987-02-015**		**1042-02-023**		**1167-01-012**		**1230-01-019**		**1272-01-020**	
		PROJECT ID		**A00130202**		**A00130215**		**A00130213**		**A00130110**		**A00130276**		**A00130209**	
		COUNTY		**Guadalupe**		**Guadalupe**		**Kendall**		**Uvalde**		**Uvalde**		**Comal**	
		HIGHWAY		**FM 467**		**FM 758**		**SH 46**		**FM 1052**		**RM 1022**		**FM 1101**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	6056-6001	PREFORMED IN-LANE(TRANS) RUMBLE STRIP	LF												
	6185-6005	TMA (MOBILE OPERATION)	DAY	20.000		14.000		14.000		10.000		10.000		26.000	
	08	RAILROAD FLAGGING: CONTRACTOR FORCE ACCOUNT WORK (NON-PARTICIPATING)	LS												
	18	LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS												
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS												
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS												

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				1272-02-011		1728-01-008		2442-01-009		2442-02-009		2666-01-014		TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB													
		PROJECT ID		**A00130212**		**A00130217**		**A00130199**		**A00130197**		**A00130216**			
		COUNTY		**Guadalupe**		**Comal**		**Bexar**		**Guadalupe**		**Comal**			
		HIGHWAY		**FM 1101**		**FM 3424**		**FM 2538**		**FM 2538**		**RM 2722**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	316-6242	AGGR(TY-PD GR-5 SAC-B)	CY											1,065.000	
	316-6446	AGGR (TY-PD GR-4 OR GR-4S SAC-A)	CY											1,642.000	
	316-6447	AGGR (TY-PD GR-4 OR GR-4S SAC-B)	CY	456.000		263.000		863.000		212.000		1,666.000		21,441.000	
	316-6521	ASPH (AC-20-5TR OR AC-20XP)	TON	80.700		46.400		152.900		37.600		295.600		4,183.800	
	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			45.000						40.000		135.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	433.000		180.000		825.000		205.000		1,020.000		21,180.000	
	666-6045	REFL PAV MRK TY I (W)18"(SLD)(100MIL)	LF											164.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	18.000		12.000		160.000		50.000		24.000		1,505.000	
	666-6147	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	LF											265.000	
	666-6156	REFL PAV MRK TY I(Y)(MED NOSE)(100MIL)	EA			2.000						1.000		14.000	
	666-6168	REFL PAV MRK TY II (W) 4" (DOT)	LF											129.000	
	666-6170	REFL PAV MRK TY II (W) 4" (SLD)	LF							16,500.000				785,912.000	
	666-6174	REFL PAV MRK TY II (W) 6" (SLD)	LF	34,600.000		14,300.000		65,620.000				86,150.000		799,590.000	
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	140.000		1,530.000						1,350.000		9,605.000	
	666-6181	REFL PAV MRK TY II (W) 18" (SLD)	LF											164.000	
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	18.000		12.000		160.000		50.000		24.000		1,505.000	
	666-6205	REFL PAV MRK TY II (Y) 4" (BRK)	LF	2,150.000				3,110.000		1,050.000		3,450.000		112,260.000	
	666-6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	13,900.000		21,600.000		46,150.000		11,600.000		72,800.000		1,274,375.000	
	666-6214	REFL PAV MRK TY II (Y) 24" (SLD)	LF											265.000	
	666-6217	REFL PAV MRK TY II (Y) (MED NOSE)	EA			2.000						1.000		14.000	
	666-6231	PAVEMENT SEALER (ARROW)	EA			8.000						6.000		56.000	
	666-6232	PAVEMENT SEALER (WORD)	EA			8.000						6.000		109.000	
	666-6242	PAVEMENT SEALER (RR XING)	EA											8.000	
	666-6243	PAVEMENT SEALER (YLD TRI)	EA	30.000		20.000								176.000	
	666-6248	PAVEMENT SEALER (NUMBER)	EA											14.000	
	666-6307	RE PM W/RET REQ TY I (W)6"(SLD)(060MIL)	LF			14,300.000						86,150.000		404,410.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA			8.000						6.000		56.000	
	668-6084	PREFAB PAV MRK TY C (W) (NUMBER)	EA											14.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA			8.000						6.000		109.000	
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)	EA											8.000	
	668-6092	PREFAB PAV MRK TY C (W) (36")(YLD TRI)	EA	30.000		20.000								176.000	
	672-6007	REFL PAV MRKR TY I-C	EA	7.000		77.000						68.000		461.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	433.000		180.000		656.000		205.000		1,020.000		18,342.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF			14,300.000						86,150.000		404,410.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY											208.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0072-05-090 **DISTRICT** San Antonio **COUNTY** Bandera, Bexar, Comal, Guadalupe, Kendall, Kerr, Uvalde

HIGHWAY FM 1052, FM 1101, FM 2538, FM 3424, FM 462, FM 467, FM 470, FM 758, IH 10, PR 31, RM 1022, RM 187, RM 2722, RM 479, SH 127, SH 46, SH 55

														TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**1272-02-011**		**1728-01-008**		**2442-01-009**		**2442-02-009**		**2666-01-014**			
		PROJECT ID		**A00130212**		**A00130217**		**A00130199**		**A00130197**		**A00130216**			
		COUNTY		**Guadalupe**		**Comal**		**Bexar**		**Guadalupe**		**Comal**			
		HIGHWAY		**FM 1101**		**FM 3424**		**FM 2538**		**FM 2538**		**RM 2722**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	6056-6001	PREFORMED IN-LANE(TRANS) RUMBLE STRIP	LF											160.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	10.000		14.000		14.000		8.000		34.000		378.000	
	08	RAILROAD FLAGGING: CONTRACTOR FORCE ACCOUNT WORK (NON-PARTICIPATING)	LS											1.000	
	18	LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS											1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS											1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS											1.000	

RDWY REF NO	DURATION OF TCP STEP	TMA/TA PER SET UP	6185-6005 TMA (MOBILE OERATION)
	DAYS	EA	DAY
1	11	2	22
2	27	2	54
3	8	2	16
4	7	2	14
5	5	2	10
6	13	2	26
7	7	2	14
8	17	2	34
9	10	2	20
10	7	2	14
11	5	2	10
12	4	2	8
13	2	2	4
14	4	2	8
15	5	2	10
16	4	2	8
17	4	2	8
18	7	2	14
19	6	2	12
20	11	2	22
21	15	2	30
22	5	2	10
23	5	2	10
TOTAL			378

DISTRICT SEAL COAT
TRUCK MOUNTED ATTENUATORS

SHEET 1 of 1

DESIGN:	DRAFT:	CHECK:	
FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		13
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

RDWY REF NO	COUNTY	HIGHWAY	LIMITS	LOCATION OF WORK	SURFACE AREA	ASPHALT				AGGREGATE		
						316				316		
						6521				6242	6446	6447
						ASPH (AC-20-5TR OR AC-20XP)				TY PD GR 5 SAC-B	TY PD GR 4 OR 4S SAC-A	TY PD GR 4 OR 4S SAC-B
						0.26 GAL/SY		0.32 GAL/SY		140 SY/CY	120 SY/CY	130 SY/CY
					SY	GAL *	TON	GAL *	TON	CY	CY	CY
1	BANDERA	RM 187	0.1 MILES EAST LOST MAPLES TO BANDERA/UVALDE COUNTY LINE	LANES	200,366			64,118	273.5			1,542
				SHOULDERS	102,037	26,530	113.2			729		
				INTERSECTIONS	5,890			1,885	8.0			46
				SUBTOTAL	308,293	26,530	113.2	66,003	281.5	729		1,588
2	BANDERA	FM 470	RM 187 TO FM 462	LANES	309,912			99,172	423.0			2,384
				SHOULDERS								
				INTERSECTIONS	1,091			350	1.5			9
				SUBTOTAL	311,003			99,522	424.5			2,393
3	BANDERA	FM 462	FM 470 TO BANDERA/MEDINA COUNTY LINE	LANES	37,575			12,024	51.3			290
				SHOULDERS								
				INTERSECTIONS	401			129	0.6			4
				SUBTOTAL	37,976			12,153	51.9			294
4	BEXAR	FM 2538	IH 10 TO BEXAR/GUADALUPE COUNTY LINE	LANES	109,748			35,120	149.8			845
				SHOULDERS								
				INTERSECTIONS	2,274			728	3.1			18
				SUBTOTAL	112,022			35,848	152.9			863
5	COMAL	PR 31	PARK ENTRANCE TO SH 46	LANES	43,316			13,862	59.1			334
				SHOULDERS								
				INTERSECTIONS								
				SUBTOTAL	43,316			13,862	59.1			334
6	COMAL	FM 1101	0.6 MI E OF FM 306 TO COMAL/GUADALUPE COUNTY LINE	LANES	81,945			26,223	111.8			631
				SHOULDERS								
				INTERSECTIONS	1,768			566	2.4			14
				SUBTOTAL	83,713			26,789	114.2			645

CONVERSION FACTOR: TONS = (GAL X 8.53)/2000

* CONTRACTORS INFORMATION ONLY

Texas Department of Transportation

DISTRICT SEAL COAT
SEAL COAT
MATERIALS SUMMARY

SHEET 1 of 4

DESIGN:	DRAFT:	CHECK:	
FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		14
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

RDWY REF NO	COUNTY	HIGHWAY	LIMITS	LOCATION OF WORK	SURFACE AREA	ASPHALT				AGGREGATE		
						316				316		
						6521				6242	6446	6447
						ASPH (AC-20-5TR OR AC-20XP)				TY PD GR 5 SAC-B	TY PD GR 4 OR 4S SAC-A	TY PD GR 4 OR 4S SAC-B
						0.26 GAL/SY		0.32 GAL/SY		140 SY/CY	120 SY/CY	130 SY/CY
					SY	GAL *	TON	GAL *	TON	CY	CY	CY
7	COMAL	FM 3424	RM 32 TO FM 306	LANES	32,784			10,491	44.7			253
				SHOULDERS								
				INTERSECTIONS	1,279			410	1.7			10
				SUBTOTAL	34,063			10,901	46.4			263
8	COMAL	RM 2722	FM 2673 TO SH 46	LANES	213,843			68,430	291.9			1,645
				SHOULDERS								
				INTERSECTIONS	2,701			865	3.7			21
				SUBTOTAL	216,544			69,295	295.6			1,666
9	GUADALUPE	FM 467	FM 775 TO FM 725	LANES	224,839			71,949	306.9			1,730
				SHOULDERS								
				INTERSECTIONS	4,784			1,531	6.5			37
				SUBTOTAL	229,623			73,480	313.4			1,767
10	GUADALUPE	FM 758	SH 46 TO SH 123	LANES	125,083			40,027	170.7			963
				SHOULDERS								
				INTERSECTIONS	1,348			432	1.8			11
				SUBTOTAL	126,431			40,459	172.5			974
11	GUADALUPE	FM 1101	COMAL/GUADALUPE COUNTY LINE TO SH 123	LANES	57,854			18,514	79.0			446
				SHOULDERS								
				INTERSECTIONS	1,237			396	1.7			10
				SUBTOTAL	59,091			18,910	80.7			456
12	GUADALUPE	FM 2538	BEXAR/GUADALUPE COUNTY LINE TO FM 775	LANES	27,521			8,807	37.6			212
				SHOULDERS								
				INTERSECTIONS								
				SUBTOTAL	27,521			8,807	37.6			212

CONVERSION FACTOR: TONS = (GAL X 8.53)/2000

* CONTRACTORS INFORMATION ONLY

DISTRICT SEAL COAT
SEAL COAT
MATERIALS SUMMARY

SHEET 2 of 4

DESIGN:	DRAFT:	CHECK:

FED.RD. DIV.NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	15

STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

RDWY REF NO	COUNTY	HIGHWAY	LIMITS	LOCATION OF WORK	SURFACE AREA	ASPHALT				AGGREGATE		
						316				316		
						6521				6242	6446	6447
						ASPH (AC-20-5TR OR AC-20XP)				TY PD GR 5 SAC-B	TY PD GR 4 OR 4S SAC-A	TY PD GR 4 OR 4S SAC-B
						0.26 GAL/SY		0.32 GAL/SY		140 SY/CY	120 SY/CY	130 SY/CY
					SY	GAL *	TON	GAL *	TON	CY	CY	CY
13	KENDALL	IH 10 WB FRt Rd	US 87B TO IH 10 WESTBOUND MAINLANE	LANES	8,316			2,662	11.4			64
				SHOULDERS								
				INTERSECTIONS								
				SUBTOTAL	8,316			2,662	11.4			64
14	KENDALL	IH 10 WB FRt Rd	FM 289 TO US 87B	LANES	66,103			21,153	90.2			509
				SHOULDERS								
				INTERSECTIONS	1,704			546	2.3			14
				SUBTOTAL	67,807			21,699	92.5			523
15	KENDALL	IH 10 WB FRt Rd	SOUTH OF GUADALUPE RIVER TO JOSHUA RANCH ROAD	LANES	41,991			13,438	57.3			324
				SHOULDERS								
				INTERSECTIONS	2,536			812	3.5			20
				SUBTOTAL	44,527			14,250	60.8			344
16	KENDALL	IH 10 EB FRt Rd	SOUTH OF GUADALUPE RIVER TO US 87 (COMFORT)	LANES	5,280			1,690	7.2			41
				SHOULDERS								
				INTERSECTIONS	1,044			335	1.4			9
				SUBTOTAL	6,324			2,025	8.6			50
17	KENDALL	IH 10 EB FRt Rd	US 87 (COMFORT) TO FM 289	LANES	37,409			11,971	51.1			288
				SHOULDERS								
				INTERSECTIONS	953			305	1.3			8
				SUBTOTAL	38,362			12,276	52.4			296
18	KENDALL	SH 46	BANDERA/KENDALL COUNTY LINE TO 0.5 MILES WEST OF IH 10	LANES	94,816			30,342	129.4			730
				SHOULDERS	46,996	12,219	52.1			336		
				INTERSECTIONS	710			228	1.0			6
				SUBTOTAL	142,522	12,219	52.1	30,570	130.4	336		736

CONVERSION FACTOR: TONS = (GAL X 8.53)/2000

* CONTRACTORS INFORMATION ONLY

Texas Department of Transportation

DISTRICT SEAL COAT
SEAL COAT
MATERIALS SUMMARY

SHEET 3 of 4

DESIGN:	DRAFT:	CHECK:	
FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		16
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

RDWY REF NO	COUNTY	HIGHWAY	LIMITS	LOCATION OF WORK	SURFACE AREA	ASPHALT				AGGREGATE		
						316				316		
						6521				6242	6446	6447
						ASPH (AC-20-5TR OR AC-20XP)				TY PD GR 5 SAC-B	TY PD GR 4 OR 4S SAC-A	TY PD GR 4 OR 4S SAC-B
						0.26 GAL/SY		0.32 GAL/SY		140 SY/CY	120 SY/CY	130 SY/CY
					SY	GAL *	TON	GAL *	TON	CY	CY	CY
19	KERR	RM 479	KERR/KIMBLE COUNTY LINE TO SH 27	LANES	170,599			54,592	232.8			1,313
				SHOULDERS								
				INTERSECTIONS	1,830			586	2.5			15
				SUBTOTAL	172,429			55,178	235.3			1,328
20	UVALDE	SH 55	UVALDE / REAL COUNTY LINE TO NUECES RIVER	LANES	353,618			113,158	482.6			2,721
				SHOULDERS								
				INTERSECTIONS	1,885			604	2.6			15
				SUBTOTAL	355,503			113,762	485.2			2,736
21	UVALDE	SH 127	US 83 TO US 90	LANES	298,803			95,617	407.8			2,299
				SHOULDERS	196,957	51,209	218.4				1,642	
				INTERSECTIONS	5,096			1,631	7.0			40
				SUBTOTAL	500,856	51,209	218.4	97,248	414.8		1,642	2,339
22	UVALDE	FM 1052	US 83 TO US 90	LANES	80,718			25,830	110.2			621
				SHOULDERS								
				INTERSECTIONS	1,000			320	1.4			8
				SUBTOTAL	81,718			26,150	111.6			629
23	UVALDE	RM 1022	US 90 TO 7.8 MI SW OF US 90	LANES	121,751			38,961	166.2			937
				SHOULDERS								
				INTERSECTIONS	434			139	0.6			4
				SUBTOTAL	122,185			39,100	166.8			941
24				LANES								
				SHOULDERS								
				INTERSECTIONS								
				SUBTOTAL								
						*		*				
				PROJECT TOTAL	3,130,145	89,958	383.7	890,949	3,800.1	1,065	1,642	21,441

CONVERSION FACTOR: TONS = (GAL X 8.53)/2000

* CONTRACTORS INFORMATION ONLY

Texas Department of Transportation

DISTRICT SEAL COAT
SEAL COAT
MATERIALS SUMMARY

SHEET 4 of 4

DESIGN:	DRAFT:	CHECK:	
FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		17
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

RDWY REF NO	ROADWAY ✳	662-6109 WK ZN PAV MRK SHT TERM (TAB) TY W	662-6111 WK ZN PAV MRK SHT TERM (TAB) TY Y-2	666-6045 REFL PAV MRK TY I (W) 18" (SLD) (100MIL)	666-6048 REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	666-6147 REFL PAV MRK TY I (Y) 24" (SLD) (100MIL)	666-6156 REFL PAV MRK TY I (Y)(MED NOSE)(100MIL)	666-6168 REFL PAV MRK TY II (W) 4" (DOT)	666-6170 REFL PAV MRK TY II (W) 4" (SLD)	666-6174 REFL PAV MRK TY II (W) 6" (SLD)	666-6178 REFL PAV MRK TY II (W) 8"(SLD)	666-6181 REFL PAV MRK TY II (W) 18" (SLD)	666-6182 REFL PAV MRK TY II (W) 24" (SLD)
		EA	EA	LF	LF	LF	EA	LF	LF	LF	LF	LF	LF
1	RM 187		1893		48					155310	330		48
2	FM 470		2235							178710			
3	FM 462		325		12				26390				12
4	FM 2538		825		160					65620			160
5	PR 31		375						31950				
6	FM 1101	45	678		36		2	66		54050	1800		36
7	FM 3424	45	180		12		2			14300	1530		12
8	RM 2722	40	1020		24		1			86150	1350		24
9	FM 467	5	1735		84					139650	200		84
10	FM 758		875		24		1		70200		425		24
11	FM 1101		433		18					34600	140		18
12	FM 2538		205		50				16500				50
13	IH 10 WB Frt Rd		74		12	25		33	2650		180		12
14	IH 10 WB Frt Rd		613		12				650				12
15	IH 10 WB Frt Rd		458		12						75		12
16	IH 10 EB Frt Rd		72		12								12
17	IH 10 EB Frt Rd		313		24				4700				24
18	SH 46		843			240	2			71200	1225		
19	RM 479		1413		20				112850				20
20	SH 55		2200		30		1		176000		150		30
21	SH 127		2795	84	635		5	30	222172		2060	84	635
22	FM 1052		590	80	200				39600		140	80	200
23	RM 1022		1030		80				82250				80
PROJECT TOTAL		135	21180	164	1505	265	14	129	785912	799590	9605	164	1505

✳ THE REFLECTIVE PAVEMENT MARKINGS (TY I) WILL ONLY BE USED FOR THE ITEMS SPECIFIED IN THE SUMMARY (MEDIAN NOSE, 18" MARKINGS & 24" MARKINGS).

RDWY REF NO	ROADWAY ✳	666-6205 REFL PAV MRK TY II (Y) 4" (BRK)	666-6207 REFL PAV MRK TY II (Y) 4" (SLD)	666-6214 REFL PAV MRK TY II (Y) 24" (SLD)	666-6217 REFL PAV MRK TY II (Y) (MED NOSE)	666-6231 PAVEMENT SEALER (ARROW)	666-6232 PAVEMENT SEALER (WORD)	666-6242 PAVEMENT SEALER (RR XING)	666-6243 PAVEMENT SEALER (YLD TRI)	666-6248 PAVEMENT SEALER (NUMBER)	666-6307 RE PM W/ RET REQTY I (W) 6" (SLD) (60MIL)	668-6077 PREFAB PAV MRK TY C (W) (ARROW)	668-6084 PREFAB PAV MRK TY C (W) (NUMBER)
		LF	LF	LF	EA	EA	EA	EA	EA	EA	LF	EA	EA
1	RM 187	5440	125642						22				
2	FM 470	8200	150470				51			14	178710		14
3	FM 462	150	25220										
4	FM 2538	3110	46150										
5	PR 31	2040	22100										
6	FM 1101	24500	42500		2	15	15				54050	15	
7	FM 3424		21600		2	8	8		20		14300	8	
8	RM 2722	3450	72800		1	6	6				86150	6	
9	FM 467	8200	99100			2	4		24			2	
10	FM 758	5400	34600		1	3	3		14			3	
11	FM 1101	2150	13900						30				
12	FM 2538	1050	11600										
13	IH 10 WB Frt Rd		5860	25		2	2	2	5			2	
14	IH 10 WB Frt Rd	1770	40350						10				
15	IH 10 WB Frt Rd	770	68750					2	15				
16	IH 10 EB Frt Rd		9283						15				
17	IH 10 EB Frt Rd	1770	40310						11				
18	SH 46	1050	68150	240	2	9	9				71200	9	
19	RM 479	3280	95950										
20	SH 55	15850	78490		1	2	2					2	
21	SH 127	19730	107550		5	9	9	2				9	
22	FM 1052	1170	37250						10				
23	RM 1022	3180	56750					2					
PROJECT TOTAL		112260	1274375	265	14	56	109	8	176	14	404410	56	14

✳ THE REFLECTIVE PAVEMENT MARKINGS (TY I) WILL ONLY BE USED FOR THE ITEMS SPECIFIED IN THE SUMMARY (MEDIAN NOSE, 18" MARKINGS & 24" MARKINGS).

DISTRICT SEAL COAT

PAVEMENT MARKING SUMMARY

SHEET 1 OF 2

Texas Department of Transportation

FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.	SHEET NO.
		18

STATE	DISTRICT	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

RDWY REF NO	ROADWAY ⁎	668-6085 PREFAB PAV MRK TY C (W) (WORD)	668-6089 PREFAB PAV MRK TY C (W) (RR XING)	668-6092 PREFAB PAV MRK TY C (W) (36")(YLD TRI)	672-6007 REFL PAV MRKR TY I-C	672-6009 REFL PAV MRKR TY II-A-A	677-6001 ELIM EXT PV MRK & MRKS (4")	6056-6001 PREFORMED IN-LANE(TRANS) RUMBLE STRIP					
		EA	EA	EA	EA	EA	LF	LF					
1	RM 187			22	17	1893							
2	FM 470	51				2235	178710						
3	FM 462					325							
4	FM 2538					656							
5	PR 31					378							
6	FM 1101	15			90	452	54050						
7	FM 3424	8		20	77	180	14300						
8	RM 2722	6			68	1020	86150						
9	FM 467	4		24	10	1388							
10	FM 758	3		14	21	875							
11	FM 1101			30	7	433							
12	FM 2538					205							
13	IH 10 WB Frt Rd	2	2	5	9	70							
14	IH 10 WB Frt Rd			10		491							
15	IH 10 WB Frt Rd		2	15	4	456							
16	IH 10 EB Frt Rd			15		88							
17	IH 10 EB Frt Rd			11		250							
18	SH 46	9			61	843	71200						
19	RM 479					1410							
20	SH 55	2			8	1094							
21	SH 127	9	2		82	1982		160					
22	FM 1052			10	7	588							
23	RM 1022		2			1030							
PROJECT TOTAL		109	8	176	461	18342	404410	160					

⁎ THE REFLECTIVE PAVEMENT MARKINGS (TY I) WILL ONLY BE USED FOR THE ITEMS SPECIFIED IN THE SUMMARY (MEDIAN NOSE, 18" MARKINGS & 24" MARKINGS).

DISTRICT SEAL COAT

PAVEMENT MARKING SUMMARY

SHEET 2 OF 2

FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.	SHEET NO.
		19

STATE	DISTRICT	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

DETOURS, BARRICADES, WARNING SIGNS, SEQUENCE OF WORK, ETC.

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE REQUIREMENTS OF ITEM 7, "LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC", OF THE STANDARD SPECIFICATIONS. IN ADDITION TO THESE REQUIREMENTS, THE FOLLOWING PROVISIONS SHALL ALSO GOVERN ON THIS CONTRACT:

1. GENERAL

(1) TRAFFIC MUST BE HANDLED THROUGHOUT THE PROJECT DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A SAFE AND COMFORTABLE PASSAGE FOR VEHICULAR AND PEDESTRIAN TRAFFIC WITH MINIMAL INCONVENIENCE TO THE PUBLIC, AS SHOWN IN THE PLANS OR AS DIRECTED/APPROVED BY THE ENGINEER.

(2) THE CONTRACTOR MAY PROPOSE/RECOMMEND MODIFICATIONS TO THE SEQUENCE OF WORK FOR CONSIDERATION BY THE ENGINEER. ANY MAJOR RECOMMENDED MODIFICATION BY THE CONTRACTOR SHALL INCLUDE ANY CHANGES TO THE VARIOUS BID ITEMS, IMPACT TO TRAFFIC, EFFECT OF OVERALL PROJECT IN TIME AND COST, ETC. IF THIS PROPOSAL IS IMPLEMENTED, THE CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPING DETAILED PLAN SHEETS TO BE SEALED BY A LICENSED PROFESSIONAL ENGINEER FOR INCLUSION WITH THE CHANGE ORDER. THE CONTRACTOR CANNOT PROCEED WITH ANY CONSTRUCTION OPERATIONS BASED ON A REVISED PHASE/SEQUENCE UNTIL WRITTEN APPROVAL IS OBTAINED FROM THE ENGINEER. IF AT ANY TIME DURING CONSTRUCTION HE CONTRACTOR'S PROPOSED PLAN OF OPERATION FOR HANDLING TRAFFIC DOES NOT PROVIDE FOR SAFE AND COMFORTABLE MOVEMENT, THE CONTRACTOR WILL IMMEDIATELY CHANGE THEIR OPERATION TO CORRECT THE UNSATISFACTORY CONDITION.

(3) DO NOT STORE ANY CONSTRUCTION MATERIAL OR EQUIPMENT AT ANY LOCATION THAT WILL CONSTITUTE A HAZARD AND WILL ENDANGER TRAFFIC.

(4) THE CONTRACTOR WILL PROVIDE ADVANCE NOTIFICATION TO THE ENGINEER OF IMPENDING / UPCOMING LANE CLOSURES FOR ALL TEMPORARY AND / OR PERMANENT LANE, RAMP, CONNECTOR, FRONTAGE, SHOULDER, ETC. CLOSURES OR DETOURS. SEE GENERAL NOTES FOR NOTIFICATION REQUIREMENTS.

(5) ACCESS TO ADJOINING PROPERTY MUST BE MAINTAINED AT ALL TIMES.

(6) TEMPORARY DRAINAGE IS THE RESPONSIBILITY OF THE CONTRACTOR.

(7) AT NO TIME SHALL TWO CONSECUTIVE INTERSECTING ROADWAYS BE CLOSED AT ONE TIME DURING CONSTRUCTION.

(8) AT NO TIME SHALL TWO CONSECUTIVE RAMPS BE CLOSED AT ONE TIME DURING CONSTRUCTION OR OVERLAY OPERATIONS.

(9) UNLESS OTHERWISE NOTED IN THE PLANS AND/OR DIRECTED BY THE ENGINEER, DAILY LANE CLOSURES SHALL BE LIMITED ACCORDING TO THE FOLLOWING RESTRICTIONS:

A. DAYTIME WORK: NORMAL CONTRACTOR WORK HOURS SHALL BE THIRTY (30) MINUTES AFTER SUNRISE OR 7:00 A.M., WHICHEVER OCCURS LATER, TO THIRTY (30) MINUTES BEFORE SUNDOWN OR 8:00 P.M., WHICHEVER OCCURS FIRST.

B. NO LANE CLOSURES WILL BE PERMITTED FOR THE FOLLOWING DATES:

C. FRIDAY, SATURDAY AND SUNDAY BEFORE MEMORIAL DAY AND LABOR DAY.

D. FRIDAY BEFORE JULY 4.

E. DURING INCLEMENT WEATHER EVENTS AS DIRECTED BY THE ENGINEER.

(10) COORDINATE WITH ADJACENT PROJECTS.

(11) COVER PERMANENT SIGNS IF NOT USED. THIS IS SUBSIDIARY TO ITEM 502.

(12) MAINTAIN ACCESS TO ADJOINING PROPERTY AT ALL TIMES.

(13) DO NOT DETOUR TRAFFIC ONTO CITY STREETS, COUNTY ROADS, PARKING LOTS OR DRIVEWAYS.

(14) COORDINATE WITH THE APPLICABLE CITY AND TXDOT FOR SIGNAL TIMING REVISIONS, AS NECESSARY.

2. SEQUENCE OF WORK

(1) THIS PROJECT WILL BE CONSTRUCTED IN THREE (3) PHASES. BEFORE THE COMMENCEMENT OF EACH PHASE, INSTALL ADVANCE WARNING SIGNS, TEMPORARY SIGNS, TEMPORARY SIGNS AND BARRICADES AS SHOWN ON THE PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER. DAILY LANE CLOSURES WILL BE USED IN ACCORDANCE WITH STATE TCP STANDARDS. DROP OFF CONDITIONS OF GREATER THAN 2" MUST HAVE A 3:1 SLOPE AT THE END OF EACH DAY, AS WELL AS THROUGHOUT THE PROJECT WHERE ACCESS TO ADJACENT PROPERTIES IS ALLOWED TO DRIVEWAYS AND SIDE STREETS.

(2) PLANING, SURFACE TREATMENTS AND OVERLAYS SHALL BE PERFORMED IN THE DIRECTION OF TRAFFIC.

(3) A BRIEF DESCRIPTION OF THESE PHASES ARE AS FOLLOWS:

PHASE 1

THE INTENT OF THIS PHASE IS TO PREPARE THE ROADWAY FOR FUTURE SEAL COAT OPERATIONS BY REMOVING EXISTING PROFILE PAVEMENT MARKINGS

(1) IMPLEMENT TRAFFIC CONTROL AS PER STATE AND DISTRICT STANDARDS.

(2) LOCATE AND RECORD EXISTING PROFILE PAVEMENT MARKINGS FOR FUTURE INSTALLATIONS.

(3) ONLY REMOVE THE EXISTING PROFILE PAVEMENT MARKINGS (ITEM 677) IN THE SAME LOCATIONS THAT WILL RECEIVE THE NEW 6-INCH TY I PROFILE PAVEMENT MARKINGS. NO OTHER PAVEMENT MARKINGS WILL BE REMOVED. ALL WORK SHALL BE COMPLETED FOR EACH REFERENCE LOCATION BEFORE MOVING TO A NEW REFERENCE LOCATION.

(4) PERFORM CLEAN-UP AND REMOVAL OF TEMPORARY CONTROL ITEMS.

PHASE 2

THE INTENT OF THIS PHASE IS TO PERFORM SEAL COAT OPERATIONS AND PLACE PAVEMENT MARKING SEALER

(1) IMPLEMENT TRAFFIC CONTROL AS PER STATE AND DISTRICT STANDARDS.

(2) HAVING PREVIOUSLY LOCATED AND RECORDED THE EXISTING PAVEMENT MARKINGS LAYOUT FOR FUTURE REPLACEMENT; REMOVE RAISED PAVMENT MARKERS AND PLACE TEMPORARY PAVEMENT MARKING TABS.

(3) PERFORM SEAL COAT OPERATIONS.

(4) UPON COMPLETION OF SEAL COAT OPERATIONS, REMOVE THE COVER OVER THE REFLECTIVE STRIP ON ALL THE TABS PRIOR TO MOVING TO A NEW REFERENCE.

(5) PERFORM CLEAN-UP AND REMOVAL OF TEMPORARY CONTROL ITEMS. CLEAN-UP OF EACH REFERENCE SHALL OCCUR BEFORE MOVING TO A NEW REFERENCE.

(6) PLACE PAVEMENT MARKING SEALER (TY II PAVEMENT MARKINGS).

PHASE 3

THE INTENT OF THIS PHASE TO PLACE FINAL ROADWAY MARKINGS AND MARKERS

(1) IMPLEMENT TRAFFIC CONTROL AS PER STATE AND DISTRICT STANDARDS.

(2) PLACE TY I PAVEMENT MARKINGS. PLACE PROFILE PAVEMENT MARKINGS. PLACE RAISED PAVEMENT MARKERS.

(3) PERFORM CLEAN-UP AND REMOVAL OF TEMPORARY CONTROL ITEMS.

3. SAFETY

(1) THE CONTRACTOR WILL PROVIDE, CONSTRUCT AND MAINTAIN BARRICADES AND SIGNS IN ACCORDANCE WITH STATE STANDARDS BC (1 - 12)-21. ANY SIGNS REQUIRED THAT ARE NOT DETAILED IN THE STANDARD SHEETS SHALL BE IN CONFORMANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" AND THE "STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS."

(2) BARRICADES AND WARNING SIGNS SHALL BE PLACED AS INDICATED ON THE PLANS. THIS SHALL BE CONSIDERED THE MINIMUM REQUIRED TO PROVIDE FOR THE SAFETY OF TRAFFIC DURING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN OTHER SUCH BARRICADES AND SIGNS DEEMED NECESSARY BY THE ENGINEER OR AS DIRECTED BY FIELD CONDITIONS, TO PROVIDE FOR THE PASSAGE OF TRAFFIC IN SAFETY AT ALL TIMES.

(3) THE CONTRACTOR SHALL PROVIDE AND MAINTAIN FLAGGERS AS DIRECTED/APPROVED BY THE ENGINEER, AT SUCH POINTS, AND FOR SUCH PERIODS OF TIME AS MAY BE REQUIRED, TO PROVIDE FOR THE SAFETY OF THE TRAVELING PUBLIC AND THE CONTRACTOR'S PERSONNEL.

(4) THE CONTRACTOR SHALL KEEP THE ROADWAY CLEAN AND FREE OF DIRT OR OTHER MATERIALS DURING HAULING OPERATIONS. IF THE CONTRACTOR DOES NOT MAINTAIN A CLEAN ROADWAY, THEY SHALL CEASE ALL CONSTRUCTION OPERATIONS, WHEN DIRECTED BY THE ENGINEER, TO CLEAN THE ROADWAY TO THE SATISFACTION OF THE ENGINEER.

4. HAULING EQUIPMENT

(1) THE USE OF RUBBER-TIRED EQUIPMENT WILL BE REQUIRED FOR MOVING DIRT OR OTHER MATERIALS ALONG OR ACROSS PAVEMENT SURFACES. WHERE THE CONTRACTOR DESIRES TO MOVE ANY EQUIPMENT NOT LICENSED FOR OPERATION ON PUBLIC HIGHWAYS, ON OR ACROSS PAVEMENT. THEY SHALL PROTECT THE PAVEMENT FROM DAMAGE AS DIRECTED / APPROVED BY THE ENGINEER.

(2) THROUGHOUT CONSTRUCTION OPERATIONS, THE CONTRACTOR WILL BE REQUIRED TO CONDUCT THEIR HAULING OPERATIONS IN A MANNER SUCH THAT VEHICLES WILL NOT HAUL OVER PREVIOUSLY RECOMPACTED SUBGRADE OR COMPACTED BASE MATERIAL, EXCEPT IN SHORT SECTIONS FOR DUMPING MANIPULATIONS.

5. FINAL CLEAN UP

UPON COMPLETION OF THE WORK AND BEFORE FINAL ACCEPTANCE AND FINAL PAYMENT IS MADE, THE CONTRACTOR SHALL CLEAR AND REMOVE FROM THE SITE ALL SURPLUS AND DISCARDED MATERIALS AND DEBRIS OF EVERY KIND AND (REMOVED RAISED PAVEMENT MARKINGS, SHOT PAPERS, CLEAR STOCKPILE LOCATIONS, ETC.) LEAVE THE ENTIRE PROJECT IN A SMOOTH, NEAT AND SIGHTLY CONDITION.

STATE OF TEXAS
CHRISTEN D. LONGORIA
107506
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Christen Longoria P.E. 8/2/2021
CHRISTEN D. LONGORIA DATE

Texas Department of Transportation

TRAFFIC CONTROL PLAN NARRATIVE

SHEET 1 OF 1

FEDERAL DIV.NO.			SHEET NO.
6			20
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

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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

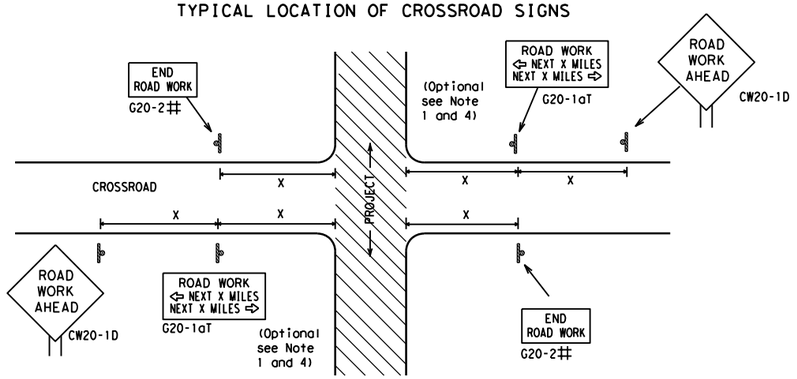
Traffic Safety Division Standard

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 9-07 8-14 5-10 5-21	0072	05	090, Etc.	IH 10, Etc.
	DIST	COUNTY		SHEET NO.
	SAT	KENDALL, Etc.		21

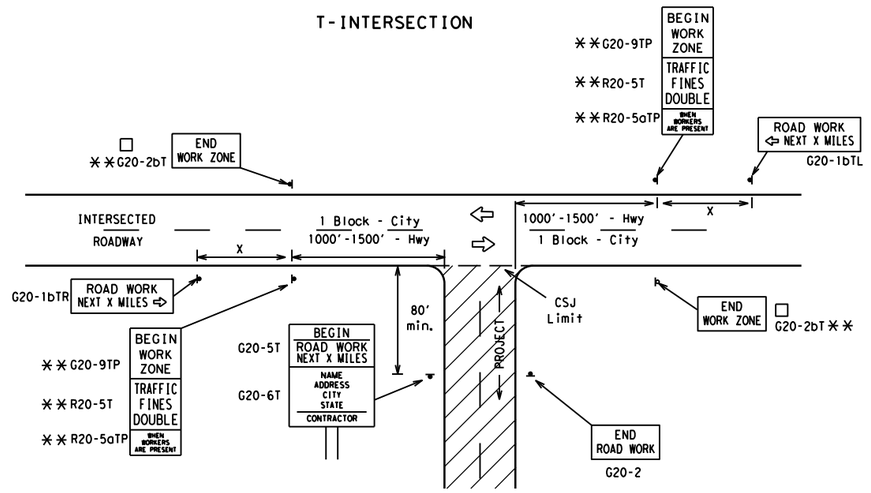
TYPICAL LOCATION OF CROSSROAD SIGNS



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.

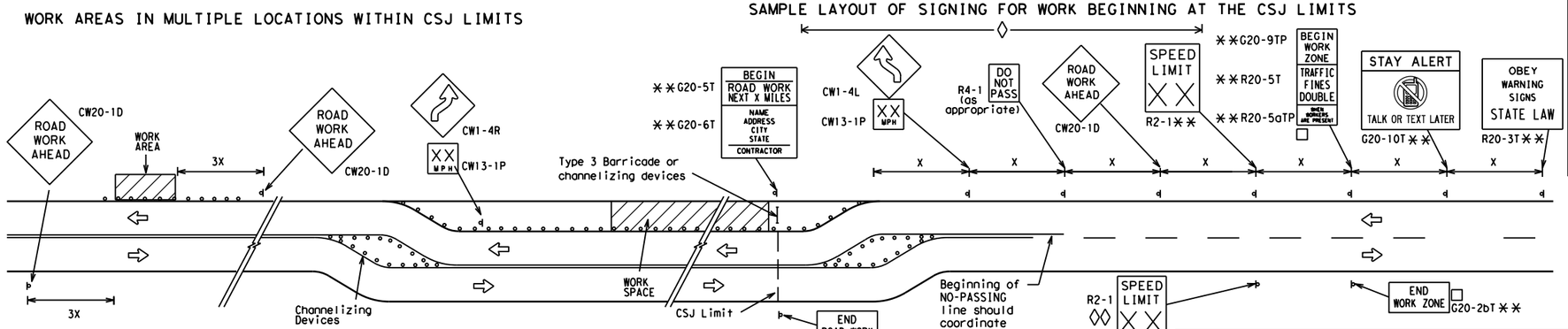
△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

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.

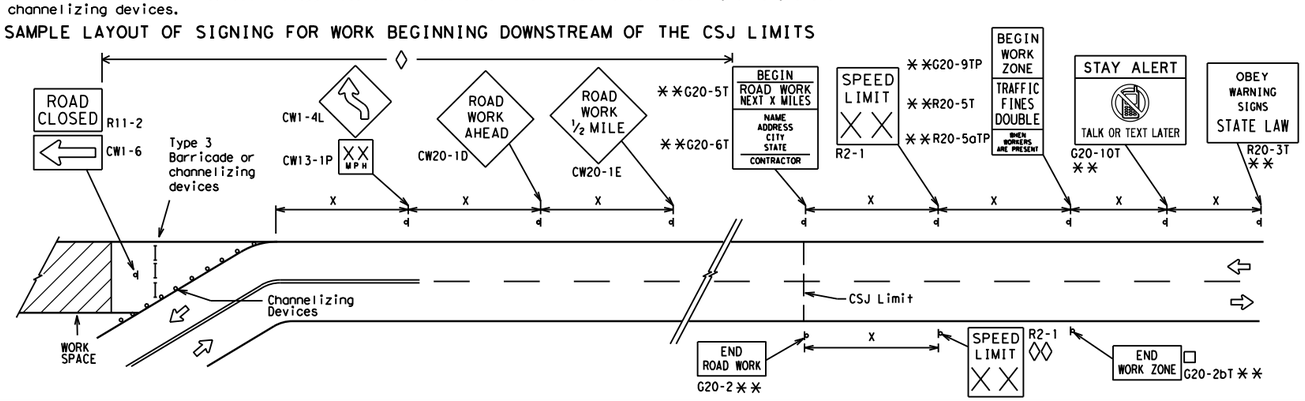
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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

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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0072	05	090, Etc.	IH 10, Etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	KENDALL, Etc.		22

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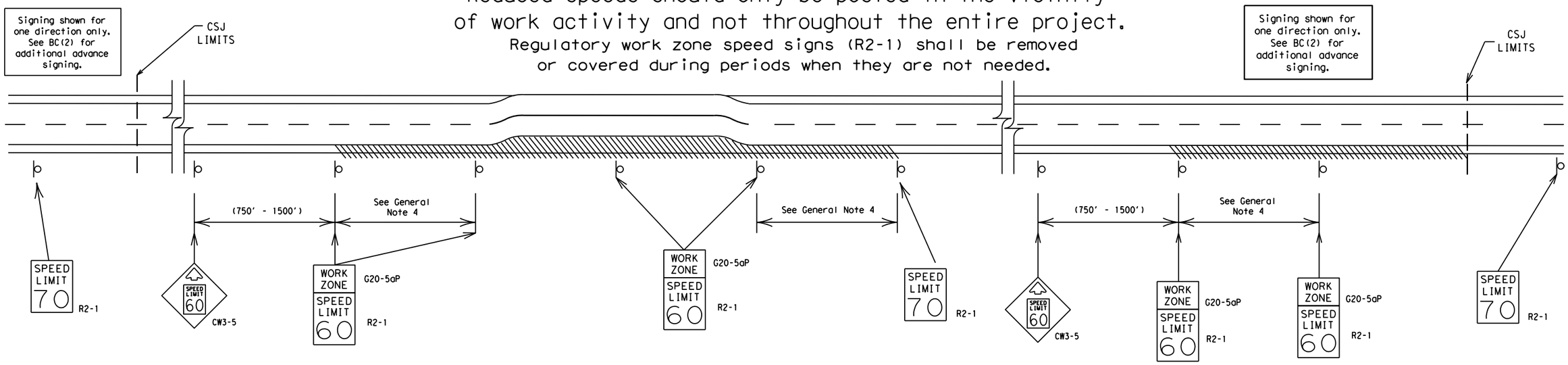
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

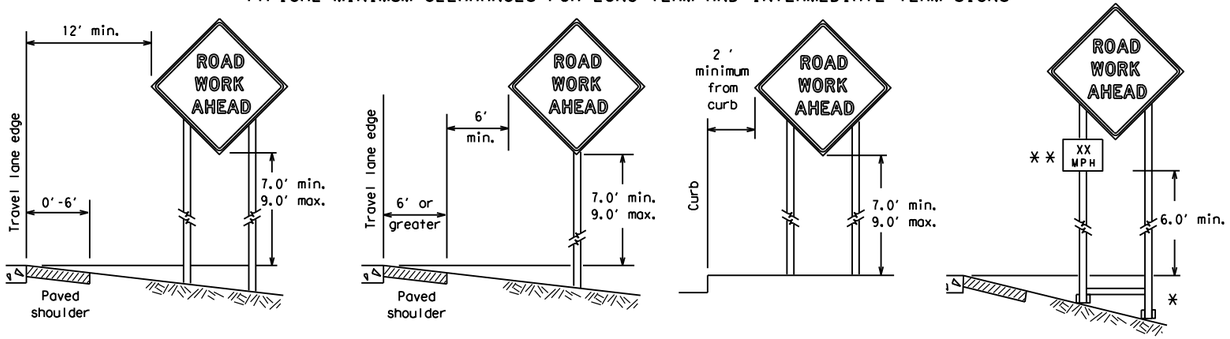
Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	0072	05	090, Etc.	IH 10, Etc.
	DIST	COUNTY		SHEET NO.
	SAT	KENDALL, Etc.		23

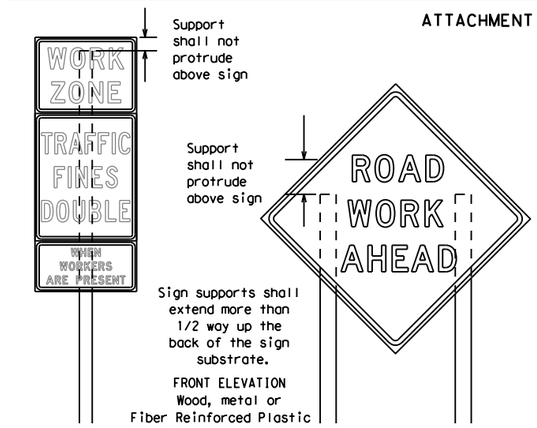
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

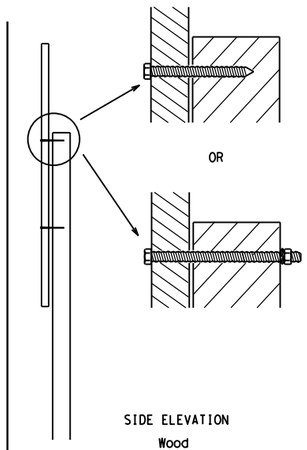


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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





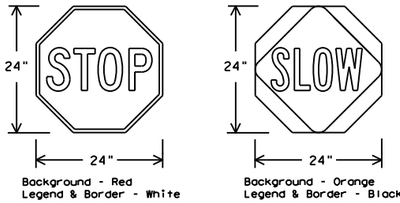
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0072	05	090, Etc.	IH 10, Etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	KENDALL, Etc.		24

DATE: 2021 2:53:20 PM
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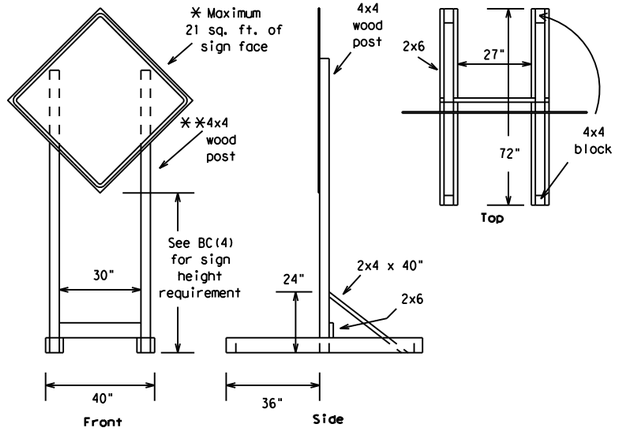
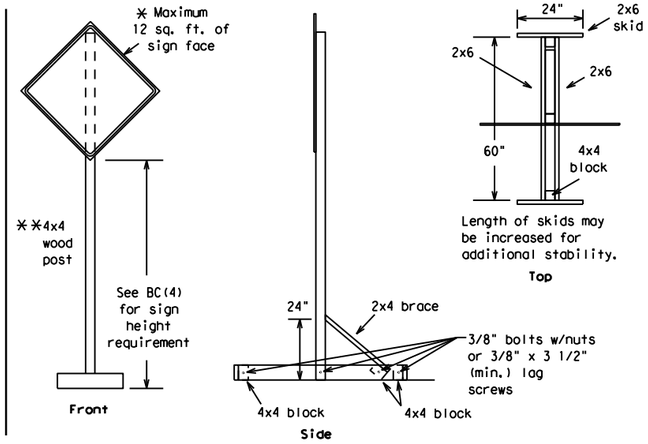
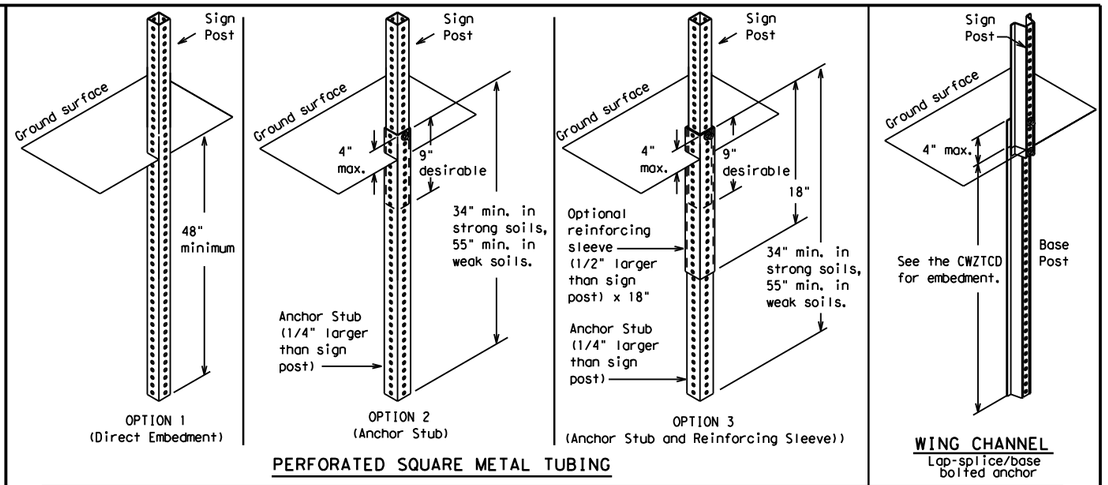




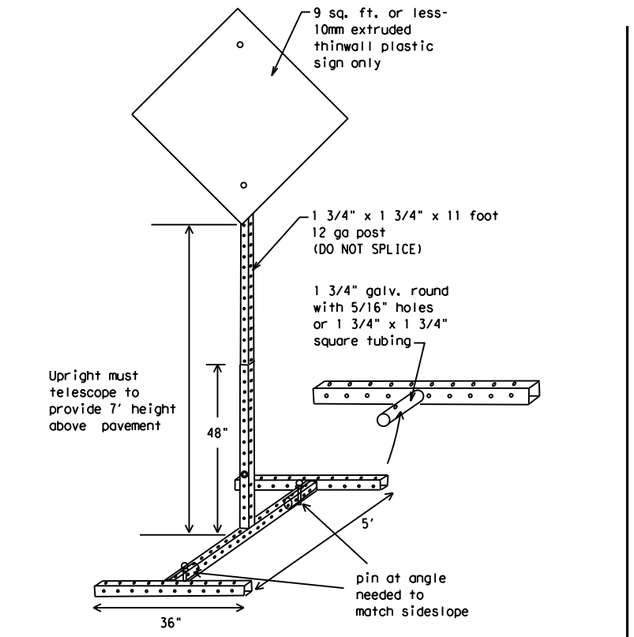
SKID MOUNTED WOOD SIGN SUPPORTS

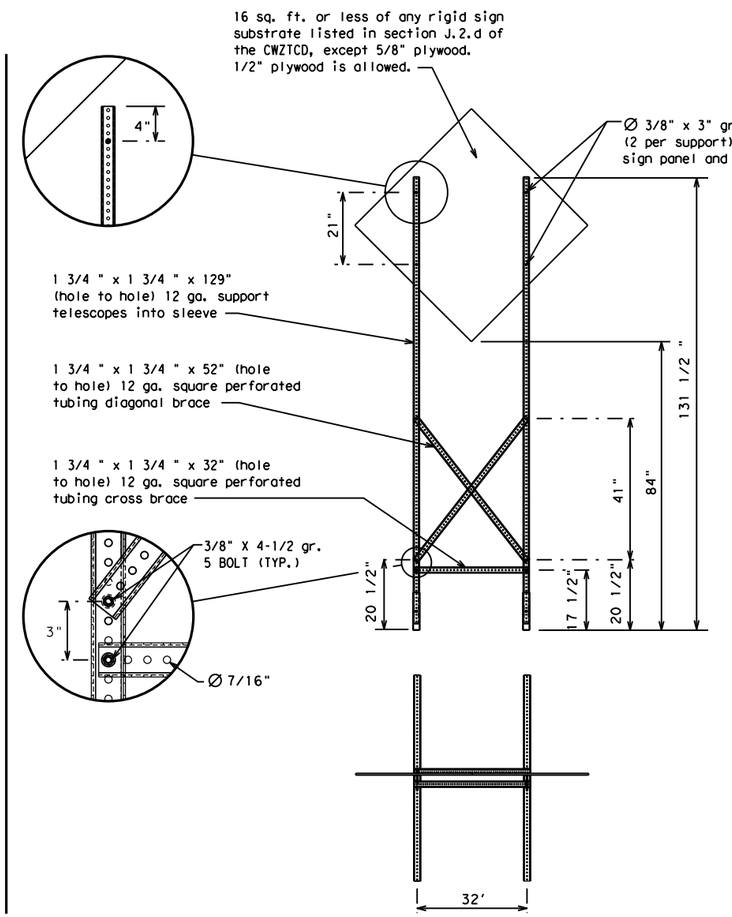
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

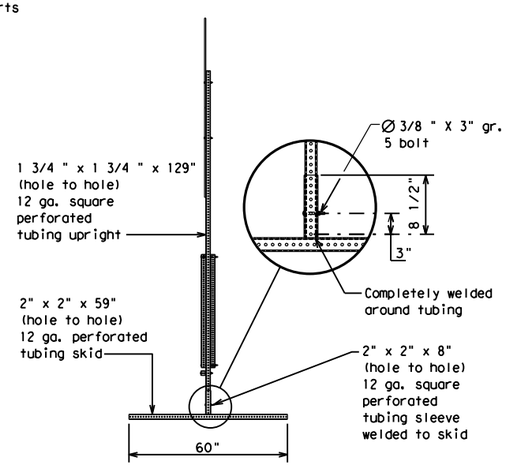


GROUND MOUNTED SIGN SUPPORTS

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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0072	05	090, Etc.	IH 10, Etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	KENDALL, Etc.		25

DATE: 2021 2:53:21 PM
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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
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	KENDALL, Etc.		26

DATE: 2021 2:53:23 PM
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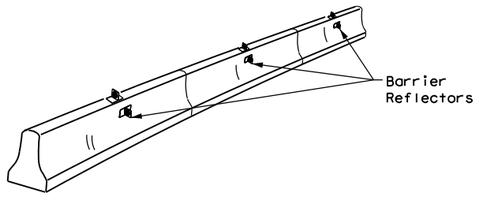
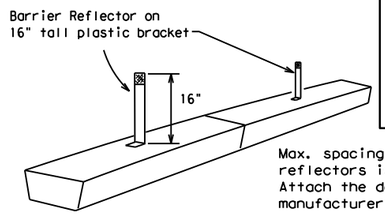
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost 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.

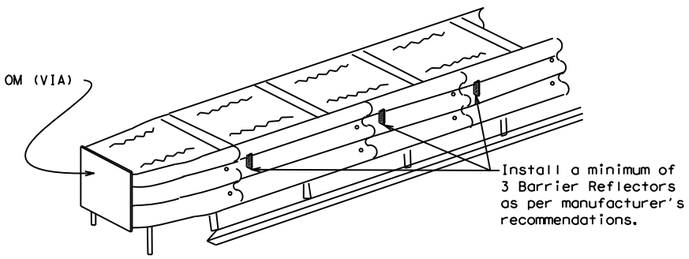


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

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.

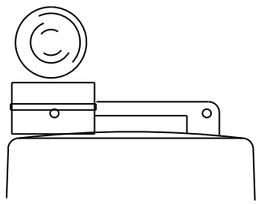


DELINEATION OF END TREATMENTS

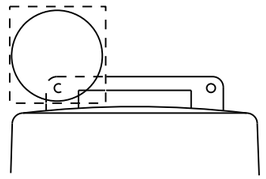
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

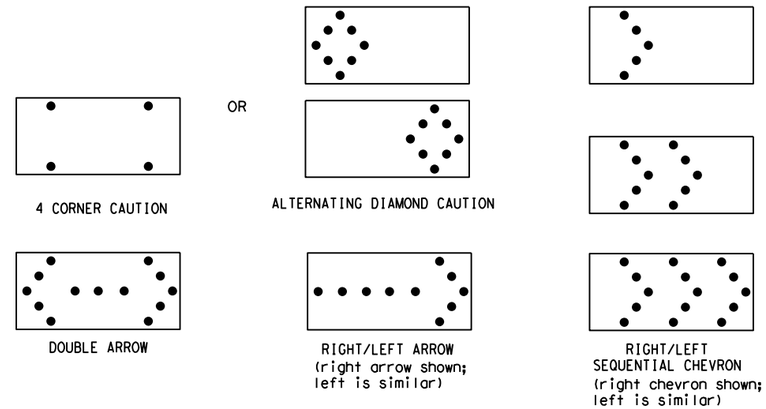
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing 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
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0072	05	090, Etc.	IH 10, Etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	KENDALL, Etc.		27

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:

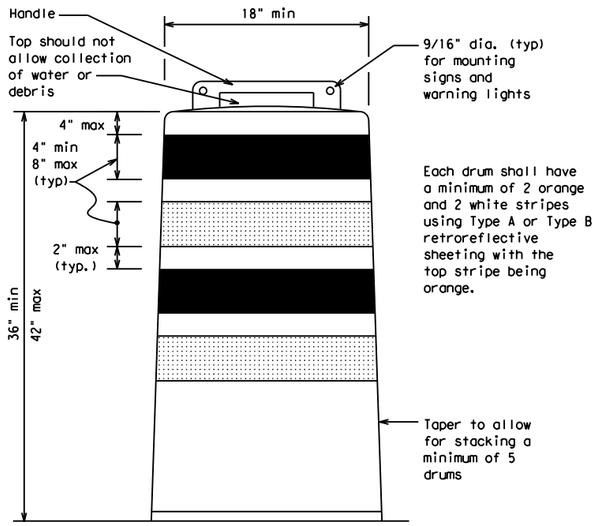
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents 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.

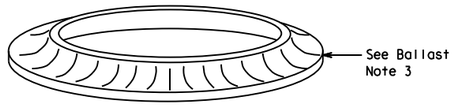
RETROREFLECTIVE SHEETING

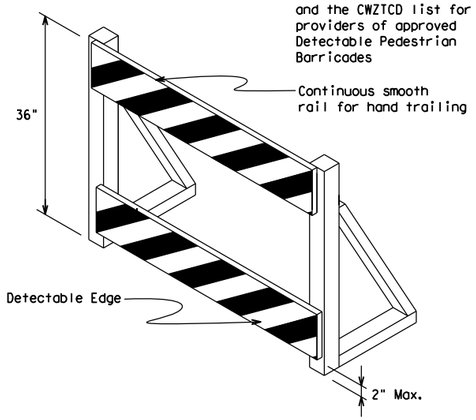
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall 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.

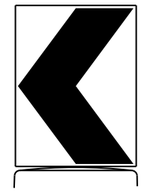




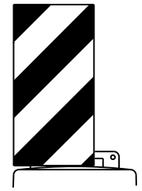


DETECTABLE PEDESTRIAN BARRICADES

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	0072	05	090, Etc.	IH 10, Etc.
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	SAT	KENDALL, Etc.		28
7-13				

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DATE: 2021 2:53:24 PM
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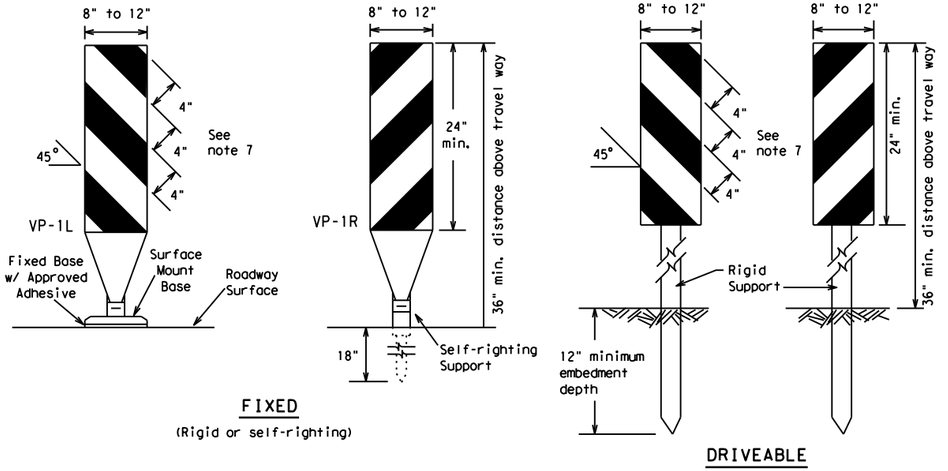
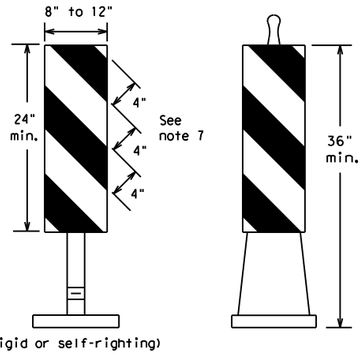


FIXED

(Rigid or self-righting)

DRIVEABLE

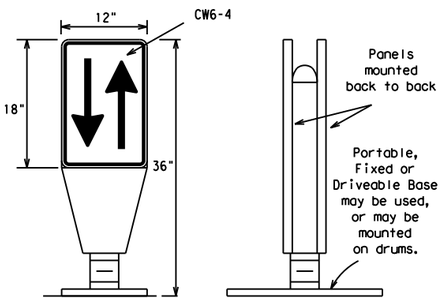


(Rigid or self-righting)

PORTABLE

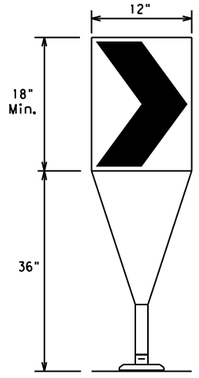
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



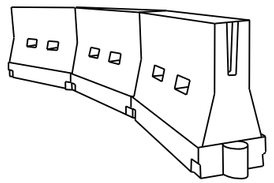
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices 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

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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	0072	05	090, Etc.	IH 10, Etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	KENDALL, Etc.		29

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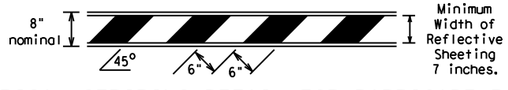
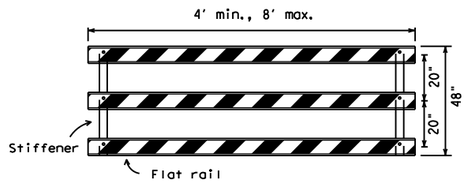
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



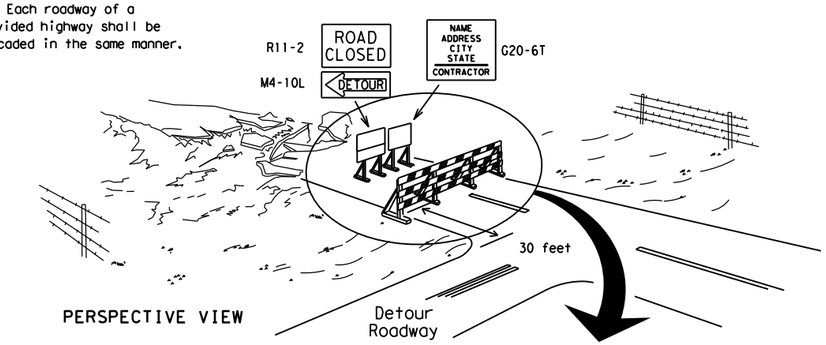
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

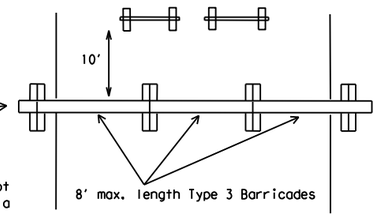
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

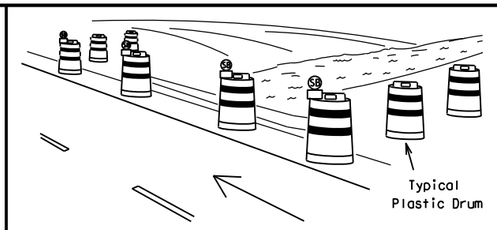
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

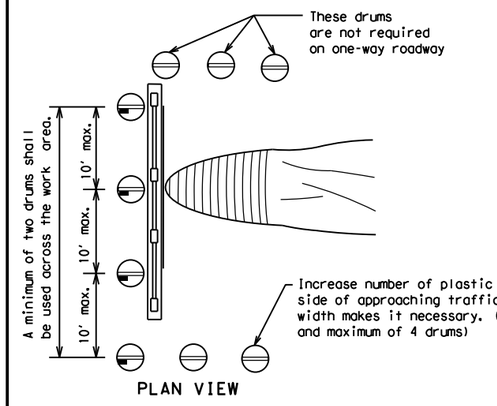
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

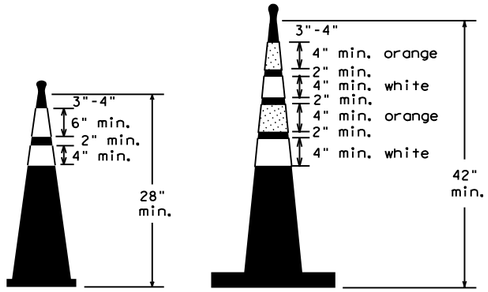
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



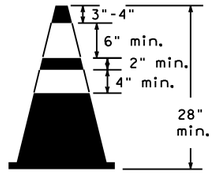
PLAN VIEW

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

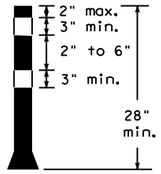
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

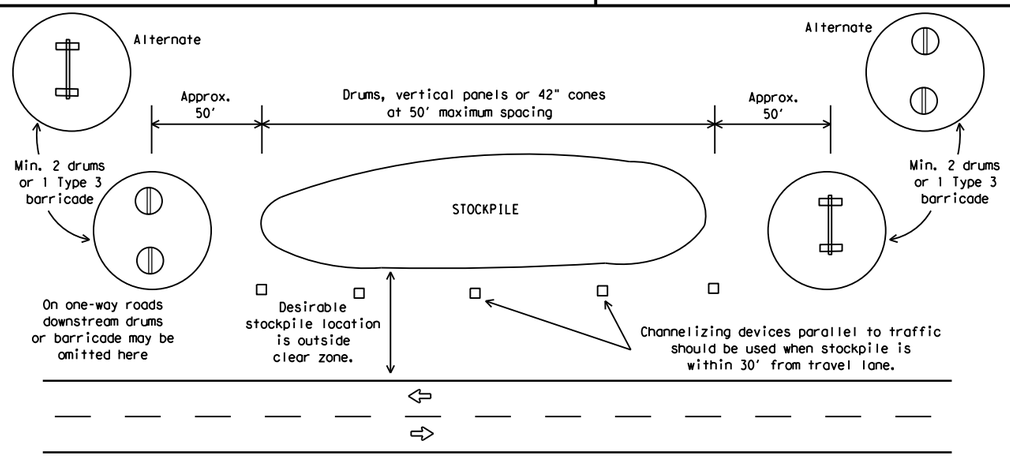


Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	0072	05	090, Etc.	IH 10, Etc.
	DIST	COUNTY		SHEET NO.
	SAT	KENDALL, Etc.		30

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

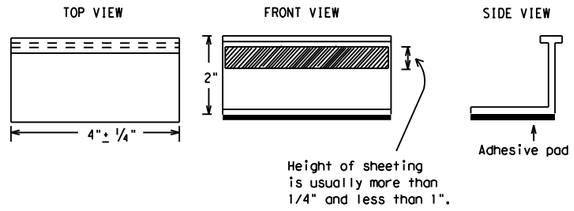
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-98 9-07 5-21 1-02 7-13 11-02 8-14	0072	05	090, Etc.	IH 10, Etc.
	DIST	COUNTY		SHEET NO.
	SAT	KENDALL, Etc.		31

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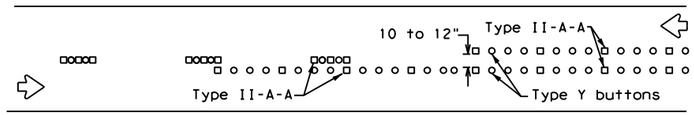
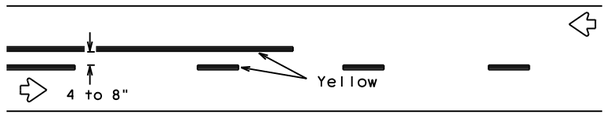
PAVEMENT MARKING PATTERNS

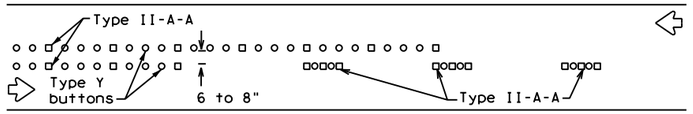
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



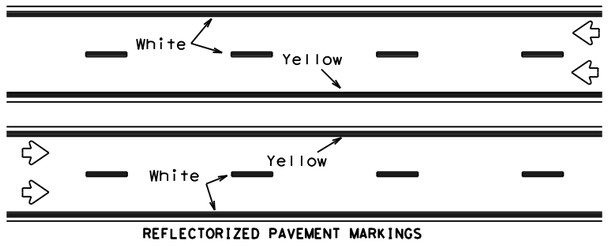
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



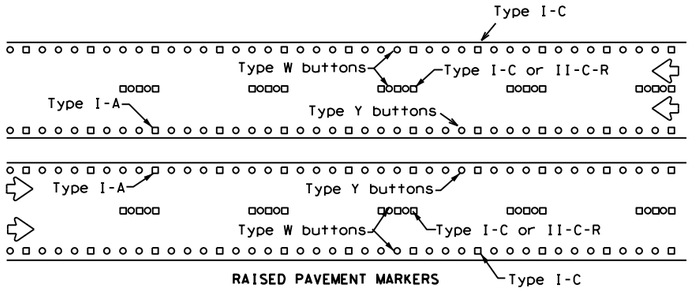
RAISED PAVEMENT MARKERS - PATTERN B

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

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



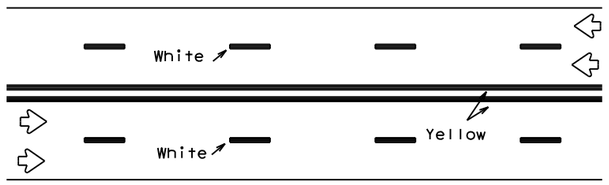
REFLECTORIZED PAVEMENT MARKINGS



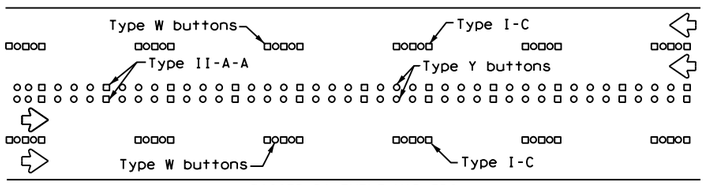
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



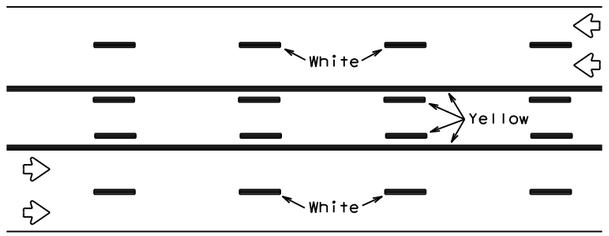
REFLECTORIZED PAVEMENT MARKINGS



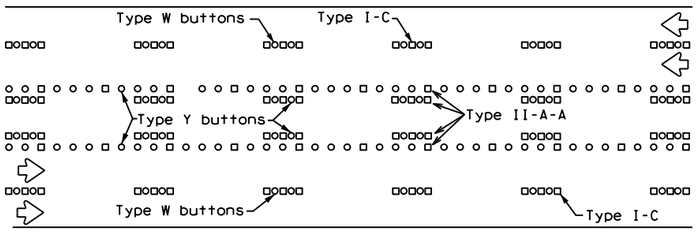
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

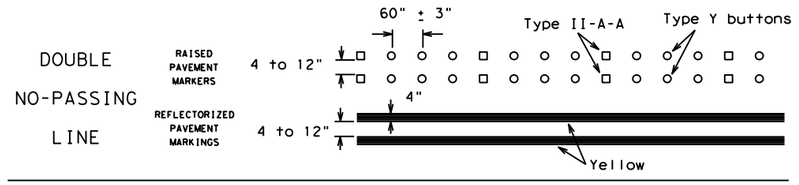
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

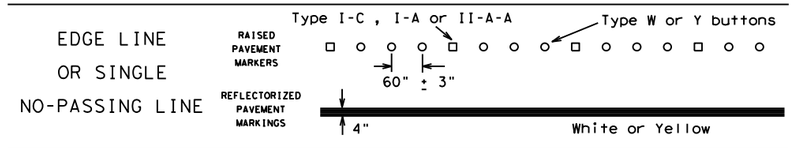
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

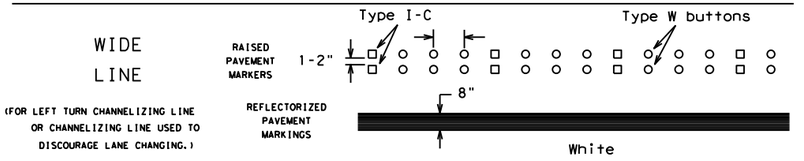


EDGE LINE OR SINGLE NO-PASSING LINE



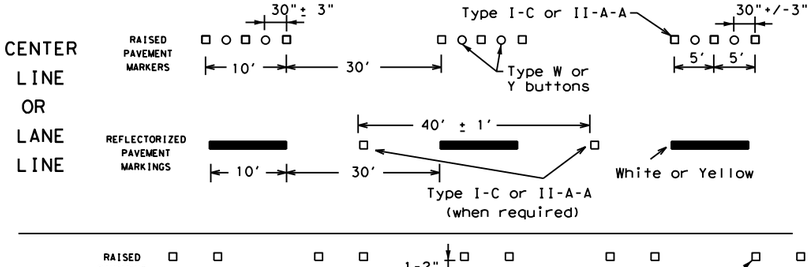
WIDE LINE

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

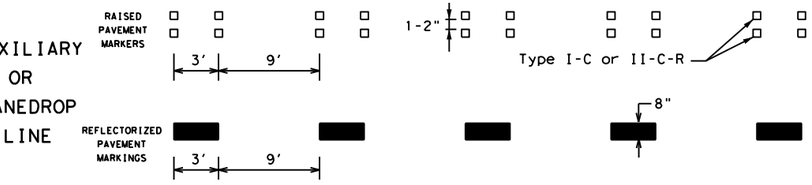


BROKEN LINES

CENTER LINE OR LANE LINE

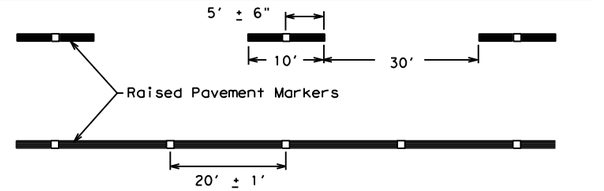


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

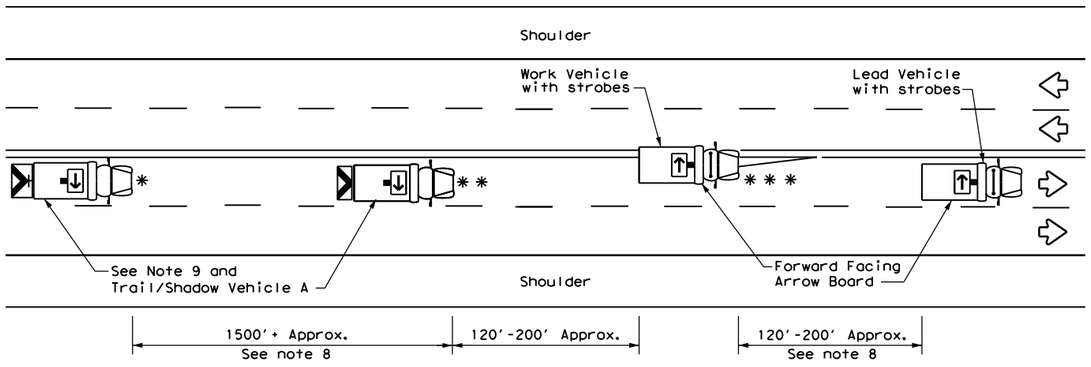
Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

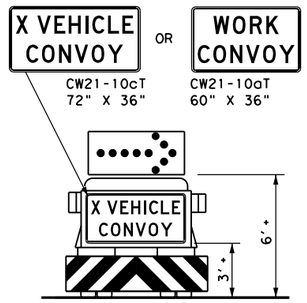
BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0072	05	090, Etc.	IH 10, Etc.
	DIST	COUNTY		SHEET NO.
	SAT	KENDALL, Etc.		32



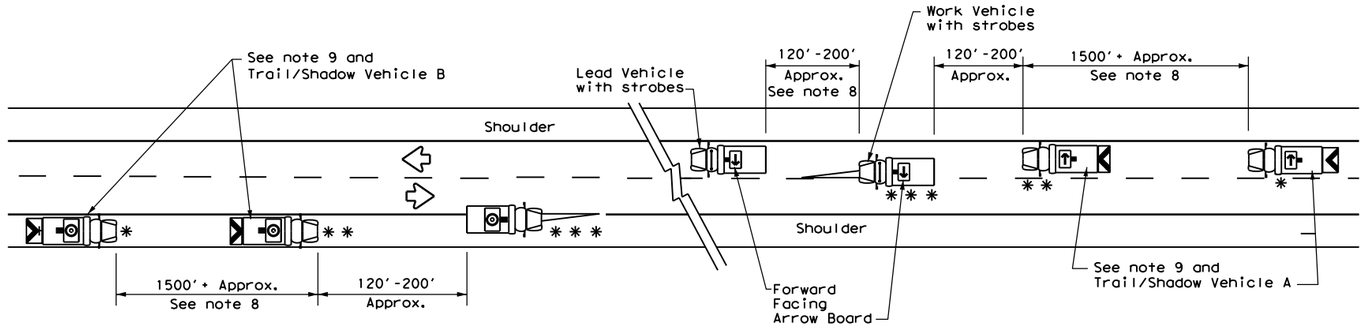
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

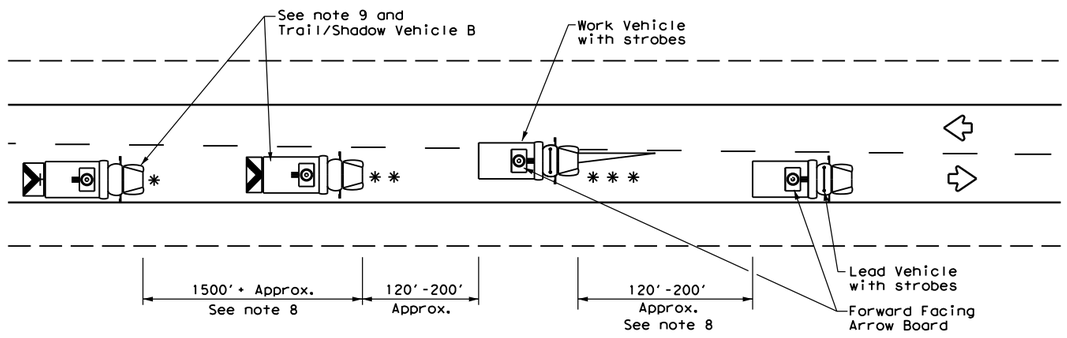


WORK ON SHOULDER

WORK ON TRAVEL LANE

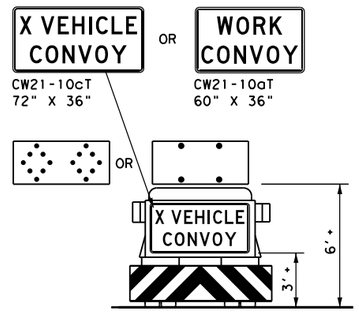
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

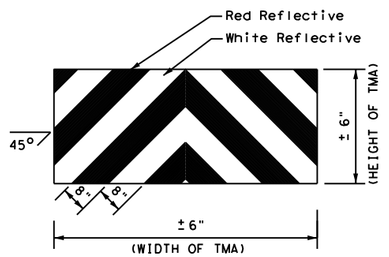
with Flashing Arrow Board in CAUTION display

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0072	05	090, Etc.	IH 10, Etc.
	DIST	COUNTY		SHEET NO.
	SAT	KENDALL, Etc.		33

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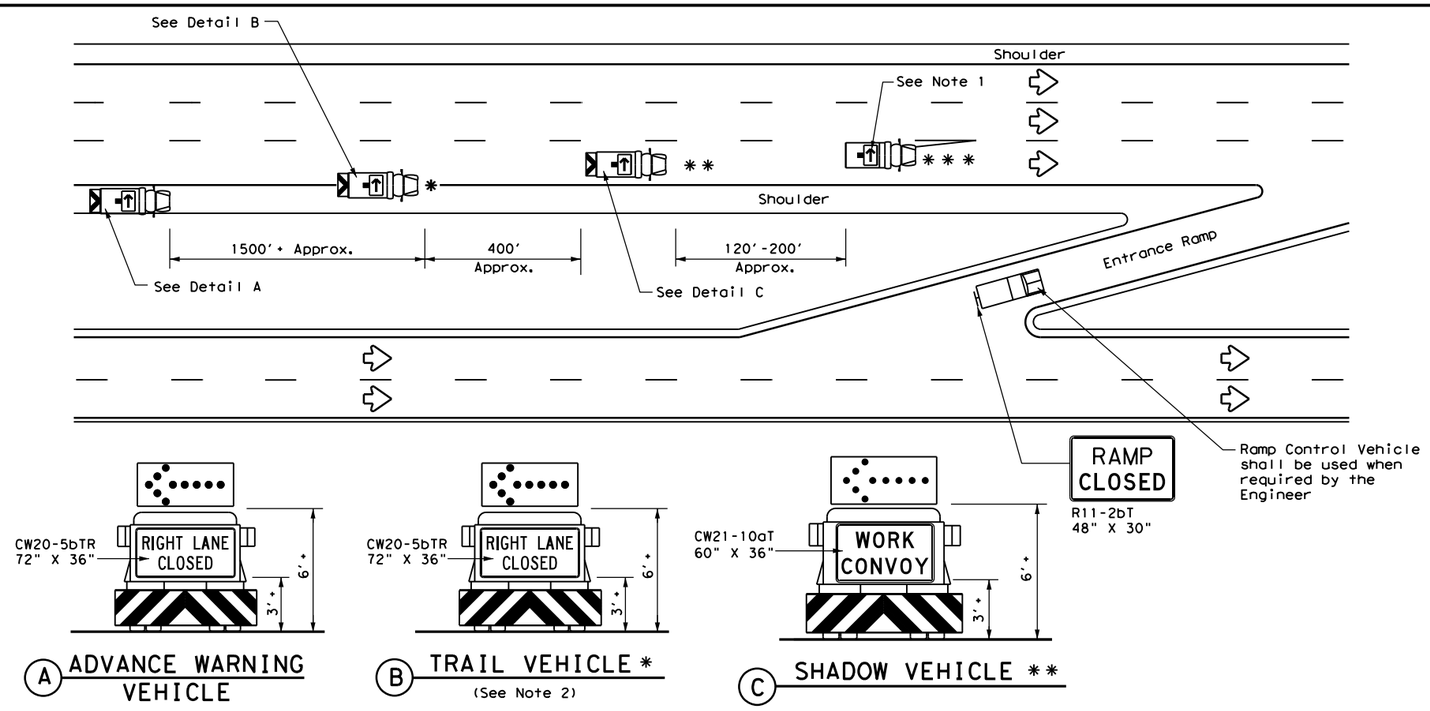
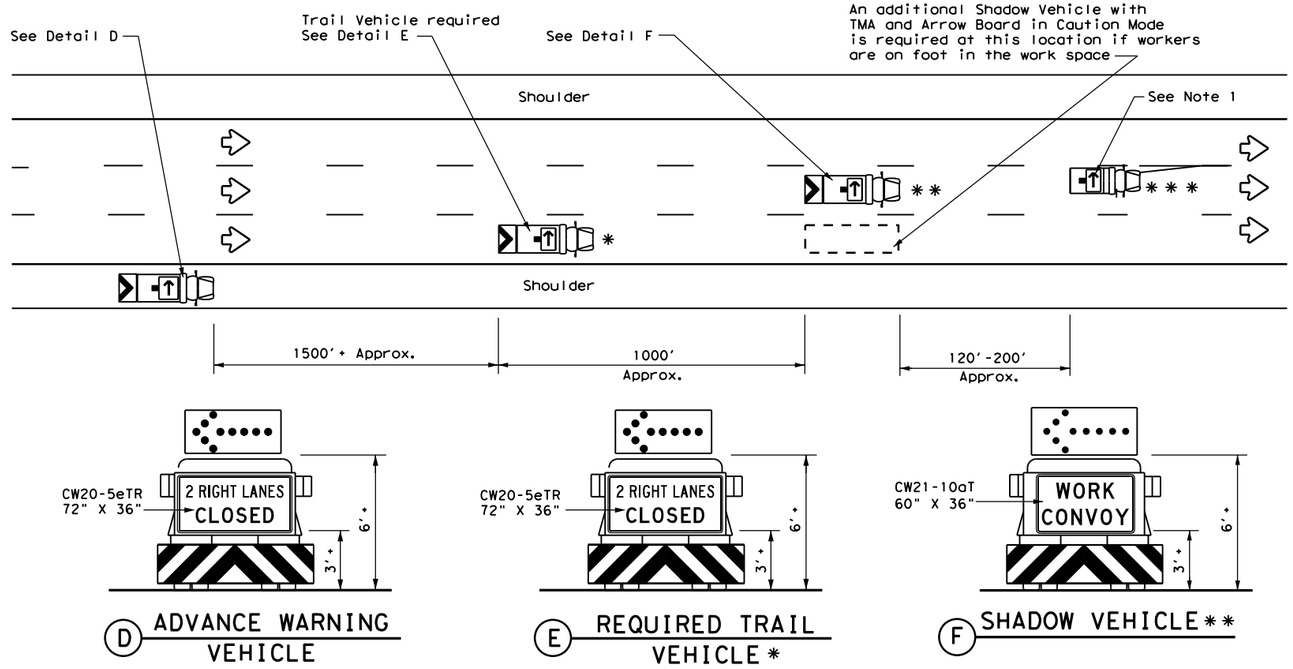


RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



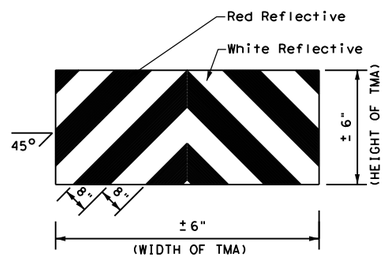
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0072	05	090, Etc.	IH 10, Etc.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	SAT	KENDALL, Etc.		34
1-97				

176

DATE: 2021 2:53:43 PM
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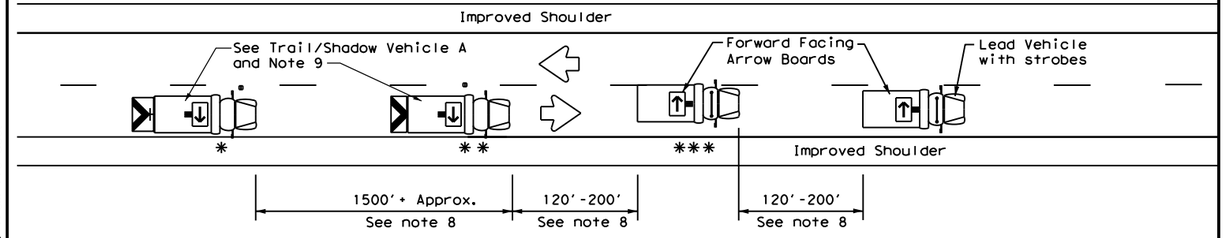
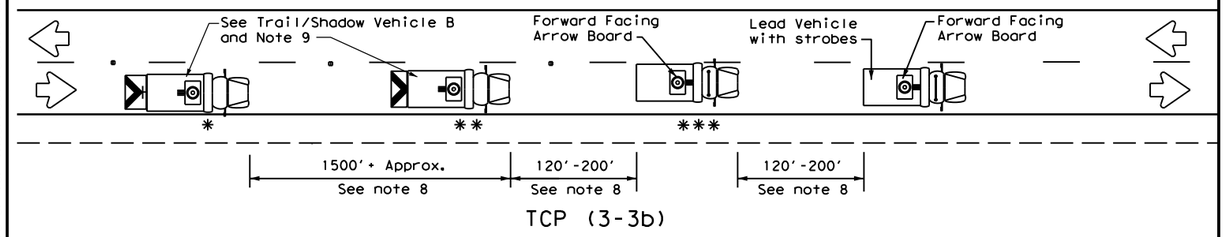


TCP (3-3a)

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



TCP (3-3b)

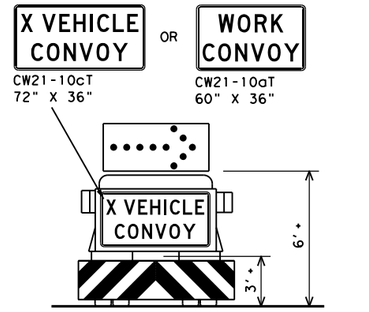
TWO LANE HIGHWAY WITHOUT PAVED SHOULDERS
(WORK ON TRAVEL LANE)

TCP (3-3c)

DIVIDED MULTILANE HIGHWAY

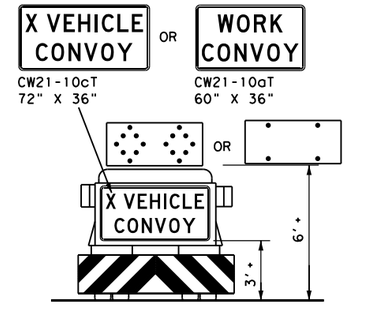
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



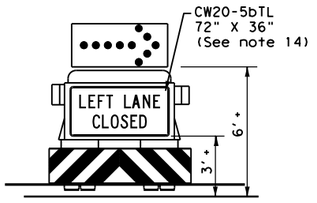
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

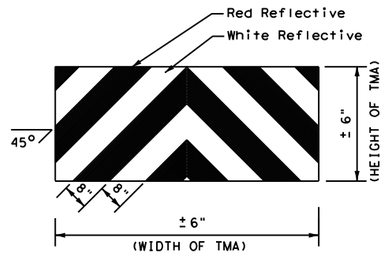


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

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

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
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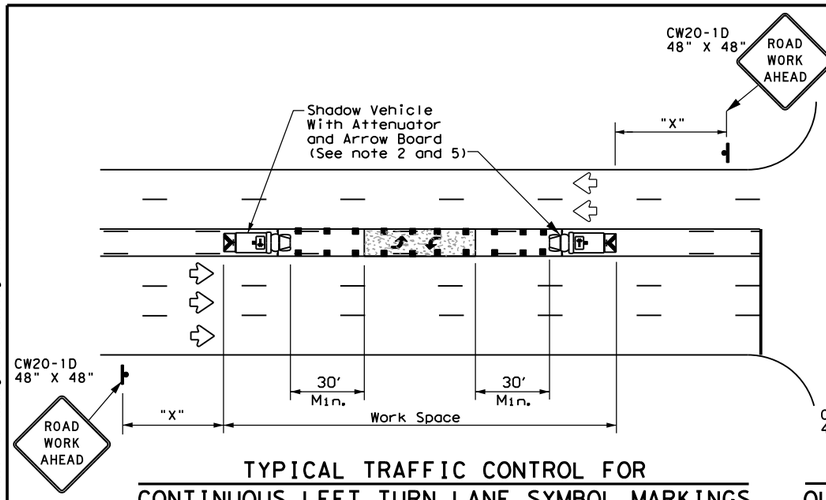
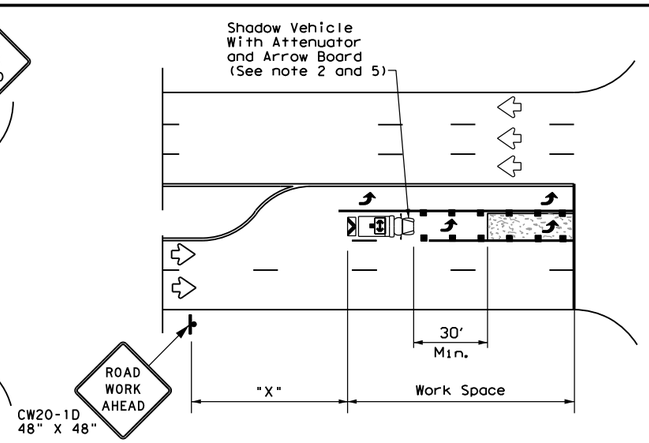
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	SAT	KENDALL, Etc.		35
1-97 7-14				

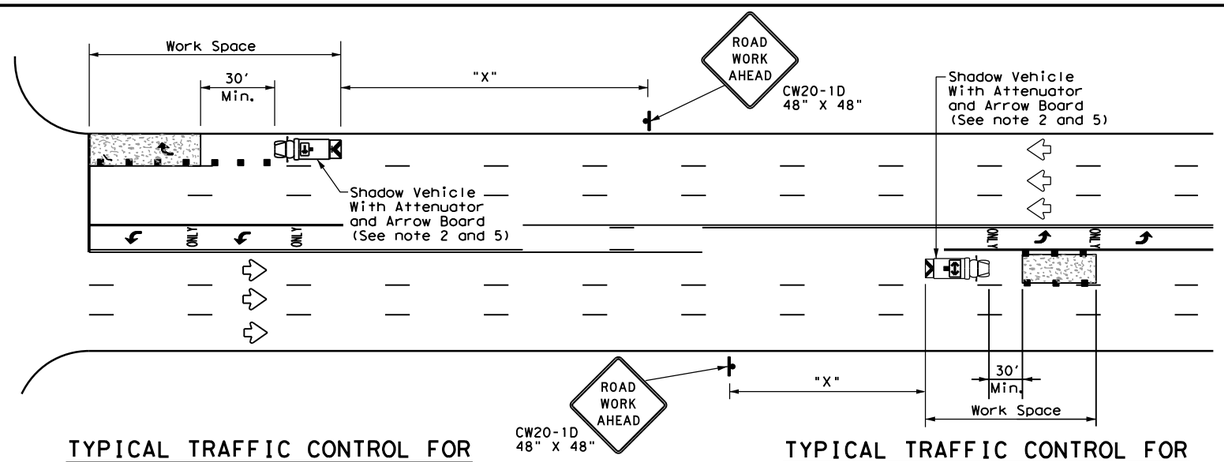
177



TYPICAL TRAFFIC CONTROL FOR
CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

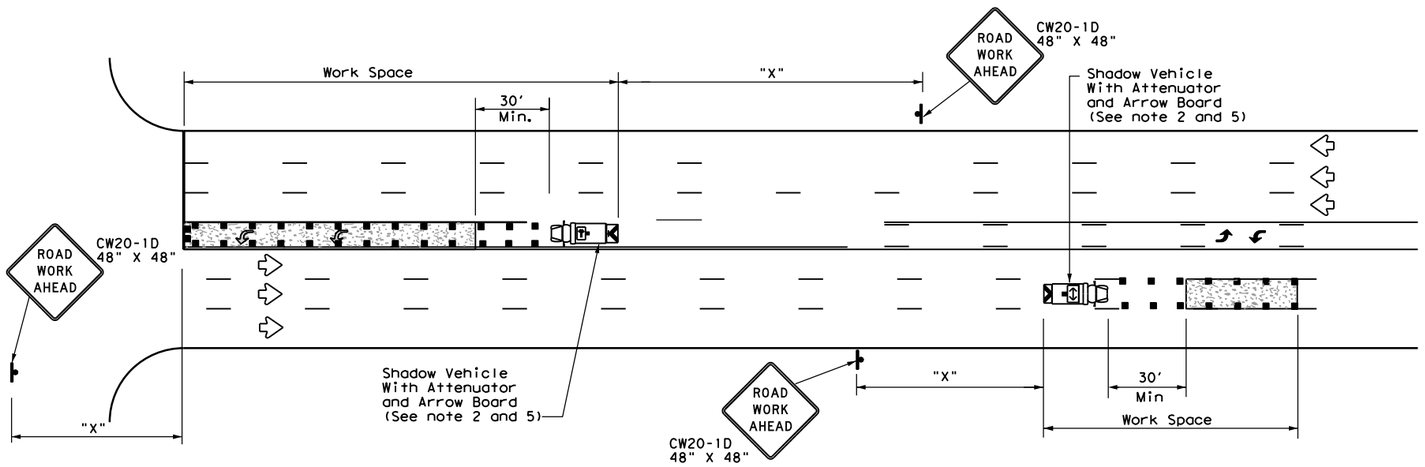


TYPICAL TRAFFIC CONTROL FOR
OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



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'

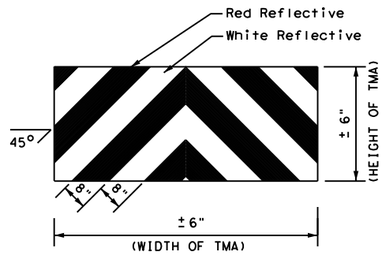
* Conventional Roads Only

** 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	0072	05	090, Etc.	IH 10, Etc.
	DIST	COUNTY		SHEET NO.
	SAT	KENDALL, Etc.		36

DATE: 2021
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2:54:00 PM

DATE: 2021 2:54:09 PM
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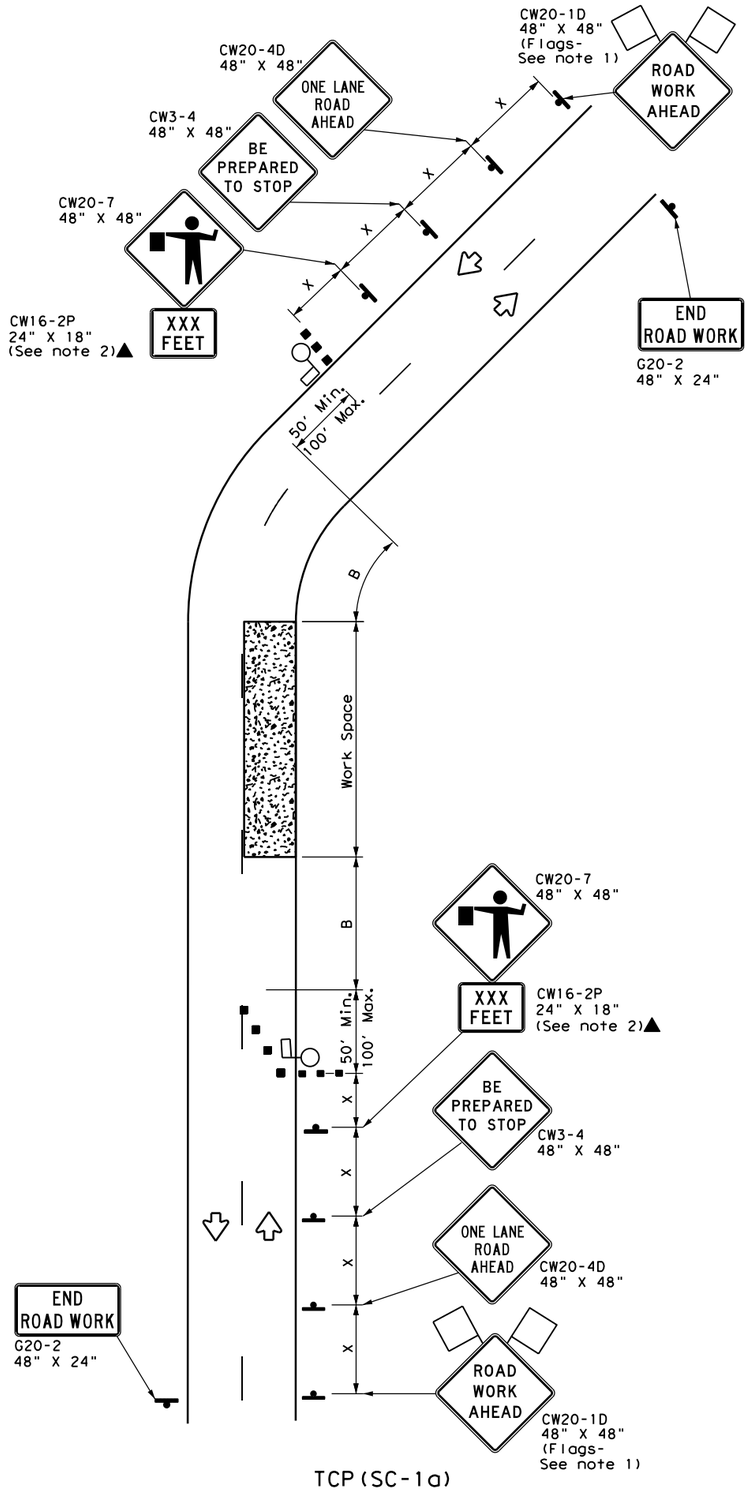
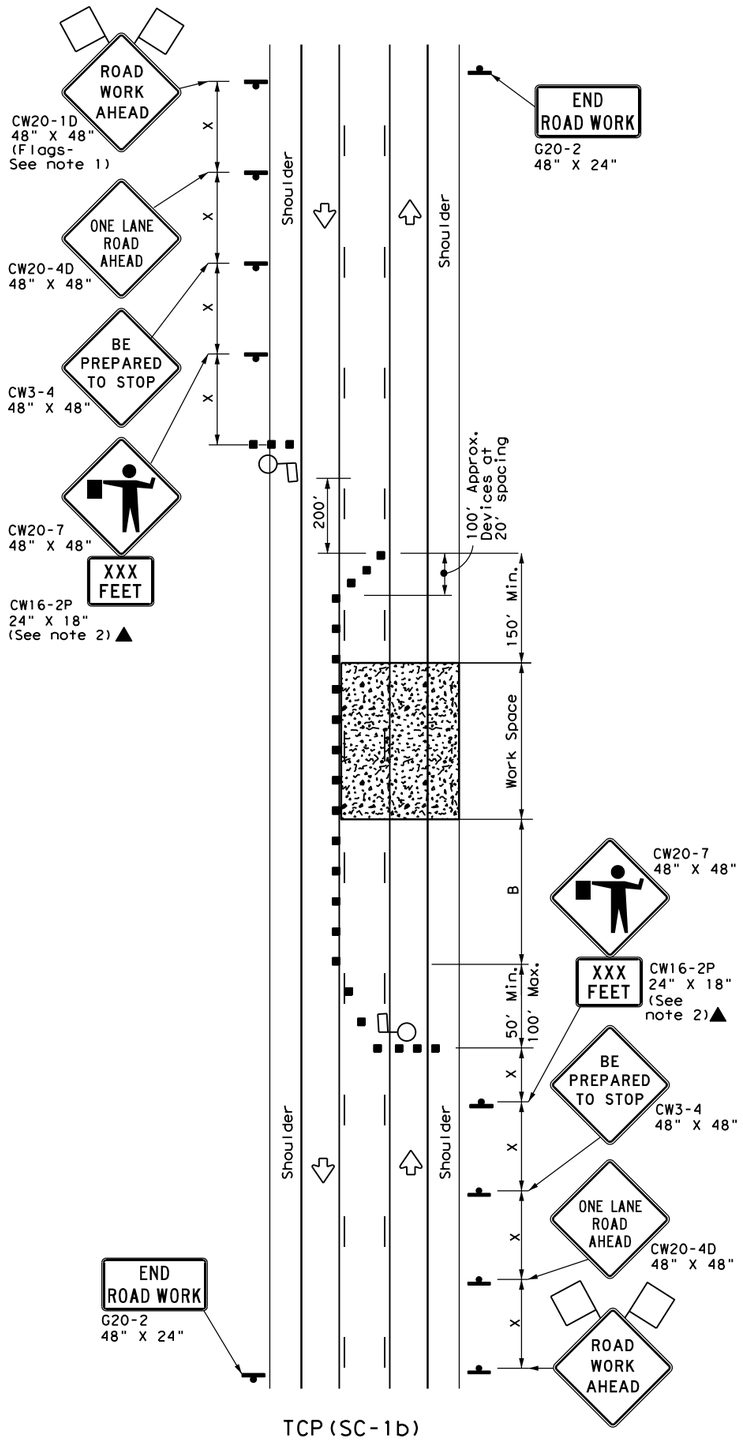


TCP(SC-1a)

ONE LANE TWO-WAY (2 LANES) CONTROL WITH PILOT VEHICLE



TCP(SC-1b)

ONE LANE TWO-WAY (3 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 "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L = WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger sign is less than 1500 feet.
5. Flaggers should use two-way radios or other methods of communication at all times to control traffic.
6. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.
7. 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).
8. 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 other member of the traffic control crew at the intersection.
9. Temporary rumble strips are not required on seal coat operations.
10. Pilot car is used to guide vehicles through traffic control zone, vehicle 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 center-line may be omitted when a pilot car is leading traffic.

Texas Department of Transportation — Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS

TCP(SC-1)-21

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©TxDOT April 2021	CONT	SECT	JOB	HIGHWAY
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	SAT	KENDALL, Etc.		37

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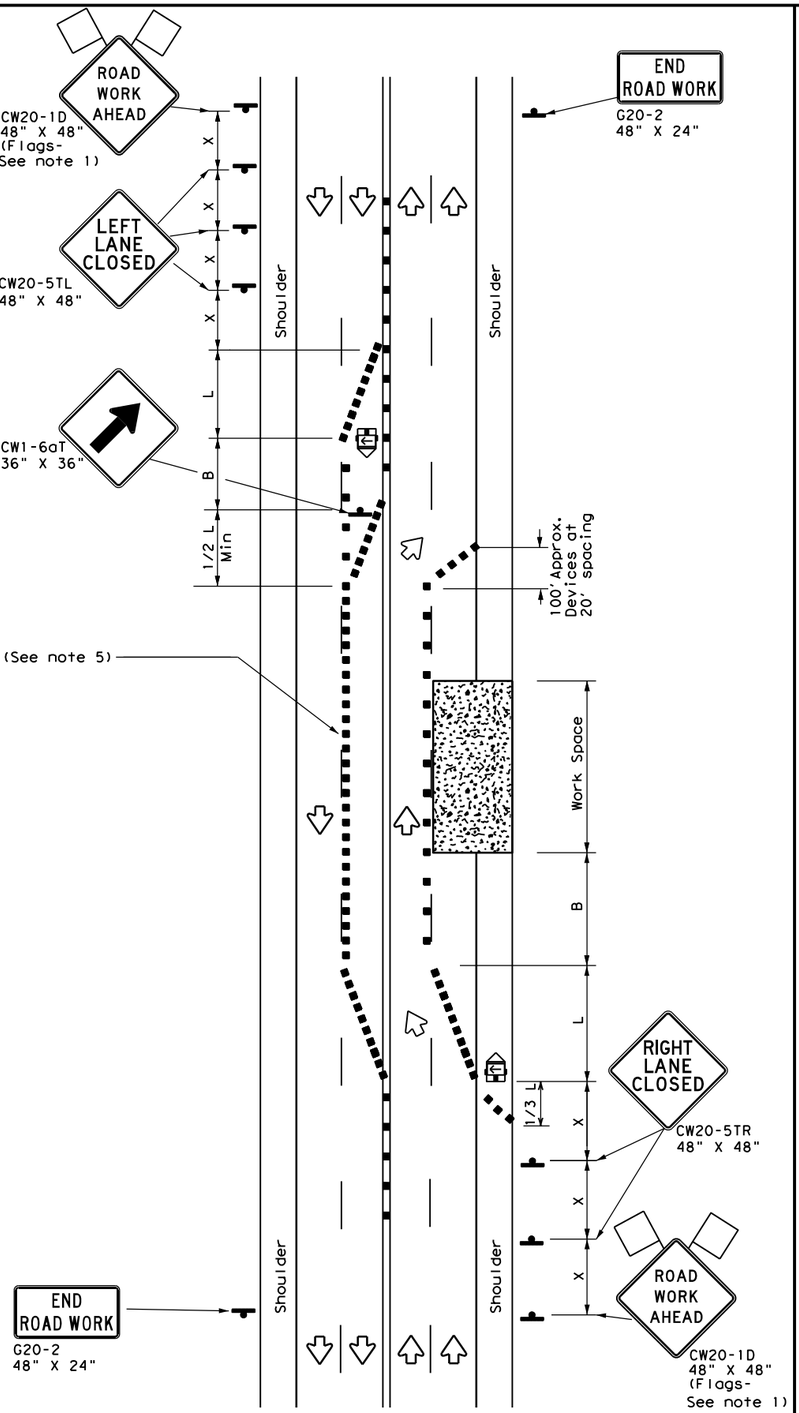
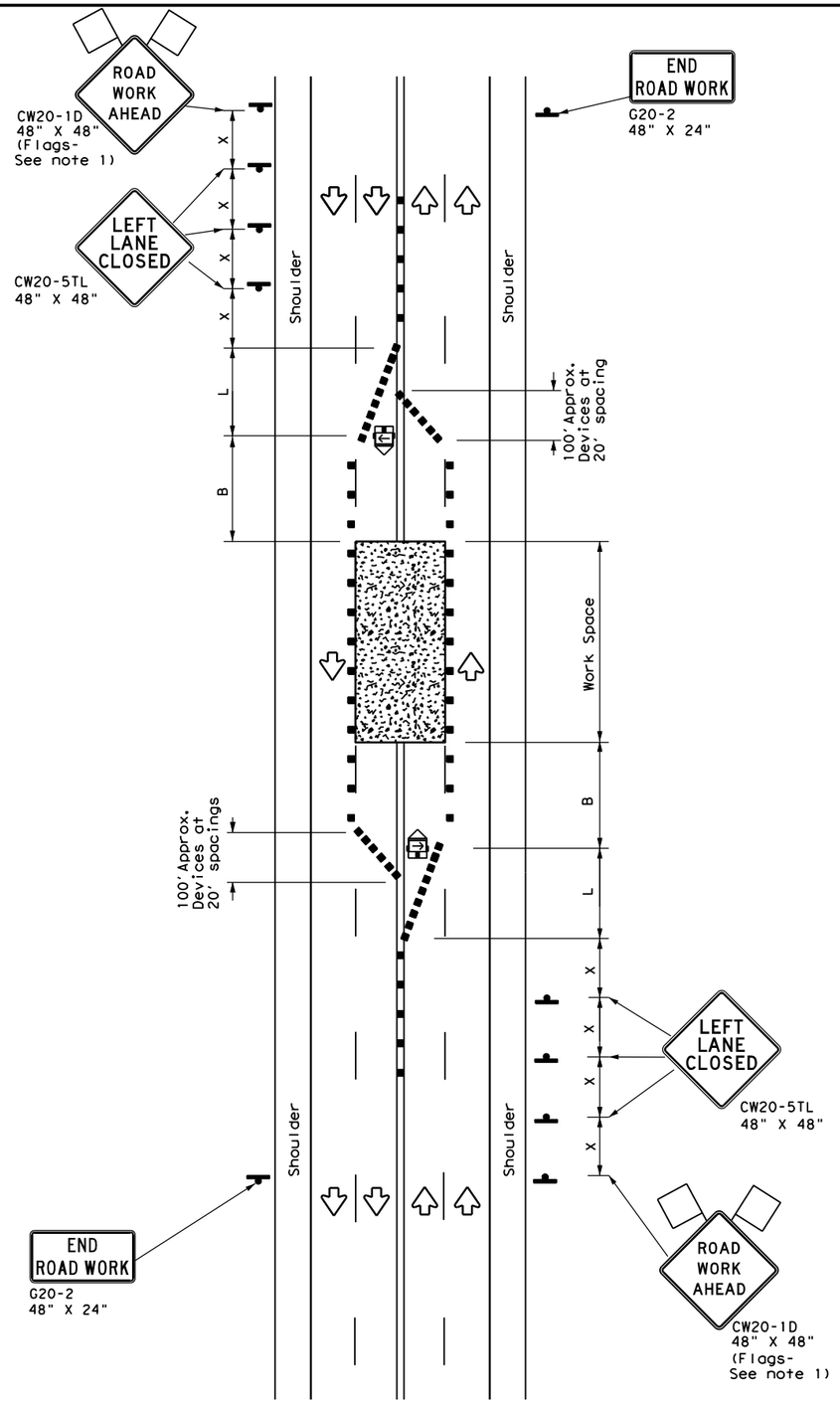


TCP (SC-2a)

ONE LANE CLOSED EACH DIRECTION
CONTROL WITH CHANNELIZING DEVICES



TCP (SC-2b)

CENTER LANES CLOSED
CONTROL WITH 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 "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150′	165′	180′	30′	60′	120′	90′
35		205′	225′	245′	35′	70′	160′	120′
40		265′	295′	320′	40′	80′	240′	155′
45	L=WS	450′	495′	540′	45′	90′	320′	195′
50		500′	550′	600′	50′	100′	400′	240′
55		550′	605′	660′	55′	110′	500′	295′
60		600′	660′	720′	60′	120′	600′	350′
65		650′	715′	780′	65′	130′	700′	410′
70		700′	770′	840′	70′	140′	800′	475′
75		750′	825′	900′	75′	150′	900′	540′

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW20-1D "ROAD WORK AHEAD" 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 other member of the traffic control crew at the intersection.
5. Temporary rumble strips are not required on seal coat operations.

TCP (SC-2a)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(SC-2)-21

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©TxDOT April 2021	CONT	SECT	JOB	HIGHWAY
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	SAT	KENDALL, Etc.		38

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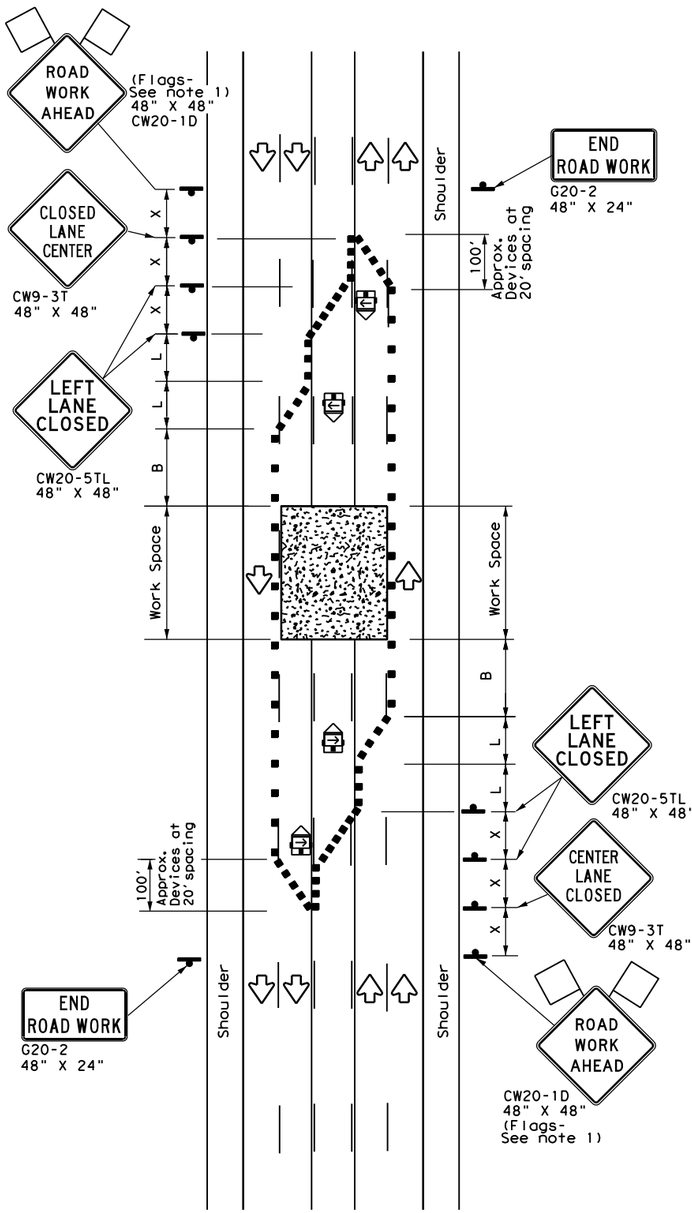
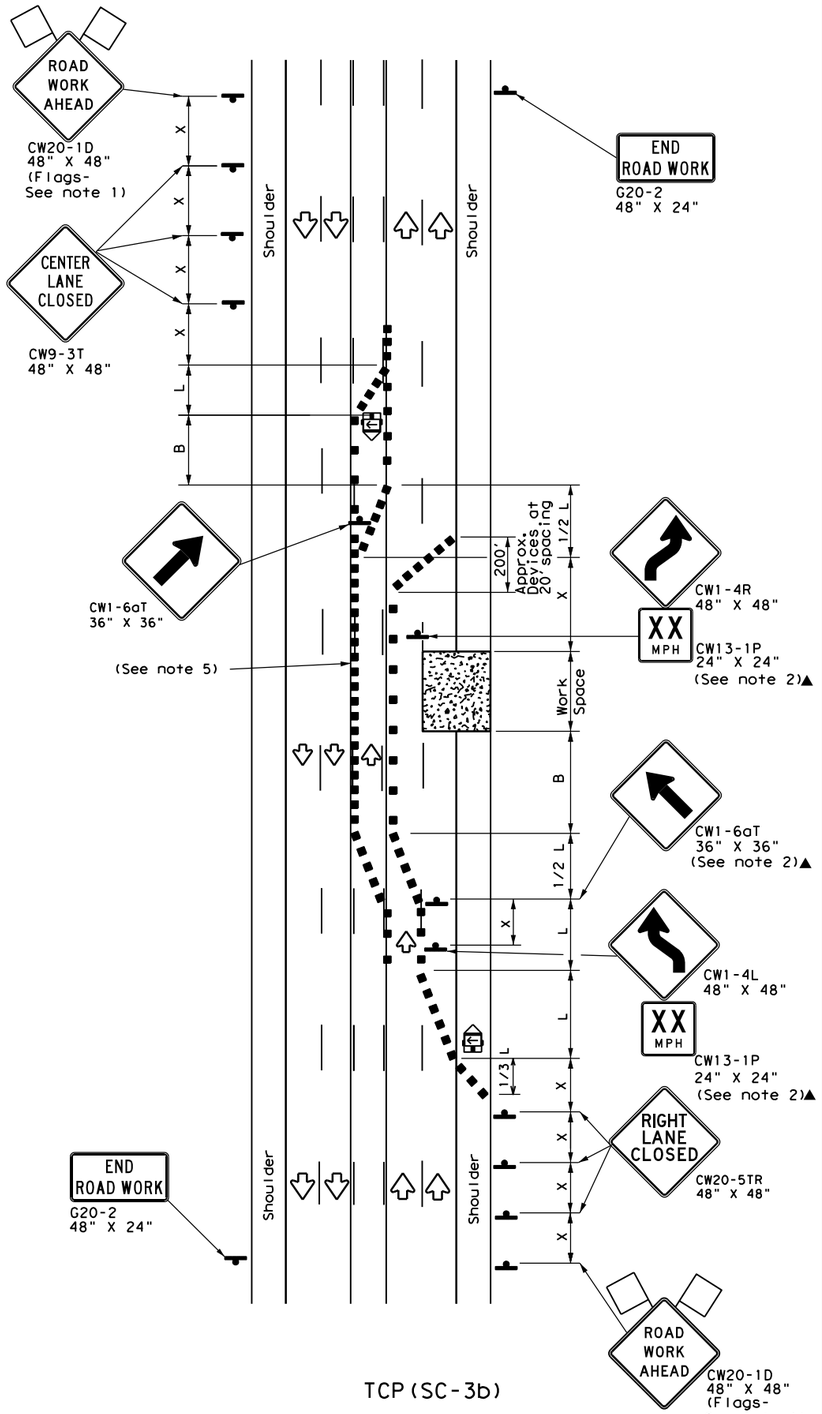


TCP(SC-3a)

CENTER LANES CLOSED
CONTROL WITH CHANNELIZING DEVICES



TCP(SC-3b)

ONE LANES CLOSED
CONTROL WITH CHANNELIZING DEVICES

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work when approved by the Engineer.
3. 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 other members of the traffic control crew at the intersection.
4. Temporary rumble strips are not required on seal coat operations.

TCP (SC-3b)

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

Texas Department of Transportation | Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS

TCP(SC-3)-21

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©TxDOT April 2021	CONT	SECT	JOB	HIGHWAY
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	SAT	KENDALL, Etc.		39

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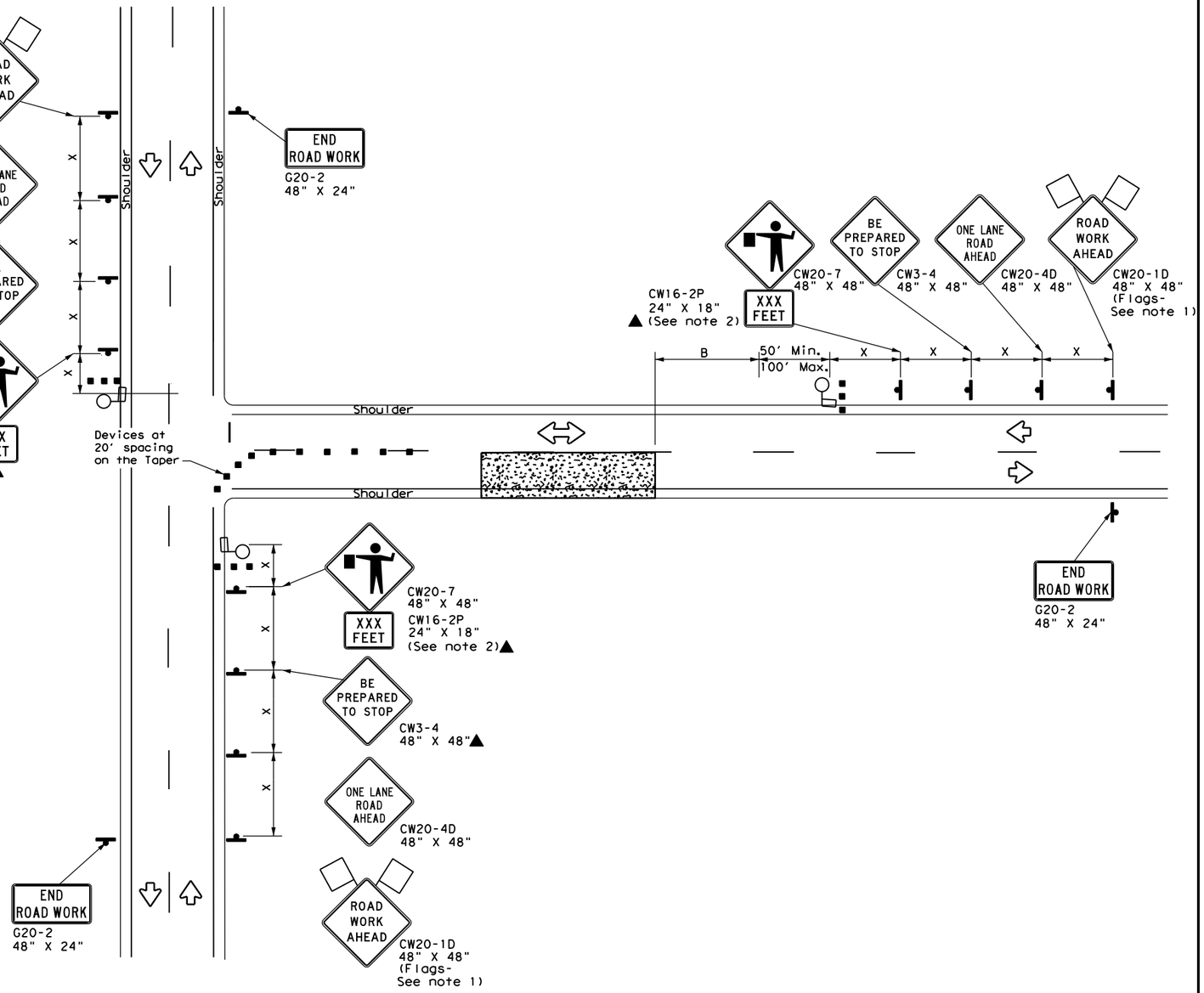

ONE LANE TWO-WAY (T-INTERSECTION) CONTROL WITH PILOT VEHICLE

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 "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication at all times to control traffic.
5. Flaggers should use 24" STOP/SLOW 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. Temporary rumble strips are not required on seal coat operations.
8. Pilot car is used to guide vehicles through traffic control zone, vehicle 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

TCP(SC-4)-21

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©TxDOT April 2021	CONT	SECT	JOB	HIGHWAY
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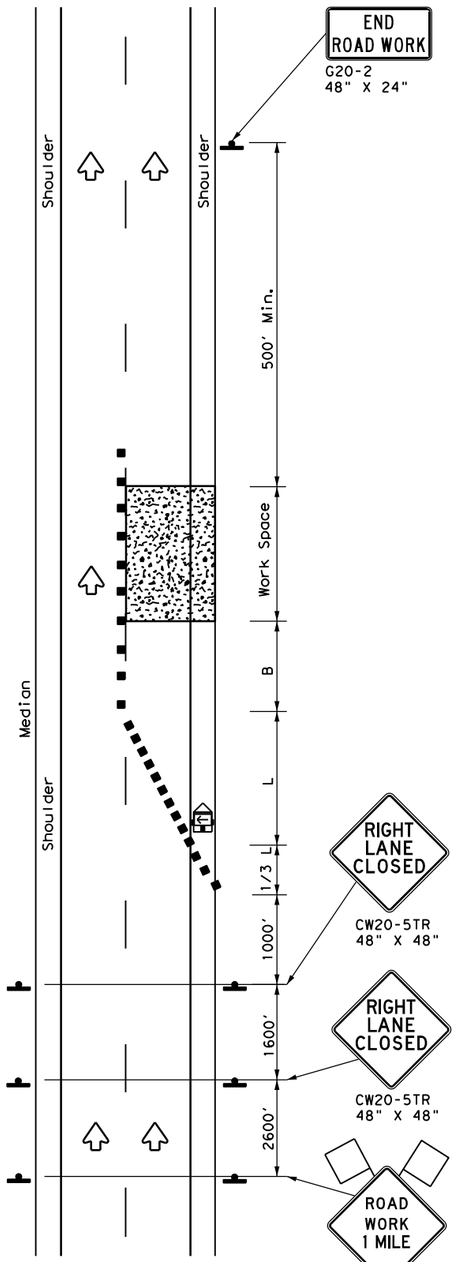
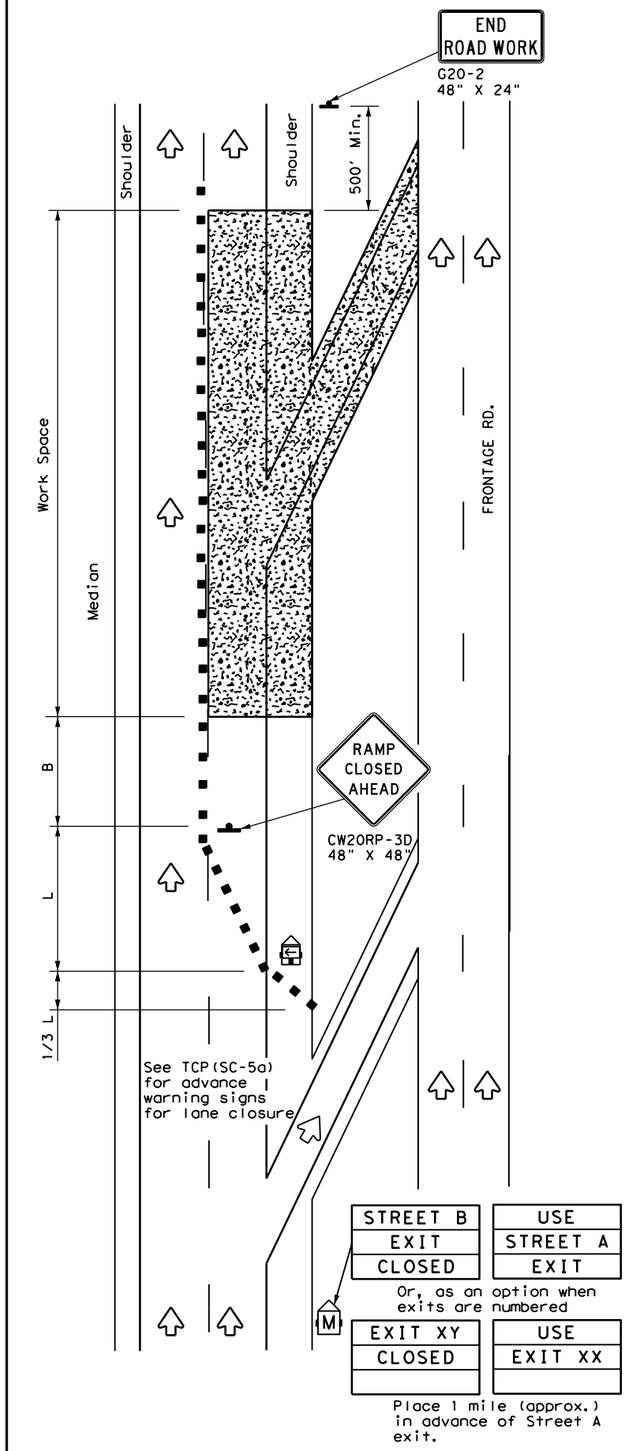
	SAT	KENDALL, Etc.		40



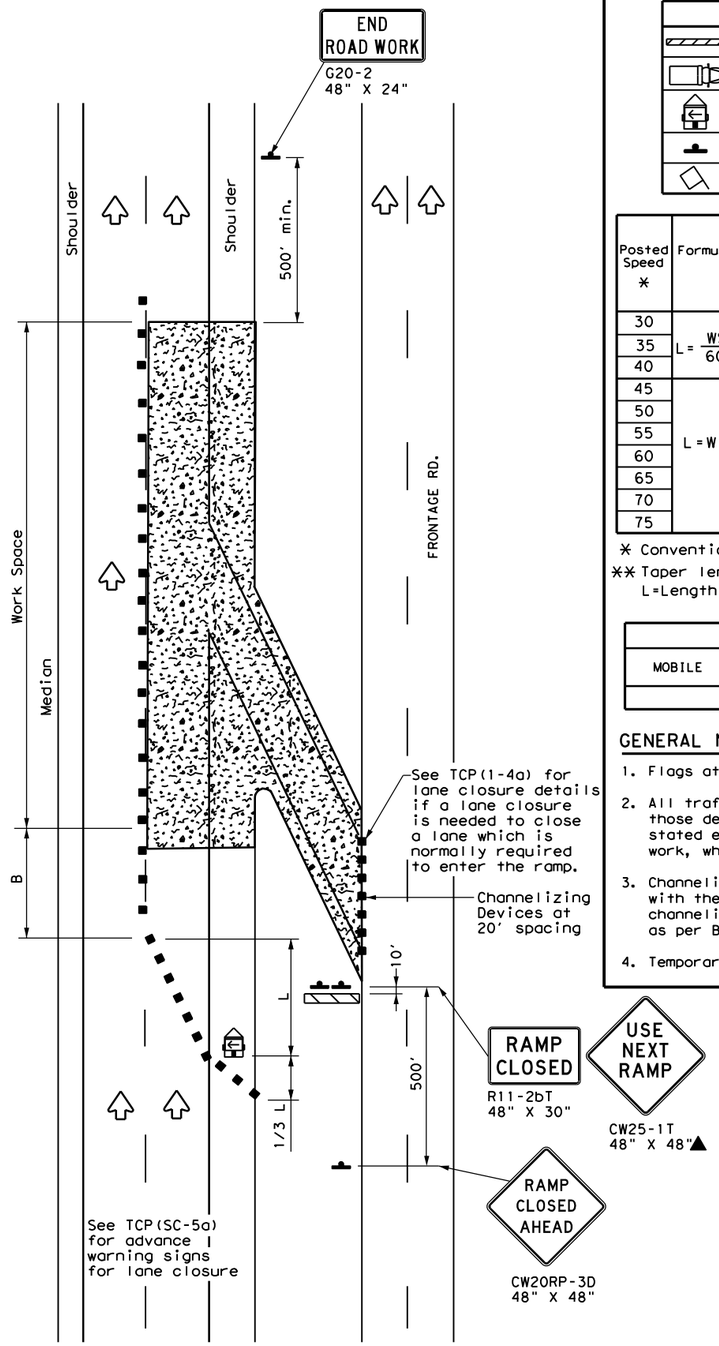
TCP (SC-5a)

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 "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
4. Temporary rumble strips are not required on seal coat operations.

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(SC-5)-21

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©TxDOT April 2021	CONT	SECT	JOB	HIGHWAY
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	SAT	KENDALL, Etc.		41

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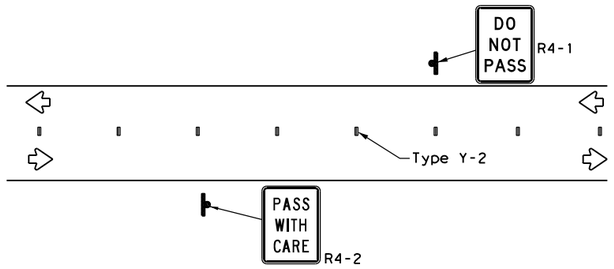
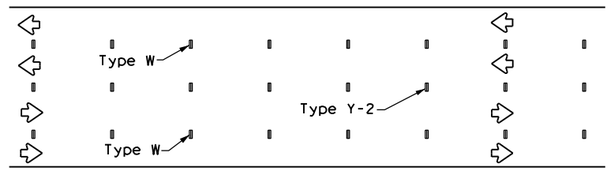
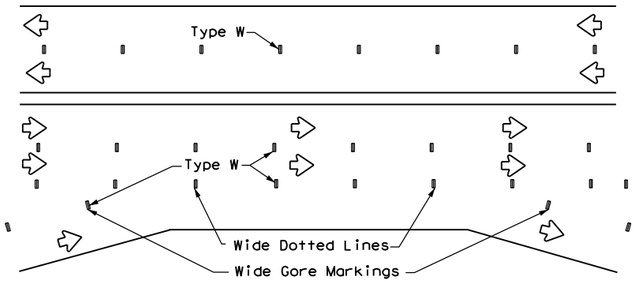
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS (TABS)



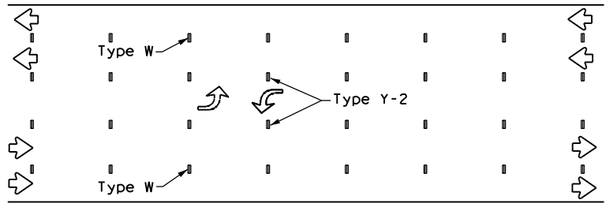
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS

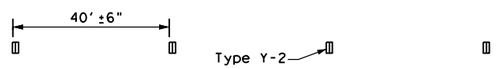


LANE LINES FOR DIVIDED HIGHWAY



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	
BROKEN LINES (FOR CENTER LINE OR LANE LINE)		
WIDE DOTTED LINES (FOR LANE DROP LINES)		
WIDE GORE MARKINGS		

NOTES:

1. Short term pavement markings shall be temporary flexible-reflective roadway marker tabs with protective cover unless otherwise specified elsewhere in plans.
2. Short term pavement markings shall NOT be used to simulate edge lines.
3. Dimensions indicated on this sheet are typical and approximate. Variations in size and height may occur between markers or devices made by manufacturers, by as much as 1/4 inch, unless otherwise noted.
4. Temporary flexible-reflective roadway marker tabs will require normal maintenance replacement when used on roadways with an ADT per lane of up to 7500 vehicles with no more than 10% truck mix. When roadways exceed these values, additional maintenance replacement of devices should be planned.
5. No segment of roadway open to traffic shall remain without permanent pavement markings for a period greater than 14 calendar days. The Contractor will be responsible for maintaining short term pavement markings until permanent pavement markings are in place. When the Contractor is responsible for placement of permanent pavement markings, no segment of roadway shall remain without permanent pavement markings for a period greater than 14 calendar days unless weather conditions prohibit placement. Permanent pavement markings shall be placed as soon as weather permits.
6. For exit gores where a lane is being dropped place wide gore markings or retroreflective channelizing devices to guide motorist through the exit. If channelizing devices are to be used it should be noted elsewhere in the plans. One piece cones are not allowed for this purpose.

TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

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

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

   http://www.txdot.gov

Texas Department of Transportation — Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS FOR SEAL COAT OPERATIONS

TCP(SC-6)-21

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		DIST	COUNTY		SHEET NO.
		SAT	KENDALL, Etc.		42

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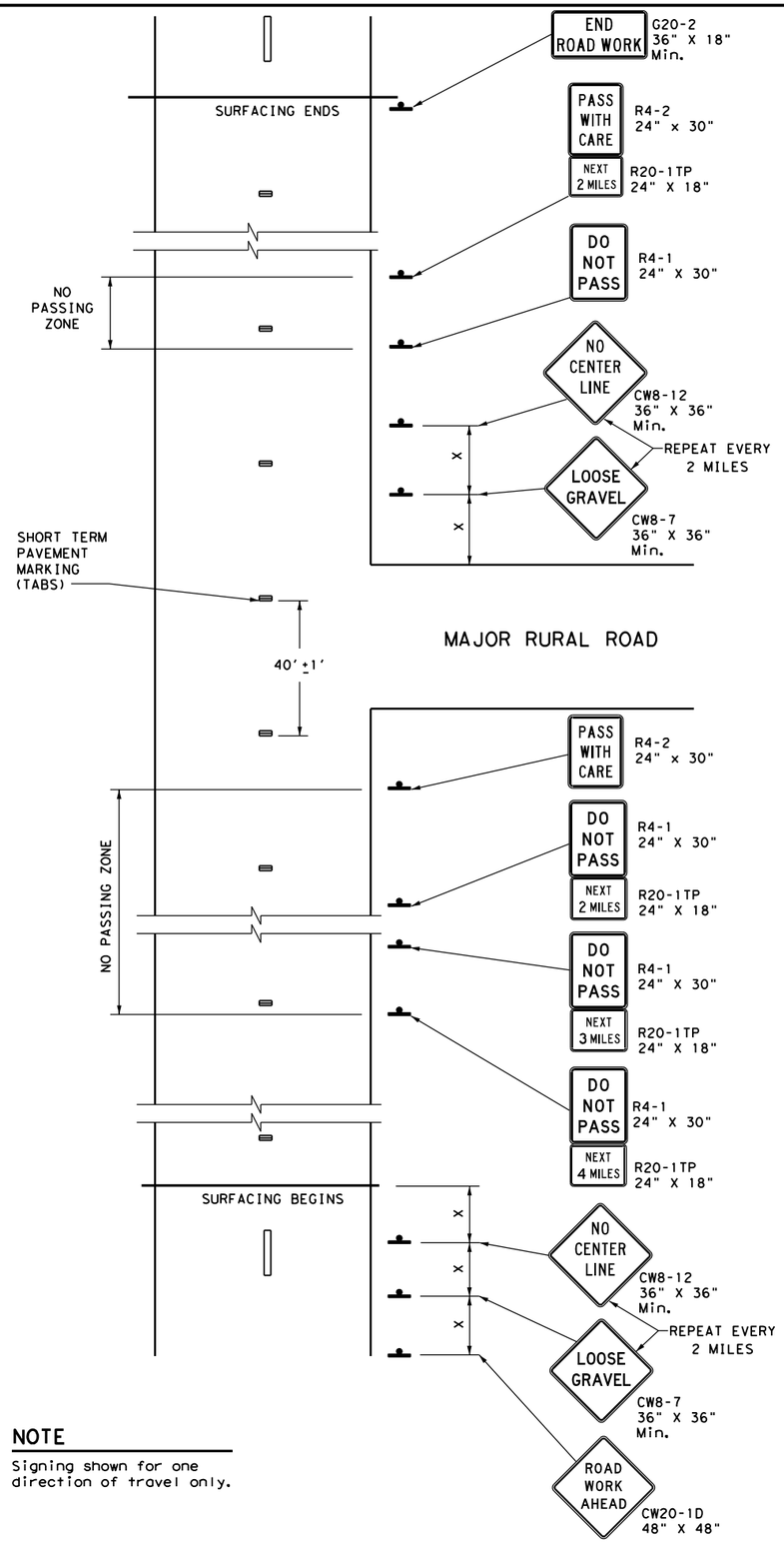
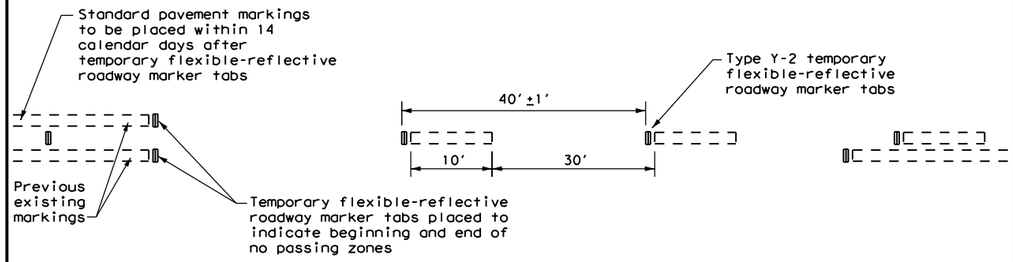


NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat operations

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

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

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

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

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

"NO CENTER LINE" SIGN (CW8-12)

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

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

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

"LOOSE GRAVEL" SIGN (CW8-7)

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

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

PAVEMENT MARKINGS

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

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

COORDINATION OF SIGN LOCATIONS

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

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

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

* Conventional Roads Only

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

GENERAL NOTES

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

Texas Department of Transportation | Traffic Safety Division Standard

TRAFFIC CONTROL DETAILS FOR SEAL COAT OPERATIONS

TCP(SC-7)-21

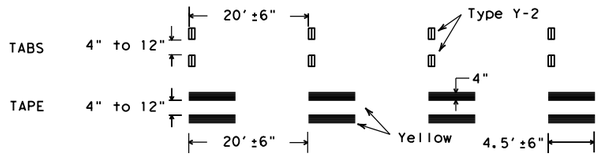
FILE: tcpsc-7-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0072	05	090, Etc.	IH 10, Etc.
	DIST	COUNTY		SHEET NO.
	SAT	KENDALL, Etc.		43

DATE: 2021 2:55:10 PM
FILE: c:\txdot\pw_online\txdot4\cary.lloyd\d052866?\WZ(STPM)-13.dgn

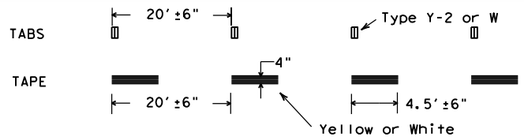
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

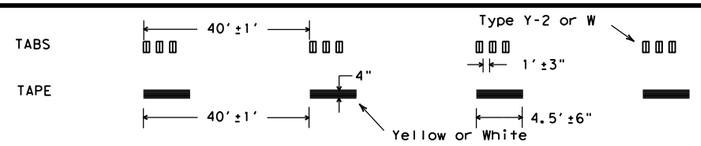


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



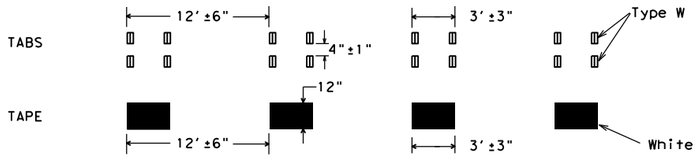
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

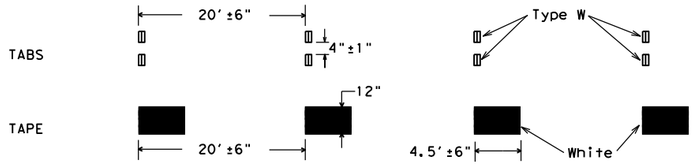


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



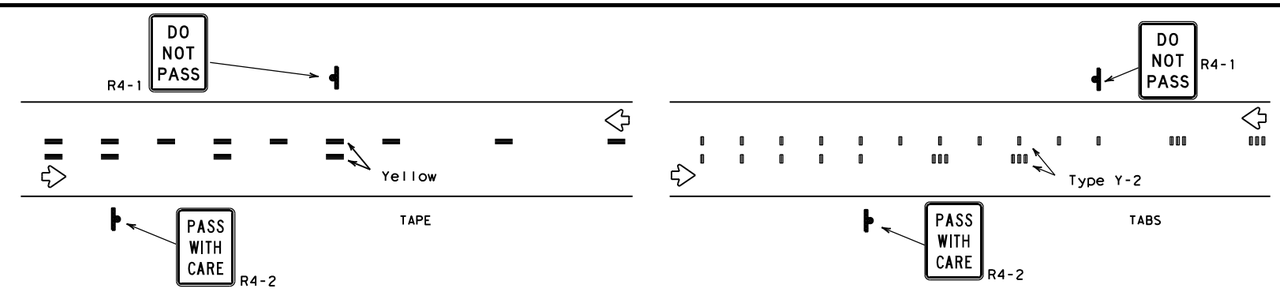
NOTES:

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

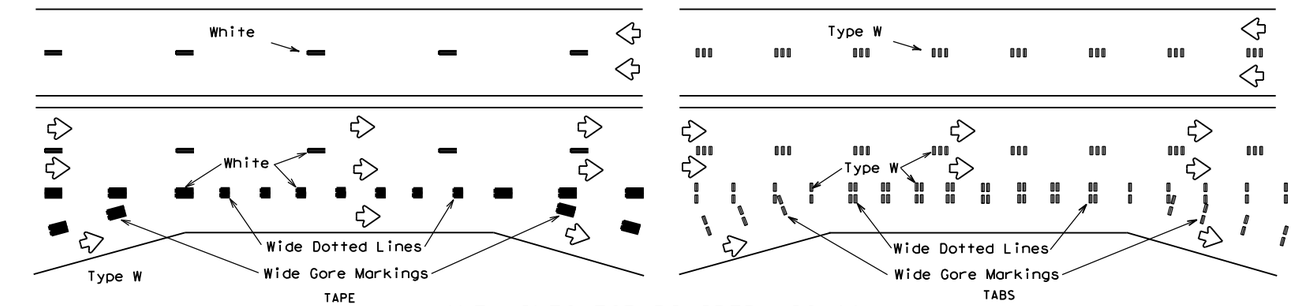
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

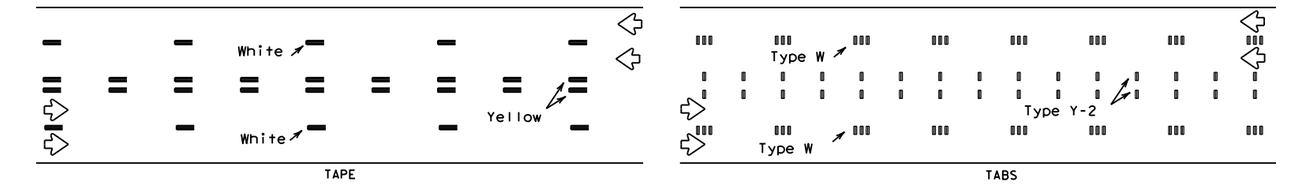
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



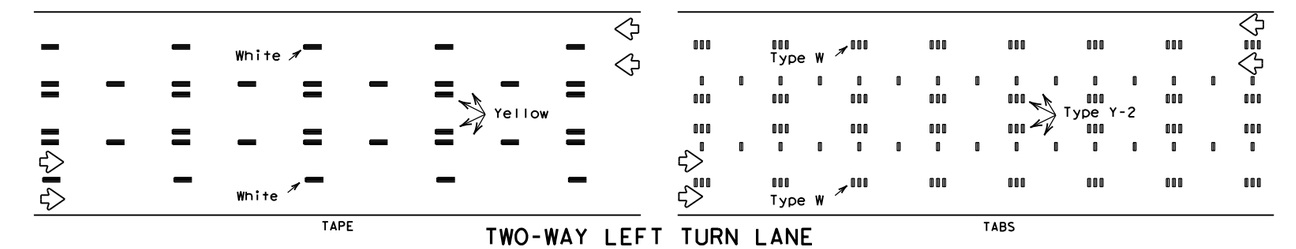
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



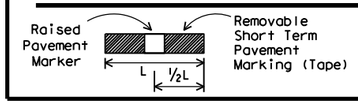
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

Texas Department of Transportation

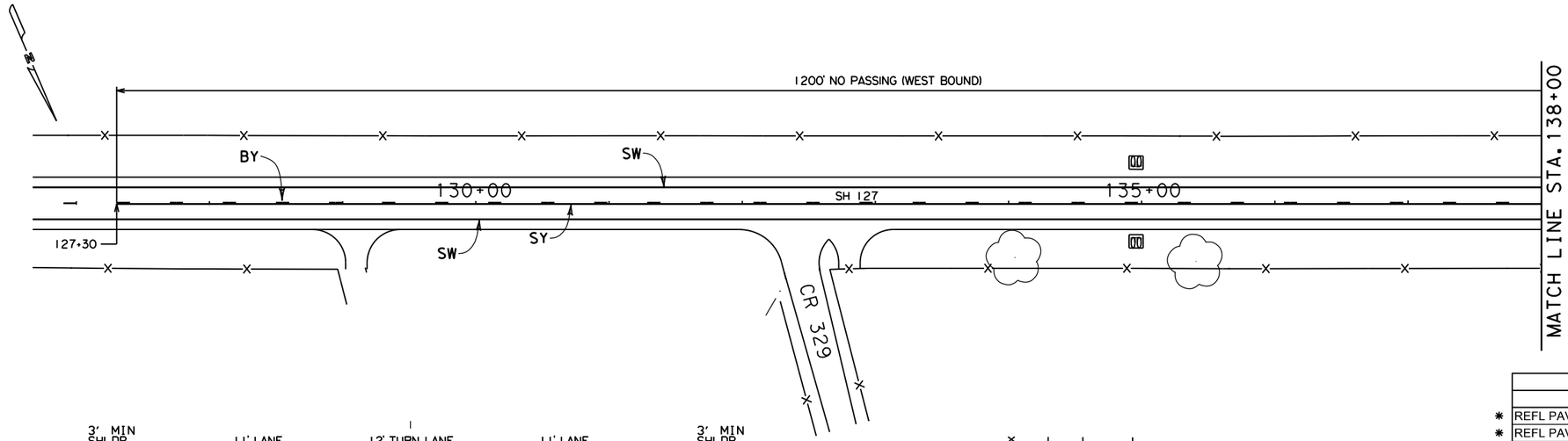
Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

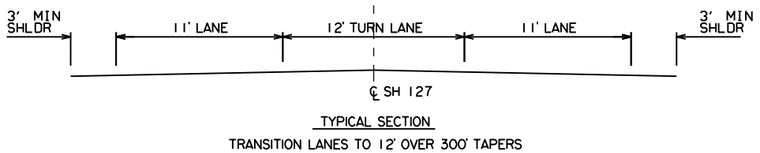
FILE:	wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS		0072	05	090, Etc.	IH 10, Etc.
1-97		DIST	COUNTY		SHEET NO.
3-03		SAT	KENDALL, Etc.		44
7-13					

111



LEGEND

SW - SOLID WHITE (4")
SY - SOLID YELLOW (4")
BY - BROKEN YELLOW (4")
DSY - DOUBLE SOLID YELLOW (4")
SW8 - SOLID WHITE (8")

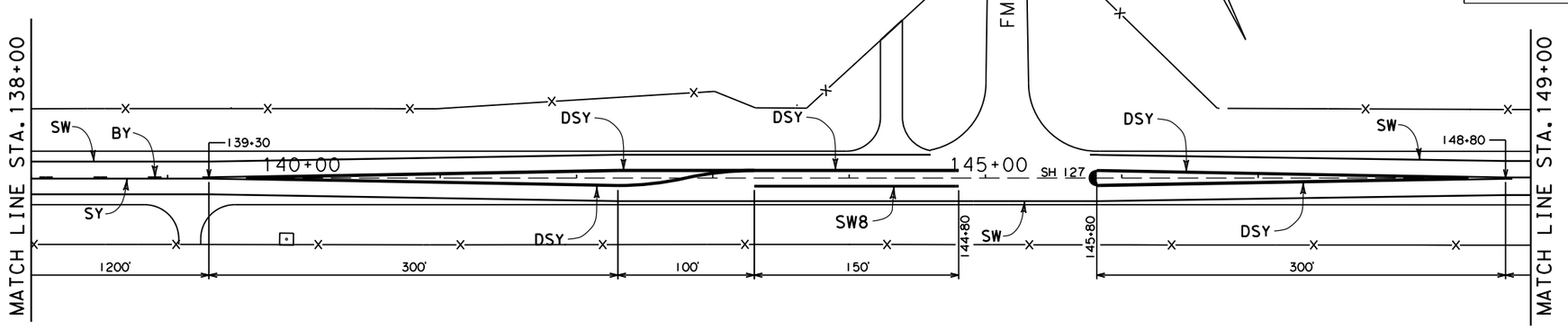


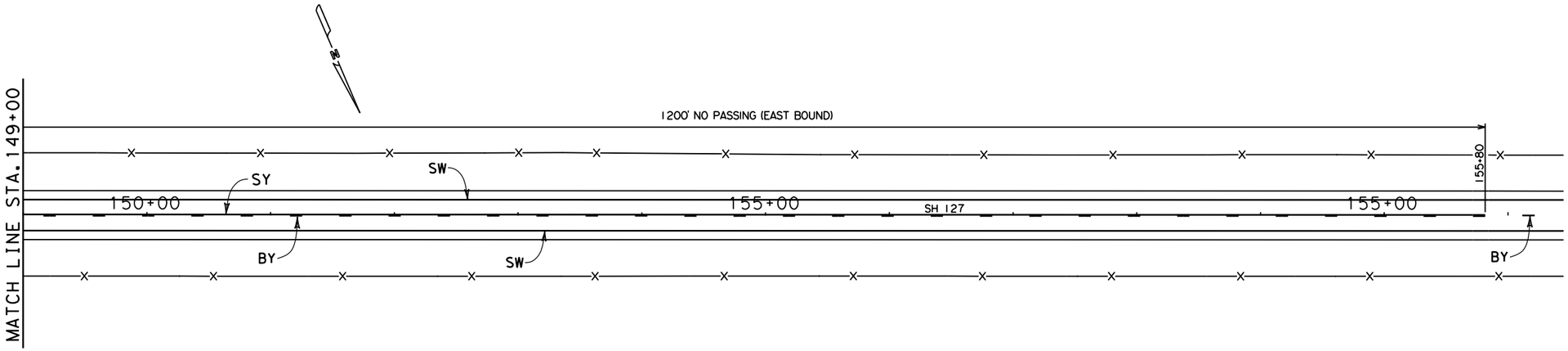
TYPICAL SECTION

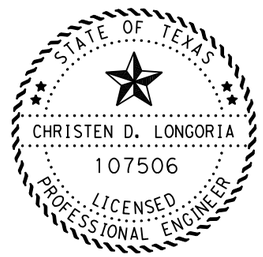
TRANSITION LANES TO 12' OVER 300' TAPERS

ESTIMATED QUANTITIES FOR CSJ 0369-01-041			
	DESCRIPTION	QUAN	UNIT
*	REFL PAV MRK TY II (W) 4" (SLD)	5810	LF
*	REFL PAV MRK TY II (W) 8"(SLD)	150	LF
*	REFL PAV MRK TY II (W) (ARROW)	2	EA
*	REFL PAV MRK TY II (W) (WORD)	2	EA
*	REFL PAV MRK TY II (Y) 4" (BRK)	520	LF
*	REFL PAV MRK TY II (Y) 4" (SLD)	4500	LF
*	REFL PAV MRK TY II (Y) (MED NOSE)	1	EA
*	REFL PAV MRKR TY I-C	8	EA
*	REFL PAV MRKR TY II-A-A	186	EA

* CONTRACTOR INFORMATION ONLY, QUANTITIES ARE INCLUDED IN ROADWAY TOTALS ON PAVEMENT MARKING SUMMARY







DocuSigned by:
Christen Longoria P.E. 8/2/2021
CHRISTEN D. LONGORIA DATE

SCALE: 1" = 100'

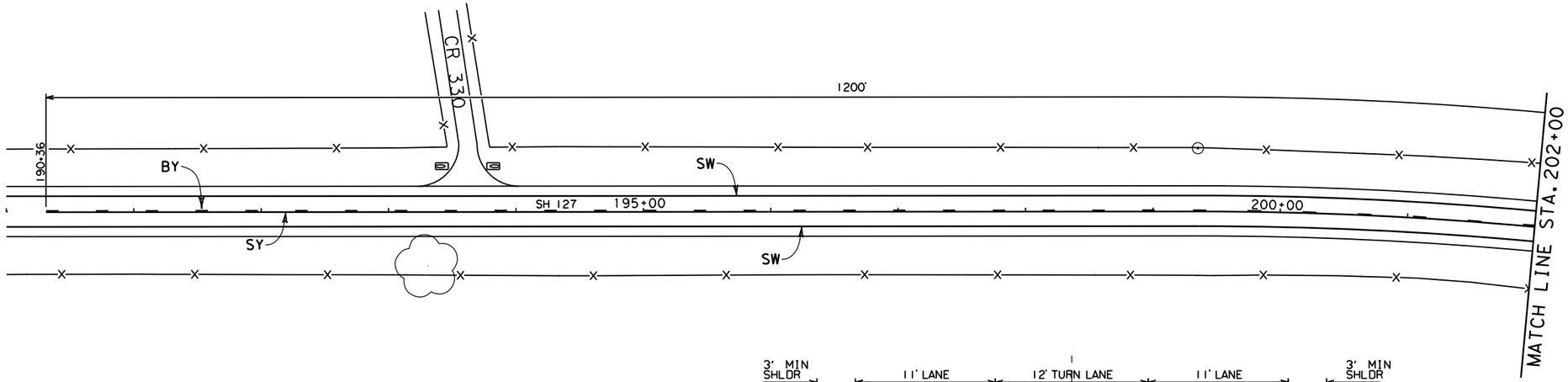
Texas Department of Transportation

LEFT TURN BAY DETAILS

(SH 127 @ FM 2730)

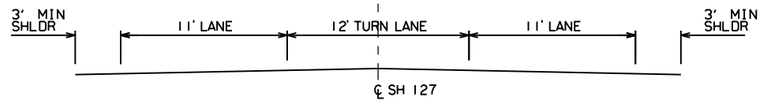
SHEET 1 of 5

FED.RD. DIV.NO.	STATE PROJECT NO.		SHEET NO.
6			45
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.



LEGEND

SW - SOLID WHITE (4")
SY - SOLID YELLOW (4")
BY - BROKEN YELLOW (4")
DSY - DOUBLE SOLID YELLOW (4")
SW8 - SOLID WHITE (8")

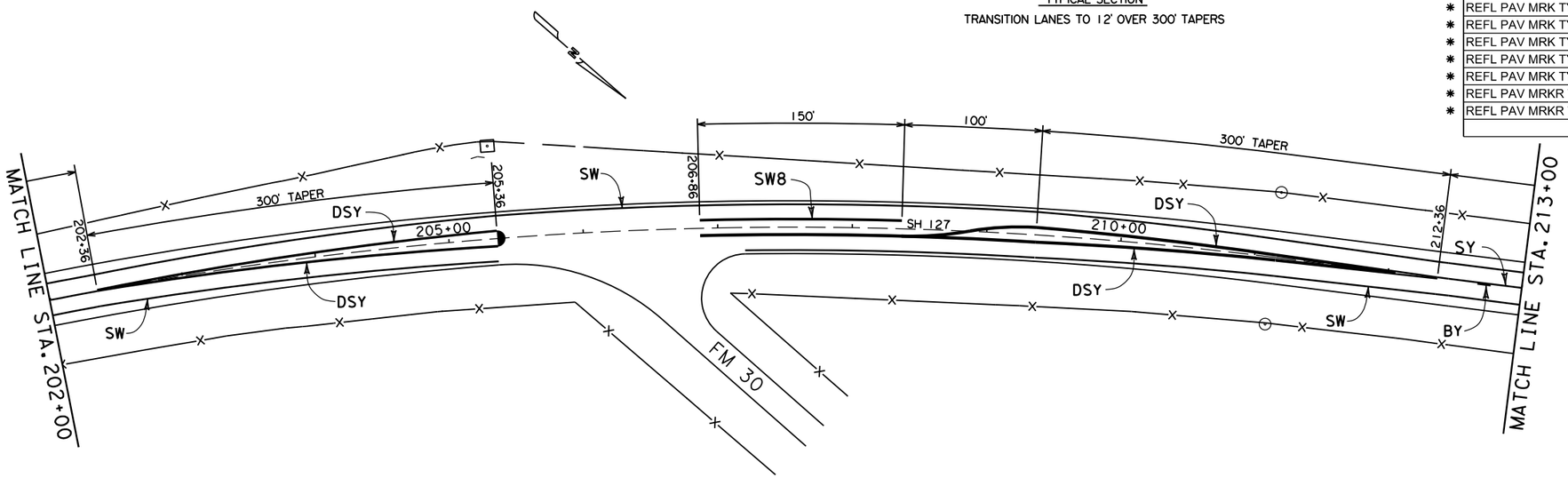


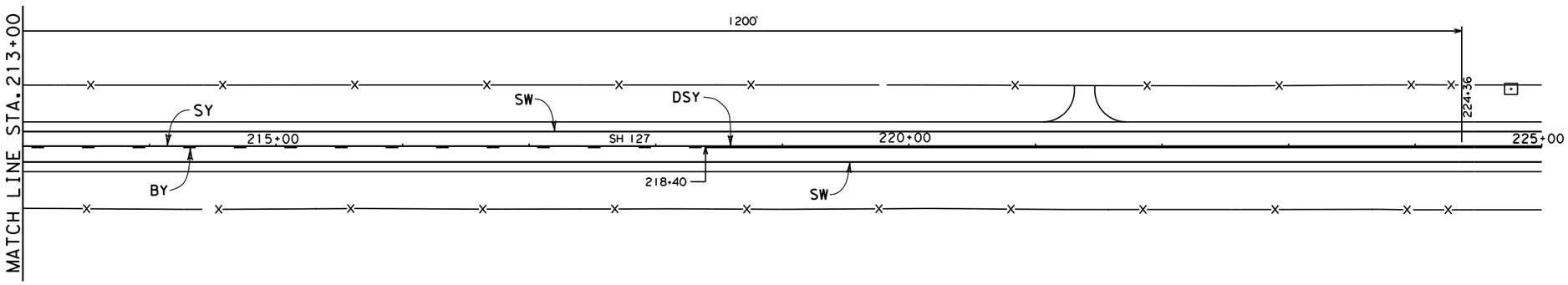
TYPICAL SECTION

TRANSITION LANES TO 12' OVER 300' TAPERS

ESTIMATED QUANTITIES FOR CSJ 0369-01-041			
	DESCRIPTION	QUAN	UNIT
*	REFL PAV MRK TY II (W) 4" (SLD)	7056	LF
*	REFL PAV MRK TY II (W) 8"(SLD)	150	LF
*	REFL PAV MRK TY II (W) (ARROW)	2	EA
*	REFL PAV MRK TY II (W) (WORD)	2	EA
*	REFL PAV MRK TY II (Y) 4" (BRK)	460	LF
*	REFL PAV MRK TY II (Y) 4" (SLD)	6300	LF
*	REFL PAV MRK TY II (Y) (MED NOSE)	1	EA
*	REFL PAV MRKR TY I-C	8	EA
*	REFL PAV MRKR TY II-A-A	201	EA

* CONTRACTOR INFORMATION ONLY. QUANTITIES ARE INCLUDED IN ROADWAY TOTALS ON PAVEMENT MARKING SUMMARY





STATE OF TEXAS
CHRISTEN D. LONGORIA
107506
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Christen Longoria P.E.
CHRISTEN D. LONGORIA
8/2/2021
DATE

SCALE: 1" = 100'

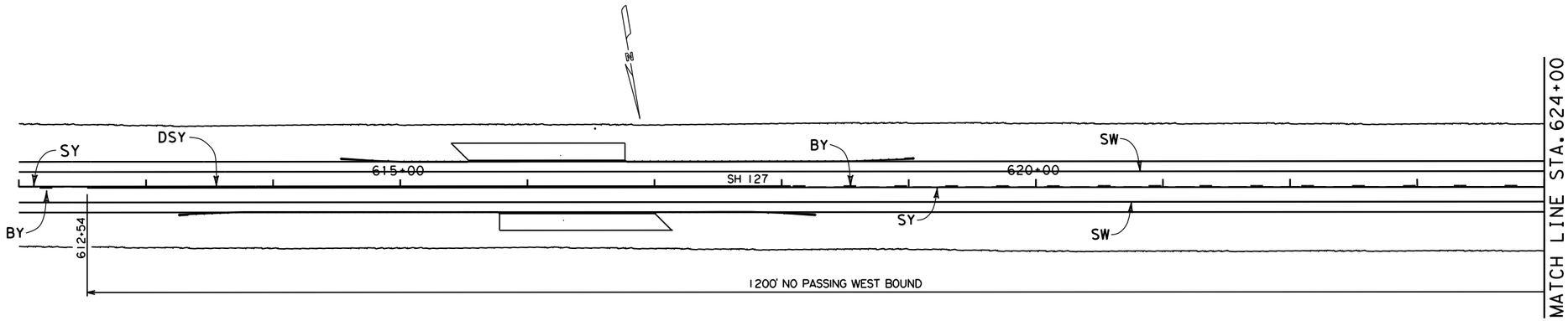
Texas Department of Transportation

LEFT TURN BAY DETAILS

(SH 127 @ FM 30)

SHEET 2 of 5

FED.RD. DIV.NO.	STATE PROJECT NO.		SHEET NO.
6			46
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

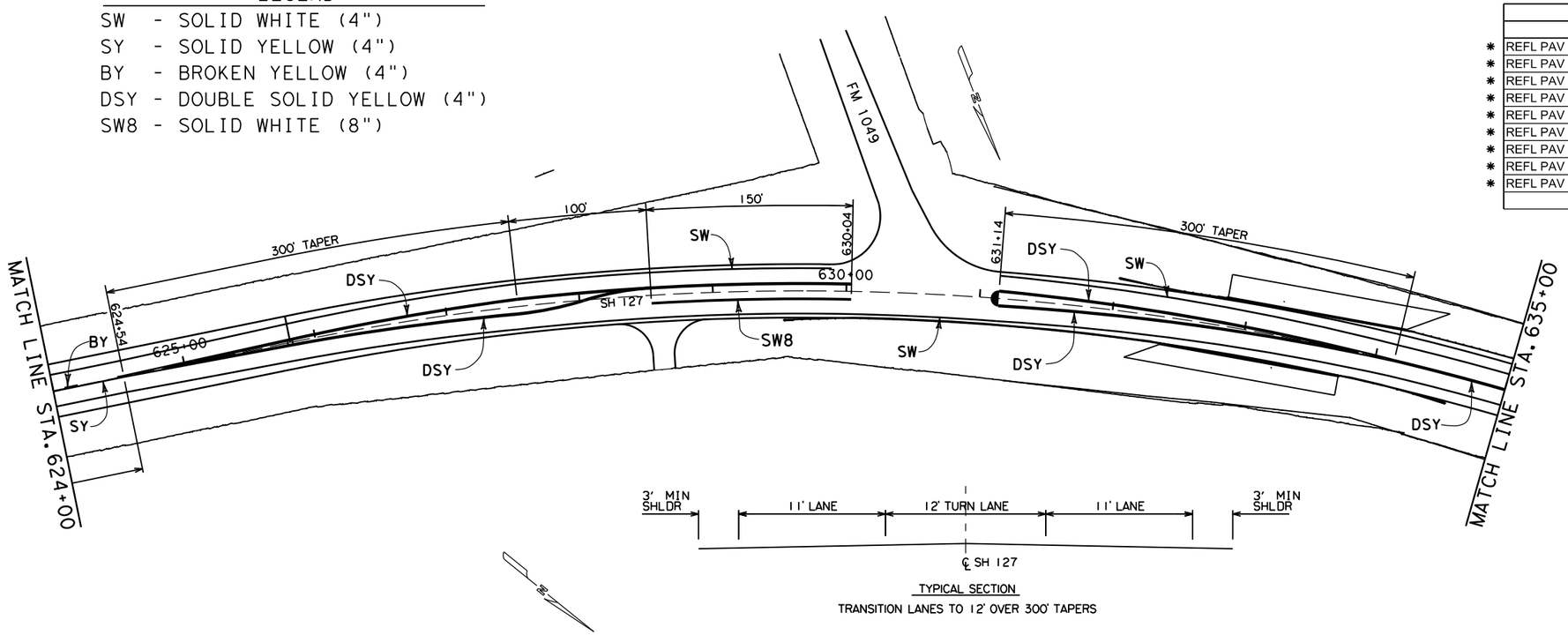


LEGEND

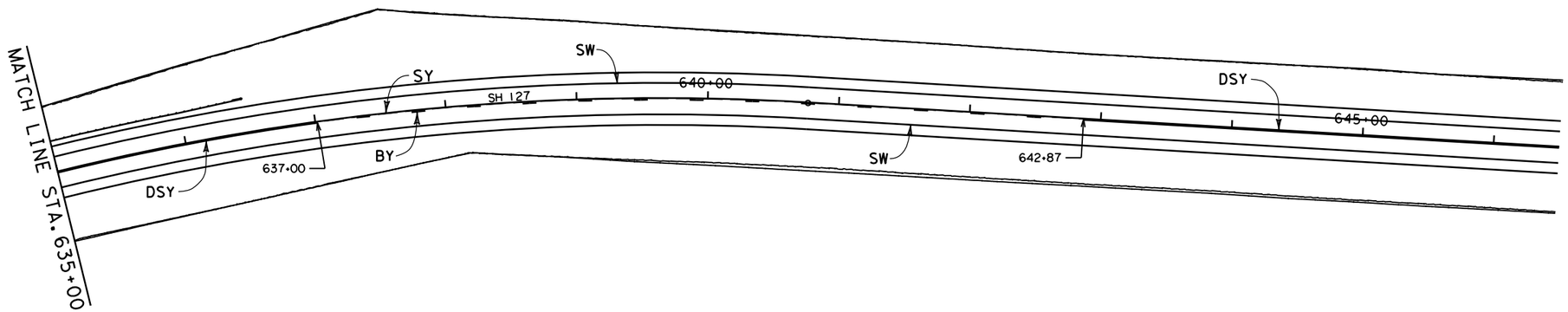
SW - SOLID WHITE (4")
SY - SOLID YELLOW (4")
BY - BROKEN YELLOW (4")
DSY - DOUBLE SOLID YELLOW (4")
SW8 - SOLID WHITE (8")

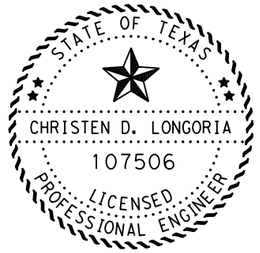
ESTIMATED QUANTITIES FOR CSJ 0369-01-041			
	DESCRIPTION	QUAN	UNIT
*	REFL PAV MRK TY II (W) 4" (SLD)	6900	LF
*	REFL PAV MRK TY II (W) 8"(SLD)	150	LF
*	REFL PAV MRK TY II (W) (ARROW)	2	EA
*	REFL PAV MRK TY II (W) (WORD)	2	EA
*	REFL PAV MRK TY II (Y) 4" (BRK)	300	LF
*	REFL PAV MRK TY II (Y) 4" (SLD)	6600	LF
*	REFL PAV MRK TY II (Y) (MED NOSE)	1	EA
*	REFL PAV MRKR TY I-C	8	EA
*	REFL PAV MRKR TY II-A-A	186	EA

* CONTRACTOR INFORMATION ONLY, QUANTITIES ARE INCLUDED IN ROADWAY TOTALS ON PAVEMENT MARKING SUMMARY



TYPICAL SECTION
TRANSITION LANES TO 12' OVER 300' TAPERS





DocuSigned by:
Christen Longoria P.E 8/2/2021
CHRISTEN D. LONGORIA DATE

SCALE: 1" = 100'

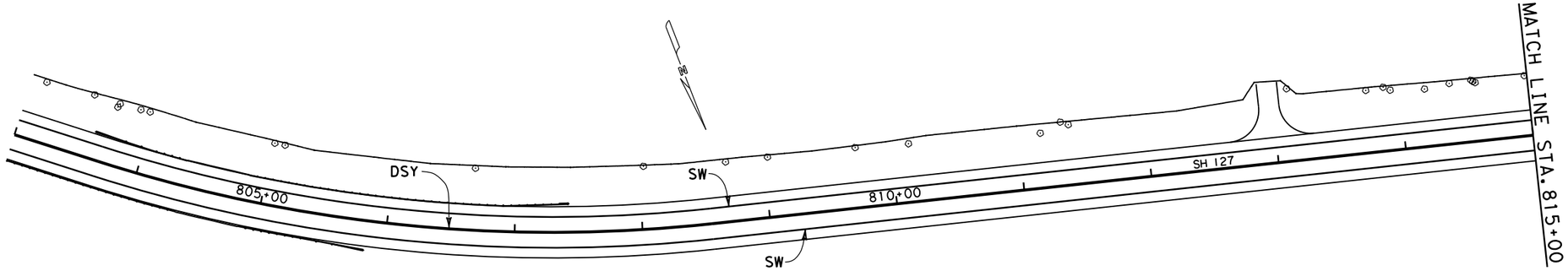
Texas Department of Transportation

LEFT TURN BAY DETAILS

(SH 127 @ FM 1049)

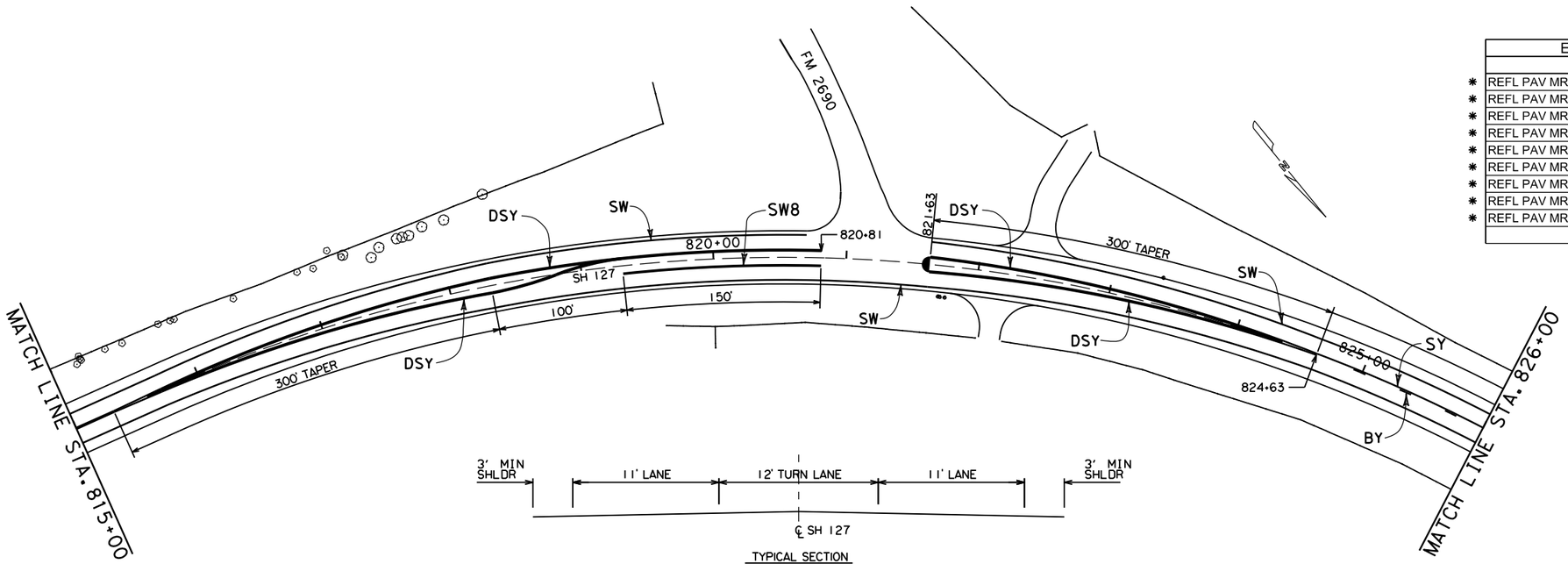
SHEET 3 of 5

FED.RD. DIV.NO.	STATE PROJECT NO.		SHEET NO.
6			47
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.



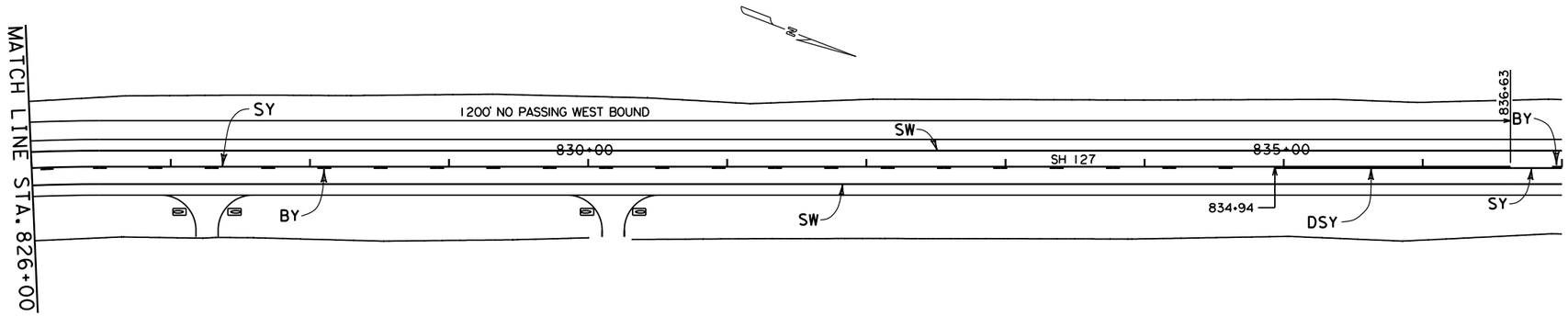
LEGEND

SW - SOLID WHITE (4")
SY - SOLID YELLOW (4")
BY - BROKEN YELLOW (4")
DSY - DOUBLE SOLID YELLOW (4")
SW8 - SOLID WHITE (8")



TYPICAL SECTION

TRANSITION LANES TO 12' OVER 300' TAPERS



ESTIMATED QUANTITIES FOR CSJ 0369-01-041			
	DESCRIPTION	QUAN	UNIT
*	REFL PAV MRK TY II (W) 4" (SLD)	6700	LF
*	REFL PAV MRK TY II (W) 8"(SLD)	150	LF
*	REFL PAV MRK TY II (W) (ARROW)	2	EA
*	REFL PAV MRK TY II (W) (WORD)	2	EA
*	REFL PAV MRK TY II (Y) 4" (BRK)	280	LF
*	REFL PAV MRK TY II (Y) 4" (SLD)	7000	LF
*	REFL PAV MRK TY II (Y) (MED NOSE)	1	EA
*	REFL PAV MRKR TY I-C	8	EA
*	REFL PAV MRKR TY II-A-A	185	EA

* CONTRACTOR INFORMATION ONLY, QUANTITIES ARE INCLUDED IN ROADWAY TOTALS ON PAVEMENT MARKING SUMMARY

STATE OF TEXAS
CHRISTEN D. LONGORIA
107506
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Christen Longoria P.E. 8/2/2021
CHRISTEN D. LONGORIA DATE

SCALE: 1" = 100'

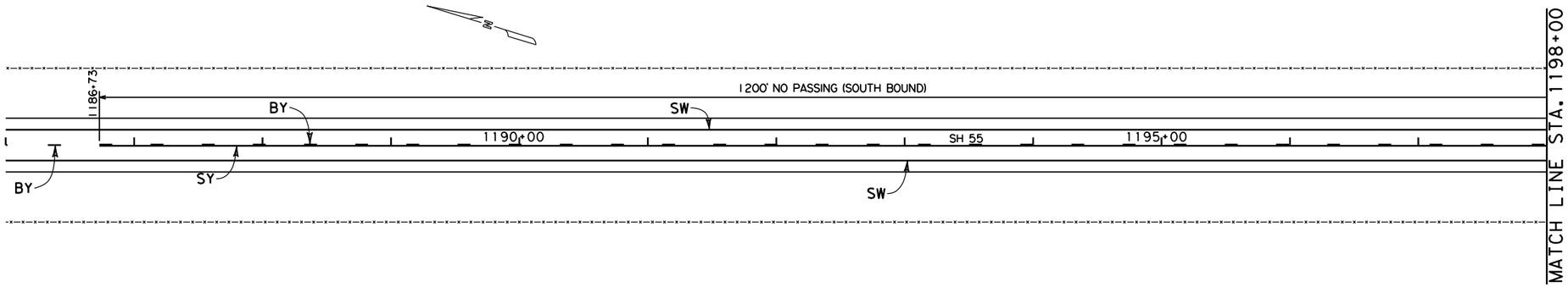
Texas Department of Transportation

LEFT TURN BAY DETAILS

(SH 127 @ FM 2690)

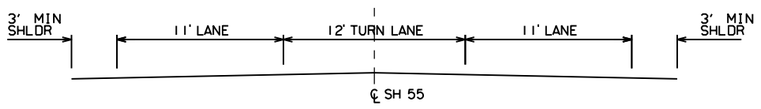
SHEET 4 of 5

FED.RD. DIV.NO.	STATE PROJECT NO.		SHEET NO.
6			48
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.



LEGEND

SW - SOLID WHITE (4")
SY - SOLID YELLOW (4")
BY - BROKEN YELLOW (4")
DSY - DOUBLE SOLID YELLOW (4")
SW8 - SOLID WHITE (8")

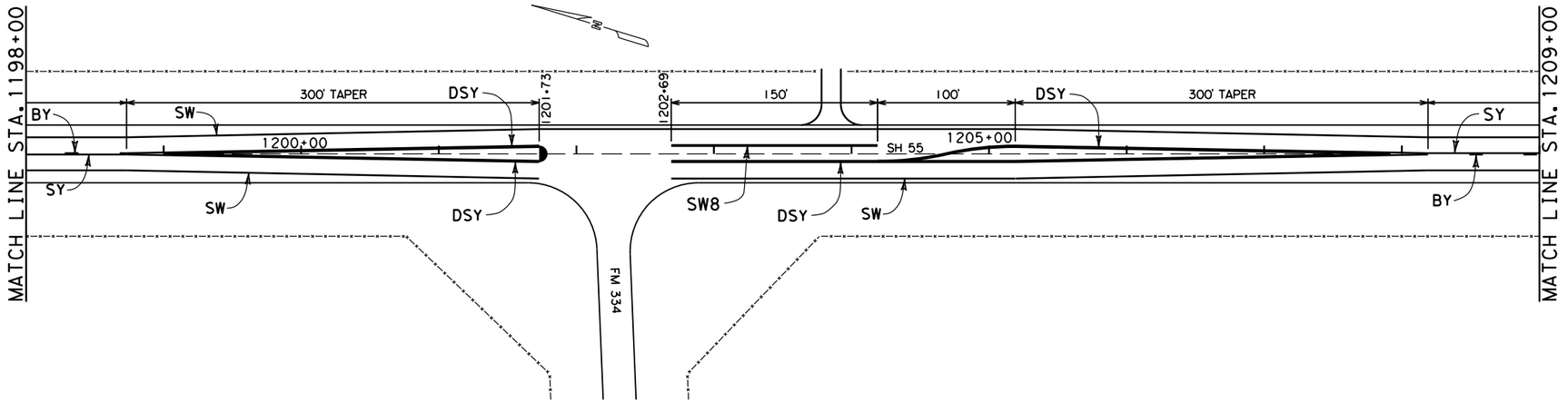


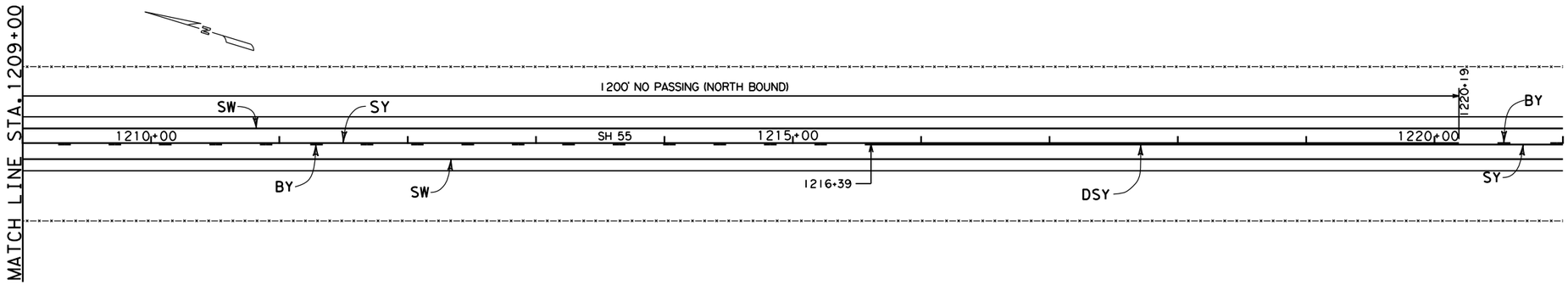
TYPICAL SECTION

TRANSITION LANES TO 12' OVER 300' TAPERS

ESTIMATED QUANTITIES FOR CSJ 0235-04-031			
	DESCRIPTION	QUAN	UNIT
*	REFL PAV MRK TY II (W) 4" (SLD)	6900	LF
*	REFL PAV MRK TY II (W) 8"(SLD)	150	LF
*	REFL PAV MRK TY II (W) (ARROW)	2	EA
*	REFL PAV MRK TY II (W) (WORD)	2	EA
*	REFL PAV MRK TY II (Y) 4" (BRK)	538	LF
*	REFL PAV MRK TY II (Y) 4" (SLD)	6050	LF
*	REFL PAV MRK TY II (Y) (MED NOSE)	1	EA
*	REFL PAV MRKR TY I-C	8	EA
*	REFL PAV MRKR TY II-A-A	188	EA

* CONTRACTOR INFORMATION ONLY, QUANTITIES ARE INCLUDED IN ROADWAY TOTALS ON PAVEMENT MARKING SUMMARY





STATE OF TEXAS
CHRISTEN D. LONGORIA
107506
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Christen Longoria P.E. 8/2/2021
CHRISTEN D. LONGORIA DATE

SCALE: 1" = 100'

Texas Department of Transportation

LEFT TURN BAY DETAILS

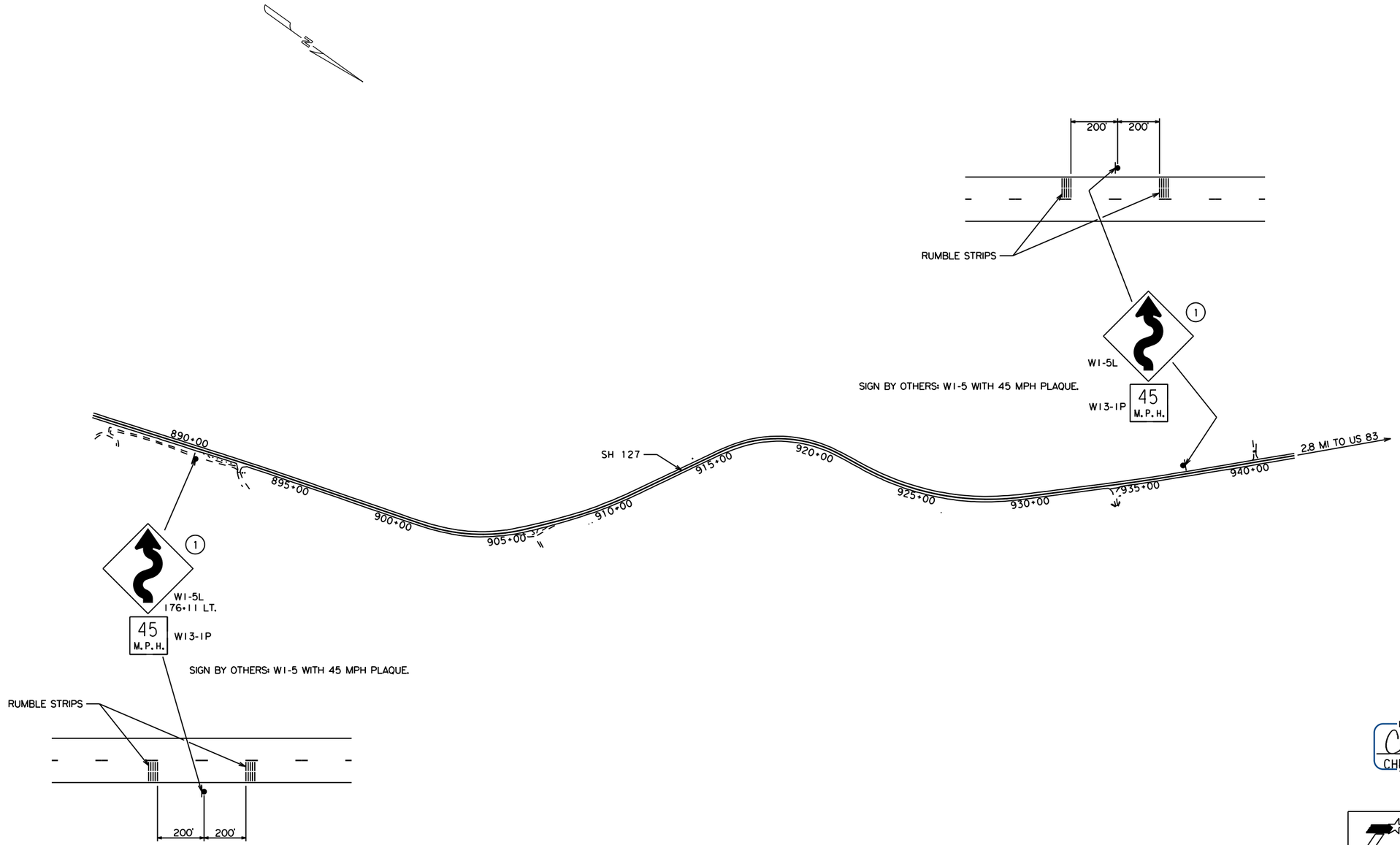
(SH 55 @ FM 334)

SHEET 5 of 5

FED.RD. DIV.NO.	STATE PROJECT NO.		SHEET NO.
6			49
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

ESTIMATED QUANTITIES FOR CSJ 0369-01-041			
ITEM	DESCRIPTION	QTY	UNIT
* 6056 6001	PREFORMED IN-LANE(TRANS) RUMBLE STRIP	160	LF

*CONTRACTOR INFORMATION ONLY, QUANTITIES ARE INCLUDED IN ROADWAY TOTALS ON PAVEMENT MARKING SUMMARY



STATE OF TEXAS
CHRISTEN D. LONGORIA
107506
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Christen Longoria P.E. 12/2/2021
CHRISTEN D. LONGORIA DATE
71AA0B38A524445...

SCALE: 1" = 100'

Texas Department of Transportation

IN-LANE TRANSVERSE RUMBLE STRIP DETAILS

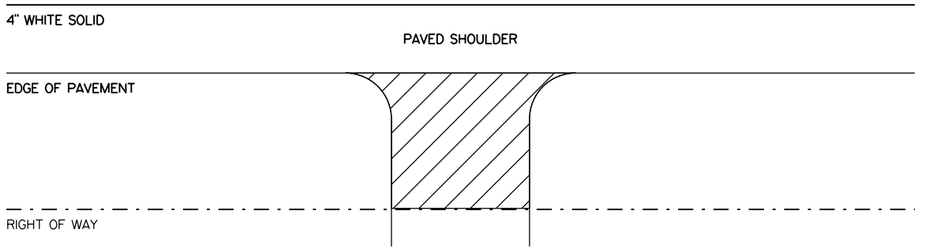
(SH 127)

FED.RD. DIV.NO.	STATE PROJECT NO.		SHEET NO.
6			50
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

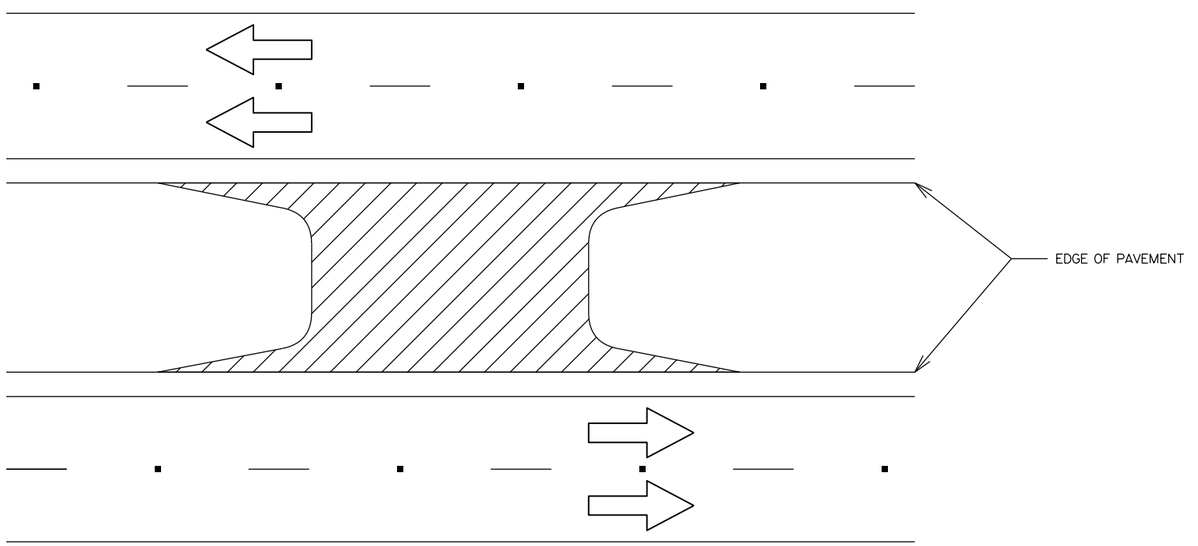
LEGEND

LIMITS OF SEAL

TYPICAL INTERSECTION LAYOUT



TYPICAL CROSS-OVER LAYOUT



STATE OF TEXAS
CHRISTEN D. LONGORIA
107506
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Christen Longoria P.E. 8/2/2021
CHRISTEN D. LONGORIA DATE

SCALE: NTS

Texas Department of Transportation

DISTRICT SEAL COAT
MISCELLANEOUS
ROADWAY DETAILS

SHEET 1 of 1

DESIGN:	DRAFT:	CHECK:	
FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		51
STATE	DIST.	COUNTY	
TEXAS	SAT	KENDALL, Etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
0072	05	090, Etc.	IH 10, Etc.

2021
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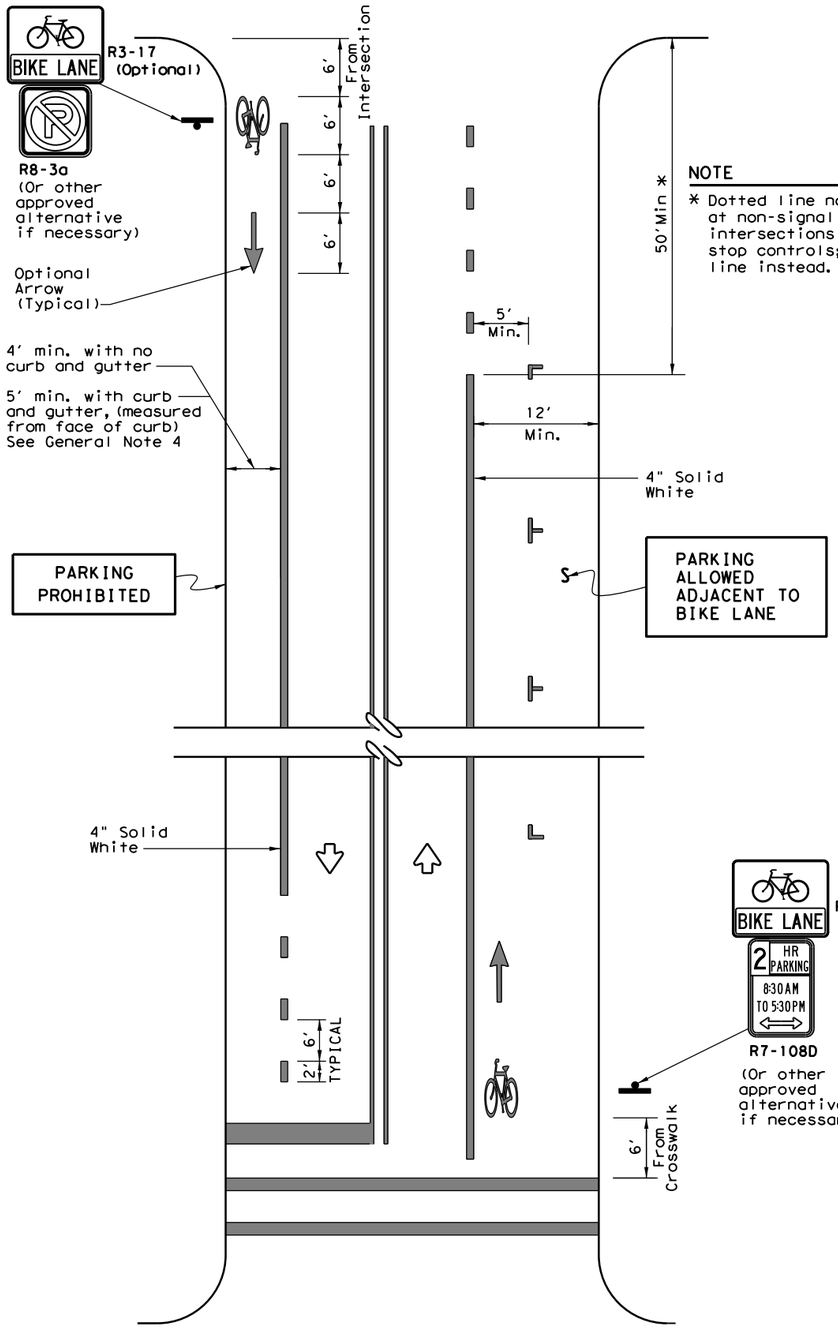
2:32:46 PM

DATE:
FILE:



NOTE

* Dotted line not necessary at non-signalized minor intersections with no stop controls; Use solid line instead.

NOTES

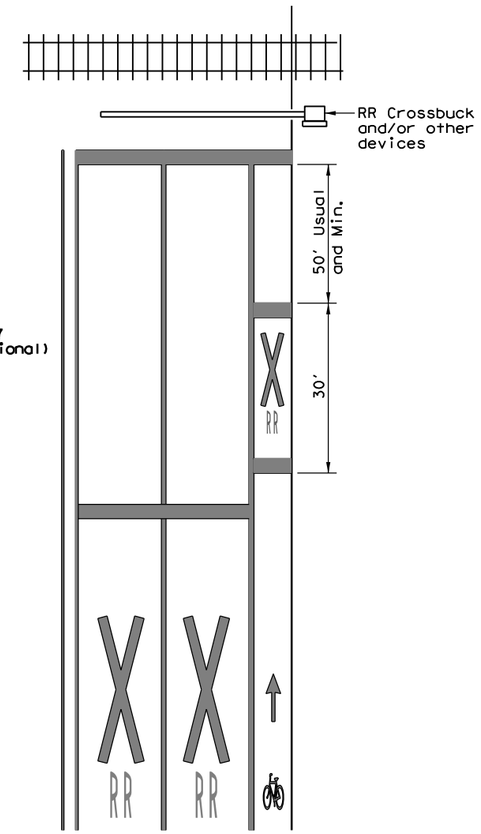
1. Bicycle lane pavement markings typically repeated after each intersection or signalized driveway.
2. On uninterrupted sections of roadway, bicycle lane pavement markings typically repeated as follows:

   -1200' for 45 MPH or less roads
   -2500' for 50 MPH and greater roads.

TWO-WAY STREET

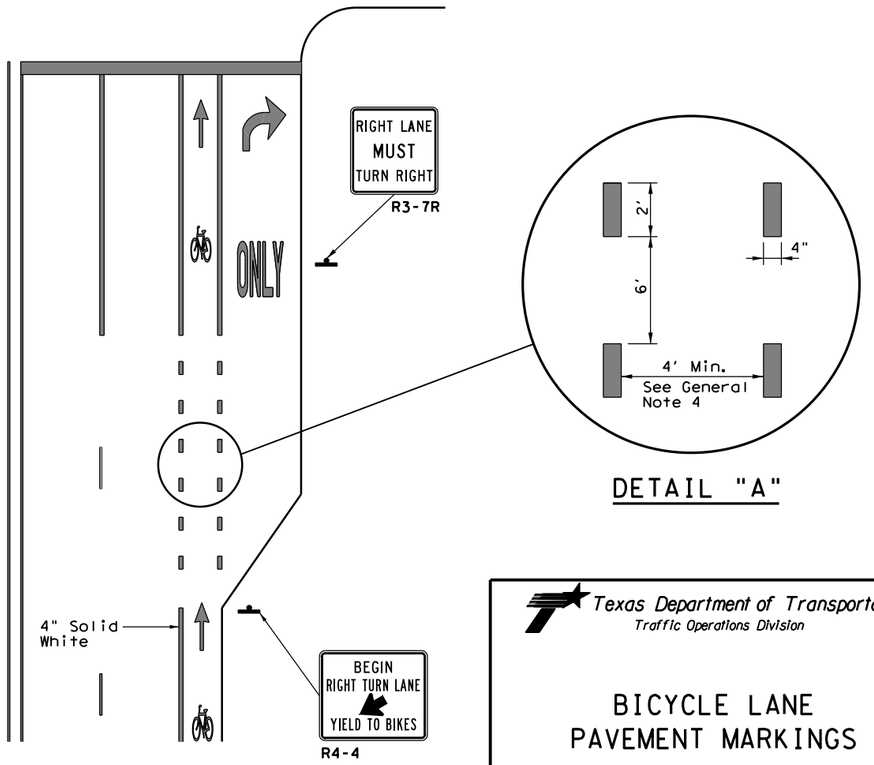
GENERAL NOTES

1. All bicycle lane pavement markings shall be white unless otherwise noted.
2. All pavement marking materials shall meet the required Department Material Specifications as specified by the plans.
3. Exact sign placement and details are shown elsewhere in the plans.
4. The current edition of AASHTO'S Guide for the Development of Bicycle Facilities should be referenced for variations in design, other geometric conditions, and lane width options.
5. Other bicycle lane symbol or word markings as shown in the Texas Manual on Uniform Traffic Control Devices may be used. Details for words, arrows and symbols as shown in the Standard Highway Sign Designs for Texas.
6. The "BIKE LANE" (R3-17) sign with the "AHEAD" (R3-17a) sign mounted directly below should be installed in advance of the beginning of a marked bike lane.
7. The "BIKE LANE" (R3-17) sign with the "END" (R3-17b) sign mounted directly below should be installed at the end of marked bicycle lane.



(See RCPM Standard for travel lane details)

RAILROAD CROSSING APPROACH



DETAIL "A"

RIGHT TURN ONLY LANE

LEGEND	
	Sign
	Traffic Flow

SPECIFICATION REFERENCE TABLE	
Traffic Paint	DMS-8200
Hot Applied Thermoplastic	DMS-8220
Permanent Prefabricated Pavement Markings	DMS-8240
Glass Traffic Beads	DMS-8290

Texas Department of Transportation
Traffic Operations Division

BICYCLE LANE PAVEMENT MARKINGS

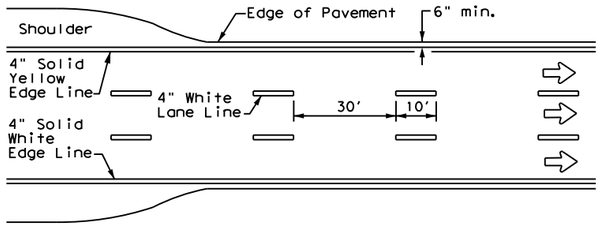
BLPM-10

REVISIONS

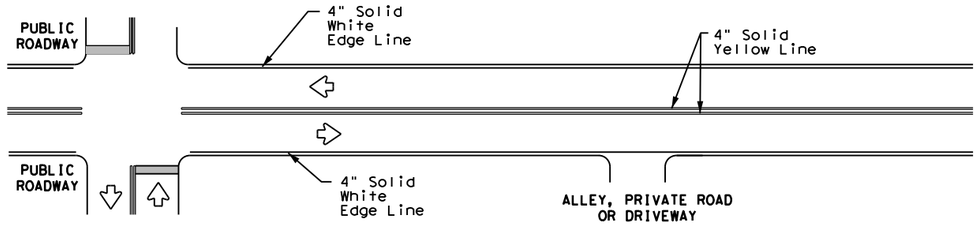
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0072	05	090, Etc.	IH 10, Etc.

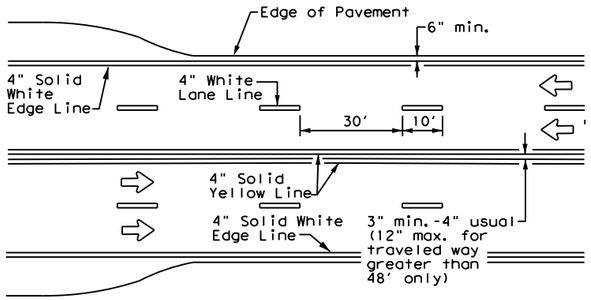
DIST	COUNTY	SHEET NO.
SAT	KENDALL, Etc.	52



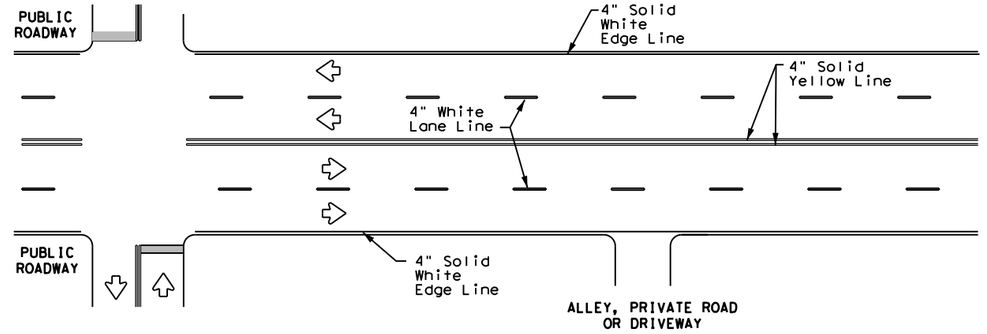
EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



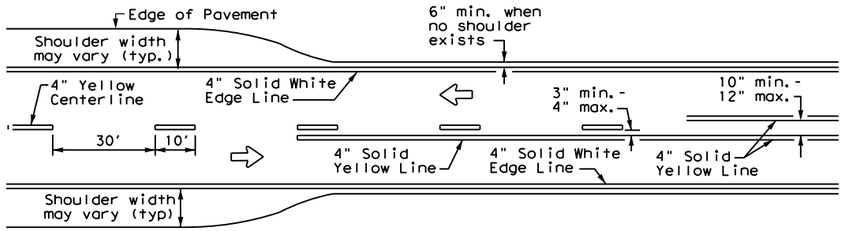
TYPICAL TWO-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS



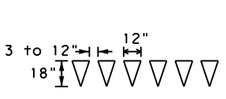
CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



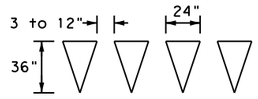
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS

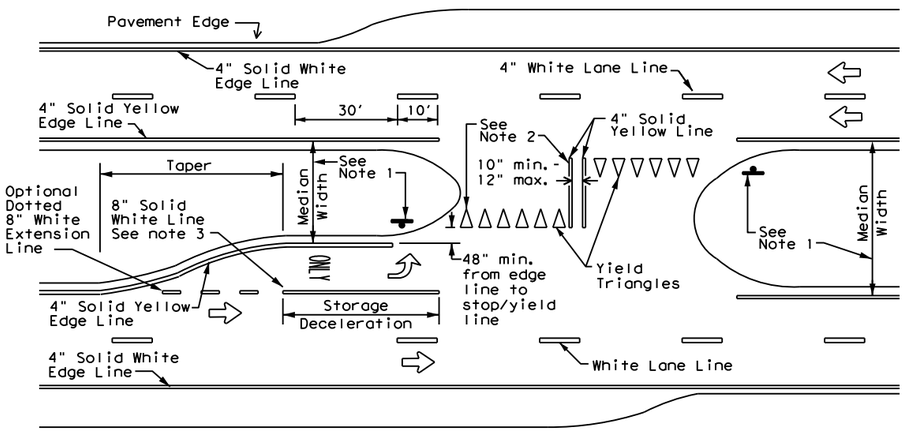


For posted speed on road being marked equal to or less than 40 MPH.



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

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

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

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

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

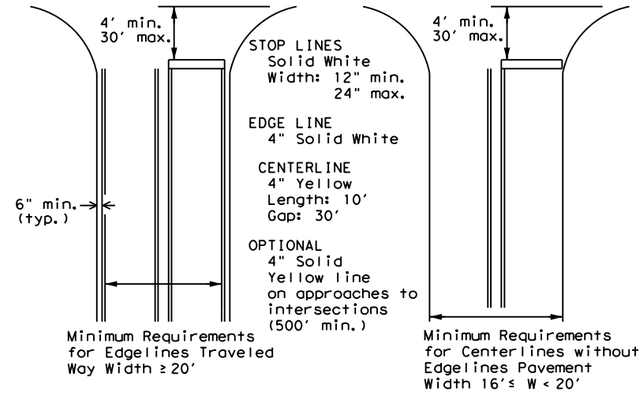
GENERAL NOTES

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

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

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

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



GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE
Based on Traveled Way and Pavement Widths
for Undivided Highways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-20

FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
©TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0072	05	090, Etc.	IH 10, Etc.
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	SAT	KENDALL, Etc.		53

22A

DATE: 2021 2:56:30 PM
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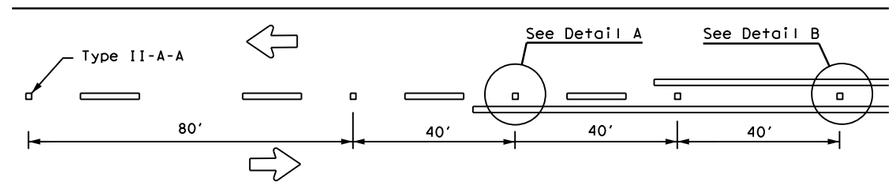
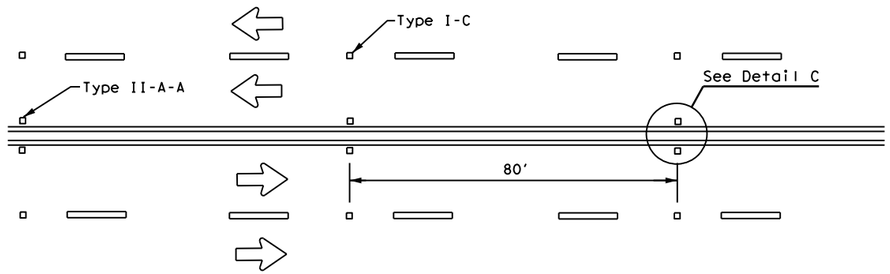
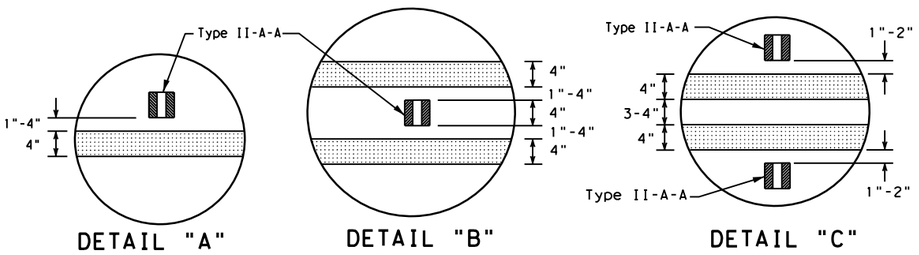
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



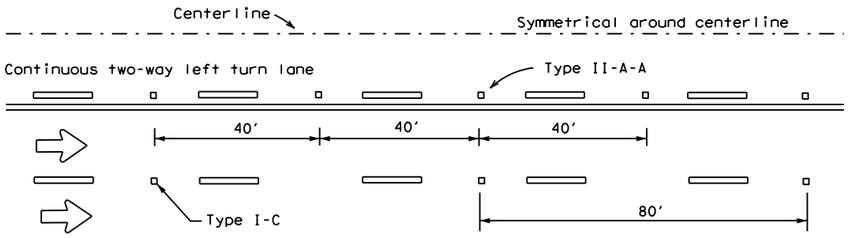
CENTERLINE FOR ALL TWO LANE ROADWAYS



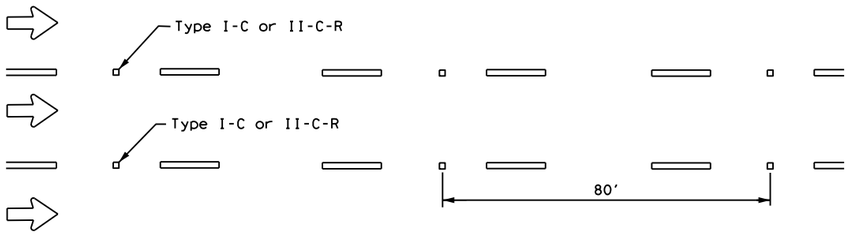
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



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



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

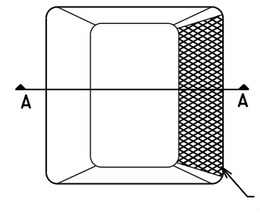


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

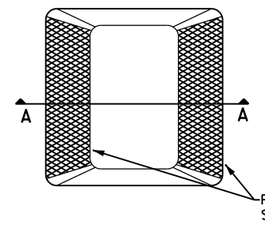
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

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

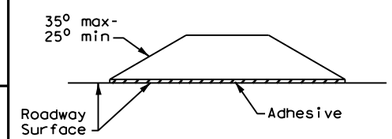
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

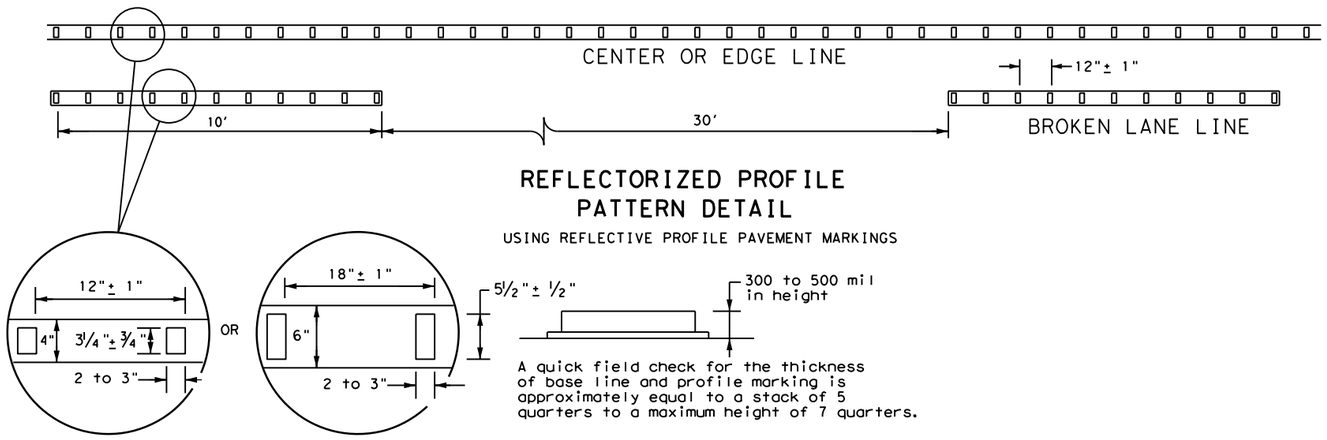


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

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

4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

NOTE

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

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

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10 5-00 2-12 8-00 6-20	0072	05	090, Etc.	IH 10, Etc.
	DIST	COUNTY		SHEET NO.
	SAT	KENDALL, Etc.		54

22B

DATE: 2021 2:56:38 PM
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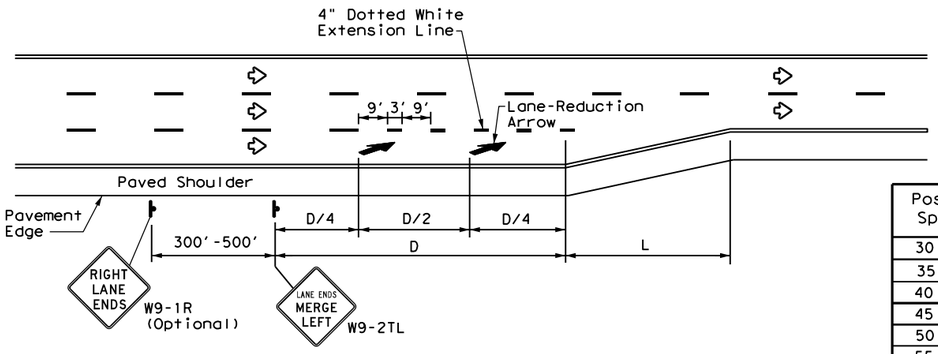
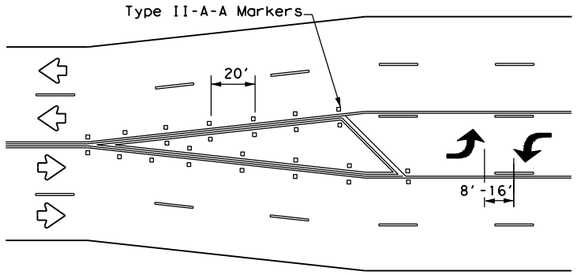


LANE REDUCTION

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

NOTES

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



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

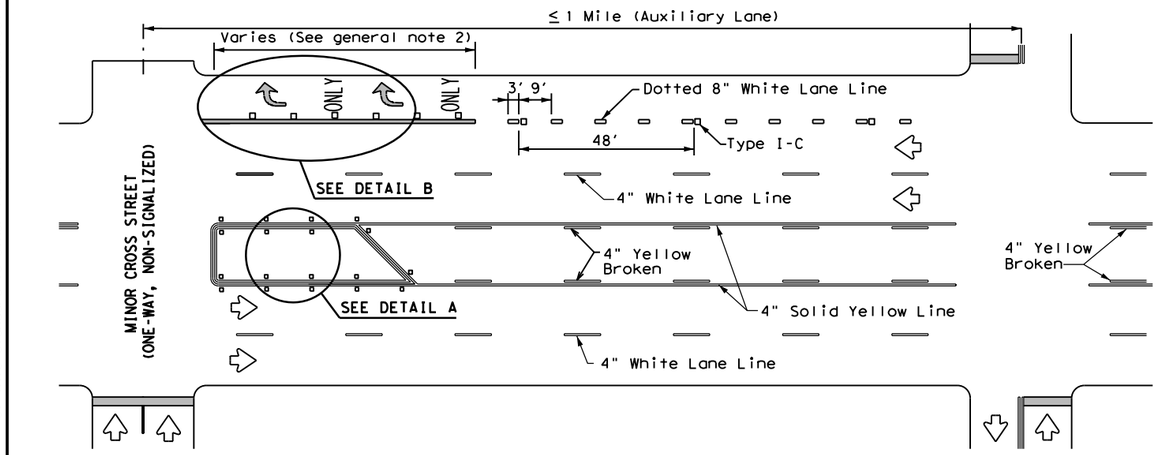
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

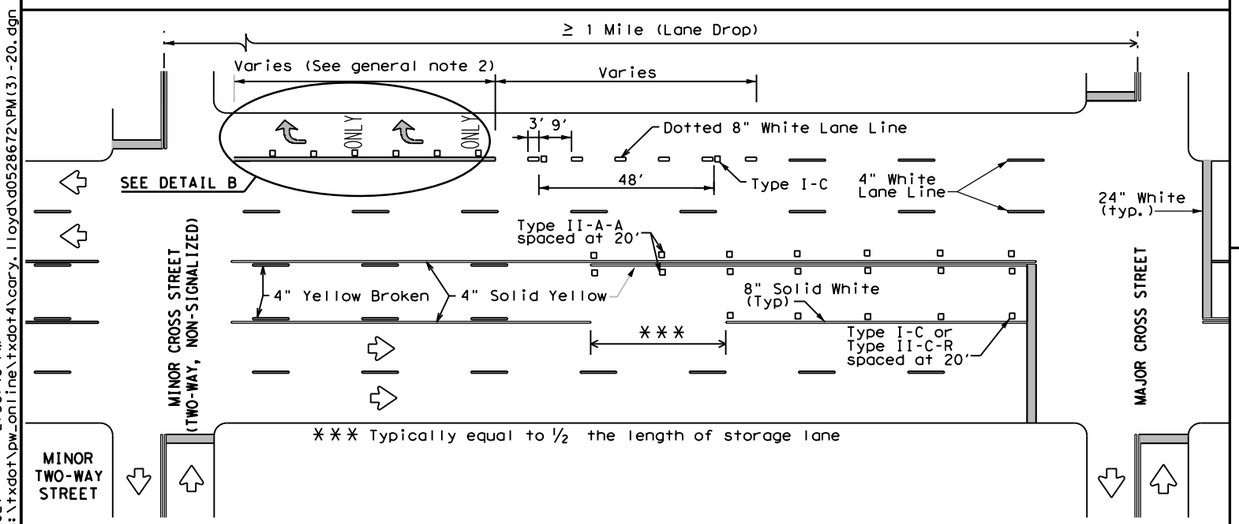
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn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

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

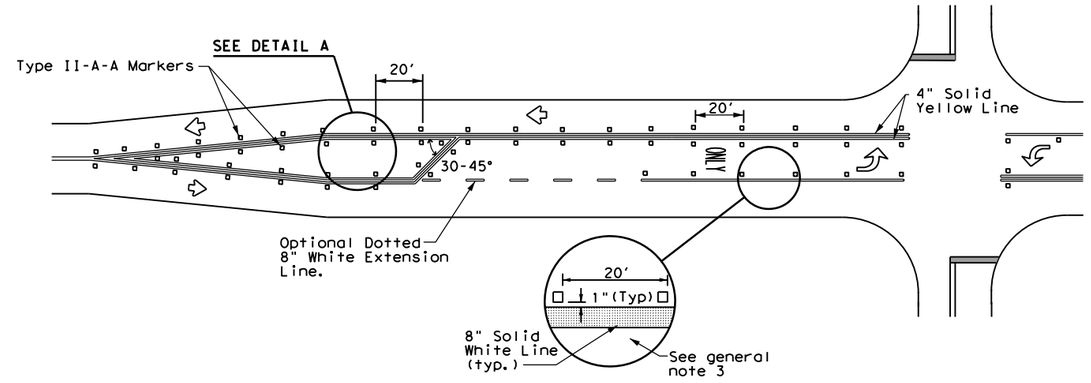
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



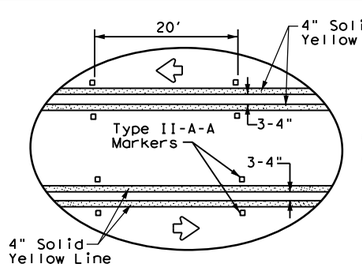
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



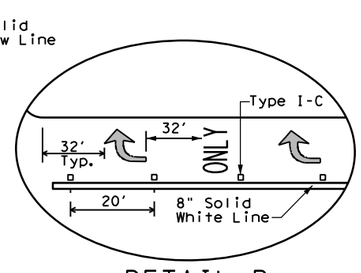
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A



DETAIL B

Texas Department of Transportation

Traffic Safety Division Standard

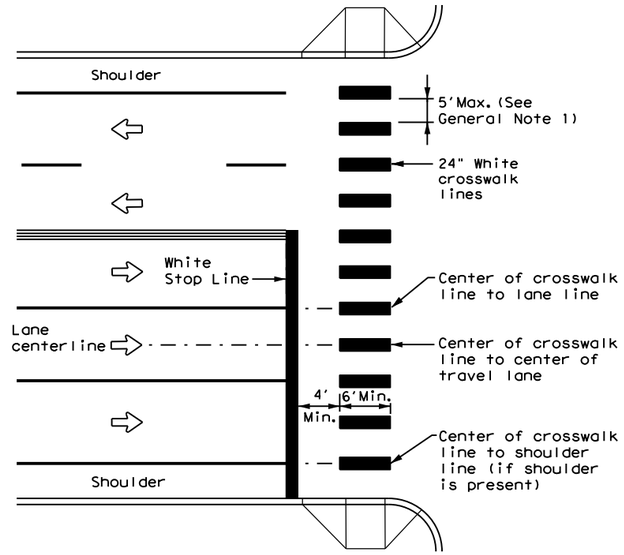
TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-20

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0072	05	090, Etc.	IH 10, Etc.
5-00 2-10	DIST	COUNTY		SHEET NO.
8-00 2-12	SAT	KENDALL, Etc.		55
3-03 6-20				

22C

DATE: 2021 2:56:46 PM
FILE: c:\txdot\pw_online\txdot4\cary.lloyd\d0528672\PM(3)-20.dgn

DATE: 2021 2:56:55 PM
FILE: c:\txdot\pw_online\txdot4\cary.lloyd\d0528672\PM(4)-20.dgn



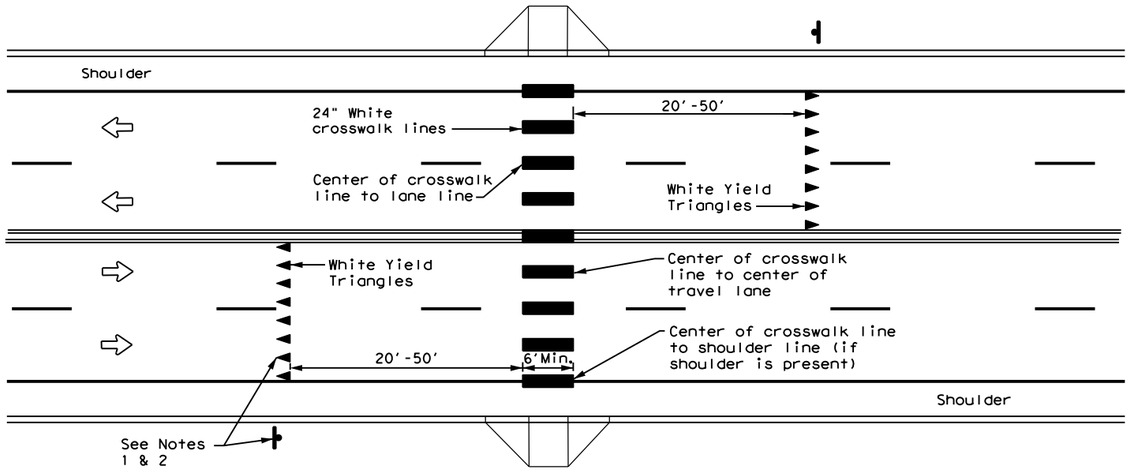
HIGH-VISIBILITY LONGITUDINAL CROSSWALK
AT CONTROLLED APPROACH

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/Yield Triangles 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 MID BLOCK HIGH-VISIBILITY
LONGITUDINAL CROSSWALK

NOTES

1. Use yield triangles with "Yield Here to Pedestrians" signs at unsignalized mid block crosswalks.
2. Use stop bars with "Stop Here on Red" signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

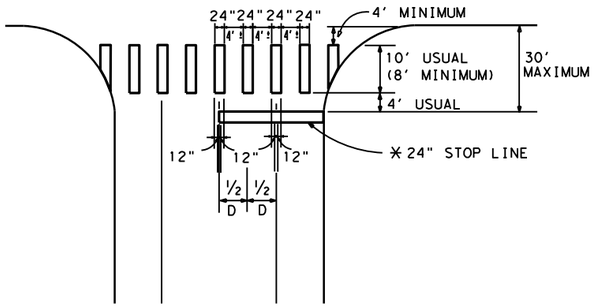
Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

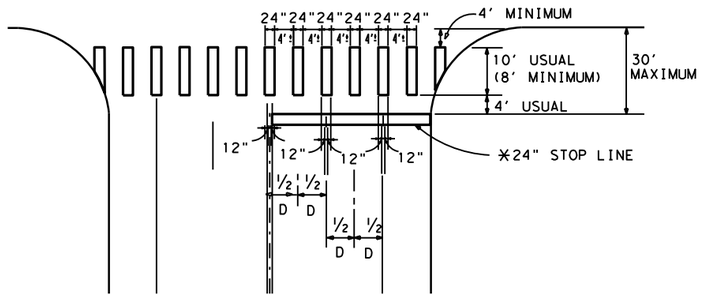
PM(4)-20

FILE: pm4-20.dgn	DN:	CK:	DW:	CK:
© TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0072	05	090, Etc.	IH 10, Etc.
	DIST	COUNTY		SHEET NO.
	SAT	KENDALL, Etc.		56

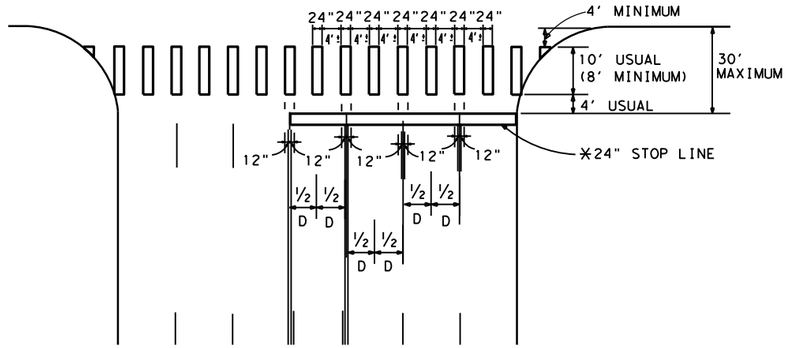
22D



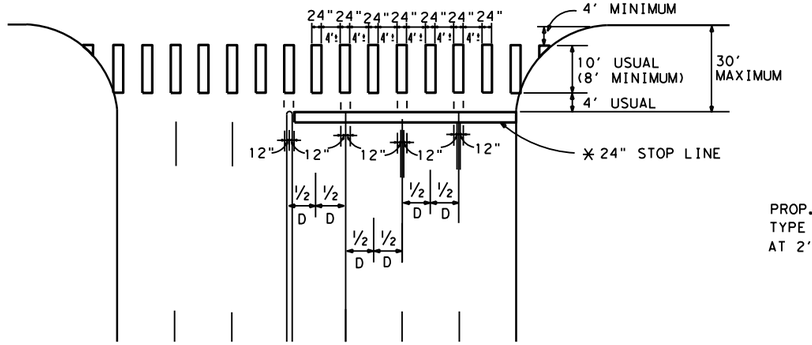
TWO LANES WITH SHOULDERS



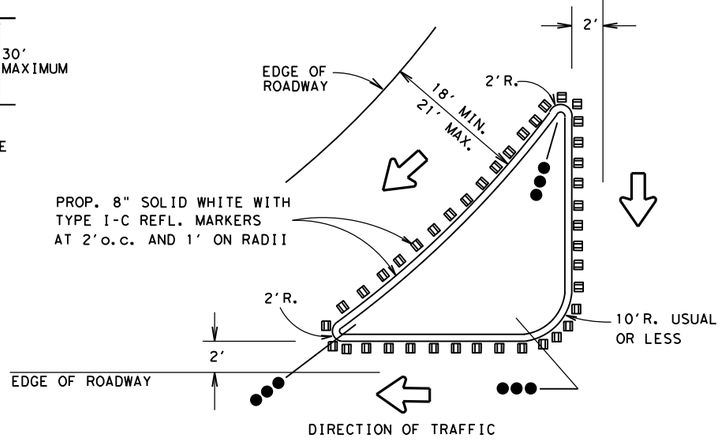
FOUR LANES WITH SHOULDERS



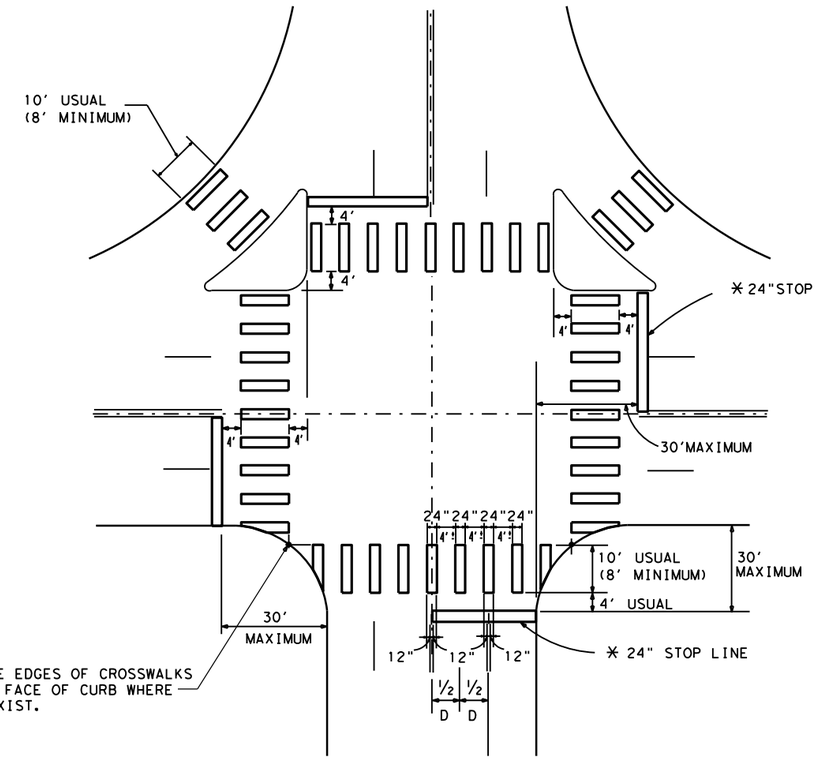
MULTI - LANES



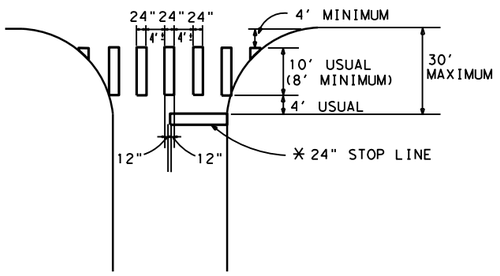
MULTI - LANE WITH MEDIAN



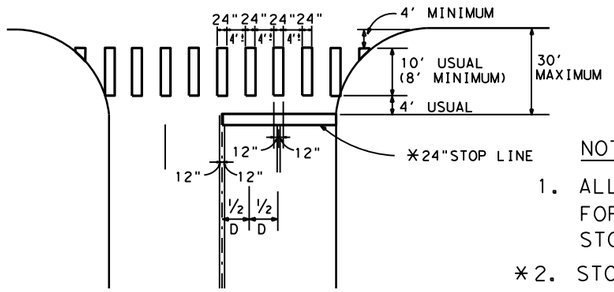
TYPICAL RIGHT TURN ISLAND
WITH DELINEATION



INTERSECTION WITH RIGHT - TURN ISLANDS



TWO LANES



FOUR LANES

NOTES:

1. ALL LONGITUDINAL LINES FORMING CROSSWALK AND STOP LINES SHALL BE WHITE
2. * STOP LINES AS REQUIRED ON DETAILED PAVEMENT MARKING PLANS.
3. "D" IS EQUAL TO ONE HALF THE DISTANCE.

LEVELS DISPLAYED

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ACC:	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	

San Antonio District Standard

TYPICAL CROSSWALK DETAILS

TCD-05

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
DEC 1999	6			57
AUG 2005	STATE	DIST.	COUNTY	
	TEXAS	SAT	KENDALL, Etc.	
	CONT.	SECT.	JOB	HIGHWAY NO.
	0072	05	090, Etc.	IH 10, Etc.

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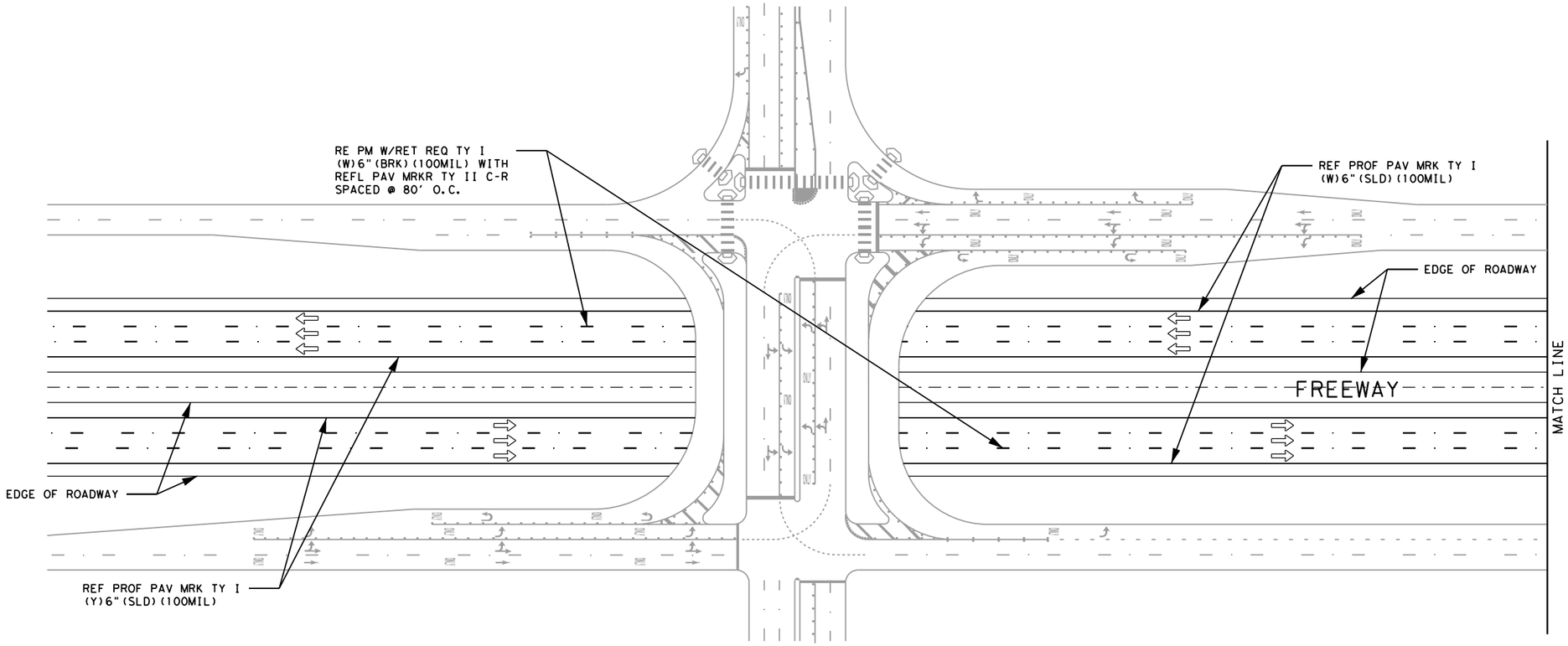

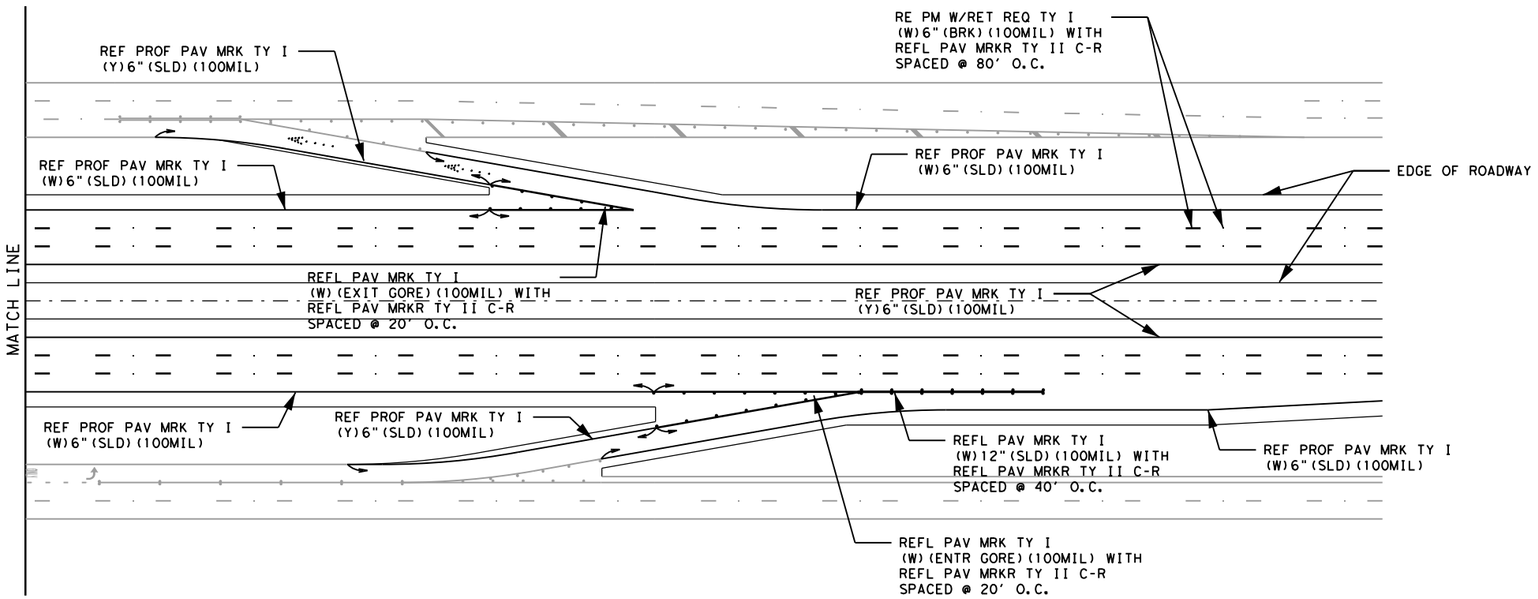

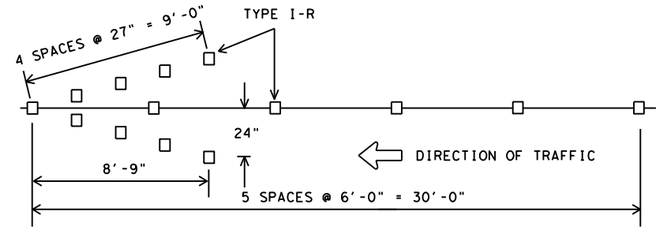

ALL RAISED MARKERS IN THE WRONG WAY ARROW SHALL BE TYPE I-R REFLECTORIZED PAVEMENT MARKERS WITH THE REFLECTORIZED SURFACE FACING THE WRONG WAY TRAFFIC. TYPE II-C-R SHALL NOT BE USED.

REFLECTORIZED WRONG WAY ARROWS, NOT TO EXCEED TWO, MAY BE PLACED ON EXIT RAMPS. LOCATION OF THE ARROWS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.

WRONG WAY ARROW DETAIL

San Antonio District Standard

TYPICAL PAVEMENT MARKING DETAILS

SCALE: NS

TPMD(1)-18

REVISIONS	FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
MAY 2018		$FAP-NUM$		58
	STATE	DIST.	COUNTY	
	TEXAS	SAT	KENDALL, Etc.	
	CONT.	SECT.	JOB	HIGHWAY NO.
	0072	05	090, Etc.	IH 10, Etc.

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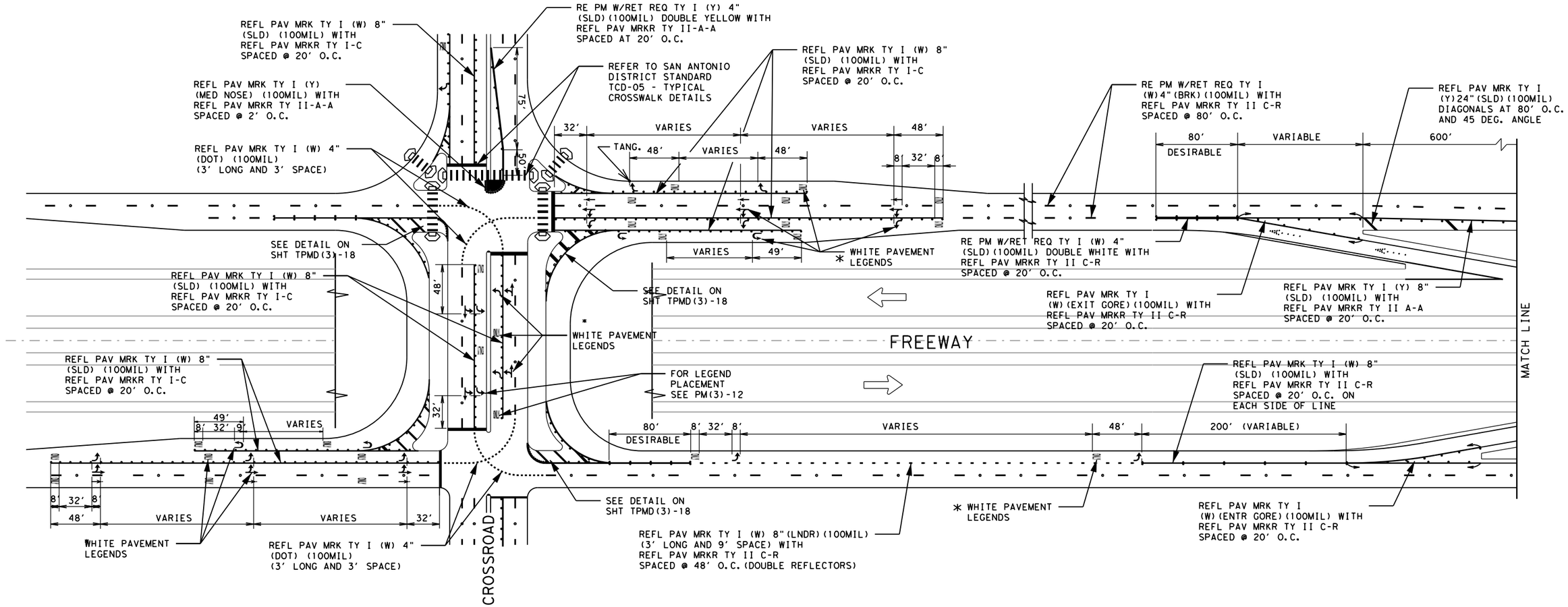

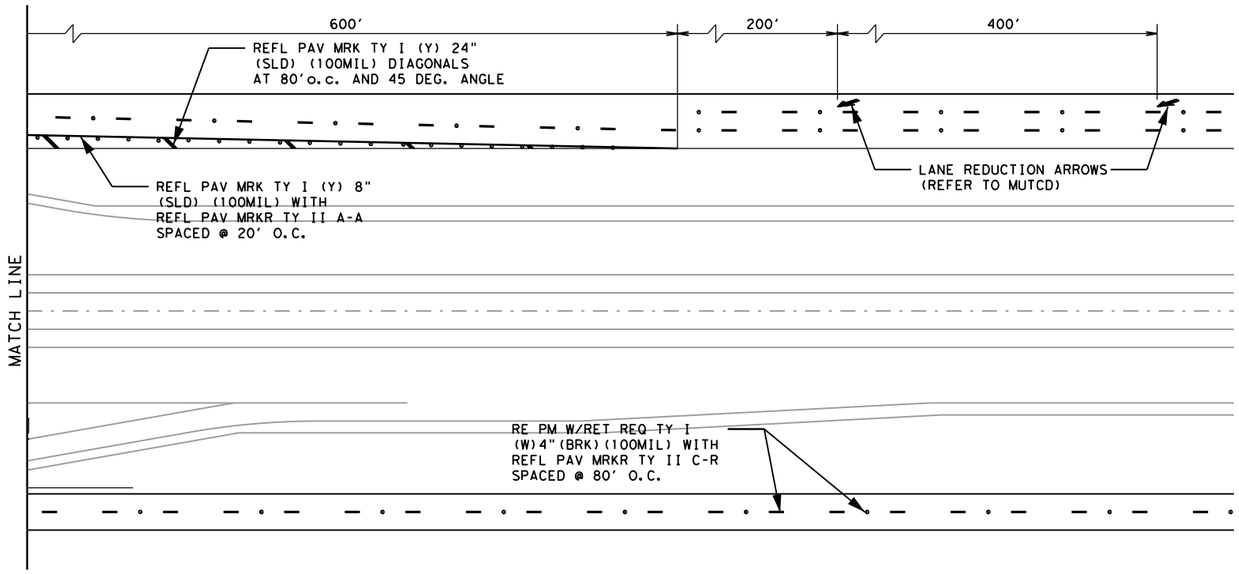

* PROPOSED WHITE LEGENDS TEXT AND ARROW SIZE TO BE IN ACCORDANCE WITH THE TEXAS MUTCD

San Antonio District Standard

TYPICAL PAVEMENT MARKING DETAILS

SCALE: NS

TPMD(2)-18

REVISIONS	FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
MAY 2018		$FAP-NUM$		59
	STATE	DIST.	COUNTY	
	TEXAS	SAT	KENDALL, Etc.	
	CONT.	SECT.	JOB	HIGHWAY NO.
	0072	05	090, Etc.	IH 10, Etc.

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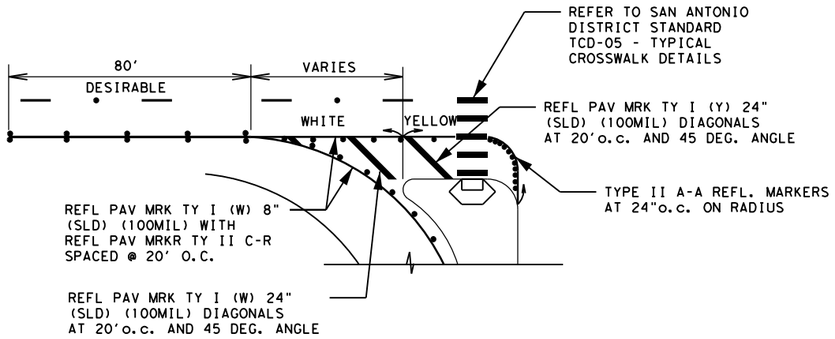
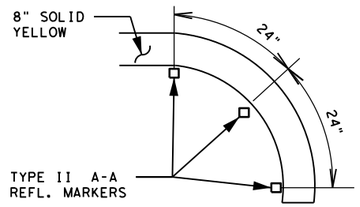
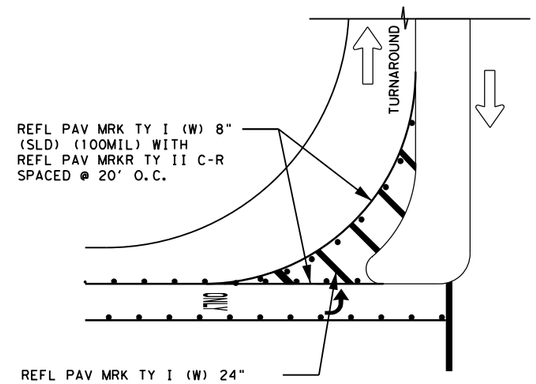
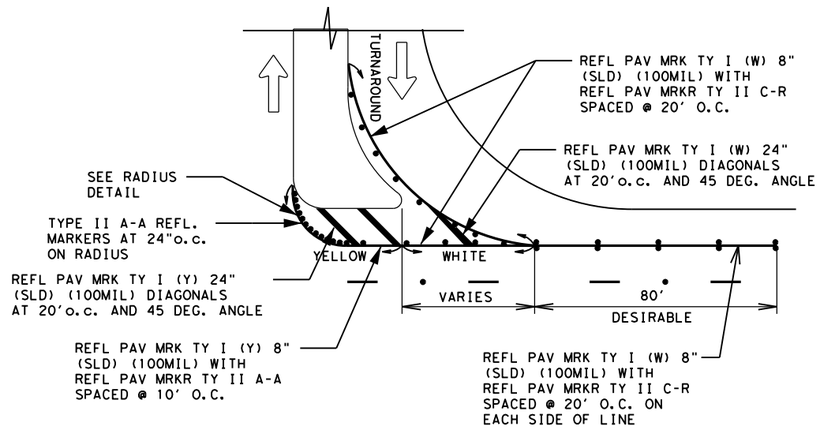




RADIUS DETAIL





TYPICAL TURNAROUND PAVEMENT MARKING DETAILS

San Antonio District Standard

TYPICAL PAVEMENT MARKING DETAILS

SCALE: NS

TPMD(3)-18

REVISIONS	FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
MAY 2018		$FAP-NUM$		60
	STATE	DIST.	COUNTY	
	TEXAS	SAT	KENDALL, Etc.	
	CONT.	SECT.	JOB	HIGHWAY NO.
	0072	05	090, Etc.	IH 10, Etc.

REVISED ON: 5-18 | CHECKED BY: GG / OMG | REVISED BY: JCO3 | DRAWN BY: TED

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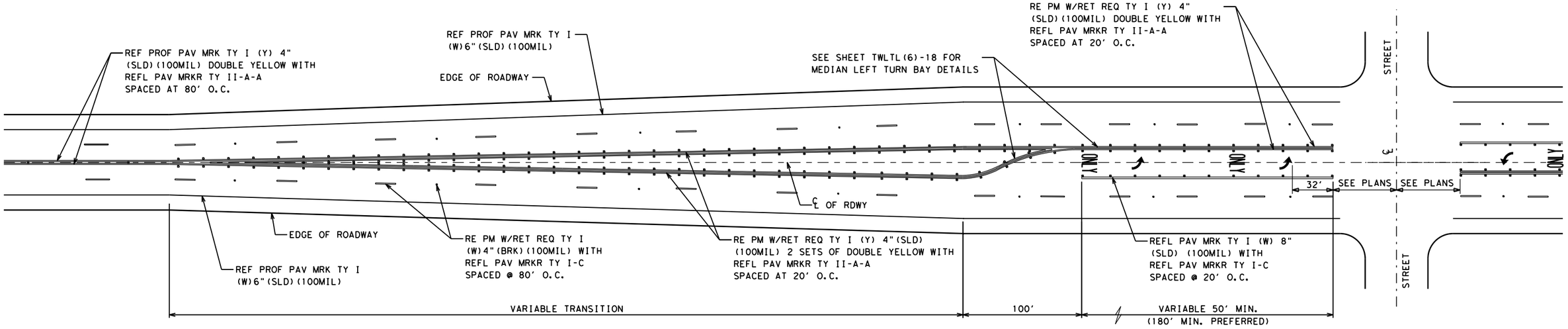
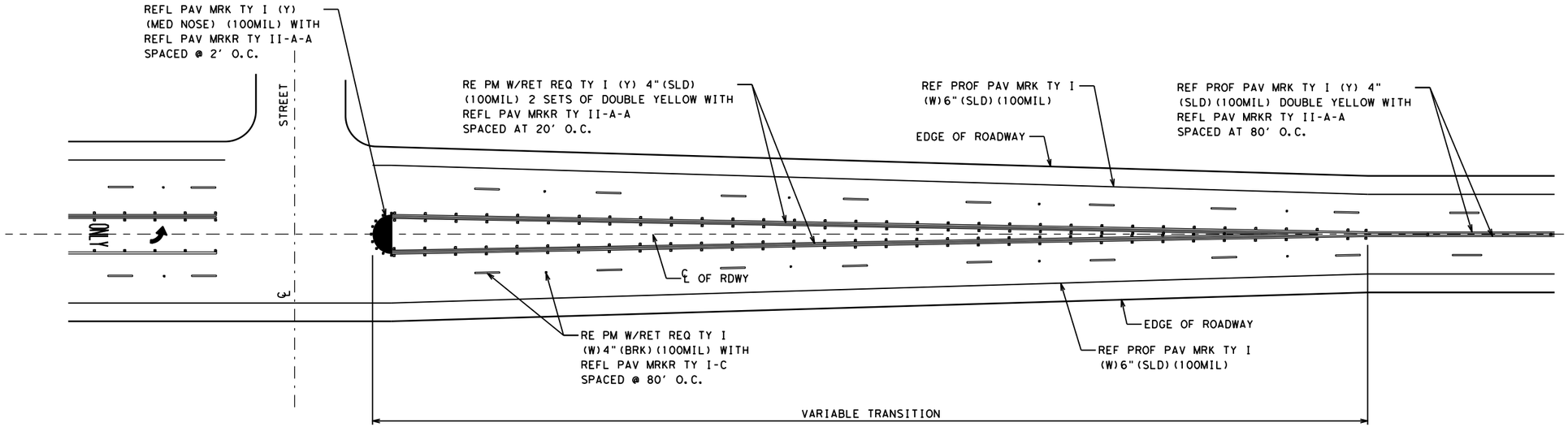


TYPICAL MEDIAN LEFT TURN BAY (FOR USE ON RURAL ROADS)

SIGNALIZED AND NON-SIGNALIZED CROSS STREETS
WITH LEFT TURN BAY



TYPICAL TRANSITION

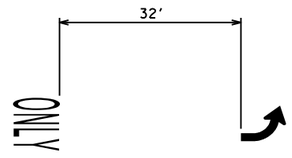
LEFT TURN BAY END CONDITION AND ROADWAY TRANSITION

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-12 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE. ALSO REFER TO STATE STANDARD PM(3)-12)

LEGEND

☐ REFLECTIVE MARKER



LEGEND

TYPICAL DETAIL
(PLACE LEGENDS IN ACCORDANCE TO STATE STANDARD PM(3)-12)

Texas Department of Transportation

San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - RURAL ROADS

SCALE: NS — **TWLTL(1)-18**

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
AUG 2002	6			61
APRIL 2003	STATE	DIST.	COUNTY	
NOV 2007	TEXAS	SAT	KENDALL, Etc.	
SEPT 2008	CONT.	SECT.	JOB	HIGHWAY NO.
MARCH 2010	0072	05	090, Etc.	IH 10, Etc.
MAY 2010				
MAY 2018				

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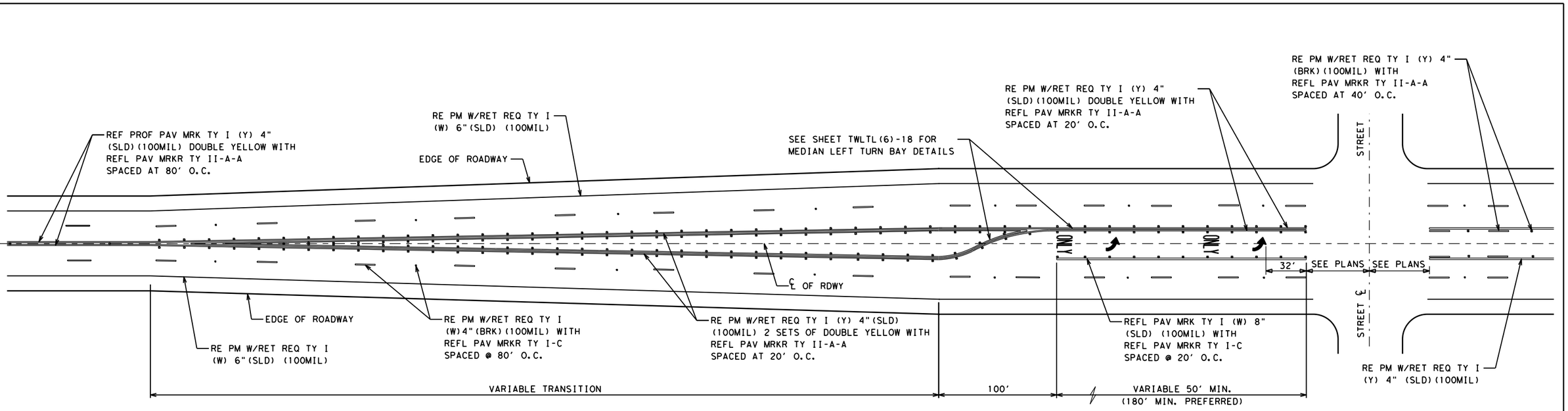
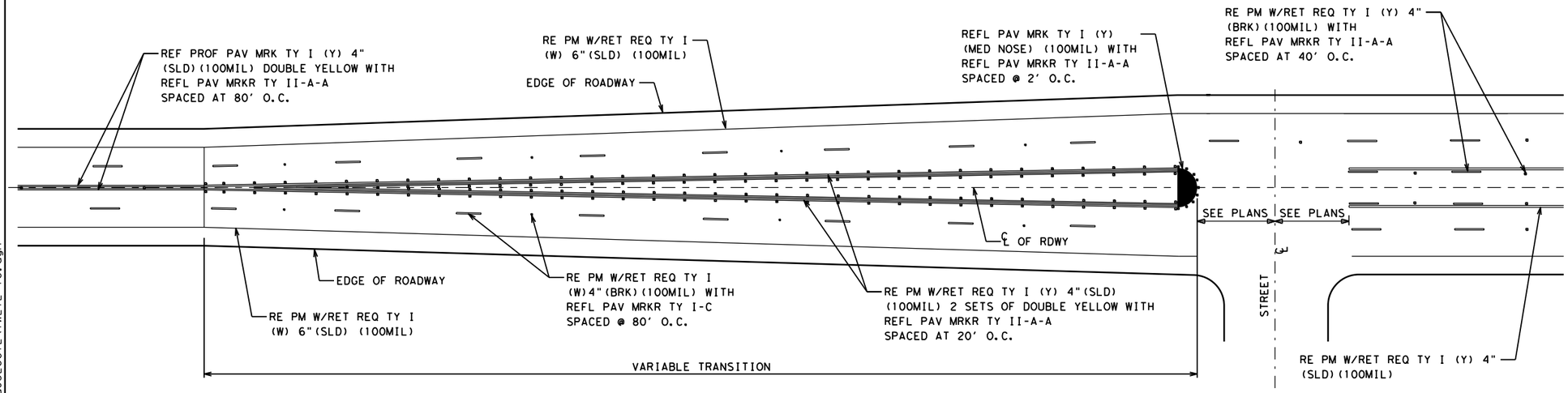


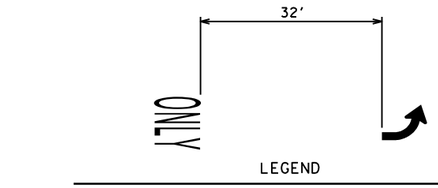
TYPICAL MEDIAN LEFT TURN BAY

SIGNALIZED AND NON-SIGNALIZED CROSS STREETS
AT BEGINNING AND END OF TWO WAY CENTER LEFT TURN LANE



TYPICAL TRANSITION

AT BEGINNING AND END OF TWO WAY CENTER LEFT TURN LANE



LEGEND

TYPICAL DETAIL
(PLACE LEGENDS IN ACCORDANCE TO STATE STANDARD PM(3)-12)

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-12 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE. ALSO REFER TO STATE STANDARD PM(3)-12)

LEGEND

☐ REFLECTIVE MARKER

San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - URBAN ROADS

SCALE: NS — **TWLTL(2)-18**

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
AUG 2002	6			62
APRIL 2003	STATE	DIST.	COUNTY	
NOV 2007	TEXAS	SAT	KENDALL, Etc.	
SEPT 2008	CONT.	SECT.	JOB	HIGHWAY NO.
MARCH 2010	0072	05	090, Etc.	IH 10, Etc.
MAY 2010				
MAY 2018				

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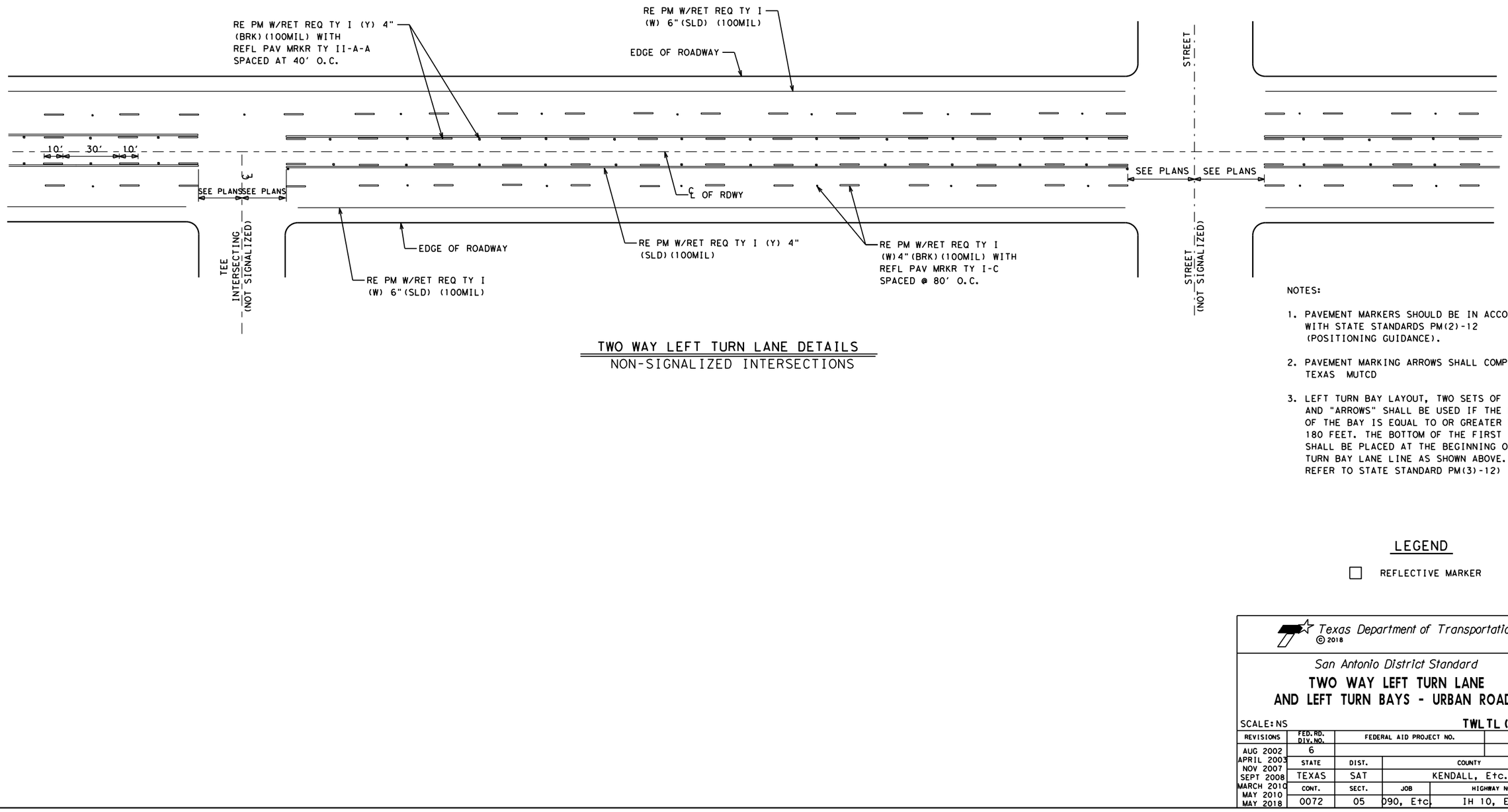

TWO WAY LEFT TURN LANE DETAILS
NON-SIGNALIZED INTERSECTIONS

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-12 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE. ALSO REFER TO STATE STANDARD PM(3)-12)

LEGEND

☐ REFLECTIVE MARKER

San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - URBAN ROADS

SCALE: NS **TWLTL(3)-18**

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
AUG 2002	6			63
APRIL 2003	STATE	DIST.	COUNTY	
NOV 2007				
SEPT 2008	TEXAS	SAT	KENDALL, Etc.	
MARCH 2010	CONT.	SECT.	JOB	HIGHWAY NO.
MAY 2010				
MAY 2018	0072	05	090, Etc.	IH 10, Etc.

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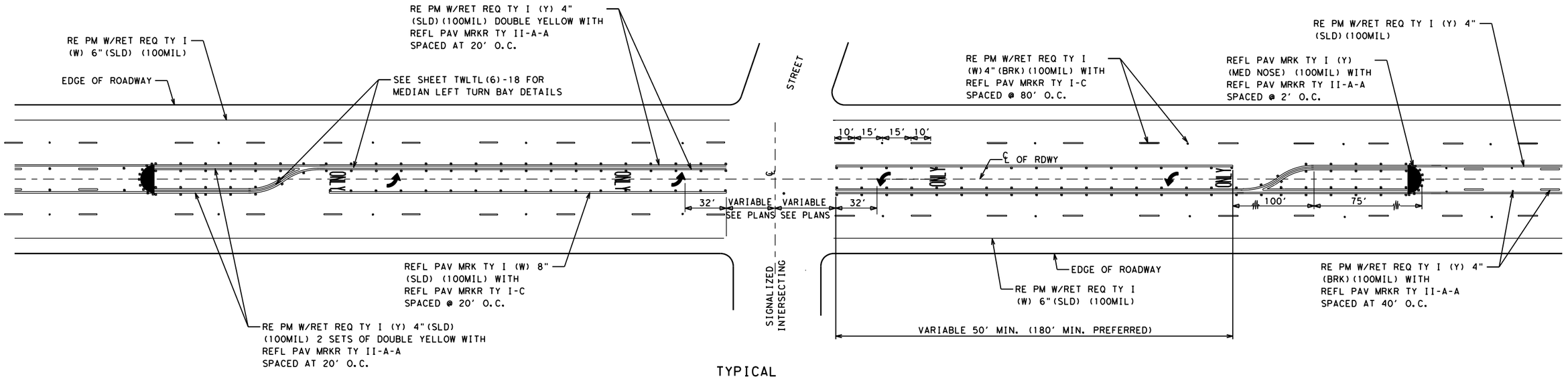
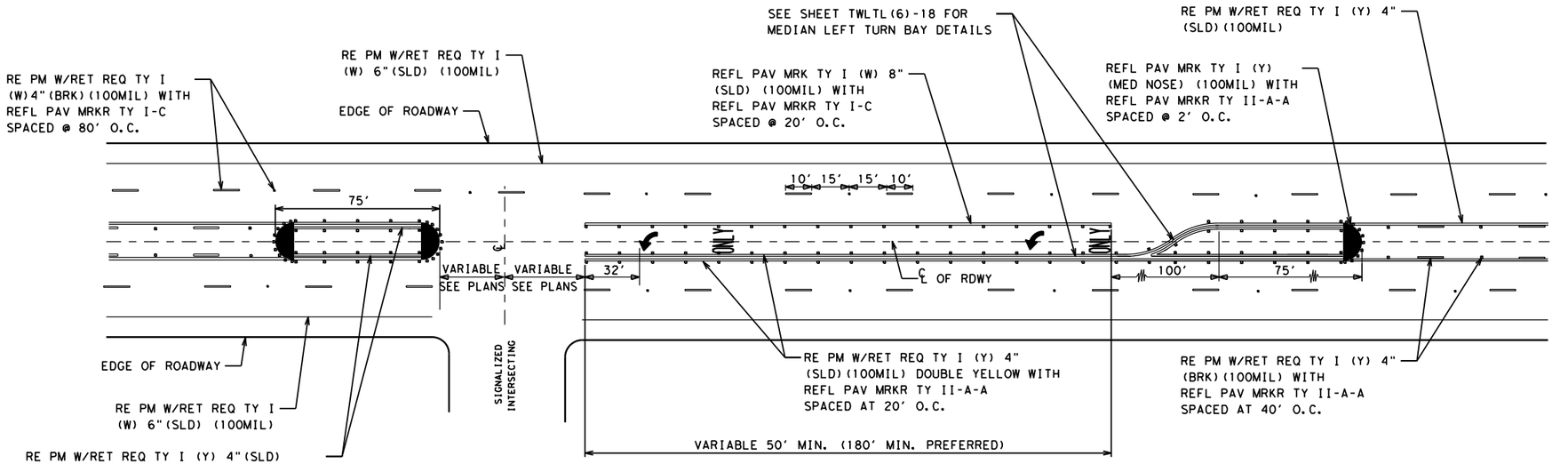
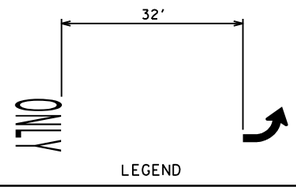


TYPICAL
TWO WAY LEFT TURN LANE DETAILS
SIGNALIZED INTERSECTING



TYPICAL
TWO WAY LEFT TURN LANE DETAILS
SIGNALIZED TEE INTERSECTION



LEGEND

TYPICAL DETAIL

(PLACE LEGENDS IN ACCORDANCE TO STATE STANDARD PM(3)-12)

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-12 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE. ALSO REFER TO STATE STANDARD PM(3)-12)

LEGEND

☐ REFLECTIVE MARKER

Texas Department of Transportation

San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - URBAN ROADS

SCALE: NS — **TWLTL(4)-18**

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
AUG 2002	6			64
APRIL 2003	STATE	DIST.	COUNTY	
NOV 2007	TEXAS	SAT	KENDALL, Etc.	
SEPT 2008	CONT.	SECT.	JOB	HIGHWAY NO.
MARCH 2010	0072	05	090, Etc.	IH 10, Etc.
MAY 2010				
MAY 2018				

REVISED ON: 5-18 | CHECKED By: G.G./OMG | REVISED By: JC03 | DRAWN By: TED

2:57:22 PM

2021

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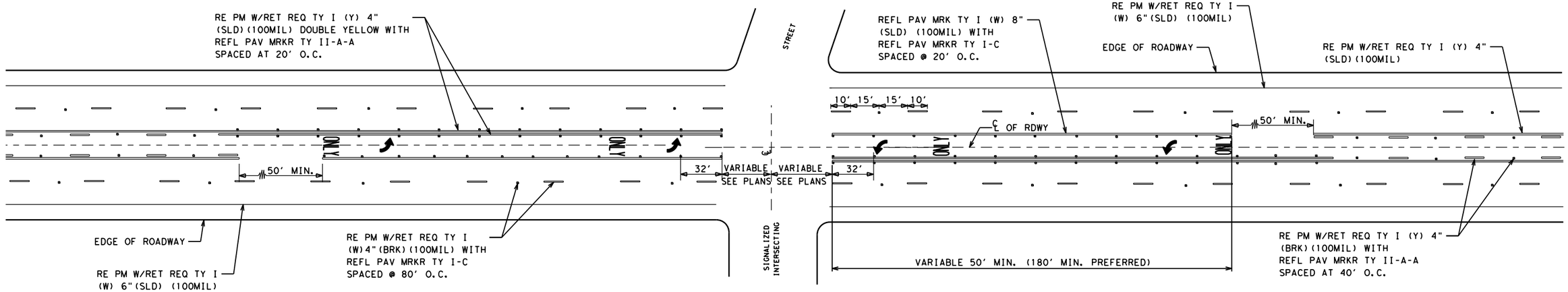
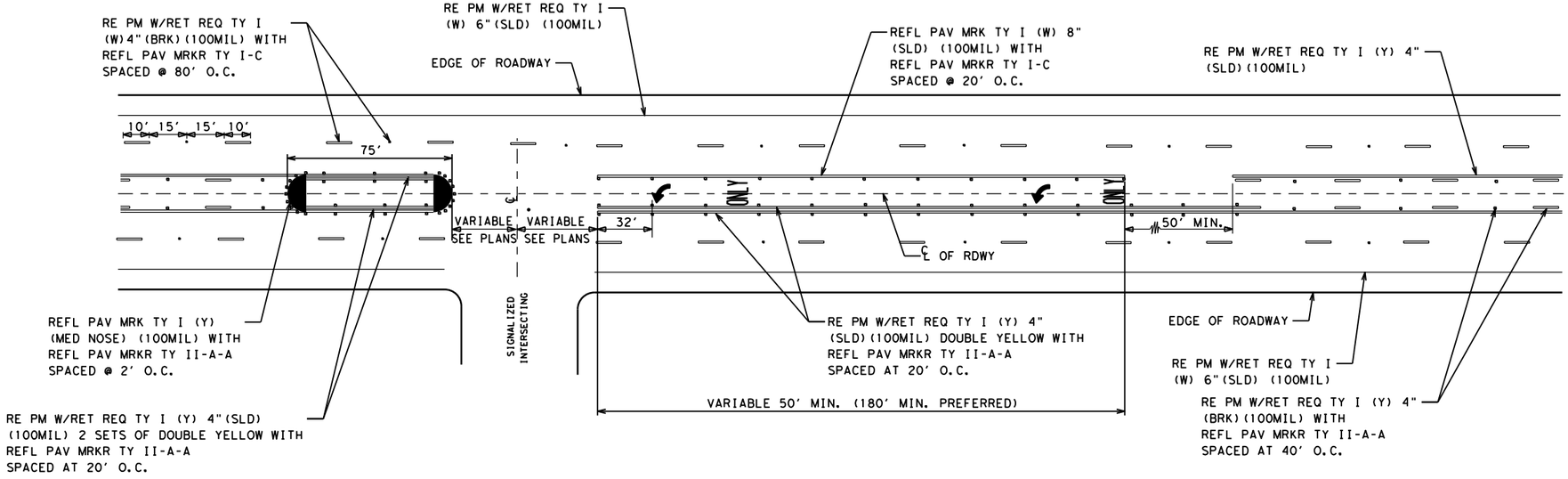
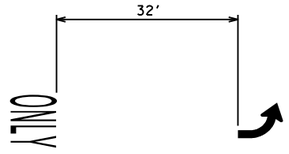
REVISED ON: 5-18 | CHECKED BY: G.G./OMG | REVISED BY: JCO3 | DRAWN BY: TED
2:57:23 PM
2021



TYPICAL
TWO WAY LEFT TURN LANE DETAILS
SIGNALIZED INTERSECTION



TYPICAL
TWO WAY LEFT TURN LANE DETAILS
SIGNALIZED TEE INTERSECTION



LEGEND

TYPICAL DETAIL

(PLACE LEGENDS IN ACCORDANCE TO STATE STANDARD PM(3)-12)

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-12 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE. ALSO REFER TO STATE STANDARD PM(3)-12)

LEGEND

☐ REFLECTIVE MARKER

San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - URBAN ROADS

SCALE: NS

TWLTL(5)-18

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
AUG 2002	6			65
APRIL 2003	STATE	DIST.	COUNTY	
NOV 2007	TEXAS	SAT	KENDALL, Etc.	
SEPT 2008	CONT.	SECT.	JOB	HIGHWAY NO.
MARCH 2010	0072	05	090, Etc.	IH 10, Etc.
MAY 2010				
MAY 2018				

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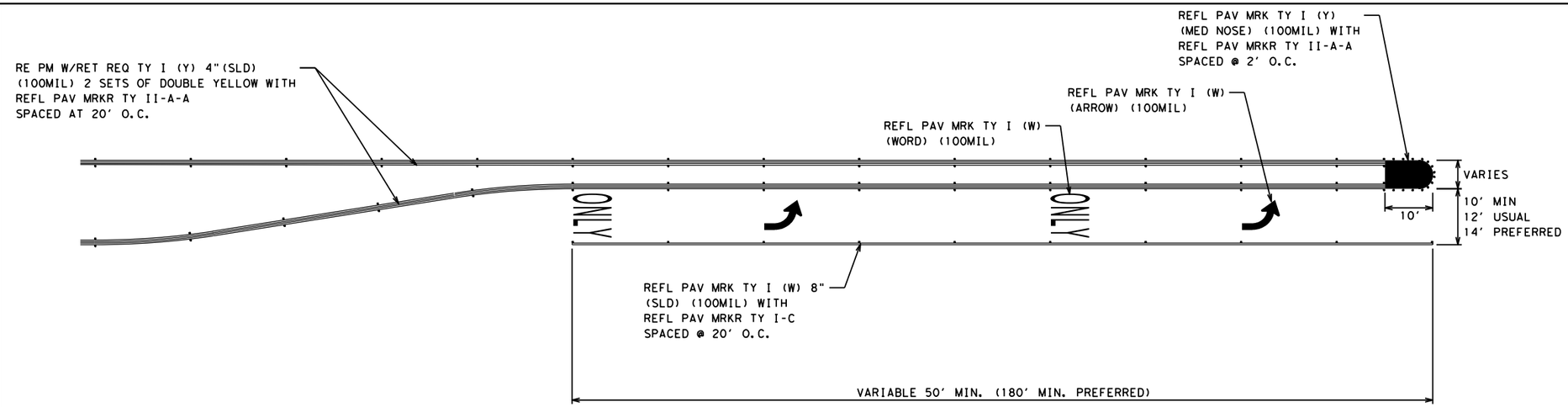
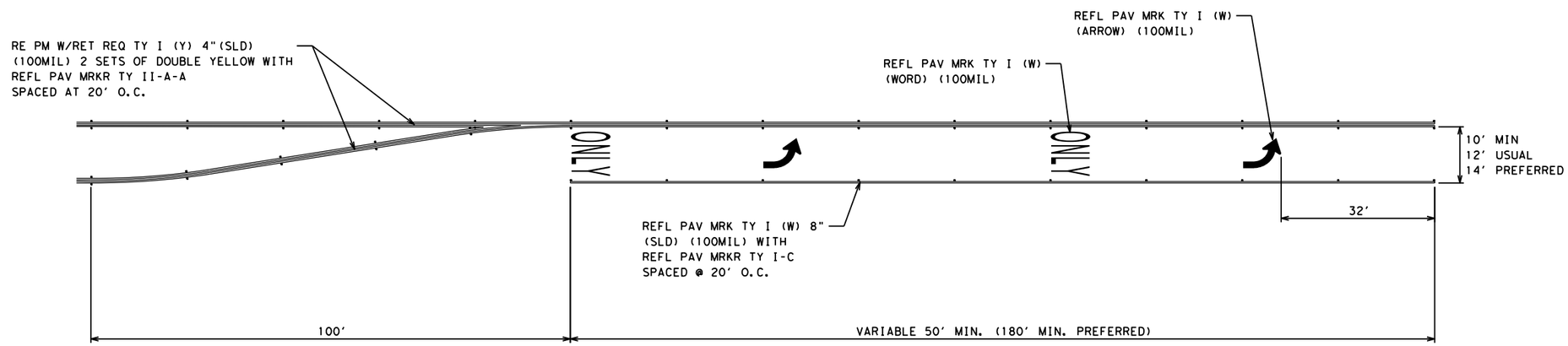
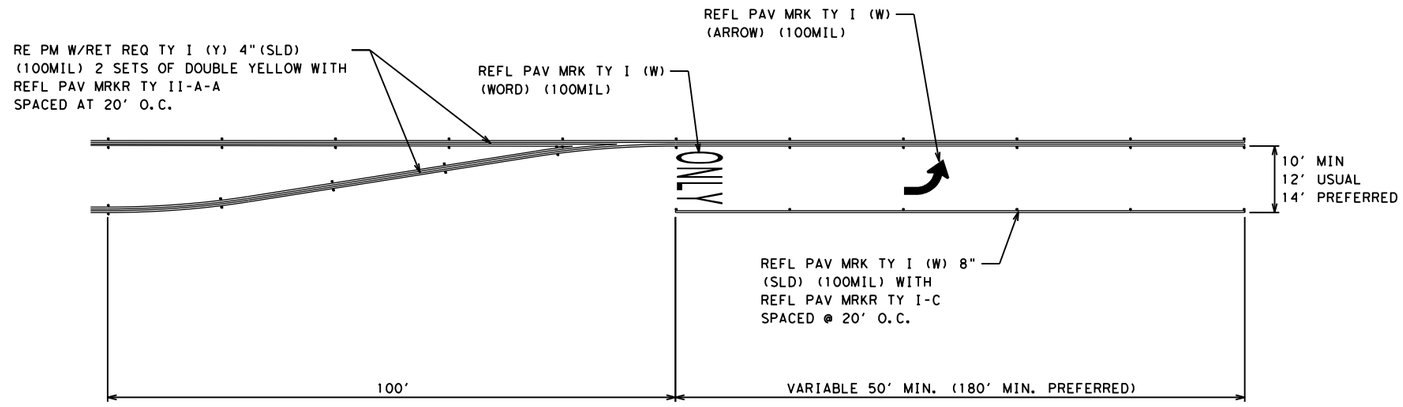






MEDIAN LEFT TURN BAY DETAILS

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-12 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE. ALSO REFER TO STATE STANDARD PM(3)-12)

LEGEND

☐ REFLECTIVE MARKER

San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - URBAN ROADS

SCALE: NS

TWLTL(6)-18

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
AUG 2002	6			66
APRIL 2003	STATE	DIST.	COUNTY	
NOV 2007	TEXAS	SAT	KENDALL, Etc.	
SEPT 2008	CONT.	SECT.	JOB	HIGHWAY NO.
MARCH 2010	0072	05	090, Etc.	IH 10, Etc.
MAY 2010				
MAY 2018				

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	0072	05	090, Etc.	IH 10, Etc.
	DIST	COUNTY		SHEET NO.
	SAT	KENDALL, Etc.		67

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
	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0072	05	090, Etc.	IH 10, Etc.
	DIST	COUNTY		SHEET NO.
	SAT	KENDALL, Etc.		68

DATE:
FILE:

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

DOT #: 742816G
Crossing Type:** At Grade
RR Company Owning Track at Crossing: Union Pacific Railroad
Operating RR Company at Track: Union Pacific Railroad
RR MP: 279.500
RR Subdivision: Del Rio
City: Sabinal
County: Uvalde
CSJ at this Crossing: 0369-01-041
Highway/Roadway name crossing the railroad: SH 127
# of regularly scheduled trains per day at this crossing: 20
# of switching movements per day at this crossing: 0
% of estimated contract cost of work within railroad ROW: <1%

Scope of Work at this Crossing to Be Performed by State Contractor:
Seal coat (no mill) and pavement markings.

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

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

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

N/A

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 4

On this project, night or weekend flagging is:

☐ Expected
☒ Not Expected

Flagging services will be provided by:

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

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

Contact Information for Flagging:

☒ UPRR - UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ BNSF - BNSF.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ KCS - KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS _____

Contractor must incorporate Construction Inspection into anticipated construction schedule.

☒ Not Required

☐ Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

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

☐ Required
☒ Not Required

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

V. RAILROAD INSURANCE REQUIREMENTS

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

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

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

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

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000 combined single limit
Railroad Protective Liability	
☐ Not Required	
☒ Non - Bridge Projects	$2,000,000 / $6,000,000
☐ Bridge Projects	$5,000,000 / $10,000,000
☐ Other	

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

On this project, an ROE agreement is:

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

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

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

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

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

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

☒ Not Required
☐ Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

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

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call Union Pacific Railroad (UPRR)
Railroad Emergency Line at 888-877-7267
Location: DOT 742816G
RR Milepost 279.500
Subdivision Del Rio

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK

PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
©TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0072	05	090, Etc.	IH 10, etc
3/2020	DIST	COUNTY		SHEET NO.
	SAT	KENDALL, ETC		69

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

DOT #: 742998V
Crossing Type: ** At Grade (2 tracks)
RR Company Owning Track at Crossing: Union Pacific Railroad
Operating RR Company at Track: Union Pacific Railroad
RR MP: 6.470
RR Subdivision: Cline Mine Ind
City: Uvalde
County: Uvalde
CSJ at this Crossing: 1230-01-019
Highway/Roadway name crossing the railroad: FM 1022
# of regularly scheduled trains per day at this crossing: 20
# of switching movements per day at this crossing: 0
% of estimated contract cost of work within railroad ROW: <1%

Scope of Work at this Crossing to Be Performed by State Contractor:
Seal coat (no mill) and pavement markings.

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

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

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

N/A

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 4

On this project, night or weekend flagging is:

- [ ] Expected
- [X] Not Expected

Flagging services will be provided by:

- [ ] Railroad Company: TxDOT will pay flagging invoices
- [X] 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:

- [X] UPRR - UP.info@railpros.com
  Call Center 877-315-0513, Select #1 for flagging
- [ ] BNSF - BNSF.info@railpros.com
  Call Center 877-315-0513, Select #1 for flagging
- [ ] KCS - KCS.info@railpros.com
  Call Center 877-315-0513, Select #1 for flagging
  - Bottom Line On-Track Safety Services
  bottomline076@aol.com, 903-767-7630
- [ ] OTHERS _____

Contractor must incorporate Construction Inspection into anticipated construction schedule.

- [X] Not Required
- [ ] Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

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

- [ ] Required
- [X] Not Required

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

V. RAILROAD INSURANCE REQUIREMENTS

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

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

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

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

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000 combined single limit
Railroad Protective Liability	
[ ] Not Required	
[X] Non - Bridge Projects	$2,000,000 / $6,000,000
[ ] Bridge Projects	$5,000,000 / $10,000,000
[ ] Other	

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

On this project, an ROE agreement is:

- [X] Not Required
- [ ] Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)
- [ ] Required: Contractor to obtain (see Item 5, Article 8.4)

With the following railroad companies: _____

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

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

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

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

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

- [X] Not Required
- [ ] Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

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

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call Union Pacific Railroad (UPRR)
Railroad Emergency Line at 888-877-7267
Location: DOT 742998V
RR Milepost 6.470
Subdivision Cline Mine Ind

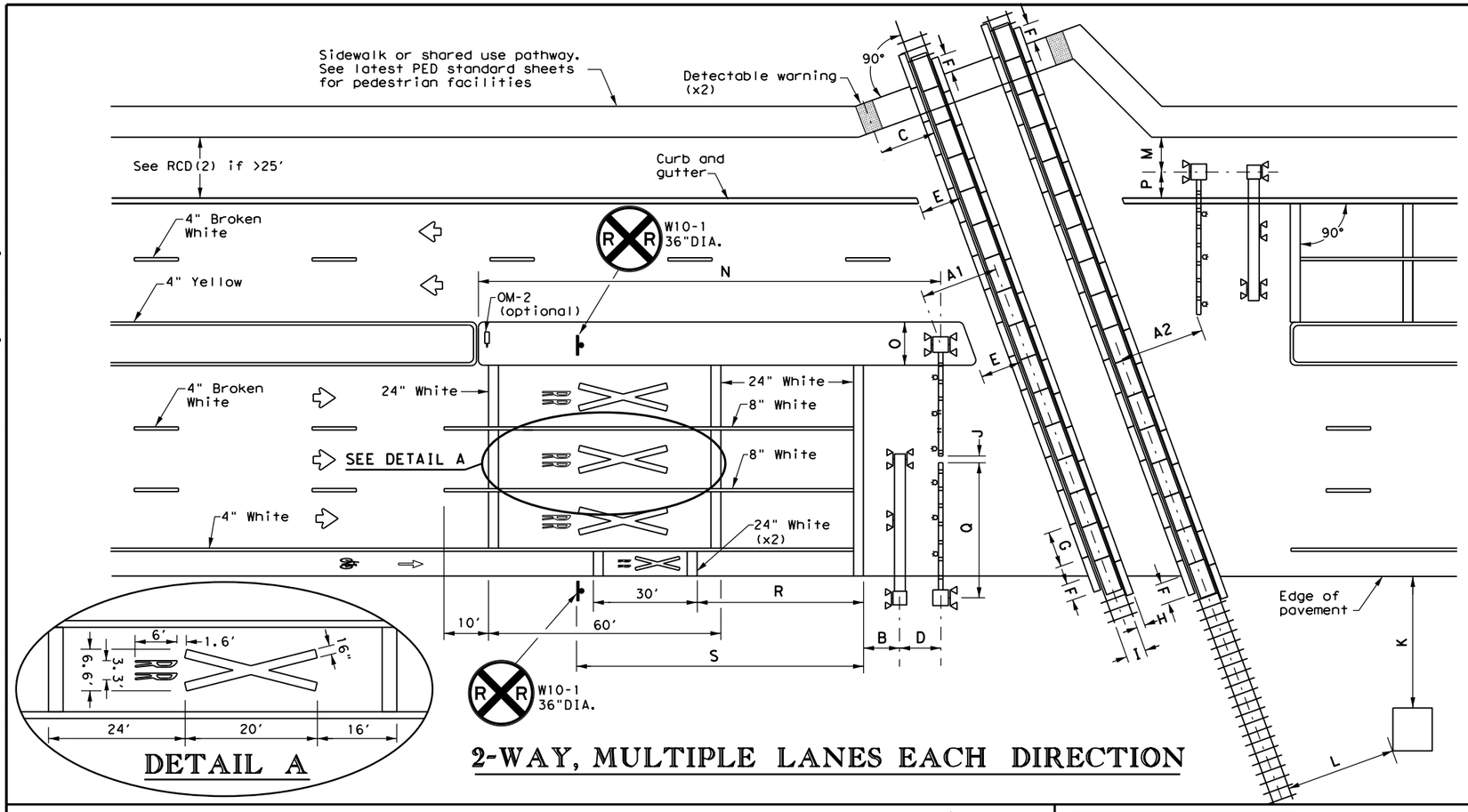
Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK

PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
© TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0072	05	090, Etc.	IH 10, etc
3/2020	DIST	COUNTY		SHEET NO.
	SAT	KENDALL, ETC		70

DATE:
FILE:



DETAIL A

2-WAY, MULTIPLE LANES EACH DIRECTION

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: Center of detectable warning device to nearest rail: 6' 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'-8.5".

J: Tip of gate to tip of gate: 2' maximum for Quiet Zone SSM or 90% of traveled way covered by gates for all other locations.

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

L: Nearest edge of RR cabin 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.

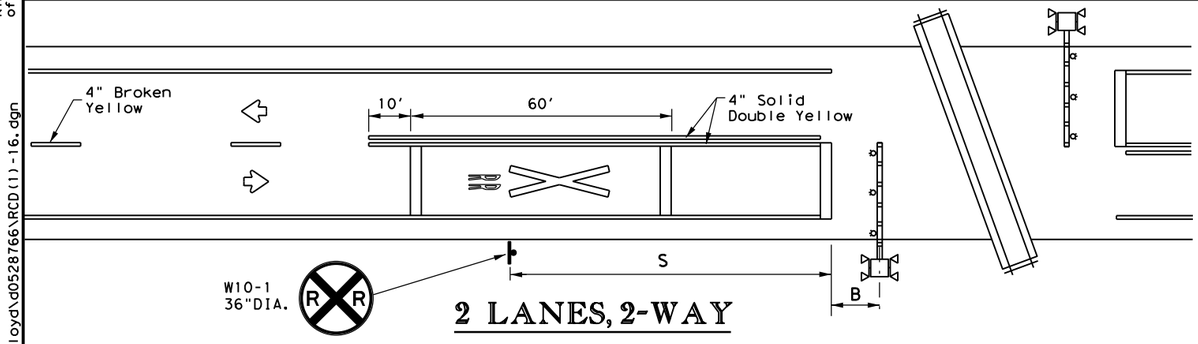
O: Width of median: 8'-6" minimum, 10' typical when using median gates. NOTE: Center of gate mast minimum 4'-3" from face of curb.

P: Center of RR mast to face of curb: 4'-3" minimum.
Center of RR mast to edge of pavement (with shoulder): 6' minimum
Center of RR mast to edge of pavement (no shoulder): 8'-3" minimum
NOTE: BNSF prefers 5'-3", 7', and 9'-3" minimums, respectively.

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.



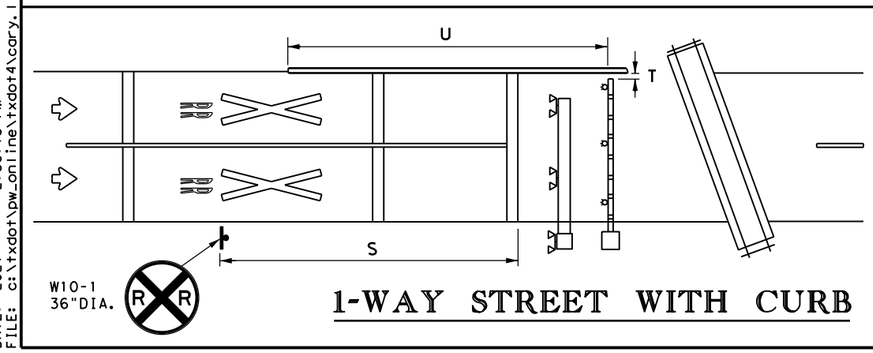
2 LANES, 2-WAY

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.

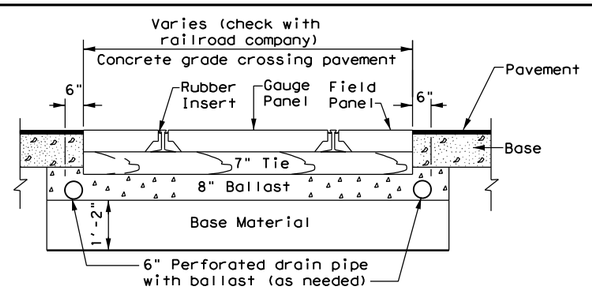


1-WAY STREET WITH CURB

NOTES

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

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



CROSSING SURFACE CROSS SECTION

Texas Department of Transportation

Traffic Operations Division Standard

RAILROAD CROSSING DETAILS SIGNING, STRIPING, AND DEVICE PLACEMENT RCD(1)-16

FILE: rcd1-16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT FEBRUARY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0072	05	090, Etc.	IH 10, Etc.
	DIST	COUNTY		SHEET NO.
	SAT	KENDALL, Etc.		71

DATE: 2021
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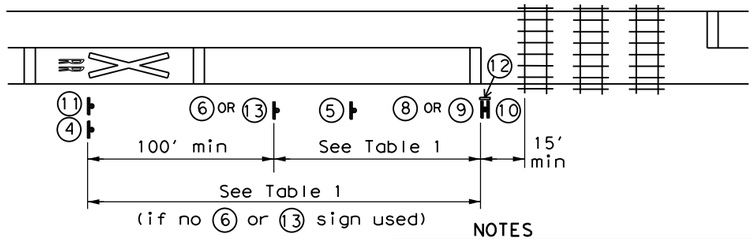
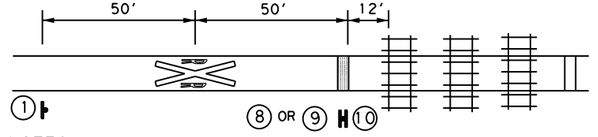


NOTES

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.

PASSIVE CROSSING



NOTES

1. A shared use pathway 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 sign sizes preferred than shown to the right on this sheet.

PATHWAY CROSSING

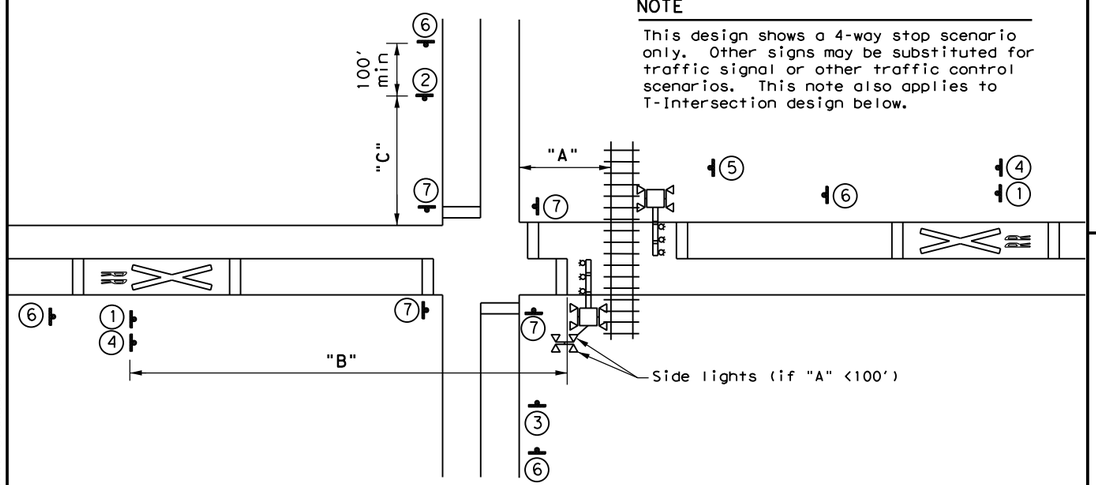
TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

GENERAL NOTES

1. Railroad company to provide active traffic control devices, CROSSBUCK (R15-1), NUMBER OF TRACKS Plaque (R15-2P) (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 Sect. 2C.05 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.

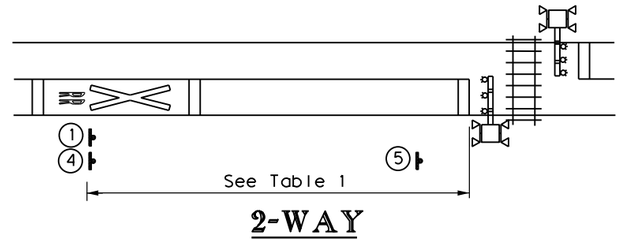
NOTE

This design shows a 4-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.

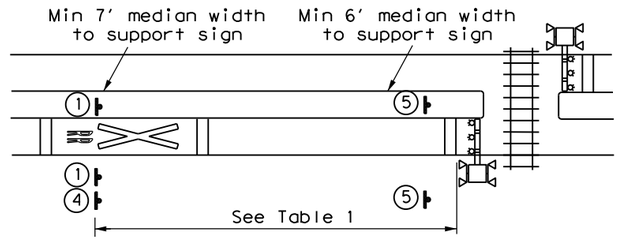


	"A" <100′	"A" ≥100′
"B"	See Table 1. Place pavement markings and signs on opposite side of intersection from rail if spacing from Table 1 would put markings within intersection.	See Table 1. Place pavement markings and signs between rail and intersection if spacing from Table 1 would put markings within 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.

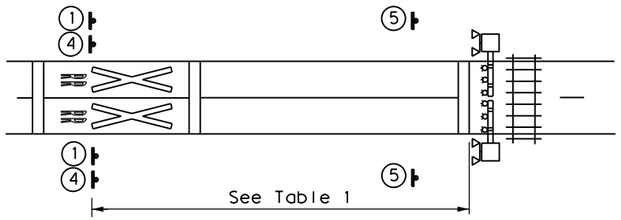
GRADE CROSSING NEAR A PARALLEL STREET



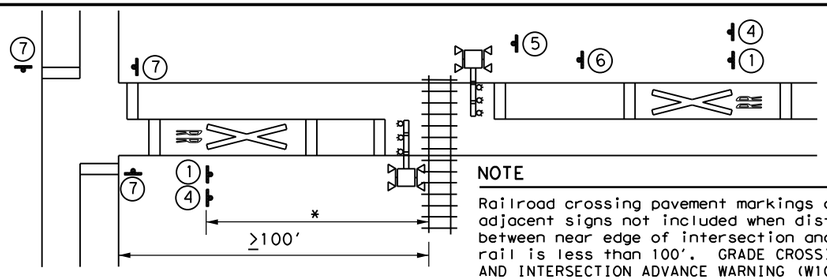
2-WAY



2-WAY WITH MEDIAN



1-WAY

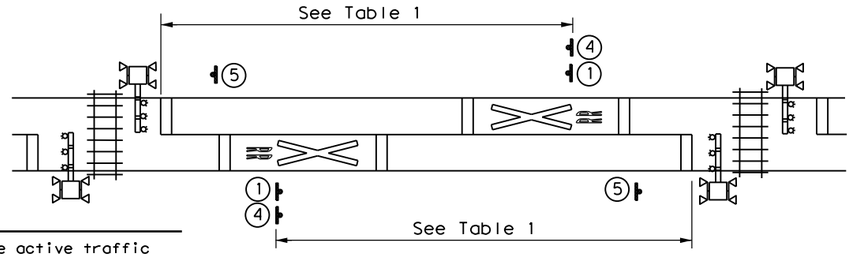


*Use Table 1 if sufficient space exists.

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

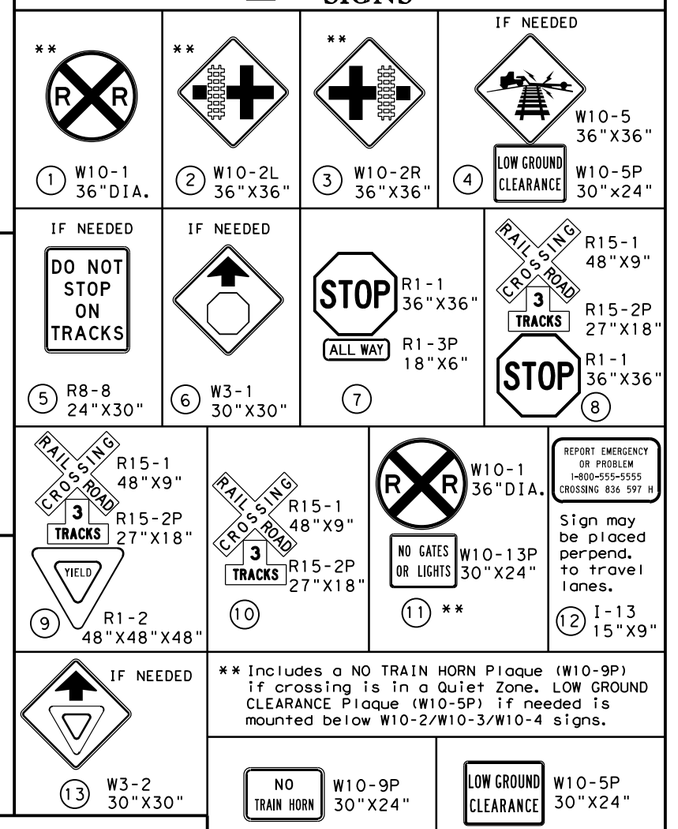


NOTE

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

2 ADJACENT CROSSINGS

SIGNS



** Includes a NO TRAIN HORN Plaque (W10-9P) if crossing is in a Quiet Zone. LOW GROUND CLEARANCE Plaque (W10-5P) if needed is mounted below W10-2/W10-3/W10-4 signs.

Texas Department of Transportation

Traffic Operations Division Standard

RAILROAD CROSSING DETAILS SIGNING & STRIPING

RCD(2)-16

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©TxDOT FEBRUARY 2016	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	SAT	KENDALL, Etc.		72

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2021 11:17:18 AM
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I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

Texas Pollutant Discharge Elimination System (TPDES) TXR 150000: Stormwater Discharge Permit or Construction General Permit (CGP) required for projects with 1 or more acres distrubed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

☒ No Action Required ☐ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000.
2. Comply with the Storm Water Pollution Prevention Plan (SW3P) and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and Texas Commission on Environmental Quality (TCEQ), Environmental Protection Agency (EPA) or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, Contractor shall submit Notice of Intent (NOI) to TCEQ and the Engineer.
5. NOI required: ☐Yes ☒No

Note: If amount of soil disturbance changes, permit requirements may change.

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

US Army Corps of Engineers (USACE) Permit required for filling, dredging, excavating or other work in any potential USACE jurisdictional water, such as, rivers, creeks, streams, or wetlands.

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

☒ No Permit Required
☐ Nationwide Permit (NWP) 14 - Pre-construction Notice (PCN) not Required
☐ Nationwide Permit 14 - PCN Required
☐ Individual 404 Permit Required
☐ Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices (BMPs) planned to control erosion, sedimentation and post-project total suspended solids (TSS).

1.

2.

3.

4.

401 Best Management Practices: (Not applicable if no USACE permit)

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

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

☐ No Action Required ☒ Required Action

Action No.

1. MIGRATORY BIRD NESTS: Schedule construction activities as needed to meet the following requirements:

   A. Do not remove or destroy any active migratory bird nests (nests containing eggs and/or flightless birds) at any time of year. If there are any active nests, they shall not be removed until the nests become inactive.

   B. On/in structures, if there are any active nests, they shall not be removed until all nests become inactive. After inactive nests are removed and/or before nest activity begins, deterrent materials may be applied to the structures to prevent future nest building.

2. See Item 5 in General Notes.

3.

4.

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the follwing 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

Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Does the project involve the demolition of a span bridge?
☐ Yes ☒ No (No further action required)

If "Yes", a pre- demolition notification must be submitted to the Texas Department of State Health Services. The contractor shall contact TxDOT's Project Engineer 25 calendar days prior to the demolition of the bridges(s) on the project to assist with the notification.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Texas Department of Transportation
San Antonio District Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic_2015-10-09_SAT.dgn	DN: TxDOT	CK: TxDOT	DW: BW	CK: GAG
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	DIST	COUNTY		SHEET NO.
	SAT	KENDALL, Etc.		73