FED. RD. DIV. NO.	PROJECT NUMBER		HIGHWAY NUMBER
6	F 2021(768), ETC.		FM 46, ETC.
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	ROBERTSON, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	1

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

DESIGN SPEED: N/A

NOTES:
* SEE SHEET 2 FOR INDEX OF SHEETS
* SEE SHEET 3 FOR PROJECT LOCATION MAP BRYAN & HOUSTON DISTRICT
* INDIVIDUAL COUNTY PROJECT LOCATION MAPS PRECEDE THE PROJECT SUMMARIES FOR EACH COUNTY

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

PROJECT NUMBER: F 2021(768), ETC.

FM 46, ETC.
ROBERTSON COUNTY, ETC.

TOTAL LENGTH OF PROJECT = 7418.40 FT= 1.405 MILES. ETC.

FOR THE CONSTRUCTION OF TRAFFIC CONTROL DEVICES
CONSISTING OF PROFILE MARKINGS.

FINAL PLANS

CONTRACTOR:
LETTING DATE:
DATE CONTRACTOR BEGAN WORK:
DATE WORK WAS COMPLETED:
DATE WORK WAS ACCEPTED:
FINAL CONTRACT COST: $

TEXAS DEPARTMENT OF TRANSPORTATION®

SUBMITTED FOR LETTING: 6/3/2021
DocuSigned by:
59B67CE6AA5C43... DESIGN MANAGER

RECOMMENDED FOR LETTING: 6/3/2021
DocuSigned by:
DAA3B0... DIRECTOR OF TRANSPORTATION PLANNING AND DEVELOPMENT

APPROVED FOR LETTING: 6/3/2021
DocuSigned by:
7A1E426988DE4A... DISTRICT ENGINEER

NO EXCEPTIONS
NO EQUATIONS
12 RAILROAD CROSSINGS

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

FILENAME: $FILE$
REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX

INDEX OF SHEETS

STATE OF TEXAS
KEITH A. KOUBA
108695
LICENSED
PROFESSIONAL ENGINEER

Keith A. Kouba, P.E.

05/24/2021

THE STANDARD SHEETS, WHICH ARE SPECIFICALLY IDENTIFIED WITH (~), HAVE BEEN SELECTED BY ME, OR UNDER MY RESPONSIBLE SUPERVISION, AS BEING APPLICABLE TO THIS PROJECT.

PRINT DATE	REVISION DATE
5/24/2021	

Texas Department of Transportation
Bryan District

INDEX OF SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	ROBERTSON, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	2

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: G:\0049\14\014\SHEETS\General\Index of Sheets.dgn

MILAM COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
31	FM 486	0337-05-049
32	FM 486	0590-05-054
33	FM 3061	0590-06-009
34	FM 437	0590-07-026
35	FM 487	0858-01-038
36	FM 979	1210-03-033
37	FM 2095	1953-01-031
38	FM 3242	2028-01-013
39	FM 2268	2136-03-008
40	FM 979	2237-01-012

BURLESON COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
2	FM 50	0457-01-066
3	FM 50	0648-03-073
4	FM 1362	0833-11-035
5	FM 1362	0833-12-023
6	FM 2000	1129-02-023

FREESTONE COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
7	SH 179	0426-01-013
8	FM 1449	0456-03-021
9	FM 489	1325-02-016
10	FM 1365	1326-02-022
11	FM 1367	1327-01-009

ROBERTSON COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
41	FM 46	0049-14-014
42	FM 46	0540-01-050
43	FM 979	1210-01-016
44	FM 979	1210-02-014
45	FM 2096	1954-01-015
46	FM 2159	2029-01-015
47	FM 979	2134-01-030

WASHINGTON COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
54	SH 105	0315-06-048
55	SH 105	0315-07-039
56	FM 390	0338-08-042
57	FM 50	0457-03-034
58	FM 1697	1564-01-033
59	FM 1697	1564-01-034
60	FM 1697	2830-02-013

WALLER COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
61	FM 1736	1687-01-018
62	FM 2979	3051-01-009

LEON COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
17	IH 45 EFR	0675-03-097
18	IH 45 EFR	0675-03-098
19	IH 45 EFR	0675-03-099
20	IH 45 EFR	0675-04-077
21	IH 45 WFR	0675-04-078
22	IH 45 EFR	0675-04-079
23	IH 45 EFR	0675-04-080
24	IH 45 EFR	0675-04-081
25	FM 1119	1223-01-045
26	FM 2539	2439-01-009

BRAZOS COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
1	FM 50	0648-02-021

MADISON COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
27	IH 45 EFR	0675-05-096
28	IH 45 WFR	0675-05-097
28A	IH 45 EFR	0675-05-101
29	FM 2289	2132-01-013
30	FM 2865	3303-01-010

WALKER COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
48	SH 30	0212-02-041
49	SS 59	0476-01-006
50	IH 45 WFR	0675-06-113
51	FM 980	0756-02-032
52	FM 1375	1402-01-038
53	FM 1791	1706-01-033

GRIMES COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
12	FM 244	0643-04-036
13	FM 244	0643-05-061
14	FM 149	0720-04-012
15	FM 2988	0944-01-028
16	FM 244	3177-01-011

N

Drawings Not To Scale

PRINT DATE	REVISION DATE
2/1/2021	-

Texas Department of Transportation
Bryan District
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PROJECT LOCATION MAP BRYAN & HOUSTON DISTRICT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC
STATE	DISTRICT	COUNTY
TEXAS	BRYAN	ROBERTSON, ETC.
CONTROL	SECTION	JOB / SHEET NO.
0049	14	014, ETC. / 3

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: $FILE$

GENERAL:

Contractor questions on this project are to be addressed to the following individuals:
Eric Bennett, P.E., A.E., Eric.Bennett@txdot.gov
James Kreamer, P.E., A.A.E., James.Kreamer@txdot.gov

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

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

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

ITEM 7 "LEGAL RELATIONS AND RESPONSIBILITIES"

This project is on a hurricane evacuation route. Furnish at the pre-construction meeting a written plan outlining procedures to suspend work, secure the job site and safely handle traffic through and across the project in the event of a hurricane evacuation.

During the hurricane season (June 1 through November 30), do not close any travel lanes except when the Contractor can demonstrate that he can provide labor, equipment, material, work plan, and quality of work to satisfactorily return all lanes to an open, all-weather travel surface within three days of receiving written or verbal notice but no later than 3 days prior to hurricane landfall. Construction of temporary lanes to an all-weather surface will be paid in accordance with Article 9.7, "Payment for Extra Work and Force Account Method".

In addition to lane closures, cease work 3 days prior to hurricane landfall on or near the roadway that adversely impacts the flow of traffic and reduces the capacity of the highway during an evacuation. Prohibit the Contractor's, sub-contractors' or material suppliers' vehicles from entering or exiting the stream of traffic including material hauling and delivery, and mobilization or demobilization of equipment. When directed, this prohibition will include a reasonable time period for the evacuees to return to their point of origin.

In the event of the declaration of a hurricane watch, warning, other severe weather warning or national or state emergency that requires the roadways in the vicinity be used as evacuation routes, cease all work that requires the Contractor's, sub-contractors' or material suppliers' vehicles to enter the stream of traffic on these primary or secondary evacuation routes. This work includes material hauling and delivery, and mobilization or demobilization of equipment.

Sheet: 4

Highway: FM 46, Etc. **Control: 0049-14-014, Etc.**
County: Robertson, Etc.

The following roadways are recognized evacuation routes in the Bryan District:

Primary Evacuation Routes: IH 45, US 290, SH 6, SH 36.

Secondary Evacuation Routes: US 79, US 84, SH 7, SH 30, SH 21, SH 105.

Other routes may be designated.

Roadway closures during the following key dates and/or special events are prohibited:

- Day before and day of Texas A&M home football games
- Texas A&M graduation
- Texas A&M Parents Weekend

The Engineer may decide to restrict construction operations or lane closures on these key dates and/or special events.

FOR UNION PACIFIC RR;

Fiber optic cable systems may be buried on the Railroad's property. Protection of the fiber optic cable systems is of extreme importance since any break could disrupt service to users resulting in business interruption and loss of revenue and profits. It is the Contractor's responsibility to telephone the Railroad at 1-800-848-8715 (a 24-hour number) to determine if fiber optic cable is buried anywhere on the Railroad's premises to be used by the State. If it is, the Contractor will telephone the telecommunications company(ies) involved, arrange for a cable locator, and make arrangements for relocation or other protection of the fiber optic cable prior to beginning any work on the Railroad's premises.

A Railroad Inspector is required to monitor the ground and track for movement during the jacking process. The installation process and all train movements must be immediately stopped if any movement of ground is detected. The damaged area must be immediately repaired. The installation process must be reviewed and modified as necessary before installation may proceed. All work associated with the installation of the culvert will be at the expense of the State of Texas.

FOR BNSF RAILWAY COMPANY;

It is the Contractor's responsibility to contact, five working days before any work is performed, the Railroad's Communications Network Control Center at 1-800-832-5452 to determine if fiber optic or other type of cable is buried in the general location where work is to be performed. In the event such cable is present, the Contractor then calls the owner of the fiber optic or cable line to determine its exact location. The State shall indemnify and hold harmless the Railroad against any cost or claims arising out of damage to any cable, but only to the extent such damage is caused by negligence of the State and/or its Contractor.

ITEM 8 "PROSECUTION AND PROGRESS"

By noon of each Wednesday, provide the Engineer a written outline of the daily work schedule for the following week. Include in the outline the times and places for proposed traffic control changes, lane and shoulder closures, and moving operations or other operations that affect traffic on the roadway.

Prepare Progress Schedule Bar Chart.

The time determination schedule was established assuming 2 crews perform installation of profile markings, 2 crews perform installation of Type I striping and profile striping, and 1 crew perform installation of raised pavement markers. These operations would be performed concurrently.

Staging or parking is limited to paved areas such as stockpile locations, or as directed by the Engineer.

ITEM 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING"

Where shown on applicable TCP standards, channelizing devices on the centerline are required at all times; including when a pilot vehicle is used to lead traffic. Mount a G20-4 sign at a conspicuous location on the rear of the vehicle. Traffic delays caused by one-lane, two-way traffic control, will not be allowed to exceed 5 minutes unless approved by the Engineer.

One way traffic control operations are required when placing centerline profile markings on all two-lane roadways, unless otherwise approved by the Engineer. Work area is limited to a maximum of 2 miles for this work.

During one-way operations, station flaggers at all county roads and any other locations, such as private businesses, that may have traffic entering the work area.

Removal of ground mounted temporary signs and supports as specified on standard sheet BC(5), shall include the immediate backfilling of support holes with Type B embankment material and the compaction of the backfill material.

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.

Sheet: 4A
Highway: FM 46, Etc. Control: 0049-14-014, Etc.
County: Robertson, Etc.

ITEM 506 "TEMPORARY EROSION, SEDIMENTATION AND ENVIRONMENTAL CONTROLS"

It is not anticipated that any erosion control devices will be needed on this project. However, in the event that any devices are needed, payment for the work will be determined in accordance with Article 9.7, "Payment for Extra Work and Force Account Method".

ITEM 666 "REFLECTORIZED PAVEMENT MARKINGS"

All striping limits must be approved by the Engineer before striping operations may begin.

ITEM 672 "RAISED PAVEMENT MARKERS"

Use flexible bituminous adhesive for applications on all pavement types.

ITEM 6185 "TRUCK MOUNTED ATTENUATOR (TMA) AND TRAILER ATTENUATOR (TA)"

In addition to the shadow vehicles with truck mounted attenuator (TMA) that are specified as being required on the traffic control plan for this project,

provide one (1) shadow vehicle with TMA for TCP (1-1)-18 as detailed on General Note 4 of this standard sheet,

provide one (1) shadow vehicle with TMA for TCP (1-2)-18 as detailed on General Note 5 of this standard sheet,

provide one (1) shadow vehicle with TMA for TCP (1-3)-18 as detailed on General Note 6 of this standard sheet,

provide one (1) shadow vehicle with TMA for TCP (1-4)-18 as detailed on General Note 4 of this standard sheet,

provide one (1) shadow vehicle with TMA for TCP (1-5)-18 as detailed on General Note 4 of this standard sheet,

provide one (1) shadow vehicle with TMA for TCP (2-1)-18 as detailed on General Note 4 of this standard sheet,

provide one (1) shadow vehicle with TMA for TCP (2-2)-18 as detailed on General Note 6 of this standard sheet,

provide one (1) shadow vehicle with TMA for TCP (2-3)-18 as detailed on General Note 7 of this standard sheet,

provide one (1) shadow vehicle with TMA for TCP (2-4)-18 as detailed on General Note 5 of this standard sheet,

provide two (2) (shadow and trail) vehicles with TMA for TCP (3-1)-13 as detailed on General Note 3 of this standard sheet.

provide three (3) (advance warning, shadow and trail) vehicles with TMA for TCP (3-2)-13 as detailed on General Note 4 of this standard sheet.

provide three (3) (advance warning, shadow and trail) vehicles with TMA for TCP (3-3)-14 as detailed on General Note 3 of this standard sheet.

provide two (2) shadow vehicles with TMA for TCP (3-4)-13 as detailed on General Note 2 of this standard sheet,

Sheet: 4B
Highway: FM 46, Etc. Control: 0049-14-014, Etc.
County: Robertson, Etc.

Therefore, nineteen (19) total shadow vehicles with TMA will be required for this type of work. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

One hundred five (105) TMA days are provided in this project estimate for stationary operation.

Two hundred sixty-two (262) TMA days are provided in the project estimate for mobile operations.

QUANTITY SHEET

CONTROLLING PROJECT ID 0049-14-014

DISTRICT Bryan **COUNTY** Brazos, Burleson, Freestone, Grimes, Leon, Madison, Milam, Robertson, Walker, Waller, Washington

HIGHWAY FM 1119, FM 1362, FM 1365, FM 1367, FM 1375, FM 1449, FM 149, FM 1697, FM 1736, FM 1791, FM 2000, FM 2095, FM 2096, FM 2159, FM 2268, FM 2289, FM 244, FM 2539, FM 2865, FM 2979, FM 2988, FM 3061, FM 3242, FM 390, FM 437, FM 46, FM 486, FM 487, FM 489, FM 50, FM 979, FM 980, IH 45, SH 105, SH 179, SH 30, SS 59

			CONTROL SECTION JOB	**0049-14-014**		**0212-02-041**		**0315-06-048**		**0315-07-039**		**0337-05-049**		**0338-08-042**	
			PROJECT ID	**A00136493**		**A00136709**		**A00136766**		**A00136767**		**A00136364**		**A00136769**	
			COUNTY	**Robertson**		**Walker**		**Washington**		**Washington**		**Milam**		**Washington**	
			HIGHWAY	**FM 46**		**SH 30**		**SH 105**		**SH 105**		**FM 486**		**FM 390**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	500-6001	MOBILIZATION	LS	100.00%											
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	5.000											
	666-6282	REF PROF PAV MRK TY I(W)4"(SLD)(060MIL)	LF	12,551.000		35,391.000		113,804.000		61,559.000		1,514.000		45,142.000	
	666-6287	REF PROF PAV MRK TY I(Y)4"(SLD)(090MIL)	LF	7,970.000		29,037.000		56,840.000		59,929.000		1,514.000		42,723.000	
	666-6291	REF PROF PAV MRK TY I(Y)4"(BRK)(090MIL)	LF	1,107.000		583.000		11,827.000		7,727.000				723.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF			11,523.000		1,234.000		5,221.000					
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	1,472.000						4,003.000					
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	212.000		337.000				38.000					
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	848.000		4,202.000				8,204.000					
	672-6007	REFL PAV MRKR TY I-C	EA			201.000		20.000		70.000					
	672-6009	REFL PAV MRKR TY II-A-A	EA	35.000		170.000		250.000		174.000		4.000		115.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA			201.000									
	6056-6002	PREFORMED CENTERLINE RUMBLE STRIP	LF	32.000				2,164.000		167.000					
	6185-6002	TMA (STATIONARY)	DAY	105.000											
	6185-6005	TMA (MOBILE OPERATION)	DAY	262.000											
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK	LS	1.000											
	08	EROSION CONTROL MAINTENANCE (NON-PART)	LS	1.000											
		SAFETY CONTINGENCY (NON-PART)	LS	1.000											

QUANTITY SHEET

CONTROLLING PROJECT ID 0049-14-014

DISTRICT Bryan

COUNTY Brazos, Burleson, Freestone, Grimes, Leon, Madison, Milam, Robertson, Walker, Waller, Washington

HIGHWAY FM 1119, FM 1362, FM 1365, FM 1367, FM 1375, FM 1449, FM 149, FM 1697, FM 1736, FM 1791, FM 2000, FM 2095, FM 2096, FM 2159, FM 2268, FM 2289, FM 244, FM 2539, FM 2865, FM 2979, FM 2988, FM 3061, FM 3242, FM 390, FM 437, FM 46, FM 486, FM 487, FM 489, FM 50, FM 979, FM 980, IH 45, SH 105, SH 179, SH 30, SS 59

			CONTROL SECTION JOB		**0426-01-013**		**0456-03-021**		**0457-01-066**		**0457-03-034**		**0476-01-006**		**0540-01-050**	
			PROJECT ID		**A00136126**		**A00136127**		**A00136086**		**A00136770**		**A00136711**		**A00136494**	
			COUNTY		**Freestone**		**Freestone**		**Burleson**		**Washington**		**Walker**		**Robertson**	
			HIGHWAY		**SH 179**		**FM 1449**		**FM 50**		**FM 50**		**SS 59**		**FM 46**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	666-6282	REF PROF PAV MRK TY I(W)4"(SLD)(060MIL)	LF					152,449.000		51,196.000				159,741.000	
	666-6287	REF PROF PAV MRK TY I(Y)4"(SLD)(090MIL)	LF					48,718.000		39,846.000				115,327.000	
	666-6291	REF PROF PAV MRK TY I(Y)4"(BRK)(090MIL)	LF					15,792.000		5,842.000				8,645.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF					1,301.000							
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	74,057.000								2,016.000		11,971.000	
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	33,529.000										1,375.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	8,321.000		17,790.000						2,076.000		13,987.000	
	672-6007	REFL PAV MRKR TY I-C	EA					55.000						3.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	171.000		45.000		276.000		175.000		6.000		425.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA												
	6056-6002	PREFORMED CENTERLINE RUMBLE STRIP	LF					5,422.000		777.000				831.000	
	6185-6002	TMA (STATIONARY)	DAY												
	6185-6005	TMA (MOBILE OPERATION)	DAY												
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK	LS												
	08	EROSION CONTROL MAINTENANCE (NON-PART)	LS												
		SAFETY CONTINGENCY (NON-PART)	LS												

QUANTITY SHEET

CONTROLLING PROJECT ID 0049-14-014

DISTRICT Bryan

COUNTY Brazos, Burleson, Freestone, Grimes, Leon, Madison, Milam, Robertson, Walker, Waller, Washington

HIGHWAY FM 1119, FM 1362, FM 1365, FM 1367, FM 1375, FM 1449, FM 149, FM 1697, FM 1736, FM 1791, FM 2000, FM 2095, FM 2096, FM 2159, FM 2268, FM 2289, FM 244, FM 2539, FM 2865, FM 2979, FM 2988, FM 3061, FM 3242, FM 390, FM 437, FM 46, FM 486, FM 487, FM 489, FM 50, FM 979, FM 980, IH 45, SH 105, SH 179, SH 30, SS 59

			CONTROL SECTION JOB	**0590-05-054**		**0590-06-009**		**0590-07-026**		**0643-04-036**		**0643-05-061**		**0648-02-021**	
			PROJECT ID	**A00136366**		**A00136386**		**A00136486**		**A00136307**		**A00136326**		**A00136066**	
			COUNTY	**Milam**		**Milam**		**Milam**		**Grimes**		**Grimes**		**Brazos**	
			HIGHWAY	**FM 486**		**FM 3061**		**FM 437**		**FM 244**		**FM 244**		**FM 50**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	666-6282	REF PROF PAV MRK TY I(W)4"(SLD)(060MIL)	LF	16,381.000		48,071.000		99,636.000		129,426.000		16,526.000		49,233.000	
	666-6287	REF PROF PAV MRK TY I(Y)4"(SLD)(090MIL)	LF	17,419.000		22,102.000		43,555.000		76,444.000		13,309.000		19,022.000	
	666-6291	REF PROF PAV MRK TY I(Y)4"(BRK)(090MIL)	LF	282.000		5,067.000		9,971.000		10,492.000				5,134.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF												
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF							7,489.000					
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF							540.000					
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF							4,768.000					
	672-6007	REFL PAV MRKR TY I-C	EA	7.000						8.000					
	672-6009	REFL PAV MRKR TY II-A-A	EA	41.000		107.000		210.000		311.000		50.000		97.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA												
	6056-6002	PREFORMED CENTERLINE RUMBLE STRIP	LF			757.000		2,069.000		1,635.000				1,278.000	
	6185-6002	TMA (STATIONARY)	DAY												
	6185-6005	TMA (MOBILE OPERATION)	DAY												
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK	LS												
	08	EROSION CONTROL MAINTENANCE (NON-PART)	LS												
		SAFETY CONTINGENCY (NON-PART)	LS												

QUANTITY SHEET

CONTROLLING PROJECT ID 0049-14-014

DISTRICT Bryan **COUNTY** Brazos, Burleson, Freestone, Grimes, Leon, Madison, Milam, Robertson, Walker, Waller, Washington

HIGHWAY FM 1119, FM 1362, FM 1365, FM 1367, FM 1375, FM 1449, FM 149, FM 1697, FM 1736, FM 1791, FM 2000, FM 2095, FM 2096, FM 2159, FM 2268, FM 2289, FM 244, FM 2539, FM 2865, FM 2979, FM 2988, FM 3061, FM 3242, FM 390, FM 437, FM 46, FM 486, FM 487, FM 489, FM 50, FM 979, FM 980, IH 45, SH 105, SH 179, SH 30, SS 59

			CONTROL SECTION JOB	**0648-03-073**		**0675-03-097**		**0675-03-098**		**0675-03-099**		**0675-04-077**		**0675-04-078**	
			PROJECT ID	**A00136087**		**A00136349**		**A00136350**		**A00136351**		**A00136352**		**A00136353**	
			COUNTY	**Burleson**		**Leon**		**Leon**		**Leon**		**Leon**		**Leon**	
			HIGHWAY	**FM 50**		**IH 45**		**IH 45**		**IH 45**		**IH 45**		**IH 45**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	666-6282	REF PROF PAV MRK TY I(W)4"(SLD)(060MIL)	LF	85,056.000											
	666-6287	REF PROF PAV MRK TY I(Y)4"(SLD)(090MIL)	LF	18,125.000											
	666-6291	REF PROF PAV MRK TY I(Y)4"(BRK)(090MIL)	LF	9,624.000											
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF												
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF			10,832.000				13,833.000		1,471.000		26,856.000	
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF					1,766.000						4,363.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF			10,832.000		22,258.000		21,540.000		1,471.000		16,245.000	
	672-6007	REFL PAV MRKR TY I-C	EA												
	672-6009	REFL PAV MRKR TY II-A-A	EA	139.000		27.000		74.000		54.000		7.000		85.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA												
	6056-6002	PREFORMED CENTERLINE RUMBLE STRIP	LF	3,785.000											
	6185-6002	TMA (STATIONARY)	DAY												
	6185-6005	TMA (MOBILE OPERATION)	DAY												
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK	LS												
	08	EROSION CONTROL MAINTENANCE (NON-PART)	LS												
		SAFETY CONTINGENCY (NON-PART)	LS												

QUANTITY SHEET

CONTROLLING PROJECT ID 0049-14-014

DISTRICT Bryan **COUNTY** Brazos, Burleson, Freestone, Grimes, Leon, Madison, Milam, Robertson, Walker, Waller, Washington

HIGHWAY FM 1119, FM 1362, FM 1365, FM 1367, FM 1375, FM 1449, FM 149, FM 1697, FM 1736, FM 1791, FM 2000, FM 2095, FM 2096, FM 2159, FM 2268, FM 2289, FM 244, FM 2539, FM 2865, FM 2979, FM 2988, FM 3061, FM 3242, FM 390, FM 437, FM 46, FM 486, FM 487, FM 489, FM 50, FM 979, FM 980, IH 45, SH 105, SH 179, SH 30, SS 59

			CONTROL SECTION JOB	**0675-04-079**		**0675-04-080**		**0675-04-081**		**0675-05-096**		**0675-05-097**		**0675-05-101**	
			PROJECT ID	**A00136354**		**A00136355**		**A00136356**		**A00136359**		**A00136360**		**A00176182**	
			COUNTY	**Leon**		**Leon**		**Leon**		**Madison**		**Madison**		**Madison**	
			HIGHWAY	**IH 45**		**IH 45**		**IH 45**		**IH 45**		**IH 45**		**IH 45**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	666-6282	REF PROF PAV MRK TY I(W)4"(SLD)(060MIL)	LF									65,410.000			
	666-6287	REF PROF PAV MRK TY I(Y)4"(SLD)(090MIL)	LF									33,837.000			
	666-6291	REF PROF PAV MRK TY I(Y)4"(BRK)(090MIL)	LF									5,130.000			
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF												
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF			3,733.000		7,750.000		1,007.000				6,494.000	
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF			481.000									
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	16,580.000		4,634.000		7,750.000		1,007.000				6,494.000	
	672-6007	REFL PAV MRKR TY I-C	EA												
	672-6009	REFL PAV MRKR TY II-A-A	EA	41.000		20.000		19.000				137.000		82.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA												
	6056-6002	PREFORMED CENTERLINE RUMBLE STRIP	LF									1,392.000			
	6185-6002	TMA (STATIONARY)	DAY												
	6185-6005	TMA (MOBILE OPERATION)	DAY												
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK	LS												
	08	EROSION CONTROL MAINTENANCE (NON-PART)	LS												
		SAFETY CONTINGENCY (NON-PART)	LS												

QUANTITY SHEET

CONTROLLING PROJECT ID 0049-14-014

DISTRICT Bryan

COUNTY Brazos, Burleson, Freestone, Grimes, Leon, Madison, Milam, Robertson, Walker, Waller, Washington

HIGHWAY FM 1119, FM 1362, FM 1365, FM 1367, FM 1375, FM 1449, FM 149, FM 1697, FM 1736, FM 1791, FM 2000, FM 2095, FM 2096, FM 2159, FM 2268, FM 2289, FM 244, FM 2539, FM 2865, FM 2979, FM 2988, FM 3061, FM 3242, FM 390, FM 437, FM 46, FM 486, FM 487, FM 489, FM 50, FM 979, FM 980, IH 45, SH 105, SH 179, SH 30, SS 59

			CONTROL SECTION JOB		**0675-06-113**		**0720-04-012**		**0756-02-032**		**0833-11-035**		**0833-12-023**		**0858-01-038**	
			PROJECT ID		**A00136713**		**A00136327**		**A00136715**		**A00136088**		**A00136089**		**A00136487**	
			COUNTY		**Walker**		**Grimes**		**Walker**		**Burleson**		**Burleson**		**Milam**	
			HIGHWAY		**IH 45**		**FM 149**		**FM 980**		**FM 1362**		**FM 1362**		**FM 487**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	666-6282	REF PROF PAV MRK TY I(W)4"(SLD)(060MIL)	LF	24,426.000		46,188.000		147,837.000		95,863.000		45,034.000		17,187.000	
	666-6287	REF PROF PAV MRK TY I(Y)4"(SLD)(090MIL)	LF	24,283.000		35,685.000		95,501.000		73,658.000		30,250.000		13,115.000	
	666-6291	REF PROF PAV MRK TY I(Y)4"(BRK)(090MIL)	LF			2,468.000		10,743.000		4,225.000		3,142.000		1,045.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF												
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	344.000				2,710.000							
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF					205.000							
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	344.000				1,271.000							
	672-6007	REFL PAV MRKR TY I-C	EA					7.000							
	672-6009	REFL PAV MRKR TY II-A-A	EA	63.000		116.000		352.000		226.000		107.000		43.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA												
	6056-6002	PREFORMED CENTERLINE RUMBLE STRIP	LF			83.000		1,338.000		746.000		332.000			
	6185-6002	TMA (STATIONARY)	DAY												
	6185-6005	TMA (MOBILE OPERATION)	DAY												
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK	LS												
	08	EROSION CONTROL MAINTENANCE (NON-PART)	LS												
		SAFETY CONTINGENCY (NON-PART)	LS												

QUANTITY SHEET

CONTROLLING PROJECT ID 0049-14-014

DISTRICT Bryan **COUNTY** Brazos, Burleson, Freestone, Grimes, Leon, Madison, Milam, Robertson, Walker, Waller, Washington

HIGHWAY FM 1119, FM 1362, FM 1365, FM 1367, FM 1375, FM 1449, FM 149, FM 1697, FM 1736, FM 1791, FM 2000, FM 2095, FM 2096, FM 2159, FM 2268, FM 2289, FM 244, FM 2539, FM 2865, FM 2979, FM 2988, FM 3061, FM 3242, FM 390, FM 437, FM 46, FM 486, FM 487, FM 489, FM 50, FM 979, FM 980, IH 45, SH 105, SH 179, SH 30, SS 59

			CONTROL SECTION JOB	**0944-01-028**		**1129-02-023**		**1210-01-016**		**1210-02-014**		**1210-03-033**		**1223-01-045**	
			PROJECT ID	**A00136328**		**A00136106**		**A00136495**		**A00136496**		**A00136488**		**A00136357**	
			COUNTY	**Grimes**		**Burleson**		**Robertson**		**Robertson**		**Milam**		**Leon**	
			HIGHWAY	**FM 2988**		**FM 2000**		**FM 979**		**FM 979**		**FM 979**		**FM 1119**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	666-6282	REF PROF PAV MRK TY I(W)4"(SLD)(060MIL)	LF	42,895.000		138,396.000		47,322.000		2,733.000		78,887.000		44,021.000	
	666-6287	REF PROF PAV MRK TY I(Y)4"(SLD)(090MIL)	LF	37,067.000				45,757.000		17,443.000		45,334.000		37,592.000	
	666-6291	REF PROF PAV MRK TY I(Y)4"(BRK)(090MIL)	LF	1,594.000				11,489.000		5,672.000		6,280.000		1,353.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF												
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF											8,202.000	
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF												
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF					5,910.000		3,040.000				8,438.000	
	672-6007	REFL PAV MRKR TY I-C	EA												
	672-6009	REFL PAV MRKR TY II-A-A	EA	116.000		315.000		239.000		109.000		176.000		130.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA												
	6056-6002	PREFORMED CENTERLINE RUMBLE STRIP	LF					2,039.000		1,097.000		1,132.000		81.000	
	6185-6002	TMA (STATIONARY)	DAY												
	6185-6005	TMA (MOBILE OPERATION)	DAY												
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK	LS												
	08	EROSION CONTROL MAINTENANCE (NON-PART)	LS												
		SAFETY CONTINGENCY (NON-PART)	LS												

QUANTITY SHEET

CONTROLLING PROJECT ID 0049-14-014

DISTRICT Bryan

COUNTY Brazos, Burleson, Freestone, Grimes, Leon, Madison, Milam, Robertson, Walker, Waller, Washington

HIGHWAY FM 1119, FM 1362, FM 1365, FM 1367, FM 1375, FM 1449, FM 149, FM 1697, FM 1736, FM 1791, FM 2000, FM 2095, FM 2096, FM 2159, FM 2268, FM 2289, FM 244, FM 2539, FM 2865, FM 2979, FM 2988, FM 3061, FM 3242, FM 390, FM 437, FM 46, FM 486, FM 487, FM 489, FM 50, FM 979, FM 980, IH 45, SH 105, SH 179, SH 30, SS 59

			CONTROL SECTION JOB		**1325-02-016**		**1326-02-022**		**1327-01-009**		**1402-01-038**		**1564-01-033**		**1564-01-034**	
			PROJECT ID		**A00136128**		**A00136129**		**A00136130**		**A00136747**		**A00136771**		**A00136772**	
			COUNTY		**Freestone**		**Freestone**		**Freestone**		**Walker**		**Washington**		**Washington**	
			HIGHWAY		**FM 489**		**FM 1365**		**FM 1367**		**FM 1375**		**FM 1697**		**FM 1697**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	666-6282	REF PROF PAV MRK TY I(W)4"(SLD)(060MIL)	LF	47,168.000		47,044.000				81,429.000		9,627.000		5,446.000	
	666-6287	REF PROF PAV MRK TY I(Y)4"(SLD)(090MIL)	LF	30,216.000		11,104.000		16,143.000		60,335.000		3,415.000		5,346.000	
	666-6291	REF PROF PAV MRK TY I(Y)4"(BRK)(090MIL)	LF	3,623.000		5,641.000		1,352.000		4,533.000		970.000			
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF												
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF			12,705.000								1,500.000	
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF			1,009.000									
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF			7,777.000								1,500.000	
	672-6007	REFL PAV MRKR TY I-C	EA												
	672-6009	REFL PAV MRKR TY II-A-A	EA	112.000		114.000		54.000		197.000		18.000		18.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA												
	6056-6002	PREFORMED CENTERLINE RUMBLE STRIP	LF	393.000		1,913.000		164.000		358.000		300.000			
	6185-6002	TMA (STATIONARY)	DAY												
	6185-6005	TMA (MOBILE OPERATION)	DAY												
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK	LS												
	08	EROSION CONTROL MAINTENANCE (NON-PART)	LS												
		SAFETY CONTINGENCY (NON-PART)	LS												

QUANTITY SHEET

CONTROLLING PROJECT ID 0049-14-014

DISTRICT Bryan **COUNTY** Brazos, Burleson, Freestone, Grimes, Leon, Madison, Milam, Robertson, Walker, Waller, Washington

HIGHWAY FM 1119, FM 1362, FM 1365, FM 1367, FM 1375, FM 1449, FM 149, FM 1697, FM 1736, FM 1791, FM 2000, FM 2095, FM 2096, FM 2159, FM 2268, FM 2289, FM 244, FM 2539, FM 2865, FM 2979, FM 2988, FM 3061, FM 3242, FM 390, FM 437, FM 46, FM 486, FM 487, FM 489, FM 50, FM 979, FM 980, IH 45, SH 105, SH 179, SH 30, SS 59

			CONTROL SECTION JOB	**1687-01-018**		**1706-01-033**		**1953-01-031**		**1954-01-015**		**2028-01-013**		**2029-01-015**	
			PROJECT ID	**A00136786**		**A00136748**		**A00136489**		**A00136497**		**A00136490**		**A00136498**	
			COUNTY	**Waller**		**Walker**		**Milam**		**Robertson**		**Milam**		**Robertson**	
			HIGHWAY	**FM 1736**		**FM 1791**		**FM 2095**		**FM 2096**		**FM 3242**		**FM 2159**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	666-6282	REF PROF PAV MRK TY I(W)4"(SLD)(060MIL)	LF	36,921.000		26,832.000		71,307.000		106,998.000		77,360.000		342.000	
	666-6287	REF PROF PAV MRK TY I(Y)4"(SLD)(090MIL)	LF	30,284.000		14,922.000		49,498.000		79,275.000		48,895.000		55,903.000	
	666-6291	REF PROF PAV MRK TY I(Y)4"(BRK)(090MIL)	LF	1,198.000		2,785.000		3,982.000		6,292.000		6,322.000		6,702.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF												
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF					1,917.000							
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF					126.000							
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF					1,209.000							
	672-6007	REFL PAV MRKR TY I-C	EA			6.000									
	672-6009	REFL PAV MRKR TY II-A-A	EA	89.000		59.000		168.000		261.000		184.000		206.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA												
	6056-6002	PREFORMED CENTERLINE RUMBLE STRIP	LF	200.000		448.000		768.000		344.000		494.000		867.000	
	6185-6002	TMA (STATIONARY)	DAY												
	6185-6005	TMA (MOBILE OPERATION)	DAY												
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK	LS												
	08	EROSION CONTROL MAINTENANCE (NON-PART)	LS												
		SAFETY CONTINGENCY (NON-PART)	LS												

QUANTITY SHEET

CONTROLLING PROJECT ID 0049-14-014

DISTRICT Bryan **COUNTY** Brazos, Burleson, Freestone, Grimes, Leon, Madison, Milam, Robertson, Walker, Waller, Washington

HIGHWAY FM 1119, FM 1362, FM 1365, FM 1367, FM 1375, FM 1449, FM 149, FM 1697, FM 1736, FM 1791, FM 2000, FM 2095, FM 2096, FM 2159, FM 2268, FM 2289, FM 244, FM 2539, FM 2865, FM 2979, FM 2988, FM 3061, FM 3242, FM 390, FM 437, FM 46, FM 486, FM 487, FM 489, FM 50, FM 979, FM 980, IH 45, SH 105, SH 179, SH 30, SS 59

			CONTROL SECTION JOB		**2132-01-013**		**2134-01-030**		**2136-03-008**		**2237-01-012**		**2439-01-009**		**2830-02-013**	
			PROJECT ID		**A00136361**		**A00136499**		**A00136491**		**A00136492**		**A00136358**		**A00136774**	
			COUNTY		**Madison**		**Robertson**		**Milam**		**Milam**		**Leon**		**Washington**	
			HIGHWAY		**FM 2289**		**FM 979**		**FM 2268**		**FM 979**		**FM 2539**		**FM 1697**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	666-6282	REF PROF PAV MRK TY I(W)4"(SLD)(060MIL)	LF	109,672.000		54,127.000		15,620.000		34,662.000		20,402.000		69,523.000	
	666-6287	REF PROF PAV MRK TY I(Y)4"(SLD)(090MIL)	LF	47,923.000		37,619.000		13,563.000		12,400.000		10,864.000		50,614.000	
	666-6291	REF PROF PAV MRK TY I(Y)4"(BRK)(090MIL)	LF	9,973.000		3,813.000		547.000		3,543.000		2,201.000		4,188.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF												
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF												
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF												
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF												
	672-6007	REFL PAV MRKR TY I-C	EA												
	672-6009	REFL PAV MRKR TY II-A-A	EA	220.000		132.000		39.000		66.000		49.000		169.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA												
	6056-6002	PREFORMED CENTERLINE RUMBLE STRIP	LF	2,782.000		179.000				1,039.000		104.000		292.000	
	6185-6002	TMA (STATIONARY)	DAY												
	6185-6005	TMA (MOBILE OPERATION)	DAY												
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK	LS												
	08	EROSION CONTROL MAINTENANCE (NON-PART)	LS												
		SAFETY CONTINGENCY (NON-PART)	LS												

QUANTITY SHEET

CONTROLLING PROJECT ID 0049-14-014

DISTRICT Bryan

COUNTY Brazos, Burleson, Freestone, Grimes, Leon, Madison, Milam, Robertson, Walker, Waller, Washington

HIGHWAY FM 1119, FM 1362, FM 1365, FM 1367, FM 1375, FM 1449, FM 149, FM 1697, FM 1736, FM 1791, FM 2000, FM 2095, FM 2096, FM 2159, FM 2268, FM 2289, FM 244, FM 2539, FM 2865, FM 2979, FM 2988, FM 3061, FM 3242, FM 390, FM 437, FM 46, FM 486, FM 487, FM 489, FM 50, FM 979, FM 980, IH 45, SH 105, SH 179, SH 30, SS 59

			CONTROL SECTION JOB		**3051-01-009**		**3177-01-011**		**3303-01-010**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00136806**		**A00136348**		**A00136363**			
			COUNTY		**Waller**		**Grimes**		**Madison**			
			HIGHWAY		**FM 2979**		**FM 244**		**FM 2865**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL			
	500-6001	MOBILIZATION	LS							100.00%		
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO							5.000		
	666-6282	REF PROF PAV MRK TY I(W)4"(SLD)(060MIL)	LF	25,429.000		57,339.000		26,254.000		2,797,377.000		
	666-6287	REF PROF PAV MRK TY I(Y)4"(SLD)(090MIL)	LF	14,901.000		32,908.000		17,776.000		1,745,306.000		
	666-6291	REF PROF PAV MRK TY I(Y)4"(BRK)(090MIL)	LF	2,207.000		5,069.000		1,291.000		222,189.000		
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF							19,279.000		
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF							200,362.000		
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF							43,981.000		
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF							198,496.000		
	672-6007	REFL PAV MRKR TY I-C	EA							377.000		
	672-6009	REFL PAV MRKR TY II-A-A	EA	59.000		135.000		57.000		7,745.000		
	672-6010	REFL PAV MRKR TY II-C-R	EA							201.000		
	6056-6002	PREFORMED CENTERLINE RUMBLE STRIP	LF	368.000		564.000		414.000		39,148.000		
	6185-6002	TMA (STATIONARY)	DAY							105.000		
	6185-6005	TMA (MOBILE OPERATION)	DAY							262.000		
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK	LS							1.000		
	08	EROSION CONTROL MAINTENANCE (NON-PART)	LS							1.000		
		SAFETY CONTINGENCY (NON-PART)	LS							1.000		

SUMMARY OF QUANTITIES

COUNTY	ITEM 666							ITEM 672			ITEM 6056
	6300	6303	6312	6315	6282	6287	6291	6007	6009	6010	6002
	RE PM W/RET REQ TY I (W) 4" (BRK)	RE PM W/RET REQ TY I (W) 4" (SLD)	RE PM W/RET REQ TY I (Y) 4" (BRK)	RE PM W/RET REQ TY I (Y) 4" (SLD)	REF PROF PAV MRK TY I (W) 4" (SLD)	REF PROF PAV MRK TY I (Y) 4" (SLD)	REF PROF PAV MRK TY I (Y) 4" (BRK)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	PREFORMED CENTERLINE RUMBLE STRIP
	(100 MIL)	(100 MIL)	(100 MIL)	(100 MIL)	(60 MIL)	(90 MIL)	(90 MIL)				
	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF
BRAZOS (21)					49,233	19,022	5,134		97		1,278
BURLESON (026)	1,301				516,798	170,751	32,783	55	1,063		10,285
FREESTONE (082)		86,762	34,538	33,888	94,212	57,463	10,616		496		2,470
GRIMES (094)		7,489	540	4,768	292,374	195,413	19,623	8	726		2,282
LEON (145)		72,677	6,610	109,748	64,423	48,456	3,554		507		185
MADISON (154)		7,501		7,501	201,336	99,536	16,394		496		4,588
MILAM (166)		1,917	126	1,209	460,625	267,395	37,039	7	1,039		6,259
ROBERTSON (198)		13,443	1,587	23,785	383,814	359,294	43,720	3	1,407		5,389
WALKER (236)	11,523	5,070	542	7,893	315,915	224,078	18,644	214	847	201	2,144
WASHINGTON (239)	6,455	5,503	38	9,704	356,297	258,713	31,277	90	919		3,700
WALLER					62,350	45,185	3,405		148		568
BASE BID TOTAL	**19,279**	**200,362**	**43,981**	**198,496**	**2,797,377**	**1,745,306**	**222,189**	**377**	**7,745**	**201**	**39,148**

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX

FILENAME: G:\00491401\Design\SUMMARY OF QUANTITIE SHEETS\SUMMARY OF QUANTITIES.dgn

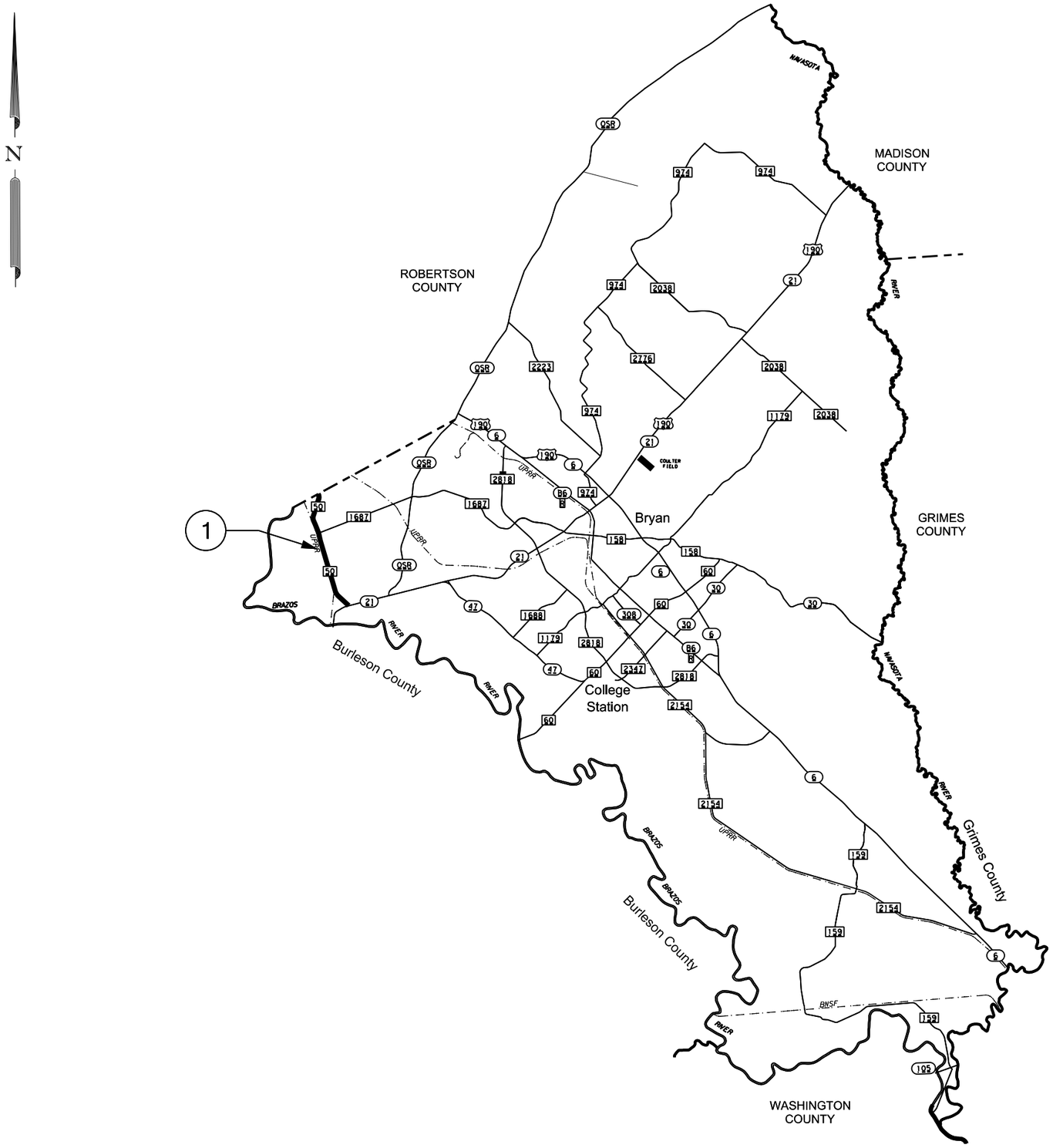
PRINT DATE	REVISION DATE
05/24/2021	

Texas Department of Transportation
Bryan District

SUMMARY OF QUANTITIES

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	ROBERTSON, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	6



BRAZOS COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
1	FM 50	0648-02-021

Drawings Not To Scale

PRINT DATE	REVISION DATE
02/24/2021	

Texas Department of Transportation
Bryan District

PROJECT LOCATION MAP
BRAZOS COUNTY

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	7

REV DATE: 2-12-2015
CSJ: 0049-14-013

FILENAME: $FILE$

PAVEMENT MARKINGS AND MARKERS SUMMARY

LOCATION NUMBER	CSJ	COUNTY	HIGHWAY	PROJECT LIMITS		HIGHWAY TYPE	TYPE OF EDGELINE RUMBLE STRIPS	TYPE OF CENTERLINE RUMBLE STRIPS	ITEM 666							ITEM 672			ITEM 6056	REMARKS
									6300	6303	6312	6315	6282	6287	6291	6007	6009	6010	6002	
									RE PM W/RET REQ TY I (W) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (W) 4" (SLD) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (SLD) (100 MIL)	REF PROF PAV MRK TY I (W) 4" (SLD) (60 MIL)	REF PROF PAV MRK TY I (Y) 4" (SLD) (90 MIL)	REF PROF PAV MRK TY I (Y) 4" (BRK) (90 MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	PREFORMED CENTERLINE RUMBLE STRIP	
				FROM	TO		(1)	(1)	(2)	(3)	(3)	(3)	(4)	(4)	(4)	(5)	(5)	(5)		
									LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF	
1	0648-02-021	BRAZOS	FM 50	ROBERTSON COUNTY LINE	SH 21	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					49,233	19,022	5,134		97		1,278	
								TOTAL	**0**	**0**	**0**	**0**	**49,233**	**19,022**	**5,134**	**0**	**97**	**0**	**1,278**	

NOTES

(1) Refer to rumble strip standards: RS(1)-13 through RS(4)-13.

(2) Retrace all white skips (W BRK) with item 666-6300.

(3) For sections with speed limits 45 mph or less, retrace white edgeline with item 666-6303, and yellow centerline with items: 666-6312 and 666-6315.

(4) For sections with speed limits higher than 45 mph, retrace white edgeline with item 666-6282, and yellow centerline with items: 666-6287 and 666-6291.

(5) This value represents the estimated amount of missing raised pavement markers (RPMs) to be replaced. Place the new RPMs only where the existing RPM is missing or damaged. This quantity is 20% of the total amount of existing RPMs (an estimated 20% loss).

PRINT DATE	REVISION DATE
02/26/2021	

Texas Department of Transportation
Bryan District

SUMMARY OF QUANTITIES (BRAZOS COUNTY)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY
TEXAS	BRYAN	ROBERTSON, ETC.

CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	8

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
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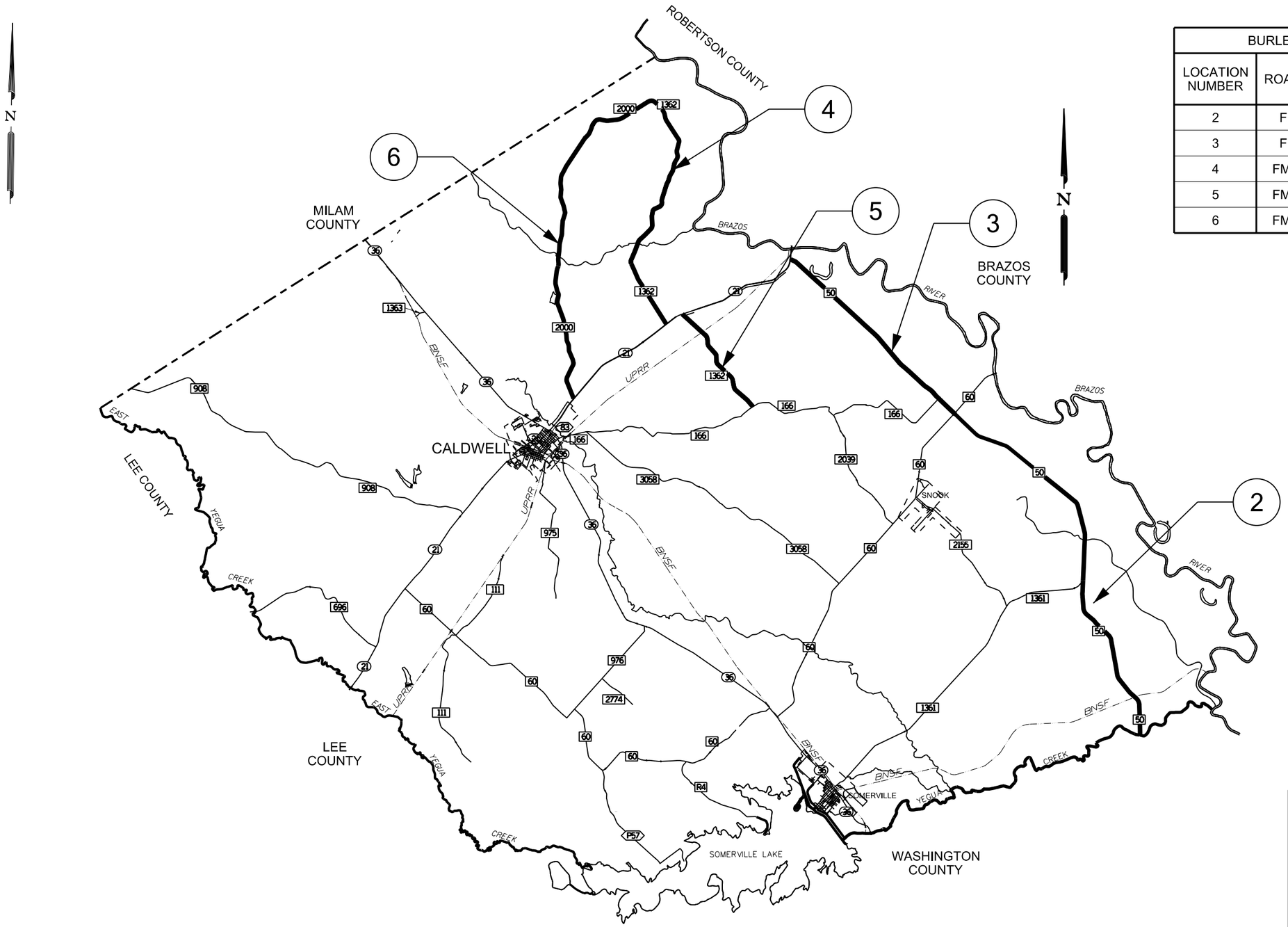
BURLESON COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
2	FM 50	0457-01-066
3	FM 50	0648-03-073
4	FM 1362	0833-11-035
5	FM 1362	0833-12-023
6	FM 2000	1129-02-023



Drawings Not To Scale

PRINT DATE	REVISION DATE
02/24/2021	

Texas Department of Transportation
Bryan District
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PROJECT LOCATION MAP
BURLESON COUNTY

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	9

REV DATE: 2-12-2015
CSJ: 0049-14-014
FILENAME: $FILE$

PAVEMENT MARKINGS AND MARKERS SUMMARY

LOCATION NUMBER	CSJ	COUNTY	HIGHWAY	PROJECT LIMITS		HIGHWAY TYPE	TYPE OF EDGELINE RUMBLE STRIPS	TYPE OF CENTERLINE RUMBLE STRIPS	ITEM 666							ITEM 672			ITEM 6056	REMARKS
									6300	6303	6312	6315	6282	6287	6291	6007	6009	6010	6002	
									RE PM W/RET REQ TY I (W) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (W) 4" (SLD) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (SLD) (100 MIL)	REF PROF PAV MRK TY I (W) 4" (SLD) (60 MIL)	REF PROF PAV MRK TY I (Y) 4" (SLD) (90 MIL)	REF PROF PAV MRK TY I (Y) 4" (BRK) (90 MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	PREFORMED CENTERLINE RUMBLE STRIP	
				FROM	TO		(1)	(1)	(2)	(3)	(3)	(3)	(4)	(4)	(4)	(5)	(5)	(5)		
									LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF	
2	0457-01-066	BURLESON	FM 50	FM 60	Washington County Line	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4	1,301				152,449	48,718	15,792	55	276		5,422	
3	0648-03-073	BURLESON	FM 50	SH 21	FM 60	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					85,056	18,125	9,624		139		3,785	
4	0833-11-035	BURLESON	FM 1362	FM 2000	SH 21	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					95,863	73,658	4,225		226		746	
5	0833-12-023	BURLESON	FM 1362	SH 21	FM 166	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					45,034	30,250	3,142		107		332	
6	* 1129-02-023	BURLESON	FM 2000	FM 1362	SH 21	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	N/A					138,396				315			
								TOTAL	**1,301**	**0**	**0**	**0**	**516,798**	**170,751**	**32,783**	**55**	**1,063**	**0**	**10,285**	

* THIS CSJ INCLUDES EDGELINE PROFILE MARKINGS ONLY. CENTERLINE PROFILE MARKINGS TO BE PLACED BY CSJ 1129-02-019, MARCH 2021 LETTING

NOTES

(1) Refer to rumble strip standards: RS(1)-13 through RS(4)-13.

(2) Retrace all white skips (W BRK) with item 666-6300.

(3) For sections with speed limits 45 mph or less, retrace white edgeline with item 666-6303, and yellow centerline with items: 666-6312 and 666-6315.

(4) For sections with speed limits higher than 45 mph, retrace white edgeline with item 666-6282, and yellow centerline with items: 666-6287 and 666-6291.

(5) This value represents the estimated amount of missing raised pavement markers (RPMs) to be replaced. Place the new RPMs only where the existing RPM is missing. This quantity is 20% of the total amount of existing RPMs (an estimated 20% loss).

PRINT DATE	REVISION DATE
02/26/2021	

Texas Department of Transportation
Bryan District

SUMMARY OF QUANTITIES (BURLESON COUNTY)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY
TEXAS	BRYAN	ROBERTSON, ETC.

CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	10

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
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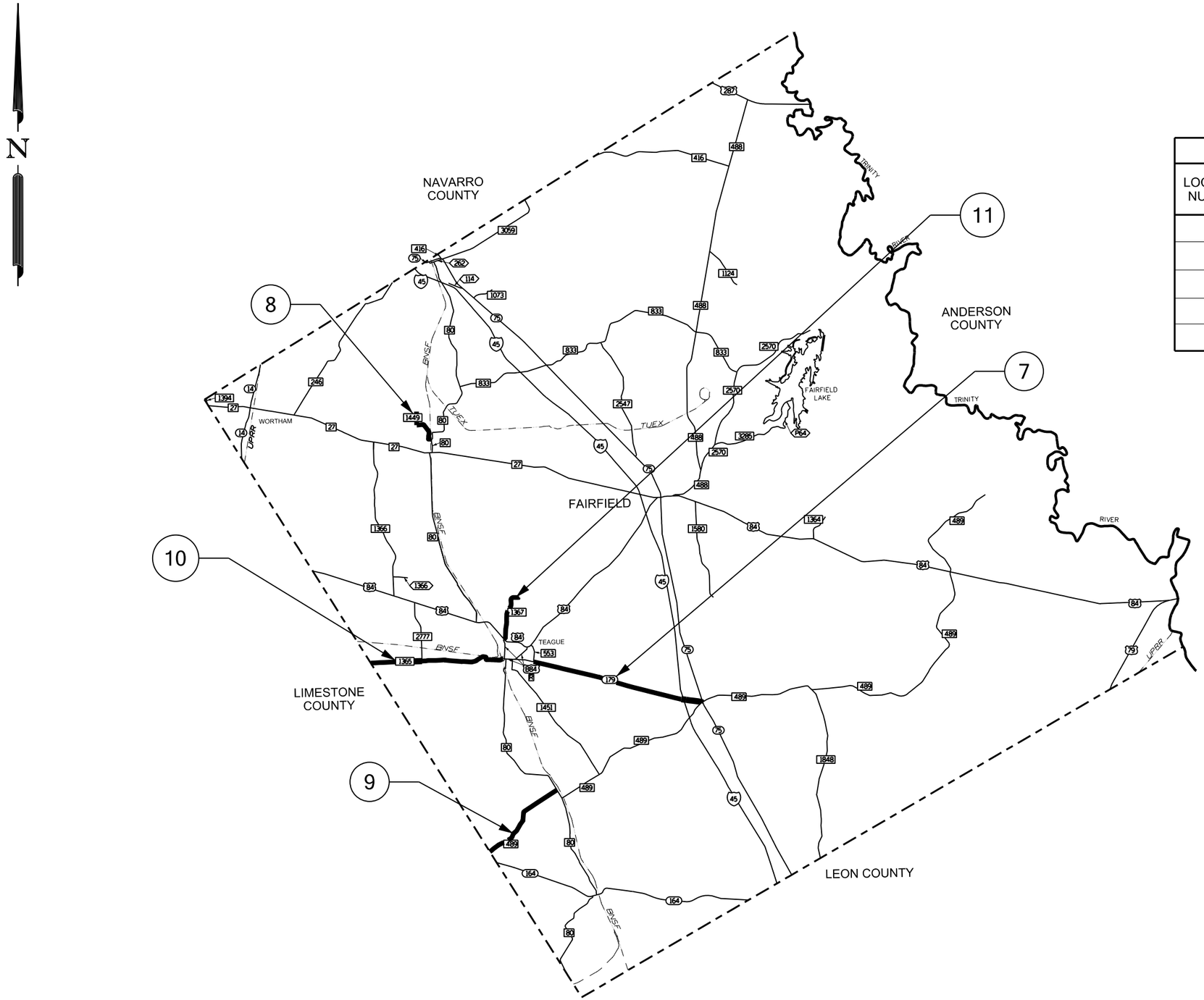


FREESTONE COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
7	SH 179	0426-01-013
8	FM 1449	0456-03-021
9	FM 489	1325-02-016
10	FM 1365	1326-02-022
11	FM 1367	1327-01-009

Drawings Not To Scale

PRINT DATE	REVISION DATE
2/24/2021	

Texas Department of Transportation
Bryan District

PROJECT LOCATION MAP
FREESTONE COUNTY

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		FM 46, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	ROBERTSON, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	11

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: $FILE$

PAVEMENT MARKINGS AND MARKERS SUMMARY

LOCATION NUMBER	CSJ	COUNTY	HIGHWAY	PROJECT LIMITS		HIGHWAY TYPE	TYPE OF EDGELINE RUMBLE STRIPS	TYPE OF CENTERLINE RUMBLE STRIPS	ITEM 666							ITEM 672			ITEM 6056	REMARKS
									6300	6303	6312	6315	6282	6287	6291	6007	6009	6010	6002	
									RE PM W/RET REQ TY I (W) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (W) 4" (SLD) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (SLD) (100 MIL)	REF PROF PAV MRK TY I (W) 4" (SLD) (60 MIL)	REF PROF PAV MRK TY I (Y) 4" (SLD) (90 MIL)	REF PROF PAV MRK TY I (Y) 4" (BRK) (90 MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	PREFORMED CENTERLINE RUMBLE STRIP	
				FROM	TO		(1)	(1)	(2)	(3)	(3)	(3)	(4)	(4)	(4)	(5)	(5)	(5)		
									LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF	
7	0426-01-013	FREESTONE	SH 179	FM 553	SH 75 (FM 489)	TWO LANE, TWO WAY	N/A	N/A		74,057	33,529	8,321					171			EXISTING MILLED RUMBLE STRIPS
8	0456-03-021	FREESTONE	FM 1449	FM 80	1.7 Mi W of FM 80	TWO LANE, TWO WAY	N/A	N/A				17,790					45			
9	1325-02-016	FREESTONE	FM 489	Limestone County Line (SH 164)	FM 80	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					47,168	30,216	3,623		112		393	
10	1326-02-022	FREESTONE	FM 1365	Limestone County Line	BU 84-R	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4		12,705	1,009	7,777	47,044	11,104	5,641		114		1,913	
11	1327-01-009	FREESTONE	FM 1367	End of State Maintenance	US 84	TWO LANE, TWO WAY	N/A	RS(3)-13 OPTION 4						16,143	1,352		54		164	
								TOTAL	**0**	**86,762**	**34,538**	**33,888**	**94,212**	**57,463**	**10,616**	**0**	**496**	**0**	**2,470**	

NOTES

(1) Refer to rumble strip standards: RS(1)-13 through RS(4)-13.

(2) Retrace all white skips (W BRK) with item 666-6300.

(3) For sections with speed limits 45 mph or less, retrace white edgeline with item 666-6303, and yellow centerline with items: 666-6312 and 666-6315.

(4) For sections with speed limits higher than 45 mph, retrace white edgeline with item 666-6282, and yellow centerline with items: 666-6287 and 666-6291.

(5) This value represents the estimated amount of missing raised pavement markers (RPMs) to be replaced. Place the new RPMs only where the existing RPM is missing. This quantity is 20% of the total amount of existing RPMs (an estimated 20% loss).

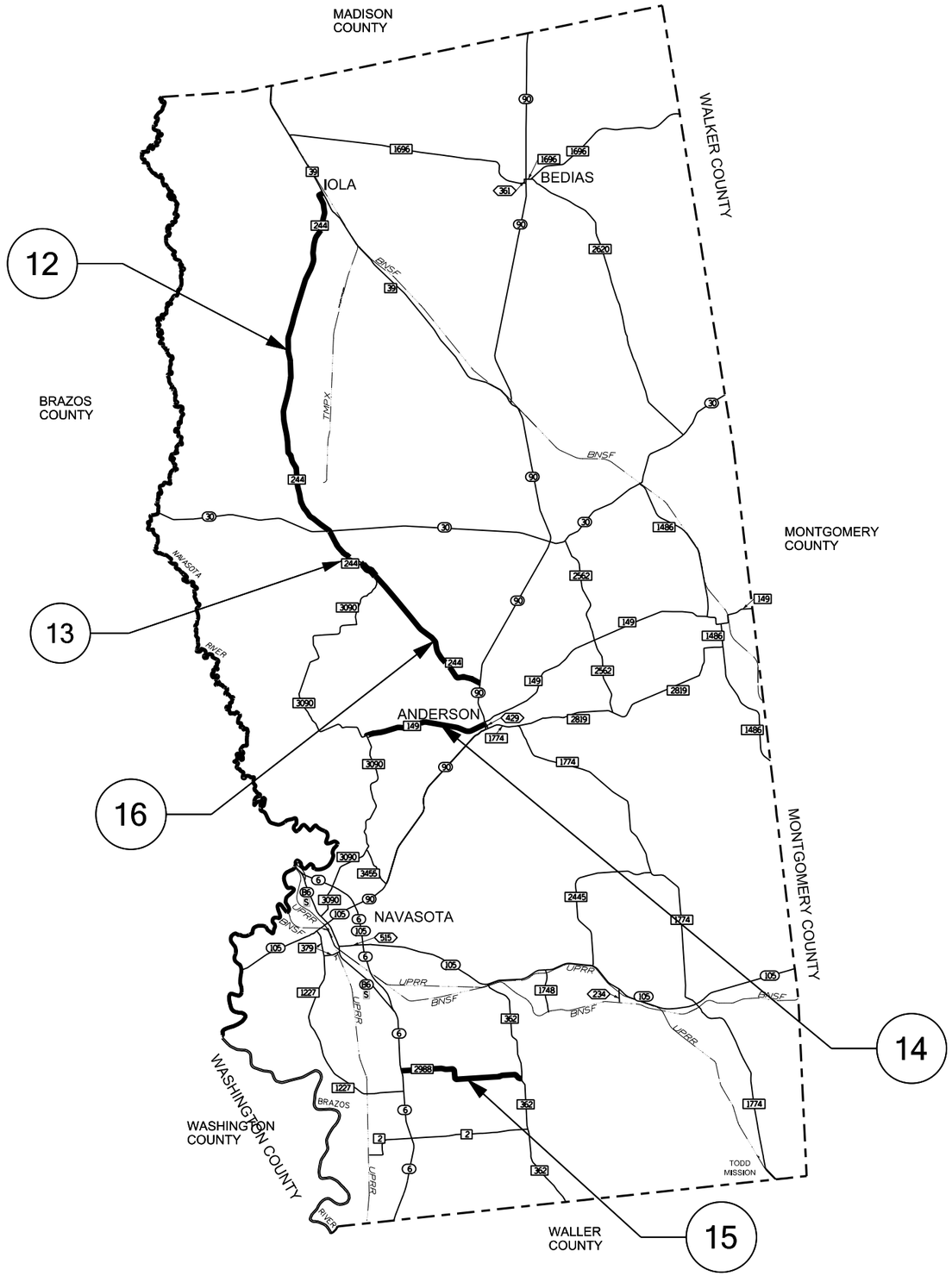
REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: G:\00491\4\01\Design\Freestone\SUMMARY OF QUANTITIES (FREESTONE COUNTY).dgn

PRINT DATE	REVISION DATE
05/13/2021	

Texas Department of Transportation
Bryan District

SUMMARY OF QUANTITIES (FREESTONE COUNTY)

FED. RD. DIV. NO.	PROJECT NUMBER		HIGHWAY NUMBER
6			FM 46, ETC.
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	ROBERTSON, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	12



GRIMES COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
12	FM 244	0643-04-036
13	FM 244	0643-05-061
14	FM 149	0720-04-012
15	FM 2988	0944-01-028
16	FM 244	3177-01-011

Drawings Not To Scale

PRINT DATE	REVISION DATE
02/24/2021	

Texas Department of Transportation
Bryan District

PROJECT LOCATION MAP GRIMES COUNTY

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON, ETC.

CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	13

REV DATE: 2-12-2015
CSJ: 0049-14-013
FILENAME: $FILES

PAVEMENT MARKINGS AND MARKERS SUMMARY

LOCATION NUMBER	CSJ	COUNTY	HIGHWAY	PROJECT LIMITS		HIGHWAY TYPE	TYPE OF EDGELINE RUMBLE STRIPS	TYPE OF CENTERLINE RUMBLE STRIPS	ITEM 666							ITEM 672			ITEM 6056	REMARKS
									6300	6303	6312	6315	6282	6287	6291	6007	6009	6010	6002	
									RE PM W/RET REQ TY I (W) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (W) 4" (SLD) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (SLD) (100 MIL)	REF PROF PAV MRK TY I (W) 4" (SLD) (60 MIL)	REF PROF PAV MRK TY I (Y) 4" (SLD) (90 MIL)	REF PROF PAV MRK TY I (Y) 4" (BRK) (90 MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	PREFORMED CENTERLINE RUMBLE STRIP	
				FROM	TO		(1)	(1)	(2)	(3)	(3)	(3)	(4)	(4)	(4)	(5)	(5)	(5)		
									LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF	
12	0643-04-036	GRIMES	FM 244	FM 39	SH 30	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4		7,489	540	4,768	129,426	76,444	10,492	8	311		1,635	
13	0643-05-061	GRIMES	FM 244	SH 30	FM 3090	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					16,526	13,309			50			
14	0720-04-012	GRIMES	FM 149	FM 3090	SH 90	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					46,188	35,685	2,468		116		83	
15	0944-01-028	GRIMES	FM 2988	SH 6	FM 362	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					42,895	37,067	1,594		116			
16	3177-01-011	GRIMES	FM 244	FM 3090	SH 90	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					57,339	32,908	5,069		135		564	
								TOTAL	**0**	**7,489**	**540**	**4,768**	**292,374**	**195,413**	**19,623**	**8**	**726**	**0**	**2,282**	

NOTES

(1) Refer to rumble strip standards: RS(1)-13 through RS(4)-13.

(2) Retrace all white skips (W BRK) with item 666-6300.

(3) For sections with speed limits 45 mph or less, retrace white edgeline with item 666-6303, and yellow centerline with items: 666-6312 and 666-6315.

(4) For sections with speed limits higher than 45 mph, retrace white edgeline with item 666-6282, and yellow centerline with items: 666-6287 and 666-6291.

(5) This value represents the estimated amount of missing raised pavement markers (RPMs) to be replaced. Place the new RPMs only where the existing RPM is missing. This quantity is 20% of the total amount of existing RPMs (an estimated 20% loss).

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: G:\00491401\01\Design\Grimes\SUMMARY OF QUANTITIES (GRIMES COUNTY).dgn

PRINT DATE	REVISION DATE
02/21/2021	

Texas Department of Transportation
Bryan District

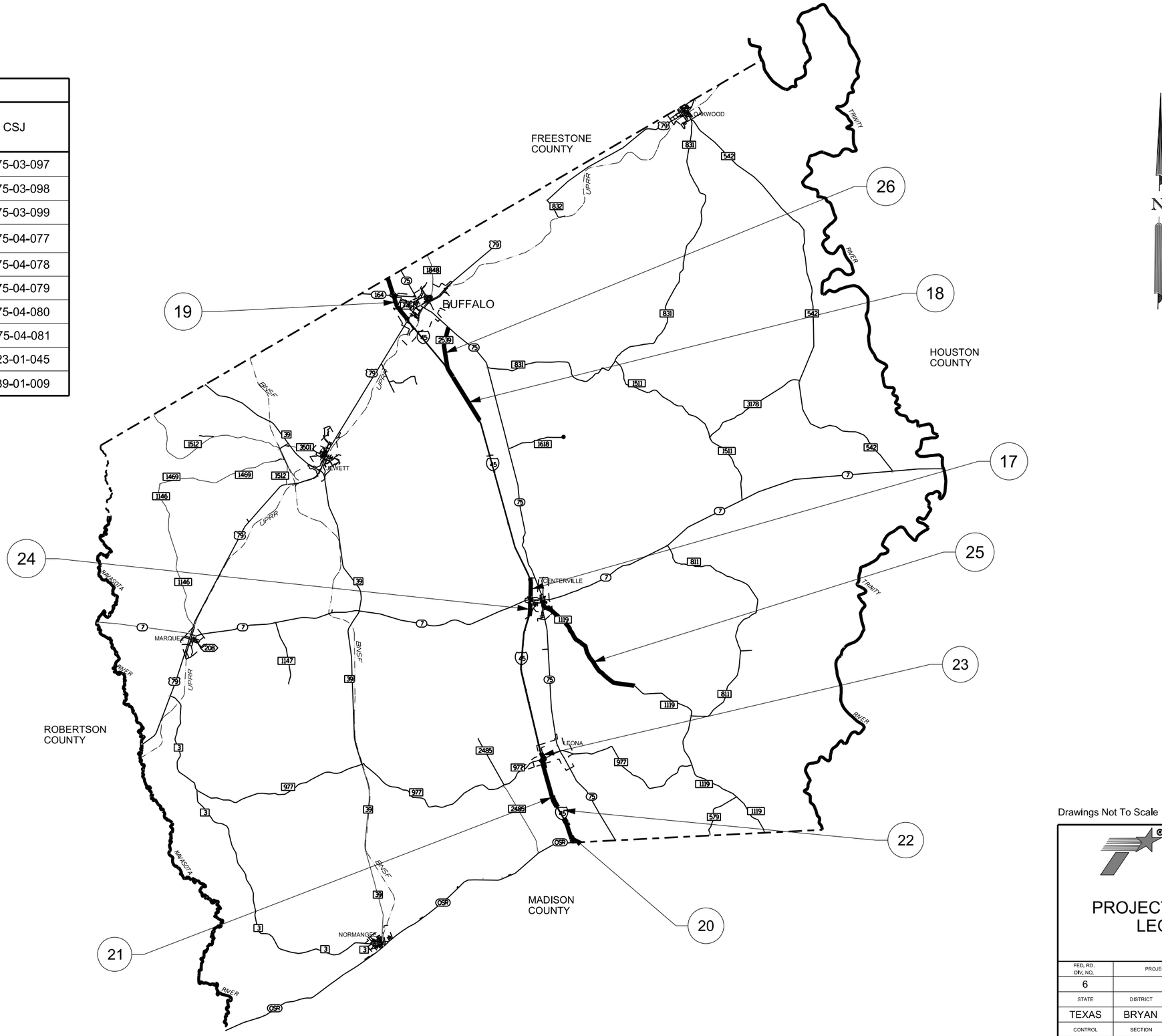
SUMMARY OF QUANTITIES (GRIMES COUNTY)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY
TEXAS	BRYAN	ROBERTSON, ETC.

CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	14

LEON COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
17	IH 45 EFR	0675-03-097
18	IH 45 EFR	0675-03-098
19	IH 45 EFR	0675-03-099
20	IH 45 EFR	0675-04-077
21	IH 45 WFR	0675-04-078
22	IH 45 EFR	0675-04-079
23	IH 45 EFR	0675-04-080
24	IH 45 EFR	0675-04-081
25	FM 1119	1223-01-045
26	FM 2539	2439-01-009



Drawings Not To Scale

PRINT DATE	REVISION DATE
02/24/2021	

Texas Department of Transportation
Bryan District

PROJECT LOCATION MAP
LEON COUNTY

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46. ETC.
STATE	DISTRICT	COUNTY
TEXAS	BRYAN	ROBERTSON, ETC.
CONTROL	SECTION	JOB / SHEET NO.
0049	14	014, ETC. / 15

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: $FILE$

PAVEMENT MARKINGS AND MARKERS SUMMARY

LOCATION NUMBER	CSJ	COUNTY	HIGHWAY	PROJECT LIMITS		HIGHWAY TYPE	TYPE OF EDGELINE RUMBLE STRIPS	TYPE OF CENTERLINE RUMBLE STRIPS	ITEM 666							ITEM 672			ITEM 6056	REMARKS
									6300	6303	6312	6315	6282	6287	6291	6007	6009	6010	6002	
				FROM	TO		(1)	(1)	RE PM W/RET REQ TY I (W) 4" (BRK) (100 MIL) (2)	RE PM W/RET REQ TY I (W) 4" (SLD) (100 MIL) (3)	RE PM W/RET REQ TY I (Y) 4" (BRK) (100 MIL) (3)	RE PM W/RET REQ TY I (Y) 4" (SLD) (100 MIL) (3)	REF PROF PAV MRK TY I (W) 4" (SLD) (60 MIL) (4)	REF PROF PAV MRK TY I (Y) 4" (SLD) (90 MIL) (4)	REF PROF PAV MRK TY I (Y) 4" (BRK) (90 MIL) (4)	REFL PAV MRKR TY I-C (5)	REFL PAV MRKR TY II-A-A (5)	REFL PAV MRKR TY II-C-R (5)	PREFORMED CENTERLINE RUMBLE STRIP	
									LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF	
17	0675-03-097	LEON	IH 45 EFR	SH 7	End of State Maintenance (1.0 Mi N of SH 7)	TWO LANE, TWO WAY	N/A	N/A		10,832		10,832					27			
18	0675-03-098	LEON	IH 45 EFR	2.4 Mi S of FM 2593	FM 2539	TWO LANE, TWO WAY	N/A	N/A			1,766	22,258					74			
19	0675-03-099	LEON	IH 45 EFR	US 79	Freestone County Line	TWO LANE, TWO WAY	N/A	N/A		13,833		21,540					54			
20	0675-04-077	LEON	IH 45 EFR	OSR	0.3 Mi N of OSR	TWO LANE, TWO WAY	N/A	N/A		1,471		1,471					7			
21	0675-04-078	LEON	IH 45 WFR	Madison County Line	FM 977	TWO LANE, TWO WAY	N/A	N/A		26,856	4,363	16,245					85			
22	0675-04-079	LEON	IH 45 EFR	0.9 Mi N of OSR	2.25 Mi N of OSR (CR 401)	TWO LANE, TWO WAY	N/A	N/A				16,580					41			
23	0675-04-080	LEON	IH 45 EFR	1.5 Mi S of FM 977	0.3 Mi N of FM 977	TWO LANE, TWO WAY	N/A	N/A		3,733	481	4,634					20			
24	0675-04-081	LEON	IH 45 EFR	0.75 Mi S of SH 7 (End of Maintenance)	SH 7	TWO LANE, TWO WAY	N/A	N/A		7,750		7,750					19			
25	1223-01-045	LEON	FM 1119	SH 7	5.0 Mi S of SH 7	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4		8,202		8,438	44,021	37,592	1,353		130		81	
26	2439-01-009	LEON	FM 2539	SH 75	1.96 Mi W of SH 75	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					20,402	10,864	2,201		49		104	
								TOTAL	**0**	**72,677**	**6,610**	**109,748**	**64,423**	**48,456**	**3,554**	**0**	**507**	**0**	**185**	

NOTES

(1) Refer to rumble strip standards: RS(1)-13 through RS(4)-13.

(2) Retrace all white skips (W BRK) with item 666-6300.

(3) For sections with speed limits 45 mph or less, retrace white edgeline with item 666-6303, and yellow centerline with items: 666-6312 and 666-6315.

(4) For sections with speed limits higher than 45 mph, retrace white edgeline with item 666-6282, and yellow centerline with items: 666-6287 and 666-6291.

(5) This value represents the estimated amount of missing raised pavement markers (RPMs) to be replaced. Place the new RPMs only where the existing RPM is missing. This quantity is 20% of the total amount of existing RPMs (an estimated 20% loss).

PRINT DATE	REVISION DATE
02/26/2021	

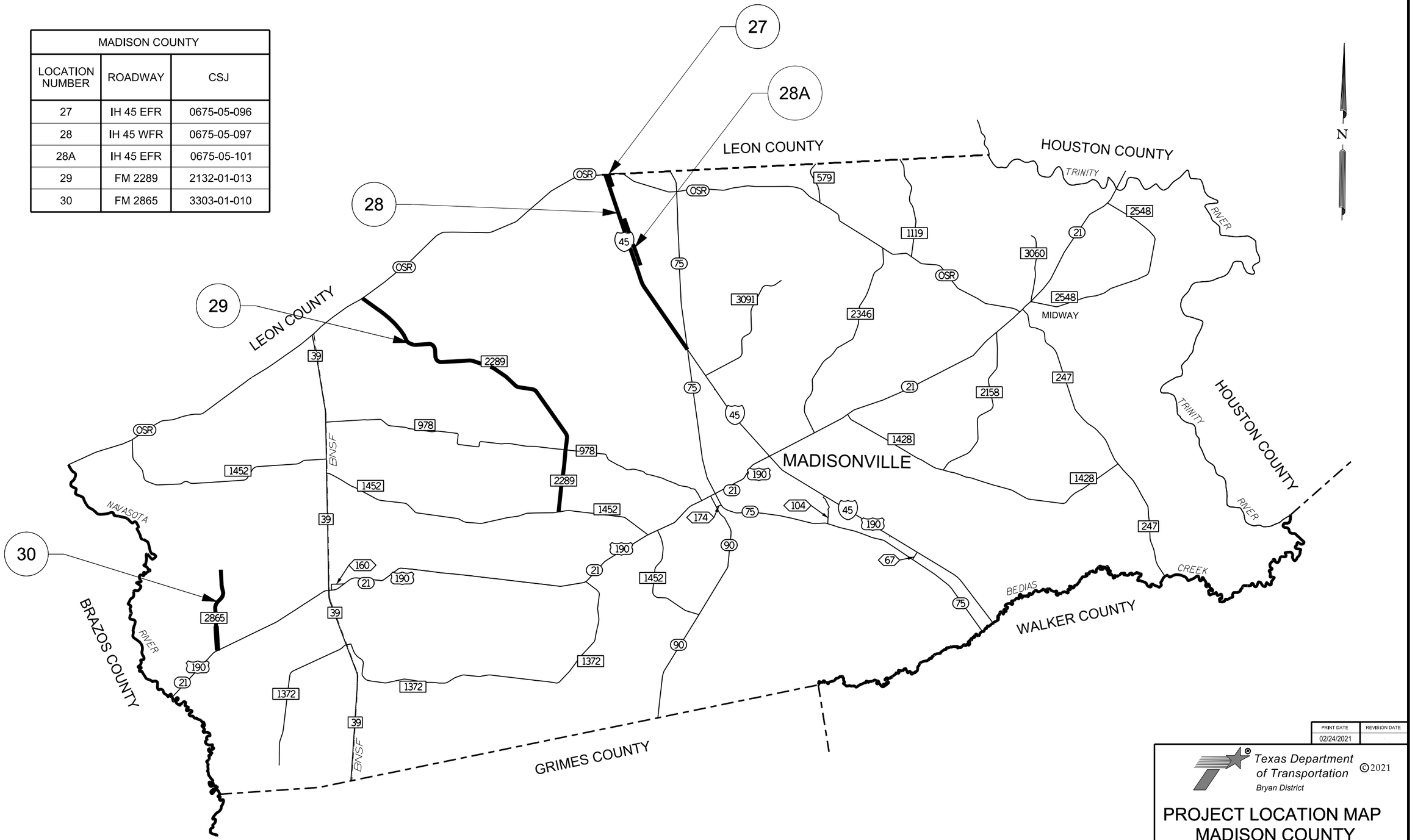
Texas Department of Transportation
Bryan District

SUMMARY OF QUANTITIES (LEON COUNTY)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.
STATE	DISTRICT	COUNTY
TEXAS	BRYAN	ROBERTSON, ETC.
CONTROL	SECTION	JOB / SHEET NO.
0049	14	014, ETC. / 16

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: G:\0049\14\014\Design\Leon\SUMMARY OF QUANTITIES (LEON COUNTY).dgn

MADISON COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
27	IH 45 EFR	0675-05-096
28	IH 45 WFR	0675-05-097
28A	IH 45 EFR	0675-05-101
29	FM 2289	2132-01-013
30	FM 2865	3303-01-010



PRINT DATE	REVISION DATE
02/24/2021	

Texas Department of Transportation
Bryan District

PROJECT LOCATION MAP
MADISON COUNTY

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.
STATE	DISTRICT	COUNTY
TEXAS	BRYAN	ROBERTSON, ETC.
CONTROL	SECTION	JOB / SHEET NO.
0049	14	014, ETC. / 17

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: $FILES

PAVEMENT MARKINGS AND MARKERS SUMMARY

LOCATION NUMBER	CSJ	COUNTY	HIGHWAY	PROJECT LIMITS		HIGHWAY TYPE	TYPE OF EDGELINE RUMBLE STRIPS	TYPE OF CENTERLINE RUMBLE STRIPS	ITEM 666							ITEM 672			ITEM 6056	REMARKS
									6300	6303	6312	6315	6282	6287	6291	6007	6009	6010	6002	
									RE PM W/RET REQ TY I (W) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (W) 4" (SLD) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (SLD) (100 MIL)	REF PROF PAV MRK TY I (W) 4" (SLD) (60 MIL)	REF PROF PAV MRK TY I (Y) 4" (SLD) (90 MIL)	REF PROF PAV MRK TY I (Y) 4" (BRK) (90 MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	PREFORMED CENTERLINE RUMBLE STRIP	
				FROM	TO		(1)	(1)	(2)	(3)	(3)	(3)	(4)	(4)	(4)	(5)	(5)	(5)		
									LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF	
27	0675-05-096	MADISON	IH 45 EFR	0.2 Mi S of OSR	OSR	ONE LANE, ONE WAY	N/A	N/A		1,007		1,007								
28	0675-05-097	MADISON	IH 45 WFR	SH 75	OSR	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					65,410	33,837	5,130		137		1,392	
28A	0675-05-101	MADISON	IH 45 EFR	0.25 Mi S of Hendrix Ln.	0.36 Mi N of Hendrix Ln.	TWO LANE, TWO WAY	N/A	N/A		6,494		6,494					82			
29	2132-01-013	MADISON	FM 2289	OSR	FM 1452	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					109,672	47,923	9,973		220		2,782	
30	3303-01-010	MADISON	FM 2865	2.52 Mi N of US 190	US190	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					26,254	17,776	1,291		57		414	
								TOTAL	**0**	**7,501**	**0**	**7,501**	**201,336**	**99,536**	**16,394**	**0**	**496**	**0**	**4,588**	

NOTES

(1) Refer to rumble strip standards: RS(1)-13 through RS(4)-13.

(2) Retrace all white skips (W BRK) with item 666-6300.

(3) For sections with speed limits 45 mph or less, retrace white edgeline with item 666-6303, and yellow centerline with items: 666-6312 and 666-6315.

(4) For sections with speed limits higher than 45 mph, retrace white edgeline with item 666-6282, and yellow centerline with items: 666-6287 and 666-6291.

(5) This value represents the estimated amount of missing raised pavement markers (RPMs) to be replaced. Place the new RPMs only where the existing RPM is missing. This quantity is 20% of the total amount of existing RPMs (an estimated 20% loss).

PRINT DATE	REVISION DATE
05/13/2021	

Texas Department of Transportation *Bryan District*

SUMMARY OF QUANTITIES (MADISON COUNTY)

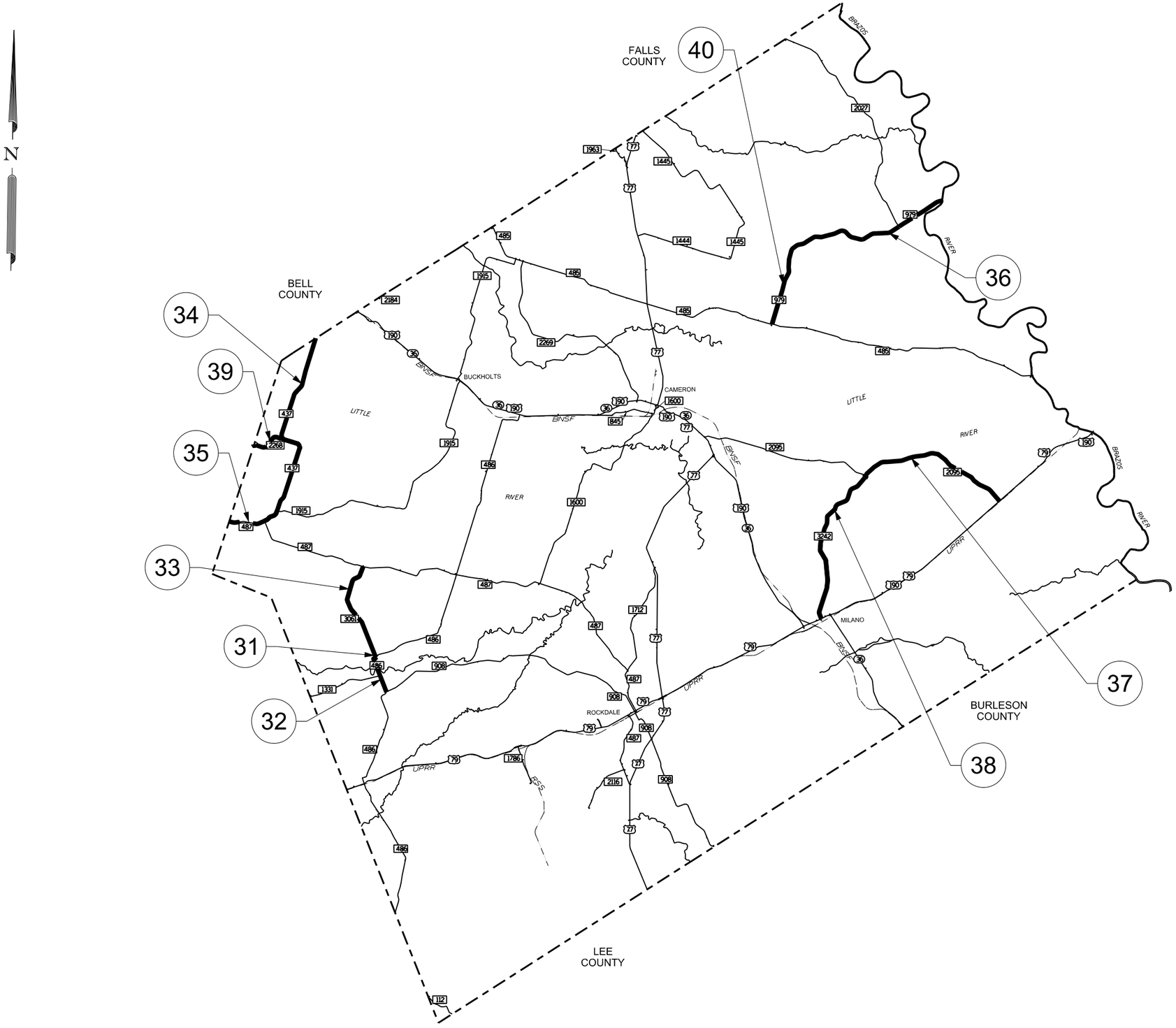
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY
TEXAS	BRYAN	ROBERTSON, ETC.

CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	18

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX

FILENAME: G:\004914\01\41\Design\Madison\SUMMARY OF QUANTITIES (MADISON COUNTY).dgn



MILAM COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
31	FM 486	0337-05-049
32	FM 486	0590-05-054
33	FM 3061	0590-06-009
34	FM 437	0590-07-026
35	FM 487	0858-01-038
36	FM 979	1210-03-033
37	FM 2095	1953-01-031
38	FM 3242	2028-01-013
39	FM 2268	2136-03-008
40	FM 979	2237-01-012

Drawings Not To Scale

PRINT DATE	REVISION DATE
02/24/2020	

Texas Department of Transportation
Bryan District

PROJECT LOCATION MAP
MILAM COUNTY

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	19

REV DATE: 2-12-2015
CSJs: 0049-14-013
FILENAME: $FILE$

PAVEMENT MARKINGS AND MARKERS SUMMARY

LOCATION NUMBER	CSJ	COUNTY	HIGHWAY	PROJECT LIMITS		HIGHWAY TYPE	TYPE OF EDGELINE RUMBLE STRIPS	TYPE OF CENTERLINE RUMBLE STRIPS	ITEM 666							ITEM 672			ITEM 6056	REMARKS
									6300	6303	6312	6315	6282	6287	6291	6007	6009	6010	6002	
									RE PM W/RET REQ TY I (W) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (W) 4" (SLD) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (SLD) (100 MIL)	REF PROF PAV MRK TY I (W) 4" (SLD) (60 MIL)	REF PROF PAV MRK TY I (Y) 4" (SLD) (90 MIL)	REF PROF PAV MRK TY I (Y) 4" (BRK) (90 MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	PREFORMED CENTERLINE RUMBLE STRIP	
				FROM	TO		(1)	(1)	(2)	(3)	(3)	(3)	(4)	(4)	(4)	(5)	(5)	(5)		
									LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF	
31	0337-05-049	MILAM	FM 486	0.15 Mi W of FM 3061	FM 3061	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					1,514	1,514			4		757	
32	0590-05-054	MILAM	FM 486	0.15 Mi W of FM3061	FM 908	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					16,381	17,419	282	7	41			
33	0590-06-009	MILAM	FM 3061	FM 487	FM 486	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					48,071	22,102	5,067		107		757	
34	0590-07-026	MILAM	FM 437	Bell County Line (4.75 Mi N of FM 2268	FM 487	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					99,636	43,555	9,971		210		2,069	
35	0858-01-038	MILAM	FM 487	Bell County Line (1.6 Mi W of FM 437)	FM 437	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					17,187	13,115	1,045		43			
36	1210-03-033	MILAM	FM 979	3.4 Mi North of FM 485	Robertson County Line (2.3 Mi E of FM 2027)	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					78,887	45,334	6,280		176		1,132	
37	1953-01-031	MILAM	FM 2095	FM 3242	US 79	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4		1,917	126	1,209	71,307	49,498	3,982		168		768	
38	2028-01-013	MILAM	FM 3242	FM 2095	US 79	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					77,360	48,895	6,322		184		494	
39	2136-03-008	MILAM	FM 2268	Bell County Line (1.5 Mi W of FM 437)	FM 437	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					15,620	13,563	547		39			
40	2237-01-012	MILAM	FM 979	FM 485	3.4 Mi N of FM 485	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					34,662	12,400	3,543		66		1,039	
								TOTAL	**0**	**1,917**	**126**	**1,209**	**460,625**	**267,395**	**37,039**	**7**	**1,039**	**0**	**6,259**	

NOTES

(1) Refer to rumble strip standards: RS(1)-13 through RS(4)-13.

(2) Retrace all white skips (W BRK) with item 666-6300.

(3) For sections with speed limits 45 mph or less, retrace white edgeline with item 666-6303, and yellow centerline with items: 666-6312 and 666-6315.

(4) For sections with speed limits higher than 45 mph, retrace white edgeline with item 666-6282, and yellow centerline with items: 666-6287 and 666-6291.

(5) This value represents the estimated amount of missing raised pavement markers (RPMs) to be replaced. Place the new RPMs only where the existing RPM is missing. This quantity is 20% of the total amount of existing RPMs (an estimated 20% loss).

PRINT DATE	REVISION DATE
02/26/2021	

Texas Department of Transportation
Bryan District

SUMMARY OF QUANTITIES (MILAM COUNTY)

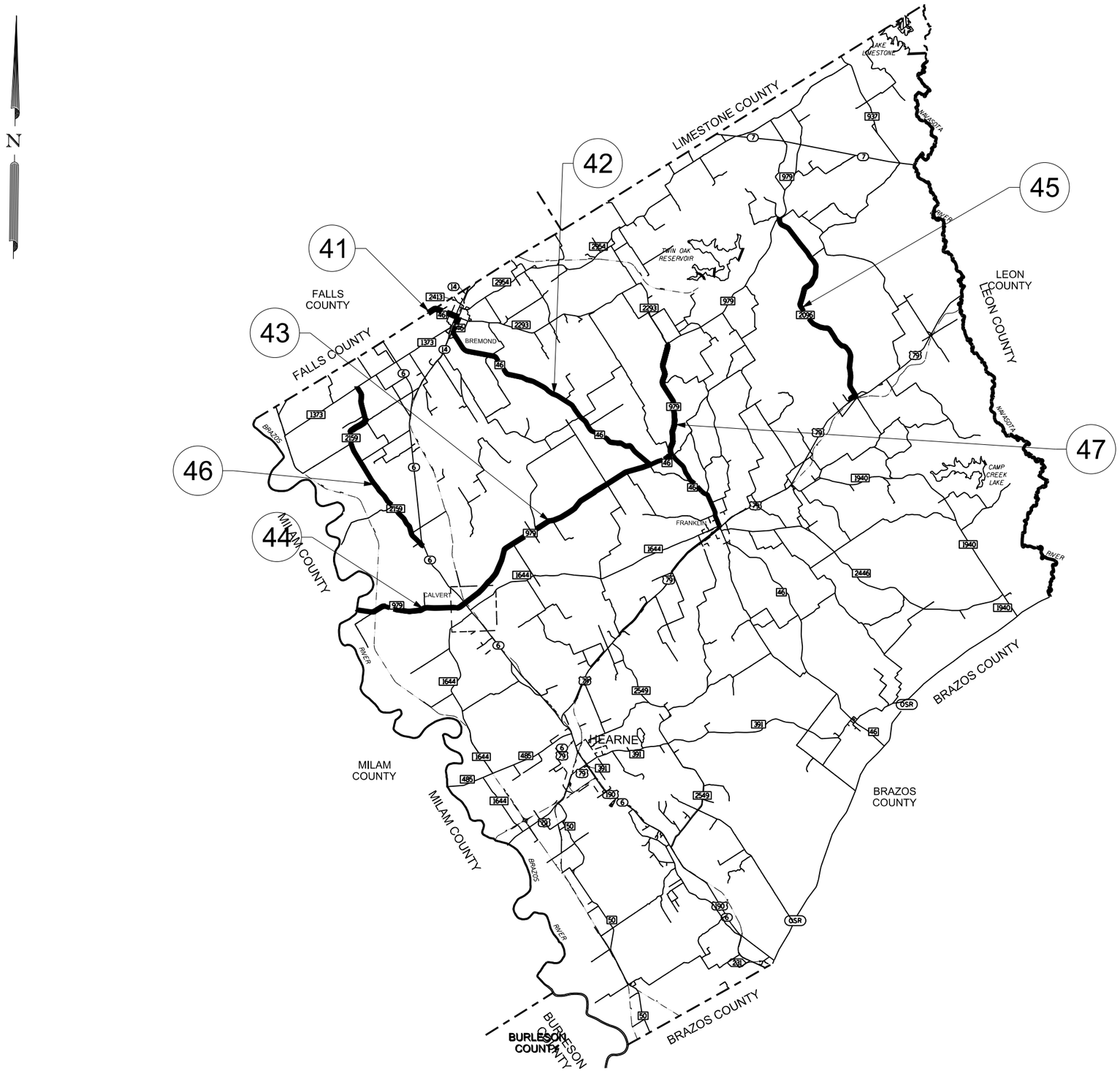
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY
TEXAS	BRYAN	ROBERTSON, ETC.

CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	20

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX

FILENAME: G:\0049\14\014\Design\Miliam\SUMMARY OF QUANTITIES (MILAM COUNTY).dgn



ROBERTSON COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
41	FM 46	0049-14-014
42	FM 46	0540-01-050
43	FM 979	1210-01-016
44	FM 979	1210-02-014
45	FM 2096	1954-01-015
46	FM 2159	2029-01-015
47	FM 979	2134-01-030

PRINT DATE	REVISION DATE
02/24/2021	

Texas Department of Transportation
Bryan District

PROJECT LOCATION MAP
ROBERTSON COUNTY

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	ROBERTSON, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	21

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: G:\00491\014\Design\Maps\Project Location Map Robertson County.dgn

PAVEMENT MARKINGS AND MARKERS SUMMARY

LOCATION NUMBER	CSJ	COUNTY	HIGHWAY	PROJECT LIMITS		HIGHWAY TYPE	TYPE OF EDGELINE RUMBLE STRIPS	TYPE OF CENTERLINE RUMBLE STRIPS	ITEM 666							ITEM 672			ITEM 6056	REMARKS
									6300	6303	6312	6315	6282	6287	6291	6007	6009	6010	6002	
									RE PM W/RET REQ TY I (W) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (W) 4" (SLD) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (SLD) (100 MIL)	REF PROF PAV MRK TY I (W) 4" (SLD) (60 MIL)	REF PROF PAV MRK TY I (Y) 4" (SLD) (90 MIL)	REF PROF PAV MRK TY I (Y) 4" (BRK) (90 MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	PREFORMED CENTERLINE RUMBLE STRIP	
				FROM	TO		(1)	(1)	(2)	(3)	(3)	(3)	(4)	(4)	(4)	(5)	(5)	(5)		
									LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF	
41	0049-14-014	ROBERTSON	FM 46	Falls County Line	SH 14	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4		1,472	212	848	12,551	7,970	1,107		35		32	
42	0540-01-050	ROBERTSON	FM 46	SH 14	US 79	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4		11,971	1,375	13,987	159,741	115,327	8,645	3	425		831	
43	1210-01-016	ROBERTSON	FM 979	SH 6	FM 46	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4				5,910	47,322	45,757	11,489		239		2,039	
44	1210-02-014	ROBERTSON	FM 979	Milam County Line	SH 6	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4				3,040	2,733	17,443	5,672		109		1,097	
45	1954-01-015	ROBERTSON	FM 2096	FM 979	US 79	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					106,998	79,275	6,292		261		344	
46	2029-01-015	ROBERTSON	FM 2159	FM 1373	SH 6	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					342	55,903	6,702		206		867	
47	2134-01-030	ROBERTSON	FM 979	FM 46	FM 2293	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					54,127	37,619	3,813		132		179	
								TOTAL	**0**	**13,443**	**1,587**	**23,785**	**383,814**	**359,294**	**43,720**	**3**	**1,407**	**0**	**5,389**	

NOTES

(1) Refer to rumble strip standards: RS(1)-13 through RS(4)-13.

(2) Retrace all white skips (W BRK) with item 666-6300.

(3) For sections with speed limits 45 mph or less, retrace white edgeline with item 666-6303, and yellow centerline with items: 666-6312 and 666-6315.

(4) For sections with speed limits higher than 45 mph, retrace white edgeline with item 666-6282, and yellow centerline with items: 666-6287 and 666-6291.

(5) This value represents the estimated amount of missing raised pavement markers (RPMs) to be replaced. Place the new RPMs only where the existing RPM is missing. This quantity is 20% of the total amount of existing RPMs (an estimated 20% loss).

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: G:\00491\41\01\Design\Robertson\SUMMARY OF QUANTITIES (ROBERTSON COUNTY).dgn

PRINT DATE	REVISION DATE
02/26/2021	

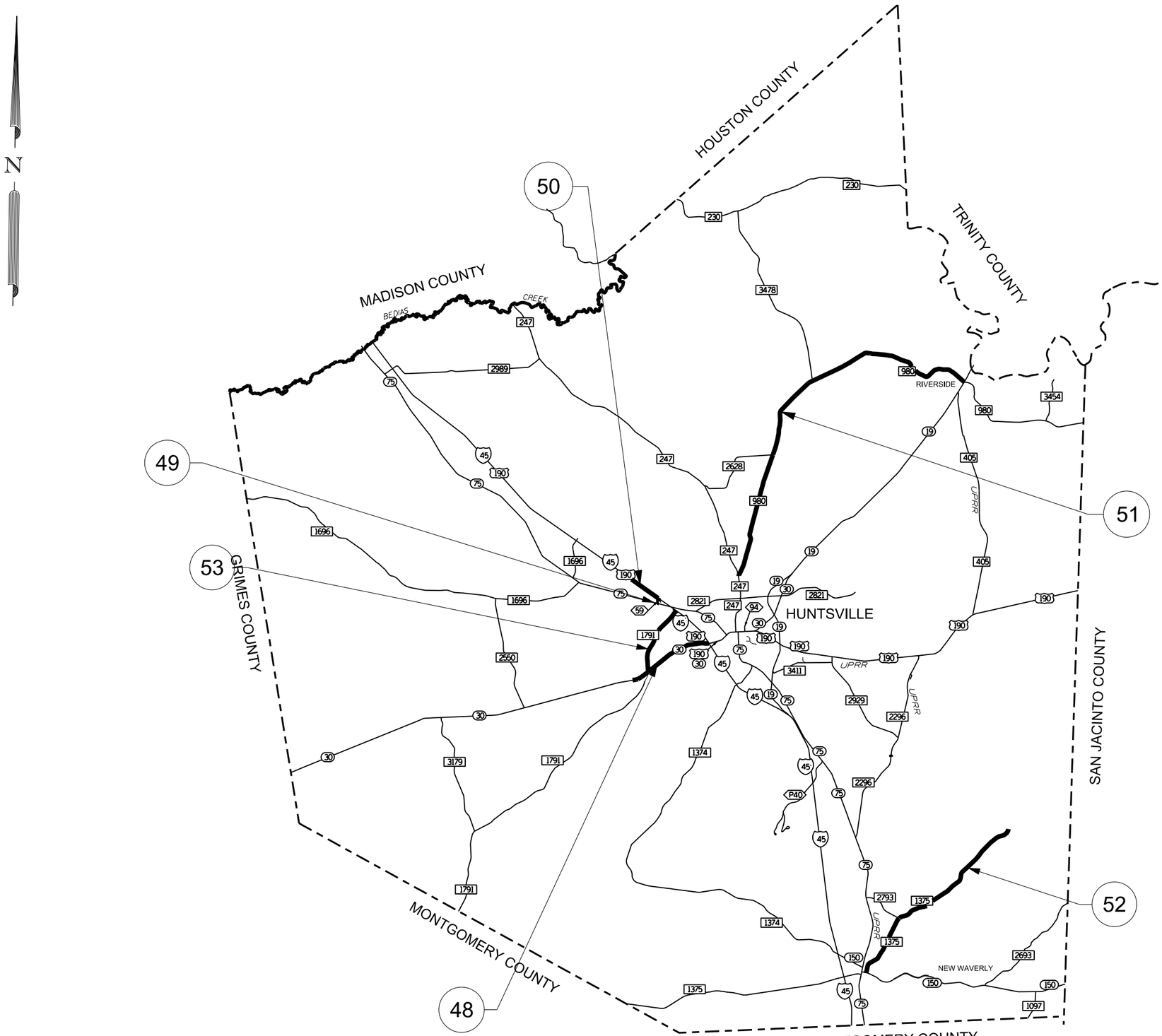
Texas Department of Transportation
Bryan District

SUMMARY OF QUANTITIES (ROBERTSON COUNTY)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY
TEXAS	BRYAN	ROBERTSON, ETC.

CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	22



WALKER COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
48	SH 30	0212-02-041
49	SS 59	0476-01-006
50	IH45 WFR	0675-06-113
51	FM 980	0756-02-032
52	FM 1375	1402-01-038
53	FM 1791	1706-01-033

Drawings Not To Scale

PRINT DATE	REVISION DATE
04/18/2021	

Texas Department of Transportation
Bryan District

PROJECT LOCATION MAP
WALKER COUNTY

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	ROBERTSON, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	23

REV DATE: 2-12-2015
CSJs: XXXX-XX-XXX
FILENAME: $FILE$

PAVEMENT MARKINGS AND MARKERS SUMMARY

LOCATION NUMBER	CSJ	COUNTY	HIGHWAY	PROJECT LIMITS		HIGHWAY TYPE	TYPE OF EDGELINE RUMBLE STRIPS	TYPE OF CENTERLINE RUMBLE STRIPS	ITEM 666							ITEM 672			ITEM 6056	REMARKS
									6300	6303	6312	6315	6282	6287	6291	6007	6009	6010	6002	
									RE PM W/RET REQ TY I (W) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (W) 4" (SLD) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (SLD) (100 MIL)	REF PROF PAV MRK TY I (W) 4" (SLD) (60 MIL)	REF PROF PAV MRK TY I (Y) 4" (SLD) (90 MIL)	REF PROF PAV MRK TY I (Y) 4" (BRK) (90 MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	PREFORMED CENTERLINE RUMBLE STRIP	
				FROM	TO		(1)	(1)	(2)	(3)	(3)	(3)	(4)	(4)	(4)	(5)	(5)	(5)		
									LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF	
48	0212-02-041	WALKER	SH 30	0.7 Mi W of FM 1791	IH 45	4-LN DIVIDED & 4-LN W/ TWLTL	RS(1) -13 RS(4)-13 OPTION 6	RS(2)-13 OPTION 3	11,523		337	4,202	35,391	29,037	583	201	170	201		
49	0476-01-006	WALKER	SS 59	0.15 Mi N of SH 75 (San Jacinto St.)	SH 75	TWO LANE, TWO WAY	N/A	N/A		2,016		2,076					6			
50	0675-06-113	WALKER	IH 45 WFR	SS 59	2.4 Mi N of SS 59	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4		344		344	24,426	24,283			63			
51	0756-02-032	WALKER	FM 980	FM 247	SH 19	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4		2,710	205	1,271	147,837	95,501	10,743	7	352		1,338	
52	1402-01-038	WALKER	FM 1375	SH 150	End of State Maintenance (5.4 Mi E of FM 2793)	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					81,429	60,335	4,533		197		358	
53	1706-01-033	WALKER	FM 1791	SH 75	SH 30	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					26,832	14,922	2,785	6	59		448	
								TOTAL	**11,523**	**5,070**	**542**	**7,893**	**315,915**	**224,078**	**18,644**	**214**	**847**	**201**	**2,144**	

NOTES

(1) Refer to rumble strip standards: RS(1)-13 through RS(4)-13.

(2) Retrace all white skips (W BRK) with item 666-6300.

(3) For sections with speed limits 45 mph or less, retrace white edgeline with item 666-6303, and yellow centerline with items: 666-6312 and 666-6315.

(4) For sections with speed limits higher than 45 mph, retrace white edgeline with item 666-6282, and yellow centerline with items: 666-6287 and 666-6291.

(5) This value represents the estimated amount of missing raised pavement markers (RPMs) to be replaced. Place the new RPMs only where the existing RPM is missing. This quantity is 20% of the total amount of existing RPMs (an estimated 20% loss).

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: G:\00491\41\01\Design\Walker\SUMMARY OF QUANTITIES (WALKER COUNTY).dgn

PRINT DATE	REVISION DATE
05/10/2021	

Texas Department of Transportation
Bryan District

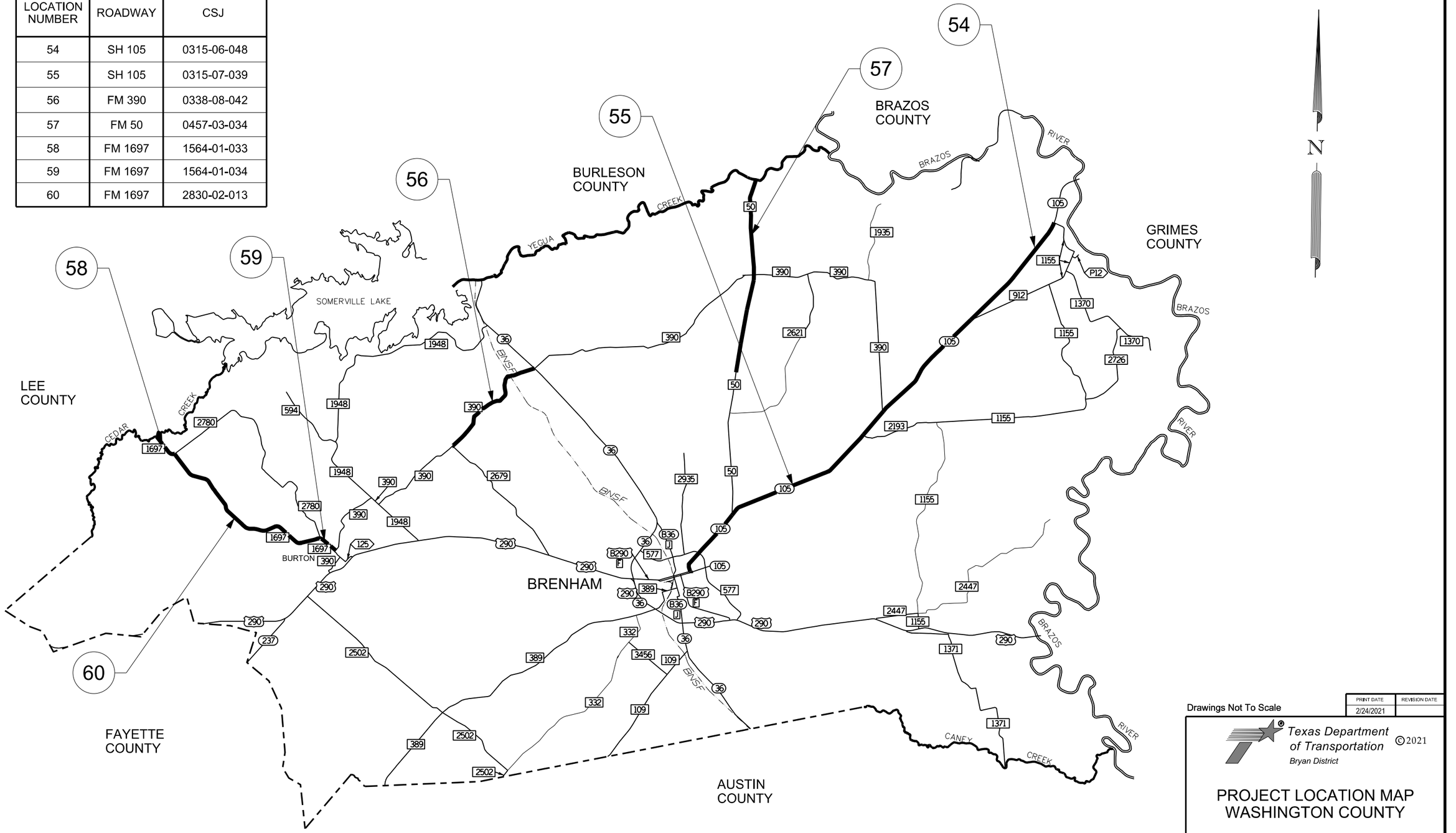
SUMMARY OF QUANTITIES (WALKER COUNTY)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY
TEXAS	BRYAN	ROBERTSON, ETC.

CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	24

WASHINGTON COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
54	SH 105	0315-06-048
55	SH 105	0315-07-039
56	FM 390	0338-08-042
57	FM 50	0457-03-034
58	FM 1697	1564-01-033
59	FM 1697	1564-01-034
60	FM 1697	2830-02-013



REV DATE: 2-12-2015
CSJ: XXX-XX-XXX

FILENAME: G:\0049\14\014\Design\Maps\Project Location Map Washington County.dgn

Drawings Not To Scale

PRINT DATE	REVISION DATE
2/24/2021	

Texas Department of Transportation
Bryan District
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PROJECT LOCATION MAP
WASHINGTON COUNTY

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	ROBERTSON, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	25

PAVEMENT MARKINGS AND MARKERS SUMMARY

LOCATION NUMBER	CSJ	COUNTY	HIGHWAY	PROJECT LIMITS		HIGHWAY TYPE	TYPE OF EDGELINE RUMBLE STRIPS	TYPE OF CENTERLINE RUMBLE STRIPS	ITEM 666							ITEM 672			ITEM 6056	REMARKS
									6300	6303	6312	6315	6282	6287	6291	6007	6009	6010	6002	
									RE PM W/RET REQ TY I (W) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (W) 4" (SLD) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (SLD) (100 MIL)	REF PROF PAV MRK TY I (W) 4" (SLD) (60 MIL)	REF PROF PAV MRK TY I (Y) 4" (SLD) (90 MIL)	REF PROF PAV MRK TY I (Y) 4" (BRK) (90 MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	PREFORMED CENTERLINE RUMBLE STRIP	
				FROM	TO		(1)	(1)	(2)	(3)	(3)	(3)	(4)	(4)	(4)	(5)	(5)	(5)		
									LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF	
54	0315-06-048	WASHINGTON	SH 105	1.4 Mi S of FM 2193	FM 1155	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4	1,234				113,804	56,840	11,827	20	250		2,164	
55	0315-07-039	WASHINGTON	SH 105	BU 290F	1.4 Mi S of FM 2193	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4	5,221	4,003	38	8,204	61,559	59,929	7,727	70	174		167	
56	0338-08-042	WASHINGTON	FM 390	FM 2679	SH 36	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					45,142	42,723	723		115			
57	0457-03-034	WASHINGTON	FM 50	Burleson County LIne	3.2 MI S of FM 390	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					51,196	39,846	5,842		175		777	
58	1564-01-033	WASHINGTON	FM 1697	Lee County Line	FM 2780 N	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					9,627	3,415	970		18		300	
59	1564-01-034	WASHINGTON	FM 1697	FM 2780 S	FM 390	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4		1,500		1,500	5,446	5,346			18			
60	2830-02-013	WASHINGTON	FM 1697	FM 2780 N	FM 2780 S	TWO LANE, TWO WAY	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					69,523	50,614	4,188		169		292	
								TOTAL	**6,455**	**5,503**	**38**	**9,704**	**356,297**	**258,713**	**31,277**	**90**	**919**	**0**	**3,700**	

NOTES

(1) Refer to rumble strip standards: RS(1)-13 through RS(4)-13.

(2) Retrace all white skips (W BRK) with item 666-6300.

(3) For sections with speed limits 45 mph or less, retrace white edgeline with item 666-6303, and yellow centerline with items: 666-6312 and 666-6315.

(4) For sections with speed limits higher than 45 mph, retrace white edgeline with item 666-6282, and yellow centerline with items: 666-6287 and 666-6291.

(5) This value represents the estimated amount of missing raised pavement markers (RPMs) to be replaced. Place the new RPMs only where the existing RPM is missing. This quantity is 20% of the total amount of existing RPMs (an estimated 20% loss).

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: G:\004914\01\41\Design\Washington\SUMMARY OF QUANTITIES (WASHINGTON COUNTY).dgn

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05/10/2021	

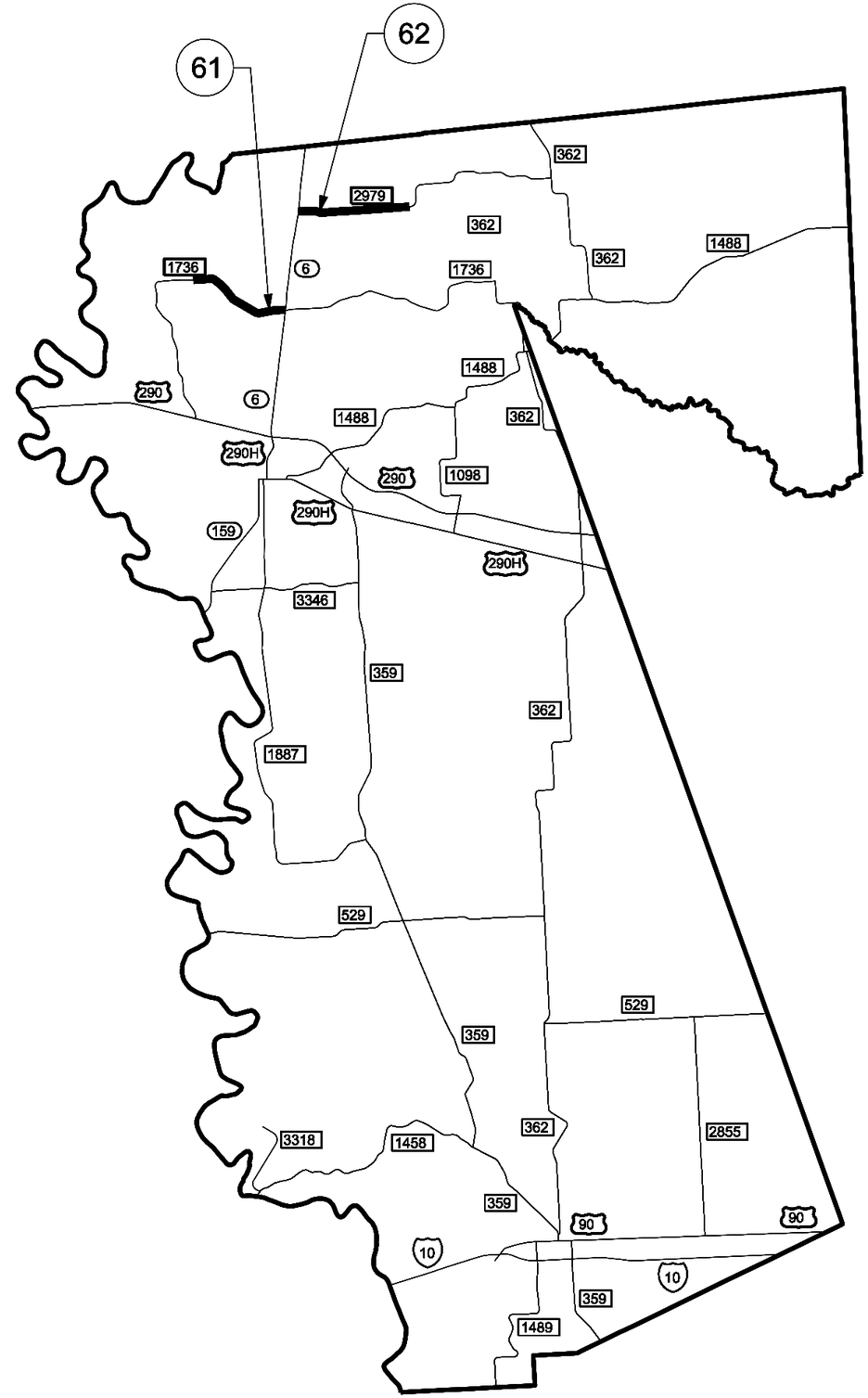
Texas Department of Transportation
Bryan District

SUMMARY OF QUANTITIES (WASHINGTON COUNTY)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY
TEXAS	BRYAN	ROBERTSON, ETC.

CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	26



WALLER COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
61	FM 1736	1687-01-018
62	FM 2979	3051-01-009

Drawings Not To Scale

PRINT DATE	REVISION DATE
5/12/2021	

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Bryan District

PROJECT LOCATION MAP
WALLER COUNTY

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON, ETC.

CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	27

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: $FILE$

PAVEMENT MARKINGS AND MARKERS SUMMARY

LOCATION NUMBER	CSJ	COUNTY	HIGHWAY	PROJECT LIMITS		HIGHWAY TYPE	TYPE OF EDGELINE RUMBLE STRIPS	TYPE OF CENTERLINE RUMBLE STRIPS	ITEM 666							ITEM 672			ITEM 6056	REMARKS
									6300	6303	6312	6315	6282	6287	6291	6007	6009	6010	6002	
									RE PM W/RET REQ TY I (W) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (W) 4" (SLD) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (BRK) (100 MIL)	RE PM W/RET REQ TY I (Y) 4" (SLD) (100 MIL)	REF PROF PAV MRK TY I (W) 4" (SLD) (60 MIL)	REF PROF PAV MRK TY I (Y) 4" (SLD) (90 MIL)	REF PROF PAV MRK TY I (Y) 4" (BRK) (90 MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	PREFORMED CENTERLINE RUMBLE STRIP	
				FROM	TO		(1)	(1)	(2)	(3)	(3)	(3)	(4)	(4)	(4)	(5)	(5)	(5)		
									LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF	
61	1687-01-018	Waller	FM 1736	SH 6	930 ft East of Clark Bottom Rd.	TWO WAY, TWO LANE	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					36,921	30,284	1,198		89		200	
62	3051-01-009	Waller	FM 2979	0.947 Mi East of SH 6	Mellman Rd.	TWO WAY, TWO LANE	RS(4)-13 OPTION 6	RS(3)-13 OPTION 4					25,429	14,901	2,207		59		368	
								TOTAL	**0**	**0**	**0**	**0**	**62,350**	**45,185**	**3,405**	**0**	**148**	**0**	**568**	

NOTES

(1) Refer to rumble strip standards: RS(1)-13 through RS(4)-13.

(2) Retrace all white skips (W BRK) with item 666-6300.

(3) For sections with speed limits 45 mph or less, retrace white edgeline with item 666-6303, and yellow centerline with items: 666-6312 and 666-6315.

(4) For sections with speed limits higher than 45 mph, retrace white edgeline with item 666-6282, and yellow centerline with items: 666-6287 and 666-6291.

(5) This value represents the estimated amount of missing raised pavement markers (RPMs) to be replaced. Place the new RPMs only where the existing RPM is missing. This quantity is 20% of the total amount of existing RPMs (an estimated 20% loss).

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
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PRINT DATE	REVISION DATE
05/24/2021	

Texas Department of Transportation
Bryan District

SUMMARY OF QUANTITIES (WALLER COUNTY)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY
TEXAS	BRYAN	ROBERTSON, ETC.

CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	28

DATE:
FILE:

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

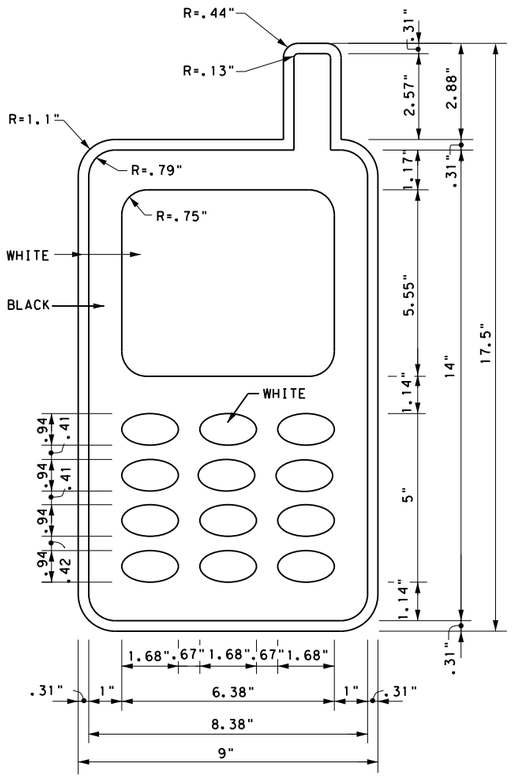
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.

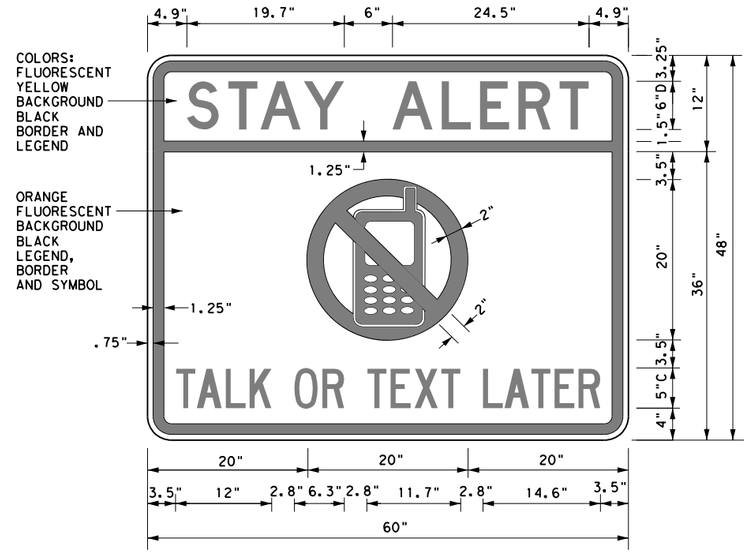
12. The Engineer has the final decision on the location of all traffic control devices.

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

WORKER SAFETY APPAREL NOTES:

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





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

SIGN DETAIL (G20-10T)

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

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

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

Texas Department of Transportation | Traffic Operations Division Standard

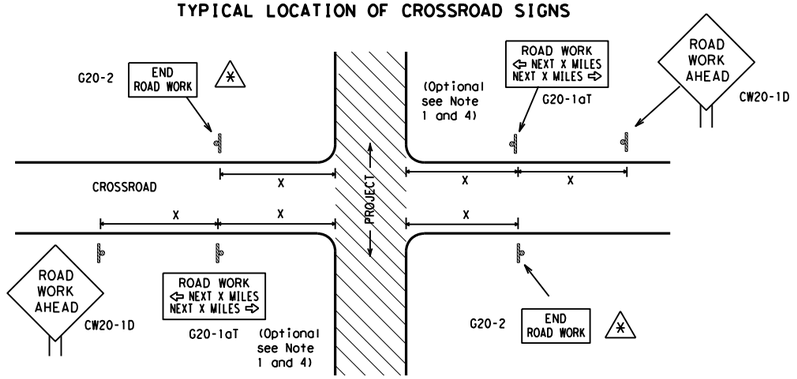
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0049	14	014, ETC.	FM 46, ETC.
4-03 5-10 8-14	DIST	COUNTY		SHEET NO.
9-07 7-13	BRY	ROBERTSON, ETC.		29

DATE:
FILE:

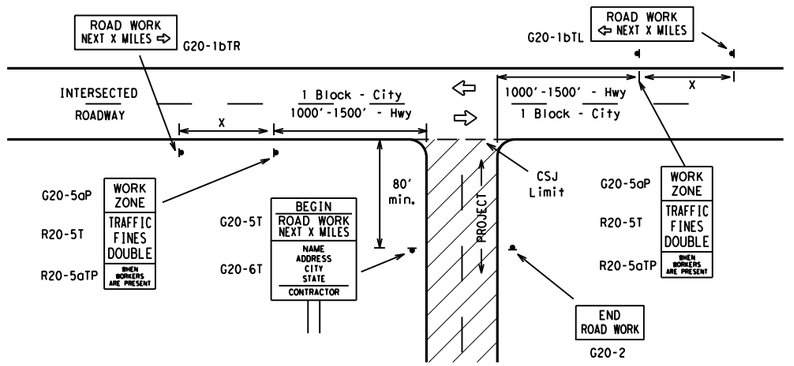
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

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

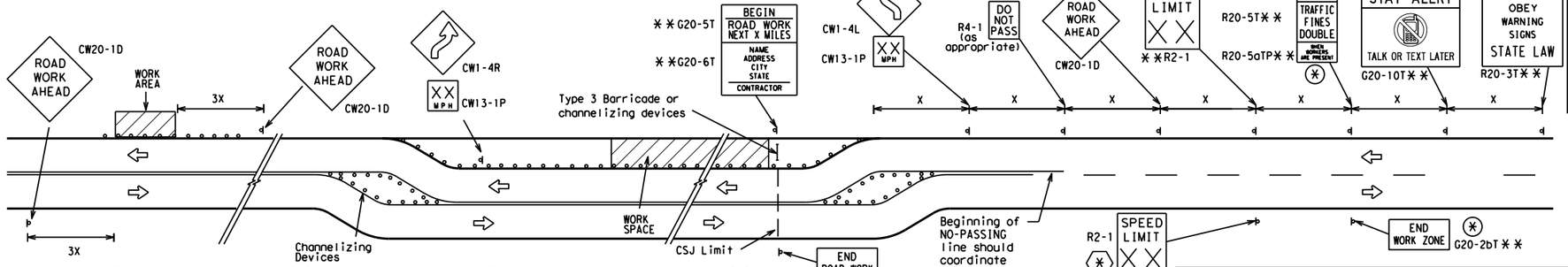
✱ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

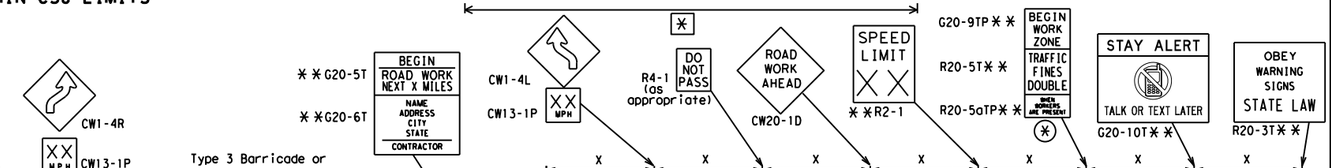
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

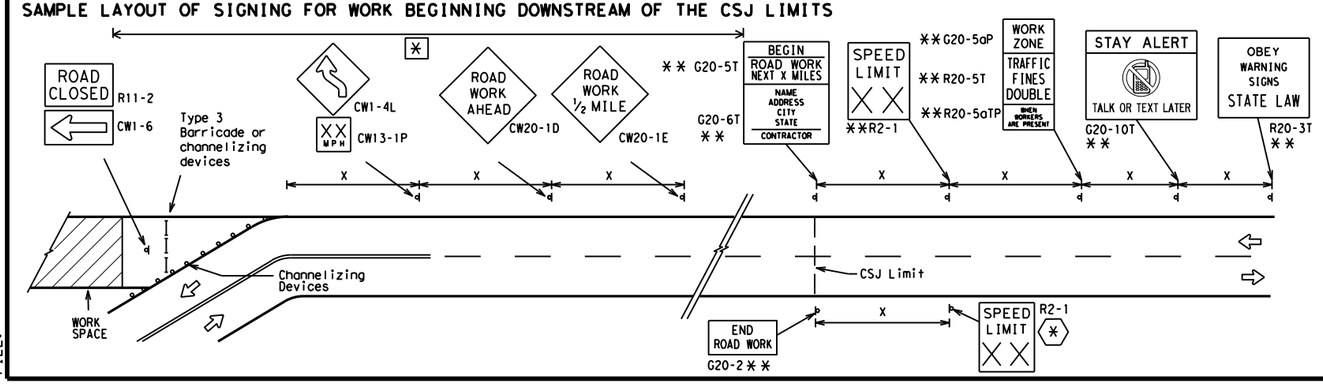


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-14

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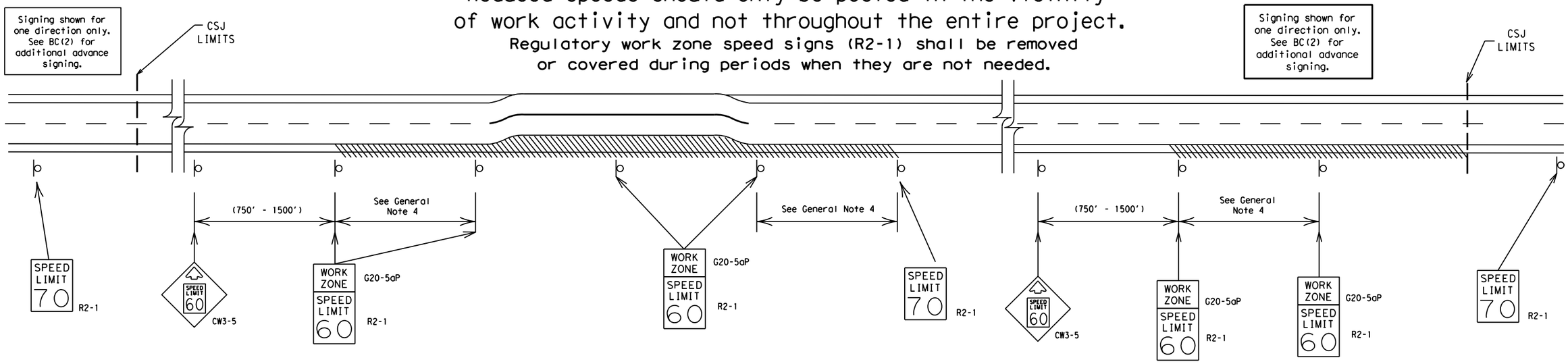
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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 travelled way.

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-14

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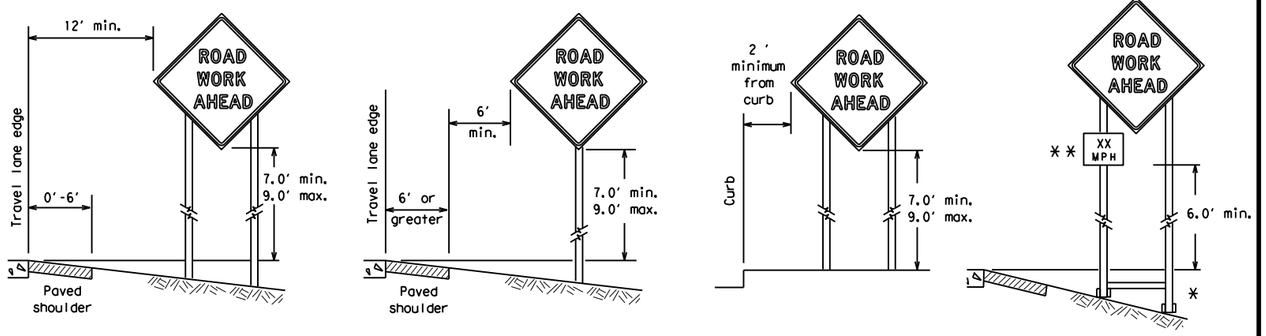
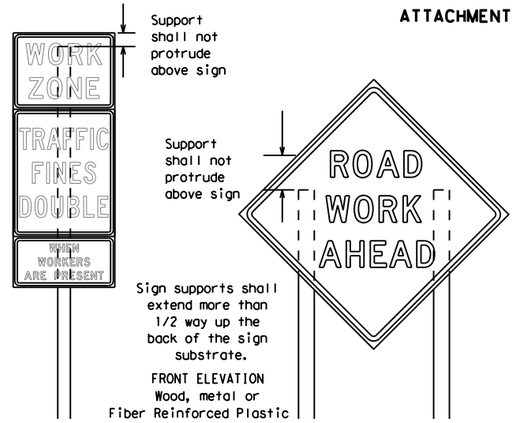
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



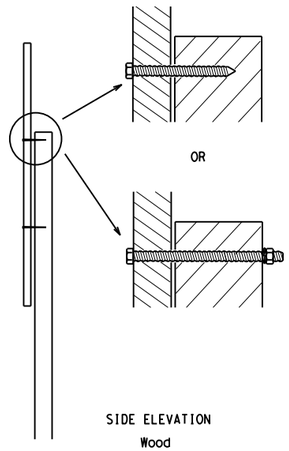
* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS



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

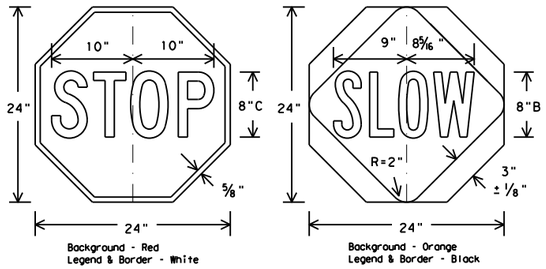


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

STOP/SLOW PADDLES

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



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-14

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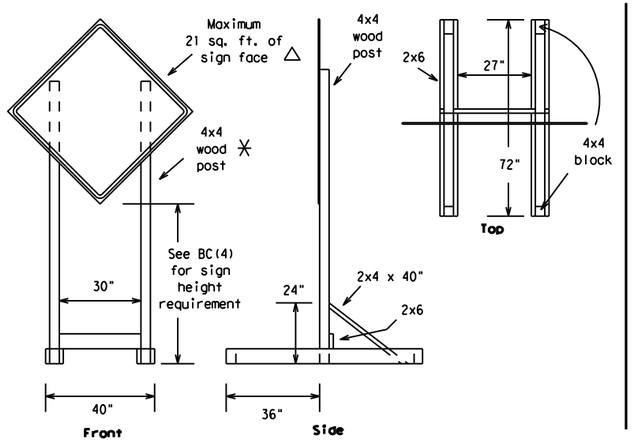
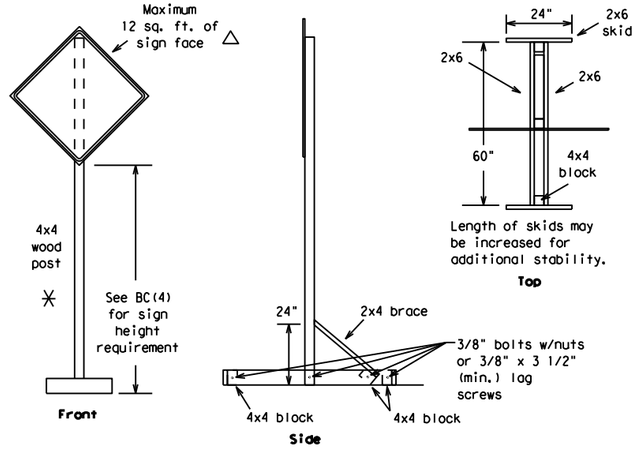
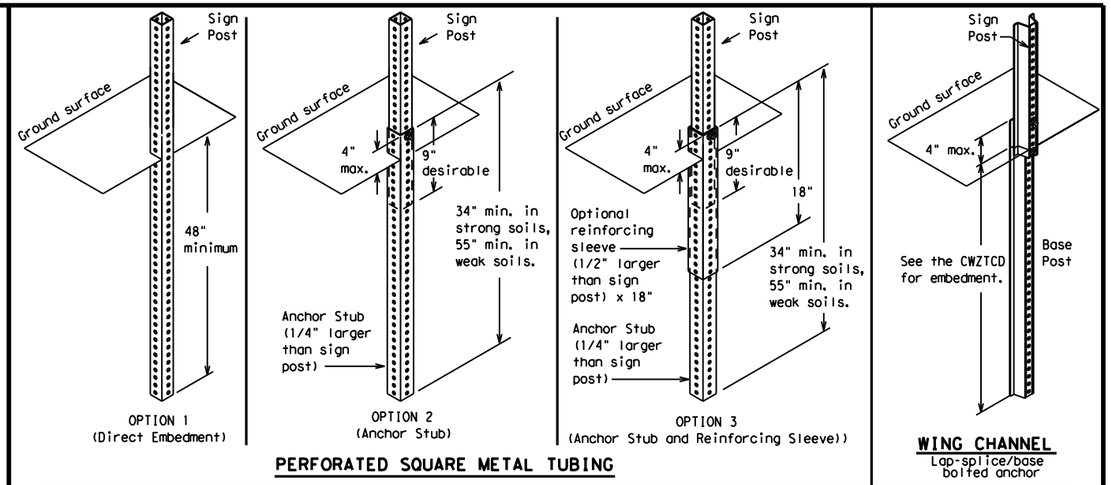




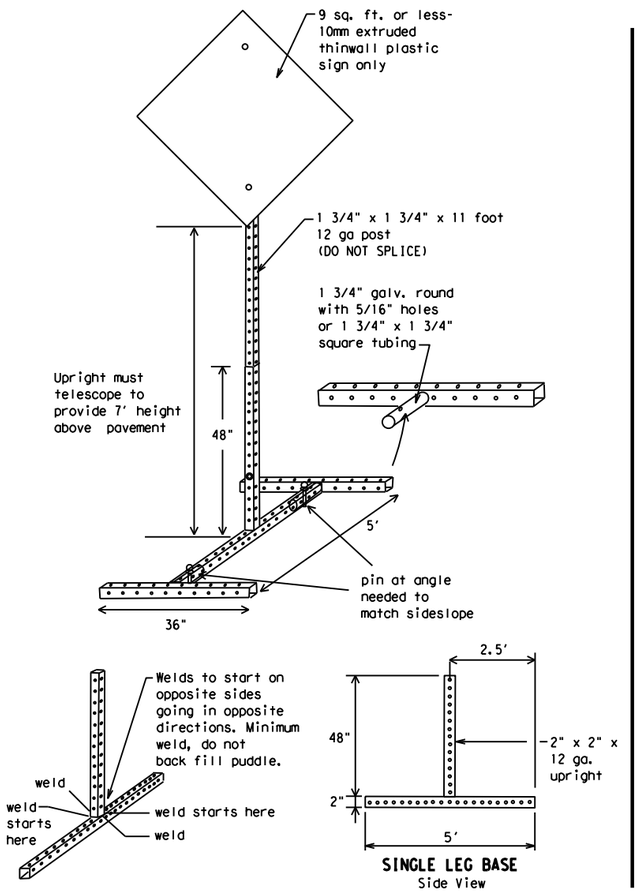
SKID MOUNTED WOOD SIGN SUPPORTS

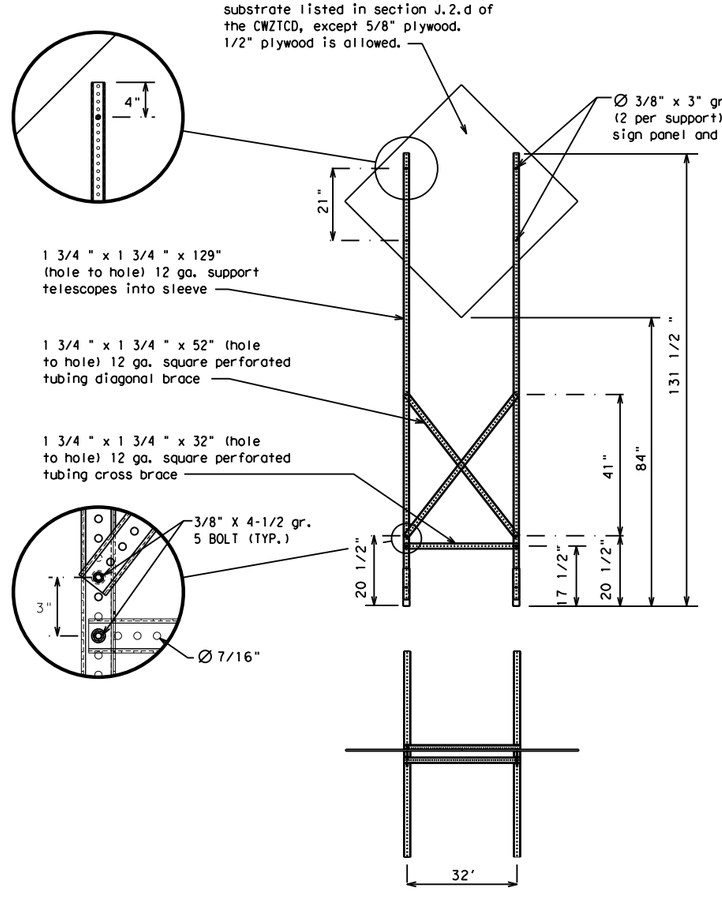
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □

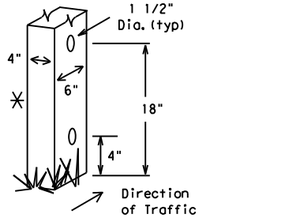


GROUND MOUNTED SIGN SUPPORTS

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

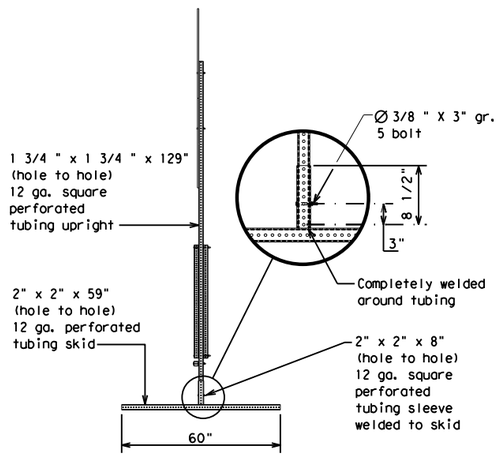






Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation — Traffic Operations Division Standard

SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-14

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-14

FILE:	bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS		0049	14	014, ETC.	FM 46, ETC.
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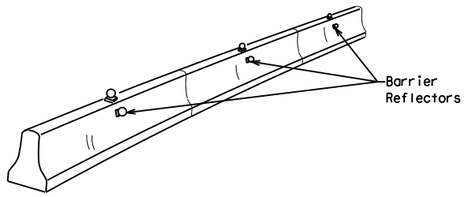
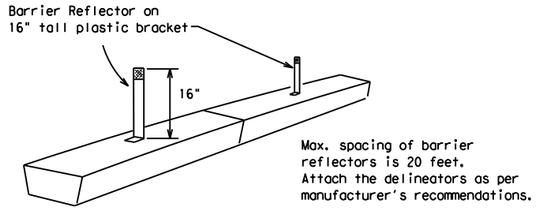
FILE:

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

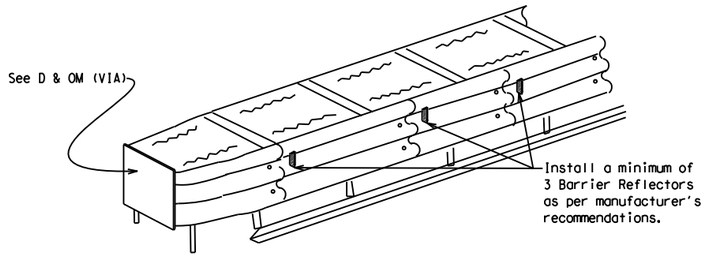


CONCRETE TRAFFIC BARRIER (CTB)

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



LOW PROFILE CONCRETE BARRIER (LPCB)

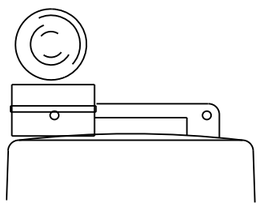


DELINEATION OF END TREATMENTS

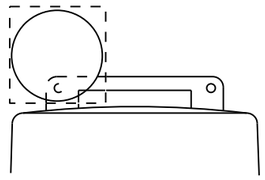
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

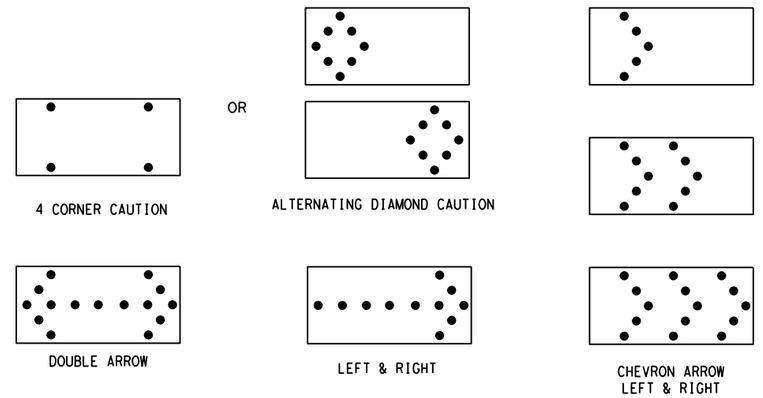
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Operations Division Standard

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

BC(7)-14

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

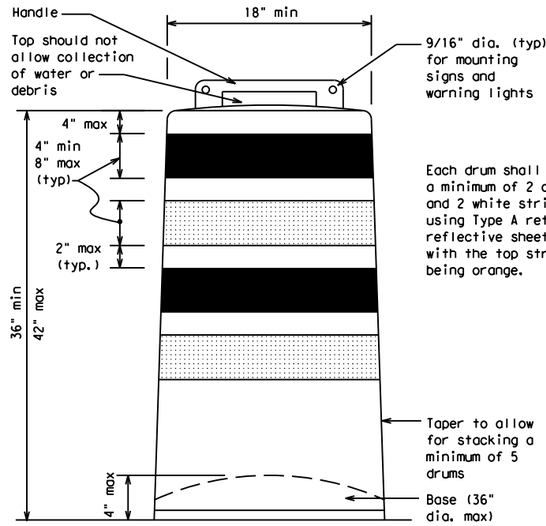
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

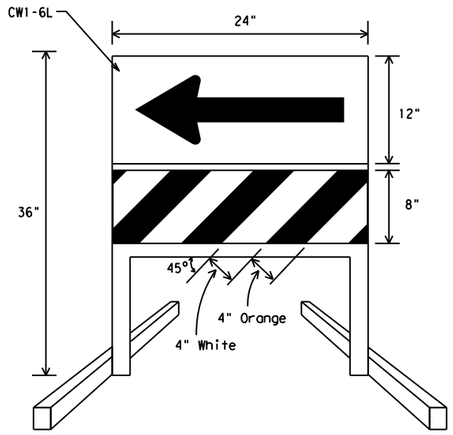
RETROREFLECTIVE SHEETING

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

BALLAST

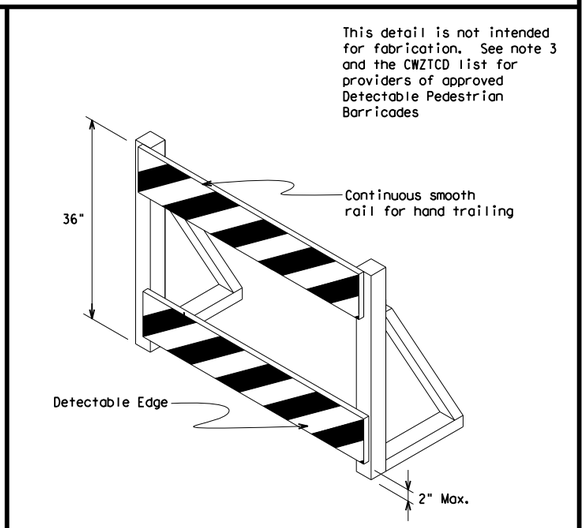
1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other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





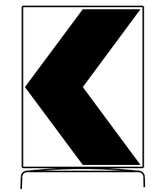
DIRECTION INDICATOR BARRICADE

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

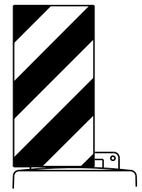


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0049	14	014, ETC.	FM 46, ETC.
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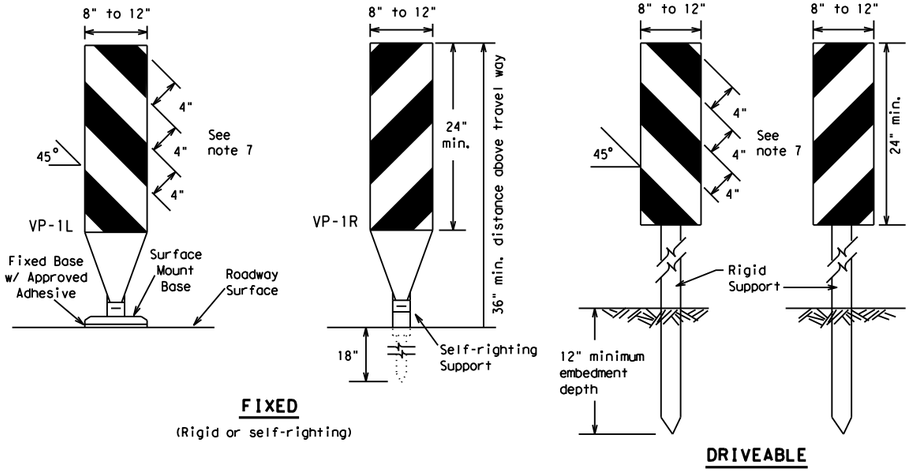
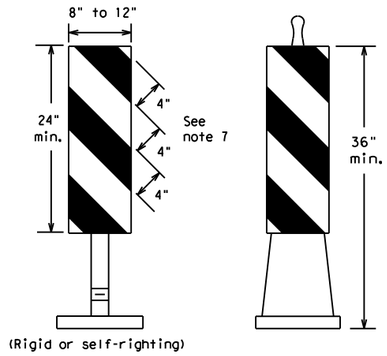


FIXED
(Rigid or self-righting)

DRIVEABLE

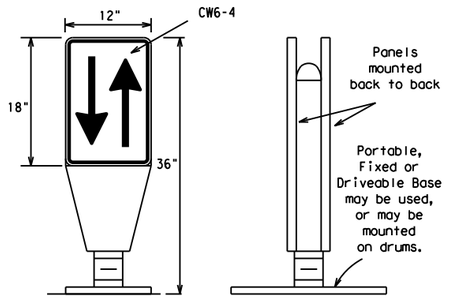


(Rigid or self-righting)

PORTABLE

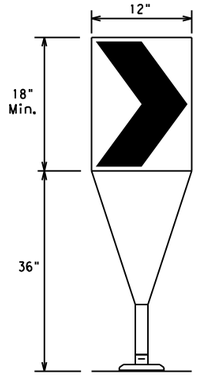
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



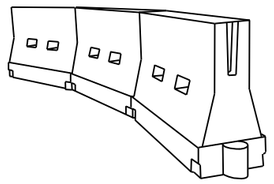
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-14

FILE:	bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS		0049	14	014, ETC.	FM 46, ETC.
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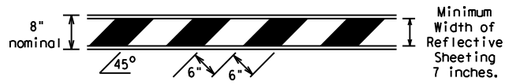
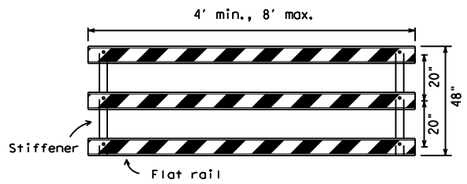
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



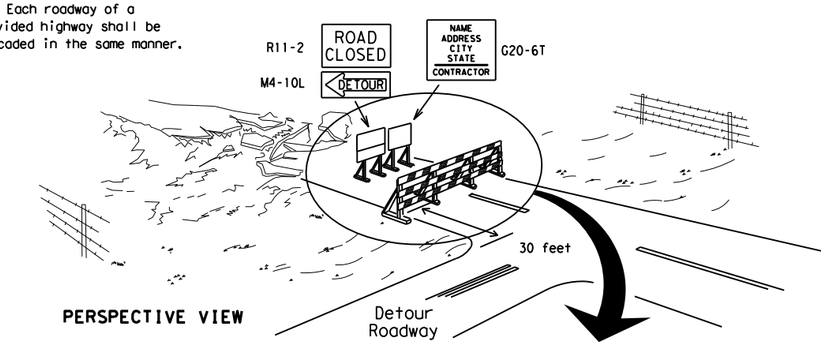
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

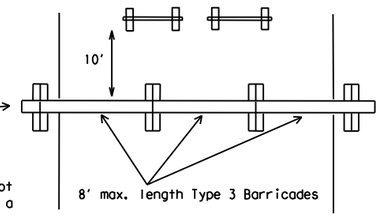
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

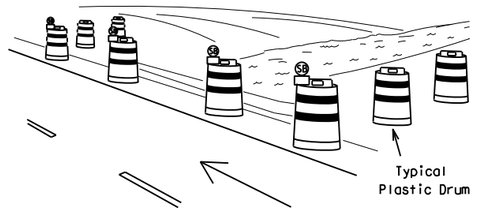
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

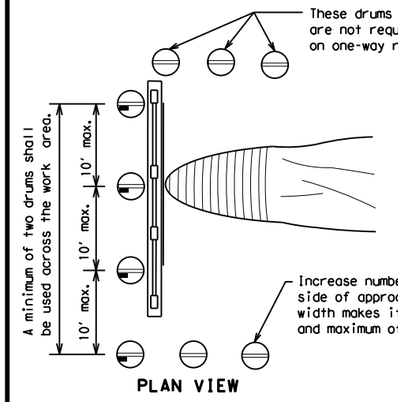
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

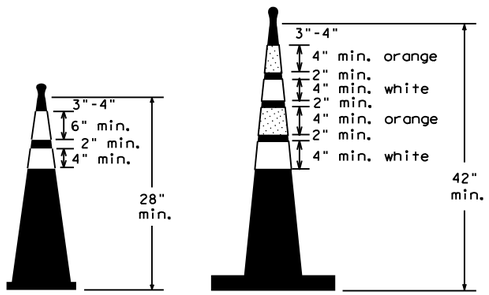
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

PLAN VIEW

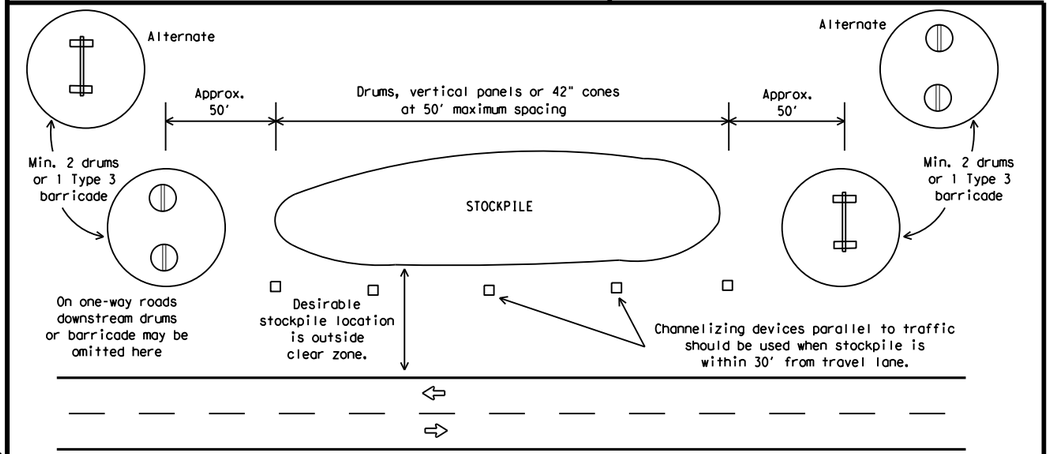
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

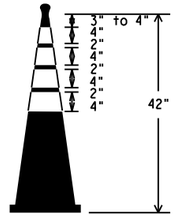
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



EDGELINE CHANNELIZER

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

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-14

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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.

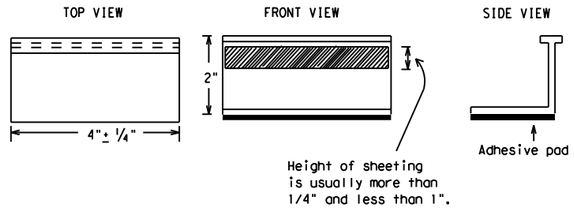
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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).

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Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0049	14	014, ETC	FM 46, ETC.
2-98 9-07	DIST	COUNTY		SHEET NO.
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11-02 8-14				

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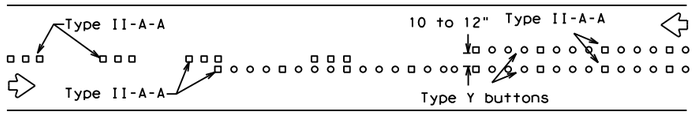
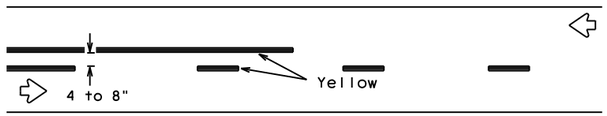
PAVEMENT MARKING PATTERNS

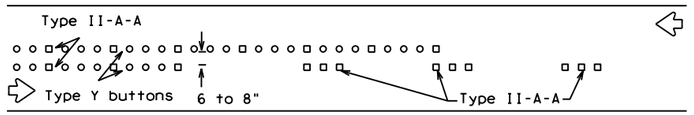
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



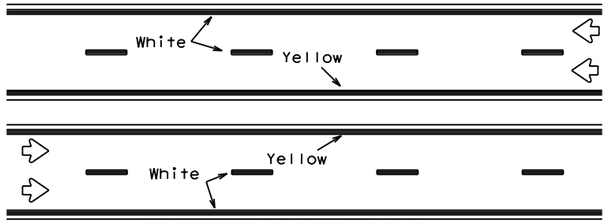
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



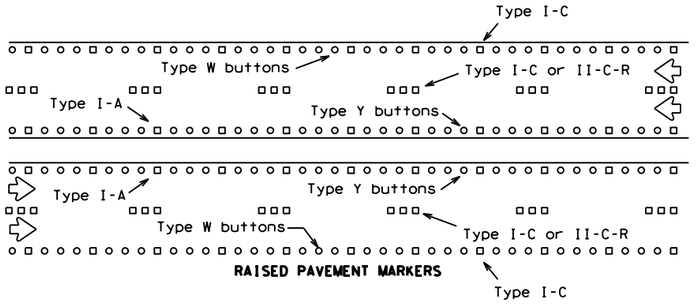
RAISED PAVEMENT MARKERS - PATTERN B

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



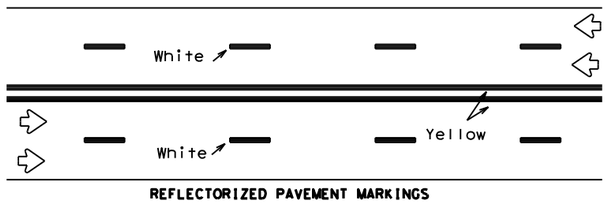
REFLECTORIZED PAVEMENT MARKINGS



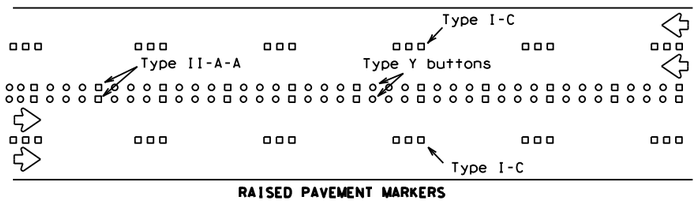
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



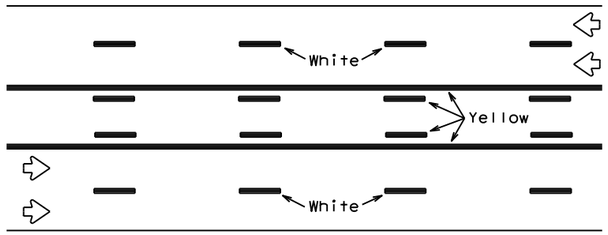
REFLECTORIZED PAVEMENT MARKINGS



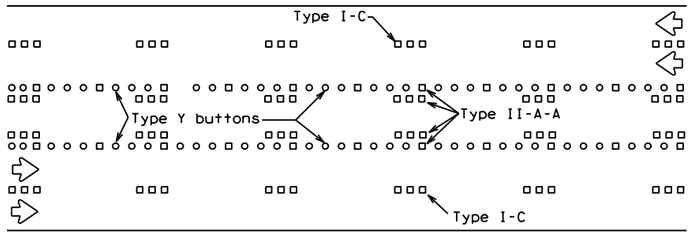
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

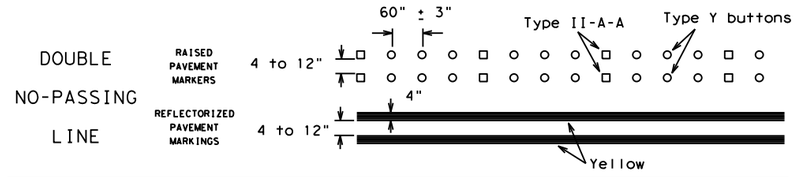
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

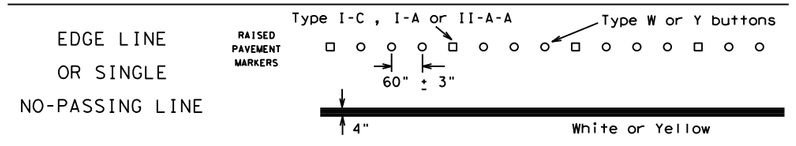
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

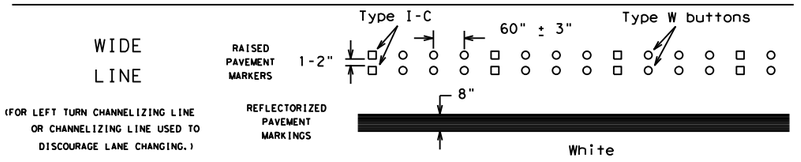


EDGE LINE OR SINGLE NO-PASSING LINE



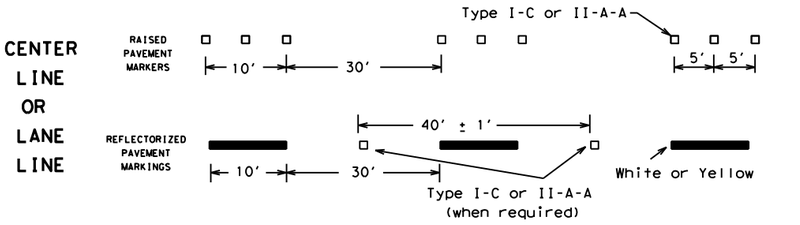
WIDE LINE

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

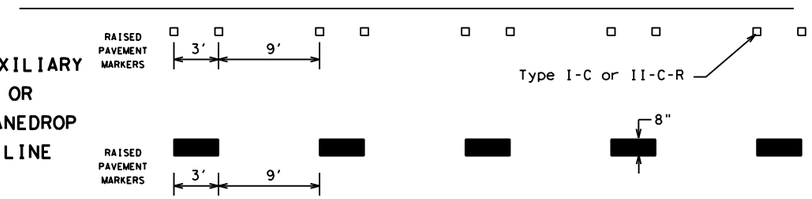


BROKEN LINES

CENTER LINE OR LANE LINE

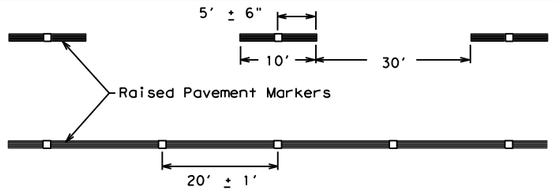


AUXILIARY OR LANEDROP LINE



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

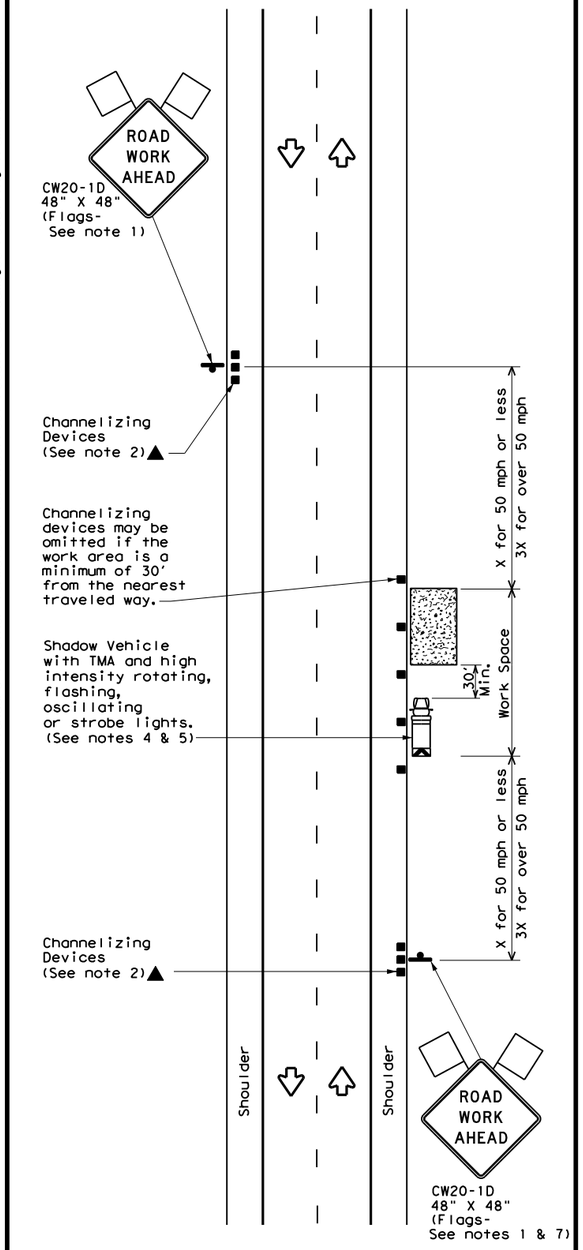
Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

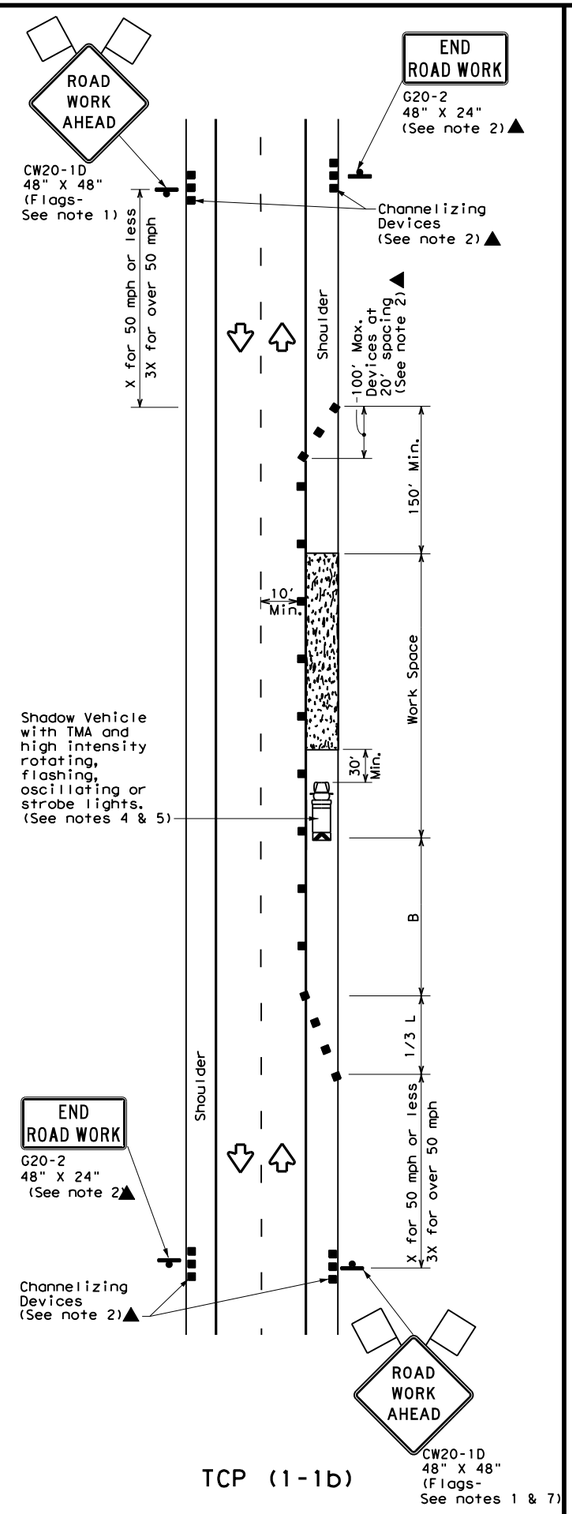
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0049	14	014, ETC.	FM 46, ETC.
1-97 9-07	DIST	COUNTY		SHEET NO.
2-98 7-13	BRY	ROBERTSON, ETC.		40
11-02 8-14				

DATE:
FILE:



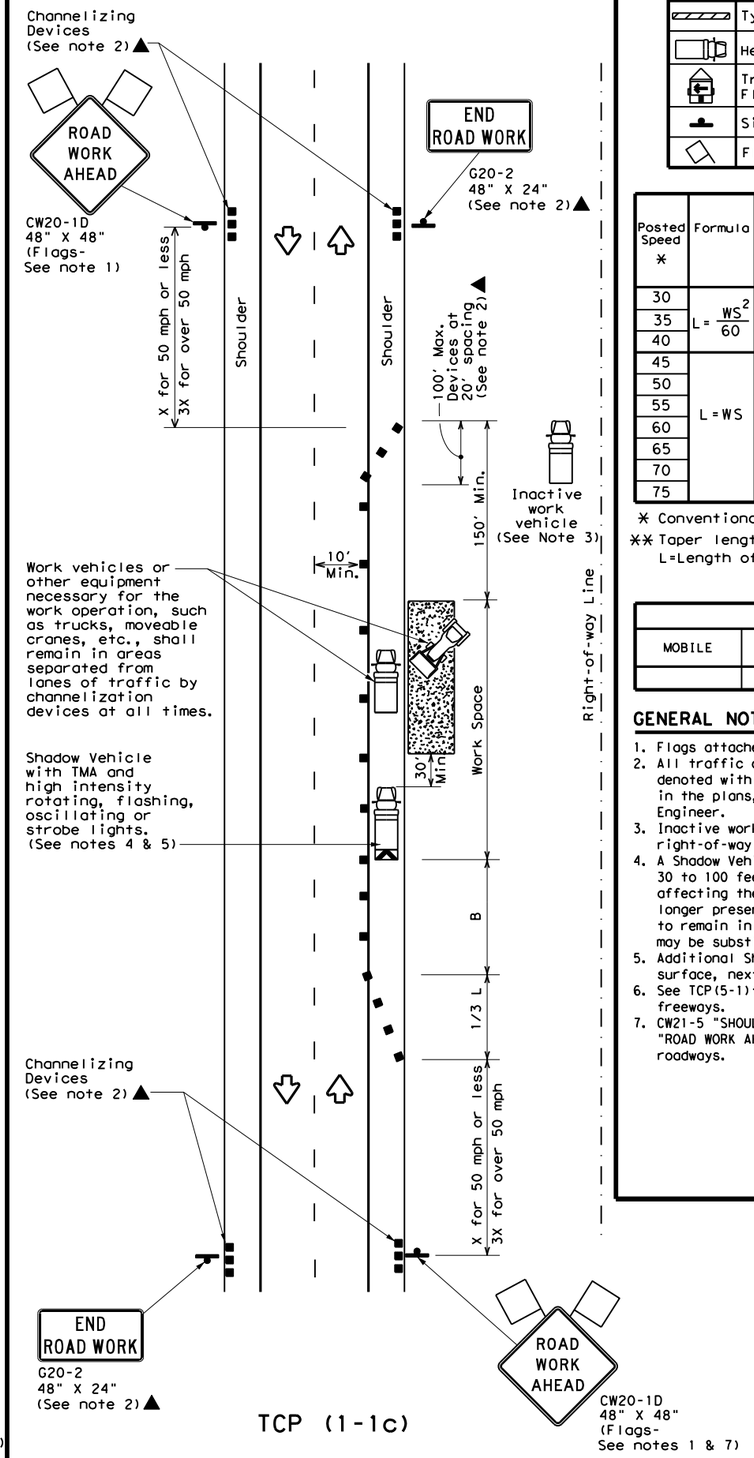
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
6. See TCP(5-1)for shoulder work on divided highways, expressways and freeways.
7. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

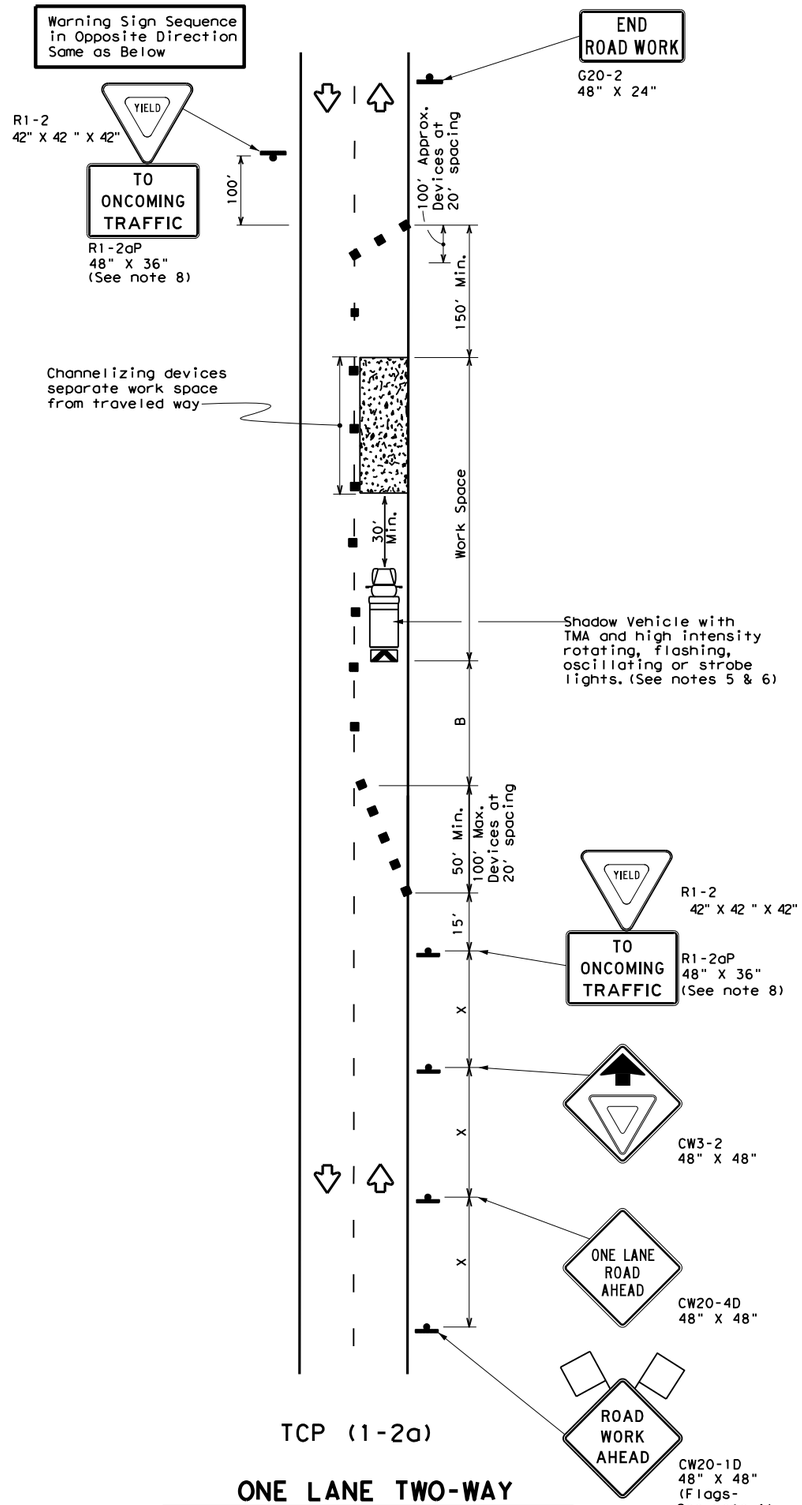
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

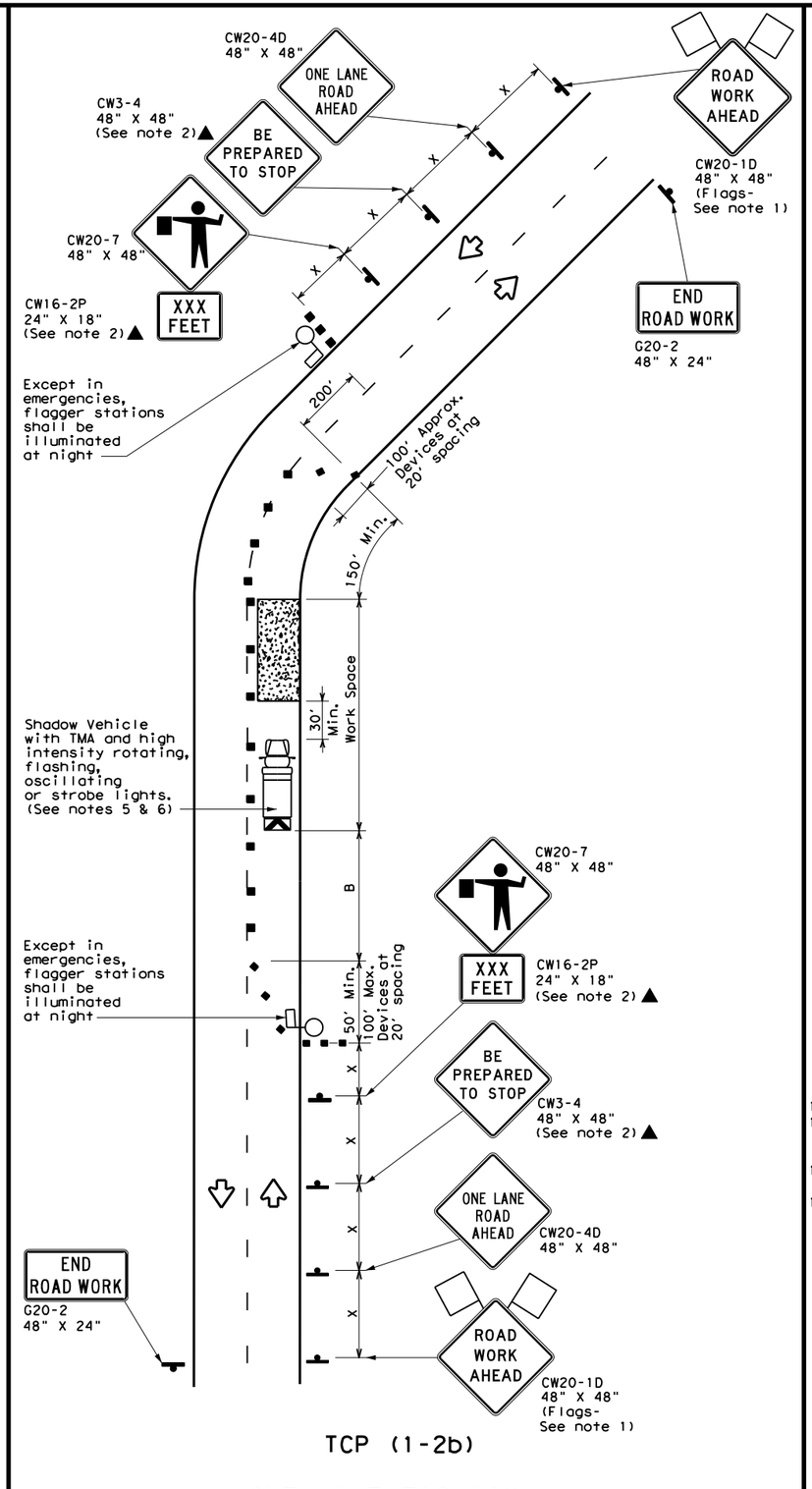
FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98	0049	14	014, ETC.	FM 46, ETC.
8-95 2-12	DIST	COUNTY		SHEET NO.
1-97 2-18	BRY	ROBERTSON, ETC.		41

DATE:
FILE:



TCP (1-2a)

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



TCP (1-2b)

ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-2a)

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

TCP (1-2b)

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

Texas Department of Transportation

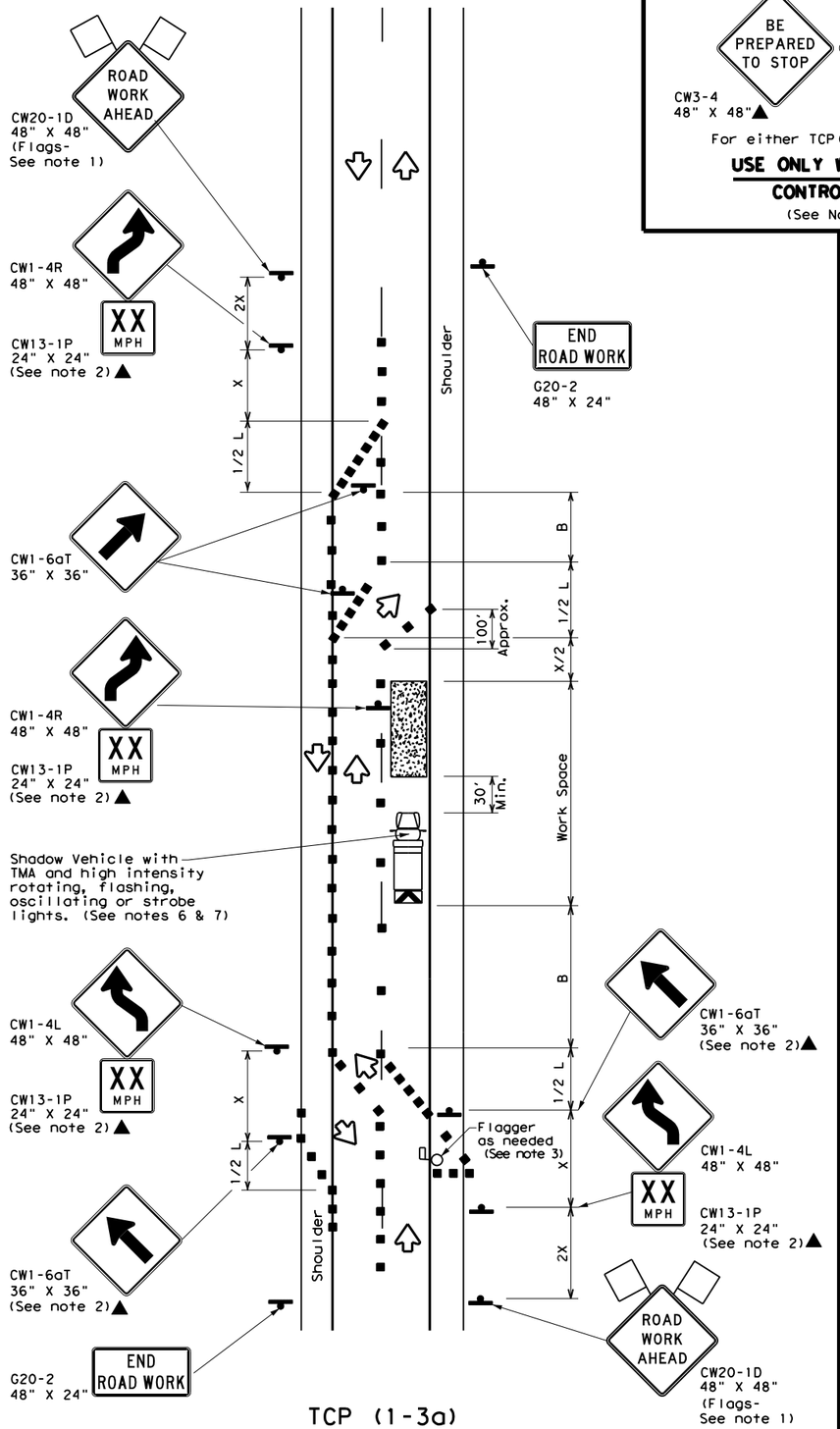
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(1-2)-18

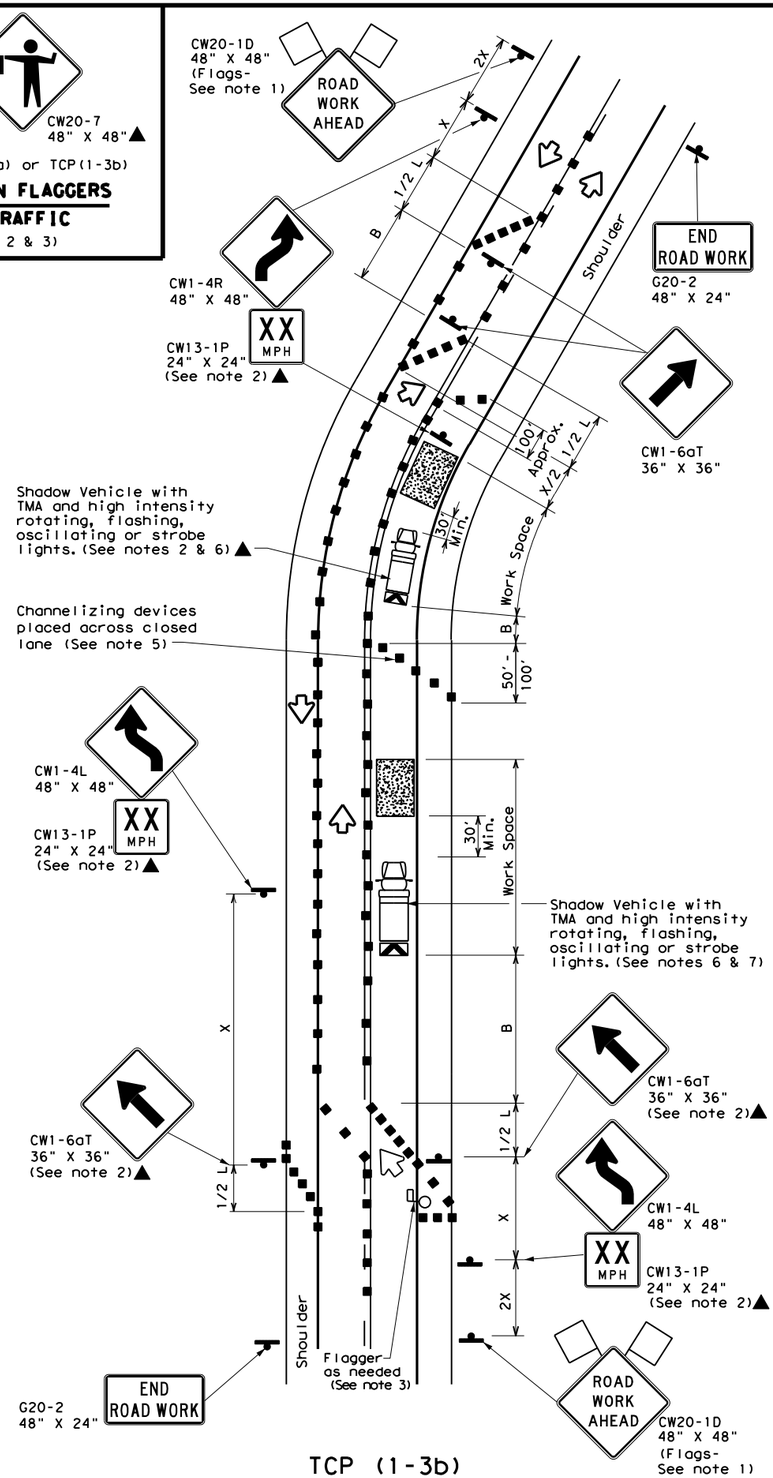
FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-90 4-98	0049	14	014, ETC.	FM 46, ETC.
2-94 2-12	DIST	COUNTY		SHEET NO.
1-97 2-18	BRY	ROBERTSON, ETC.		42

DATE:
FILE:



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

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

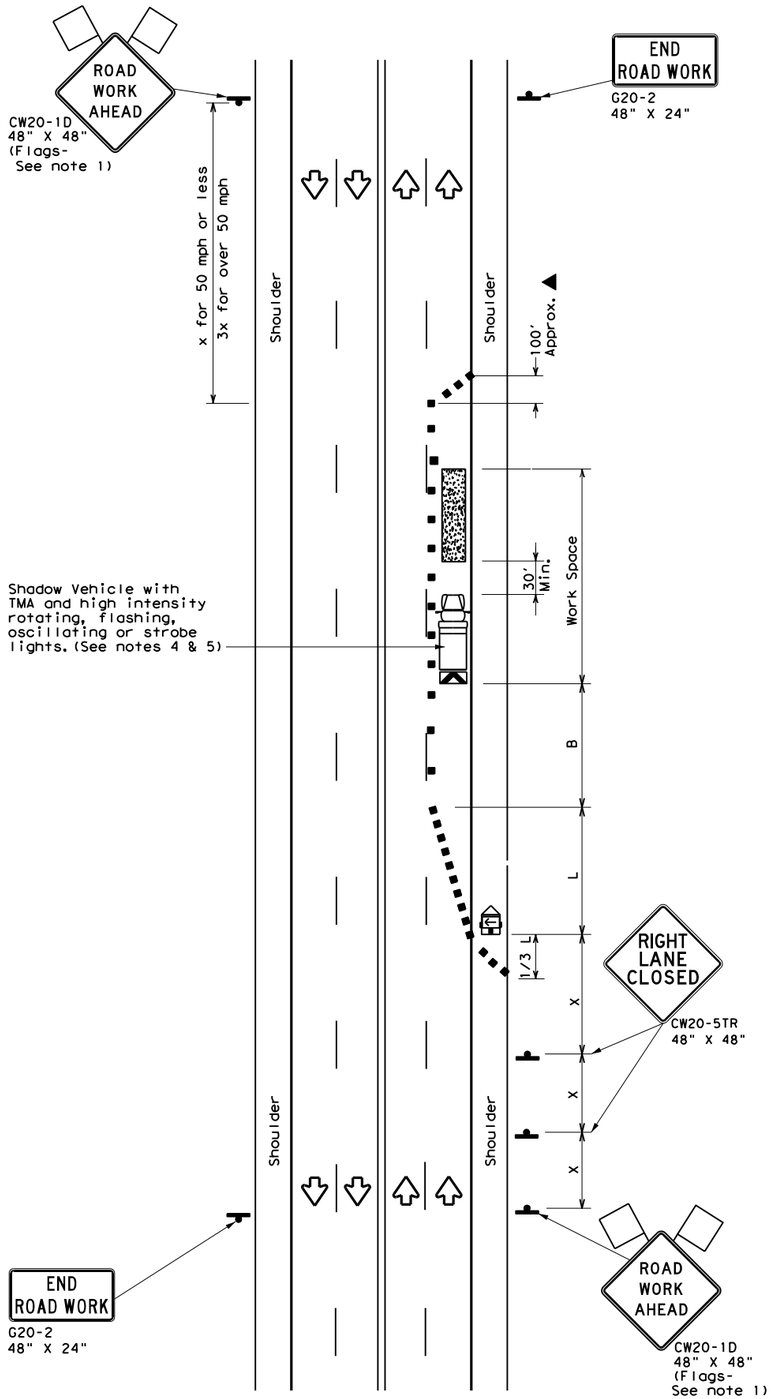
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

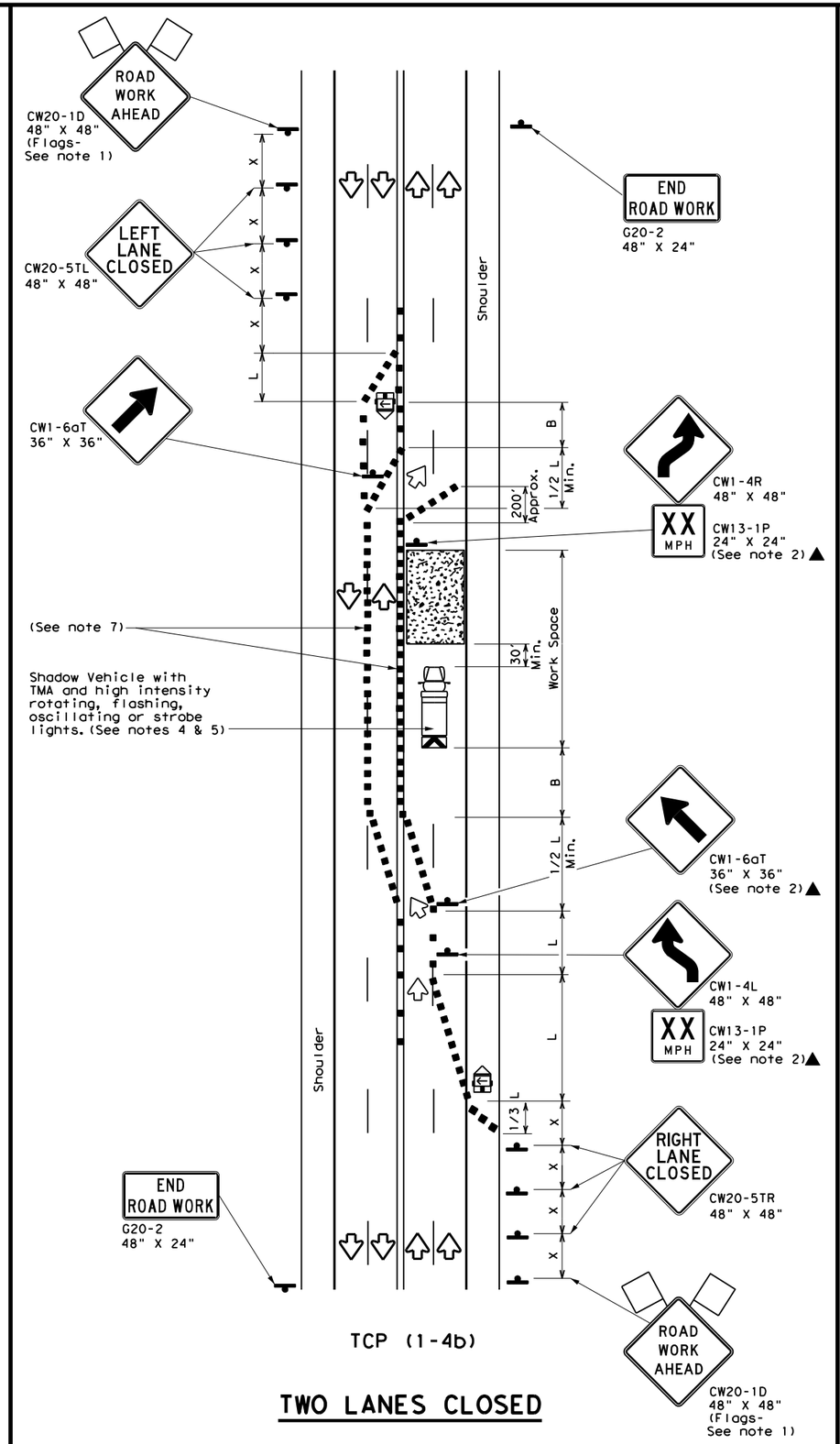
FILE: tcp1-3-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0049	14	014, ETC.	FM 46, ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	BRY	ROBERTSON, ETC.		43
1-97 2-18				

DATE:
FILE:



TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

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

Posted Speed *	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. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-4a)

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

TCP (1-4b)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-18

FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0049	14	014, ETC.	FM 46, ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	BRY	ROBERTSON, ETC.		44
1-97 2-18				

DATE:
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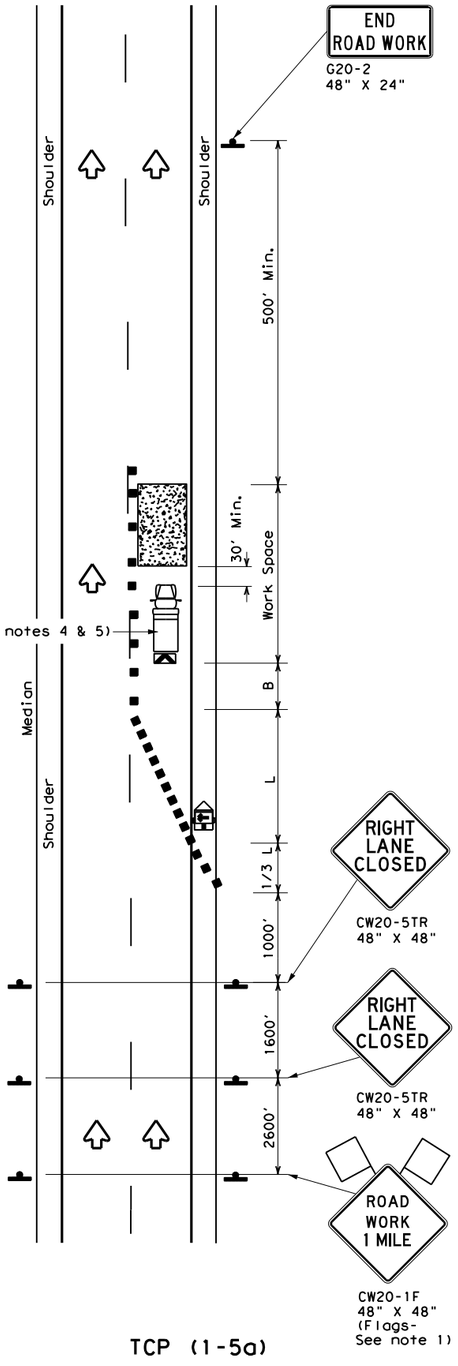
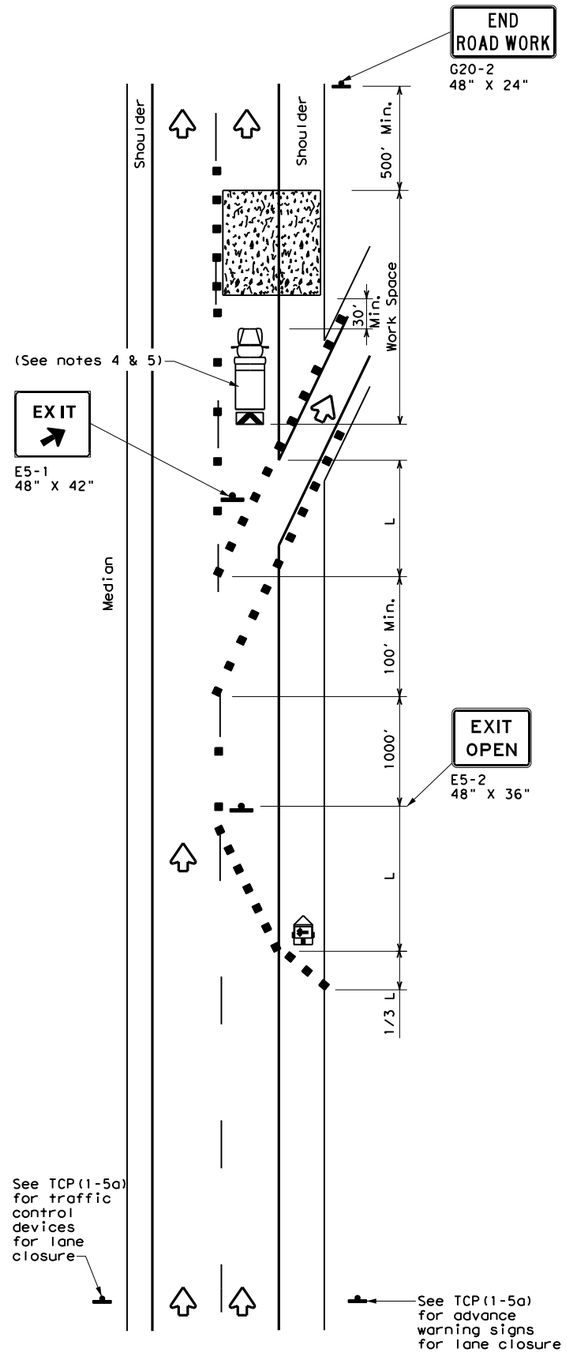


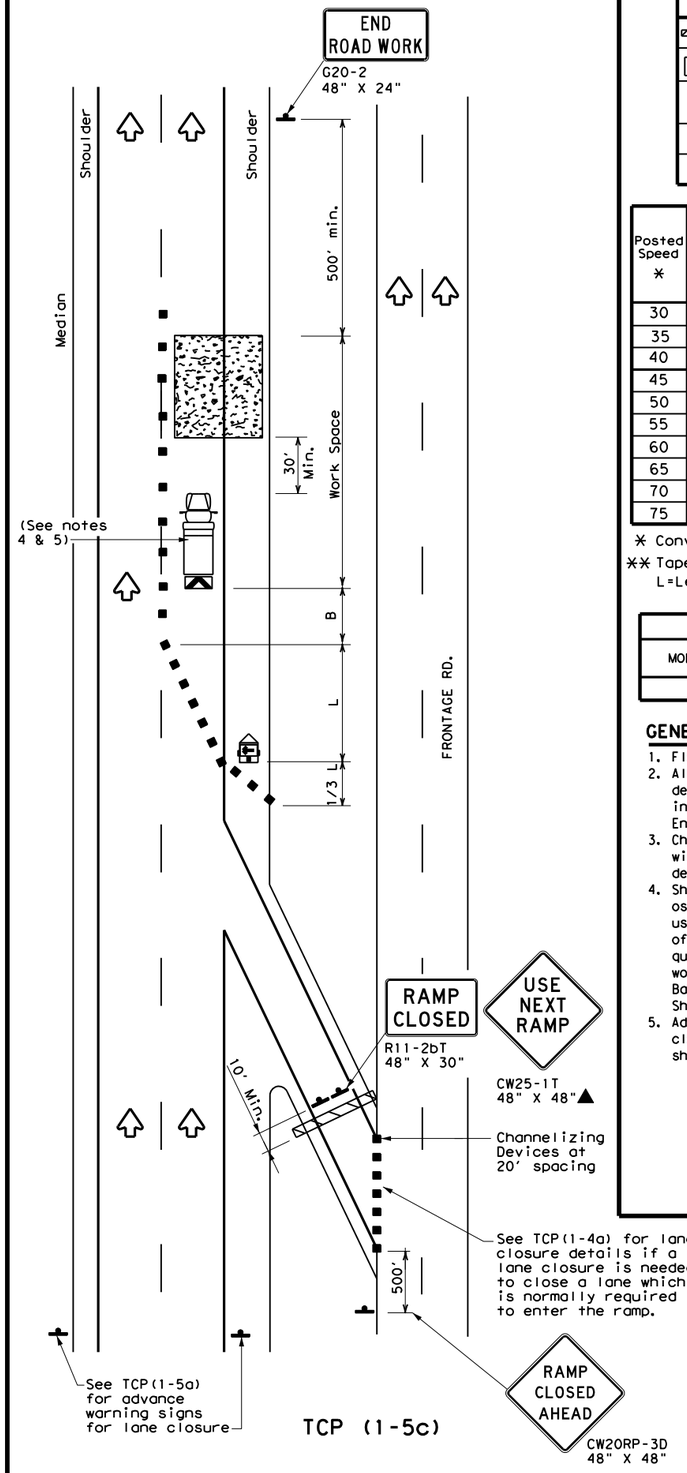
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

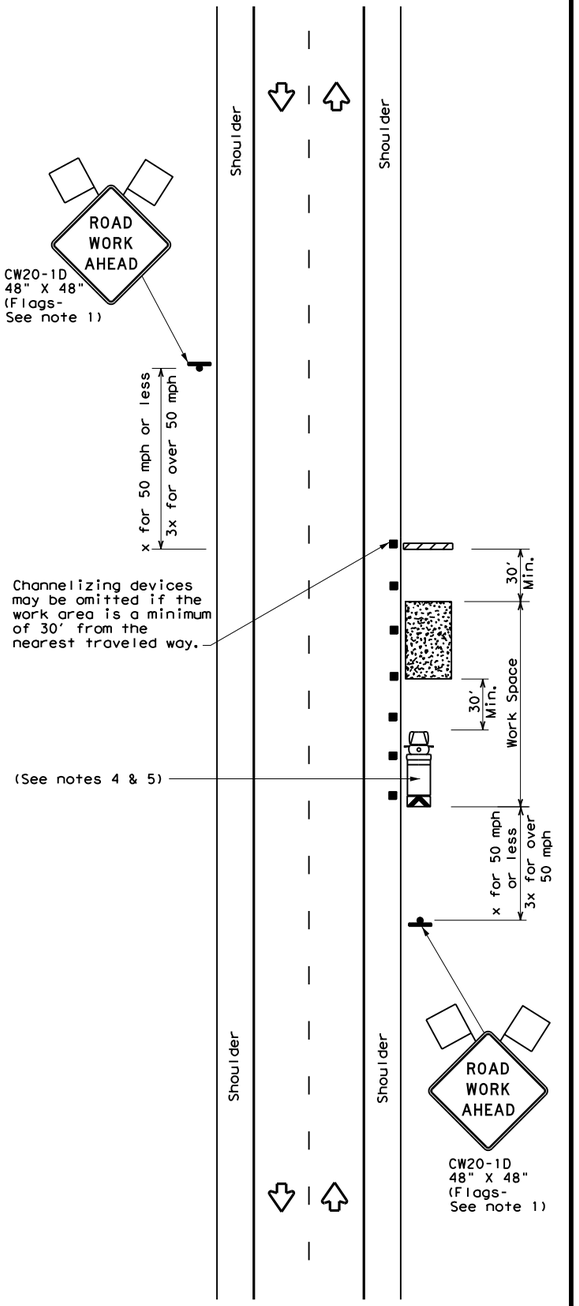
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-18

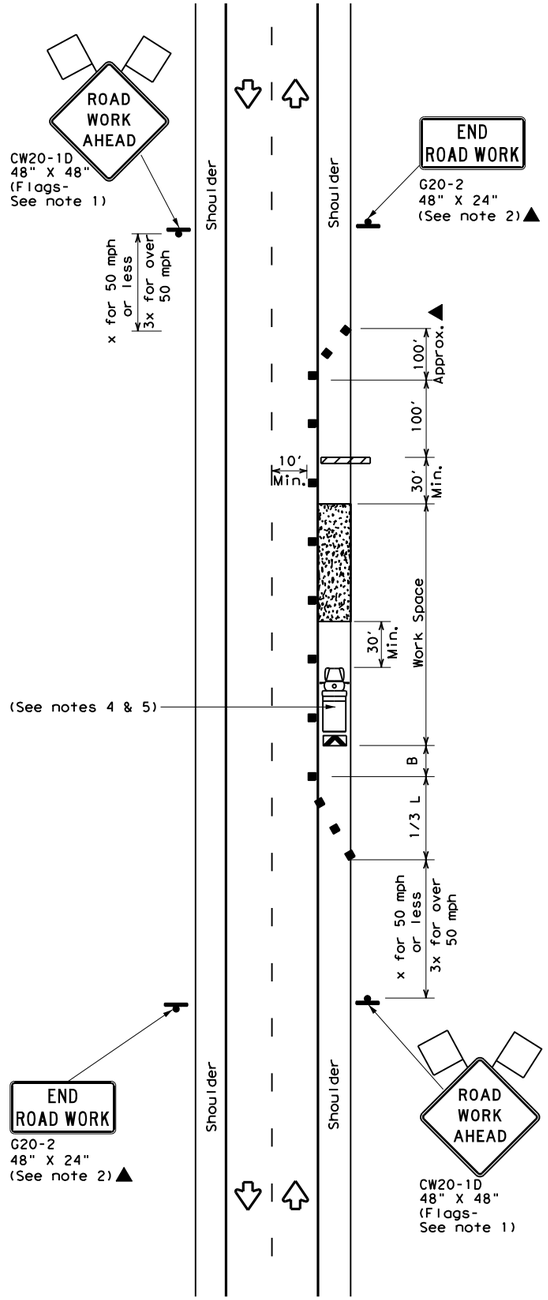
FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	0049	14	014, ETC.	FM 46, ETC.
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON, ETC.		45

DATE:
FILE:



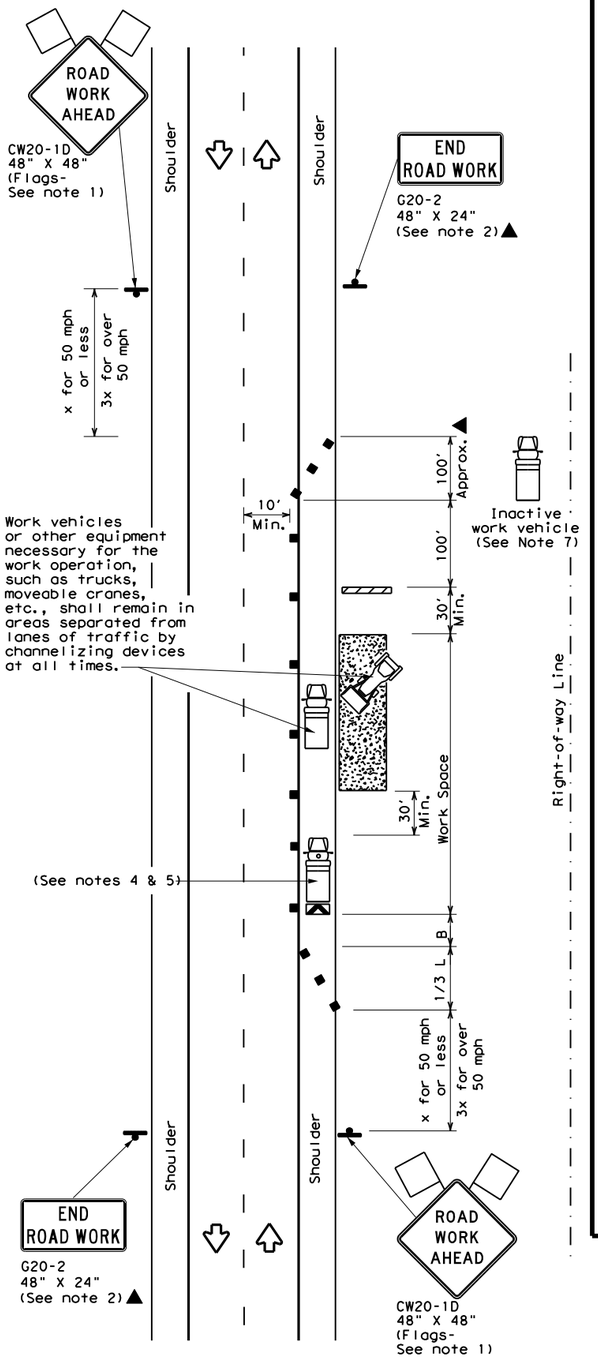
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
3. Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
8. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

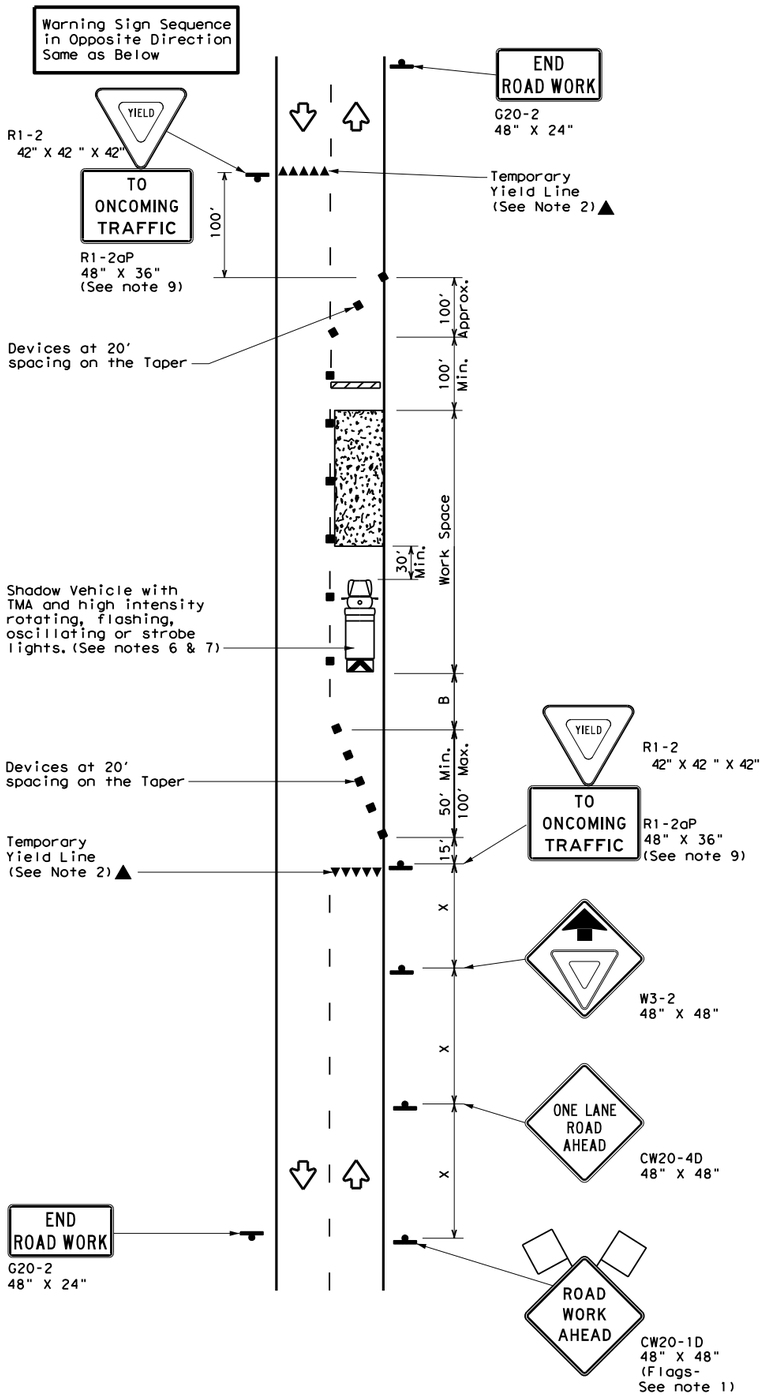
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

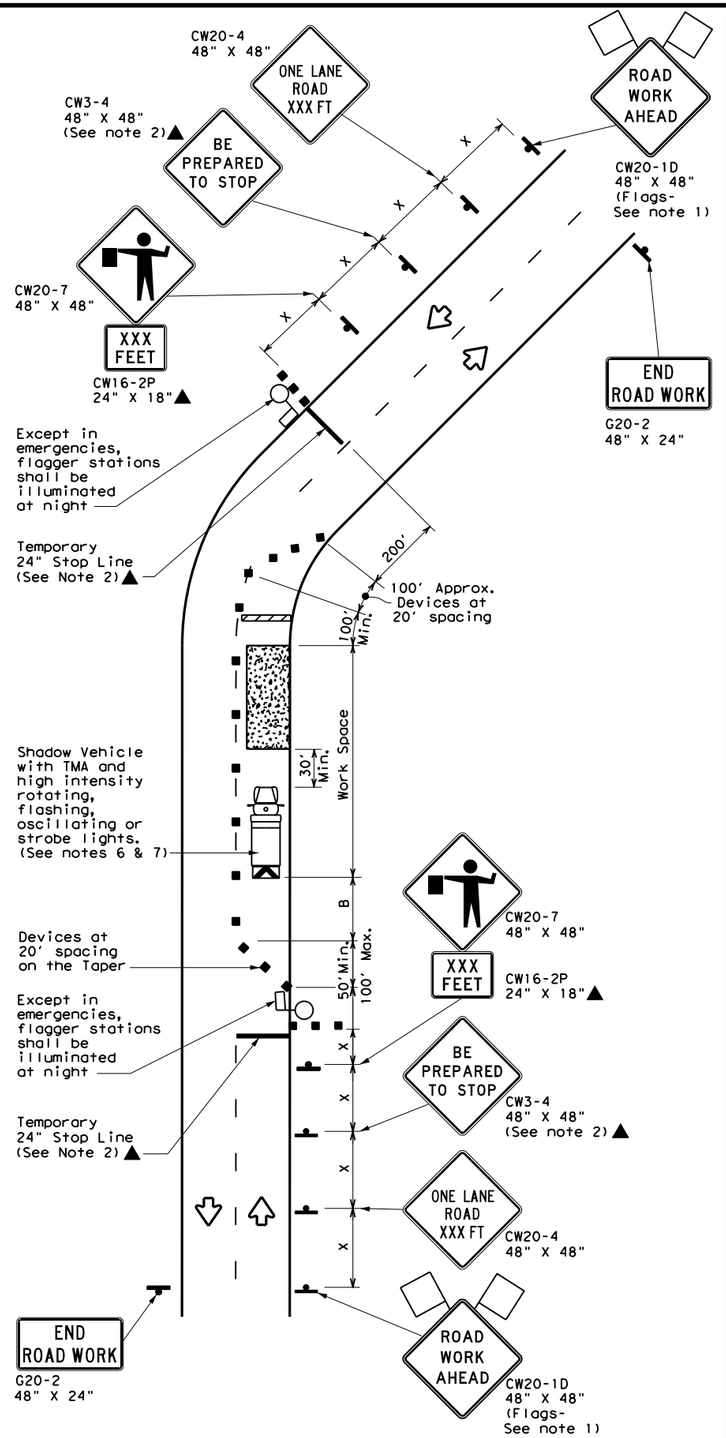
TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0049	14	014, ETC.	FM 46, ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	BRY	ROBERTSON, ETC.		46
1-97 2-18				

DATE:
FILE:



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



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

LEGEND

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

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

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

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

GENERAL NOTES

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

TCP (2-2a)

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

TCP (2-2b)

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

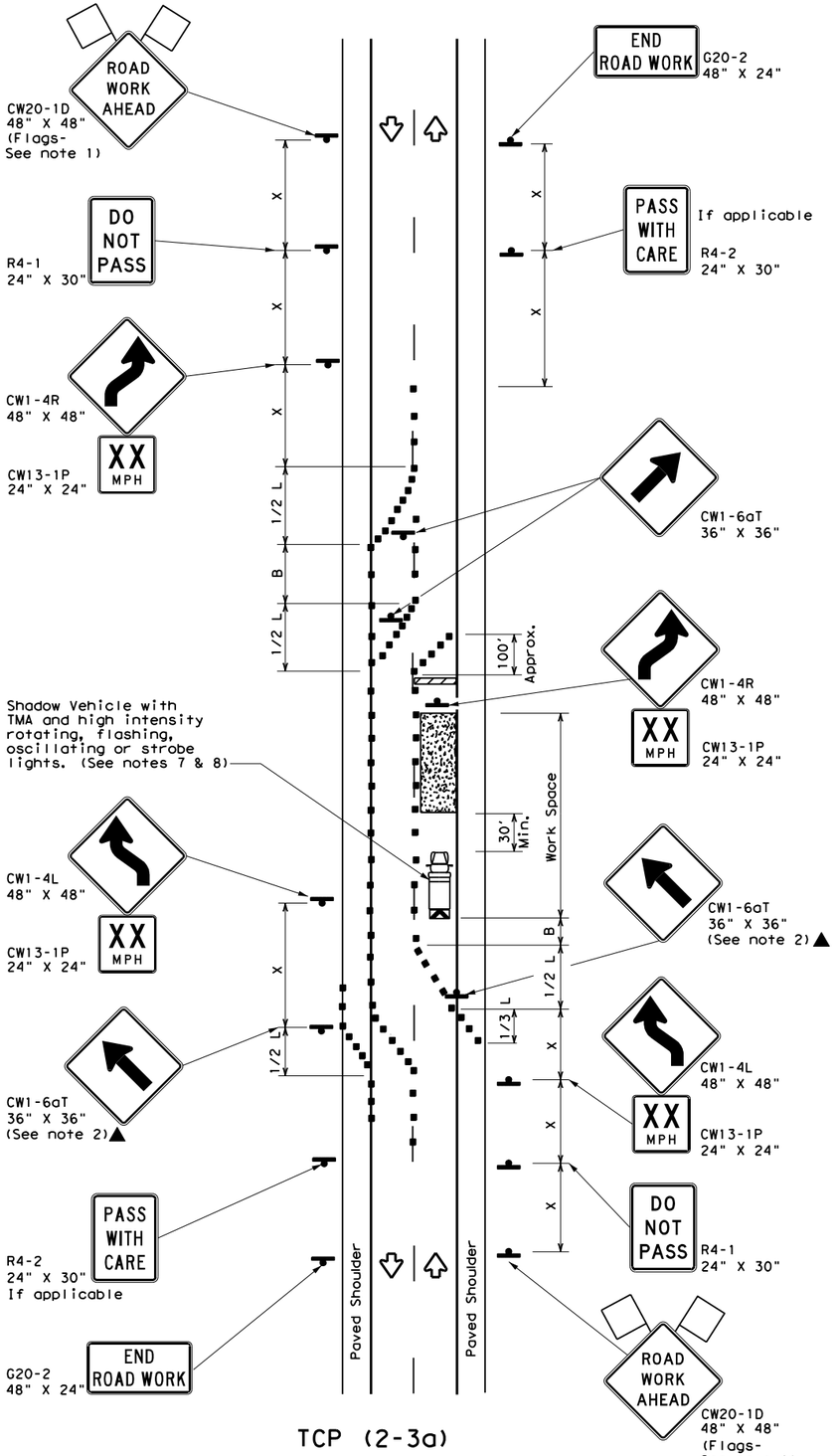
Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(2-2)-18

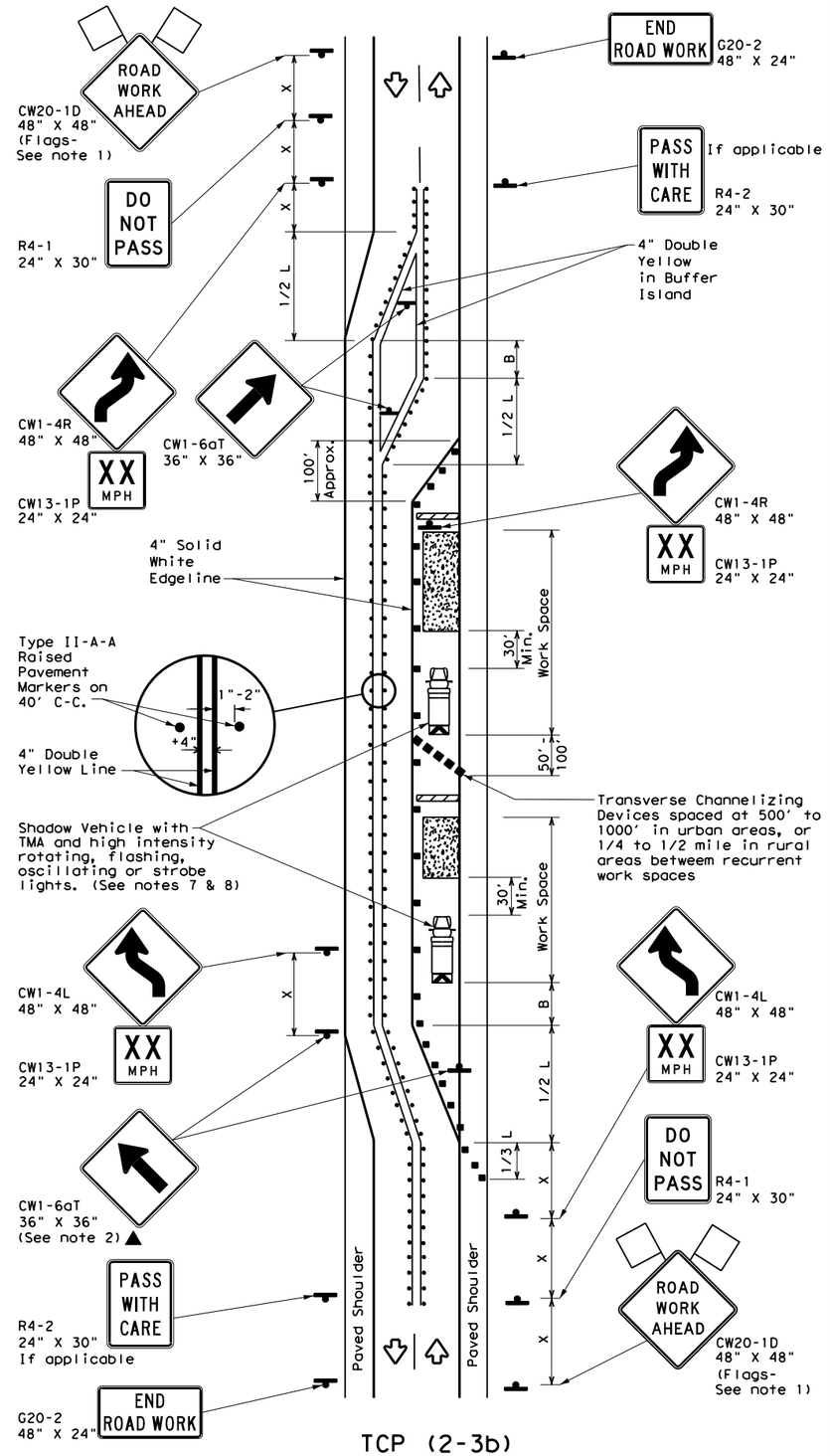
FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0049	14	014,ETC.	FM 46,ETC.
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON, ETC.		47

DATE:
FILE:



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

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

LEGEND			
	Type 3 Barricade	■ ■	Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	....	Raised Pavement Markers Ty II-AA
	Sign		Traffic Flow
	Flag		Flagger

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

* Conventional Roads Only

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

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
				TCP(2-3b)ONLY
			✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
4. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
5. The R4-1 "DO NOT PASS," R4-2 " PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
6. Conflicting pavement marking shall be removed for long term projects.
7. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted.
8. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-3a)

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

Texas Department of Transportation

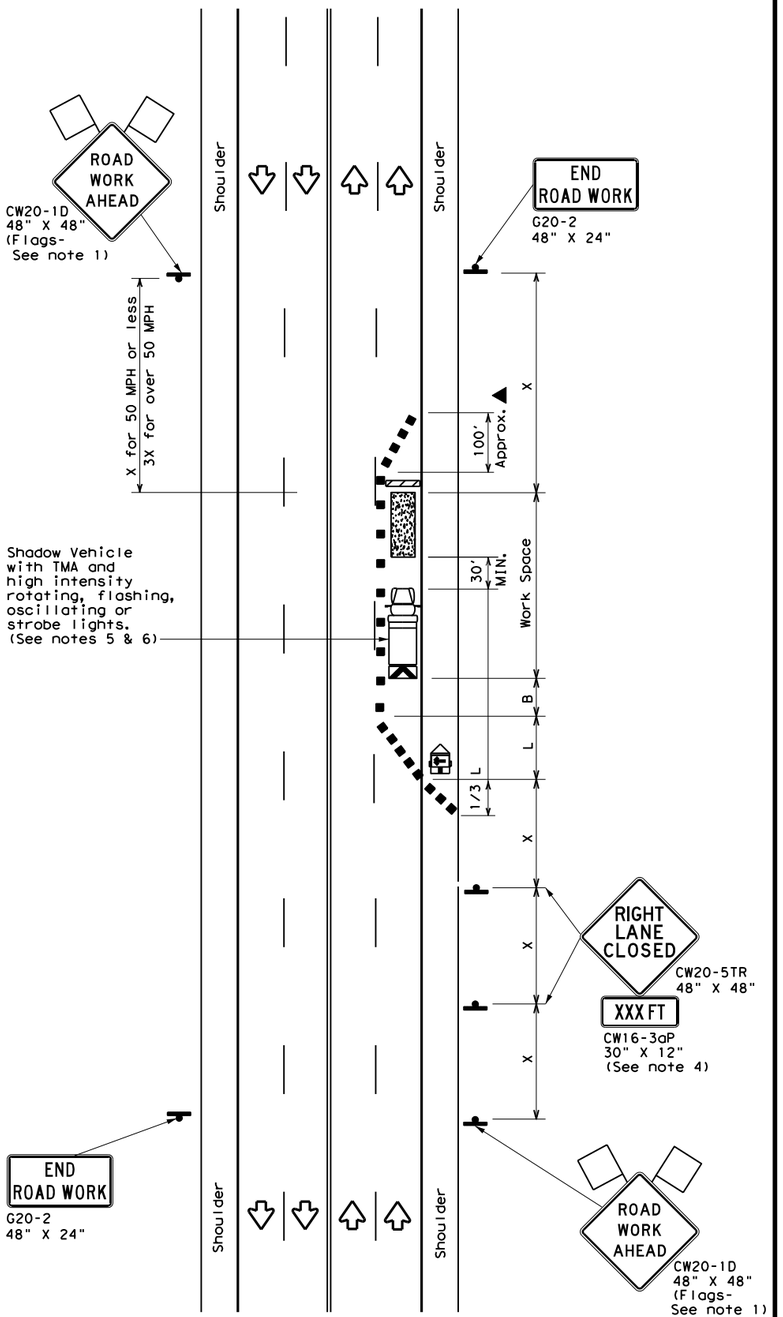
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-18

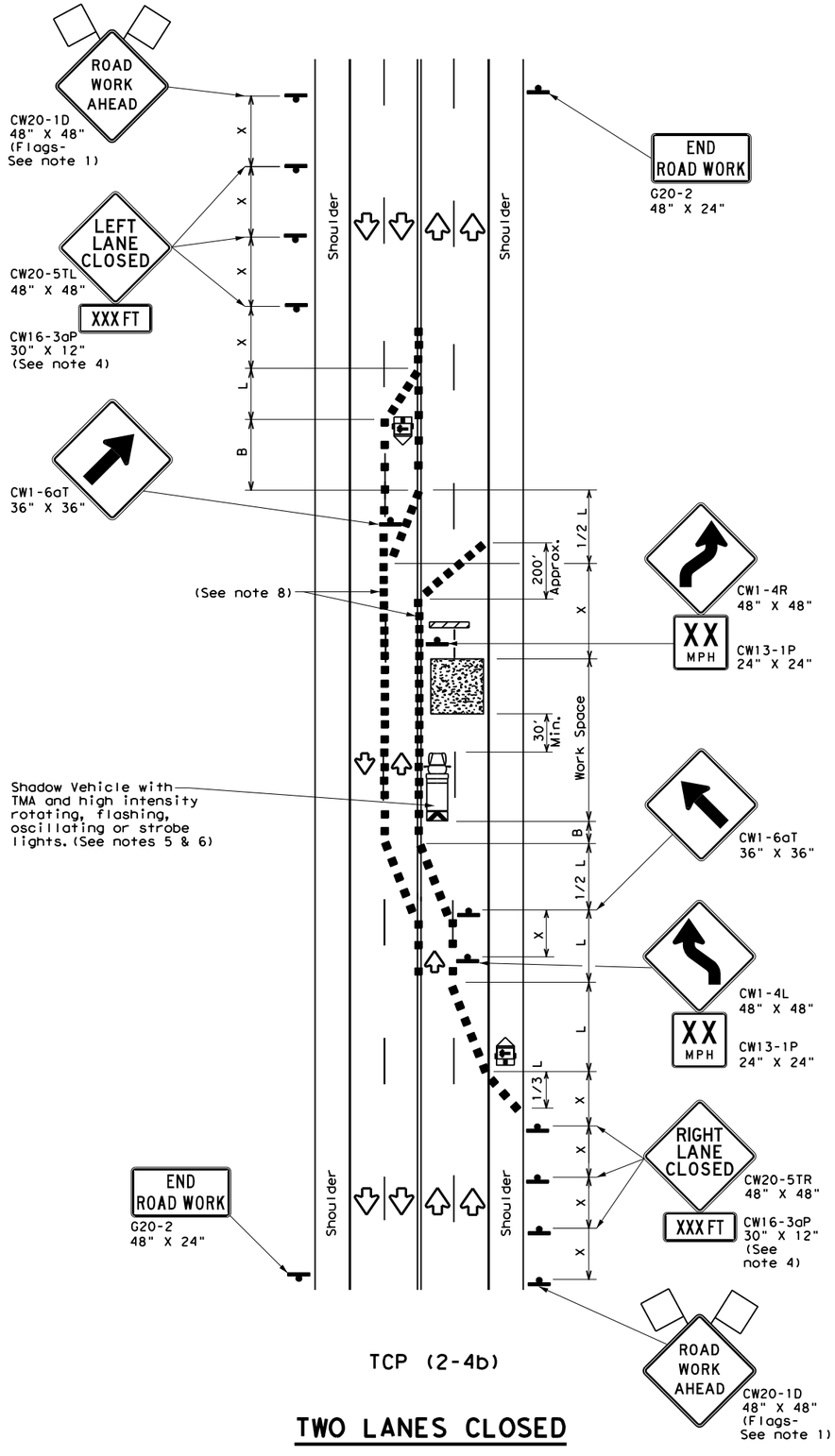
FILE: tcp(2-3)-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0049	14	014,ETC.	FM 46, ETC.
8-95 3-03	DIST	COUNTY		SHEET NO.
1-97 2-12	BRY	ROBERTSON, ETC.		48
4-98 2-18				

DATE:
FILE:



TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	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 downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-4a)

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

TCP (2-4b)

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

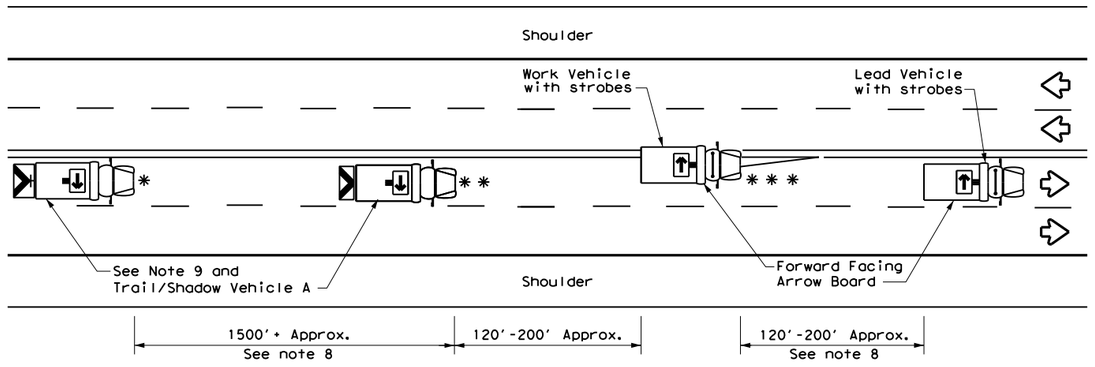
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

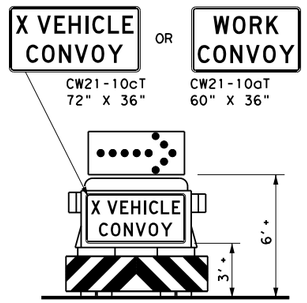
TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0049	14	014,ETC.	FM 46, ETC.
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	BRY	ROBERTSON, ETC.		49



TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

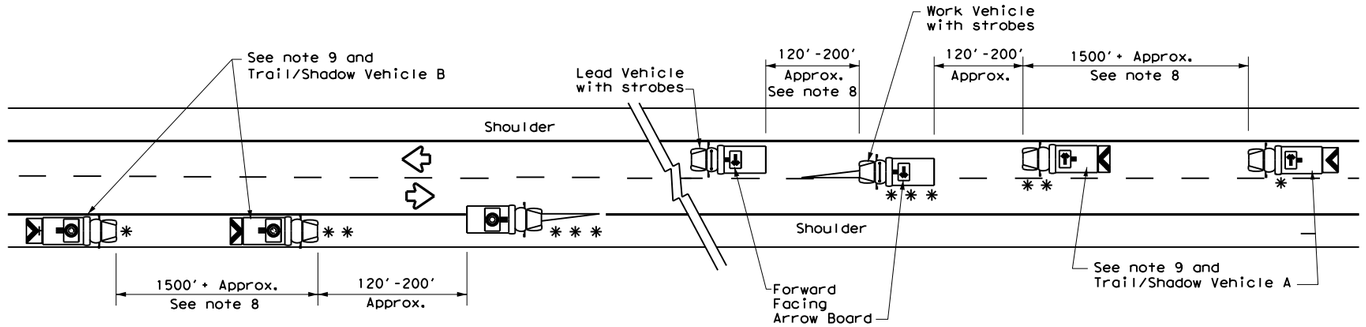
with RIGHT Directional display Flashing Arrow Board

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

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

GENERAL NOTES

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

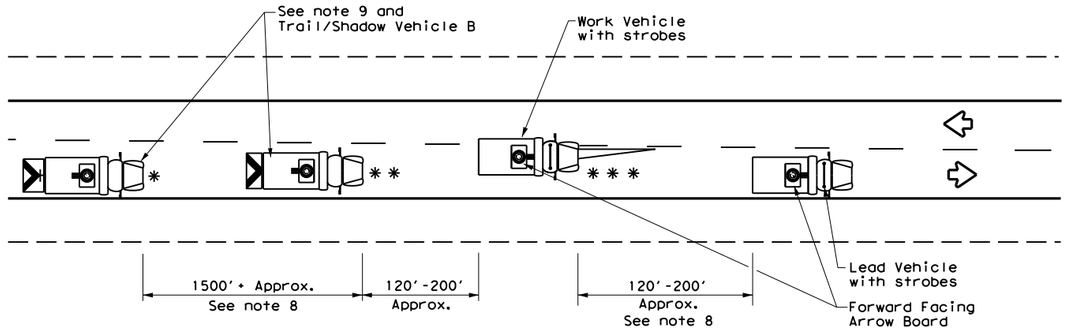


WORK ON SHOULDER

WORK ON TRAVEL LANE

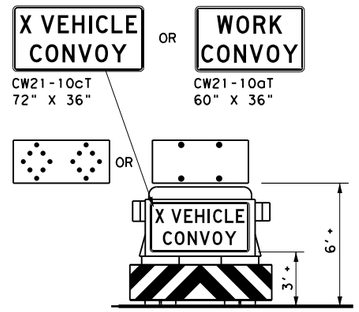
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



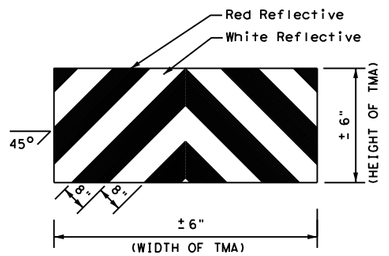
TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in CAUTION display



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

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	0049	14	014,ETC.	FM 46,ETC.
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON,ETC.		50

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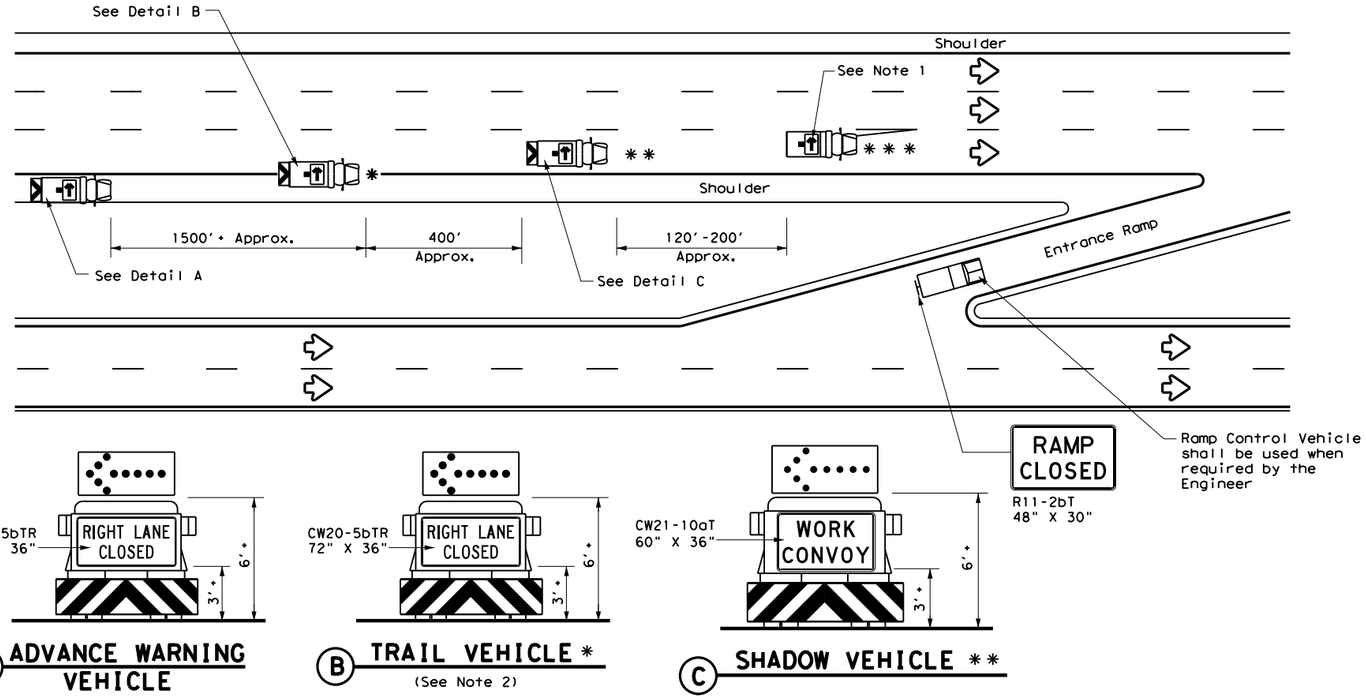
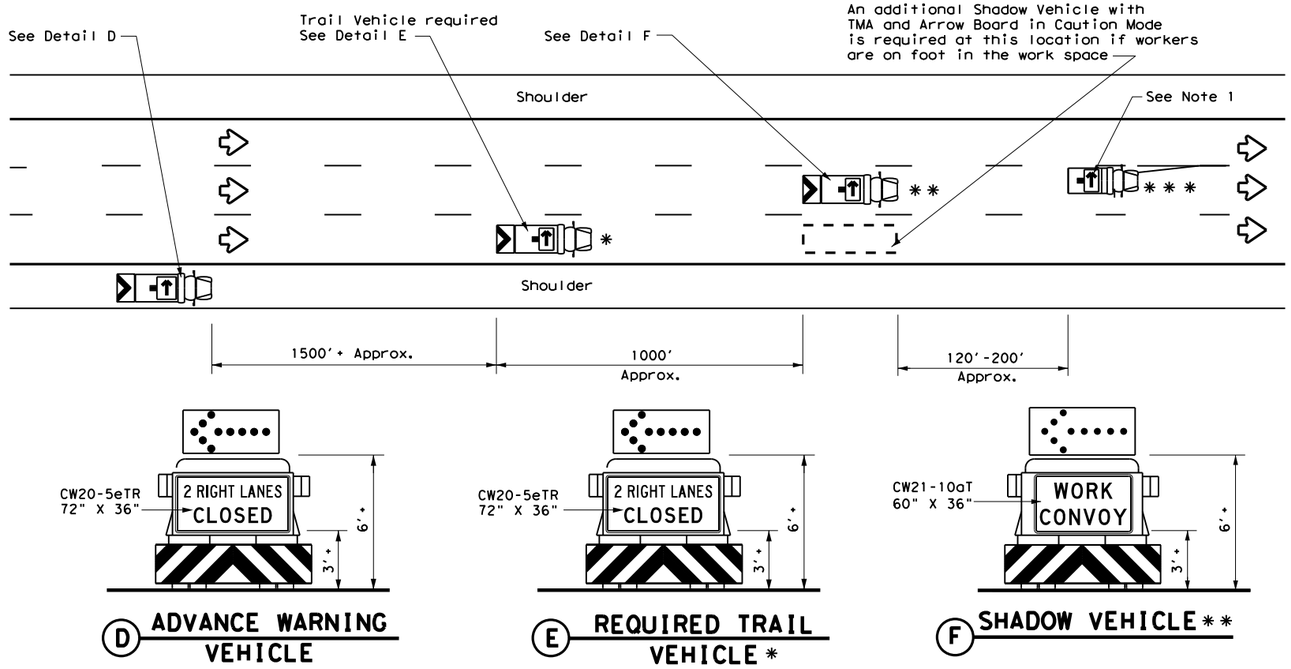


RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



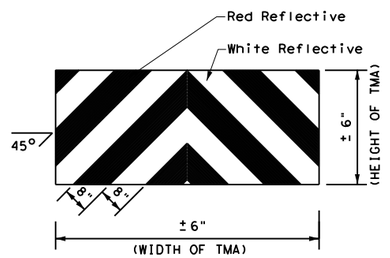
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0049	14	014, ETC.	FM 46, ETC.
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON, ETC.		51

176

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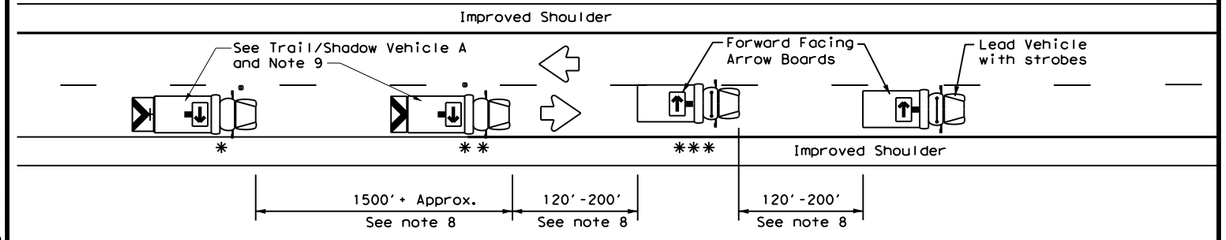
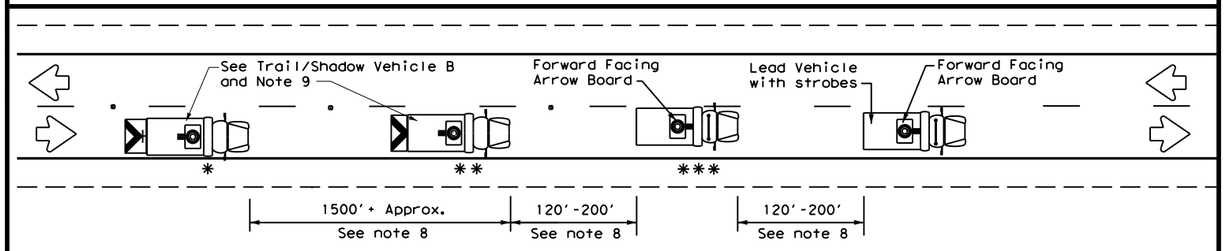


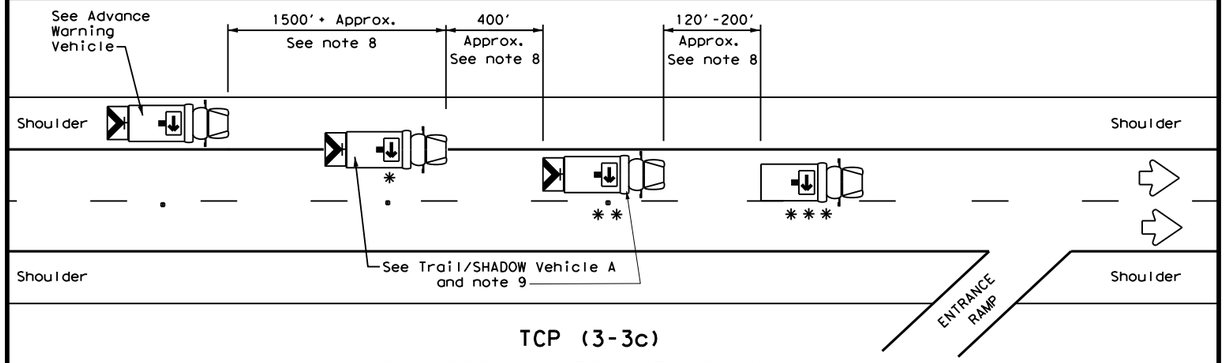
TCP (3-3a)

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



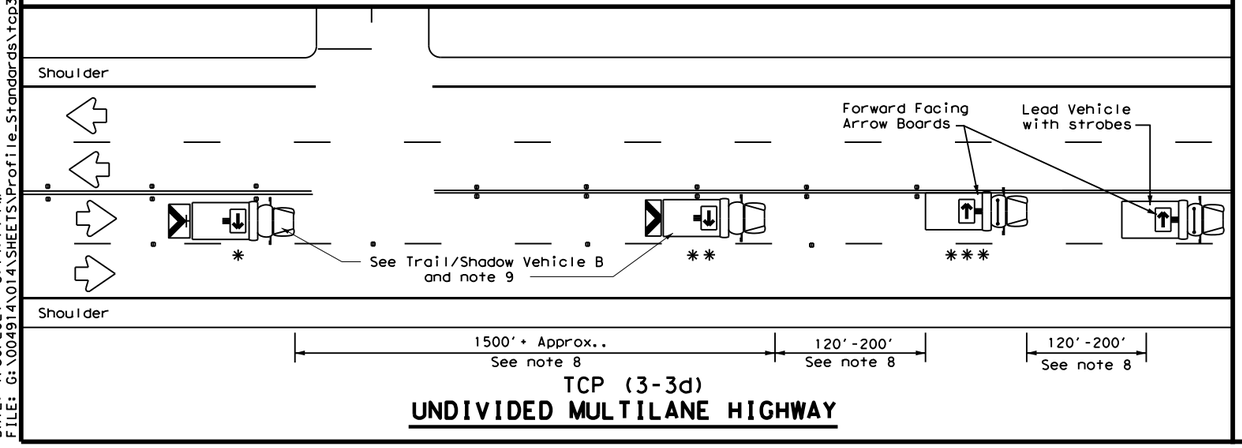
TCP (3-3b)

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



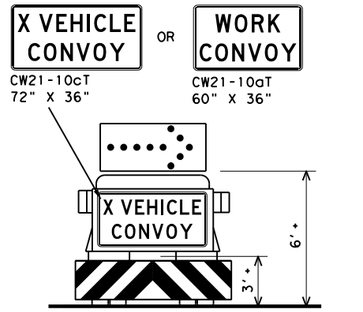
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



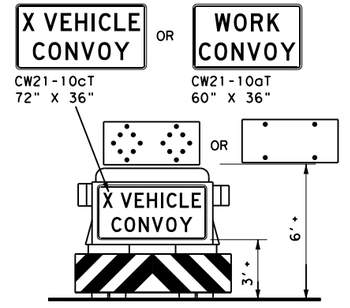
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



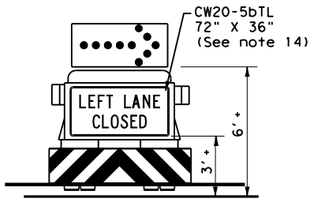
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

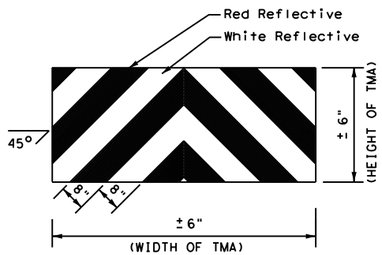


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

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

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0049	14	014,ETC.	FM 46,ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	BRY	ROBERTSON,ETC.		52
1-97 7-14				

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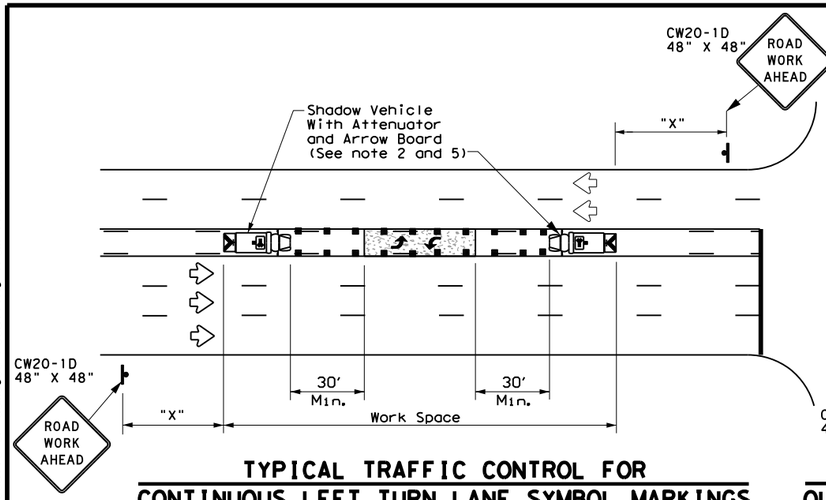
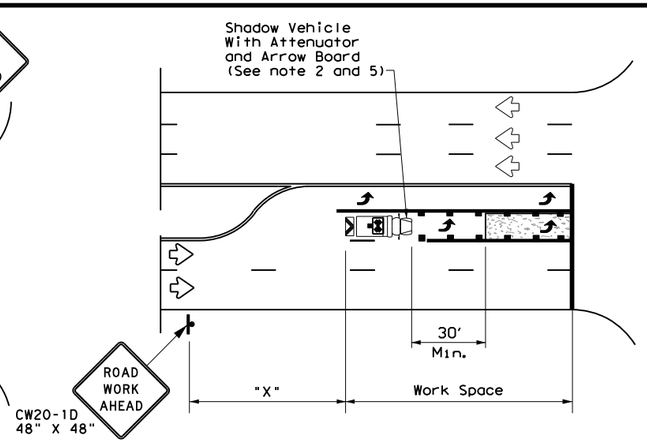
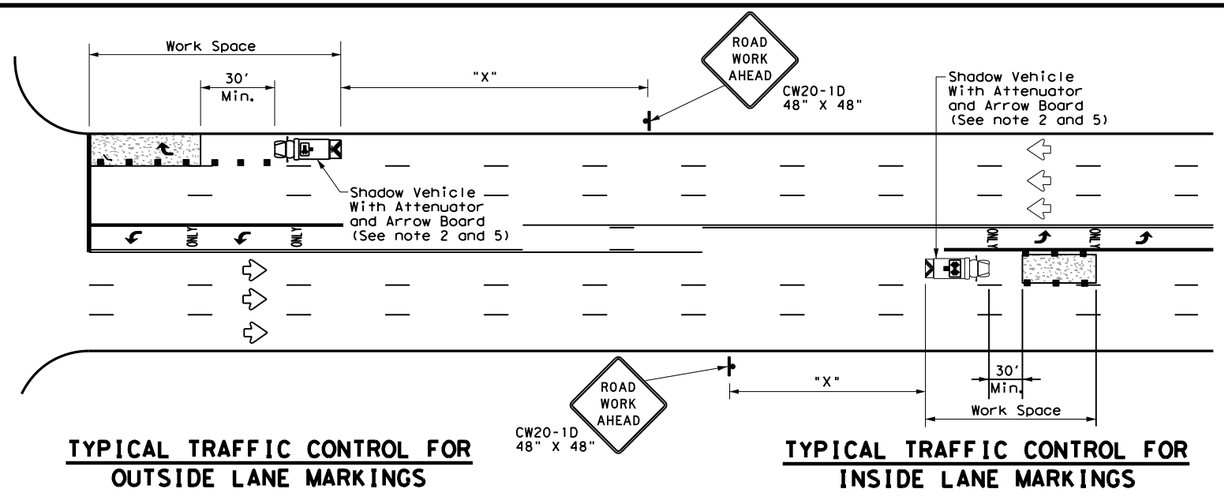


TYPICAL TRAFFIC CONTROL FOR CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

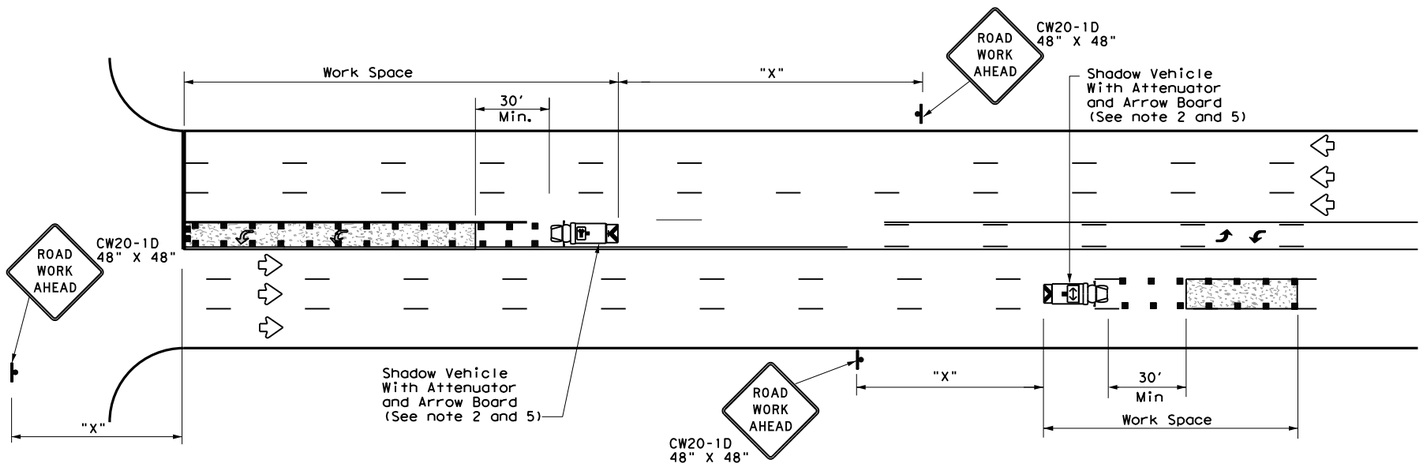


TYPICAL TRAFFIC CONTROL FOR OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



TYPICAL TRAFFIC CONTROL FOR OUTSIDE LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR INSIDE LANE MARKINGS



TYPICAL TRAFFIC CONTROL FOR LEFT TURN LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR CENTER LANE MARKINGS

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

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

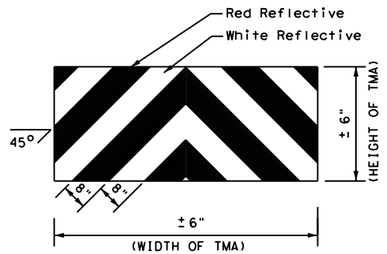
* Conventional Roads Only

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

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

GENERAL NOTES

1. This traffic control plan is for use on conventional roads posted at 45 mph or less and is intended for mobile operations that move continuously or intermittently (stopping up to approximately 15 minutes) such as short-line striping and in-lane rumble strips. When activities are anticipated to take longer amounts of time or traffic conditions warrant, a short duration or short-term stationary traffic control plan should be used.
2. A Truck Mounted Attenuator shall be used on Shadow Vehicle. Striping on the back panel of all truck mounted attenuators shall be 8" red and white reflective sheeting placed in an inverted "V" design. Reflective sheeting shall meet or exceed the reflectivity and color requirements of departmental material specification DMS-8300, Type A.
3. All traffic control devices shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD), latest edition.
4. The use of yellow rotating beacons or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the drivers side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
5. Flashing arrow board shall be used on Shadow Vehicle. Flashing arrow board shall be Type B or Type C as per BC Standards. The arrow board operation shall be controlled from inside the truck.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS FOR ISOLATED WORK AREAS UNDIVIDED HIGHWAYS

TCP(3-4)-13

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©TxDOT July, 2013	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON,ETC.		53

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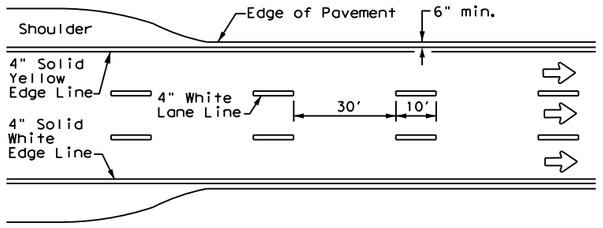
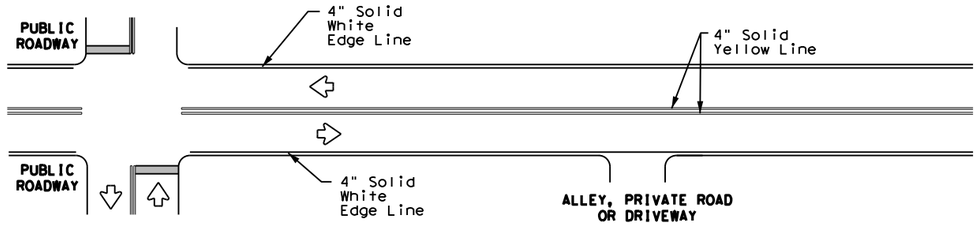
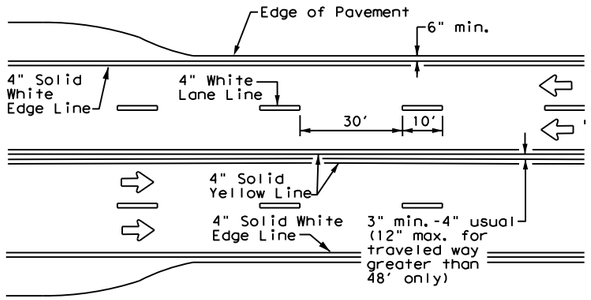


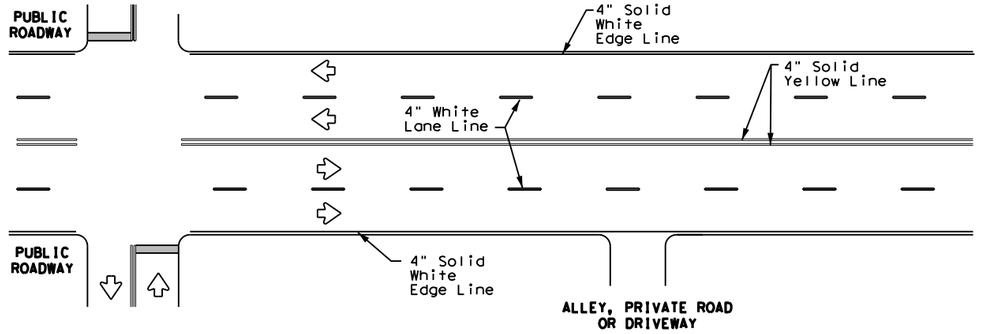
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



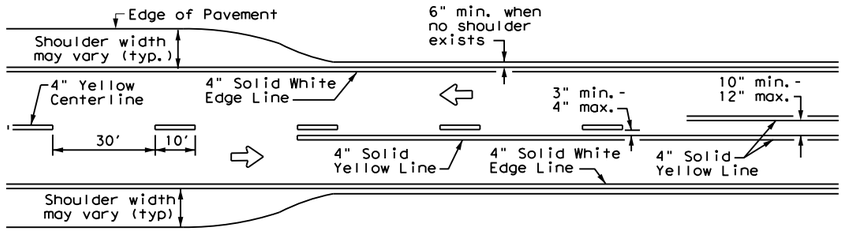
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



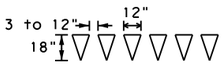
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



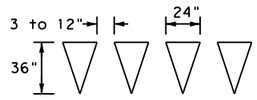
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

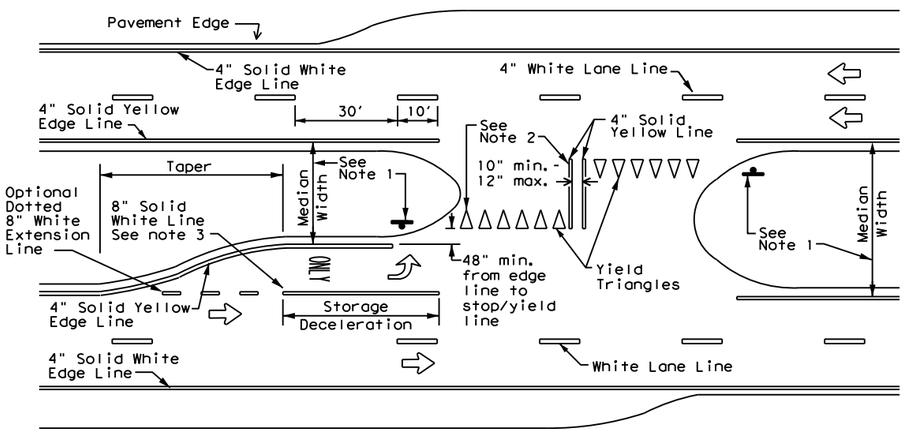


For posted speed on road being marked equal to or less than 40 MPH.



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

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

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.

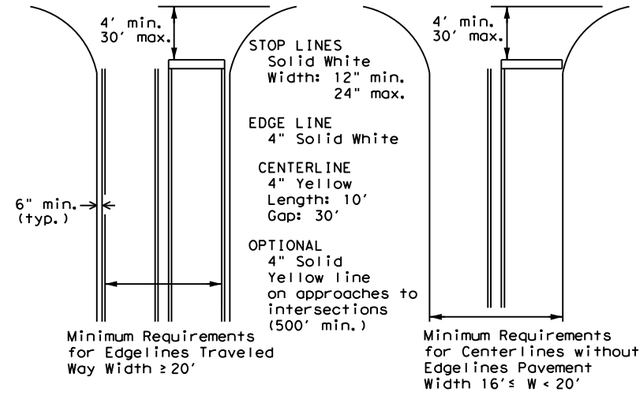
GENERAL NOTES

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

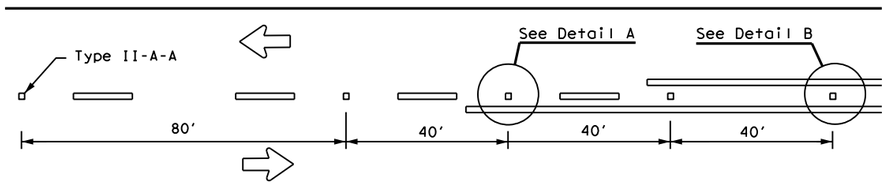
PM(1)-20

FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0049	14	014, ETC.	FM 46, ETC.
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	BRY	ROBERTSON, ETC.		54

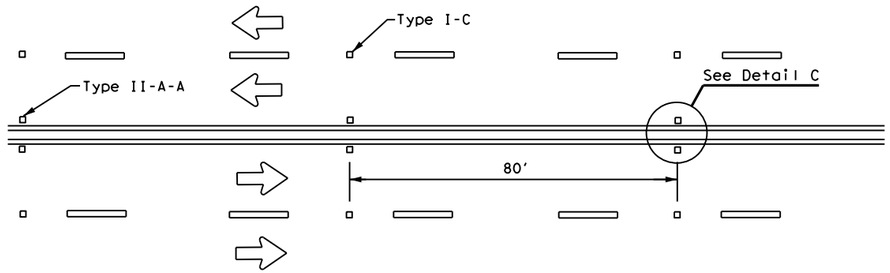
22A

DATE: 5/13/2021 1:42:00 PM
FILE: G:\004914\014\SHEETS\Profile_Standards\pm1-20 (1).dgn

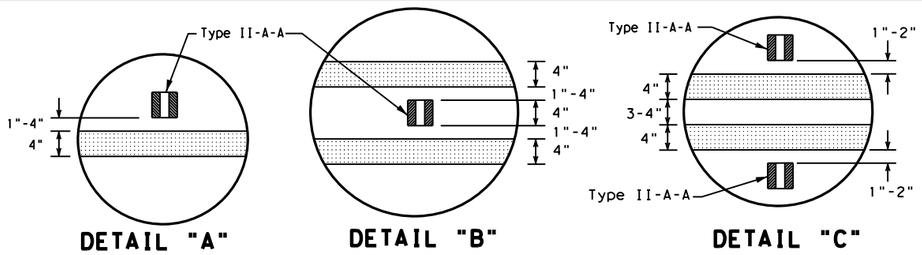
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



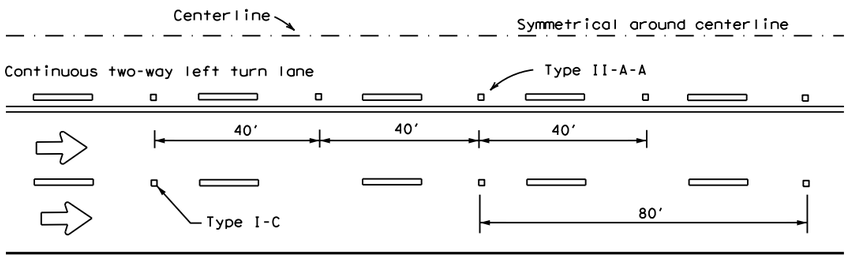
CENTERLINE FOR ALL TWO LANE ROADWAYS



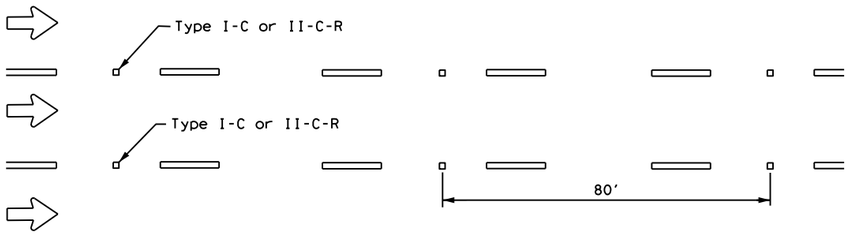
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



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

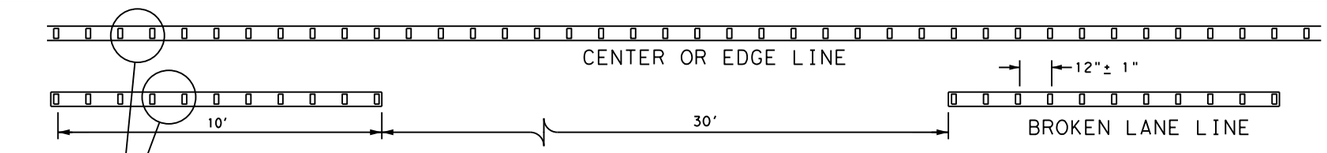


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



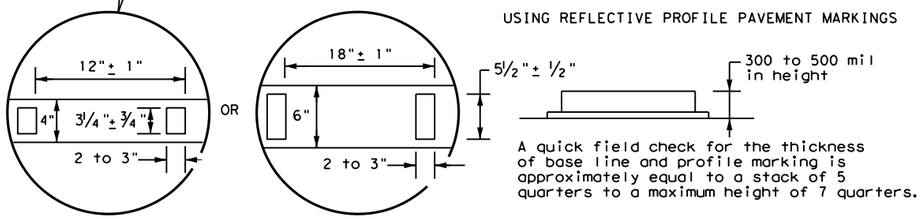
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

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

NOTE

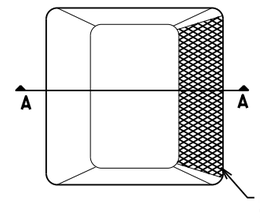
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

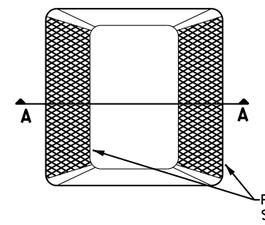
1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

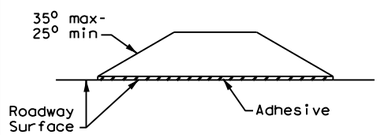
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation

Traffic Safety Division Standard

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

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10	0049	14	014,ETC.	FM 46,ETC.
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	BRY	ROBERTSON,ETC.		55

22B

DATE: 5/13/2021 1:44:18 PM
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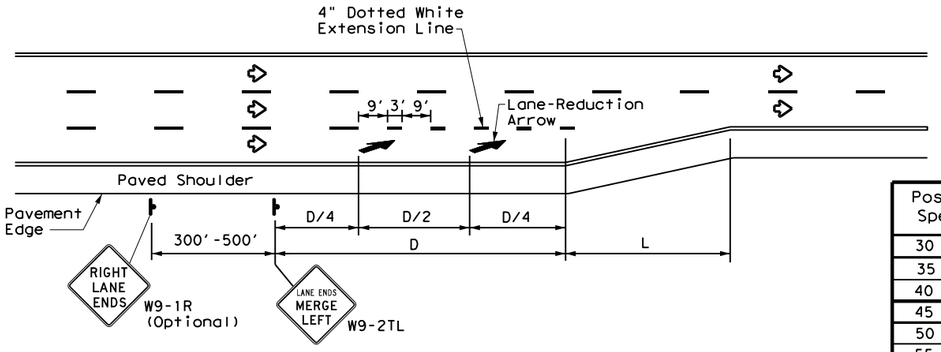
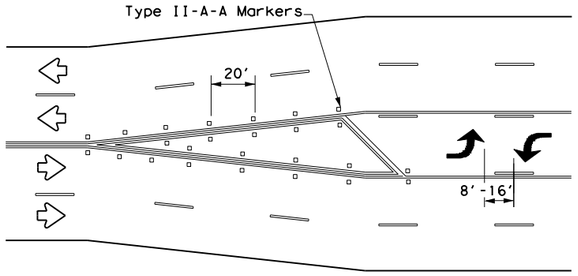


LANE REDUCTION

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.

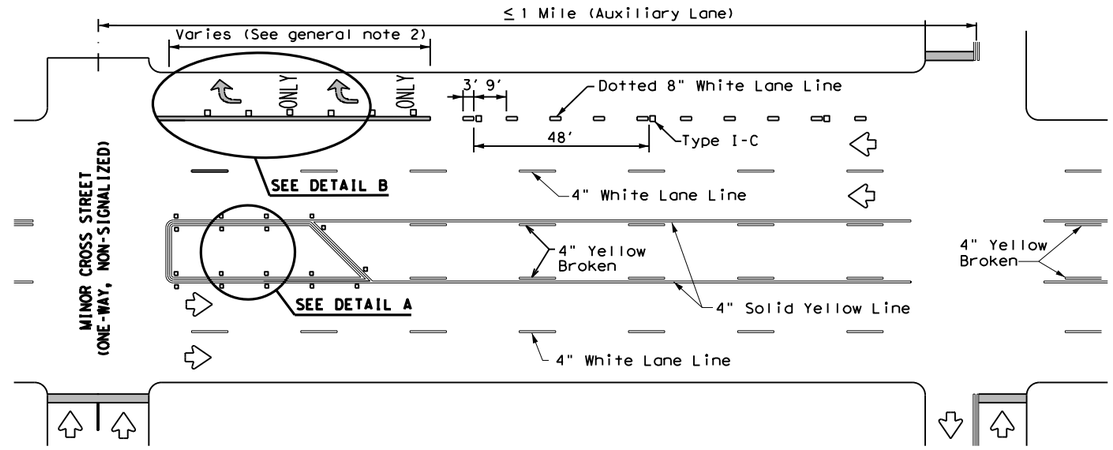
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

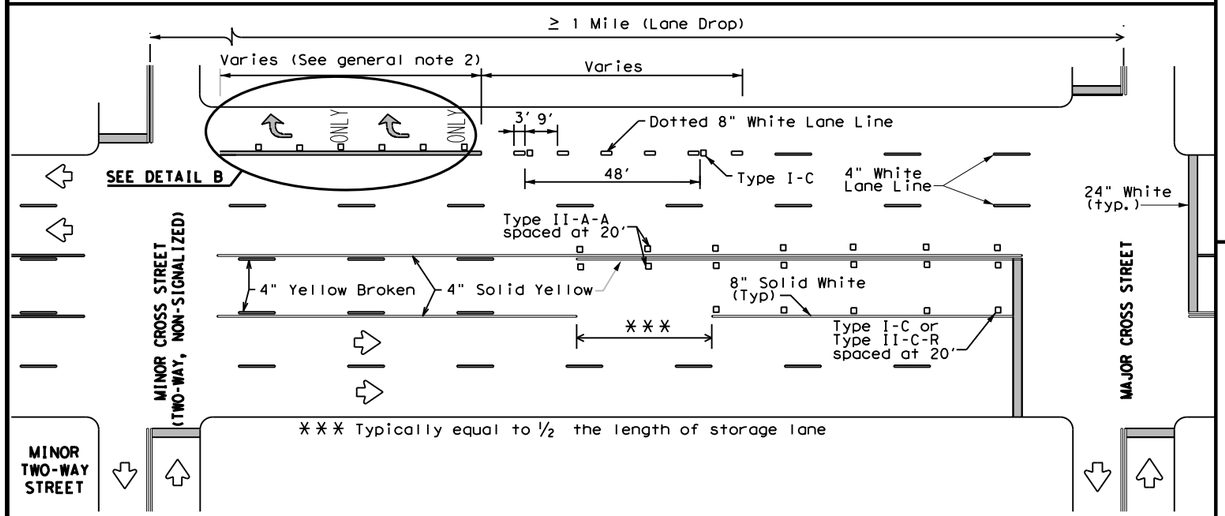
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn 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

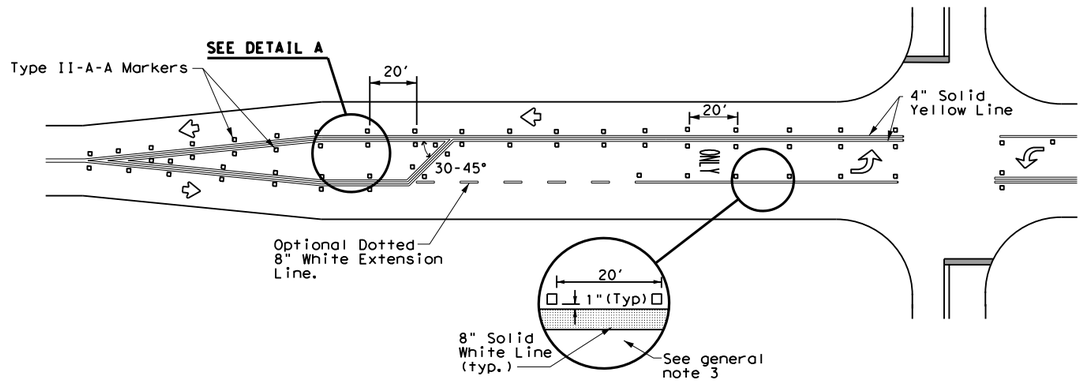
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



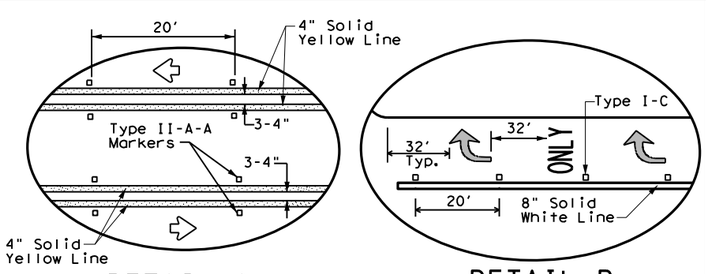
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



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



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



Texas Department of Transportation

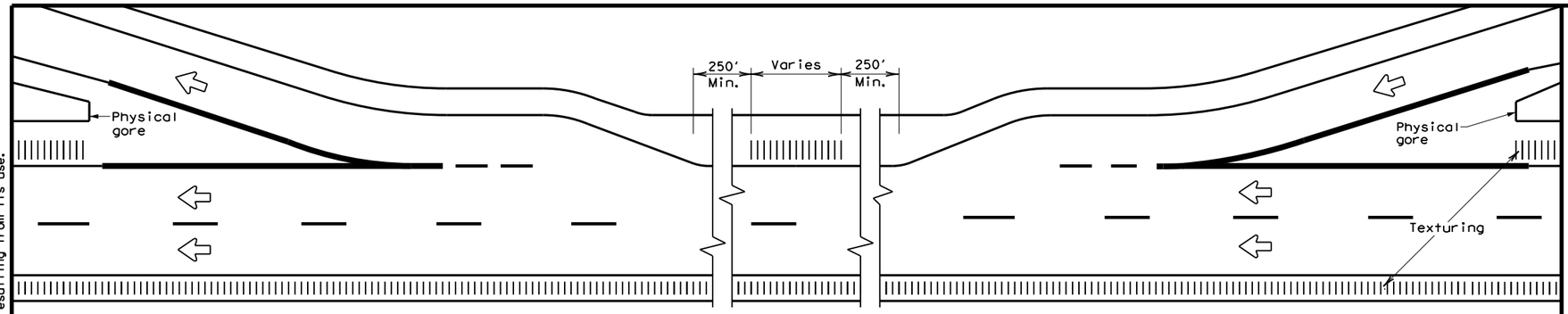
Traffic Safety Division Standard

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

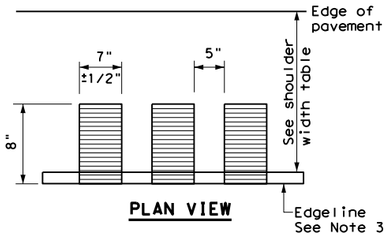
FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0049	14	014, ETC.	FM 46, ETC.
5-00 2-10	DIST	COUNTY		SHEET NO.
8-00 2-12	BRY	ROBERTSON, ETC.		56
3-03 6-20				

220

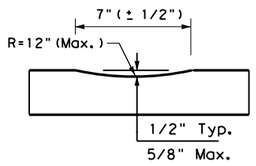
DATE:
FILE:



TYPICAL RUMBLE STRIP PLACEMENT AT EXIT AND ENTRANCE RAMPS

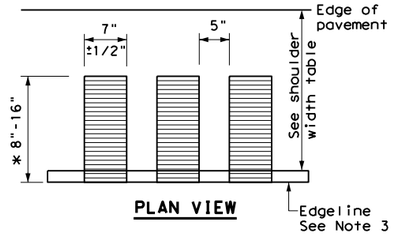


PLAN VIEW



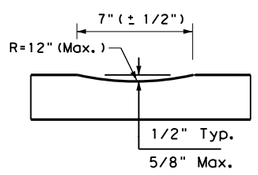
PROFILE VIEW
OPTION 1

CONTINUOUS MILLED DEPRESSIONS
(Rumble Stripes)



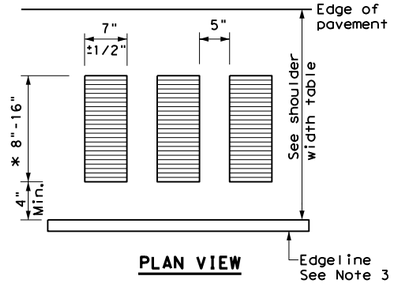
PLAN VIEW

* This distance may vary based on width of shoulder



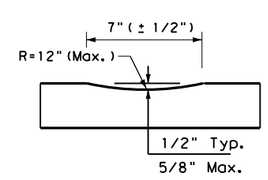
PROFILE VIEW
OPTION 2

CONTINUOUS MILLED DEPRESSIONS
(Rumble Stripes)



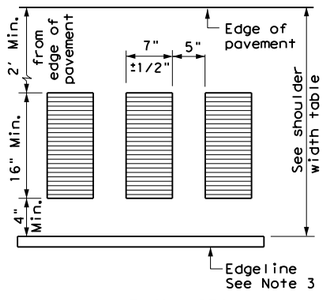
PLAN VIEW

* This distance may vary based on width of shoulder

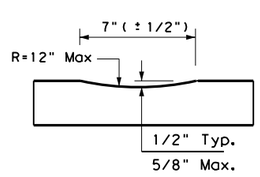


PROFILE VIEW
OPTION 3

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



PLAN VIEW



PROFILE VIEW
OPTION 4

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)

GENERAL NOTES

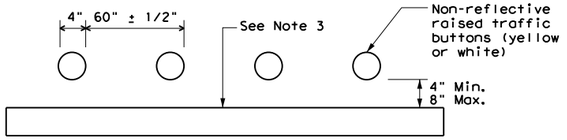
1. Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
2. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall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

WHEN INSTALLING MILLED DEPRESSION EDGELINE RUMBLE STRIPS:

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

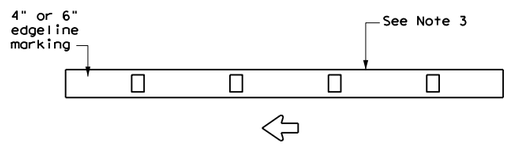
WHEN INSTALLING RAISED OR PROFILE EDGELINE RUMBLE STRIPS:

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



PLAN VIEW
OPTION 5

RAISED EDGELINE RUMBLE STRIPS



PLAN VIEW
OPTION 6

PROFILE EDGELINE MARKINGS

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

Texas Department of Transportation

Traffic Operations Division Standard

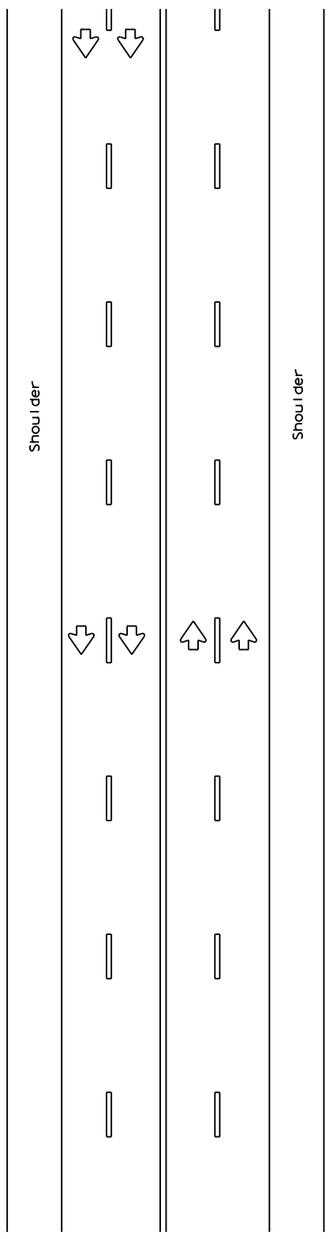
EDGELINE RUMBLE STRIPS ON FREEWAYS AND DIVIDED HIGHWAYS
RS(1)-13

FILE: rs(1)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-10 10-13	0049	14	014, ETC.	FM 46, ETC.
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON, ETC.		57

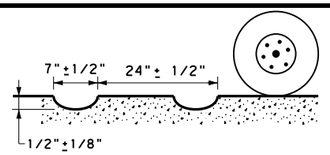
DATE:
FILE:

DATE:
FILE:

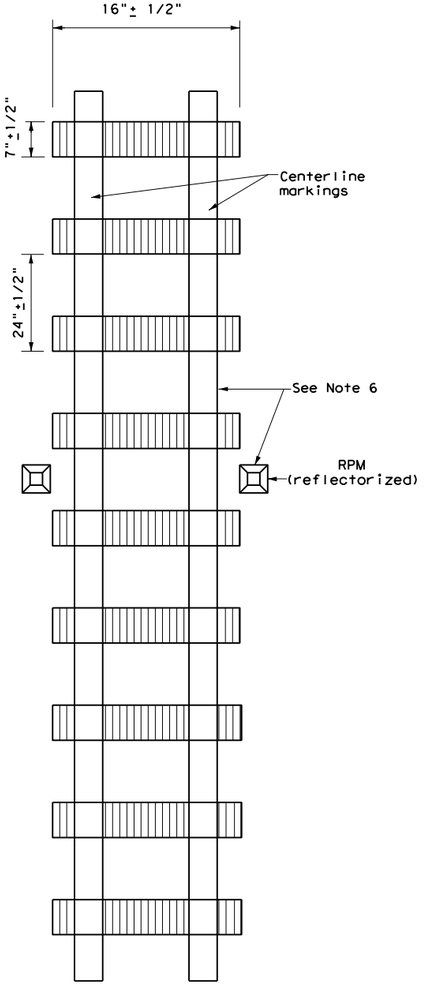
CENTERLINE RUMBLE STRIPS



MULTILANE UNDIVIDED HIGHWAY WITH SHOULDER

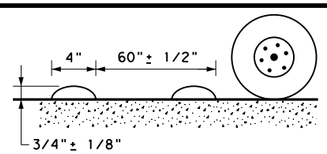


PROFILE VIEW

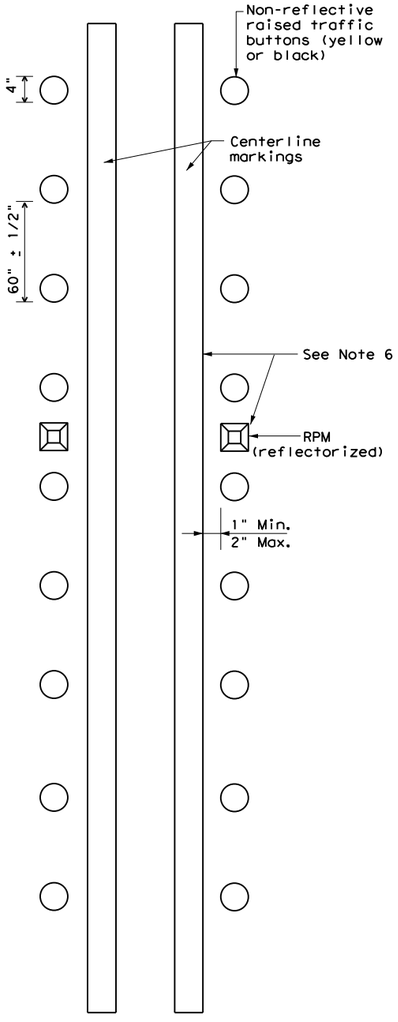


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

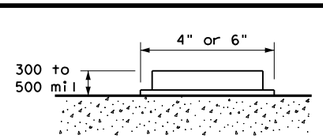


PROFILE VIEW

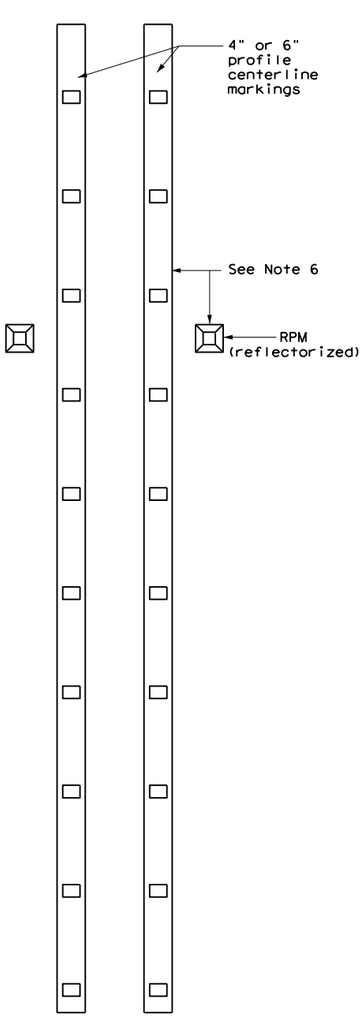


PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW
OPTION 3

PROFILE CENTERLINE MARKINGS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on multilane undivided highways.
2. Centerline and edgeline rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections and driveways with high usage of large trucks.
6. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inch depth of milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips for normal centerline spacing. For wider medians, specify in the plans the exact placement of the rumble strips. Place the rumble strips under each centerline marking or centered in the middle of the median.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The color of the button should be yellow for a continuous no passing roadway. The button will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.

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

11. See standard sheet RS(4).

Texas Department of Transportation®

Traffic Operations Division Standard

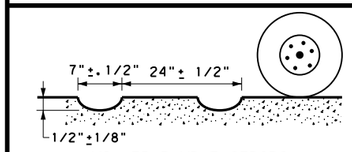
CENTERLINE RUMBLE STRIPS ON MULTILANE UNDIVIDED HIGHWAYS

RS(2)-13

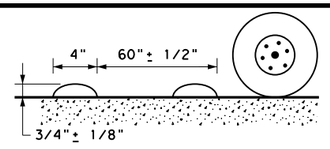
FILE: rs(2)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0049	14	014, ETC.	FM 46, ETC.
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON, ETC.		58

DATE:
FILE:

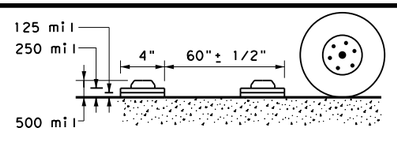
CENTERLINE RUMBLE STRIPS



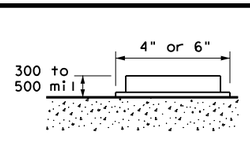
MILLED RUMBLE STRIPS



RAISED TRAFFIC BUTTONS

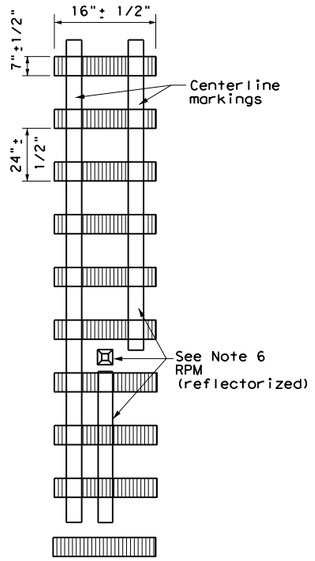


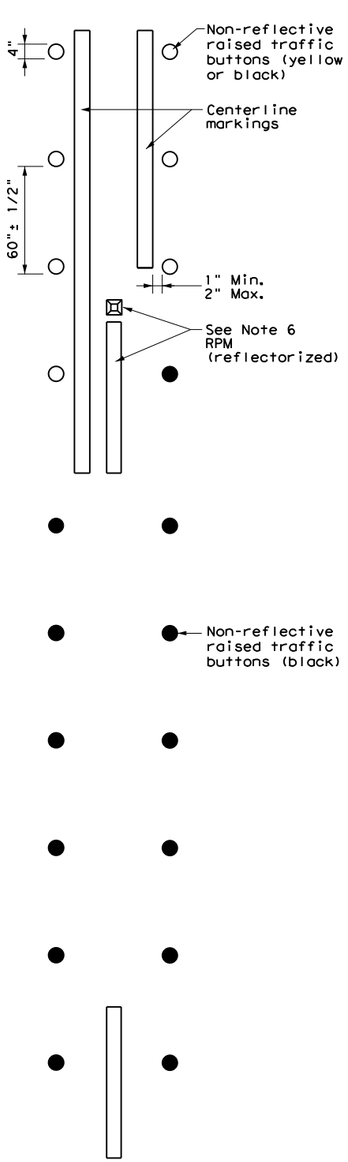
PREFORMED THERMOPLASTIC STRIPS

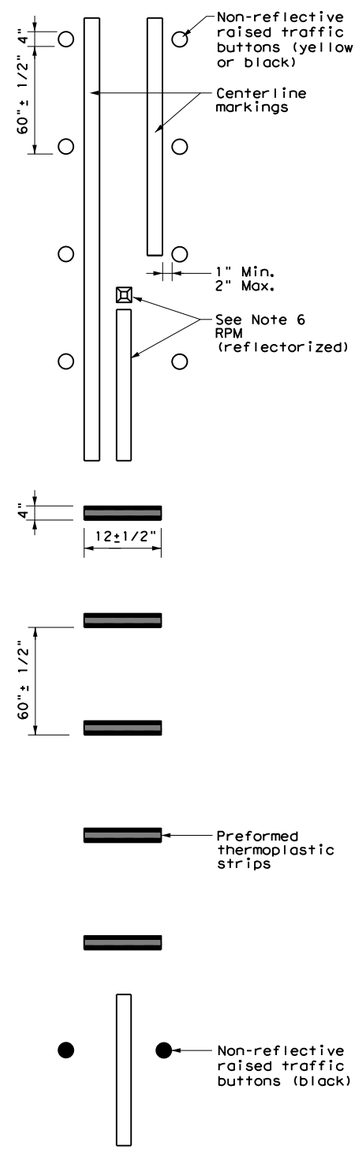


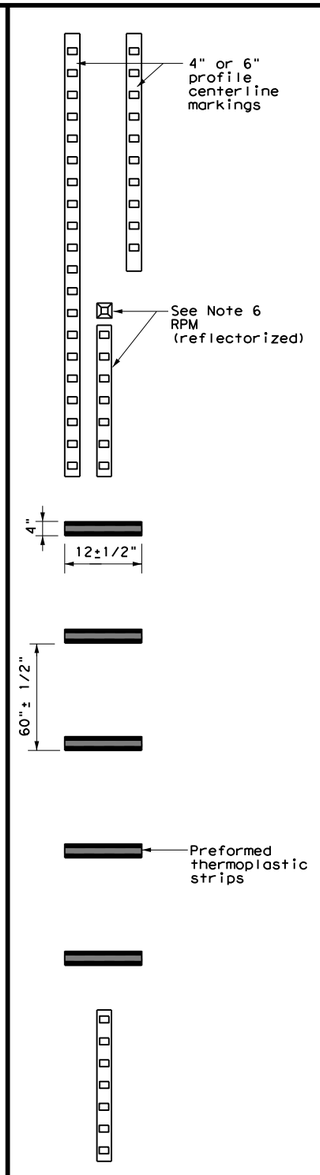
PROFILE MARKINGS

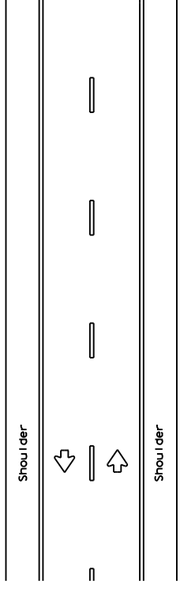
PROFILE VIEW



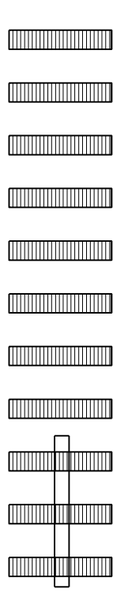








TWO LANE TWO-WAY ROADWAYS



PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS

PLAN VIEW
OPTION 3

RAISED CENTERLINE RUMBLE STRIPS AND PREFORMED THERMOPLASTIC STRIPS

PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC STRIPS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on two-lane highways with or without shoulders.
2. Centerline and edgeline rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks.
6. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, and dimensions pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inch depth of milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
11. The color of the button should be yellow for a continuous no passing roadway. Black buttons should be used in areas where passing is allowed.

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

12. See standard sheet RS(4).

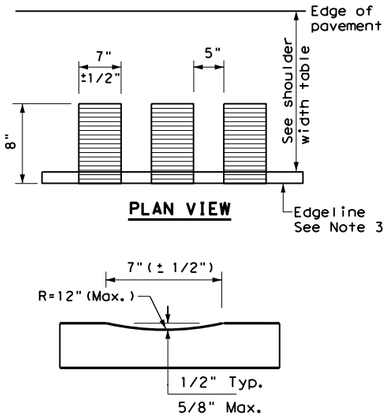
Texas Department of Transportation®

Traffic Operations Division Standard

CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS

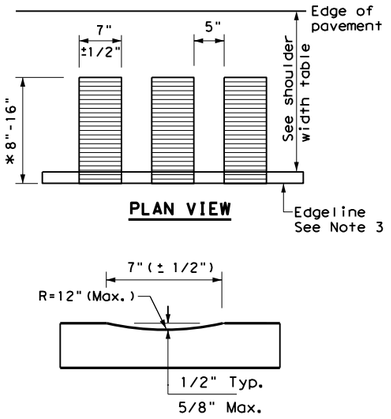
RS(3)-13

FILE: rs(3)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0049	14	014, ETC.	FM 46, ETC.
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON, ETC.		59



OPTION 1

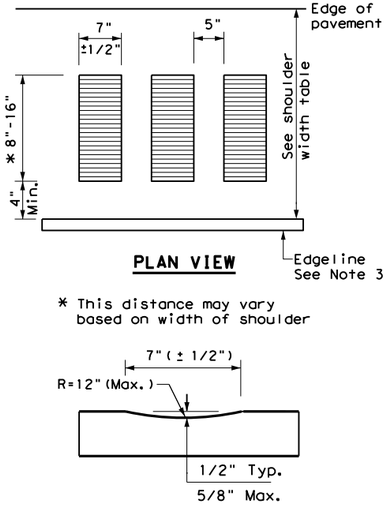
CONTINUOUS MILLED DEPRESSIONS
(Rumble Stripes)



* This distance may vary based on width of shoulder

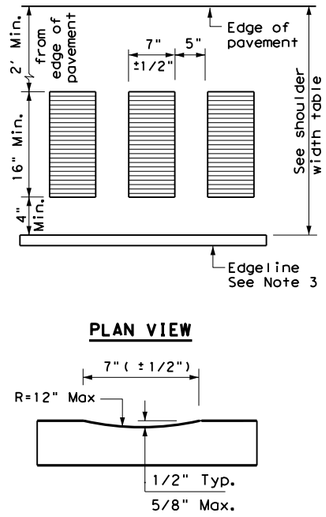
OPTION 2

CONTINUOUS MILLED DEPRESSIONS
(Rumble Stripes)



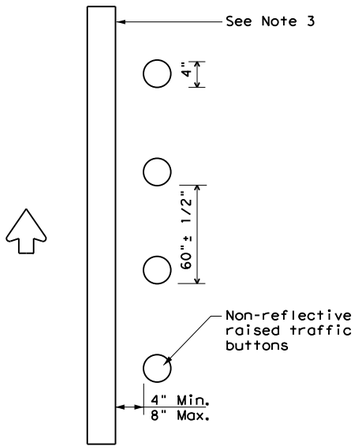
OPTION 3

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



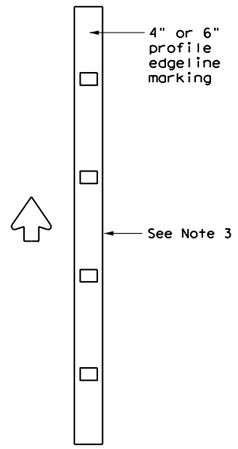
OPTION 4

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



OPTION 5

RAISED EDGELINE RUMBLE STRIPS



OPTION 6

PROFILE EDGELINE MARKINGS

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

GENERAL NOTES

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

WHEN INSTALLING MILLED DEPRESSION EDGELINE RUMBLE STRIPS:

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

WHEN INSTALLING RAISED OR PROFILE EDGELINE RUMBLE STRIPS:

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

Texas Department of Transportation

Traffic Operations Division Standard

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

FILE: rs(4)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0049	14	014, ETC.	FM 46, ETC.
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON, ETC.		60

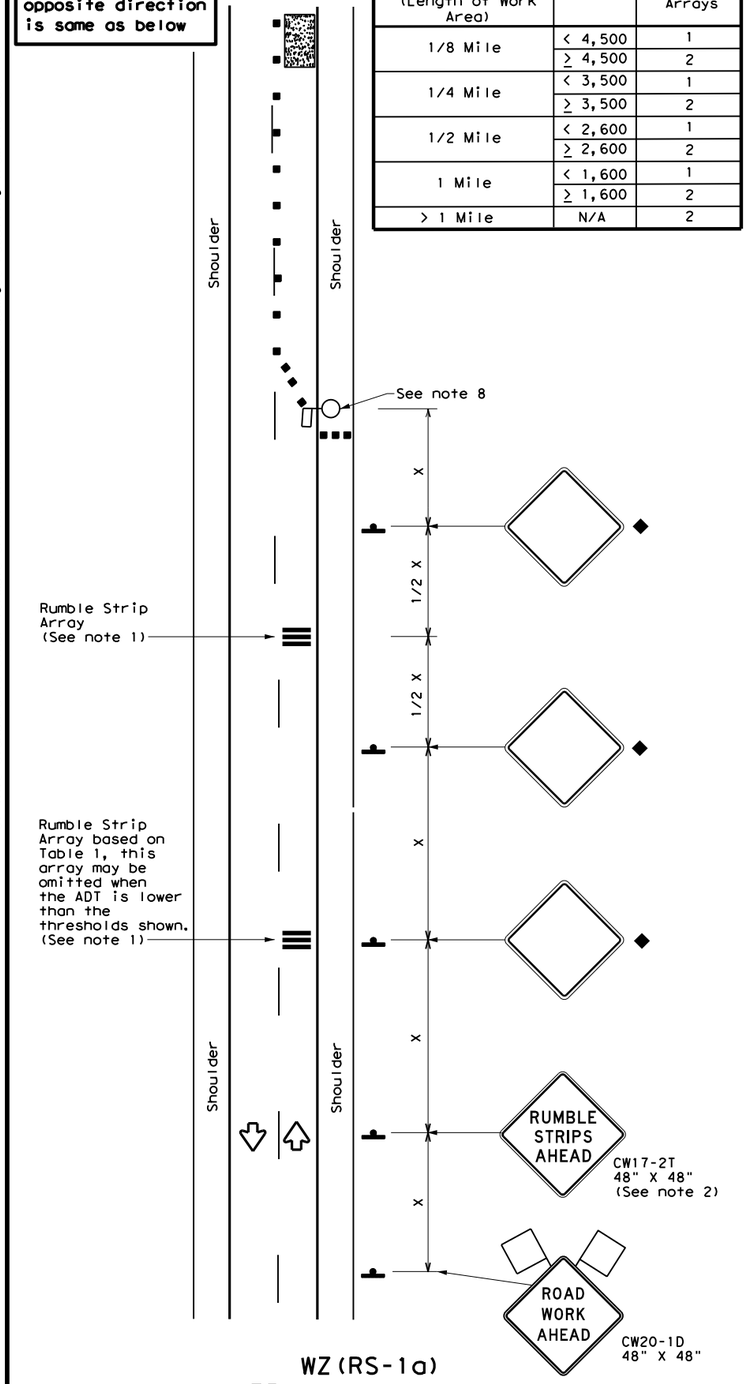
DATE:
FILE:

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

DATE:
FILE:

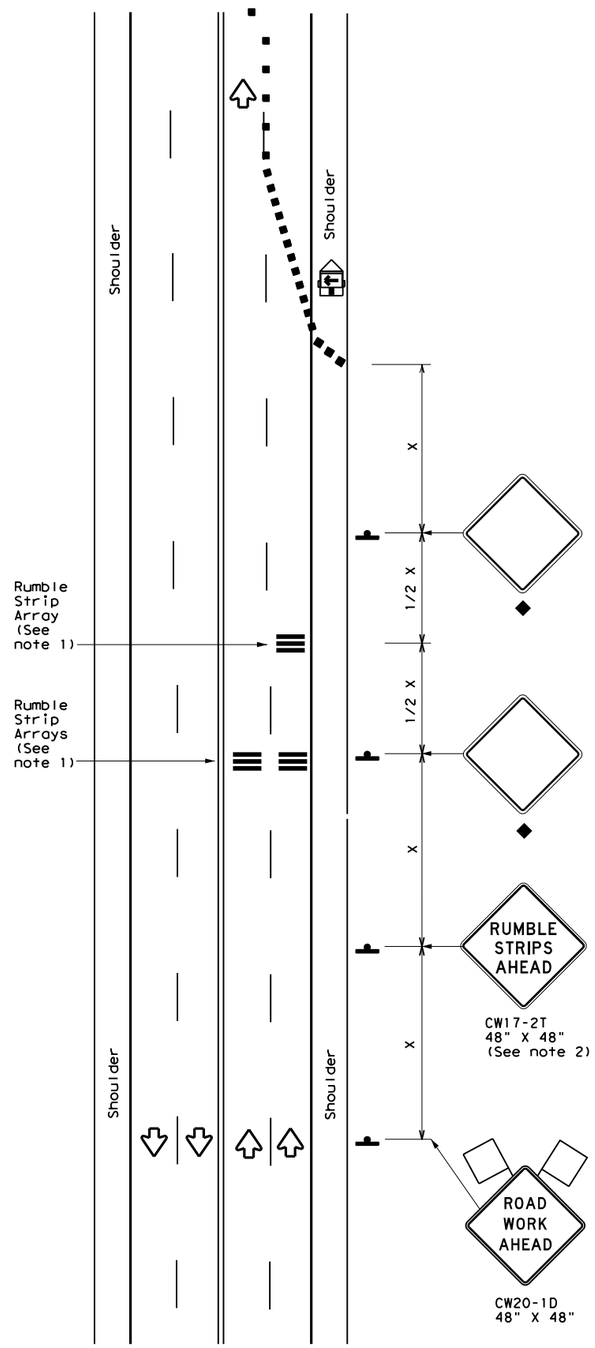
Warning sign and rumble strip sequence in opposite direction is same as below

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



WZ(RS-1a)
75 mph or Less

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)
75 mph or Less

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

* Conventional Roads Only

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-16

FILE: wzrs16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0049	14	014,ETC.	FM 46,ETC.
2-14	DIST	COUNTY		SHEET NO.
4-16	BRY	ROBERTSON,ETC.		61

FREESTONE COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
8	FM 1449	0456-03-021
10	FM 1365	1326-02-022

ROBERTSON COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
42	FM 46	0540-01-050
43	FM 979	1210-01-016
44	FM 979	1210-02-014

BRAZOS COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
1	FM 50	0648-02-021

BURLESON COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
2	FM 50	0457-01-066
5	FM 1362	0833-12-023

WASHINGTON COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
56	FM 390	0338-08-042

WALLER COUNTY		
LOCATION NUMBER	ROADWAY	CSJ
61	FM 1736	1687-01-018

N

Drawings Not To Scale

PRINT DATE	REVISION DATE
2/1/2021	

Texas Department of Transportation
Bryan District

RAILROAD CROSSING PROJECT LOCATION MAP BRYAN DISTRICT (017)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	-	FM 46, ETC.
STATE	DISTRICT	COUNTY
TEXAS	BRYAN	ROBERTSON, ETC
CONTROL	SECTION	JOB / SHEET NO.
0049	14	014, ETC. / 62

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: $FILE$

BNSF RAILROAD CROSSING LOCATIONS														
Location #	**County**	**CSJ**	**RRX DOT #**	**Highway Type & Number**	**Crossing Position**	**Primary Operating Railroad**	**RR Mile Post**	**RR Subdivision**	**City or Municipality**	**# of Regularly Scheduled Trains per Day**	**# of Switching Movements per Day**	**Speed of Trains (mph)**	**ADT (yr, vpd)**	**Posted Speed Limit (mph)**
2	BURLESON	0457-01-066	024263G	FM 50	AT GRADE	BNSF Railway Co.	11.74	CONROE	SOMERVILLE	8	0	1 to 49	2014, 9510	65
8	FREESTONE	0456-03-021	597201R	FM 1449	AT GRADE	BNSF Railway Co.	214.5	DFW	KIRVIN	6	0	1 to 40	2010, 170	55
10	FREESTONE	1326-02-022	597190F	FM 1365	AT GRADE	BNSF Railway Co.	204.024	HOUSTON	TEAGUE	8	0	1 to 30	2003, 1300	60
56	WASHINGTON	0338-08-042	022863C	FM 390	RR Under	BNSF Railway Co.	135.5	GALVESTON	SOMERVILLE	20	0	1 to 55	2010, 720	70

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: G:\00491\4\01\4\SHEETS\Railroad\Profile\BNSF Location Information Table.dgn

PRINT DATE	REVISION DATE
2/1/2021	

Texas Department of Transportation ©
Bryan District Standard

BNSF RAILROAD CROSSING LOCATION INFORMATION TABLE

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	-	FM 46, ETC.
STATE	**DISTRICT**	**COUNTY**
TEXAS	BRYAN	ROBERTSON, ETC.
CONTROL	**SECTION**	**JOB** / **SHEET NO.**
0049	14	014, ETC / 63

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

DOT #: SEE LOCATION CHART
Crossing Type: SEE LOCATION CHART
RR Company Owning Track at Crossing: BNSF Railway
Operating RR Company at Track: BNSF Railway
RR MP: SEE LOCATION CHART
RR Subdivision: SEE LOCATION CHART
City: SEE LOCATION CHART
County: SEE LOCATION CHART
CSJ at this Crossing: SEE LOCATION CHART
Highway/Roadway name crossing the railroad: SEE LOCATION CHART
# of regularly scheduled trains per day at this crossing: SEE LOCATION CHART
# of switching movements per day at this crossing: SEE LOCATION CHART
% of estimated contract cost of work within railroad ROW: .1 % per location

Scope of Work at this Crossing to Be Performed by State Contractor:

1. Furnish and install barricades.
2. Striping and texturing roadway.

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

N/A

** 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: 1 per each location

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:

- [ ] UPRR - UP.info@railpros.com
  Call Center 877-315-0513, Select #1 for flagging
- [x] 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: BNSF RAILWAY

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 BNSF Railway (BNSF)
Railroad Emergency Line at 800-832-5452 Option 1
For location and RR Milepost: See Railroad Crossing Location Information Table**

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK FOR BNSF RAILWAY

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
©TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0049	14	014, ETC.	FM 46, ETC
3/2020	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON, ETC.		64

UNION PACIFIC RAILROAD CROSSING LOCATIONS														
Location #	**County**	**CSJ**	**RRX DOT #**	**Highway Type & Number**	**Crossing Position**	**Primary Operating Railroad**	**RR Mile Post**	**RR Subdivision**	**City or Municipality**	**# of Regularly Scheduled Trains per Day**	**# of Switching Movements per Day**	**Speed of Trains (mph)**	**ADT (yr, vpd)**	**Posted Speed Limit (mph)**
1	BRAZOS	0648-02-021	765836H	FM 50	AT GRADE	Union Pacific Railroad	18.200	GIDDINGS	MUMFORD	24	0	30 to 55	2013, 50	30
1	BRAZOS	0648-02-021	765841E	FM 50	AT GRADE	Union Pacific Railroad	16.890	GIDDINGS	MUMFORD	24	0	27 to 55	2001, 30	30
1	BRAZOS	0648-02-021	765842L	FM 50	AT GRADE	Union Pacific Railroad	16.39	GIDDINGS	MUMFORD	24	0	27 to 55	2013, 70	30
5	BURLESON	0833-12-023	765828R	FM 1362	AT GRADE	Union Pacific Railroad	24.050	GIDDINGS	COOKS POINT	24	0	30 to 60	2010, 470	55
42	ROBERTSON	0540-01-050	744845Y	FM 46	AT GRADE	Union Pacific Railroad	142.711	ENNIS	BREMOND	16	0	30 to 60	2011, 2300	55
43	ROBERTSON	1210-01-016	745246G	FM 979	AT GRADE	Union Pacific Railroad	128.99	ENNIS	CALVERT	16	0	30 to 60	2014, 5815	55
44	ROBERTSON	1210-02-014	430217Y	FM 979	AT GRADE	Union Pacific Railroad	112.75	FORT WORTH	CALVERT	12	0	30 to 60	2011, 510	55
61	WALLER	1687-01-018	743129E	FM 1736	AT GRADE	Union Pacific Railroad	49.81	EUREKA	HEMPSTEAD	2	0	20 to 40	2009, 590	55

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: $FILE$

PRINT DATE	REVISION DATE
04/18/2021	

Texas Department of Transportation
Bryan District

UNION PACIFIC RAILROAD CROSSING LOCATION INFORMATION TABLE

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY
TEXAS	BRYAN	ROBERTSON, ETC.

CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	65

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

DOT #: SEE LOCATION CHART
Crossing Type: AT GRADE
RR Company Owning Track at Crossing: UNION PACIFIC RAILROAD
Operating RR Company at Track: UNION PACIFIC RAILROAD
RR MP: SEE LOCATION CHART
RR Subdivision: SEE LOCATION CHART
City: SEE LOCATION CHART
County: SEE LOCATION CHART
CSJ at this Crossing: SEE LOCATION CHART
Highway/Roadway name crossing the railroad: SEE LOCATION CHART
# of regularly scheduled trains per day at this crossing: SEE LOCATION CHART
# of switching movements per day at this crossing: SEE LOCATION CHART
% of estimated contract cost of work within railroad ROW: .1 % per location

Scope of Work at this Crossing to Be Performed by State Contractor:
1. Furnish and install barricades.
2. Striping and texturing roadway.

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

** 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: 1 per each location

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: UNION PACIFIC RAILROAD

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
For location and RR Milepost: See Railroad Crossing Location Information Table

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK
UNION PACIFIC RAILROAD

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
©TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS 3/2020	0049	14	014, ETC.	FM 46, ETC.
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON, ETC.		66

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: G:\00491401\14\SHEETS\Railroad\Profile\UP RAILROAD SCOPE OF WORK.dgn

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	0049	14	014, ETC.	FM 46, ETC.
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON, ETC.		67

DATE:
FILE:

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 1/4 inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.15 RAILROAD FLAGGING

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

3.16 CLEANING OF RIGHT-OF-WAY

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

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0049	14	014, ETC.	FM 46, ETC.
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON, ETC.		68

DATE:
FILE:

During the planning phase of project development the following environmental permits, issues and commitments have been developed during coordination with resource agencies, local governmental entities and the general public. Any change orders and/or deviations from the final design must be reported to the Engineer prior to the commencement of construction activities. As additional environmental clearances may be required.

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

☐ Required Action ☒ No Action Required

Refer to 2014 TxDOT Standard Specification Items:
7.7.2 Texas Pollutant Discharge Elimination System (TPDES) Permits and Storm Water Pollution Prevention PLans (SWP3)
506 Temporary Erosion, Sedimentation and Environmental Controls
734 Litter Removal
735 Debris Removal
738 Cleaning and Sweeping Highways

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

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.
The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☒ No Permit Required

☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP#

Information regarding the USACE Nationwide Permit Program can be found at:
http://www.swf.usace.army.mil/Missions/Regulatory/Permitting/GeneralPermits.aspx

Refer to 2014 TxDOT Standard Specification Items:
7.7.3 Work in Waters of the United States
7.7.6 Project Specific Locations
496 Removing Structures
506 Temporary Erosion, Sedimentation and Environmental Controls
506.4.3.4 Restricted Activities and Required Precautions

III. CULTURAL RESOURCES

Refer to 2014 TxDOT Standard Specification Item 7.7.1 Cultural Resources, in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) immediately cease work in the vicinity and contact the Engineer.

☐ Required Action ☒ No Action Required

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.

☐ Required Action ☒ No Action Required

Refer to 2014 TxDOT Standard Specification Items:
160 Topsoil
161 Compost
162 Sodding for Erosion Control
164 Seeding for Erosion Control
166 Fertilizer
168 Vegetative Watering
169 Soil Retention Blankets
170 Irrigation System
180 Wildflower Seeding
192 Landscape Planting
193 Landscape Establishment
506 Temporary Erosion, Sedimentation, and Environmental Controls
730 Roadside Mowing
751 Landscape Maintenance
752 Tree and Brush Removal

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

☒ Required Action ☐ No Action Required

Action No.

1. Do not kill snakes or other animals!

2. Do not destroy nests on structures within the project limits.

   Temporarily prevent the building of nests on any structures that require work within the project limits during the construction timeframe.

   This can be accomplished by application of bird repellant gel, netting, or removal by hand every 3-4 days.

   The nesting/breeding season for migratory birds is March 1 - September 1.

Under the Migratory Bird Treaty Act (MBTA), it is unlawful by any means or manner, to pursue, hunt, take, capture, [or] kill any migratory birds except as permitted by regulation (16 U.S.C. 703-704). Neither the statute nor its implementing regulations (Title 50, Code of Federal Regulations, Parts 10, 13, 21) exempt unintentional take of migratory birds. The unauthorized take (e.g. killing, capturing, or collecting) of migratory birds is a strict liability criminal offense that does not require knowledge or specific intent on the part of the offender. Even when engaged in an otherwise lawful activity for which the intent is not the killing of migratory birds, a violation may be committed.

3. If caves or sinkholes are discovered, cease work in the immediate area to verify the presence or absence of wildlife.

4. BMPs for T and E species will be discussed at the preconstruction meeting.

The Bryan District Environmental Section can be contacted at (979) 778-9766 to assist with the removal of wildlife that will not leave on their own with gentle persuasion.

Refer to 2014 TxDOT Standard Specification Item:
7.7.6 Project Specific Locations

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 appropiate 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 Engineerimmediately. The Contractor shall be responsiblefor 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

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

☐ Yes ☒ No

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

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

☐ Yes ☒ No

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

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

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

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

☒ Required Action ☐ No Action Required

Action No.

1. The Clean Water Act, in part, requires that any spill of oil that could enter a waterway, as defined by the Act, and that violates applicable water quality standards or causes a film or sheen on water require reporting to the TCEQ and local authorities.
   Contact the Bryan District Enviromental Section at 979-778-9766.

   If potentially hazardous material and/or contaminated media (i.e. soil, groudwater, surface water, sediment, building materials) are unexpectedly encountered during construction, immediately cease work in the vicinity and contact the Engineer.

   Refer to 2014 TxDOT Standard Specification Items:
   6.10 Hazardous Materials
   7.12 Responsibility for Hazardous Materials

VII. OTHER ENVIRONMENTAL ISSUES

☐ Required Action ☒ No Action Required

Refer to 2014 TxDOT Standard Specification Items:
7.7.6 Project Specific Locations
751 Landscape Maintenance

Contacts:

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PRINT DATE	REVISION DATE
05/13/2021	02/12/2015

Texas Department of Transportation
Bryan District

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		FM 46, ETC.

STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	ROBERTSON, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0049	14	014, ETC.	69

REV DATE: 2-12-2015
CSJ: XXXX-XX-XXX
FILENAME: G:\0049\14\014\SHEETS\ENV\EPIC.DGN