FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	C76-7-38, ETC		1
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038, ETC	US 67, ETC

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

INDEX OF SHEETS

SEE SHEET 2

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

STATE PROJECT NO. C76-7-38, ETC

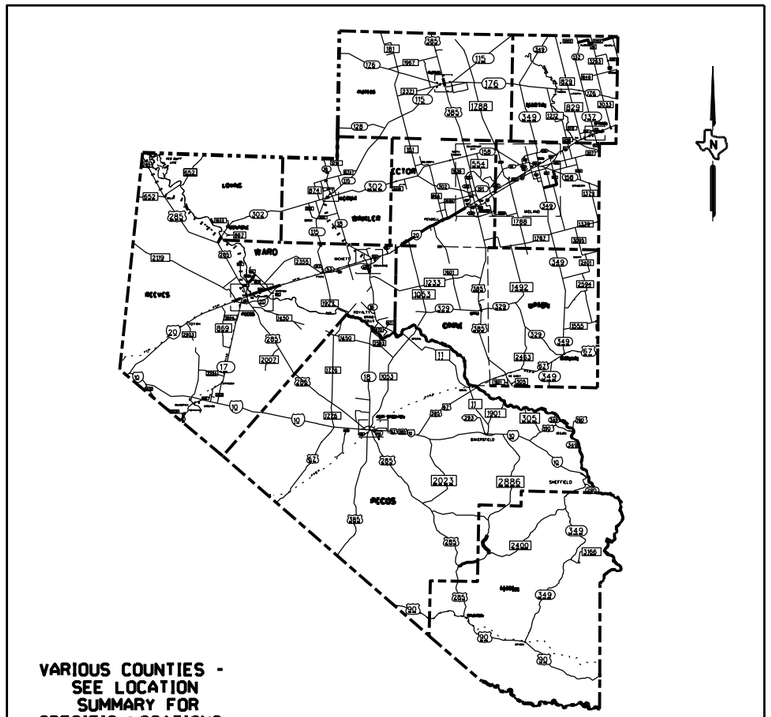
UPTON, ETC
US 67, ETC

NET LENGTH OF PROJECT: 642908 FT = 150.371 MI

LIMITS: FROM: REAGAN COUNTY LINE, ETC TO: 0.2 MILES WEST OF SH 329, ETC.

FOR THE CONSTRUCTION OF SEAL COAT

CONSISTING OF CRUMB RUBBER SEAL & PAVEMENT MARKINGS



VARIOUS COUNTIES - SEE LOCATION SUMMARY FOR SPECIFIC LOCATIONS

EXCEPTIONS: N/A
EQUATIONS: N/A
RR CROSSINGS: N/A

SCALE: N/A

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: 7/19/2022 20__

DocuSigned by:
_____, P.E.
AREA ENGINEER
470B0C90852E493...

RECOMMENDED FOR LETTING: 7/19/2022 20__

DocuSigned by:
_____, P.E.
DIRECTOR OF TRANSPORTATION
PLANNING AND DEVELOPMENT

APPROVED FOR LETTING: 7/19/2022 20__

DocuSigned by:
_____, P.E.
DISTRICT ENGINEER

COUNTY_____
HWY. NO._____
DATE ACCEPTED_____
PROJ. NO._____
LETTING DATE_____

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

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, JUNE 1, 2004 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: SPECIAL LABOR PROVISIONS FOR STATE PROJECTS (000--008).

STAT08

INDEX OF SHEETS

STATE OF TEXAS
CAITLIN J S SWICK
142199
LICENSED
PROFESSIONAL ENGINEER

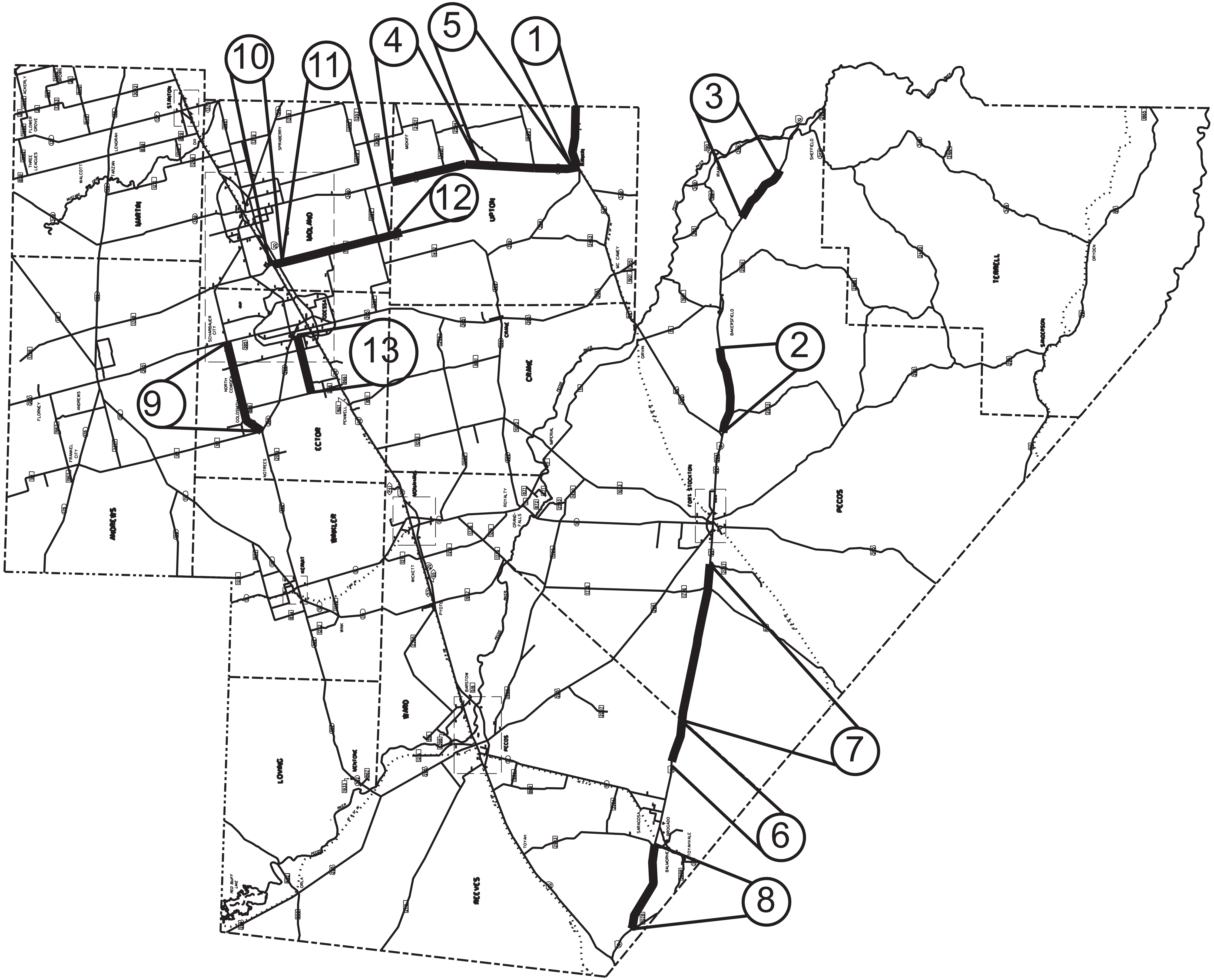
THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE WITH AN (*) HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

_____ , P.E. 07/08/2022
DATE

INDEX OF SHEETS

Texas Department of Transportation

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			2
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038, ETC	US 67, ETC



STATE OF TEXAS
CAITLIN J S SWICK
142199
LICENSED
PROFESSIONAL ENGINEER

07/08/2022

LOCATION MAP

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.			SHEET NO.
6				3
STATE	STATE DIST.	COUNTY		
TEXAS	ODA	UPTON, ETC		
CONT.	SECT.	JOB	HIGHWAY NO.	
0076	07	0038, ETC	US 67, ETC	

Crumb Rubber

PROJECT REFERANCE	PROJECT CONTROL	LIMITS	HIGHWAY & COUNTY
1	0076-07-038	FROM: REAGAN COUNTY LINE TO: 0.2 MILES WEST OF SH 329	US 67 UPTON
2	0140-02-051	FROM: 1.5 MI EAST OF US 67 TO: 13.7 MI EAST OF US 67	IH 10 PECOS
3	0140-05-027	FROM: 2.12 MI EAST OF US 190 TO: 5.54 MI WEST OF SH 349	IH 10 PECOS
4	0380-11-030	FROM: MIDLAND COUNTY LINE TO: 0.33 MILES SOUTH OF COUNTY ROAD 111	SH 349 UPTON
5	0380-12-027	FROM: 0.33 MILES SOUTH OF COUNTY ROAD 111 TO: US 67	SH 349 UPTON
6	0441-06-037	FROM: PECOS COUNTY LINE TO: 6.4 MILES WEST OF PECOS C/L	IH 10 REEVES
7	0441-07-073	FROM: REEVES COUTY LINE TO: 0.8 MILES WEST OF FM 2037	IH 10 PECOS
8	0441-09-051	FROM: FM 3078 TO: 0.5 MILES EAST OF FM 2903	IH 10 REEVES
9	0463-07-051	FROM: FM 866 TO: US 385	SH 158 ECTOR
10	1718-01-037	FROM: BI 20 E TO: IH 20	SH 349 MIDLAND
11	1718-01-038	FROM: IH 20 TO: UPTON COUNTY LINE	FM 1788 MIDLAND
12	1718-02-011	FROM: MIDLAND COUNTY LINE TO: EDGE OF PAVEMENT	FM 1788 UPTON
13	1870-01-036	FROM: KNOX AVE TO: FM 866	FM 2020 ECTOR

STATE OF TEXAS
CAITLIN J S SWICK
142199
LICENSED
PROFESSIONAL ENGINEER

07/08/2022

PROJECT LOCATIONS

Texas Department of Transportation

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			4
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	PECOS, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038, ETC	US 67, ETC

General Notes:

Contractor questions on this project will be accepted through email at the following address:

- ODA-PreLettingQuestions@txdot.gov

All contractor questions will be reviewed by the Engineer. All questions and/or responses will be posted to TxDOT's Public FTP at the following Address:

https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/

The site is organized by District, Project Type (Construction or Maintenance), Letting Date, CCSJ/Project Name.

Item 5: Control of the Work

Upon completion of the work, remove liter, debris, objectionable material, temporary structures, excess materials, and equipment from the work locations. Clean and restore property damaged by the Contractor's operations during the prosecution of the work. Leave the work locations in a neat and presentable condition.

Item 6: Control of Materials

Restrict storage of equipment and materials to approved areas. The Engineer will not approve storage in any TxDOT yard.

Properly dispose of any waste generated from servicing equipment on the project.

Item 7: Legal Relations and Responsibilities

If access to the project is required through a new or unapproved driveway (i.e. material source, stockpile location, field office, etc.), obtain an approved "Permit to Construct Access Driveway Facilities on Highway Right Of Way" (TxDOT Form 1058) before beginning any construction operations.

Utilities (public, private and TxDOT) exist throughout the project. Prior to any excavation, investigate to determine the utility locations within the project right-of-way. Contact the TxDOT Odessa Traffic Operations shop at 432-498-4690 to investigate and determine the location of any TxDOT utility that may exist within the project right-of-way. Exercise caution when excavating in areas where investigations have determined that utilities exist.

No significant traffic generating events have been identified.

As an element of ensuring public safety and convenience under Article 7.2.4, the contractor is hereby directed to open all closed lanes and shoulders and remove all traffic control devices from and areas where work is not being actively performed unless overnight traffic control is installed as approved by the Engineer. Removed devices must be stored outside of the clear zones near the right of way line or removed from the right of way line entirely.

County: UPTON, ETC **Sheet: 5**
Highway: US 67, Etc **Control: 0076-07-038, ETC**

Ensure that all sealed expansion joints on bridges are covered by an approved method immediately prior to seal coat application. Keep the expansion joints covered until sweeping operations are complete. This work will be paid for under Item 316 as part of surface preparation.

Item 8: Prosecution and Progress

The latest start work date will be July 19, 2023.

The following portions of the plans may affect the Contractor's planned construction sequencing. Direct attention to the appropriate plan sheets.

-Traffic Control Plan

-Storm Water Pollution Prevention Plan

-Environmental Permit, Issues And Commitments (EPIC)

-Railroad Exhibits and/or Notes

Maintain ingress and egress to intersecting streets, driveways and adjacent roadways at all times.

Working days will be computed and charged in accordance with Article 8. 3.1.2. "Six-Day Workweek."

Item 210: Rolling

Additional passes may be required by the Engineer for specific locations and/or condition.

Item 300: Asphalts, Oils, and Emulsions

Do not use any material that has not been tested and approved prior to shipment, as indicated by a current TxDOT laboratory number on the shipping ticket.

Item 302: Aggregates for Surface Treatments

The target value for the desired percent by weight of residual bitumen coating on the aggregate is 1.0%.

Use unmodified performance grade of 64-22 (PG 64-22) or better to pre-coating aggregate.

Apply a liquid asphalt anti-stripping agent at the plant during pre-coating of a type and at a rate approved by the Engineer.

LRA seal coat aggregate will not be used.

Item 316: Seal Coat

Furnish Type “II” asphalt-rubber binder containing Grade B rubber.

Do not apply hot asphalt-rubber between August 31st and May 1st unless authorized in writing.

No aggregate placed on a reference location shall be of contrasting color or come from an old stockpile. Mixing of aggregate from a more oxidized pile with a less oxidized pile on a reference location will not be allowed.

Surface treat the existing surfaced intersections, auxiliary lanes, curve widenings and widened dip sections plus any additional areas encountered during construction to conform to the existing surface. The limits are the end of the curb returns, the right-of-way line, or the adjacent traffic lane, as directed.

For each referenced location, perform a test strip covering an area of at least rock land to adjust asphalt rates and to confirm aggregate rates and rolling patterns. Pause work at the completion of the test strip to receive Engineer approval before additional work can proceed.

Provide the Engineer with this information prior to the seal coat application. Provide control that is acceptable to the Engineer for yield calculations.

A transverse variable (TVAR) asphalt application rate approved by the Engineer will be required on this project when the Engineer determines TVAR is needed based on a test strip.

In addition to other asphalt distributor requirements, the asphalt distributor shall be capable of providing a transversely varied asphalt rate. The Contractor shall demonstrate that the distributor can apply an asphalt rate outside of the wheel path locations between 22 and 23 percent higher than the asphalt rate being applied in the wheel paths. The calibration of the distributor will include verification of this capability and a description of the spray bar(s) and nozzles to be used. The percentage difference in asphalt rate provided by each tested spray bar and nozzle arrangement shall be provided to the Engineer.

Aggregate must be free of dust before use. Limited use of water at the stockpile is allowed for rock surface cleaning.

Remove and properly dispose of all raised pavement markings and traffic buttons from the roadway before seal coat application.

Contractor shall provide a list of stockpile locations prior to placement of any material on the job site. Contractor shall have Engineer and Odessa District Environmental Officer approval of any and all stockpile locations prior to stockpiling of aggregate or other material. Stockpile locations will not be permitted on or adjacent to landscaped or non-mow areas.

As seal coat operations are completed at each location, clean and level all stockpile locations to the satisfaction of the Engineer.

County: UPTON, ETC **Sheet: 5A**
Highway: US 67, Etc **Control: 0076-07-038, ETC**

Clean up paper, asphalt and excess rock after seal coat placement as each reference location is completed. Contractor shall nor proceed ahead more than two reference locations before clean-up operations have been accomplished at the previous completed reference locations.

Remove asphalt inadvertently sprayed on concrete surfaces such curbs at the Contractor’s expense.

Item 502: Barricades, Signs, and Traffic Handling

Stop work immediately if any major traffic control element such as an advanced warning flashing panel or TMA or PCMS is not in good working order or is incorrectly placed.

Furnish flaggers/spotters to warn equipment operators of approaching traffic in addition to the flaggers required to the traffic control plans.

Relocate or remove temporary signs as necessary. This work is considered subsidiary to various bid items.

Use an advanced warning flashing arrow panel for the closing of traffic lanes. Provide an advanced warning flashing arrow panel as a standby unit on the job site; the standby unit shall be in good working condition and ready for immediate use.

Maintain "No Center Line", "Do Not Pass" and "Pass With Care" signs until the permanent lane markings have been placed in accordance with plans.

This project has an advisory work zone speed plaque of 60 mph to be placed on the LOOSE GRAVEL warning sign. This advisory plaque will be used to supplement the warning sign and to indicate speed for the condition indicated. The warning sign and advisory speed plaque will be removed once the condition or need for the sign no longer exists.

Place chevrons, at a minimum, on every other drum used for outsides of curves, merging tapers and shifting tapers.

Vertical panels shall be self-righting.

Remove or completely cover construction signs not in use.

Do not lay down signs.

The Contractor Force Account “Safety Contingency” that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor’s Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

Item 506: Temporary Erosion, Sedimentation, and Environmental Controls

It is not anticipated that erosion control devices will be needed on this project. In the event that devices are needed, the Storm Water Pollution Prevention Plan shall consist of using the following items and/or items as directed by the Engineer. Payment for the work may be determined in accordance with Item 4, Article 4. "Changes in the Work".

-Biodegradable Erosion Control Logs

Item 662: Work Zone Pavement Markings

After permanent pavement markings are placed, pull tabs from hot mix surface and/or cut off tabs flush with the pavement on seal coat surface. Remove tabs from the project and dispose of properly.

Place short-tern markings in proper alignment with the location of the final pavement markings. (Final pavement markings shall be placed in accordance with the current pavement marking standards in the plans.) Short-term markings that are not in alignment of the final pavement markings shall be removed and replaced at the Contractor's expense.

Item 666 Reflectorized Pavement Markings

Measure thickness for the markings in accordance with Tex-854-B using usage rates (Part II).

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

There are no General Notes for additional shadow vehicle(s) with truck mounted attenuator (TMA) on TCP (3-1)-13; the shadow vehicle(s) with TMA specified on the traffic control plan as "required" is the quantity that has been estimated for this operation.

There are no General Notes for additional shadow vehicle(s) with truck mounted attenuator (TMA) on TCP (3-3)-14; the shadow vehicle(s) with TMA specified on the traffic control plan as "required" is the quantity that has been estimated for this operation.

Basis of Estimate for Mobile TMAs			
Standard	**TMA(Stationary)**		
	Required	**Optional**	**Total**
TCP(3-1)-13	2	0	2
TCP(3-3)-14	2	0	2

The Contractor will be responsible for determining if one or more operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0076-07-038 **DISTRICT** Odessa **COUNTY** Ector, Midland, Pecos, Reeves, Upton
HIGHWAY FM 1788, FM 2020, IH 10, SH 158, SH 349, US 67

			CONTROL SECTION JOB	**0076-07-038**		**0140-02-051**		**0140-05-027**		**0380-11-030**		**0380-12-027**		**0441-06-037**	
			PROJECT ID	**A00179033**		**A00179216**		**A00179217**		**A00179031**		**A00179036**		**A00179088**	
			COUNTY	**Upton**		**Pecos**		**Pecos**		**Upton**		**Upton**		**Reeves**	
			HIGHWAY	**US 67**		**IH 10**		**IH 10**		**SH 349**		**SH 349**		**IH 10**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-6007	ASPH (A-R TYPE II)	GAL	170,143.000		331,243.000		278,655.000		277,197.000		263,111.000		174,353.000	
	316-6124	AGGR(TY-PB GR-3 SAC-A)	CY	3,547.000		6,904.000		5,809.000		5,777.000		5,484.000		3,636.000	
	500-6001	MOBILIZATION	LS	1.000											
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	3.000											
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	300.000		9,720.000		8,160.000		4,530.000		3,250.000		5,080.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	4,300.000						1,350.000		2,240.000			
	666-6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	2,994.000		32,380.000		27,190.000		15,080.000					
	666-6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	111,489.000		129,498.000		108,726.000		156,670.000		160,328.000		67,719.000	
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	9,997.000		829.000				1,296.000		1,216.000		2,503.000	
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF												
	666-6184	REFL PAV MRK TY II (W) (ARROW)	EA							2.000		3.000			
	666-6192	REFL PAV MRK TY II (W) (WORD)	EA							2.000		3.000			
	666-6205	REFL PAV MRK TY II (Y) 4" (BRK)	LF	11,170.000											
	666-6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	30,130.000		129,498.000		108,726.000		107,928.000		178,746.000		67,719.000	
	672-6007	REFL PAV MRKR TY I-C	EA	150.000											
	672-6009	REFL PAV MRKR TY II-A-A	EA	940.000						1,350.000		2,240.000			
	672-6010	REFL PAV MRKR TY II-C-R	EA	150.000		1,620.000		1,360.000						850.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	4.000		6.000		6.000		6.000		8.000		4.000	
	08	CONTRACTOR FORCE ACCOUNT EROSION CONTROL MAINTENANCE (NON-PARTICIPATING)	LS	1.000											
		CONTRACTOR FORCE ACCOUNT SAFETY CONTINGENCY (NON-PARTICIPATING)	LS	1.000											
		CONTRACTOR FORCE ACCOUNT WORK (NON-PARTICIPATING)	LS	1.000											

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0076-07-038 **DISTRICT** Odessa **COUNTY** Ector, Midland, Pecos, Reeves, Upton
HIGHWAY FM 1788, FM 2020, IH 10, SH 158, SH 349, US 67

				0441-07-073		0441-09-051		0463-07-051		1718-01-037		1718-01-038		1718-02-011	
		CONTROL SECTION JOB													
		PROJECT ID		A00179089		A00179129		A00179028		A00179132		A00179135		A00179045	
		COUNTY		Pecos		Reeves		Ector		Midland		Midland		Upton	
		HIGHWAY		IH 10		IH 10		SH 158		SH 349		FM 1788		FM 1788	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-6007	ASPH (A-R TYPE II)	GAL	683,287.000		378,070.000		172,008.000		23,699.000		239,282.000		16,778.000	
	316-6124	AGGR(TY-PB GR-3 SAC-A)	CY	14,249.000		7,881.000		3,588.000		495.000		4,990.000		350.000	
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	19,710.000		11,070.000				680.000					
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA					4,970.000		910.000		7,510.000		820.000	
	666-6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	65,700.000		36,890.000				2,260.000					
	666-6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	260,381.000		146,858.000		115,586.000		9,018.000		203,474.000		18,642.000	
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	14,586.000		3,930.000		1,957.000							
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF							468.000					
	666-6184	REFL PAV MRK TY II (W) (ARROW)	EA							16.000		2.000			
	666-6192	REFL PAV MRK TY II (W) (WORD)	EA							13.000					
	666-6205	REFL PAV MRK TY II (Y) 4" (BRK)	LF					13,710.000		2,260.000		19,550.000		2,340.000	
	666-6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	260,381.000		146,858.000		13,073.000		9,018.000		52,153.000			
	672-6007	REFL PAV MRKR TY I-C	EA												
	672-6009	REFL PAV MRKR TY II-A-A	EA					850.000		230.000		1,640.000		120.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	3,290.000		1,840.000									
	6185-6005	TMA (MOBILE OPERATION)	DAY	14.000		8.000		4.000		2.000		6.000		2.000	
	08	CONTRACTOR FORCE ACCOUNT EROSION CONTROL MAINTENANCE (NON-PARTICIPATING)	LS												
		CONTRACTOR FORCE ACCOUNT SAFETY CONTINGENCY (NON-PARTICIPATING)	LS												
		CONTRACTOR FORCE ACCOUNT WORK (NON-PARTICIPATING)	LS												

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0076-07-038 **DISTRICT** Odessa **COUNTY** Ector, Midland, Pecos, Reeves, Upton
HIGHWAY FM 1788, FM 2020, IH 10, SH 158, SH 349, US 67

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**1870-01-036**			
		PROJECT ID		**A00178975**			
		COUNTY		**Ector**			
		HIGHWAY		**FM 2020**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	316-6007	ASPH (A-R TYPE II)	GAL	44,345.000		3,052,171.000	
	316-6124	AGGR(TY-PB GR-3 SAC-A)	CY	925.000		63,635.000	
	500-6001	MOBILIZATION	LS			1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO			3.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	30.000		62,530.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	1,280.000		23,380.000	
	666-6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	90.000		182,584.000	
	666-6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	31,372.000		1,519,761.000	
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF			36,314.000	
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	848.000		1,316.000	
	666-6184	REFL PAV MRK TY II (W) (ARROW)	EA	1.000		24.000	
	666-6192	REFL PAV MRK TY II (W) (WORD)	EA	1.000		19.000	
	666-6205	REFL PAV MRK TY II (Y) 4" (BRK)	LF	3,510.000		52,540.000	
	666-6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	2,767.000		1,106,997.000	
	672-6007	REFL PAV MRKR TY I-C	EA			150.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	220.000		7,590.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA			9,110.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	2.000		72.000	
	08	CONTRACTOR FORCE ACCOUNT EROSION CONTROL MAINTENANCE (NON-PARTICIPATING)	LS			1.000	
		CONTRACTOR FORCE ACCOUNT SAFETY CONTINGENCY (NON-PARTICIPATING)	LS			1.000	
		CONTRACTOR FORCE ACCOUNT WORK (NON-PARTICIPATING)	LS			1.000	

ROADWAY QUANTITIES

PROJECT REFERENCE NUMBER	PROJECT CONTROL	HIGHWAY	REF MRK to REF MRK	LENGTH (MIL)	PROJECT AREA	ITEM 0316-6007 ASPH (AR TYPE II)	ITEM 0316-6124 AGGR (TY-PB GR-3 SAC-A)	ITEM 0662-6109 WK ZN PAV MRK SHT TERM (TAB) TY W	ITEM 0662-6111 WK ZN PAV MRK SHT TERM (TAB) TY Y-2
					SY	GAL	CY	EA	EA
						0.60 GAL/SY	80 SY/CY		
1	0076-07-038	US 67	FROM: REAGAN COUNTY LINE TO: 0.2 MILES WEST OF SH 329	10.669	283564	170143	3547	300	4300
2	0140-02-051	IH 10	FROM: 1.5 MI EAST OF US 67 TO: 13.7 MI EAST OF US 67	15.244	552066	331243	6904	9720	0
3	0140-05-027	IH 10	FROM: 2.12 MI EAST OF US 190 TO: 5.54 MI WEST OF SH 349	6.42	464422	278655	5809	8160	0
4	0380-11-030	SH 349	FROM: MIDLAND COUNTY LINE TO: 0.33 MILES SOUTH OF CR 111	15.244	461993	277197	5777	4530	1350
5	0380-12-027	SH 349	FROM: 0.33 MILES SOUTH OF CR 111 TO: US 67	14.719	438516	263111	5484	3250	2240
6	0441-06-037	IH 10	FROM: PECOS COUNTY LINE TO: 6.4 MILES WEST OF PECOS C/L	6.42	290584	174353	3636	5080	0
7	0441-07-073	IH 10	FROM: REEVES COUTY LINE TO: MM 252	24.579	1138794	683287	14249	19710	0
8	0441-09-051	IH 10	FROM: FM 3078 TO: 0.5 MILES EAST OF FM 2903	13.965	630111	378070	7881	11070	0
9	0463-07-051	SH 158	FROM: FM 866 TO: US 385	10.272	286676	172008	3588	0	4970
10	1718-01-037	SH 349	FROM: BI 20 E TO: IH 20 SOUTH FRT RD	0.854	39497	23699	495	680	910
11	1718-01-038	FM 1788	FROM: IH 20 SOUTH FRT RD TO: UPTON COUNTY LINE	20.77	398797	239282	4990	0	7510
12	1718-02-011	FM 1788	FROM: MIDLAND COUNTY LINE TO: EDGE OF PAVEMENT	1.783	27963	16778	350	0	820
13	1870-01-036	FM 2020	FROM: KNOX AVE TO: FM 866	9.432	73908	44345	925	30	1280
		TOTAL:	TOTALS	150.371	5086891	3052171	63635	62530	23380

STATE OF TEXAS
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CONSOLIDATED SUMMARY

SHEET 1 OF 3

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			9
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038, ETC	US 67, ETC

PAVEMENT MARKING QUANTITIES

PROJECT REFERENCE NUMBER	PROJECT CONTROL	HIGHWAY	REF MRK to REF MRK	LENGTH (MIL)	0666-6167	0666-6170	0666-6178	0666-6182	0666-6184	0666-6192	0666-6205	0666-6207
					REFL PAV MRK TY II (W) 4" (BRK)	REFL PAV MRK TY II (W) 4" (SLD)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (W) (ARROW)	REFL PAV MRK TY II (W) (WORD)	REFL PAV MRK TY II (Y) 4" (BRK)	REFL PAV MRK TY II (Y) 4" (SLD)
					LF	LF	LF	LF	EA	EA	LF	LF
1	0076-07-038	US 67	FROM: REAGAN COUNTY LINE TO: 0.2 MILES WEST OF SH 329	10.669	2994	111489	9997	0	0	0	11170	30130
2	0140-02-051	IH 10	FROM: 1.5 MI EAST OF US 67 TO: 13.7 MI EAST OF US 67	15.244	32380	129498	829	0	0	0	0	129498
3	0140-05-027	IH 10	FROM: 2.12 MI EAST OF US 190 TO: 5.54 MI WEST OF SH 349	6.42	27190	108726	0	0	0	0	0	108726
4	0380-11-030	SH 349	FROM: MIDLAND COUNTY LINE TO: 0.33 MILES SOUTH OF CR 111	15.244	15080	156670	1296	0	2	2	0	107928
5	0380-12-027	SH 349	FROM: 0.33 MILES SOUTH OF CR 111 TO: US 67	14.719	0	160328	1216	0	3	3	0	178746
6	0441-06-037	IH 10	FROM: PECOS COUNTY LINE TO: 6.4 MILES WEST OF PECOS C/L	6.42	0	67719	2503	0	0	0	0	67719
7	0441-07-073	IH 10	FROM: REEVES COUTY LINE TO: MM 252	24.579	65700	260381	14586	0	0	0	0	260381
8	0441-09-051	IH 10	FROM: FM 3078 TO: 0.5 MILES EAST OF FM 2903	13.965	36890	146858	3930	0	0	0	0	146858
9	0463-07-051	SH 158	FROM: FM 866 TO: US 385	10.272	0	115586	1957	0	0	0	13710	13073
10	1718-01-037	SH 349	FROM: BI 20 E TO: IH 20 SOUTH FRT RD	0.854	2260	9018	0	468	16	13	2260	9018
11	1718-01-038	FM 1788	FROM: IH 20 SOUTH FRT RD TO: UPTON COUNTY LINE	20.77	0	203474	0	0	2	0	19550	52153
12	1718-02-011	FM 1788	FROM: MIDLAND COUNTY LINE TO: EDGE OF PAVEMENT	1.783	0	18642	0	0	0	0	2340	0
13	1870-01-036	FM 2020	FROM: KNOX AVE TO: FM 866	9.432	90	31372	0	848	1	1	3510	2767
		TOTAL:	TOTALS	150.371	182584	1519761	36314	1316	24	19	52540	1106997

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CONSOLIDATED SUMMARY

SHEET 2 OF 3

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			10
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038,ETC	US 67, ETC

RAISED PAVEMENT MARKER QUANTITIES

PROJECT REFERENCE NUMBER	PROJECT CONTROL	HIGHWAY	REF MRK to REF MRK	LENGTH (MIL)	0672-6007	0672-6009	0672-6010	* 677	6185-6005
					REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	TMA (MOBILE OPERATIONS)
					EA	EA	EA	EA	DAY
1	0076-07-038	US 67	FROM: REAGAN COUNTY LINE TO: 0.2 MILES WEST OF SH 329	10.669	150	940	150	1240	4
2	0140-02-051	IH 10	FROM: 1.5 MI EAST OF US 67 TO: 13.7 MI EAST OF US 67	15.244	0	0	1620	1620	6
3	0140-05-027	IH 10	FROM: 2.12 MI EAST OF US 190 TO: 5.54 MI WEST OF SH 349	6.42	0	0	1360	1360	6
4	0380-11-030	SH 349	FROM: MIDLAND COUNTY LINE TO: 0.33 MILES SOUTH OF CR 111	15.244	0	1350	0	1350	6
5	0380-12-027	SH 349	FROM: 0.33 MILES SOUTH OF CR 111 TO: US 67	14.719	0	2240	0	2240	8
6	0441-06-037	IH 10	FROM: PECOS COUNTY LINE TO: 6.4 MILES WEST OF PECOS C/L	6.42	0	0	850	850	4
7	0441-07-073	IH 10	FROM: REEVES COUTY LINE TO: MM 252	24.579	0	0	3290	3290	14
8	0441-09-051	IH 10	FROM: FM 3078 TO: 0.5 MILES EAST OF FM 2903	13.965	0	0	1840	1840	8
9	0463-07-051	SH 158	FROM: FM 866 TO: US 385	10.272	0	850	0	850	4
10	1718-01-037	SH 349	FROM: BI 20 E TO: IH 20 SOUTH FRT RD	0.854	0	230	0	230	2
11	1718-01-038	FM 1788	FROM: IH 20 SOUTH FRT RD TO: UPTON COUNTY LINE	20.77	0	1640	0	1640	6
12	1718-02-011	FM 1788	FROM: MIDLAND COUNTY LINE TO: EDGE OF PAVEMENT	1.783	0	120	0	120	2
13	1870-01-036	FM 2020	FROM: KNOX AVE TO: FM 866	9.432	0	220	0	220	2
		TOTAL:	TOTALS	150.371	150	7590	9110	16850	72

* FOR CONTRACTOR INFORMATION ONLY

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Texas Department of Transportation

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		11

STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038, ETC	US 67, ETC

	316-6124 AGGR(TY-PB GR-3 SAC-A)	316-6007 ASPH (A-R TYPE II)
AGGREGATE RATE (SY/CY) :	80	
ASPHALT RATE (GAL/SY) :		0.600

PROJECT SUMMARY

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6124 AGGR(TY-PB GR-3 SAC-A) 80 SY/CY	316-6007 ASPH (A-R TYPE II) 0.60 GAL/SY
1	0076-07-038	US 67	RM: 764 + 0.000 TO 774 + 0.00	FT	FT	SY	CY	GAL
PROJECT LIMITS								
FROM: REAGAN COUNTY LINE			MAIN LANES	1,964	64.0	13,967	175	8,381
TO: 0.2 MILES WEST OF SH 329			MAIN LANES	3,949	61.0	26,766	335	16,060
COUNTY	UPTON		MAIN LANES	8,358	42.0	39,004	488	23,403
			MAIN LANES	3,669	40.0	16,307	204	9,785
			MAIN LANES	5,019	39.0	21,749	272	13,050
			MAIN LANES	7,864	40.0	34,952	437	20,972
			MAIN LANES	25,595	46.0	130,819	1,636	78,492
			TOTAL	56,418		283,564	3,547	170,143

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ROADWAY SUMMARY

SHEET 1 OF 13

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			12
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

	316-6124 AGGR(TY-PB GR-3 SAC-A)	316-6007 ASPH (A-R TYPE II)
AGGREGATE RATE (SY/CY) :	80	
ASPHALT RATE (GAL/SY) :		0.600

PROJECT SUMMARY

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6124 AGGR(TY-PB GR-3 SAC-A) 80 SY/CY	316-6007 ASPH (A-R TYPE II) 0.60 GAL/SY
2	0140-02-051	IH 10	RM: 274 + 0.235 TO 286 + 0.498	FT	FT	SY	CY	GAL
PROJECT LIMITS								
FROM: 1.5 MI EAST OF US 67			MAIN LANES	64,748	38.0	273,381	3,418	164,029
TO: 13.7 MI EAST OF US 67			MAIN LANES	64,791	38.0	273,562	3,420	164,138
COUNTY	PECOS							
			EXIT 277 EAST EXIT	199	35.0	774	10	465
			EXIT 277 WEST ENTRANCE	434	32.0	1,544	20	927
			EXIT 277 WEST EXIT	215	34.0	813	11	488
			EXIT 277 EAST ENTRANCE	560	32.0	1,992	25	1,196
			TOTAL	130,947		552,066	6,904	331,243

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ROADWAY SUMMARY

SHEET 2 OF 13

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			13
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

	316-6124 AGGR(TY-PB GR-3 SAC-A)	316-6007 ASPH (A-R TYPE II)
AGGREGATE RATE (SY/CY) :	80	
ASPHALT RATE (GAL/SY) :		0.600

PROJECT SUMMARY

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6124 AGGR(TY-PB GR-3 SAC-A) 80 SY/CY	316-6007 ASPH (A-R TYPE II) 0.60 GAL/SY
3	0140-05-027	IH 10	RM: 310 - 0.442 TO 320 - 0.146	FT	FT	SY	CY	GAL
PROJECT LIMITS								
FROM: 2.12 MI EAST OF US 190 TO: 5.54 MI WEST OF SH 349			MAIN LANES	54,363	38.0	229,533	2,870	137,720
			MAIN LANES	54,363	38.0	229,533	2,870	137,720
COUNTY		PECOS						
			EXIT 314 EB EXIT	246	32.0	875	11	525
			EXIT 314 EB ENTRANCE	677	28.0	2,107	27	1,265
			EXIT 314 WB EXIT	219	30.0	730	10	438
			EXIT 314 WB ENTRANCE	435	34.0	1,644	21	987
			TOTAL	110,303		464,422	5,809	278,655

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ROADWAY SUMMARY

SHEET 3 OF 13

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		14

STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

	316-6124 AGGR(TY-PB GR-3 SAC-A)	316-6007 ASPH (A-R TYPE II)
AGGREGATE RATE (SY/CY) :	80	
ASPHALT RATE (GAL/SY) :		0.600

PROJECT SUMMARY

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6124 AGGR(TY-PB GR-3 SAC-A) 80 SY/CY	316-6007 ASPH (A-R TYPE II) 0.60 GAL/SY
4	0380-11-030	SH 349	RM: 362 + 0.000 TO 376 + 0.819	FT	FT	SY	CY	GAL
PROJECT LIMITS								
FROM: MIDLAND COUNTY LINE			MAIN LANES	33,993	53.0	200,181	2,503	120,109
TO: 0.33 MILES SOUTH OF CR 111				1,028	59.0	6,740	85	4,044
COUNTY		UPTON		43,314	53.0	255,072	3,189	153,044
			TOTAL	78,335		461,993	5,777	277,197

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ROADWAY SUMMARY

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Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			15
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

	316-6124 AGGR(TY-PB GR-3 SAC-A)	316-6007 ASPH (A-R TYPE II)
AGGREGATE RATE (SY/CY) :	80	
ASPHALT RATE (GAL/SY) :		0.600

PROJECT SUMMARY

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6124 AGGR(TY-PB GR-3 SAC-A) 80 SY/CY	316-6007 ASPH (A-R TYPE II) 0.60 GAL/SY
5	0380-12-027	SH 349	RM: 376 + 0.819 TO 392 + 0.038	FT	FT	SY	CY	GAL
PROJECT LIMITS								
FROM: 0.33 MILES SOUTH OF CR 111 TO: US 67			MAIN LANES	54,605	53.0	321,563	4,020	192,938
				19,695	40.0	87,534	1,095	52,521
				1,573	48.0	8,390	105	5,034
				2,334	40.0	10,374	130	6,225
				1,957	49.0	10,655	134	6,393
COUNTY		UPTON						
			TOTAL	80,164		438,516	5,484	263,111

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ROADWAY SUMMARY

SHEET 5 OF 13

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			16
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

	316-6124 AGGR(TY-PB GR-3 SAC-A)	316-6007 ASPH (A-R TYPE II)
AGGREGATE RATE (SY/CY) :	80	
ASPHALT RATE (GAL/SY) :		0.600

PROJECT SUMMARY

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6124 AGGR(TY-PB GR-3 SAC-A) 80 SY/CY	316-6007 ASPH (A-R TYPE II) 0.60 GAL/SY
6	0441-06-037	IH 10	RM: 221 - 0.010 TO 227 + 0.403	FT	FT	SY	CY	GAL
PROJECT LIMITS								
FROM: PECOS COUNTY LINE			MAIN LANES	33,870	38.0	143,007	1,788	85,805
TO: 6.4 MILES WEST OF PECOS C/L			MAIN LANES	33,849	38.0	142,918	1,787	85,751
COUNTY	REEVES							
			EXIT 222 EAST EXIT	133	35.0	518	7	311
			EXIT 222 WEST ENTRANCE	407	32.0	1,448	19	869
			EXIT 222 WEST EXIT	319	34.0	1,206	16	724
			EXIT 222 EAST ENTRANCE	418	32.0	1,487	19	893
			TOTAL	68,996		290,584	3,636	174,353

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ROADWAY SUMMARY

SHEET 6 OF 13

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			17
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

	316-6124 AGGR(TY-PB GR-3 SAC-A)	316-6007 ASPH (A-R TYPE II)
AGGREGATE RATE (SY/CY) :	80	
ASPHALT RATE (GAL/SY) :		0.600

PROJECT SUMMARY

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6124 AGGR(TY-PB GR-3 SAC-A) 80 SY/CY	316-6007 ASPH (A-R TYPE II) 0.60 GAL/SY
7	0441-07-073	IH 10	RM: 227 + 0.403 TO 252 + 0.00	FT	FT	SY	CY	GAL
PROJECT LIMITS								
FROM: REEVES COUTY LINE			MAIN LANES	29,216	38.0	123,357	1,542	74,015
TO: 0.8 MILES WEST OF FM 2037			MAIN LANES	1,122	48.0	5,984	75	3,591
COUNTY		REEVES	MAIN LANES	2,093	38.0	8,838	111	5,303
			MAIN LANES	2,068	50.0	11,489	144	6,894
			MAIN LANES	95,690	38.0	404,025	5,051	242,415
			MAIN LANES	95,834	38.0	404,633	5,058	242,780
			MAIN LANES	1,144	50.0	6,356	80	3,814
			MAIN LANES	3,058	38.0	12,912	162	7,748
			MAIN LANES	1,933	48.0	10,310	129	6,186
			MAIN LANES	28,223	38.0	119,164	1,490	71,499
			EXIT 246 WB ENTRANCE	430	34.0	1,625	21	975
				574	35.0	2,233	28	1,340
				430	34.0	1,625	21	975
			S REST AREA ENTRANCE	1,047	35.0	4,072	51	2,444
			EXIT 241 WB EXIT	195	34.0	737	10	443
			EXIT 241 WB ENTRANCE	466	35.0	1,813	23	1,088
			EXIT 241 EB EXIT	190	34.0	718	9	431
				460	35.0	1,789	23	1,074
			S REST AREA EXIT	202	34.0	764	10	459
			N REST AREA ENTRANCE	508	35.0	1,976	25	1,186
			EXIT 246 WB EXIT	216	34.0	816	11	490
				303	35.0	1,179	15	708
			N REST AREA EXIT	194	34.0	733	10	440
			EXIT 229 WB EXIT	375	35.0	1,459	19	876
			EXIT 246 EB EXIT	193	34.0	730	10	438
			EXIT 235 EB EXIT	410	35.0	1,595	20	957
			EXIT 235 WB ENTRANCE	530	34.0	2,003	26	1,202
			EXIT 229 EB ENTRANCE	500	35.0	1,945	25	1,167
				552	34.0	2,086	27	1,252
			EXIT 229 EB EXIT	470	35.0	1,828	23	1,097
			TOTAL	268,626		1,138,794	14,249	683,287

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ROADWAY SUMMARY

SHEET 7 OF 13

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			18
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

	316-6124 AGGR(TY-PB GR-3 SAC-A)	316-6007 ASPH (A-R TYPE II)
AGGREGATE RATE (SY/CY) :	80	
ASPHALT RATE (GAL/SY) :		0.600

PROJECT SUMMARY

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6124 AGGR(TY-PB GR-3 SAC-A) 80 SY/CY	316-6007 ASPH (A-R TYPE II) 0.60 GAL/SY
8	0441-09-051	IH 10	RM: 193 - 0.145 TO 207 + 0.110	FT	FT	SY	CY	GAL
PROJECT LIMITS								
FROM: FM 3078			MAIN LANES	73,429	38.0	310,034	3,876	186,021
TO: 0.5 MILES EAST OF FM 2903				73,429	38.0	310,034	3,876	186,021
COUNTY	REEVES							
			EXIT 206 WB EXIT	450	36.0	1,800	23	1,080
			EXIT 206 EB ENTRANCE	482	44.0	2,357	30	1,415
			EXIT 192 WB EXIT	275	36.0	1,100	14	660
			EXIT 192 EB ENTRANCE	298	44.0	1,457	19	875
			EXIT 206 EB EXIT	309	36.0	1,236	16	742
			EXIT 206 WB ENTRANCE	428	44.0	2,093	27	1,256
			TOTAL	149,100		630,111	7,881	378,070

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ROADWAY SUMMARY

SHEET 8 OF 13

Texas Department of Transportation

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			19
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

	316-6124 AGGR(TY-PB GR-3 SAC-A)	316-6007 ASPH (A-R TYPE II)
AGGREGATE RATE (SY/CY) :	80	
ASPHALT RATE (GAL/SY) :		0.600

PROJECT SUMMARY

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6124 AGGR(TY-PB GR-3 SAC-A) 80 SY/CY	316-6007 ASPH (A-R TYPE II) 0.60 GAL/SY
9	0463-07-051	SH 158	RM: 248 + 0.915 TO 259 + 0.187	FT	FT	SY	CY	GAL
PROJECT LIMITS								
FROM: FM 866 TO: US 385			MAIN LANES	31,507	44.0	154,035	1,926	92,421
			MAIN LANES	891	50.0	4,950	62	2,970
COUNTY		ECTOR	MAIN LANES	1,838	44.0	8,986	113	5,392
			MAIN LANES	4,060	47.0	21,203	266	12,722
			MAIN LANES	17,915	44.0	87,585	1,095	52,551
			MAIN LANES	950	60.0	6,334	80	3,801
			MAIN LANES	632	40.0	2,809	36	1,686
			US 385 EB EXIT	168	20.0	374	5	225
			US 385 WB ENTRANCE	180	20.0	400	5	240
			TOTAL	58,141		286,676	3,588	172,008

STATE OF TEXAS
CAITLIN J S SWICK
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ROADWAY SUMMARY

SHEET 9 OF 13

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		20

STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

	316-6124 AGGR(TY-PB GR-3 SAC-A)	316-6007 ASPH (A-R TYPE II)
AGGREGATE RATE (SY/CY) :	80	
ASPHALT RATE (GAL/SY) :		0.600

PROJECT SUMMARY

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6124 AGGR(TY-PB GR-3 SAC-A) 80 SY/CY	316-6007 ASPH (A-R TYPE II) 0.60 GAL/SY
10	1718-01-037	FM 1788	RM: 328 - 0.893 TO 328 + 0.000	FT	FT	SY	CY	GAL
PROJECT LIMITS								
FROM: BI 20 E			MAIN LANES	1,724	76.0	14,559	182	8,736
TO: IH 20 SOUTH FRT RD			MAIN LANES	1,358	84.0	12,675	159	7,605
COUNTY		MIDLAND	MAIN LANES	1,240	89.0	12,263	154	7,358
			TOTAL	4,322		39,497	495	23,699

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ROADWAY SUMMARY

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Texas Department of Transportation

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			21
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

	316-6124 AGGR(TY-PB GR-3 SAC-A)	316-6007 ASPH (A-R TYPE II)
AGGREGATE RATE (SY/CY) :	80	
ASPHALT RATE (GAL/SY) :		0.600

PROJECT SUMMARY

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6124 AGGR(TY-PB GR-3 SAC-A) 80 SY/CY	316-6007 ASPH (A-R TYPE II) 0.60 GAL/SY
11	1718-01-038	FM 1788	RM: 348 + 0.000 TO 328 + 0.000	FT	FT	SY	CY	GAL
PROJECT LIMITS								
FROM: IH 20 SOUTH FRT RD			MAIN LANES	11,077	27.0	33,231	416	19,939
TO: UPTON COUNTY LINE			MAIN LANES	69,734	32.0	247,944	3,100	148,767
COUNTY		MIDLAND	MAIN LANES	14,977	41.0	68,229	853	40,938
			MAIN LANES	333	48.0	1,776	23	1,066
			MAIN LANES	1,294	54.0	7,764	98	4,659
			MAIN LANES	1,724	76.0	14,559	182	8,736
			MAIN LANES	1,358	84.0	12,675	159	7,605
			MAIN LANES	1,240	89.0	12,263	154	7,358
			TOTAL	101,837		398,797	4,990	239,282

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ROADWAY SUMMARY

SHEET 11 OF 13

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		22

STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

	316-6124 AGGR(TY-PB GR-3 SAC-A)	316-6007 ASPH (A-R TYPE II)
AGGREGATE RATE (SY/CY) :	80	
ASPHALT RATE (GAL/SY) :		0.600

PROJECT SUMMARY

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6124 AGGR(TY-PB GR-3 SAC-A) 80 SY/CY	316-6007 ASPH (A-R TYPE II) 0.60 GAL/SY
12	1718-02-011	FM 1788	RM: 348 + 0.000 TO 350 + 0.179	FT	FT	SY	CY	GAL
PROJECT LIMITS								
FROM: MIDLAND COUNTY LINE TO: EDGE OF PAVEMENT			MAIN LANES	9,321	27.0	27,963	350	16,778
COUNTY		UPTON						
			TOTAL	9,321		27,963	350	16,778

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ROADWAY SUMMARY

SHEET 12 OF 13

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			23
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

	316-6124 AGGR(TY-PB GR-3 SAC-A)	316-6007 ASPH (A-R TYPE II)
AGGREGATE RATE (SY/CY) :	80	
ASPHALT RATE (GAL/SY) :		0.600

PROJECT SUMMARY

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6124 AGGR(TY-PB GR-3 SAC-A) 80 SY/CY	316-6007 ASPH (A-R TYPE II) 0.60 GAL/SY
13	1870-01-036	FM 2020	RM: 248 - 0.090 TO 258 + 0.000	FT	FT	SY	CY	GAL
PROJECT LIMITS								
FROM: KNOX AVE TO: FM 866			MAIN LANES	565	80.0	5,023	63	3,014
COUNTY		ECTOR	MAIN LANES	15,121	41.0	68,885	862	41,331
			TOTAL	15,686		73,908	925	44,345

STATE OF TEXAS
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ROADWAY SUMMARY

SHEET 13 OF 13

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		24

STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

BASIS OF ESTIMATE

LOCATION 1

CSJ 0076-07-038
COUNTY UPTON
HIGHWAY US 67

EXIST ADT 4,190 (YEAR) 2020

BEGIN REF MRK 764 + 0.000 TO **END REF MRK** 774 + 0.000

LIMITS: FROM: REAGAN COUNTY LINE
TO: 0.2 MILES WEST OF SH 329

TYPE OF WORK Crumb Rubber

TOTAL AREA 283,564 SY

SURFACE TREATMENT

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		283,564	SY
316 6007	ASPH (A-R TYPE II)	0.60 GAL/SY	170,143	GAL
316 6124	AGGR(TY-PB GR-3 SAC-A)	80 SY/CY	3,547	CY

PAVEMENT MARKINGS

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6109	WK ZN PAV MRK SHT TERM (TAB)TY W	300	EA
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	4,300	EA
666 6167	REFL PAV MRK TY II (W) 4" (BRK)	2,994	LF
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	111,489	LF
666 6178	REFL PAV MRK TY II (W) 8" (SLD)	9,997	LF
666 6205	REFL PAV MRK TY II (Y) 4" (BRK)	11,170	LF
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	30,130	LF

RAISED PAVEMENT MARKERS

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6007	REFL PAV MRKR TY I-C	150	EA
672 6009	REFL PAV MRKR TY II-A-A	940	EA
672 6010	REFL PAV MRKR TY II-C-R	150	EA
* *0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	1,240	EA

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BASIS OF ESTIMATE
SHEET 1 OF 13

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			25
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

BASIS OF ESTIMATE

LOCATION 2

CSJ 0140-02-051
COUNTY PECOS
HIGHWAY IH 10

(YEAR)
EXIST ADT 7,754 2020

BEGIN REF MRK 274 + 0.235 TO **END REF MRK** 286 + 0.498

LIMITS: FROM: 1.5 MI EAST OF US 67
TO: 13.7 MI EAST OF US 67

TYPE OF WORK Crumb Rubber

TOTAL AREA 552,066 SY

SURFACE TREATMENT

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		552,066	SY
316 6007	ASPH (A-R TYPE II)	0.60 GAL/SY	331,243	GAL
316 6124	AGGR(TY-PB GR-3 SAC-A)	80 SY/CY	6,904	CY

PAVEMENT MARKINGS

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6109	WK ZN PAV MRK SHT TERM (TAB)TY W	9,720	EA
666 6167	REFL PAV MRK TY II (W) 4" (BRK)	32,380	LF
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	129,498	LF
666 6178	REFL PAV MRK TY II (W) 8" (SLD)	829	LF
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	129,498	LF

RAISED PAVEMENT MARKERS

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6010	REFL PAV MRKR TY II-C-R	1,620	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	1,620	EA

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BASIS OF ESTIMATE
SHEET 2 OF 13

Texas Department of Transportation

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			26
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

BASIS OF ESTIMATE

LOCATION 3

CSJ 0140-05-027
COUNTY PECOS
HIGHWAY IH 10

EXIST ADT 8,580 (YEAR) 2020

BEGIN REF MRK 310 - 0.442 TO **END REF MRK** 320 - 0.146

LIMITS: FROM: 2.12 MI EAST OF US 190
TO: 5.54 MI WEST OF SH 349

TYPE OF WORK Crumb Rubber

TOTAL AREA 464,422 SY

SURFACE TREATMENT

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		464,422	SY
316 6007	ASPH (A-R TYPE II)	0.60 GAL/SY	278,655	GAL
316 6124	AGGR(TY-PB GR-3 SAC-A)	80 SY/CY	5,809	CY

PAVEMENT MARKINGS

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6109	WK ZN PAV MRK SHT TERM (TAB)TY W	8,160	EA
666 6167	REFL PAV MRK TY II (W) 4" (BRK)	27,190	LF
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	108,726	LF
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	108,726	LF

RAISED PAVEMENT MARKERS

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6010	REFL PAV MRKR TY II-C-R	1,360	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	1,360	EA

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BASIS OF ESTIMATE
SHEET 3 OF 13

Texas Department of Transportation

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			27
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

BASIS OF ESTIMATE

LOCATION 4

CSJ 0380-11-030
COUNTY UPTON
HIGHWAY SH 349

EXIST ADT 8,821 (YEAR) 2019

BEGIN REF MRK 362 + 0.00 TO **END REF MRK** 76 + 0.819

LIMITS: FROM: MIDLAND COUNTY LINE
TO: 0.33 MILES SOUTH OF COUNTY ROAD 111

TYPE OF WORK Crumb Rubber

TOTAL AREA 461,993 SY

SURFACE TREATMENT

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		461,993	SY
316 6007	ASPH (A-R TYPE II)	0.60 GAL/SY	277,197	GAL
316 6124	AGGR(TY-PB GR-3 SAC-A)	80 SY/CY	5,777	CY

PAVEMENT MARKINGS

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6109	WK ZN PAV MRK SHT TERM (TAB)TY W	4,530	EA
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	1,350	EA
666 6167	REFL PAV MRK TY II (W) 4" (BRK)	15,080	LF
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	156,670	LF
666 6178	REFL PAV MRK TY II (W) 8" (SLD)	1,296	LF
666 6184	REFL PAV MRK TY II (W) (ARROW)	2	EA
666 6192	REFL PAV MRK TY II (W) (WORD)	2	EA
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	107,928	LF

RAISED PAVEMENT MARKERS

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6009	REFL PAV MRKR TY II-A-A	1,350	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	1,350	EA

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BASIS OF ESTIMATE
SHEET 4 OF 13

Texas Department of Transportation

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			28
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

BASIS OF ESTIMATE

LOCATION 5

CSJ 0380-12-027
COUNTY UPTON
HIGHWAY SH 349

EXIST ADT 2,466 (YEAR) 2020

BEGIN REF MRK 376 + 0.81 TO **END REF MRK** 92 + 0.038

LIMITS: FROM: 0.33 MILES SOUTH OF COUNTY ROAD 111
TO: US 67

TYPE OF WORK Crumb Rubber

TOTAL AREA 438,516 SY

SURFACE TREATMENT

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		438,516	SY
316 6007	ASPH (A-R TYPE II)	0.60 GAL/SY	263,111	GAL
316 6124	AGGR(TY-PB GR-3 SAC-A)	80 SY/CY	5,484	CY

PAVEMENT MARKINGS

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6109	WK ZN PAV MRK SHT TERM (TAB)TY W	3,250	EA
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	2,240	EA
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	160,328	LF
666 6178	REFL PAV MRK TY II (W) 8" (SLD)	1,216	LF
666 6184	REFL PAV MRK TY II (W) (ARROW)	3	EA
666 6192	REFL PAV MRK TY II (W) (WORD)	3	EA
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	178,746	LF

RAISED PAVEMENT MARKERS

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6009	REFL PAV MRKR TY II-A-A	2,240	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	2,240	EA

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STATE OF TEXAS
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BASIS OF ESTIMATE
SHEET 5 OF 13

Texas Department of Transportation

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			29
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

BASIS OF ESTIMATE

LOCATION 6

CSJ 0441-06-037
COUNTY REEVES
HIGHWAY IH 10

(YEAR)
EXIST ADT 4,350 2020

BEGIN REF MRK 221 - 0.01 TO **END REF MRK** 27 + 0.403

LIMITS: FROM: PECOS COUNTY LINE
TO: 6.4 MILES WEST OF PECOS C/L

TYPE OF WORK Crumb Rubber

TOTAL AREA 290,584 SY

SURFACE TREATMENT

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		290,584	SY
316 6007	ASPH (A-R TYPE II)	0.60 GAL/SY	174,353	GAL
316 6124	AGGR(TY-PB GR-3 SAC-A)	80 SY/CY	3,636	CY

PAVEMENT MARKINGS

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6109	WK ZN PAV MRK SHT TERM (TAB)TY W	5,080	EA
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	67,719	LF
666 6178	REFL PAV MRK TY II (W) 8" (SLD)	2,503	LF
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	67,719	LF

RAISED PAVEMENT MARKERS

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6010	REFL PAV MRKR TY II-C-R	850	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	850	EA

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BASIS OF ESTIMATE
SHEET 6 OF 13

Texas Department of Transportation

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			30
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

BASIS OF ESTIMATE

LOCATION 7

CSJ 0441-07-073
COUNTY REEVES
HIGHWAY IH 10

		(YEAR)
EXIST ADT	4,350	2020

BEGIN REF MRK 227 + 0.403 TO **END REF MRK** 252 + 0.000

LIMITS: FROM: REEVES COUTY LINE
TO: 0.8 MILES WEST OF FM 2037

TYPE OF WORK Crumb Rubber

TOTAL AREA 1,138,794 SY

SURFACE TREATMENT

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		1,138,794	SY
316 6007	ASPH (A-R TYPE II)	0.60 GAL/SY	683,287	GAL
316 6124	AGGR(TY-PB GR-3 SAC-A)	80 SY/CY	14,249	CY

PAVEMENT MARKINGS

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6109	WK ZN PAV MRK SHT TERM (TAB)TY W	19,710	EA
666 6167	REFL PAV MRK TY II (W) 4" (BRK)	65,700	LF
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	260,381	LF
666 6178	REFL PAV MRK TY II (W) 8" (SLD)	14,586	LF
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	260,381	LF

RAISED PAVEMENT MARKERS

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6010	REFL PAV MRKR TY II-C-R	3,290	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	3,290	EA

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BASIS OF ESTIMATE
SHEET 7 OF 13

Texas Department of Transportation

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			31
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

BASIS OF ESTIMATE

LOCATION 8

CSJ 0441-09-051
COUNTY REEVES
HIGHWAY IH 10

EXIST ADT 6,175 (YEAR) 2020

BEGIN REF MRK 193 - 0.14 TO **END REF MRK** 07 + 0.110

LIMITS: FROM: FM 3078
TO: 0.5 MILES EAST OF FM 2903

TYPE OF WORK Crumb Rubber

TOTAL AREA 630,111 SY

SURFACE TREATMENT

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		630,111	SY
316 6007	ASPH (A-R TYPE II)	0.60 GAL/SY	378,070	GAL
316 6124	AGGR(TY-PB GR-3 SAC-A)	80 SY/CY	7,881	CY

PAVEMENT MARKINGS

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6109	WK ZN PAV MRK SHT TERM (TAB)TY W	11,070	EA
666 6167	REFL PAV MRK TY II (W) 4" (BRK)	36,890	LF
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	146,858	LF
666 6178	REFL PAV MRK TY II (W) 8" (SLD)	3,930	LF
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	146,858	LF

RAISED PAVEMENT MARKERS

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6010	REFL PAV MRKR TY II-C-R	1,840	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	1,840	EA

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BASIS OF ESTIMATE
SHEET 8 OF 13

Texas Department of Transportation

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			32
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

BASIS OF ESTIMATE

LOCATION 9

CSJ 0463-07-051
COUNTY ECTOR
HIGHWAY SH 158

(YEAR)
EXIST ADT 4,804 2020

BEGIN REF MRK 248 + 0.91 TO **END REF MRK** 59 + 0.187

LIMITS: FROM: FM 866
TO: US 385

TYPE OF WORK Crumb Rubber

TOTAL AREA 286,676 SY

SURFACE TREATMENT

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		286,676	SY
316 6007	ASPH (A-R TYPE II)	0.60 GAL/SY	172,008	GAL
316 6124	AGGR(TY-PB GR-3 SAC-A)	80 SY/CY	3,588	CY

PAVEMENT MARKINGS

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	4,970	EA
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	115,586	LF
666 6178	REFL PAV MRK TY II (W) 8" (SLD)	1,957	LF
666 6205	REFL PAV MRK TY II (Y) 4" (BRK)	13,710	LF
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	13,073	LF

RAISED PAVEMENT MARKERS

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6009	REFL PAV MRKR TY II-A-A	850	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	850	EA

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STATE OF TEXAS
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BASIS OF ESTIMATE
SHEET 9 OF 13

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			33
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

BASIS OF ESTIMATE

LOCATION 10

CSJ 1718-01-037
COUNTY MIDLAND
HIGHWAY FM 1788

EXIST ADT 14,820 (YEAR) 2020

BEGIN REF MRK 328 - 0.89 TO **END REF MRK** 328 + 0.000

LIMITS: FROM: BI 20 E
TO: IH 20 SOUTH FRT RD

TYPE OF WORK Crumb Rubber

TOTAL AREA 39,497 SY

SURFACE TREATMENT

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		39,497	SY
316 6007	ASPH (A-R TYPE II)	0.60 GAL/SY	23,699	GAL
316 6124	AGGR(TY-PB GR-3 SAC-A)	80 SY/CY	495	CY

PAVEMENT MARKINGS

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6109	WK ZN PAV MRK SHT TERM (TAB)TY W	680	EA
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	910	EA
666 6167	REFL PAV MRK TY II (W) 4" (BRK)	2,260	LF
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	9,018	LF
666 6182	REFL PAV MRK TY II (W) 24" (SLD)	468	LF
666 6184	REFL PAV MRK TY II (W) (ARROW)	16	EA
666 6192	REFL PAV MRK TY II (W) (WORD)	13	EA
666 6205	REFL PAV MRK TY II (Y) 4" (BRK)	2,260	LF
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	9,018	LF

RAISED PAVEMENT MARKERS

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6009	REFL PAV MRKR TY II-A-A	230	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	230	EA

* FOR CONTRACTOR INFORMATION ONLY

STATE OF TEXAS
CAITLIN J S SWICK
142199
LICENSED
PROFESSIONAL ENGINEER

07/08/2022

BASIS OF ESTIMATE
SHEET 10 OF 13

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			34
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

BASIS OF ESTIMATE

LOCATION 11

CSJ 1718-01-038
COUNTY MIDLAND
HIGHWAY FM 1788

EXIST ADT 8,821 (YEAR) 2019

BEGIN REF MRK 348 + 0.00 TO **END REF MRK** 28 + 0.000

LIMITS: FROM: IH 20 SOUTH FRT RD
TO: UPTON COUNTY LINE

TYPE OF WORK Crumb Rubber

TOTAL AREA 398,797 SY

SURFACE TREATMENT

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		398,797	SY
316 6007	ASPH (A-R TYPE II)	0.60 GAL/SY	239,282	GAL
316 6124	AGGR(TY-PB GR-3 SAC-A)	80 SY/CY	4,990	CY

PAVEMENT MARKINGS

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	7,510	EA
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	203,474	LF
666 6184	REFL PAV MRK TY II (W) (ARROW)	2	EA
666 6205	REFL PAV MRK TY II (Y) 4" (BRK)	19,550	LF
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	52,153	LF

RAISED PAVEMENT MARKERS

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6009	REFL PAV MRKR TY II-A-A	1,640	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	1,640	EA

* FOR CONTRACTOR INFORMATION ONLY

STATE OF TEXAS
CAITLIN J S SWICK
142199
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07/08/2022

BASIS OF ESTIMATE
SHEET 11 OF 13

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		35

STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

BASIS OF ESTIMATE

LOCATION 12

CSJ	1718-02-011	
COUNTY	UPTON	
HIGHWAY	FM 1788	
		(YEAR)
EXIST ADT	465	2020

BEGIN REF MRK 348 + 0.00 TO **END REF MRK** 50 + 0.179

LIMITS: FROM: MIDLAND COUNTY LINE
TO: EDGE OF PAVEMENT

TYPE OF WORK Seal Coat

TOTAL AREA 27,963 SY

SURFACE TREATMENT

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		27,963	SY
316 6007	ASPH (A-R TYPE II)	0.60 GAL/SY	16,778	GAL
316 6124	AGGR(TY-PB GR-3 SAC-A)	80 SY/CY	350	CY

PAVEMENT MARKINGS

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	820	EA
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	18,642	LF
666 6205	REFL PAV MRK TY II (Y) 4" (BRK)	2,340	LF

RAISED PAVEMENT MARKERS

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6009	REFL PAV MRKR TY II-A-A	120	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	120	EA

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07/08/2022

BASIS OF ESTIMATE
SHEET 12 OF 13

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			36
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

BASIS OF ESTIMATE

LOCATION 13

CSJ 1870-01-036
COUNTY ECTOR
HIGHWAY FM 2020

(YEAR)
EXIST ADT 20,790 2020

BEGIN REF MRK 248 - 0.09 TO **END REF MRK** 58 + 0.000

LIMITS: FROM: KNOX AVE
TO: FM 866

TYPE OF WORK Crumb Rubber

TOTAL AREA 73,908 SY

SURFACE TREATMENT

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		73,908	SY
316 6007	ASPH (A-R TYPE II)	0.60 GAL/SY	44,345	GAL
316 6124	AGGR(TY-PB GR-3 SAC-A)	80 SY/CY	925	CY

PAVEMENT MARKINGS

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6109	WK ZN PAV MRK SHT TERM (TAB)TY W	30	EA
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	1,280	EA
666 6167	REFL PAV MRK TY II (W) 4" (BRK)	90	LF
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	31,372	LF
666 6182	REFL PAV MRK TY II (W) 24" (SLD)	848	LF
666 6184	REFL PAV MRK TY II (W) (ARROW)	1	EA
666 6192	REFL PAV MRK TY II (W) (WORD)	1	EA
666 6205	REFL PAV MRK TY II (Y) 4" (BRK)	3,510	LF
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	2,767	LF

RAISED PAVEMENT MARKERS

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6009	REFL PAV MRKR TY II-A-A	220	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	220	EA

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STATE OF TEXAS
CAITLIN J S SWICK
142199
LICENSED
PROFESSIONAL ENGINEER

07/08/2022

BASIS OF ESTIMATE
SHEET 13 OF 13

Texas Department of Transportation®

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		37

STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038	US 67, ETC

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0076	07	038, ETC	US 67, ETC
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	ODA	UPTON, ETC		38
5-10 5-21				

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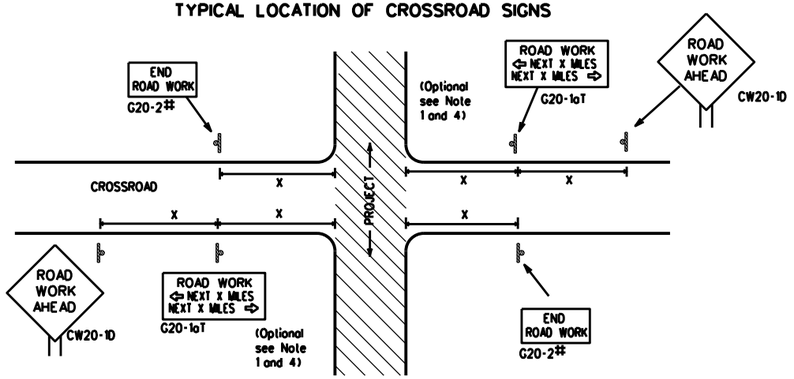
DATE:
FILE:

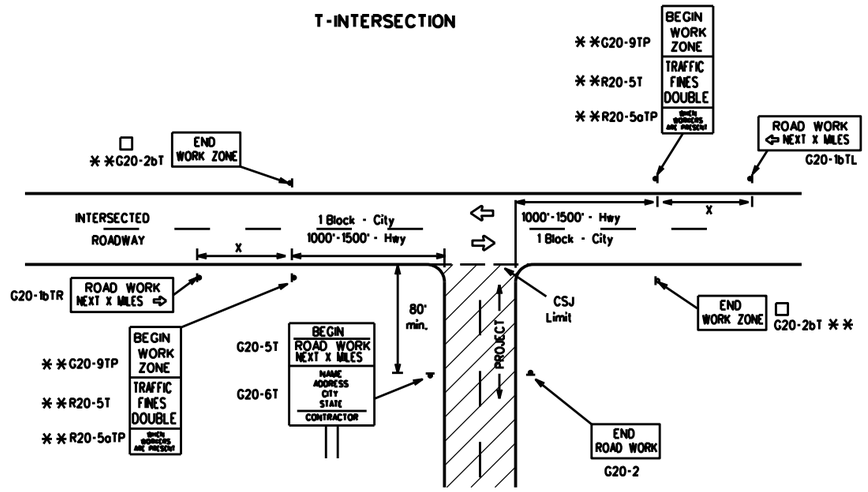
TYPICAL LOCATION OF CROSSROAD SIGNS



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 as per TMUTCD Part 5. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The "ROAD WORK NEXT X MILES"(G20-1aT)sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING

1.5.6

SIZE

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

SPACING

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

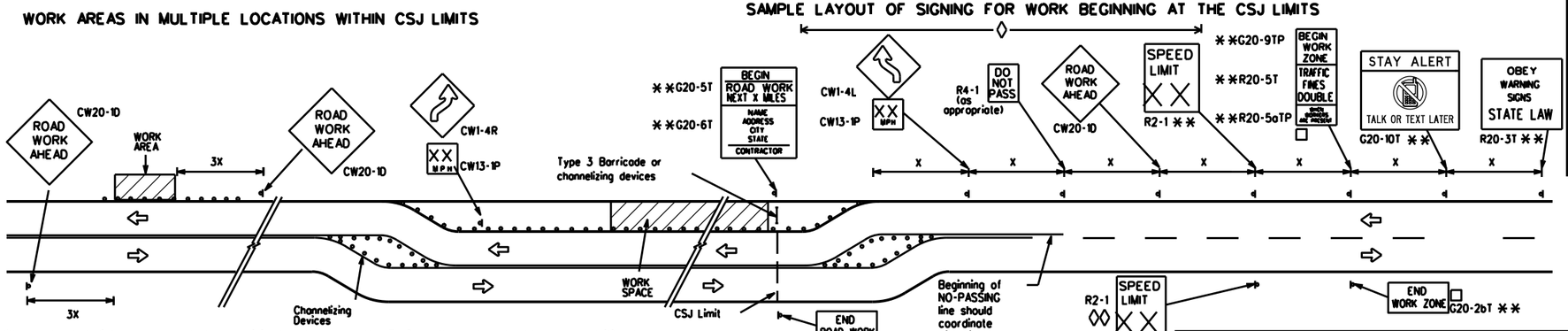
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

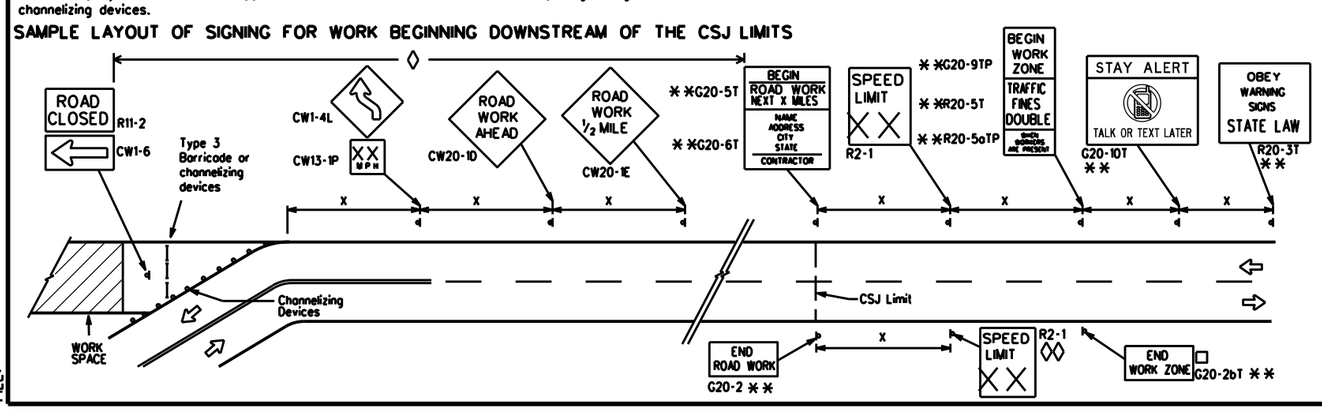
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

NOTES

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

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

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

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

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

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

SHEET 2 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

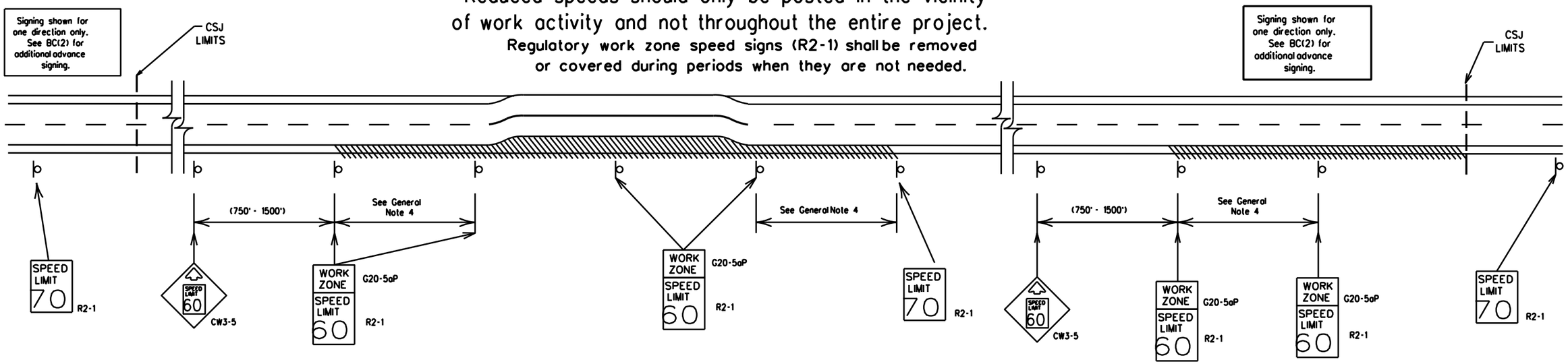
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0076	07	038+ ETC	US 67+ ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	00A	UPTON+ ETC		39

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

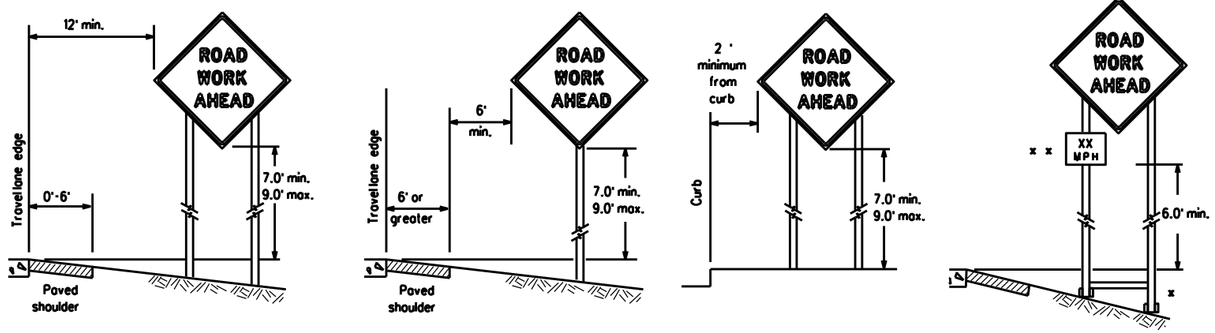
BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0076	07	038, ETC	US 67, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ODA	UPTON, ETC		40

DATE:
FILE:

DATE:
FILE:

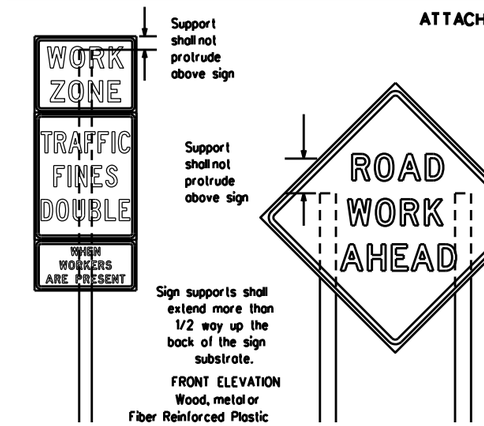
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



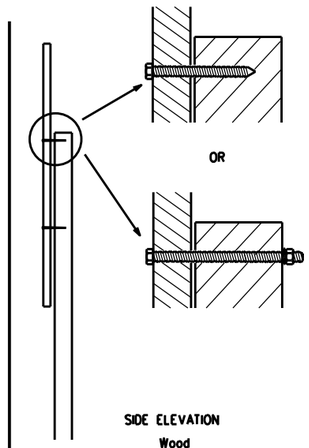
x When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

x x When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travellane. 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.

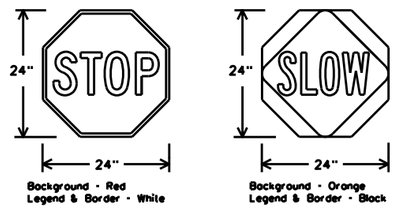


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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".
2. STOP/SLOW paddles shall be retroreflectorized when used at night.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0076	07	038. ETC	US 67. ETC
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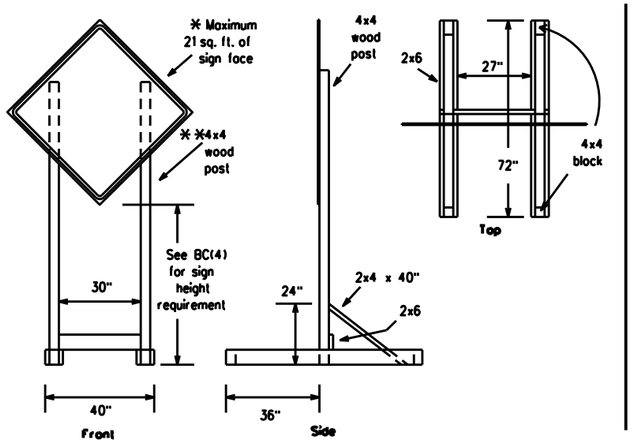
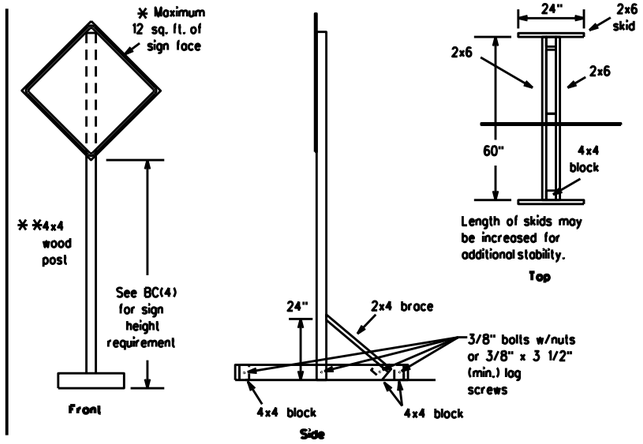
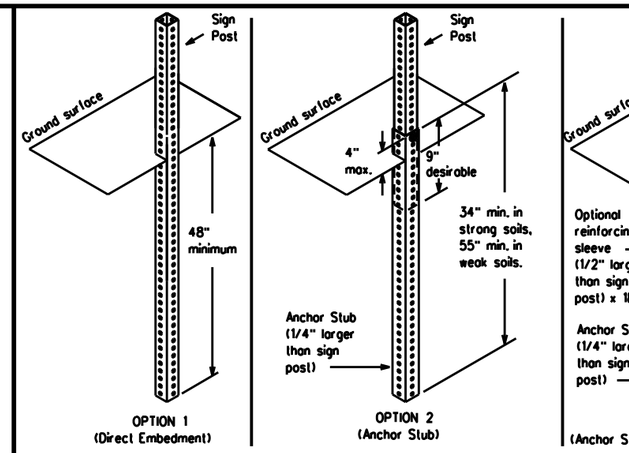


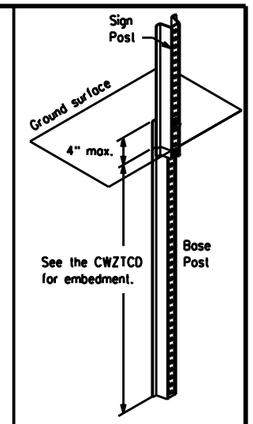


SKID MOUNTED WOOD SIGN SUPPORTS

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



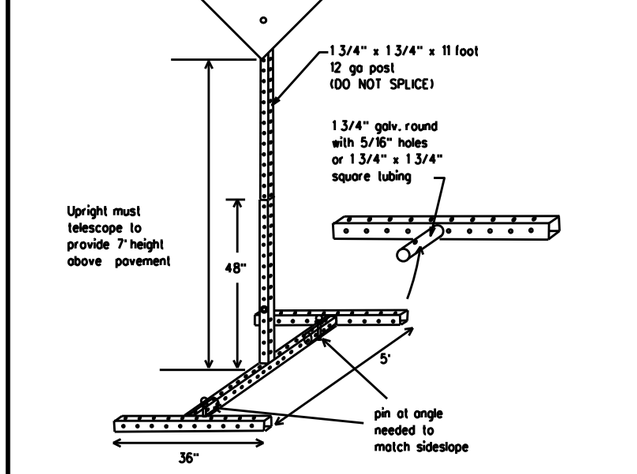
PERFORATED SQUARE METAL TUBING

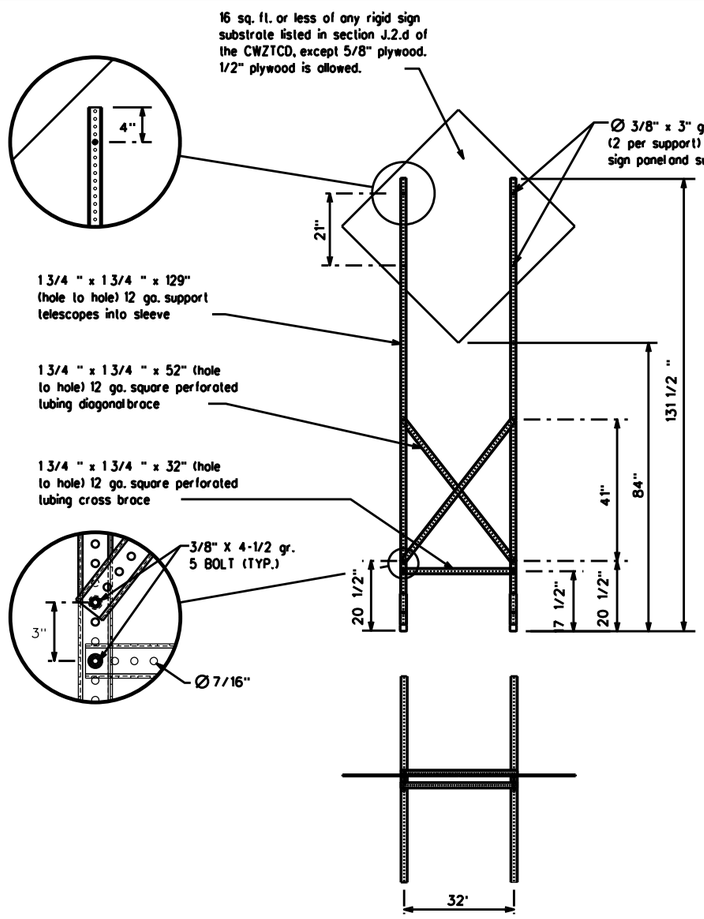


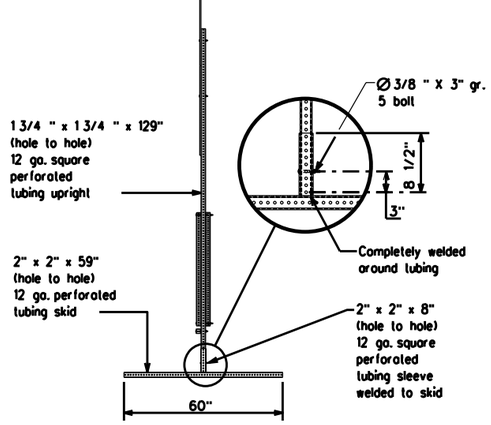
WING CHANNEL
Lap-splice/base bolted anchor

GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

SHEET 5 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

* 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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0076	07	038+ ETC	US 67+ ETC
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DATE:
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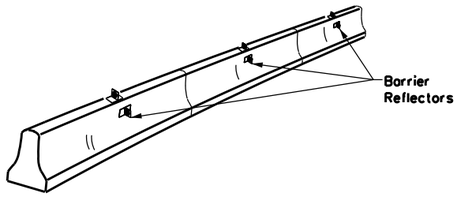
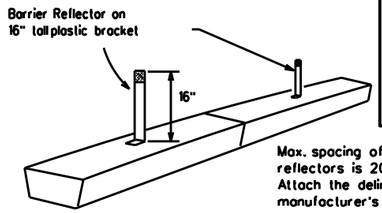
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



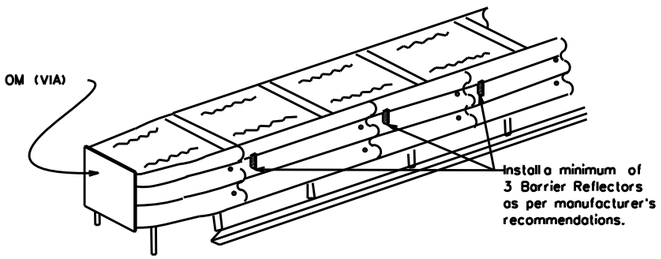
CONCRETE TRAFFIC BARRIER (CTB)

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



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

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

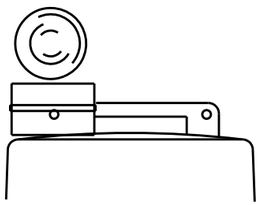
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

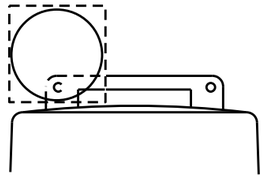
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

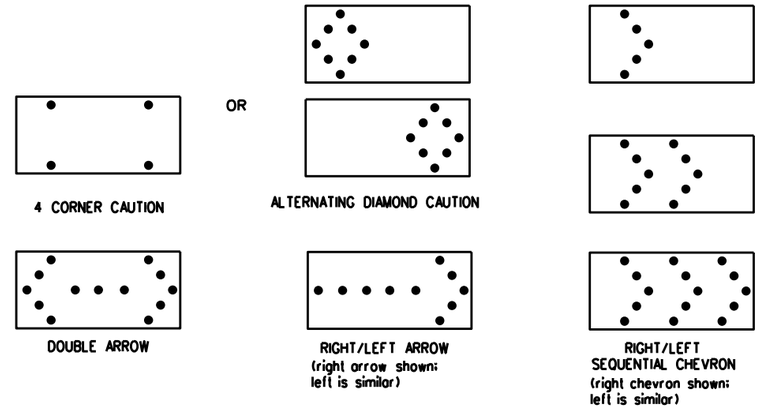
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION
Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0076	07	038. ETC	US 67. ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ODA	UPTON. ETC		44

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DATE:
FILE:

GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

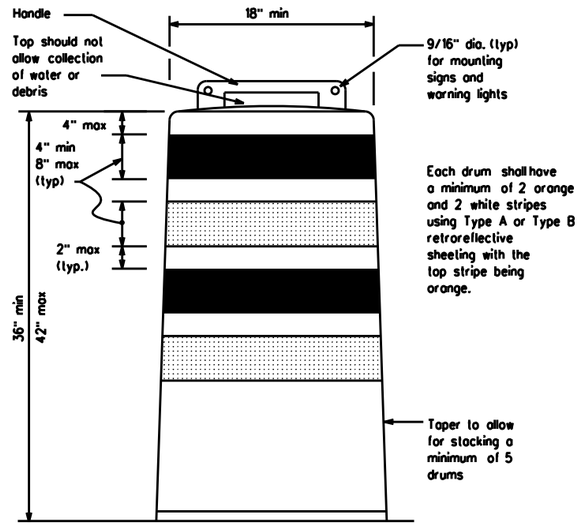
1. Plastic drums shall be a two-piece design: the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

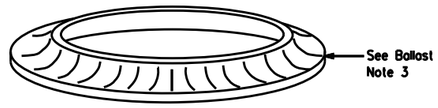
RETROREFLECTIVE SHEETING

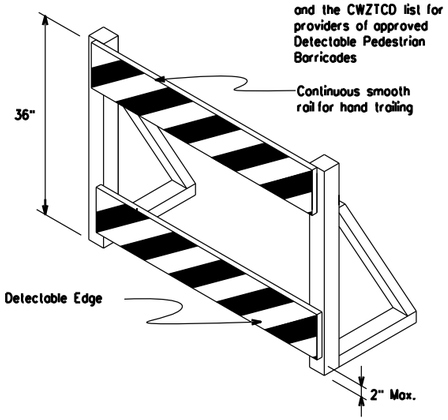
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

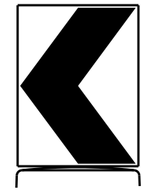




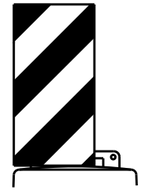


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

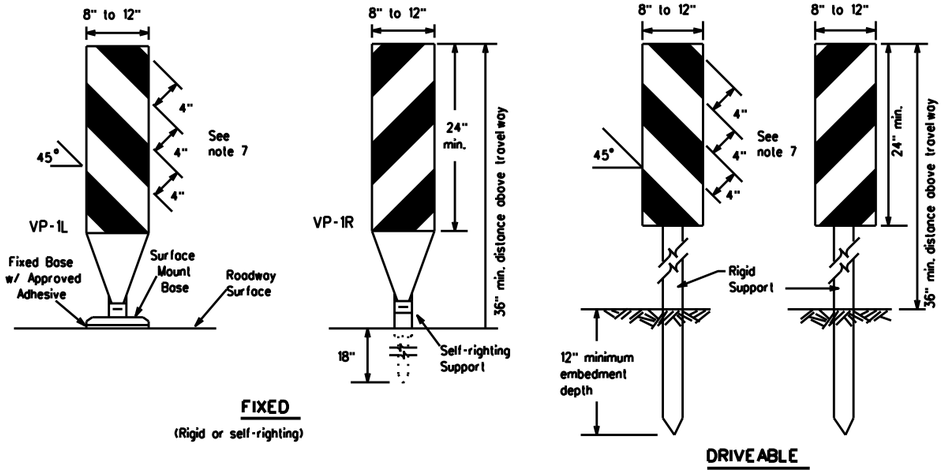
SHEET 8 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

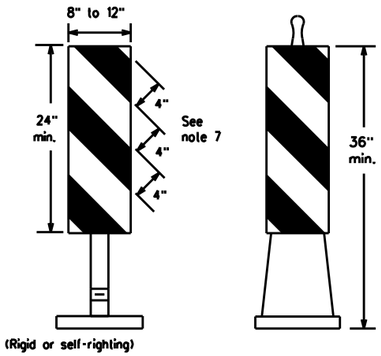
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0076	07	038+ ETC	US 67+ ETC
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	ODA	UPTON+ ETC		45
7-13				



FIXED

(Rigid or self-righting)

DRIVEABLE

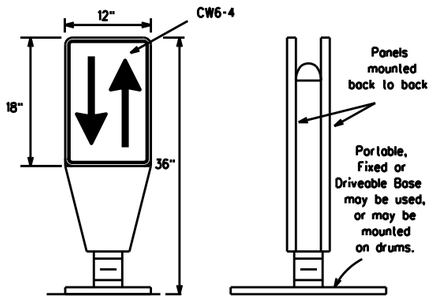


(Rigid or self-righting)

PORTABLE

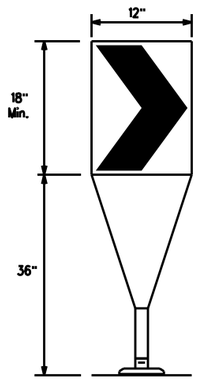
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



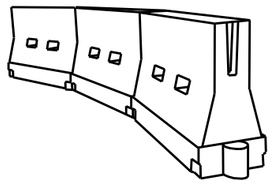
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0076	07	038, ETC	US 67, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
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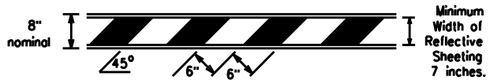
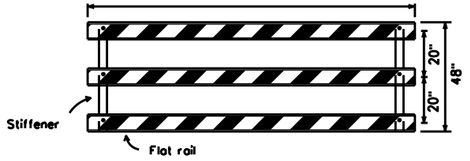
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



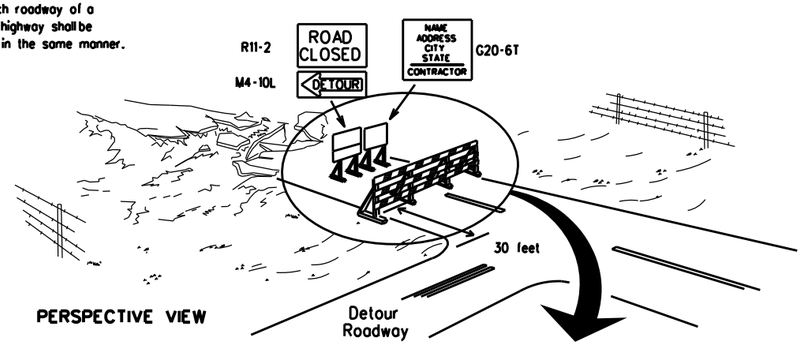
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

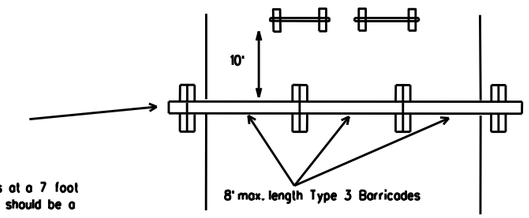
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

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

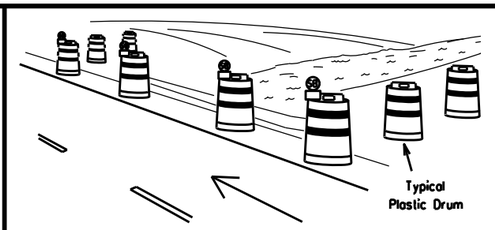
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

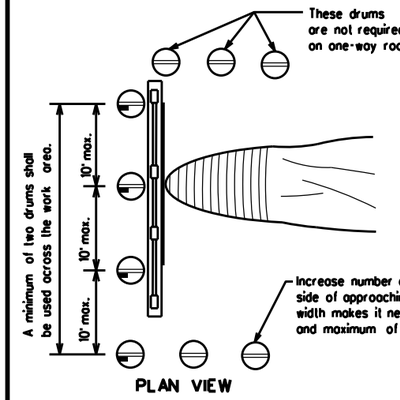
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

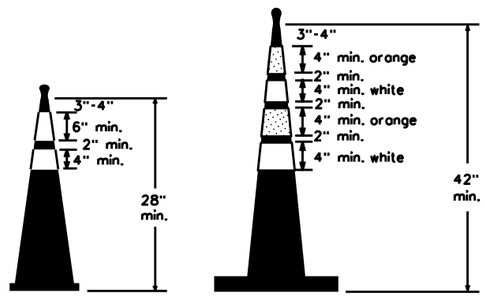
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



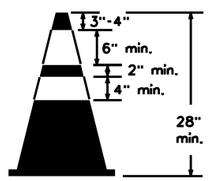
PLAN VIEW

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

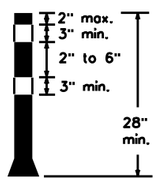
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

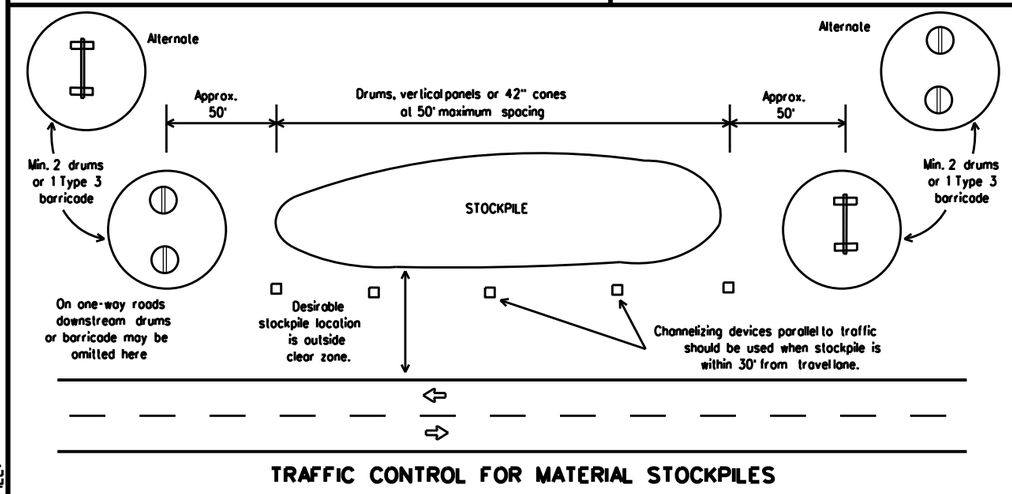


Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

DATE:
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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

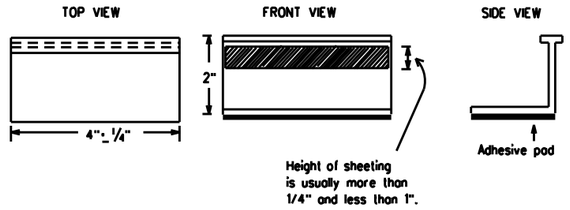
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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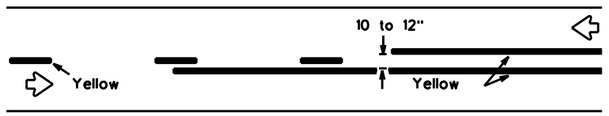
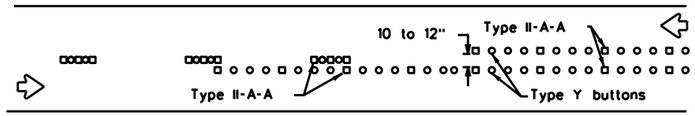
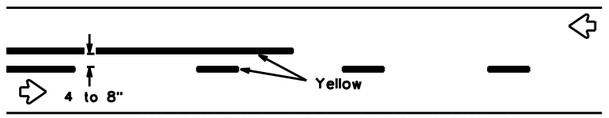
PAVEMENT MARKING PATTERNS



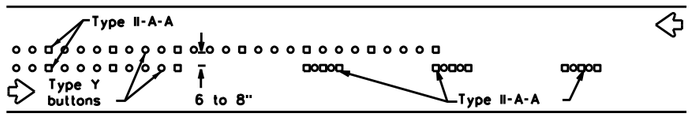
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



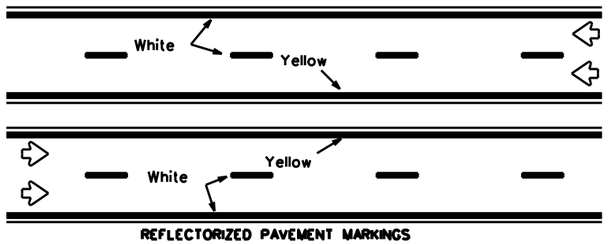
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



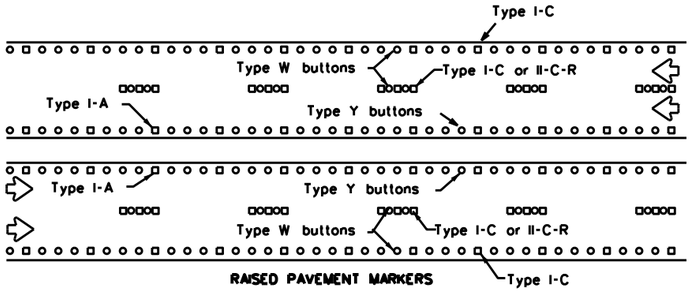
RAISED PAVEMENT MARKERS - PATTERN B

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

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



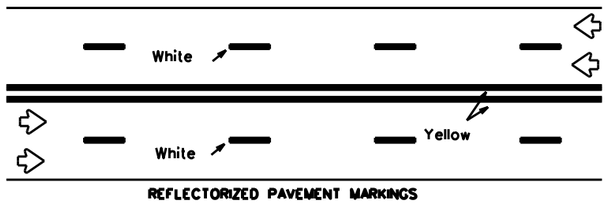
REFLECTORIZED PAVEMENT MARKINGS



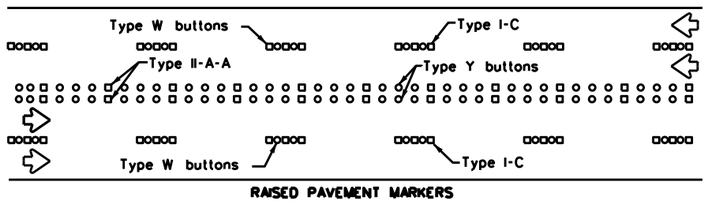
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



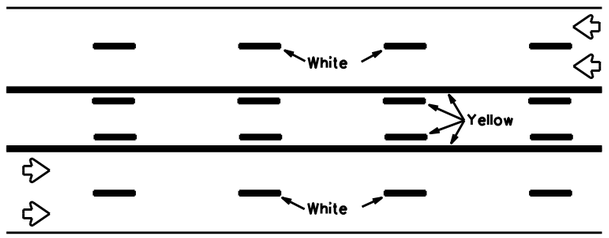
REFLECTORIZED PAVEMENT MARKINGS



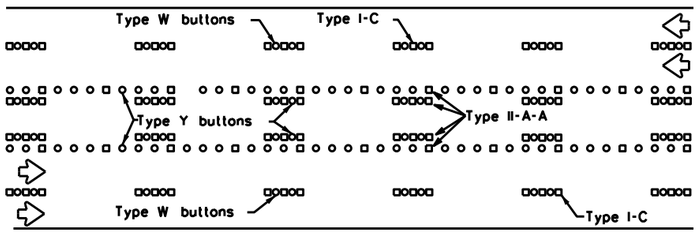
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

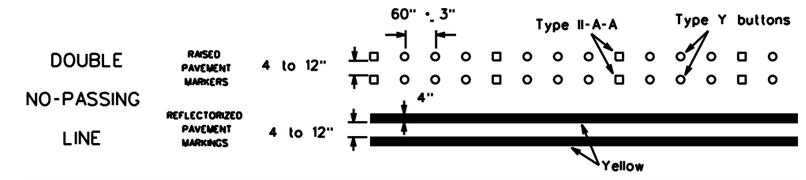
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

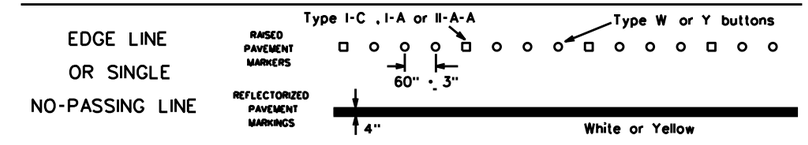
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

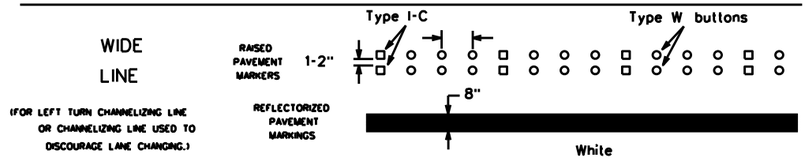


EDGE LINE OR SINGLE NO-PASSING LINE



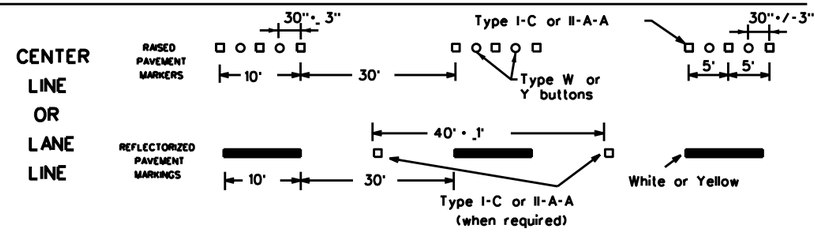
WIDE LINE

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

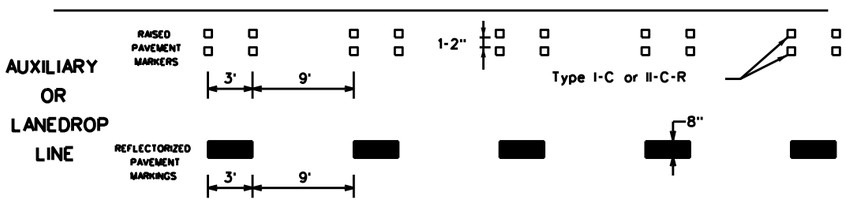


BROKEN LINES

CENTER LINE OR LANE LINE

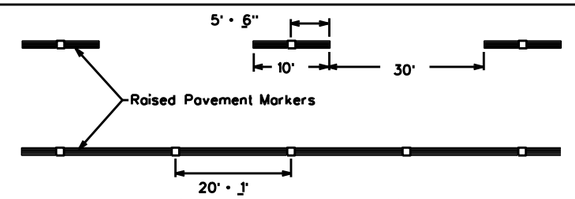


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

SHEET 12 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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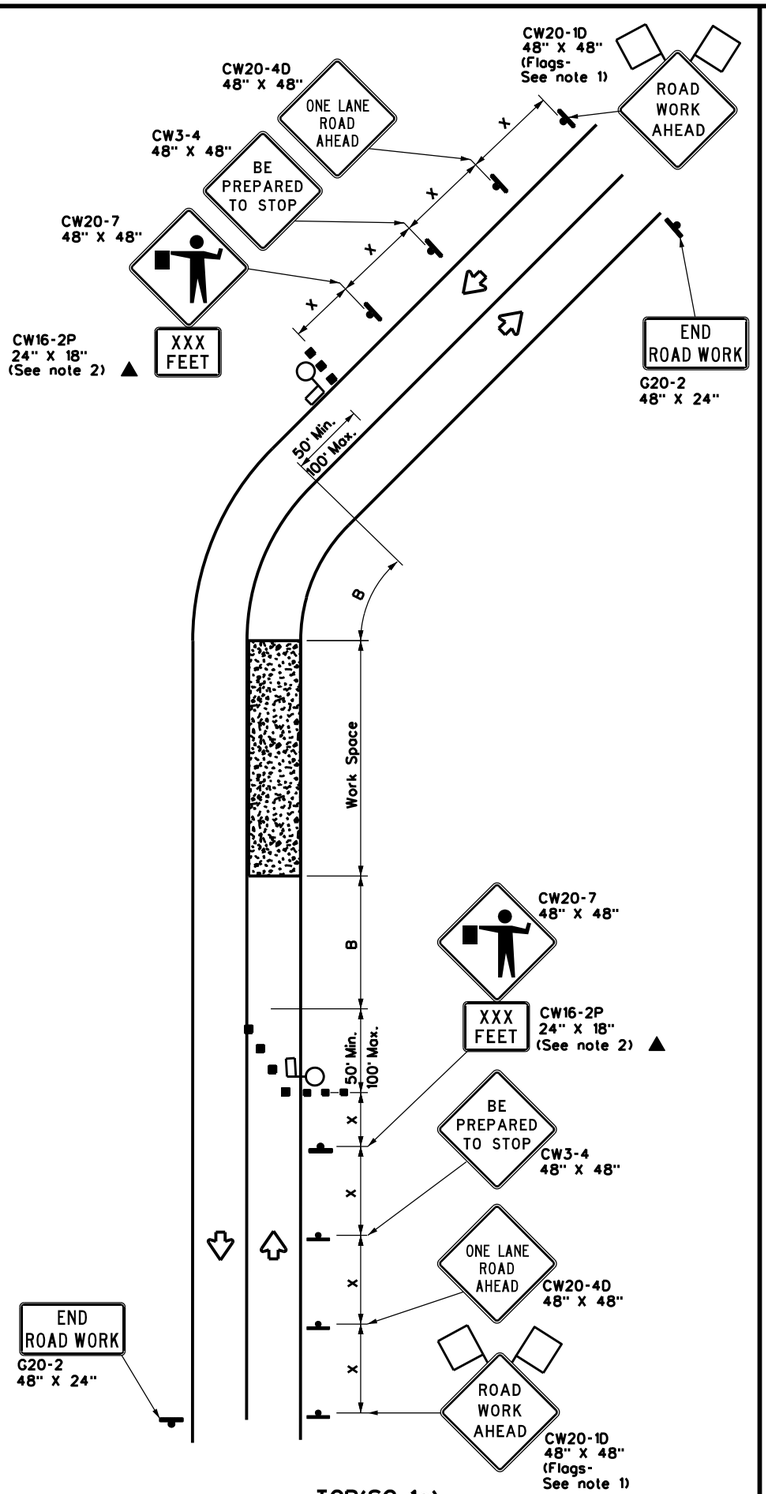
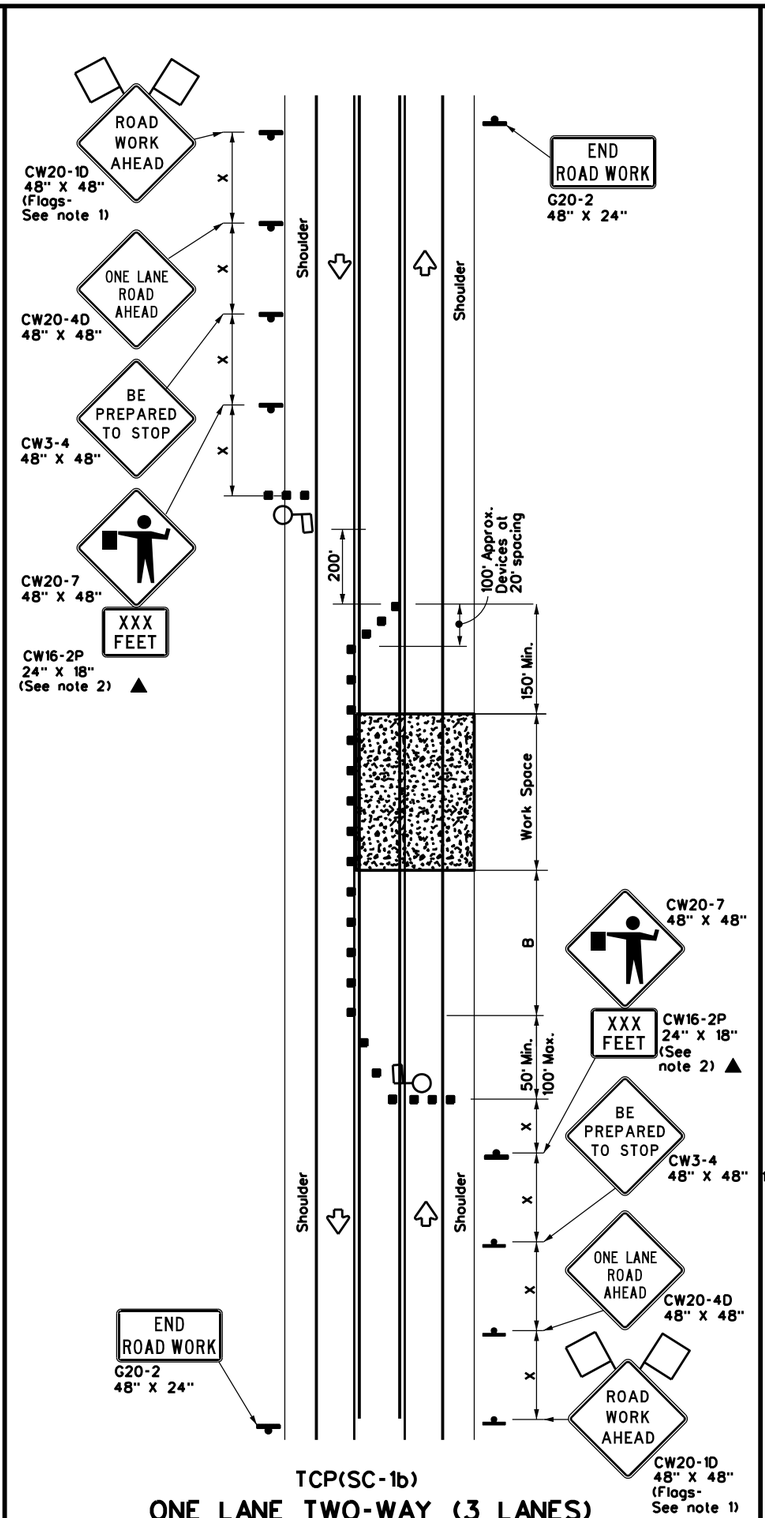


TCP(SC-1a)

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



TCP(SC-1b)

ONE LANE TWO-WAY (3 LANES) CONTROL WITH PILOT VEHICLE AND CHANNELIZING DEVICES

LEGEND

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger sign is less than 1500 feet.
5. Flaggers should use two-way radios or other methods of communication at all times to control traffic.
6. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.
7. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
8. If the seal coat operation crosses intersections, traffic in these areas must be controlled, Care must be taken to prevent vehicles from crossing the asphalt before the aggregate is placed. This may require positioning other member of the traffic control crew at the intersection.
9. Temporary rumble strips are not required on seal coat operations.
10. Pilot car is used to guide vehicles through traffic control zone, vehicle shall have an identification name displayed and "PILOT CAR, FOLLOW ME" (G20-4) sign or message board mounted in a conspicuous position on rear.

TCP (SC-1a)

1. Channelizing devices on the center-line may be omitted when a pilot car is leading traffic.

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS

TCP(SC-1)-21

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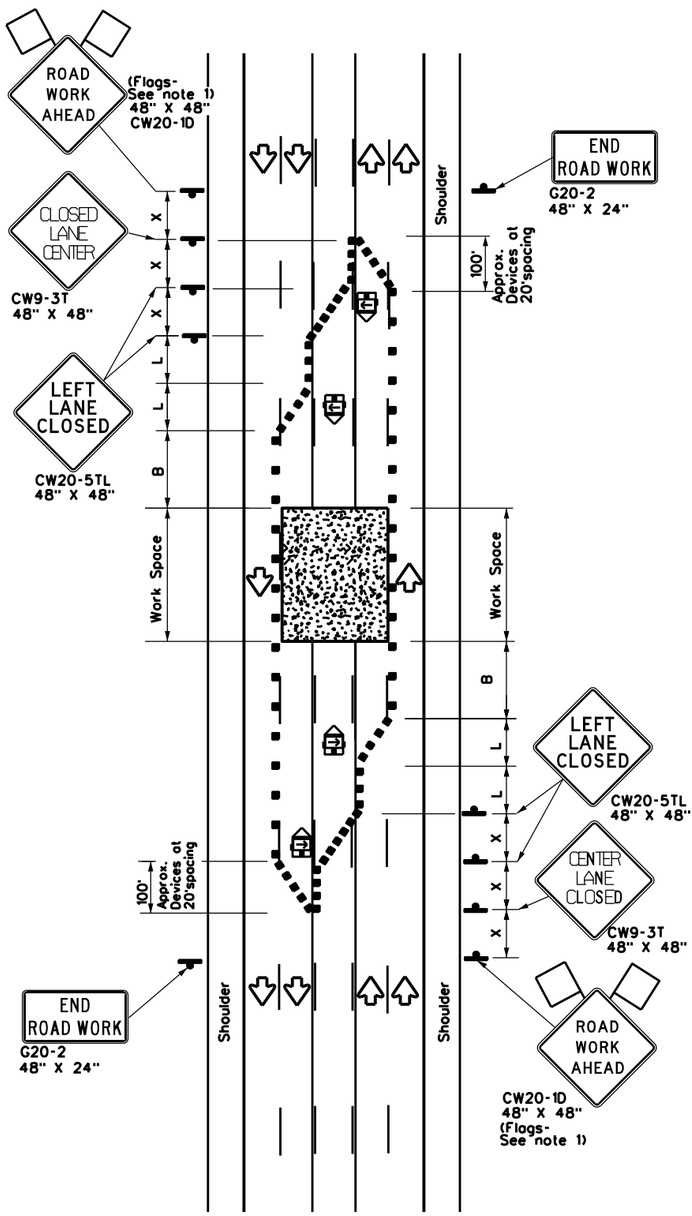
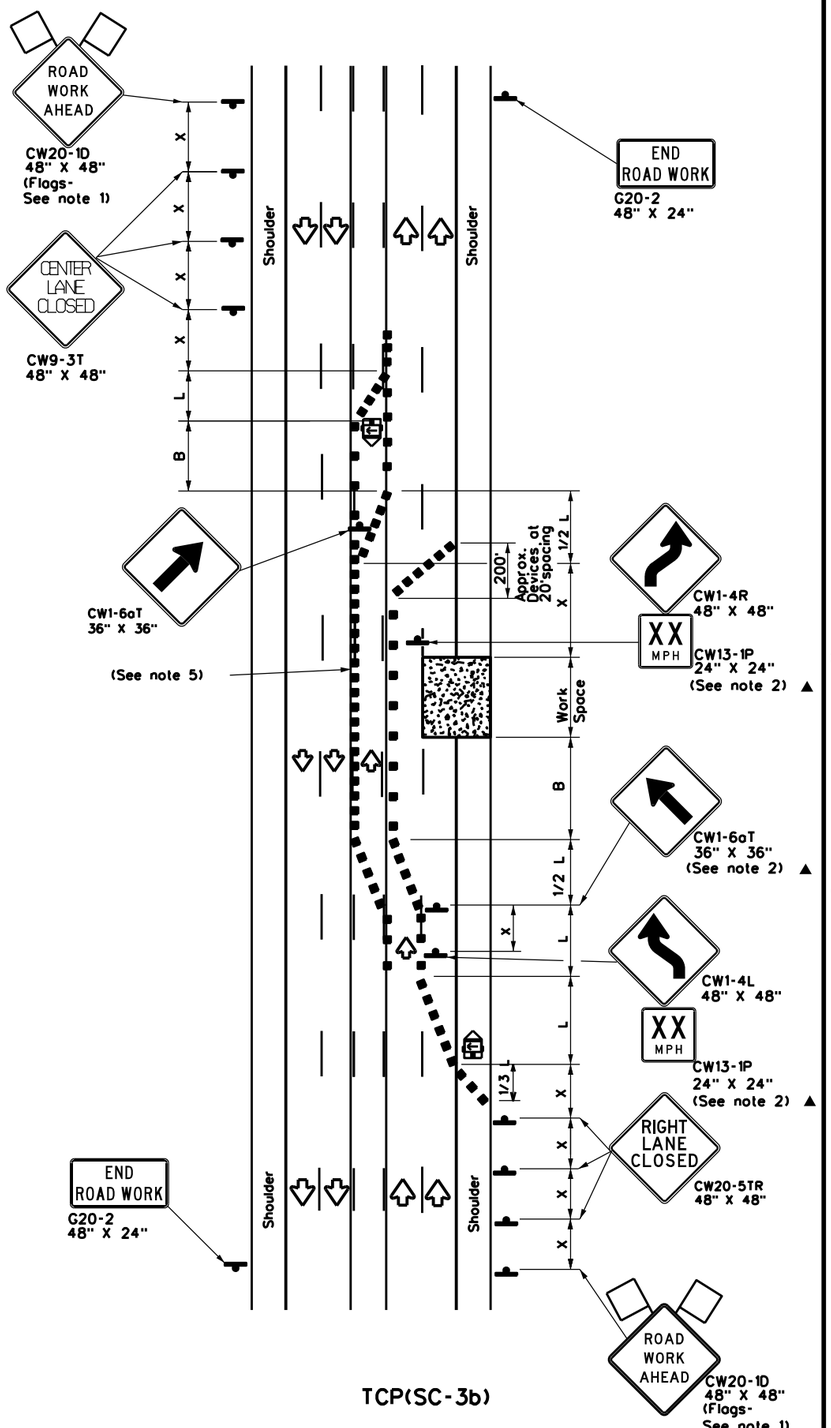


TCP(SC-3a)

CENTER LANES CLOSED
CONTROL WITH CHANNELIZING DEVICES



TCP(SC-3b)

ONE LANES CLOSED
CONTROL WITH CHANNELIZING DEVICES

LEGEND

	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	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. If the seal coat operation crosses intersections, traffic in these areas must be controlled. Care must be taken to prevent vehicles from crossing the asphalt before the aggregate is placed. This may require positioning other members of the traffic control crew at the intersection.
4. Temporary rumble strips are not required on seal coat operations.

TCP (SC-3b)

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

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS

TCP(SC-3)-21

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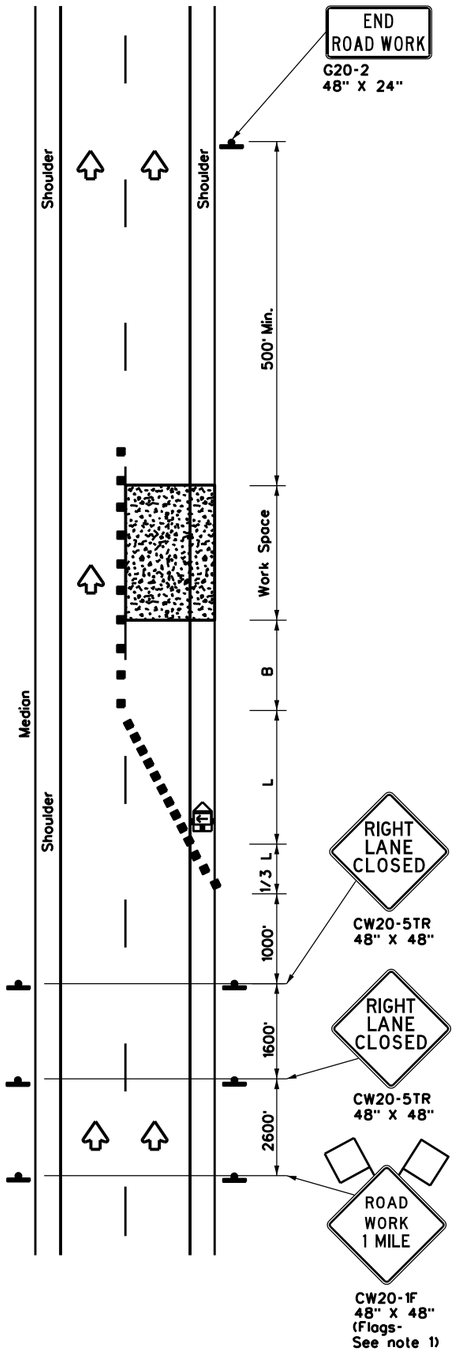
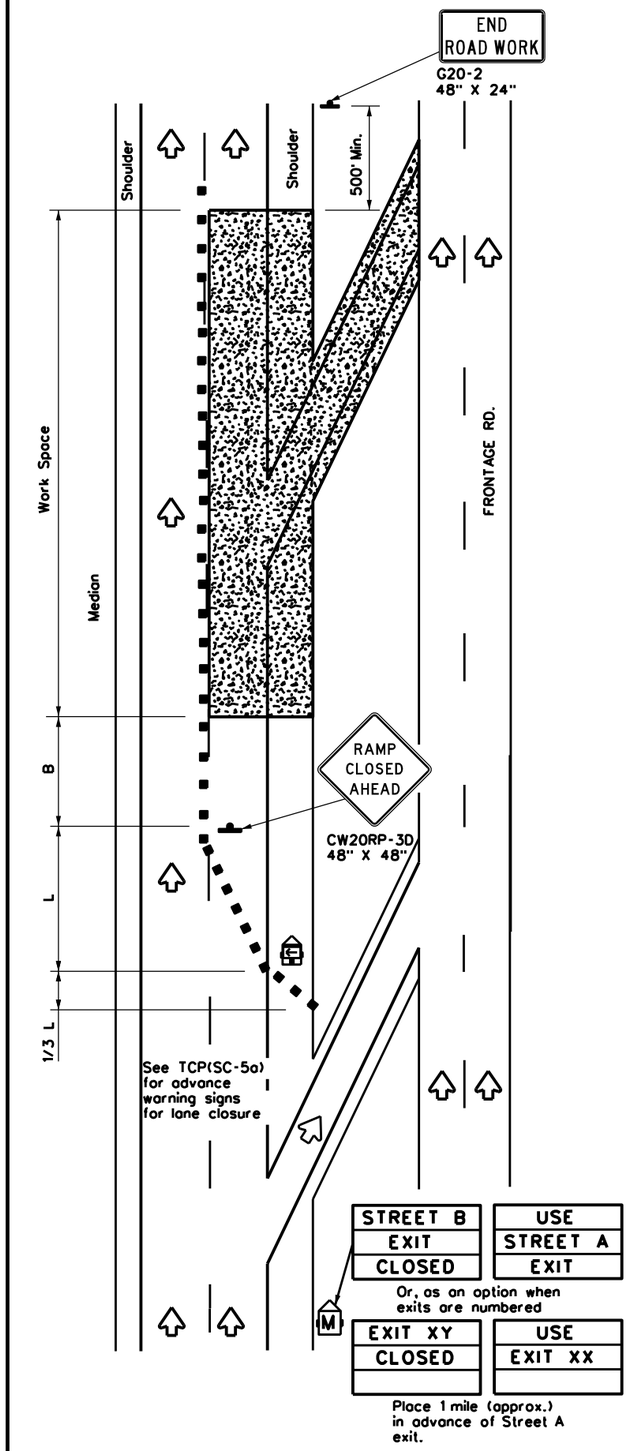


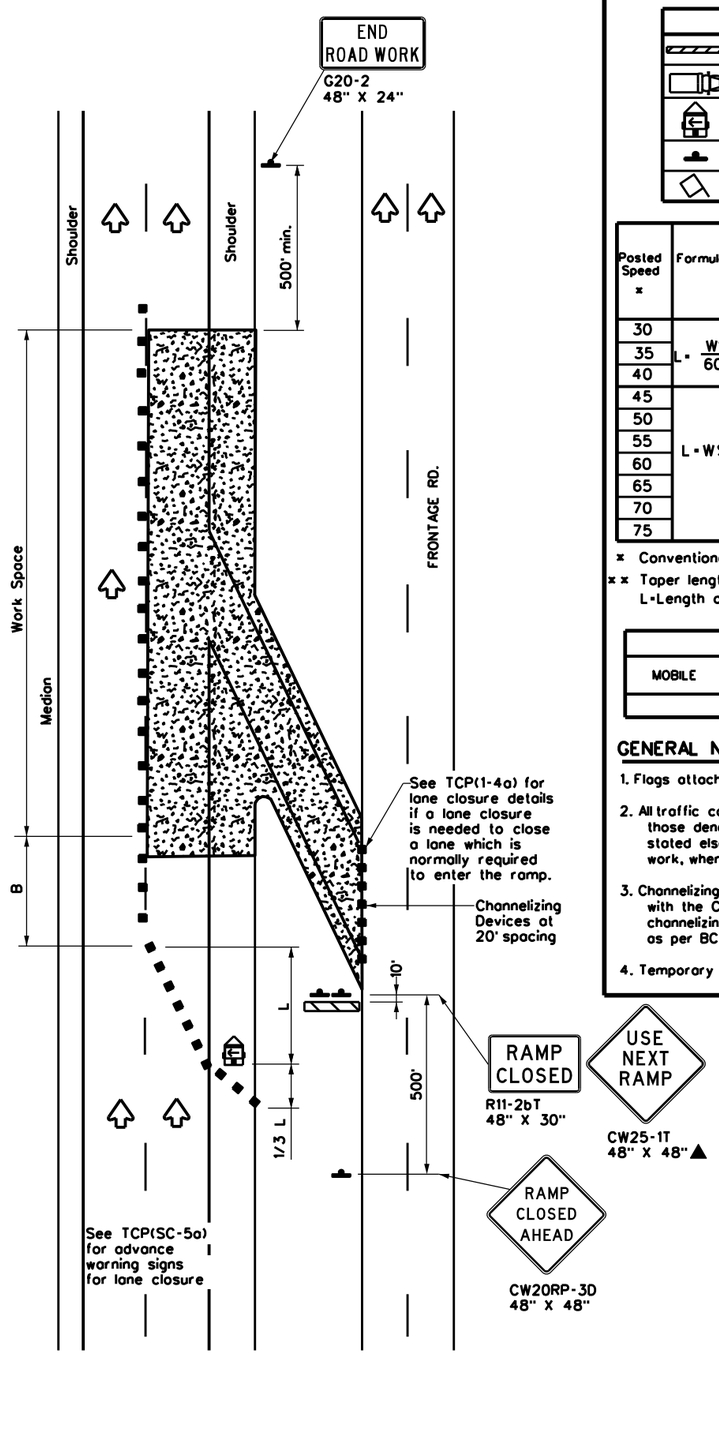
TCP (SC-5a)

ONE LANE CLOSURE



TCP (SC-5b)

LANE AND RAMP CLOSURE AT EXIT RAMPS



TCP (SC-5c)

LANE AND RAMP CLOSURE AT ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(SC-5)-21

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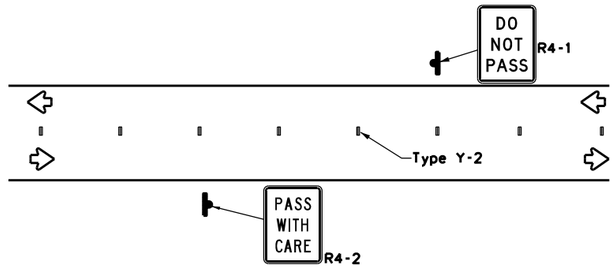
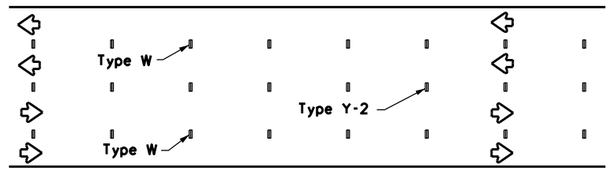
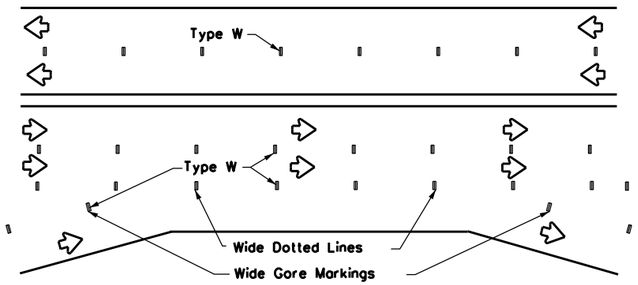
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS (TABS)



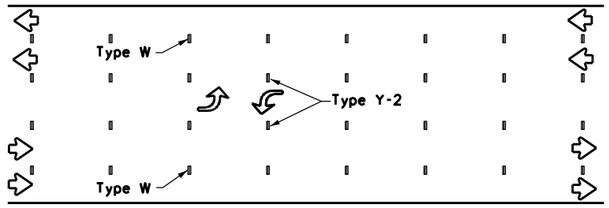
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



LANE LINES FOR DIVIDED HIGHWAY



TWO-WAY LEFT TURN LANE

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS (TABS)

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

NOTES:

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

TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS FOR SEAL COAT OPERATIONS

TCP(SC-6)-21

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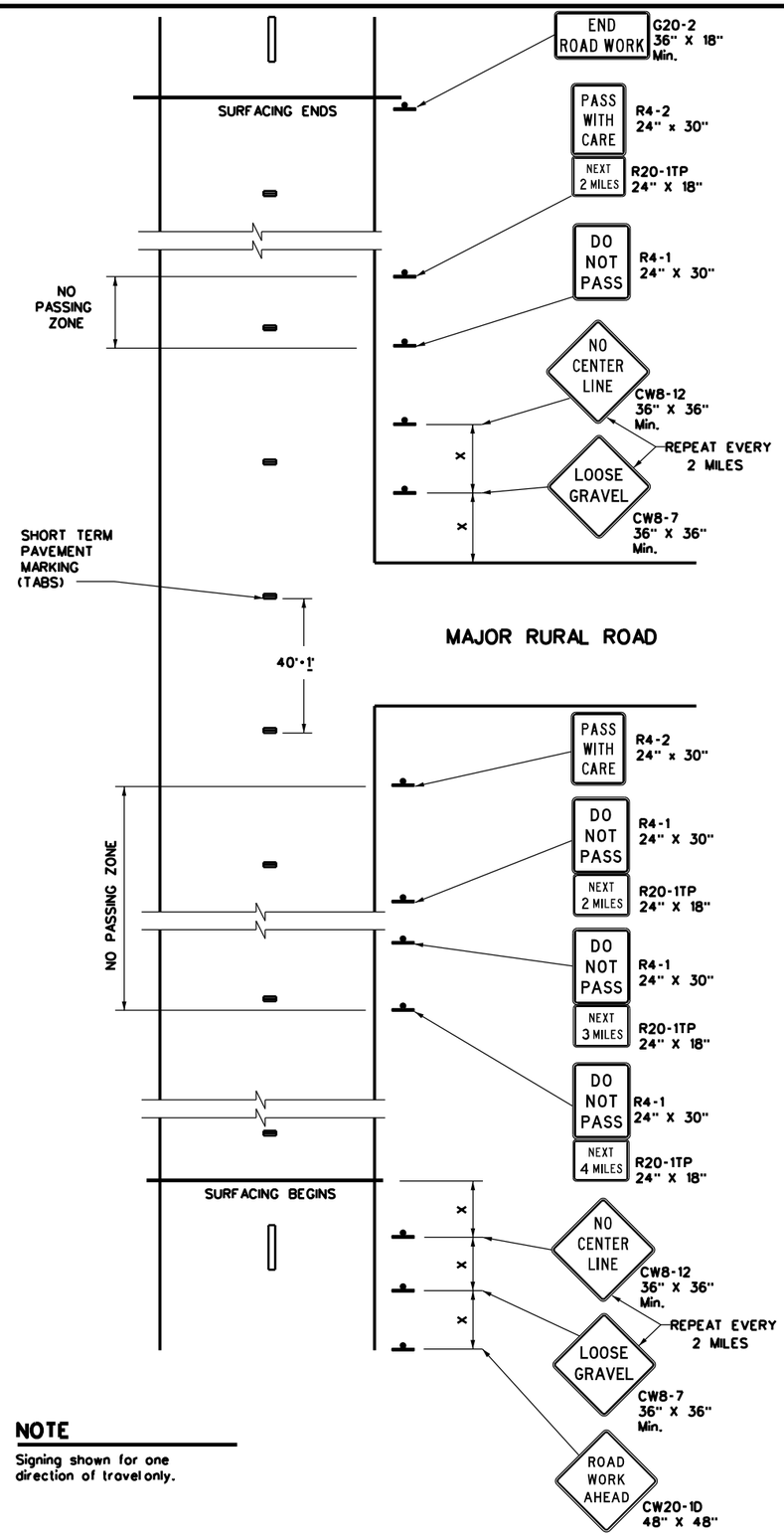
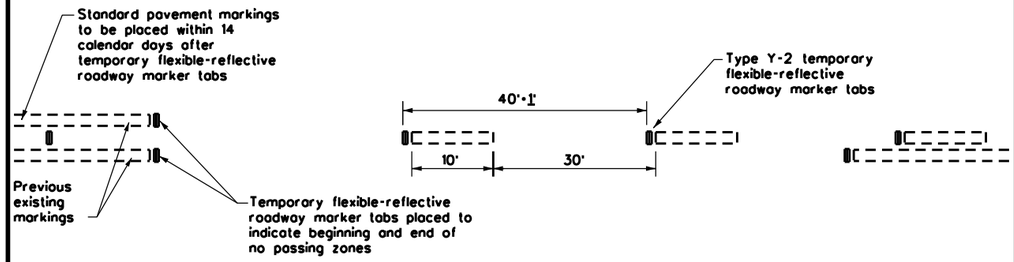


NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat operations

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

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

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

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

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

"NO CENTER LINE" SIGN (CW8-12)

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

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

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

"LOOSE GRAVEL" SIGN (CW8-7)

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

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

PAVEMENT MARKINGS

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

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

COORDINATION OF SIGN LOCATIONS

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

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

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

* Conventional Roads Only

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC CONTROL DETAILS FOR SEAL COAT OPERATIONS

TCP(SC-7)-21

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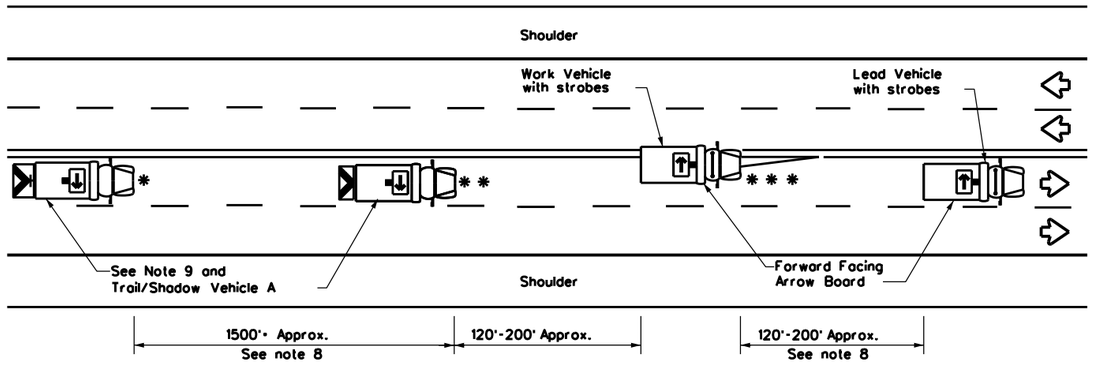
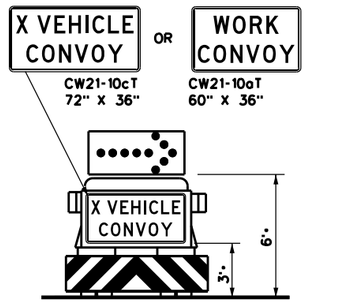


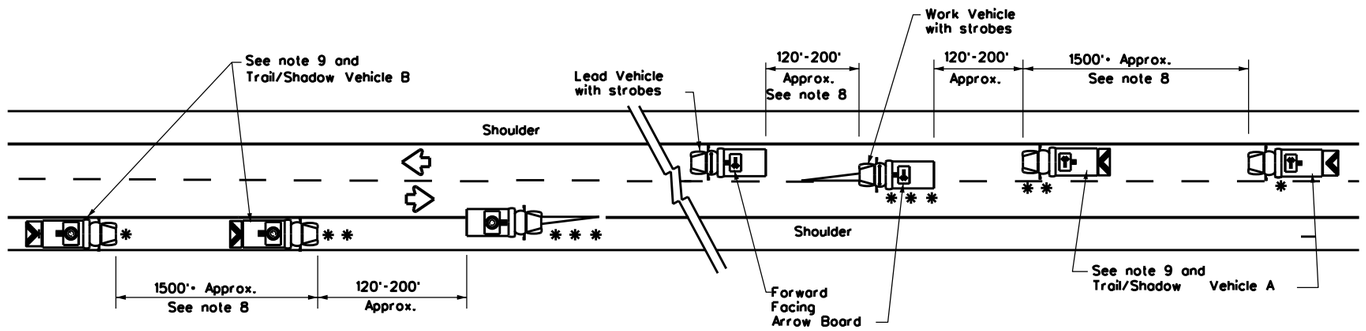
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

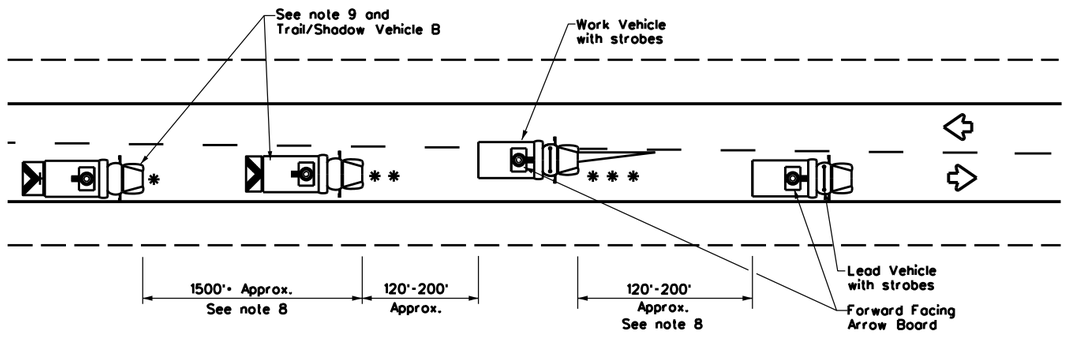


WORK ON SHOULDER

WORK ON TRAVEL LANE

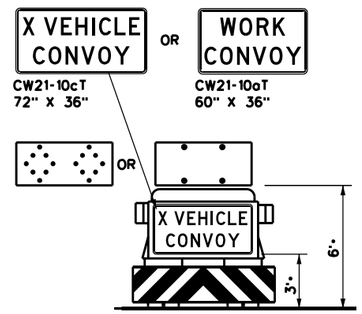
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in CAUTION display

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

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.

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

3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.

4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.

5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.

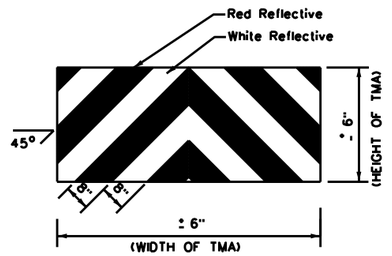
6. Each vehicle shall have two-way radio communication capability.

7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.

8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.

9. "X VEHICLE CONVOY" (CW21-10cT) or "WORK CONVOY" (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped "WORK CONVOY"(CW21-10T) or "X VEHICLE CONVOY" (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.

10. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.



STRIPING FOR TMA

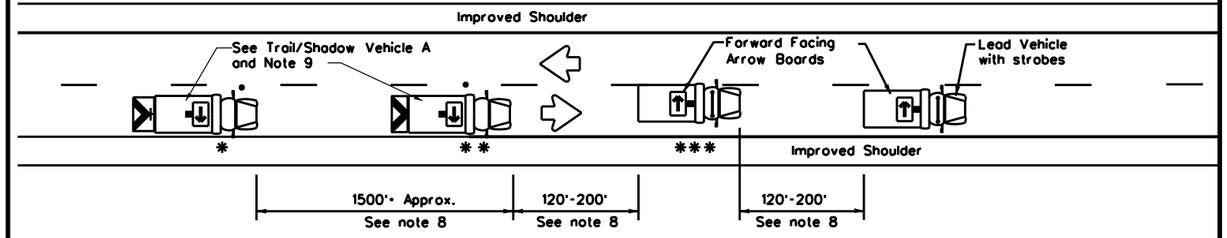
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

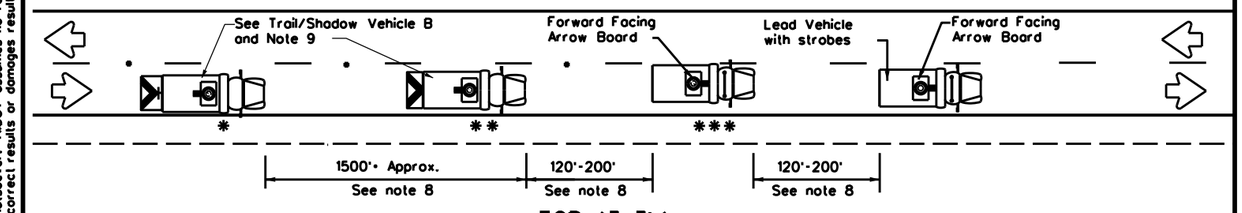
TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0076	07	038. ETC	US 67. ETC
2-94 4-98 8-95 7-13 1-97	DIST	COUNTY		SHEET NO.
	ODA	UPTON. ETC		55



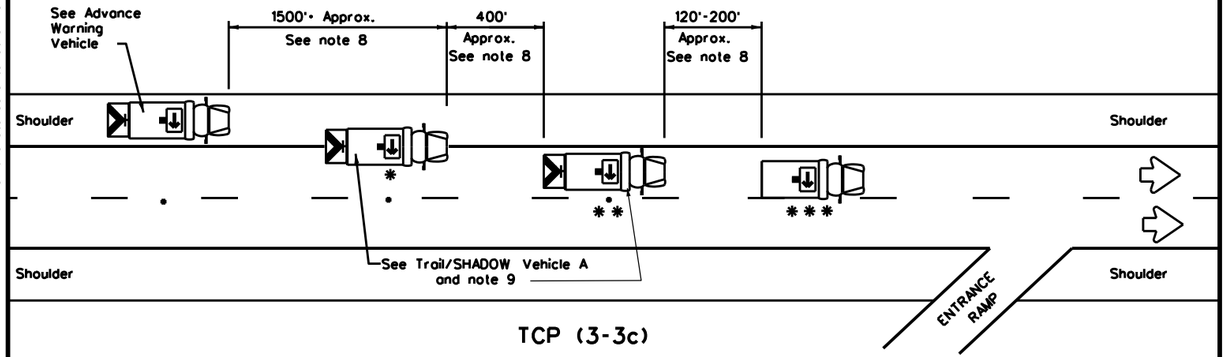
TCP (3-3a)

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



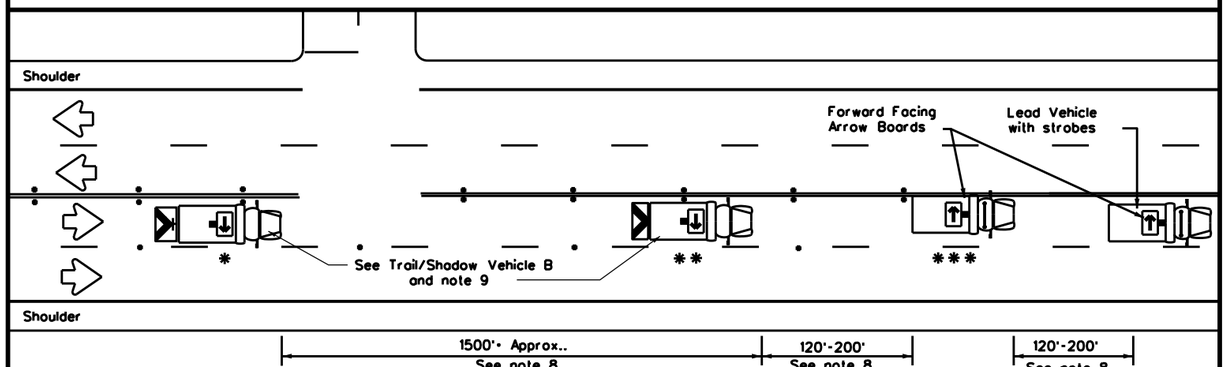
TCP (3-3b)

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



TCP (3-3c)

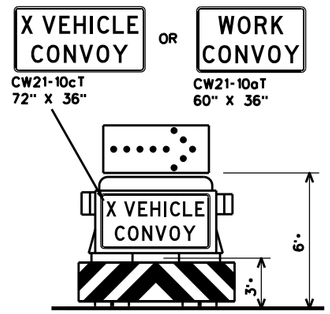
DIVIDED MULTILANE HIGHWAY



TCP (3-3d)

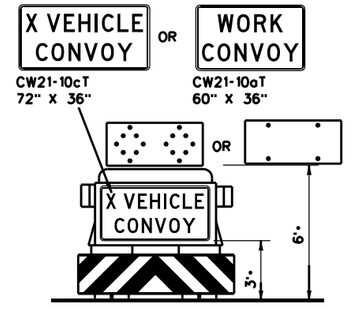
UNDIVIDED MULTILANE HIGHWAY

DATE:
FILE:



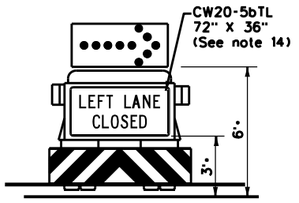
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

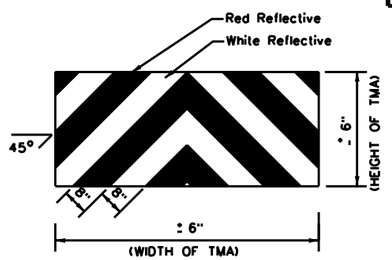


TRAIL/SHADOW VEHICLE B

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

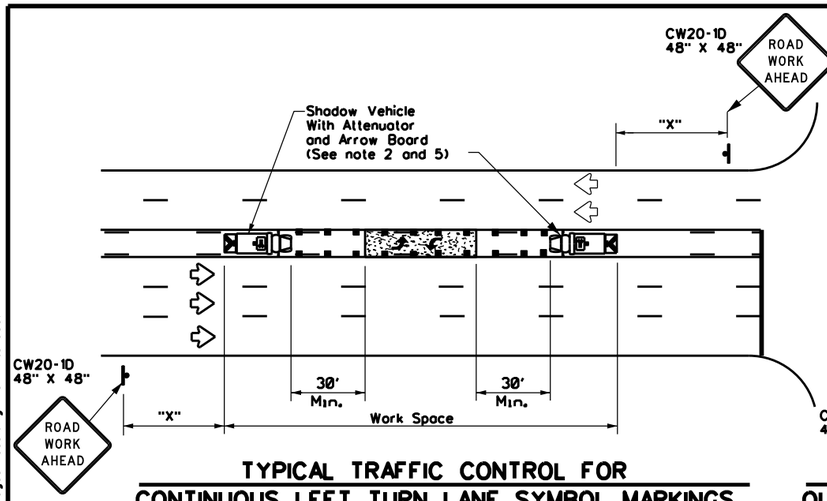
1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer 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

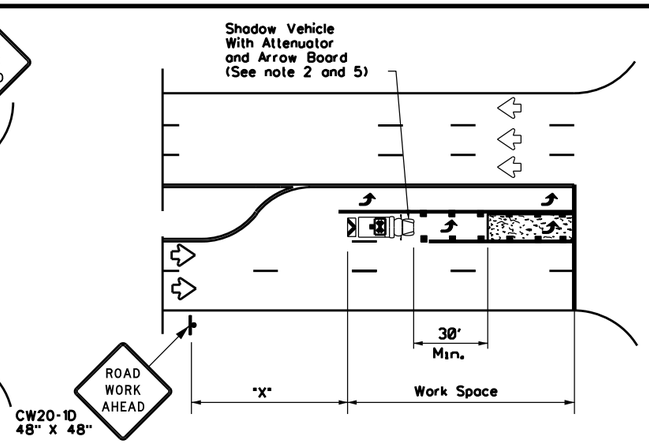
Traffic Operations Division Standard

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

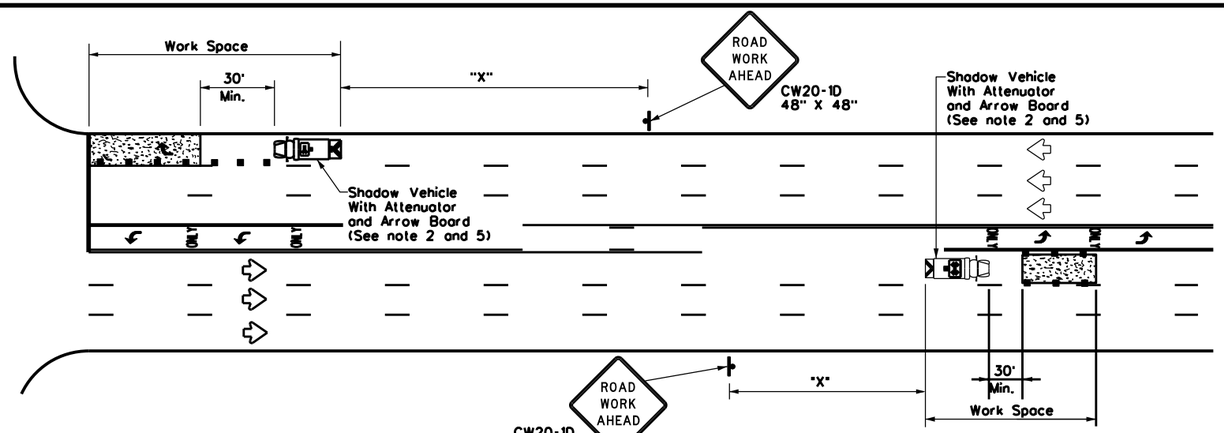
FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0076	07	038• ETC	US 67• ETC
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	ODA	UPTON• ETC		56
1-97 7-14				



TYPICAL TRAFFIC CONTROL FOR
CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

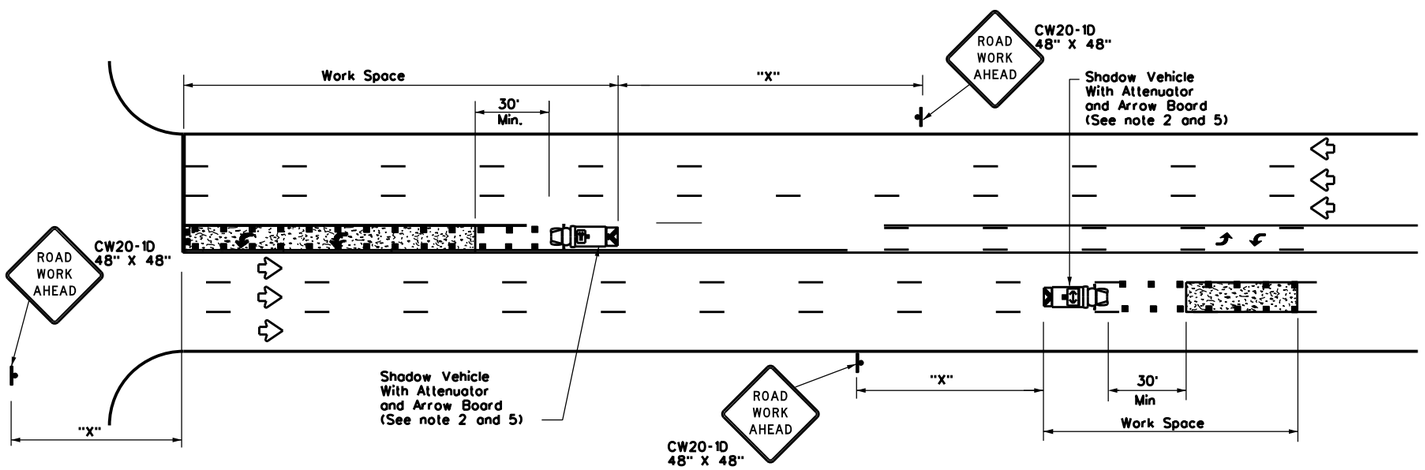


TYPICAL TRAFFIC CONTROL FOR
OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



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

DATE:
FILE:

LEGEND

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

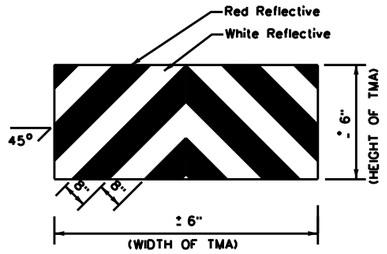
1. This traffic control plan is for use on conventional roads posted at 45 mph or less and is intended for mobile operations that move continuously or intermittently (stopping up to approximately 15 minutes) such as short-line striping and in-lane rumble strips. When activities are anticipated to take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

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

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

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

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



STRIPING FOR TMA

Texas Department of Transportation

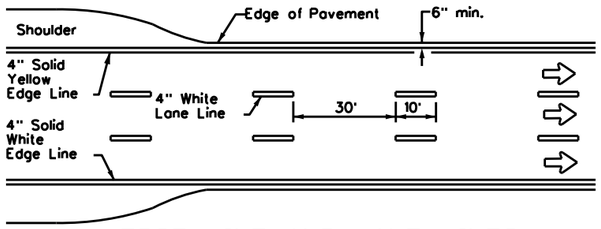
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS FOR ISOLATED WORK AREAS UNDIVIDED HIGHWAYS

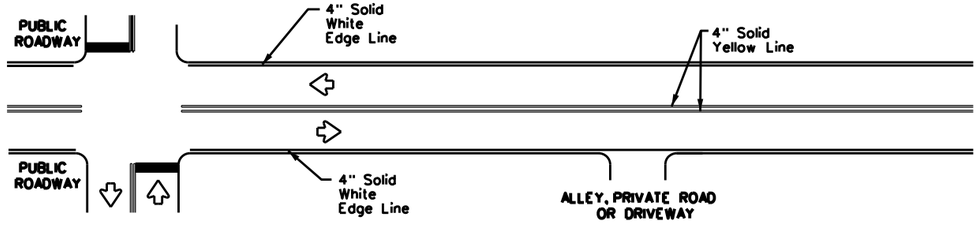
TCP(3-4)-13

FILE: tcp3-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT July, 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0076	07	038, ETC	US 67, ETC
	DIST	COUNTY		SHEET NO.
	ODA	UPTON, ETC		56

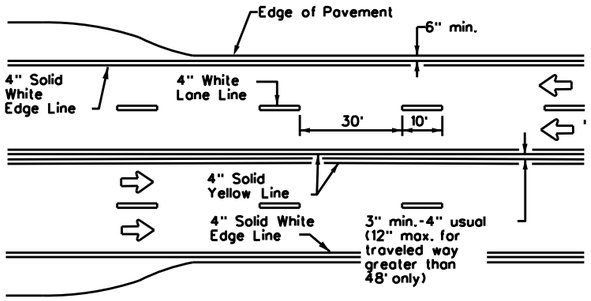
DATE:
FILE:



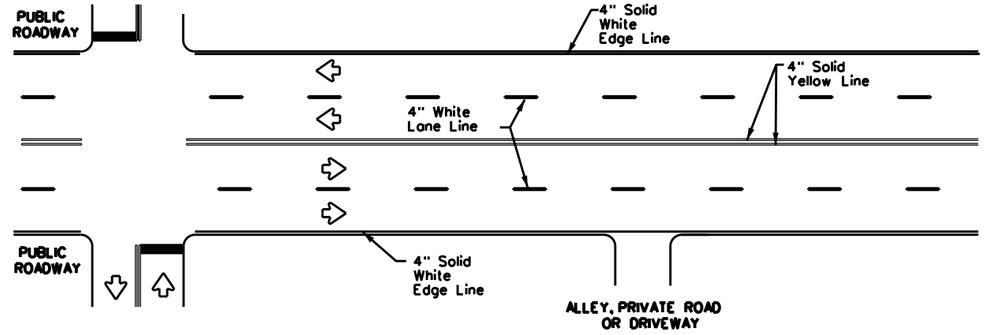
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



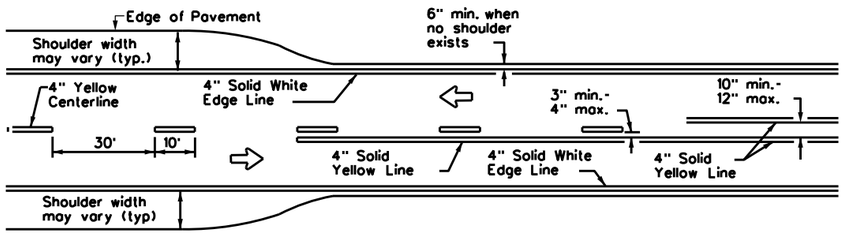
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



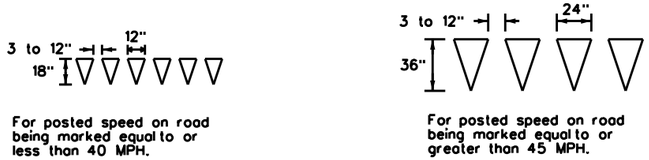
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



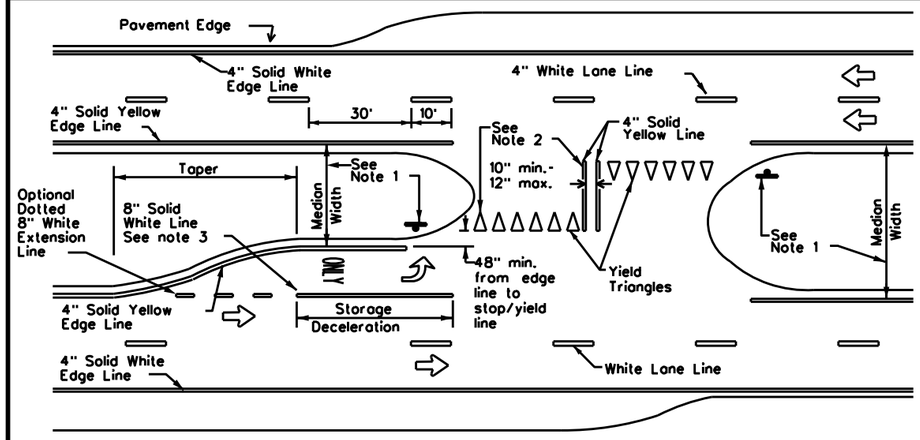
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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 boys, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

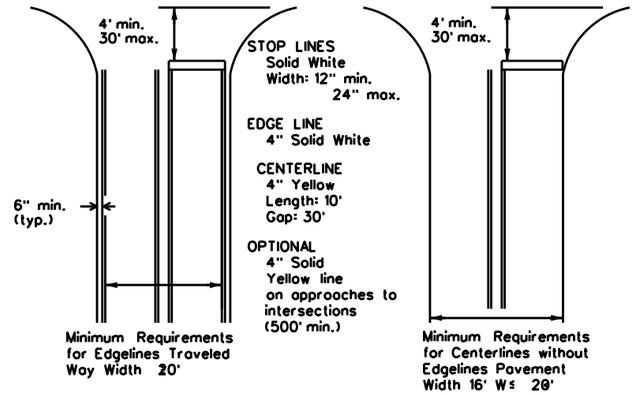
GENERAL NOTES

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 Deportmental 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

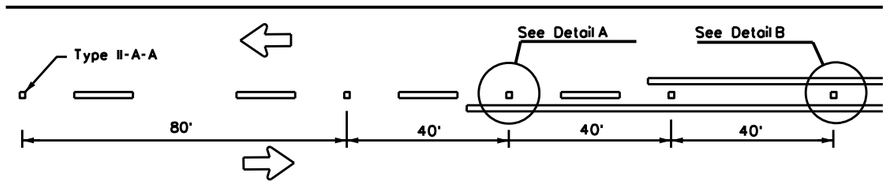
TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-20

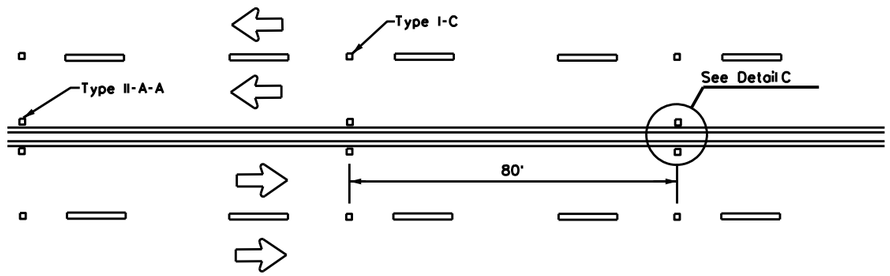
FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0076	07	038, ETC	US 67, ETC
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	ODA	UPTON, ETC		58

22A

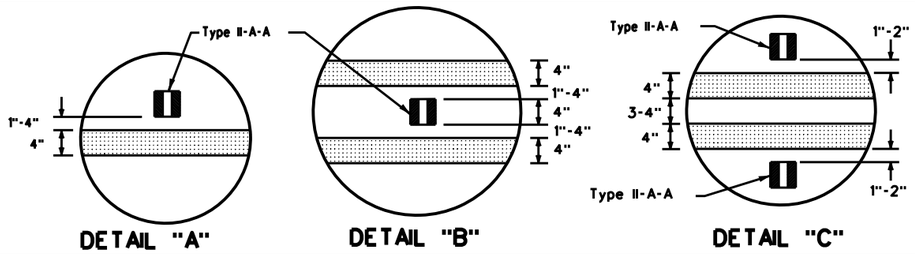
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



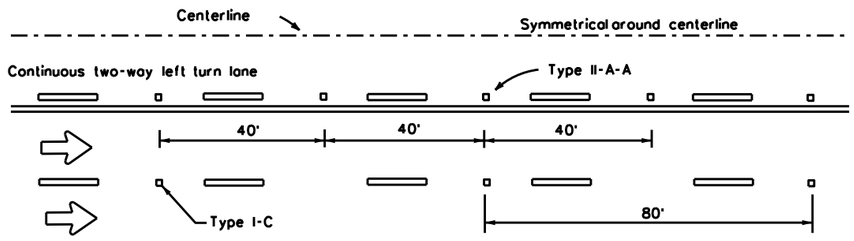
CENTERLINE FOR ALL TWO LANE ROADWAYS



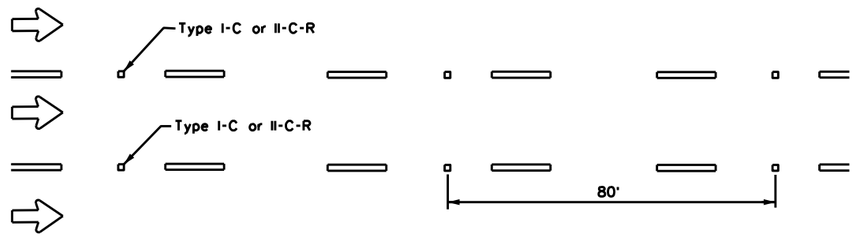
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



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

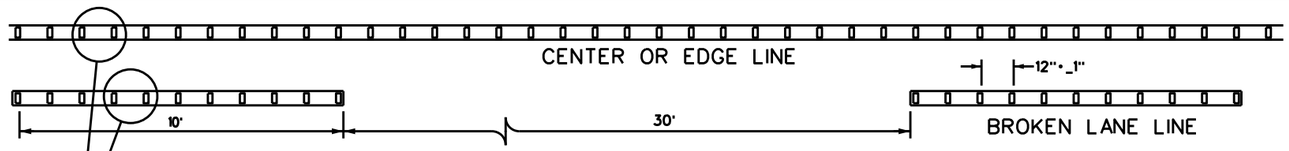


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



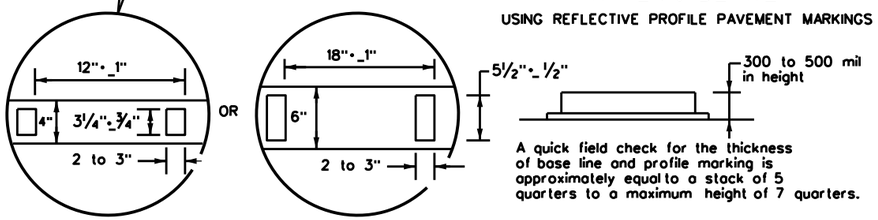
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



4" EDGE LINE, CENTER LINE OR LANE LINE

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

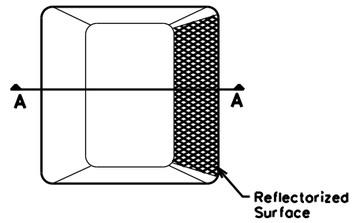
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

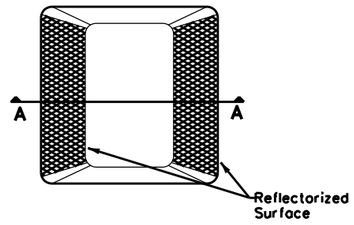
1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

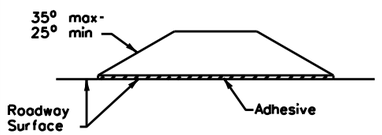
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation

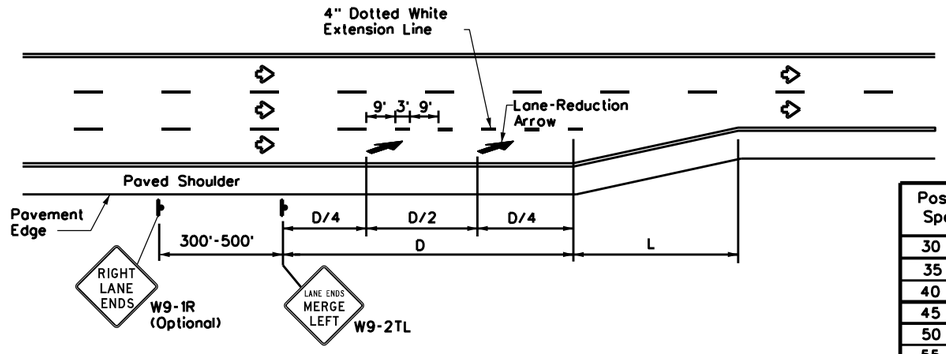
Traffic Safety Division Standard

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	0076	07	038. ETC	US 67. ETC
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	00A	UPTON. ETC		59

22B

DATE:
FILE:

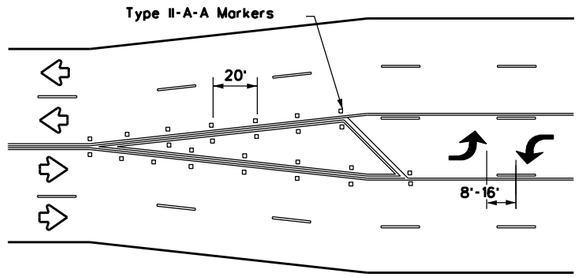


LANE REDUCTION

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

NOTES

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



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

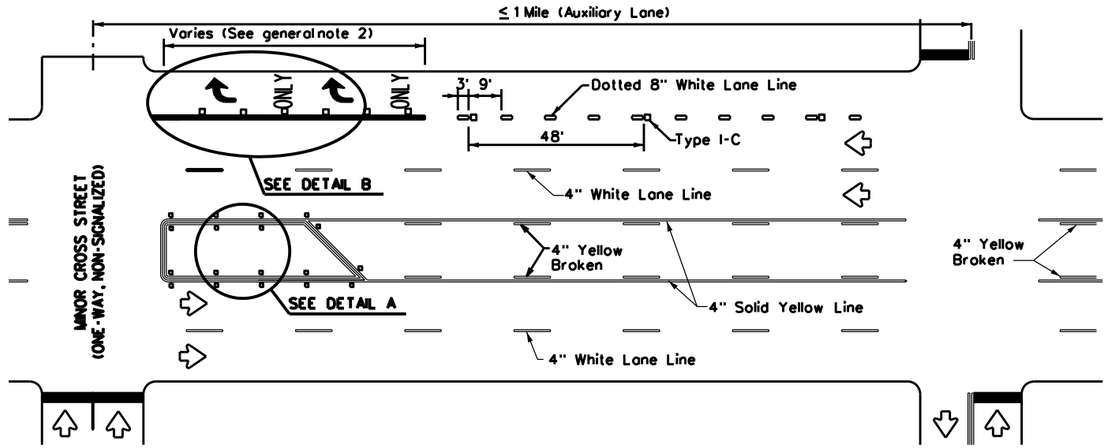
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

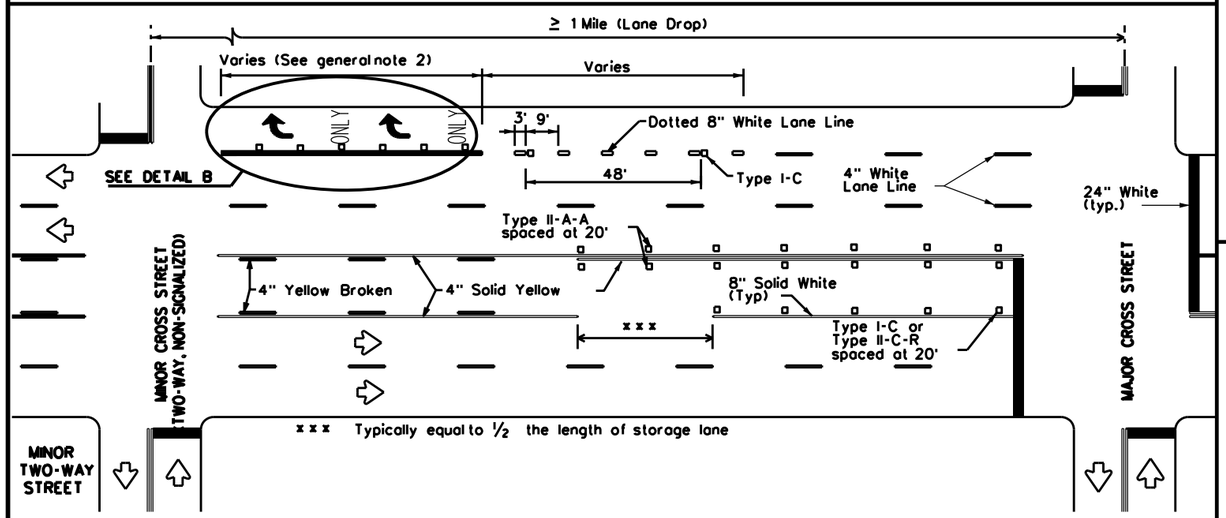
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn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

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

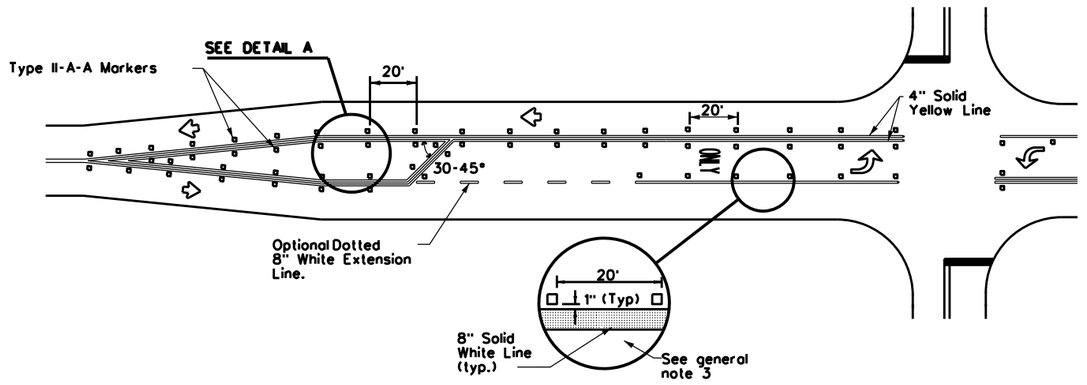
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



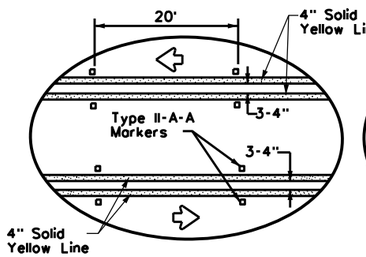
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



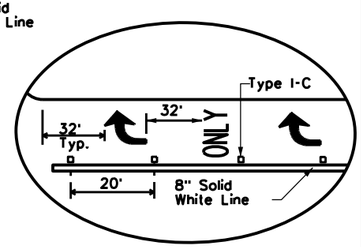
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A



DETAIL B

Texas Department of Transportation

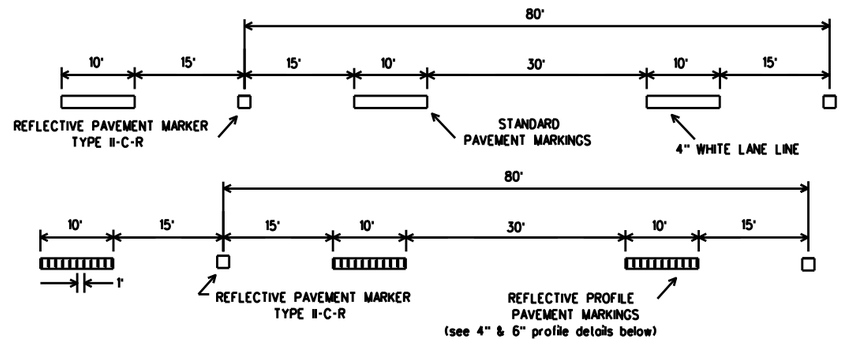
Traffic Safety Division Standard

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

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 5-00 2-10 8-00 2-12 3-03 6-20	0076	07	038, ETC	US 67, ETC
	DIST	COUNTY		SHEET NO.
	ODA	UPTON, ETC		60

22C

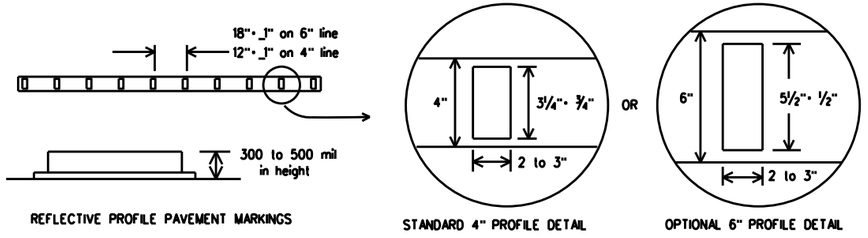
DATE:
FILE:



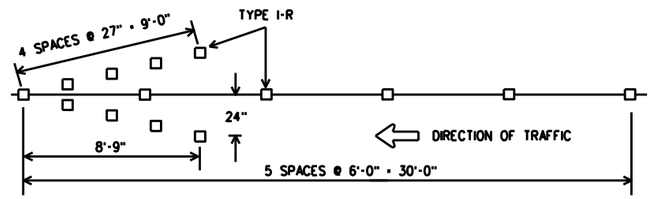
PAVEMENT MARKERS (REFL) TYPE II-C-R SHALL BE SPACED ON 80' CENTERS WITH THE CLEAR FACE TOWARD NORMAL TRAFFIC AND THE RED FACE TOWARD WRONG WAY TRAFFIC.

TRAFFIC LANE LINES PAVEMENT MARKING DETAILS

EDGELINES SHOULD TYPICALLY BE 4" WIDE AND THE MATERIALS SHALL BE AS SPECIFIED IN THE PLANS.
IF RAISED PROFILE PAVEMENT MARKINGS ARE USED SEE DETAILS BELOW.



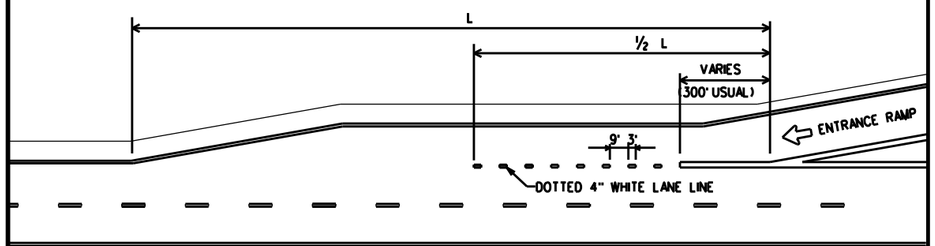
EDGELINE PAVEMENT MARKINGS



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

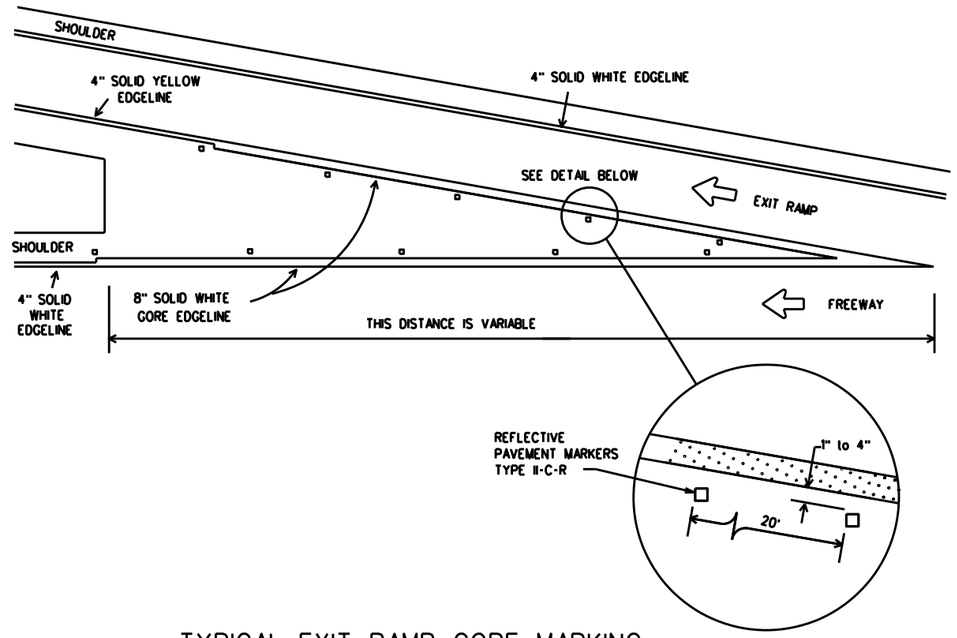
REFLECTORIZED WRONG WAY ARROWS, NOT TO EXCEED TWO, MAY BE PLACED ON EXIT RAMPS. LOCATION OF THE ARROWS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.

WRONG WAY ARROW DETAIL

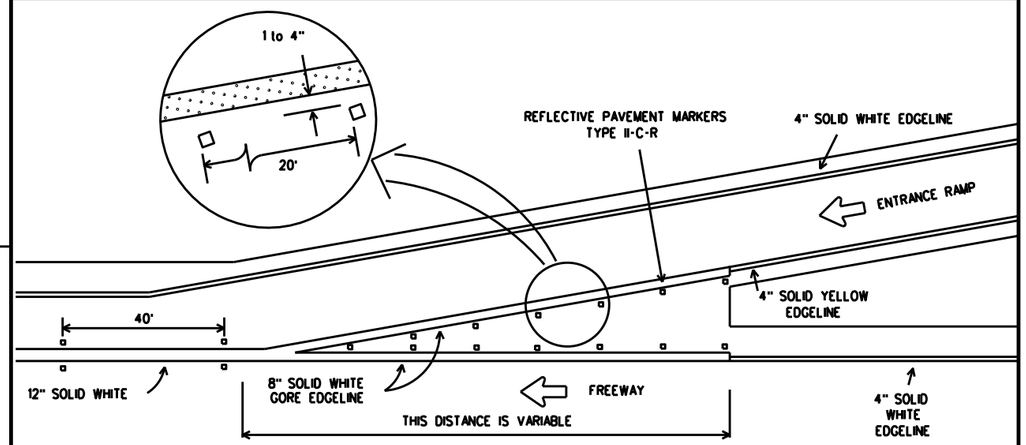


PARALLEL ACCELERATION LANE

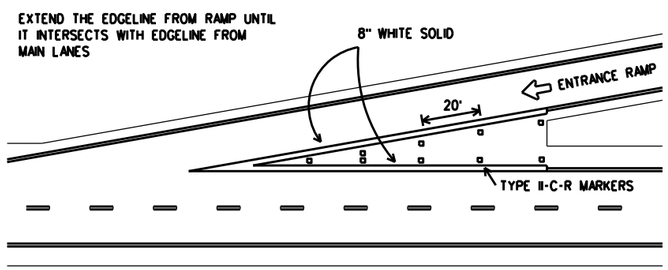
DATE:
FILE:



TYPICAL EXIT RAMP GORE MARKING



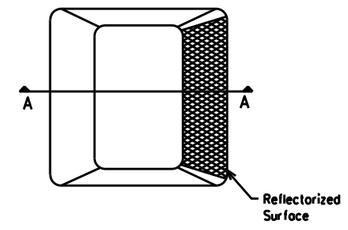
TYPICAL ENTRANCE RAMP GORE MARKING



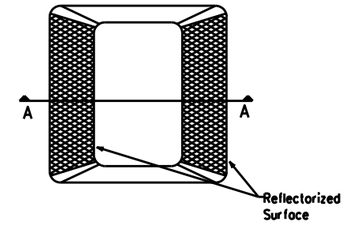
TAPERED ACCELERATION LANE

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

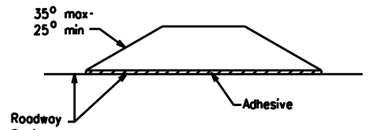
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

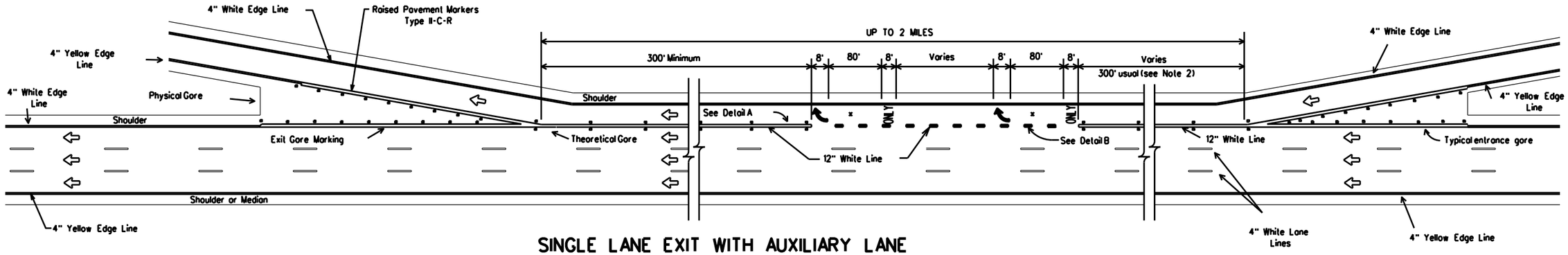
Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS WITH RAISED PAVEMENT MARKERS

FPM(1)-12

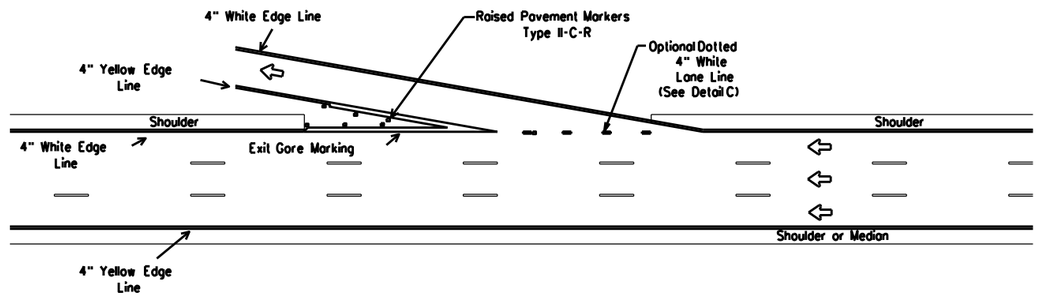
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS		CONT	SECT	JOB	HIGHWAY
4-92	2-10	0076	07	038, ETC	US 67, ETC
5-00	2-12	DIST	COUNTY		SHEET NO.
8-00		ODA	UPTON, ETC		61
2-08					

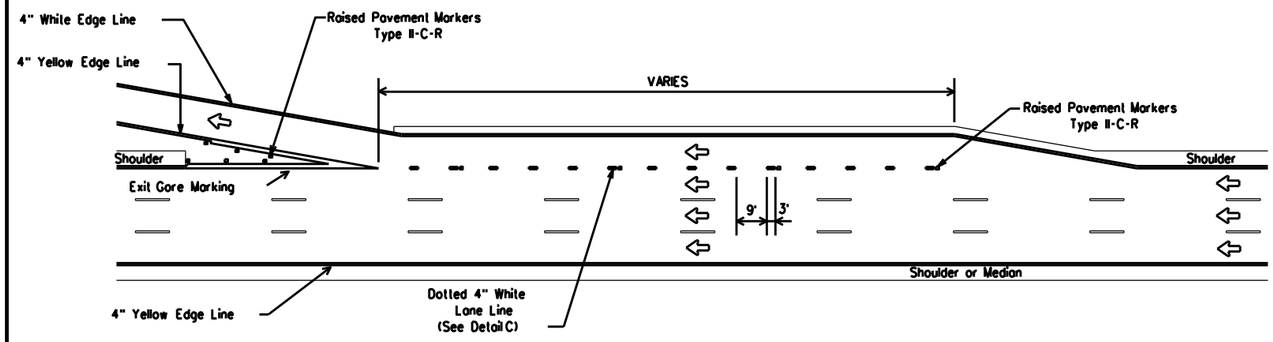


SINGLE LANE EXIT WITH AUXILIARY LANE

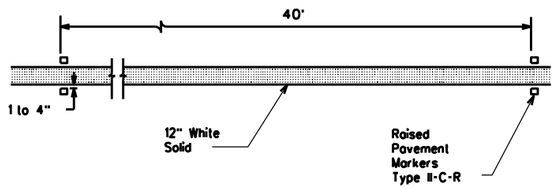
(See Note 2)



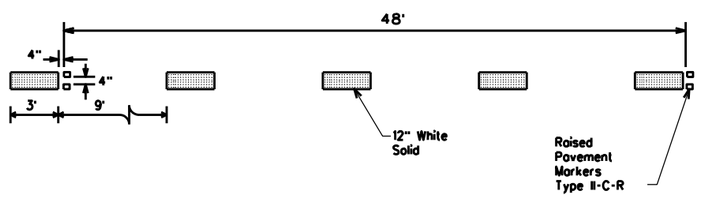
TAPERED DECELERATION LANE



PARALLEL DECELERATION LANE

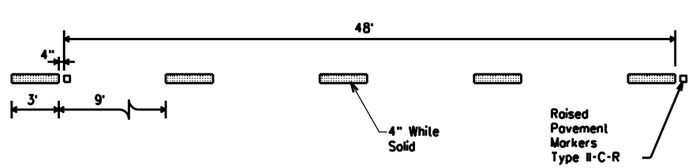


DETAIL A



DETAIL B

Wide (12") Dotted Lane Line (See Note 3)



DETAIL C

Normal (4") Dotted Lane Line (See Note 4)

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") Dotted Lane Line (See Detail B) is used to separate a through lane from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.
4. Normal (4") Dotted Lane Line (See Detail C) is used at parallel acceleration and deceleration lanes.

LEGEND	
⇦	Denotes direction of traffic.
↱	Pavement marking arrows (white)
*	Arrow markings are optional, however "ONLY" is required if arrow is used

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

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

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS ENTRANCE AND EXIT RAMPS

FPM(2)-12

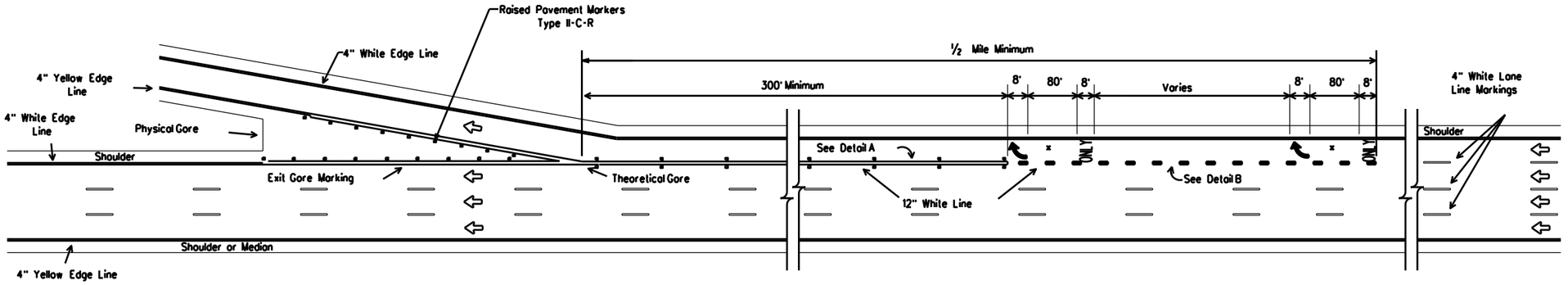
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
4-92 2-10
8-95 2-12
5-00
8-00

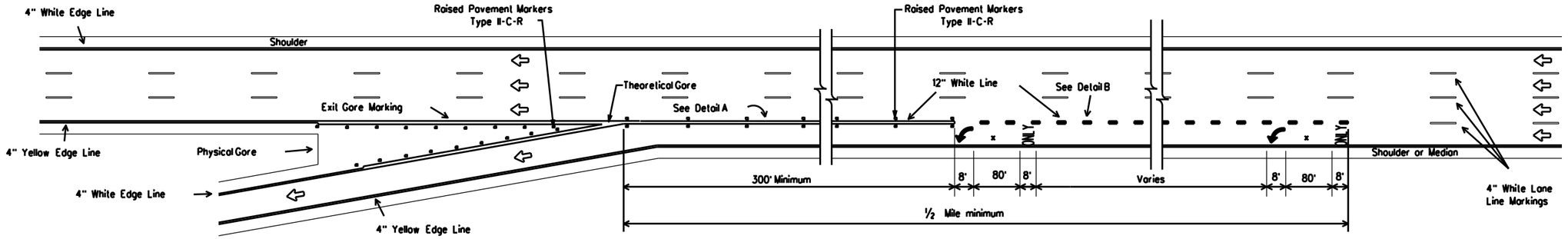
CONT	SECT	JOB	HIGHWAY
0076	07	038, ETC	US 67, ETC
DIST	COUNTY		SHEET NO.
ODA	UPTON, ETC		62

DATE:
FILE:

238



SINGLE LANE EXIT - LANE DROP OR EXIT ONLY

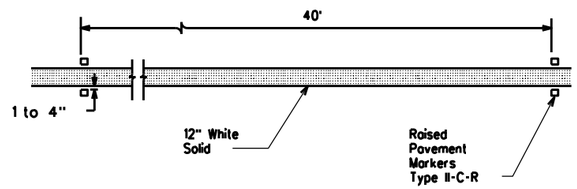


SINGLE LANE EXIT - LANE DROP OR EXIT ONLY (LEFTHAND)

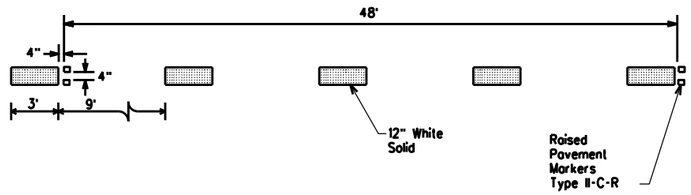
LEGEND	
⇦	Denotes direction of traffic.
↱	Pavement marking arrows (white)
X	Arrow markings are optional, however "ONLY" is required if arrow is used

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") Dotted Lane Line (See Detail B) is used to separate a through lane from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.



DETAIL A



DETAIL B

Wide (12") Dotted Lane Line (See Note 3)

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

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

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS LANE DROP (EXIT ONLY) EXIT RAMPS

FPM(3)-12

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

REVISIONS
5-00
8-00
2-10
2-12

CONT	SECT	JOB	HIGHWAY
0076	07	038, ETC	US 67, ETC
DIST	COUNTY		SHEET NO.
ODA	UPTON, ETC		63

23C

DATE:
FILE:

STORM WATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TPDES General Permit TXR150000. The operator, The Texas Department of Transportation ensures that Project specifications provide that adequate BMPs have been developed for this project. The contractor shall be the party responsible for implementing the BMPs described herein. The contractor shall implement changes approved by the Project Engineer to the SWP3 within the times specified in the SWP3 or the TPDES General Permit. Operators affected by modifications to specifications will be notified in a timely manner.

1.SITE OR PROJECT DESCRIPTION:

NATURE OF THE CONSTRUCTION ACTIVITY: SEE TITLE SHEET

POTENTIAL POLLUTANTS AND SOURCES:

Sediment laden storm water	*Storm water conveyance over disturbed areas*
Fuels, oils, and lubricants	*Construction vehicles and storage areas*
Transported soil	*Off site vehicle tracking*
Construction debris and waste	*Various construction activities*
Sanitary waste	*Restroom facilities*
Trash	*Construction site and Receptacles*
Other	*None*
Other	*None*

SEQUENCE OF ACTIVITIES THAT WILL DISTURB SOILS:

1. *No activities are anticipated to disturb soils.*
2.
3.
4.
5.
6.
7.
8.

AREAS:

TOTAL AREA OF PROJECT: ACRES 00.000

TOTAL AREA OF SOIL DISTURBANCE: ACRES 000.00

TOTAL AREA OFF-SITE: Acreage and Description to be Attached

DATA DESCRIBING THE SOIL: *N/A*

GENERAL LOCATION MAP: SEE TITLE SHEET

DETAILED SITE MAP: SEE SWP3 SITE MAP/S SHEET/S

THE LOCATION AND DESCRIPTION OF CONCRETE AND ASPHALT PLANTS:

N/A

NAME OF RECEIVING WATERS: *In the west part of the district, storm water run off will flow into several draws that eventually flows into the upper Pecos River which is segment No.2311 of the Rio Grande Basin. In the east part of the district, storm water run off will flow into several draws that eventually into segment No.1412 of the Colorado River Basin.*

A COPY OF TPDES CGP TXR150000 IS INCLUDED IN THE SWP3 FILE.

REMARKS:

401 WATER QUALITY CERTIFICATION: YES ____ NO X

2.BEST MANAGEMENT PRACTICES (BMPs):

EROSION AND SEDIMENT CONTROLS: Erosion and sediment controls have been designed to retain sediment on-site. Controls shall be utilized to reduce off site transport of suspended sediments and pollutants if it is necessary to pump water from the site. Control measures shall be installed per specifications or as directed. Sediment must be removed from controls per the plan requirements or manufacturers recommendations, but no later than the time that design capacity has been reduced by 50%. If sediment escapes the site, accumulations will be removed to minimize further negative effects. Controls will be developed to limit the off site transportation of litter, construction debris, and construction materials.

INTERIM(INT), PERMANENT(PER), AND 401 CERTIFICATION BMP'S:

EROSION CONTROLS:	401	INT	PER
☐ *Blankets and Matting*		—	—
☐ *Sod*		—	—
☐ *Preserve Existing Vegetation*		—	—
☐ *Soil Stabilization*		—	—
☐ *Permanent Vegetation*		—	—
☒ *No Erosion Controls are Required.*			

SEDIMENT CONTROLS:	401	INT	PER
☐ *Silt Fence*		—	—
☐ *Rock Berm*		—	—
☐ *Buffer Zones*		—	—
☐ *Vegetative Filter Strips*		—	—
☐ *Ditch Block*		—	—
☒ *No Sediment Controls are Required.*			

POST CONSTRUCTION TSS CONTROL (401 CERTIFICATION ONLY):

- ☐ *Vegetation Lined Drainage Ditch*
- ☐ *Retention/Irrigation*
- ☐ *Erosion Control Compost*
- ☐ *Grassy Swales*
- ☐ *Vegetative Filter Strips*
- ☒ *No Post Construction TSS Control Required.*

SEQUENCE OR SCHEDULE OF IMPLEMENTATION:

1. *N/A*
2.
3.
4.
5.
6.
7.
8.

The dates of major grading activities, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization practices are initiated, are available in the project diary or SWP3. Stabilization measures must be initiated as soon as practicable in portions of the site where construction has temporarily or permanently ceased. The Odessa District is located in a semi-arid area and the 14 and 21 day requirements are not applicable except, as directed by the Engineer.

3.STRUCTURAL CONTROL PRACTICES:

Structural control practices for this project are listed elsewhere herein.

4.PERMANENT STORM WATER CONTROLS:

Structural control practices installed during construction will be maintained and inspected after construction has ceased on the site and until final stabilization is attained. Unless specified in the plans, after project acceptance TxDOT will assume maintenance responsibilities for the controls and measures. Other permanent controls include existing and proposed: riprap at culvert inlets and outlets, diversion dikes, swales, retaining walls, and other similar devices.

5.OTHER CONTROLS:

OFF-SITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST: The off site vehicle tracking of sediments shall be minimized by removal of excess dirt from the road and at entrances to the work site. Stabilized Construction Entrances and Exits shall be constructed per the plans or as directed by the Project Engineer. The generation of dust will be minimized as directed by the Project Engineer by dampening haul roads and covering haul trucks with a tarpaulin.

CONSTRUCTION AND WASTE MATERIALS: The contractor will maintain a clean, orderly construction site. Construction waste including trash, rubble, scrap and vegetation shall be disposed of in lidded dumpsters or in a manner approved by the Project Engineer. Disposal methods must meet Federal, State, and Local waste management guidelines. No construction waste will be buried or burned on site. Spoils disposal, material storage, and materials resulting from the destruction of existing roads and structures shall be stored in areas designated by the Project Engineer and protected from run-off. All waterways shall be cleared of temporary embankment, temporary bridges, matting, false work, piling, debris, or other obstructions placed during construction operations, that are not part of the finished work, as soon as practicable. All excess soil generated by the construction will be collected and disposed of by the contractor. Disposal areas, stockpiles, and haul roads shall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters. Disposal areas shall not be located in any wetland, water body, or stream bed.

POLLUTANT SOURCES FROM AREAS OTHER THAN CONSTRUCTION: Staging areas and vehicle maintenance areas shall be located and constructed in a manner to minimize the runoff of pollutants. If potential pollutant sources are identified after the start of construction, controls and measures shall be implemented as directed by the Project Engineer.

5.OTHER CONTROLS (CONT):

DEDICATED ASPHALT PLANTS: Asphalt or asphaltic material for this project will be produced off site. If the project requires a dedicated asphalt plant and the plant within 1 mile of the project limits it will be considered an off site PSL. Consideration shall be given to on site plant and storage facilities and measures implemented as directed by the Project Engineer.

DEDICATED CONCRETE PLANTS: Cement or Concrete material for this project will be produced off site. If the project requires a dedicated concrete plant and the plant is within 1 mile of the project limits it will be considered an off site PSL. Consideration shall be given to on site plant and storage facilities and measures implemented as directed by the Project Engineer. Concrete trucks shall be washed or washed out in locations designated by the Project Engineer. The locations shall be protected by a berm sufficient to contain all waste and wash water. Wash water shall not be allowed to enter any storm drainage system or waterway. The residual material and contaminated soil shall be collected and disposed of in accordance with Federal, State, and Local guidelines. Staging areas and vehicle maintenance areas shall be located and constructed in a manner to minimize the runoff of pollutants.

HAZARDOUS MATERIALS AND SPILL REPORTING: The contractor shall take appropriate measures to prevent, minimize, and control the spillage or leakage of hazardous materials and any associated wastes on site and in maintenance and staging areas. hazardous materials shall include but are not limited to paints, acids, solvents, asphalt products, chemical additives, curing compounds, oils, fuels, and lubricants. Hazardous materials shall not be stored, accumulated, or transported in open containers subject to precipitation or spillage, but shall be stored, accumulated, or transported in closed containers of the type recommended by the manufacturer. In the event of a spill the Project Engineer should be contacted immediately. All spills shall be immediately cleaned and any contaminated soil removed and disposed of in accordance with Local, State, and Federal laws. Fuel tanks shall be protected by a secondary containment, such as a lined berm, capable of containing 1.5 times the capacity of the tank, or as approved by the Project Engineer.

OFF SITE PSLs: All off site project specific locations including dedicated asphalt plants, concrete plants, or utility installations, required by the contractor, are the contractor's responsibility. The contractor shall secure all permits required by local, state, or federal laws for off site PSLs. The contractor shall provide diagrams and areas of disturbance for all PSL's within 1 mile of the project.

SANITARY FACILITIES: All sanitary or septic wastes that are generated onsite shall be treated and disposed of in accordance with state and local regulations. Raw sewage or septage shall not be discharged or buried on site. Precaution shall be taken to prevent illicit discharges to storm water. Licensed waste management contractors shall be required to dispose of sanitary waste. Porta johns will be required for the laboratory and construction site or as directed by the Project Engineer.

VELOCITY DISSIPATION DEVICES: Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel as shown in the plans or as directed by the Project Engineer to provide a non-erosive flow velocity from the structure to a watercourse so that the natural physical and biological characteristics and functions are maintained and protected.

6.APPROVED STATE AND LOCAL PLANS:

This SWP3 is consistent with requirements specified in applicable sediment and erosion site plans or site permits, or storm water management site plans or permits approved by federal, state, or local officials.

7.MAINTENANCE:

Control measures shall be properly installed according to specifications. If inspections or other information indicates a control has been installed, used, or is performing inadequately, the contractor must replace or modify the control as soon as practicable after discovery. Control measures shall be maintained in effective operating condition. If inspections determine that BMPs are not operating effectively maintenance will be performed as necessary to continue the effectiveness of the controls. Maintenance must be accomplished as soon as practicable. Controls adjacent to creeks, culverts, bridges, and water crossings shall have priority. Controls that have been disabled, run over, removed, or otherwise rendered ineffective must be corrected immediately upon discovery.

8.INSPECTION OF CONTROLS:

A TxDOT inspector will inspect disturbed areas of the site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, and structural controls for evidence of, or the potential for, pollutants entering the drainage system. Sediment and erosion controls measures identified in the SWP3 will be inspected to ensure that they are operating correctly. Locations where vehicles enter or exit the site will be inspected for evidence of off-site vehicle tracking. Inspections will be conducted every month and within 24 hours after the end of a storm event of 0.5 inches or greater. The SWP3 will be modified based on the result of these inspections. Revisions will be completed within 7 Calendar days following the inspection. Revised implementation schedules will be described in the SWP3 and implemented as soon as practicable. Rain gages will be maintained on site for the duration of the project. Reports summarizing the scope of the inspections are included in the SWP3 file.

9.NON-STORM WATER COMPONENTS:

The contractor shall be required to implement appropriate pollution prevention controls and measures for all eligible non-storm water components of the discharge as approved and directed by the Project Engineer.

STATE OF TEXAS
CAITLIN J S SWICK
142199
LICENSED
PROFESSIONAL ENGINEER

07/18/2022

SWP3 Notes.dgn

SWP3 NOTES

Texas Department of Transportation

REV: 10-25-16

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			64
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	UPTON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0076	07	038, ETC	US 67, ETC

DATE:
FILE:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1.

2.

☒ No Action Required ☐ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000

2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.

3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.

4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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

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

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

☒ No Permit Required

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

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

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

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

1.

2.

3.

4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

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IV. VEGETATION RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

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

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

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

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

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

☐ Yes ☒ No

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

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

☐ Yes ☐ No

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

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

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

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Texas Department of Transportation

Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0076	07	038. ETC	US 67. ETC
12-12-2011 (DS)	DIST	COUNTY		SHEET NO.
05-07-14 ADDED NOTE SECTION IV.	ODA	UPTON. ETC		65
01-23-2015 SECTION I CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.				