

FEDERAL AID PROJECT NO.			
F 2025(244), ETC.			
CONT	SECT	JOB	HIGHWAY
0250	03	051	US 281, ETC.
DIST	COUNTY		SHEET NO.
FTW	ERATH, ETC.		1

STATE OF TEXAS DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

STATE PROJECT OR FEDERAL-AID PROJECT F 2025(244), ETC.

US 281, ETC.
ERATH COUNTY, ETC.

FUNCTIONAL CLASS: VARIES
DESIGN SPEED: VARIES
AADT: VARIES

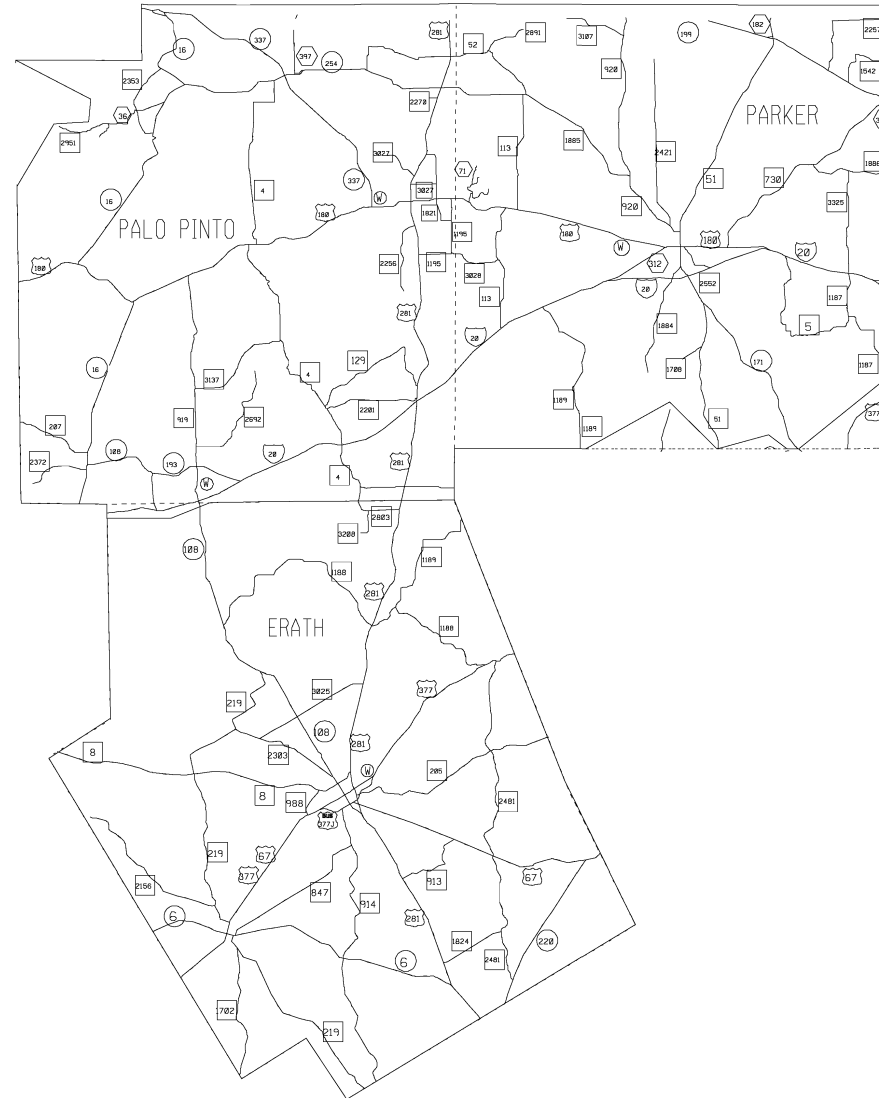
INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	INDEX OF SHEETS

CSJ	HWY	LIMITS	ROADWAY LENGTH		BRIDGE LENGTH		PROJECT LENGTH	
			FEET	MILES	FEET	MILES	FEET	MILES
0250-03-051	US 281	FROM PALO PINTO COUNTY LINE TO F.M.B	104,052.96	19.707	N/A	N/A	104,052.96	19.707

FOR THE CONSTRUCTION OF SEAL COAT WORK
CONSISTING OF SEALCOAT AND PAVEMENT MARKINGS

TOTAL PROJECT LENGTH = 63.523 MILES



REGISTERED ACCESSIBILITY
SPECIALIST (RAS)
INSPECTION REQUIRED.
TDLR NO. EABPRJ:

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROADS: NONE

REQUIRED SIGNS SHALL BE IN ACCORDANCE WITH
BC (1)-21 THRU BC (12)-21 AND THE "TEXAS
MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF
TRANSPORTATION, SEPTEMBER 1, 2024 AND SPECIFICATION
ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS
PROJECT. REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID
CONSTRUCTION CONTRACT (FORM FHWA 1273, OCTOBER 23, 2023).

LETTING DATE: _____
 CONTRACTOR: _____
 WORK BEGAN: _____
 WORK COMPLETED: _____
 WORK ACCEPTED: _____
 CHANGE ORDERS: _____



SUBMITTED FOR LETTING: 9/21/2024
 DocuSigned by: Janet Crawford
 DIRECTOR OF MAINTENANCE

RECOMMENDED FOR LETTING: 9/27/2024
 DocuSigned by: [Signature]
 7879B0B92E5D DIRECTOR, TP&D

APPROVED FOR LETTING: 9/30/2024
 DocuSigned by: David M Salazar, P.E.
 B741E64FAD824 DISTRICT ENGINEER

GENERAL

- 1 TITLE SHEET
- 2 INDEX OF SHEETS
- 3, 3A-3D GENERAL NOTES
- 4 ESTIMATES & QUANTITY
- 5 LIMIT SHEET SUMMARY FY 25
- 6 SEAL COAT MATERIAL SELECTION TABLE
- 7 SEAL COAT INDEX
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- 15-18 FPM (1)-22 THRU FPM (4)-22*
- 19-20 RCD (1)-22 THRU RCD (2)-22*

BARRICADE AND CONSTRUCTION STANDARDS

- 21-32 BC (1-1)-18 THRU BC (12)-21*

TRAFFIC CONTROL PLAN STANDARDS

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- 38-39 TCP (3-1)-13 THRU (3-2)-13*
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- 47-48 TCP (6-8)-14 THRU (6-9)-14*
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ENVIRONMENTAL

- 57 EPIC



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

DocuSigned by
Elijah Zelekov, P.E. 9/20/2024
465921483440... Date

INDEX OF SHEETS



SHEET 1 OF 1

FHWA DIVISION	PROJECT NO.	HIGHWAY NO.	SHEET NO.	
6	F 2025(244)	US 281, ETC.		
STATE	COUNTY		SHEET NO.	
TEXAS	ERATH, ETC.		2	
DISTRICT	CONTROL	SECTION	JOB	
FTW	0250	03	051	

Project Number: F2025(244)

County: ERATH, ETC.

Control: 0250-03-051, ETC

Highway: US 281, ETC.

GENERAL NOTES:

Specification Data:

Basis of Estimate

Item Description

	Rate	Unit
316 ASPH (A-R TYPE II)	0.60 gal./sy	gal.
316 AGGR (TY PB GR-3)	130 sy. / cy.	cy.

Note: The rates of asphalt and aggregate application are for estimating purposes only and may be varied as directed.

Special Notes:

Electronic files containing answered pre-letting questions and other project related design information will be placed in the following FTP site periodically.

Check this site for new information. Notices of new postings will not be sent out by the Engineer.

The data located in these files is for non-construction purposes only and can be found at

TxDOT's public FTP site at <https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting Responses/>.

Access is read-only.

All files in the FTP site are subject to the License Agreement shown on the FTP site.

To obtain a copy of the project plans free of charge, submit a request from the following site: <http://www.txdot.gov/business/letting-bids/plans-online.html>

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

Area Engineer: [Janet Crawford, P.E.](mailto:Janet.Crawford@txdot.gov) Janet.Crawford@txdot.gov
Design Engineer: [Elijah Zelenov, P.E.](mailto:Elijah.S.Zelenov@txdot.gov) Elijah.S.Zelenov@txdot.gov

For Q&A's on Proposals navigate to <https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors>. Use the

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dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

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

General:

Plans are required for this project. Plans may be obtained from one of the plan companies listed in the "Special Notice to Contractors", or viewed at Texas Department of Transportation's (TxDOTs) Internet site at <https://www.txdot.gov/business/letting-bids/plans-online.html>

Calculating, Recording and Reporting Test Data - Use appropriate TxDOT Excel templates to calculate and record all test data. These forms are available on the TxDOT website at <http://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/forms/site-manager.html> under the "Site Manager Forms" heading. Submit test results by email or CD within 24 hours of test completion.

Contract Prosecution: Each contract awarded by the Department stands on its own, and as such, is separate from other contracts. A Contractor awarded multiple contracts must be capable and sufficiently staffed to concurrently process and/or execute all contracts at the same time.

Personnel will be experienced in items of work in contract.

Furnish crew(s) and equipment capable of maintaining work in a continuous manner for the completion of the work listed on the work order.

Project Description - This project consists of **Seal Coat Surface Treatments and Pavement Markings** on sections of highway within the Fort Worth District as shown in the contract and defined in these general notes and specifications. Coordinate all work through the District Maintenance representative listed below:

Chief Inspector
2501 Southwest Loop IH820
Fort Worth, TX 76133
(817) 370-6524

Item 4. Scope of Work.

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Reimbursement for project overhead will not be considered until project completion has extended beyond the original Contract Time.

Item 5. Control of the Work.

For this project establish a rate verification section (rock land) for each individual project referenced. Provide the Engineer with this information prior to the seal coat application. Provide control that is acceptable to the Engineer for yield calculations.

Item 5.5. Cooperation of Contractor.

Designate superintendent in accordance with second paragraph of Article 5.5. Cooperation of Contractor in the Standard Specifications for Construction and Maintenance of Highways, Streets, And Bridges.

Item 6. Control of Materials.

The Buy America Material Classification Sheet is located at the below link.

<https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html> for clarification on material categorization.

Item 7. Legal Relations and Responsibilities.

This contract requires work to be done within railroad right of way. Cooperate with the railroads and comply with all their requirements including obtaining any required training before performing work within railroad right of way.

Submit to the Engineer an original railroad liability insurance policy.

Item 7.2.4. Public Safety and Convenience.

Personal vehicles will not be parked within the right-of-way at any time, including any section closed to the traveling public.

Operations will be curtailed or halted during special events that may result in delays or congestion to the traveling public.

No work that restricts or interferes with traffic shall be allowed from 3:00 pm on the day preceding the Holiday or Event to 9:00 am on the day after the Holiday or Event. The following Holiday/Event lane closure restriction requirements apply to this project:

Holiday Lane Closure Restrictions	
New Year's Eve and New Year's Day (December 31 through January 1)	3 PM December 30 through 9 AM January 2

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Easter Holiday Weekend (Friday through Sunday)	3PM Thursday through 9 AM Monday
Memorial Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Independence Day (July 3 through July 5)	3 PM July 2 through 9 AM July 6
Labor Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Thanksgiving Holiday (Wednesday through Sunday)	3 PM Tuesday through 9 AM Monday
Christmas Holiday (December 23 through December 26)	3 PM December 22 through 9 AM December 27

No lane closures within approximately 1-mile proximity (based on potential impact) of major retail traffic generators (i.e. malls) (Thanksgiving Day through January 2). This includes the events listed below:

Event Lane Closure Restrictions			
3 PM the day before Event to 9 AM the day after the Event			
NASCAR Races at Texas Motor Speedway (generally 3 events):	NASCAR Nationwide and Sprint Cup Series (Held in late March/early April)	NASCAR Nationwide and Sprint Cup Series (Held in Late October/early November)	Indy Series Racing and NASCAR Truck Series (Held in June)
Fort Worth Stock Show and Rodeo			
Arlington Entertainment District			
Grapevine Festivals			
May Fest			
Weatherford Peach Festival			

The above list of events is not all inclusive and should be added to or adjusted as needed. When deemed necessary, the Engineer will modify the list of major events when new events develop, existing events are rescheduled, or when warranted.

Modifications to Lane Closure / Work Restrictions:

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Submit a request in writing for approval by the Engineer a minimum of 10 days in advance of implementing a change to lane closure restrictions.

When deemed necessary, the Engineer will lengthen, shorten, or otherwise modify lane closure restrictions as traffic conditions warrant.

When deemed necessary, the Engineer will modify the list of major events when new events develop, existing events are rescheduled, or when warranted.

Do not discolor or damage existing curb and curb and gutter during construction operations. In the event of discoloration or damage, clean or repair as directed.

Item 8. Prosecution and Progress

Working days will be computed and charged in accordance with Section 8.3.1.1, 'Five-Day Workweek.' The total working days shall not exceed 132 days.

The contract working days will begin on May 1, 2024.

Item 8.5 Project Schedules

Prepare the progress schedule as a bar chart, include all planned work activities and sequences and show contract completion within the number of working days specified. Submit an updated hard copy when changes to the schedule occur or when requested.

Item 210. Rolling

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

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 316. Seal Coat

The asphalt and aggregate rates shown hereon are for average conditions. The rate may be varied as determined by the Engineer to obtain proper embedment of aggregate.

The Engineer will approve asphalt and aggregate rates prior to application

Prepare the roadway surface prior to placing asphalt to the satisfaction of the Engineer. Some areas may require more extensive cleaning than other areas. This work will not be paid for directly but will be subsidiary to pertinent items.

The Contractor will furnish the distributor nozzles. The nozzles will be furnished such that the nozzles outside the wheel paths of the travel way will place 22 to 32 % more by volume than the

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nozzles over the wheel paths or as directed. The Contractor will provide the percent difference (by volume) between the largest nozzle used and nozzles one and two steps below the largest nozzle.

Before stockpiling aggregate, the contractor will be required to provide the Department with stockpile locations and a sequence of work for each reference.

As seal coat operations are completed at each location, clean up stockpiles and remove construction debris to the satisfaction of the Engineer. Contractor shall not proceed ahead more than two reference locations before clean-up operations have been accomplished at the previously completed reference locations.

Remove any obstructions to existing drainage due to the contractor's operations, as required, at the Contractor's expense.

The following certified inspectors will be required with certifications through TXAPA:

- A level 1 Seal Coat Inspector (Department Only): A Department Inspector with a Level 1 Seal Coat certification should be on the job site or available by phone.
- Level 2 Seal Coat Specialist (Department and Contractor): A Contractor Superintendent, Foreman or Project Manger with a Level 2 Seal Coat certification must be on the job site or available by phone, unless otherwise approved by the Engineer, any time seal coat work is being performed.

Volcanic stone with a maximum dry loose unit weight of 60 LB/CF will be required for TY E aggregate.

Item 502. Barricades, Signs, and Traffic Handling

Provide equipment such as trucks, trailers, autos, etc., with highly visible omni-directional warning flashing lights. These lights will be used within the work zone at all times. Provide forward facing arrow panel on lead vehicles when working in a continuous turn lanes. The Engineer will approve all equipment and vehicles prior to use.

Provide signing and traffic control in compliance with the Texas Manual on Uniform Traffic Control Devices (TMUTCD), latest edition, and the appropriate traffic control method as outlined in the TMUTCD, and elsewhere in the plans.

Work zone lengths will be determined by 2-mile section or 15-minute maximum round trip interval by the pilot car unless otherwise approved by the Engineer.

The contractor force account 'safety contingency' that has been established for this project is intended to be utilized for work zone enhancements to improve the effectiveness of the traffic control plan that could typically not be foreseen in the project planning and design stage. These

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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.

Existing signs are to remain as long as they do not interfere with construction and they do not conflict with the traffic control plan.

Do not place barricades, signs, or any other traffic control devices where they interfere with sight distance at driveways or side streets. Provide access to all driveways during all phases of construction unless otherwise noted in the plans or as directed.

Equipment and materials will not be left within thirty feet (30’) of the travel lane during non-working hours

Item 505. Truck Mounted Attenuators (TMA) and Trailer Attenuator (TA).

The total number of truck mounted attenuators (TMA) required when utilizing the traffic control standards are shown in the tables below

TCP 1 Series	Scenario	Required TMA
(1-1)-18	All	1
(1-2)-18	All	1
(1-3)-18	A	1
	B	2
(1-4)-18	All	1
(1-5)-18	All	1

TCP 3 Series	Scenario	Required TMA
(3-1)-13	All	2
(3-2)-13	All	3
(3-3)-14	A	2
	B	2
	C	3
	D	2
(3-4)-13	All	1, unless working inside a left turn lane, then 2.

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TCP 5 Series	Scenario	Required TMA
(5-1)-18	A	1
	B	2

TCP 6 Series	Scenario	Required TMA
(6-1)-12	A	1
	B	2
(6-2)-12	All	1
(6-3)-12	All	1
(6-4)-12	A	1
	B	2
(6-8)-14	All	1
(6-9)-14	All	1

Shadow vehicles equipped for truck mounted attenuators (TMA) for mobile and stationary operations must be available for use at any time as determined by the Engineer.

The Contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMA needed for the project for those times per plan requirements. Additional TMAs used that are not specified in the plans in which the Contractor expects compensation will require prior approval from the Engineer.

Item 506. Temporary Erosion, Sedimentation, and Environmental Controls

The Storm Water Pollution Prevention Plan (SWP3) consists of temporary erosion control measures needed and provided for under this Item. The disturbed area is less than one acre and use of erosion control measures is not anticipated. If physical conditions encountered at the job site require necessary controls, BMP installation, maintenance, and removal will be paid as extra work on a force account basis per Articles 4.4 and 9.7.

Item 662. Work Zone Pavement Markings

Temporary tabs will be placed in accordance with TCP (SC-6) and TCP (SC-7) for the seal coat operations.

Temporary tabs will not be placed more than 24 hours prior to the seal coat operations beginning on that road.

Temporary tabs will be completely removed after raised pavement markings are placed and prior to the project being accepted.

Item 666. Reflectorized Pavement Markings

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Provide dotting as guides to mark the lateral location of pavement markings and raised pavement markers for centerline, lane line and edge line for permanent stripe placement. Mark the proposed locations for no passing markings and gore markings for approval by the Engineer prior to placement.

Sealed roadways will be allowed to cure for 3 days before TY II Markings or Prefabricated Pavement Markings are placed unless otherwise directed by the Engineer.

Type II markings must meet the following minimum retro reflectivity values for edge line markings, centerline or no passing barrier-line, and lane lines when measured any time after 3 days, but not later than 10 days after application: White markings: 175 mcd/m²lx, Yellow markings: 100 mcd/m²lx.

Acceptance of the pavement markings will be based upon the mil thickness specified in Item 666 for the various surface types. Mil thickness of thermoplastic paint shall be made to the top surface of the thermoplastic material not to the top of partially immersed external beads.

Item 672. Raised Pavement Markers.

Furnish RPMs free of rust, scale, dirt, oil, grease, moisture, and contaminants that might adversely affect the adhesive bond.

Place all pavement markers in proper alignment with the guides. The maximum deviation rate in alignment is 1 in. per 200 ft. of roadway. The maximum deviation is to not exceed 2 in or be abrupt.

Removed Raised Pavement Markers and adhesives are property of the Contractor and will be disposed of at a State approved site off Department property. This will not be paid for directly and is considered subsidiary to these items.

Item 677. Eliminating Existing Pavement Markings and Markers.

Use Mechanical Method for the removal of markings.



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0250-03-051

DISTRICT Fort Worth
HIGHWAY IH 20, US 180, US 281

COUNTY Erath, Palo Pinto, Parker

CONTROL SECTION JOB				0007-09-024		0007-10-070		0250-03-051		0314-01-089		0314-01-090		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00194812		A00194813		A00194653		A00194859		A00194977			
COUNTY				Palo Pinto		Palo Pinto		Erath		Parker		Parker			
HIGHWAY				US 180		US 180		US 281		IH 20		IH 20			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	316-7001	ASPH (A-R TYPE II)	GAL	57,728.000		131,241.000		346,843.000		113,860.000		113,860.000		763,532.000	
	316-7208	AGGR (TY-PB, GR-3)(SAC-B)	CY	740.000		1,683.000		4,447.000		1,460.000		1,460.000		9,790.000	
	500-7001	MOBILIZATION	LS					1.000						1.000	
	502-7004	BARRICADES, SIGNS AND TRAFFIC HANDLING	EA	1.000		1.000		1.000		1.000		1.000		5.000	
	503-7002	PORTABLE CHANGEABLE MESSAGE SIGN	EA					4.000						4.000	
	505-7001	TMA (STATIONARY)	DAY	1.000		1.000		1.000		1.000		1.000		5.000	
	505-7003	TMA (MOBILE OPERATION)	DAY	2.000		2.000		2.000		2.000		2.000		10.000	
	662-7112	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	66.000		448.000		1,467.000						1,981.000	
	662-7114	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	862.000		1,696.000		2,754.000		1,615.000		1,445.000		8,372.000	
	666-7172	RE PM TY II (W) 6" (BRK)	LF	180.000		8,530.000		15,260.000						23,970.000	
	666-7173	RE PM TY II (W) 6" (DOT)	LF					2,660.000						2,660.000	
	666-7175	RE PM TY II (W) 6" (SLD)	LF	55,930.000		104,430.000		207,000.000		96,440.000		89,830.000		553,630.000	
	666-7179	RE PM TY II (W) 8" (SLD)	LF	1,080.000				4,690.000						5,770.000	
	666-7182	RE PM TY II (W) 12" (SLD)	LF					50.000						50.000	
	666-7184	RE PM TY II (W) 24" (SLD)	LF					30.000		130.000		120.000		280.000	
	666-7186	RE PM TY II (W) (ARROW)	EA	14.000				10.000		1.000		5.000		30.000	
	666-7194	RE PM TY II (W) (WORD)	EA	10.000				10.000		3.000		5.000		28.000	
	666-7200	RE PM TY II (W) 18" (YLD TRI)	EA							36.000		36.000		72.000	
	666-7211	RE PM TY II (Y) 6" (BRK)	LF	5,430.000		8,570.000		4,080.000		10,760.000		8,510.000		37,350.000	
	666-7213	RE PM TY II (Y) 6" (SLD)	LF	43,970.000		94,930.000		193,540.000		80,000.000		76,040.000		488,480.000	
	666-7279	RE PROF PM (W)6"(SLD) RAISD PROF ONLY	LF			55,930.000		207,000.000		96,440.000		89,830.000		449,200.000	
	666-7280	RE PROF PM (Y)6"(SLD) RAISD PROF ONLY	LF			43,970.000		193,540.000		80,000.000		76,040.000		393,550.000	
	672-7004	REFL PAV MRKR TY II-A-A	EA	862.000		1,696.000		2,754.000		1,615.000		1,445.000		8,372.000	
	672-7006	REFL PAV MRKR TY II-C-R	EA	66.000		448.000		1,467.000						1,981.000	
	677-7001	ELIM EXT PM & MRKS (4")	LF					400,540.000						400,540.000	
	3001-7001	FRICTIONAL ASPH SURF PRESERV TRTMT	SY	54,120.000		129,620.000				43,792.000		43,792.000		271,324.000	
08		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK	LS					1.000						1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (NON-PART)	LS					1.000						1.000	

REFERENCE	COUNTY	CSJ	ROADWAY	LIMITS FROM	LIMITS TO	316	316	500	503	502	505	505	662	662	666	666	666	666	666	666	
						7001	7208	7001	7002	7004	7001	7003	7112	7114	7172	7173	7175	7179	7182	7184	7186
						ASPH (A-R TYPE II)	AGGR (TY-PB GR-3 SAC-B)	MOBILIZATION	PORTABLE CHANGEABLE MESSAGE SIGN	BARRICADES, SIGNS AND TRAFFIC HANDLING	TMA STATIONARY	TMA (MOBILE OPERATION)	WK ZN PAV MRK SHT TERM (TAB) TY W	WK ZN PAV MRK SHT TERM (TAB) TY Y-2	RE PM TY II (W) 6" (BRK)	RE PM TY II (W) 6" (DOT)	RE PM TY II (W) 6" (SLD)	RE PM TY II (W) 8" (SLD)	RE PM TY II (W) 12" (SLD)	PREFAB PAV MK TY C (W) 24"	RE PM TY II (W) (ARROW)
						GAL	CY	LS	EA	EA	DAY	DAY	EA	EA	LF	LF	LF	LF	LF	LF	EA
2551	PALO PINTO	0007-09-024	US0180-KG	DODSON PRAIRIE ROAD	.3 MILES WEST OF MILL BRANCH	131241	1683			1	1	2	448	1696	8530		104430				
2552	PALO PINTO	0007-10-070	US0180-KG	.3 MILES WEST OF MILL BRANCH	SW 12 AVE	57728	740			1	1	2	66	862	180		55930	1080			14
2553	ERATH	0250-03-051	US0281-KG	PALO PINTO COUNTY LINE	FM 8	346843	4447	1	4	1	1	2	1467	2754	15260	2660	207000	4690	50	30	10
2554	PARKER	0314-01-090	IH0020-XG	PALO PINTO COUNTY LINE	DENNIS RD	113860	1460			1	1	2		1445			89830			120	5
2555	PARKER	0314-01-089	IH0020-AG	PALO PINTO COUNTY LINE	DENNIS RD	113860	1460			1	1	2		1615			96440			130	1
TOTAL						763532	9790	1	4	5	5	10	1981	8372	23970	2660	553630	5770	50	280	30

REFERENCE	COUNTY	CSJ	ROADWAY	666	666	666	666	666	666	672	672	677	3001	08	08
				7194	7200	7211	7213	7279	7280	7004	7006	7001	7001		
				RE PM TY II (W) (WORD)	RE PM TY II (W) 18" (YLD TRI)	RE PM TY II (Y) 6" (BRK)	RE PM TY II (Y) 6" (SLD)	RE PROF PM(W)6" (SLD) RAISD PROF ONLY	RE PROF PM(Y)6" (SLD) RAISD PROF ONLY	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	ELIM EXT PM & MRKS (4")	FRICTIONAL ASPH SURF PRESERV TRTMT	FORCE ACCOUNT - SAFETY CONTINGENCY	FORCE ACCOUNT - EROSION CONTROL
				EA	EA	LF	LF	LF	LF	EA	EA	LF	SY	LS	LS
2551	PALO PINTO	0007-09-024	US0180-KG			8570	94930			1696	448		129620		
2552	PALO PINTO	0007-10-070	US0180-KG	10		5430	43970	55930	43970	862	66		54120		
2553	ERATH	0250-03-051	US0281-KG	10		4080	193540	207000	193540	2754	1467	400540		1	1
2554	PARKER	0314-01-090	IH0020-XG	5	36	8510	76040	89830	76040	1445			43792		
2555	PARKER	0314-01-089	IH0020-AG	3	36	10760	80000	96440	80000	1615			43792		
TOTAL				28	72	37350	488480	449200	393550	8372	1981	400540	271325	1	1

LIMIT SHEET SUMMARY
FY 25



SHEET 1 OF 1

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	F 2025(244)		US 281, ETC.
STATE	COUNTY		SHEET NO.
TEXAS	ERATH, ETC.		5
DISTRICT	CONTROL	SECTION	
FTW	0250	03	051

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DATE:
FILE:

SEAL COAT MATERIAL SELECTION TABLE		
TIER I: HEAVY USE - USE ONLY THE SELECTED MATERIALS.		
TYPE	ASPHALT RUBBER (A-R) <input type="checkbox"/> A-R ONLY	ASPHALT CEMENT (AC) <input type="checkbox"/> AC ONLY
ASPHALT	<input checked="" type="checkbox"/> A-R TY II <input type="checkbox"/> A-R TY III <input type="checkbox"/> SP 300-	<input type="checkbox"/> AC-20-5TR <input type="checkbox"/> AC-20XP <input type="checkbox"/> AC-15P <input type="checkbox"/> SP 300-
TIER II: MODERATE USE - USE THESE MATERIALS OR ANY SELECTED TIER I MATERIAL COMBINATIONS OF THE ALLOWED TYPES.		
TYPE	ASPHALT CEMENT (AC) <input type="checkbox"/> AC ONLY	ASPHALT EMULSION <input type="checkbox"/> EMULSION ONLY
ASPHALT	<input type="checkbox"/> AC-10-2TR <input type="checkbox"/> AC-15P <input type="checkbox"/> AC-20XP <input type="checkbox"/> AC-10 W/2%SBR <input type="checkbox"/> AC-5 W/2%SBR <input type="checkbox"/> SP 300-	<input type="checkbox"/> CHFRS-2P <input type="checkbox"/> HFRS-2P <input type="checkbox"/> CRS-2P <input type="checkbox"/> SP 300-
TIER III: LIGHT USE - USE THESE MATERIALS OR ANY SELECTED TIER I OR TIER II MATERIAL COMBINATIONS OF THE ALLOWED TYPES.		
TYPE	ASPHALT CEMENT (AC) <input type="checkbox"/> AC ONLY	ASPHALT EMULSION <input type="checkbox"/> EMULSION ONLY
ASPHALT	<input type="checkbox"/> AC-10 <input type="checkbox"/> AC-5 <input type="checkbox"/> SP 300-	<input type="checkbox"/> CRS-2 <input type="checkbox"/> CRS-2H <input type="checkbox"/> HFRS-2 <input type="checkbox"/> SP 300-
DISTRICTWIDE SEAL COAT PROJECT SEASONS: REFER TO ITEM 316 FOR TEMPERATURE AND WEATHER RESTRICTIONS.		
SEASON 1: AMA, CHS, LBB		MAY 15 TO AUG 31
SEASON 2: ABL, ATL, BWD, DAL, FTW, LFK, ODA, PAR, SJT, TYL, WAC, WFS		MAY 1 TO AUG 31
SEASON 3: AUS, BMT, BRY, ELP, HOU, SAT, YKM		MAY 1 TO SEP 15
SEASON 4: CRP, LRD, PHR		APR 1 TO SEPT 30
NOTE: SEAL COATS ON ROUTINE MAINTENANCE CONTRACTS MUST BE COMPLETED BY AUGUST 31 UNLESS OTHERWISE SHOWN ON THE PLANS.		

INSTRUCTIONS TO THE CONTRACTOR:

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



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

DocuSigned by:
Elijah Zelevov P.E. 9/20/2024
 4848... Date

SEAL COAT MATERIAL SELECTION TABLE					
SCTABLE					
FILE: sctable.dgn	DN: TxDOT	CK:	DW:	CK:	
© TxDOT: March 2014	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0250	03	051	US 281, ETC.	
	DIST	COUNTY		SHEET NO.	
	FTW	ERATH, ETC.		6	

DN: DW: CK: CK:

YEAR	REFERENCE	COUNTY	FC	CSJ	ROADWAY	LIMITS FROM	LIMITS TO	REF FROM	REF TO	DFO FROM	DFO TO	CENTERLINE MILES	NO. OF LANES	LANE MILES	ADT
2025	2551	PALO PINTO	4	0007-09-024	US0180-KG	DODSON PRAIRIE ROAD	.3 MILES WEST OF MILL BRANCH	508+.229	512+1.364	255.018	260.143	5.125	2	10.25	1414
2025	2552	PALO PINTO	4	0007-10-070	US0180-KG	.3 MILES WEST OF MILL BRANCH	SW 12 AVE	512+1.364	528-.828	260.143	273.952	13.809	2	27.618	3815
2025	2553	ERATH	3	0250-03-051	US0281-KG	PALO PINTO COUNTY LINE	FM 8	304+0.034	322+1.719	108.139	127.846	19.707	3	59.121	10652
2025	2554	PARKER	1	0314-01-090	IH0020-XG	PALO PINTO COUNTY LINE	DENNIS RD	390+.320	402+.849	389.576	402.017	12.441	2	24.882	1844
2025	2555	PARKER	1	0314-01-089	IH0020-AG	PALO PINTO COUNTY LINE	DENNIS RD	390+.320	402+.849	389.576	402.017	12.441	2	24.882	1951

TOTAL LANE MILES: 146.753

FUNCTIONAL CLASSIFICATION
 1- INTERSTATE
 2-PRINCIPAL ARTERIAL (OTHER FREEWAYS & EXPRESSWAYS)
 3-PRINCIPAL ARTERIAL
 4-MINOR ARTERIAL
 5-MAJOR COLLECTOR
 6-MINOR COLLECTOR

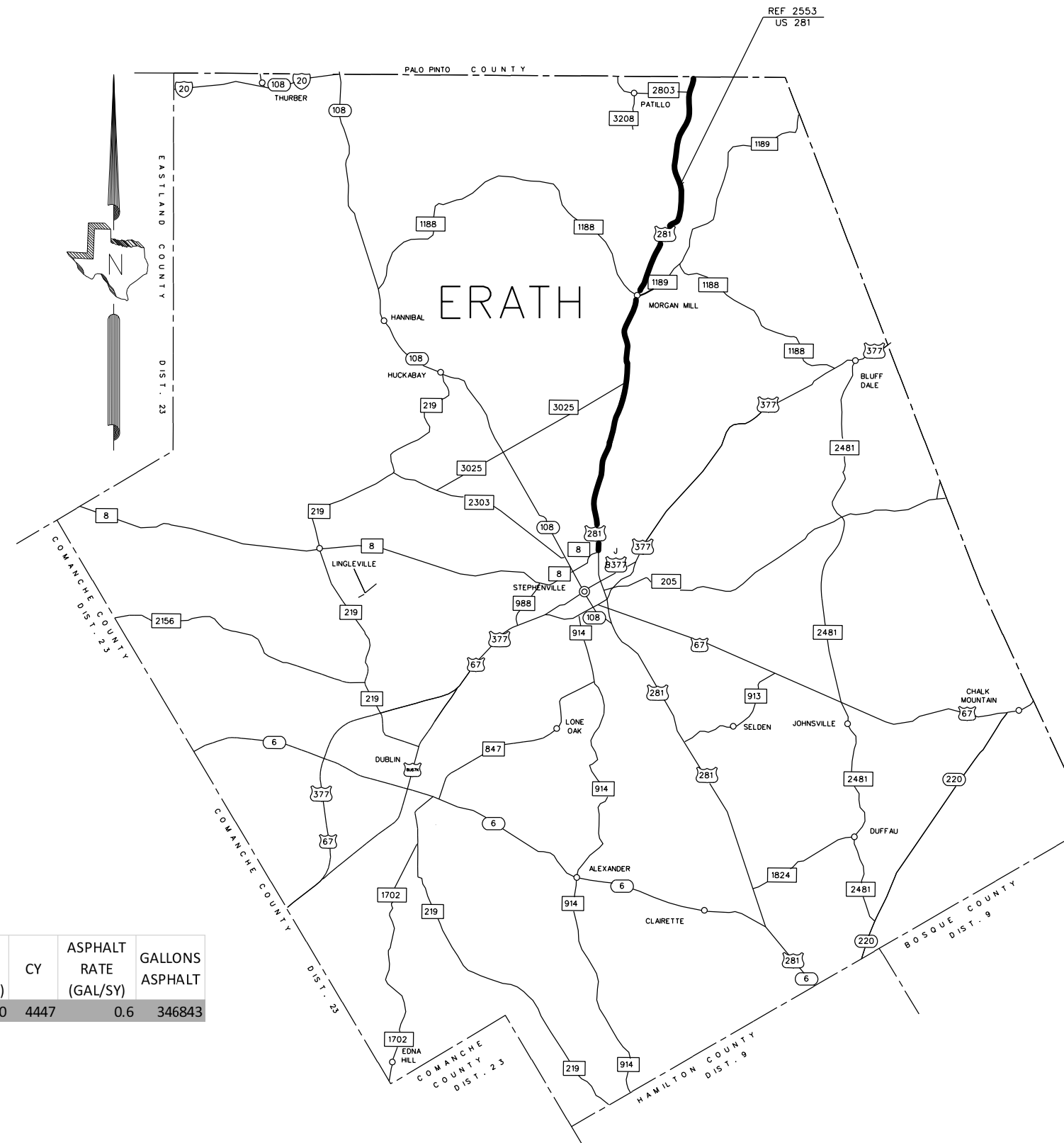


SHEET 1 OF 1

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.	
6	F 2025(244)		US 281, ETC.	
STATE	COUNTY			SHEET NO.
TEXAS	ERATH, ETC.			7
DISTRICT	CONTROL	SECTION	JOB	
FTW	0250	03	051	

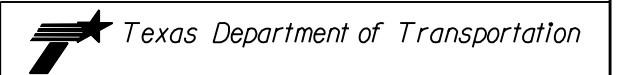
DATE: \$DATE\$
 FILE: \$FILE\$

* FOR CONTRACTOR INFORMATION ONLY



REFERENCE	COUNTY	CSJ	ROADWAY	SY	Rock Type	Rock Rate (SY/CY)	CY	ASPHALT RATE (GAL/SY)	GALLONS ASPHALT
2053	ERATH	0250-03-051	US0281-KG	578072	TY-PB GR-3 SAC-B	130	4447	0.6	346843

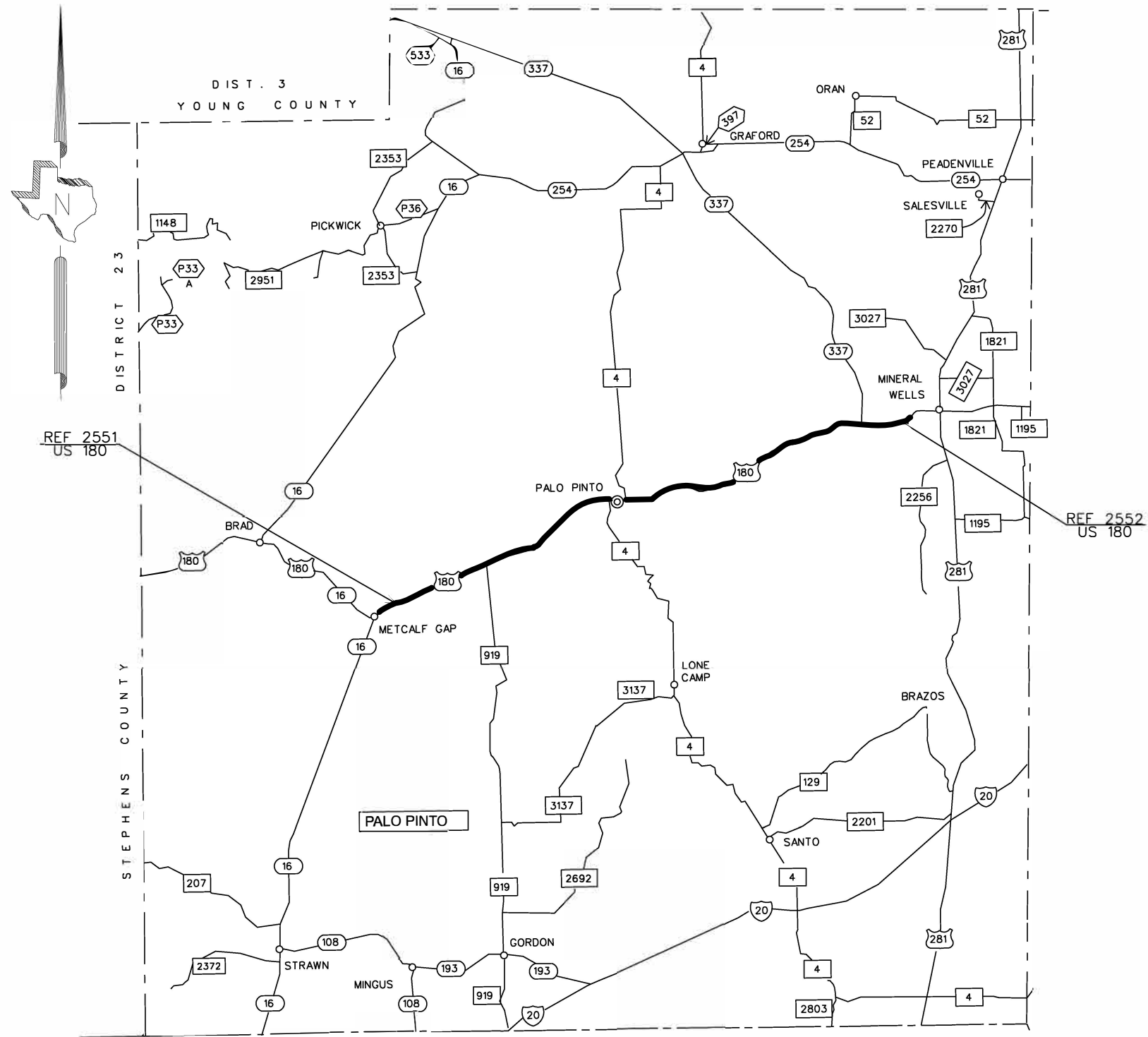
PROJECT LOCATION MAP
ERATH COUNTY
NOT TO SCALE



C.O	FED.RD. DIV.NO. 6	STATE PROJECT NO. F 2025(244)		SHEET NO. 8
REVISIONS	STATE	DISTRICT	COUNTY	8
	TEXAS	FTW	ERATH, ETC.	
	CONTROL	SECTION	JOB	HIGHWAY NO. US 281, ETC.
	0250	03	051	

Any work within 500 feet of TxDOT traffic signal, illumination system, and/or ITS system will require the Contractor to contact the TxDOT Fort Worth SignalShop at (817) 370-6505.

* FOR CONTRACTOR INFORMATION ONLY



PROJECT LOCATION MAP
PALO PINTO COUNTY
NOT TO SCALE

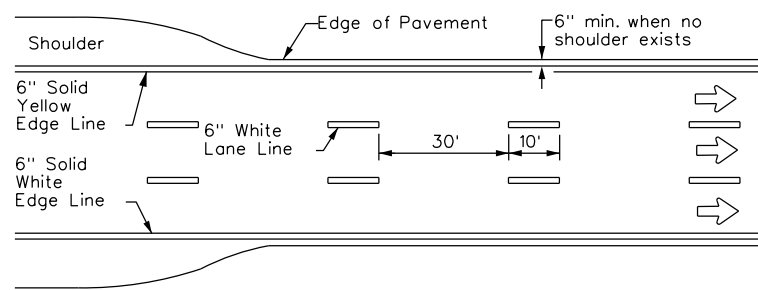
REFERENCE	COUNTY	CSJ	ROADWAY	SY	Rock Type	Rock Rate (SY/CY)	CY	ASPHALT RATE (GAL/SY)	GALLONS ASPHALT	FRictional ASPH SURF PRESERV TRTMT (SY)
2051	PALO PINTO	0007-09-024	US0180-KG	218735	TY-PB GR-3 SAC-B	130	1683	0.6	131241	129620
2052	PALO PINTO	0007-10-070	US0180-KG	96213	TY-PB GR-3 SAC-B	130	740	0.6	57728	54120

C.O.	FED. RD. DIV. NO. 6	STATE PROJECT NO. F 2025(244)		SHEET NO. 9
REVISIONS	STATE	DISTRICT	COUNTY	HIGHWAY NO. US 281, ETC.
	TEXAS	FTW	ERATH, ETC.	
	CONTROL	SECTION	JOB	
	0250	03	051	

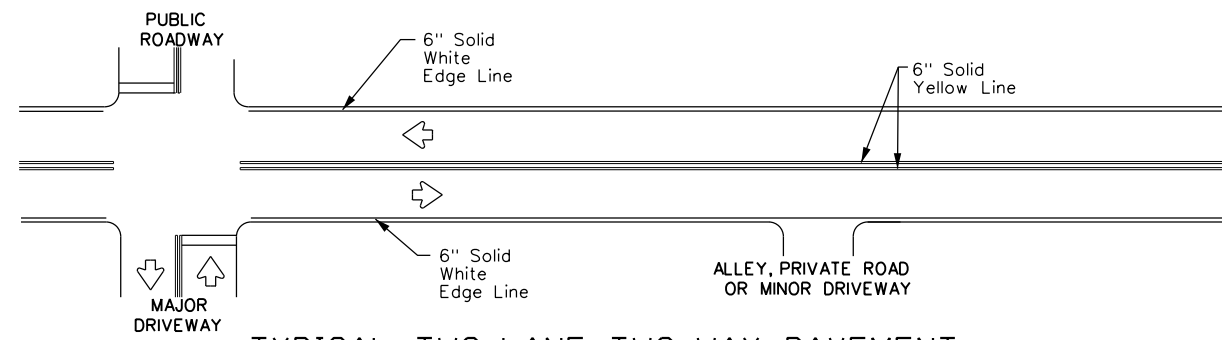
Any work within 500 feet of TxDOT traffic signal, illumination system, and/or ITS system will require the Contractor to contact the TxDOT Fort Worth Signal Shop at (817) 370-6505.

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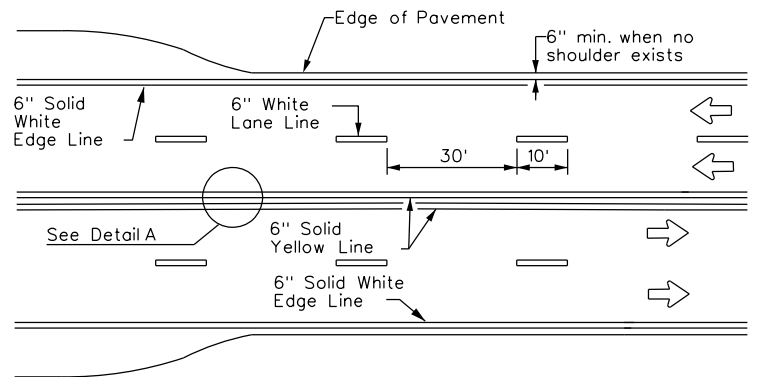
DATE: FILE:



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

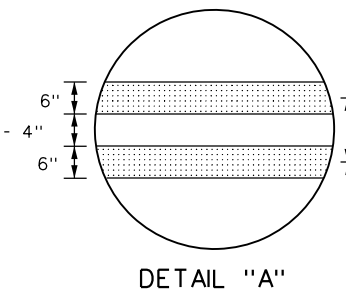


**TYPICAL TWO-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS**

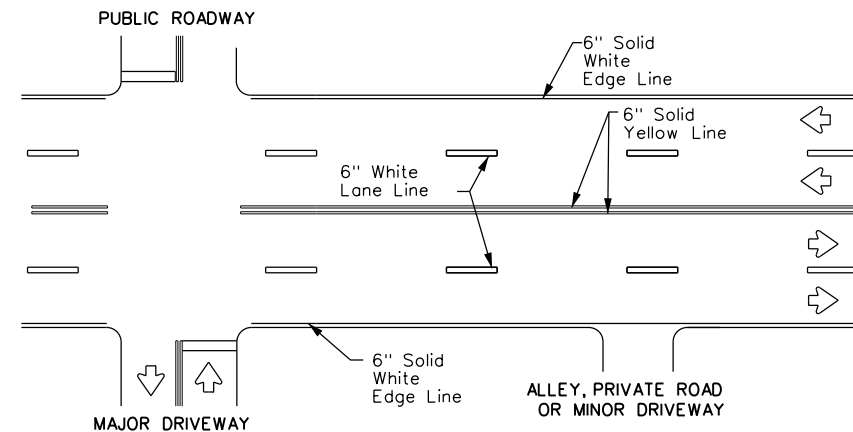


**CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS**

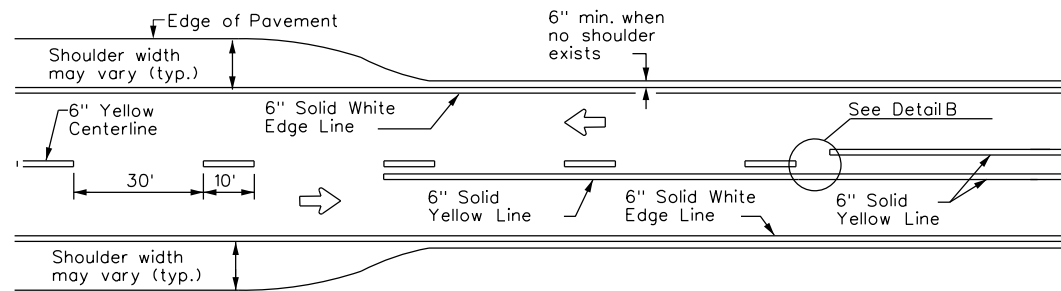
* 2" minimum for restripe projects when approved by the Engineer.
** 8" minimum for restripe projects when approved by the Engineer.



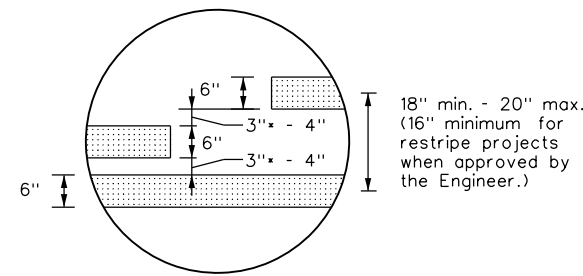
DETAIL "A"
9" min. - 10" typ.
(18" max. for traveled way greater than 48' only)



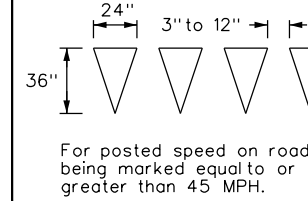
**TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS**



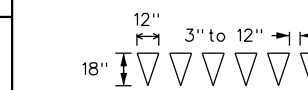
**TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS**



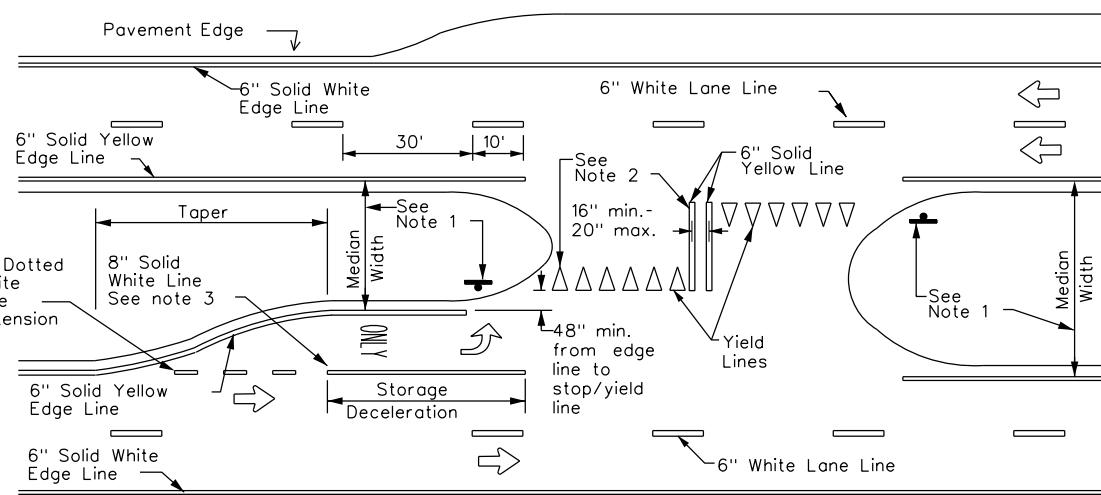
DETAIL "B"
18" min. - 20" max.
(16" minimum for restripe projects when approved by the Engineer.)
* 2" minimum for restripe projects when approved by the Engineer.



YIELD LINES



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



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

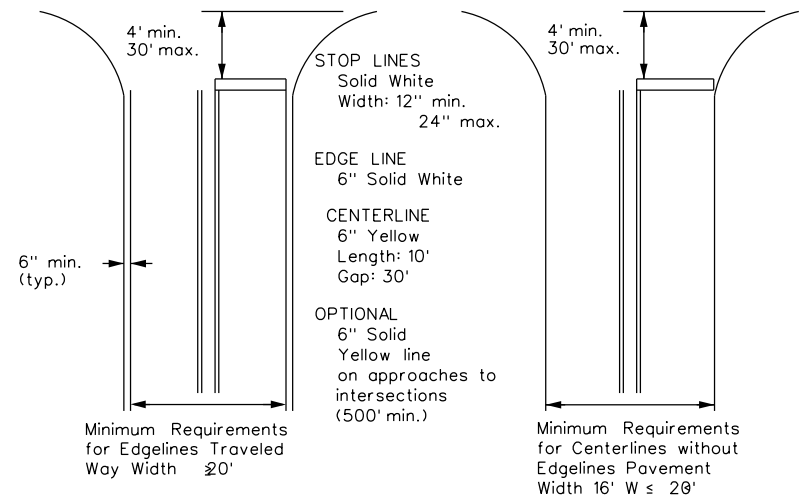
- Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

GENERAL NOTES

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

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

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



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

**GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE**

Based on Traveled Way and Pavement Widths for Undivided Roadways



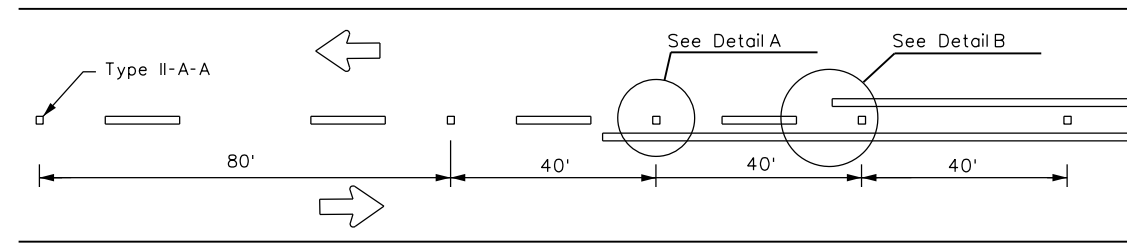
**TYPICAL STANDARD
PAVEMENT MARKINGS**

PM(1)-22

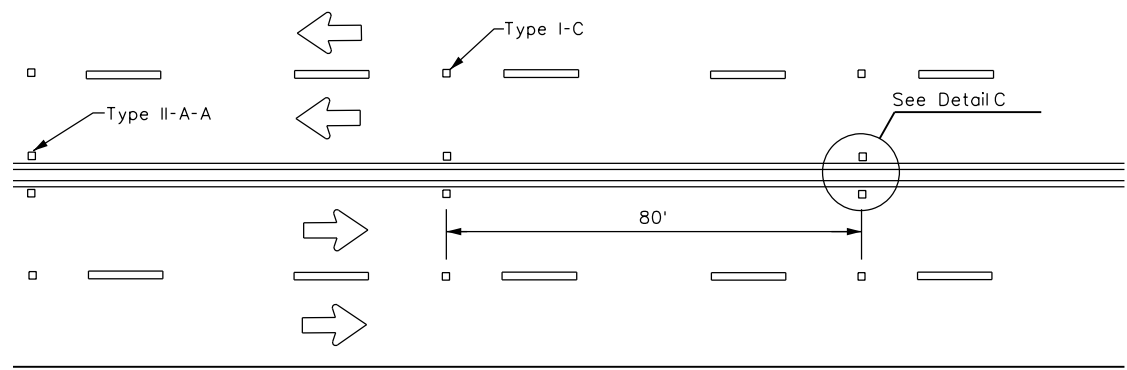
FILE: pml-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
11-78 8-00 6-20	DIST	COUNTY	SHEET NO.	
8-95 3-03 12-22	FTW	ERATH, ETC.	11	
5-00 2-12				

REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

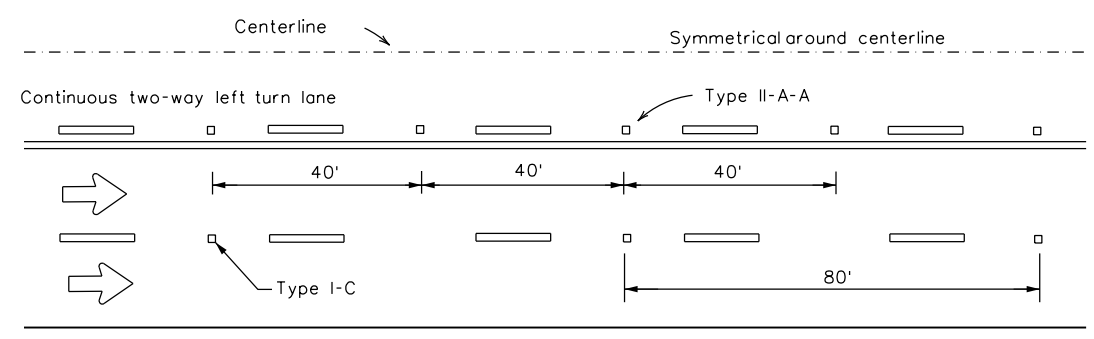
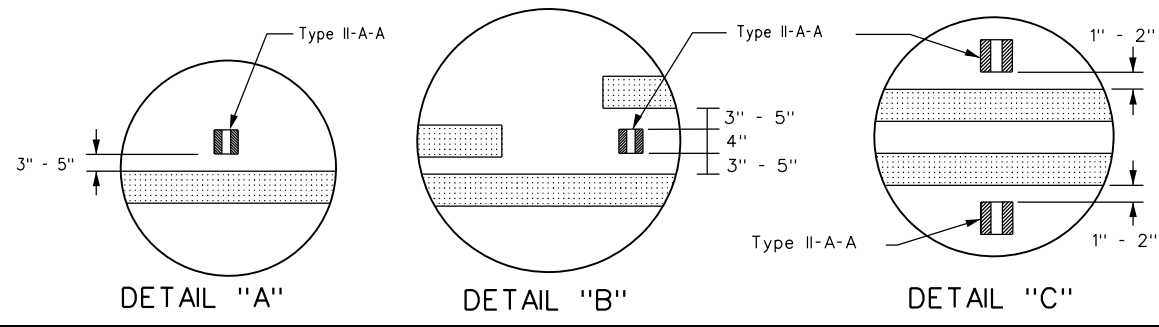
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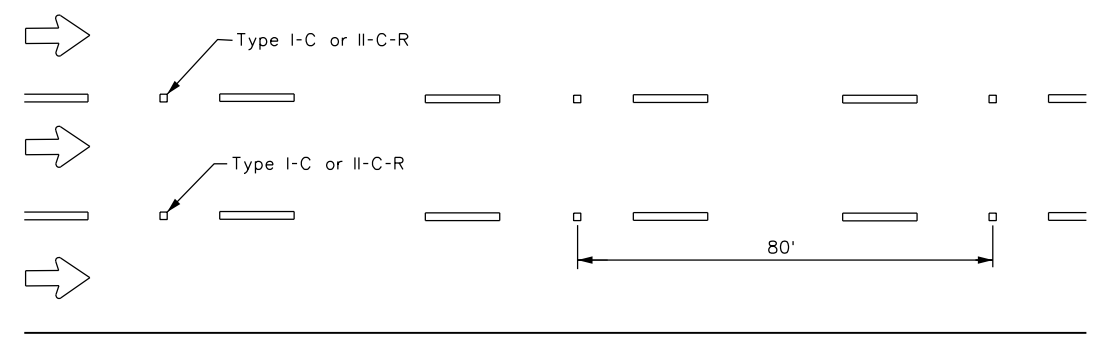
CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS



CENTERLINE & LANE LINES
FOR FOUR LANE TWO-WAY ROADWAYS

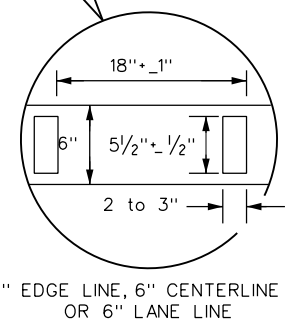
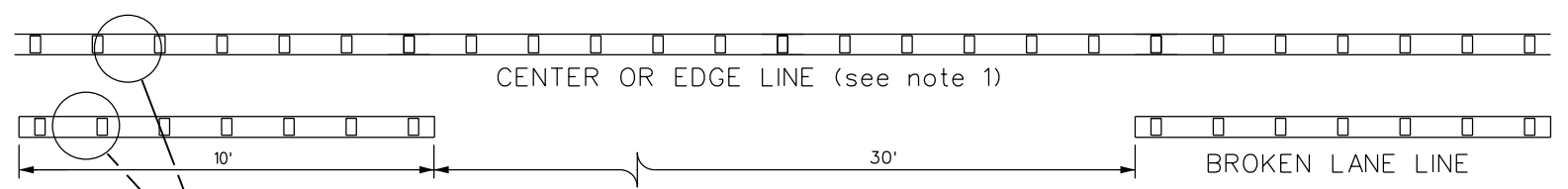


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

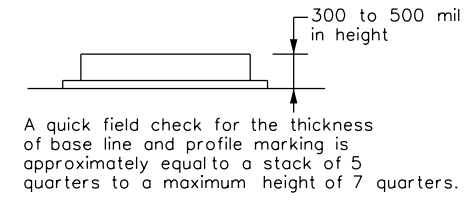


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.
See Note 3.



REFLECTORIZED PROFILE
PATTERN DETAIL
USING REFLECTIVE PROFILE PAVEMENT MARKINGS



NOTES

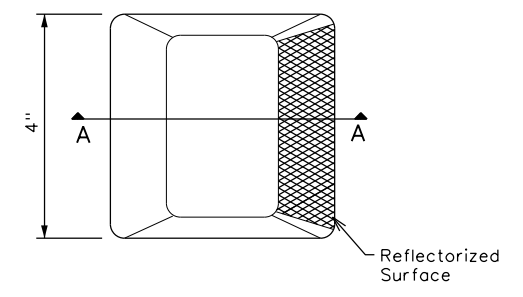
- Edge lines should typically be 6" wide and the materials shall be specified in the plans.
- Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

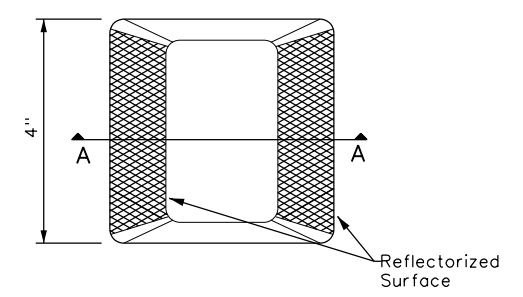
- All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
- On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
- Use raised pavement marker Type I-C with undivided roadways, flush medians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

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

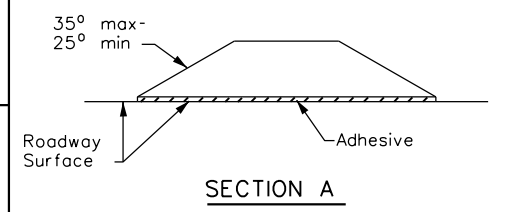
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



RAISED PAVEMENT MARKERS



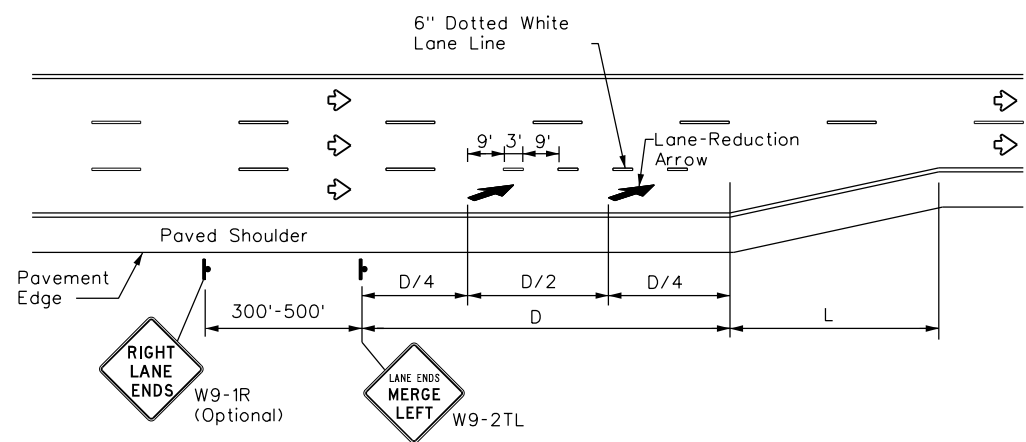
POSITION GUIDANCE USING
RAISED MARKERS
REFLECTORIZED PROFILE
MARKINGS
PM(2)-22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
4-77 8-00 6-20	DIST	COUNTY	SHEET NO.	
4-92 2-10 12-22	FTW	ERATH, ETC.	12	
5-00 2-12				

DATE:
FILE:

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DATE: FILE:



LANE REDUCTION

NOTES

- 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.
- On divided highways, an additional RIGHT LANE ENDS (W9-1R) sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
- 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.
- For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

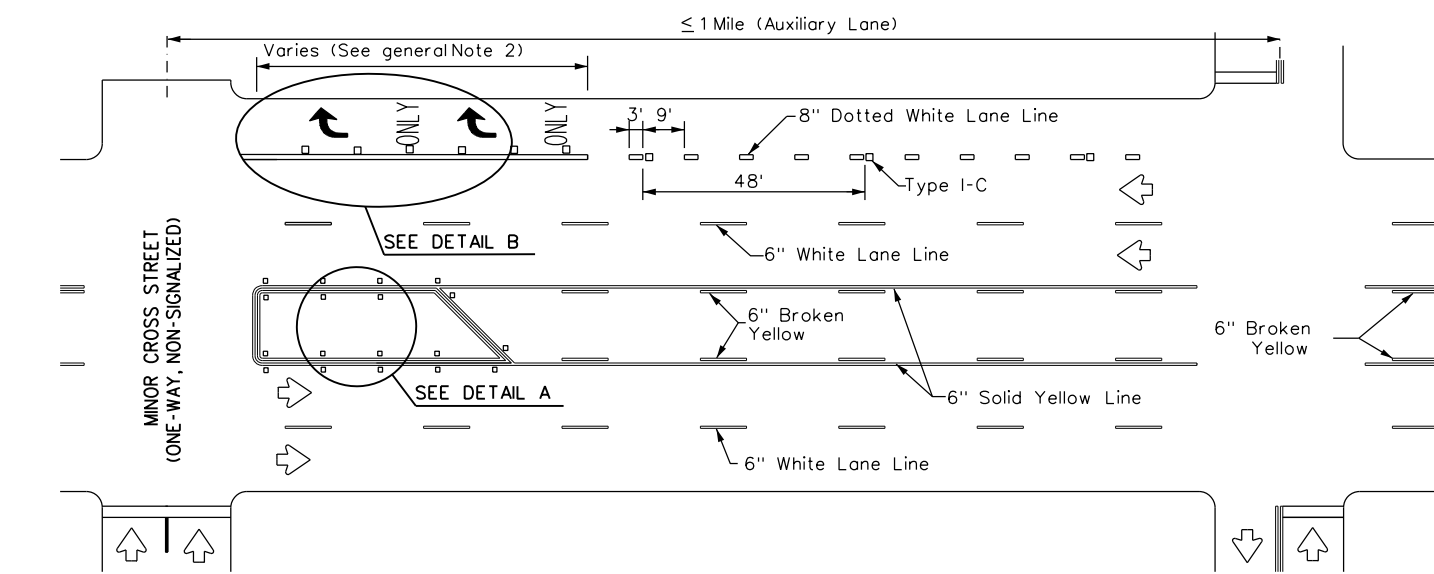
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L = \frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	L=WS
45 MPH	775	
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

GENERAL NOTES

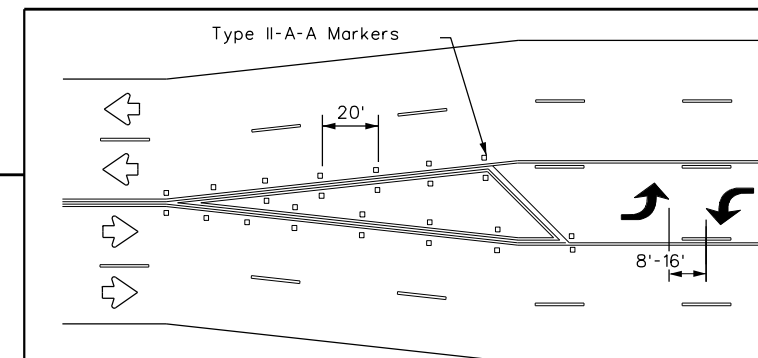
- Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
- 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.
- 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.
- Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

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

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

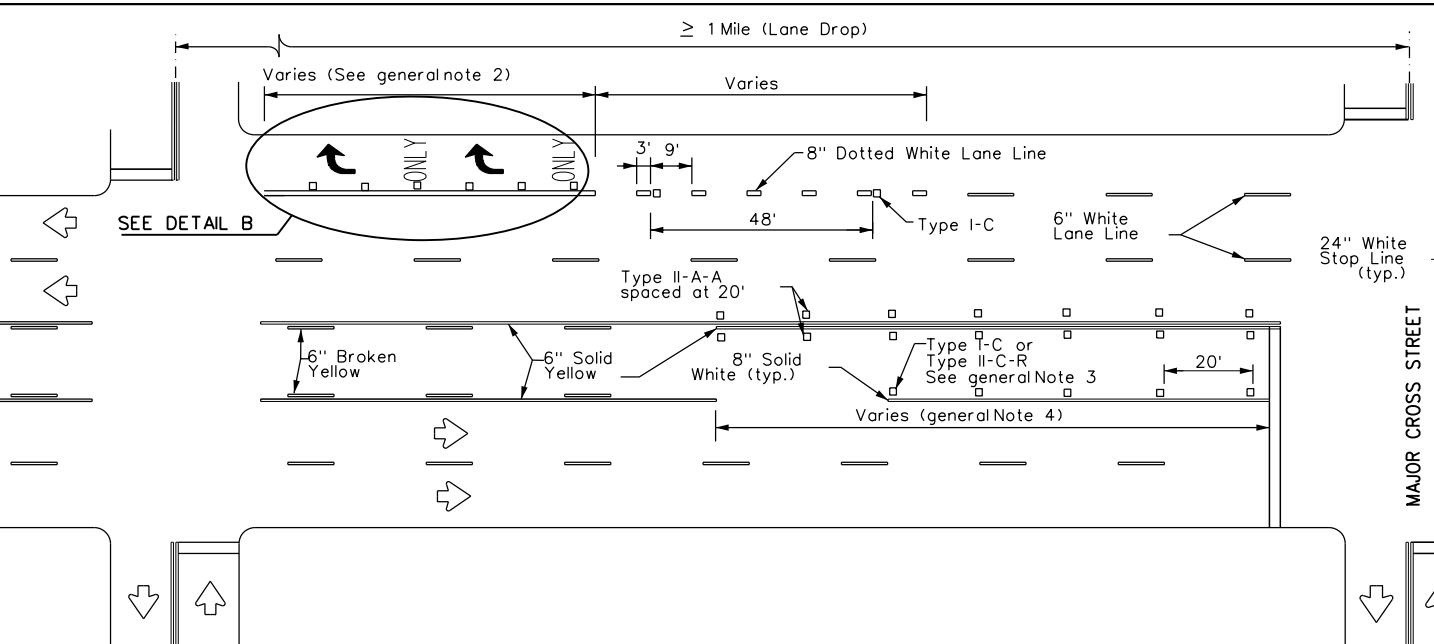


TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE

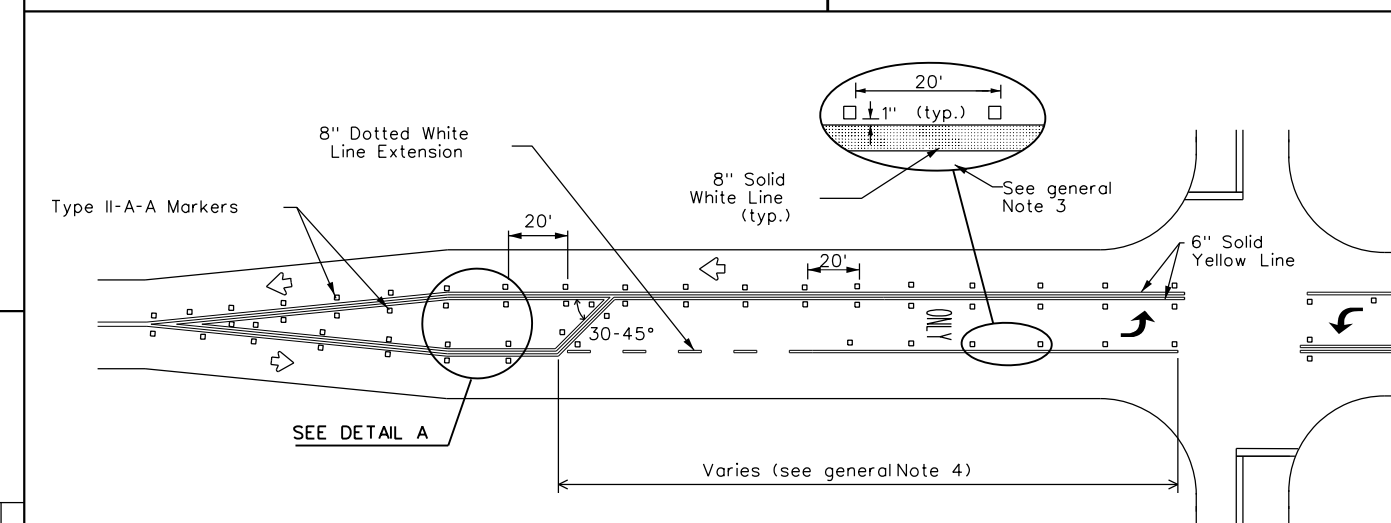


A two-way left-turn (TWLTL) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

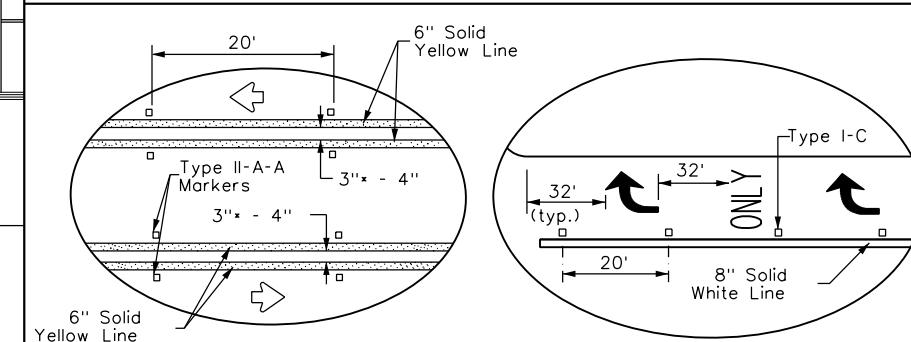
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY



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



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A

DETAIL B

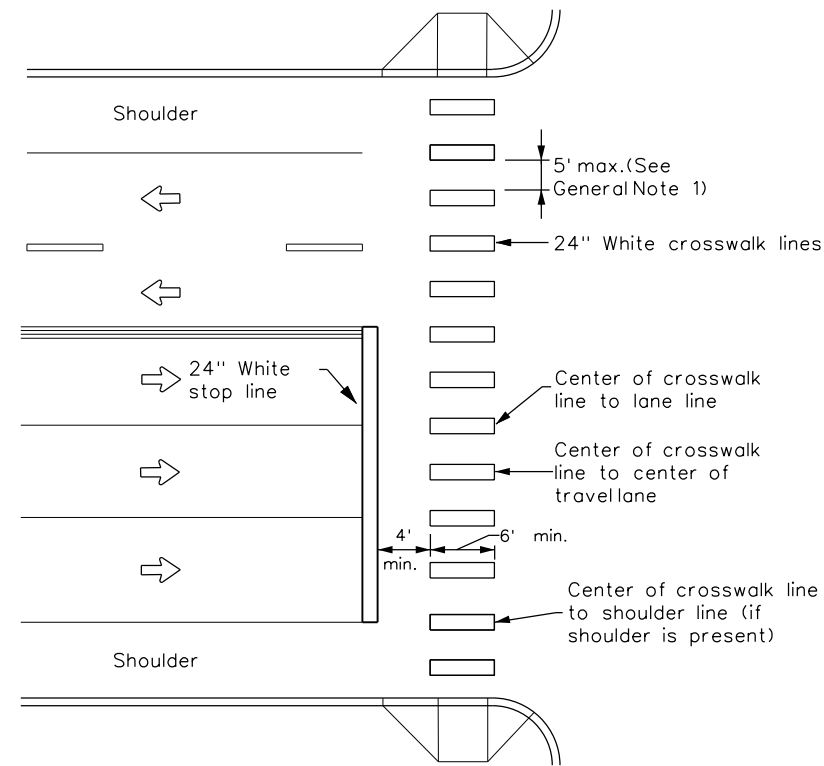
• 2" minimum allowed for restripe projects when approved by the Engineer.

Texas Department of Transportation
Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
4-98 3-03 6-20	DIST	COUNTY	SHEET NO.	
5-00 2-10 12-22	FTW	ERATH, ETC.	13	
8-00 2-12				

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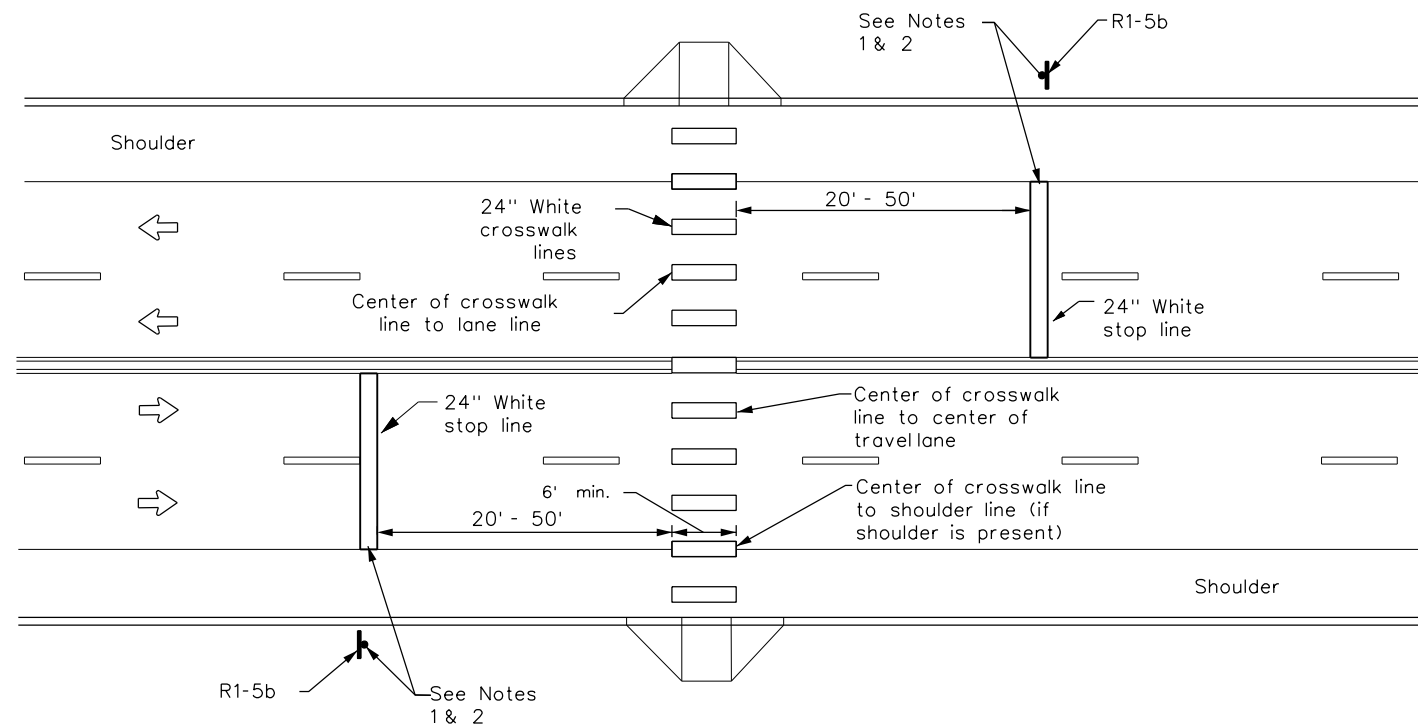
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

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

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

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



UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

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



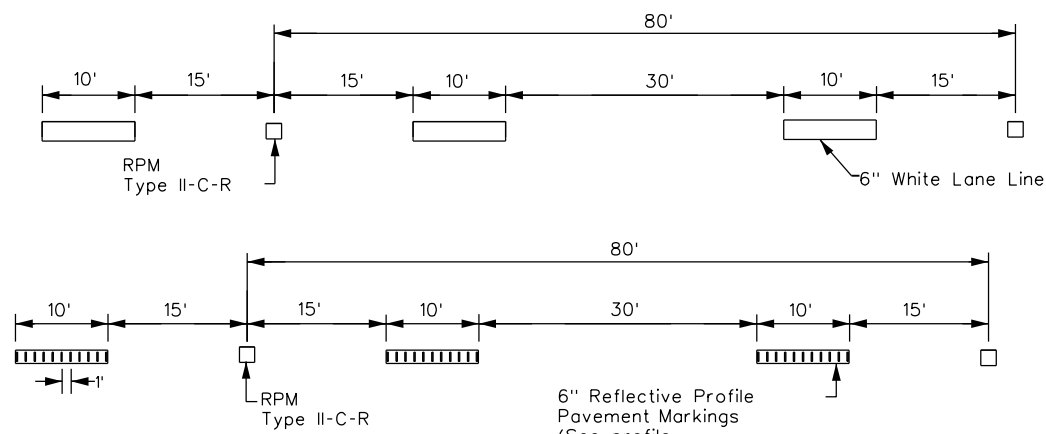
CROSSWALK PAVEMENT MARKINGS

PM(4)-22A

FILE: pm4-22a.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
6-20	DIST	COUNTY	SHEET NO.	
6-22	FTW	ERATH, ETC.	14	
12-22				
22D				

DATE:
FILE:

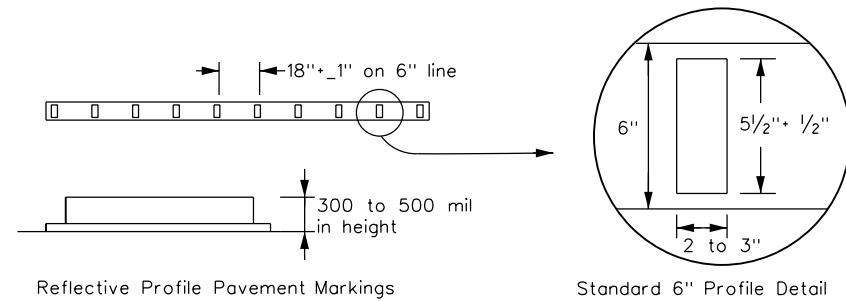
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NOTE

ReflectORIZED raised pavement markers 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. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.

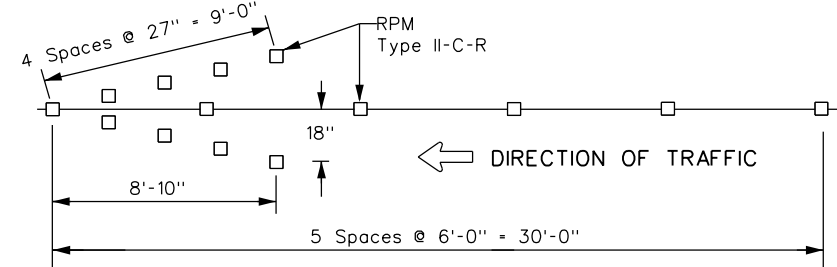
TRAFFIC LANE LINES PAVEMENT MARKING



NOTE

Edge lines should typically be 6" wide and the materials shall be as specified in the plans. See details above if reflective profile pavement markings are to be used.

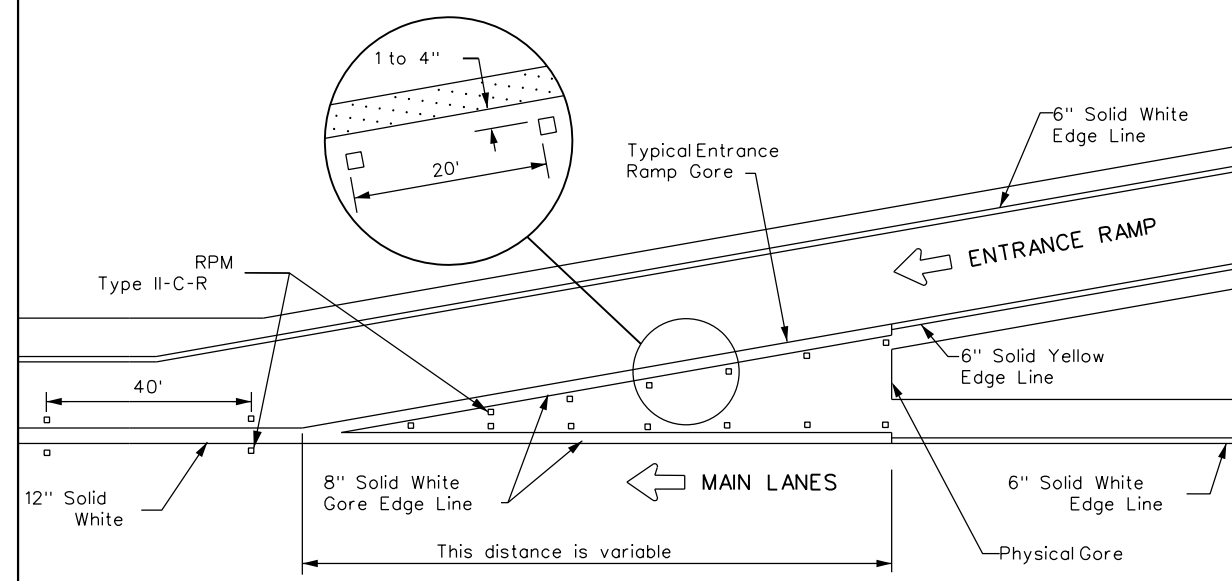
EDGE LINE PAVEMENT MARKINGS



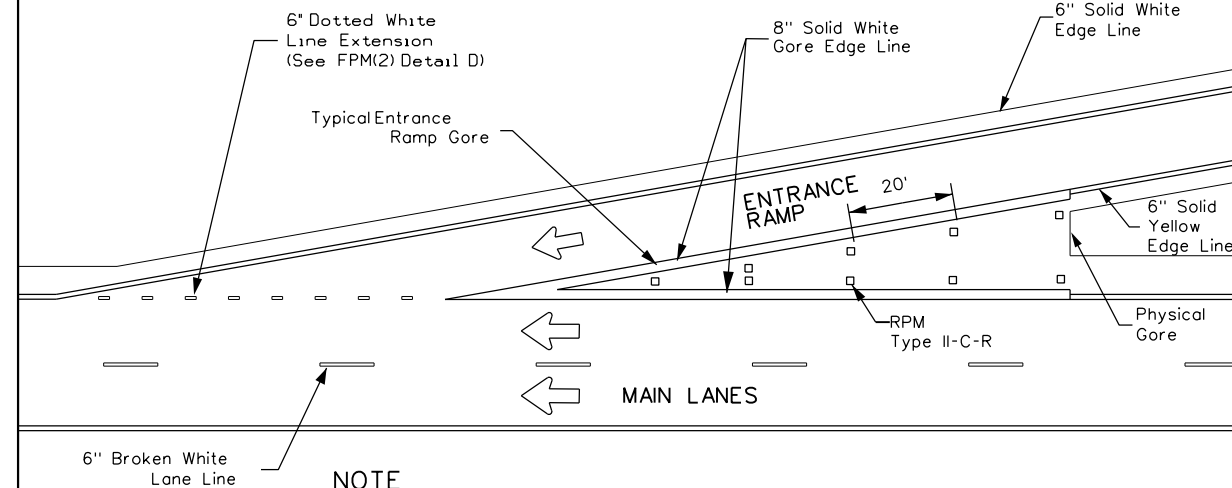
NOTES

1. ReflectORIZED raised pavement markers Type-II-C-R in the wrong way arrow shall have the clear face toward normal traffic and the red face toward the wrong way traffic.
2. Red reflectORIZED wrong way arrows, not to exceed two, may be placed on exit ramps. Locations of the arrows shall be as shown in the plans or as directed by the engineer.

WRONG WAY ARROW



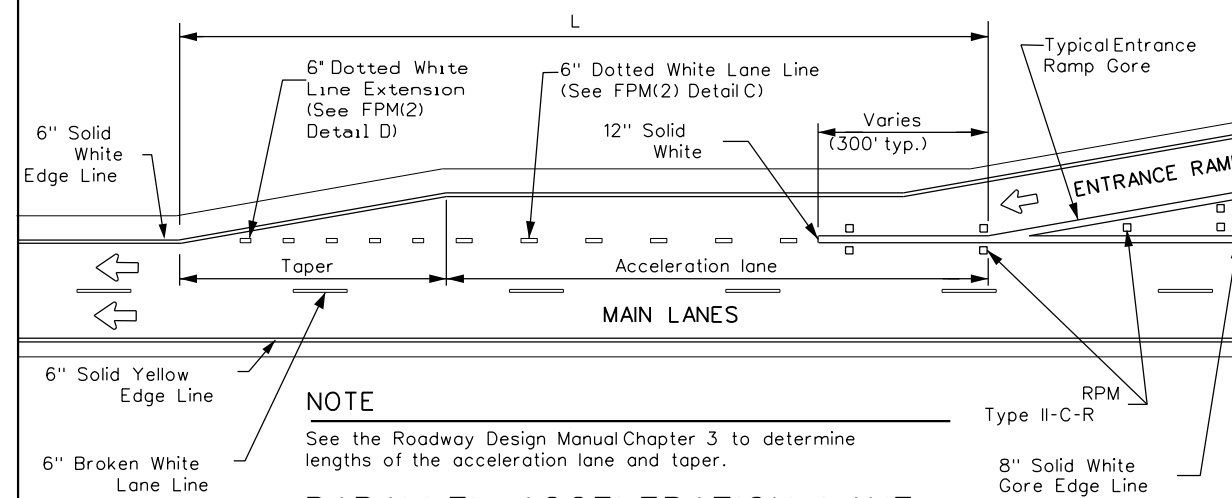
TYPICAL ENTRANCE RAMP GORE MARKING



NOTE

See the Roadway Design Manual Chapter 3 to determine if a tapered acceleration lane may be used.

TAPERED ACCELERATION LANE



NOTE

See the Roadway Design Manual Chapter 3 to determine lengths of the acceleration lane and taper.

PARALLEL ACCELERATION LANE

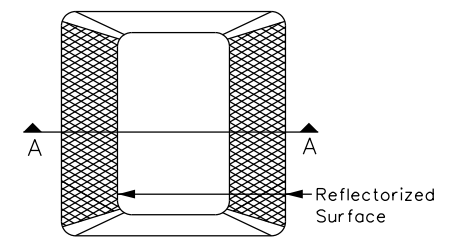
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

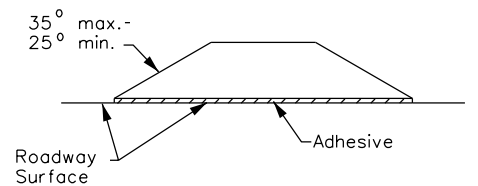
LEGEND	
	Traffic flow
	Pavement marking arrows (white)
	ReflectORIZED Raised Markers (RPM) Type II-C-R

GENERAL NOTE

On concrete pavements the raised pavement markers shall be placed to one side of the longitudinal joints.



Type II (Top View)



SECTION A

REFLECTORIZED RAISED PAVEMENT MARKER (RPM)

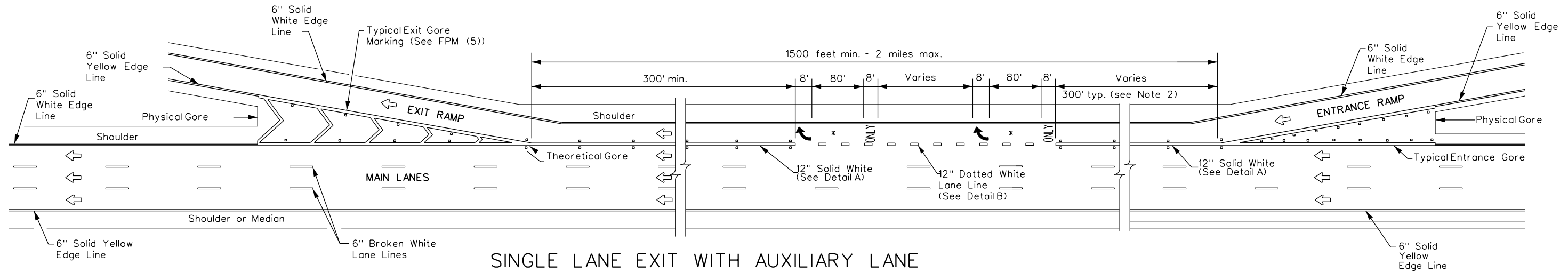


TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS WITH RAISED PAVEMENT MARKERS FPM(1)-22

FILE: fpm(1)-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
5-74 8-00 2-12	DIST	COUNTY	SHEET NO.	
4-92 2-08 10-22	FTW	ERATH, ETC.	15	
5-00 2-10				

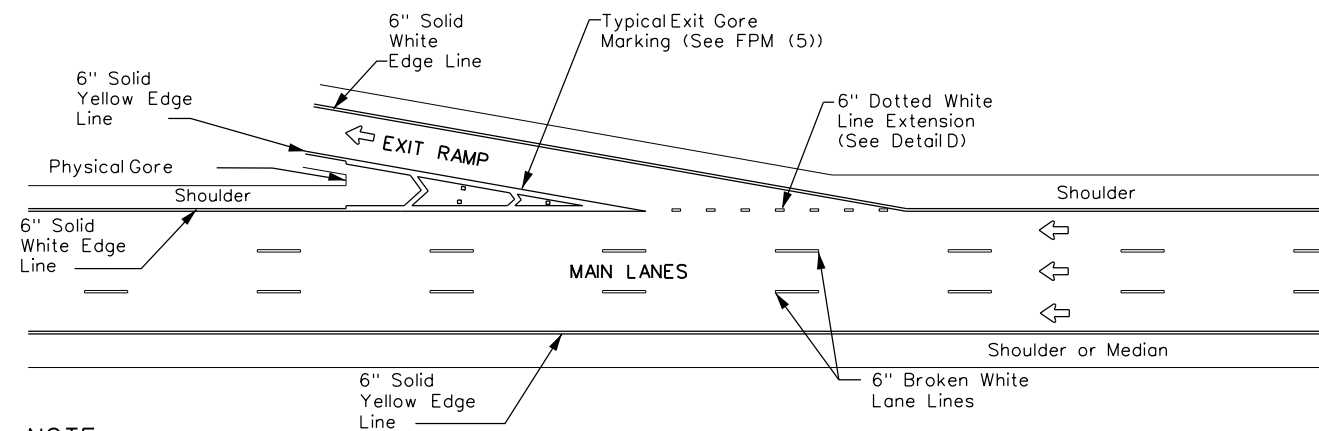
DATE: FILE:

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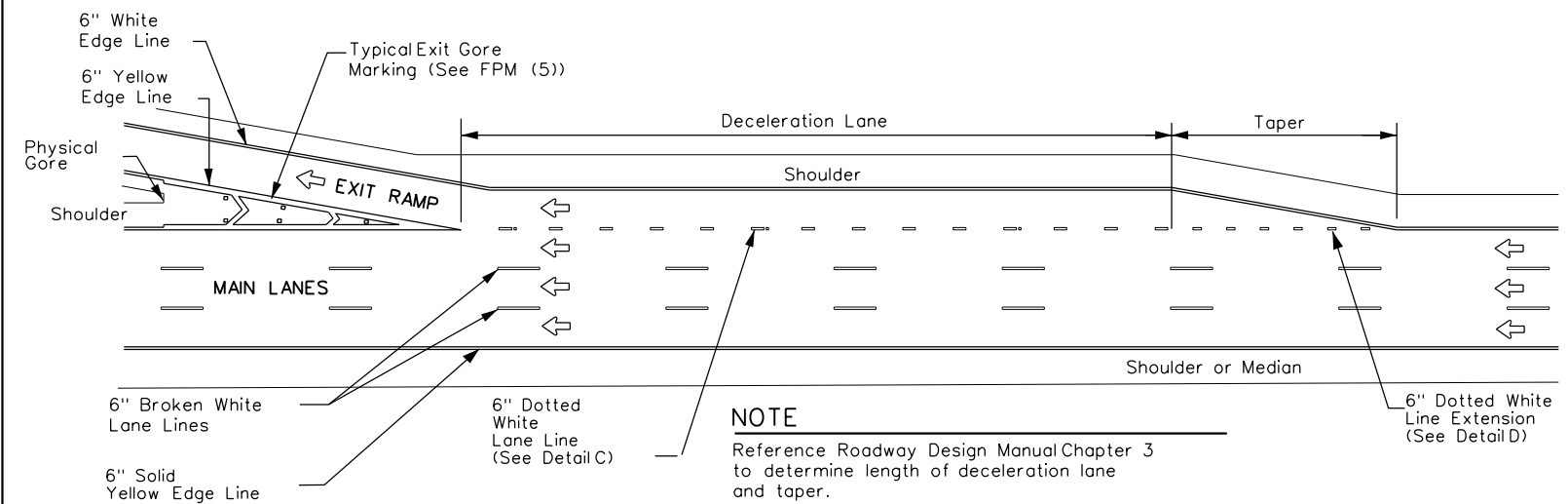
SINGLE LANE EXIT WITH AUXILIARY LANE

(See Note 2)



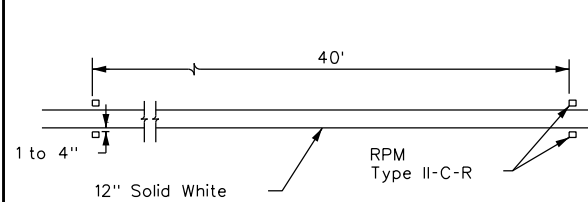
TAPERED DECELERATION LANE

NOTE
Reference Roadway Design Manual Chapter 3 to determine if tapered deceleration lane may be used.

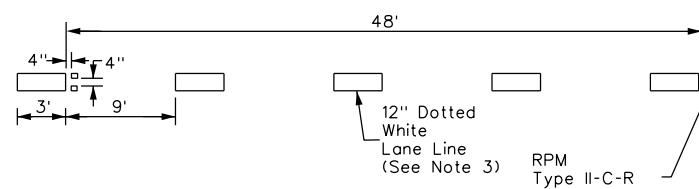


PARALLEL DECELERATION LANE

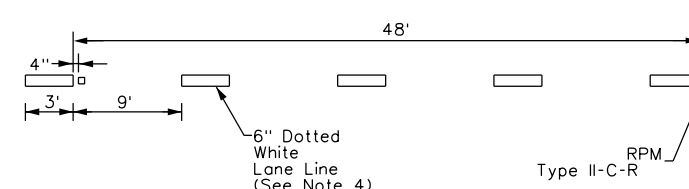
NOTE
Reference Roadway Design Manual Chapter 3 to determine length of deceleration lane and taper.



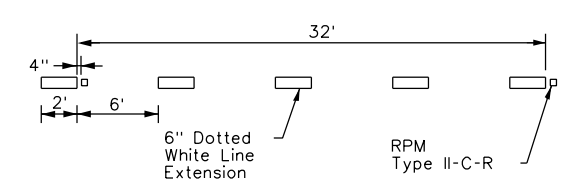
DETAIL A



DETAIL B



DETAIL C



DETAIL D

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 that continues beyond the interchange from an adjacent mandatory exit lane.
4. Normal (6") dotted lane line (see Detail C) is used at parallel acceleration and deceleration lanes.
5. See FPM(1) for traffic lane line pavement marking details.

LEGEND

	Traffic flow
	Pavement marking arrows (white)
	Reflectorized Raised Markers (RPM) Type II-C-R
	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.

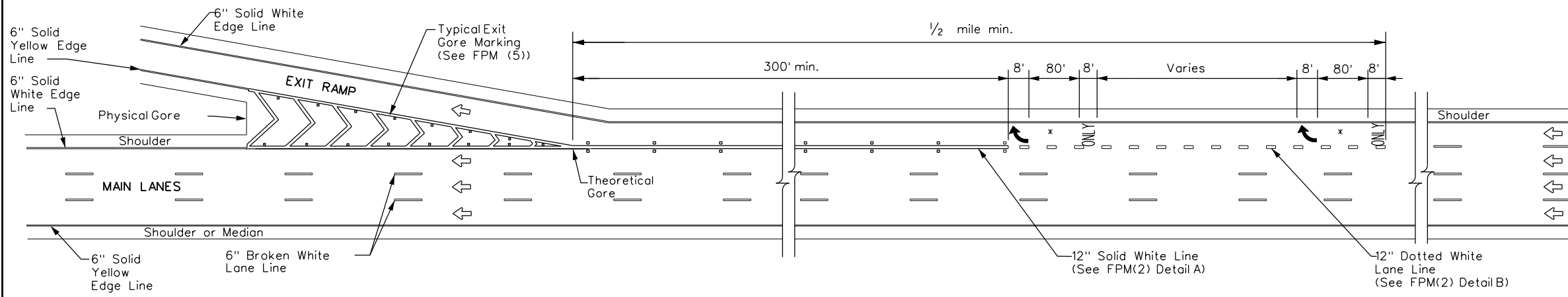


TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS ENTRANCE AND EXIT RAMP

FPM(2)-22

FILE: fpm(2)-22.dgn	DN: October 2022	CK: 03	DW: 051	CK: US 281, ETC.
© TxDOT October 2022		CON: 0250	SECT: 03	JOB: 051
REVISIONS		DIST: FTW	COUNTY: ERATH, ETC.	SHEET NO. 16
2-77	5-00	2-12		
4-92	8-00	10-22		
8-95	2-10			

DATE:
FILE:

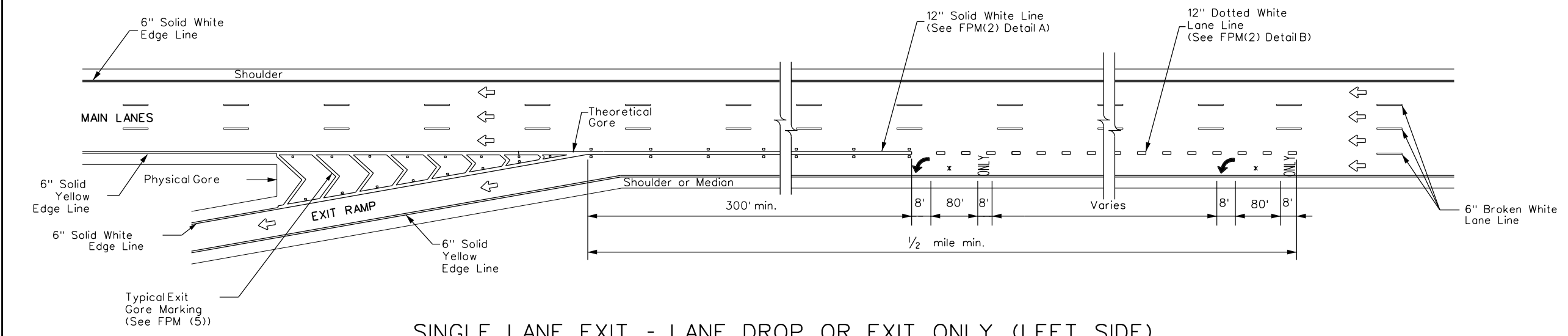


SINGLE LANE EXIT - LANE DROP OR EXIT ONLY

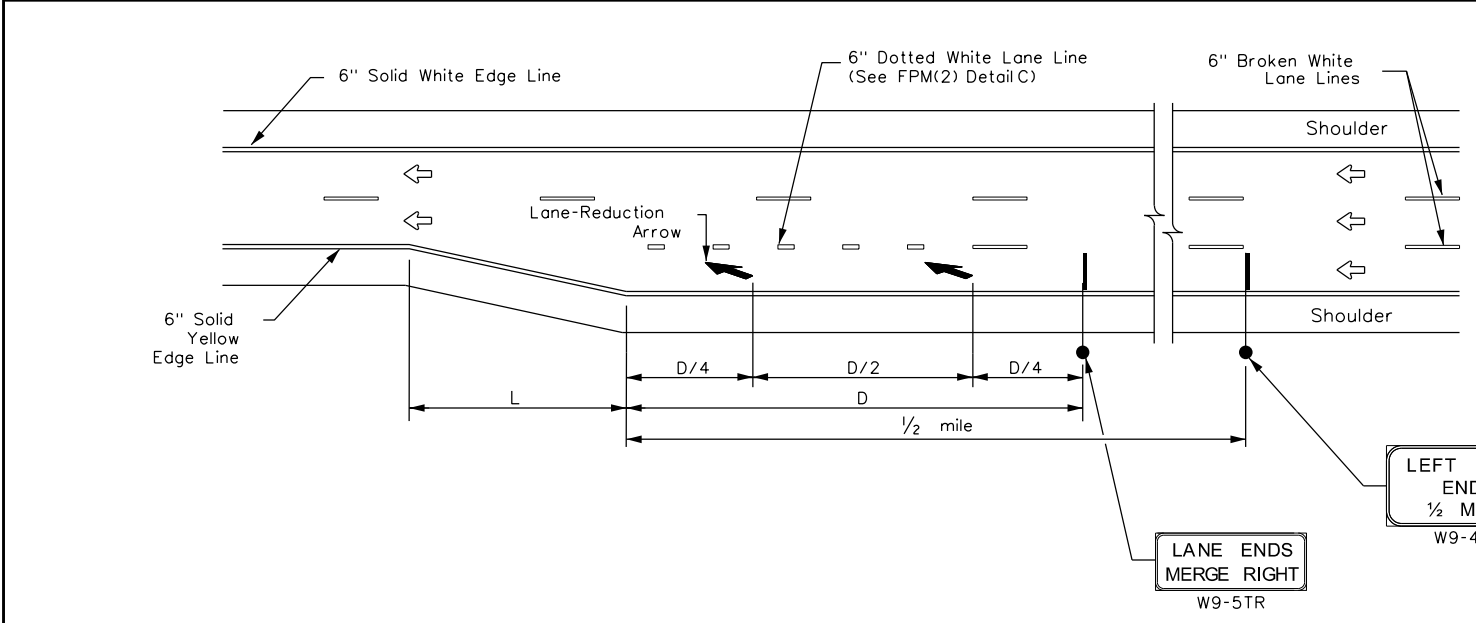
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

LEGEND	
	Traffic flow
	Pavement marking arrows (white)
	ReflectORIZED Raised Markers (RPM) Type II-C-R
	Arrow markings are optional, however "ONLY" is required if arrow is used



SINGLE LANE EXIT - LANE DROP OR EXIT ONLY (LEFT SIDE)



FREEWAY LANE REDUCTION

NOTES

1. Large Guide signs shall conform to the TxDOT Freeway Signing Handbook.
2. 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.
3. Arrows and sign details can be found in the Standard Highway Sign Designs for Texas (SHSD) at <http://www.txdot.gov>.
4. These guidelines may also be applied to the design of a right side lane reduction. Use LANE ENDS MERGE LEFT (W9-5TL) and RIGHT LANE ENDS 1/2 MILE (W9-4TR) signs in lieu of what is shown on drawing.

ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
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	
80 MPH	1,500	
85 MPH	1,625	

LEFT LANE ENDS 1/2 MILE W9-4TL

LANE ENDS MERGE RIGHT W9-5TR

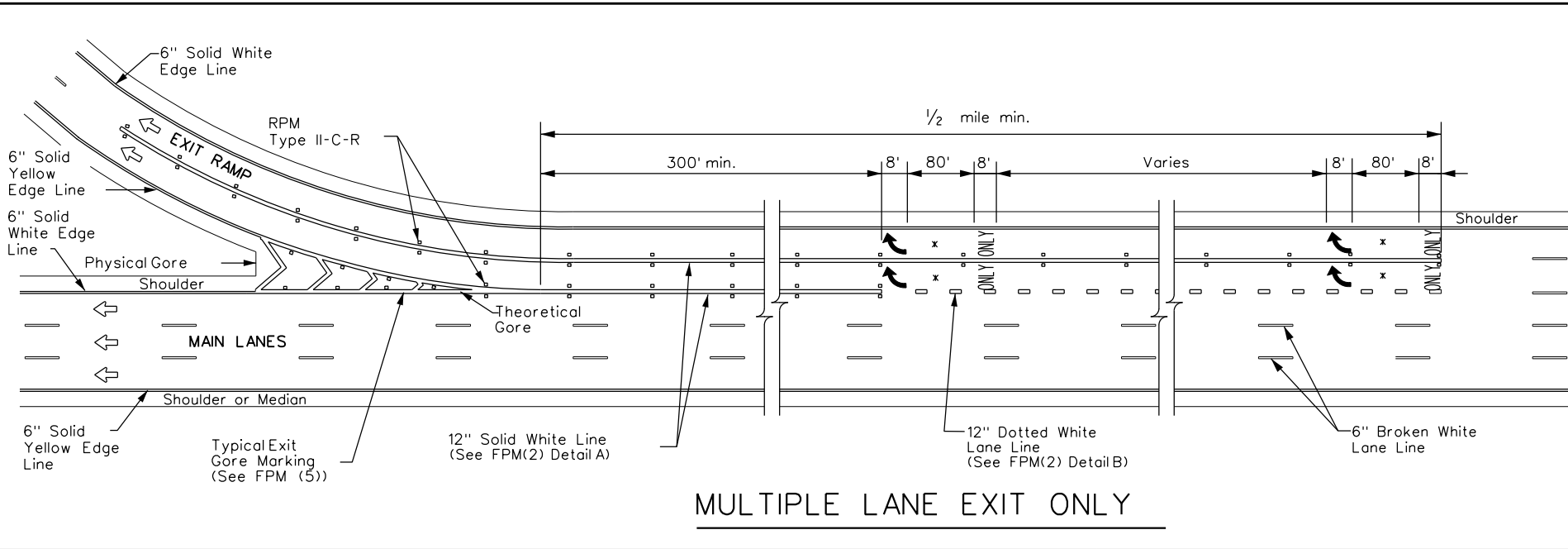
GENERAL NOTES

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 FPM(2) Detail B) is used to separate a through lane that continues beyond the interchange from an adjacent mandatory exit lane.
4. Edge lines are not required in curb and gutter sections of frontage roads.
5. See FPM(1) for traffic lane line pavement marking details.



TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS SINGLE LANE DROP (EXIT ONLY) AND LANE REDUCTION DETAILS FPM(3)-22

FILE: fpm(3)-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
4-92 2-10	DIST	COUNTY	SHEET NO.	
5-00 2-12	FTW	ERATH, ETC.	17	
8-00 10-22				



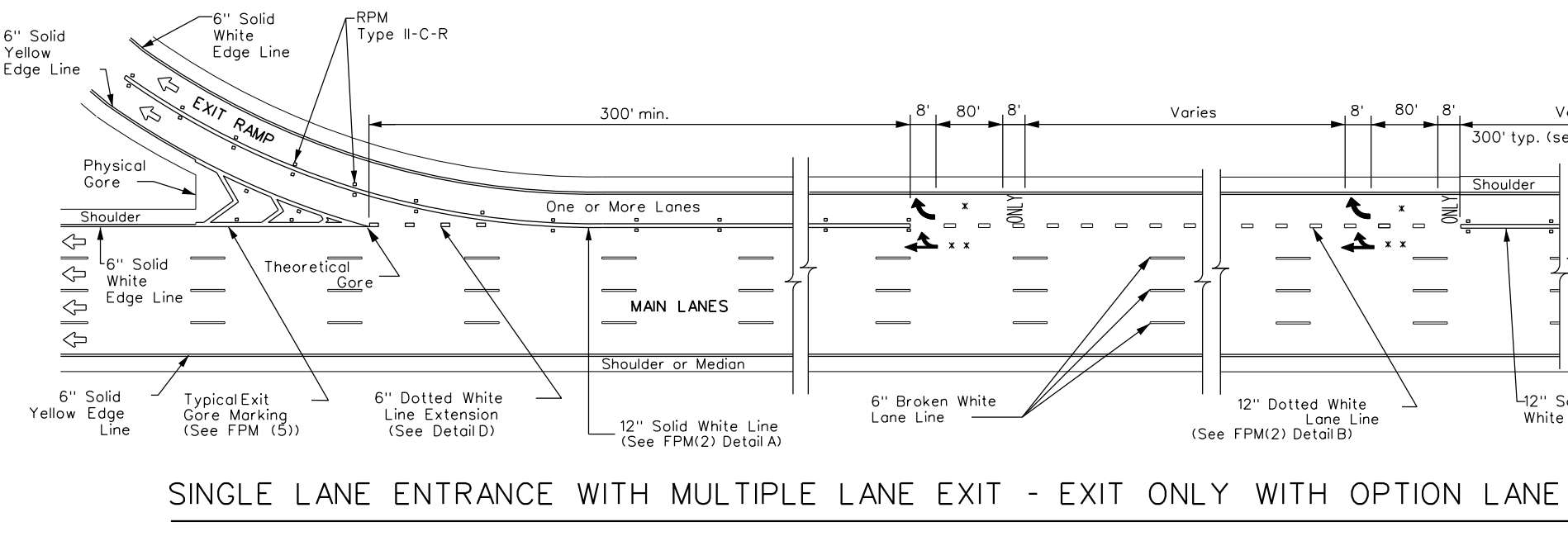
LEGEND	
↔	Traffic Flow
□	Reflectorized Raised Markers (RPM) Type II-C-R
↩	Pavement marking arrow (white)
*	Arrow markings are optional, however "ONLY" is required if arrow is used
* *	Arrow markings are optional

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.

- 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 FPM(2) Detail B) is used to separate a through lane that continues beyond the interchange from an adjacent mandatory exit lane.
 4. Edge lines are not required in curb and gutter sections of frontage roads.
 5. See FPM(1) for traffic lane line pavement marking details.

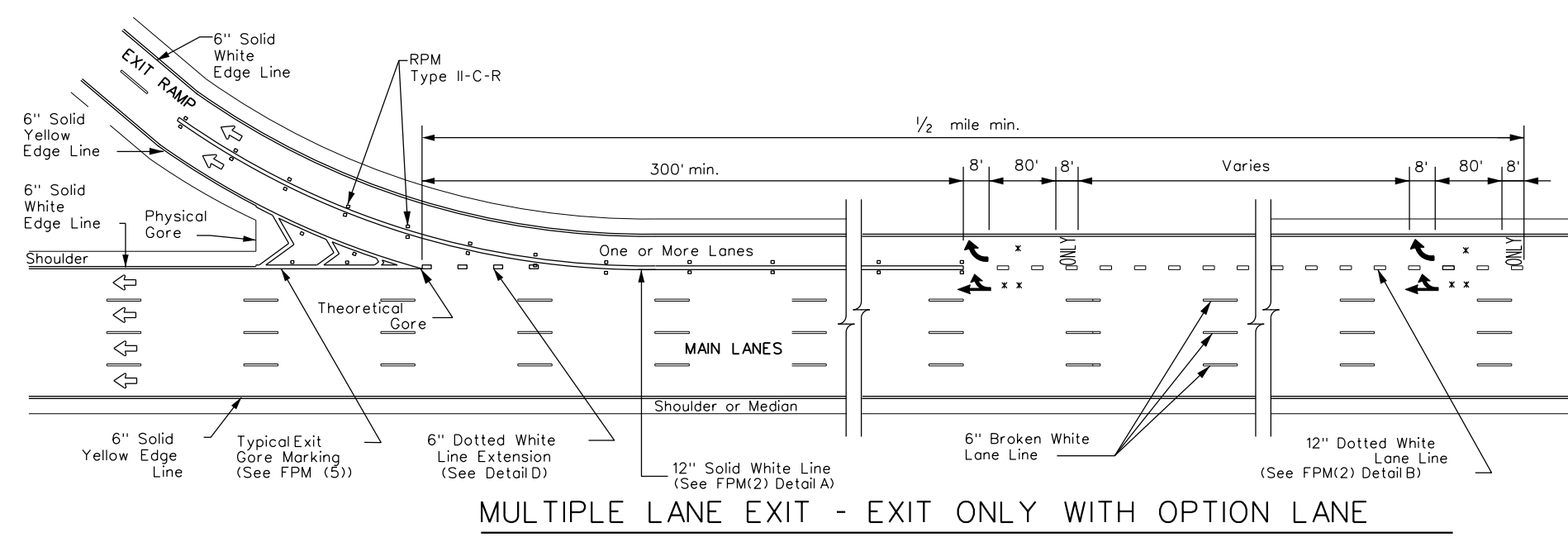
MULTIPLE LANE EXIT ONLY



NOTE

This design is used when an entrance ramp is followed by a dual lane exit ramp within 2400' downstream (theoretical gore to theoretical gore).

SINGLE LANE ENTRANCE WITH MULTIPLE LANE EXIT - EXIT ONLY WITH OPTION LANE



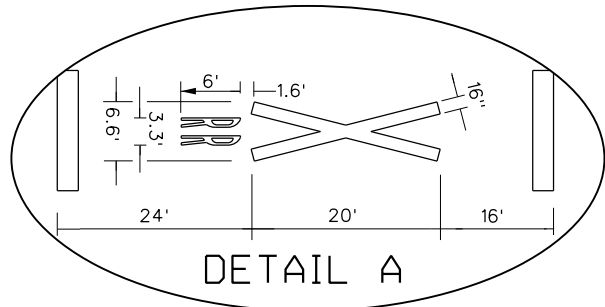
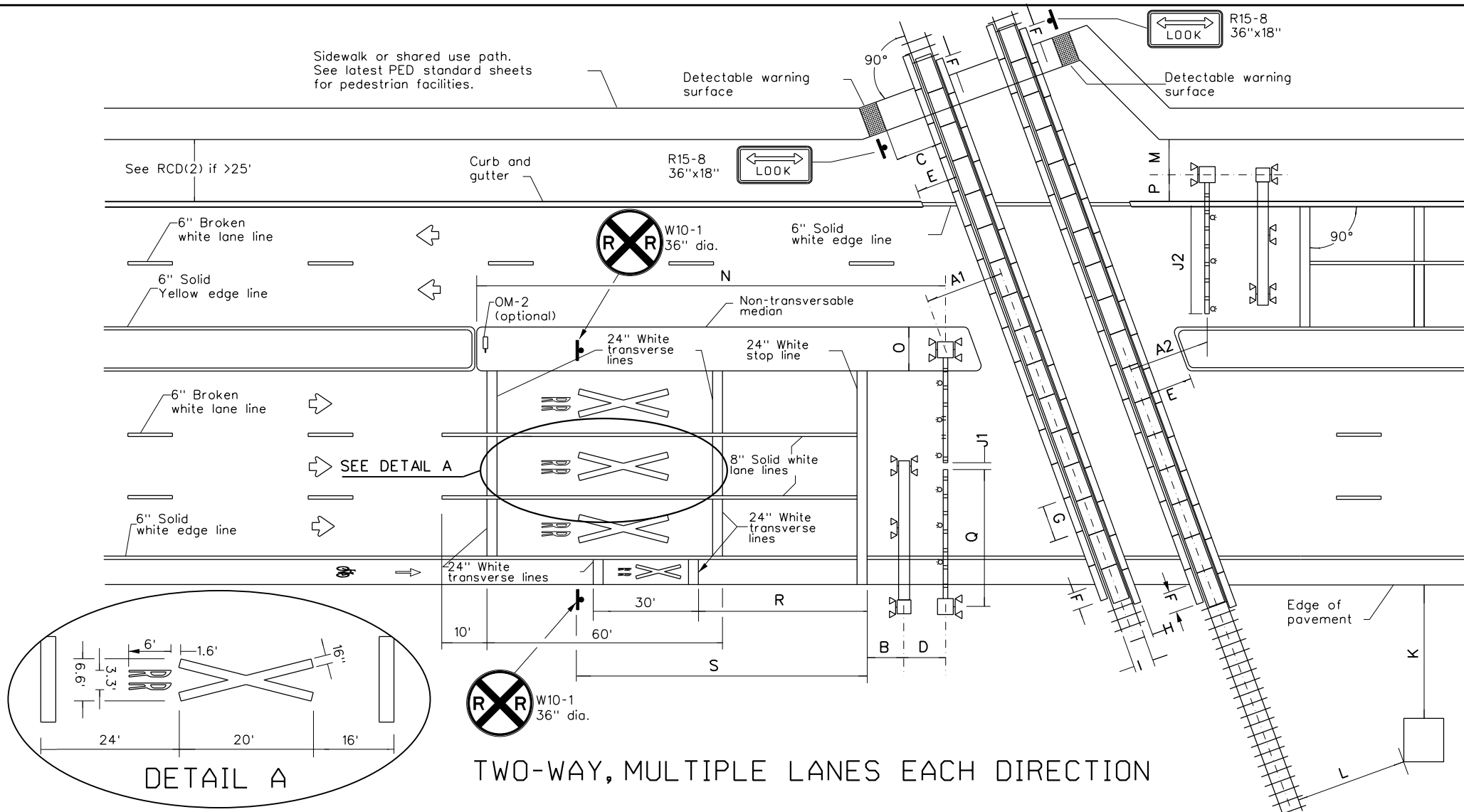
MULTIPLE LANE EXIT - EXIT ONLY WITH OPTION LANE

DATE:
FILE:

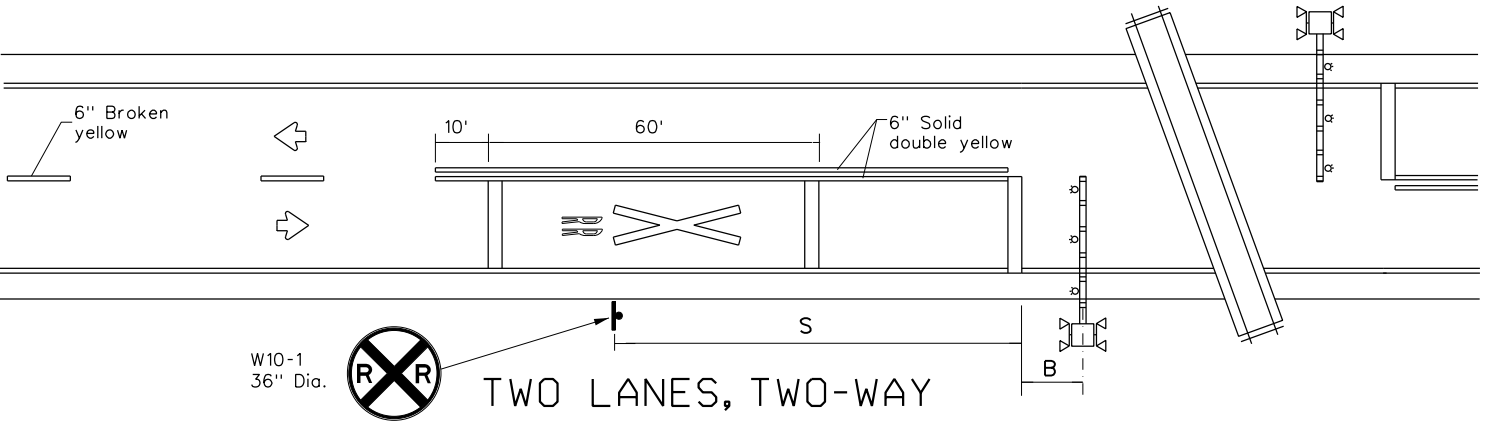
				Traffic Safety Division Standard	
TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS MULTIPLE LANE DROP (EXIT) DETAILS FPM(4)-22					
FILE: fpm(4)-22.dgn	DN:	CK:	DW:	CK:	
© TXDOT October 2022		CONT: 0250	SECT: 03	JOB: 051	HIGHWAY: US 281, ETC.
REVISIONS		DIST: FTW	COUNTY: ERATH, ETC.	SHEET NO. 18	
2-77	2-10				
5-00	2-12				
8-00	10-22				

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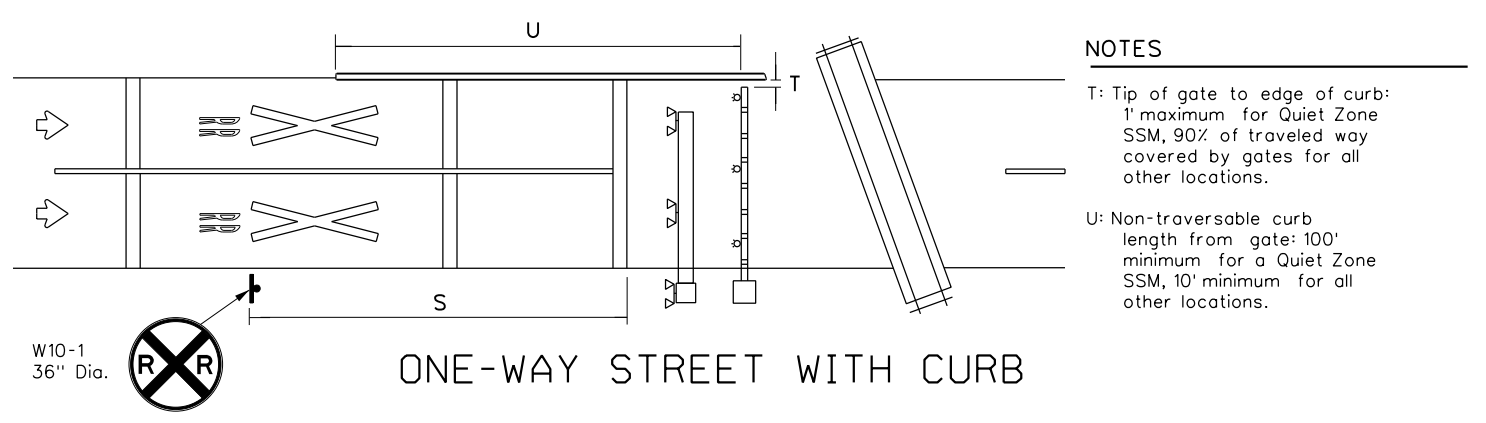
DATE: FILE:



TWO-WAY, MULTIPLE LANES EACH DIRECTION



TWO LANES, TWO-WAY



ONE-WAY STREET WITH CURB

NOTES

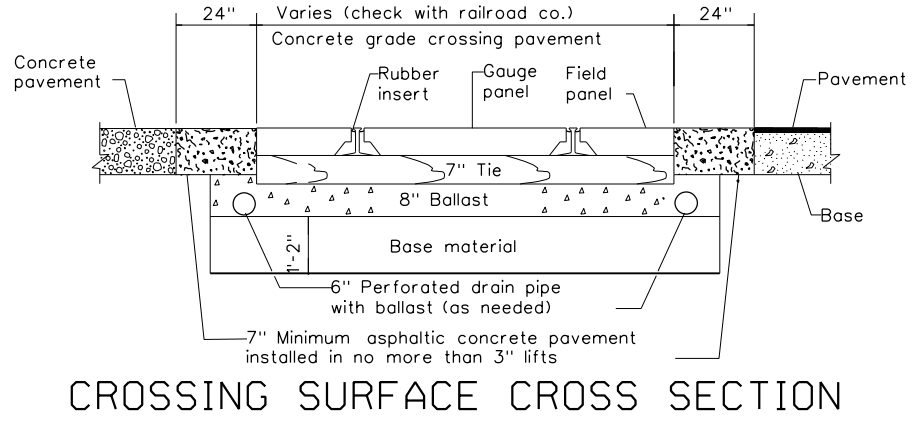
- T: Tip of gate to edge of curb: 1' maximum for Quiet Zone SSM, 90% of traveled way covered by gates for all other locations.
- U: Non-traversable curb length from gate: 100' minimum for a Quiet Zone SSM, 10' minimum for all other locations.

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

	Sign
	Object Marker
	Traffic Flow
	Cantilever
	Gate Assembly
	Mast Flasher Pair

GENERAL NOTES

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



CROSSING SURFACE CROSS SECTION

NOTES

- A1: Center of RR mast to center of rail: 12' minimum, 15' typical.
- A2: Tip of gate to center of rail: 12' minimum, 15' typical.
- B: Center of mast (cantilever, gate, or mast flasher) of nearest active traffic control device to stop line: 8' (NOTE: Stop line may be moved as needed, but should be at least 8' back from gates, if present).
- C: Near edge of detectable warning surface to nearest rail: 12' minimum.
- D: Center of gate mast to center of cantilever mast: 6' typical. NOTE: Cantilever may be located in front or behind gates.
- E: Edge of median or curb to nearest rail: 10' typical. NOTE: Design median edge to be parallel with rail.
- F: Edge of planking panel from edge of pavement or sidewalk: 3' minimum. NOTE: Field panels need not be in line with gauge panels.
- G: Length of panels along rail: 8' typical.
- H: Width of field panel: 2' typical (check with railroad company).
- I: Distance between rails: 4'- 8'1/2".
- J1: Tip of gate to tip of gate: 2' maximum.
- J2: 90% of traveled roadway to be covered by gate.
- K: Nearest edge of RR cabinet from edge of pavement: 30' typical. NOTE: Cabinet not required to be parallel to edge of pavement.
- L: Nearest edge of RR cabinet from nearest rail: 25' typical.
- M: Center of RR mast to edge of sidewalk: 6' minimum.
- N: Center of gate mast to leading edge of non-traversable median: 100' minimum to qualify as a Quiet Zone SSM. NOTE: 60' will suffice if there is a street intersection within the 100' and all street intersections within 60' are closed.
- O: Width of median for RR gate assembly: 8'-6" minimum, 10' typical when using median gates. NOTE: Center of gate mast minimum 4'-3" from face of curb.
- P: Center of RR mast to face of curb: 5'-3" minimum. Center of RR mast to edge of pavement (with shoulder): 7' minimum. Center of RR mast to edge of pavement (no shoulder): 9'-3" minimum. NOTE: Final location determined by the railroad company.
- Q: Gate length: 28' or less typical, but railroad company may allow up to 32' under special circumstances.
- R: Stop line to first RR Crossing transverse line (bike lane): 50' typical.
- S: Stop line to GRADE CROSSING ADVANCE WARNING (W10-1) sign and adjacent RR Crossing pavement markings. See Table 1. See RCD(2) for other signs.

Texas Department of Transportation
Traffic Safety Division Standard

RAILROAD CROSSING DETAILS

SIGNING, STRIPING, AND DEVICE PLACEMENT

RCD(1)-22

FILE: rcd1-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2022	CON: 0250	SECT: 03	JOB: 051	HIGHWAY: US 281, ETC.
2-16	DIST: FTW	COUNTY: ERATH, ETC.	SHEET NO. 19	

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).

<p>THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov</p>
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

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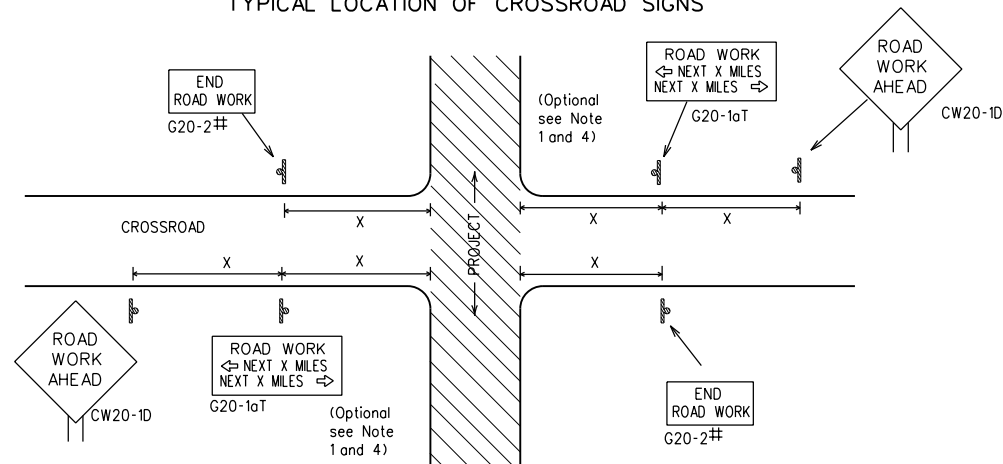
**BARRICADE AND CONSTRUCTION
 GENERAL NOTES
 AND REQUIREMENTS**

BC(1)-21

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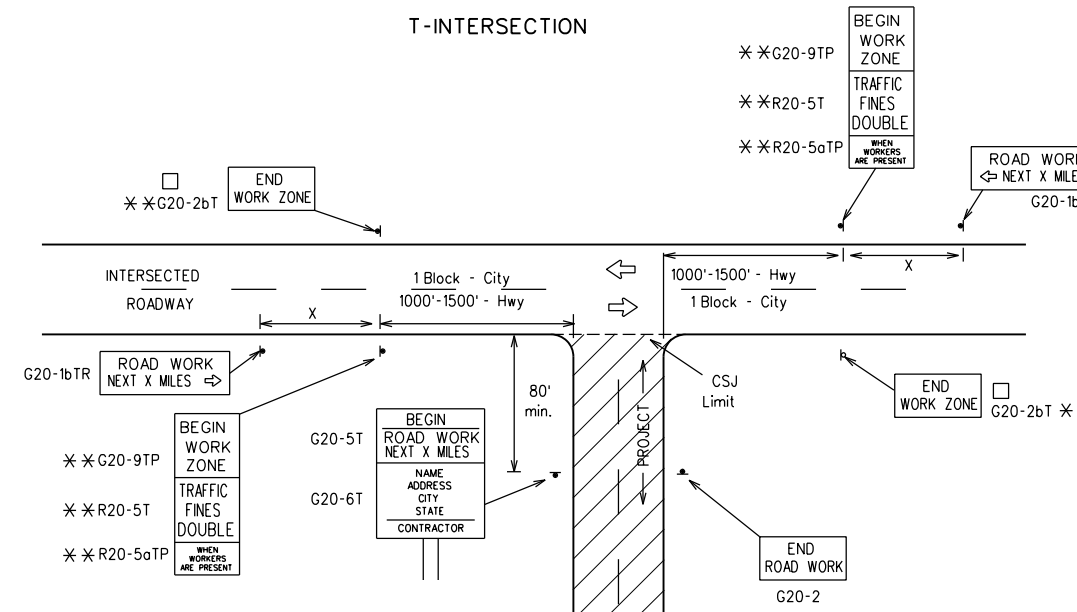
TYPICAL LOCATION OF CROSSROAD SIGNS



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

- 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.
- 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.
- 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.
- 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.
- Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
- 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

- 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.
- 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

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

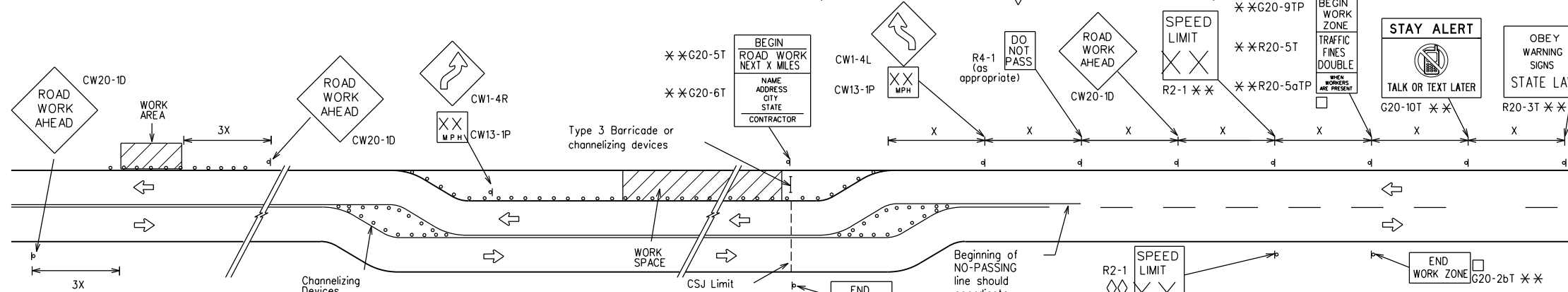
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

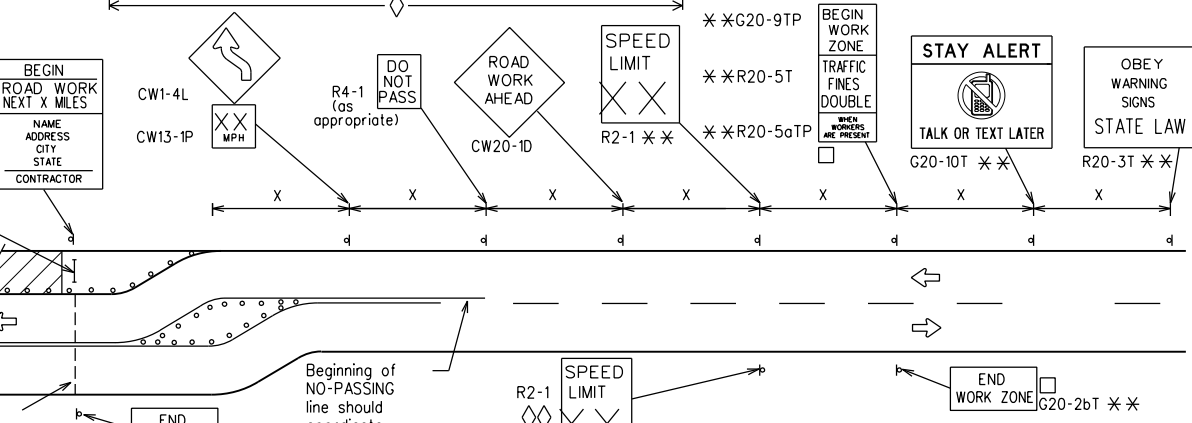
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be 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".
- Only diamond shaped warning sign sizes are indicated.
- See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

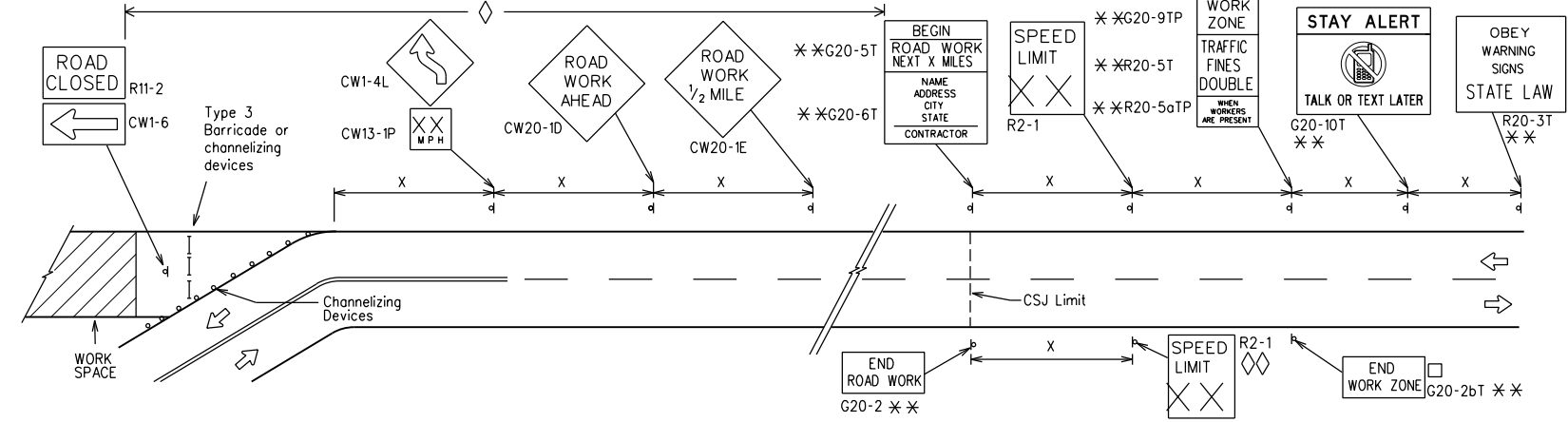
SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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.

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



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



BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

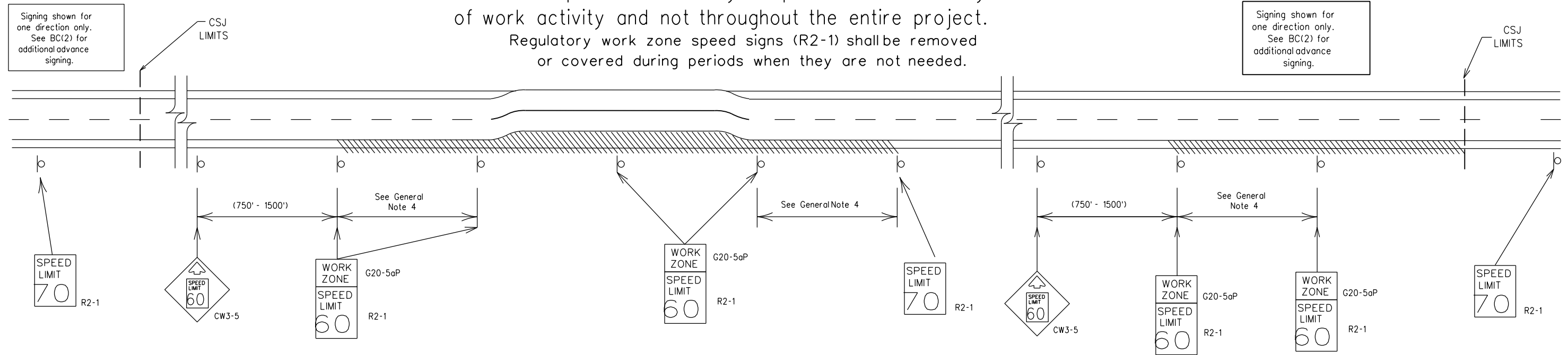
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- 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

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- 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
- Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
- 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.
- Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
- Techniques that may help reduce traffic speeds include but are not limited to:
 - Law enforcement.
 - Flagger stationed next to sign.
 - Portable changeable message sign (PCMS).
 - Low-power (drone) radar transmitter.
 - Speed monitor trailers or signs.
- Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
- 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.

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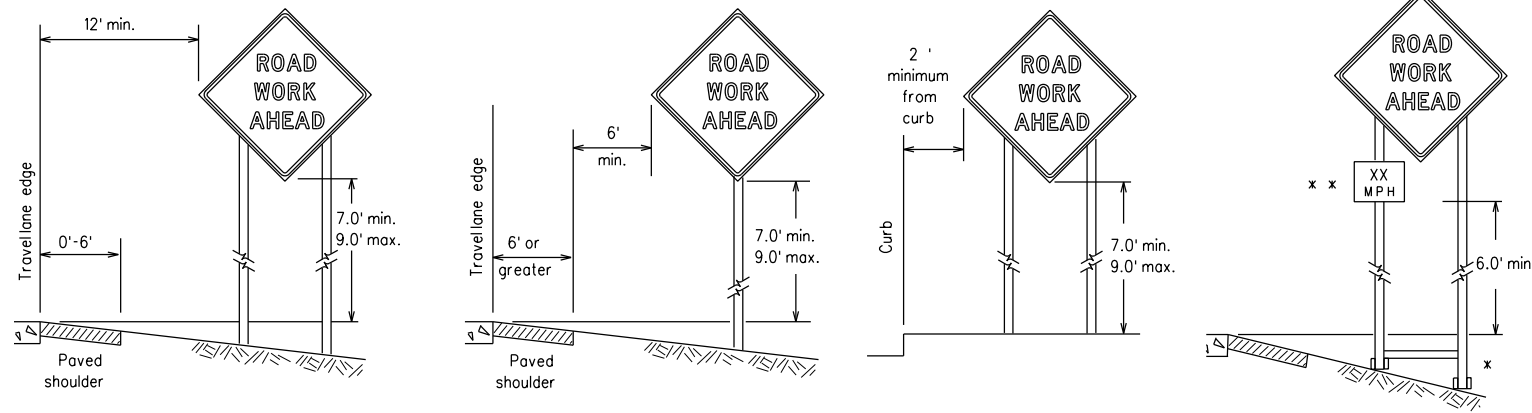


BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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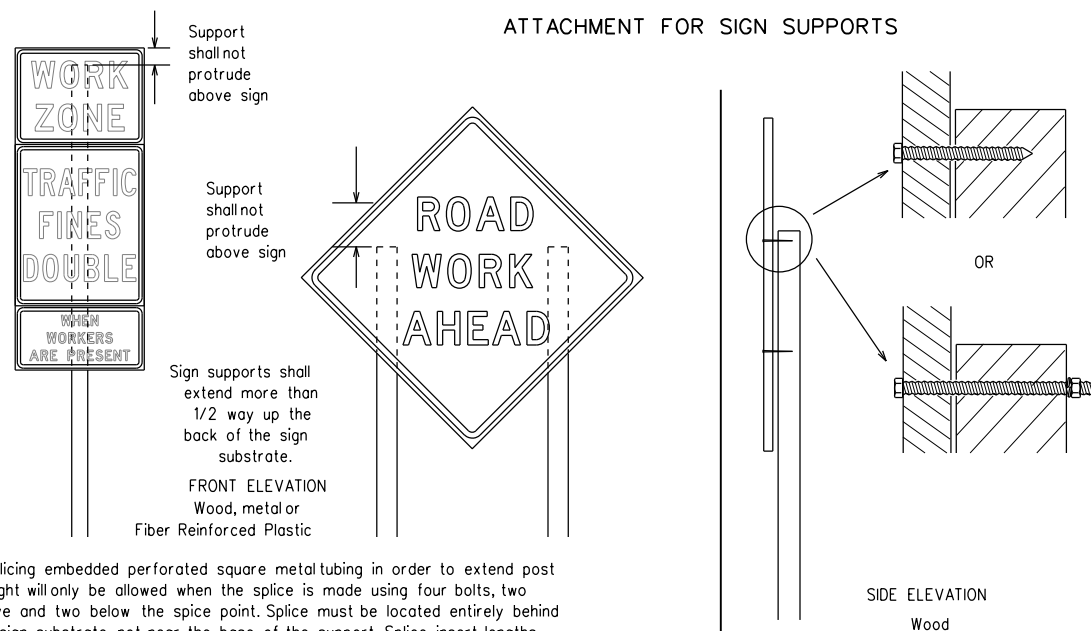
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



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

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

ATTACHMENT FOR SIGN SUPPORTS

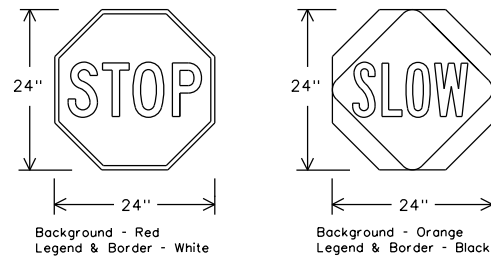


Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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



BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

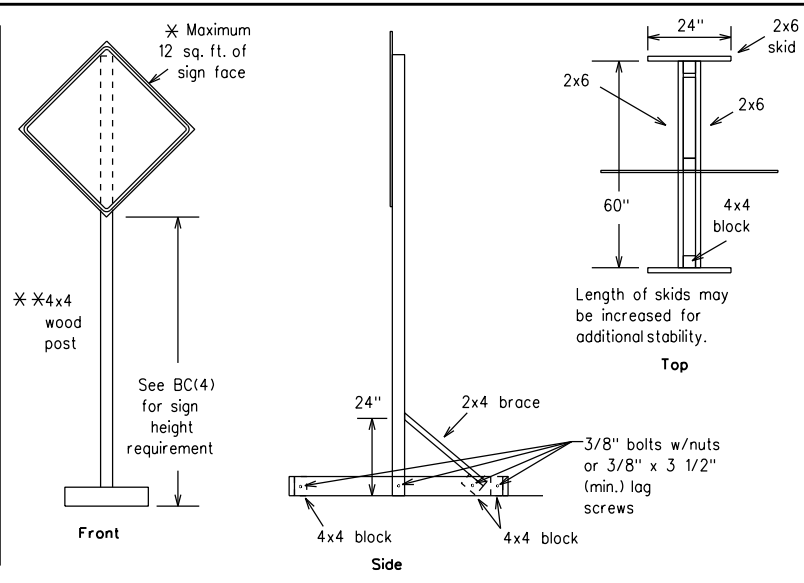
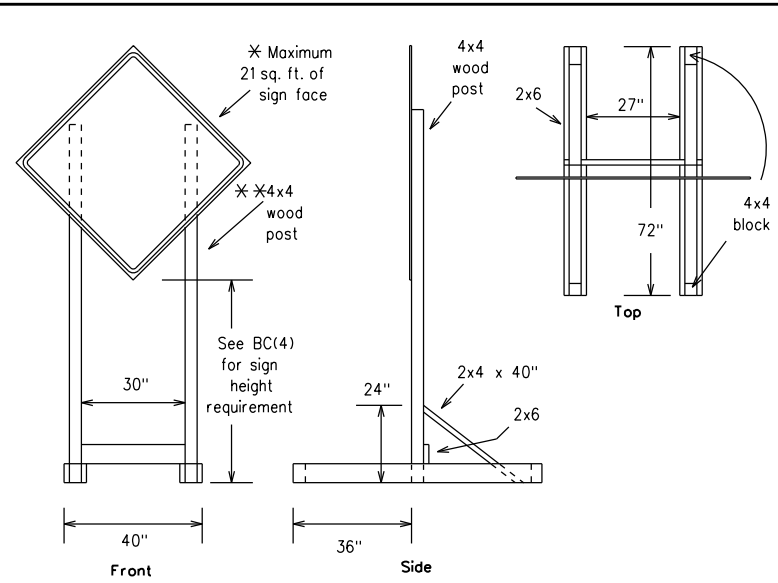
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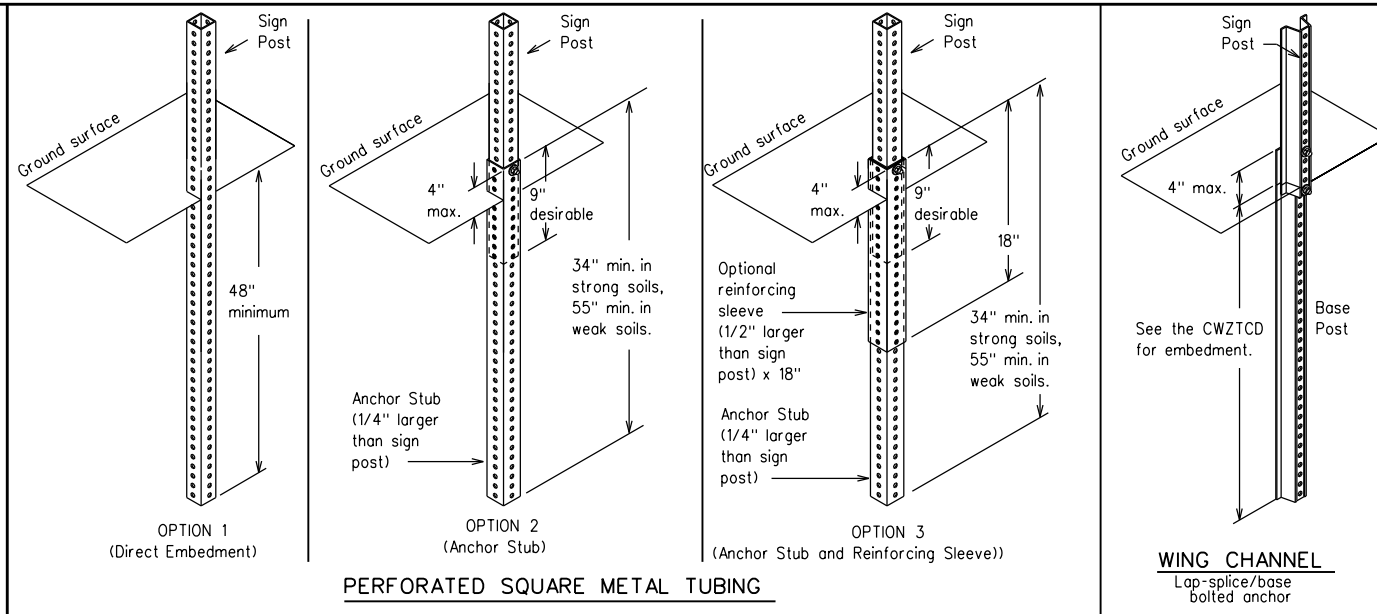
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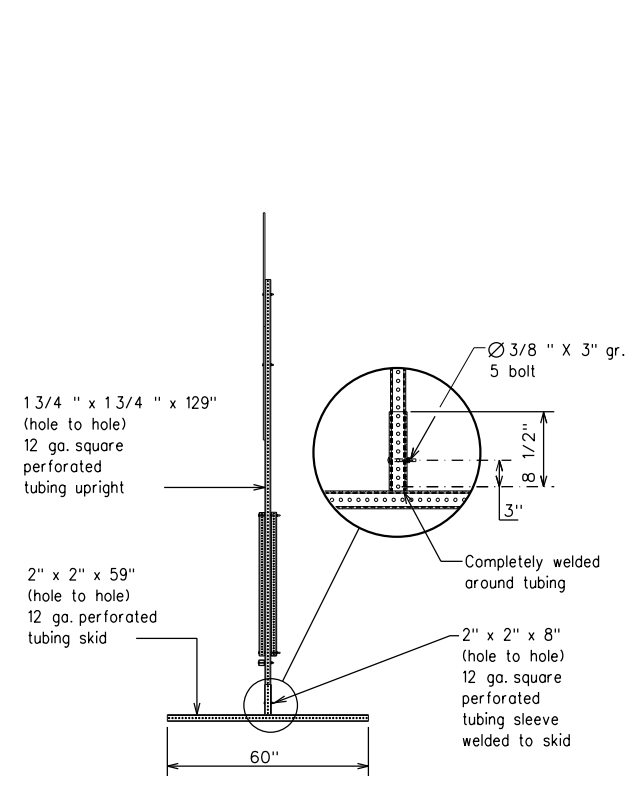
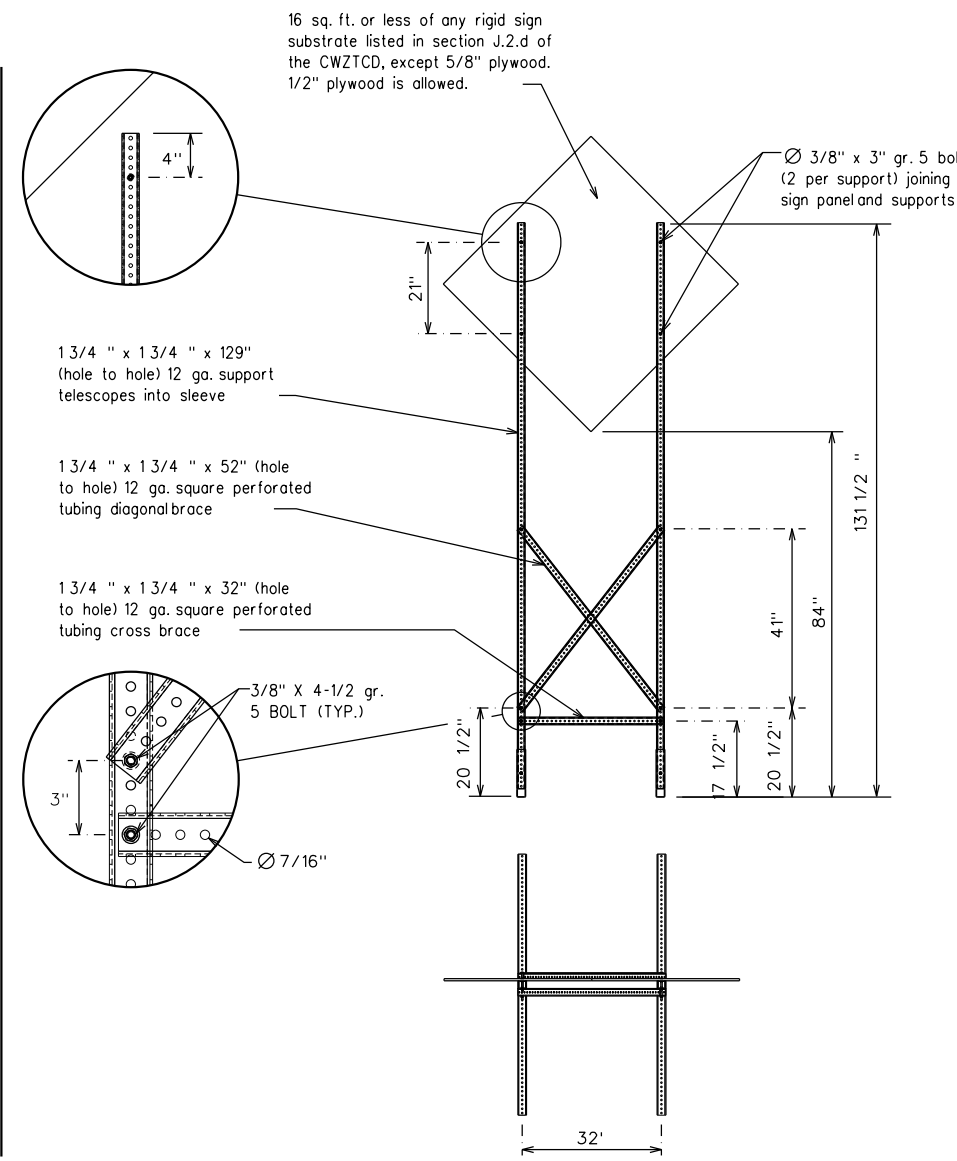
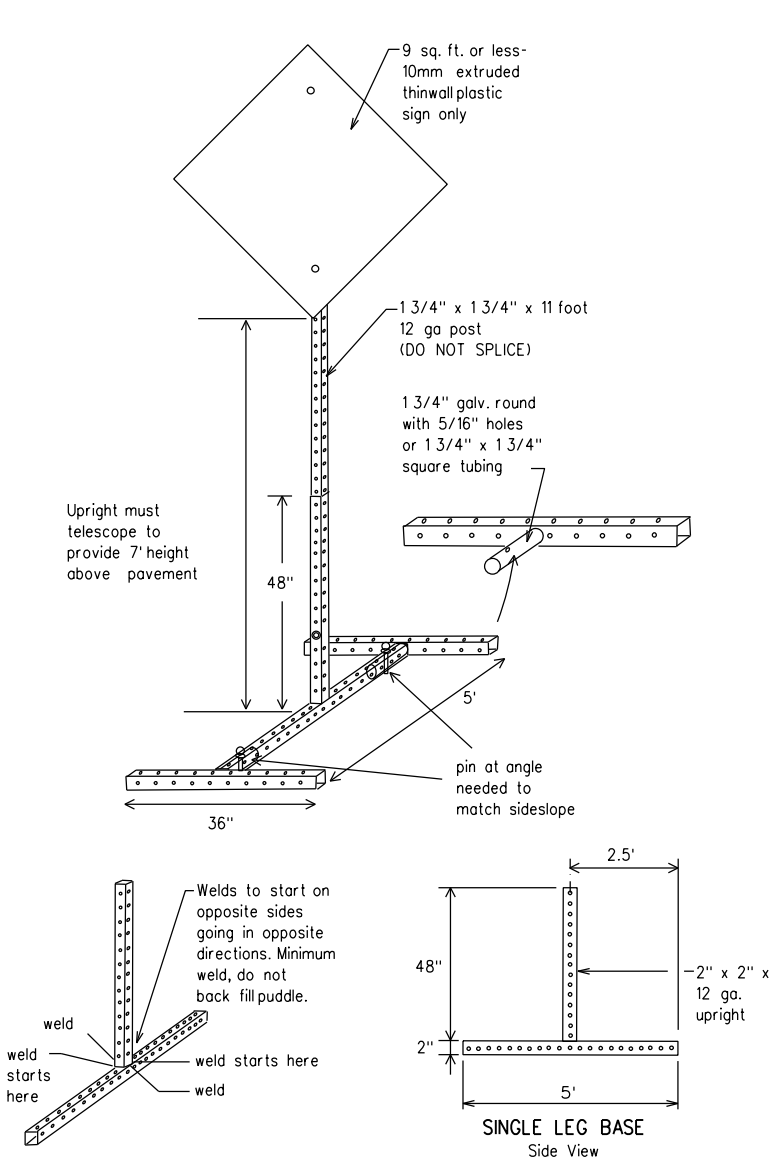
SKID MOUNTED WOOD SIGN SUPPORTS

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



GROUND MOUNTED SIGN SUPPORTS

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



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

- Nails may be used in the assembly of wooden sign supports, but 3/8 inch bolts with nuts or 3/8 inch x 1 1/2 inch lag screws must be used on every joint for final connection.
 - No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
 - 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



BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

PORTABLE CHANGEABLE MESSAGE SIGNS

- The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
- 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.
- 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.
- Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
- Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
- When in use, the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
- 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.
- 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.
- Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
- 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.
- Do not use the word "Danger" in message.
- Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
- Do not display messages that scroll horizontally or vertically across the face of the sign.
- 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.
- 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.
- Each line of text should be centered on the message board rather than left or right justified.
- 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.

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WORD OR PHRASE	ABBREVIATION	WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD	Major	MAJ
Alternate	ALT	Miles	MI
Avenue	AVE	Miles Per Hour	MPH
Best Route	BEST RTE	Minor	MNR
Boulevard	BLVD	Monday	MON
Bridge	BRDG	Normal	NORM
Cannot	CANT	North	N
Center	CTR	Northbound	(route) N
Construction Ahead	CONST AHD	Parking	PKING
CROSSING	XING	Road	RD
Detour Route	DETOUR RTE	Right Lane	RT LN
Do Not	DONT	Saturday	SAT
East	E	Service Road	SERV RD
Eastbound	(route) E	Shoulder	SHLDR
Emergency	EMER	Slippery	SLIP
Emergency Vehicle	EMER VEH	South	S
Entrance, Enter	ENT	Southbound	(route) S
Express Lane	EXP LN	Speed	SPD
Expressway	EXPWY	Street	ST
XXXX Feet	XXXX FT	Sunday	SUN
Fog Ahead	FOG AHD	Telephone	PHONE
Freeway	FRWY, FWY	Temporary	TEMP
Freeway Blocked	FWY BLKD	Thursday	THURS
Friday	FRI	To Downtown	TO DWNTN
Hazardous Driving	HAZ DRIVING	Traffic	TRAF
Hazardous Material	HAZMAT	Travelers	TRVLR
High-Occupancy Vehicle	HOV	Tuesday	TUES
Highway	Hwy	Time Minutes	TIME MIN
Hour(s)	HR, HRS	Upper Level	UPR LEVEL
Information	INFO	Vehicles (s)	VEH, VEHS
It Is	ITS	Warning	WARN
Junction	JCT	Wednesday	WED
Left	LFT	Weight Limit	WT LIMIT
Left Lane	LFT LN	West	W
Lane Closed	LN CLOSED	Westbound	(route) W
Lower Level	LWR LEVEL	Wet Pavement	WET PVMT
Maintenance	MAINT	Will Not	WONT

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

FREEWAY CLOSED X MILE
ROAD CLOSED AT SH XXX
ROAD CLSD AT FM XXXX
RIGHT X LANES CLOSED
CENTER LANE CLOSED
NIGHT LANE CLOSURES
VARIOUS LANES CLOSED
EXIT CLOSED
MALL DRIVEWAY CLOSED
XXXXXXXX BLVD CLOSED

Other Condition List

FRONTAGE ROAD CLOSED
SHOULDER CLOSED XXX FT
RIGHT LN CLOSED XXX FT
RIGHT X LANES OPEN
DAYTIME LANE CLOSURES
I-XX SOUTH EXIT CLOSED
EXIT XXX CLOSED X MILE
RIGHT LN TO BE CLOSED
X LANES CLOSED TUE - FRI
ROADWORK XXX FT
FLAGGER XXXX FT
RIGHT LN NARROWS XXXX FT
MERGING TRAFFIC XXXX FT
LOOSE GRAVEL XXXX FT
DETOUR X MILE
ROADWORK PAST SH XXXX
BUMP XXXX FT
TRAFFIC SIGNAL XXXX FT
ROAD REPAIRS XXXX FT
LANE NARROWS XXXX FT
TWO-WAY TRAFFIC XX MILE
CONST TRAFFIC XXX FT
UNEVEN LANES XXXX FT
ROUGH ROAD XXXX FT
ROADWORK NEXT FRI-SUN
US XXX EXIT X MILES
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
DETOUR NEXT X EXITS
USE EXIT XXX
STAY ON US XXX SOUTH
TRUCKS USE US XXX N
WATCH FOR TRUCKS
EXPECT DELAYS
REDUCE SPEED XXX FT
USE OTHER ROUTES
STAY IN LANE

FORM X LINES RIGHT
USE XXXXX RD EXIT
USE EXIT I-XX NORTH
USE I-XX E TO I-XX N
WATCH FOR TRUCKS
EXPECT DELAYS
PREPARE TO STOP
END SHOULDER USE
WATCH FOR WORKERS

Location List

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

Warning List

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

* * Advance Notice List

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

* * See Application Guidelines Note 6.

APPLICATION GUIDELINES

- Only 1 or 2 phases are to be used on a PCMS.
- The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
- A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
- A Location Phase is necessary only if a distance or location is not included in the first phase selected.
- If two PCMS are used in sequence, they must be separated by a minimum of 1000 ft. Each PCMS should be limited to two phases, and should be understandable by themselves.
- 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

- The words RIGHT, LEFT and ALL can be interchanged as appropriate.
- Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
- EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
- Highway names and numbers replaced as appropriate.
- ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
- AHEAD may be used instead of distances if necessary.
- FT and MI, MILE and MILES interchanged as appropriate.
- AT, BEFORE and PAST interchanged as needed.
- 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

- 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.
- 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.
- 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.
- 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.

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BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

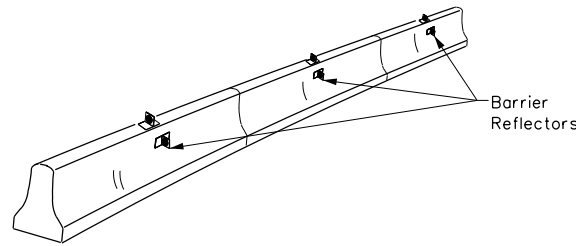
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© TxDOT November 2002	CONT SECT	JOB	HIGHWAY	
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9-07 8-14	DIST	COUNTY	SHEET NO.	
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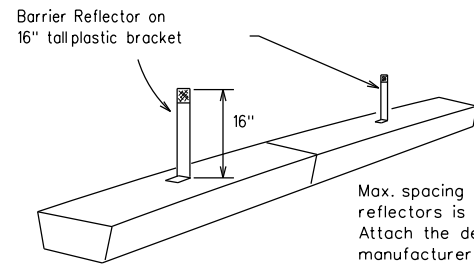
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



CONCRETE TRAFFIC BARRIER (CTB)

- 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.
- 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.
- When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
- Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
- Maximum spacing of Barrier Reflectors is forty (40) feet.
- Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
- Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
- Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
- Single slope barriers shall be delineated as shown on the above detail.



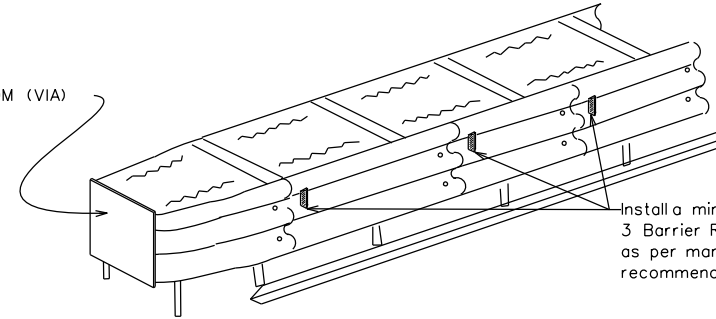
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

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

LOW PROFILE CONCRETE BARRIER (LPCB)

See D & OM (VIA)



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.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

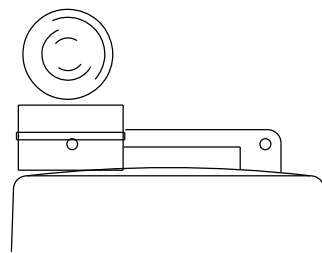
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet 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.
- 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".
- The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
- 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.
- 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.
- The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

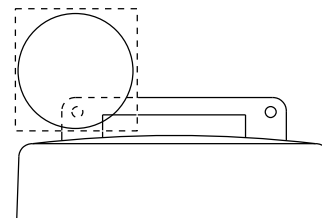
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing 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.
- 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.
- Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
- Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
- 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

- 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.
- 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.
- The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
- Round reflectors shall be fully reflectorized, including the area where attached to the drum.
- 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.
- 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.
- When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
- The warning reflector should be mounted on the side of the handle nearest approaching traffic.
- The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.



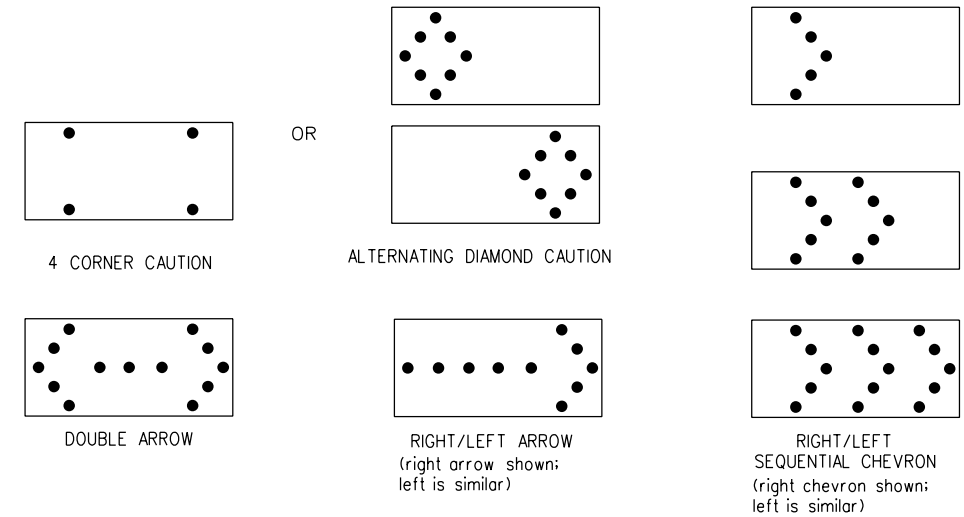
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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.

- 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.
- 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.
- 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.
- The Flashing Arrow Board should be able to display the following symbols:



- The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
- The straight line caution display is NOT ALLOWED.
- 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.
- 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.
- The sequential arrow display is NOT ALLOWED.
- The flashing arrow display is the TxDOT standard; however, the sequential chevron display may be used during daylight operations.
- The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
- A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
- 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.
- 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

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
- Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
- Refer to the CWZTCD for a list of approved TMAs.
- TMAs are required on freeways unless otherwise noted in the plans.
- 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.
- The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.



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

BC(7)-21

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GENERAL NOTES

- For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
- 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.
- 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.
- 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).
- 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.
- 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:

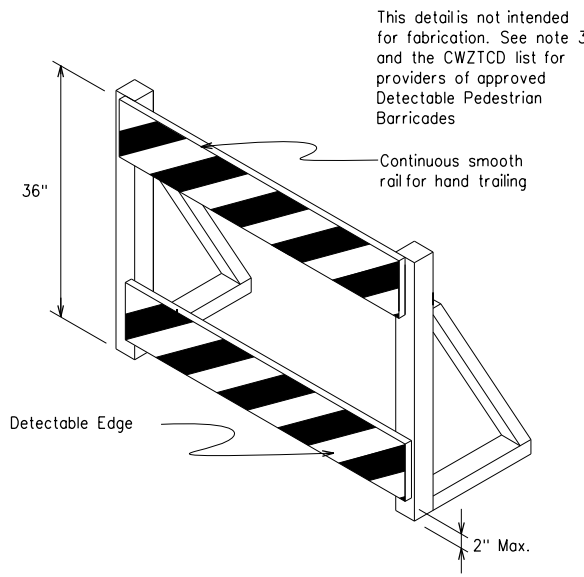
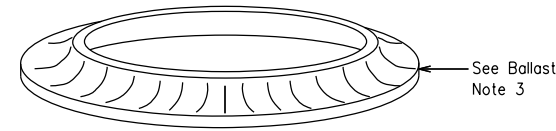
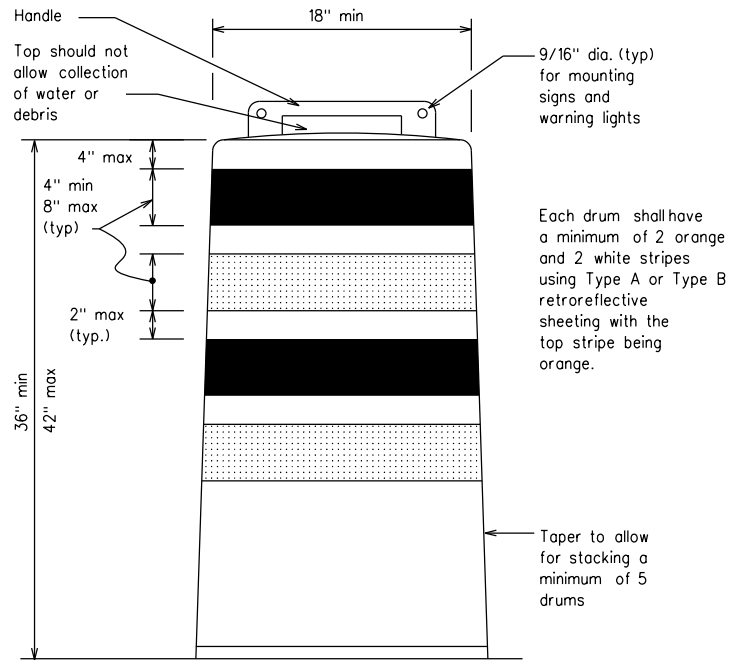
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
- 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.
- 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.
- 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.
- 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.
- 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.
- Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
- Drum body shall have a maximum unballasted weight of 11 lbs.
- Drum and base shall be marked with manufacturer's name and model number.

RETROREFLECTIVE SHEETING

- 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.
- 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.

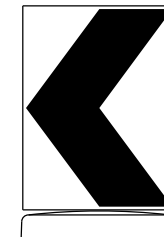
BALLAST

- 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.
- 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.
- Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
- 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.
- 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.
- Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.

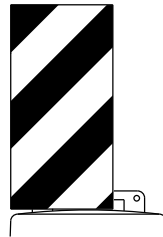


DETECTABLE PEDESTRIAN BARRICADES

- 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.
- 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.
- 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.
- 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.
- Warning lights shall not be attached to detectable pedestrian barricades.
- 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

- Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
- Chevrons and other work zone signs with an orange background shall be manufactured with Type B or Type C Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
- 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.
- 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.
- Signs shall be installed using a 1/2 inch (nominal) and nut, two washers, and one locking washer for each connection.
- Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
- 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.
- 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



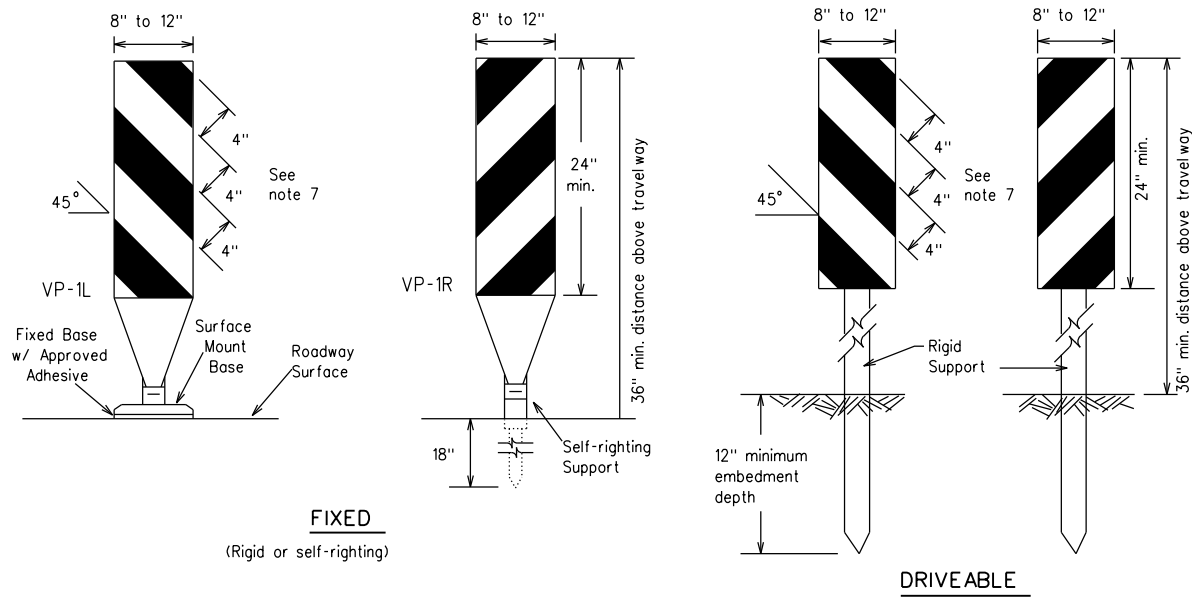
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

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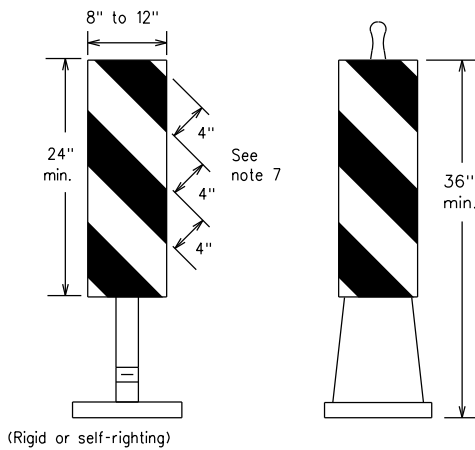
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FIXED
(Rigid or self-righting)

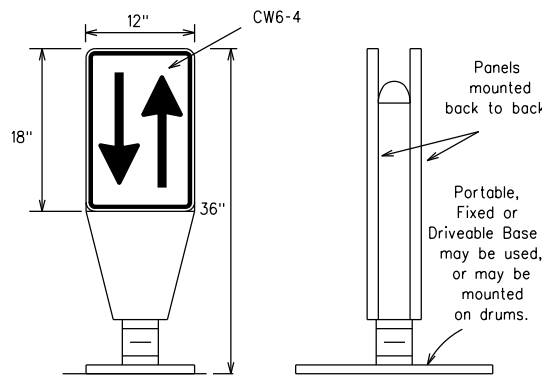
DRIVEABLE



PORTABLE

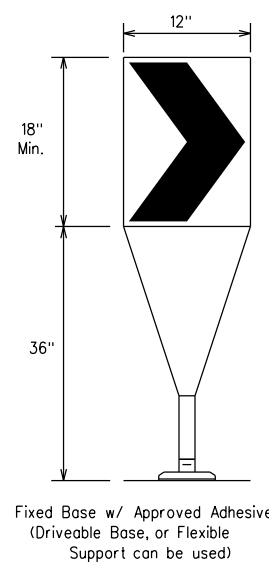
VERTICAL PANELS (VPs)

- Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
- 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.
- 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.
- VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
- Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- Sheeting for the VP's shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
- Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.



OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

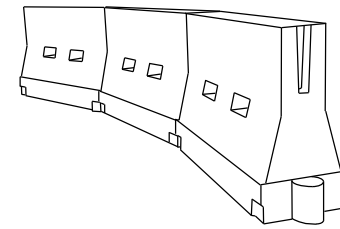
- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
- The OTLD may be used in combination with 42" cones or VP's.
- Spacing between the OTLD shall not exceed 500 feet. 42" cones or VP's placed between the OTLD's should not exceed 100 foot spacing.
- 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.



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

- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- 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.
- 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.
- To be effective, the chevron should be visible for at least 500 feet.
- 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.
- For Long Term Stationary use on tapers or transitions on freeways and divided highways, self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

- 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.
- LCDs may be used instead of a line of cones or drums.
- LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
- LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
- 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

- 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.
- 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.
- 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.
- 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.
- When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

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

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

GENERAL NOTES

- 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).
- 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.
- 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).
- 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.
- Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
- 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.
- The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.

Posted Speed	Formula	Minimum Desirable Taper Lengths x x			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent
30	L = 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'

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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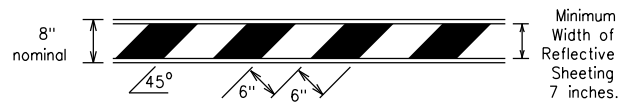
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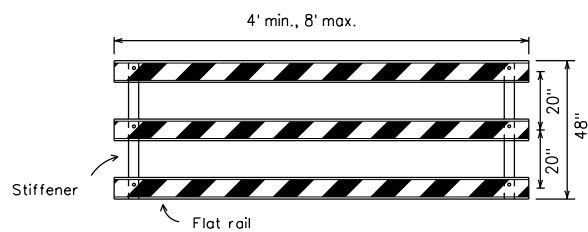
TYPE 3 BARRICADES

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.

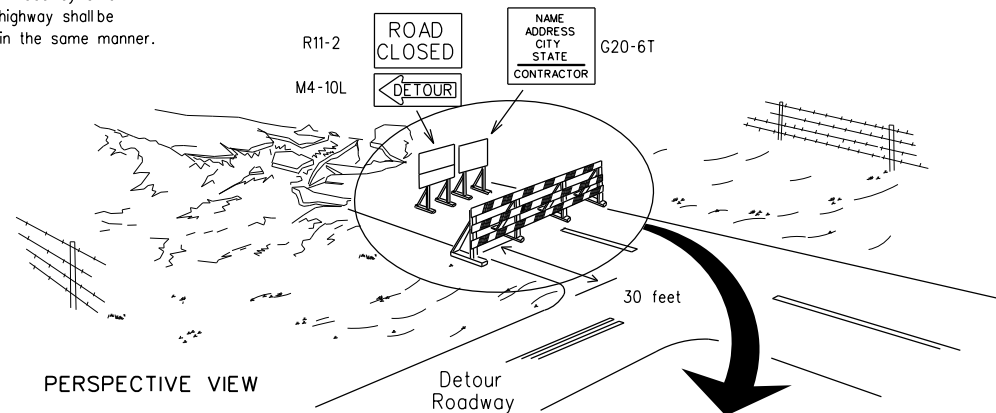


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

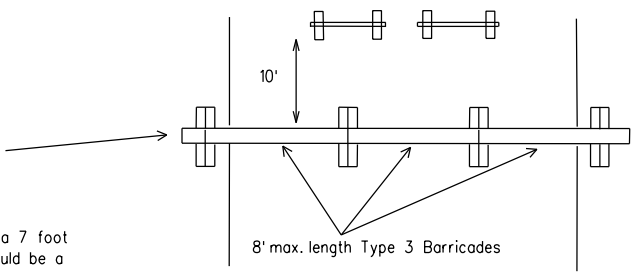
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

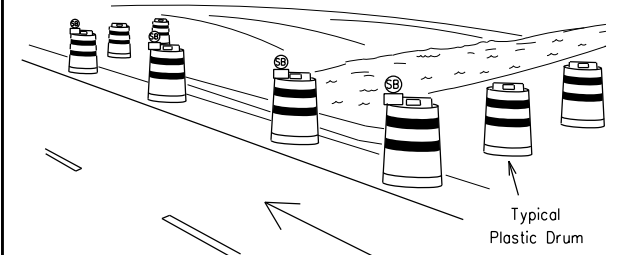
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.

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.

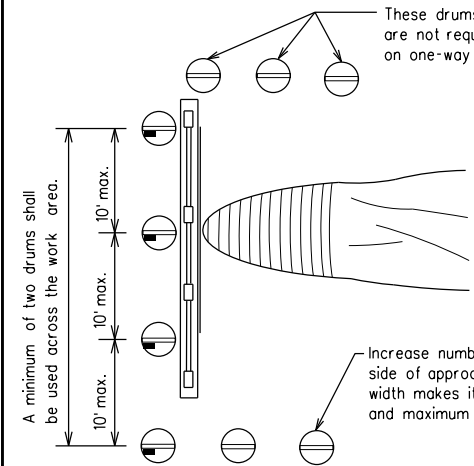


PLAN VIEW

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

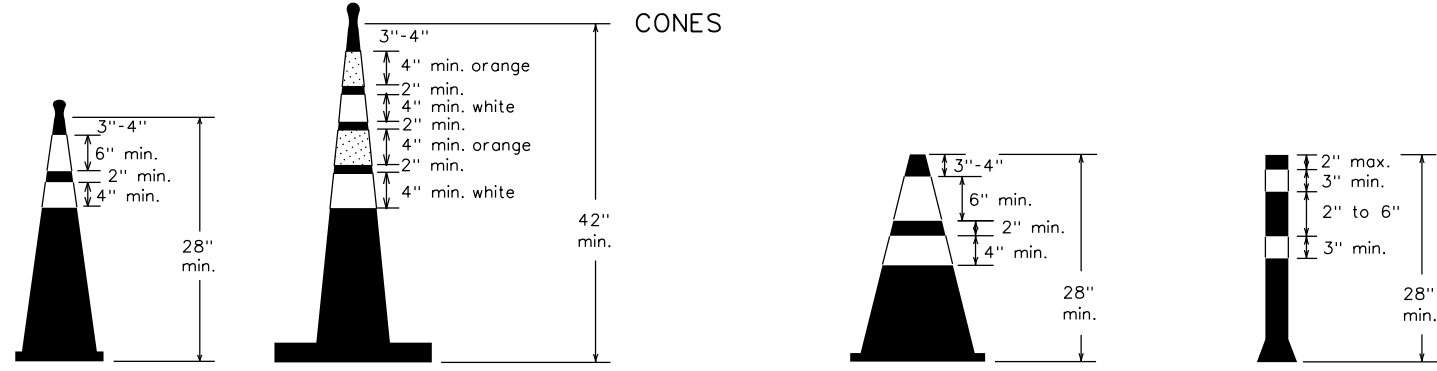


PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

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

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

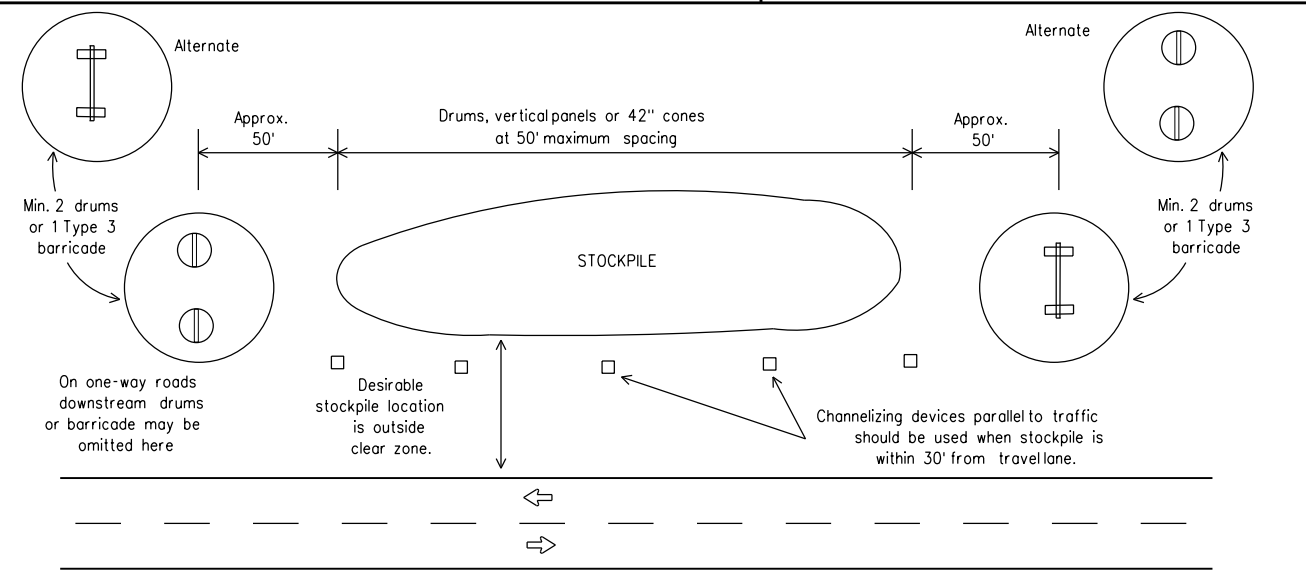


Two-Piece cones

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.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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.



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

- 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.
- Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- Additional supplemental pavement marking details may be found in the plans or specifications.
- Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
- 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).
- 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.
- All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

- Raised pavement markers are to be placed according to the patterns on BC(12).
- 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

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

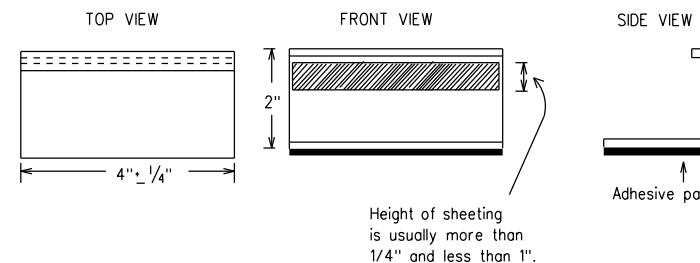
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
- 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.
- 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.
- 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

- 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.
- 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.
- 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".
- The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
- Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
- Blast cleaning may be used but will not be required unless specifically shown in the plans.
- Over-painting of the markings SHALL NOT BE permitted.
- Removal of raised pavement markers shall be as directed by the Engineer.
- 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.
- 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**

- Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
- 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.
 - 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.
 - 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.
- Small design variances may be noted between tab manufacturers.
- 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

- Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
- All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
- 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).

SHEET 11 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

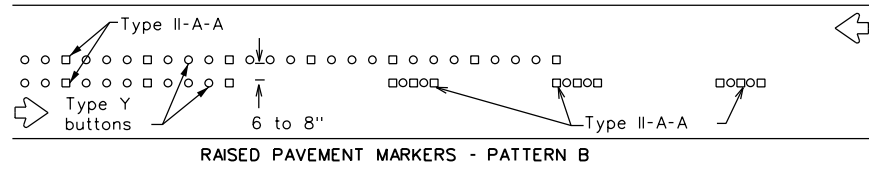
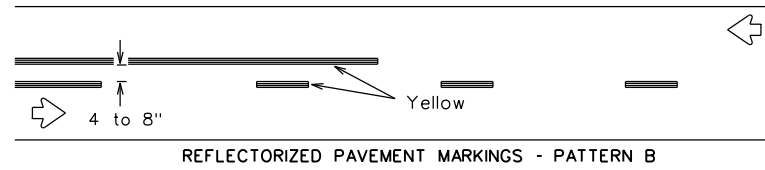
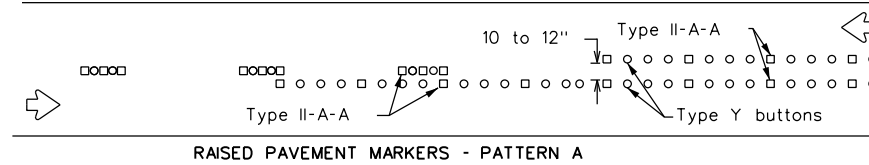
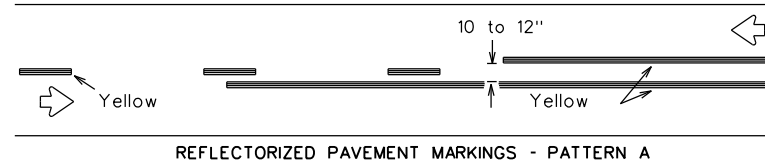
BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS		0250	03	051
2-98	9-07	5-21		US 281, ETC.
1-02	7-13			
11-02	8-14			
	DIST	COUNTY	SHEET NO.	
	FTW	ERATH, ETC.	31	

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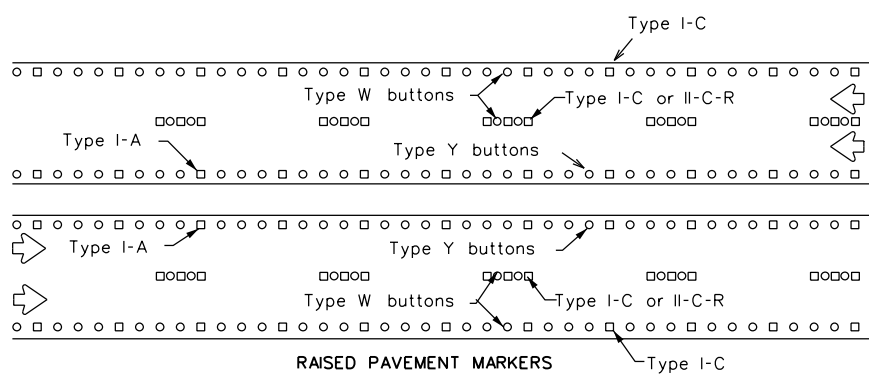
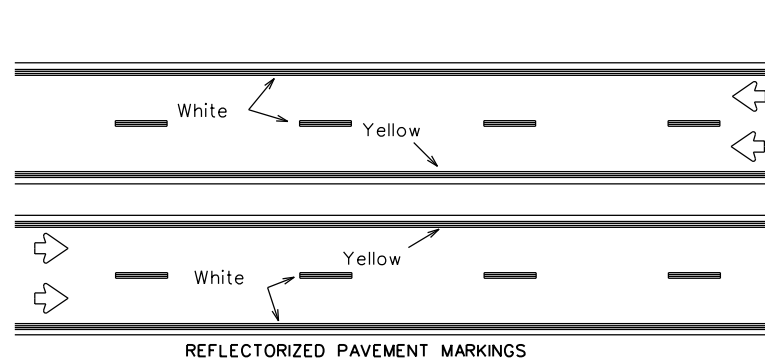
DATE:
FILE:

PAVEMENT MARKING PATTERNS



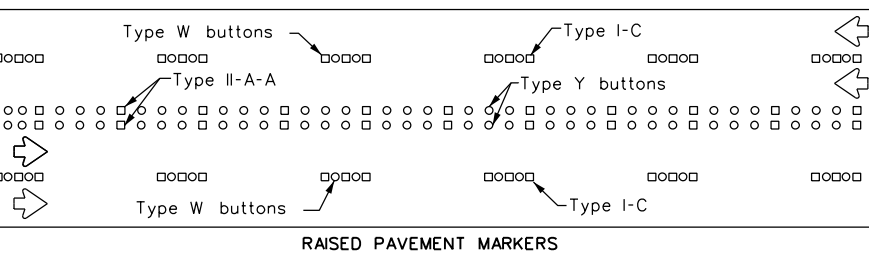
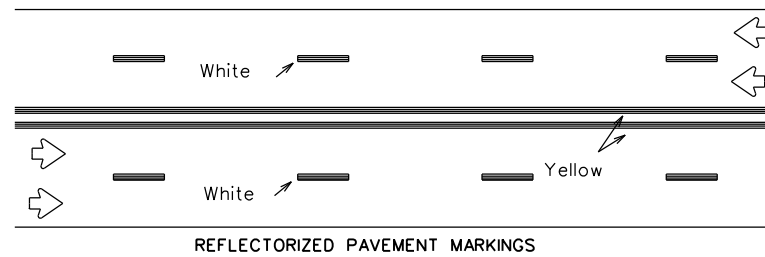
Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectORIZED pavement markings.

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



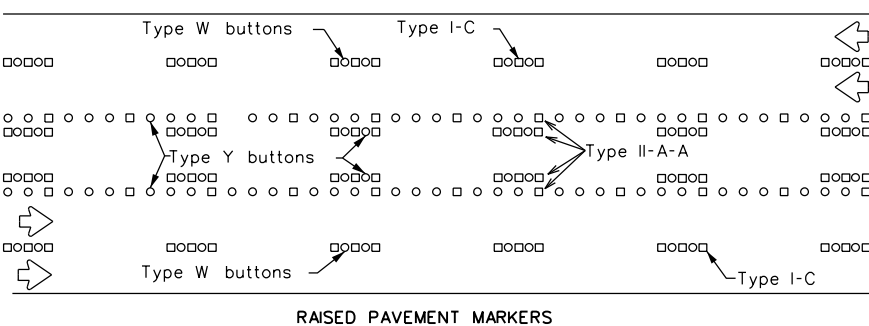
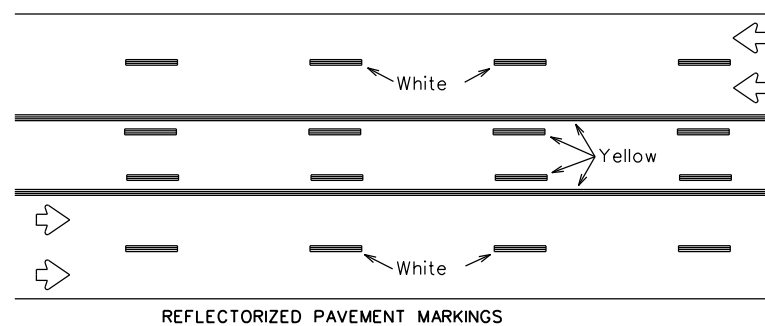
Prefabricated markings may be substituted for reflectORIZED pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



Prefabricated markings may be substituted for reflectORIZED pavement markings.

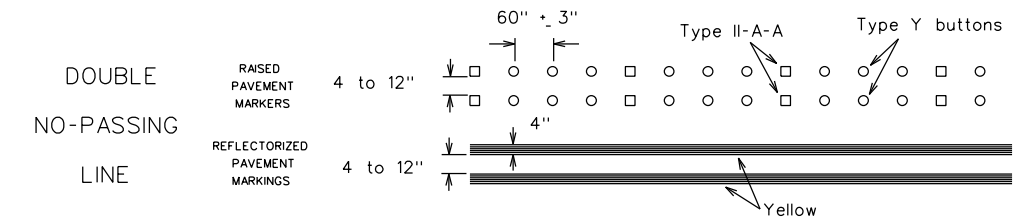
LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



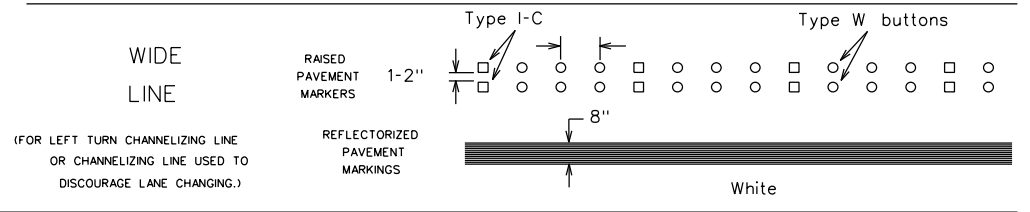
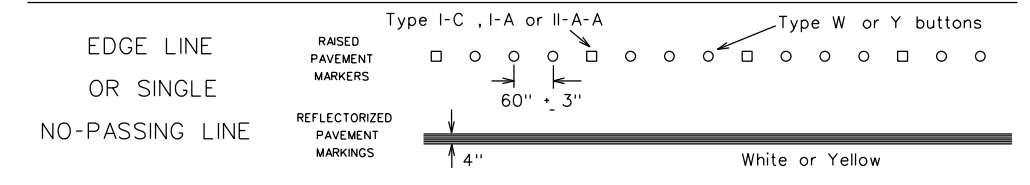
Prefabricated markings may be substituted for reflectORIZED pavement markings.

TWO-WAY LEFT TURN LANE

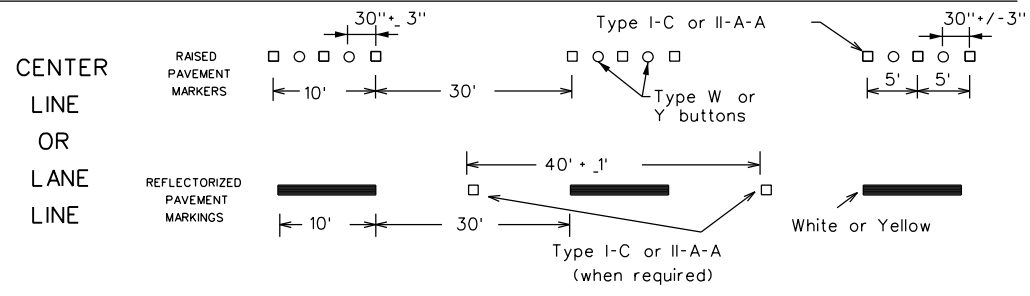
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



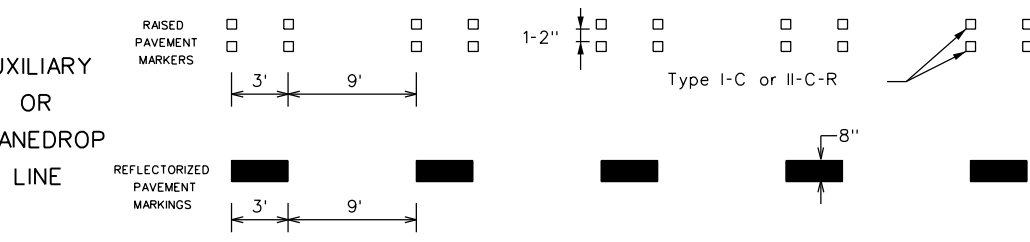
SOLID LINES



BROKEN LINES

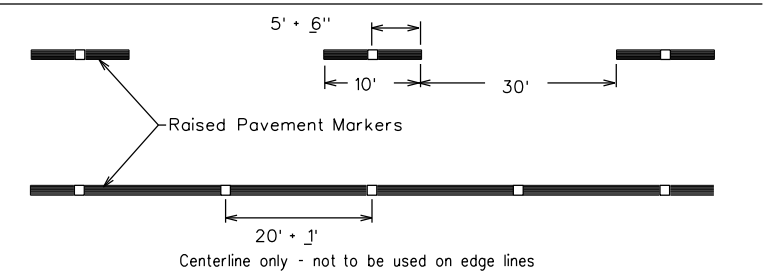


AUXILIARY OR LANEDROP LINE



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.



SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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."

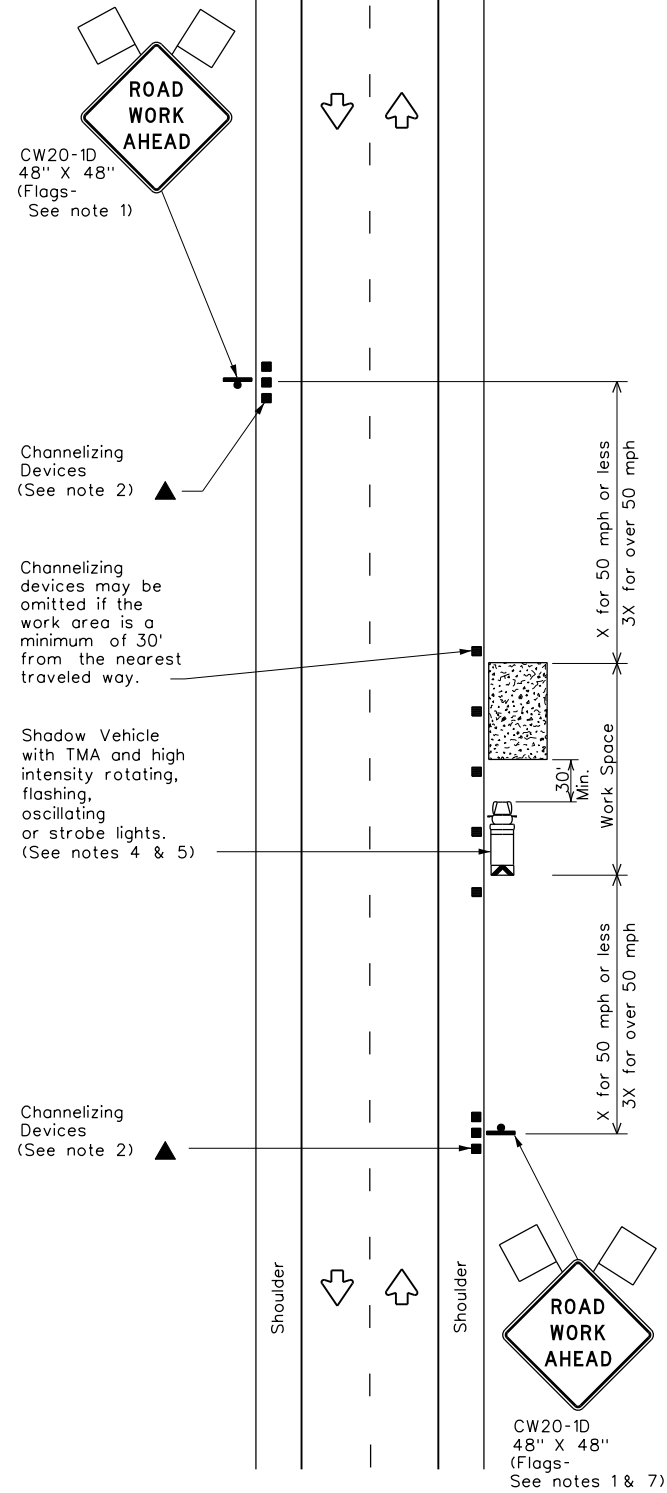
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©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
1-97 9-07 5-21	DIST	COUNTY	SHEET NO.	
2-98 7-13	FTW	ERATH, ETC.	32	
11-02 8-14				

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DATE: FILE:

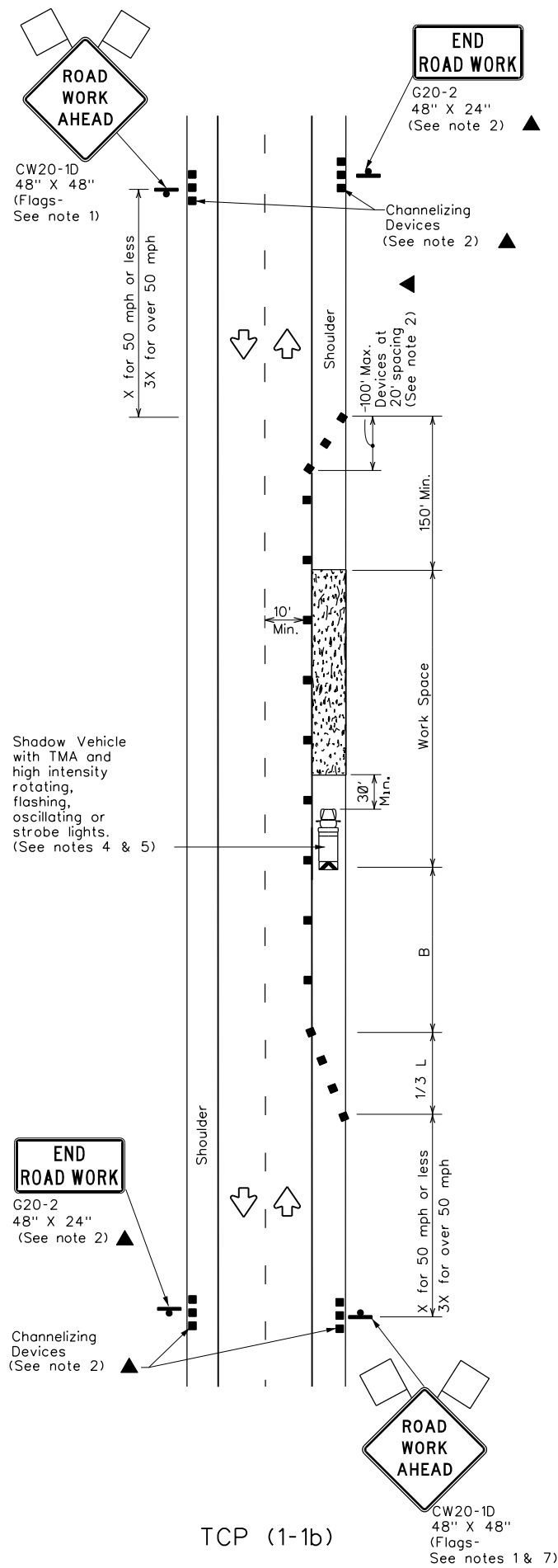
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: FILE:



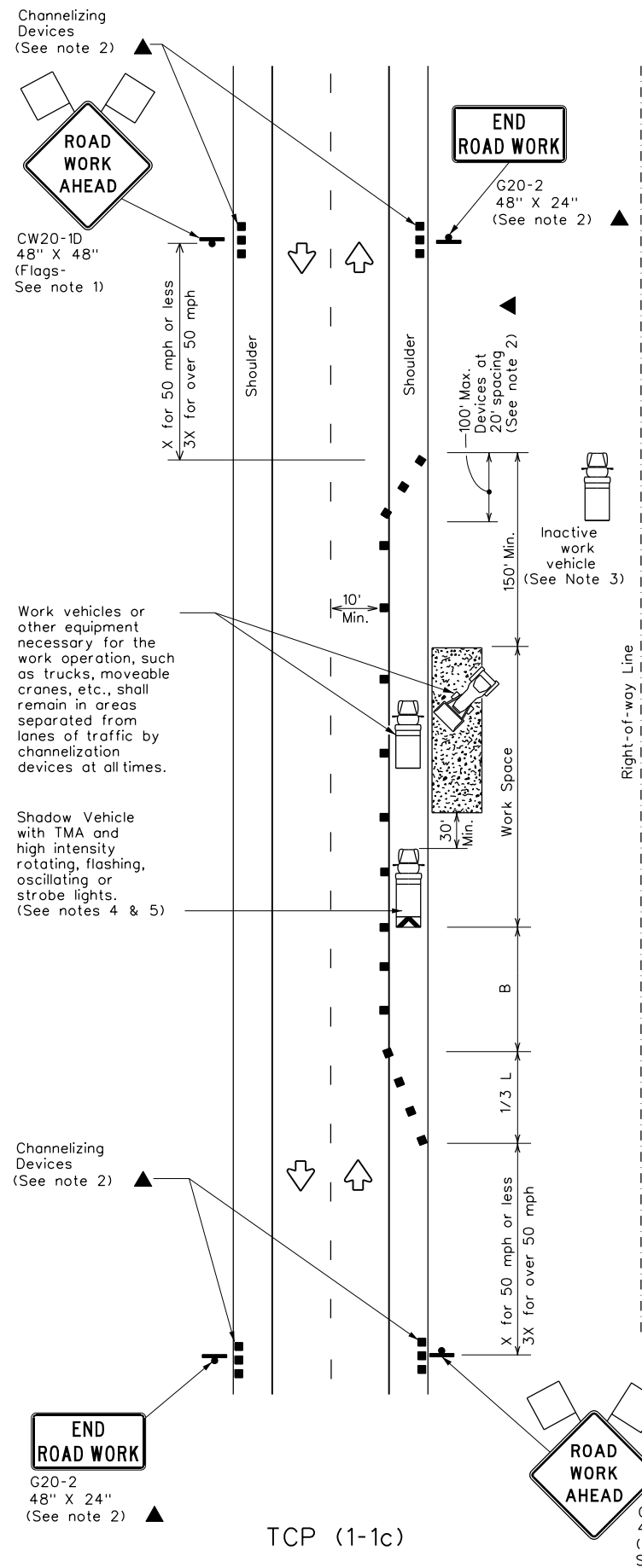
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths x x			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	L = 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

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



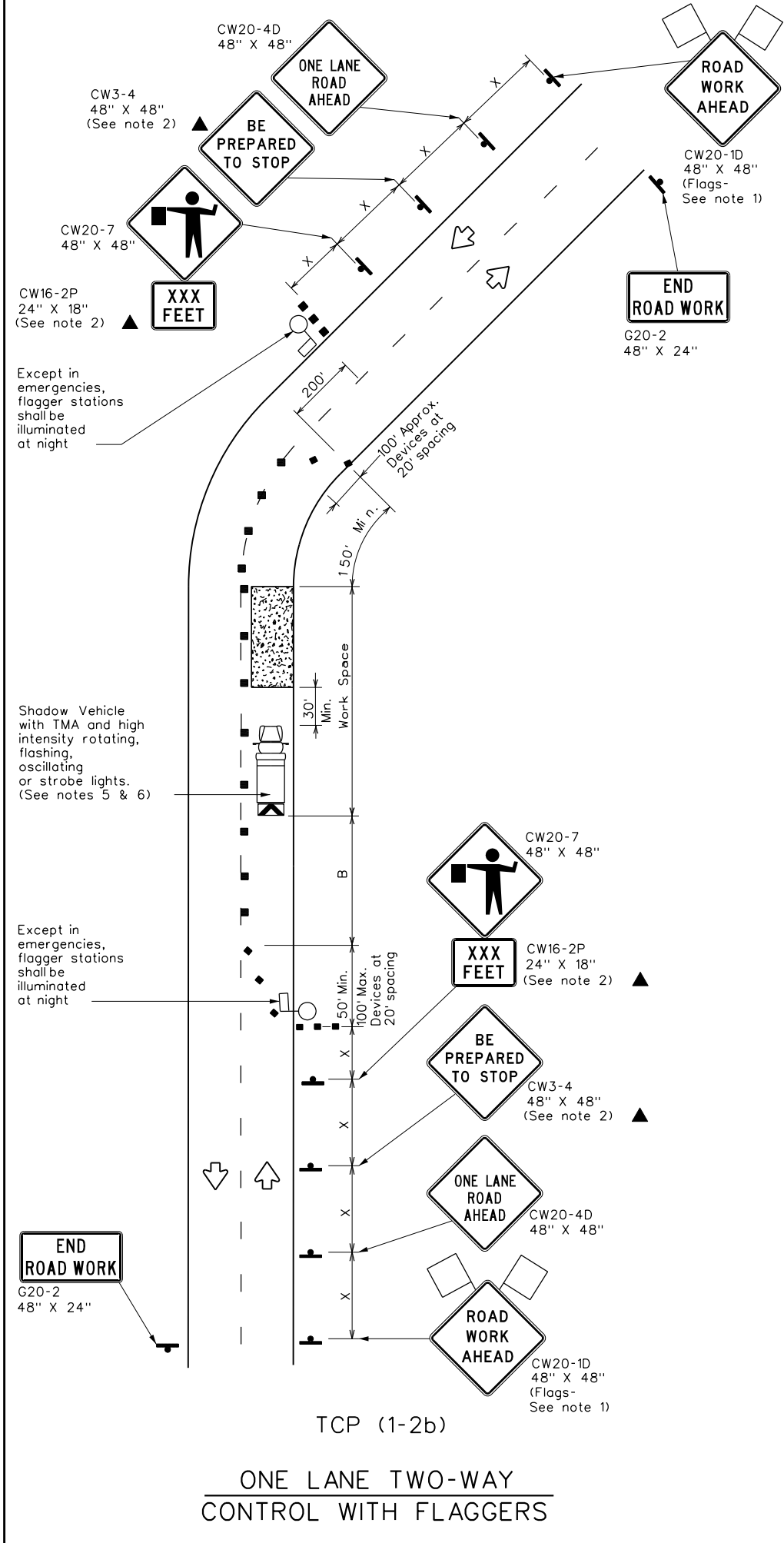
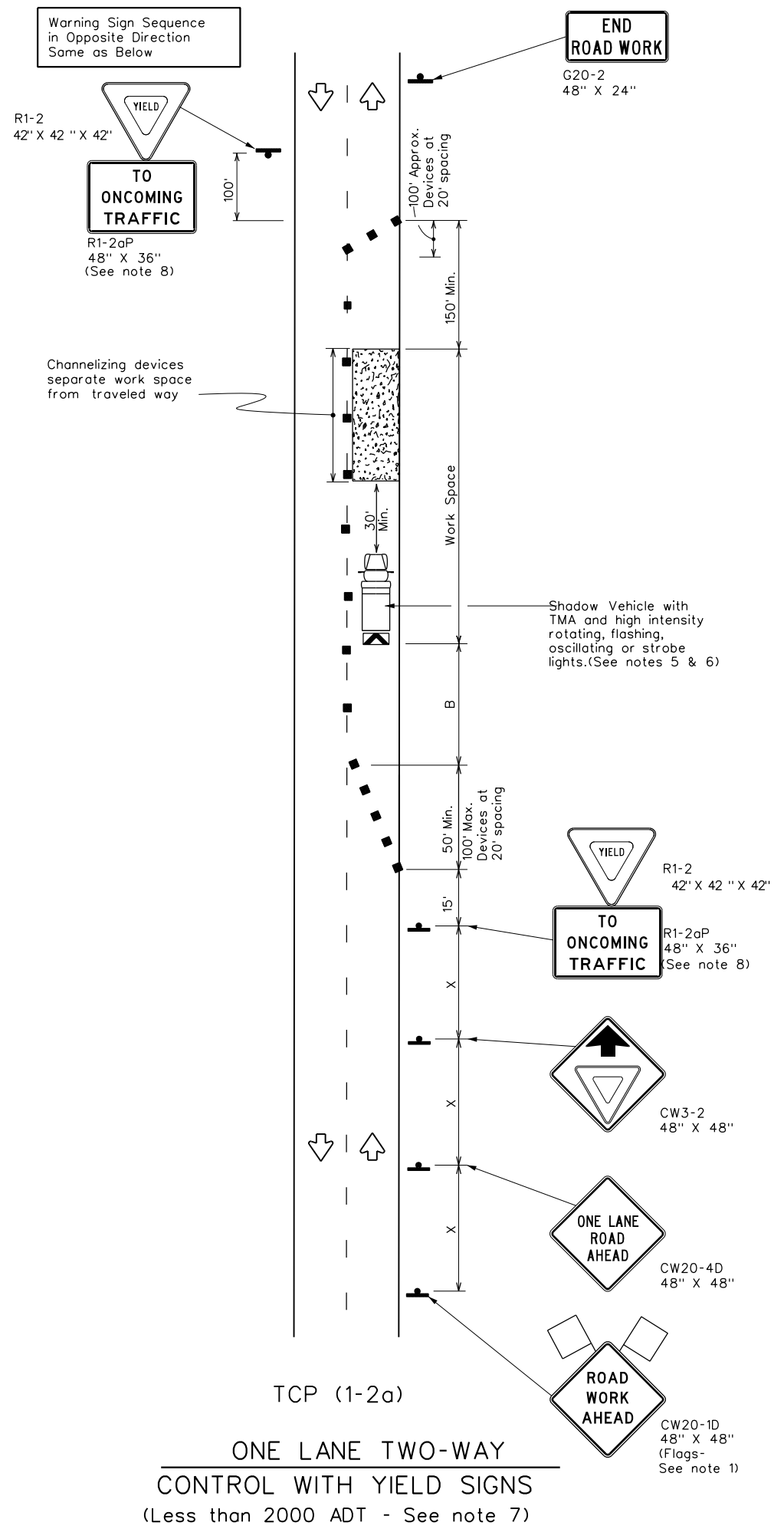
**TRAFFIC CONTROL PLAN
CONVENTIONAL ROAD
SHOULDER WORK**

TCP(1-1)-18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT REVISIONS	CONT	SECT	JOB	HIGHWAY
2-94 4-98	0250	03	051	US 281, ETC.
8-95 2-12	DIST	COUNTY		SHEET NO.
1-97 2-18	FTW	ERATH, ETC.		33

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

Posted Speed x	Formula	Minimum Desirable Taper Lengths x x			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	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'

x Conventional Roads Only
 x x 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
	✓	✓		

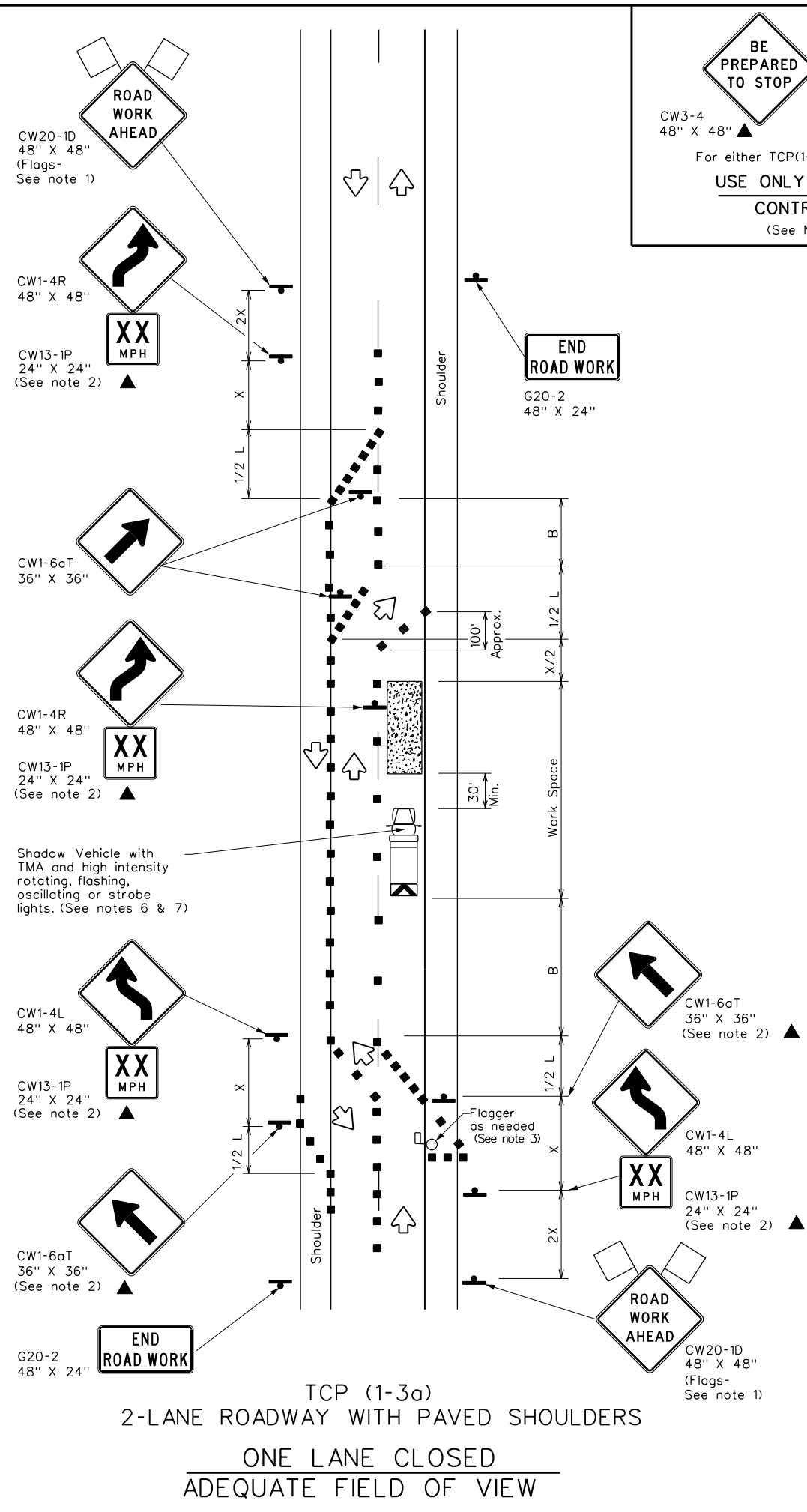
GENERAL NOTES

- Flags attached to signs where shown are REQUIRED.
 - 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.
 - 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.
 - Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
 - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
- TCP (1-2a)**
- R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work spaces should be no longer than one half city block. In rural areas on roadways with less than 2000 ADT, work spaces should be no longer than 400 feet.
 - R1-2 "YIELD" sign with R1-2aP "TO ONCOMING TRAFFIC" plaque shall be placed on a support at a 7 foot minimum mounting height.
- TCP (1-2b)**
- Flaggers should use two-way radios or other methods of communication to control traffic.
 - Length of work space should be based on the ability of flaggers to communicate.
 - 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).
 - Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
 - Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

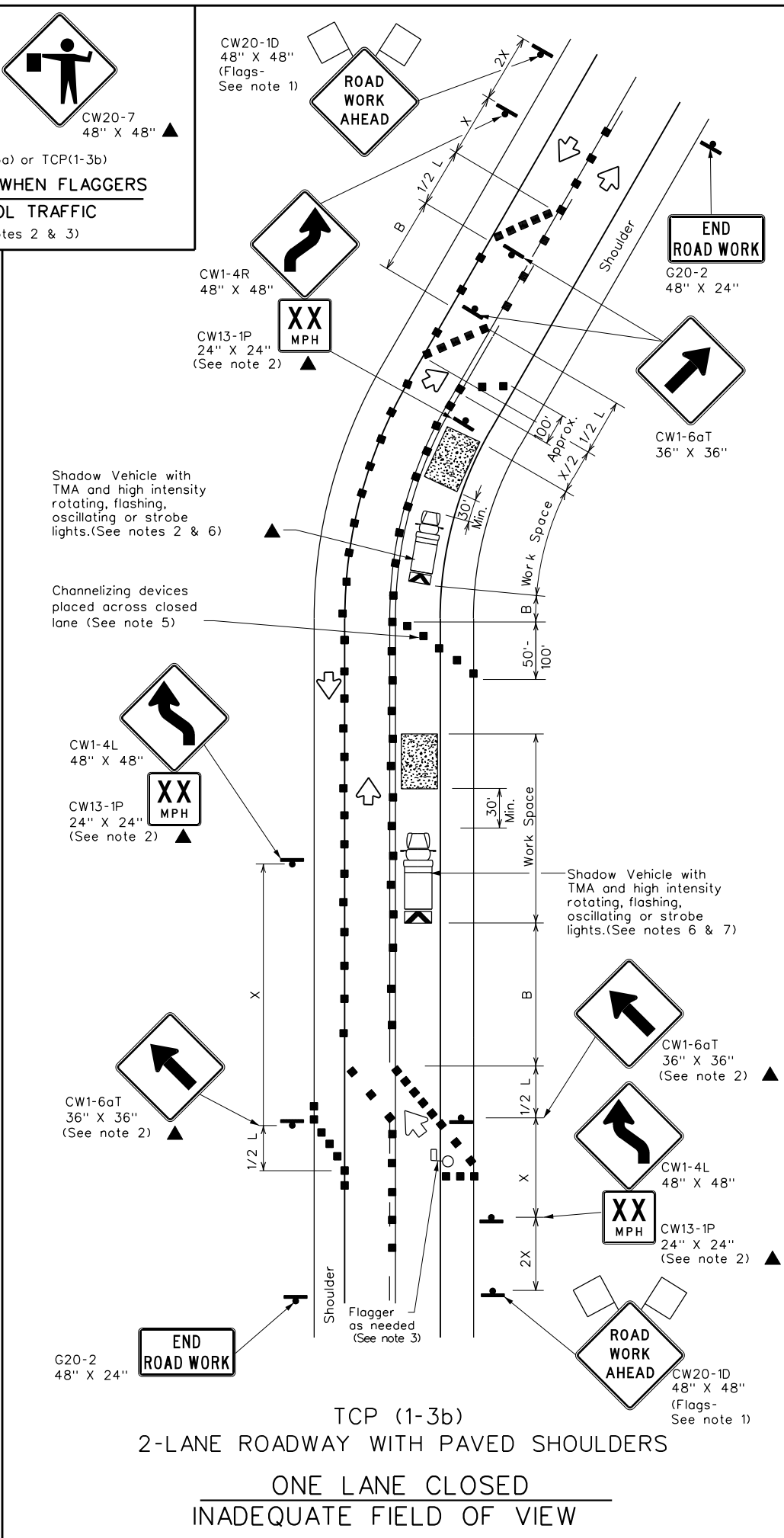
		Traffic Operations Division Standard	
TRAFFIC CONTROL PLAN			
ONE-LANE TWO-WAY			
TRAFFIC CONTROL			
TCP(1-2)-18			
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© TxDOT December 1985	CON:	SECT:	JOB:
REVISIONS	0250	03	051
4-90 4-98			US 281, ETC.
2-94 2-12			
1-97 2-18			
	DIST:	COUNTY:	SHEET NO.:
	FTW	ERATH, ETC.	34

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BE PREPARED TO STOP
USE ONLY WHEN FLAGGERS CONTROL TRAFFIC
(See Notes 2 & 3)



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

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

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

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

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

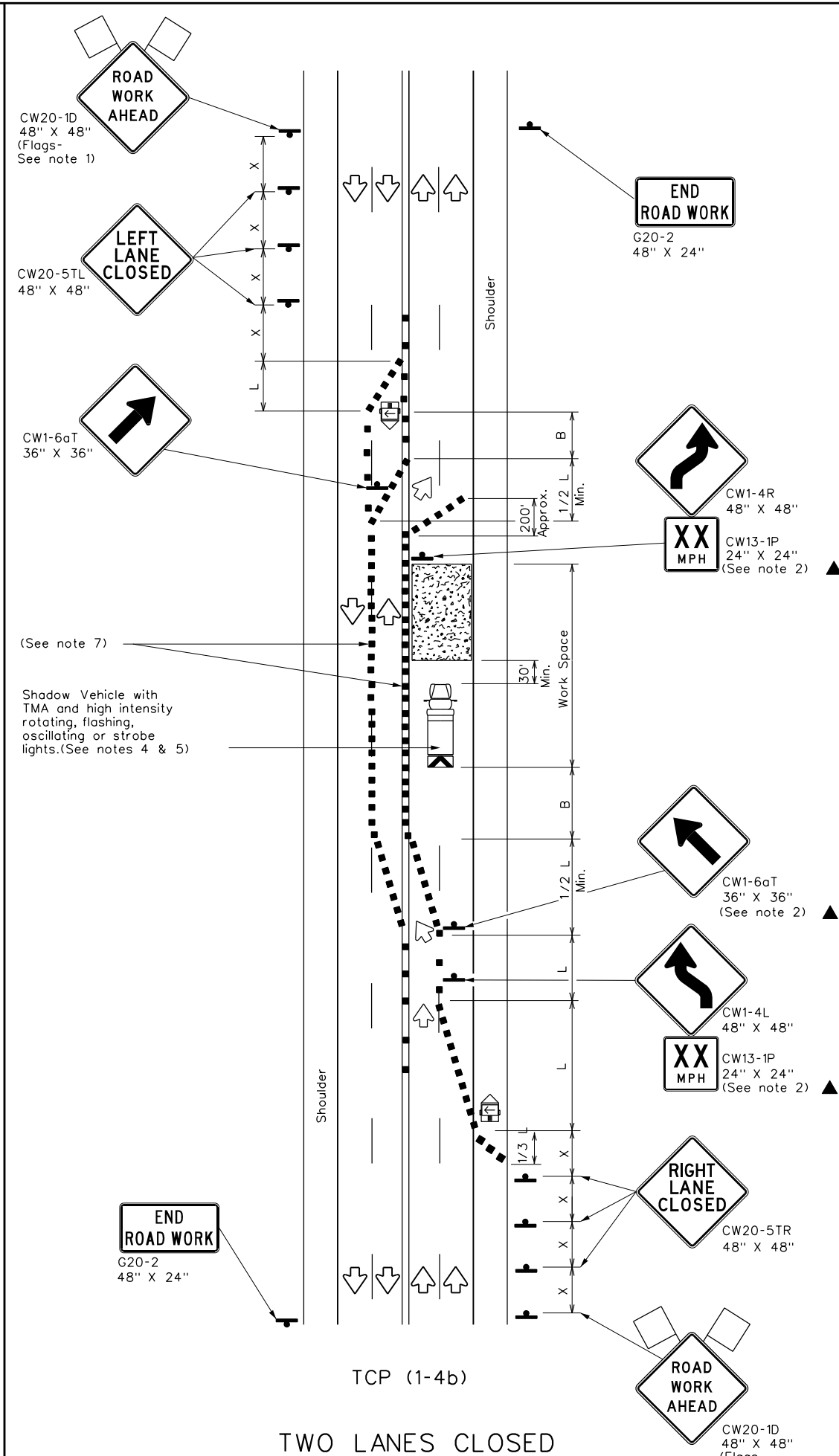
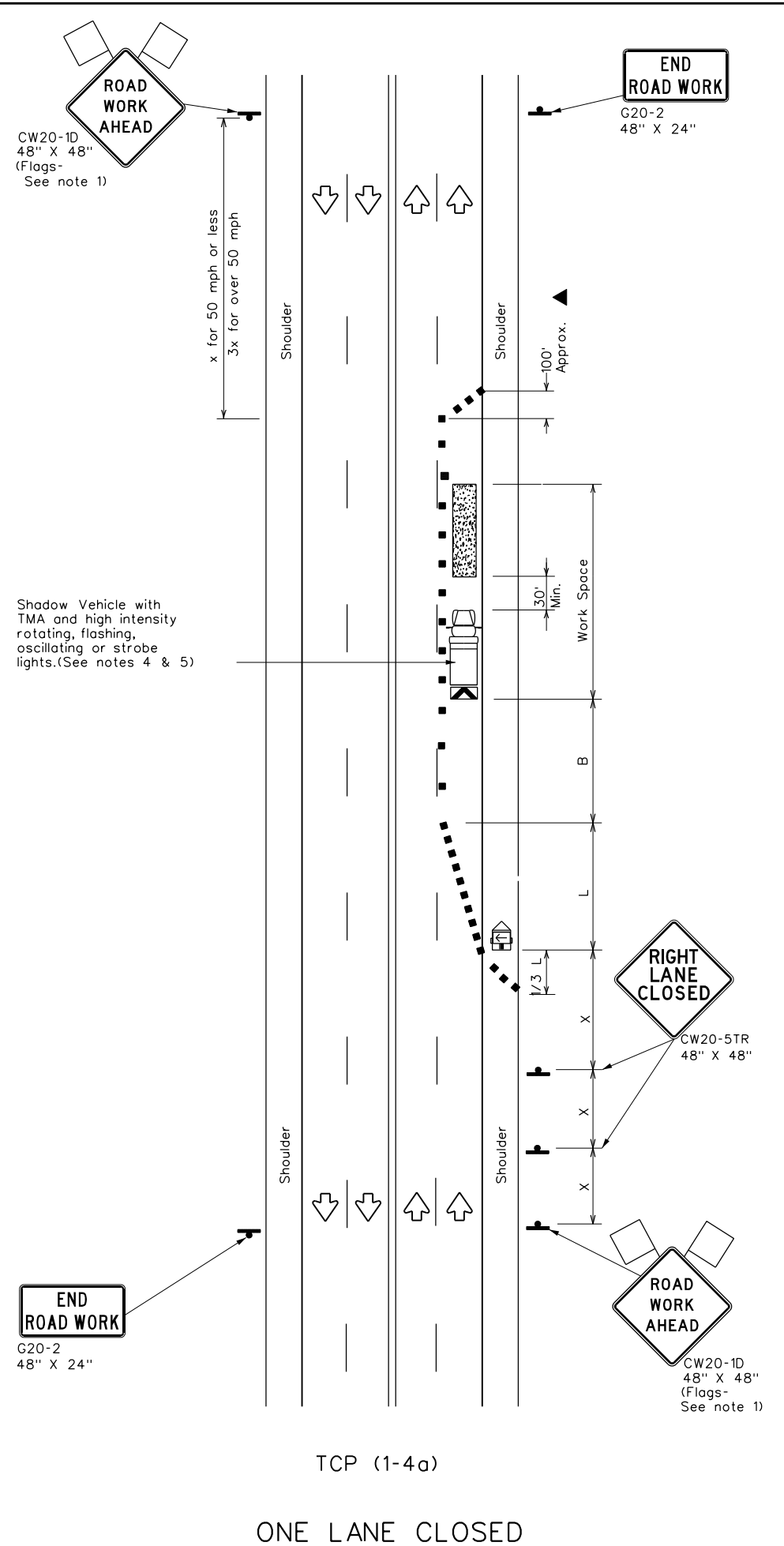
Texas Department of Transportation Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
TRAFFIC SHIFTS ON
TWO LANE ROADS
TCP(1-3)-18

FILE: tcp1-3-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CON:	SECT:	JOB:	HIGHWAY:
REVISIONS	0250	03	051	US 281, ETC.
2-94 4-98	DIST:	COUNTY:	SHEET NO.:	
8-95 2-12	FTW	ERATH, ETC.	35	
1-97 2-18				

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

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

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

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

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

TCP (1-4a)
 6. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

TCP (1-4b)
 7. Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

Texas Department of Transportation
 Traffic Operations Division Standard

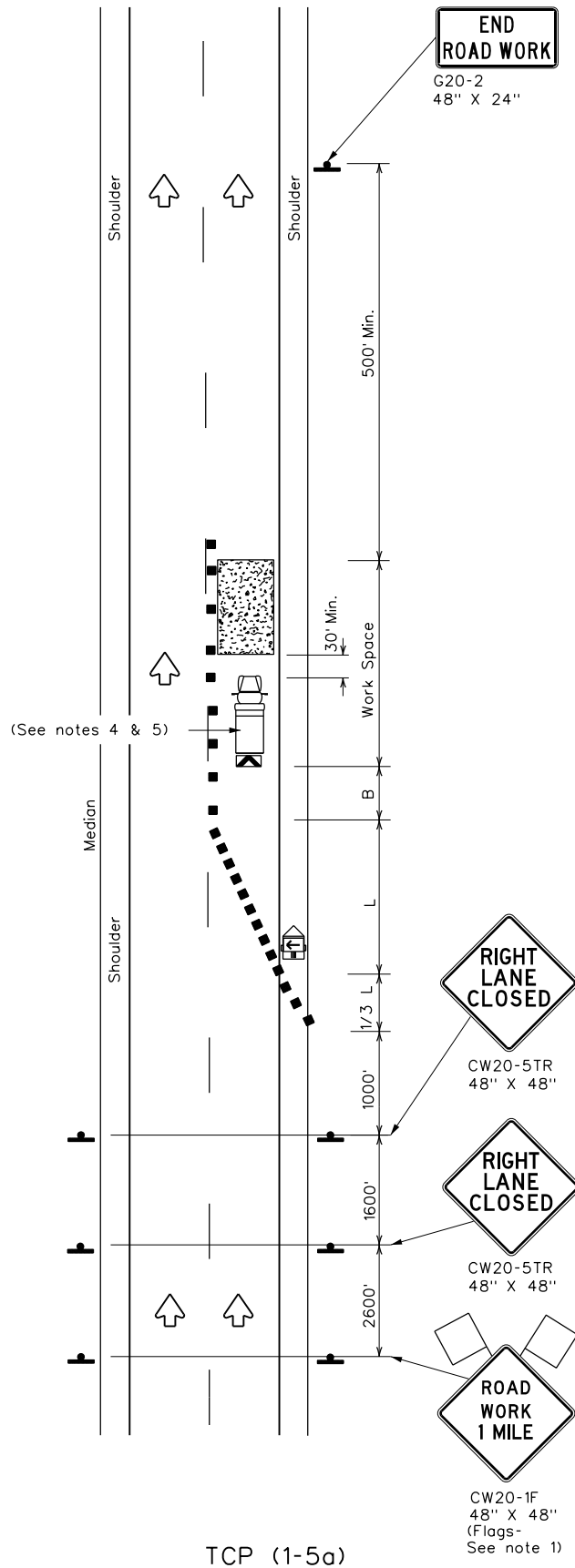
TRAFFIC CONTROL PLAN
LANE CLOSURES ON MULTILANE
CONVENTIONAL ROADS

TCP(1-4)-18

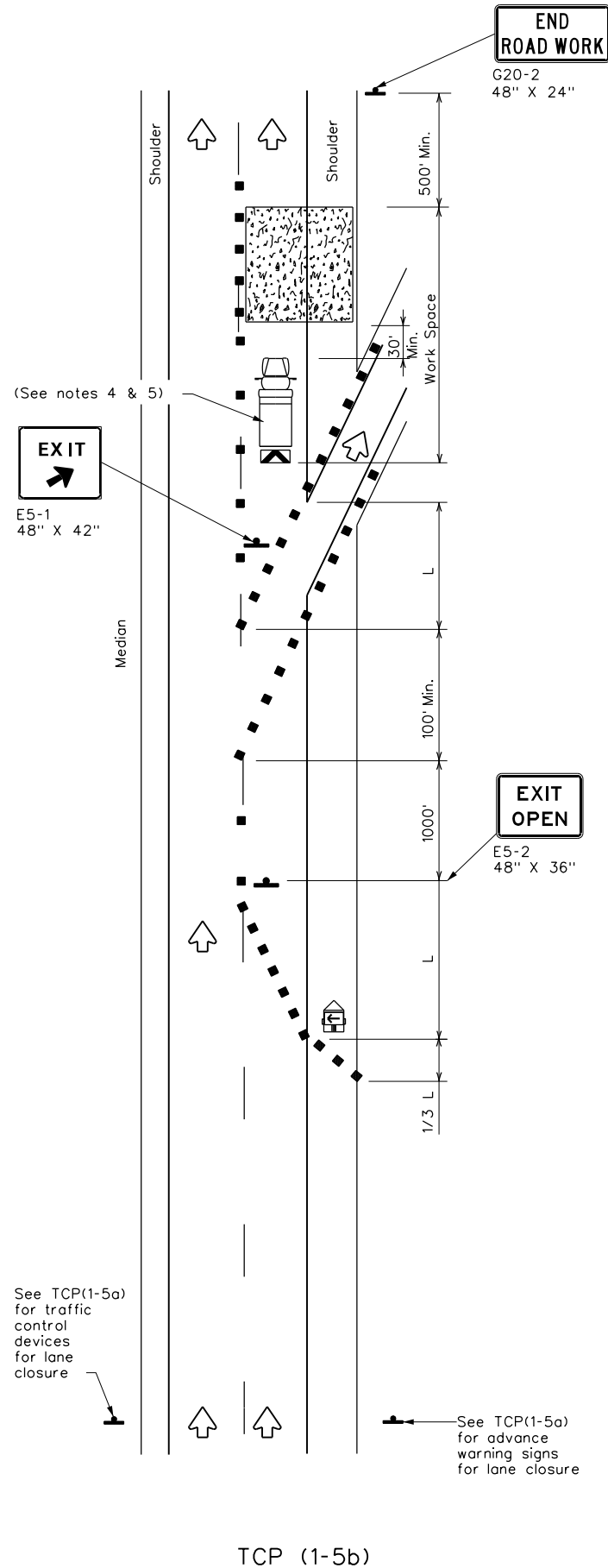
FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 2-12	FTW	ERATH, ETC.	36	
1-97 2-18				

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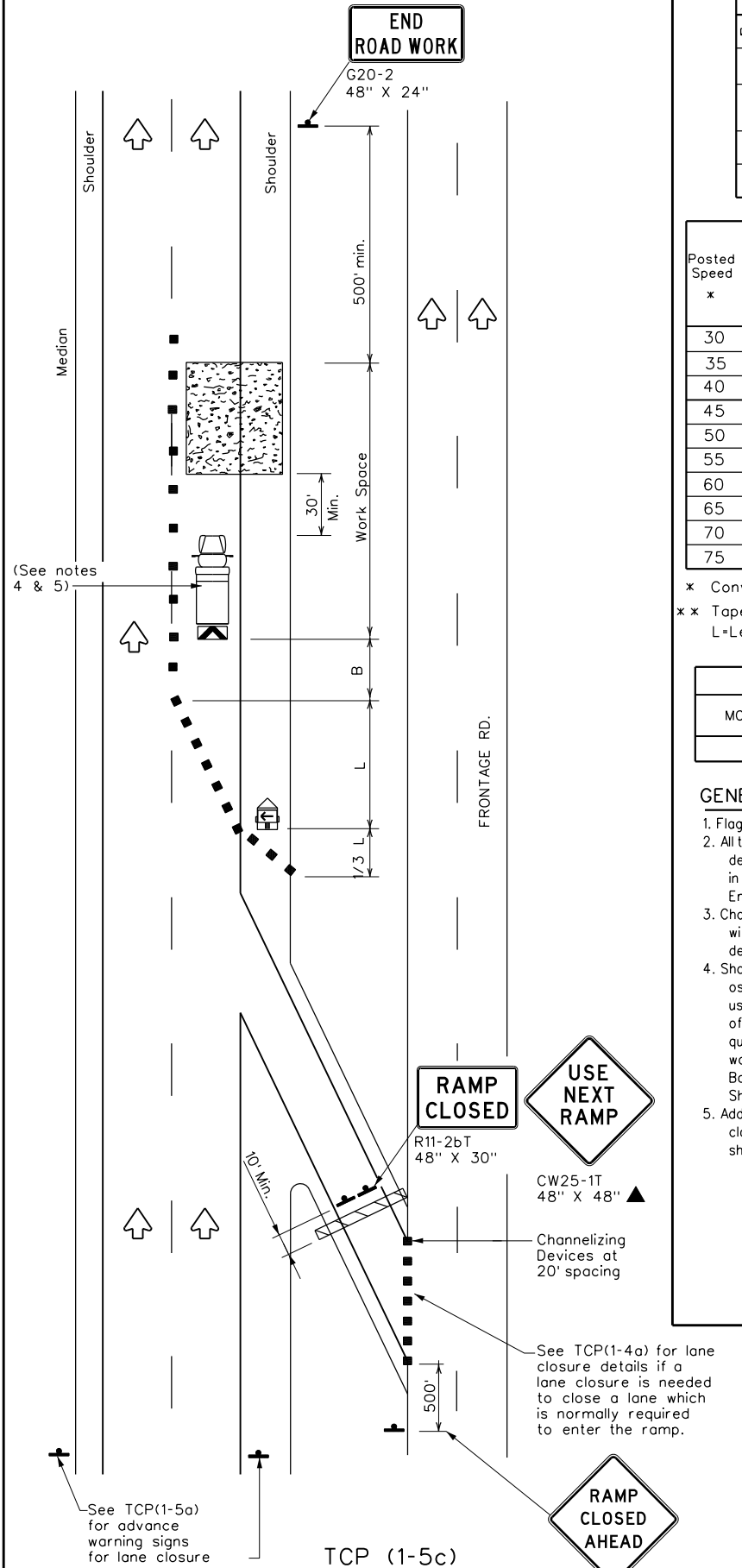
DATE: FILE:



TCP (1-5a) ONE LANE CLOSURE



TCP (1-5b) LANE CLOSURE NEAR EXIT RAMP



TCP (1-5c) LANE CLOSURE NEAR ENTRANCE RAMP

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

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

* Conventional Roads Only
 * x 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

- Flags attached to signs where shown, are REQUIRED.
- 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.
- 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.
- Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
- Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

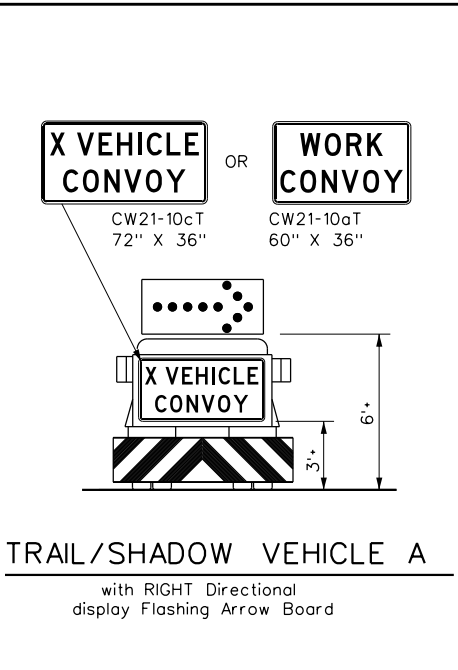
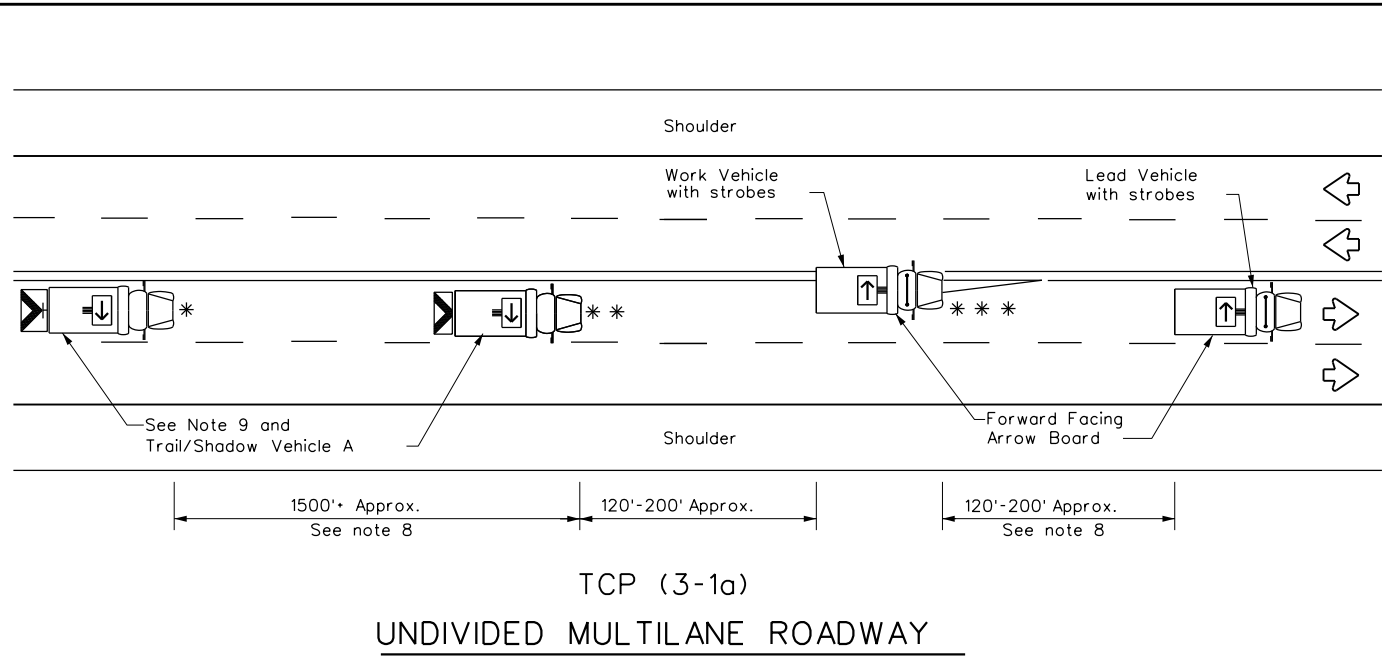


TRAFFIC CONTROL PLAN
 LANE CLOSURES FOR
 DIVIDED HIGHWAYS

TCP(1-5)-18

FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
2-18 REVISIONS	0250	03	051	US 281, ETC.
	DIST	COUNTY	SHEET NO.	
	FTW	ERATH, ETC.	37	

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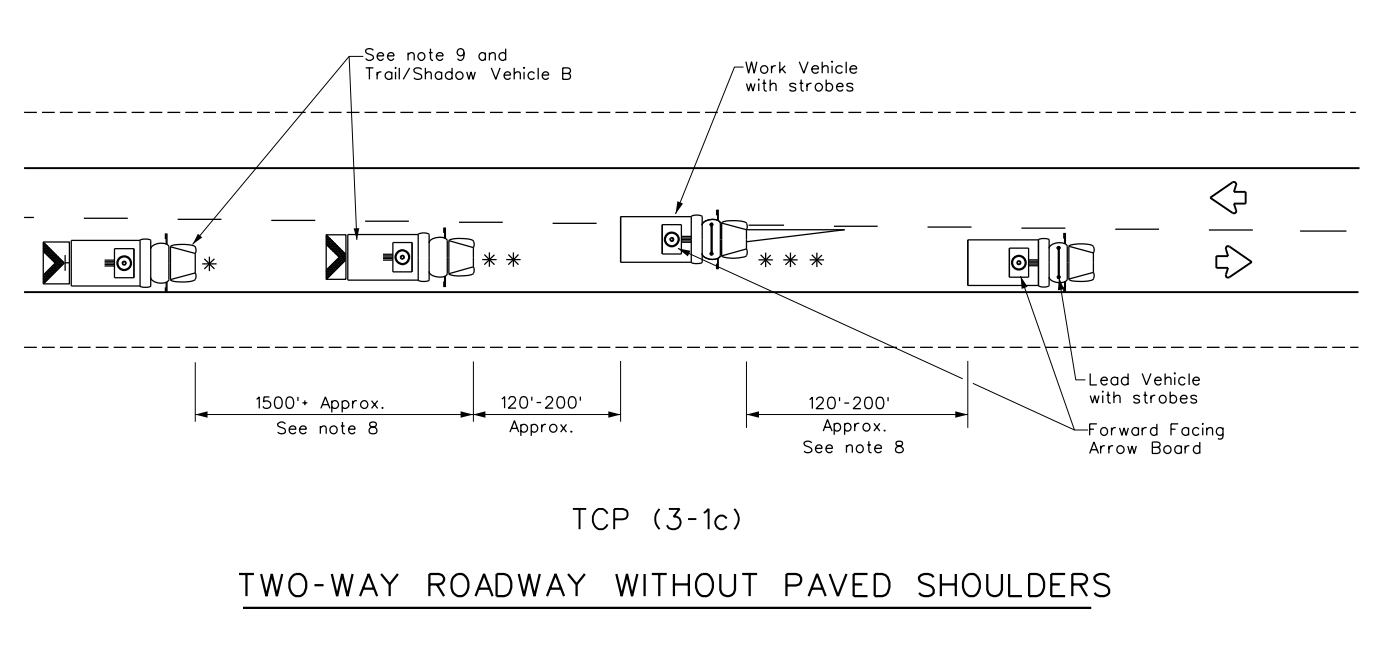
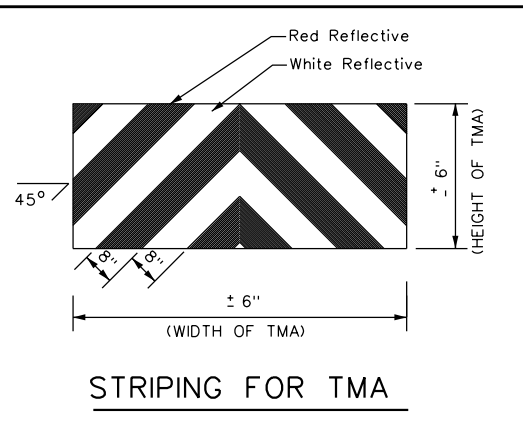
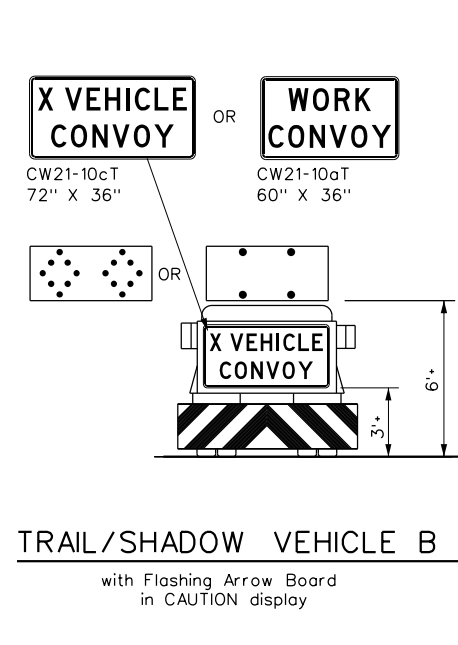
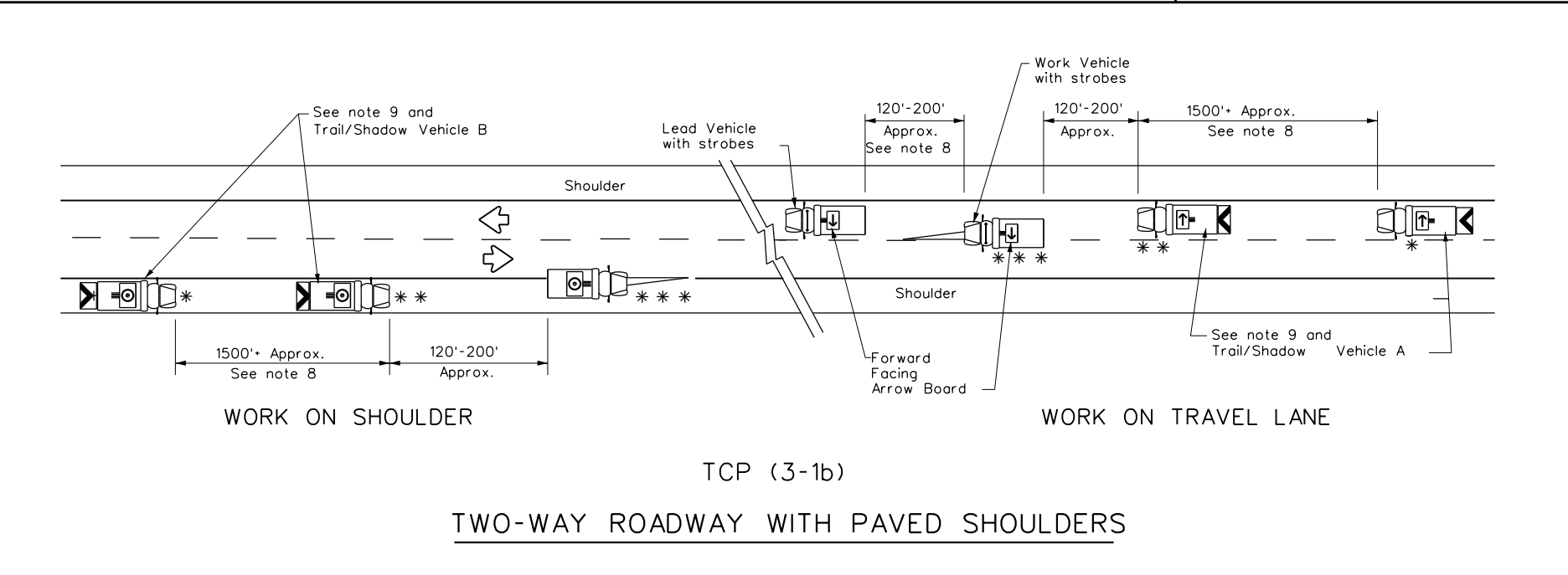


LEGEND				
*	Trail Vehicle	ARROW BOARD DISPLAY		
**	Shadow Vehicle			
***	Work Vehicle		RIGHT Directional	
	Heavy Work Vehicle	LEFT Directional		
	Truck Mounted Attenuator (TMA)	Double Arrow		
	Traffic Flow	CAUTION (Alternating Diamond or 4 Corner Flash)		

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.



Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
MOBILE OPERATIONS
UNDIVIDED HIGHWAYS

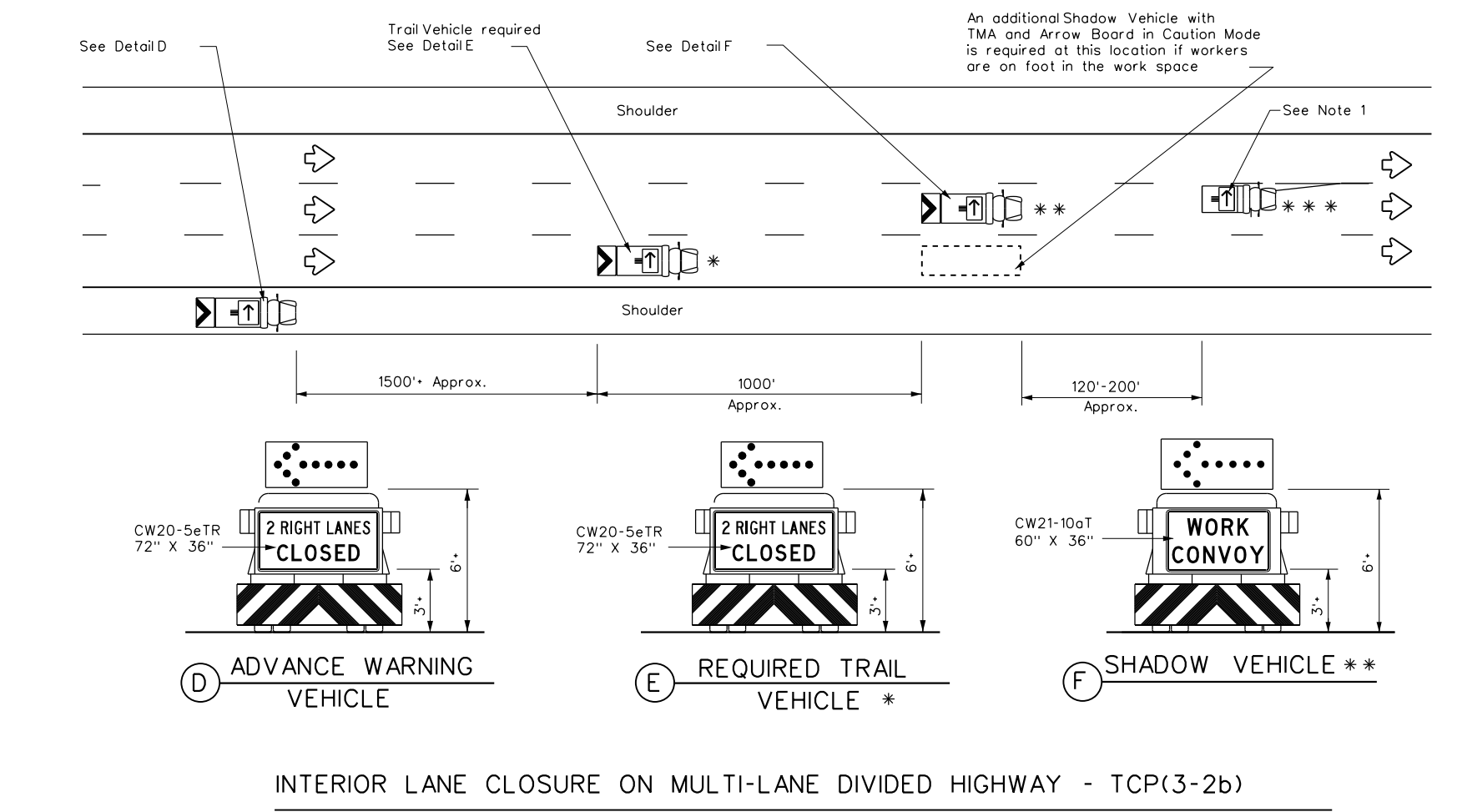
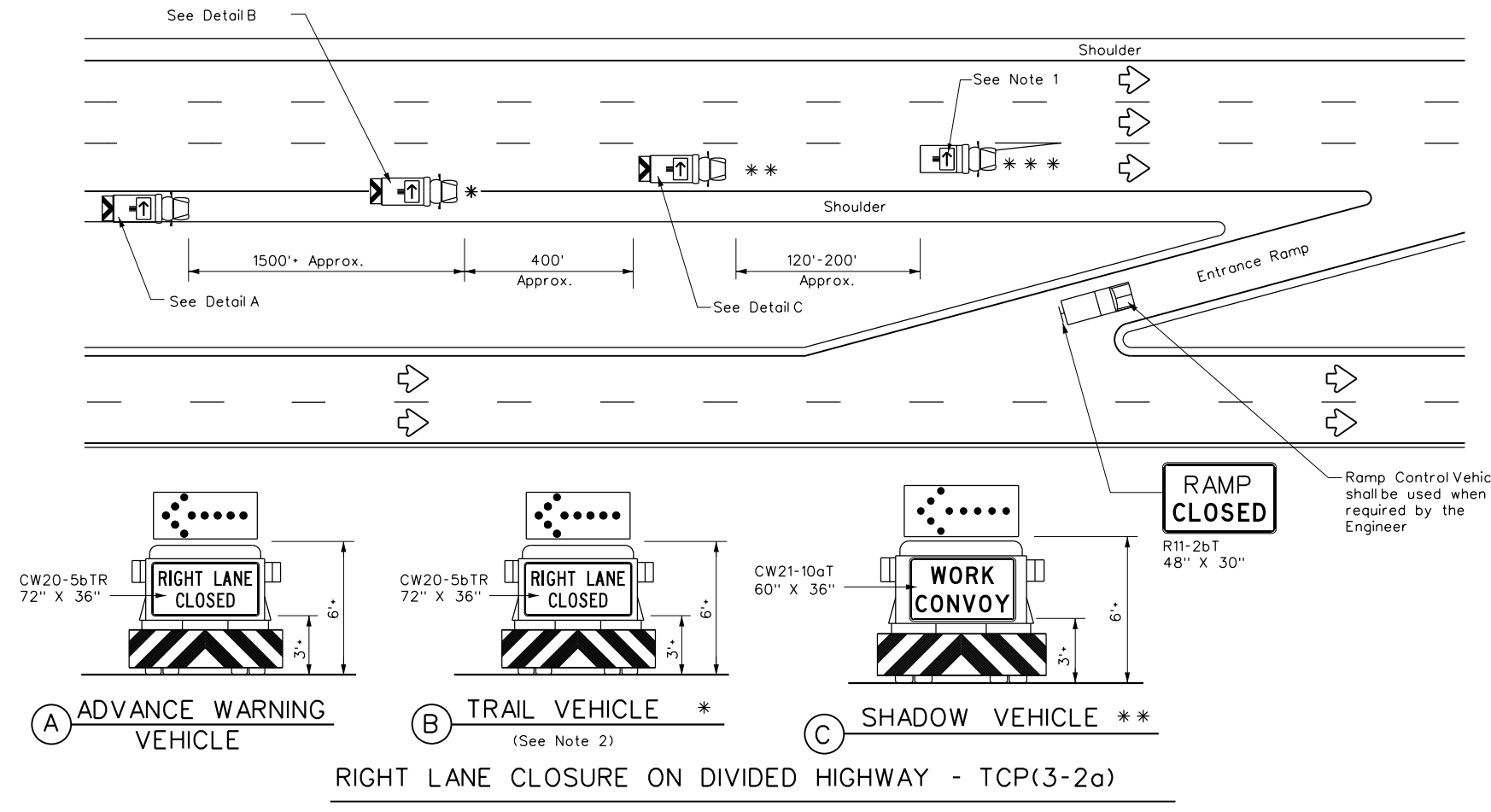
TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 7-13	FTW	ERATH, ETC.	38	
1-97				

DATE: FILE:

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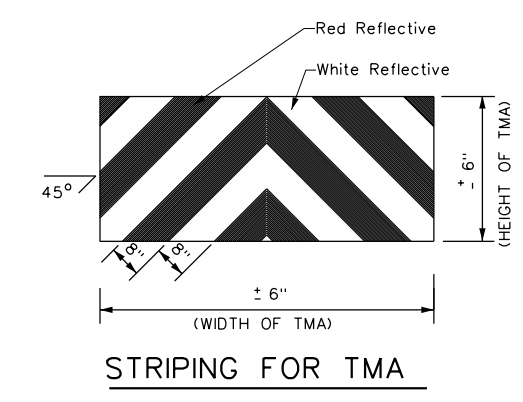
DATE: FILE:



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	⊠	CAUTION (Alternating Diamond or 4 Corner Flash)

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

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



Texas Department of Transportation
Traffic Operations Division Standard

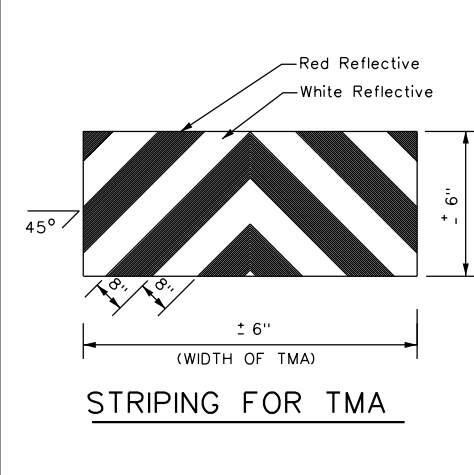
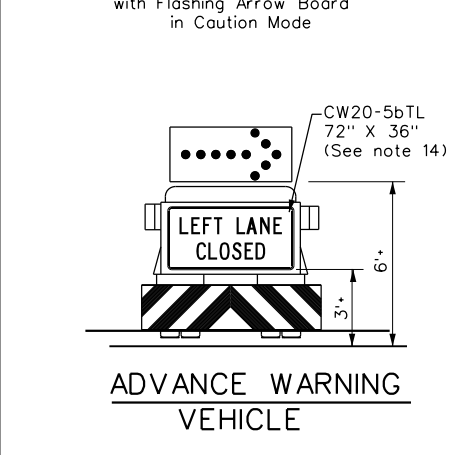
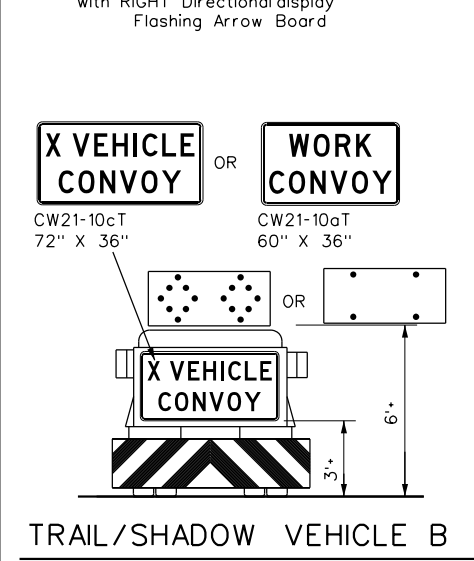
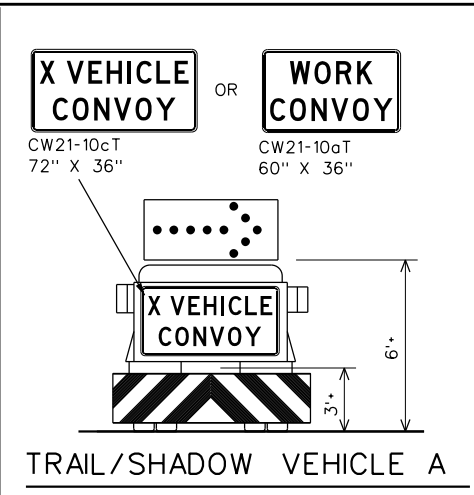
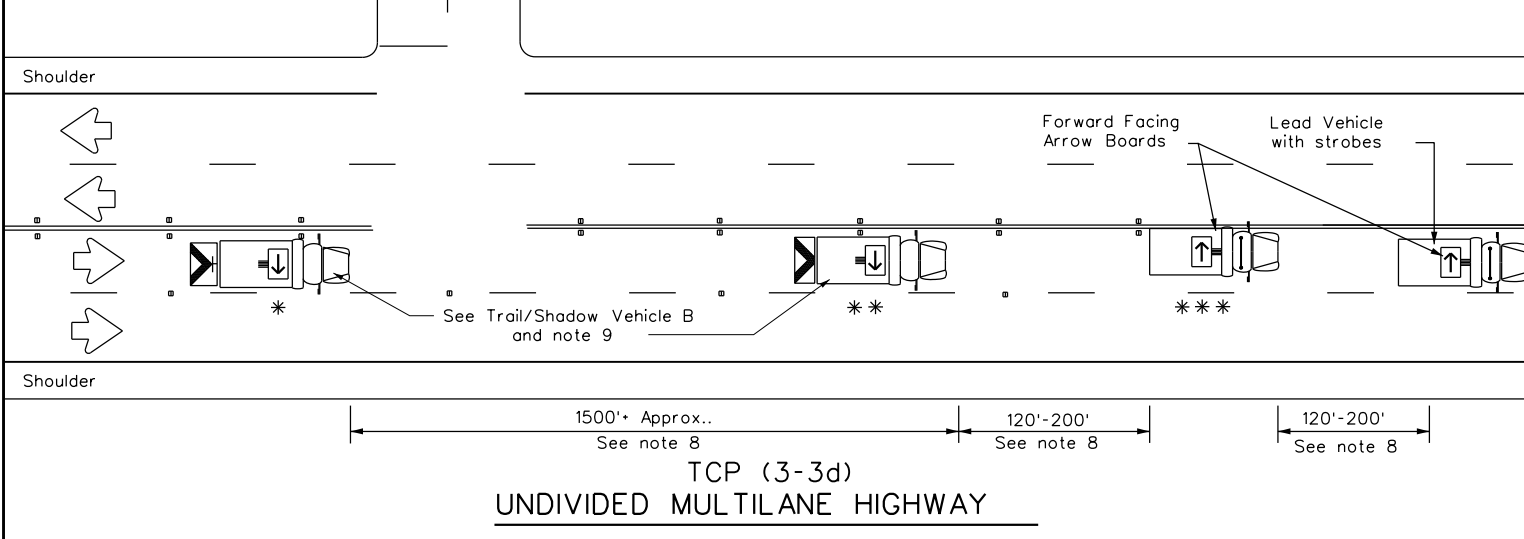
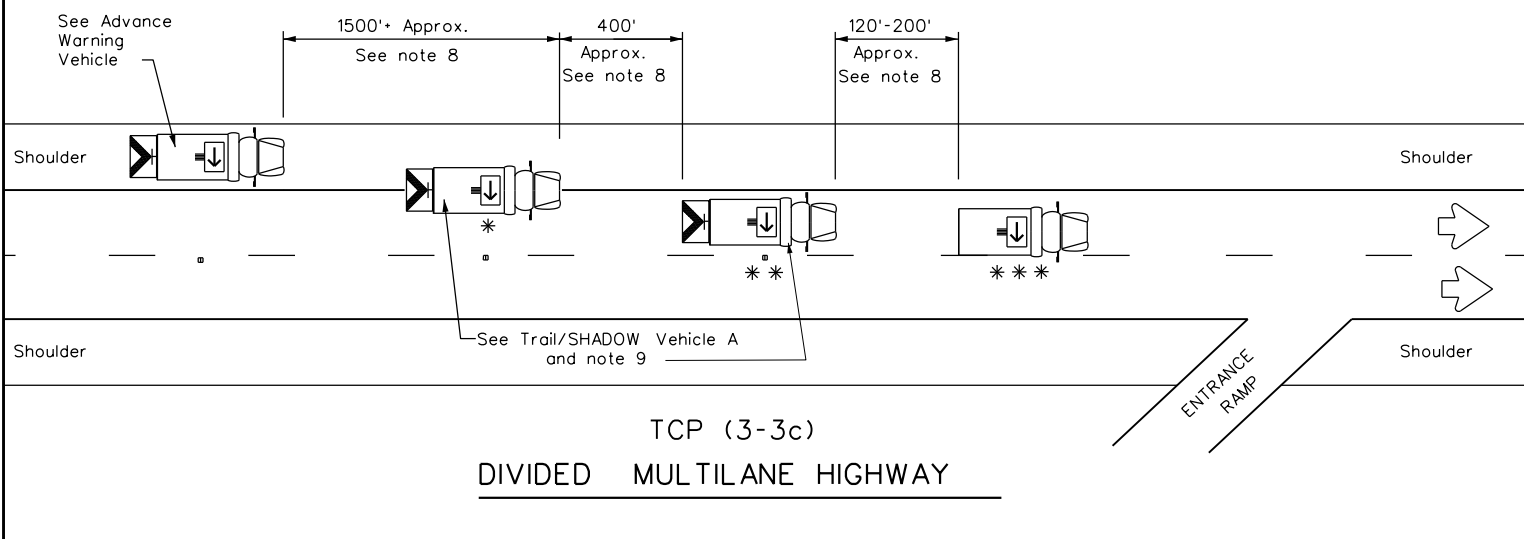
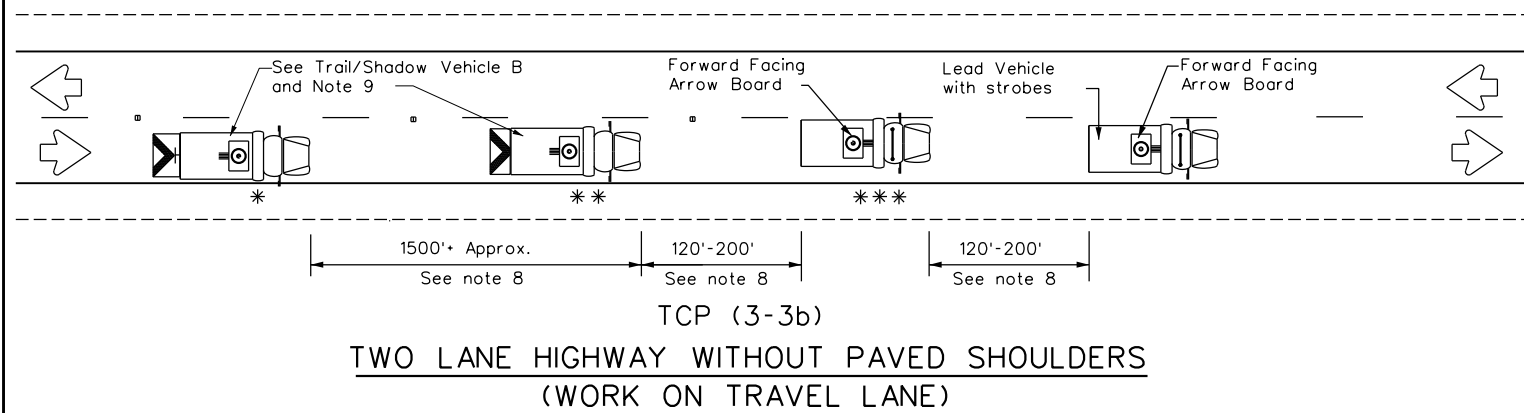
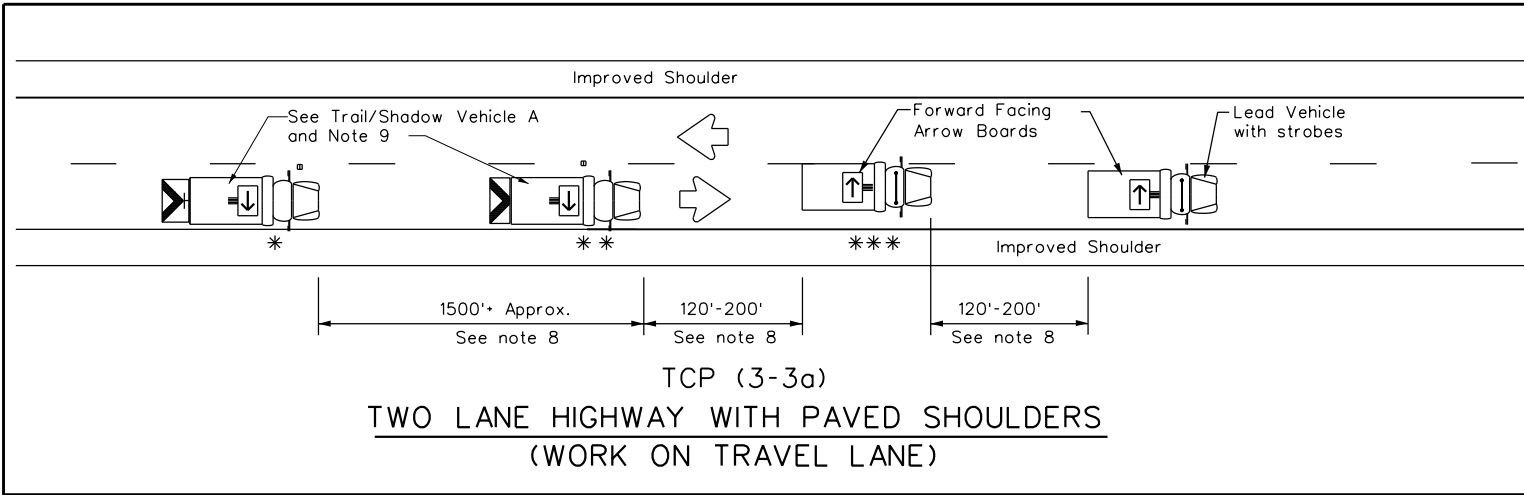
**TRAFFIC CONTROL PLAN
MOBILE OPERATIONS
DIVIDED HIGHWAYS**

TCP(3-2)-13

FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 7-13	FTW	ERATH, ETC.	39	
1-97				

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DATE: FILE:



LEGEND			
* Trail Vehicle		ARROW BOARD DISPLAY	
** Shadow Vehicle			
*** Work Vehicle		RIGHT	DIRECTIONAL
	LEFT	DIRECTIONAL	
	DOUBLE	ARROW	
	CAUTION (Alternating Diamond or 4 Corner Flash)		

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

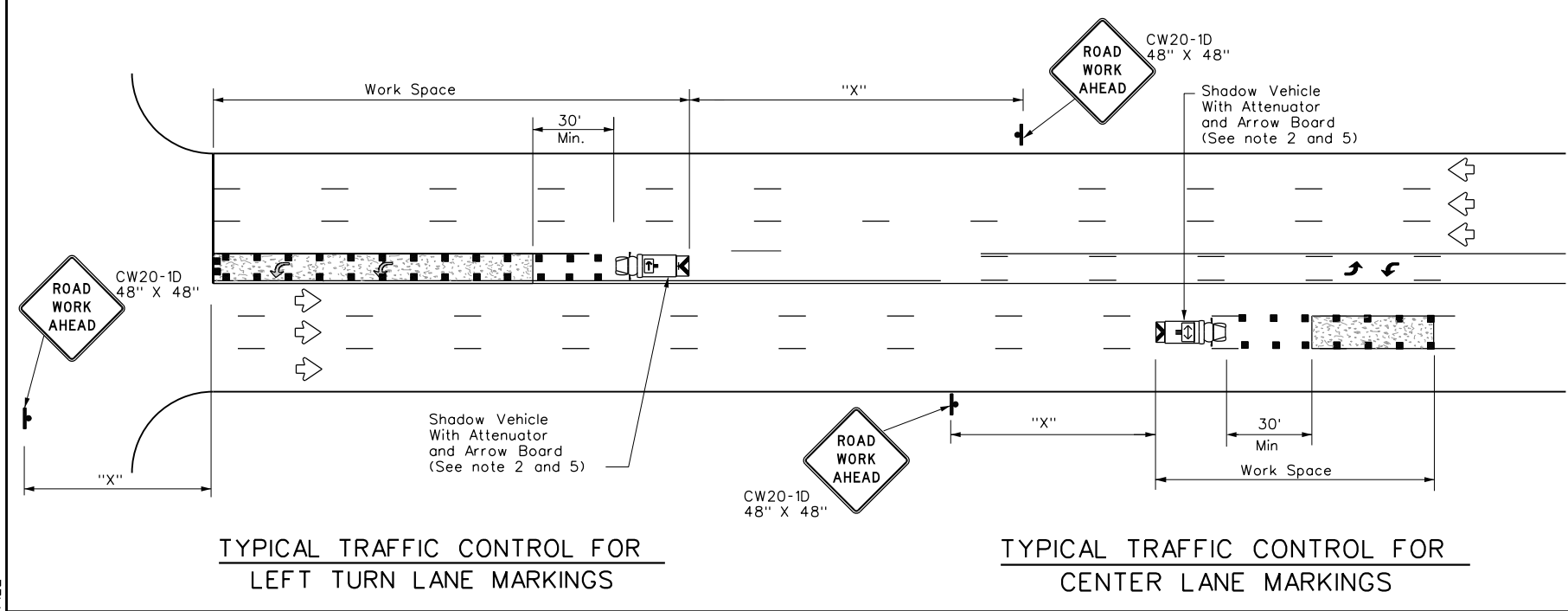
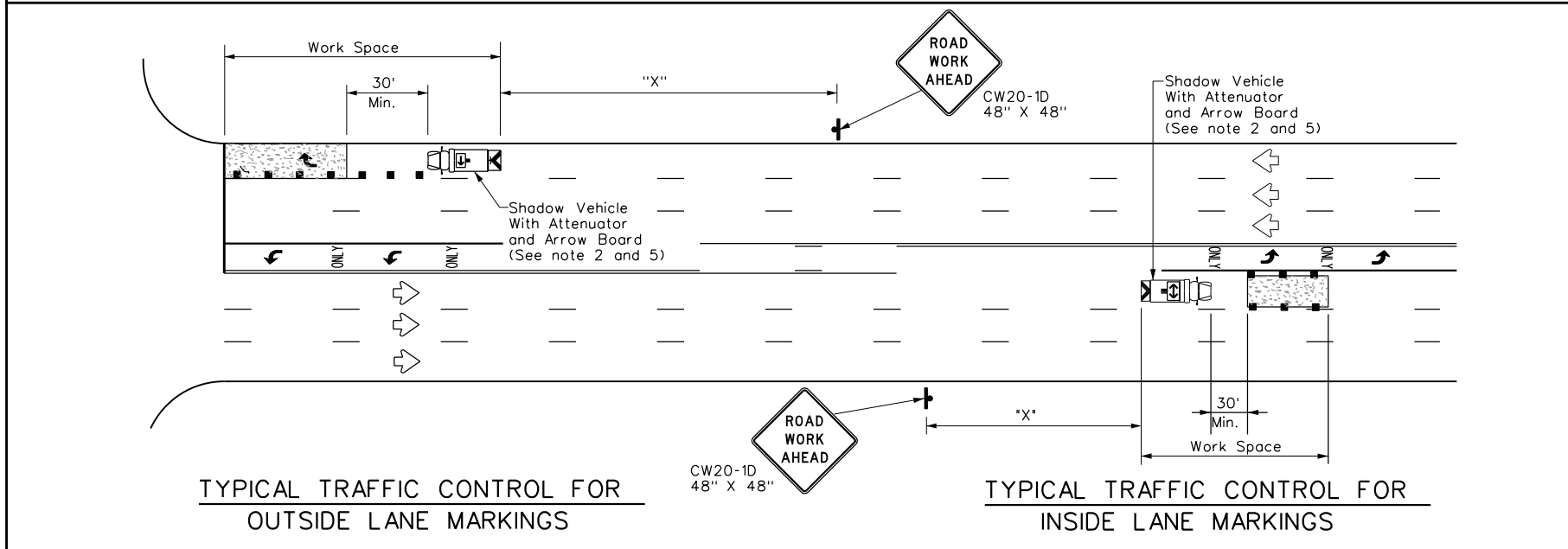
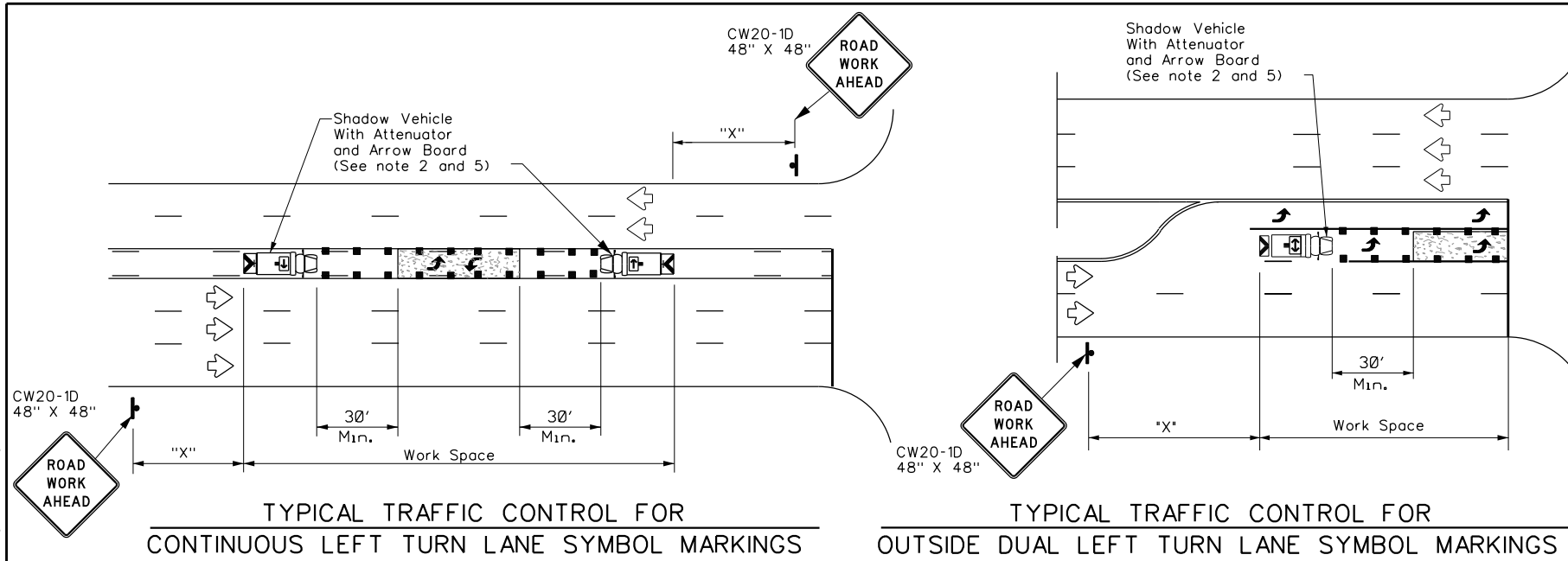
**TRAFFIC CONTROL PLAN
MOBILE OPERATIONS
RAISED PAVEMENT
MARKER INSTALLATION/
REMOVAL
TCP(3-3)-14**

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
2-94 4-98				
8-95 7-13				
1-97 7-14				
	DIST	COUNTY		SHEET NO.
	FTW	ERATH, ETC.		40

177

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

x Conventional Roads Only

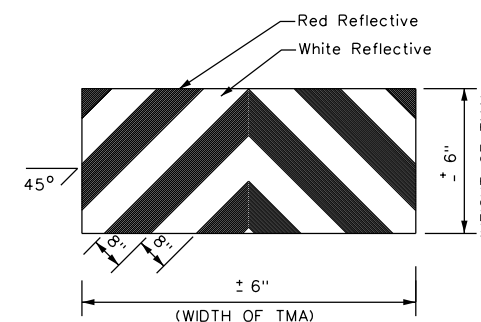
xx Taper lengths have been rounded off.

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

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

GENERAL NOTES

1. 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.



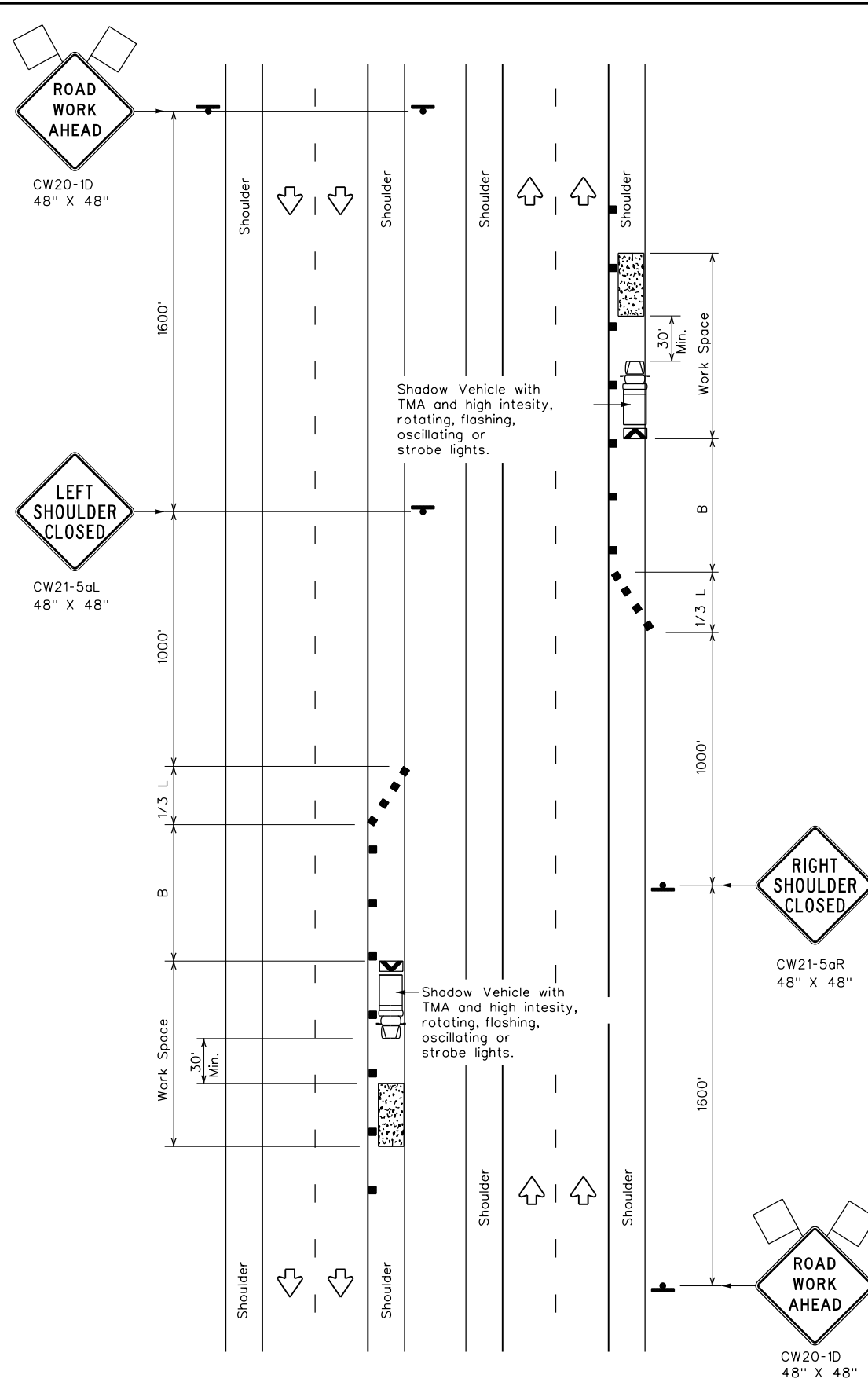
Texas Department of Transportation
Traffic Operations Division Standard

**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	0250	03	051	US 281, ETC.
	DIST	COUNTY	SHEET NO.	
	FTW	ERATH, ETC.	41	

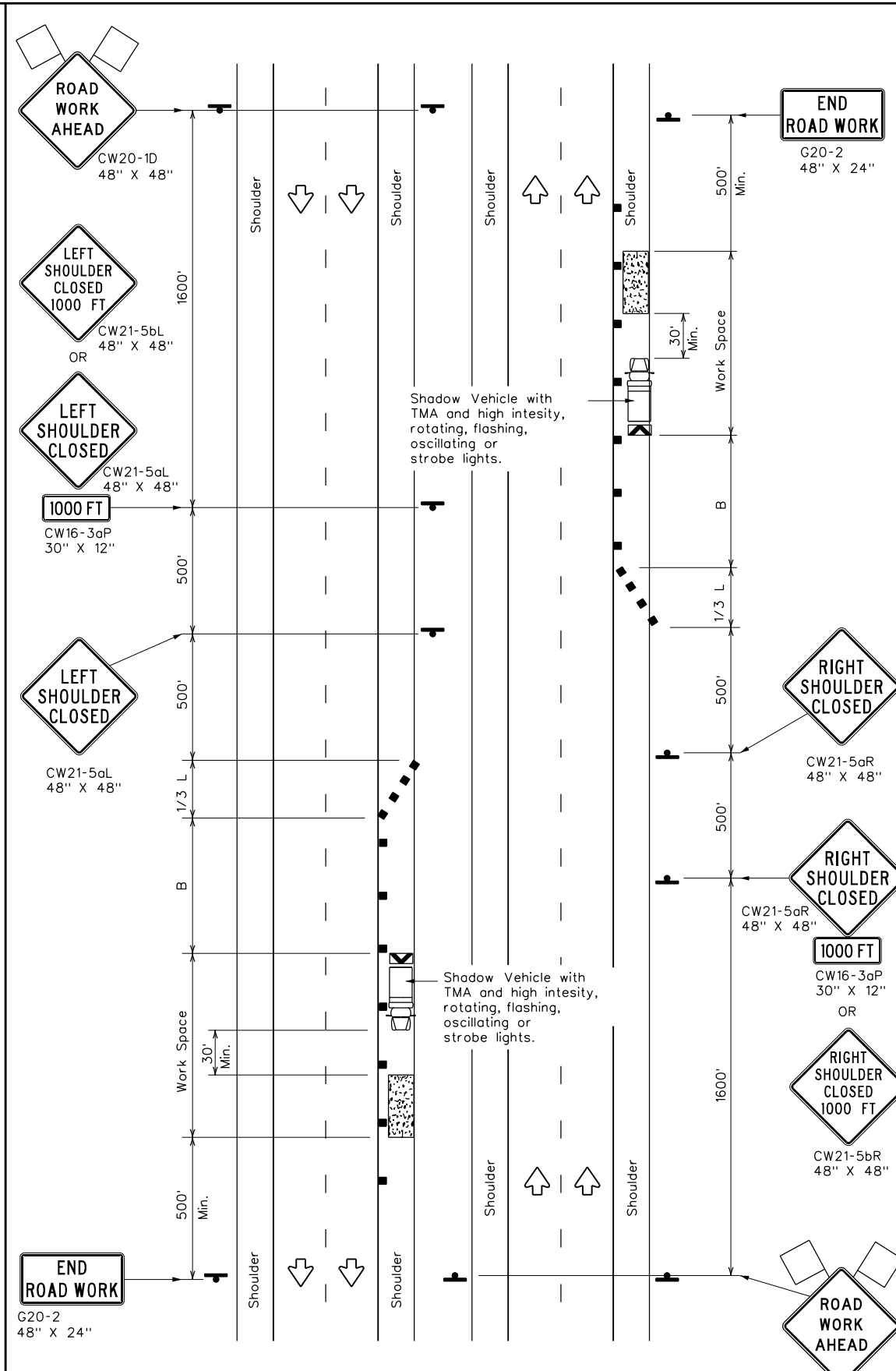
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DATE:
FILE:



TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

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

Posted Speed * S	Formula	Minimum Desirable Taper Lengths * x			Suggested Maximum Spacing of Channelizing Devices		Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent	
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	90'
35		205'	225'	245'	35'	70'	120'
40		265'	295'	320'	40'	80'	155'
45	L = WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

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

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	TCP(5-1a)	TCP(5-1b)	TCP(5-1b)	

GENERAL NOTES

1. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30' to 100' in advance of the area of crew exposure without adversely effecting the performance or quality of the work. Type 3 barricades or drums may be substituted when workers on foot are no longer present when approved by the Engineer.
2. 28" tall or taller one-piece cones will be allowed only for Short Duration or Short Term stationary operations when workers are present to maintain the devices upright and in proper location. Intermediate Term stationary work areas should use Drums, Vertical Panels or 42" tall two-piece cones.



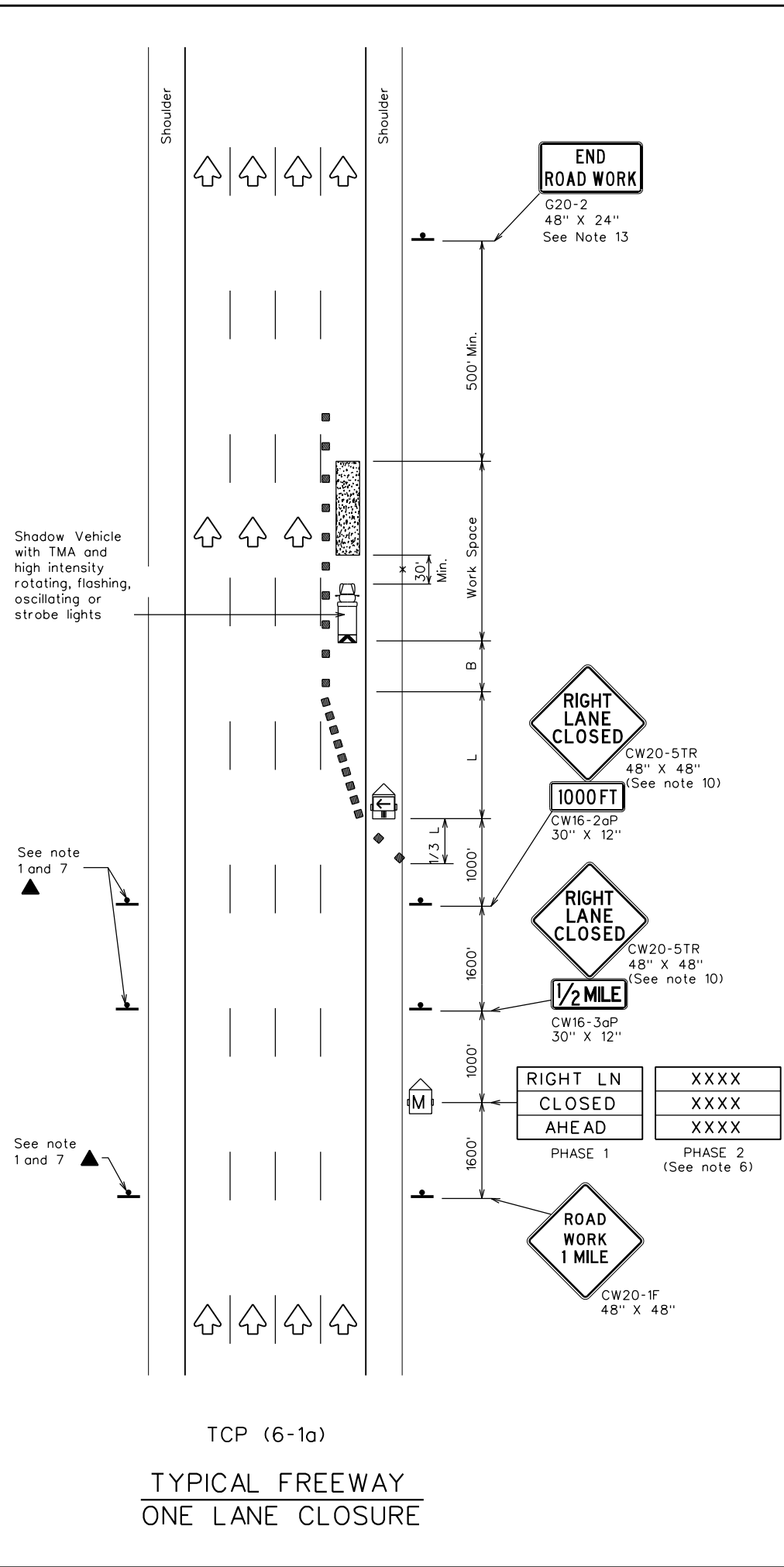
TRAFFIC CONTROL PLAN
 SHOULDER WORK FOR
 FREEWAYS / EXPRESSWAYS

TCP(5-1)-18

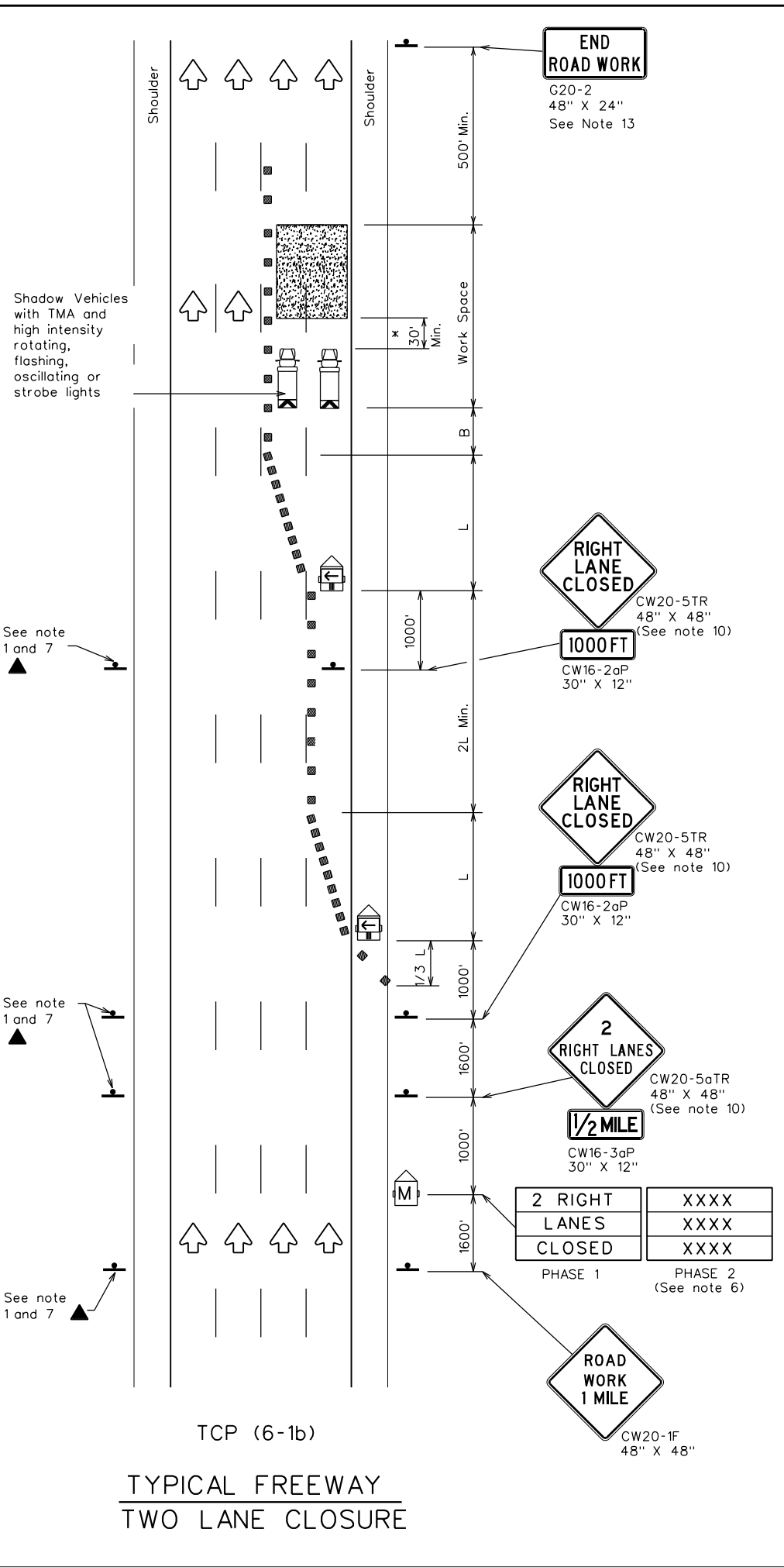
FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
2-18	DIST	COUNTY	SHEET NO.	
	FTW	ERATH, ETC.	42	

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DATE: FILE:



TCP (6-1a)
TYPICAL FREEWAY
ONE LANE CLOSURE



TCP (6-1b)
TYPICAL FREEWAY
TWO LANE CLOSURE

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

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

** 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

- All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
- Drums or 42" cones are the typical channelizing devices. For Intermediate Term Stationary work, drums shall be used on tapers with drums or 42" cones used on tangent sections. Other channelizing devices may be used as directed by the Engineer.
- All construction signs and barricades placed during any phase of work shall remain in place until removal is approved by the Engineer.
- The Engineer may direct the Contractor to furnish additional signs and barricades as required to maintain traffic flow, detours and motorist safety during construction.
- Static message boards or changeable message signs stating the date and duration of ramp or freeway lane closures shall be placed a minimum of seven (7) calendar days in advance of the actual closure.
- Phase 2 of the PCMS message should include appropriate information formatted as shown on BC(6), such as "MERGE LEFT," recommended advisory speed, delay information, or other specific warnings.
- Duplicate construction warning signs should be erected on the medians side of freeways where median width will permit and traffic volume justifies the signing.
- The number of closed lanes may be increased provided the spacing of traffic control devices, taper lengths and tangent lengths meet the requirements of the TMUTCD.
- Warning signs for intermediate term stationary work should be mounted at 7' to the bottom of the sign.
- Warning signs shown shall be appropriately altered for left lane closures. When signs are mounted at 1' height for short term stationary or short duration work, sign versions shown in the SHSD for Texas with distances on the sign face rather than mounted on a plaque below the sign may be used.
- When possible, PCMS units should be located in advance of the last available exit ramp prior to the lane closure to allow motorists an alternate route. They may also be relocated to improve advance warning in case of unanticipated queuing or congestion.
- For Intermediate Term Stationary work at night, floodlights should be used to illuminate the work area and equipment crossings. Floodlights shall not produce a disabling glare condition for road users or workers.
- The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

* A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Texas Department of Transportation
Traffic Operations Division Standard

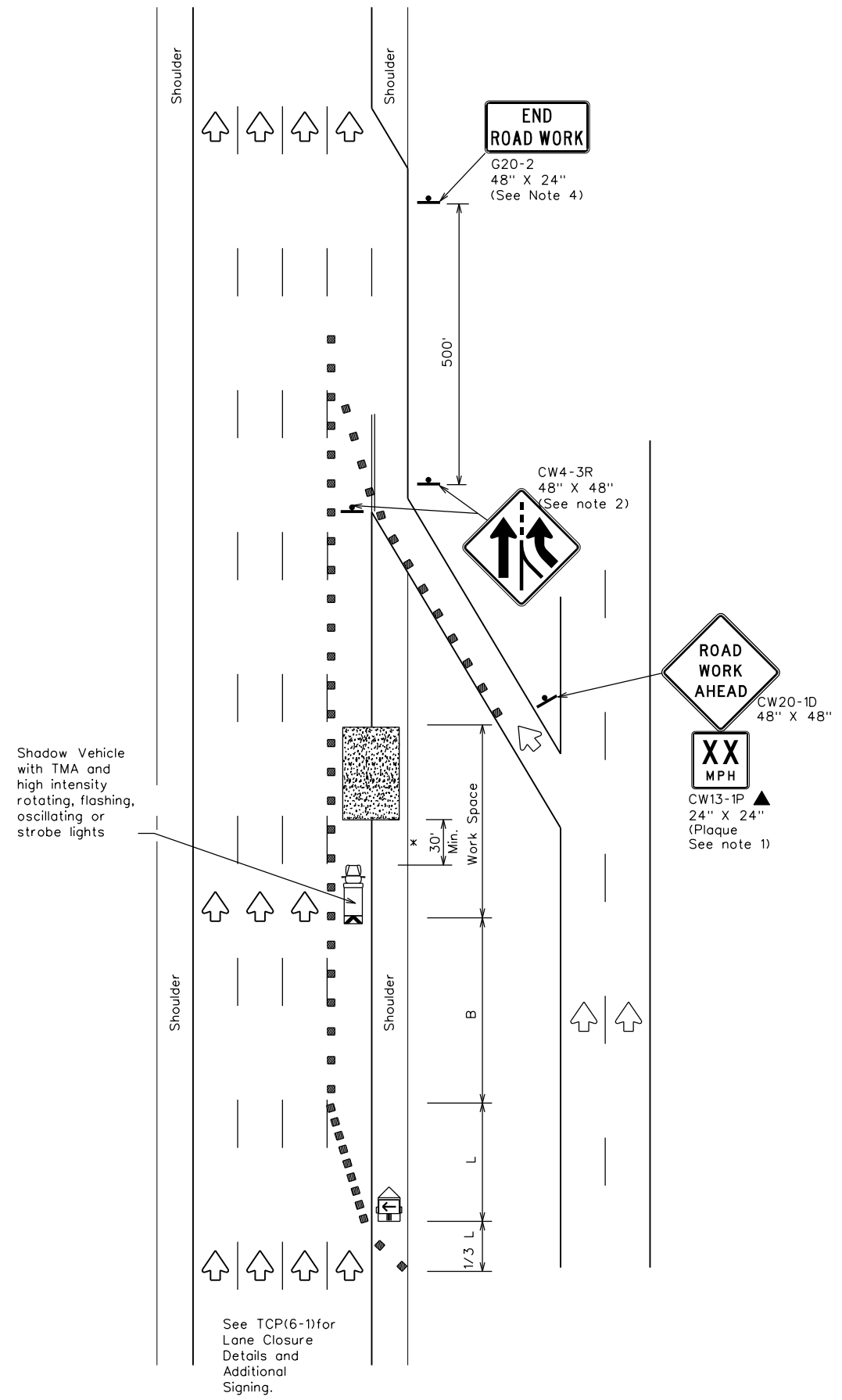
TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

TCP(6-1)-12

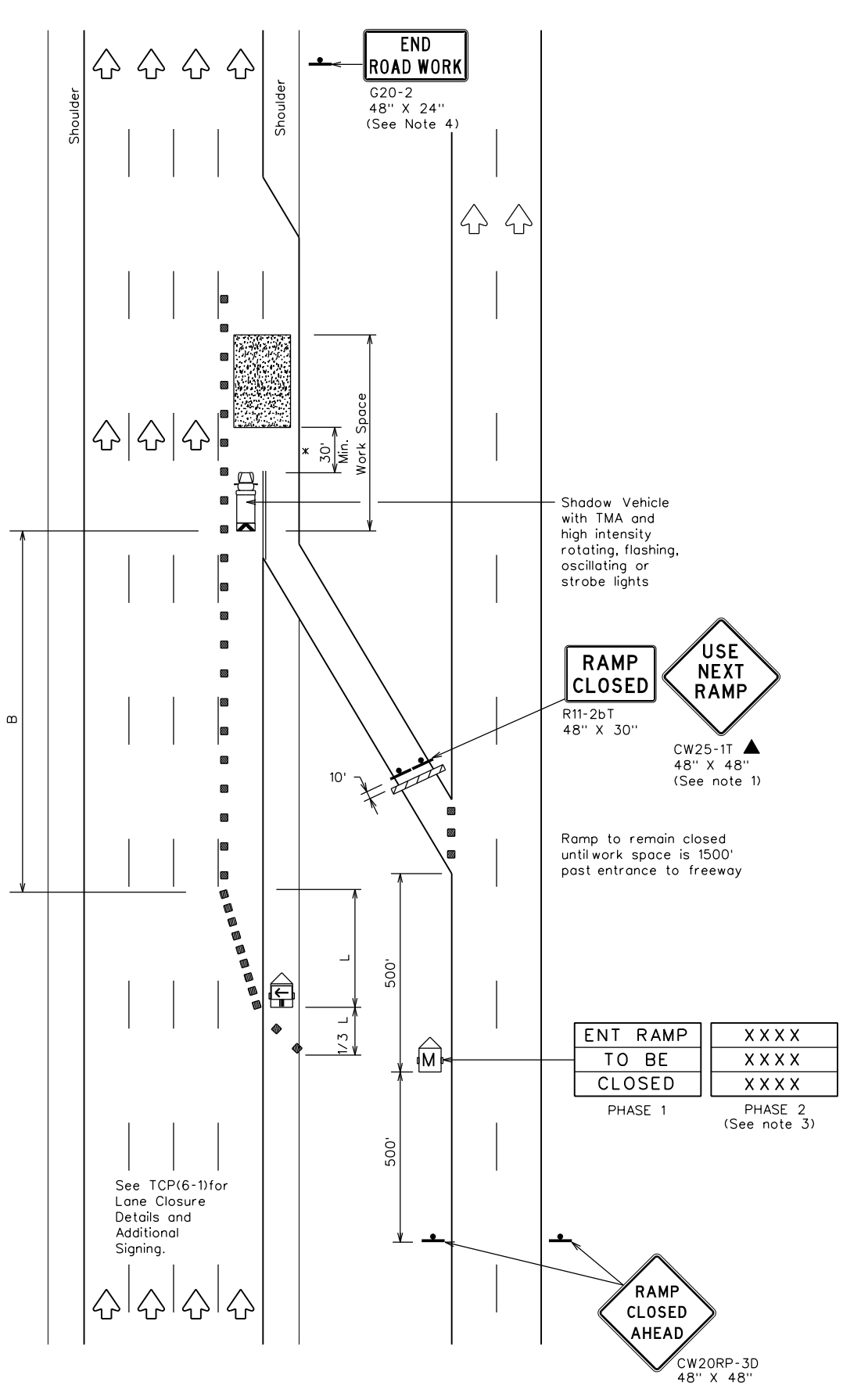
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© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
8-12	0250	03	051	US 281, ETC.
	DIST	COUNTY	SHEET NO.	
	FTW	ERATH, ETC.	43	

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DATE: FILE:



TCP (6-2a)
ENTRANCE RAMP OPEN
WORK WITHIN 500' OF RAMP



TCP (6-2b)
ENTRANCE RAMP CLOSED

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

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

** 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

- All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
- ADDED LANE Symbol (CW4-3) sign may be omitted when sign between ramp and mainline can be seen from both roadways.
- See "Advance Notice List" on BC(6) for recommended date and time formatting options for PCMS Phase 2 message.
- The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

x A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.



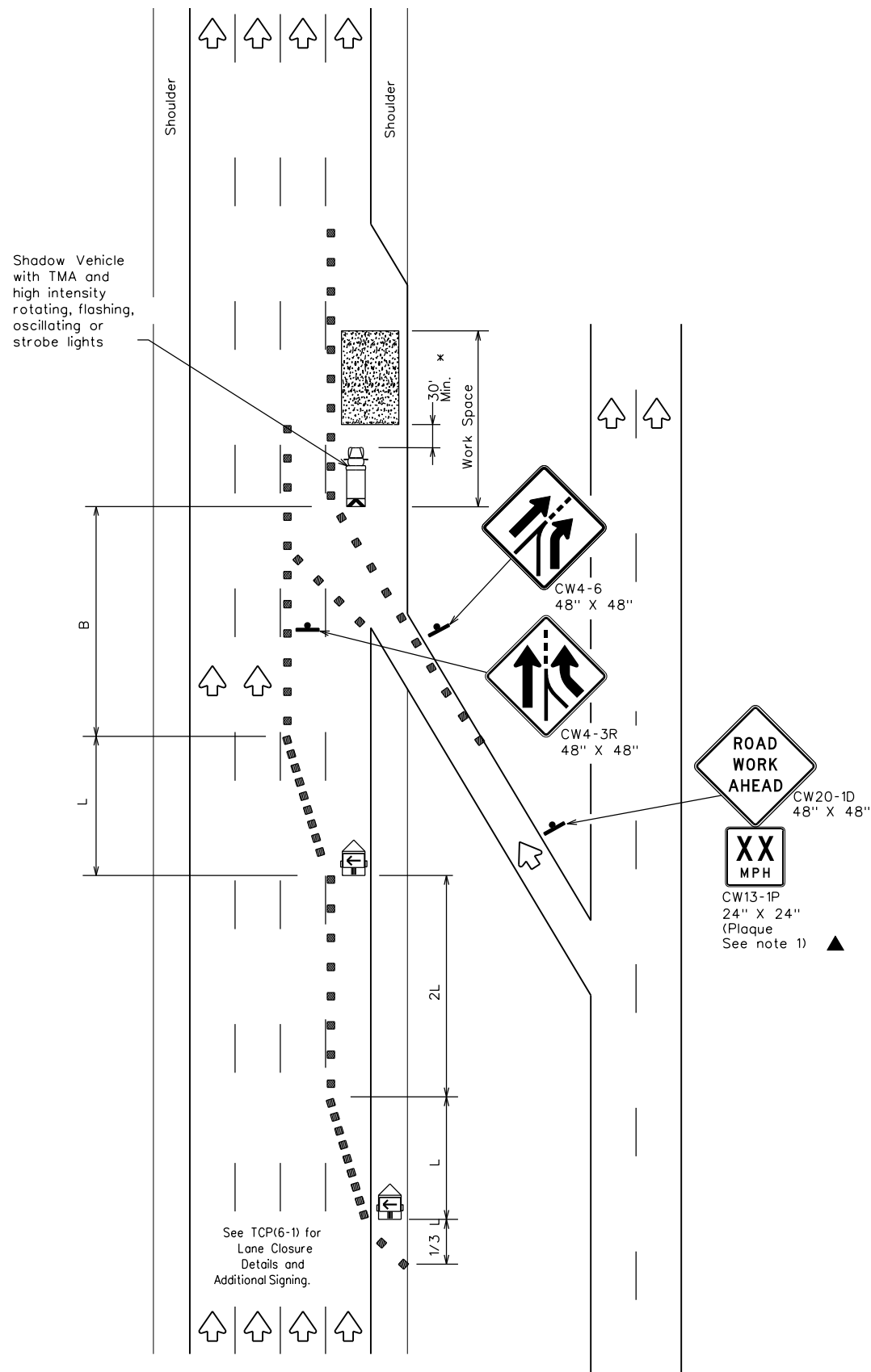
TRAFFIC CONTROL PLAN
WORK AREA NEAR RAMP

TCP(6-2)-12

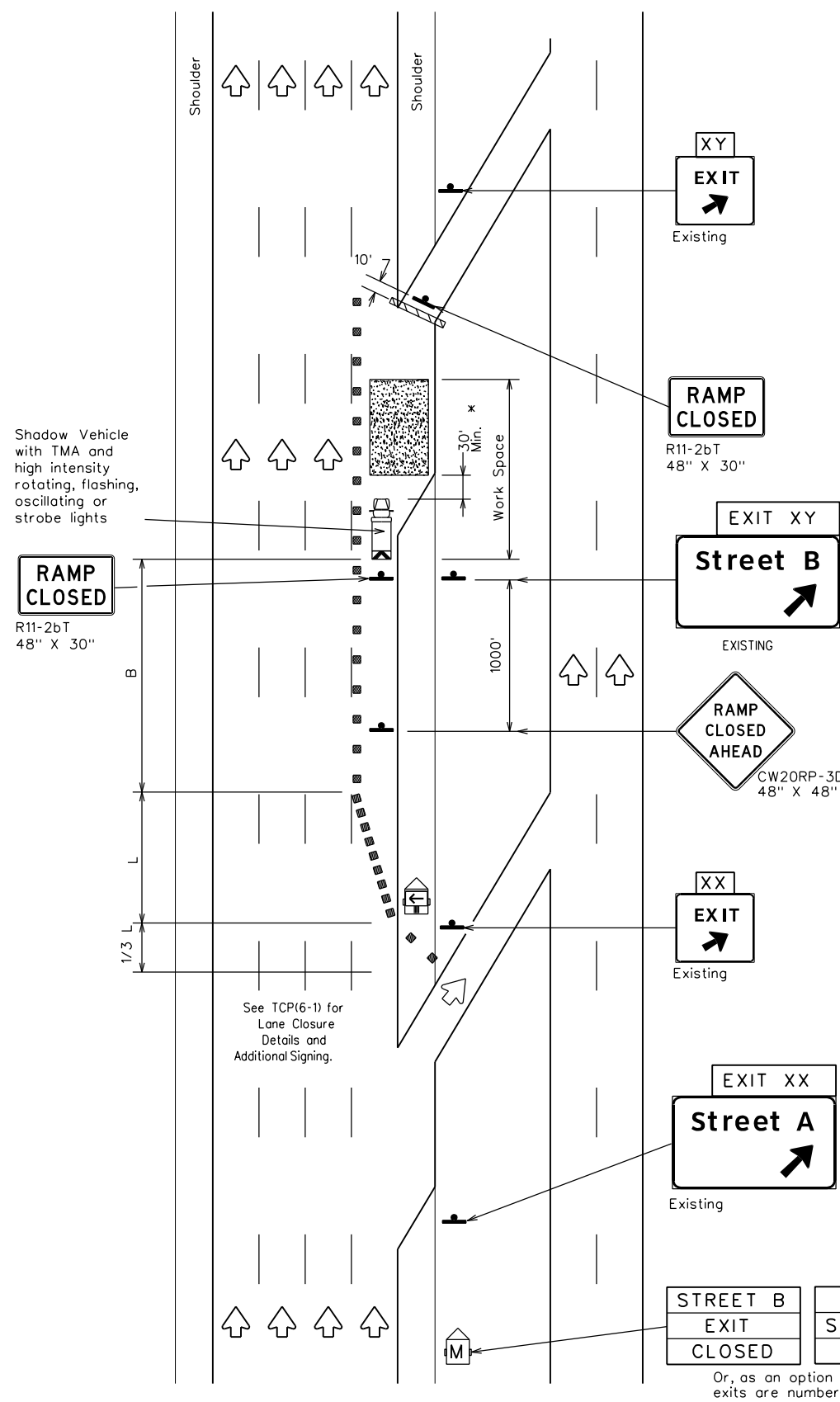
FILE: tcp6-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
1-97 8-98	DIST	COUNTY	SHEET NO.	
4-98 8-12	FTW	ERATH, ETC.	44	

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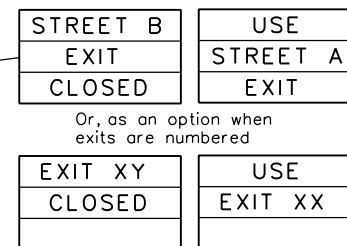
DATE: FILE:



TCP (6-3a)
ENTRANCE RAMP OPEN



TCP (6-3b)
EXIT RAMP CLOSED
TRAFFIC EXITS PRIOR TO CLOSED RAMP



Place 1 mile (approx.) in advance of Street A exit.

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

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

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.

* A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

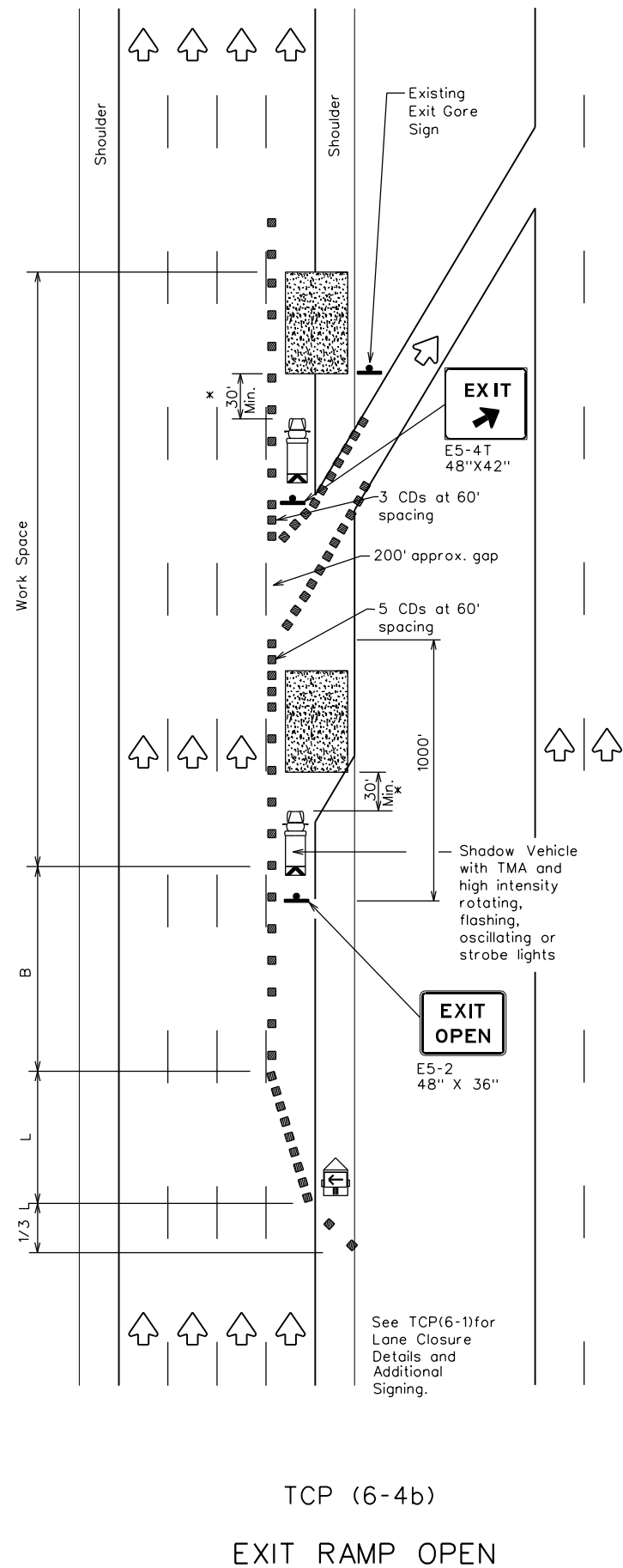
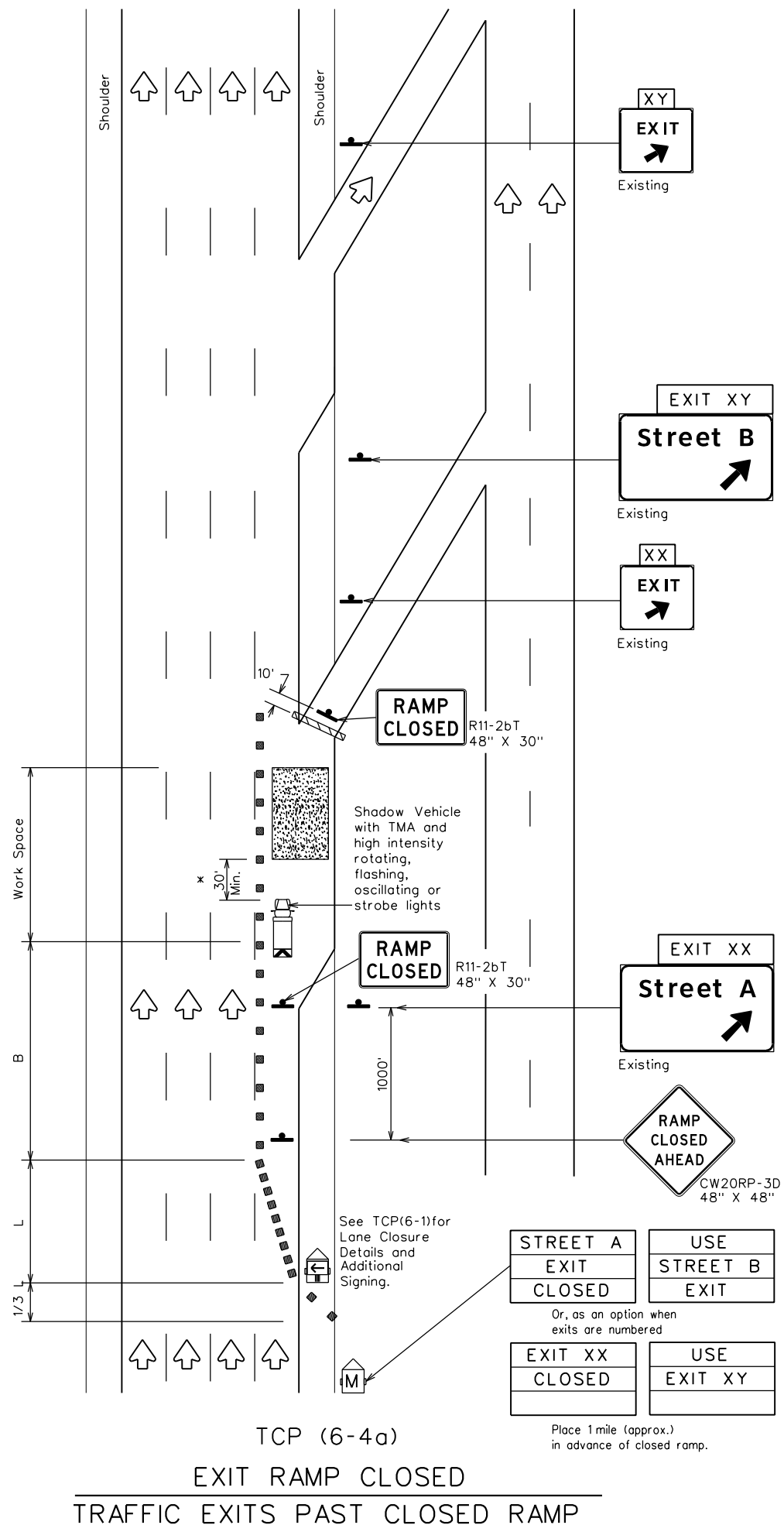
TRAFFIC CONTROL PLAN
WORK AREA BEYOND RAMP

TCP(6-3)-12

FILE: tcp6-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
1-97 8-98	DIST	COUNTY	SHEET NO.	
4-98 8-12	FTW	ERATH, ETC.	45	

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DATE: FILE:



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

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

* * * 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

- All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
- See BC Standards for sign details.

* A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.



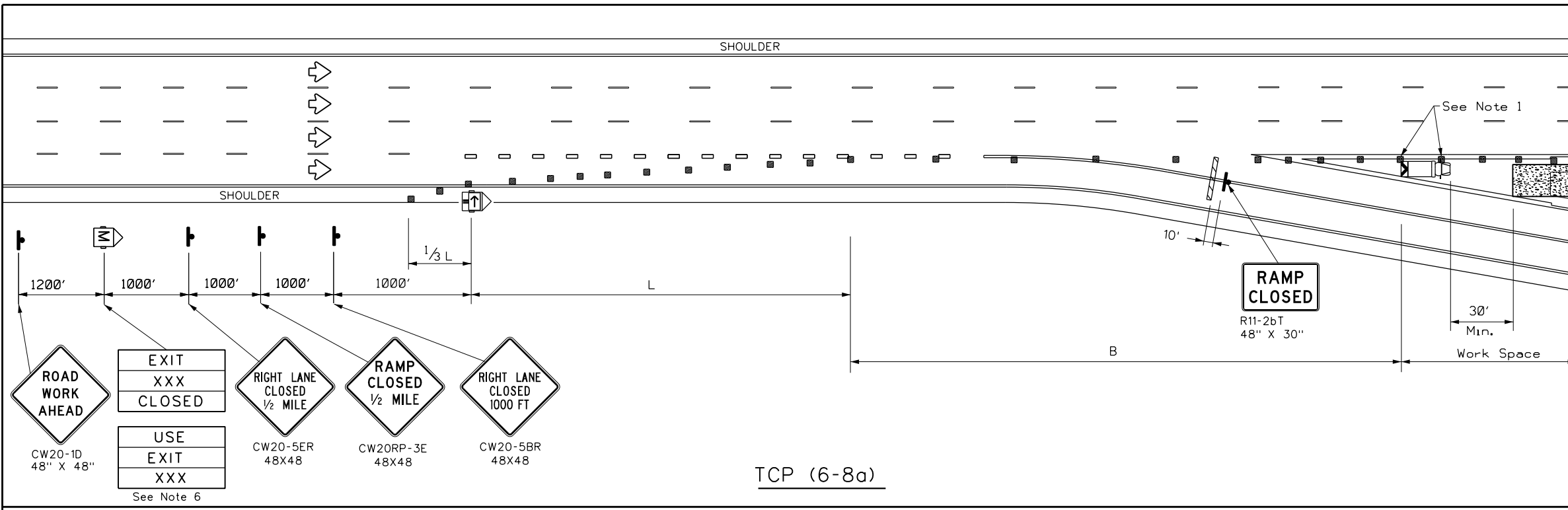
**TRAFFIC CONTROL PLAN
WORK AREA AT EXIT RAMP**

TCP(6-4)-12

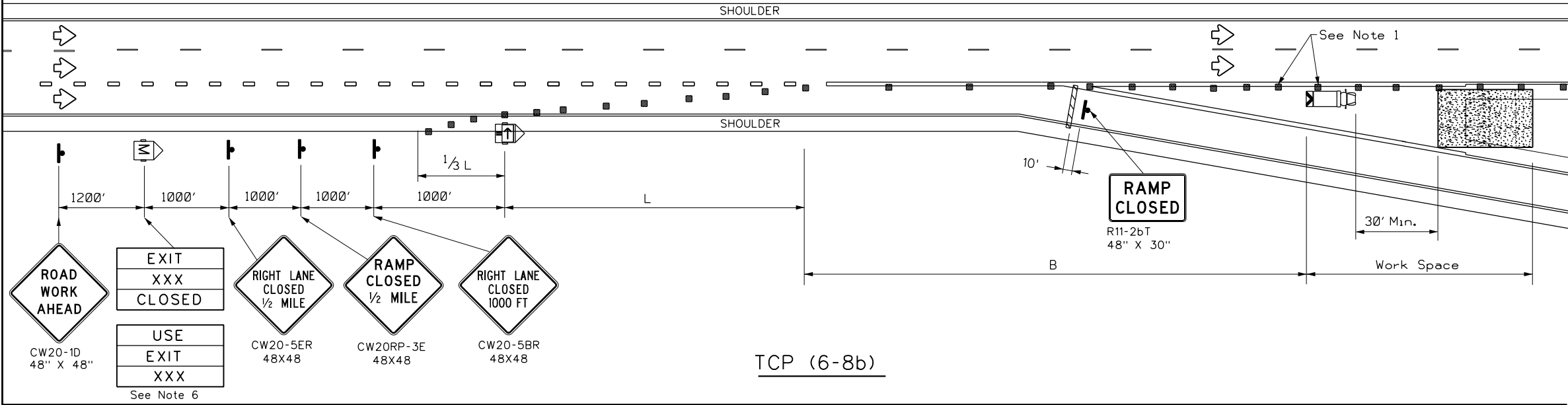
FILE: tcp6-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
1-97 8-98	DIST	COUNTY	SHEET NO.	
4-98 8-12	FTW	ERATH, ETC.	46	

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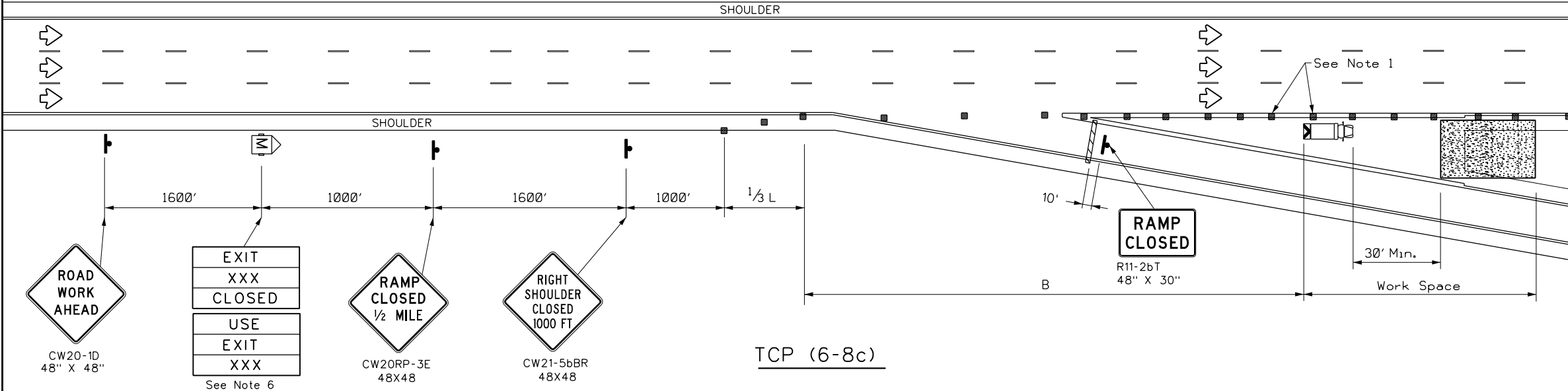
DATE: FILE:



TCP (6-8a)



TCP (6-8b)



TCP (6-8c)

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

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

** 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

- Place channelizing devices in the gore at 20' spacing.
- See the Standard Highway Sign Design for Texas (SHSD) for sign details.
- The PCMS may be omitted when a permanent DMS sign is available in an appropriate location to display a similar message as called for on the PCMS.
- When it is determined that a through lane should be closed in addition to the exit ramp, refer to TCP(6-4) for traffic control details.
- Truck mounted attenuator is required.
- The PCMS may be omitted if replaced with a "RAMP CLOSED" AHEAD (CW20RP-3D) Sign.
- Roadway ADT should be greater than 10,000.



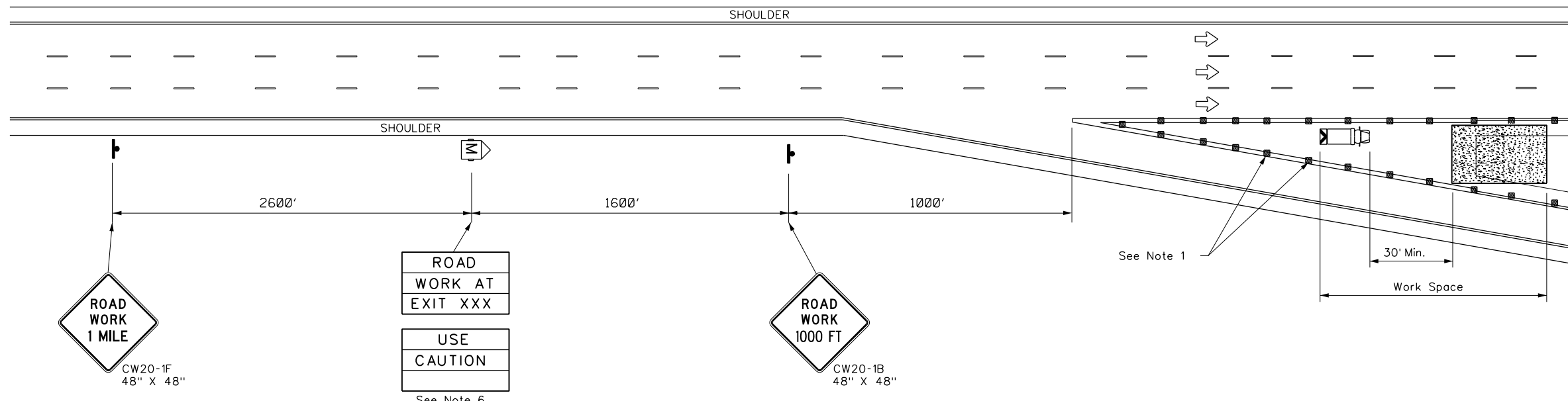
WORK IN EXIT GORE FOR ADT GREATER THAN 10,000

TCP(6-8)-14

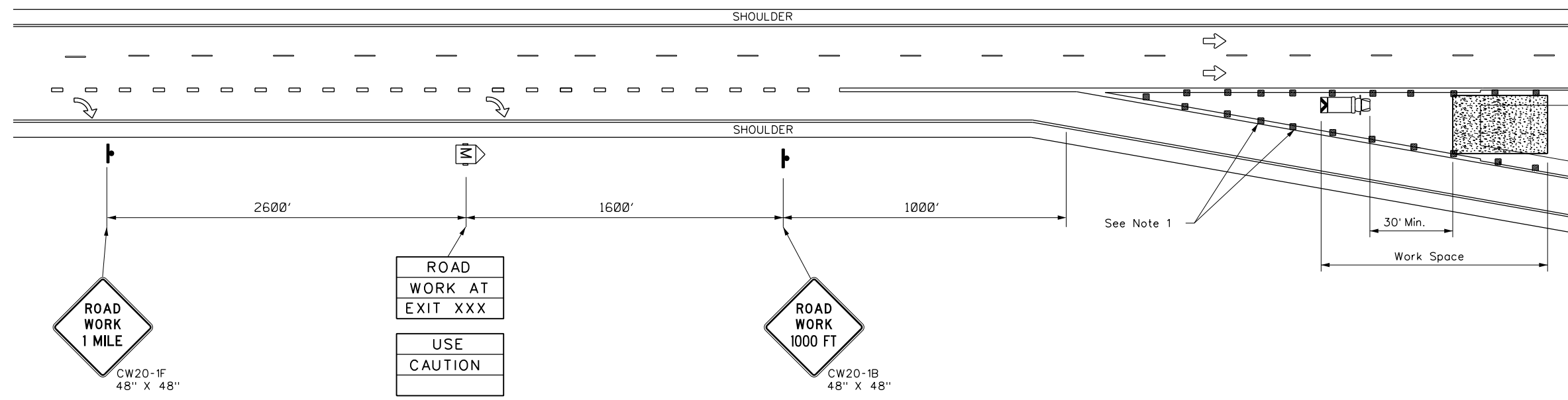
FILE: tcp6-8.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
	DIST	COUNTY	SHEET NO.	
	FTW	ERATH, ETC.	47	

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DATE:
FILE:



TCP (6-9a)



TCP (6-9b)

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

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

** 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**
- Place channelizing devices in the gore at 20' spacing.
 - See the Standard Highway Sign Design for Texas (SHSD) for sign details.
 - The PCMS may be omitted when a permanent DMS sign is available in an appropriate location to display a similar message as called for on the PCMS.
 - When it is determined that a through lane should be closed in addition to the exit ramp, refer to TCP(6-4) and TCP(6-8) for traffic control details.
 - Truck mounted attenuators are required.
 - The PCMS may be omitted if replaced with a "ROAD WORK 1/2 MILE" (CW20-1E).
 - Roadway ADT should be less than 10,000.



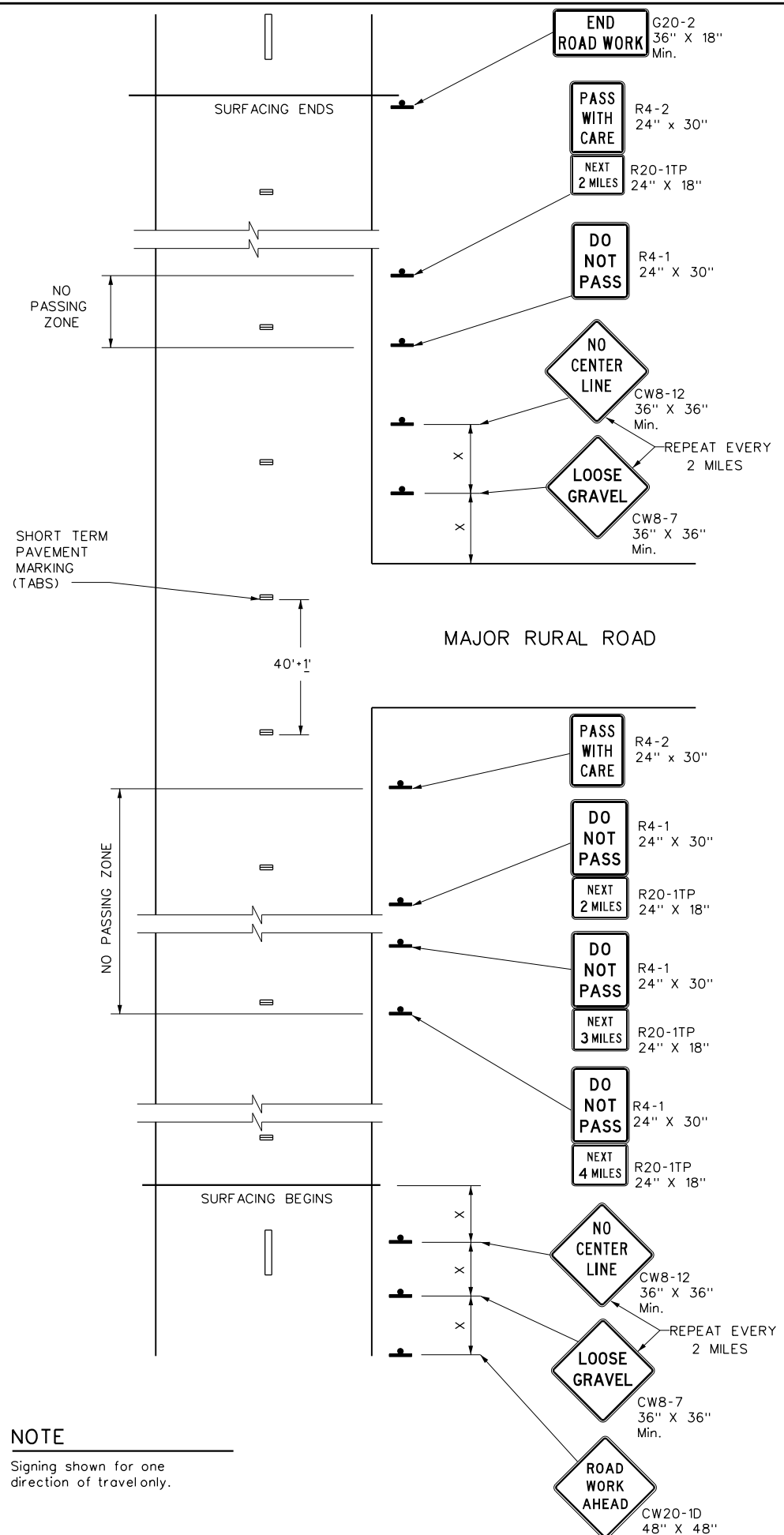
**WORK IN EXIT GORE
FOR ADT LESS THAN 10,000**

TCP(6-9)-14

FILE: tcp6-9.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
	DIST	COUNTY	SHEET NO.	
	FTW	ERATH, ETC.	48	

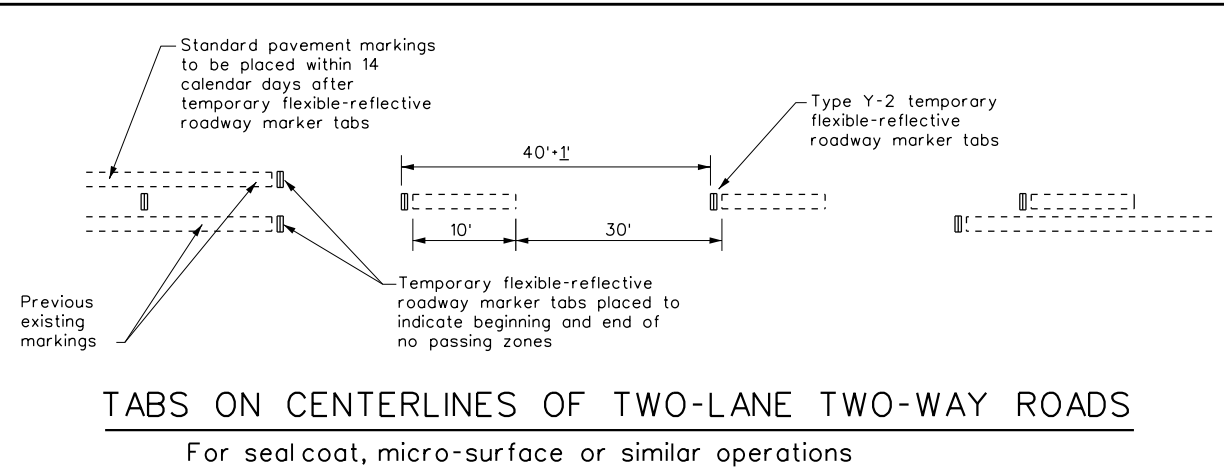
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DATE: FILE:



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, micro-surface or similar 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 day's 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.
- C. Tab placement for overlay/inlay operations shall be as shown on the WZ(STPM) standard sheet.

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 Long-Term / Intermediate-Term 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.



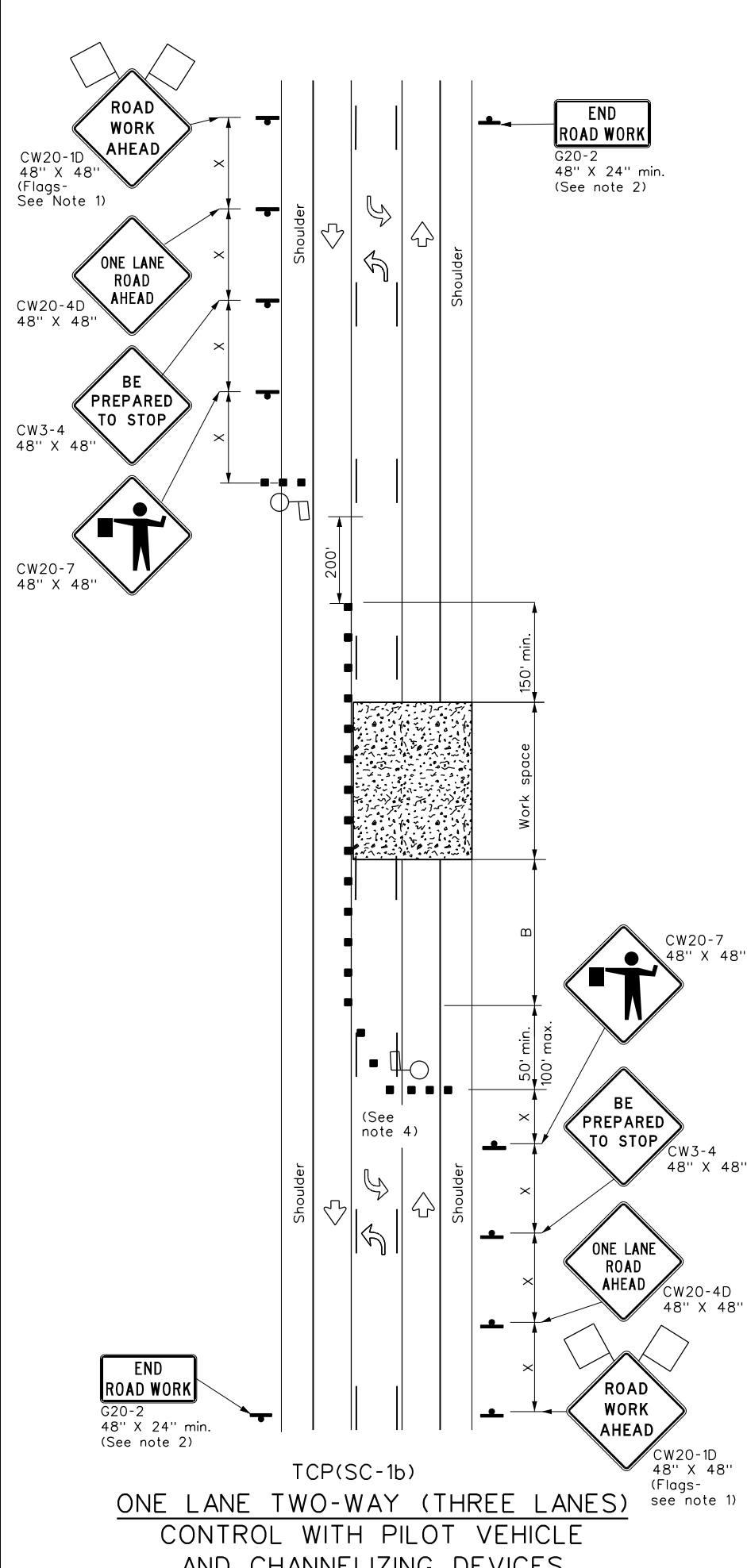
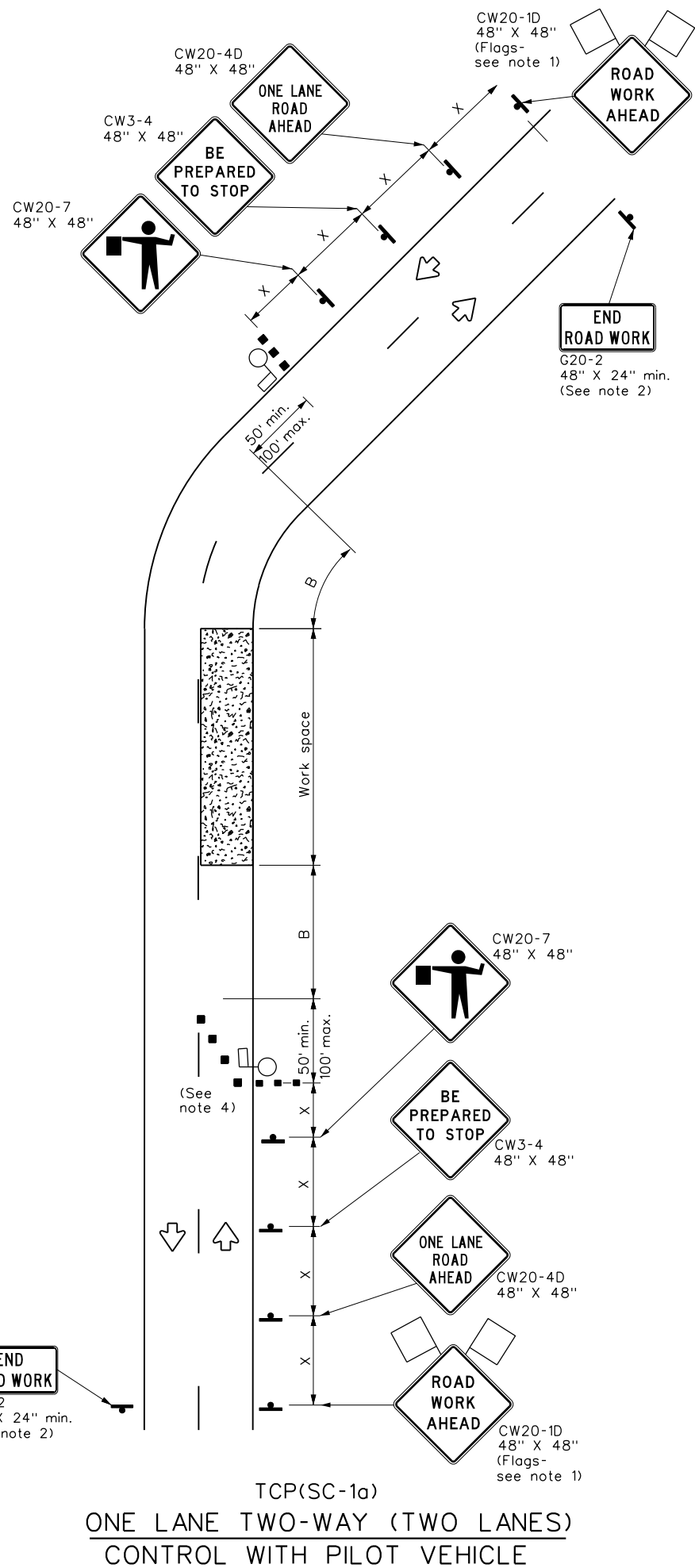
TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP(7-1)-13

FILE: tcp7-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT March 1991	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
4-92 4-98	DIST	COUNTY	SHEET NO.	
1-97 7-13	FTW	ERATH, ETC.	49	

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DATE: FILE:



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

Posted Speed *	Formula	Minimum Desirable Taper Lengths * x			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing Distance "X"	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	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

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

TCP (SC-1a)

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

SHEET 1 OF 8



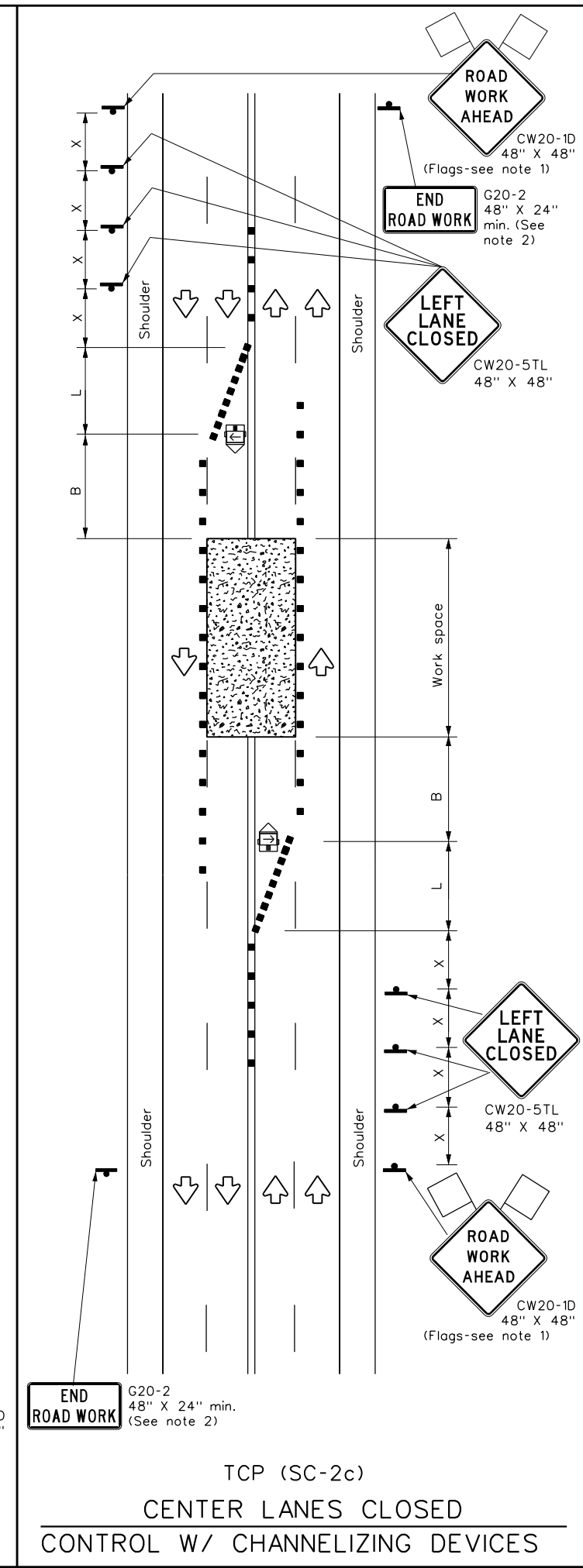
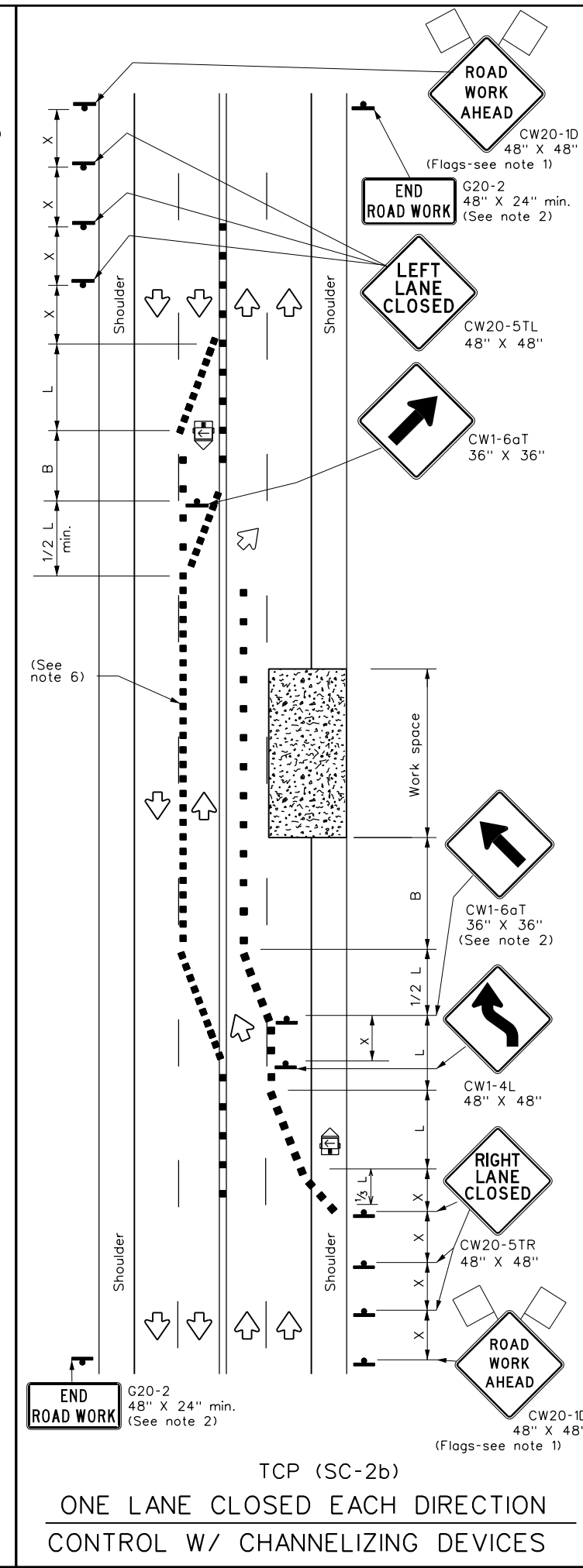
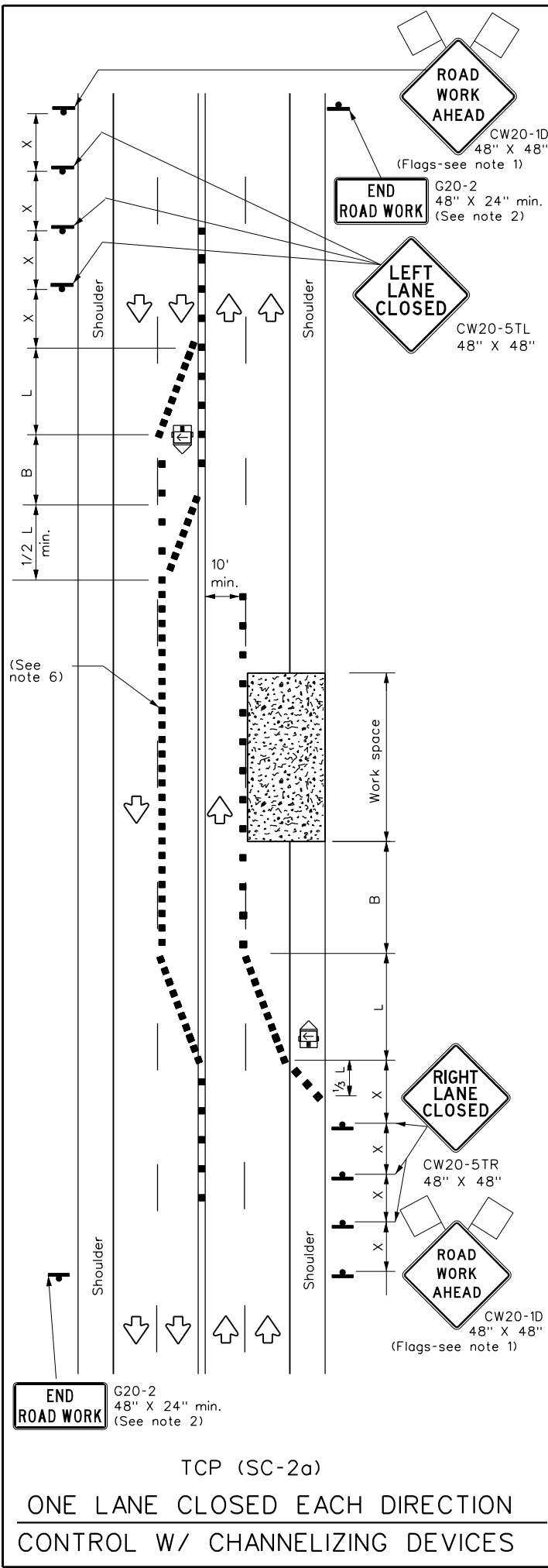
**TRAFFIC CONTROL PLAN
SEAL COAT OPERATIONS
ONE-LANE TWO-WAY**

TCP(SC-1)-22

FILE: tcpsc-1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
4-21	DIST	COUNTY	SHEET NO.	
10-22	FTW	ERATH, ETC.	50	

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DATE: FILE:



LEGEND

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

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

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

TYPICAL USAGE

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

- GENERAL NOTES**
- Flags attached to signs where shown are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except: if project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.
 - The ROAD WORK AHEAD (CW20-1D) sign may be repeated if the visibility of the work zone is less than 1500 feet.
 - If the sealcoat operation crosses intersections, traffic in these areas must be controlled. Care must be taken to prevent vehicles from crossing the asphalt before the aggregate is placed. This may require positioning additional traffic control personnel (flaggers) at the intersection.
 - Temporary rumble strips are not required on sealcoat operations.

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

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

SHEET 2 OF 8

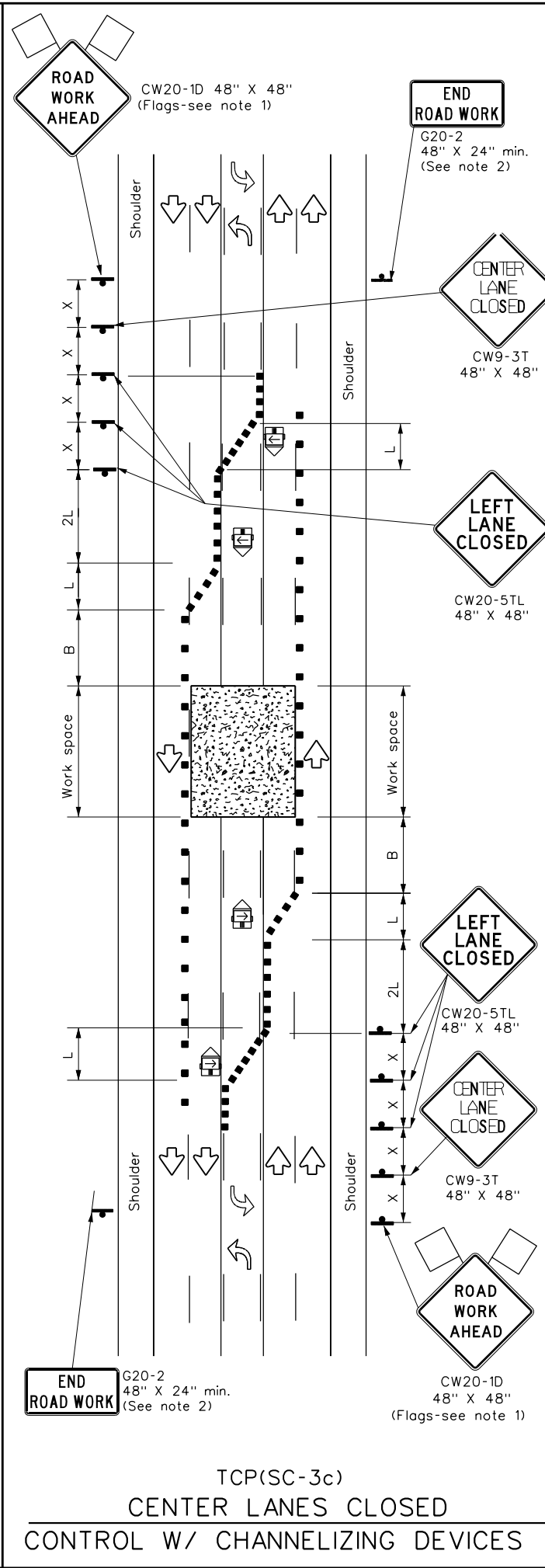
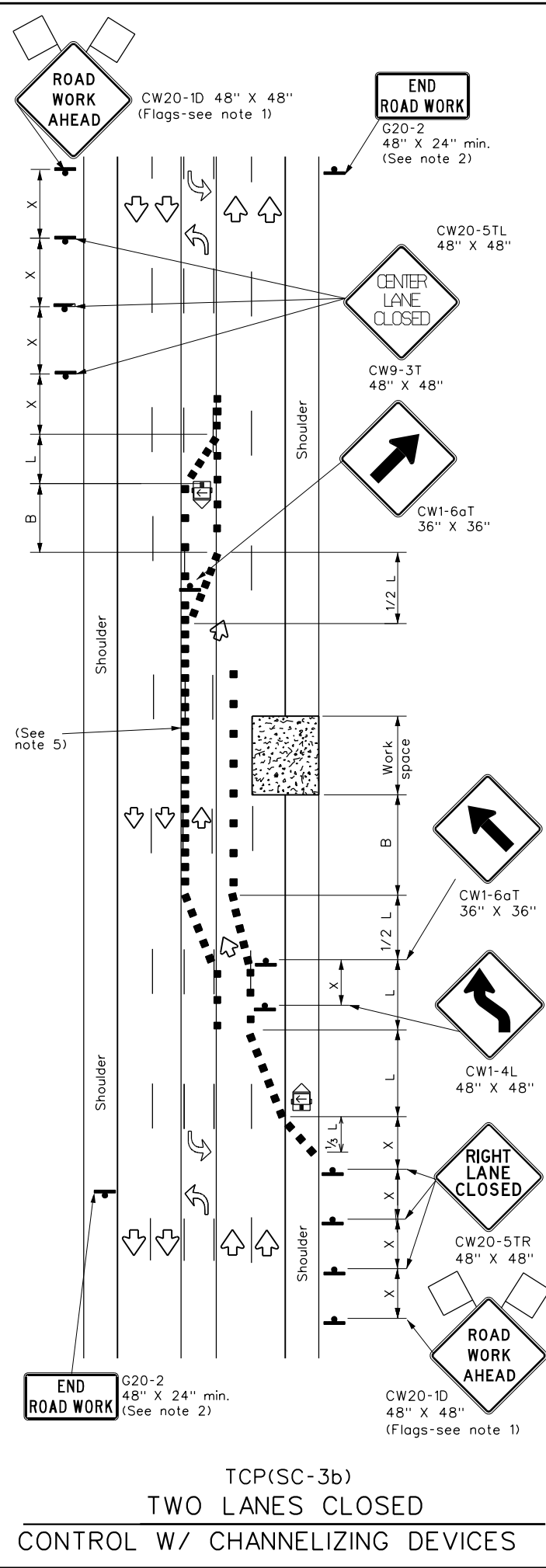
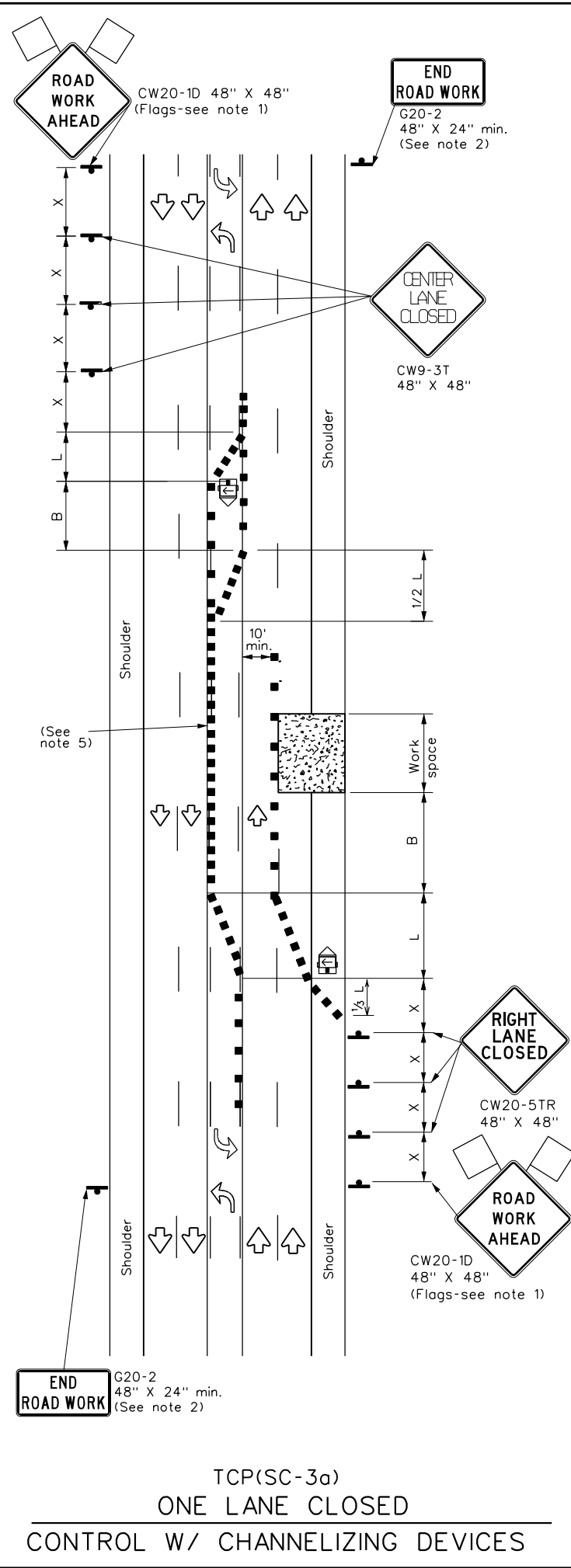
Texas Department of Transportation
Traffic Safety Division Standard

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

FILE: tcpsc-2-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
4-21 10-22	DIST	COUNTY	SHEET NO.	
	FTW	ERATH, ETC.	51	

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DATE: FILE:



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

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

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

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

GENERAL NOTES

- Flags attached to signs where shown are REQUIRED.
- All traffic control devices illustrated are REQUIRED, except: if project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.
- If the sealcoat operation crosses intersections, traffic in these areas must be controlled. Care must be taken to prevent vehicles from crossing the asphalt before the aggregate is placed. This may require positioning additional traffic control personnel (flaggers) at the intersection.
- Temporary rumble strips are not required on sealcoat operations.

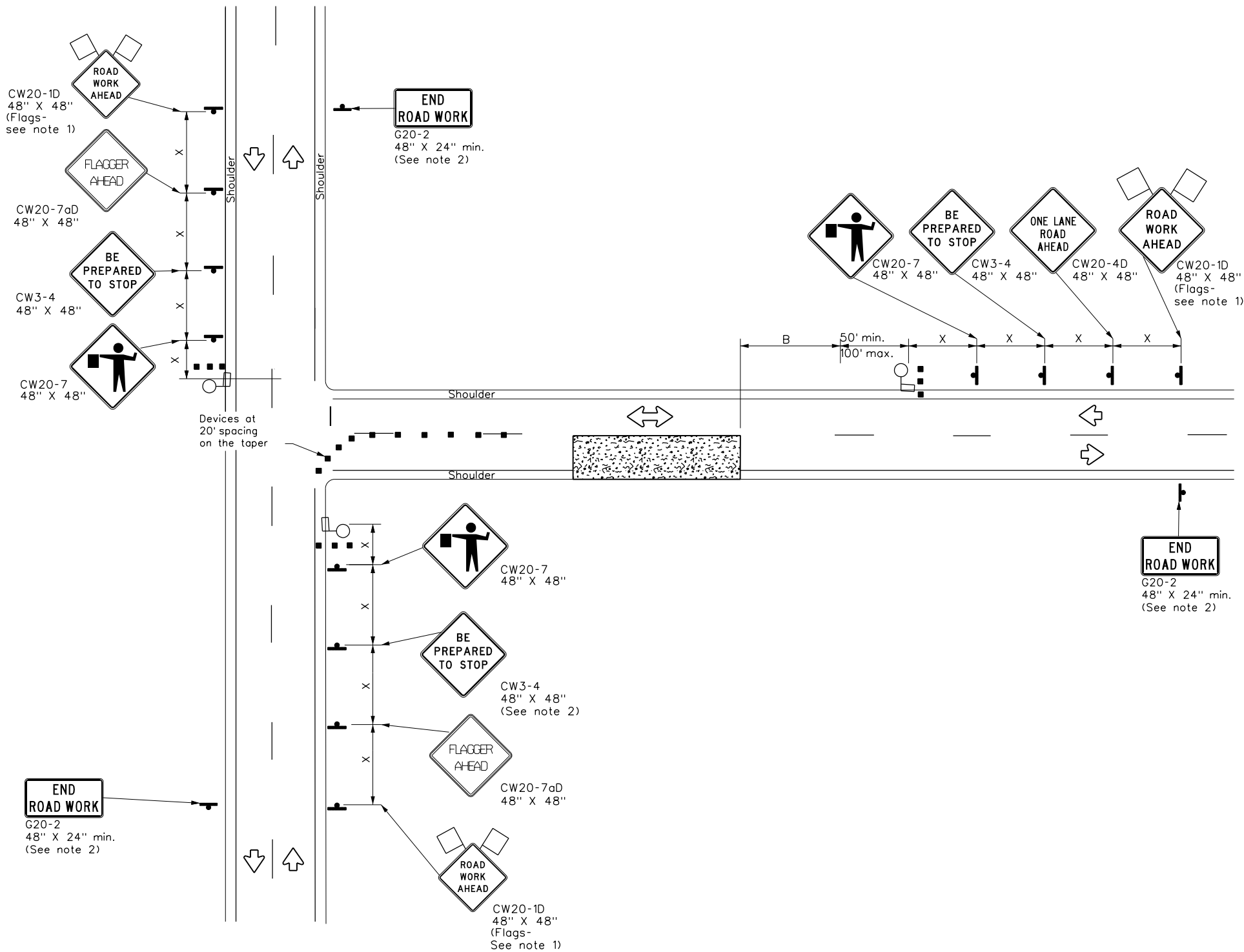
TCP (SC-3a) and (SC-3b)

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

		Traffic Safety Division Standard	
TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS MULTILANE ROADS (W/ CENTER LEFT TURN LANE) TCP(SC-3)-22			
FILE: tcpsc-3-22.dgn	DN:	CK:	DW:
© TxDOT October 2022	CONT SECT	JOB	HIGHWAY
REVISIONS	0250 03	051	US 281, ETC.
4-21	DIST	COUNTY	SHEET NO.
10-22	FTW	ERATH, ETC.	52

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DATE: FILE:



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

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

Posted Speed x	Formula	Minimum Desirable Taper Lengths x x			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing Distance "x"	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	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'

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

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

GENERAL NOTES

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

SHEET 4 OF 8



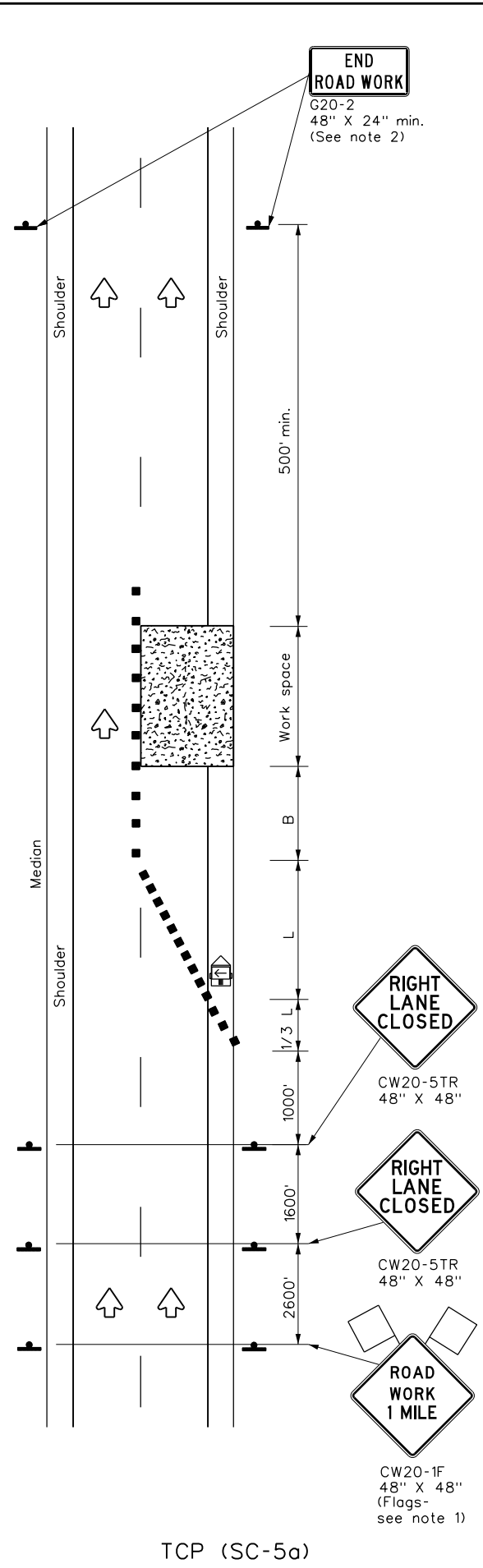
**TRAFFIC CONTROL PLAN
SEAL COAT OPERATIONS
NEAR INTERSECTION**

TCP(SC-4)-22

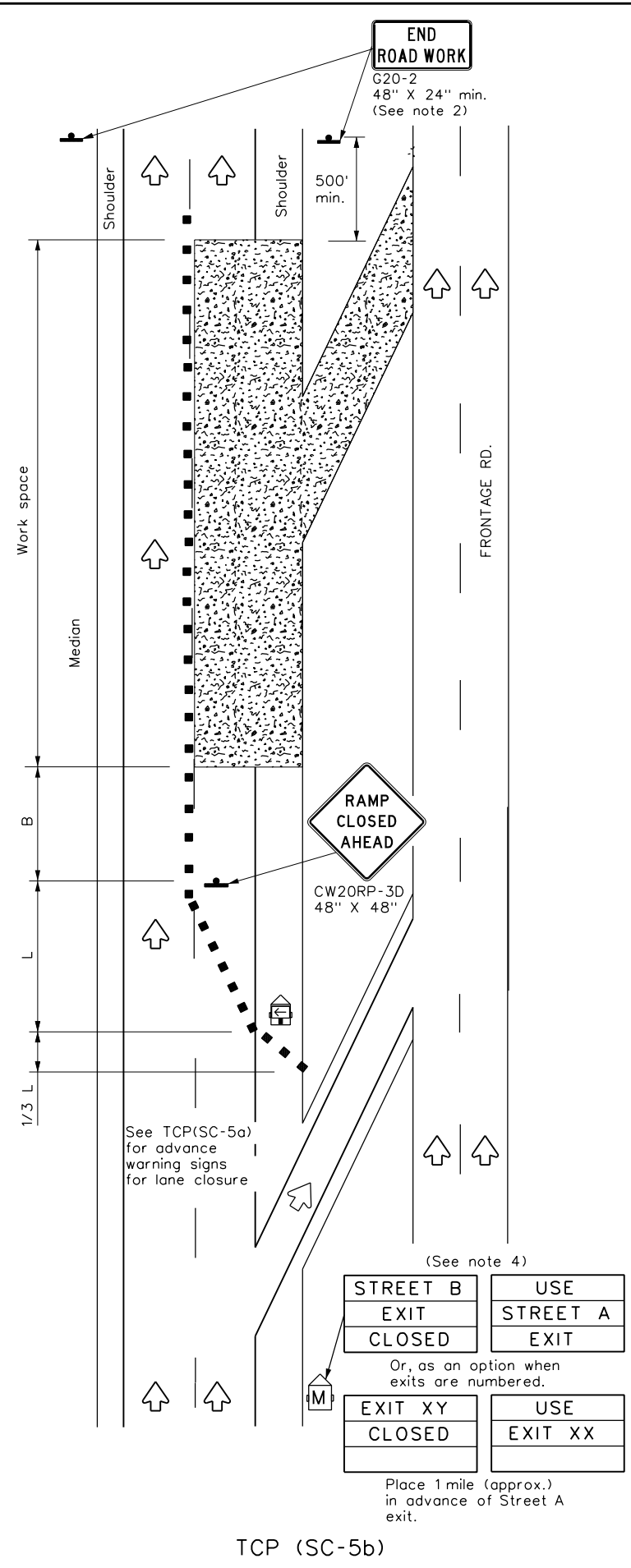
FILE: tcpsc-4-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
4-21	DIST	COUNTY	SHEET NO.	
10-22	FTW	ERATH, ETC.	53	

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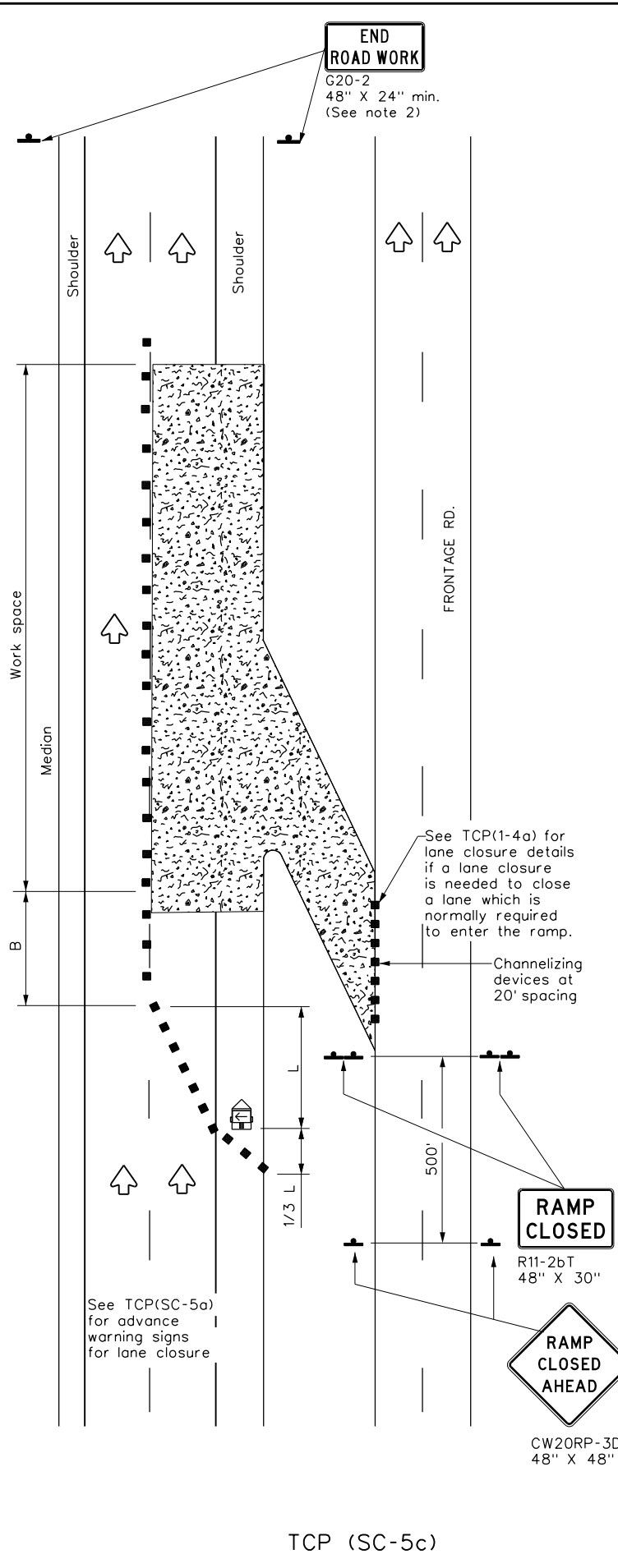
DATE: FILE:



TCP (SC-5a)
ONE LANE CLOSURE



TCP (SC-5b)
LANE AND RAMP CLOSURE
AT EXIT RAMP



TCP (SC-5c)
LANE AND RAMP CLOSURE AT ENTRANCE RAMP

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

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

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

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

- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except:
 - If project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.
 - USE NEXT RAMP (CW25-1T) sign is optional with approval by the Engineer.
 - 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.
 - The PCMS may be omitted if: it is replaced with a RAMP CLOSED AHEAD (CW20RP-3D) sign or when a permanent Dynamic Message Sign (DMS) is available in the appropriate location to display a similar message as called for on the PCMS.
 - Temporary rumble strips are not required on seal coat operations.



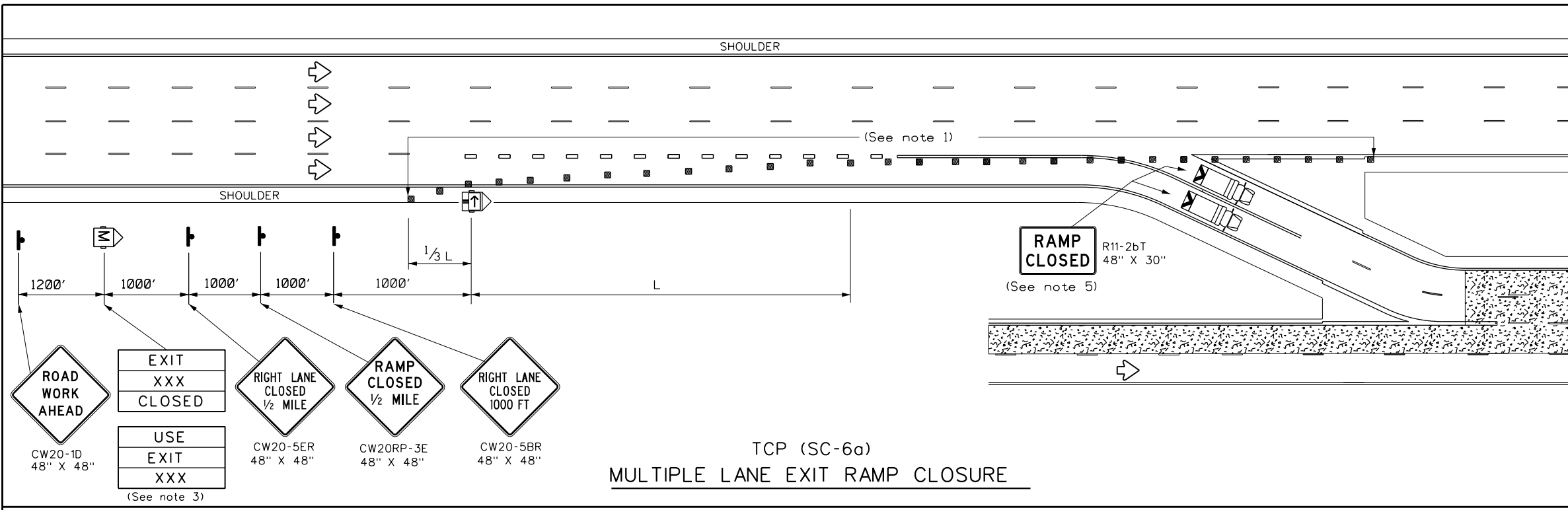
TRAFFIC CONTROL PLAN
SEAL COAT OPERATIONS
DIVIDED HIGHWAYS

TCP(SC-5)-22

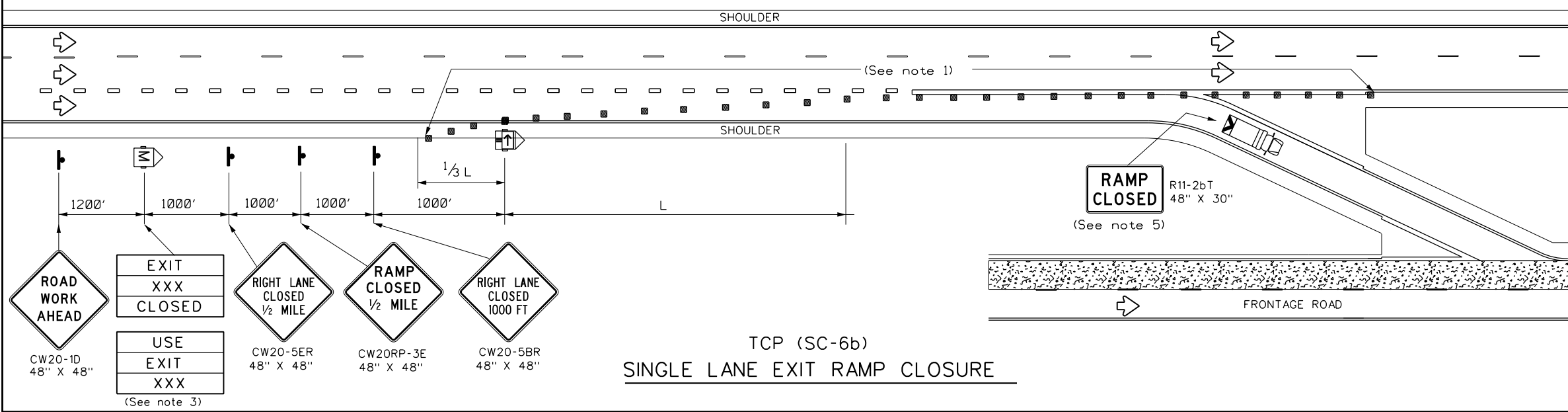
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© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
4-21	DIST	COUNTY	SHEET NO.	
10-22	FTW	ERATH, ETC.	54	

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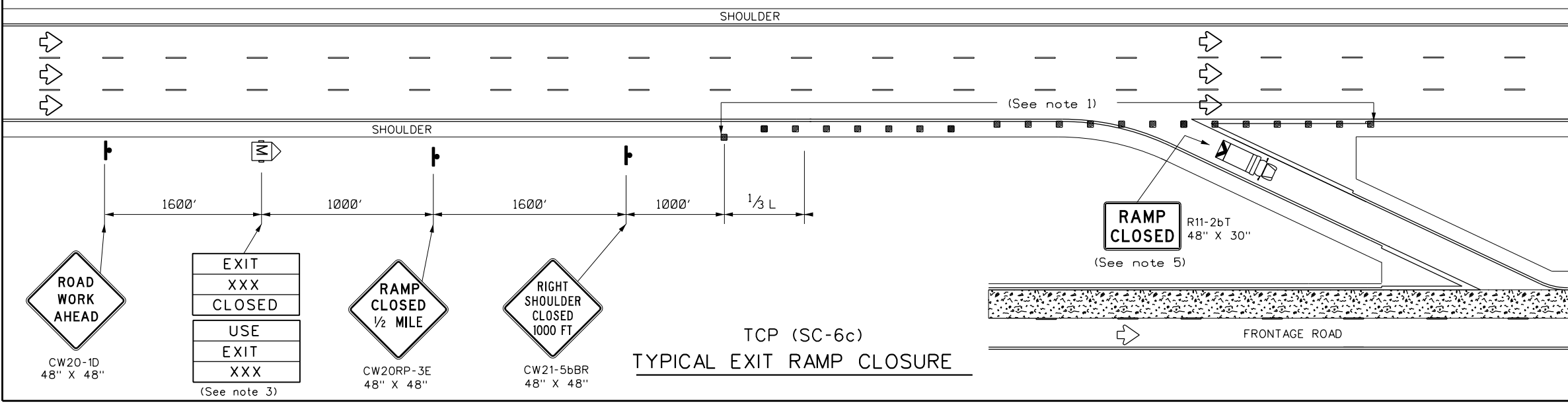
DATE: FILE:



TCP (SC-6a)
MULTIPLE LANE EXIT RAMP CLOSURE



TCP (SC-6b)
SINGLE LANE EXIT RAMP CLOSURE



TCP (SC-6c)
TYPICAL EXIT RAMP CLOSURE

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

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

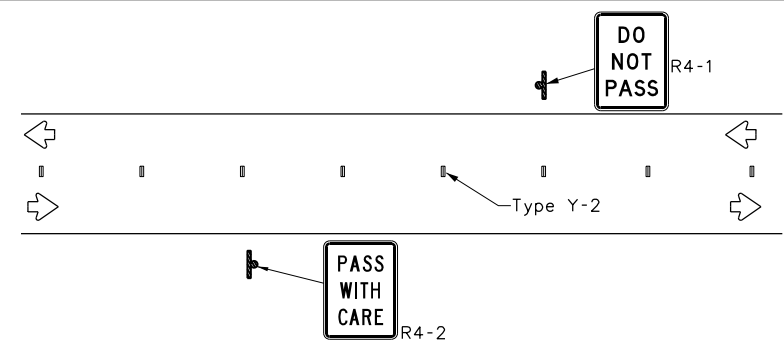
** Taper lengths have been rounded off.
L = Length of Taper (FT) W = Width of Offset (FT)
S = Posted Speed (MPH)

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

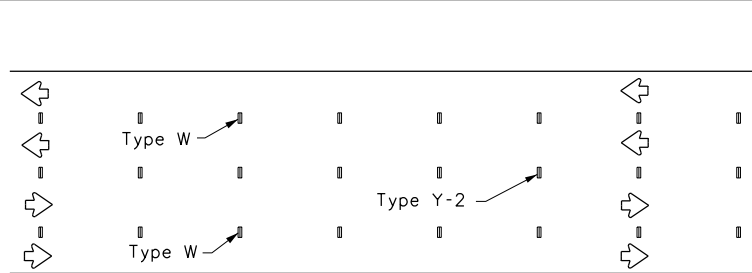
- GENERAL NOTES**
- Place channelizing devices at 20' spacings. Tighter spacing allowed as necessary to address field conditions or observed driver behavior.
 - See the Standard Highway Sign Design for Texas (SHSD) for sign details.
 - The PCMS may be omitted if replaced with a RAMP CLOSED AHEAD (CW20RP-3D)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

FILE: tcpsc-6-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
10-22	0250	03	051	US 281, ETC.
REVISIONS	DIST	COUNTY	SHEET NO.	
	FTW	ERATH, ETC.	55	

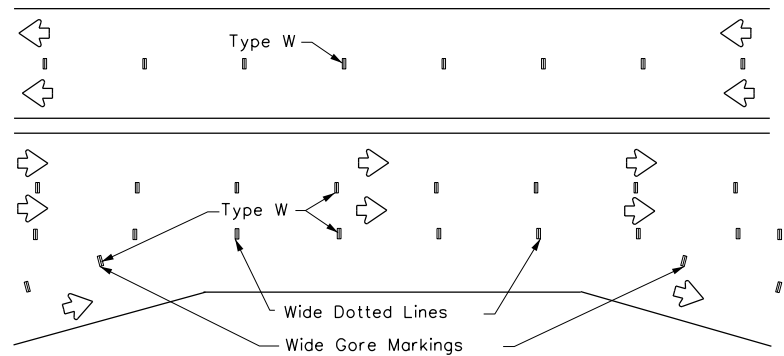
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS (TABS)



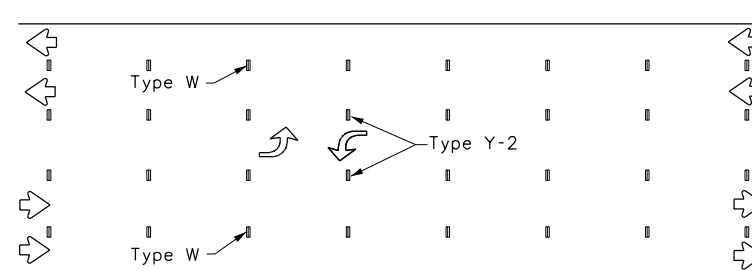
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS

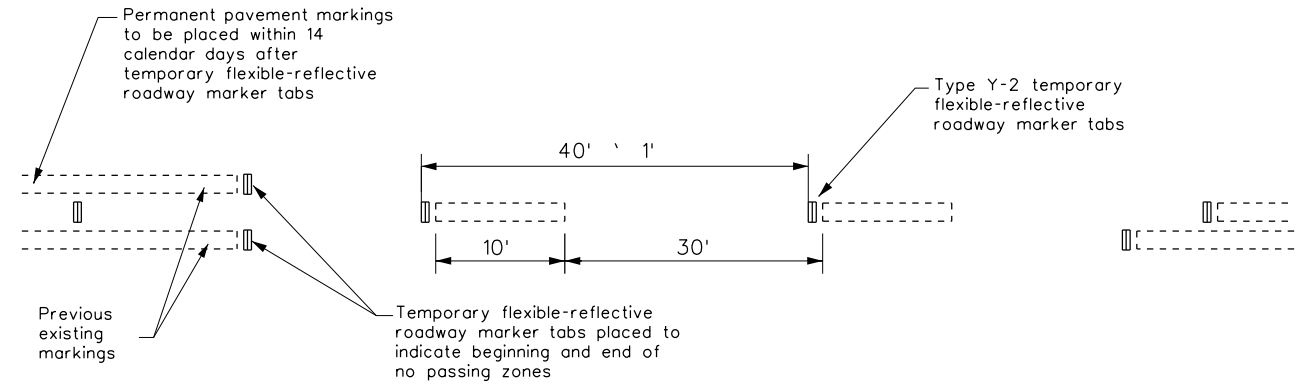


LANE LINES FOR DIVIDED HIGHWAY



TWO-WAY LEFT TURN LANE

TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS



TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS

1. Temporary markings for surfacing projects shall be Temporary Flexible-Reflective Roadway Marker Tabs with protective cover unless otherwise approved by the Engineer. Tabs are to be installed to provide true alignment for striping crews or as directed by the Engineer. Tabs will be placed at the spacing indicated. Tabs should be applied to the pavement no more than two days before the surfacing is applied. After the surfacing is rolled and swept, the protective cover over the reflective strip shall be removed.
2. Temporary Flexible-Reflective Roadway Marker Tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with a yellow body); Type Y (one amber reflective surface with yellow body); and Type W (one white or silver reflective surface with white body). Additional details may be found on BC(11).
3. Temporary Flexible-Reflective Roadway Marker Tabs will require normal maintenance replacement when used on roadways with an Average Daily Traffic (ADT) per lane of up to 7500 vehicles with no more than 10% truck mix. When roadway volumes exceed these values, additional maintenance replacement of these devices should be planned for.
4. When dry, tabs shall be visible for a minimum distance of 200 feet during normal daylight hours and when illuminated by automobile low-beam head light at night, unless sight distance is restricted by roadway geometrics.
5. No two consecutive tabs nor four tabs per 1000 feet of line shall be missing or fail to meet the visual performance requirements of Note 4.
6. Tabs shall meet requirements of Departmental Material Specification DMS-8242.
7. Tabs shall NOT be used to simulate edge lines.

NOTES:

1. The Contractor will be responsible for maintaining short term pavement markings until permanent pavement markings are in place. When the Contractor is responsible for placement of permanent pavement markings, no segment of roadway shall remain without permanent pavement markings for a period greater than 14 calendar days unless weather conditions prohibit placement. Permanent pavement markings shall be placed as soon as weather permits.
2. For exit gores where a lane is being dropped, place wide gore markings or retroreflective channelizing devices to guide motorist through the exit. If channelizing devices are to be used it should be noted elsewhere in the plans. One piece cones are NOT acceptable.
3. Dimensions indicated on this sheet are typical and approximate. Variations in size and height may occur between markers or devices made by manufacturers, by as much as 1/4 inch, unless otherwise noted.

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

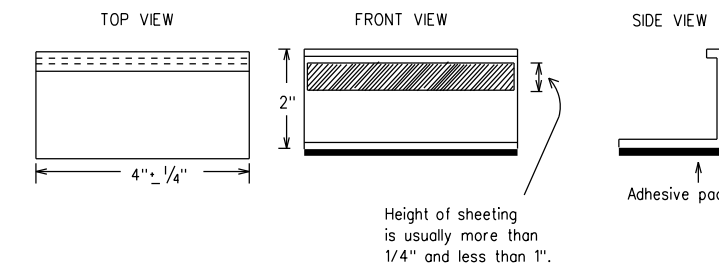
1. DMSs referenced above may be found along with embedded links to their respective MPLs at the following website: <http://www.txdot.gov>

SHEET 7 OF 8

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS (TABS)

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

TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS



Traffic Safety Division Standard

TEMPORARY PAVEMENT MARKINGS FOR SEAL COAT OPERATIONS

TCP(SC-7)-22

FILE: tcpsc-7-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0250	03	051	US 281, ETC.
4-21	DIST	COUNTY	SHEET NO.	
10-22	FTW	ERATH, ETC.	56	

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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 adjacent MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.
(Note: leave blank only if no adjacent MS4 operator(s) are affected)

1.
2.
- No Action Required Required Action

- Action No.
1.
2.
3.
4.

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.
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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 |
| <input type="checkbox"/> Temporary Vegetation | <input type="checkbox"/> Silt Fence | <input type="checkbox"/> Vegetative Filter Strips |
| <input type="checkbox"/> Blankets/Matting | <input type="checkbox"/> Rock Berm | <input type="checkbox"/> Retention/Irrigation Systems |
| <input type="checkbox"/> Mulch | <input type="checkbox"/> Triangular Filter Dike | <input type="checkbox"/> Extended Detention Basin |
| <input type="checkbox"/> Sodding | <input type="checkbox"/> Sand Bag Berm | <input type="checkbox"/> Constructed Wetlands |
| <input type="checkbox"/> Interceptor Swale | <input type="checkbox"/> Straw Bale Dike | <input type="checkbox"/> Wet Basin |
| <input type="checkbox"/> Diversion Dike | <input type="checkbox"/> Brush Berms | <input type="checkbox"/> Erosion Control Compost |
| <input type="checkbox"/> Erosion Control Compost | <input type="checkbox"/> Erosion Control Compost | <input type="checkbox"/> Mulch Filter Berm and Socks |
| <input type="checkbox"/> Mulch Filter Berm and Socks | <input type="checkbox"/> Mulch Filter Berm and Socks | <input type="checkbox"/> Compost Filter Berm and Socks |
| <input type="checkbox"/> Compost Filter Berm and Socks | <input type="checkbox"/> Compost Filter Berm and Socks | <input type="checkbox"/> Vegetation Lined Ditches |
| | <input type="checkbox"/> Stone Outlet Sediment Traps | <input type="checkbox"/> Sand Filter Systems |
| | <input type="checkbox"/> Sediment Basins | <input type="checkbox"/> Grassy Swales |

III. CULTURAL RESOURCES

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

- No Action Required Required Action

- Action No.
1.
2.
3.

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.
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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.
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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	SWSP: 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
NQ: 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: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labeling as required by the Act.
Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the 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.

GENERAL NOTE:

Any change orders and/or deviations from the design must be reported to the Engineer prior to commencement of construction activities, as additional environmental clearance may be required.

 Texas Department of Transportation		Design Division Standard	
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS			
EPIC			
FILE: epic.dgn	DN: TxDOT	CK:	DW: CK:
© TxDOT: February 2015	CONT	SECT	JOB
12-12-2011 (DS) REVISIONS	0250	03	051
09-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY	SHEET NO.
01-23-2015 SECTION I CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	FTW	ERATH, ETC.	57

DATE:
FILE: