

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	F 2024 (005)		1
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	WARD, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072, ETC	SH 18, ETC

INDEX OF SHEETS

SEE SHEET 2

STATE OF TEXAS  
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED  
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NO. F 2024(005)

WARD, ETC  
SH 18, ETC

NET LENGTH OF ROADWAY: 1172160 FT = 222.000 MI

LIMITS: From: 0.22 MILES SOUTH OF FM 1776, ETC. To: PECOS COUNTY LINE, ETC.

FOR THE CONSTRUCTION OF SEAL COAT  
CONSISTING OF SEAL COAT & PAVEMENT MARKINGS

FINAL PLANS

CONTRACTOR:

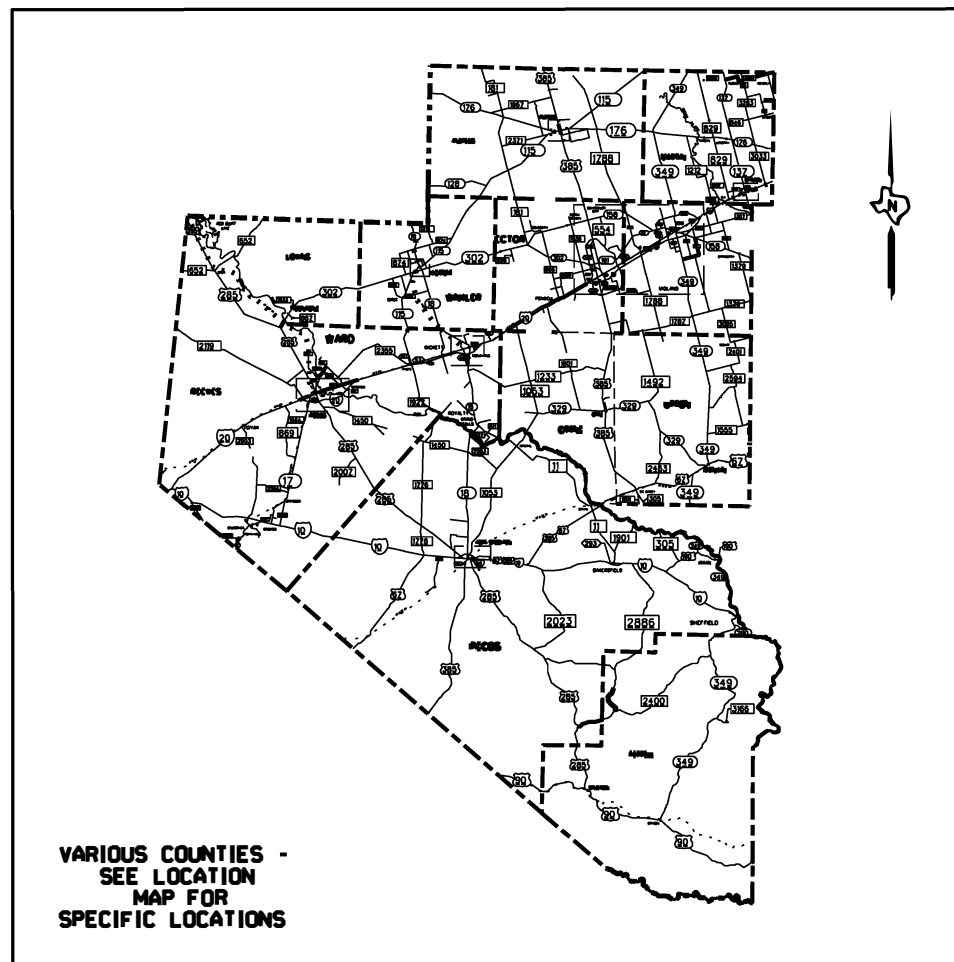
LETTING DATE:

DATE CONTRACTOR BEGAN WORK:

DATE WORK WAS COMPLETED:

DATE WORK WAS ACCEPTED:

FINAL CONTRACT COST: \$



VARIOUS COUNTIES -  
SEE LOCATION  
MAP FOR  
SPECIFIC LOCATIONS

EXCEPTIONS: NONE  
EQUATIONS: NONE  
RR CROSSINGS: FM 11 TXPF PECOS  
IH 10 TXPF PECOS  
IH 10 TXPF PECOS  
IH 10 TXPF PECOS

SCALE: NTS

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF  
TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS  
LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS  
PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID  
CONSTRUCTION CONTRACTS [(FORM FHWA 1273, JULY, 2022).]

TEXAS DEPARTMENT OF TRANSPORTATION

SUBMITTED 8/1/2023  
FOR LETTING: \_\_\_\_\_ 20\_\_

DocuSigned by:  
*Nestor Mendez*, P.E.  
AREA ENGINEER

RECOMMENDED 8/1/2023  
FOR LETTING: \_\_\_\_\_ 20\_\_

DocuSigned by:  
*[Signature]*, P.E.  
DIRECTOR OF TRANSPORTATION  
PLANNING AND DEVELOPMENT

APPROVED 8/2/2023  
FOR LETTING: \_\_\_\_\_ 20\_\_

DocuSigned by:  
*Eric L. Lohman*, P.E.  
DISTRICT ENGINEER

PRINTED DATE: XX/XX/XXXX

COUNTY \_\_\_\_\_  
PROJ. NO. \_\_\_\_\_  
HWY. NO. \_\_\_\_\_  
LETTING DATE \_\_\_\_\_  
DATE ACCEPTED \_\_\_\_\_

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45
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- 4      PROJECT LOCATIONS
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- 9-11      CONSOLIDATED SUMMARY
- 12-24      ROADWAY SUMMARY
- 25-37      BASIS OF ESTIMATE

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- 53      \* TCP (SC - 6) - 22
- 54      \* TCP (SC - 7) - 22
- 55      \* TCP (3 - 1) - 13
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- 68      ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

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

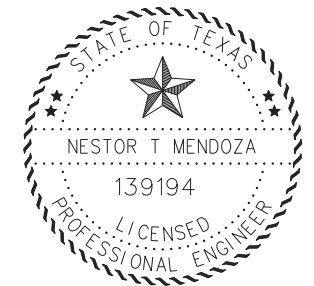
DocuSigned by:

*Nestor Mendoza Jr., P.E.* .PE

7/21/2023

DATE

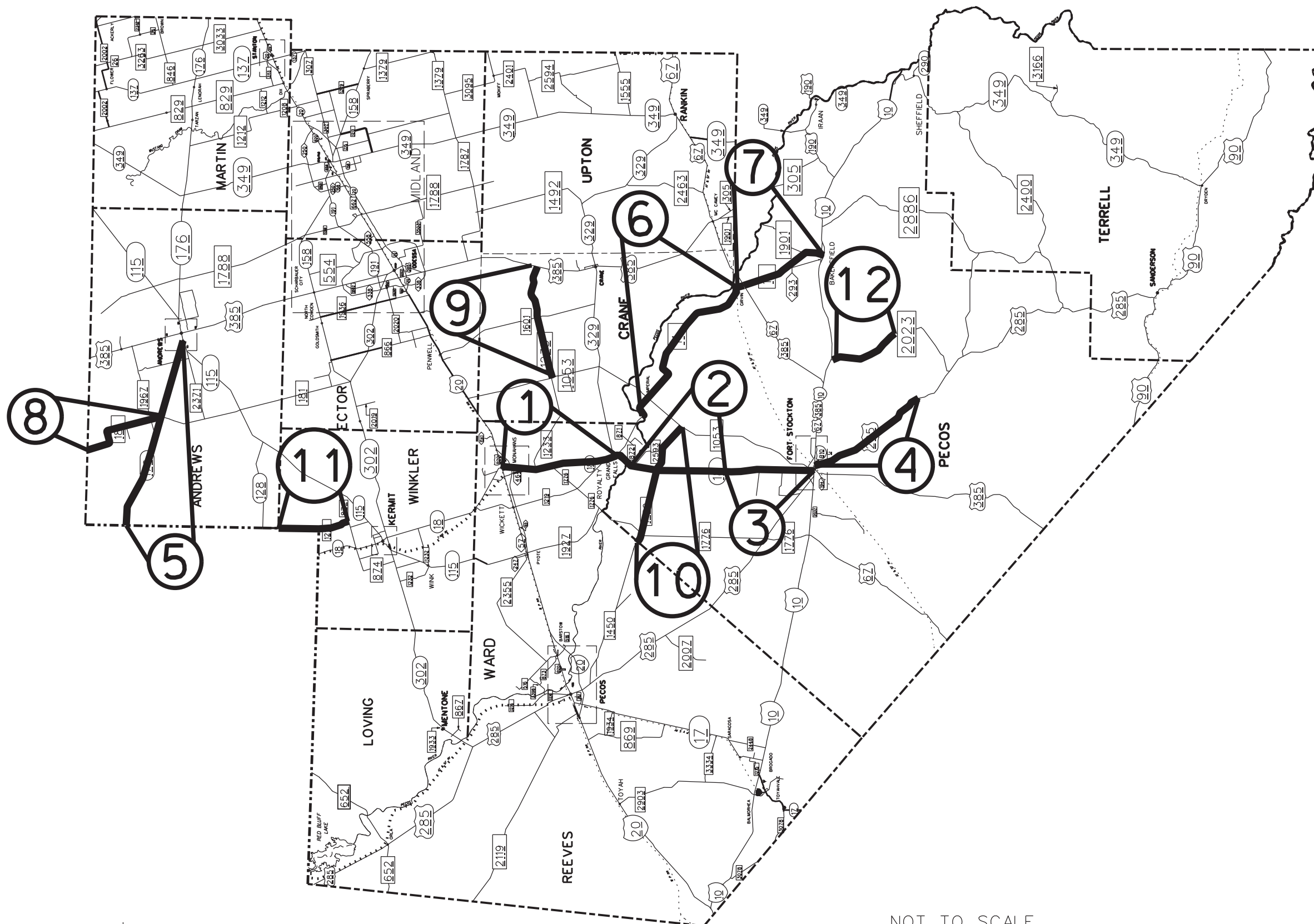
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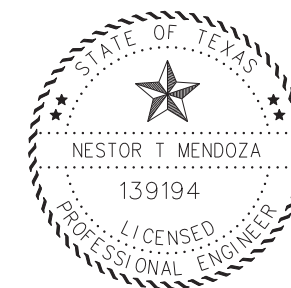
**INDEX OF SHEETS**



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			2
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	WARD, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072, ETC	SH 18, ETC



NOT TO SCALE



DocuSigned by:  
*Nestor T Mendoza, P.E.*  
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7/11/2023

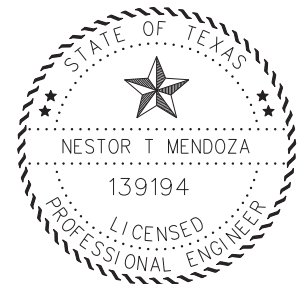
### LOCATION MAP



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			3
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	WARD, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	SH 18, ETC

### SEAL COAT

PROJECT REFERENCE NUMBER	PROJECT CONTROL	LIMITS	HIGHWAY & COUNTY
1	0292-04-072	FROM: 0.22 MILES SOUTH OF FM 1776 TO: PECOS COUNTY LINE	SH 18 WARD
2	0292-05-020	FROM: WARD COUNTY LINE TO: 14.85 MILES NORTH OF DICKENSON BLVD	SH 18 PECOS
3	0292-06-037	FROM: DICKENSON BLVD TO: 14.85 MILES NORTH OF DICKENSON BLVD	SH 18 PECOS
4	0293-01-031	FROM: DICKENSON BLVD TO: 19.26 MILES SOUTH OF DICKENSON BLVD	US 285 PECOS
5	0548-05-053	FROM: NEW MEXICO STATE LINE TO: SH 115	SH 176 ANDREWS
6	0629-03-040	FROM: CRANE COUNTY LINE TO: US 67	FM 11 PECOS
7	0629-04-013	FROM: US 67 TO: IH 10 SFR End Of Pavement	FM 11 PECOS
8	0961-02-016	FROM: GAINES COUNTY LINE TO: SH 176	FM 181 ANDREWS
9	1367-01-017	FROM: FM 1053 TO: US 385	FM 1233 CRANE
10	1639-02-021	FROM: REEVES COUNTY LINE TO: FM 1053	FM 1450 PECOS
11	1825-01-009	FROM: SH 128 TO: WINKLER COUNTY LINE	FM 1218 ANDREWS
12	1825-02-012	FROM: ANDREWS COUNTY LINE TO: FM 874	FM 1218 WINKLER
13	2566-01-009	FROM: IH 10 NFR TO: END OF RM 2023	RM 2023 PECOS



DocuSigned by:

*Nestor T Mendoza, P.E.*

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7/11/2023

### PROJECT LOCATIONS



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			4
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	WARD, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072, ETC	SH 18, ETC

County: WARD, ETC  
Highway: SH 18, ETC

Sheet: 5  
Control: 0292-04-072, ETC

**General Notes:**

Contractor questions on this project are to be addressed to the following individual(s):  
[ODA-PreLettingQuestions@txdot.gov](mailto:ODA-PreLettingQuestions@txdot.gov)

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

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

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

**Item 5: Control of the Work**

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

**Item 6: Control of Materials**

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

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

To comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law, the contractor must submit a notarized original of the TxDOT Construction Material Buy America Certification Form for all items classified as construction materials. This form is not required for materials classified as a manufactured product.

Refer to the Buy America Material Classification Sheet for clarification on material categorization.

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**

If access to the project is required through a new or unapproved driveway (i.e. material source, stockpile location, field office, etc.), obtain an approved "Permit to Construct Access Driveway

County: WARD, ETC  
Highway: SH 18, ETC

Sheet: 5  
Control: 0292-04-072, ETC

Facilities on Highway Right Of Way" (TxDOT Form 1058) before beginning any construction operations.

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

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

Festival	Start Date	End Date
Memorial Day	May 27 <sup>th</sup>	May 27 <sup>th</sup>
July 4 <sup>th</sup>	July 4 <sup>th</sup>	July 4 <sup>th</sup>
Labor Day	September 2nd	September 2nd

Coordinate any adjustments to the schedule with the Engineer if the anticipated dates change.

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

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

**Item 8: Prosecution and Progress**

Hot asphalt will be applied between May 1<sup>st</sup> and August 31<sup>st</sup> unless authorized in writing.

The latest start work date will be July 17, 2024.

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

- Traffic Control Plan
- Storm Water Pollution Prevention Plan
- Environmental Permit, Issues And Commitments (EPIC)
- Railroad Exhibits and/or Notes

**County: WARD, ETC**  
**Highway: SH 18, ETC**

**Sheet: 5A**  
**Control: 0292-04-072, ETC**

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

Working days will be computed and charged in accordance with Article 8. 3.1.4. "Standard Workweek."

**Item 210: Rolling**

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

**Item 300: Asphalts, Oils, and Emulsions**

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

**Item 302: Aggregates for Surface Treatments**

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

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

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

LRA seal coat aggregate will not be used.

**Item 316: Seal Coat**

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

AC asphalts have been estimated at 8.70 lbs/gal.

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

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

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

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

**County: WARD, ETC**  
**Highway: SH 18, ETC**

**Sheet: 5A**  
**Control: 0292-04-072, ETC**

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

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

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

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

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

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

Clean up paper, asphalt and excess rock after seal coat placement as each reference location is completed. Contractor shall not proceed ahead more than two reference locations before clean-up operations have been accomplished at the previous completed reference locations.

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

**Item 502: Barricades, Signs, and Traffic Handling**

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

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

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

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

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

County: WARD, ETC  
Highway: SH 18, ETC

Sheet: 5B  
Control: 0292-04-072, ETC

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

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

Vertical panels shall be self-righting.

Remove or completely cover construction signs not in use.

Do not lay down signs.

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

**Item 506: Temporary Erosion, Sedimentation, and Environmental Controls**

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

-Biodegradable Erosion Control Logs

**Item 662: Work Zone Pavement Markings**

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

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

**Item 666 ReflectORIZED Pavement Markings**

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

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

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

County: WARD, ETC  
Highway: SH 18, ETC

Sheet: 5B  
Control: 0292-04-072, ETC

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

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

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



# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0292-04-072

DISTRICT Odessa

COUNTY Andrews, Crane, Pecos, Ward, Winkler

HIGHWAY FM 11, FM 1218, FM 1233, FM 1450, FM 181, RM 2023, SH 176, SH 18, US 285

CONTROL SECTION JOB				0292-04-072		0292-05-020		0292-06-037		0293-01-031		0548-05-053		0629-03-040	
PROJECT ID				A00189334		A00189335		A00189336		A00189337		A00189339		A00189340	
COUNTY				Ward		Pecos		Pecos		Pecos		Andrews		Pecos	
HIGHWAY				SH 18		SH 18		SH 18		US 285		SH 176		FM 11	
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-6048	ASPH (AC-20-5TR)	TON	527.000		507.000		663.000		725.000		1,615.000		837.000	
	316-6126	AGGR(TY-PB GR-4 SAC-A)	CY	2,648.000		2,544.000		3,333.000		3,625.000		8,102.000		4,208.000	
	500-6001	MOBILIZATION	LS	1.000											
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	5.000											
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA					3,530.000		1,990.000		9,320.000			
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	5,730.000		6,210.000		10,840.000		7,880.000		4,680.000		13,470.000	
	666-6171	REFL PAV MRK TY II (W) 6" (BRK)	LF					11,770.000		6,610.000		31,060.000			
	666-6174	REFL PAV MRK TY II (W) 6" (SLD)	LF	133,756.000		145,692.000		143,844.000		202,510.000		302,460.000		308,812.000	
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF			391.000		495.000		112.000		13,874.000			
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF					292.000		96.000				135.000	
	666-6184	REFL PAV MRK TY II (W) (ARROW)	EA					6.000				32.000			
	666-6192	REFL PAV MRK TY II (W) (WORD)	EA					6.000				32.000			
	666-6196	REFL PAV MRK TY II (W) (RR XING)	EA											2.000	
	666-6208	REFL PAV MRK TY II (Y) 6" (BRK)	LF	15,250.000		17,360.000		13,530.000		20,710.000				36,080.000	
	666-6210	REFL PAV MRK TY II (Y) 6" (SLD)	LF	30,302.000		10,261.000		488,237.000		49,744.000		373,810.000		66,535.000	
	666-6214	REFL PAV MRK TY II (Y) 24" (SLD)	LF									81.000			
	668-6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	EA							12.000		28.000			
	672-6007	REFL PAV MRKR TY I-C	EA					590.000		340.000		1,560.000			
	672-6009	REFL PAV MRKR TY II-A-A	EA	1,150.000		1,000.000		6,780.000		1,660.000		4,680.000		2,640.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	4.000		4.000		14.000		6.000		16.000		10.000	
18		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000											
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000											
		RAILROAD FLAGGING: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000											





# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0292-04-072

DISTRICT Odessa

COUNTY Andrews, Crane, Pecos, Ward, Winkler

HIGHWAY FM 11, FM 1218, FM 1233, FM 1450, FM 181, RM 2023, SH 176, SH 18, US 285

CONTROL SECTION JOB				0629-04-013		0961-02-016		1367-01-017		1639-02-021		1825-01-009		1825-02-012	
PROJECT ID				A00189341		A00189342		A00189344		A00189345		A00179044		A00189370	
COUNTY				Pecos		Andrews		Crane		Pecos		Andrews		Winkler	
HIGHWAY				FM 11		FM 181		FM 1233		FM 1450		FM 1218		FM 1218	
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-6048	ASPH (AC-20-5TR)	TON	317.000		439.000		592.000		613.000		63.000		281.000	
	316-6126	AGGR(TY-PB GR-4 SAC-A)	CY	1,593.000		2,213.000		2,970.000		3,050.000		316.000		1,407.000	
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA												
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	6,610.000		6,540.000		8,150.000		9,170.000		1,160.000		5,070.000	
	666-6171	REFL PAV MRK TY II (W) 6" (BRK)	LF												
	666-6174	REFL PAV MRK TY II (W) 6" (SLD)	LF	151,596.000		149,476.000		193,532.000		216,232.000		26,176.000		112,744.000	
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	127.000											
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	11.000		12.000		62.000		135.000				22.000	
	666-6184	REFL PAV MRK TY II (W) (ARROW)	EA												
	666-6192	REFL PAV MRK TY II (W) (WORD)	EA												
	666-6196	REFL PAV MRK TY II (W) (RR XING)	EA												
	666-6208	REFL PAV MRK TY II (Y) 6" (BRK)	LF	17,460.000		16,540.000		21,340.000		24,890.000		3,050.000		13,650.000	
	666-6210	REFL PAV MRK TY II (Y) 6" (SLD)	LF	39,152.000		59,032.000		54,270.000		36,307.000		6,478.000		22,691.000	
	666-6214	REFL PAV MRK TY II (Y) 24" (SLD)	LF												
	668-6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	EA												
	672-6007	REFL PAV MRKR TY I-C	EA												
	672-6009	REFL PAV MRKR TY II-A-A	EA	1,370.000		1,570.000		1,750.000		1,700.000		240.000		970.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	6.000		6.000		6.000		6.000		2.000		4.000	
18		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS												
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS												
		RAILROAD FLAGGING: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS												



# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0292-04-072

DISTRICT Odessa

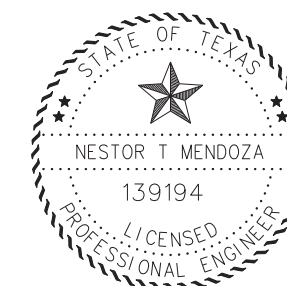
COUNTY Andrews, Crane, Pecos, Ward, Winkler

HIGHWAY FM 11, FM 1218, FM 1233, FM 1450, FM 181, RM 2023, SH 176, SH 18, US 285

CONTROL SECTION JOB				2566-01-009		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00189373			
COUNTY				Pecos			
HIGHWAY				RM 2023			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	316-6048	ASPH (AC-20-5TR)	TON	329.000		7,508.000	
	316-6126	AGGR(TY-PB GR-4 SAC-A)	CY	1,654.000		37,663.000	
	500-6001	MOBILIZATION	LS			1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO			5.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA			14,840.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	5,130.000		90,640.000	
	666-6171	REFL PAV MRK TY II (W) 6" (BRK)	LF			49,440.000	
	666-6174	REFL PAV MRK TY II (W) 6" (SLD)	LF	126,394.000		2,213,224.000	
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF			14,999.000	
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF			765.000	
	666-6184	REFL PAV MRK TY II (W) (ARROW)	EA			38.000	
	666-6192	REFL PAV MRK TY II (W) (WORD)	EA			38.000	
	666-6196	REFL PAV MRK TY II (W) (RR XING)	EA			2.000	
	666-6208	REFL PAV MRK TY II (Y) 6" (BRK)	LF	13,240.000		213,100.000	
	666-6210	REFL PAV MRK TY II (Y) 6" (SLD)	LF	38,933.000		1,275,752.000	
	666-6214	REFL PAV MRK TY II (Y) 24" (SLD)	LF			81.000	
	668-6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	EA			40.000	
	672-6007	REFL PAV MRKR TY I-C	EA			2,490.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	1,150.000		26,660.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	4.000		88.000	
18		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS			1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS			1.000	
		RAILROAD FLAGGING: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS			1.000	

### ROADWAY QUANTITIES

PROJECT REFERENCE NUMBER	PROJECT CONTROL	HIGHWAY	REF MRK to REF MRK	LENGTH (MIL)	PROJECT AREA	ITEM	ITEM	ITEM	ITEM
						0316-6048 ASPH (AC-20-5TR)	0316-6126 AGGR (TY-PB GR-4 SAC-A)	0662-6109 WK ZN PAV MRK SHT TERM (TAB) TY W	0662-6111 WK ZN PAV MRK SHT TERM (TAB) TY Y-2
						SY	TON	CY	EA
1	0292-04-072	SH 18	FROM: 0.22 MILES SOUTH OF FM 1776 TO: PECOS COUNTY LINE	21.095	317549	527	2648	0	5730
2	0292-05-020	SH 18	FROM: WARD COUNTY LINE TO: 14.85 MILES NORTH OF DICKENSON BLVD	13.737	304873	507	2544	0	6210
3	0292-06-037	SH 18	FROM: DICKENSON BLVD TO: 14.85 MILES NORTH OF DICKENSON BLVD	14.85	399,562	663	3333	3530	10840
4	0293-01-031	US 285	FROM: DICKENSON BLVD TO: 19.26 MILES SOUTH OF DICKENSON BLVD	19.279	434318	725	3625	1990	7880
5	0548-05-053	SH 349	FROM: NEW MEXICO STATE LINE TO: SH 115	30.502	971,657	1,615	8,102	9,320	4,680
6	0629-03-040	FM 11	FROM: CRANE COUNTY LINE TO: US 67	29.889	504448	837	4208	0	13470
7	0629-04-013	FM 11	FROM: US 67 TO: IH 10 SFR End Of Pavement	14.338	191071	317	1593	0	6610
8	0961-02-016	FM 181	FROM: GAINES COUNTY LINE TO: SH 176	14.192	265540	439	2213	0	6540
9	1367-01-017	FM 1233	FROM: FM 1053 TO: US 385	18.366	356142	592	2970	0	8150
10	1639-02-021	FM 1450	FROM: REEVES COUNTY LINE TO: FM 1053	20.655	365068	613	3050	0	9170
11	1825-01-009	FM 1218	FROM: SH 128 TO: WINKLER COUNTY LINE	2.477	37810	63	316	0	1160
12	1825-02-012	FM 181	FROM: ANDREWS COUNTY LINE TO: FM 874	10.689	168343	281	1407	0	5070
13	2566-01-009	RM 2023	FROM: IH 10 NFR TO: END OF RM 2023	11.931	198363	329	1654	0	5130
<b>TOTAL:</b>				222	4514744	7508	37663	14840	90640



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### CONSOLIDATED SUMMARY

SHEET 1 OF 3

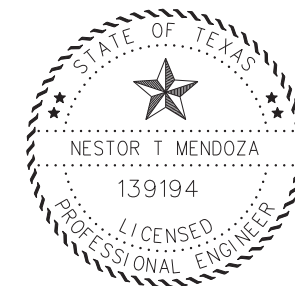


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FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6				9
STATE	STATE DIST.	COUNTY		
TEXAS	ODA	WARD, ETC		
CONT.	SECT.	JOB	HIGHWAY NO.	
0292	04	072, ETC	SH 18, ETC	

PAVEMENT MARKING QUANTITIES

PROJECT REFERENCE NUMBER	PROJECT CONTROL	HIGHWAY	REF MRK to REF MRK	LENGTH (MIL)	0666-6171	0666-6174	0666-6178	0666-6182	0666-6184	0666-6192	0666-6196	0666-6208	0666-6210
					REFL PAV MRK TY II (W) 6" (BRK)	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (W) (ARROW)	REFL PAV MRK TY II (W) (WORD)	REFL PAV MRK TY II (W) (RR XING)	REFL PAV MRK TY II (Y) 6" (BRK)	REFL PAV MRK TY II (Y) 6" (SLD)
					LF	LF	LF	LF	EA	EA	EA	LF	LF
1	0292-04-072	SH 18	FROM: 0.22 MILES SOUTH OF FM 1776 TO: PECOS COUNTY LINE	21.095	0	133756	0	0	0	0	0	15250	30302
2	0292-05-020	SH 18	FROM: WARD COUNTY LINE TO: 14.85 MILES NORTH OF DICKENSON BLVD	13.737	0	145692	391	0	0	0	0	17360	10261
3	0292-06-037	SH 18	FROM: DICKENSON BLVD TO: 14.85 MILES NORTH OF DICKENSON BLVD	14.85	11770	143844	495	292	6	6	0	13530	488237
4	0293-01-031	US 285	FROM: DICKENSON BLVD TO: 19.26 MILES SOUTH OF DICKENSON BLVD	19.279	6610	202510	112	96	0	0	0	20710	49744
5	0548-05-053	SH 349	FROM: TERRELL COUNTY LINE TO: SH 290	30.502	31,060	302460	13874	0	32	32	0	0	373810
6	0629-03-040	FM 11	FROM: CRANE COUNTY LINE TO: US 67	29.889	0	308812	0	135	0	0	2	36080	66535
7	0629-04-013	FM 11	FROM: US 67 TO: IH 10 SFR End Of Pavement	14.338	0	151596	127	11	0	0	0	17460	39152
8	0961-02-016	FM 181	FROM: GAINES COUNTY LINE TO: SH 176	14.192	0	149476	0	12	0	0	0	16540	59032
9	1367-01-017	FM 1233	FROM: FM 1053 TO: US 385	18.366	0	193532	0	62	0	0	0	21340	54270
10	1639-02-021	FM 1450	FROM: REEVES COUNTY LINE TO: FM 1053	20.655	0	216232	0	135	0	0	0	24890	36307
11	1825-01-009	FM 1218	FROM: SH 128 TO: WINKLER COUNTY LINE	2.477	0	26176	0	0	0	0	0	3050	6478
12	1825-02-012	FM 181	FROM: ANDREWS COUNTY LINE TO: FM 874	10.689	0	112744	0	22	0	0	0	13650	22691
13	2566-01-009	RM 2023	FROM: IH 10 NFR TO: END OF RM 2023	11.931	0	126394	0	0	0	0	0	13240	38933
<b>TOTAL:</b>				222	49440	2213224	14999	765	38	38	2	213100	1275752



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CONSOLIDATED SUMMARY

SHEET 2 OF 3

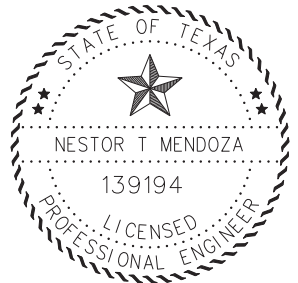


FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			10
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	WARD, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072.ETC	SH 18, ETC

RAISED PAVEMENT MARKER QUANTITIES

PROJECT REFERENCE NUMBER	PROJECT CONTROL	HIGHWAY	REF MRK to REF MRK	LENGTH (MIL)	0666-6214	0668-6091	0672-6007	0672-6009	* 677	6185-6005
					REFL PAV MRK TY II (Y) 24" (SLD)	PREFAB PAV MRK TY C (W) (18") (YLD TRI)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	TMA (MOBILE OPERATIONS)
					LF	EA	EA	EA	EA	DAY
1	0292-04-072	SH 18	FROM: 0.22 MILES SOUTH OF FM 1776 TO: PECOS COUNTY LINE	21.095	0	0	0	1150	1150	4
2	0292-05-020	SH 18	FROM: WARD COUNTY LINE TO: 14.85 MILES NORTH OF DICKENSON BLVD	13.737	0	0	0	1000	1000	4
3	0292-06-037	SH 18	FROM: DICKENSON BLVD TO: 14.85 MILES NORTH OF DICKENSON BLVD	14.85	0	0	590	6780	7370	14
4	0293-01-031	US 285	FROM: DICKENSON BLVD TO: 19.26 MILES SOUTH OF DICKENSON BLVD	19.279	0	12	340	1660	2000	6
5	0548-05-053	SH 349	FROM: TERRELL COUNTY LINE TO: SH 290	30.502	81	28	1560	4680	6240	16
6	0629-03-040	FM 11	FROM: CRANE COUNTY LINE TO: US 67	29.889	0	0	0	2,640	2640	10
7	0629-04-013	FM 11	FROM: US 67 TO: IH 10 SFR End Of Pavement	14.338	0	0	0	1370	1370	6
8	0961-02-016	FM 181	FROM: GAINES COUNTY LINE TO: SH 176	14.192	0	0	0	1570	1570	6
9	1367-01-017	FM 1233	FROM: FM 1053 TO: US 385	18.366	0	0	0	1750	1750	6
10	1639-02-021	FM 1450	FROM: REEVES COUNTY LINE TO: FM 1053	20.655	0	0	0	1700	1700	6
11	1825-01-009	FM 1218	FROM: SH 128 TO: WINKLER COUNTY LINE	2.477	0	0	0	240	240	2
12	1825-02-012	FM 181	FROM: ANDREWS COUNTY LINE TO: FM 874	10.689	0	0	0	970	970	4
13	2566-01-009	RM 2023	FROM: IH 10 NFR TO: END OF RM 2023	11.931	0	0	0	1150	1150	4
<b>TOTAL:</b>				222	81	40	2490	26660	29150	88

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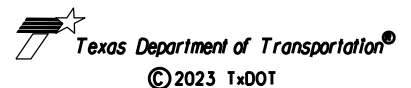


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CONSOLIDATED SUMMARY

SHEET 3 OF 3

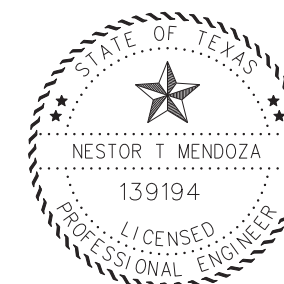


FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6				11
STATE	STATE DIST.	COUNTY		
TEXAS	ODA	WARD, ETC		
CONT.	SECT.	JOB	HIGHWAY NO.	
0292	04	072, ETC	SH 18, ETC	

	<b>316-6126 AGGR(TY-PB GR-4 SAC-A)</b>	<b>* ASPH (AC-20-5TR)</b>
<b>AGGREGATE RATE (SY/CY) :</b>	120	
<b>ASPHALT RATE (GAL/SY) :</b>		0.380

**PROJECT SUMMARY**

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6126 AGGR(TY-PB GR-4 SAC-A)  120 SY/CY	* ASPH (AC-20-5TR)  0.38 GAL/SY	316-6048 ASPH (AC-20-5TR)  TON
1	0292-04-072	SH 18	RM: 360 - 0.520 TO 374 + 0.000	FT	FT	SY	CY	GAL	TON
PROJECT LIMITS									
FROM: 0.22 MILES SOUTH OF FM 1776			MAIN LANES	47,707	44.0	233,235	1,944	88,630	386
TO: PECOS COUNTY LINE			MAIN LANES	2,229	72.0	17,832	149	6,777	30
COUNTY	WARD		MAIN LANES	16,674	35.0	64,844	541	24,641	108
			REST AREA	268	55.0	1,638	14	623	3
<b>TOTAL</b>				66,878		317,549	2,648	120,671	527



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**ROADWAY SUMMARY**  
SHEET 1 OF 13



FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6				10
STATE	STATE DIST.	COUNTY		
TEXAS	ODA	SH 18, ETC		
CONT.	SECT.	JOB	HIGHWAY NO.	
0292	04	072	WARD, ETC	

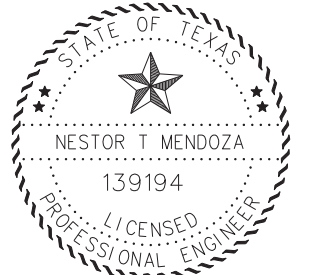
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	<b>316-6126 AGGR(TY-PB GR-4 SAC-A)</b>	<b>* ASPH (AC-20-5TR)</b>
<b>AGGREGATE RATE (SY/CY) :</b>	120	
<b>ASPHALT RATE (GAL/SY) :</b>		0.380

**PROJECT SUMMARY**

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6126 AGGR(TY-PB GR-4 SAC-A)	* ASPH (AC-20-5TR)	316-6048 ASPH(AC-20-5TR)
2	0292-05-020	SH 18	RM: 374 + 0.000 TO 388 + 0.000	FT	FT	SY	120 SY/CY	0.38 GAL/SY	TON
<b>PROJECT LIMITS</b>									
FROM: WARD COUNTY LINE			MAIN LANES	51,032	38.0	215,469	1,796	81,879	357
TO: 14.85 MILES NORTH OF DICKENSON			MAIN LANES	1,325	45.0	6,625	56	2,518	11
COUNTY		PECOS	MAIN LANES	16,531	36.0	66,124	552	25,128	110
			MAIN LANES	925	44.0	4,523	38	1,719	8
			MAIN LANES	3,033	36.0	12,132	102	4,611	21
<b>TOTAL</b>				72,846		304,873	2,544	115,855	507

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**ROADWAY SUMMARY**  
SHEET 2 OF 13



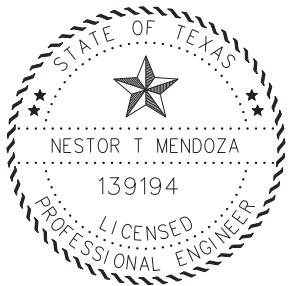
FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6				12
STATE	STATE DIST.	COUNTY		
TEXAS	ODA	SH 18, ETC		
CONT.	SECT.	JOB	HIGHWAY NO.	
0292	04	072	WARD, ETC	

	<b>316-6126 AGGR(TY-PB GR-4 SAC-A)</b>	<b>* ASPH (AC-20-5TR)</b>
<b>AGGREGATE RATE (SY/CY) :</b>	120	
<b>ASPHALT RATE (GAL/SY) :</b>		0.380

**PROJECT SUMMARY**

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6126 AGGR(TY-PB GR-4 SAC-A)	* ASPH (AC-20-5TR)	316-6048 * ASPH (AC-20-5TR)
3	0292-06-037	SH 18	RM: 388 + 0.000 TO 403 + 0.071	FT	FT	SY	CY	GAL	TON
<b>PROJECT LIMITS</b>									
FROM: DICKENSON BLVD			MAIN LANES	2,665	45.0	13,325	112	5,064	23
TO: 14.85 MILES NORTH OF DICKENSON			MAIN LANES	2,810	65.0	20,295	170	7,713	34
COUNTY		PECOS	MAIN LANES	19,119	66.0	140,206	1,169	53,279	232
			MAIN LANES	19,409	42.0	90,576	755	34,419	150
			MAIN LANES	33,790	36.0	135,160	1,127	51,361	224
			<b>TOTAL</b>	<b>77,793</b>		<b>399,562</b>	<b>3,333</b>	<b>151,836</b>	<b>663</b>

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**ROADWAY SUMMARY**

SHEET 3 OF 13



FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6				13
STATE	STATE DIST.	COUNTY		
TEXAS	ODA	SH 18, ETC		
CONT.	SECT.	JOB	HIGHWAY NO.	
0292	04	072	WARD, ETC	

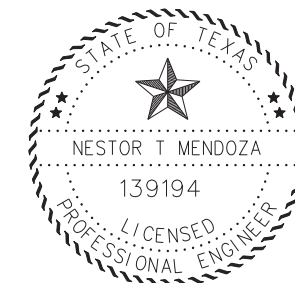


	<b>316-6126 AGGR(TY-PB GR-4 SAC-A)</b>	<b>* ASPH (AC-20-5TR)</b>
<b>AGGREGATE RATE (SY/CY) :</b>	120	
<b>ASPHALT RATE (GAL/SY) :</b>		0.380

**PROJECT SUMMARY**

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6126 AGGR(TY-PB GR-4 SAC-A)	* ASPH (AC-20-5TR)	316--6048 ASPH (AC-20-5TR)
							120 SY/CY	0.38 GAL/SY	
4	0293-01-031	US 285	RM: 424 - 0.179 TO 443 + 0.340	FT	FT	SY	CY	GAL	TON
PROJECT LIMITS									
FROM: DICKENSON BLVD			MAIN LANES	1,816	36.0	7,264	61	2,761	13
TO: 19.26 MILES SOUTH OF DICKENSON			MAIN LANES	2,207	60.0	14,714	123	5,592	25
COUNTY		PECOS	MAIN LANES	1,838	48.0	9,803	82	3,726	17
			MAIN LANES	7,571	36.0	30,284	253	11,508	51
			MAIN LANES	2,301	48.0	12,272	103	4,664	21
			MAIN LANES	2,590	60.0	17,267	144	6,562	29
			MAIN LANES	16,807	36.0	67,228	561	25,547	112
			MAIN LANES	1,753	44.0	8,571	72	3,257	15
			MAIN LANES	692	36.0	2,768	24	1,052	5
			MAIN LANES	54,030	44.0	264,147	2,202	100,376	437
<b>TOTAL</b>				91,605		434,318	3,625	165,045	725

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**ROADWAY SUMMARY**

SHEET 4 OF 13

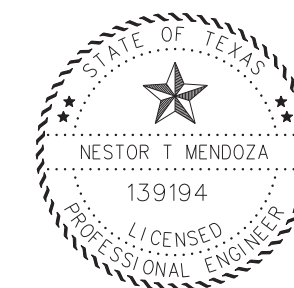


FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6				14
STATE	STATE DIST.	COUNTY		
TEXAS	ODA	SH 18, ETC		
CONT.	SECT.	JOB	HIGHWAY NO.	
0292	04	072	WARD, ETC	

	<b>316-6124 AGGR(TY-PB GR-4 SAC-A)</b>	<b>* ASPH (AC-20-5TR)</b>
<b>AGGREGATE RATE (SY/CY) :</b>	120	
<b>ASPHALT RATE (GAL/SY) :</b>		0.380

**PROJECT SUMMARY**

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6124 AGGR(TY-PB GR-4 SAC-A)	* ASPH (AC-20-5TR)	316-6048 ASPH (AC-20-5TR)
							120 SY/CY	0.38 GAL/SY	
5	0548-05-053	SH 176	RM: 222 + 0.000 TO 253 + 0.026	FT	FT	SY	CY	GAL	TON
PROJECT LIMITS									
FROM: NEW MEXICO STATE LINE			MAIN LANES	5,081	62.0	35,003	292	13,302	58
TO: SH 115			MAIN LANES	84,420	53.0	497,140	4,143	188,914	822
COUNTY		ANDREWS	MAIN LANES	2,415	70.0	18,784	157	7,138	32
			MAIN LANES	2,322	65.0	16,770	140	6,373	28
			MAIN LANES	4,679	60.0	31,194	260	11,854	52
			MAIN LANES	60,371	53.0	355,519	2,963	135,098	588
			MAIN LANES	1,107	56.0	6,888	58	2,618	12
			MAIN LANES	201	30.0	670	6	255	2
			MAIN LANES	575	30.0	1,917	16	729	4
			REST AREA	245	24.0	654	6	249	2
				529	22.0	1,294	11	492	3
				335	28.0	1,043	9	397	2
				510	22.0	1,247	11	474	3
				500	23.0	1,278	11	486	3
			FM 181 INTERSECTION	725	28.0	2,256	19	858	4
			<b>TOTAL</b>	164,015		971,657	8,102	369,237	1,615



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**ROADWAY SUMMARY**  
SHEET 5 OF 13



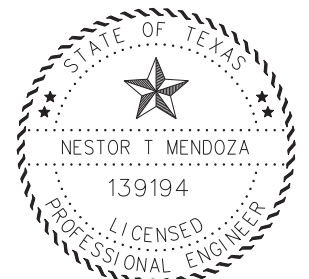
FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			15
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

	<b>316-6126 AGGR(TY-PB GR-4 SAC-A)</b>	<b>* ASPH (AC-20-5TR)</b>
<b>AGGREGATE RATE (SY/CY) :</b>	120	
<b>ASPHALT RATE (GAL/SY) :</b>		0.380

**PROJECT SUMMARY**

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6126 AGGR(TY-PB GR-4 SAC-A)	* ASPH (AC-20-5TR)	316-6048 ASPH (AC-20-5TR)
6	0629-03-040	FM 11	RM: 240 + 0.000 TO 271- 0.047	FT	FT	SY	120 SY/CY CY	0.38 GAL/SY GAL	TON
PROJECT LIMITS									
FROM: CRANE COUNTY LINE TO: US 67			MAIN LANES	2,200	32.0	7,823	66	2,973	13
COUNTY			MAIN LANES	5,504	30.0	18,347	153	6,972	31
PECOS			MAIN LANES	3,431	32.0	12,200	102	4,636	21
			MAIN LANES	3,945	30.0	13,150	110	4,997	22
			MAIN LANES	785	39.0	3,402	29	1,293	6
			MAIN LANES	2,390	45.0	11,950	100	4,541	20
			MAIN LANES	1,565	45.0	7,825	66	2,974	13
			MAIN LANES	138,134	28.0	429,751	3,582	163,306	711
			<b>TOTAL</b>	157,954		504,448	4,208	191,692	837

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**ROADWAY SUMMARY**  
SHEET 6 OF 13



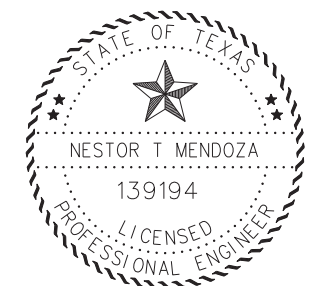
FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6				16
STATE	STATE DIST.	COUNTY		
TEXAS	ODA	SH 18, ETC		
CONT.	SECT.	JOB	HIGHWAY NO.	
0292	04	072	WARD, ETC	

	<b>316-6126 AGGR(TY-PB GR-4 SAC-A)</b>	<b>* ASPH (AC-20-5TR)</b>
<b>AGGREGATE RATE (SY/CY) :</b>	120	
<b>ASPHALT RATE (GAL/SY) :</b>		0.380

**PROJECT SUMMARY**

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6126 AGGR(TY-PB GR-4 SAC-A)	* ASPH (AC-20-5TR)	316-6048 ASPH (AC-20-5TR)
7	0629-04-013	FM 11	RM: 271-0.047 TO 285 + 0.704	FT	FT	SY	120 SY/CY	0.38 GAL/SY	
PROJECT LIMITS									
FROM: US 67			MAIN LANES	72,078	22.0	176,191	1,469	66,953	292
TO: IH 10 SFR End Of Pavement			MAIN LANES	3,720	36.0	14,880	124	5,655	25
COUNTY		PECOS							
<b>TOTAL</b>				75,798		191,071	1,593	72,608	317

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**ROADWAY SUMMARY**  
SHEET 7 OF 13



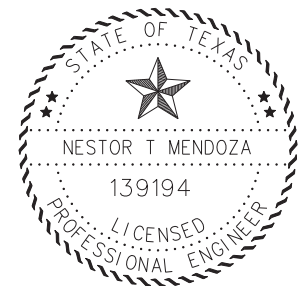
FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			17
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

	<b>316-6126 AGGR(TY-PB GR-4 SAC-A)</b>	<b>* ASPH (AC-20-5TR)</b>
<b>AGGREGATE RATE (SY/CY) :</b>	120	
<b>ASPHALT RATE (GAL/SY) :</b>		0.380

**PROJECT SUMMARY**

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6126 AGGR(TY-PB GR-4 SAC-A)	* ASPH (AC-20-5TR)	316-6048 ASPH (AC-20-5TR)
8	0961-02-016	FM 181	RM: 292 + 0.000 TO 306 + 0.389	FT	FT	SY	120 SY/CY CY	0.38 GAL/SY GAL	TON
PROJECT LIMITS									
FROM: GAINES COUNTY LINE TO: SH 176			MAIN LANES	74,683	32.0	265,540	2,213	100,906	439
COUNTY		ANDREWS							
<b>TOTAL</b>				74,683		265,540	2,213	100,906	439

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**ROADWAY SUMMARY**  
SHEET 8 OF 13



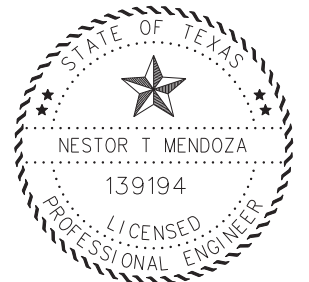
FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6				18
STATE	STATE DIST.	COUNTY		
TEXAS	ODA	SH 18, ETC		
CONT.	SECT.	JOB	HIGHWAY NO.	
0292	04	072	WARD, ETC	

	<b>316-6126 AGGR(TY-PB GR-4 SAC-A)</b>	<b>* ASPH (AC-20-5TR)</b>
<b>AGGREGATE RATE (SY/CY) :</b>	120	
<b>ASPHALT RATE (GAL/SY) :</b>		0.380

**PROJECT SUMMARY**

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6126 AGGR(TY-PB GR-4 SAC-A)	* ASPH (AC-20-5TR)	316-6048 ASPH (AC-20-5TR)
							120 SY/CY	0.38 GAL/SY	
9	1367-01-014	FM 1233	RM: 244 - 0.569 TO 262 + 0.024	FT	FT	SY	CY	GAL	TON
<b>PROJECT LIMITS</b>									
FROM: FM 1053			MAIN LANES	390	44.0	1,907	16	725	4
TO: US 385			MAIN LANES	96,010	33.0	352,037	2,934	133,775	582
COUNTY		CRANE	MAIN LANES	366	45.0	1,830	16	696	4
			INTERSECTION	28	60.0	184	2	70	1
			INTERSECTION	28	60.0	184	2	70	1
			<b>TOTAL</b>	<b>96,821</b>		<b>356,142</b>	<b>2,970</b>	<b>135,336</b>	<b>592</b>

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**ROADWAY SUMMARY**  
SHEET 9 OF 13

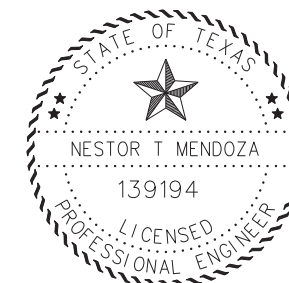


FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			19
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

	<b>316-6126 AGGR(TY-PB GR-4 SAC-A)</b>	<b>* ASPH (AC-20-5TR)</b>
<b>AGGREGATE RATE (SY/CY) :</b>	120	
<b>ASPHALT RATE (GAL/SY) :</b>		0.380

**PROJECT SUMMARY**

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6126 AGGR(TY-PB GR-4 SAC-A)	* ASPH (AC-20-5TR)	316-6048 ASPH (AC-20-5TR)
							120 SY/CY	0.38 GAL/SY	
10	1639-02-021	FM 1450	RM: 218 - 0.000 TO 239 + 0.024	FT	FT	SY	CY	GAL	TON
PROJECT LIMITS									
FROM: REEVES COUNTY LINE			MAIN LANES	5,710	28.0	17,765	149	6,751	30
TO: FM 1053			MAIN LANES	1,348	45.0	6,740	57	2,562	12
COUNTY		PECOS	MAIN LANES	1,174	35.0	4,566	39	1,736	8
			MAIN LANES	1,178	45.0	5,890	50	2,239	10
			MAIN LANES	36,803	28.0	114,499	955	43,510	190
			MAIN LANES	582	38.0	2,458	21	935	5
			MAIN LANES	15,191	28.0	47,261	394	17,960	79
			MAIN LANES	1,167	44.0	5,706	48	2,169	10
			MAIN LANES	44,963	32.0	159,869	1,333	60,751	265
				18	45.0	88	1	34	1
				18	45.0	88	1	34	1
				18	35.0	69	1	27	1
				18	35.0	69	1	27	1
			<b>TOTAL</b>	108,186		365,068	3,050	138,735	613



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**ROADWAY SUMMARY**  
SHEET 10 OF 13



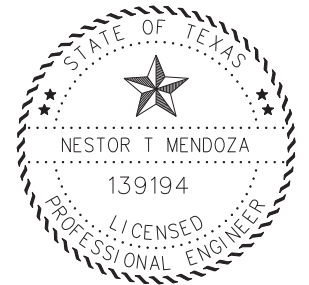
FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			21
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

	<b>316-6126 AGGR(TY-PB GR-4 SAC-A)</b>	<b>* ASPH (AC-20-5TR)</b>
<b>AGGREGATE RATE (SY/CY) :</b>	120	
<b>ASPHALT RATE (GAL/SY) :</b>		0.380

**PROJECT SUMMARY**

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6126 AGGR(TY-PB GR-4 SAC-A)	* ASPH (AC-20-5TR)	316-6048 ASPH (AC-20-5TR)
11	1825-01-009	FM 1218	RM: 310 - 0.034 TO 314 + 0.000	FT	FT	SY	120 SY/CY	0.38 GAL/SY	0.00 GAL/SY
PROJECT LIMITS									
FROM: SH 128			MAIN LANES	13,088	26.0	37,810	316	14,368	63
TO: WINKLER COUNTY LINE									
COUNTY		ANDREWS							
<b>TOTAL</b>				13,088		37,810	316	14,368	63

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**ROADWAY SUMMARY**  
SHEET 11 OF 13



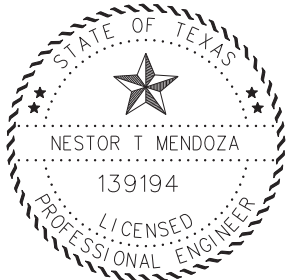
FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			22
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC



	<b>316-6126 AGGR(TY-PB GR-4 SAC-A)</b>	<b>* ASPH (AC-20-5TR)</b>
<b>AGGREGATE RATE (SY/CY) :</b>	120	
<b>ASPHALT RATE (GAL/SY) :</b>		0.380

**PROJECT SUMMARY**

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6126 AGGR(TY-PB GR-4 SAC-A)	* ASPH (AC-20-5TR)	316-6048 ASPH (AC-20-5TR)
12	1825-02-012	FM 181	RM: 292 + 0.000 TO 306 + 0.389	FT	FT	SY	120 SY/CY	0.38 GAL/SY	TON
PROJECT LIMITS									
FROM: GAINES COUNTY LINE			MAIN LANES	9,839	26.0	28,424	237	10,802	47
TO: SH 176			MAIN LANES	3,727	32.0	13,252	111	5,036	22
COUNTY		ANDREWS	MAIN LANES	21,043	26.0	60,791	507	23,101	101
			MAIN LANES	459	32.0	1,632	14	621	3
			MAIN LANES	1,068	45.0	5,340	45	2,030	9
			MAIN LANES	20,292	26.0	58,622	489	22,277	97
			INTERSECTION	23	55.0	141	2	54	1
			INTERSECTION	23	55.0	141	2	54	1
			<b>TOTAL</b>	56,474		168,343	1,407	63,975	281



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**ROADWAY SUMMARY**  
SHEET 12 OF 13



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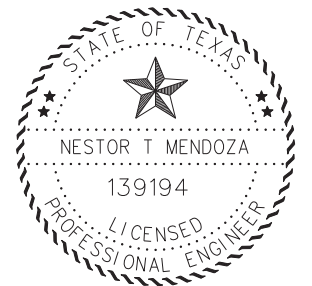
FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6				23
STATE	STATE DIST.	COUNTY		
TEXAS	ODA	SH 18, ETC		
CONT.	SECT.	JOB	HIGHWAY NO.	
0292	04	072	WARD, ETC	

	<b>316-6126 AGGR(TY-PB GR-4 SAC-A)</b>	<b>* ASPH (AC-20-5TR)</b>
<b>AGGREGATE RATE (SY/CY) :</b>	120	
<b>ASPHALT RATE (GAL/SY) :</b>		0.380

**PROJECT SUMMARY**

REF. NO.	PROJECT CONTROL	HIGHWAY	PROJECT DESCRIPTION	LENGTH	WIDTH	SURFACE AREA	316-6126 AGGR(TY-PB GR-4 SAC-A)	* ASPH (AC-20-5TR)	316-6048 ASPH (AC-20-5TR)
13	2566-01-009	RM 2023	RM: 398 - 0.021 TO 410 + 0.092	FT	FT	SY	120 SY/CY CY	0.38 GAL/SY GAL	TON
PROJECT LIMITS									
FROM: IH 10 NFR			MAIN LANES	1,968	36.0	7,872	66	2,992	14
TO: END OF RM 2023			MAIN LANES	61,229	28.0	190,491	1,588	72,387	315
COUNTY		PECOS							
<b>TOTAL</b>				63,197		198,363	1,654	75,379	329

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**ROADWAY SUMMARY**  
SHEET 13 OF 13



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			24
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

### BASIS OF ESTIMATE

**LOCATION 1**

CSJ 0292-04-072  
 COUNTY WARD  
 HIGHWAY SH 18

EXIST ADT 4,936 (YEAR) 2021

BEGIN REF MRK 360 - 0.520 TO END REF MRK 374 + 0.000

LIMITS: FROM: 0.22 MILES SOUTH OF FM 1776  
 TO: PECOS COUNTY LINE

TYPE OF WORK Seal Coat

TOTAL AREA 317,549 SY

**SURFACE TREATMENT**

ITEM	DESCRIPTION	RATE	QUANTIT	UNIT
	AREA		317,549	SY
*	ASPH (AC-20-5TR)	0.380 GAL/SY	120,671	GAL
316 6048	ASPH (AC-20-5TR)		527	TON
316 6126	AGGR(TY-PB GR-4 SAC-A)	120 SY/CY	2,648	CY

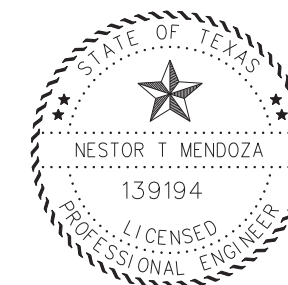
**PAVEMENT MARKINGS**

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	5,730	EA
666 6174	REFL PAV MRK TY II (W) 6" (SLD)	133,756	LF
666 6208	REFL PAV MRK TY II (Y) 6" (BRK)	15,250	LF
666 6210	REFL PAV MRK TY II (Y) 6" (SLD)	30,302	LF

**RAISED PAVEMENT MARKERS**

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6009	REFL PAV MRKR TY II-A-A	1,150	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	1,150	EA

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**BASIS OF ESTIMATE**

SHEET 1 OF 13



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			25
STATE	STATE DIST.	COUNTY	
TEXAS	04A	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

### BASIS OF ESTIMATE

**LOCATION 2**

CSJ 0292-05-020  
 COUNTY PECOS  
 HIGHWAY SH 18

EXIST ADT 1,812 (YEAR) 2021

BEGIN REF MRK 374 + 0.000 TO END REF MRK 388 + 0.000

LIMITS: FROM: WARD COUNTY LINE  
 TO: 14.85 MILES NORTH OF DICKENSON BLVD

TYPE OF WORK Seal Coat

TOTAL AREA 304,873 SY

**SURFACE TREATMENT**

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		304,873	SY
*	ASPH(AC-20-5TR)	0.380 GAL/SY	115,855	GAL
316 6048	ASPH(AC-20-5TR)		507	TON
316 6126	AGGR(TY-PB GR-4 SAC-A)	120 SY/CY	2,544	CY

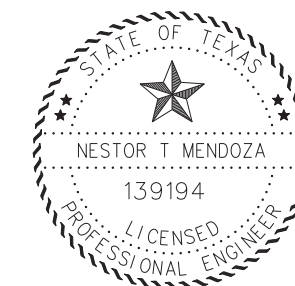
**PAVEMENT MARKINGS**

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	6,210	EA
666 6174	REFL PAV MRK TY II (W) 6" (SLD)	145,692	LF
666 6178	REFL PAV MRK TY II (W) 8" (SLD)	391	LF
666 6208	REFL PAV MRK TY II (Y) 6" (BRK)	17,360	LF
666 6210	REFL PAV MRK TY II (Y) 6" (SLD)	10,261	LF

**RAISED PAVEMENT MARKERS**

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6009	REFL PAV MRKR TY II-A-A	1,000	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	1,000	EA

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**BASIS OF ESTIMATE**

SHEET 2 OF 13



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			26
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

### BASIS OF ESTIMATE

**LOCATION 3**

CSJ 0292-06-037  
 COUNTY PECOS  
 HIGHWAY SH 18

EXIST ADT 1,341 (YEAR) 2021

BEGIN REF MRK 388 + 0.000 TO END REF MRK 403 + 0.071

LIMITS: FROM: DICKENSON BLVD  
 TO: 14.85 MILES NORTH OF DICKENSON BLVD

TYPE OF WORK Seal Coat

TOTAL AREA 399,562 SY

**SURFACE TREATMENT**

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		399,562	SY
*	ASPH (AC-20-5TR)	0.380 GAL/SY	151,836	GAL
316 6048	ASPH (AC-20-5TR)		663	TON
316 6126	AGGR(TY-PB GR-4 SAC-A)	120 SY/CY	3,333	CY

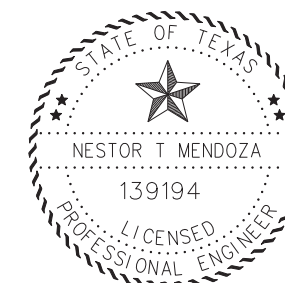
**PAVEMENT MARKINGS**

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6109	WK ZN PAV MRK SHT TERM (TAB)TY W	3,530	EA
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	10,840	EA
666 6171	REFL PAV MRK TY II (W) 6" (BRK)	11,770	LF
666 6174	REFL PAV MRK TY II (W) 6" (SLD)	143,844	LF
666 6178	REFL PAV MRK TY II (W) 8" (SLD)	495	LF
666 6182	REFL PAV MRK TY II (W) 24" (SLD)	292	LF
666 6184	REFL PAV MRK TY II (W) (ARROW)	6	EA
666 6192	REFL PAV MRK TY II (W) (WORD)	6	EA
666 6208	REFL PAV MRK TY II (Y) 6" (BRK)	13,530	LF
666 6210	REFL PAV MRK TY II (Y) 6" (SLD)	488,237	LF

**RAISED PAVEMENT MARKERS**

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6007	REFL PAV MRKR TY I-C	590	EA
672 6009	REFL PAV MRKR TY II-A-A	6,780	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	7,370	EA

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**BASIS OF ESTIMATE**  
 SHEET 3 OF 13



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			27
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

### BASIS OF ESTIMATE

**LOCATION 4**

CSJ 0293-01-031  
 COUNTY PECOS  
 HIGHWAY US 285

EXIST ADT 4,002 (YEAR) 2021

BEGIN REF MRK 424 - 0.179 TO END REF MRK 443 + 0.340

LIMITS: FROM: DICKENSON BLVD  
 TO: 19.26 MILES SOUTH OF DICKENSON BLVD

TYPE OF WORK Seal Coat

TOTAL AREA 434,318 SY

**SURFACE TREATMENT**

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		434,318	SY
*	ASPH (AC-20-5TR)	0.380 GAL/SY	165,045	GAL
316 6048	ASPH (AC-20-5TR)		725	TON
316 6126	AGGR(TY-PB GR-4 SAC-A)	120 SY/CY	3,625	CY

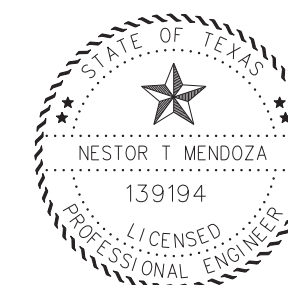
**PAVEMENT MARKINGS**

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6109	WK ZN PAV MRK SHT TERM (TAB)TY W	1,990	EA
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	7,880	EA
666 6171	REFL PAV MRK TY II (W) 6" (BRK)	6,610	LF
666 6174	REFL PAV MRK TY II (W) 6" (SLD)	202,510	LF
666 6178	REFL PAV MRK TY II (W) 8" (SLD)	112	LF
666 6182	REFL PAV MRK TY II (W) 24" (SLD)	96	LF
666 6208	REFL PAV MRK TY II (Y) 6" (BRK)	20,710	LF
666 6210	REFL PAV MRK TY II (Y) 6" (SLD)	49,744	LF
668 6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	12	EA

**RAISED PAVEMENT MARKERS**

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6007	REFL PAV MRKR TY I-C	340	EA
672 6009	REFL PAV MRKR TY II-A-A	1,660	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	2,000	EA

\* FOR CONTRACTOR INFORMATION ONLY



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**BASIS OF ESTIMATE**  
 SHEET 4 OF 13



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			28
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

### BASIS OF ESTIMATE

**LOCATION 5**

CSJ 0548-05-053  
 COUNTY ANDREWS  
 HIGHWAY SH 176

EXIST ADT 2,708 (YEAR) 2021

BEGIN REF MRK 222 + 0.000 TO END REF MRK 253 + 0.026

LIMITS: FROM: NEW MEXICO STATE LINE  
 TO: SH 115

TYPE OF WORK Seal Coat

TOTAL AREA 971,657 SY

**SURFACE TREATMENT**

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		971,657	SY
*	ASPH (AC-20-5TR)	0.380 GAL/SY	369,237	GAL
316 6048	ASPH (AC-20-5TR)		1,615	TON
316 6126	AGGR(TY-PB GR-4 SAC-A)	120 SY/CY	8,102	GAL

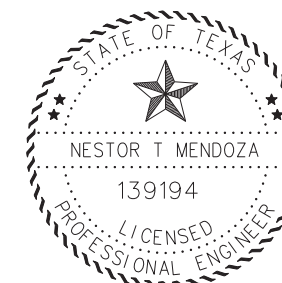
**PAVEMENT MARKINGS**

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6109	WK ZN PAV MRK SHT TERM (TAB)TY W	9,320	EA
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	4,680	EA
666 6171	REFL PAV MRK TY II (W) 6" (BRK)	31,060	LF
666 6174	REFL PAV MRK TY II (W) 6" (SLD)	302,460	LF
666 6178	REFL PAV MRK TY II (W) 8" (SLD)	13,874	LF
666 6184	REFL PAV MRK TY II (W) (ARROW)	32	EA
666 6192	REFL PAV MRK TY II (W) (WORD)	32	EA
666 6210	REFL PAV MRK TY II (Y) 6" (SLD)	373,810	LF
666 6214	REFL PAV MRK TY II (Y) 24" (SLD)	81	LF
668 6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	28	EA

**RAISED PAVEMENT MARKERS**

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6007	REFL PAV MRKR TY I-C	1,560	EA
672 6009	REFL PAV MRKR TY II-A-A	4,680	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	6,240	EA

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**BASIS OF ESTIMATE**

SHEET 5 OF 13



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			29
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

### BASIS OF ESTIMATE

**LOCATION 6**

CSJ 0629-03-040  
 COUNTY PECOS  
 HIGHWAY FM 11

EXIST ADT 547 (YEAR) 2021

BEGIN REF MRK 240 + 0.000 TO END REF MRK 271 - 0.047

LIMITS: FROM: CRANE COUNTY LINE  
 TO: US 67

TYPE OF WORK Seal Coat

TOTAL AREA 504,448 SY

**SURFACE TREATMENT**

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		504,448	SY
*	ASPH (AC-20-5TR)	0.380 GAL/SY	191,692	CY
316 6048	ASPH (AC-20-5TR)		837	TON
316 6126	AGGR(TY-PB GR-4 SAC-A)	120 SY/CY	4,208	GAL

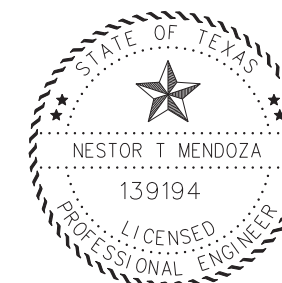
**PAVEMENT MARKINGS**

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	13,470	EA
666 6174	REFL PAV MRK TY II (W) 6" (SLD)	308,812	LF
666 6182	REFL PAV MRK TY II (W) 24" (SLD)	135	LF
666 6196	REFL PAV MRK TY II (W) (RR XING)	2	EA
666 6208	REFL PAV MRK TY II (Y) 6" (BRK)	36,080	LF
666 6210	REFL PAV MRK TY II (Y) 6" (SLD)	66,535	LF

**RAISED PAVEMENT MARKERS**

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6009	REFL PAV MRKR TY II-A-A	2,640	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	2,640	EA

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**BASIS OF ESTIMATE**

SHEET 6 OF 13



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			30
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC



### BASIS OF ESTIMATE

**LOCATION 7**

CSJ 0629-04-013  
 COUNTY PECOS  
 HIGHWAY FM 11

EXIST ADT 663 (YEAR) 2021

BEGIN REF MRK 271 - 0.047 TO END REF MRK 285 + 0.704

LIMITS: FROM: US 67  
 TO: IH 10 SFR End Of Pavement

TYPE OF WORK Seal Coat

TOTAL AREA 191,071 SY

**SURFACE TREATMENT**

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		191,071	SY
*	ASPH (AC-20-5TR)	0.380 GAL/SY	72,608	GAL
316 6048	ASPH (AC-20-5TR)		317	TON
316 6126	AGGR(TY-PB GR-4 SAC-A)	120 SY/CY	1,593	GAL

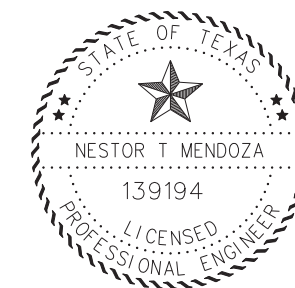
**PAVEMENT MARKINGS**

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	6,610	EA
666 6174	REFL PAV MRK TY II (W) 6" (SLD)	151,596	LF
666 6178	REFL PAV MRK TY II (W) 8" (SLD)	127	LF
666 6182	REFL PAV MRK TY II (W) 24" (SLD)	11	LF
666 6208	REFL PAV MRK TY II (Y) 6" (BRK)	17,460	LF
666 6210	REFL PAV MRK TY II (Y) 6" (SLD)	39,152	LF

**RAISED PAVEMENT MARKERS**

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6009	REFL PAV MRKR TY II-A-A	1,370	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	1,370	EA

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**BASIS OF ESTIMATE**

SHEET 7 OF 13



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			31
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

### BASIS OF ESTIMATE

**LOCATION 8**

**CSJ** 0961-02-016  
**COUNTY** ANDREWS  
**HIGHWAY** FM 181

**EXIST ADT** 865 (YEAR) 2021

**BEGIN REF MRK** 292 + 0.000 TO **END REF MRK** 306 + 0.389

**LIMITS:** FROM: GAINES COUNTY LINE  
 TO: SH 176

**TYPE OF WORK** Seal Coat

**TOTAL AREA** 265,540 SY

**SURFACE TREATMENT**

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		265,540	SY
*	ASPH (AC-20-5TR)	0.380 GAL/SY	100,906	GAL
316 6048	ASPH (AC-20-5TR)		439	TON
316 6126	AGGR(TY-PB GR-4 SAC-A)	120 SY/CY	2,213	CY

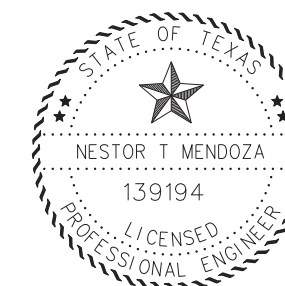
**PAVEMENT MARKINGS**

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	6,540	EA
666 6174	REFL PAV MRK TY II (W) 6" (SLD)	149,476	LF
666 6182	REFL PAV MRK TY II (W) 24" (SLD)	12	LF
666 6208	REFL PAV MRK TY II (Y) 6" (BRK)	16,540	LF
666 6210	REFL PAV MRK TY II (Y) 6" (SLD)	59,032	LF

**RAISED PAVEMENT MARKERS**

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6009	REFL PAV MRKR TY II-A-A	1,570	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	1,570	EA

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**BASIS OF ESTIMATE**

SHEET 8 OF 13



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			32
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

### BASIS OF ESTIMATE

**LOCATION 9**

CSJ 1367-01-014  
 COUNTY CRANE  
 HIGHWAY FM 1233

EXIST ADT 832 (YEAR) 2021

BEGIN REF MRK 244 - 0.569 TO END REF MRK 262 + 0.024

LIMITS: FROM: FM 1053  
 TO: US 385

TYPE OF WORK Seal Coat

TOTAL AREA 356,142 SY

**SURFACE TREATMENT**

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		356,142	SY
	ASPH (AC-20-5TR)	0.380 GAL/SY	135,336	GAL
316 6048	ASPH (AC-20-5TR)		592	TON
316 6126	AGGR(TY-PB GR-4 SAC-A)	120 SY/CY	2,970	CY

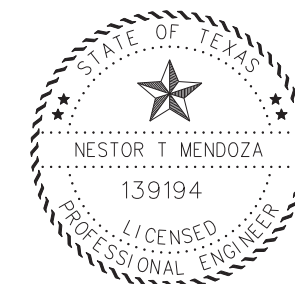
**PAVEMENT MARKINGS**

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	8,150	EA
666 6174	REFL PAV MRK TY II (W) 6" (SLD)	193,532	LF
666 6182	REFL PAV MRK TY II (W) 24" (SLD)	62	LF
666 6208	REFL PAV MRK TY II (Y) 6" (BRK)	21,340	LF
666 6210	REFL PAV MRK TY II (Y) 6" (SLD)	54,270	LF

**RAISED PAVEMENT MARKERS**

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6009	REFL PAV MRKR TY II-A-A	1,750	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	1,750	EA

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**BASIS OF ESTIMATE**

SHEET 9 OF 13



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			33
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

### BASIS OF ESTIMATE

**LOCATION 10**

CSJ 1639-02-021  
 COUNTY PECOS  
 HIGHWAY FM 1450

EXIST ADT 628 (YEAR) 2021

BEGIN REF MRK 218 - 0.000 TO END REF MRK 239 + 0.024

LIMITS: FROM: REEVES COUNTY LINE  
 TO: FM 1053

TYPE OF WORK Seal Coat

TOTAL AREA 365,068 SY

**SURFACE TREATMENT**

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		365,068	SY
*	ASPH (AC-20-5TR)	0.380 GAL/SY	138,735	GAL
316 6048	ASPH (AC-20-5TR)		613	TON
316 6124	AGGR(TY-PB GR-3 SAC-A)	120 SY/CY	3,050	CY

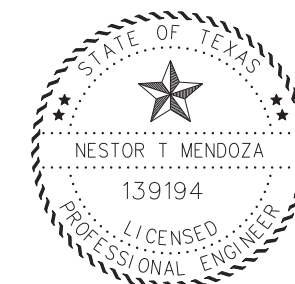
**PAVEMENT MARKINGS**

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	9,170	EA
666 6174	REFL PAV MRK TY II (W) 6" (SLD)	216,232	LF
666 6182	REFL PAV MRK TY II (W) 24" (SLD)	135	LF
666 6208	REFL PAV MRK TY II (Y) 6" (BRK)	24,890	LF
666 6210	REFL PAV MRK TY II (Y) 6" (SLD)	36,307	LF

**RAISED PAVEMENT MARKERS**

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6009	REFL PAV MRKR TY II-A-A	1,700	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	1,700	EA

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**BASIS OF ESTIMATE**  
 SHEET 10 OF 13



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			34
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

### BASIS OF ESTIMATE

**LOCATION 11**

**CSJ COUNTY HIGHWAY**      1825-01-009  
                                          ANDREWS  
                                          FM 1218

**EXIST ADT**                      1,252      (YEAR) 2021

**BEGIN REF MRK**      310 - 0.034      TO      **END REF MRK**      314 + 0.000

**LIMITS:**      FROM: SH 128  
                                          TO: WINKLER COUNTY LINE

**TYPE OF WORK**      Seal Coat

**TOTAL AREA**      37,810 SY

**SURFACE TREATMENT**

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		37,810	SY
*	ASPH (AC-20-5TR)	0.380 GAL/SY	14,368	GAL
316 6048	ASPH (AC-20-5TR)		63	TON
316 6126	AGGR(TY-PB GR-4 SAC-A)	120 SY/CY	316	CY

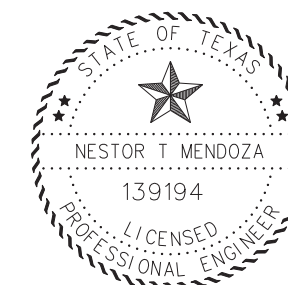
**PAVEMENT MARKINGS**

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	1,160	EA
666 6174	REFL PAV MRK TY II (W) 6" (SLD)	26,176	LF
666 6208	REFL PAV MRK TY II (Y) 6" (BRK)	3,050	LF
666 6210	REFL PAV MRK TY II (Y) 6" (SLD)	6,478	LF

**RAISED PAVEMENT MARKERS**

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

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**BASIS OF ESTIMATE**

SHEET 11 OF 13



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			35
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

### BASIS OF ESTIMATE

**LOCATION 12**

**CSJ** 1825-02-012  
**COUNTY** ANDREWS  
**HIGHWAY** FM 181

**EXIST ADT** 1,264 (YEAR) 2021

**BEGIN REF MRK** 292 + 0.000 **TO** **END REF MRK** 306 + 0.389

**LIMITS:** FROM: GAINES COUNTY LINE  
 TO: SH 176

**TYPE OF WORK** Seal Coat

**TOTAL AREA** 168,343 SY

**SURFACE TREATMENT**

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		168,343	SY
*	ASPH (AC-20-5TR)	0.380 GAL/SY	63,975	GAL
316 6048	ASPH (AC-20-5TR)		281	TON
316 6126	AGGR(TY-PB GR-4 SAC-A)	120 SY/CY	1,407	CY

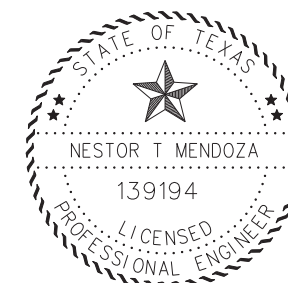
**PAVEMENT MARKINGS**

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	5,070	EA
666 6174	REFL PAV MRK TY II (W) 6" (SLD)	112,744	LF
666 6182	REFL PAV MRK TY II (W) 24" (SLD)	22	LF
666 6208	REFL PAV MRK TY II (Y) 6" (BRK)	13,650	LF
666 6210	REFL PAV MRK TY II (Y) 6" (SLD)	22,691	LF

**RAISED PAVEMENT MARKERS**

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6009	REFL PAV MRKR TY II-A-A	970	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	970	EA

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**BASIS OF ESTIMATE**

SHEET 12 OF 12



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			35
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

### BASIS OF ESTIMATE

**LOCATION 13**

CSJ 2566-01-009  
 COUNTY PECOS  
 HIGHWAY RM 2023

EXIST ADT 90 (YEAR) 2021

BEGIN REF MRK 398 - 0.021 TO END REF MRK 410 + 0.092

LIMITS: FROM: IH 10 NFR  
 TO: END OF RM 2023

TYPE OF WORK Seal Coat

TOTAL AREA 198,363 SY

**SURFACE TREATMENT**

ITEM	DESCRIPTION	RATE	QUANTITY	UNIT
	AREA		198,363	SY
*	ASPH (AC-20-5TR)	0.380 GAL/SY	75,379	GAL
316 6048	ASPH (AC-20-5TR)		329	TON
316 6126	AGGR(TY-PB GR-4 SAC-A)	120 SY/CY	1,654	CY

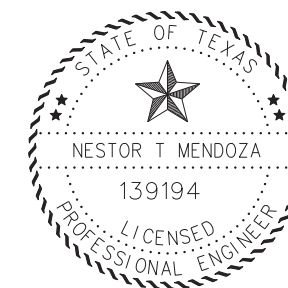
**PAVEMENT MARKINGS**

ITEM	DESCRIPTION	QUANTITY	UNIT
662 6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	5,130	EA
666 6174	REFL PAV MRK TY II (W) 6" (SLD)	126,394	LF
666 6208	REFL PAV MRK TY II (Y) 6" (BRK)	13,240	LF
666 6210	REFL PAV MRK TY II (Y) 6" (SLD)	38,933	LF

**RAISED PAVEMENT MARKERS**

ITEM	DESCRIPTION	QUANTITY	UNIT
672 6009	REFL PAV MRKR TY II-A-A	1,150	EA
*0677	ELIM EXT PAV MRK & MRKR (RAIS PAV MRKR)	1,150	EA

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**BASIS OF ESTIMATE**

SHEET 13 OF 13



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			36
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

**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><b>THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT</b>  <a href="http://www.txdot.gov">http://www.txdot.gov</a></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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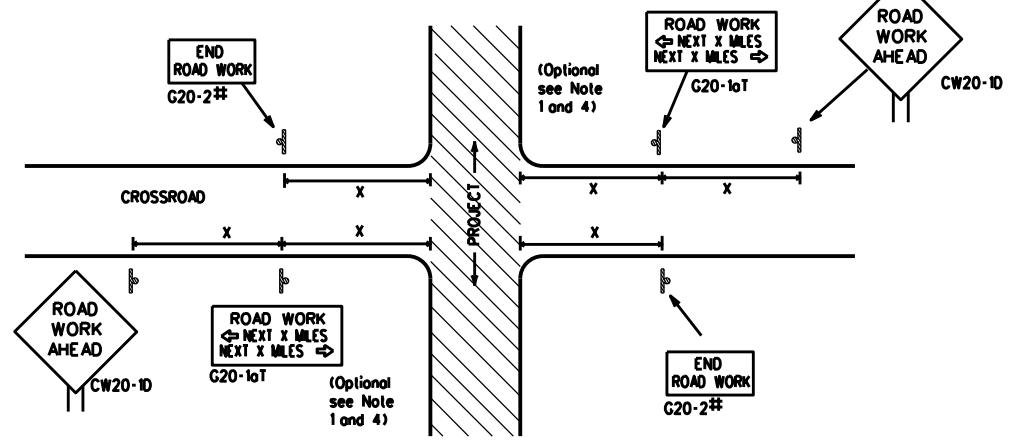
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SHEET 1 OF 12

 Texas Department of Transportation		Traffic Safety Division Standard	
<p><b>BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS</b></p> <p><b>BC(1)-21</b></p>			
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
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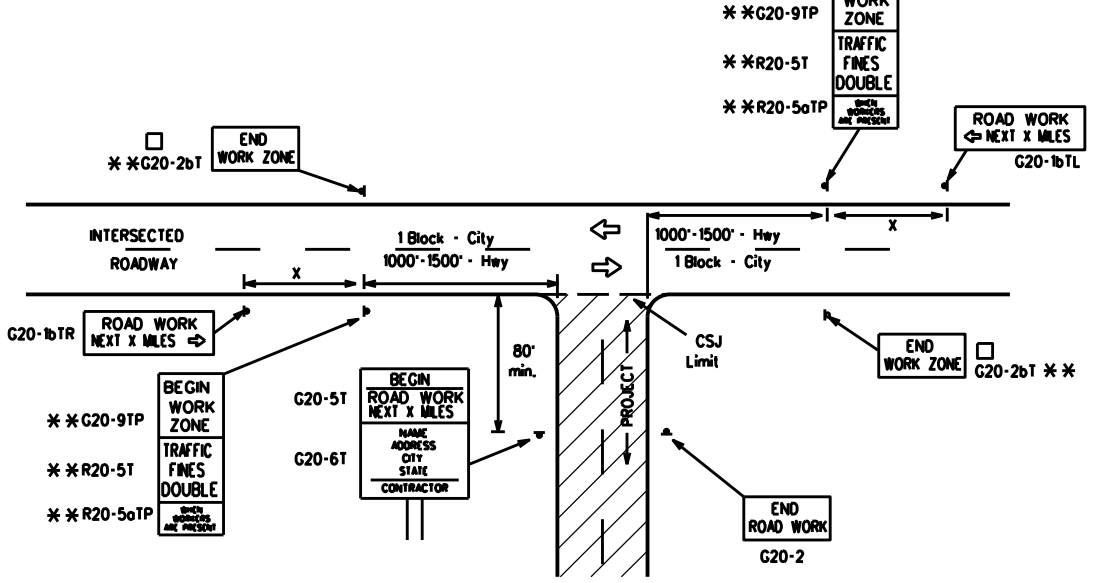


TYPICAL LOCATION OF CROSSROAD SIGNS



- ## 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

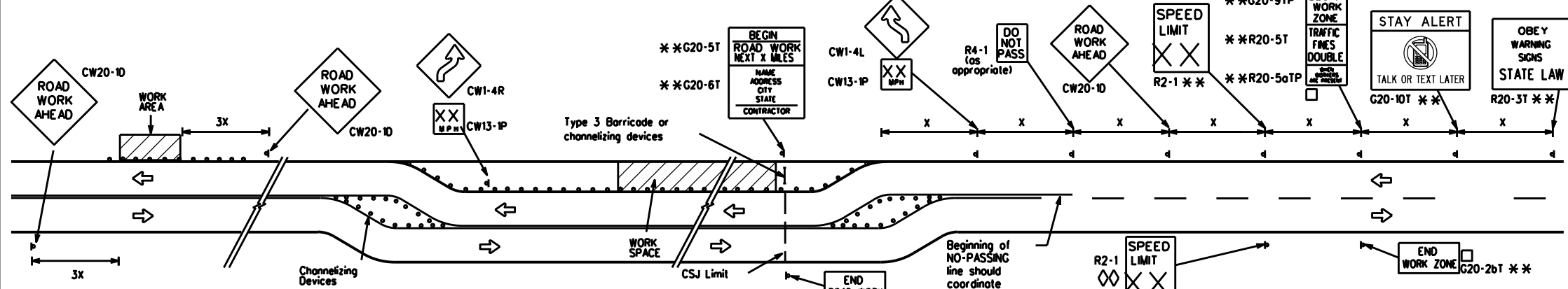
Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed MPH	Sign Spacing "X" Feet (Apprx.)
CW20 <sup>4</sup>	48" x 48"	48" x 48"	30	120
CW21			35	160
CW23			40	240
CW25			45	320
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	50	400
CW3, CW4, CW5, CW6, CW8-3, CW10,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

- 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

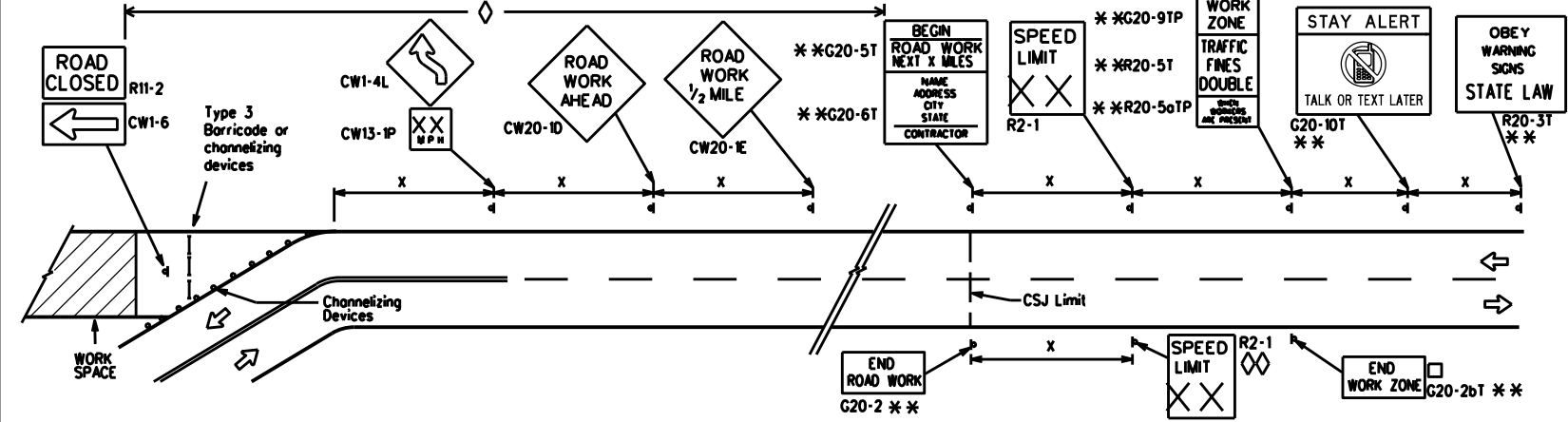
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be 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 DOWNSTREAM OF THE CSJ LIMITS



NOTES

- The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-5T) sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.
- The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.
- CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.
- Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.
- Contractor will install a regulatory speed limit sign at the end of the work zone.

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

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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© TxDOT November 2002	CONT: 0292	SECT: 04	JOB: 072, ETC	SH: 18, ETC
REVISIONS: 9-07 8-14 7-13 5-21	DIST: ODA	COUNTY: WARD, ETC	SHEET NO.: 39	

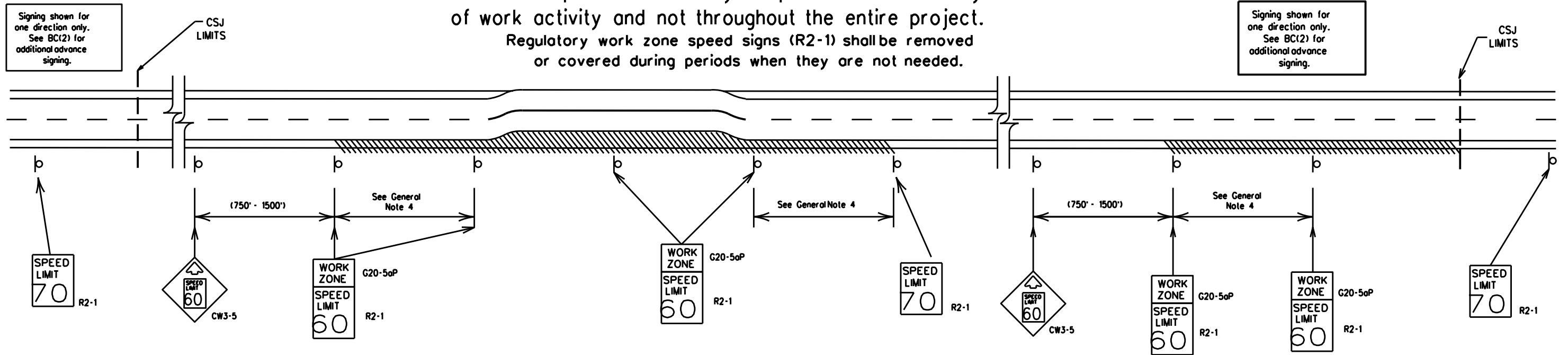
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# TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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:
  - Low 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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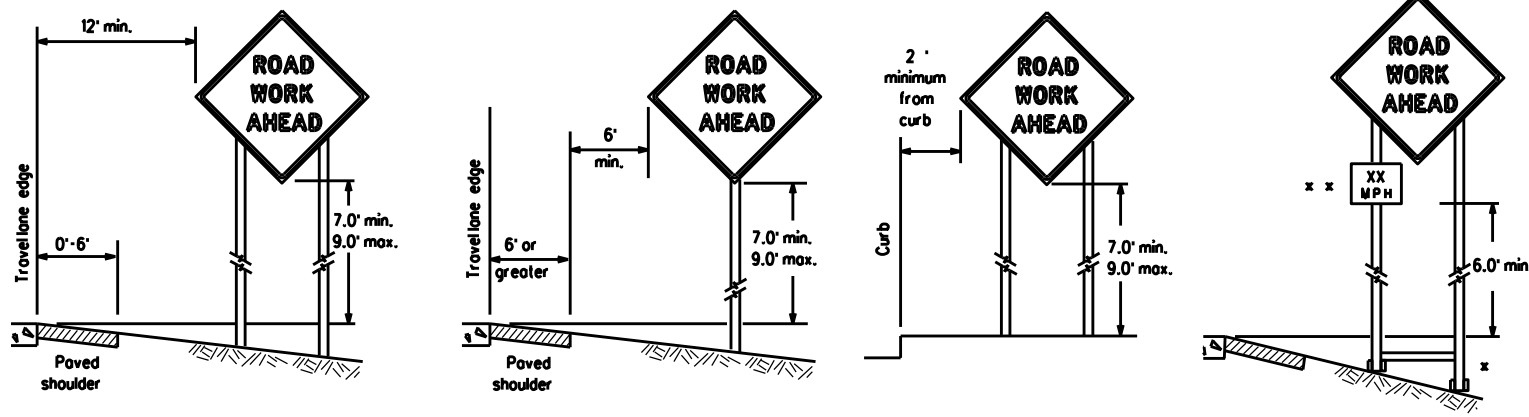


## BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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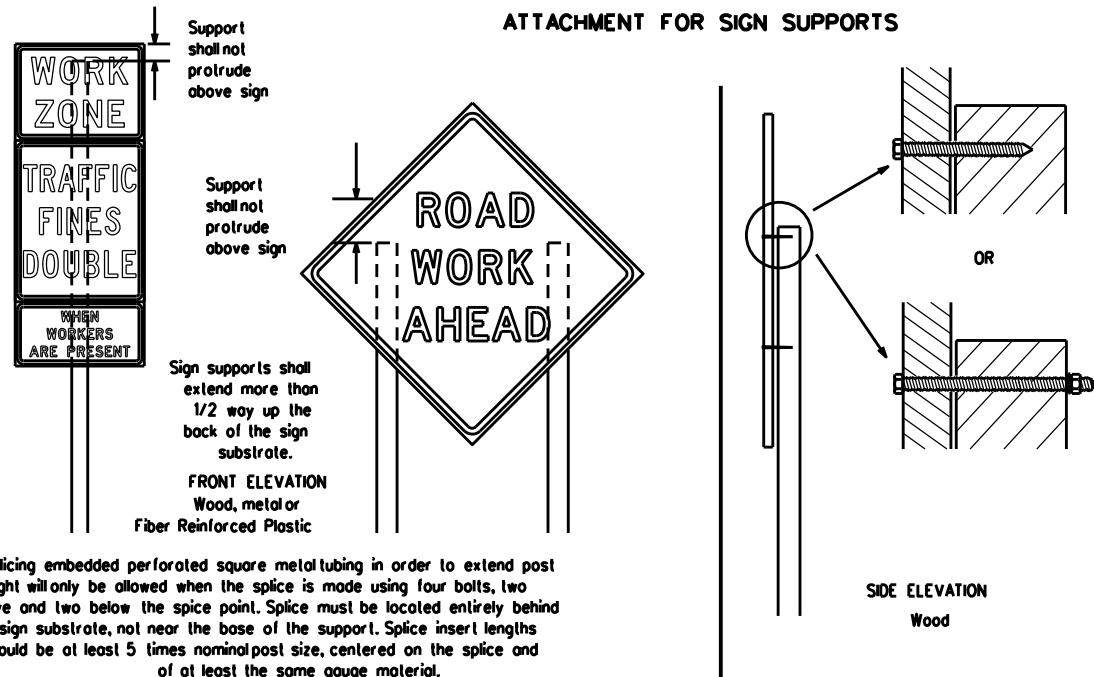
**TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS**



\* 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**



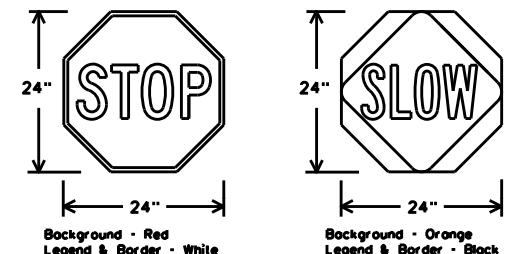
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the 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 retroreflective 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 <sub>TL</sub> OR C <sub>TL</sub> 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**

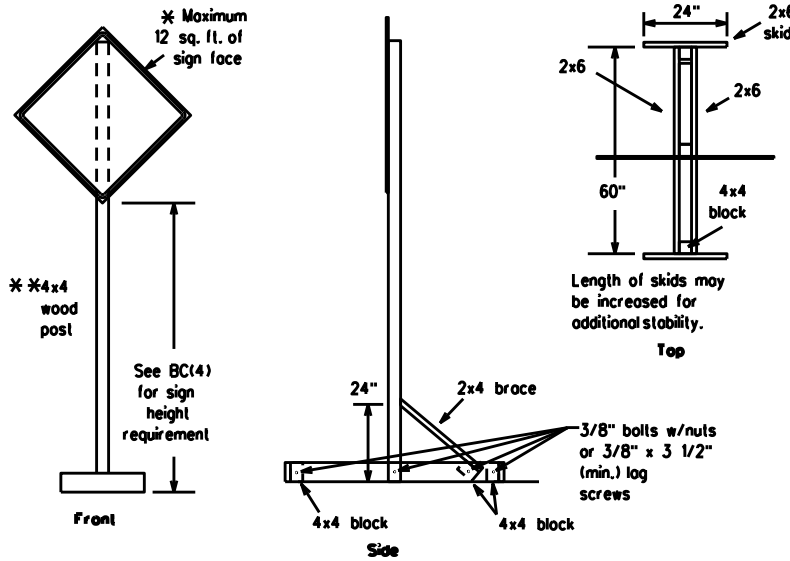
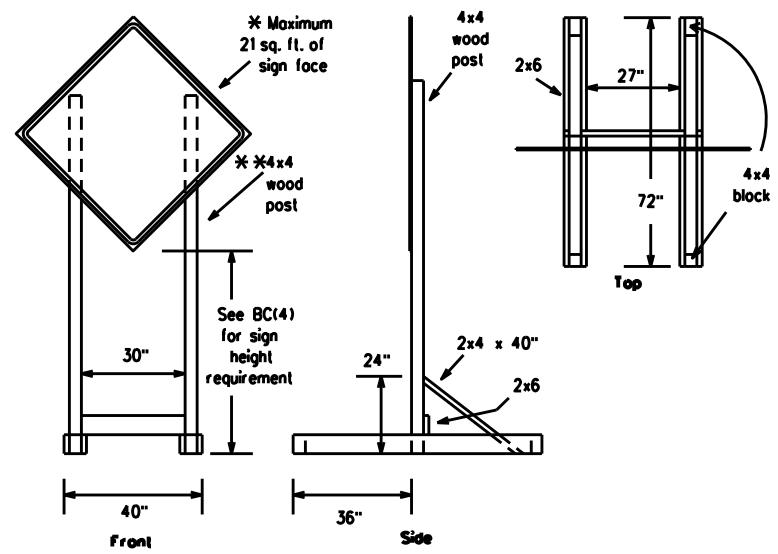
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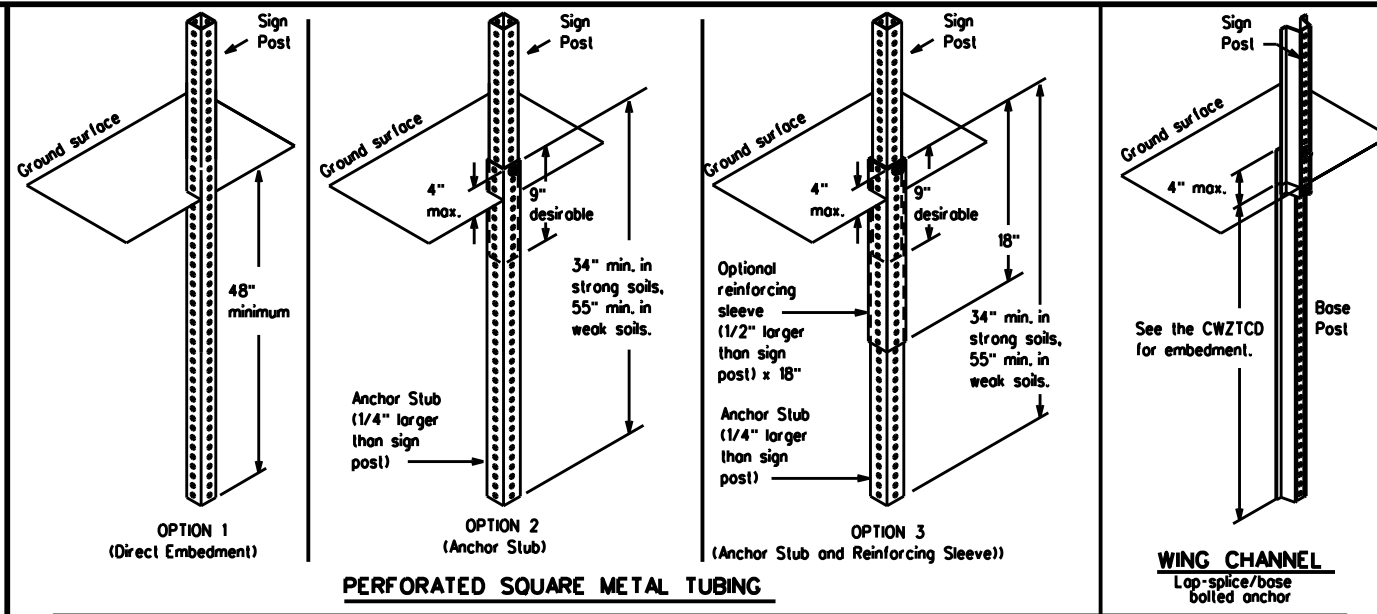
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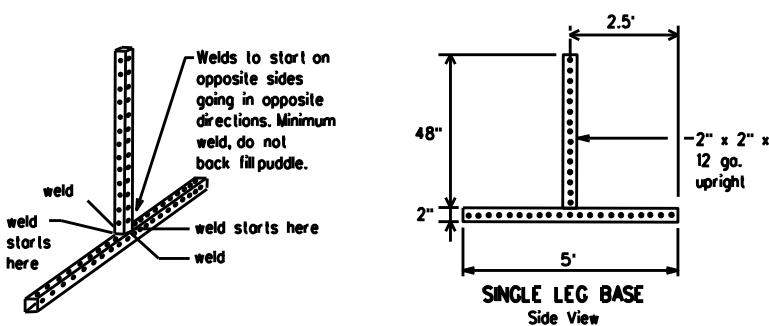
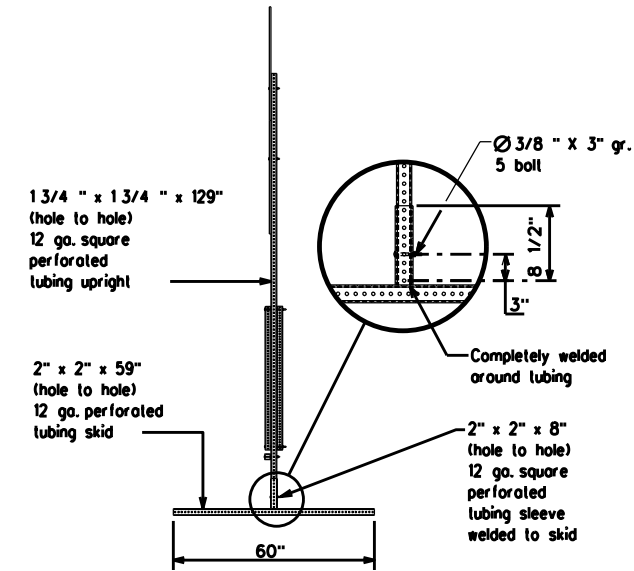
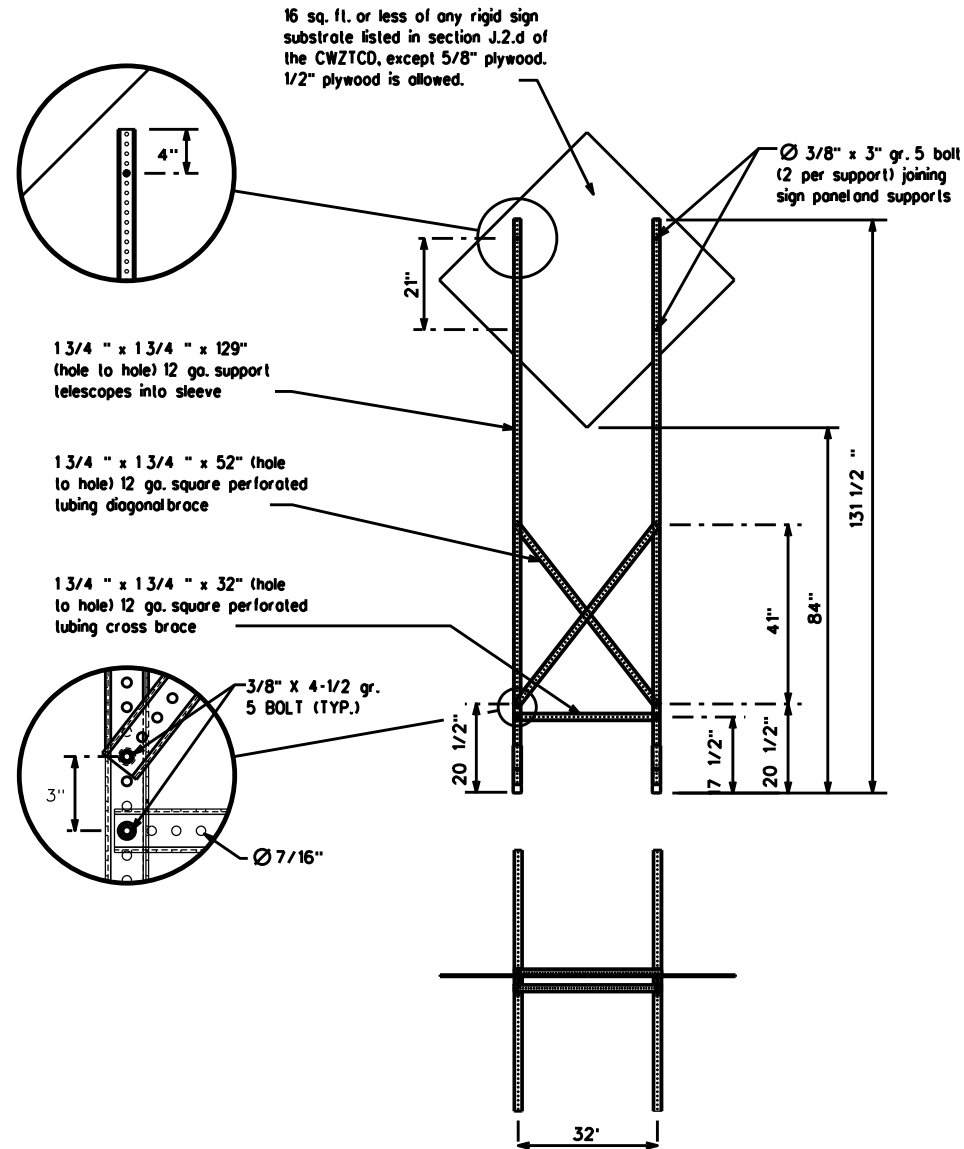
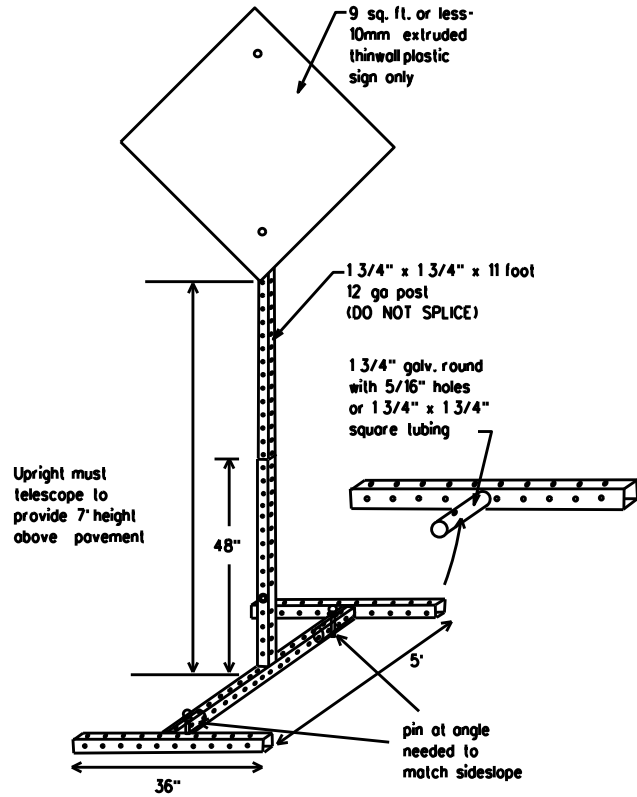
### SKID MOUNTED WOOD SIGN SUPPORTS

\* 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

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

- \* See BC(4) for definition of "Work Duration."
- \*\* Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
- See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

SHEET 5 OF 12



## BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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REVISIONS		DIST:		COUNTY:		SHEET NO.:			
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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
Canal	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
XXXXXXXXX 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

\* 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

### Location List

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

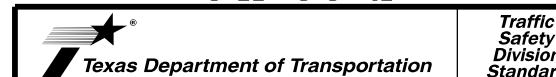
- The words RIGHT, LEFT and ALL can be interchanged as appropriate.
- Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
- EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
- Highway names and numbers replaced as appropriate.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

SHEET 6 OF 12



# BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

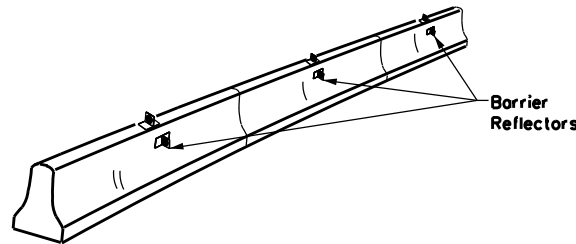
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© TxDOT November 2002	CONT: 0292	SECT: 04	JOB: 072, ETC	HIGHWAY: SH 18, ETC
REVISIONS: 9-07 8-14	DIST: 7-13 5-21	COUNTY: ODA	WARD, ETC	SHEET NO.: 43

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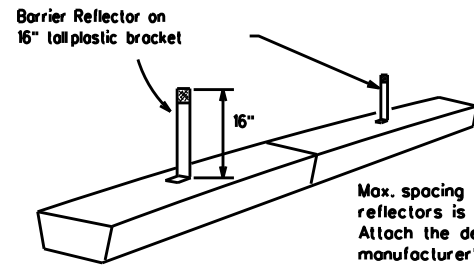
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



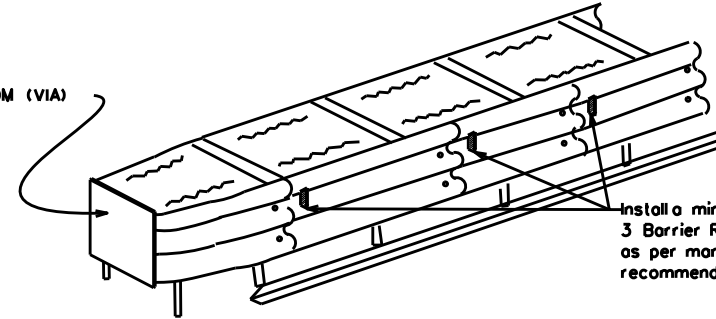
**LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES**

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**

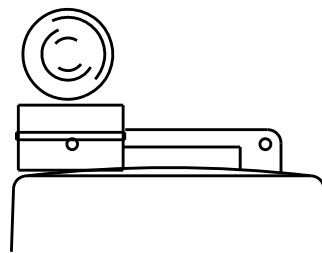
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet 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**

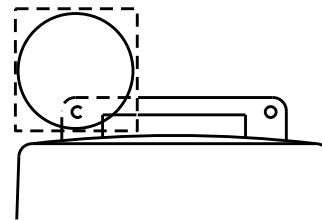
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing 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.



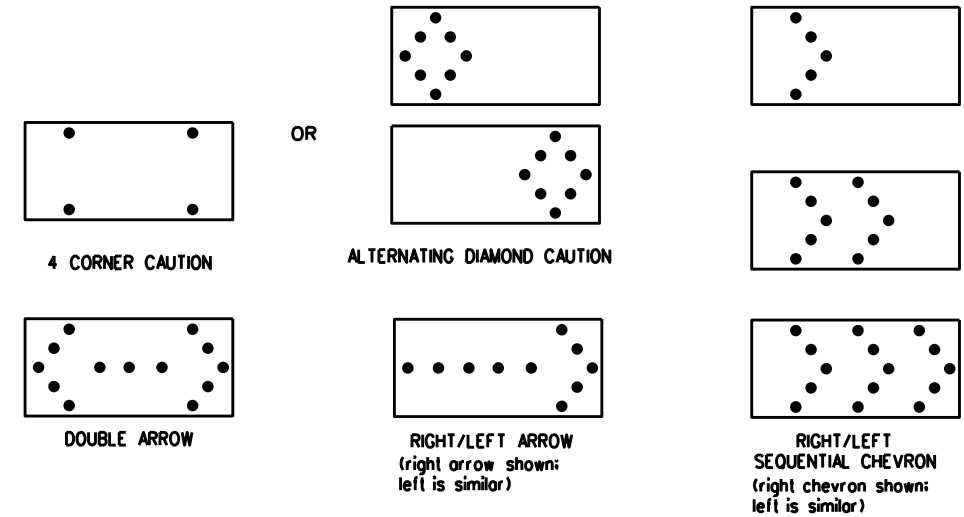
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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:

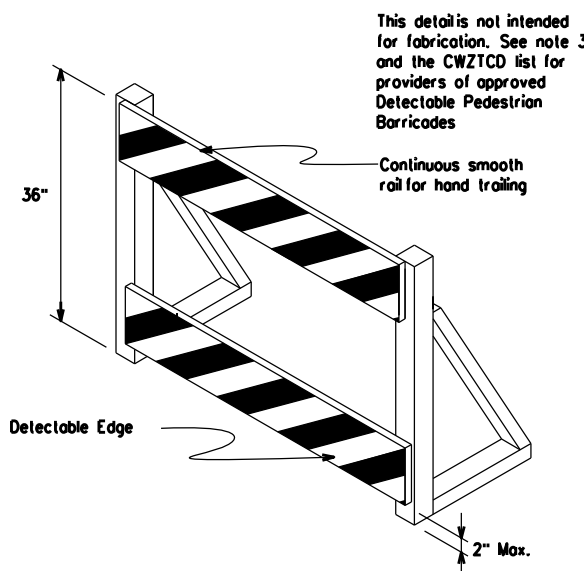
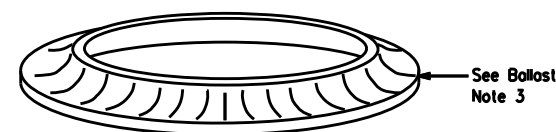
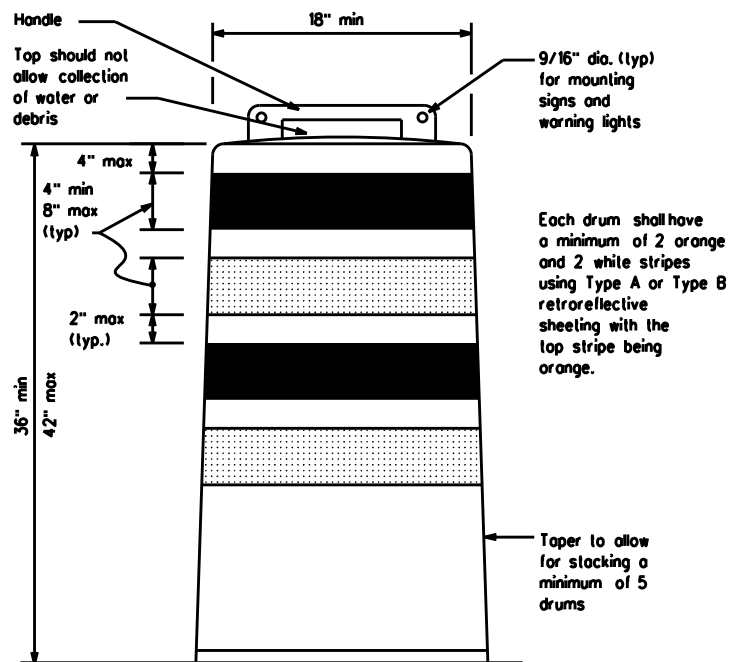
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

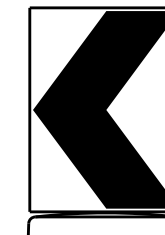
**BALLAST**

- 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.

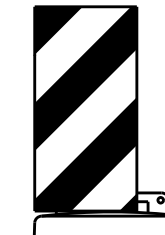


**DETECTABLE PEDESTRIAN BARRICADES**

- 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 bolt (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 of 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



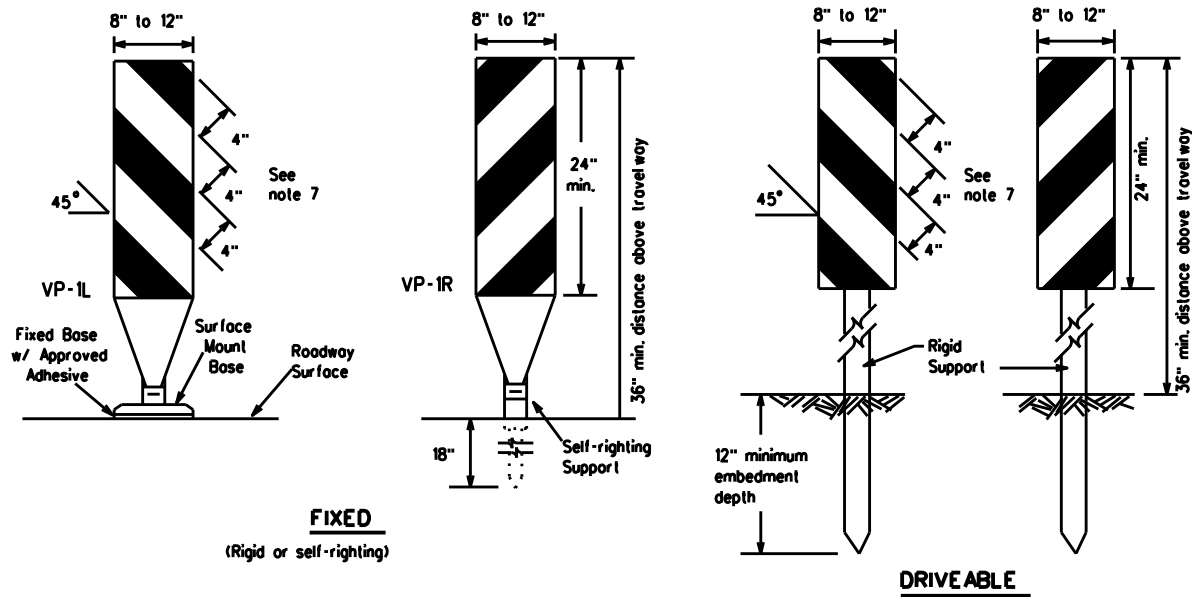
**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC(8)-21**

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© TxDOT	November 2002	CONT:	0292	SECT:	04	JOB:	072. ETC	SH:	18. ETC
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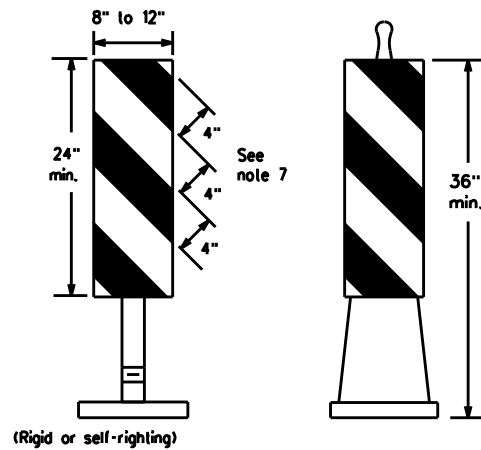
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**FIXED**  
(Rigid or self-righting)

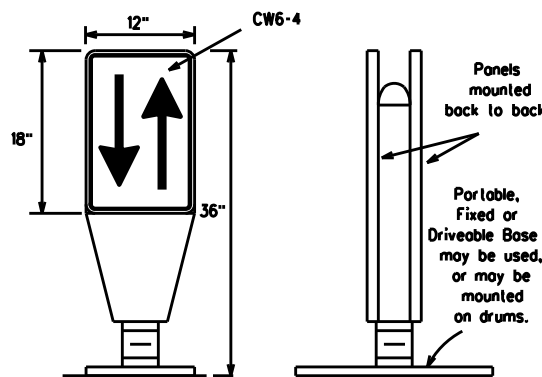
**DRIVEABLE**



**PORTABLE**

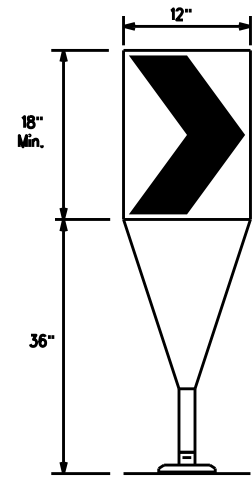
**VERTICAL PANELS (VPs)**

- Vertical Panels (VPs) are normally used to channelize traffic or divide opposing lanes of traffic.
- VPs 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 of 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 panels is 36 inches or greater, a panel stripe of 6 inches shall be used.



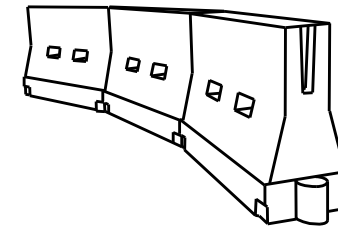
**OPPOSING TRAFFIC LANE DIVIDERS (OTLD)**

- 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 VPs.
- Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs 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.



- 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 cones 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			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent
30	L = WS <sup>2</sup> / 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**

SHEET 9 OF 12



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC(9)-21**

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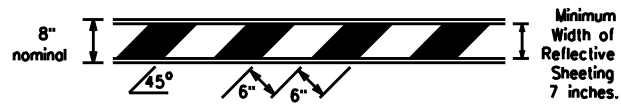
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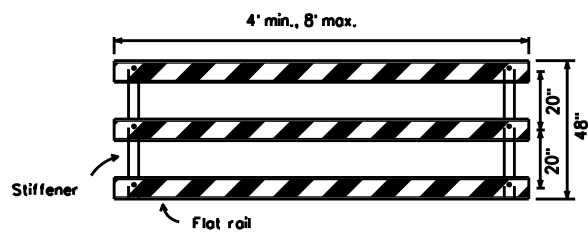
**TYPE 3 BARRICADES**

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 stocked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



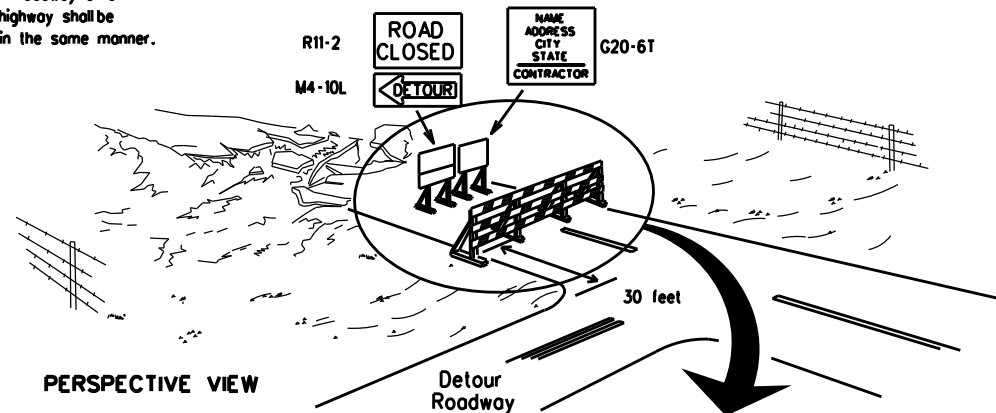
**TYPICAL STRIPING DETAIL FOR BARRICADE RAIL**



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

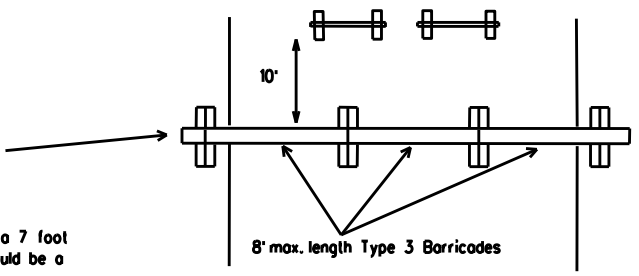
**TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES**

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



PERSPECTIVE VIEW

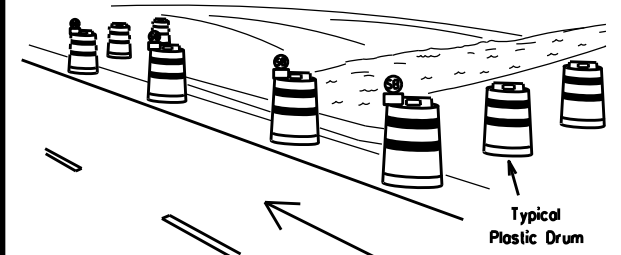
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



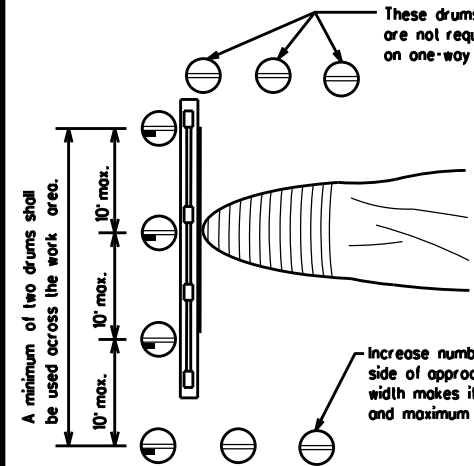
PLAN VIEW

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

**TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION**



PERSPECTIVE VIEW



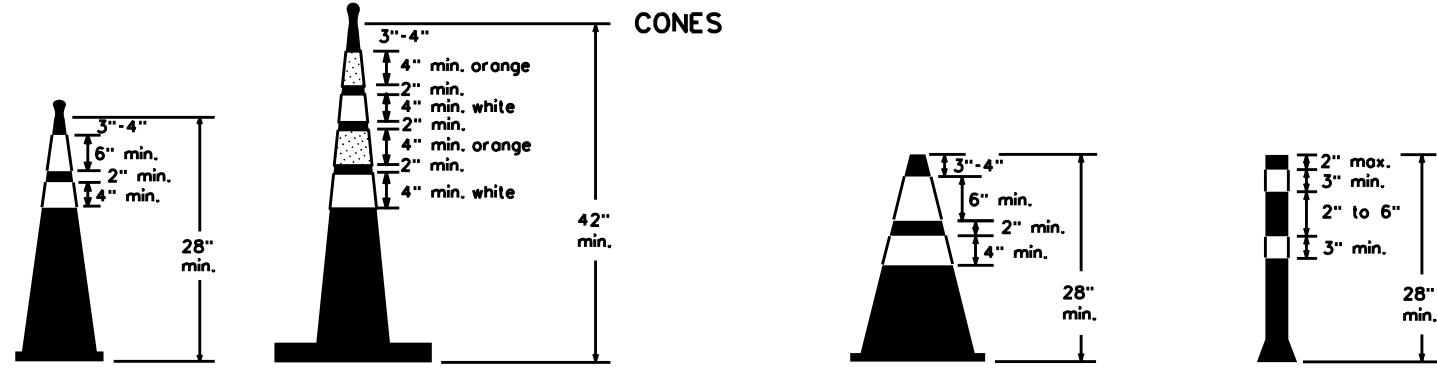
PLAN VIEW

Increase number of plastic drums on the side of approaching traffic if the crown width makes it necessary. (minimum of 2 and maximum of 4 drums)

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

**CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS**

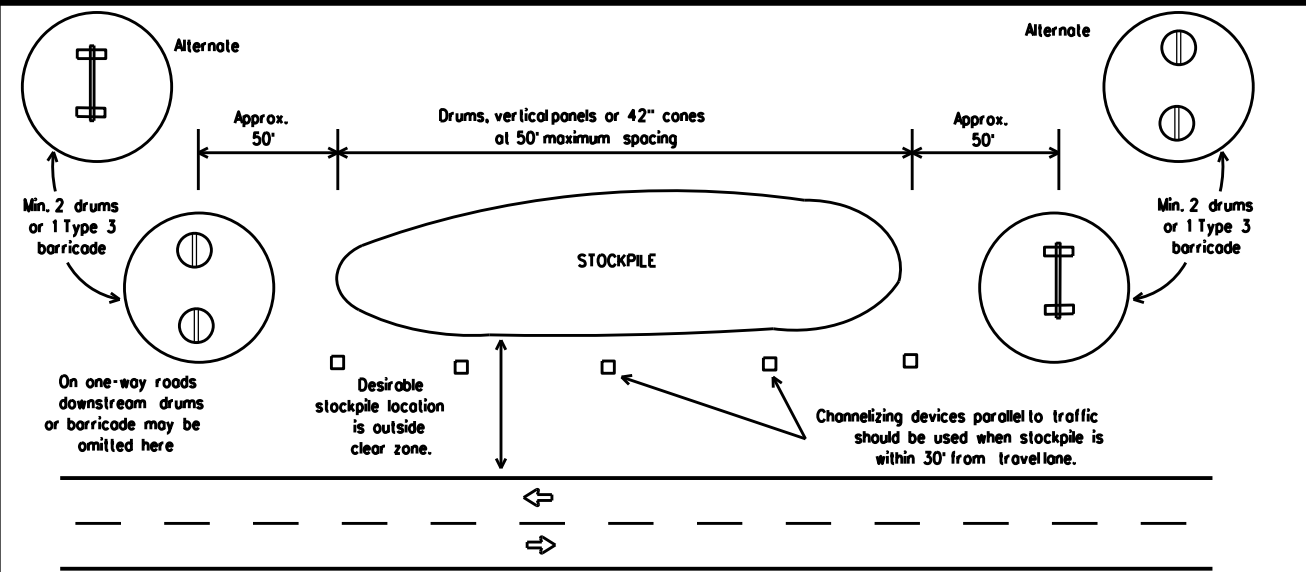


Two-Piece cones

One-Piece cones

Tubular Marker

28" Cones shall have a minimum weight of 9 1/2 lbs.  
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.



**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 in 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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9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	00A	WARD. ETC	47	

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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.

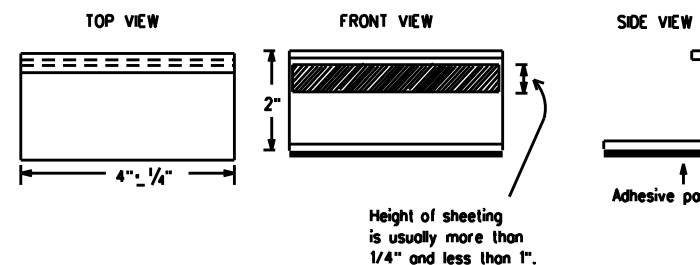
### MAINTAINING WORK ZONE PAVEMENT MARKINGS

- 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.
- Block-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

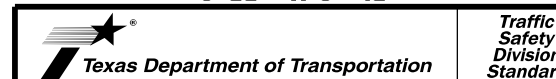
- Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
- All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
- Adhesive for guidemarks shall be bituminous material hot applied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

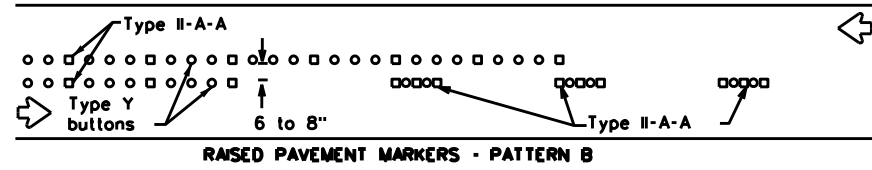
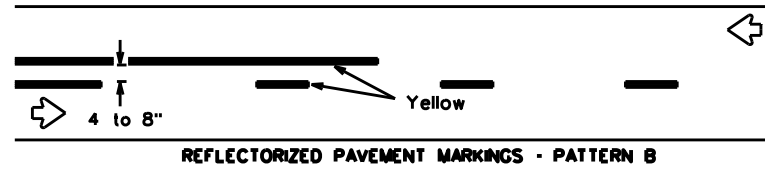
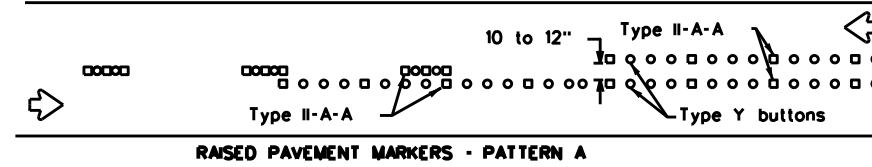
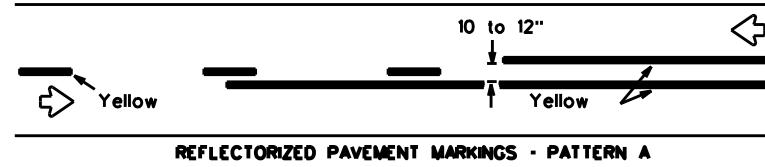
BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS		0292	04	072, ETC
2-98	9-07	5-21		SH 18, ETC
1-02	7-13			
11-02	8-14			
	DIST	COUNTY		SHEET NO.
	00A	WARD, ETC		48

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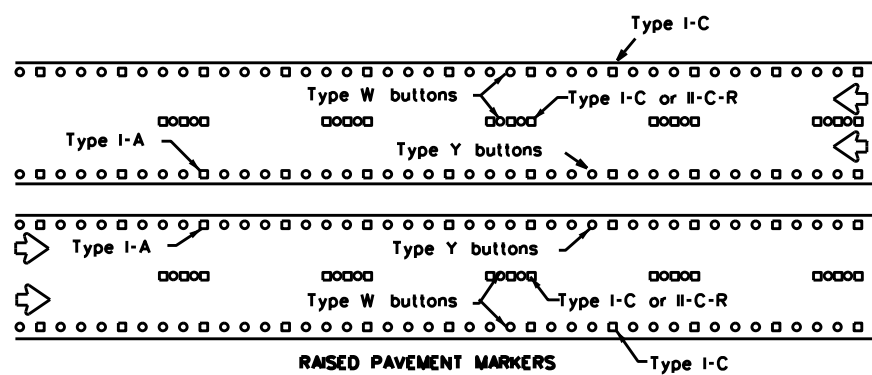
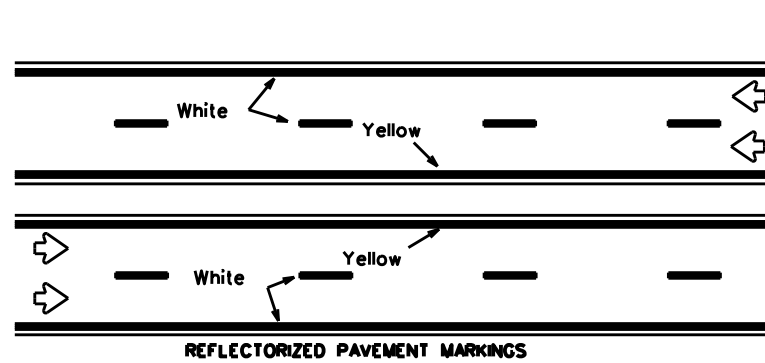
DATE:  
FILE:

## PAVEMENT MARKING PATTERNS



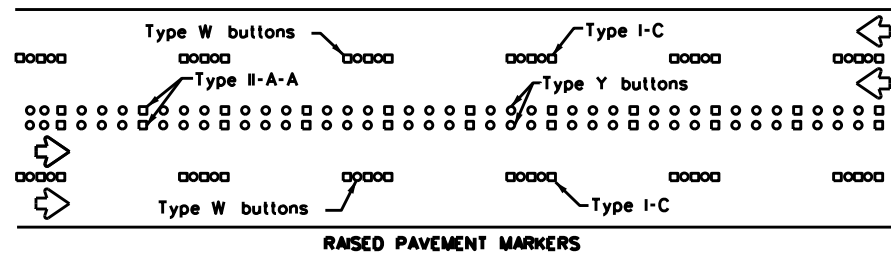
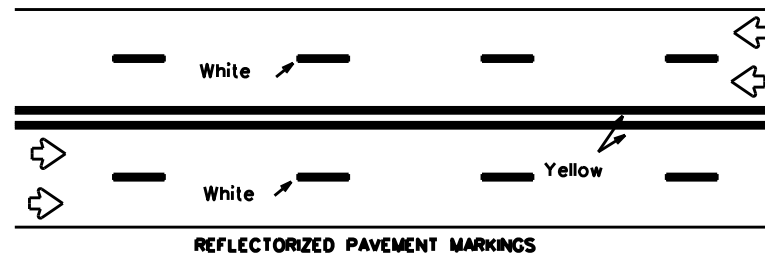
Pattern A is the TxDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectORIZED pavement markings.

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



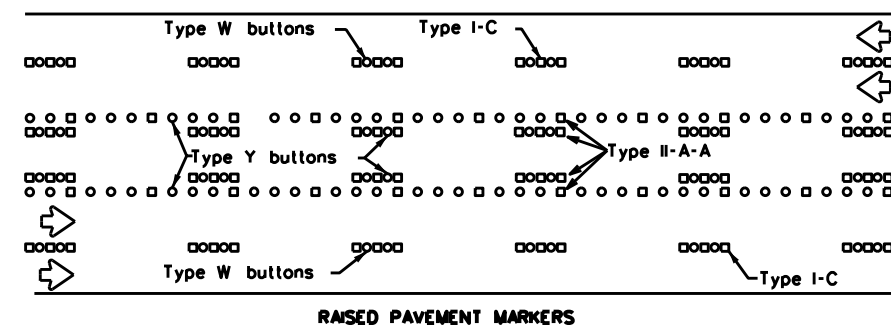
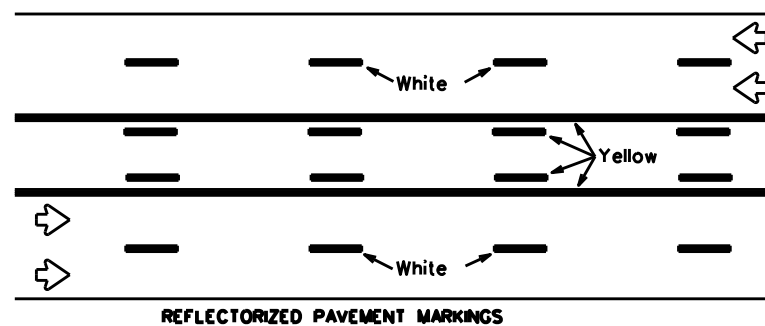
Prefabricated markings may be substituted for reflectORIZED pavement markings.

## EDGE & LANE LINES FOR DIVIDED HIGHWAY



Prefabricated markings may be substituted for reflectORIZED pavement markings.

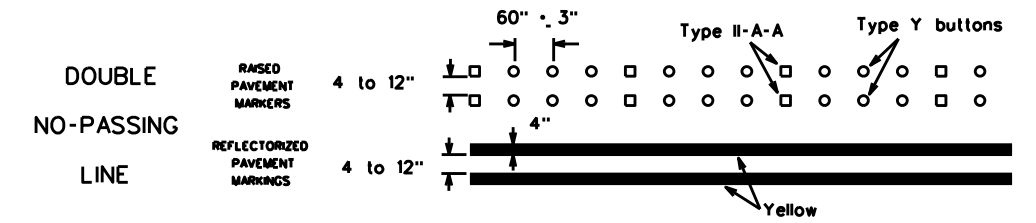
## LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



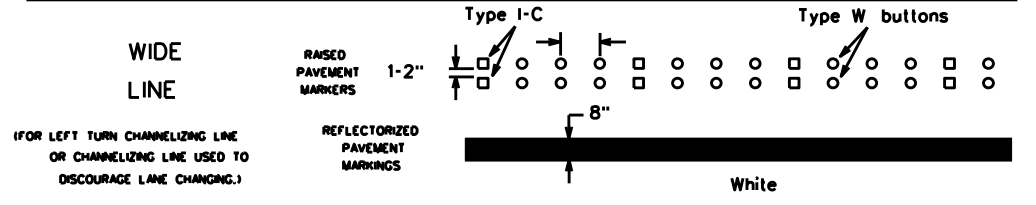
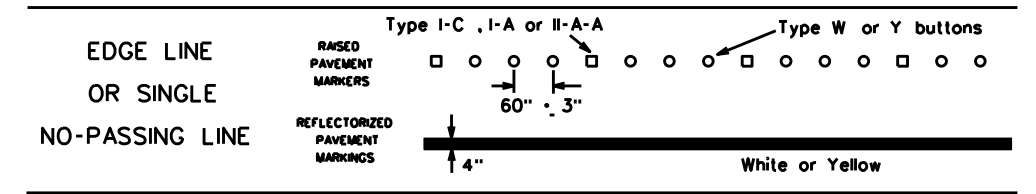
Prefabricated markings may be substituted for reflectORIZED pavement markings.

## TWO-WAY LEFT TURN LANE

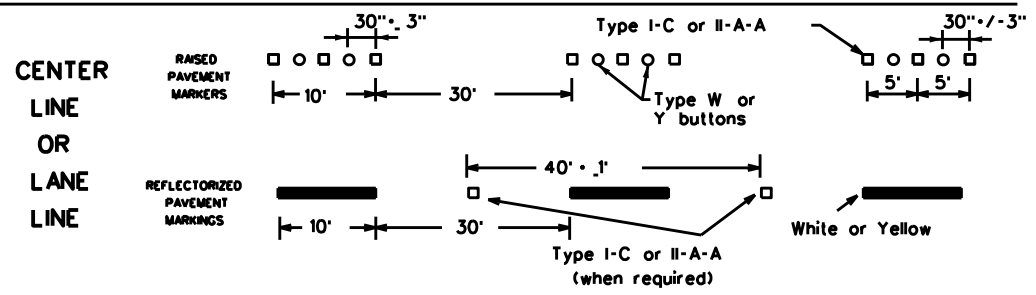
## STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



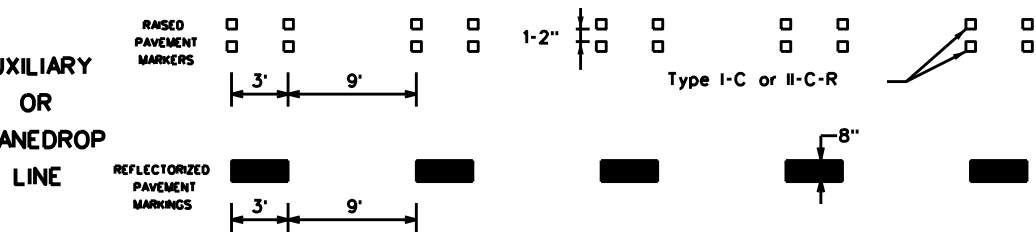
### SOLID LINES



### BROKEN LINES

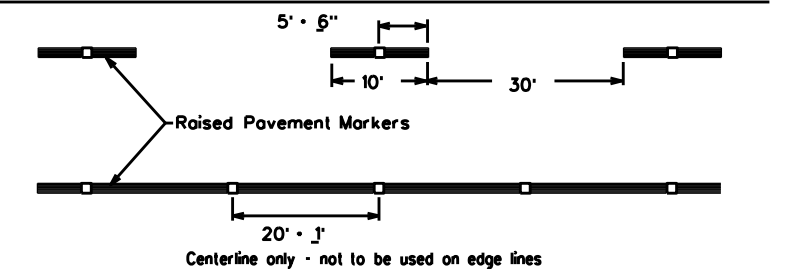


### AUXILIARY OR LANEDROP LINE



### 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."

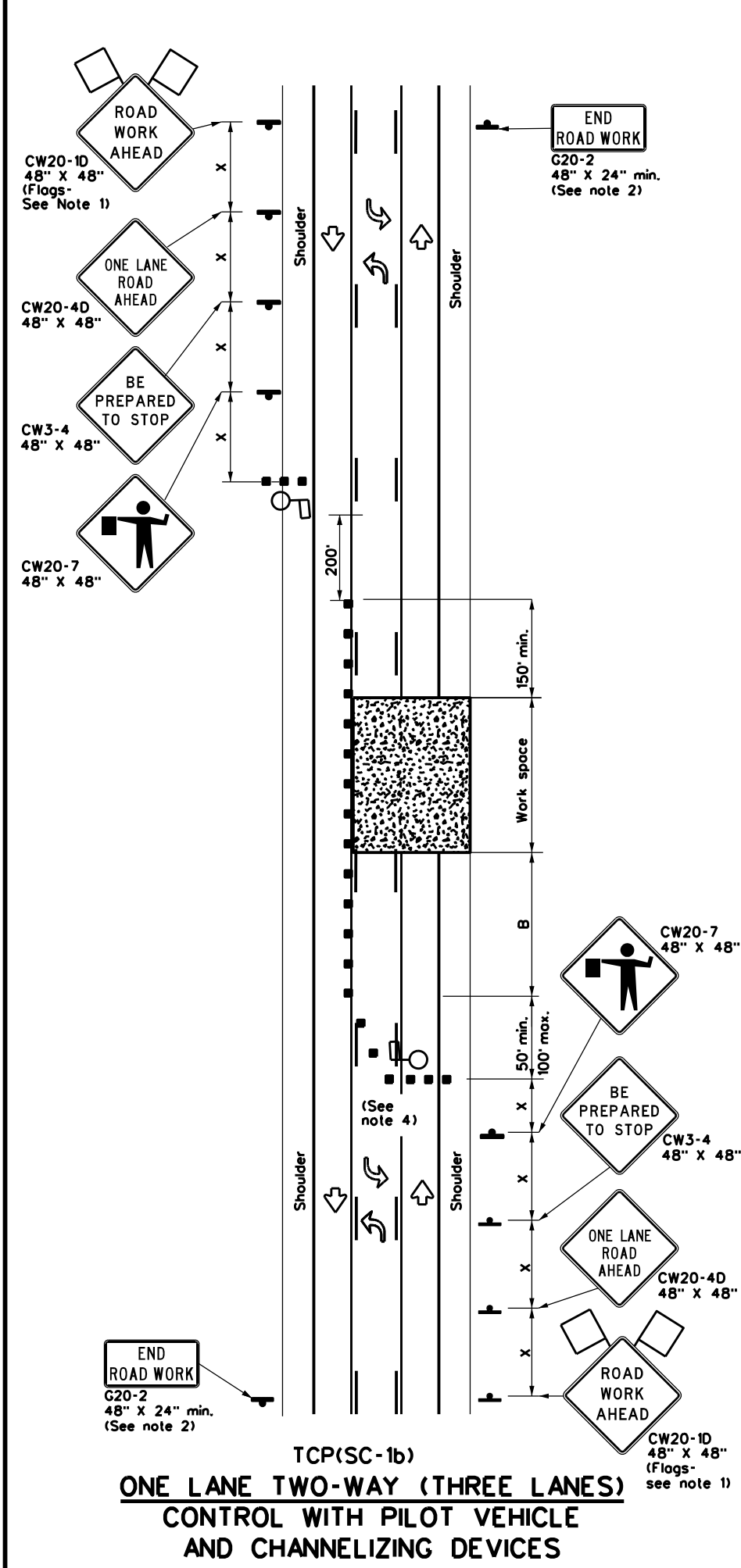
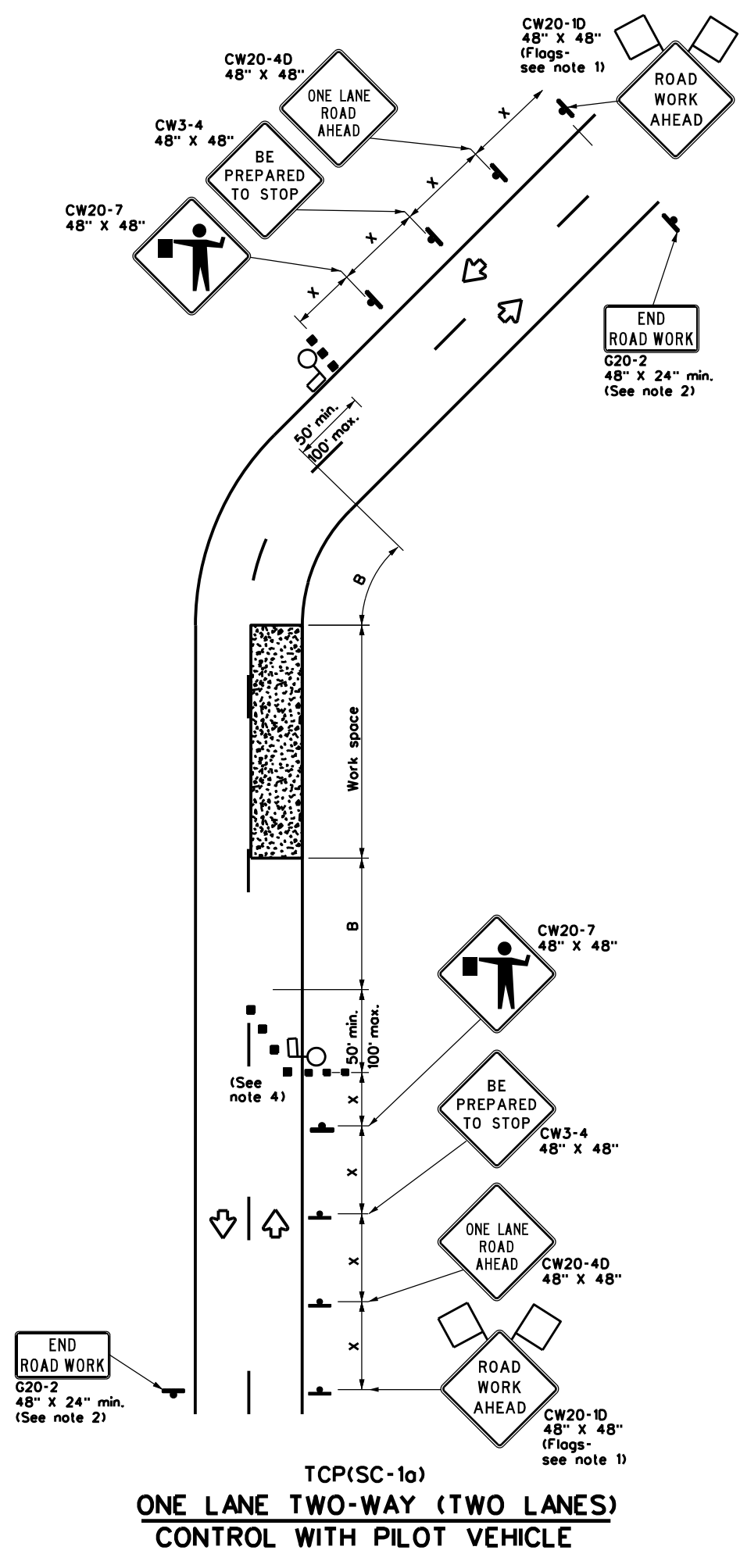
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT: 0292	SECT: 04	JOB: 072, ETC	HIGHWAY: SH 18, ETC
REVISIONS	DIST: COUNTY		SHEET NO.	
1-97 9-07 5-21	00A		WARD, ETC 49	
2-98 7-13				
11-02 8-14				

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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"	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.
- 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)**

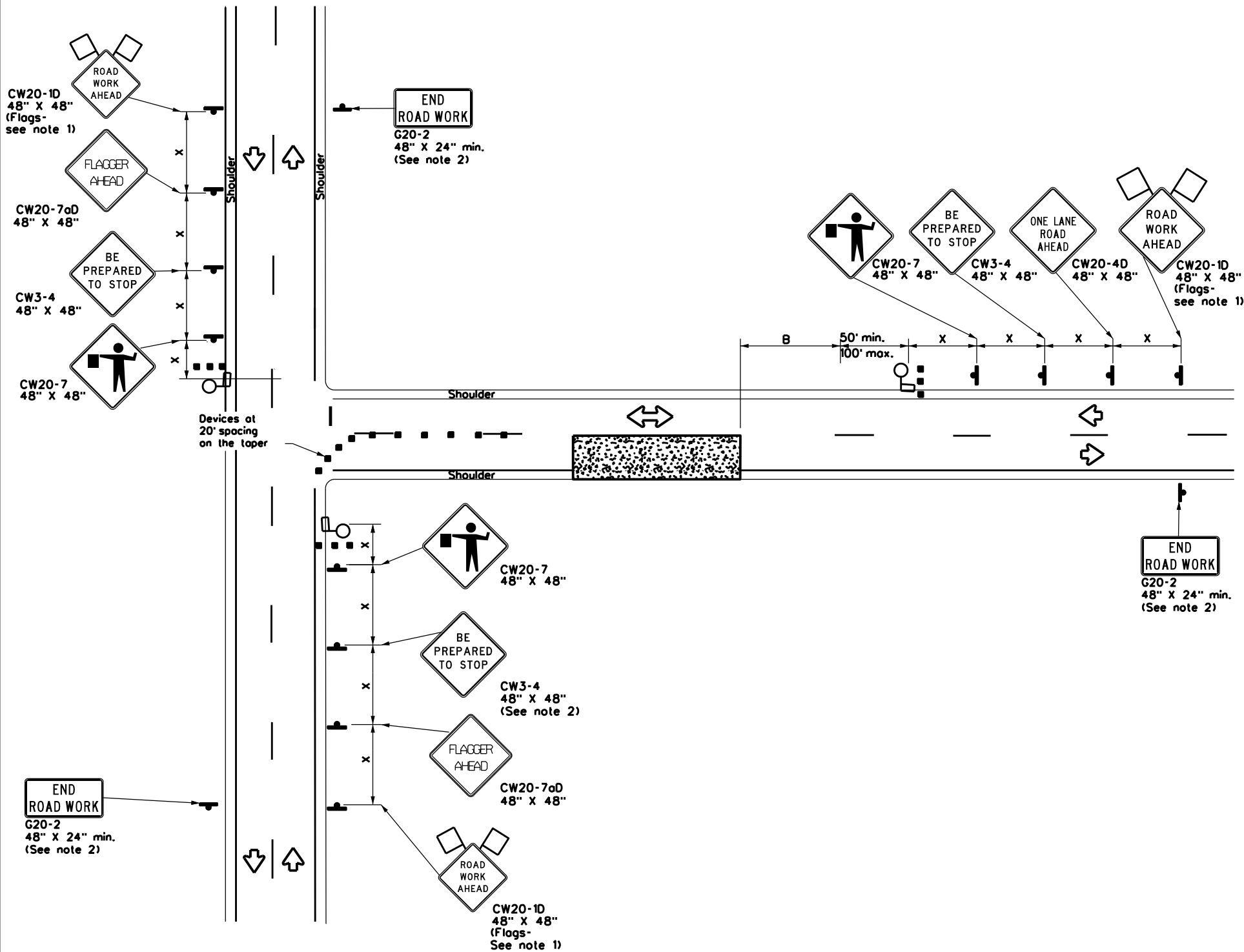
- Channelizing devices on the centerline are not required when a pilot car is leading traffic, unless directed by the Engineer.

SHEET 1 OF 8

Texas Department of Transportation		Traffic Safety Division Standard	
<b>TRAFFIC CONTROL PLAN</b> <b>SEAL COAT OPERATIONS</b> <b>ONE-LANE TWO-WAY</b> <b>TCP(SC-1)-22</b>			
FILE: tcpsc-1-22.dgn	DN:	CK:	DW:
© TxDOT October 2022	CON:	SECT:	HIGHWAY:
REVISIONS	0292	04	072, ETC
4-21	DIST:	COUNTY:	SHEET NO.:
10-22	00A	WARD, ETC	50

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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



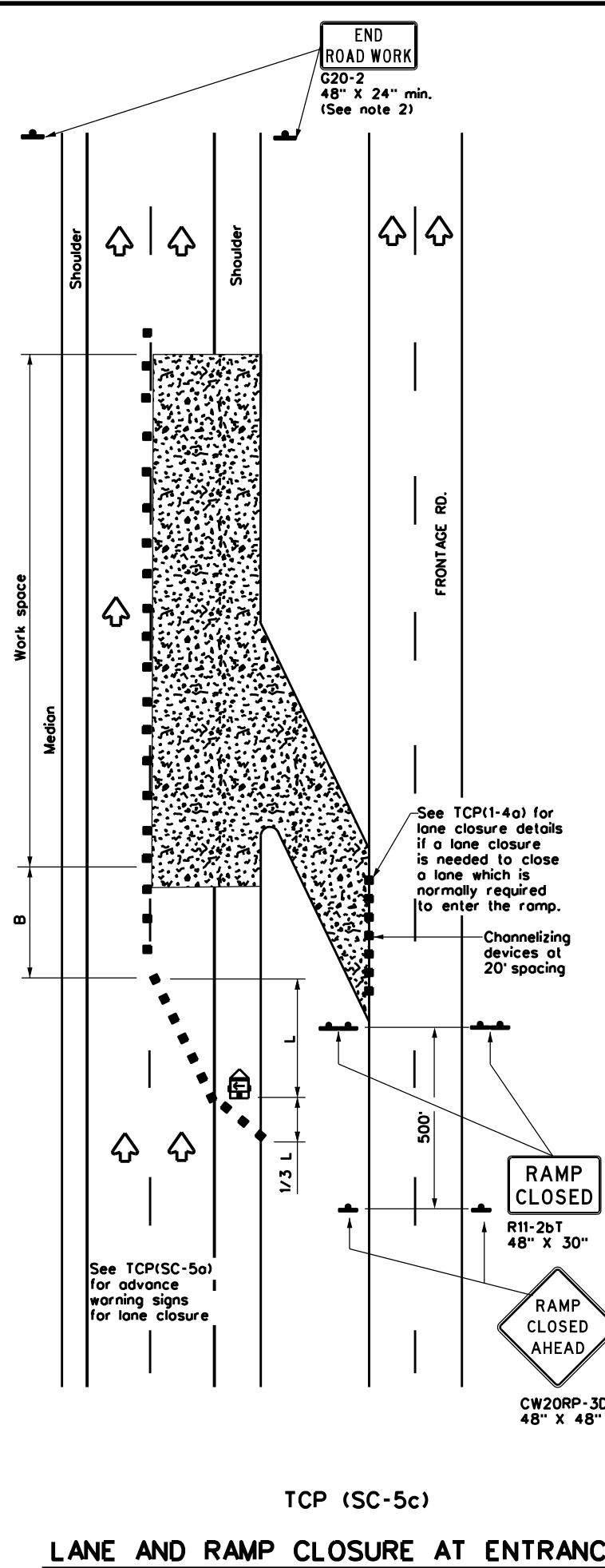
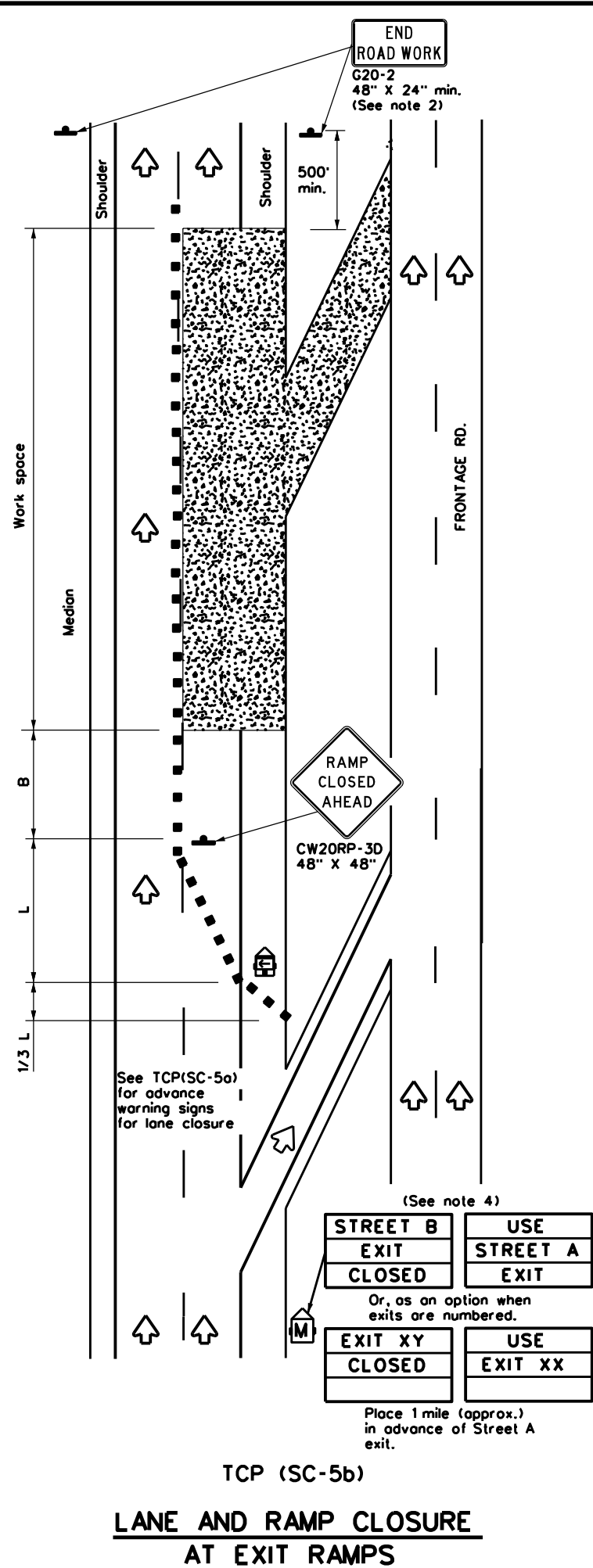
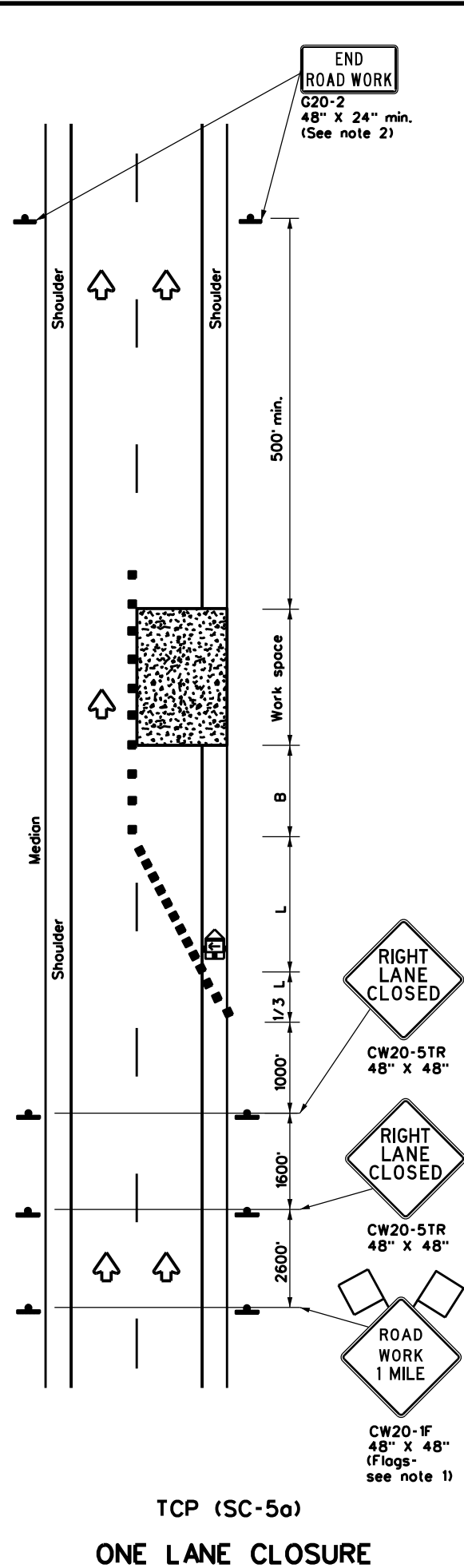
**TRAFFIC CONTROL PLAN  
SEAL COAT OPERATIONS  
NEAR INTERSECTION**

**TCP(SC-4)-22**

FILE: tcpsc-4-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0292	04	072, ETC	SH 18, ETC
4-21	DIST	COUNTY	SHEET NO.	
10-22	ODA	WARD, 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			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'

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.
  - 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.

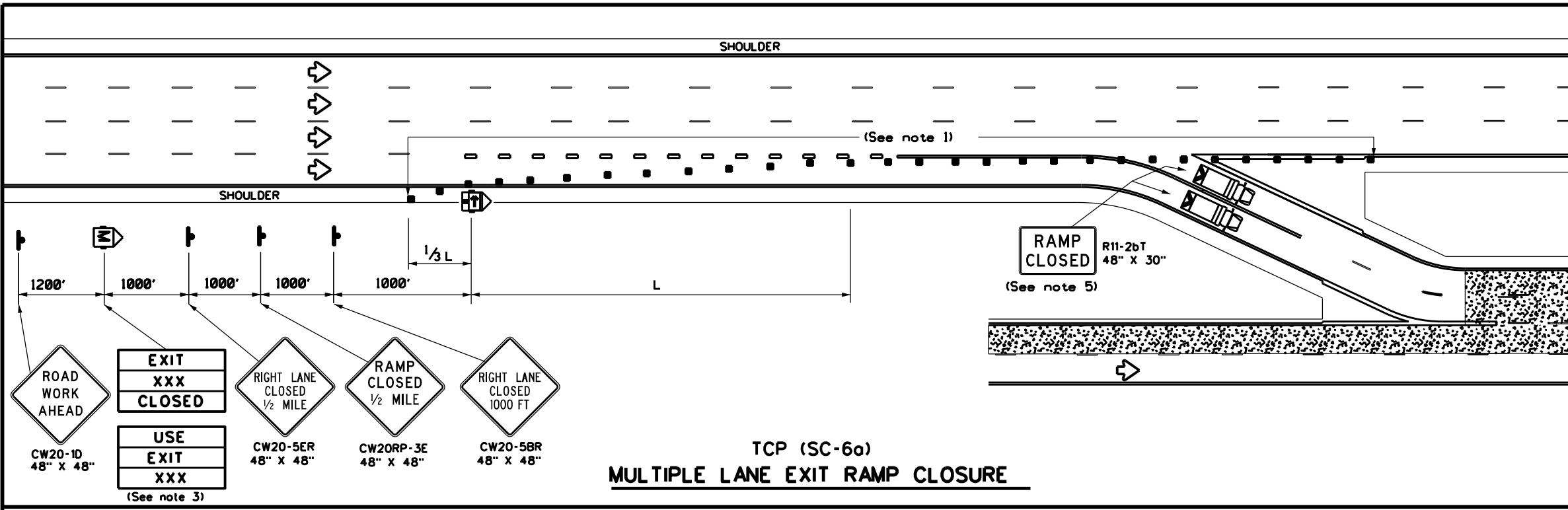
**TRAFFIC CONTROL PLAN  
SEAL COAT OPERATIONS  
DIVIDED HIGHWAYS**

**TCP(SC-5)-22**

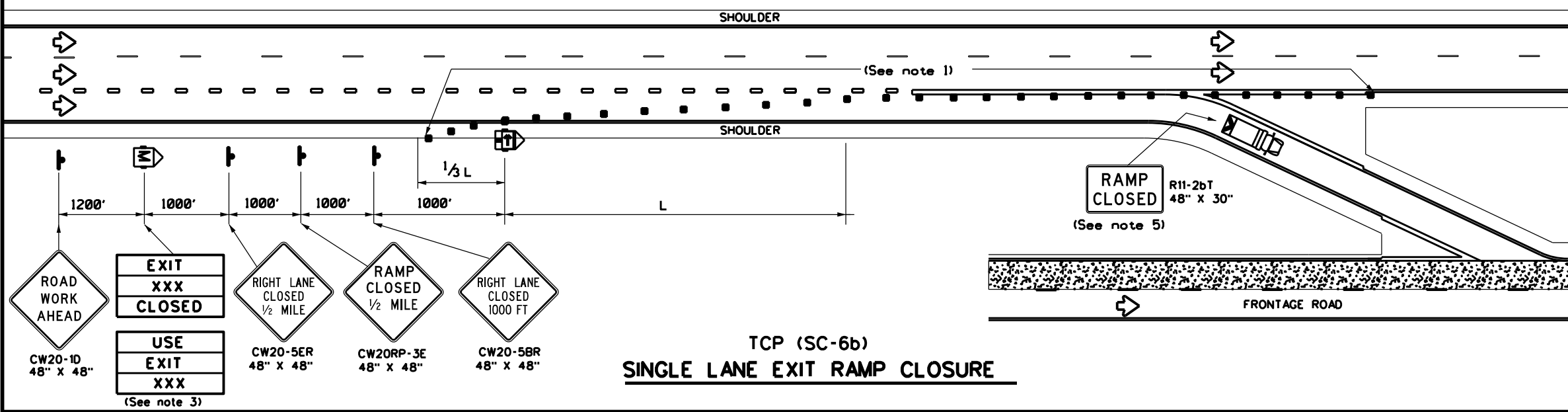
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© TxDOT October 2022	CON: 0292	SECT: 04	JOB: 072, ETC	HIGHWAY: SH 18, ETC
4-21 10-22	DIST:	COUNTY:	WARD, ETC	SHEET NO.: 52

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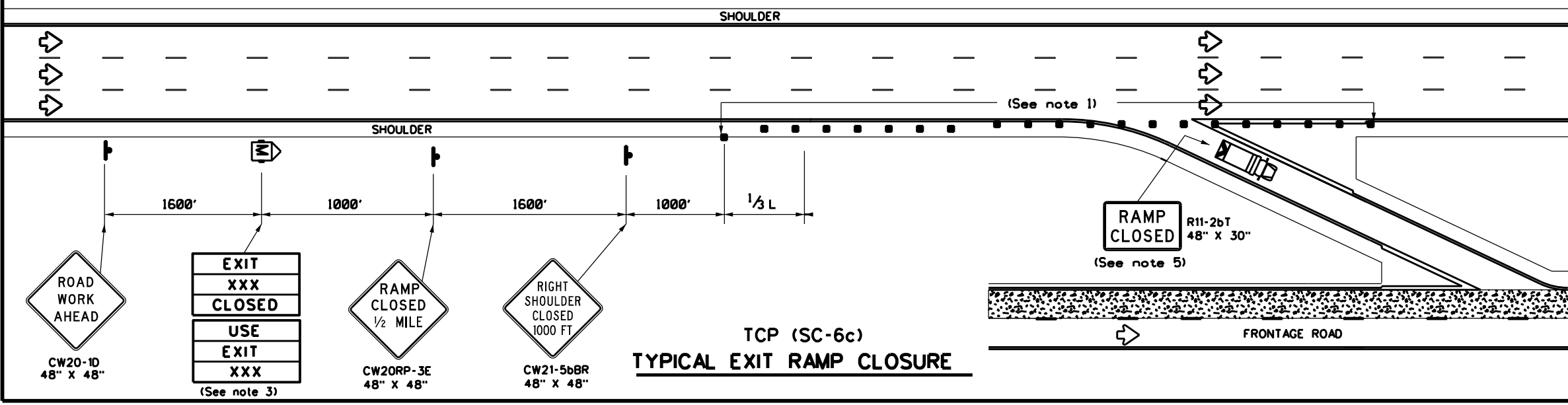
DATE: FILE:



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 (CW2ORP-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.

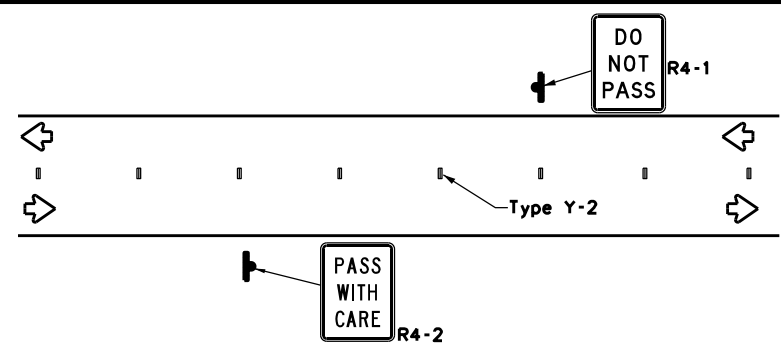
TRAFFIC CONTROL PLAN  
SEAL COAT OPERATIONS  
DIVIDED HIGHWAYS

TCP(SC-6)-22

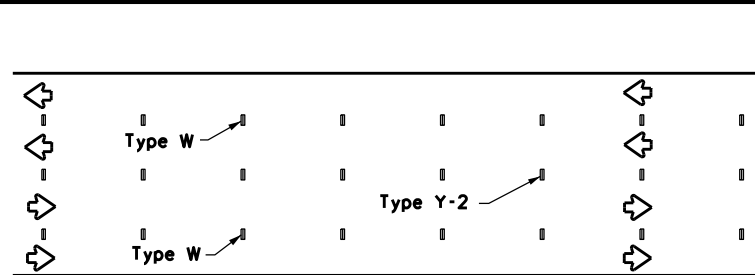
FILE: tcpsc-6-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
10-22	0292	04	072, ETC	SH 18, ETC
REVISIONS	DIST	COUNTY	SHEET NO.	
	ODA	WARD, ETC	53	

**WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS (TABS)**

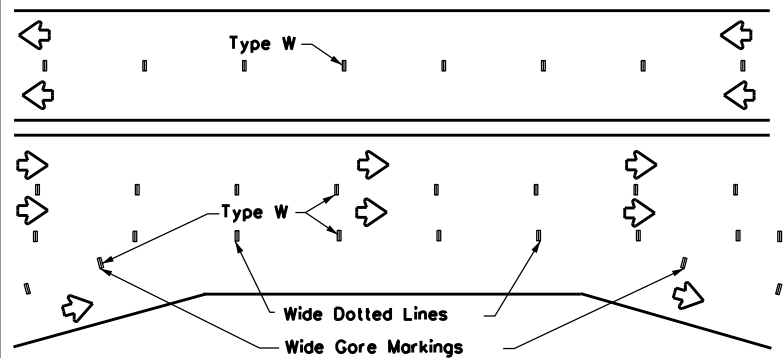
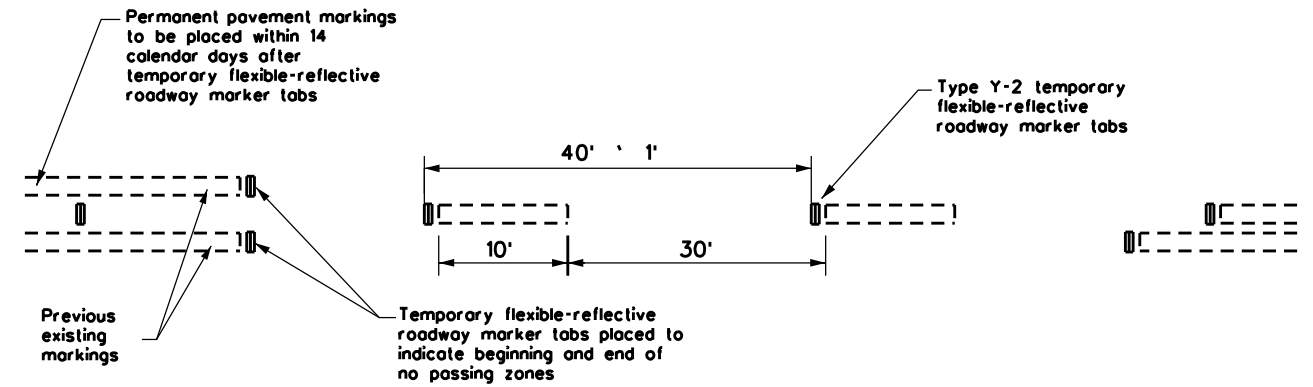
**TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS**



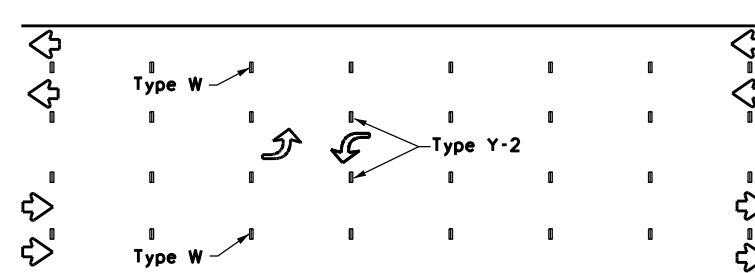
**CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS**



**LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS**



**LANE LINES FOR DIVIDED HIGHWAY**



**TWO-WAY LEFT TURN LANE**

**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)**

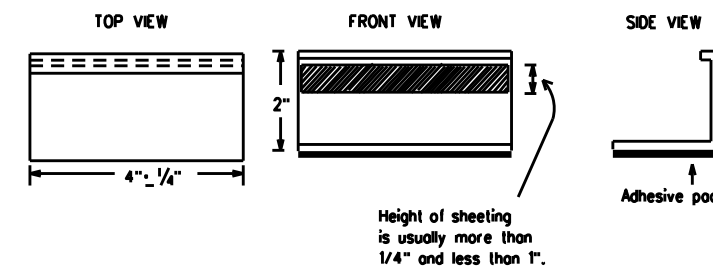
1. DMSs referenced above may be found along with embedded links to their respective MPLs at the following website: <http://www.txdot.gov>

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**



**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	0292	04	072, ETC	SH 18, ETC
4-21	DIST	COUNTY	SHEET NO.	
10-22	ODA	WARD, ETC	54	

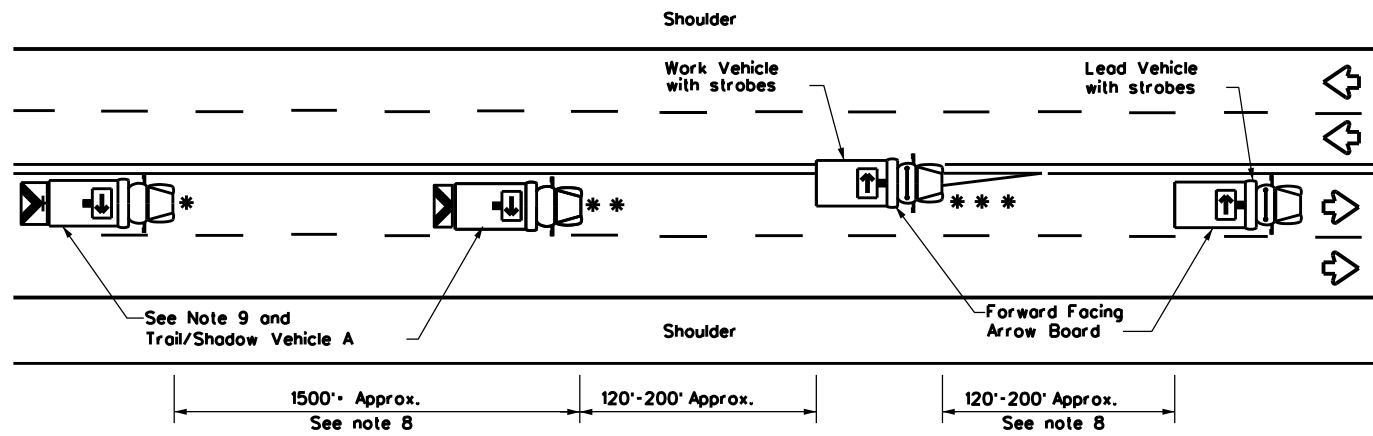
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DATE: FILE:

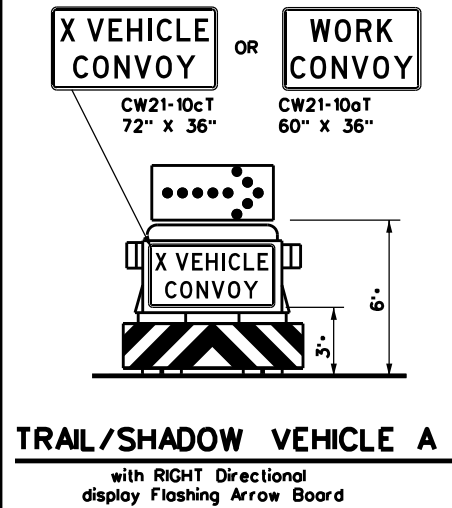


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DATE: FILE:



**TCP (3-1a)**  
**UNDIVIDED MULTILANE ROADWAY**



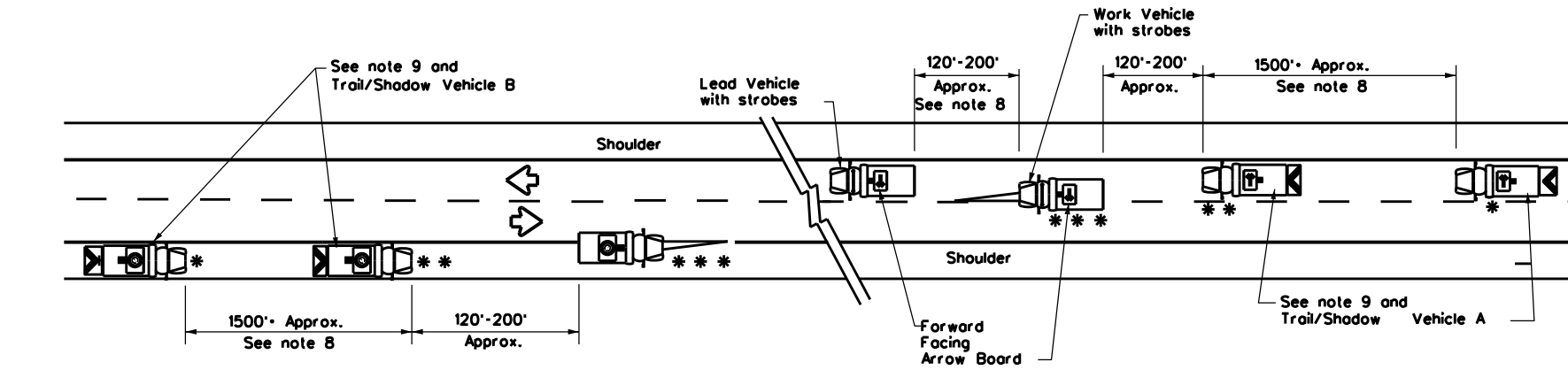
**TRAIL/SHADOW VEHICLE A**  
with RIGHT Directional display Flashing Arrow Board

LEGEND		ARROW BOARD DISPLAY	
*	Trail Vehicle		
**	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)

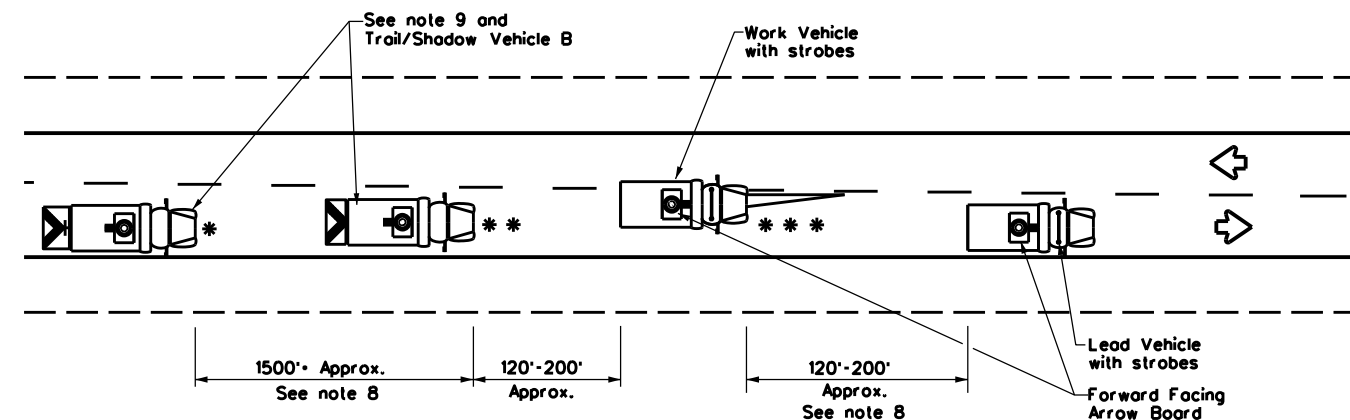
TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
✓				

**GENERAL NOTES**

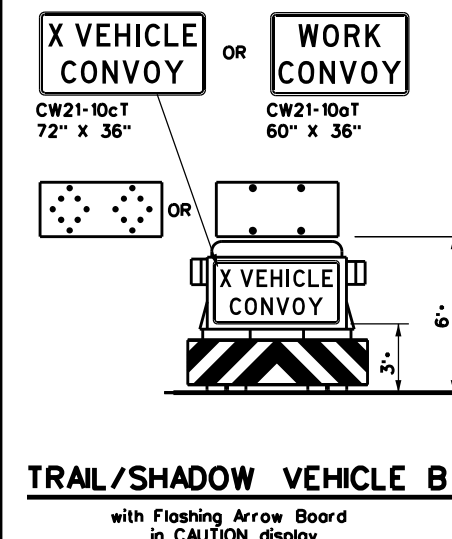
- TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
- 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 SHADOW VEHICLE and TRAIL VEHICLE are required.
- 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.
- 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.
- 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 and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
- "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.
- 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.



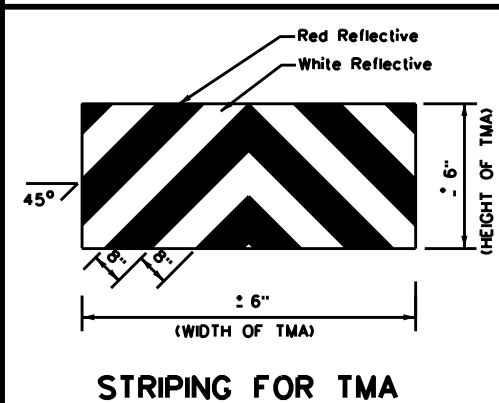
**TCP (3-1b)**  
**TWO-WAY ROADWAY WITH PAVED SHOULDERS**



**TCP (3-1c)**  
**TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS**



**TRAIL/SHADOW VEHICLE B**  
with Flashing Arrow Board in CAUTION display



**STRIPING FOR TMA**



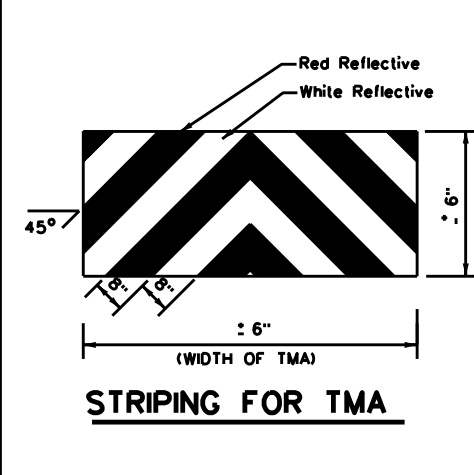
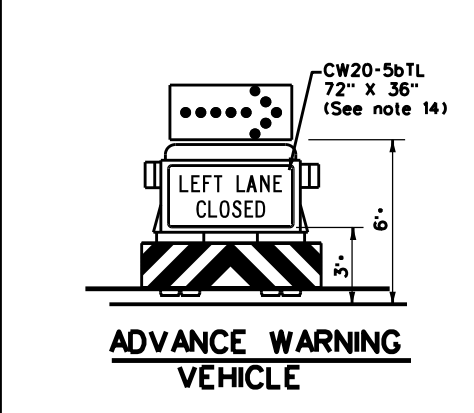
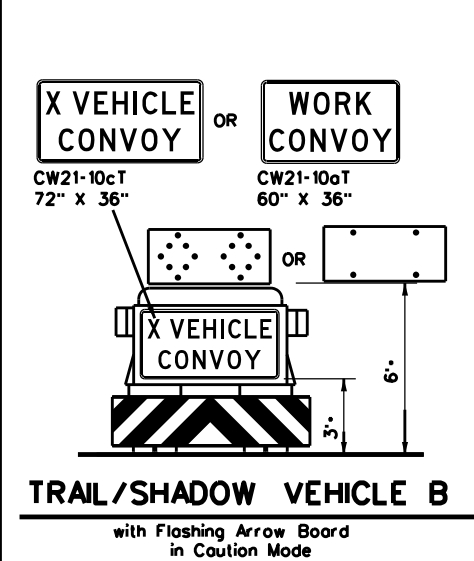
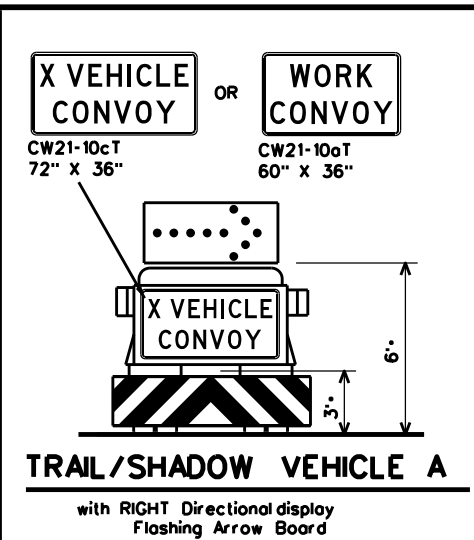
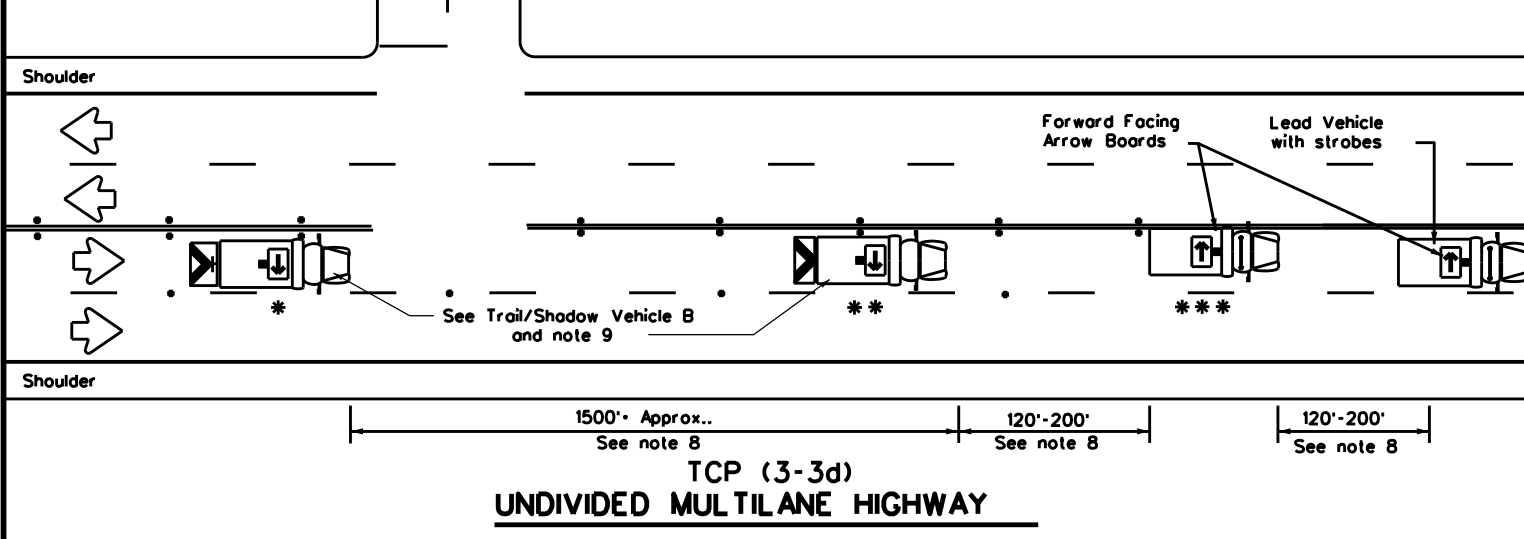
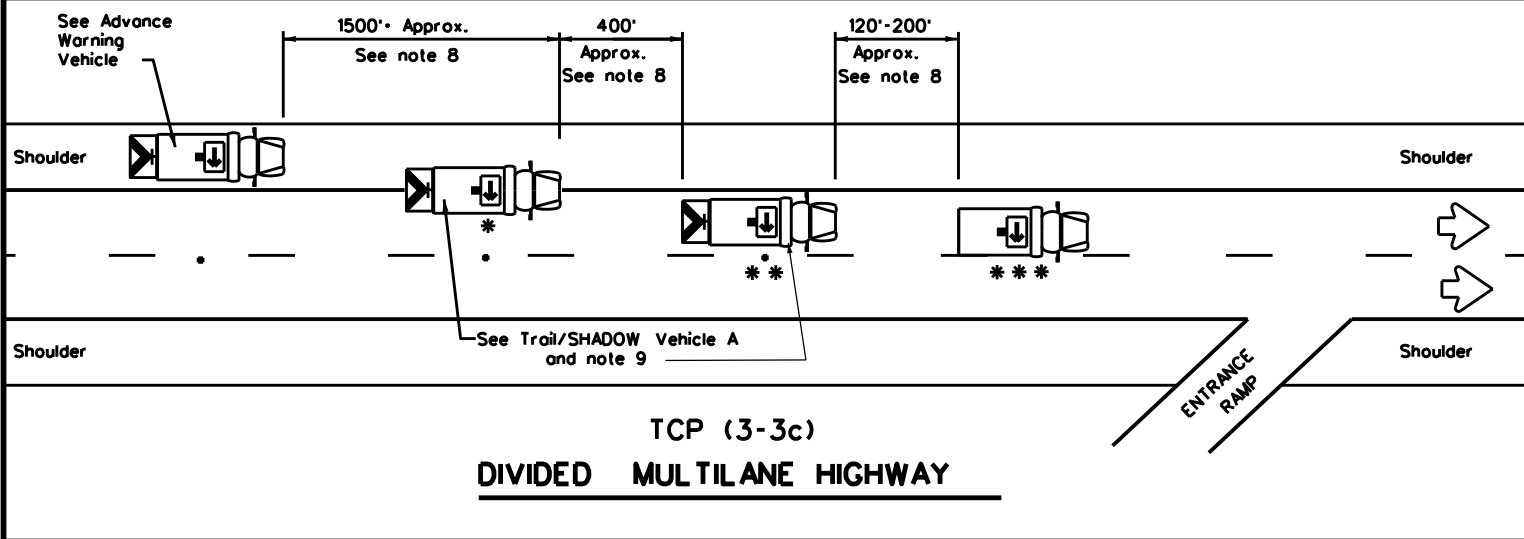
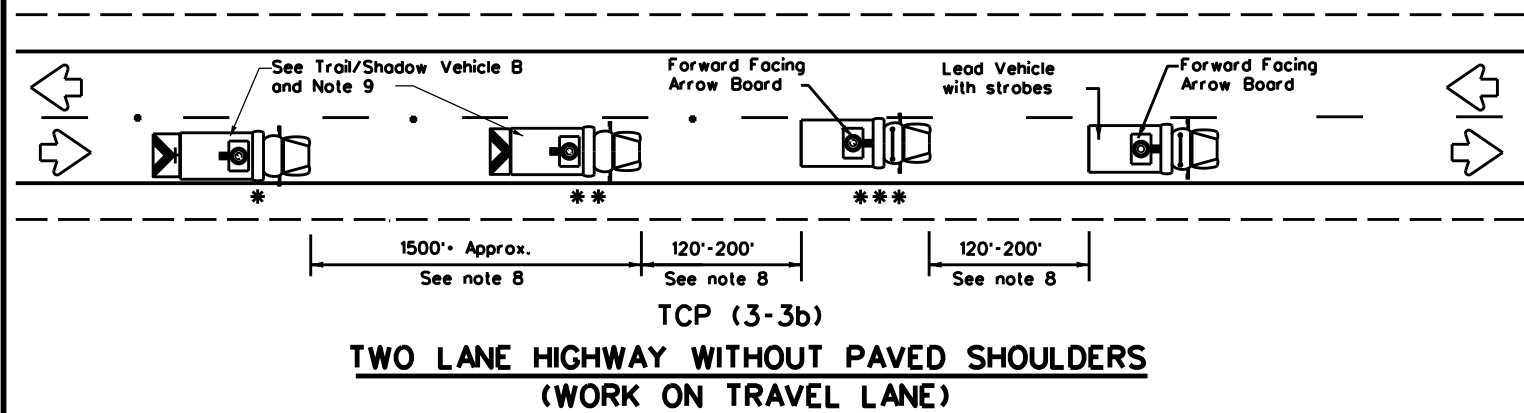
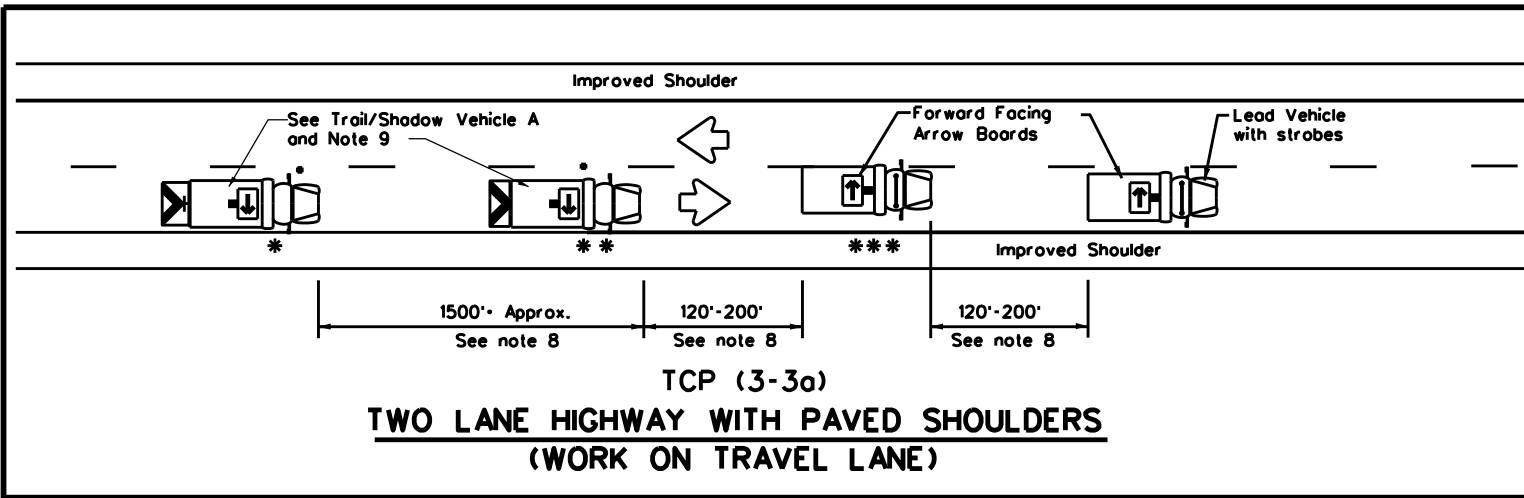
**TRAFFIC CONTROL PLAN  
MOBILE OPERATIONS  
UNDIVIDED HIGHWAYS**

**TCP(3-1)-13**

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0292	04	072. ETC	SH 18. ETC
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 7-13	ODA	WARD. ETC	55	
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
✓				

**GENERAL NOTES**

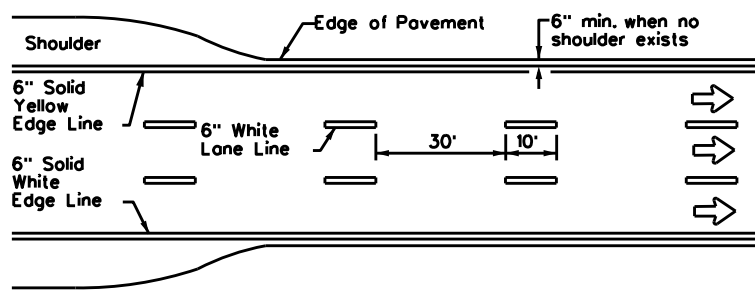
1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer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

Texas Department of Transportation  
 Traffic Operations Division Standard

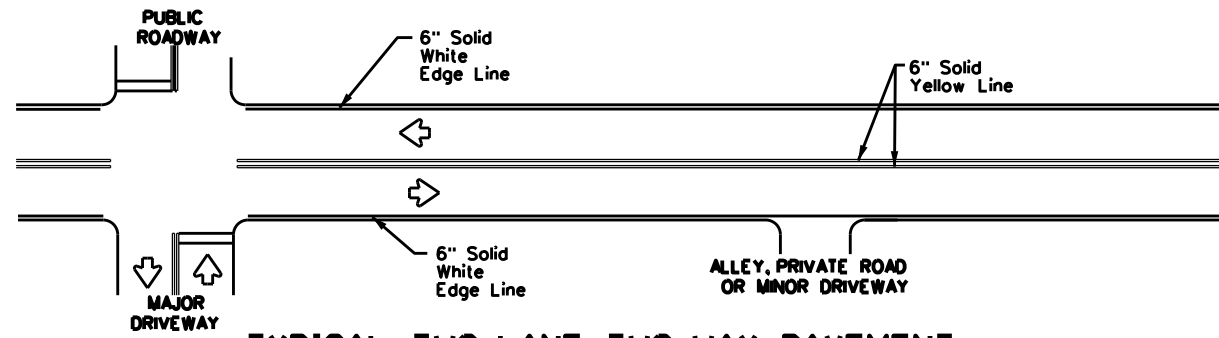
**TRAFFIC CONTROL PLAN**  
**MOBILE OPERATIONS**  
**RAISED PAVEMENT**  
**MARKER INSTALLATION/**  
**REMOVAL**  
**TCP(3-3)-14**

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 7-13	ODA	WARD, ETC	56	
1-97 7-14				

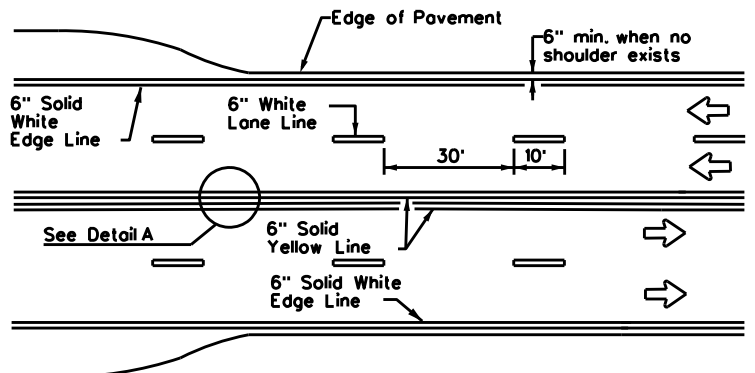
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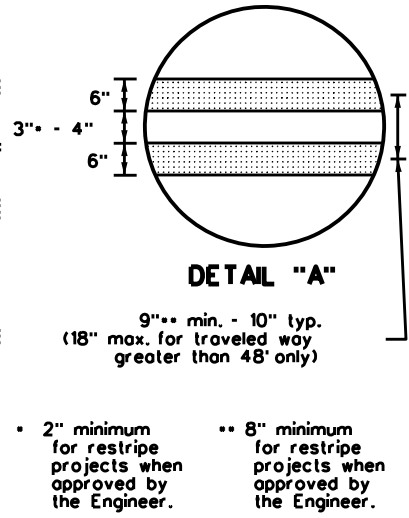
**EDGE LINE AND LANE LINES  
ONE-WAY ROADWAY  
WITH OR WITHOUT SHOULDERS**



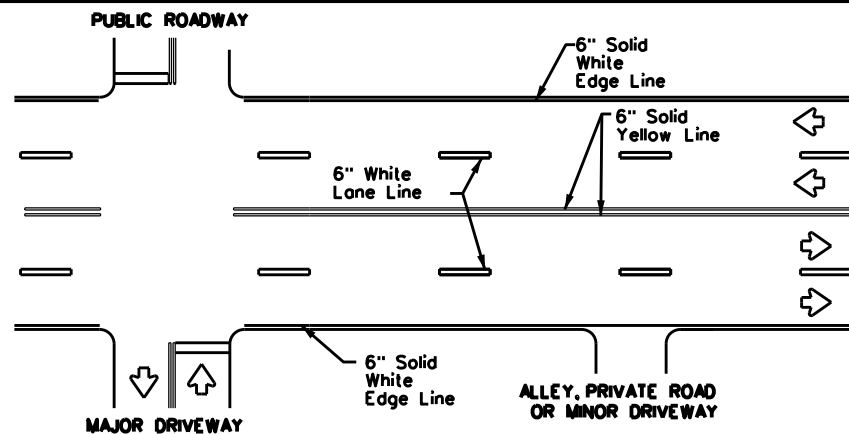
**TYPICAL TWO-LANE, TWO-WAY PAVEMENT  
MARKINGS THROUGH INTERSECTIONS**



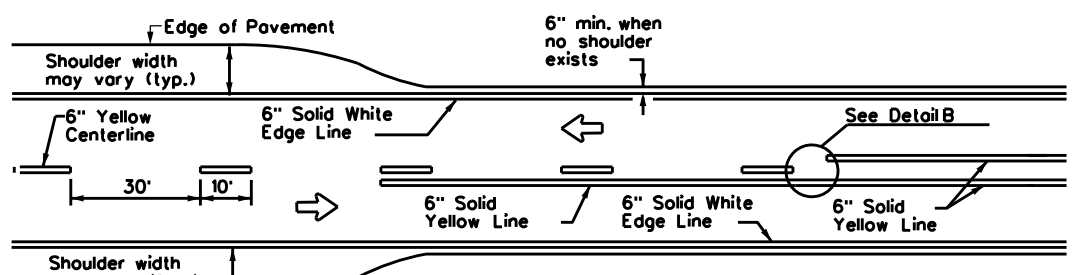
**CENTERLINE AND LANE LINES  
FOUR LANE TWO-WAY ROADWAY  
WITH OR WITHOUT SHOULDERS**



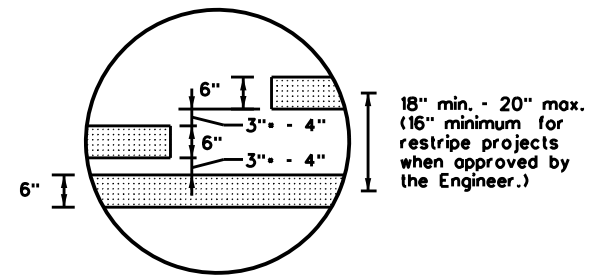
• 2" minimum for restripe projects when approved by the Engineer.  
 •• 8" minimum for restripe projects when approved by the Engineer.



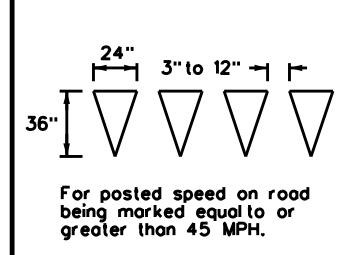
**TYPICAL MULTI-LANE, TWO-WAY PAVEMENT  
MARKINGS THROUGH INTERSECTIONS**



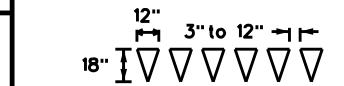
**TWO LANE TWO-WAY ROADWAY  
WITH OR WITHOUT SHOULDERS**



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



**YIELD LINES**



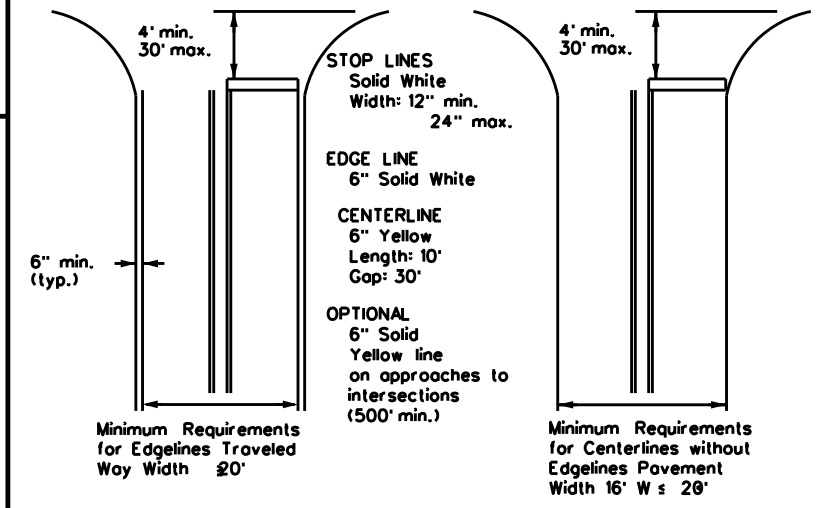
For posted speed on road being marked equal to or less than 40 MPH.

**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.

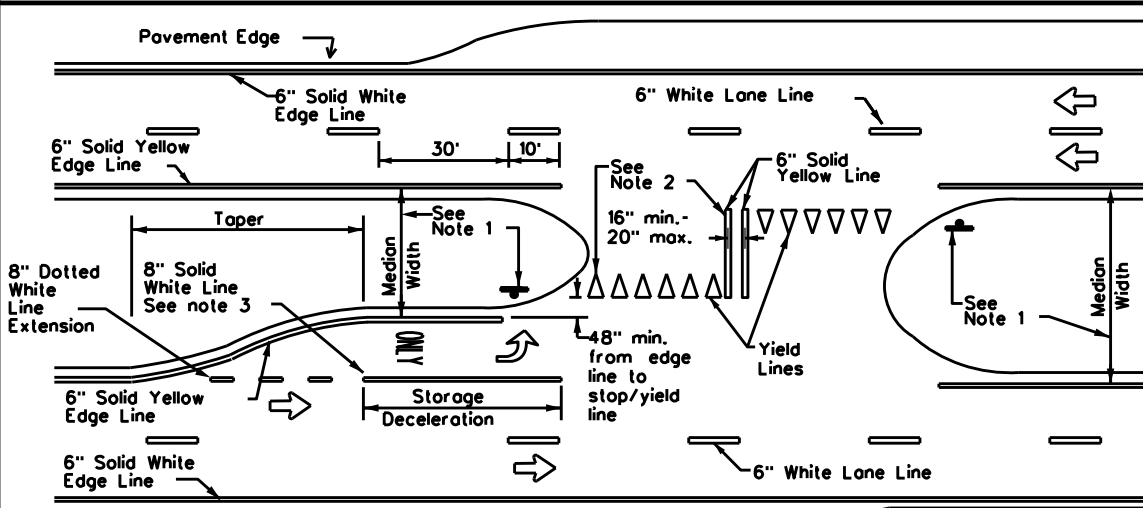


NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

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

**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.



**FOUR LANE DIVIDED ROADWAY CROSSOVERS**



**TYPICAL STANDARD  
PAVEMENT MARKINGS**

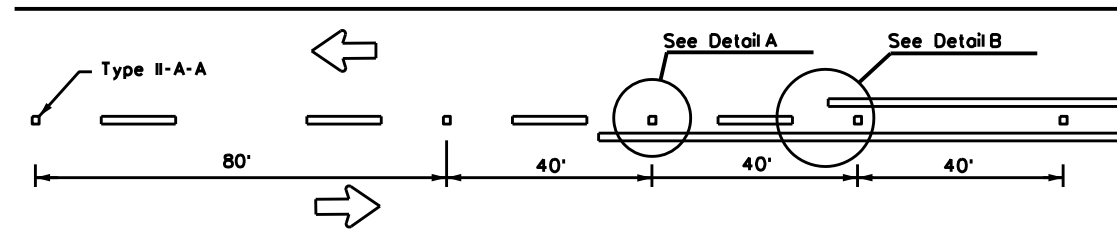
**PM(1)-22**

FILE: pml-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
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8-95 3-03 12-22	DIST	COUNTY	SHEET NO.	
5-00 2-12	00A	WARD, ETC	57	

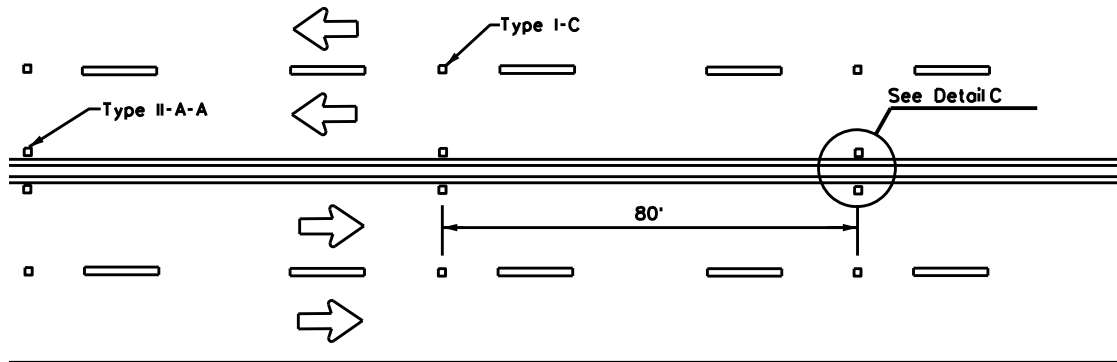
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# REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

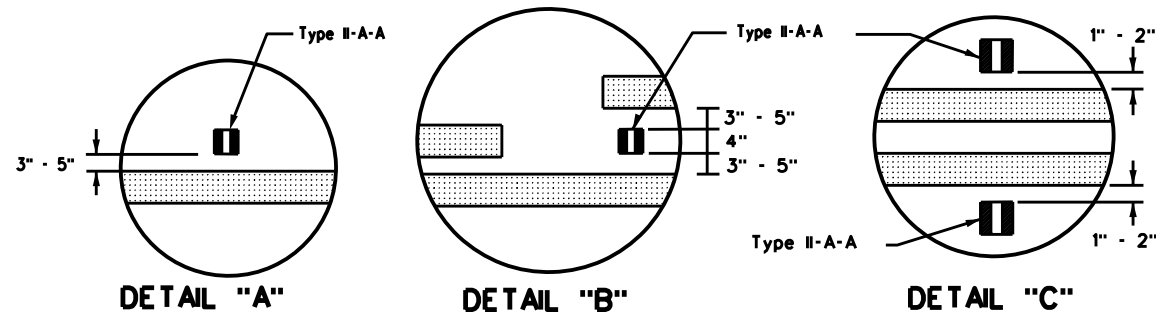
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**CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS**



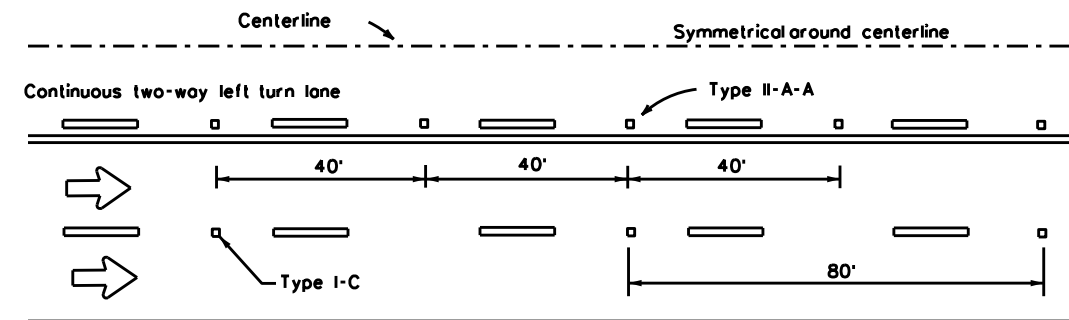
**CENTERLINE & LANE LINES  
FOR FOUR LANE TWO-WAY ROADWAYS**



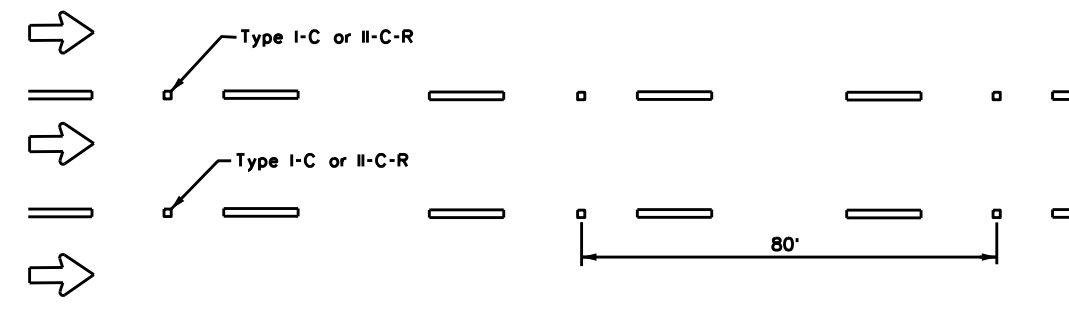
**DETAIL "A"**

**DETAIL "B"**

**DETAIL "C"**

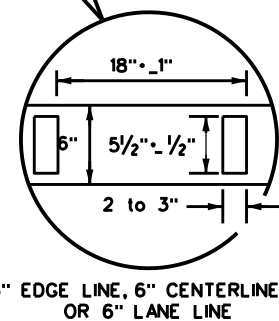
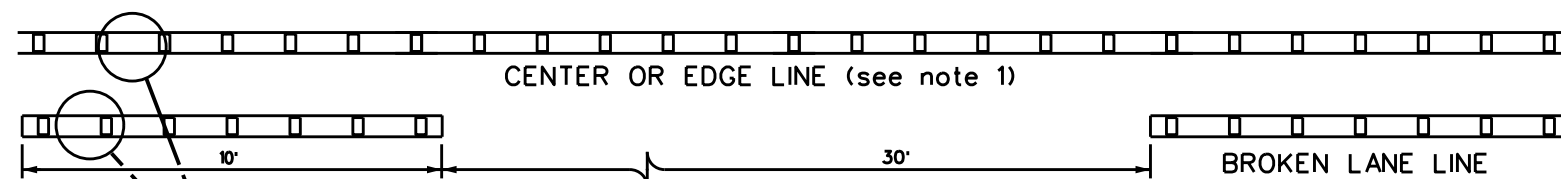


**CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE**

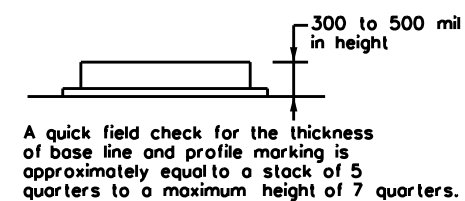


**LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)**

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



**REFLECTORIZED PROFILE  
PATTERN DETAIL  
USING REFLECTIVE PROFILE PAVEMENT MARKINGS**



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

**NOTES**

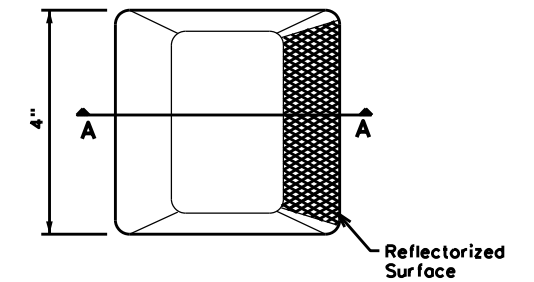
- Edge lines should typically be 6" wide and the materials shall be specified in the plans.
- Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

**GENERAL NOTES**

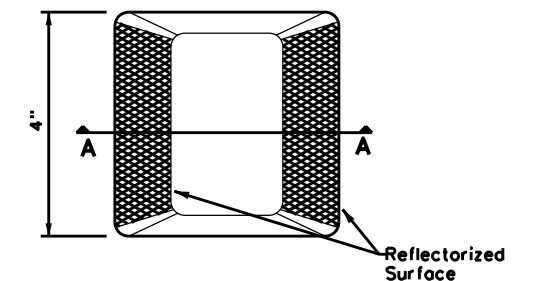
- All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
- On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
- Use raised pavement marker Type I-C with undivided roadways, flush medians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

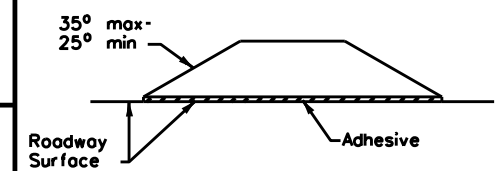
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



**Type I (Top View)**



**Type II (Top View)**



**SECTION A**

**RAISED PAVEMENT MARKERS**



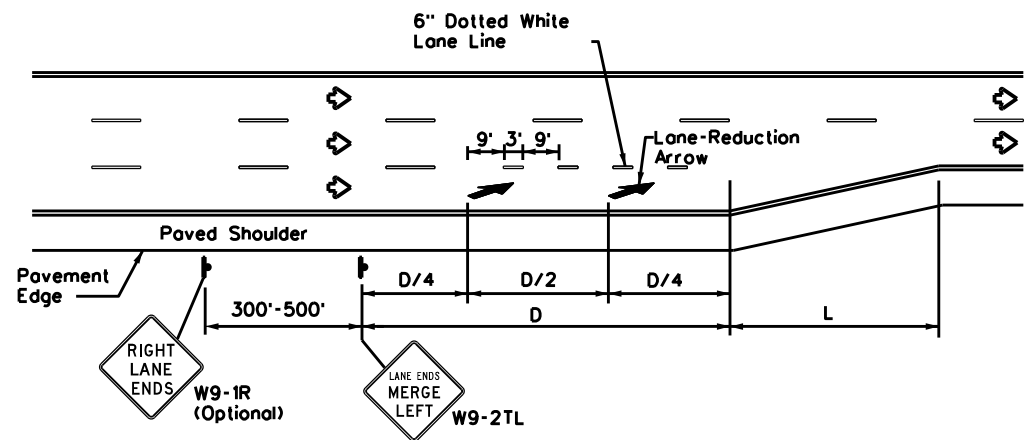
**POSITION GUIDANCE USING  
RAISED MARKERS  
REFLECTORIZED PROFILE  
MARKINGS  
PM(2)-22**

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0232	04	072, ETC	SH, ETC
4-77 8-00 6-20	DIST	COUNTY	SHEET NO.	
4-92 2-10 12-22	00A	WARD, ETC	58	
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.

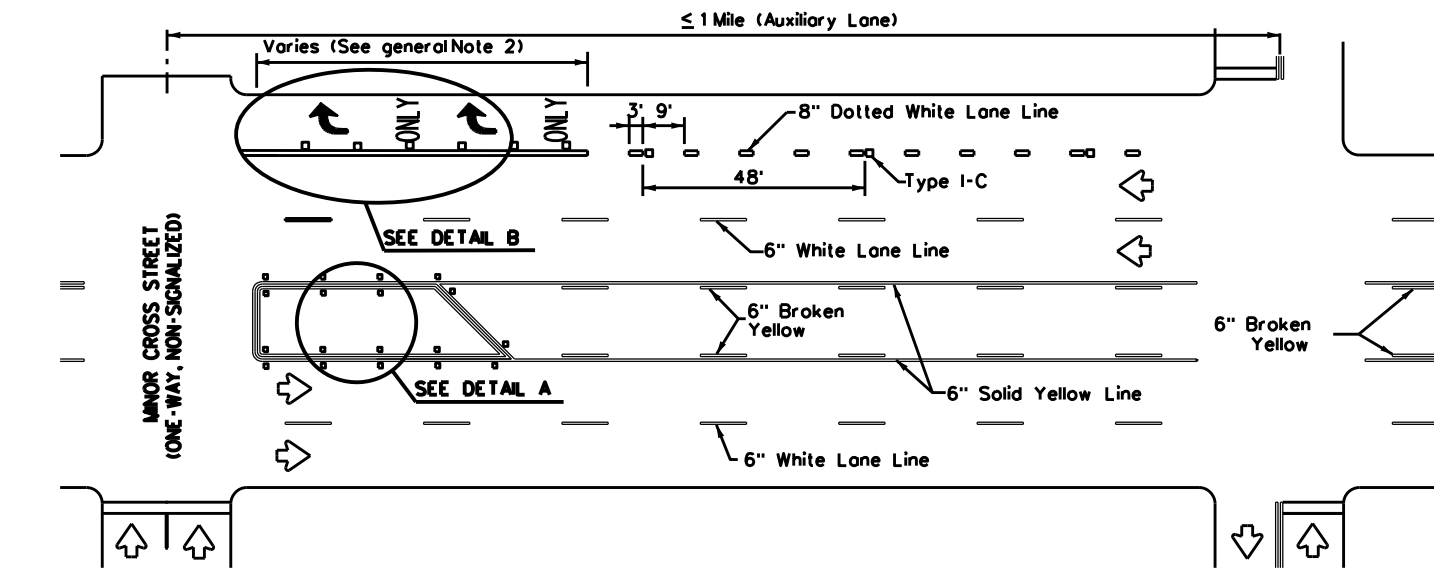
ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	L = $\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	L = WS
45 MPH	775	
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

**GENERAL NOTES**

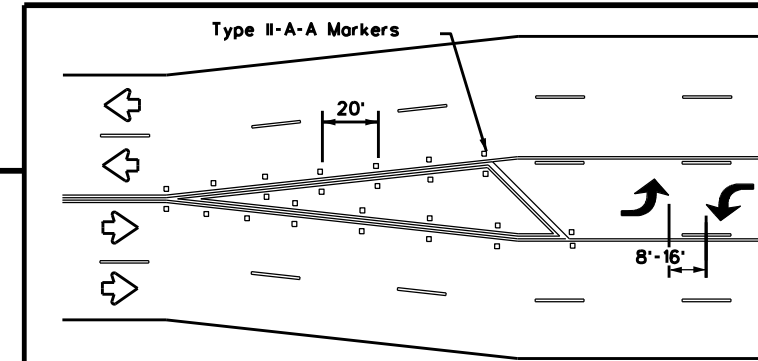
- Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn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

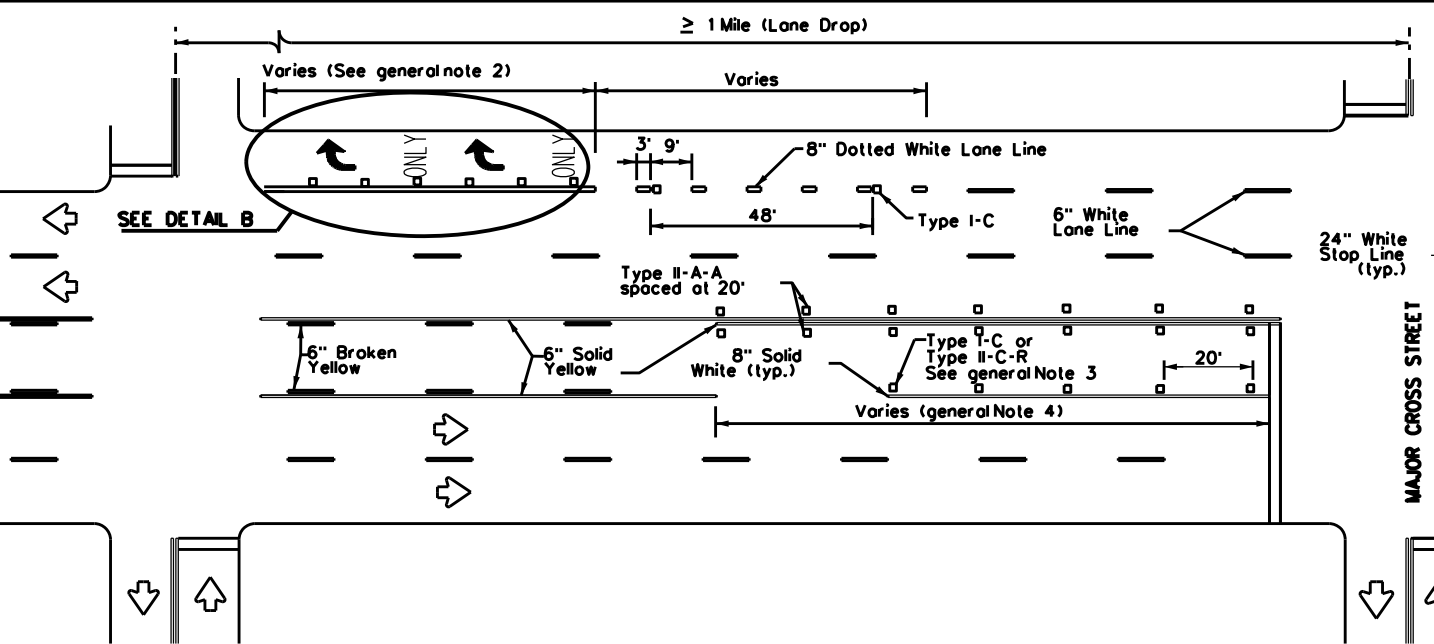


**TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE**

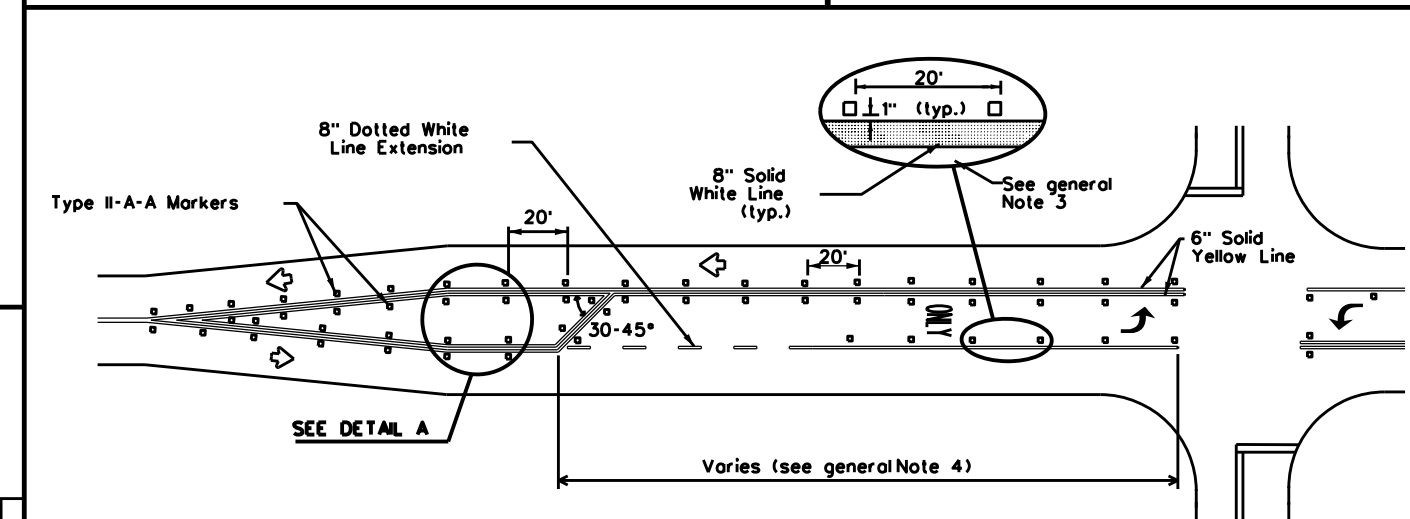


A two-way left-turn (TWL) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

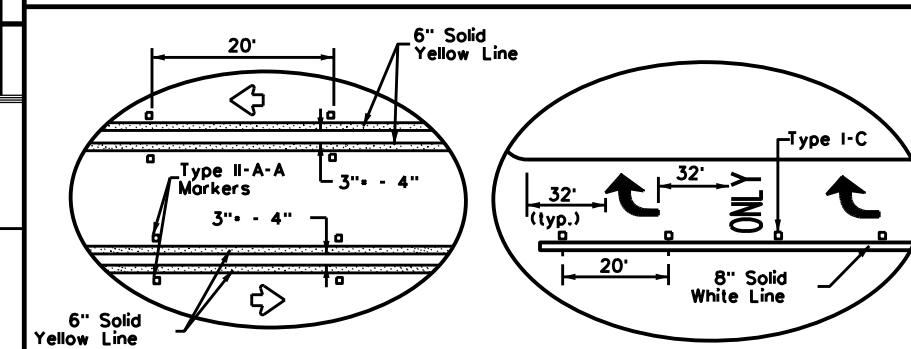
**TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY**



**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

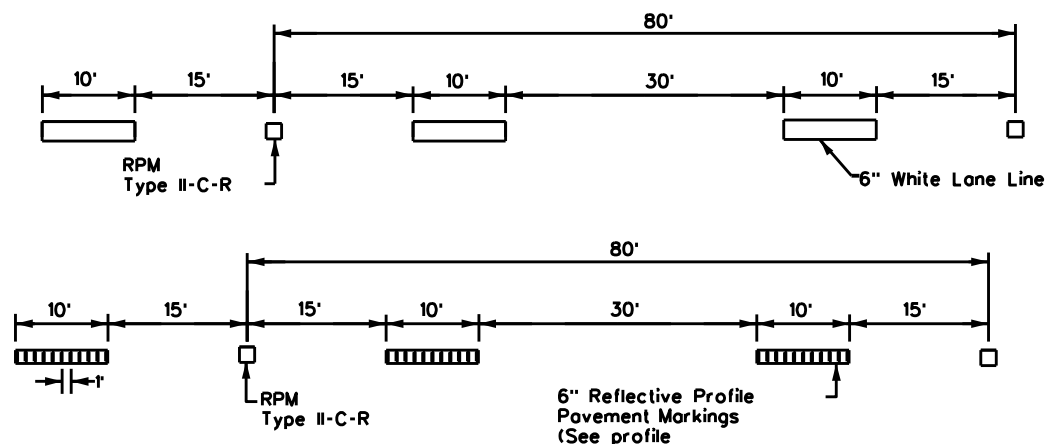
**TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-22**

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CON:	SECT:	JOB:	HIGHWAY:
REVISIONS	0292	04	072, ETC	SH 18, ETC
4-98 3-03 6-20	DIST:	COUNTY:	WARD, ETC	SHEET NO.
5-00 2-10 12-22	ODA			59
8-00 2-12				

22C

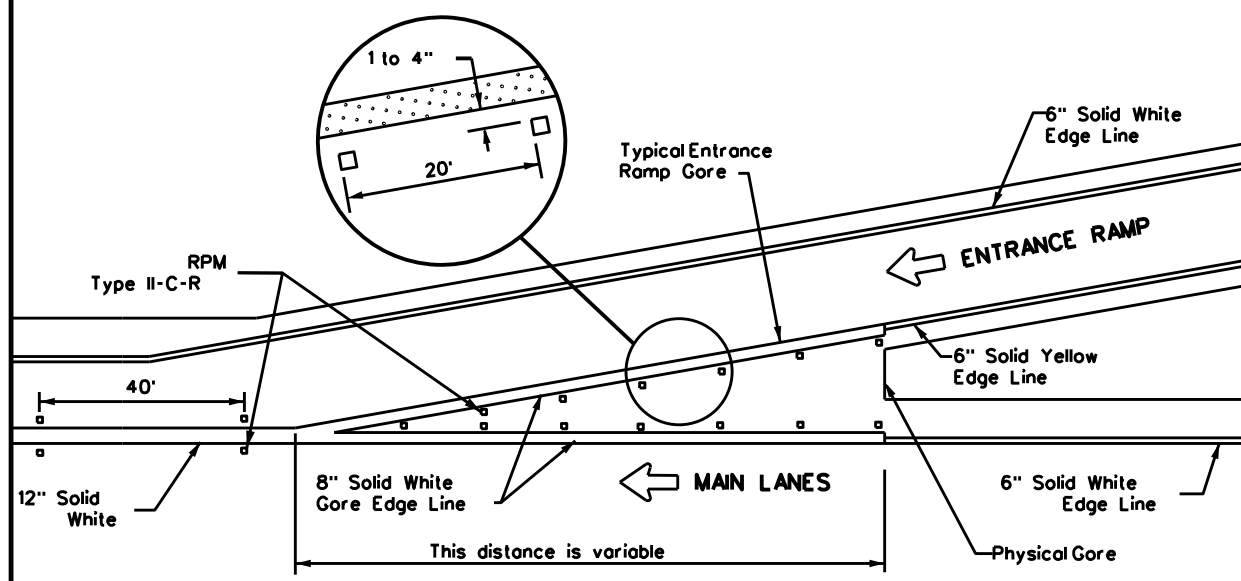
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DATE: FILE:



**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**



**TYPICAL ENTRANCE RAMP GORE MARKING**

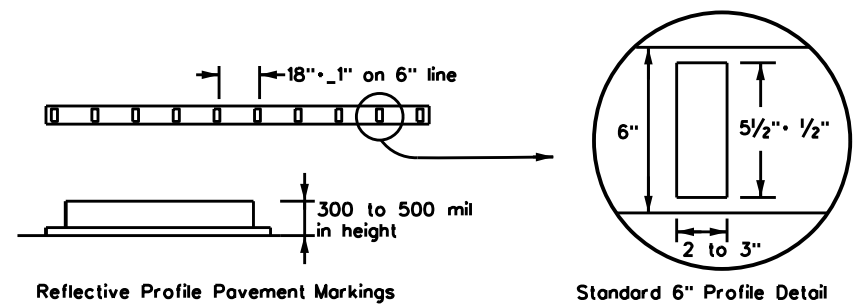
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

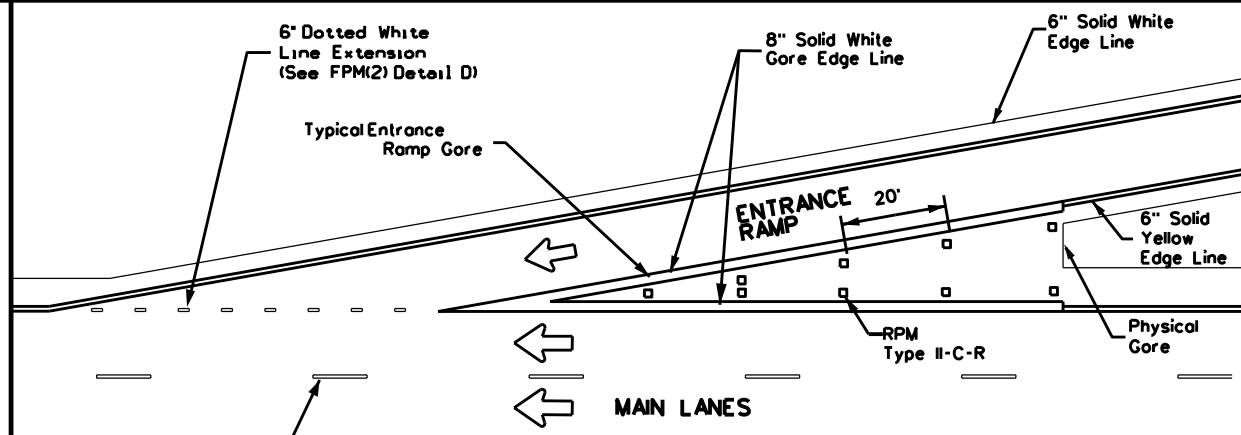
**GENERAL NOTE**

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



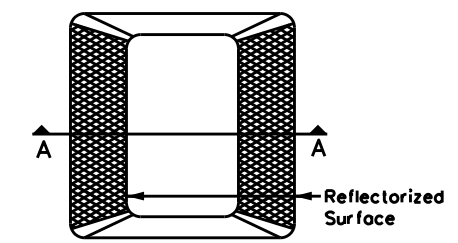
**NOTE**  
 Edge lines should typically be 6" wide and the materials shall be as specified in the plans. See details above if reflective profile pavement markings are to be used.

**EDGE LINE PAVEMENT MARKINGS**

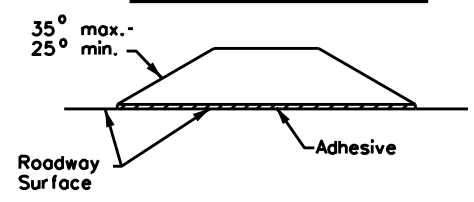


**NOTE**  
 See the Roadway Design Manual Chapter 3 to determine if a tapered acceleration lane may be used.

**TAPERED ACCELERATION LANE**

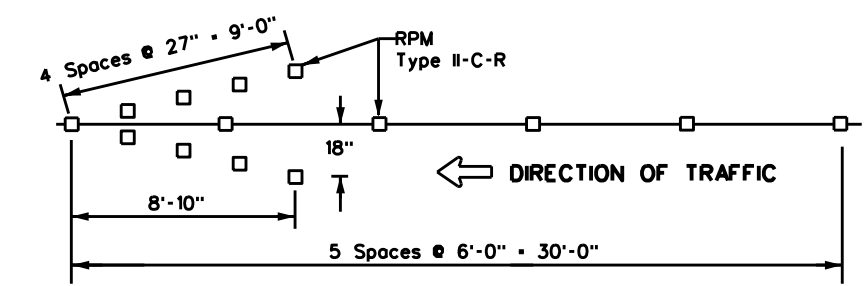


Type II (Top View)



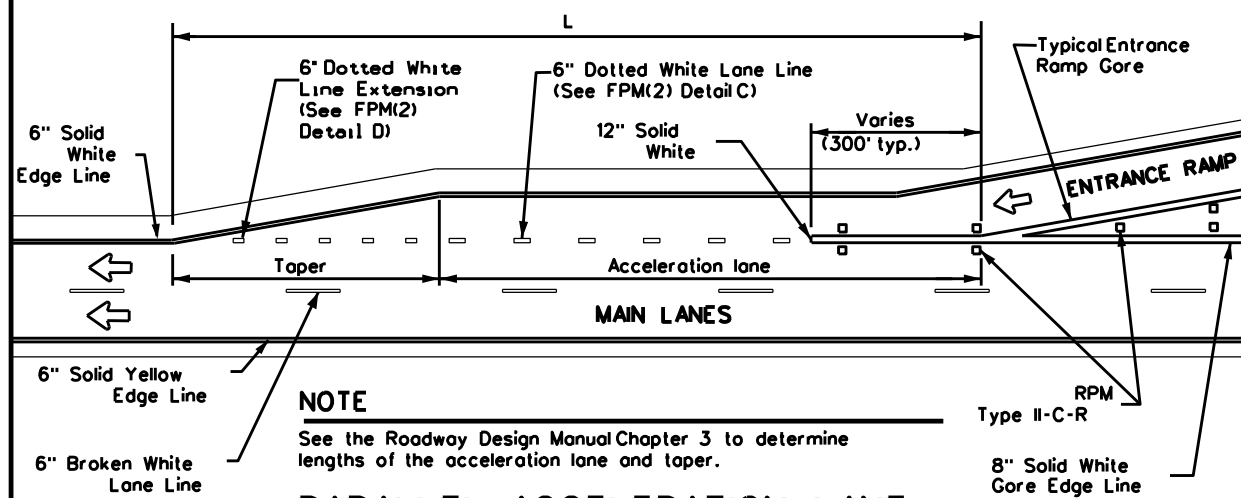
SECTION A

**REFLECTORIZED RAISED PAVEMENT MARKER (RPM)**



**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**



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

**PARALLEL ACCELERATION LANE**

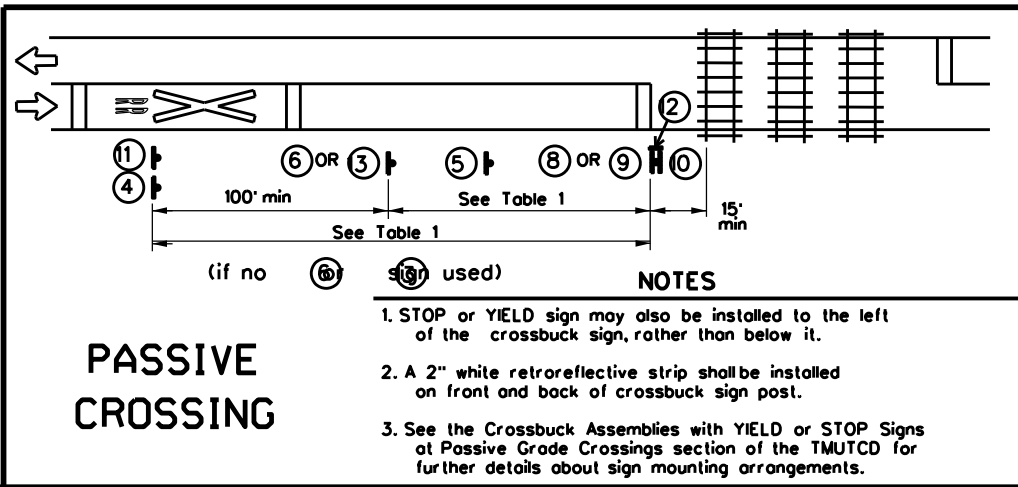
Texas Department of Transportation Traffic Safety Division Standard

**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	0292	04	072, ETC	SH 18, ETC
5-74 8-00 2-12	DIST	COUNTY	SHEET NO.	
4-92 2-08 10-22	ODA	WARD, ETC	60	
5-00 2-10				

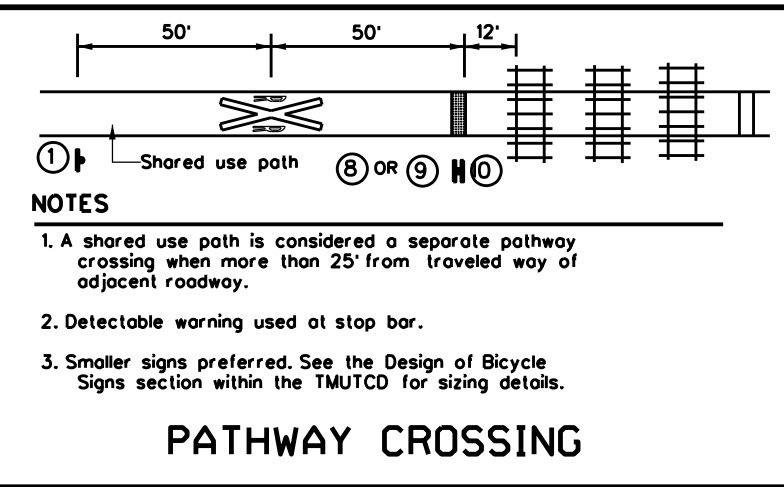
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DATE: FILE:



### PASSIVE CROSSING

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

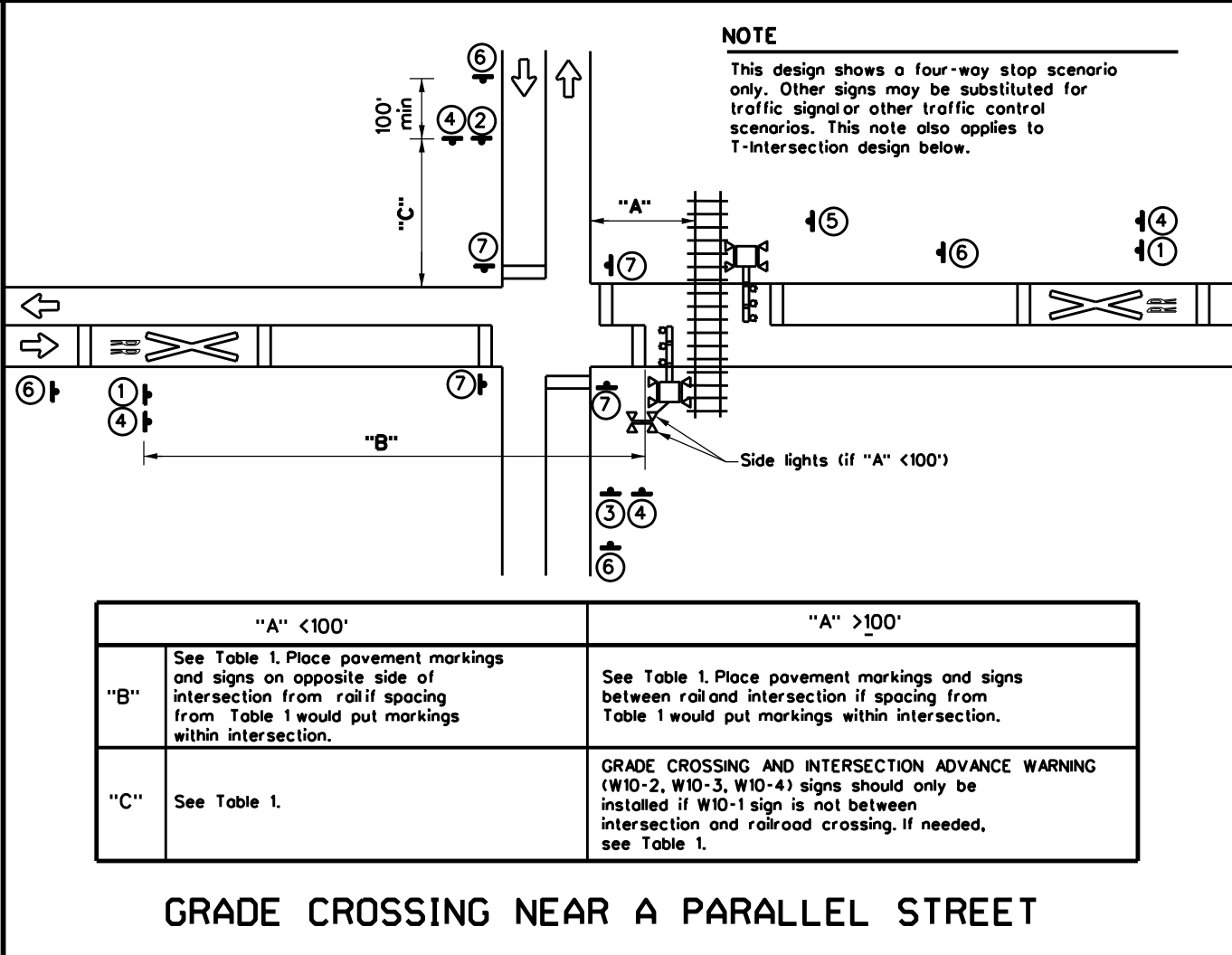


### PATHWAY CROSSING

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

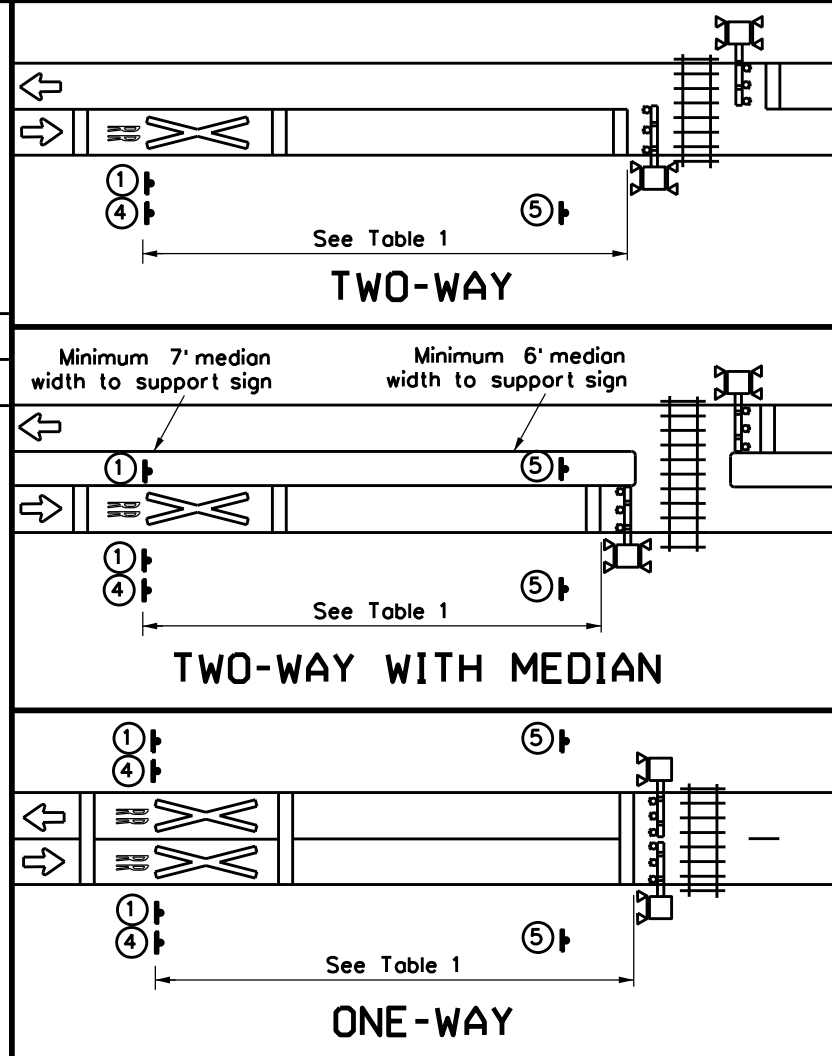
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

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



### GRADE CROSSING NEAR A PARALLEL STREET

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



### ONE-WAY

### TWO-WAY WITH MEDIAN

### TWO-WAY

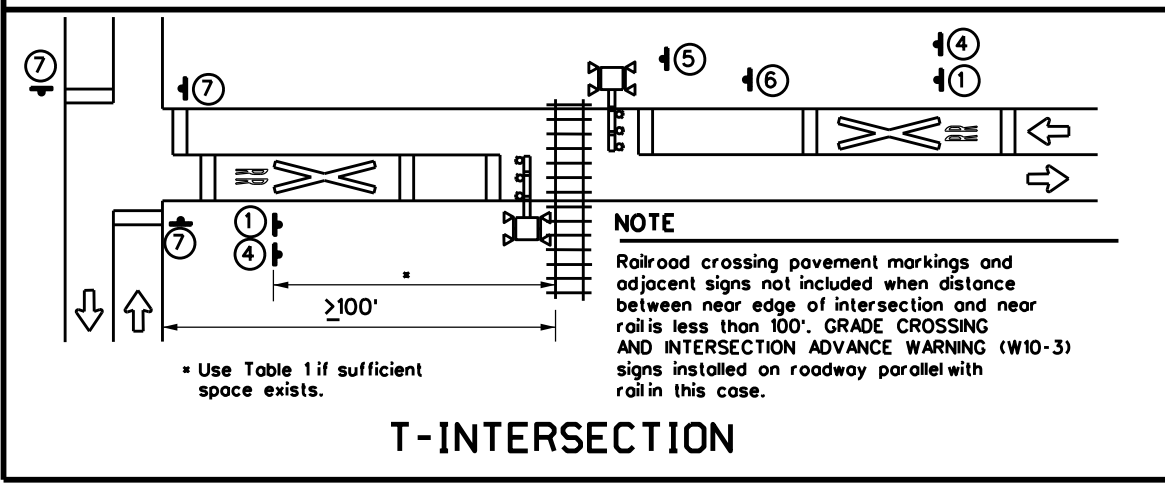
- NOTE**
- Separate active traffic control devices, railroad crossing pavement markings, and adjacent signs required when tracks are more than 100' apart.

### TWO ADJACENT CROSSINGS

**SIGNS**

1 W10-1 36" Dia.	2 W10-2L 36" x 36"	3 W10-2R 36" x 36"	4 LOW GROUND CLEARANCE W10-5P 30" x 24"
5 RB-8 24" x 30"	6 W3-1 30" x 30"	7 STOP R1-1 36" x 36" ALL WAY R1-3P 18" x 6"	R15-1 48" x 9"
R15-2P 27" x 18"	R15-2P 27" x 18"	W10-13P 30" x 24"	I-13 15" x 9"
9 R1-2 48" x 48" x 48"	13 W3-2 30" x 30"	W10-9P 30" x 24"	REPORT EMERGENCY OR PROBLEM 1-800-555-5555 CROSSING 836 597 H

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



### T-INTERSECTION

\* Use Table 1 if sufficient space exists.

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

Texas Department of Transportation Traffic Safety Division Standard

## RAILROAD CROSSING DETAILS SIGNING & STRIPING

### RCD(2)-22

FILE: rcd2-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0292	04	072, ETC	SH 18, ETC
2-16	DIST	COUNTY	SHEET NO.	
11-22	ODA	WARD, ETC	61	

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

**1.02 REQUEST FOR INFORMATION / CLARIFICATION**

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

**1.03 PLANS / SPECIFICATIONS**

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

**PART 2 - UTILITIES AND FIBER OPTIC**

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

**PART 3 - CONSTRUCTION**

**3.01 GENERAL**

- A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.
- B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.
- C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.
- D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.
- E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.
- F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.
- G. All permanent clearances shall be verified before project closing.

**3.02 RAILROAD OPERATIONS**

- A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.
- B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. Railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.
- C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:
  - 1. Conditional Work Windows: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.
  - 2. Absolute Work Windows: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

**3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES**

- A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.
- B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.
- C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.
- D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
  - 1. Exactly what the work entails.
  - 2. The days and hours that work will be performed.
  - 3. The exact location of work, and proximity to the tracks.
  - 4. The type of window requested and the amount of time requested.
  - 5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.
- E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

**3.04 INSURANCE**

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

**3.05 RAILROAD SAFETY ORIENTATION**

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

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."
- B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

**3.06 COOPERATION**


The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

**3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES**

Abide by the following minimum temporary clearances during the course of construction:  
A. 15' - 0" (BNSF/UPRR) and 14'-0" (KCS) horizontal from centerline of track  
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.  
For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

**3.08 APPROVAL OF REDUCED CLEARANCES**

- A. Maintain minimum track clearances during construction as specified in Section 3.07.
- B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.
- C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

 Texas Department of Transportation		Rail Division		
<b>RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS</b>				
FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0292	04	072. ETC	SH 18. ETC
	DIST	COUNTY		SHEET NO.
	00A	WARD. ETC		62



**3.09 MAINTENANCE OF RAILROAD FACILITIES**

- A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.
- B. Perform all such maintenance and repair of damages due to the Contractor's operations at Contractor's expense.
- C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

**3.10 SITE INSPECTIONS BY RAILROAD'S DESIGNATED REPRESENTATIVE**

- A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
  1. Pre-construction meetings.
  2. Pile driving/drilling of caissons or drilled shafts.
  3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
  4. Erection of precast concrete or steel bridge superstructure.
  5. Placement of waterproofing (prior to placing ballast on bridge deck).
  6. Completion of the bridge structure.
- B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.
- C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

**3.11 RAILROAD REPRESENTATIVES**

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

- A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.
- B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.
- C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.
- D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.
- E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

**3.12 COMMUNICATIONS AND SIGNAL LINES**

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

**3.13 TRAFFIC CONTROL**

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

**3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK**

- A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".
- B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

UPRR 1-800-336-9193  
7:00 AM to 9:00 PM CST Monday-Friday except holidays,  
staffed 24 hrs/day for emergencies  
48 hrs notice required

BNSF 1-800-533-2891  
24 hour number  
5 working days notice required

KCS 1-800-344-8377  
Texas One Call, a 24 hour number  
48 hrs notice required, excluding weekends and holidays

If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.


- C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of 1/4 inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

**3.15 RAILROAD FLAGGING**

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

**3.16 CLEANING OF RIGHT-OF-WAY**

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

 Texas Department of Transportation				Rail Division	
<b>RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS</b>					
FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0140	01	081. ETC	1H 10. ETC	
March 2020	DIST	COUNTY	SHEET NO.		
	00A	PECOS. ETC	63		

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

DOT #: 018904X  
 Crossing Type: PUBLIC  
 RR Company Owning Track at Crossing: TEXAS PACIFICO TRANSPORTATION LIMITED  
 Operating RR Company at Track: TEXAS PACIFICO TRANSPORTATION LIMITED  
 RR MP: 849.57  
 RR Subdivision: BIG LAKE  
 City: MCCAMEY  
 County: PECOS  
 CSJ at this Crossing: 0629-03-040  
 Highway/Roadway name crossing the railroad: FM 11  
 \* of regularly scheduled trains per day at this crossing: 1  
 \* of switching movements per day at this crossing: 0  
 % of estimated contract cost of work within railroad ROW: 0.01%

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

SEAL COAT

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

FLAGGING

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

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

NONE

**III. FLAGGING & INSPECTION**

\* of Days of Railroad Flagging Expected: \_\_\_\_\_

On this project, night or weekend flagging is:

- Expected  
 Not Expected

Flagging services will be provided by:

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

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

Contact Information for Flagging:

- UPRR - UP.info@railpros.com  
 Call Center 877-315-0513, Select #1 for flagging  
 - UP.request@nrssinc.net  
 Call Center 877-984-6777  
  
 BNSF - BNSF.info@railpros.com  
 Call Center 877-315-0513, Select #1 for flagging  
  
 KCS - KCS.info@railpros.com  
 Call Center 877-315-0513, Select #1 for flagging  
 - Bottom Line On-Track Safety Services  
 bottomline076@aol.com, 903-767-7630

OTHERS \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Contractor must incorporate Construction Inspection into anticipated construction schedule.

- Not Required  
 Required: Contact Information for Construction Inspection:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD**

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

- Required  
 Not Required

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

**V. RAILROAD INSURANCE REQUIREMENTS**

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

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

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

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

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	\$500,000 / \$500,000 / \$500,000
Commercial General Liability	\$2,000,000 / \$4,000,000
Business Automobile	\$2,000,000 combined single limit

Railroad Protective Liability	
<input type="checkbox"/> Not Required	
<input checked="" type="checkbox"/> Non - Bridge Projects	\$2,000,000 / \$6,000,000
<input type="checkbox"/> Bridge Projects	\$5,000,000 / \$10,000,000
<input type="checkbox"/> Other	

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

On this project, an ROE agreement is:

- Not Required  
  
 Required: TxDOT CST to assist in obtaining \_\_\_\_\_ with the UPRR (see Item 5, Article 8.3)  
 Required: UPRR Maintenance Consent Letter. TxDOT CST to assist.  
  
 Required: Contractor to obtain (see Item 5, Article 8.4)

With the following railroad companies: \_\_\_\_\_

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

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

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

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

**VII. RAILROAD COORDINATION MEETING**

On this project, a Railroad Coordination Meeting is:

- Not Required  
 Required

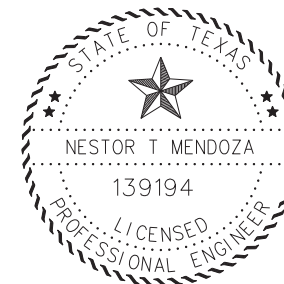
See Item 5, Article 8.1 for more details.

**VIII. SUBCONTRACTORS**

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

**IX. EMERGENCY NOTIFICATION**

In Case of Railroad Emergency  
 Call TEXAS PACIFICO (TxPF)  
 Railroad Emergency Line at 800-742-8905  
 Location: DOT 018904X  
 RR Milepost 849.57  
 Subdivision BIG LAKE



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*Nestor T Mendoza, P.E.*

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7/11/2023



**RAILROAD SCOPE OF WORK  
PROJECT SPECIFIC DETAILS**

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
© TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
9/2021	0292	04	072	SH18, ETC
	DIST	COUNTY	SHEET NO.	
	ODA	WARD, ETC	62	

DATE:  
FILE:

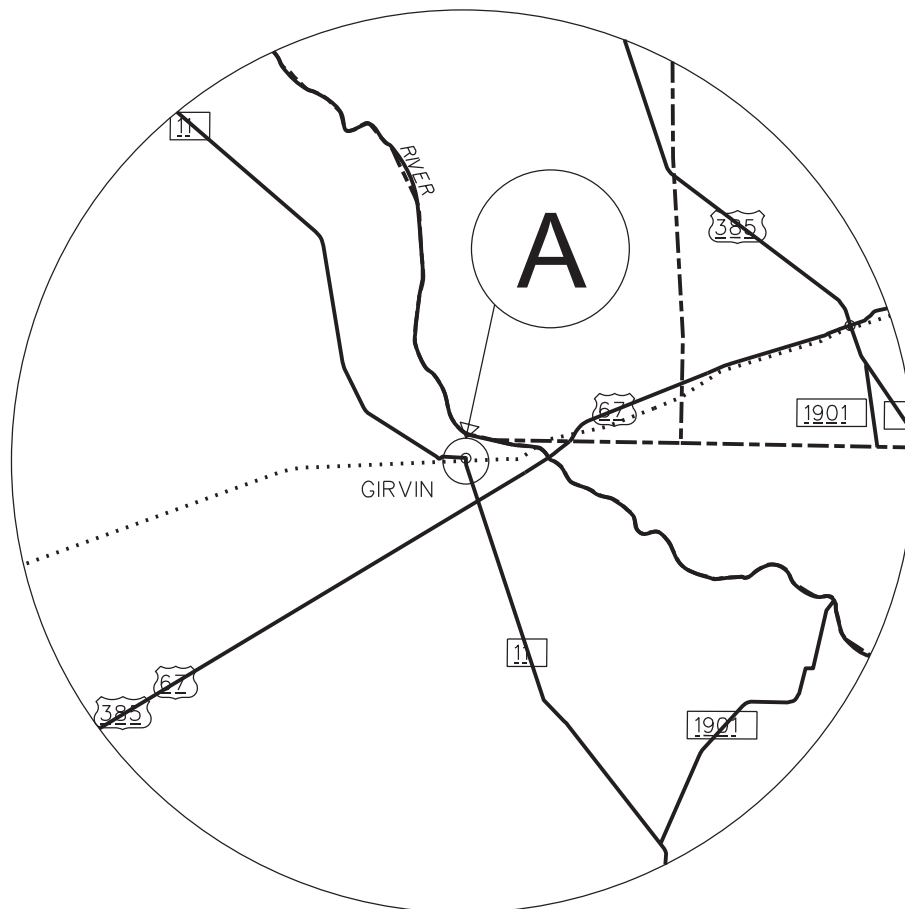
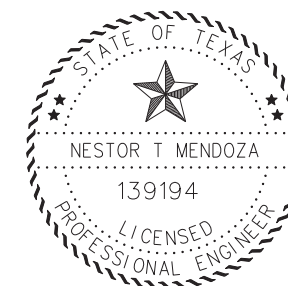


EXHIBIT A

RAILROAD COMPANY: TEXAS PACIFICO TRANSPORTATION LIMITED  
 DOT NO: 018904X  
 CSJ: 0292-04-072  
 PROJECT: 2024 ODESSA DISTRICT SEAL COAT  
 HIGHWAY: FM 11



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 7/11/2023

RAILROAD CROSSING  
 LOCATION



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			63
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	SH 18, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072	WARD, ETC

**STORMWATER POLLUTION PREVENTION PLAN (SWP3):**

This SWP3 has been developed in accordance with TxDOT policy for projects disturbing less than 1 acre of soil, and not part of a larger common plan of development.

For all projects with any soil disturbing activities, TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office. If no field office is available, then this SWP3 shall be kept at the appropriate TxDOT Area Office.

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

**1.0 SITE/PROJECT DESCRIPTION**

**1.1 PROJECT CONTROL SECTION JOB (CSJ):**  
0292-04-072, ETC

**1.2 PROJECT LIMITS:**

From: 0.22 MILES SOUTH OF FM 1776, ETC

To: PECOS COUNTY LINE, ETC

**1.3 PROJECT COORDINATES:**

BEGIN: (Lat) \_\_\_\_\_, (Long) \_\_\_\_\_

END: (Lat) \_\_\_\_\_, (Long) \_\_\_\_\_

**1.4 TOTAL PROJECT AREA (Acres):** \_\_\_\_\_

**1.5 TOTAL AREA TO BE DISTURBED (Acres):** \_\_\_\_\_

**1.6 NATURE OF CONSTRUCTION ACTIVITY:**

PREVENTATIVE MAINTENENCE

**1.7 MAJOR SOIL TYPES:**

Soil Type	Description

**1.8 PROJECT SPECIFIC LOCATIONS (PSLs):**

PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

- PSLs determined during preconstruction meeting
- PSLs determined during construction
- No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

**1.9 CONSTRUCTION ACTIVITIES:**

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.3.)

- Mobilization
- Install sediment and erosion controls
- Blade existing topsoil into windrows, prep ROW, clear and grub
- Remove existing pavement
- Grading operations, excavation, and embankment
- Excavate and prepare subgrade for proposed pavement widening
- Remove existing culverts, safety end treatments (SETs)
- Remove existing metal beam guard fence (MBGF), bridge rail
- Install proposed pavement per plans
- Install culverts, culvert extensions, SETs
- Install mow strip, MBGF, bridge rail
- Place flex base
- Rework slopes, grade ditches
- Blade windrowed material back across slopes
- Revegetation of unpaved areas
- Achieve site stabilization and remove sediment and erosion control measures

Other: \_\_\_\_\_

Other: \_\_\_\_\_

Other: \_\_\_\_\_

**1.10 POTENTIAL POLLUTANTS AND SOURCES:**

- Sediment laden stormwater from stormwater conveyance over disturbed area
- Fuels, oils, and lubricants from construction vehicles, equipment, and storage
- Solvents, paints, adhesives, etc. from various construction activities
- Transported soils from offsite vehicle tracking
- Construction debris and waste from various construction activities
- Contaminated water from excavation or dewatering pump-out water
- Sanitary waste from onsite restroom facilities
- Trash from various construction activities/receptacles
- Long-term stockpiles of material and waste
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**1.11 RECEIVING WATERS:**

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody

\* Add (\*) for impaired waterbodies with pollutant in ( ).

**1.12 ROLES AND RESPONSIBILITIES: TxDOT**

- Development of plans and specifications
- Perform SWP3 inspections
- Maintain SWP3 records and update to reflect daily operations
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR**

- Day To Day Operational Control
- Maintain schedule of major construction activities
- Install, maintain and modify BMPs
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_



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7/11/2023

**STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)**

FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
				66
STATE	STATE DIST.	COUNTY		
TEXAS	ODA	WARD, ETC		
CONT.	SECT.	JOB	HIGHWAY NO.	
0292	04	072, ETC	SH 18, ETC	

**STORMWATER POLLUTION PREVENTION PLAN (SWP3):**

**2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE**

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

**2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:**

**T / P**

- Protection of Existing Vegetation
- Vegetated Buffer Zones
- Soil Retention Blankets
- Geotextiles
- Mulching/ Hydromulching
- Soil Surface Treatments
- Temporary Seeding
- Permanent Planting, Sodding or Seeding
- Biodegradable Erosion Control Logs
- Rock Filter Dams/ Rock Check Dams
- Vertical Tracking
- Interceptor Swale
- Riprap
- Diversion Dike
- Temporary Pipe Slope Drain
- Embankment for Erosion Control
- Paved Flumes
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**2.2 SEDIMENT CONTROL BMPs:**

**T / P**

- Biodegradable Erosion Control Logs
- Dewatering Controls
- Inlet Protection
- Rock Filter Dams/ Rock Check Dams
- Sandbag Berms
- Sediment Control Fence
- Stabilized Construction Exit
- Floating Turbidity Barrier
- Vegetated Buffer Zones
- Vegetated Filter Strips
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

**2.3 PERMANENT CONTROLS:**

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

**2.4 OFFSITE VEHICLE TRACKING CONTROLS:**

- Excess dirt/mud on road removed daily
- Haul roads dampened for dust control
- Loaded haul trucks to be covered with tarpaulin
- Stabilized construction exit
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

**2.5 POLLUTION PREVENTION MEASURES:**

- Chemical Management
- Concrete and Materials Waste Management
- Debris and Trash Management
- Dust Control
- Sanitary Facilities
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**2.6 VEGETATED BUFFER ZONES:**

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

**2.7 ALLOWABLE NON-STORMWATER DISCHARGES:**

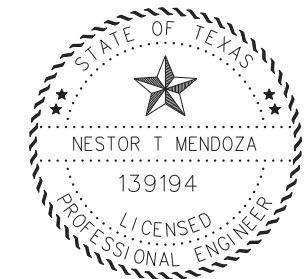
- Fire hydrant flushings
- Irrigation drainage
- Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- Potable water sources
- Springs
- Uncontaminated groundwater
- Water used to wash vehicles or control dust
- Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

**2.8 INSPECTIONS:**

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3 .

**2.9 MAINTENANCE:**

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3.



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 7/11/2023

**STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)**

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			67
STATE	STATE DIST.	COUNTY	
TEXAS	ODA	WARD, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0292	04	072, ETC	SH 18, ETC

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

1.  
2.  
 No Action Required       Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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

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

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

- No Permit Required  
 Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)  
 Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)  
 Individual 404 Permit Required  
 Other Nationwide Permit Required: NWP# \_\_\_\_\_

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

1.  
2.  
3.  
4.

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

**Best Management Practices:**

<b>Erosion</b>	<b>Sedimentation</b>	<b>Post-Construction TSS</b>
<input type="checkbox"/> Temporary Vegetation	<input type="checkbox"/> Silt Fence	<input type="checkbox"/> Vegetative Filter Strips
<input type="checkbox"/> Blankets/Mulching	<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.  
4.

**IV. VEGETATION RESOURCES**

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

- No Action Required       Required Action

Action No.

1.  
2.  
3.  
4.

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

- No Action Required       Required Action

Action No.

1.  
2.  
3.  
4.

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

**LIST OF ABBREVIATIONS**

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

**VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES**

General (applies to all projects):

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

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: 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.  
2.  
3.

 Texas Department of Transportation		Design Division Standard		
<b>ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS</b>  <b>EPIC</b>				
FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
© TxDOT - February 2015		CONT	SECT	HIGHWAY
12-12-2011 (DS) REVISIONS		0292	04	072. ETC SH 18. ETC
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.		ODA	WARD. ETC	68

DATE:  
FILE: