INDEX OF SHEETS

SEE SHEET NO. 2

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

BRIDGE PREVENTATIVE MAINTENANCE CONTRACT PROJECT NUMBER			
BPM - 647093001			
CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		1

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

BRIDGE PREVENTATIVE MAINTENANCE CONTRACT BPM - 647093001

US 377, ETC.
KIMBLE, ETC.

NET LENGTH OF PROJECT = 1.000 MI

LIMITS: VARIOUS LOCATIONS IN THE SAN ANGELO DISTRICT

FOR THE CONSTRUCTION OF
BRIDGE PREVENTATIVE MAINTENANCE REPAIRS

FINAL PLANS

Letting Date: _____

Name of Contractor: _____

Date Work Began: _____

Date Work Completed: _____

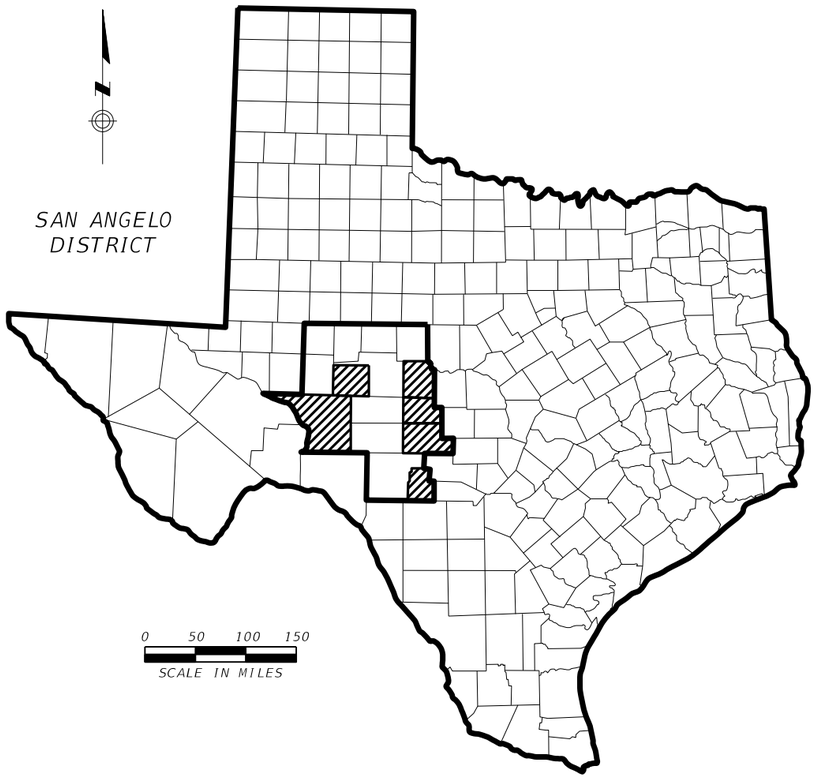
Date Work Accepted: _____

Final Contract Cost: _____

Project was built according to the Plans & Specifications. These final plans reflect the work done and the quantities shown thereon and on the Final Estimate are Final Quantities.

Area Engineer _____ Date _____

Summary of Change Orders:



9/9/2024

STATE OF TEXAS
JORDAN A. SEFCIK
129853
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Jordan A. Sefcik
2926CE8D1B10401...

EXCEPTIONS
NONE

EQUATIONS
NONE

RAILROAD CROSSINGS
NONE

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

2024 Texas Department of Transportation

RECOMMENDED FOR LETTING: 9/10/2024

DocuSigned by:
Nicholas Greenly
DDFB9C6522AF49E...
District Design Engineer

APPROVED FOR LETTING: 9/9/2024

DocuSigned by:
Jordan A. Sefcik
2926CE8D1B10401
District Director of Maintenance

DATE: 9/9/2024 10:02:03 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/001 TITLE SHEET

GENERAL

TRAFFIC CONTROL PLAN

TRAFFIC CONTROL STANDARDS

BRIDGE REPAIR DETAILS

BRIDGE STANDARDS

STATE OF TEXAS
JORDAN A. SEFCIK
129853
LICENSED
PROFESSIONAL ENGINEER

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

DocuSigned by:
Jordan A Sefcik
2926CE8D1B10401...

9/9/2024
DATE

Texas Department of Transportation

San Angelo District

INDEX OF SHEETS

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.

DIST	COUNTY	SHEET NO.
SJT	KIMBLE, ETC.	2

DATE: 9/9/2024 10:02:04 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/002 INDEX OF SHEETS

GENERAL NOTES

Work consists of Bridge Preventative Maintenance repairs including but not limited to concrete structure repairs, concrete bridge beam repairs, and scour repairs and countermeasure installation.

The following Standard Sheets have been modified: None

Locate the project bulletin board at an approved location within the project limits such as at a field office, staging area, or stockpile, and make accessible to the public at all times. Do not remove the bulletin board from the project until approved. If a construction site notice is required for the project, post a copy at each geographically separated work location.

In those instances where fixed features require, vary the governing slopes indicated in these plans from within the limits to the extent determined.

If Contractor elects to establish a pit within 200 ft. of a public road, construct a barrier or other device in accordance with Natural Resources Code, Chapter 133, and Section 133.041.

Do not use salt water with solids in excess of 10,000 parts per million, as determined by evaporation.

Contractor questions concerning the work on this project are to be directed to and addressed by the following individuals through email, phone, and in person:

Junction Area Engineer Jesus Garcia, P.E.; email Jesus.Garcia9@txdot.gov and Assistant Area Engineer Randy Baiza, P.E.; email Randy.Baiza@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

Questions concerning the letting process may be directed to and addressed by the San Angelo Maintenance Office:

Director of Maintenance Jordan Sefcik, P.E.; email Jordan.Sefcik@txdot.gov.

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.

County: Kimble, Various Counties **Sheet:** 3

Highway: US 377, Various Locations **Control:** 6470-93-001

A meeting shall be conducted before work begins. The Contractor and the Superintendent(s) responsible for the supervision of the work shall attend. The Contractor shall discuss proposed work methods, work schedules, and any other information which may affect the work.

Item 5, "Control of the Work"

State Highway right of way markers destroyed by the Contractor shall be replaced by a Texas Registered Professional Land Surveyor (RPLS) at no cost to the State. Provide written documentation from the RPLS attesting to the replacement of the right of way markers.

Make suitable advance notification to affected non-participating municipalities regarding Class B underground facilities. Contact the Department's San Angelo District Traffic Office at telephone number (325) 947-9208 to have the Department's existing traffic signal and illumination utilities located, and call the Department's San Angelo District Maintenance Office at telephone number (325) 947-9322 to have the Department's existing irrigation utilities located.

Responsibility for construction surveying shall conform to Section 5.9.3., "Method C."

Item 6, "Control of Materials"

When allowed, store materials and equipment in approved areas within the right of way.

Access the work area from the right of way.

To comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law, the contractor must submit an 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"

No significant traffic generator events have been identified.

Item 8, "Prosecution and Progress"

Submit the sequence of work and estimated progress schedule on paper or as a Portable Document Format (PDF) electronic file compatible with Adobe Systems Incorporated "Acrobat Reader XI".

Charges for working days shall conform to Section 8.3.1.5., "Calendar Day".

Work shall be completed by August 31st 2025, the end of Fiscal Year 2025.

Item 9, "Measurement and Payment"

The progress payment period shall end two working days before the last working day of the month. Deliver invoices to be paid as material on hand on or before the end of the progress payment period.

For projects that include a disadvantaged business enterprises (DBE) goal, provide a conversion rate for units of payment for work subcontracted to DBE if units of payments differ from those shown on the plans.

Item 429, "Concrete Structure Repair"

Maintain a complete paper copy of the TxDOT Concrete Repair Manual at each active location which requires work performed under this Item. This document is available as a free download from: http://onlinemanuals.txdot.gov/txdotmanuals/crm/crm.pdf.

Obtain approval of both damaged concrete removal and concrete surface preparation before placing repair materials.

Item 432, "Riprap"

Furnish and install 1/2-in. thick joint filler board conforming to DMS-6310, "Joint Sealants and Fillers" between concrete riprap and adjacent existing concrete, and where directed.

Item 502, "Barricades, Signs and Traffic Handling"

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.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 6470-93-001 **DISTRICT** San Angelo **COUNTY** Kimble
HIGHWAY US0377

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**6470-93-001**			
		PROJECT ID		**A00211402**			
		COUNTY		**Kimble**			
		HIGHWAY		**US0377**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	104-7006	REMOV CONC (RIPRAP)	SY	267.000		267.000	
	104-7047	REMOV CONC (MISC)	CY	125.000		125.000	
	401-7001	FLOWABLE BACKFILL	CY	73.000		73.000	
	429-7005	CONC STR REPAIR(DECK REP (FULL DEPTH))	SF	10.000		10.000	
	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	1,550.000		1,550.000	
	429-7009	CONC STR REPAIR (STANDARD)	SF	50.000		50.000	
	432-7043	RIPRAP (STONE PROTECTION)(18 IN)	CY	362.000		362.000	
	432-7045	RIPRAP (STONE PROTECTION)(24 IN)	CY	450.000		450.000	
	480-7001	CLEAN EXIST CULVERTS	EA	1.000		1.000	
	500-7001	MOBILIZATION	LS	1.000		1.000	
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	6.000		6.000	
	503-7001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	60.000		60.000	
	505-7001	TMA (STATIONARY)	DAY	60.000		60.000	
	778-7001	CONCRETE RAIL REPAIR (IN-KIND)	LF	22.000		22.000	
	788-7002	CONCRETE BEAM REPAIR (CFRP)	EA	3.000		3.000	
	7020-7003	GEN DEBRIS REMOVE FROM UNDER BRIDGES	CY	40.000		40.000	

COUNTY	0104-7006 REMOV CONC (RIPRAP)	0104-7047 REMOV CONC (MISC)	0401-7001 FLOWABLE BACKFILL	0429-7005 CONC STR REPAIR (DECK REP (FULL DEPTH))	0429-7007 CONC STR REPAIR (VERTICAL & OVERHEAD)	0429-7009 CONC STR REPAIR (STANDARD)	0432-7043 RIPRAP (STONE PROTECTION) (18 IN)	0432-7045 RIPRAP (STONE PROTECTION) (24 IN)	0480-7001 CLEAN EXIST CULVERTS	0500-7001 MOBILIZATION	0502-7001 BARRICADES, SIGNS, AND TRAFFIC HANDLING	0503-7001 PORTABLE CHANGEABLE MESSAGE SIGN	0505-7001 TMA (STATIONARY)	0778-7001 CONCRETE RAIL REPAIR (IN-KIND)	0788-7002 CONCRETE BEAM REPAIR (CFRP)	7020-7003 GEN DEBRIS REMOVE FROM UNDER BRIDGES
	SY	CY	CY	SF	SF	SF	CY	CY	EA	LS	MO	DAY	DAY	LF	EA	CY
CONCHO (A)	-	-	8.0	-	-	-	30.0	-	-	-	-	-	-	-	-	-
CROCKETT (B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	-
IRION (C)	-	-	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-
KIMBLE (D)	-	-	-	10.0	1550.0	-	-	-	-	-	-	-	-	2.0	2.0	-
MENARD (E)	267.0	-	25.0	-	-	-	332.0	-	-	-	-	-	-	-	-	-
REAL (F)	-	125.0	40.0	-	-	50.0	-	450.0	-	-	-	-	-	20.0	-	40.0
PROJECT TOTALS	**267.0**	**125.0**	**73.0**	**10.0**	**1550.0**	**50.0**	**362.0**	**450.0**	**1.0**	**1.0**	**6.0**	**60.0**	**60.0**	**22.0**	**3.0**	**40.0**

9/9/2024

STATE OF TEXAS
JORDAN A. SEFCIK
129853
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Jordan A. Sefcik
2926CE8D1B10401...

Texas Department of Transportation

San Angelo District

QUANTITY SUMMARY

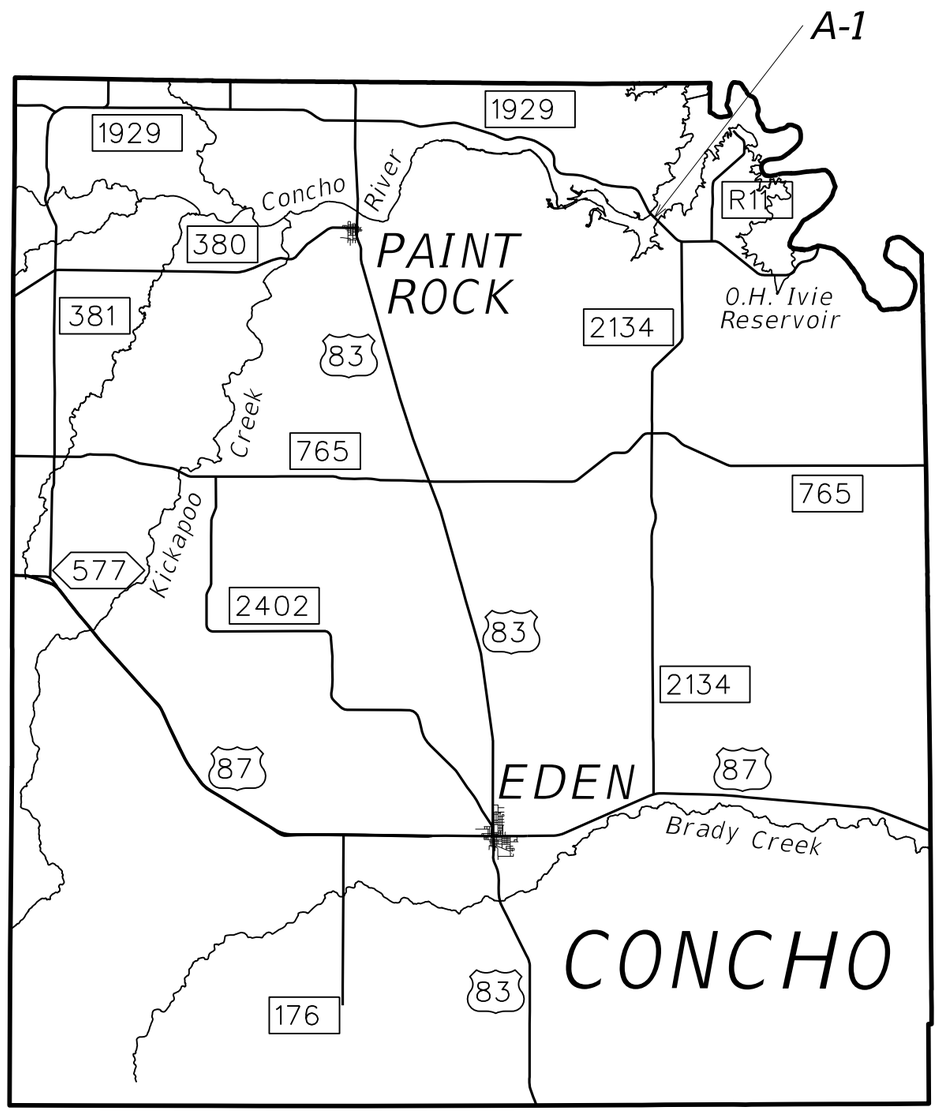
SHEET ISSUED OR LAST REVISED

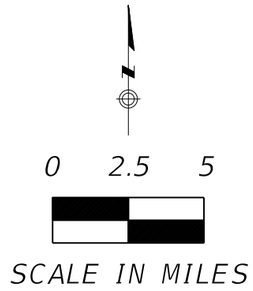
CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.

DIST	COUNTY	SHEET NO.
SJT	KIMBLE, ETC.	5

DATE: 9/9/2024 10:02:10 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/005 QUANTITY SUMMARY

Site No.	Structure ID	County Name	Highway	Feature Crossed	Location Description	Latitude	Longitude
A-1	07-048-1651-07-007	CONCHO	FM 1929	CONCHO RIVER	1.05 MI W OF FM 2134	31.51103394	-99.75136687





Texas Department of Transportation — San Angelo District

LOCATION MAP
CONCHO COUNTY

SHEET 1 OF 1

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		6

DATE: 9/9/2024 10:02:11 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/A-1 CONCHO LOC

Site No.	Structure ID	Work Description	0401-7001 FLOWABLE BACKFILL	0432-7043 RIPRAP (STONE PROTECTION) (18IN)
			CY	CY
A-1	07-048-1651-07-007	MODERATE EROSION VOID IN THE NORTHWEST ASPHALT APPROACH PAVEMENT ADJACENT TO THE WEST CORNER RAIL. MINOR EMBANKMENT EROSION HAS UNDERMINED THE WEST AND NORTH CORNER WINGWALL END UP TO 6". LONG TERM FILL SETTLEMENT AND EROSION HAVE UNDERMINED THE NORTHWEST ABUTMENT CAP UP TO 6" VERTICALLY AND 3' BACK OVER LENGTH. PUMP FLOWABLE FILL INTO THE VOIDS BELOW THE WEST CORNER RAIL, NORTH AND WEST CORNER WINGWALLS, AND NORTHWEST ABUTMENT CAP.	8.0	30.0
		County Totals:	8.0	30.0

DATE: 9/9/2024 10:02:12 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/A-2 CONCHO 0S

Texas Department of Transportation

San Angelo District

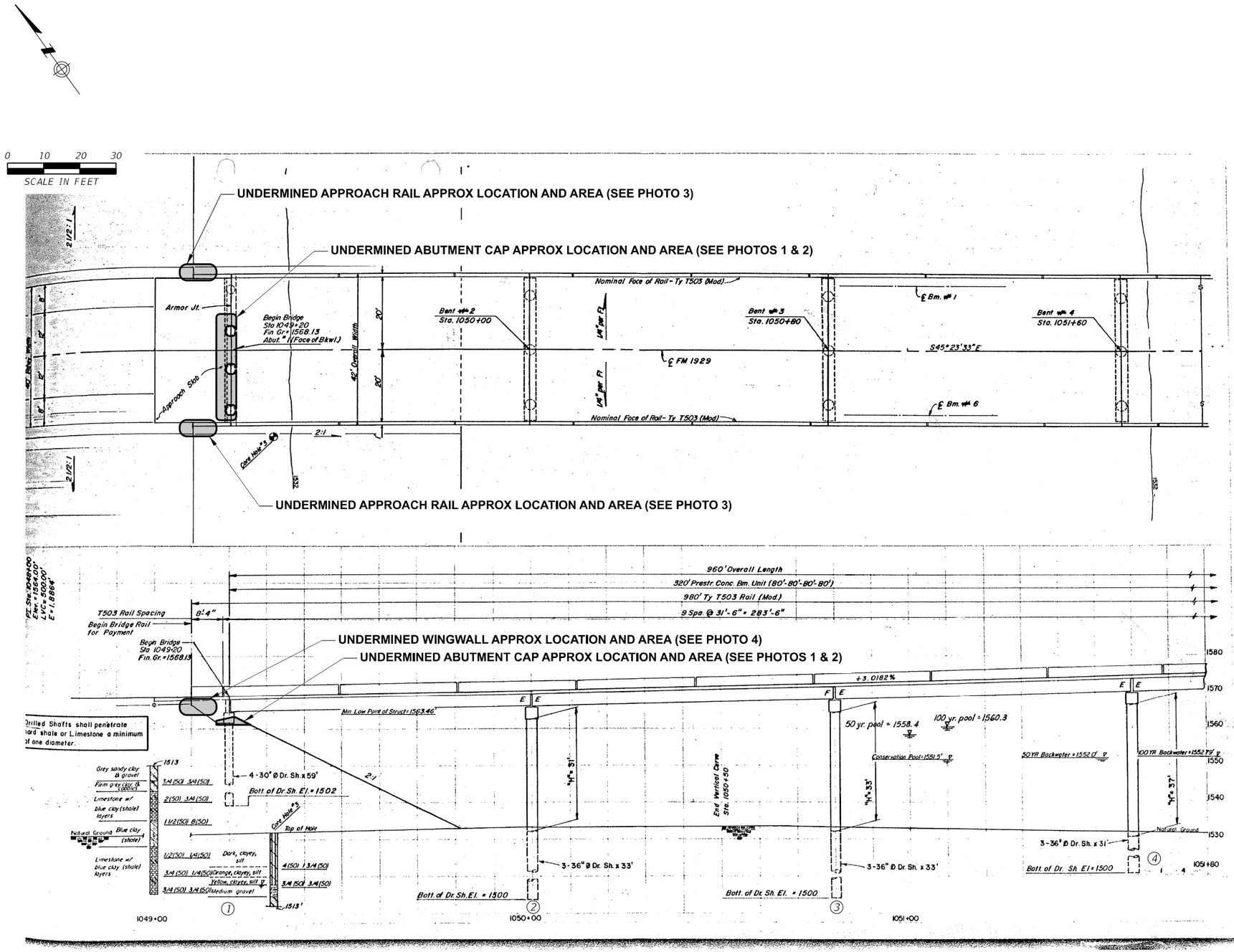
QUANTITY SUMMARY CONCHO COUNTY

SHEET 1 OF 1

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.

DIST	COUNTY	SHEET NO.
SJT	KIMBLE, ETC.	7



BRIDGE REPAIR LAYOUT

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

2. LAYOUT, STATIONS, AND ELEVATIONS SHOWN ARE BASED ON AS-BUILT PLANS.

3. REPAIR LOCATIONS NOTED ARE APPROXIMATE AND ARE PROVIDED AS A VISUAL AID. ACTUAL REPAIR LOCATIONS TO BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING REPAIR WORK.

4. SEE AS-BUILT PLANS SHOWING DETAILS OF EXISTING STEEL BEAMS, DIAPHRAGMS, AND BEARINGS.

5. SEE PHOTOS FOR REPAIR LOCATIONS ON THE FOLLOWING SHEET.

9/9/2024

STATE OF TEXAS
JORDAN A. SEFCIK
129853
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Jordan A. Sefcik
2926CE8D1B10401...

Texas Department of Transportation | San Angelo District

FM 1929

CONCHO COUNTY SITE A-1

OVER CONCHO RIVER
07-048-1651-07-007

SHEET 1 OF 2 SCALE 1"=30'

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST.	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		8

DATE: 9/9/2024 10:02:13 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/A-3 CONCHO DETAILS

PHOTO 1.
- UNDERMINED NORTWEST ABUTMENT CAP, LOOKING NORTH.

PHOTO 2.
- UNDERMINED NORTHWEST ABUTMENT CAP, LOOKING WEST.

PHOTO 3.
- EROSION VOID IN NORTHWEST APPROACH, LOOKING SOUTH.

PHOTO 4.
- EROSION VOID AT NORTH AND WEST CORNER WINGWALL. WEST CORNER SHOWN, LOOKING EAST.

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

2. REPAIR LOCATIONS NOTED ARE APPROXIMATE AND ARE PROVIDED AS A VISUAL AID. ACTUAL REPAIR LOCATIONS TO BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING REPAIR WORK.

3. SEE PHOTOS SHOWING DETAILS OF REPAIR AREAS.

BRIDGE REPAIR PHOTOS

Texas Department of Transportation | San Angelo District

FM 1929

CONCHO COUNTY
SITE A-1

OVER CONCHO RIVER
07-048-1651-07-007

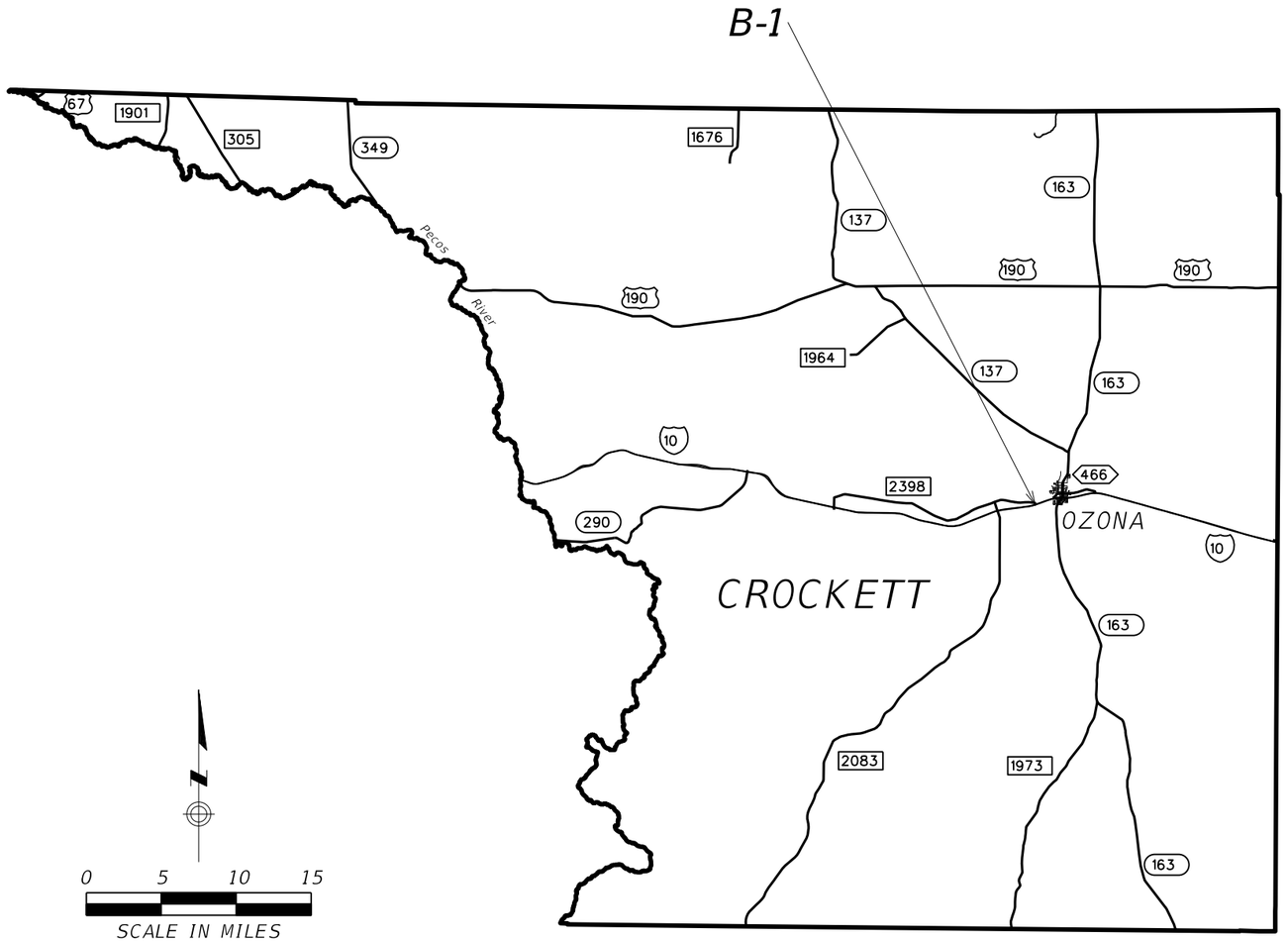
SHEET 2 OF 2

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		9

DATE: 9/9/2024 10:02:15 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/A-3 CONCHO DETAILS

Site No.	Structure ID	County Name	Highway	Feature Crossed	Location Description	Latitude	Longitude
B-1	07-053-0140-11-110	CROCKETT	IH 10 EB	RM 2398	1.90 MI W OF US 163	30.69860875	-101.23232049



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Texas Department of Transportation — San Angelo District

LOCATION MAP
CROCKETT COUNTY

SHEET 1 OF 1

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		10

Site No.	Structure ID	Work Description	0788-7002 CONCRETE BEAM REPAIR (CFRP)
			EA
B-1	07-053-0140-11-110	BEAM 2 FROM SOUTH IN SPAN 2 HAS MODERATE OVERHEIGHT IMPACT SPALL WITH EXPOSED STRAND ~10" LONG OVER SOUTH BOUND LANE. REPAIR OVERHEIGHT IMPACT SPALLS AT THE BOTTOM OF BEAM 2 EXTERIOR FROM SOUTH IN SPAN 2. TO AVOID FURTHER STRAND CORROSION, WRAP REPAIR AREAS WITH CARBON FIBER REINFORCED POLYMER PROTECTION WRAP.	1.0
		County Totals:	1.0

DATE: 9/9/2024 10:02:18 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/B-2 CROCKETT 05

Texas Department of Transportation

San Angelo District

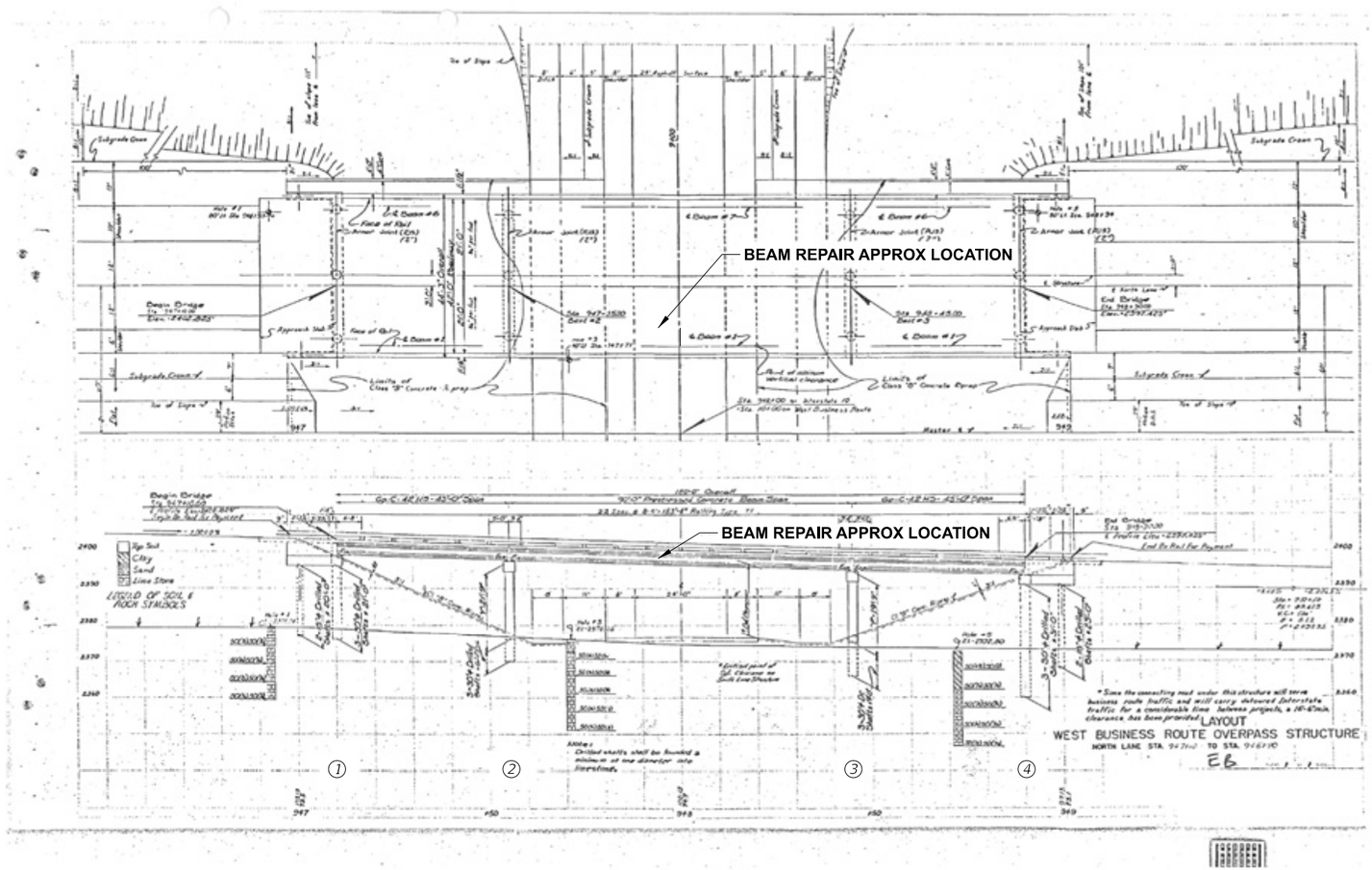
QUANTITY SUMMARY
CROCKETT COUNTY

SHEET 1 OF 1

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		11

0 20 40
SCALE IN FEET



BRIDGE REPAIR LAYOUT

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

2. LAYOUT, STATIONS, AND ELEVATIONS SHOWN ARE BASED ON AS-BUILT PLANS.

3. REPAIR LOCATIONS NOTED ARE APPROXIMATE AND ARE PROVIDED AS A VISUAL AID. ACTUAL REPAIR LOCATIONS TO BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING REPAIR WORK.

4. SEE AS-BUILT PLANS SHOWING DETAILS OF EXISTING STEEL BEAMS, DIAPHRAGMS, AND BEARINGS.

5. SEE PHOTOS FOR REPAIR LOCATIONS ON THE FOLLOWING SHEET.

9/9/2024

STATE OF TEXAS
JORDAN A. SEFCIK
129853
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Jordan A. Sefcik
2926CE8D1B10401...

Texas Department of Transportation | San Angelo District

IH 10 EB

CROCKETT COUNTY SITE B-1

OVER RM 2398
07-053-0140-11-110

SHEET 1 OF 2 SCALE 1"=40'

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.

DIST	COUNTY	SHEET NO.
SJT	KIMBLE, ETC.	12

DATE: 9/9/2024 10:02:19 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/B-3 CROCKETT DETAILS

PHOTO 1.
- OVERHEIGHT IMPACT SPALL OF BEAM 2 OF SPAN 2, LOOKING NORTH.

BRIDGE REPAIR PHOTOS

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

2. REPAIR LOCATIONS NOTED ARE APPROXIMATE AND ARE PROVIDED AS A VISUAL AID. ACTUAL REPAIR LOCATIONS TO BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING REPAIR WORK.

3. SEE PHOTOS SHOWING DETAILS OF REPAIR AREAS.

Texas Department of Transportation | San Angelo District

IH 10 EB

CROCKETT COUNTY
SITE B-1
OVER RM 2398
07-053-0140-11-110

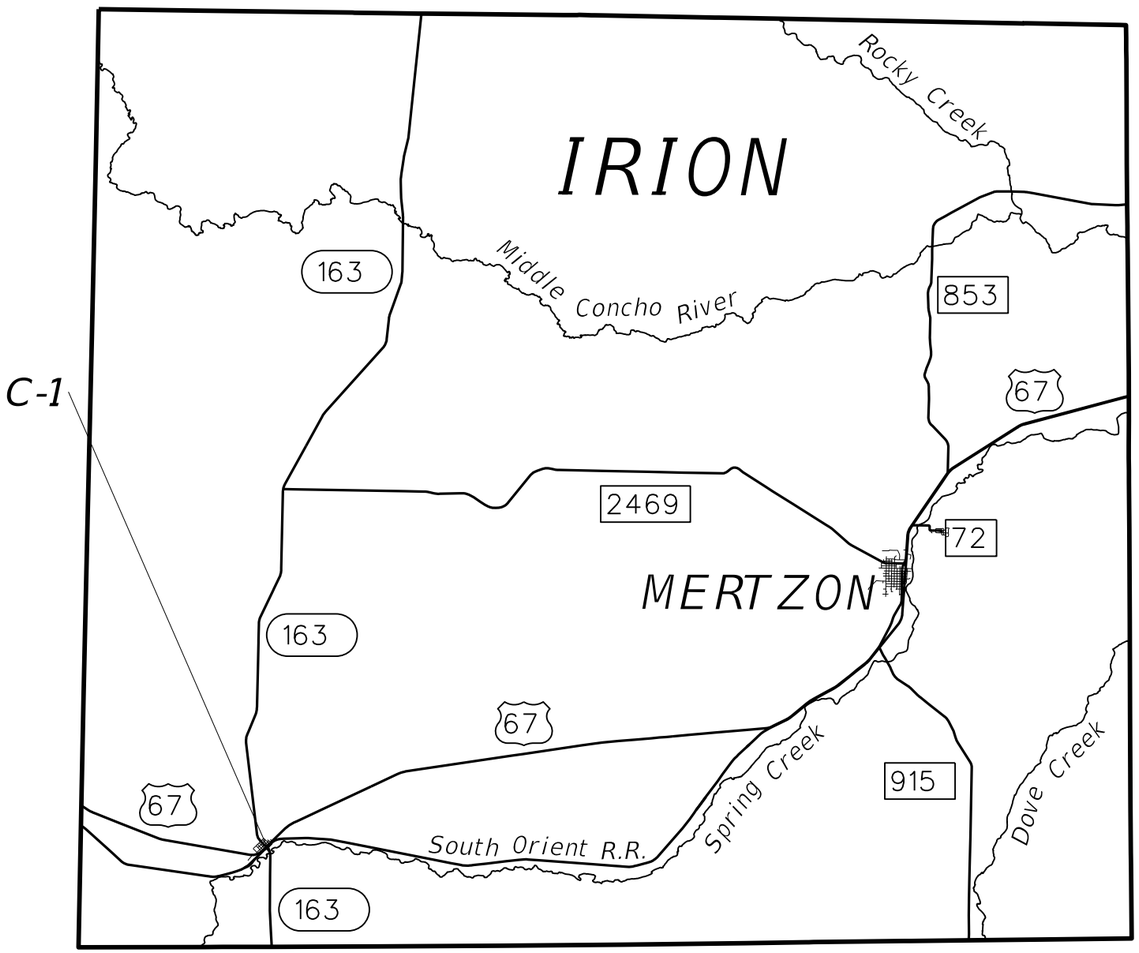
SHEET 2 OF 2

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		13

DATE: 9/9/2024 10:02:20 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/B-3 CROCKETT DETAILS

Site No.	Structure ID	County Name	Highway	Feature Crossed	Location Description	Latitude	Longitude
C-1	07-119-0412-01-001	IRION	SH 163	DRAW	0.25 MI S OF US 67	31.12459426	-101.16854910



0 2.5 5

SCALE IN MILES

Texas Department of Transportation

San Angelo District

LOCATION MAP
IRION COUNTY

SHEET 1 OF 1

©TxDOT 2024	CONT	SECT	JOB	HIGHWAY
SHEET ISSUED OR LAST REVISED	6470	93	001	US 377, ETC.
	DIST	COUNTY		SHEET NO.
	SJT	KIMBLE, ETC.		14

DATE: 9/9/2024 10:02:22 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/C-1 IRION LOC

Site No.	Structure ID	Work Description	0480-7001 CLEAN EXIST CULVERTS
			EA
C-1	07-119-0412-01-001	MODERATE ACCUMULATION OF TUMBLE WEED DRIFT IN SEVERAL BARRELS DUE TO FENCE ACROSS DOWNSTREAM FACE OF BARRELS. REMOVE TUMBLE WEEDS AND DEBRIS, AND CLEAN CULVERT BARRELS.	1.0
		County Totals:	1.0

DATE: 9/9/2024 10:02:23 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/C-2 IRION QS

Texas Department of Transportation

San Angelo District

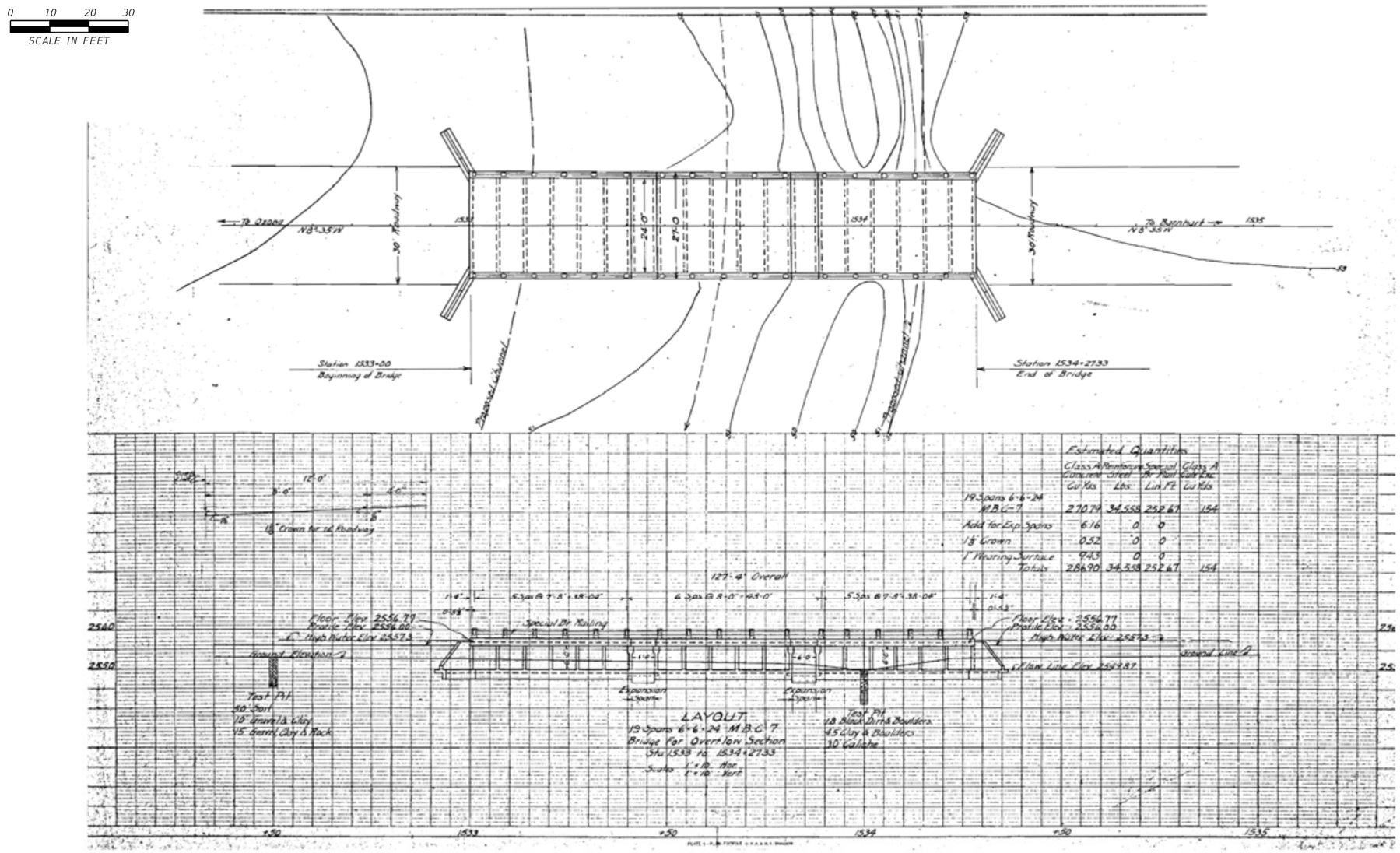
QUANTITY SUMMARY
IRION COUNTY

SHEET 1 OF 1

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.

DIST	COUNTY	SHEET NO.
SJT	KIMBLE, ETC.	15



BRIDGE REPAIR LAYOUT

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

2. LAYOUT, STATIONS, AND ELEVATIONS SHOWN ARE BASED ON AS-BUILT PLANS.

3. REPAIR LOCATIONS NOTED ARE APPROXIMATE AND ARE PROVIDED AS A VISUAL AID. ACTUAL REPAIR LOCATIONS TO BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING REPAIR WORK.

4. SEE AS-BUILT PLANS SHOWING DETAILS OF EXISTING STEEL BEAMS, DIAPHRAGMS, AND BEARINGS.

5. SEE PHOTOS FOR REPAIR LOCATIONS ON THE FOLLOWING SHEET.

9/9/2024

STATE OF TEXAS
JORDAN A. SEFCIK
129853
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Jordan A. Sefcik
2926CE8D1B10401...

Texas Department of Transportation | San Angelo District

SH 163

IRION COUNTY SITE C-1

OVER DRAW
07-119-0412-01-001

SHEET 1 OF 2 SCALE 1"=30'

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		16

DATE: 9/9/2024 10:02:24 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/C-3 IRION DETAILS

PHOTO 1.
- TYPICAL DEBRIS BUILD UP IN BARRELS.

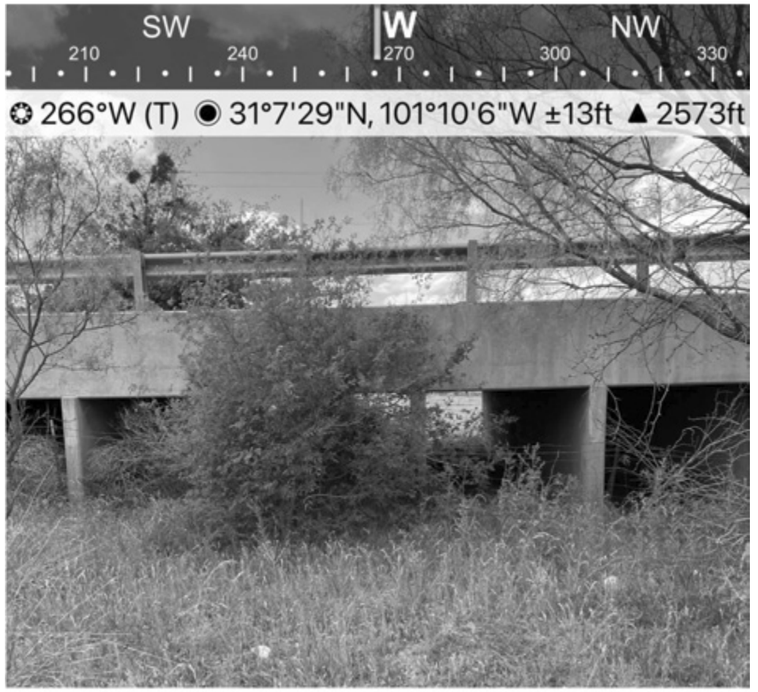


PHOTO 2.
- SHRUBBERY AND DEBRIS BLOCKING BARRELS, LOOKING WEST.

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

2. REPAIR LOCATIONS NOTED ARE APPROXIMATE AND ARE PROVIDED AS A VISUAL AID. ACTUAL REPAIR LOCATIONS TO BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING REPAIR WORK.

3. SEE PHOTOS SHOWING DETAILS OF REPAIR AREAS.

BRIDGE REPAIR PHOTOS

Texas Department of Transportation | San Angelo District

SH 163

IRION COUNTY
SITE C-1
OVER DRAW
07-119-0412-01-001

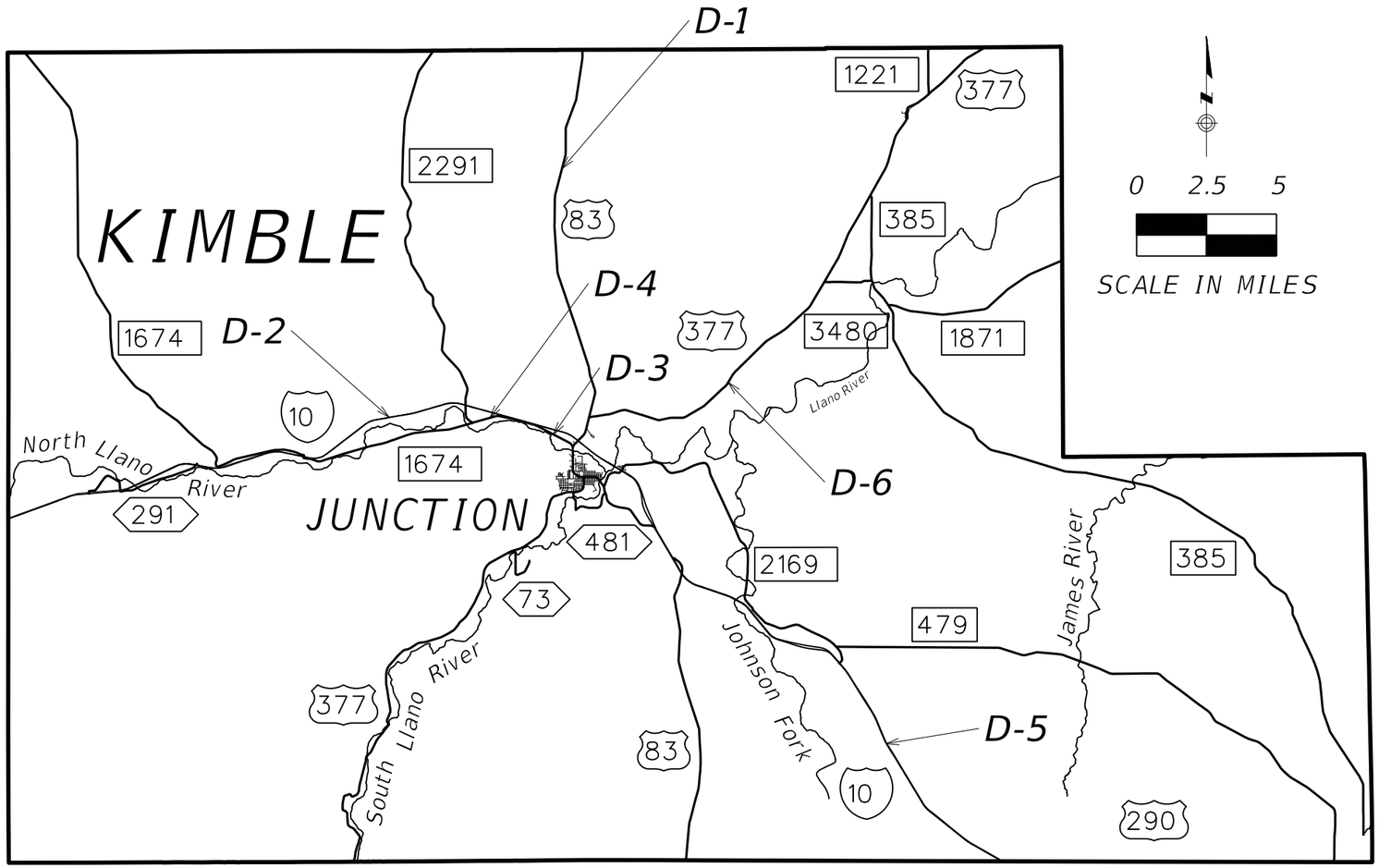
SHEET 2 OF 2

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		17

DATE: 9/9/2024 10:02:26 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/C-3 IRION DETAILS 01/1 - Pre-Letting/C-3 IRION DETAILS

Site No.	Structure ID	County Name	Highway	Feature Crossed	Location Description	Latitude	Longitude
D-1	07-134-0035-07-031	KIMBLE	US 83	GENTRY CREEK	10.30 MI N OF IH 10	30.65208995	-99.78303807
D-2	07-134-0141-09-131	KIMBLE	COUNTY ROAD	IH 10	6.50 MI W OF US 377	30.52195983	-99.87996227
D-3	07-134-0141-18-033	KIMBLE	FM 1674	ELM SLOUGH	0.50 MI W OF US 377	30.50950614	-99.78563983
D-4	07-134-0141-18-051	KIMBLE	FM 1674	BEAR CREEK	3.20 MI W OF US 377	30.52001982	-99.82865345
D-5	07-134-0142-01-057	KIMBLE	IH 10 EB	DITCH & OLD SEGOVIA ROAD	5.60 MI N OF US 290	30.35217895	-99.59264635
D-6	07-134-0149-01-021	KIMBLE	US 377	GENTRY CREEK	5.20 MI E OF US 377	30.534528	-99.68852986



Texas Department of Transportation

San Angelo District

LOCATION MAP
KIMBLE COUNTY

SHEET 1 OF 1

©TxDOT 2024	CONT	SECT	JOB	HIGHWAY
SHEET ISSUED OR LAST REVISED	6470	93	001	US 377, ETC.
	DIST	COUNTY		SHEET NO.
	SJT	KIMBLE, ETC.		18

DATE: 9/9/2024 10:02:28 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/D-1 KIMBLE LOC

Site No.	Structure ID	Work Description	0429-7005 CONC STR REPAIR (DECK REP (FULL DEPTH))	0429-7007 CONC STR REPAIR (VERTICAL & OVERHEAD)	0778-7001 CONCRETE RAIL REPAIR (IN-KIND)	0788-7002 CONCRETE BEAM REPAIR (CFRP)
			SF	SF	LF	EA
D-1	07-134-0035-07-031	PIER CAP #4 (FROM SOUTH) HAS A LARGE SPALL (~ 3.5' W X FULL HEIGHT X UP TO 0.3' D) WITH EXPOSED REBAR, (UP TO 0.3') BEARING LOSS AT BEAM #2 (FROM WEST) AND FLEXURE CRACKING WITH EFFLORESCENCE UNDER SPALL. REPAIR LARGE SPALL IN PIER CAP #4 (FROM SOUTH) AT BEARING AREA OF BEAM #2 (FROM WEST).	-	25.0	-	-
D-2	07-134-0141-09-131	EAST BEAM OF SPAN #2 (FROM SOUTH) HAS IMPACT SPALLING/DELAMINATION (~ OVER 5' L X 2.7' W X 0.5' D) WITH ONE EXPOSED STRAND. WEST BEAM OF SPAN #2 HAS SEVERAL SMALL IMPACT SPALLS (~ OVER 4' L X 1.2' W X 0.3' H) WITH ONE EXPOSED BOTTOM STRAND. REPAIR OVERHEIGHT IMPACT SPALLING IN EAST AND WEST BEAMS OF BENT #2 (FROM SOUTH). WRAP WITH CARBON FIBER REINFORCED POLYMER PROTECTION WRAP AFTER REPAIRS ARE COMPLETED.	-	-	-	1.0
D-3	07-134-0141-18-033	ONE POST OVER NORTHWEST WINGWALL HAS BROKEN LOOSE AT BASE AND IS NO LONGER CONNECTED TO FLEXBEAM DUE TO IMPACT. REPLACE DAMAGED CONCRETE RAIL POST AT NORTHWEST WINGWALL. REPAIR ALL SPALLS AND DAMAGE TO BRIDGE RAIL.	-	275.0	2.0	-
D-4	07-134-0141-18-051	PIER CAPS HAVE MINOR HORIZONTAL CRACKS AND MINOR TO MODERATE DELAMINATIONS AND SPALLS (UP TO 6' X 1'), A FEW WITH EXPOSED REBAR. CLEAN AND PATCH DELAMINATIONS AND SPALLS IN PIER CAPS. UNDERSIDE OF DECK AND OVERHANGS HAVE MINOR TO MODERATE DELAMINATIONS AND SPALLS, SOME WITH EXPOSED REBAR, MAINLY ALONG CONSTRUCTION JOINTS AND DECK JOINT AT BENT 3. CLEAN AND PATCH DELAMINATIONS AND SPALLS AT UNDERSIDE OF DECK.	-	900.0	-	-
D-5	07-134-0142-01-057	NORTHEAST DECK OVERHANG OF SOUTHEAST SPAN HAS IMPACT FRACTURE CRACKING AND DELAMINATION/SPALLING (~ 4.5' L X 1' W X UP TO 1" D) WITH EXPOSED REBAR AT BRIDGE RAIL POST CONNECTION DUE TO PREVIOUS IMPACT TO RAILING. FULL DEPTH DECK REPAIR ON DAMAGED NORTHEAST DECK OVERHANG OF SOUTHEAST SPAN AT BRIDGE RAIL POST CONNECTION.	10.0	-	-	-
D-6	07-134-0149-01-021	UNDERSIDE DECK AND DECK OVERHANG HAVE MINOR TRANSVERSE AND LONGITUDINAL CRACKS. THERE ARE DELAMINATIONS AND SPALLS, SOME WITH EXPOSED REBAR, MAINLY ALONG DIAPHRAGMS BELOW CONSTRUCTION JOINTS. BENT CAP #4 HAS A MODERATE HORIZONTAL DELAMINATION CRACK (~1/16") ALONG THE TOP OF CAP IN BOTH SIDES. CAP AT BENT 4 FROM SOUTHWEST HAS MINOR TO MODERATE HORIZONTAL DELAMINATION CRACKS ALONG TOP EDGE. CLEAN AND REPAIR ALL DELAMINATIONS AND SPALLING DESCRIBED.	-	350.0	-	-
		County Totals:	10.0	1550.0	2.0	1.0

Texas Department of Transportation

San Angelo District

QUANTITY SUMMARY
KIMBLE COUNTY

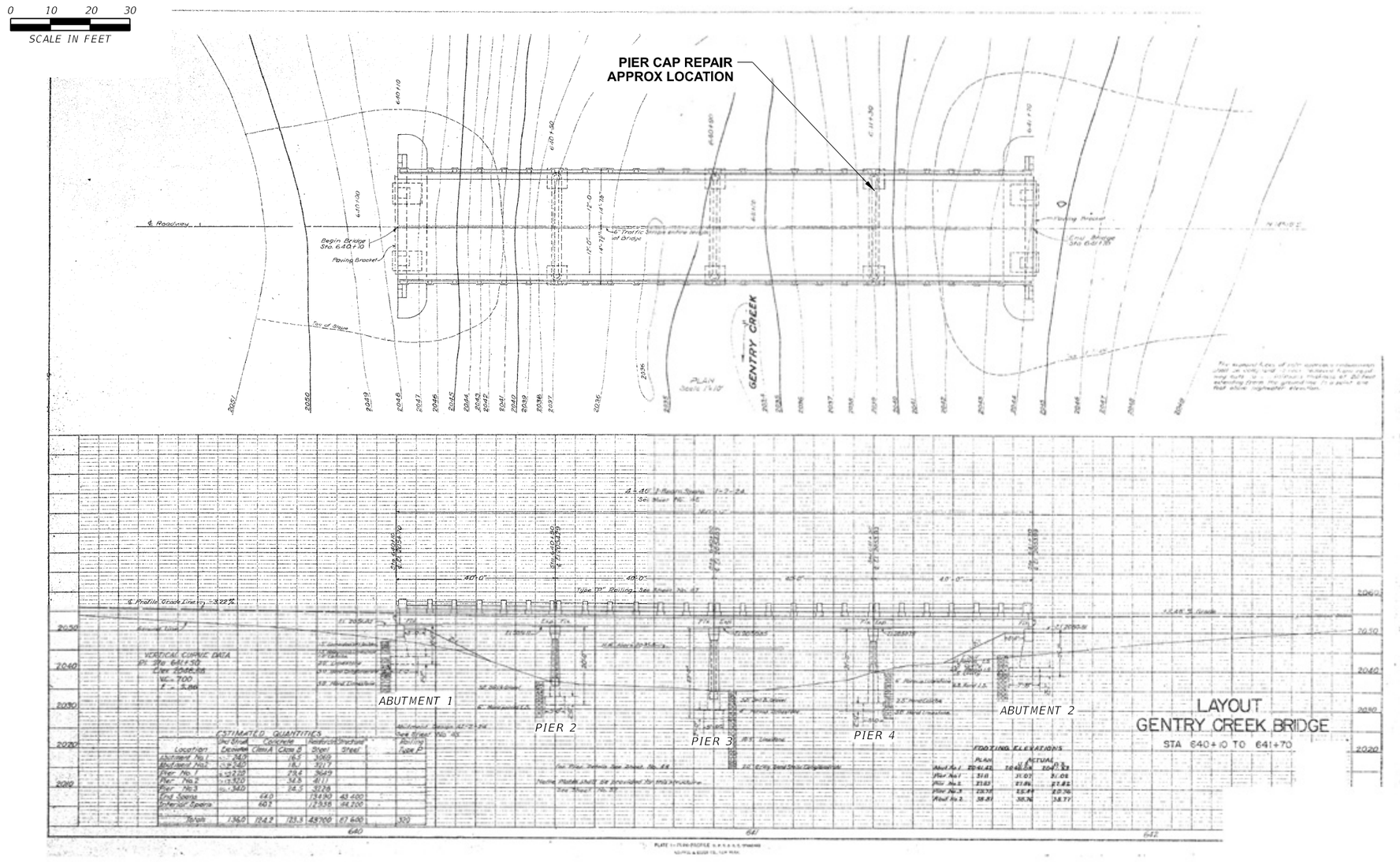
SHEET 1 OF 1

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.

DIST	COUNTY	SHEET NO.
SJT	KIMBLE, ETC.	19

DATE: 9/9/2024 10:02:29 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/D-2 KIMBLE QS



BRIDGE REPAIR LAYOUT

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

2. LAYOUT, STATIONS, AND ELEVATIONS SHOWN ARE BASED ON AS-BUILT PLANS.

3. REPAIR LOCATIONS NOTED ARE APPROXIMATE AND ARE PROVIDED AS A VISUAL AID. ACTUAL REPAIR LOCATIONS TO BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING REPAIR WORK.

4. SEE AS-BUILT PLANS SHOWING DETAILS OF EXISTING STEEL BEAMS, DIAPHRAGMS, AND BEARINGS.

5. SEE PHOTOS FOR REPAIR LOCATIONS ON THE FOLLOWING SHEET.

9/9/2024

STATE OF TEXAS
JORDAN A. SEFCIK
129853
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Jordan A. Sefcik
2926CE8D1B10401...

Texas Department of Transportation

San Angelo District

US 83

KIMBLE COUNTY SITE D-1

OVER GENTRY CREEK
07-134-0035-07-031

SHEET 1 OF 2 SCALE 1"=30'

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST.	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		20

DATE: 9/9/2024 10:02:31 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/D-3 KIMBLE DETAILS

PHOTO 1.
- SPALLING OF PIER CAP 3,
LOOKING NORTH.

GENERAL NOTES

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3. SEE PHOTOS SHOWING DETAILS OF REPAIR AREAS.

BRIDGE REPAIR PHOTOS

Texas Department of Transportation — San Angelo District

US 83

KIMBLE COUNTY
SITE D-1
OVER GENTRY CREEK
07-134-0035-07-031

SHEET 2 OF 2

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.

DIST	COUNTY	SHEET NO.
SJT	KIMBLE, ETC.	21

DATE: 9/9/2024 10:02:33 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/D-3 KIMBLE DETAILS

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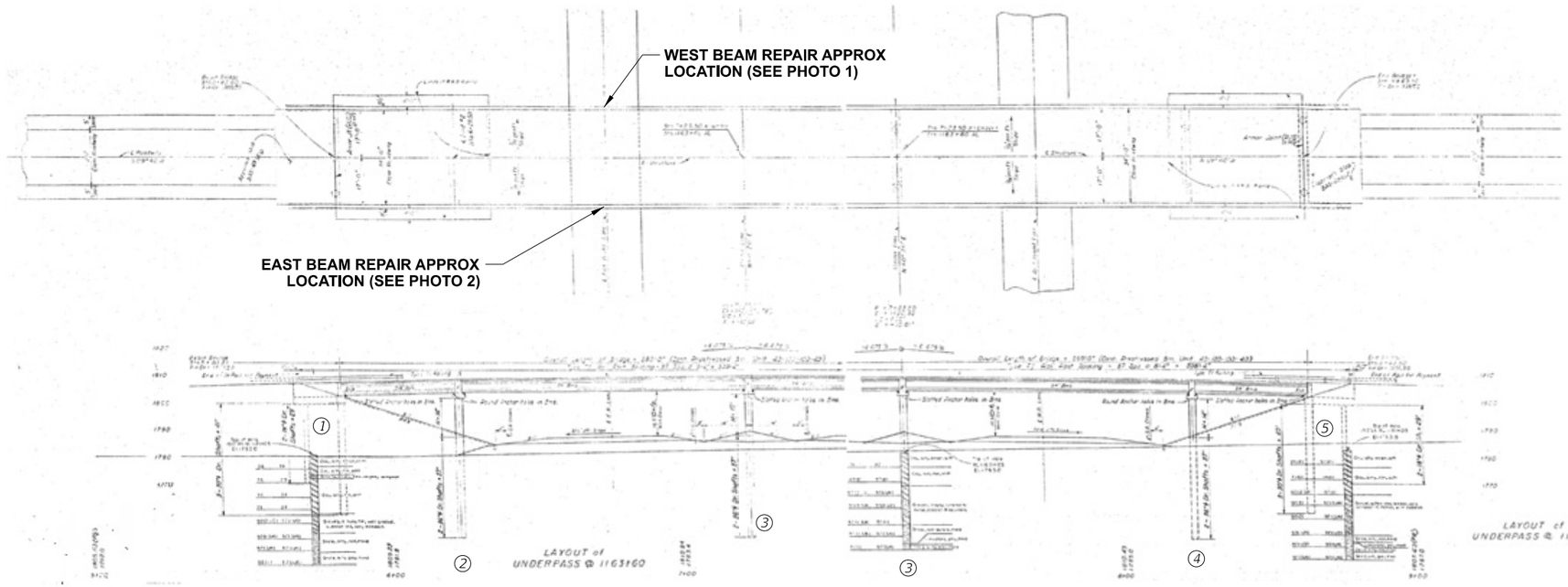

BRIDGE REPAIR LAYOUT

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

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4. SEE AS-BUILT PLANS SHOWING DETAILS OF EXISTING STEEL BEAMS, DIAPHRAGMS, AND BEARINGS.

5. SEE PHOTOS FOR REPAIR LOCATIONS ON THE FOLLOWING SHEET.

9/9/2024

STATE OF TEXAS
JORDAN A. SEFCIK
129853
LICENSED PROFESSIONAL ENGINEER

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Jordan A. Sefcik
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Texas Department of Transportation | San Angelo District

COUNTY ROAD

KIMBLE COUNTY SITE D-2

OVER IH 10
07-134-0141-09-131

SHEET 1 OF 2 SCALE 1"=50'

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		22

DATE: 9/9/2024 10:02:34 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/D-3 KIMBLE DETAILS

PHOTO 1.
- WEST BEAM OF SPAN #2,
FROM SOUTH.

PHOTO 2.
- EAST BEAM OF SPAN #2,
FROM SOUTH.

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

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3. SEE PHOTOS SHOWING DETAILS OF REPAIR AREAS.

BRIDGE REPAIR PHOTOS

Texas Department of Transportation | San Angelo District

COUNTY ROAD

KIMBLE COUNTY
SITE D-2
OVER IH 10
07-134-0141-09-131

SHEET 2 OF 2

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.

DIST	COUNTY	SHEET NO.
SJT	KIMBLE, ETC.	23

DATE: 9/9/2024 10:02:36 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/D-3 KIMBLE DETAILS

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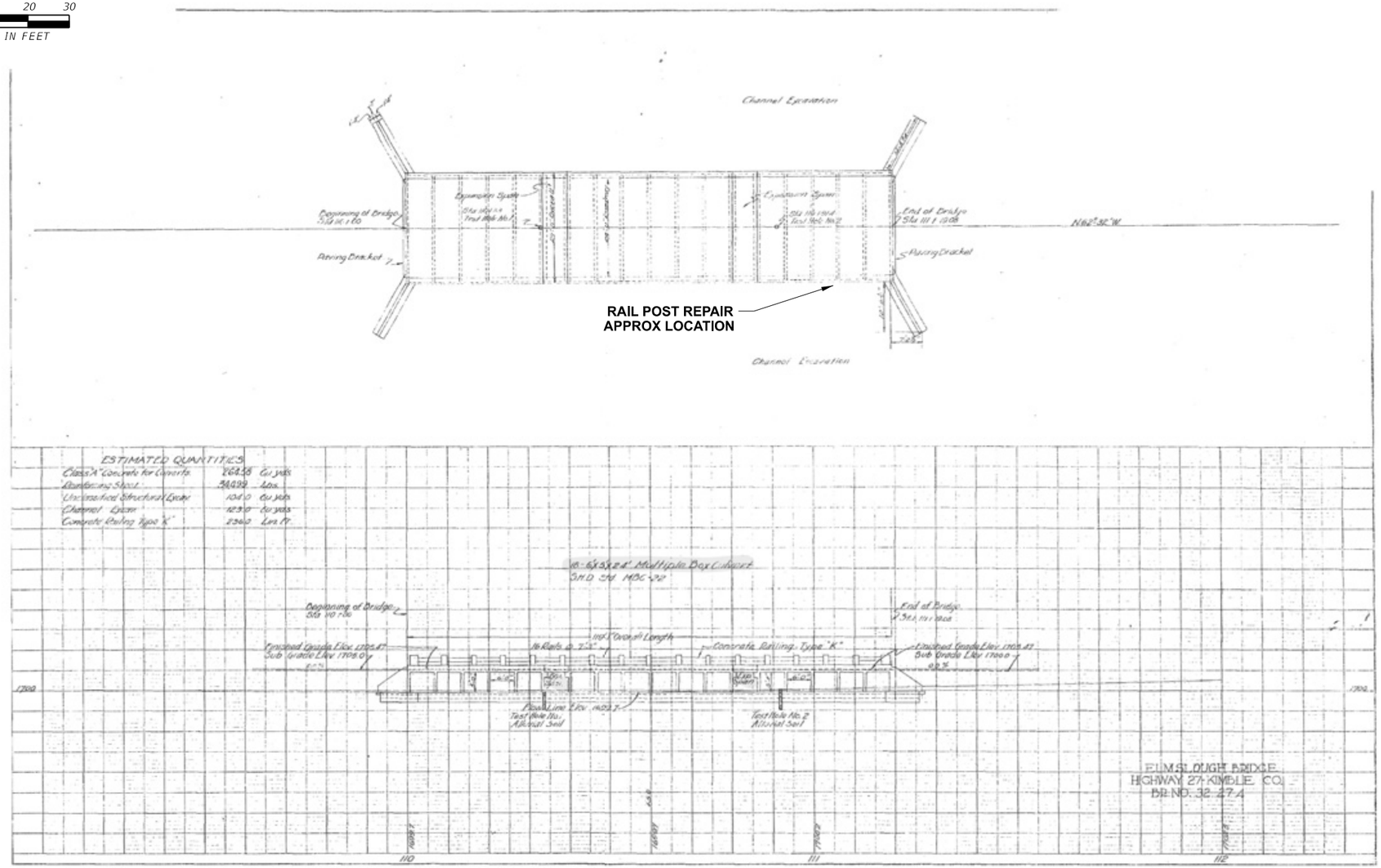
SCALE IN FEET



BRIDGE REPAIR LAYOUT

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

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4. SEE AS-BUILT PLANS SHOWING DETAILS OF EXISTING STEEL BEAMS, DIAPHRAGMS, AND BEARINGS.

5. SEE PHOTOS FOR REPAIR LOCATIONS ON THE FOLLOWING SHEET.

9/9/2024

STATE OF TEXAS
JORDAN A. SEFCIK
129853
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Jordan A. Sefcik
2926CE8D1B10401...

Texas Department of Transportation | San Angelo District

FM 1674

KIMBLE COUNTY
SITE D-3

OVER ELM SLOUGH
07-134-0141-18-033

SHEET 1 OF 2 SCALE 1"=30'

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		24

DATE: 9/9/2024 10:02:37 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/D-3 KIMBLE DETAILS

PHOTO 1.
- DAMAGED CONCRETE POST AT NORTHWEST WINGWALL, LOOKING NORTH.

GENERAL NOTES

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3. SEE PHOTOS SHOWING DETAILS OF REPAIR AREAS.

BRIDGE REPAIR PHOTOS

Texas Department of Transportation — San Angelo District

FM 1674

KIMBLE COUNTY
SITE D-3
OVER ELM SLOUGH
07-134-0141-18-033

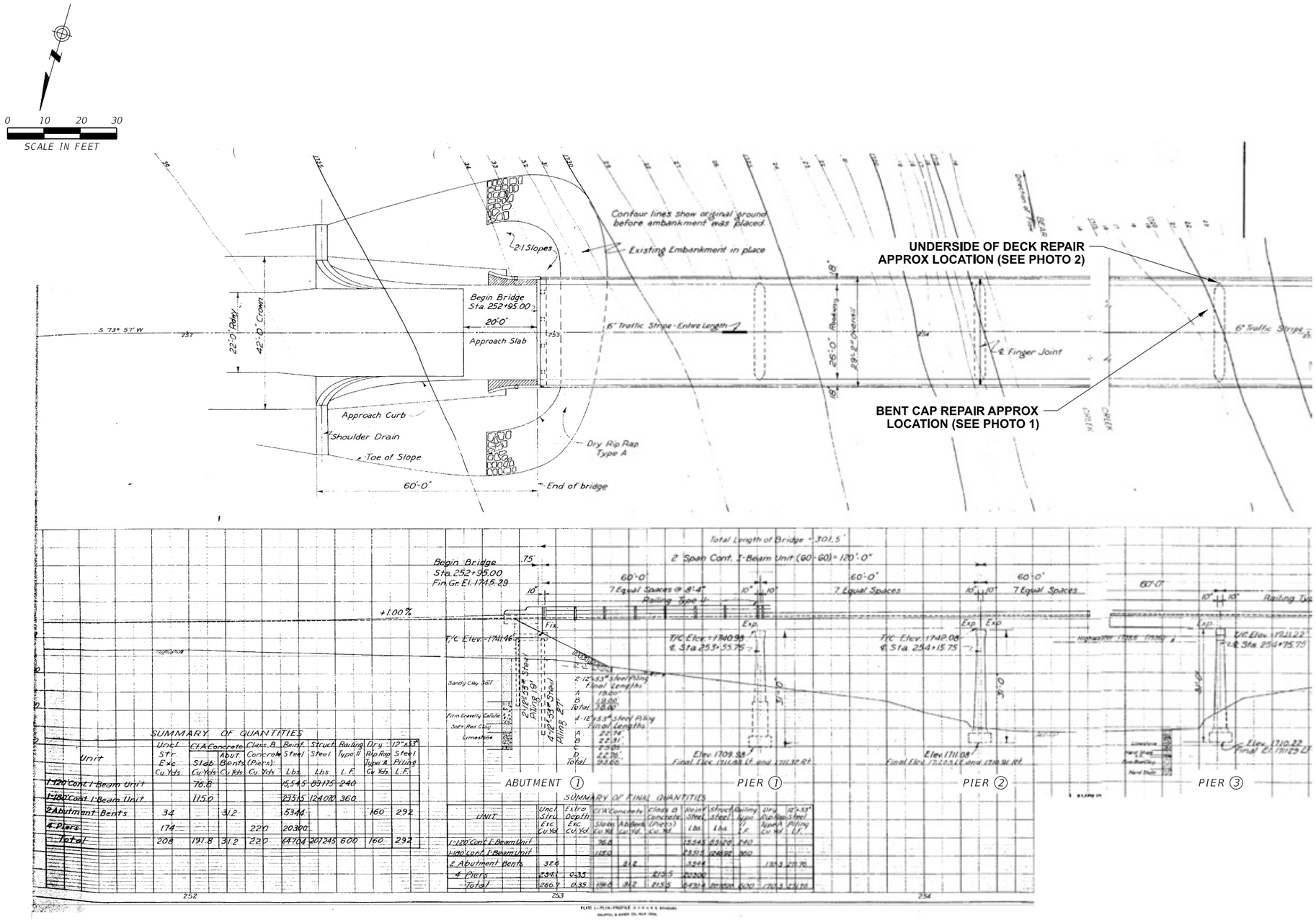
SHEET 2 OF 2

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.

DIST	COUNTY	SHEET NO.
SJT	KIMBLE, ETC.	25

DATE: 9/9/2024 10:02:40 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/D-3 KIMBLE DETAILS



SUMMARY OF QUANTITIES

Unit	Uncl. Str. Exc. Cu. Yds.	CIA Concrete Slab Cu. Yds.	CIA Concrete Abut. Bents (Piers) Cu. Yds.	Class B Concrete Cu. Yds.	Reinf. Steel Lbs.	Struct. Steel Lbs.	Railing Type B L.F.	Dry Rip Rap Type A Cu. Yds.	12"x53" Steel Piling L.F.
1-120' Cont I-Beam Unit		76.8			15545	89175	240		
1-180' Cont I-Beam Unit		115.0			23515	124070	360		
2 Abutment Bents	34		3.2		5344			160	292
4 Piers	174			220	20300				
Total	208	191.8	3.2	220	64704	207245	600	160	292

SUMMARY OF FINAL QUANTITIES

UNIT	Unch. Stru. Exc. Cu.Yd.	Extra Depth Exc. Cu.Yd.	CIA Concrete Slabs	CIA Concrete Abut. Beam	Class B Concrete (Piers) Cu. Yd.	Reinf. Steel Lbs.	Struct. Steel Lbs.	Railing Type B L.F.	Dry Rip Rap Type A Cu. Yd.	12"x53" Steel Piling L.F.
1-120' Cont I-Beam Unit			76.8			15545	89175	240		
1-180' Cont I-Beam Unit			115.0			23515	124070	360		
2 Abutment Bents	32.6			3.2		5344			160	292
4 Piers	239.1	0.35			215.5	20300				
Total	266.9	0.35	191.8	3.2	215.5	64704	207245	600	160	292

BRIDGE REPAIR LAYOUT

GENERAL NOTES

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9/9/2024

STATE OF TEXAS
JORDAN A. SEFCIK
129853
LICENSED
PROFESSIONAL ENGINEER

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Texas Department of Transportation | San Angelo District

FM 1674

KIMBLE COUNTY SITE D-4

OVER BEAR CREEK
07-134-0141-18-051

SHEET 1 OF 2 SCALE 1"=30'

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		26

DATE: 9/9/2024 10:02:41 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/D-3 KIMBLE DETAILS

PHOTO 1.
- DELAMINATION IN PIER CAP AT BENT 3, LOOKING WEST.

PHOTO 2.
- DELAMINATION AND SPALLING IN UNDERSIDE OF DECK OVER BENT 3, LOOKING WEST.

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

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3. SEE PHOTOS SHOWING DETAILS OF REPAIR AREAS.

BRIDGE REPAIR PHOTOS

Texas Department of Transportation | San Angelo District

FM 1674

KIMBLE COUNTY
SITE D-4

OVER BEAR CREEK
07-134-0141-18-051

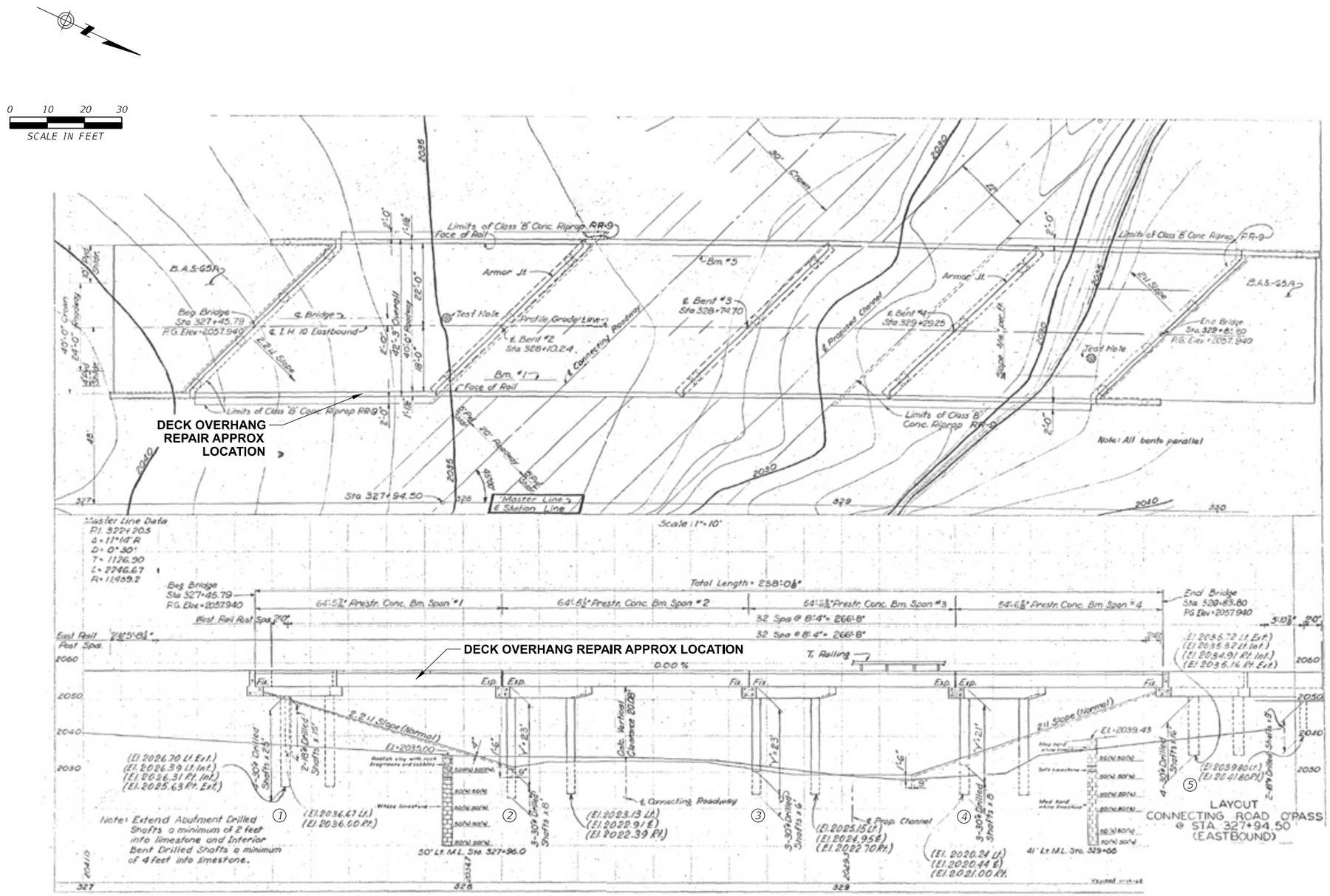
SHEET 2 OF 2

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.

DIST	COUNTY	SHEET NO.
SJT	KIMBLE, ETC.	27

DATE: 9/9/2024 10:02:43 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/D-3 KIMBLE DETAILS



BRIDGE REPAIR LAYOUT

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

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5. SEE PHOTOS FOR REPAIR LOCATIONS ON THE FOLLOWING SHEET.

9/9/2024

STATE OF TEXAS
JORDAN A. SEFCIK
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PROFESSIONAL ENGINEER

DocuSigned by:
Jordan A. Sefcik
2926CE8D1B10401...

Texas Department of Transportation | San Angelo District

IH 10 EB

KIMBLE COUNTY SITE D-5

OVER DITCH & OLD SEGOVIA ROAD
07-134-0142-01-057

SHEET 1 OF 3 SCALE 1"=30'

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		28

DATE: 9/9/2024 10:02:43 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/D-3 KIMBLE DETAILS

PHOTO 1.
- NORTHEAST DECK OVERHANG IN SPAN 1 FROM THE SOUTH SPALLING, LOOKING WEST.

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

2. REPAIR LOCATIONS NOTED ARE APPROXIMATE AND ARE PROVIDED AS A VISUAL AID. ACTUAL REPAIR LOCATIONS TO BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING REPAIR WORK.

3. SEE PHOTOS SHOWING DETAILS OF REPAIR AREAS.

BRIDGE REPAIR PHOTOS

Texas Department of Transportation | San Angelo District

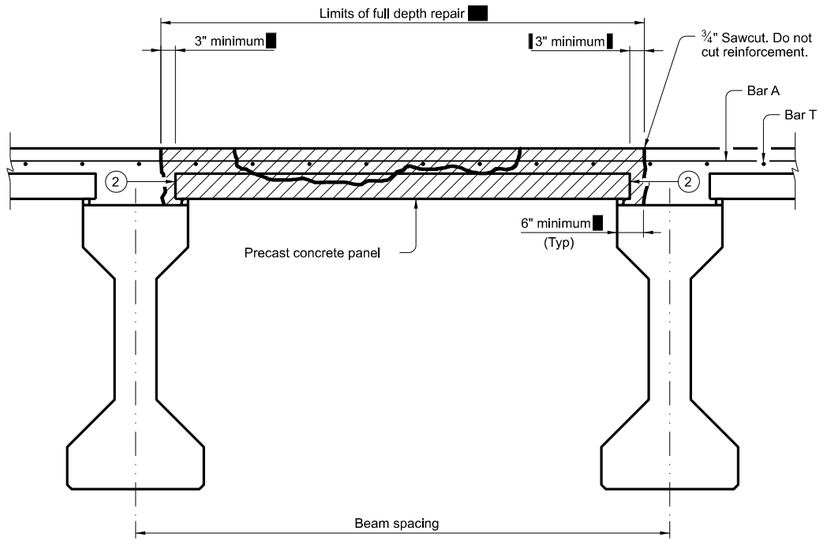
IH 10 EB

KIMBLE COUNTY
SITE D-5
OVER DITCH & OLD SEGOVIA ROAD
07-134-0142-01-057

SHEET 2 OF 3

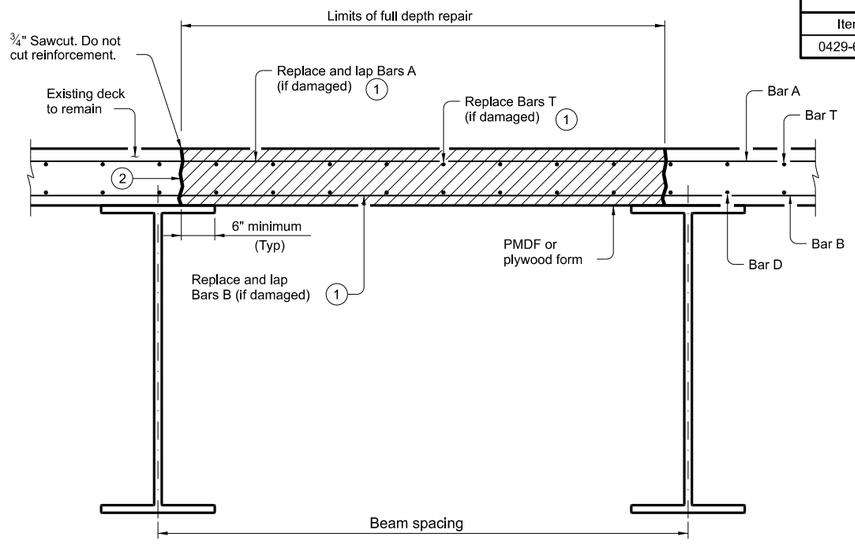
SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		29



FULL DEPTH DECK REPAIR WITH PANELS

(Showing concrete beams)



FULL DEPTH DECK REPAIR WITHOUT PANELS

(Showing steel beams)

TABLE OF ESTIMATED QUANTITIES

Item	Description	Units	Quantity
0429-6005	CONC STR REPAIR (DECK REP (FULL DEPTH))	SF	10.0

REINFORCING BAR TABLE

Bar	Size	Max Spa	Bar Laps	
			Uncoated	Coated
A	#5	6"	2'-0"	3'-0"
T	#4	9"	1'-7"	2'-5"
B	#5	6"	2'-0"	3'-0"
D	#4	9"	1'-7"	2'-5"

Reinforcing steel is approximately 3 lbs/sf per mat

(1) See REINFORCING BAR TABLE for bar sizes and laps to provide if bars cannot be salvaged.

(2) Chip to remove deck material and panel (if present) using maximum 15lb hammer. Do not damage beam top flange. Remove enough deck material to provide for 6" minimum ledge on beam flange.

REPAIR PROCEDURE

Refer to the TxDOT Concrete Repair Manual Chapter 3, Section 4 for detailed repair steps.

1) Sound repair area and mark repair limits using straight lines in the presence of the Engineer.
2) Saw cut the entire perimeter of the repair boundary ¾" deep without cutting into existing reinforcement.
3) Use power-driven chipping tools (up to 30lb. hammer) to remove concrete. Use 15lb. hammers near the repair boundaries to prevent damage caused to sound concrete outside of the repair limits.
4) Remove damaged reinforcement and install new reinforcement as directed by the Engineer.
5) For uncoated steel reinforcing, abrasive blast steel until all rust is removed and steel is clean. Do not abrasive blast coated reinforcing. Restore damaged epoxy coating in accordance with Item 440.3.6.3.
6) Install formwork.
7) Prepare surfaces for concrete placement in accordance with Item 422.4.6.5.
8) Obtain approval of the prepared surface by the Engineer before placing concrete.
9) Place concrete according to Item 422, "Concrete Superstructures" and allow to cure.

PHOTO SHOWING LIMITS OF REPAIR

Photos shown are for informational purposes and may not reflect exact site conditions or magnitude of repairs needed. Field verify magnitude of repairs prior to ordering materials.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide Class S concrete (f'c = 4,000 psi). Alternatively, Type A or D concrete repair materials conforming to DMS-4655 may be used if approved by the Engineer.
Do not open to traffic until repairs meet a minimum compressive strength of 3,600 psi.

GENERAL NOTES:

Do not damage existing reinforcing. Replace reinforcing steel if more than 25% of the cross sectional area of reinforcing is damaged. Provide laps per Reinforcing Bar Table.
Perform all concrete repairs in accordance with Item 422 and Chapter 3, Section 4 of TxDOT's Concrete Repair Manual. A copy of the Concrete Repair Manual must be available on site during all concrete repair operations.
See elsewhere in plans for repair locations.

9/9/2024

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Texas Department of Transportation | Bridge Division

IH 10 EB

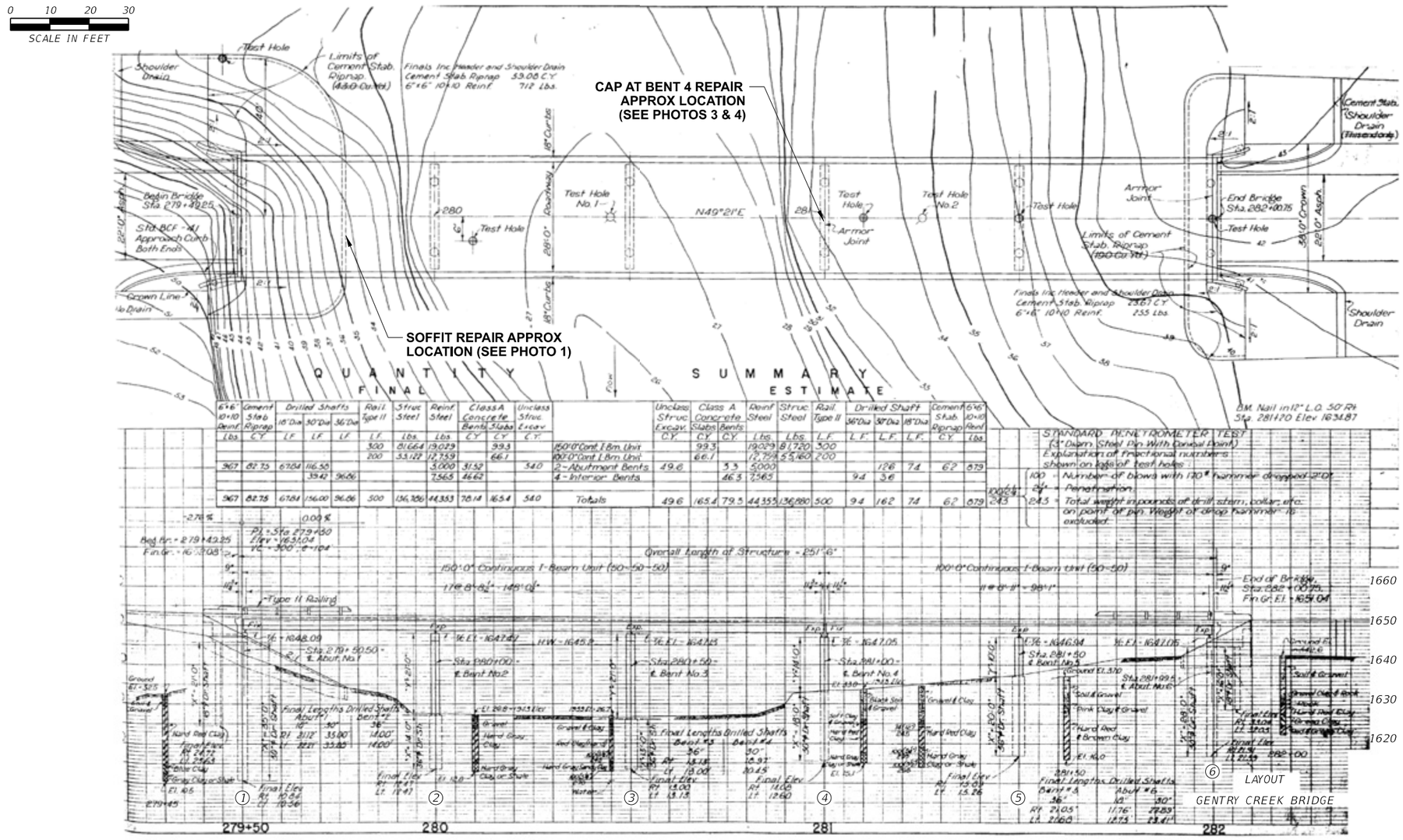
FULL DEPTH REPAIR DETAIL

KIMBLE COUNTY SITE D-5
NBI: 07-134-0142-01-057

SHEET 3 OF 3

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2024	CONT	SECT	JOB	HIGHWAY
REVISIONS 06-24	6470	93	001	US 377, ETC.
	DIST	COUNTY		SHEET NO.
	SJT	KIMBLE, ETC.		30

DATE: 9/9/2024 10:02:47 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/D-3 KIMBLE DETAILS



6"x6" 10x10 Reinf.	Cement Stab Riprap	Drilled Shafts 16" Dia	30" Dia	36" Dia	Rail Type II	Struc Steel	Reinf Steel	Class A Concrete Bents	Slabs	Unclass Struc Excav	
Lbs	C.Y.	L.F.	L.F.	L.F.	L.F.	Lbs.	Lbs	C.Y.	C.Y.	C.Y.	
					300	81,664	19,029		99.3		150'-0" Cont. T Bm. Unit
					200	55,122	12,759		66.1		100'-0" Cont. T Bm. Unit
967	82.75	67.84	116.55				5,000	31.52		34.0	2 - Abutment Bents
				39.42	96.06		7,565	46.62			4 - Interior Bents
967	82.75	67.84	156.00	96.06	500	136,786	44,393	78.14	165.4	34.0	Totals

Unclass Struc Excav.	Class A Concrete Slabs	Bents	Reinf Steel	Struc Steel	Rail Type II	Drilled Shaft 36"Dia	30"Dia	18"Dia	Cement Stab. Riprap	6"x6" 10x10 Reinf
C.Y.	C.Y.	C.Y.	Lbs.	Lbs.	L.F.	L.F.	L.F.	L.F.	C.Y.	Lbs
	99.3		19029	81,720	300					
	66.1		12,759	55,160	200					
		5.3	5000				126	74	62	679
		46.3	7,565			94	36			
100.4	165.4	79.5	44,355	136,880	500	94	162	74	62	679
243										

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

2. LAYOUT, STATIONS, AND ELEVATIONS SHOWN ARE BASED ON AS-BUILT PLANS.

3. REPAIR LOCATIONS NOTED ARE APPROXIMATE AND ARE PROVIDED AS A VISUAL AID. ACTUAL REPAIR LOCATIONS TO BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING REPAIR WORK.

4. SEE AS-BUILT PLANS SHOWING DETAILS OF EXISTING STEEL BEAMS, DIAPHRAGMS, AND BEARINGS.

5. SEE PHOTOS FOR REPAIR LOCATIONS ON THE FOLLOWING SHEET.

BRIDGE REPAIR LAYOUT

9/9/2024

STATE OF TEXAS
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Texas Department of Transportation

San Angelo District

US 377

KIMBLE COUNTY SITE D-6

OVER GENTRY CREEK
07-134-0149-01-021

SHEET 1 OF 2 SCALE 1"=30'

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		31

DATE: 9/9/2024 10:02:48 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/D-3 KIMBLE DETAILS

PHOTO 1.
- SPALLS IN DECK SOFFIT IN SPAN 1 FROM SOUTHWEST, LOOKING SOUTHWEST.

PHOTO 2.
- TYPICAL DELAMINATION AND SPALLS OF DECK UNDERSIDE, COMMON ALONG THE DIAPHRAMS BELOW CONSTRUCTION JOINTS.

PHOTO 3.
- HORIZONTAL CRACKS IN CAP AT BENT 4 FROM SOUTHWEST, LOOKING NORTH.

PHOTO 4.
- HORIZONTAL CRACKS IN CAP AT BENT 4 FROM SOUTHWEST, LOOKING SOUTHWEST.

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

2. REPAIR LOCATIONS NOTED ARE APPROXIMATE AND ARE PROVIDED AS A VISUAL AID. ACTUAL REPAIR LOCATIONS TO BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING REPAIR WORK.

3. SEE PHOTOS SHOWING DETAILS OF REPAIR AREAS.

BRIDGE REPAIR PHOTOS

Texas Department of Transportation — San Angelo District

US 377

KIMBLE COUNTY SITE D-6

OVER GENTRY CREEK
07-134-0149-01-021

SHEET 2 OF 2

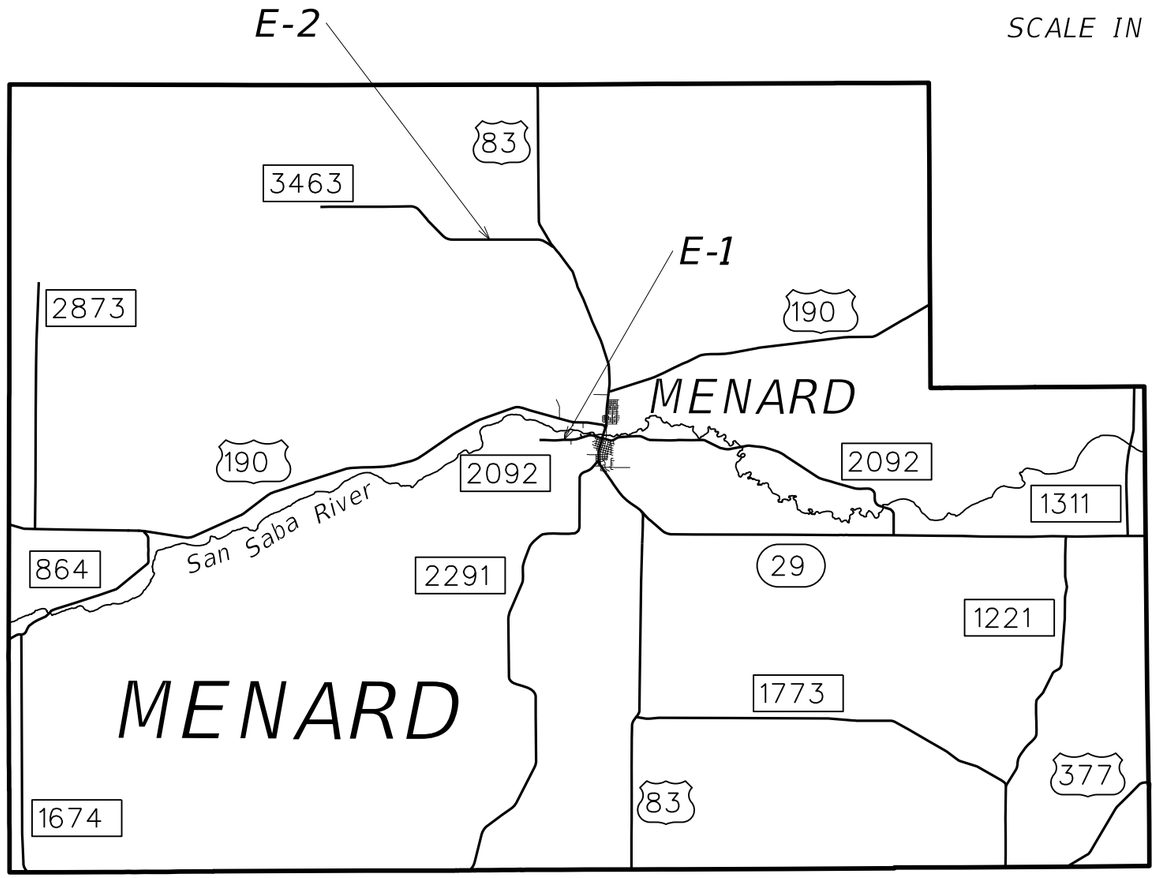
SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.

DIST.	COUNTY	SHEET NO.
SJT	KIMBLE, ETC.	32

DATE: 9/9/2024 10:02:50 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/D-3 KIMBLE DETAILS

Site No.	Structure ID	County Name	Highway	Feature Crossed	Location Description	Latitude	Longitude
E-1	07-164-2008-01-002	MENARD	FM 2092	LOS MORAS CREEK	1.25 MI W OF US 83	30.91682451	-99.80679322
E-2	07-164-3209-01-002	MENARD	RM 3463	CELERY CREEK	2.05 MI W OF US 83	31.01298502	-99.84623362



0 2.5 5

SCALE IN MILES

Texas Department of Transportation

San Angelo District

LOCATION MAP
MENARD COUNTY

SHEET 1 OF 1

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.

DIST	COUNTY	SHEET NO
SJT	KIMBLE, ETC.	33

DATE: 9/9/2024 10:02:52 AM
FILE: pw://txdot.projectwiseonline.com:TxDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/E-1 MENARD LOC

Site No.	Structure ID	Work Description	0104-7006 REMOV CONC (RIPRAP)	0401-7001 FLOWABLE BACKFILL	0432-7043 RIPRAP (STONE PROTECTION) (18 IN)
			SY	CY	CY
E-1	07-164-2008-01-002	SOUTHWEST CORNER RIPRAP IS FAILING. RIPRAP HAS FRACTURED, SETTLED, IS EXPOSED, UNDERMINED AND IS SHIFTING AWAY FROM SOUTHWEST WINGWALL (~ 0.5') AND GUARDFENCE. REMOVE EXISTING FAILED RIPRAP, THE EMBANKMENT REBUILT, AND NEW FLEXIBLE SCOUR COUNTERMEASURES PLACED AT THE SW EMBANKMENT.	267.0	20.0	267.0
E-2	07-164-3209-01-002	SOUTHWEST WINGWALL IS UNDERMINED UP TO 2'. WEST RIPRAP TOEWALL IS EXPOSED (UP TO 2.8' D) AND UNDERMINED (~ 1') DUE TO CHANNEL BED SCOUR. THE SOUTHWEST RIPRAP TOEWALL IS EXPOSED (UP TO 4') AND UNDERMINED (UP TO 2.8'). EAST HEADER RIPRAP TOEWALL IS EXPOSED (UP TO 2.9' D) WITH NO UNDERMINING. BACKFILL UNDERMINED AREA OF SOUTHWEST RIPRAP AND ADD ROCK RIPRAP ALONG EXPOSED TOEWALLS OF SOUTHWEST RIPRAP, WEST RIPRAP AND EAST RIPRAP. REPAIR UNDERMINING AT SOTHWEST WINGWALL.	-	5.0	65.0
		County Totals:	267.0	25.0	332.0

DATE: 9/9/2024 10:02:53 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/E-2 MENARD.DS

Texas Department of Transportation

San Angelo District

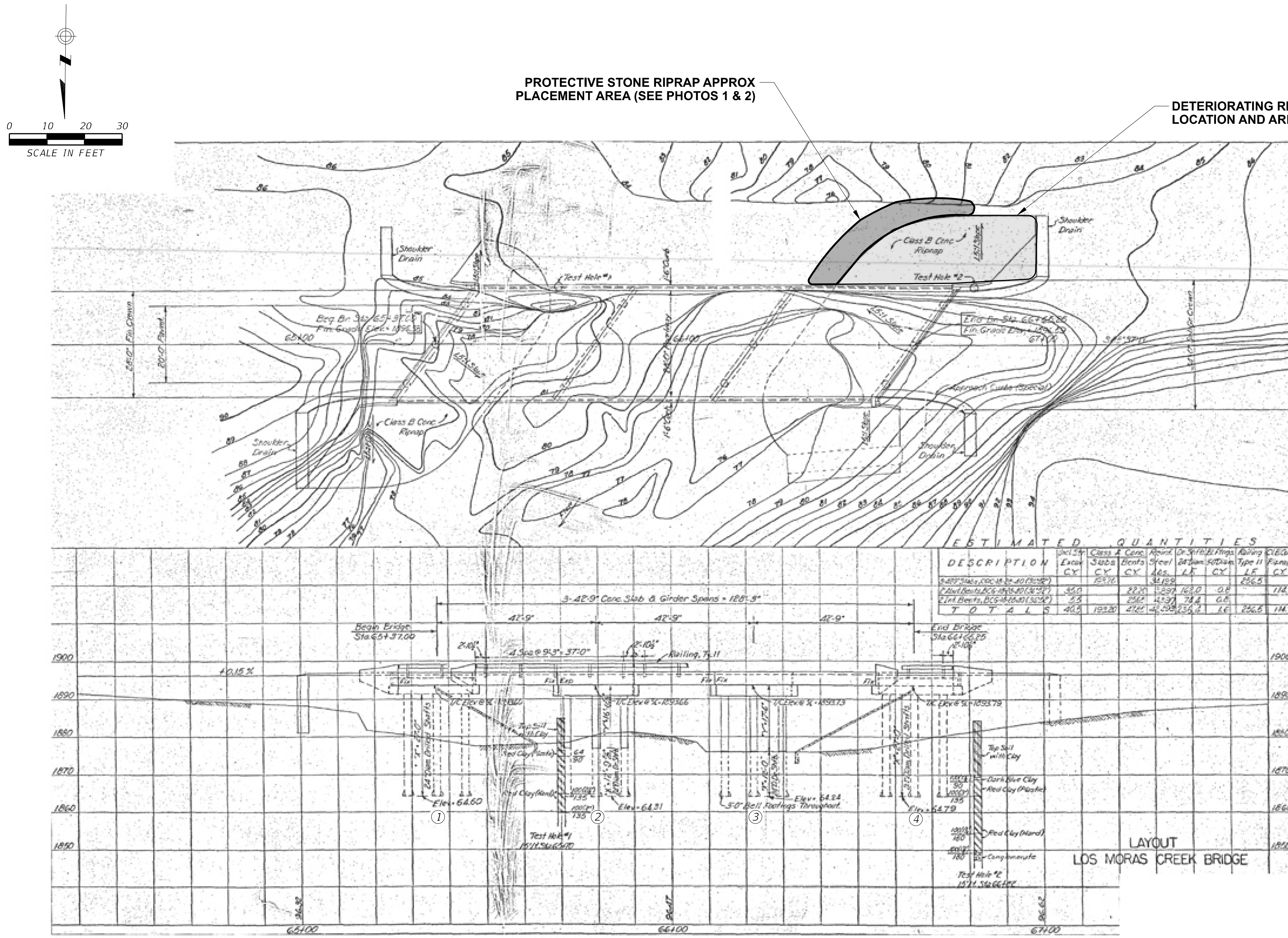
QUANTITY SUMMARY
MENARD COUNTY

SHEET 1 OF 1

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.

DIST	COUNTY	SHEET NO.
SJT	KIMBLE, ETC.	34



ESTIMATED QUANTITIES

DESCRIPTION	Uncl. Str. Excav CY	Class C Conc Slabs CY	Class C Conc Bents CY	Reinf. Steel Lbs.	Dr. Shaft 24" Diam LF	Bl. Ftngs 30" Diam CY	Railing Type II LF	Cl. B Conc Riprap CY
3-42'9" Slabs, CGC-18-28-40 (32'x32')		193.20		32,195			256.5	
2 Abut Bents, BC6-18-28-40 (32'x32')	35.0		22.20	2,897	162.0	0.8		114.7
2 Int. Bents, BC6-18-28-40 (32'x32')	5.5		25.62	4,537	73.4	0.8		
TOTALS	40.5	193.20	47.82	41,538	235.4	1.6	256.5	114.7

BRIDGE REPAIR LAYOUT

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.
2. LAYOUT, STATIONS, AND ELEVATIONS SHOWN ARE BASED ON AS-BUILT PLANS.
3. REPAIR LOCATIONS NOTED ARE APPROXIMATE AND ARE PROVIDED AS A VISUAL AID. ACTUAL REPAIR LOCATIONS TO BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING REPAIR WORK.
4. SEE AS-BUILT PLANS SHOWING DETAILS OF EXISTING STEEL BEAMS, DIAPHRAGMS, AND BEARINGS.
5. SEE PHOTOS FOR REPAIR LOCATIONS ON THE FOLLOWING SHEET.

9/9/2024

STATE OF TEXAS
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Texas Department of Transportation | San Angelo District

FM 2092

MENARD COUNTY
SITE E-1

OVER LOS MORAS CREEK
07-164-2008-01-002

SHEET 1 OF 2 SCALE 1"=30'

©TxDOT 2024	CONT	SECT	JOB	HIGHWAY
SHEET ISSUED OR LAST REVISED	6470	93	001	US 377, ETC.
	DIST		COUNTY	SHEET NO.
	SJT		KIMBLE, ETC.	35

DATE: 9/9/2024 10:02:54 AM
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PHOTO 1.
- DETERIORATION OF SOUTHWEST RIPRAP, LOOKING NORTHWEST.

PHOTO 2.
- DETERIORATION OF SOUTHWEST RIPRAP, LOOKING WEST.

GENERAL NOTES

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BRIDGE REPAIR PHOTOS

Texas Department of Transportation | San Angelo District

FM 2092

MENARD COUNTY
SITE E-1

OVER LOS MORAS CREEK
07-164-2008-01-002

SHEET 2 OF 2

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.

DIST	COUNTY	SHEET NO.
SJT	KIMBLE, ETC.	36

DATE: 9/9/2024 10:02:58 AM
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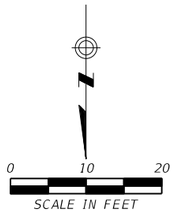

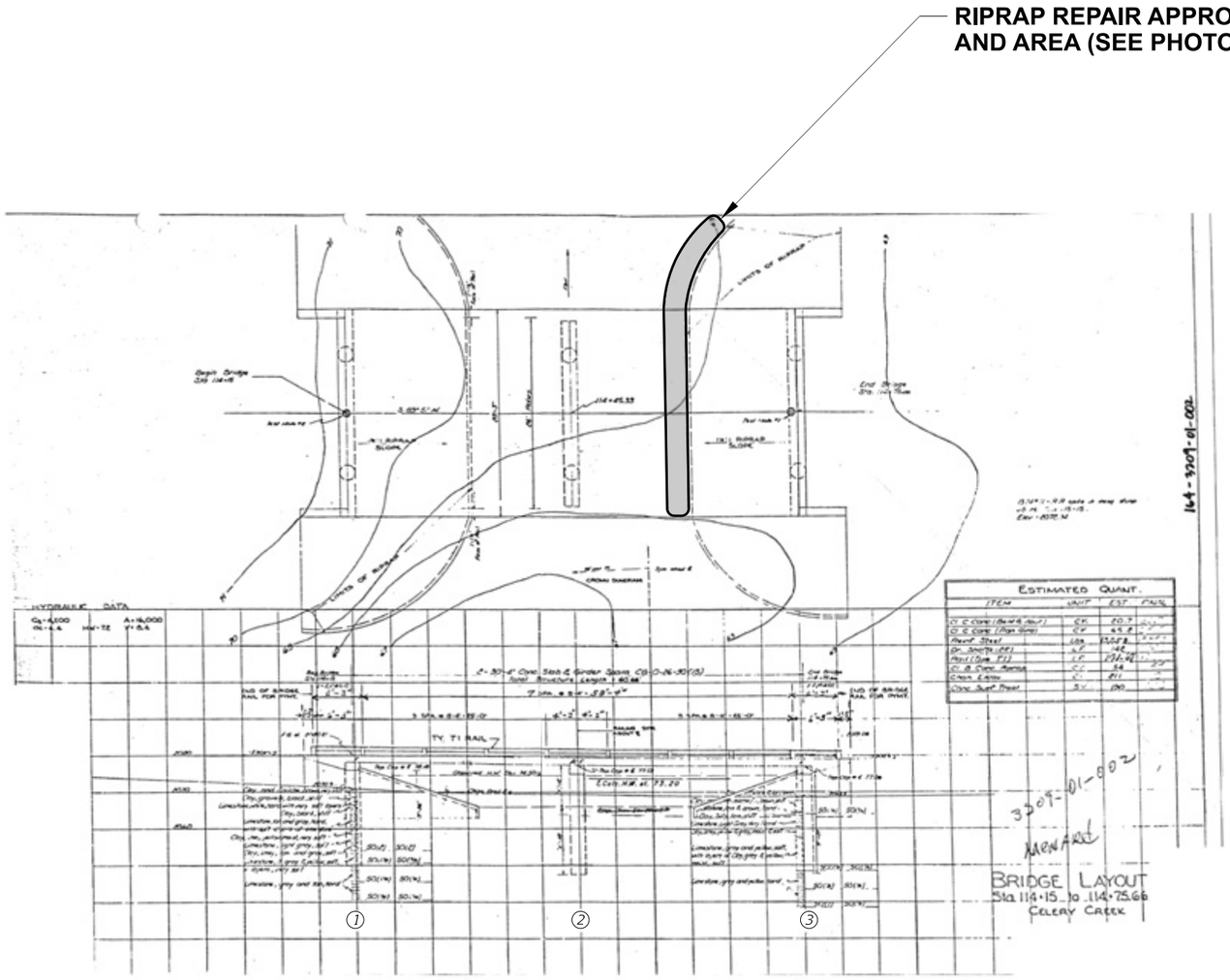

BRIDGE REPAIR LAYOUT

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Texas Department of Transportation

San Angelo District

RM 3463

MENARD COUNTY SITE E-2

OVER CELERY CREEK
07-164-3209-01-002

SHEET 1 OF 2 SCALE 1"=20'

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		37

DATE: 9/9/2024 10:02:59 AM
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PHOTO 1.
- EXPOSED AND UNDERMINED SOUTHWEST RIPRAP, LOOKING NORTHWEST.

PHOTO 2.
- EXPOSED AND UNDERMINED SOUTHWEST RIPRAP, LOOKING WEST.

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

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3. SEE PHOTOS SHOWING DETAILS OF REPAIR AREAS.

BRIDGE REPAIR PHOTOS

Texas Department of Transportation | San Angelo District

RM 3463

MENARD COUNTY SITE E-2

OVER CELERY CREEK
07-164-3209-01-002

SHEET 2 OF 2

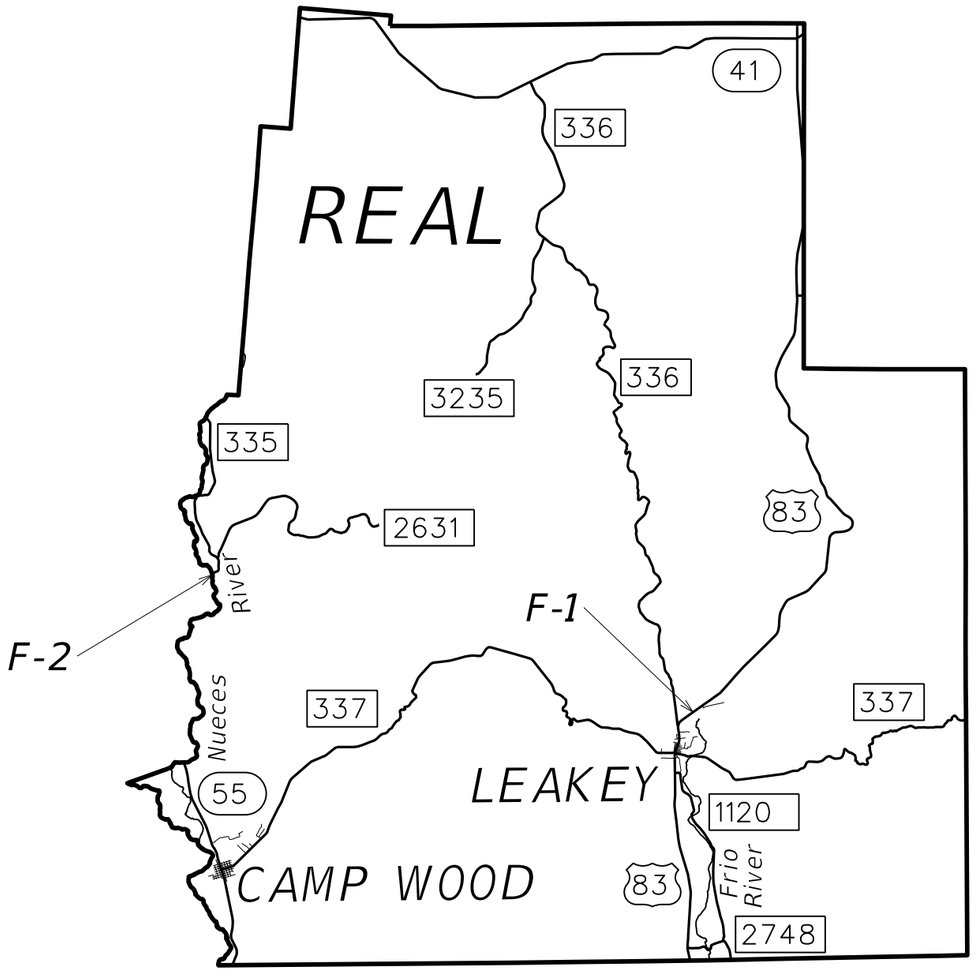
SHEET ISSUED OR LAST REVISED

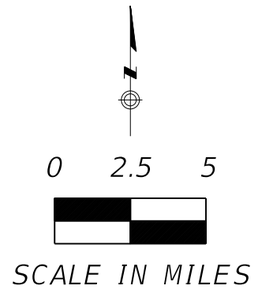
CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.

DIST	COUNTY	SHEET NO
SJT	KIMBLE, ETC.	38

DATE: 9/9/2024 10:03:00 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/E-3 MENARD DETAILS

Site No.	Structure ID	County Name	Highway	Feature Crossed	Location Description	Latitude	Longitude
F-1	07-193-0036-05-040	REAL	US 83	WEST FRIO RIVER	0.70 MI N OF RM 336	29.74430448	-99.75289178
F-2	07-193-0830-02-001	REAL	RM 335	NUECES RIVER	0.75 MI S OF RM 2631	29.81025044	-100.0175117





Texas Department of Transportation

San Angelo District

LOCATION MAP
REAL COUNTY

SHEET 1 OF 1

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		39

DATE: 9/9/2024 10:03:01 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/F-1 REAL LOC

Site No.	Structure ID	Work Description	0104-7047 REMOV CONC (MISC)	0401-7001 FLOWABLE BACKFILL	0429-7009 CONC STR REPAIR (STANDARD)	0432-7045 RIPRAP (STONE PROTECTION) (24 IN)	0778-7001 CONCRETE RAIL REPAIR (IN-KIND)	7020-7003 GEN DEBRIS REMOVE FROM UNDER BRIDGES
			CY	CY	SF	CY	LF	CY
F-1	07-193-0036-05-040	ONE SECTION (~ 28' LENGTH) OF NORTHWEST BRIDGE RAIL OVER SPAN #10 (FROM SOUTHWEST) IS SLIGHTLY LEANING INWARD (~ 1") WITH WIDE (~ 1/2" WIDTH) HORIZONTAL CRACKING AT BASE IN OUTSIDE FASCIA. BRIDGE RAILS HAVE MINOR (UP TO 1' DIAMETER X < 1" DEPTH) SPALLING (SOME WITH EXPOSED STEEL) AND DELAMINATION AT VARIOUS LOCATIONS. SPALLING IS MOSTLY IN NORTHWEST BRIDGE RAIL NEAR BASE. REPAIR WIDE HORIZONTAL CRACKING ALONG BASE OF NORTHWEST BRIDGE RAIL OVER SPAN #10 (FROM SOUTHWEST). REPAIR SPALLED AND DELAMINATED SECTIONS IN BRIDGE RAILS.	-	-	50.0	-	20.0	-
F-2	07-193-0830-02-001	A LARGE (~ 20' DIAMETER X 6' DEPTH) SCOUR HOLE UNDER THE BRIDGE HAS CAUSED PARTIAL FAILURE OF INTERLOCKING CONCRETE BLOCK RIPRAP AND HAS DISPLACED SOME ROCKS ALONG SOUTHWEST ABUTMENT. EMBANKMENT EROSION HAS EXPOSED (UP TO 1.5' DEPTH X ALMOST FULL LENGTH) AND UNDERMINED (UP TO 4') SOUTHWEST ABUTMENT CAP EXPOSING (UP TO 1.5' DEPTH) DRILLED SHAFTS. PLACE STONE RIPRAP AT SOUTH EMBANKMENT, FILL VOIDED AREA UNDER SOUTH APPROACH SLAB, REMOVE ANY REMAINING TIMBER DEBRIS, FAILED A-JACKS, AND FAILED GABION BASKETS FROM AROUND THE SOUTH ABUTMENT.	125.0	40.0	-	450.0	-	40.0
		County Totals:	125.0	40.0	50.0	450.0	20.0	40.0

DATE: 9/9/2024 10:03:06 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/F-2 REAL QS

Texas Department of Transportation

San Angelo District

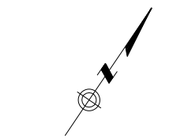
QUANTITY SUMMARY
REAL COUNTY

SHEET 1 OF 1

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.

DIST	COUNTY	SHEET NO.
SJT	KIMBLE, ETC.	40



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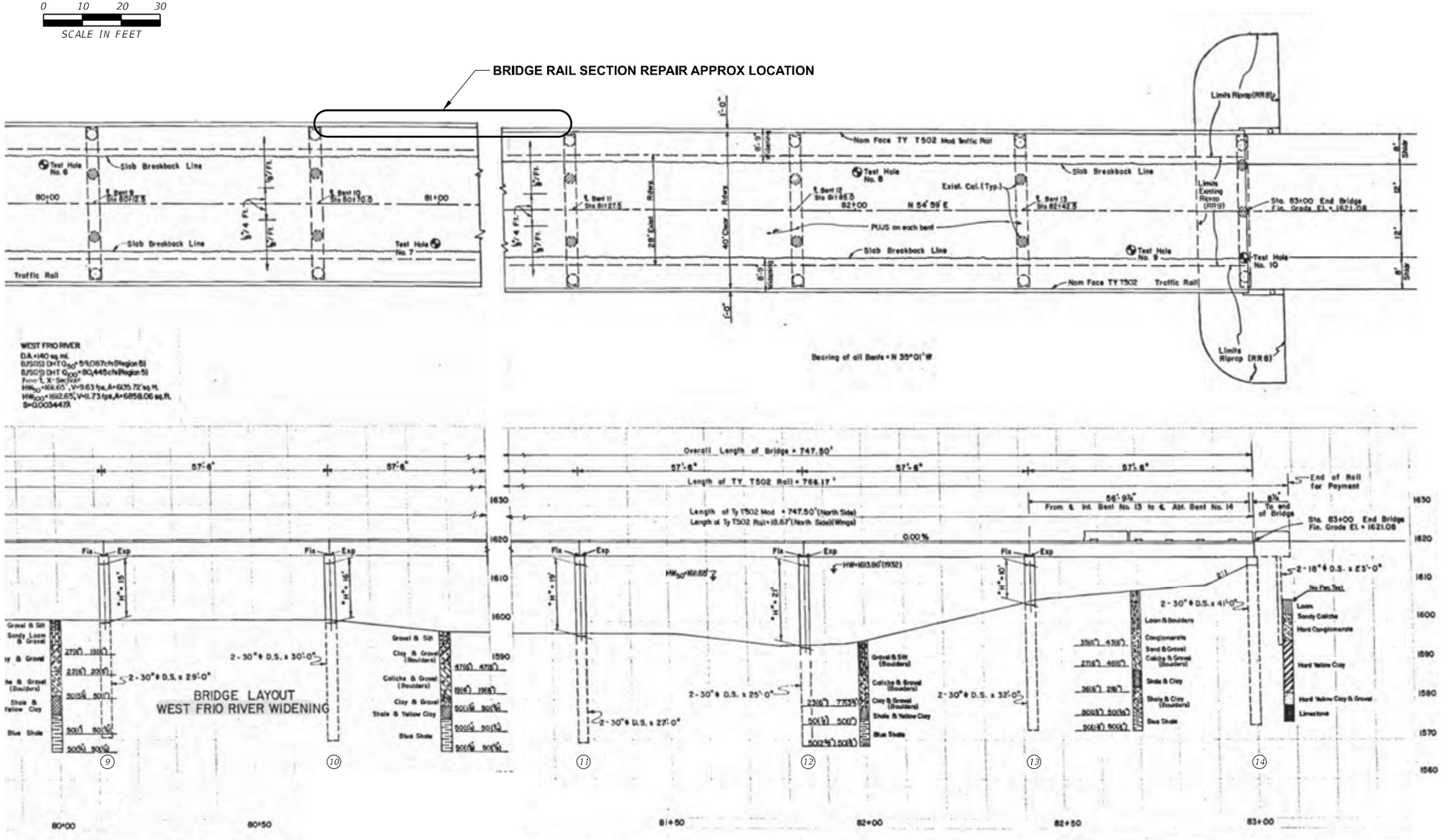
SCALE IN FEET



BRIDGE REPAIR LAYOUT

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

2. LAYOUT, STATIONS, AND ELEVATIONS SHOWN ARE BASED ON AS-BUILT PLANS.

3. REPAIR LOCATIONS NOTED ARE APPROXIMATE AND ARE PROVIDED AS A VISUAL AID. ACTUAL REPAIR LOCATIONS TO BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING REPAIR WORK.

4. SEE AS-BUILT PLANS SHOWING DETAILS OF EXISTING STEEL BEAMS, DIAPHRAGMS, AND BEARINGS.

5. SEE PHOTOS FOR REPAIR LOCATIONS ON THE FOLLOWING SHEET.

9/9/2024

STATE OF TEXAS
JORDAN A. SEFCIK
129853
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Jordan A. Sefcik
2926CE8D1B10401...

Texas Department of Transportation | San Angelo District

US 83

REAL COUNTY SITE F-1

OVER WEST FRIO REIVER
07-193-0036-05-040

SHEET 1 OF 2 | SCALE 1"=30'

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		41

DATE: 9/9/2024 10:03:08 AM
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PHOTO 1.
- CRACK IN NORTHWEST BRIDGE RAIL IN SPAN 10, LOOKING SOUTHEAST.

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

2. REPAIR LOCATIONS NOTED ARE APPROXIMATE AND ARE PROVIDED AS A VISUAL AID. ACTUAL REPAIR LOCATIONS TO BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING REPAIR WORK.

3. SEE PHOTOS SHOWING DETAILS OF REPAIR AREAS.

BRIDGE REPAIR PHOTOS

Texas Department of Transportation | San Angelo District

US 83

REAL COUNTY
SITE F-1

OVER WEST FRIO RIVER
07-193-0036-05-040

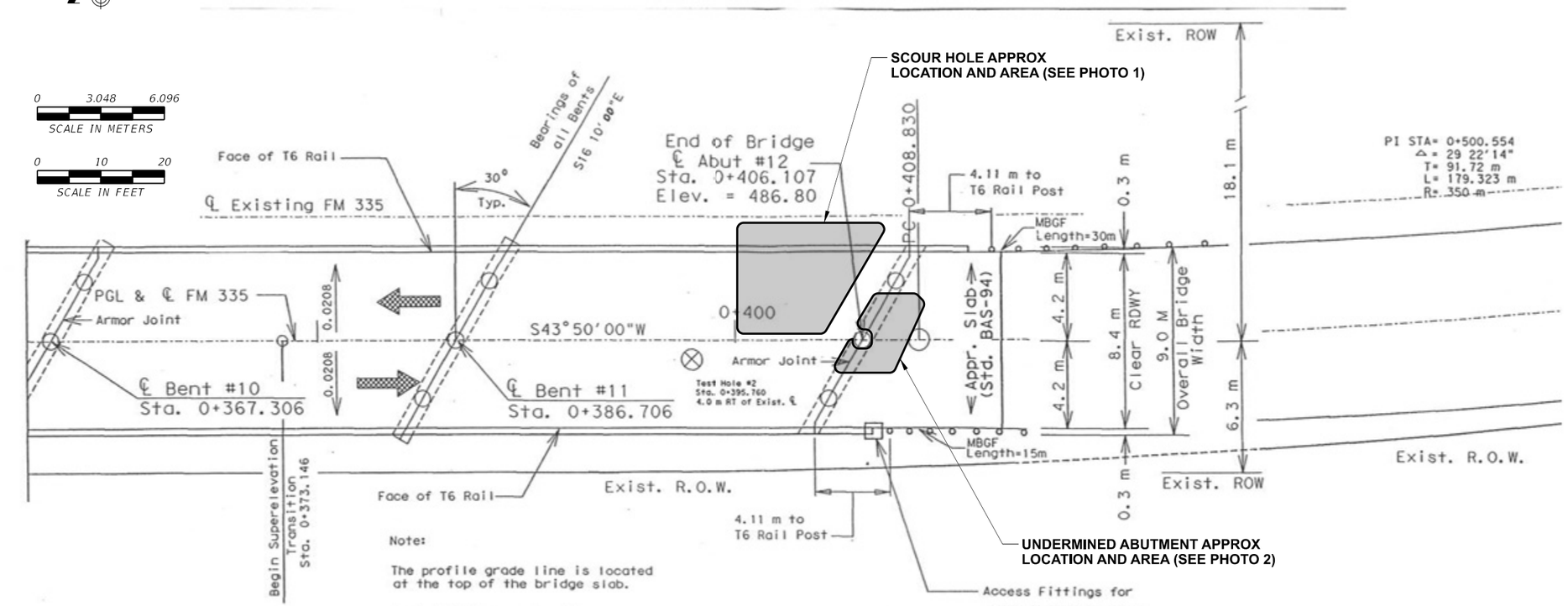
SHEET 2 OF 2

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.

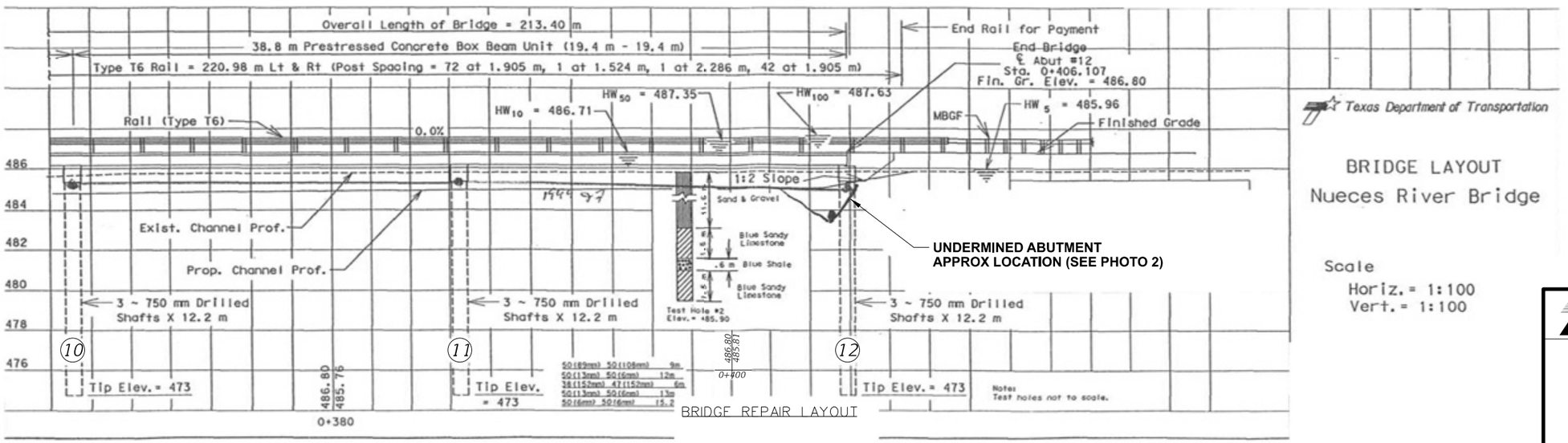
DIST	COUNTY	SHEET NO
SJT	KIMBLE, ETC.	42

DATE: 9/9/2024 10:03:12 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/F-3 REAL DETAILS



GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.
2. LAYOUT, STATIONS, AND ELEVATIONS SHOWN ARE BASED ON AS-BUILT PLANS.
3. REPAIR LOCATIONS NOTED ARE APPROXIMATE AND ARE PROVIDED AS A VISUAL AID. ACTUAL REPAIR LOCATIONS TO BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING REPAIR WORK.
4. SEE AS-BUILT PLANS SHOWING DETAILS OF EXISTING STEEL BEAMS, DIAPHRAGMS, AND BEARINGS.
5. SEE PHOTOS FOR REPAIR LOCATIONS ON THE FOLLOWING SHEET.



BRIDGE REPAIR LAYOUT

Texas Department of Transportation

BRIDGE LAYOUT
Nueces River Bridge

Scale
Horiz. = 1:100
Vert. = 1:100

9/9/2024

STATE OF TEXAS
JORDAN A. SEFCIK
129853
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Texas Department of Transportation | San Angelo District

RM 335

REAL COUNTY SITE F-2

OVER NUECES RIVER
07-193-0830-02-001

SHEET 1 OF 2 SCALE 1"=20'

©TxDOT 2024	CONT	SECT	JOB	HIGHWAY
SHEET ISSUED OR LAST REVISED	6470	93	001	US 377, ETC.
	DIST	COUNTY		SHEET NO.
	SJT	KIMBLE, ETC.		43

DATE: 9/9/2024 10:03:13 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/F-3 REAL DETAILS

PHOTO 1.
- CHANNEL BED SCOUR HOLE UNDER SPAN 11, LOOKING SOUTHWEST.

PHOTO 2.
- UNDERMINED SOUTHWEST ABUTMENT, LOOKING SOUTH.

GENERAL NOTES

1. SEE ESTIMATED QUANITIES FOR SCOPE OF BRIDGE REHABILITATION.

2. REPAIR LOCATIONS NOTED ARE APPROXIMATE AND ARE PROVIDED AS A VISUAL AID. ACTUAL REPAIR LOCATIONS TO BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING REPAIR WORK.

3. SEE PHOTOS SHOWING DETAILS OF REPAIR AREAS.

BRIDGE REPAIR PHOTOS

Texas Department of Transportation | San Angelo District

RM 335

REAL COUNTY
SITE F-2
OVER NUECES RIVER
07-193-0830-02-001

SHEET 2 OF 2

SHEET ISSUED OR LAST REVISED

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		44

DATE: 9/9/2024 10:03:16 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/F-3 REAL DETAILS

GENERAL NOTES

1. When a contractor force account "Safety Contingency" has been established for the project, it is for work zone enhancements that were unforeseen in the project planning and design stage, but would improve the effectiveness of the traffic control plan. 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 doing so does not slow implementation of work zone enhancements.
2. Shadow, lead, trail, and ramp control vehicles shown on the plans are required.
3. Use high level warning flags on advance warning signs during daytime operations.
4. Provide flaggers at such times and locations as directed to ensure the safe passage of traffic through construction areas. When flaggers are used to control traffic, furnish and install signs CW20-7 "FLAGGER SYMBOL", CW20-7aD "FLAGGER AHEAD", and CW3-4 "BE PREPARED TO STOP". Flaggers shall use 24 in. STOP/SLOW paddles.
5. Temporarily relocate existing mailbox assemblies on portable mailbox stands as shown on the plans, or as directed. Use materials conforming to the Compliant Work Zone Tra c Control Device List (CWZTCDL).
6. Prior to each work day, make provisions to exclude vehicles from parking within work areas.
7. Temporarily relocate existing permanent sign assemblies to temporary supports as shown on the plans, or as directed.
8. Omit advance warning signs and furnish and install reduced size signs CW20-1 "ROAD WORK AHEAD" mounted back to back with reduced size signs G20-2 "END ROAD WORK" signs at intersecting city streets and county roads.
9. Furnish and install signs CW20-1D "ROAD WORK AHEAD", G20-1aT "ROAD WORK ←NEXT X MILES, NEXT X MILES→", and G20-2 "END ROAD WORK" at intersecting state highways.
10. Sign and buffer spacing may be altered to fit field conditions, as directed.
11. In addition to providing a Contractor's Responsible Person and a phone number for emergency contact, have employee(s) available to respond on the project for emergencies and for taking corrective measures within 30 minutes.
12. Cones may be used as the typical channelizing device for freeway surfacing projects.
13. 28 in. tall cones will be allowed only for short duration or short term stationary operations when workers are present to maintain the devices upright and in proper location. Intermediate term stationary work areas should use drums, vertical panels, or 42 in. tall two-piece cones.
14. All construction signs and barricades placed during any phase of work shall remain in place until removal is approved by the Engineer.
15. The Engineer may direct the Contractor to furnish additional signs and barricades as required to maintain traffic flow, detours and motorist safety during construction.
16. Warning signs for long term stationary work should be mounted at 7 ft. to the bottom of the sign.
17. For long term stationary work at night, floodlights should be used to illuminate the work area and equipment crossings. Floodlights shall not produce a disabling glare condition for road users or workers.
18. All motor vehicle equipment having an obstructed view to the rear shall have a reverse signal alarm audible above the surrounding noise level.
19. Traffic control devices denoted with the triangle symbol on the plans may be omitted.
20. When sheet WZ(RS) is included in the plans, furnish and install temporary rumble strips for daytime lane closures. Do not use temporary rumble strips on freeways or expressways.
21. When sheet WZ(BRK) is included in the plans, furnish and install signs CW21-1T "GIVE US A BRAKE".
22. Flags attached to signs shown in the plans are required.
23. Signs END ROAD WORK (G20-2) may be omitted when conflicting with G20-2 signs already in place on the project.
24. The Engineer will determine advisory speeds to be shown on plaques CW13-1P.
25. Temporary work zone devices (including portable barriers) manufactured after December 31, 2019 must have been successfully tested to the 2016 edition of Manual for Assessing Safety Hardware (MASH). Such devices manufactured on or before this date, and successfully tested to either National Cooperative Highway Research Program (NCHRP) Report 350 or the 2009 edition of MASH, may continue to be used.

TRUCK MOUNTED ATTENUATOR REQUIREMENTS

Provide the number of vehicles with truck mounted attenuators listed in the table below. The Contractor shall determine if multiple operations will occur at the same time, to determine the total number of truck mounted attenuators needed for the project.

WZ(BTS-1)	N/A	TCP(2-3)	1 or 2	TCP(6-1)	1 or 2
TCP(1-1)	1	TCP(2-4)	1	TCP(6-2)	1
TCP(1-2)	1	TCP(2-5)	N/A	TCP(6-3)	1
TCP(1-3)	1 or 2	TCP(2-6)	N/A	TCP(6-4)	1 or 2
TCP(1-4)	1	TCP(3-1)	N/A	TCP(6-5)	1 or 2
TCP(1-5)	1	TCP(3-2)	N/A	TCP(6-6)	4
TCP(1-6)	1	TCP(3-3)	N/A	TCP(6-7)	1
TCP(2-1)	1	TCP(3-4)	N/A	TCP(6-8)	1
TCP(2-2)	1	TCP(5-1)	1	TCP(6-9)	1
TRAFFIC CONTROL PLAN PILOT VEHICLE OPERATION					N/A
TRAFFIC CONTROL PLAN TWO LANE CLOSURES ON FOUR LANE UNDIVIDED HIGHWAYS					N/A
TRAFFIC CONTROL PLAN LANE CLOSURES WITH BARRIER					N/A
TRAFFIC CONTROL PLAN SHOULDER CLOSURES WITH BARRIER					N/A
TRAFFIC CONTROL PLAN WORK SPACE NEAR SHOULDER					N/A
TRAFFIC CONTROL PLAN CROSSOVER CLOSURE					N/A
TRAFFIC CONTROL PLAN TURNAROUND CLOSURE					N/A
TRAFFIC CONTROL PLAN LANE CLOSURES WITH TRAFFIC SIGNAL AND BARRIER					N/A
TRAFFIC CONTROL PLAN LANE CLOSURES WITH TRAFFIC SIGNAL					N/A
TRAFFIC CONTROL PLAN FREEWAY CLOSURE					N/A

PORTABLE CHANGEABLE MESSAGE SIGN REQUIREMENTS

Provide the portable changeable message signs listed in the table below. The Contractor shall determine if multiple operations will occur at the same time, to determine the total number of portable changeable message signs needed for the project.

TCP(6-1)	1	TCP(6-6)	1	TCP(SC-5)	N/A
TCP(6-2)	1	TCP(6-7)	1	TCP(SC-6)	N/A
TCP(6-3)	1	TCP(6-8)	1		
TCP(6-4)	1	TCP(6-9)	1		
TRAFFIC CONTROL PLAN LANE CLOSURES WITH BARRIER					N/A
TRAFFIC CONTROL PLAN SHOULDER CLOSURES WITH BARRIER					N/A
TRAFFIC CONTROL PLAN LANE CLOSURES WITH TRAFFIC SIGNAL AND BARRIER					N/A
TRAFFIC CONTROL PLAN LANE CLOSURES WITH TRAFFIC SIGNAL					N/A
TRAFFIC CONTROL PLAN FREEWAY CLOSURE					N/A

TYPICAL USAGE

MOBILE
Work that moves continuously or intermittently (stopping for up to approximately 15 minutes).

SHORT DURATION
Work that occupies a location up to 1 hour.

SHORT TERM STATIONARY
Daytime work that occupies a location for more than 1 hour in a single daylight period.

INTERMEDIATE TERM STATIONARY
Work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than 1 hour.

LONG TERM STATIONARY
Work that occupies a location more than 3 days.

9/9/2024

STATE OF TEXAS
JORDAN A. SEFCIK
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Texas Department of Transportation | San Angelo District

TRAFFIC CONTROL PLAN GENERAL REQUIREMENTS

SHEET 1 OF 1

©TxDOT 2024	CONT.	SECT	JOB	HIGHWAY
SHEET ISSUED OR LAST REVISED	6470	93	001	US 377, ETC.
06-24	DIST	COUNTY		SHEET NO.
	SJT	KIMBLE, ETC.		45

DATE: 9/9/2024 10:03:18 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/045 TCP GEN REQUIREMENTS

SEQUENCE OF WORK

1. Identify bridge location, hazards, and equipment needed to perform work.
2. Place traffic controls at the work site(s).
3. Perform work described in the plans as directed by the Engineer.
4. Clean work site. Dispose of waste properly.
5. Remove traffic controls.
6. Continue same proceedure at all sites.

IMPORTANT NOTICE TO CONTRACTOR

1. The Contractor shall use the traffic control standards included in the plans according to the typical usage definitions shown, unless otherwise directed by the Engineer.
2. The Contractor may work at multiple locations simultaneously, providing additional labor and material to complete the work and safely conduct traffic through the sites.
3. The Contractor shall work on only one side of the roadway at a time when the roadway (travel lanes and/or shoulders) is restricted in width.
4. The Contractor shall clear traffic control devices from the travel lanes before darkness, safely store them, and protect any incomplete work.
5. The Contractor shall complete work within the 2025 fiscal year.
6. The Contractor shall adjust work as directed by the Engineer to maximize the effectiveness of repairs.
7. The Contractor shall locate all utilities at each site and notify the Engineer if there is a conflict present.
8. Debris created as a result of construction shall be disposed of in a manner acceptable to the Engineer.
9. Vegetation within the scope of work will be inspected by the contractor to ensure there are no actively nesting birds residing in it. Should such birds be present, the Contractor shall inform the Engineer. The Contractor shall not displace, disturb or otherwise affect the nesting birds or vegitation which may harbor actively nesting birds unless directed by the Engineer.
10. Should hazardous material be encountered when preparing the right of way the Contractor shall inform the Engineer.

GENERAL NOTES:

1. WORK ZONE STRIPING SHALL CONFORM TO THESE TYPICAL SECTIONS AND THE TCP STANDARDS INCLUDED IN THESE PLANS.
2. REMOVE OR COVER EXISTING SIGNS IN CONFLICT WITH THE TCP AS DIRECTED BY THE ENGINEER.

9/9/2024

STATE OF TEXAS
JORDAN A. SEFCIK
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Texas Department of Transportation

San Angelo District

TRAFFIC CONTROL PLAN SUMMARY AND SEQUENCE OF WORK

SHEET 1 OF 1

REVISIONS

CONT	SECT	JOB	HIGHWAY
6470	93	001	US 377, ETC.
DIST	COUNTY		SHEET NO.
SJT	KIMBLE, ETC.		46

DATE: 9/9/2024 10:03:19 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/046 TCP SUM AND SEQUENCE OF WORK

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

DATE: 9/9/2024 10:03:21 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/S - BC-21.dgn

SHEET 1 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

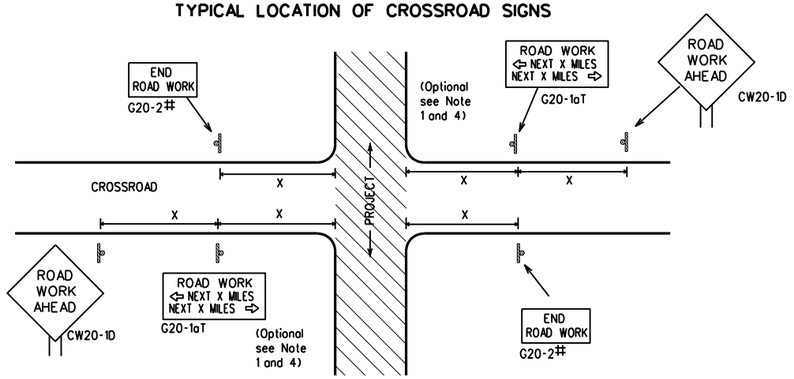
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	93	001	US 377, ETC.
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	SJT	KIMBLE, ETC.		47
5-10 5-21				

DATE: 9/9/2024 10:03:21 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1- Pre-Letting/S - BC-21.dgn

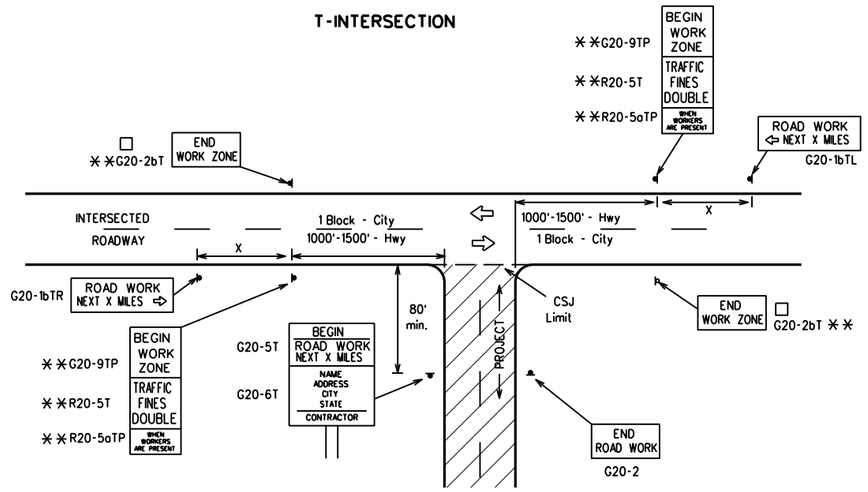
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

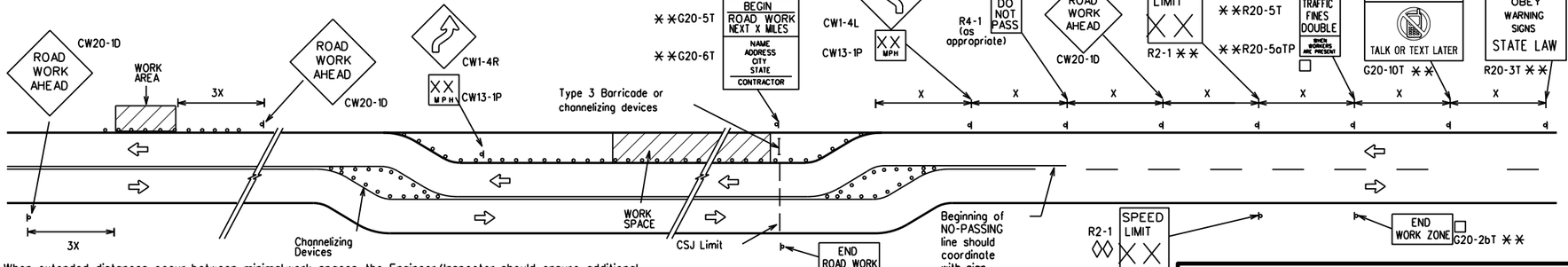
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

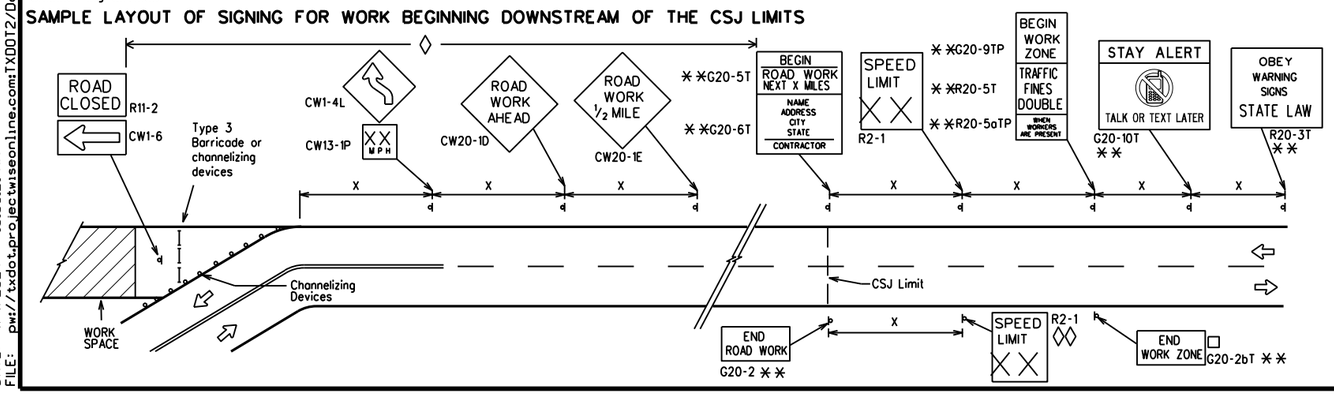
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	6470	93	001	US 377, ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
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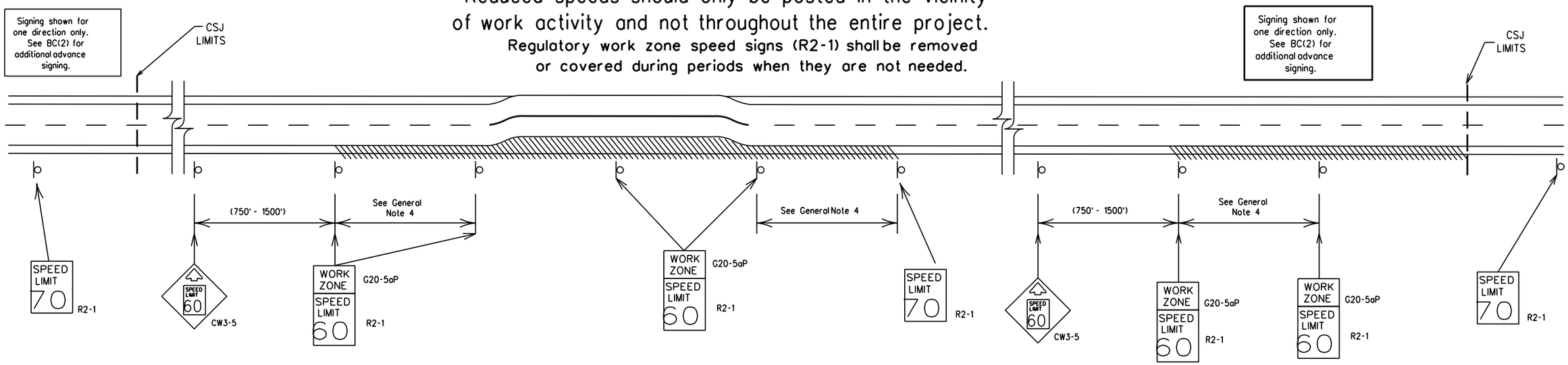
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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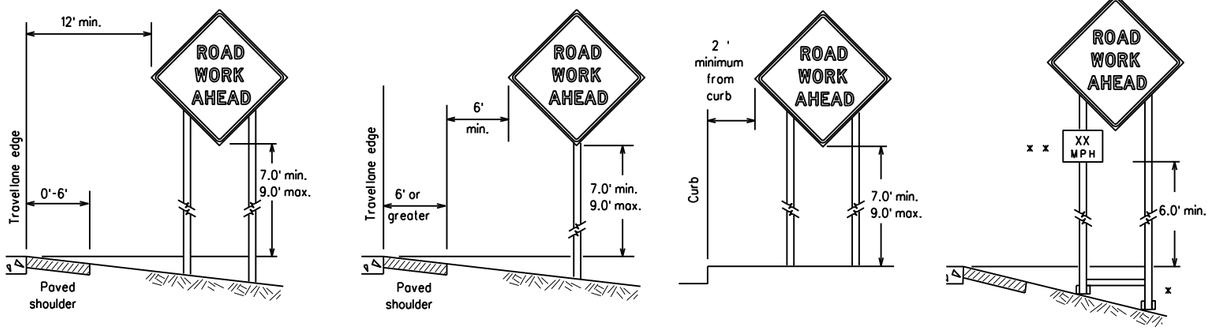
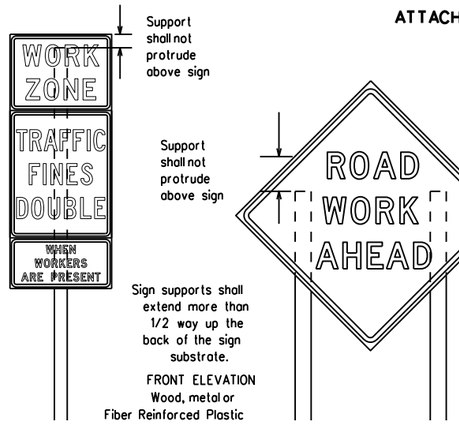
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

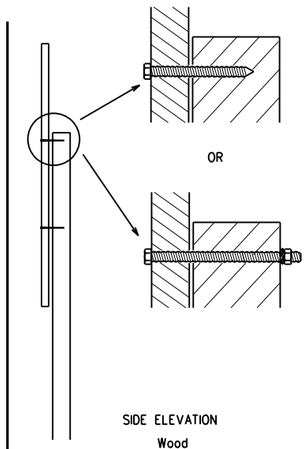


x When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





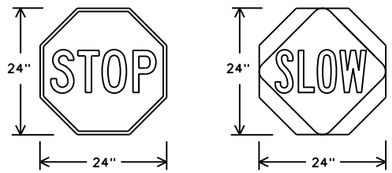
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

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BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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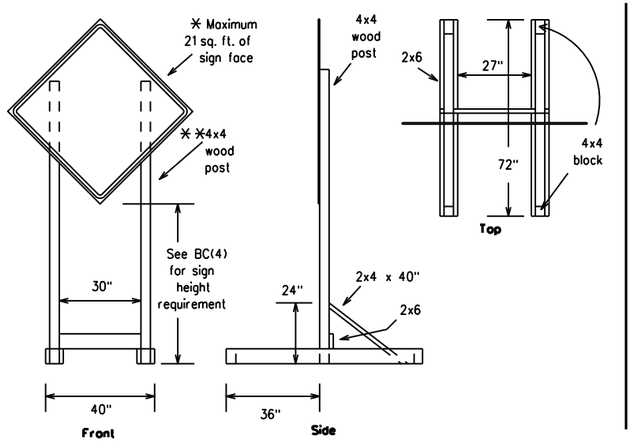
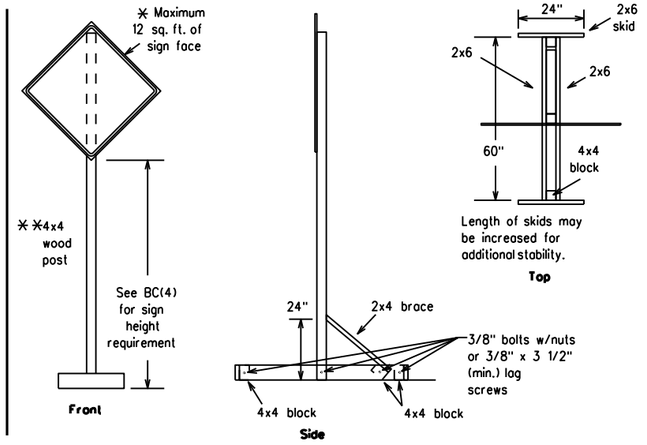
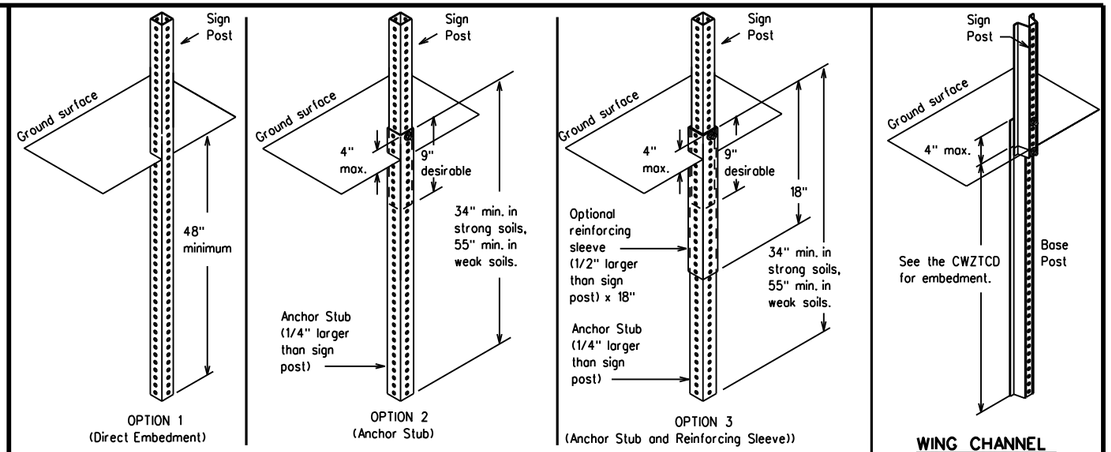




SKID MOUNTED WOOD SIGN SUPPORTS

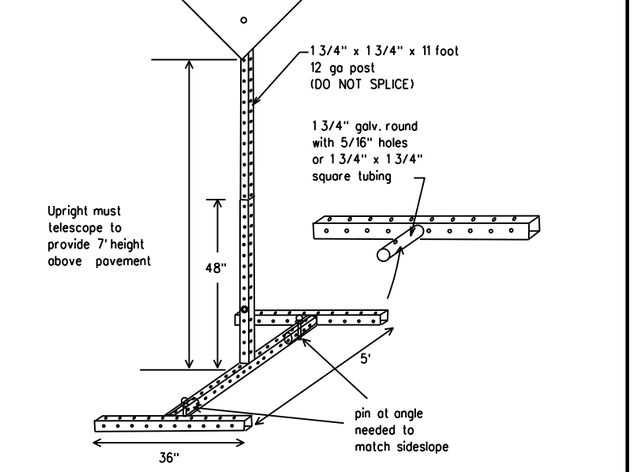
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

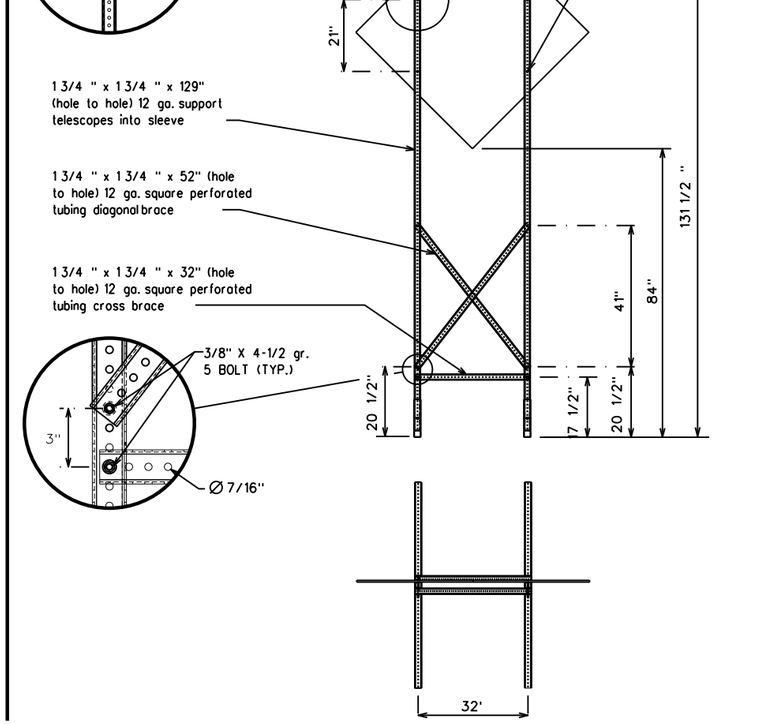


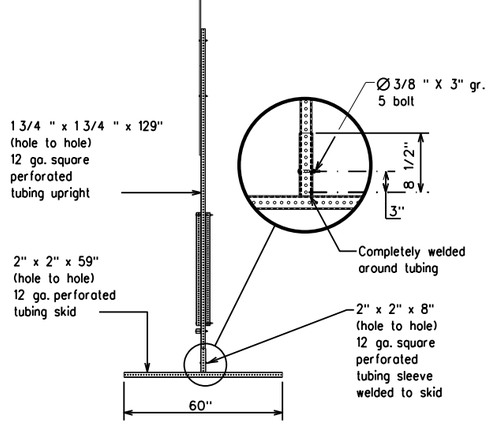
PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

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Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

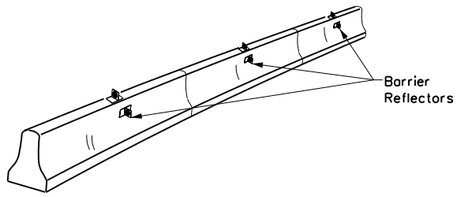
BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	93	001	US 377, ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SJT	KIMBLE, ETC.		52

100

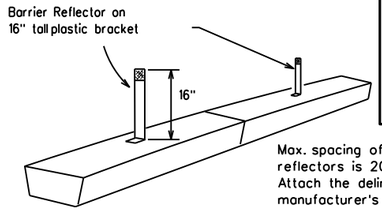
DATE: 9/9/2024 10:03:22 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/S - BC-21.dgn

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



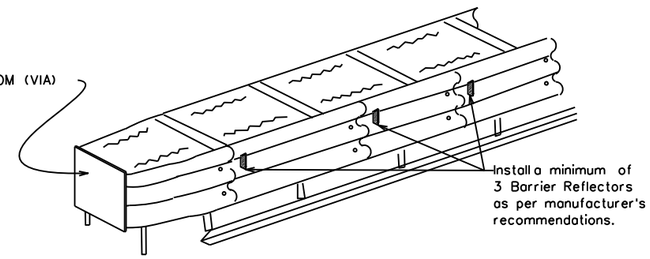
CONCRETE TRAFFIC BARRIER (CTB)

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



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

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

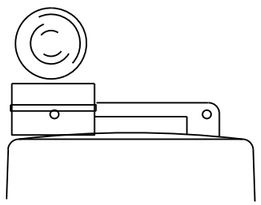
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

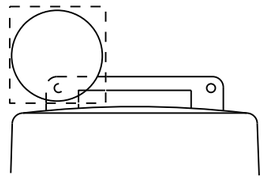
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

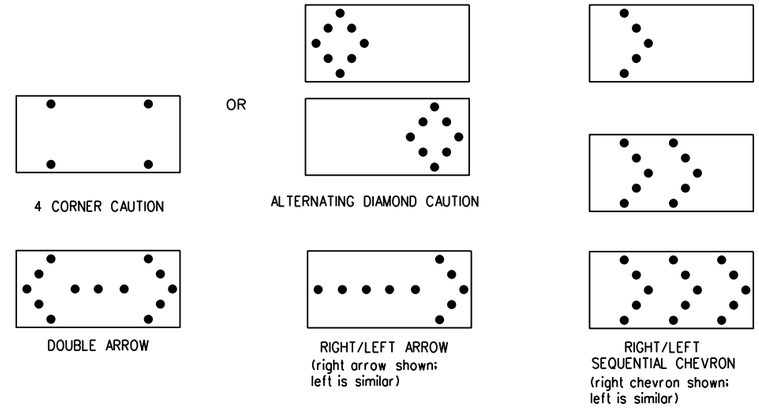
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



4 CORNER CAUTION

ALTERNATING DIAMOND CAUTION

DOUBLE ARROW

RIGHT/LEFT ARROW
(right arrow shown;
left is similar)

RIGHT/LEFT
SEQUENTIAL CHEVRON
(right chevron shown;
left is similar)

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

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

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

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	93	001	US 377, ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SJT	KIMBLE, ETC.		53

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DATE: 9/9/2024 10:03:22 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/S - BC-21.dgn

GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

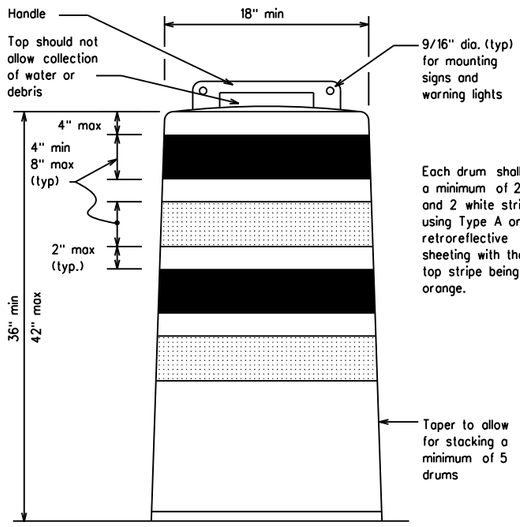
1. Plastic drums shall be a two-piece design: the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

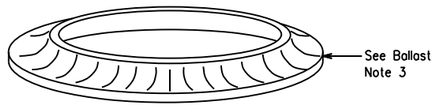
RETROREFLECTIVE SHEETING

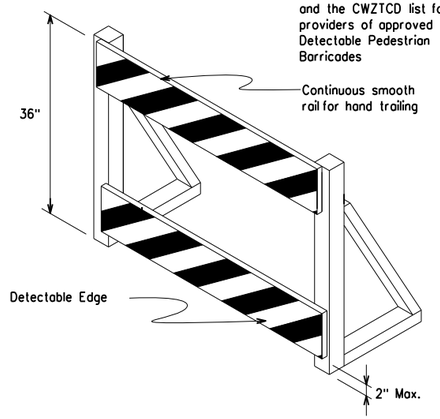
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

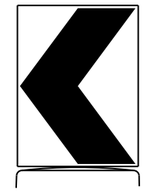




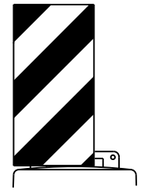


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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9-07 5-21	SJT	KIMBLE, ETC.		54
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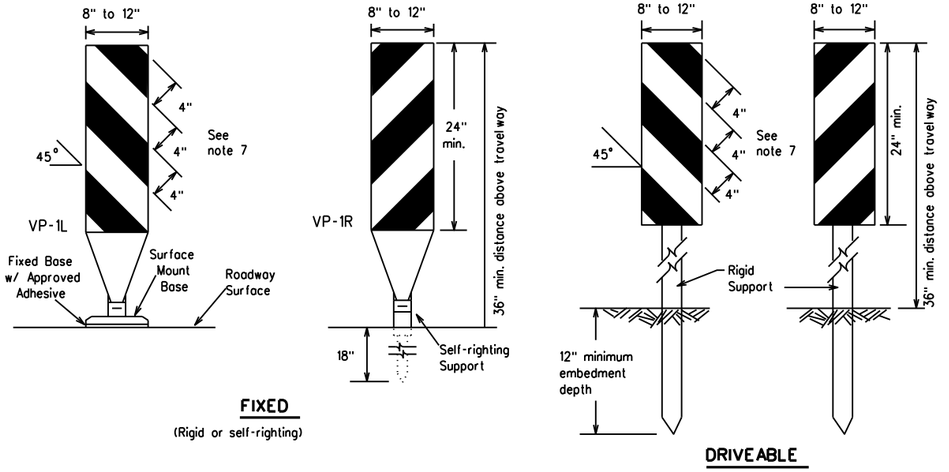
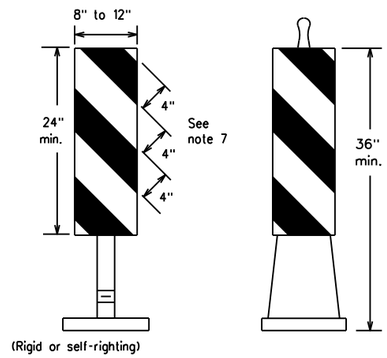


FIXED
(Rigid or self-righting)

DRIVEABLE

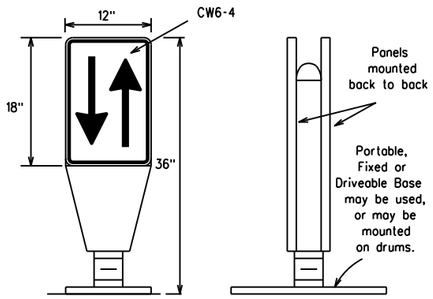


(Rigid or self-righting)

PORTABLE

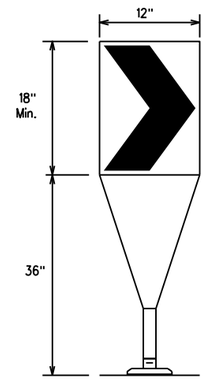
VERTICAL PANELS (VPs)

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



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

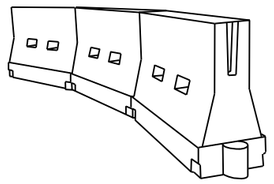
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



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

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

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

GENERAL NOTES

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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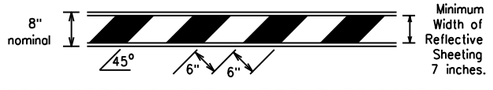
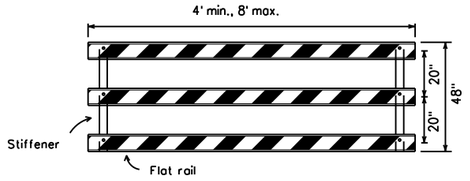
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



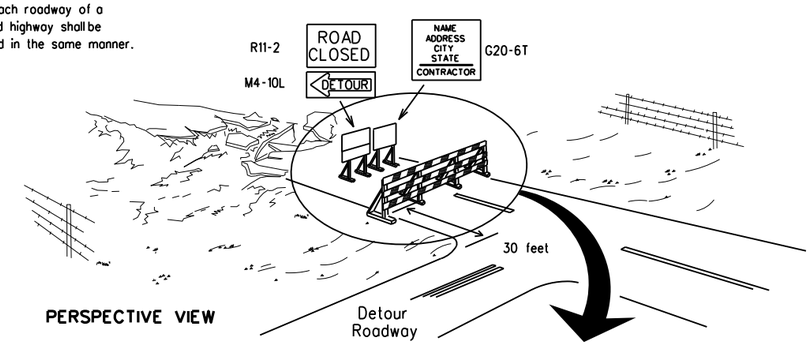
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

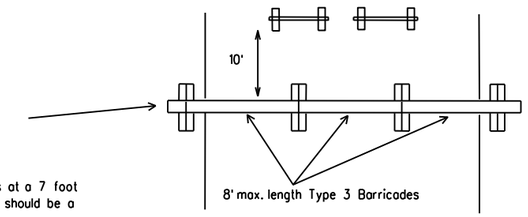
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

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

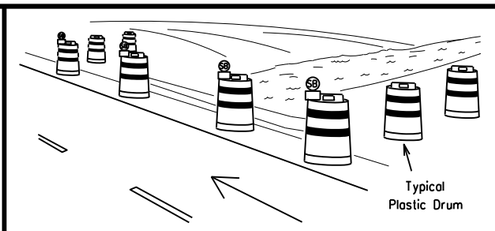
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

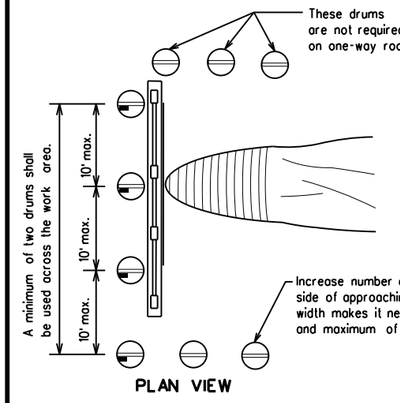
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

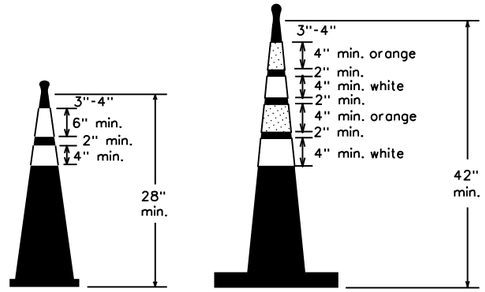
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



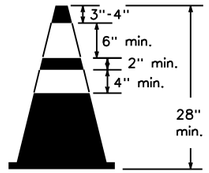
PLAN VIEW

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

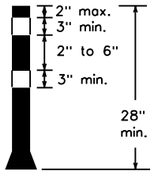
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

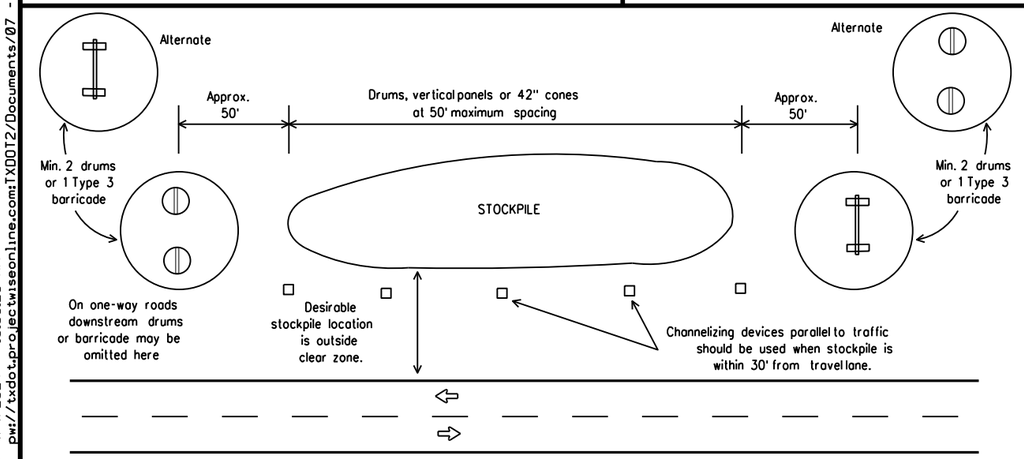


Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

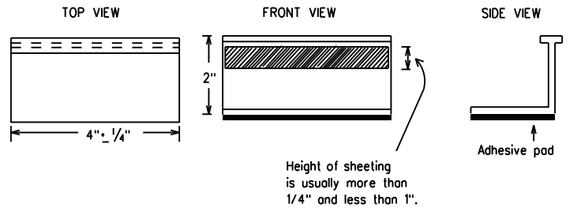
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

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BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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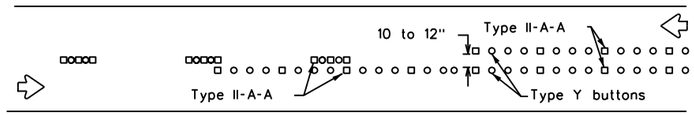
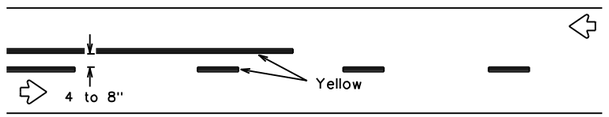
PAVEMENT MARKING PATTERNS

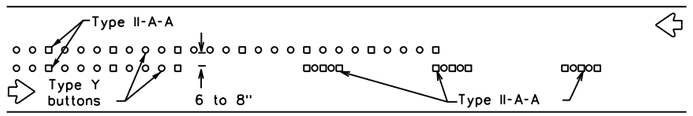
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



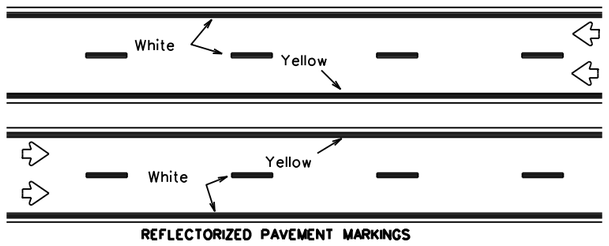
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



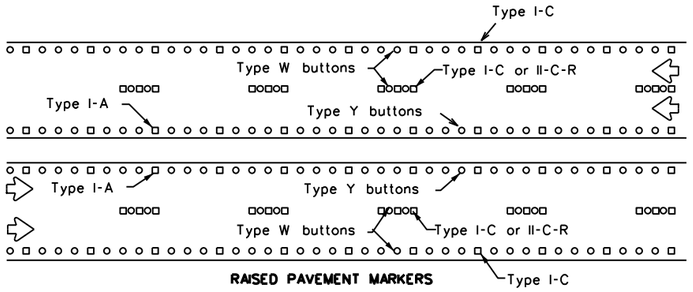
RAISED PAVEMENT MARKERS - PATTERN B

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

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



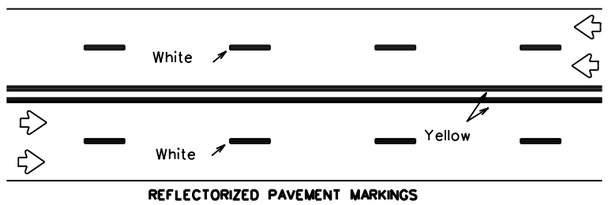
REFLECTORIZED PAVEMENT MARKINGS



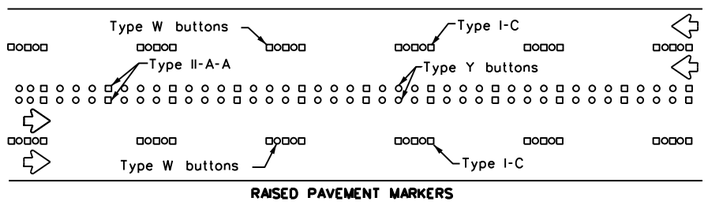
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



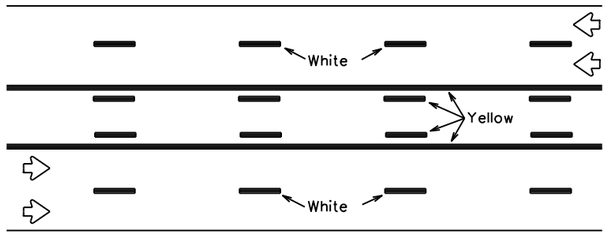
REFLECTORIZED PAVEMENT MARKINGS



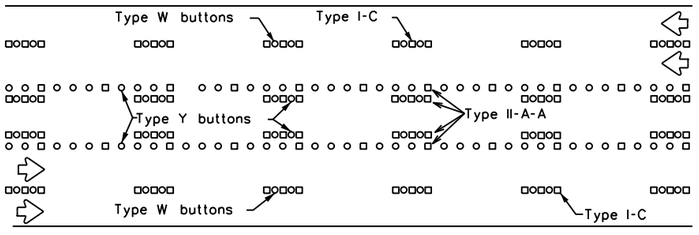
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

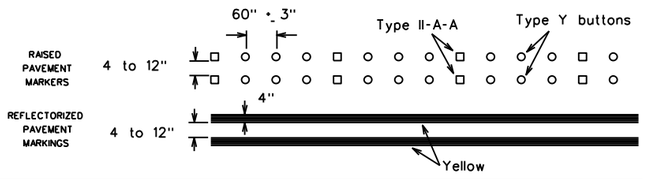
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

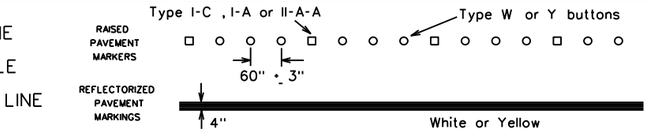
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

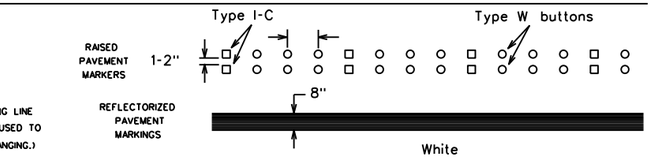


EDGE LINE OR SINGLE NO-PASSING LINE



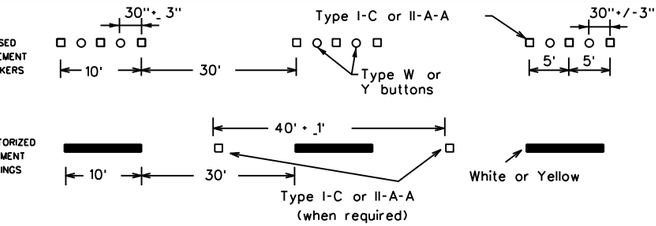
WIDE LINE

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

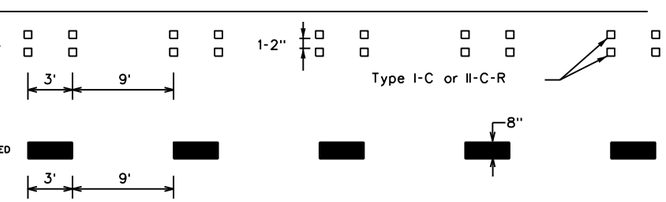


BROKEN LINES

CENTER LINE OR LANE LINE

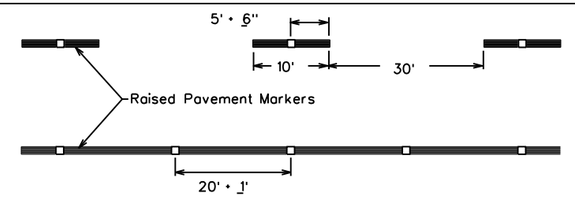


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

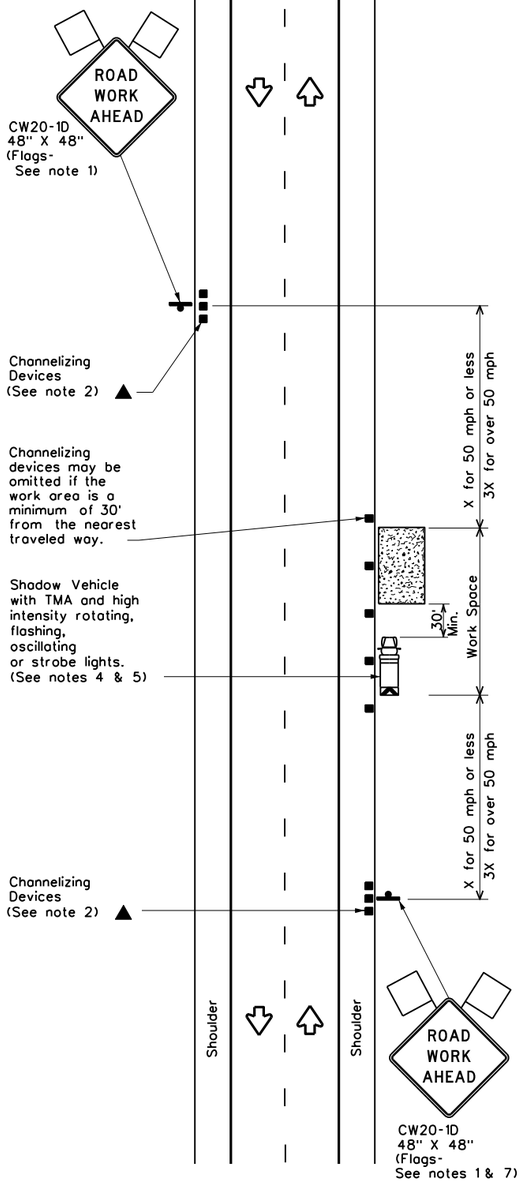
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

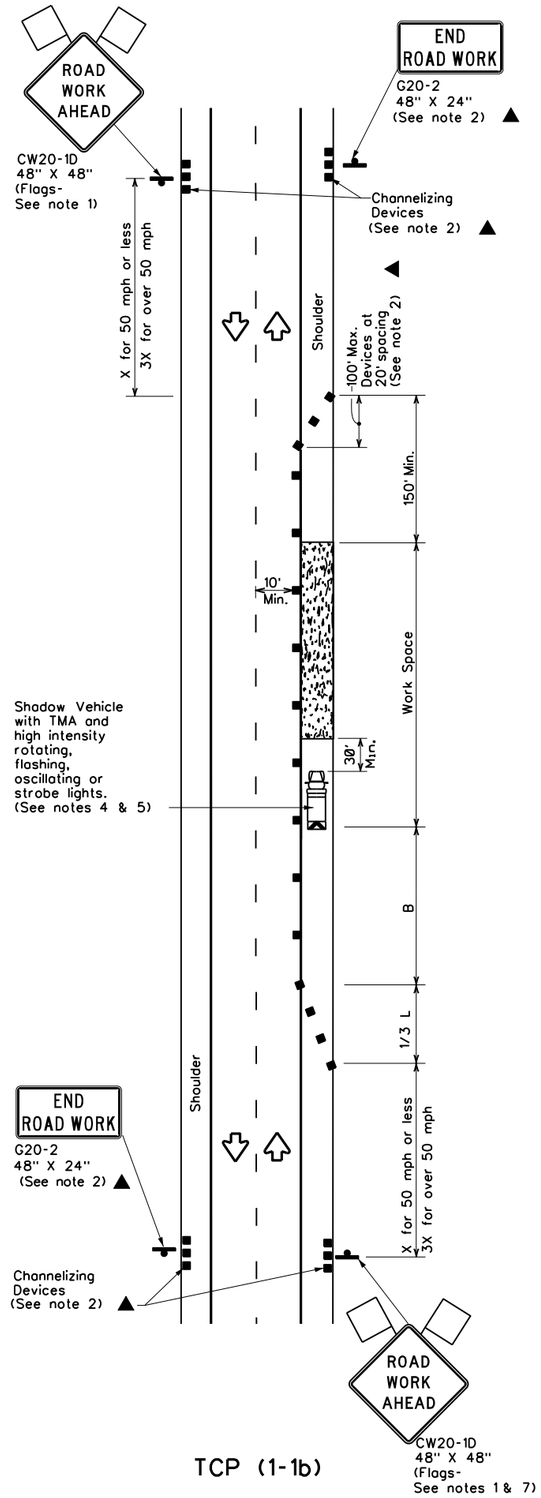
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	6470	93	001	US 377, ETC.
	DIST	COUNTY		SHEET NO.
	SJT	KIMBLE, ETC.		58

DATE: 9/9/2024 10:03:24 AM
FILE: p:\\txdot.projectwiseonline.com\TXDOT12\Documents\07 - SJT\Maintenance Projects\tcp1-1-18.dgn



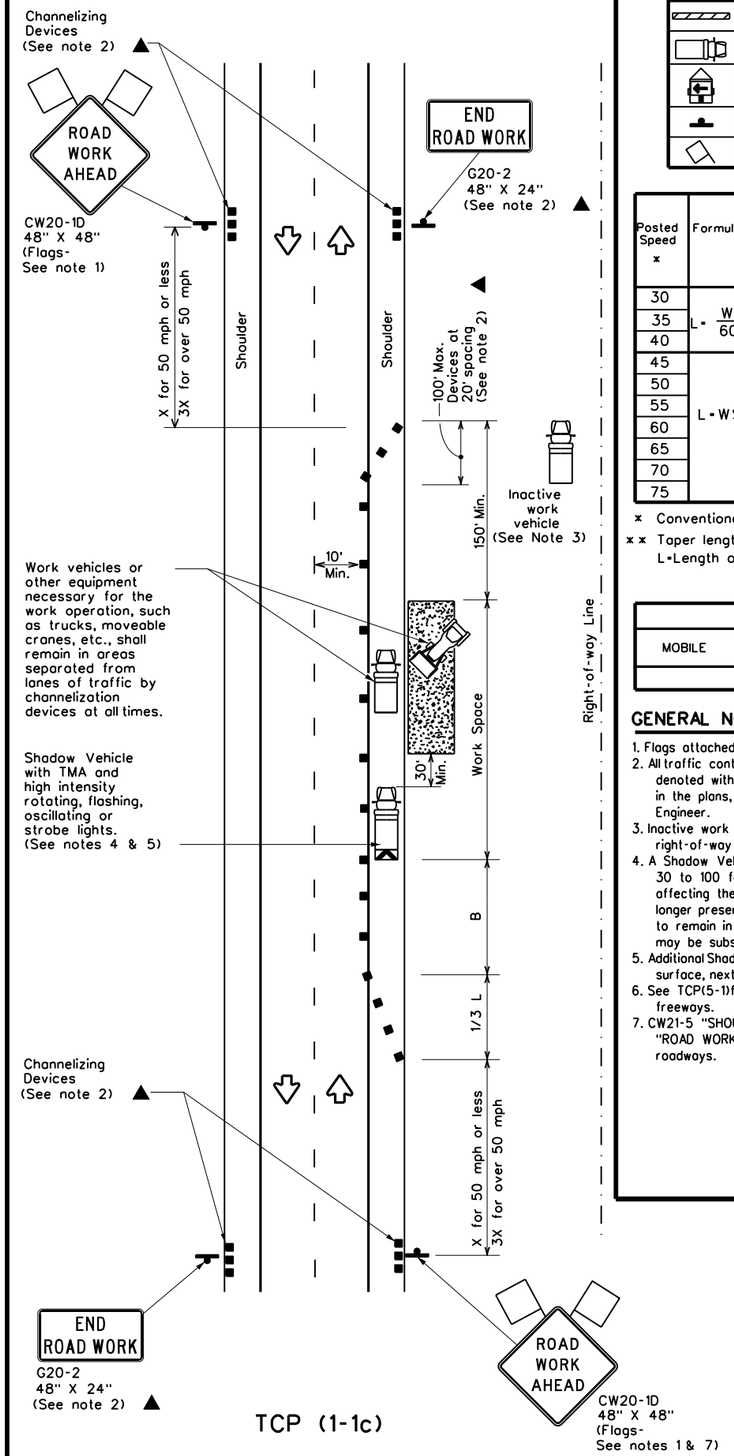
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

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

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

GENERAL NOTES

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

Texas Department of Transportation

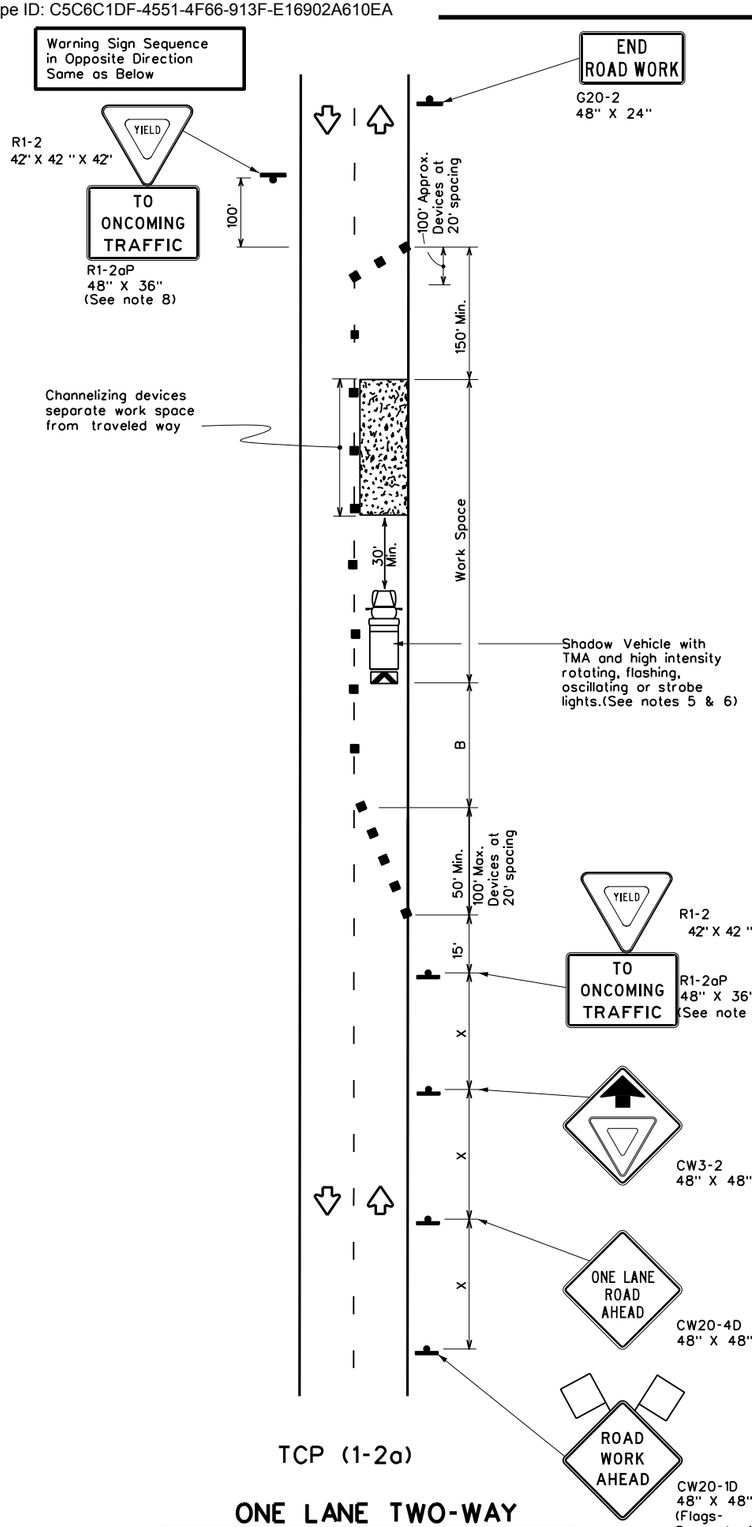
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	93	001	US 377, ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	SJT	KIMBLE, ETC.		59
1-97 2-18				

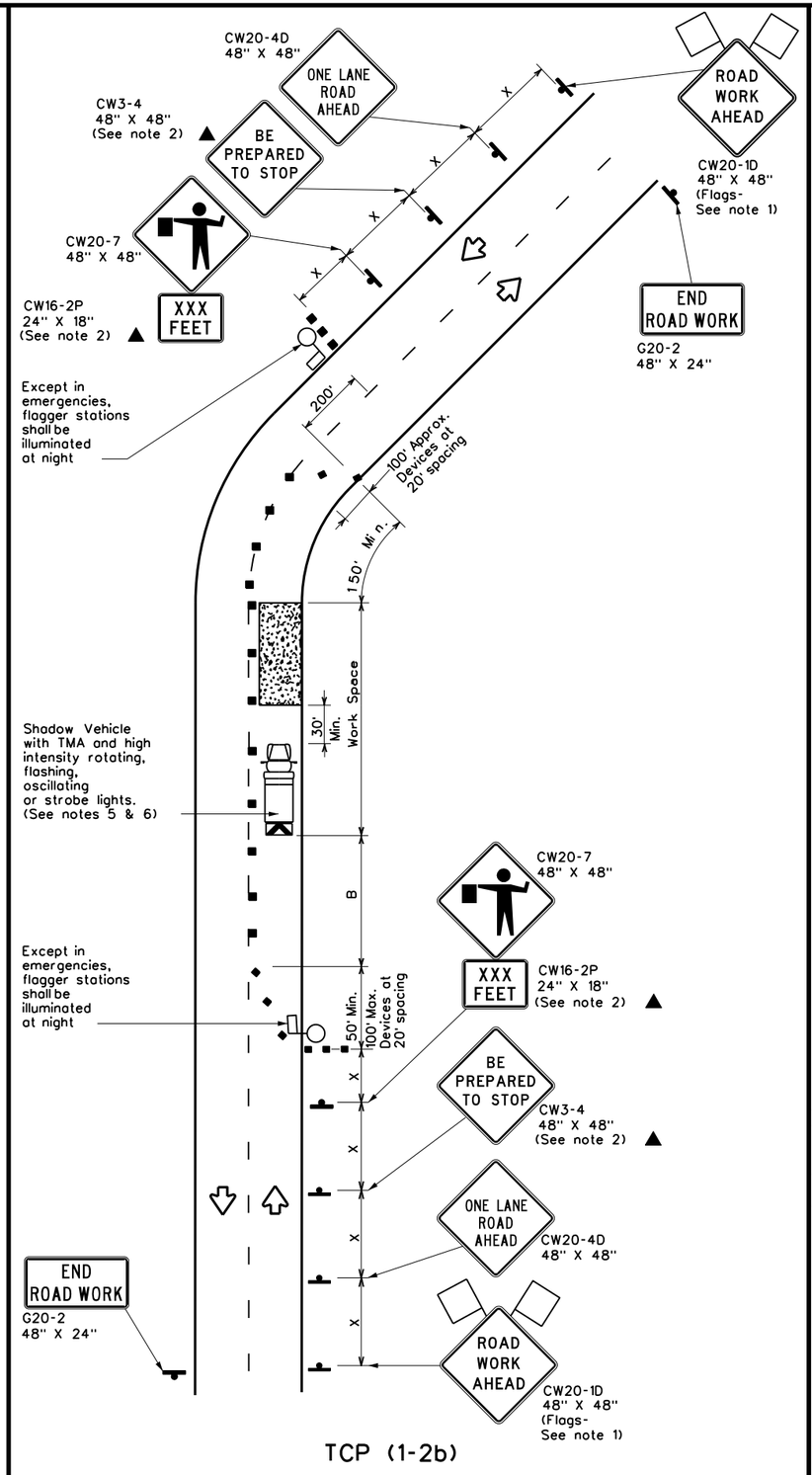
151



TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY CONTROL WITH FLAGGERS

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

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

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

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

GENERAL NOTES

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

TCP (1-2a)

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

TCP (1-2b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

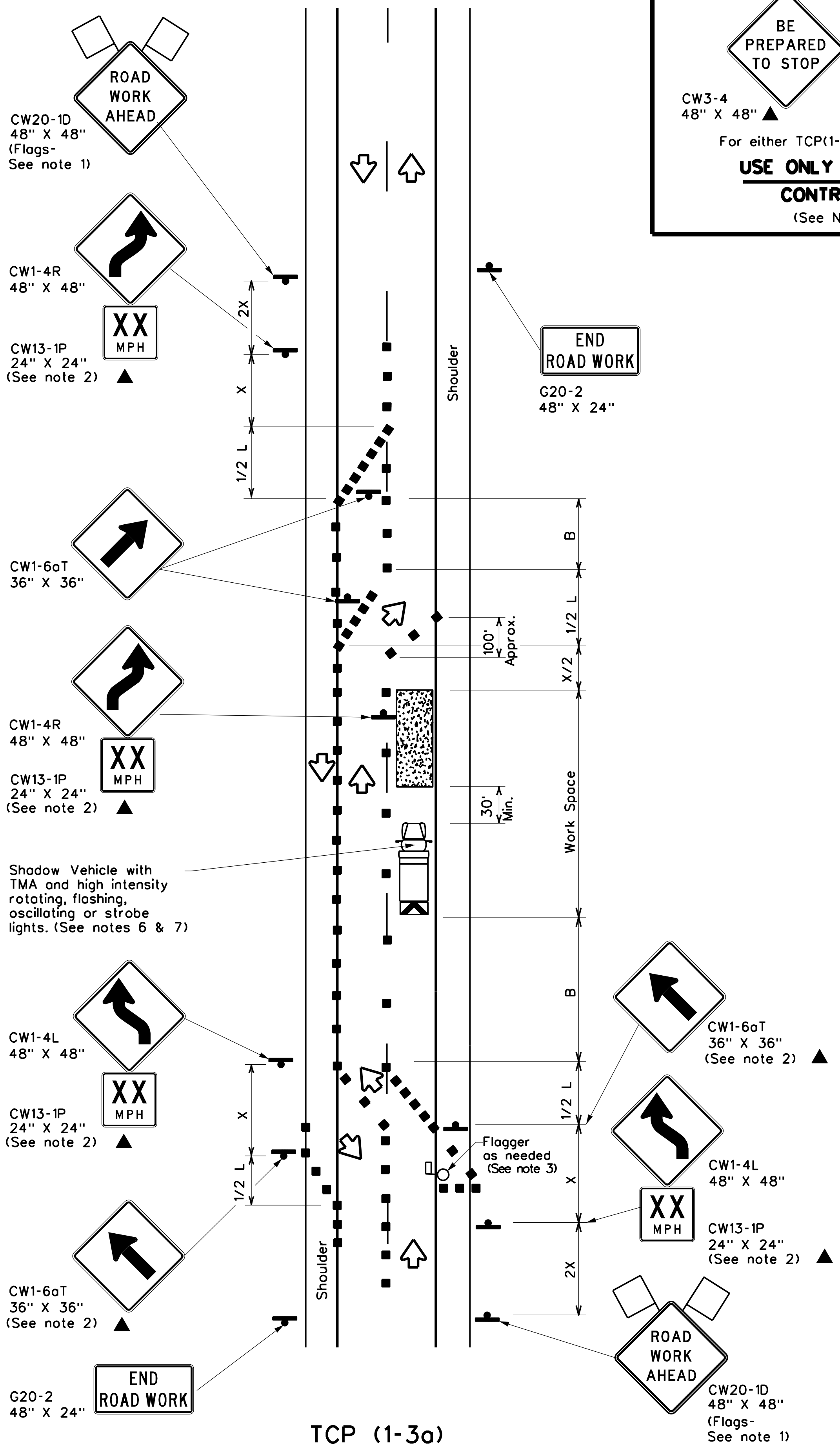
FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-90 4-98 2-94 2-12 1-97 2-18	6470	93	001	US 377, ETC.
	DIST	COUNTY		SHEET NO.
	SJT	KIMBLE, ETC.		60

DATE: 9/9/2024 10:03:26 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT12/Documents/07 - SJT/Maintenance Projects/...

For either TCP(1-3a) or TCP(1-3b)

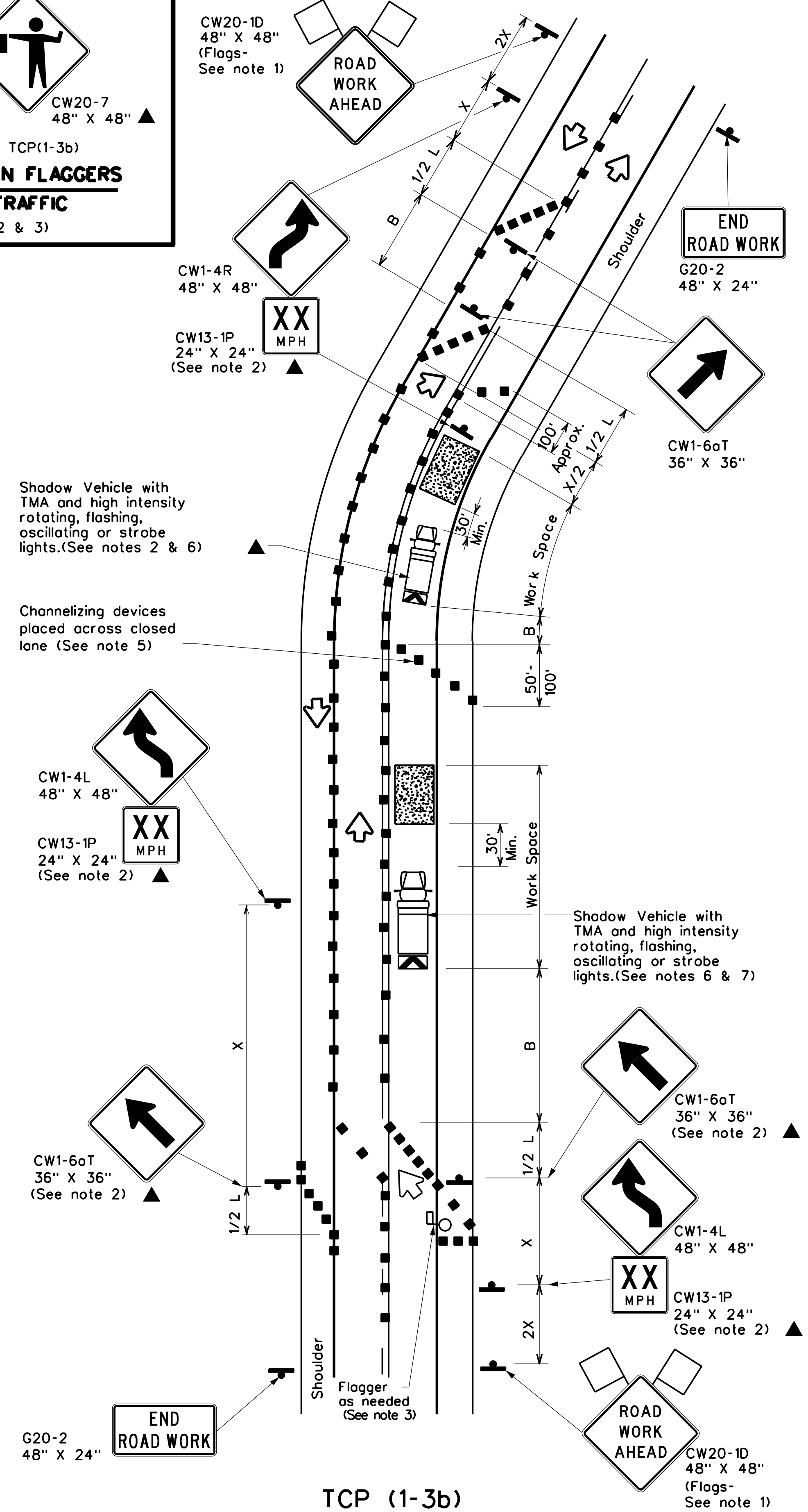
USE ONLY WHEN FLAGGERS CONTROL TRAFFIC

(See Notes 2 & 3)



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

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

LEGEND

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

FILE: tcp1-3-18.dgn		DN:	CK:	DW:	CK:
© TxDOT December 1985		CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18		6470	93	001	US 377, ETC.
		DIST		COUNTY	SHEET NO.
		SJT		KIMBLE, ETC.	61

DATE: 9/9/2024 10:03:28 AM
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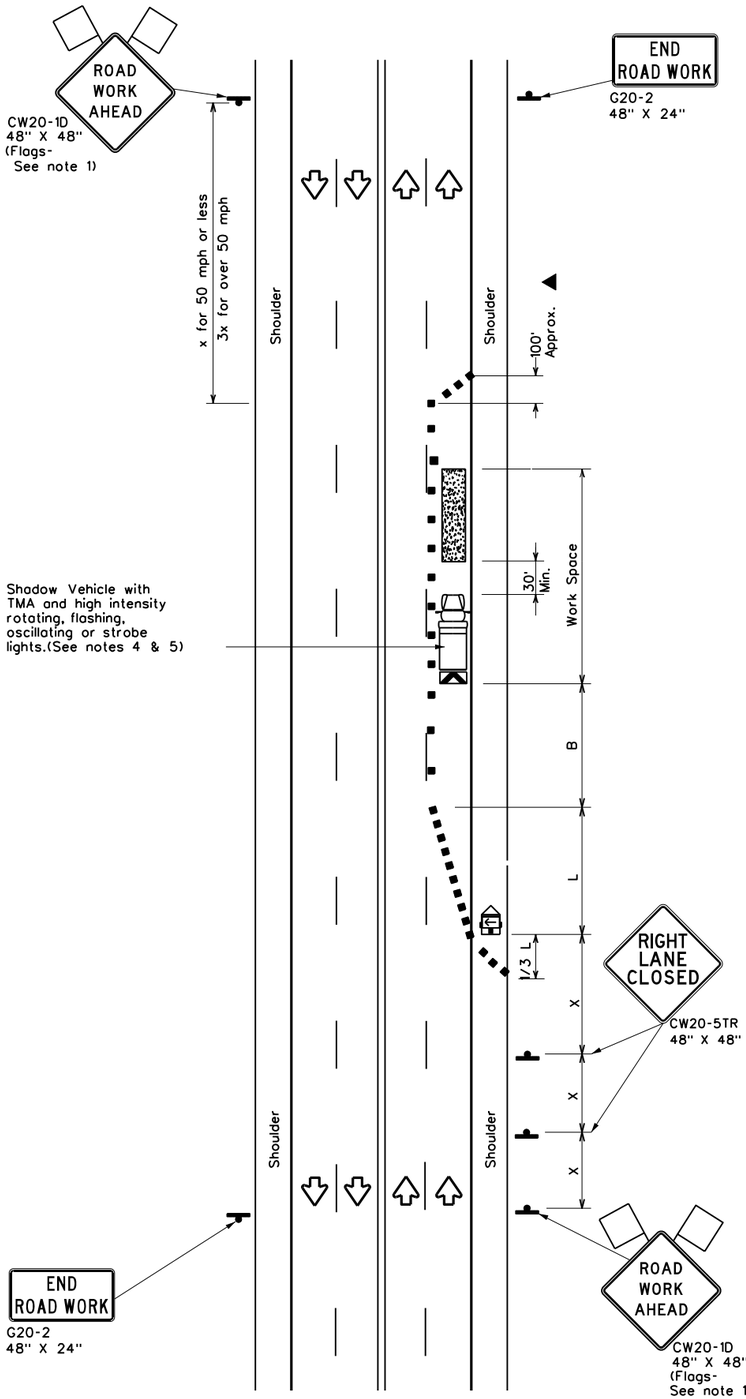
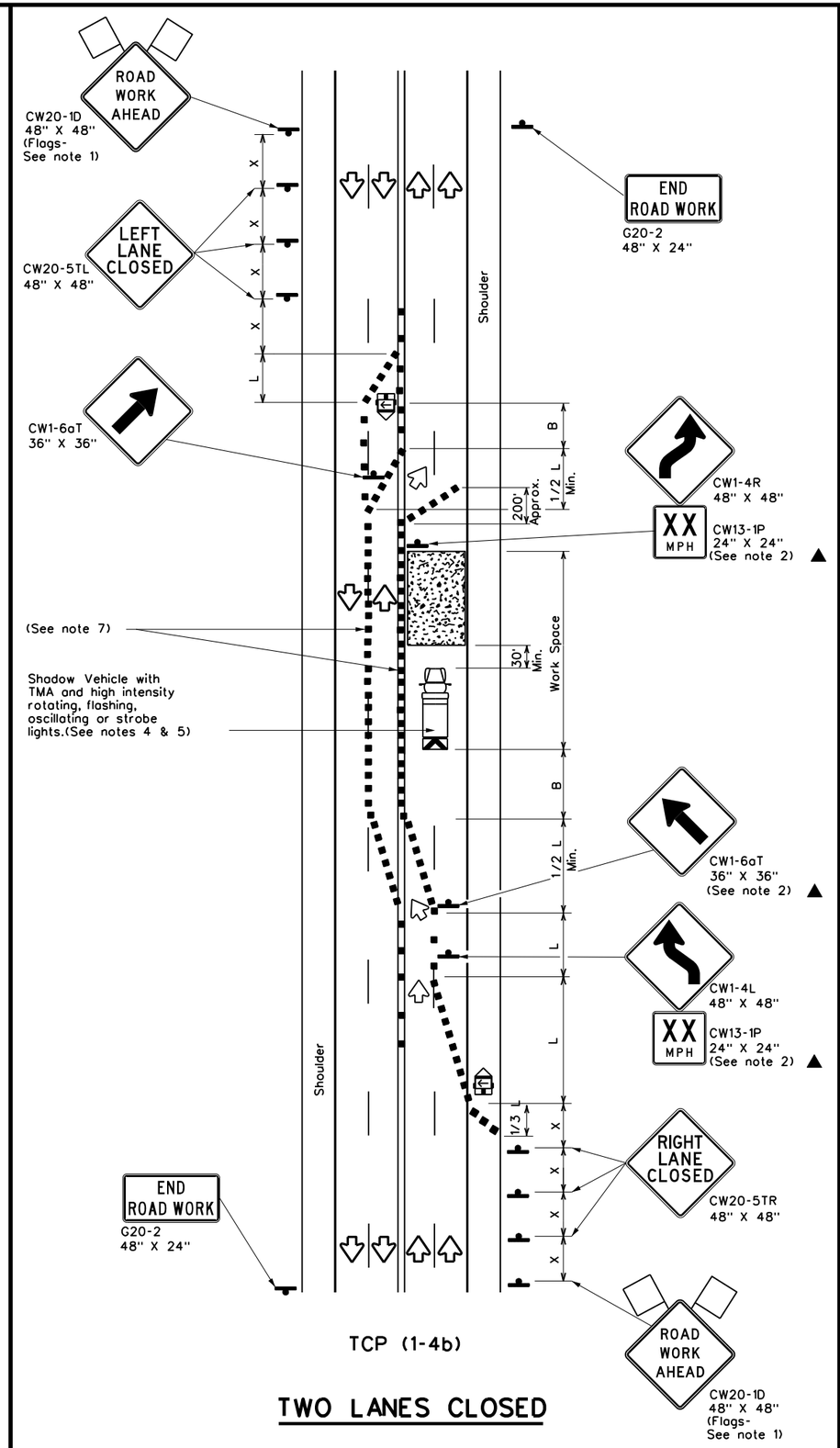


TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

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

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

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

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

GENERAL NOTES

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

TCP (1-4a)

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

TCP (1-4b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-18

FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	93	001	US 377, ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	SJT	KIMBLE, ETC.		62
1-97 2-18				

DATE: 9/9/2024 10:03:29 AM
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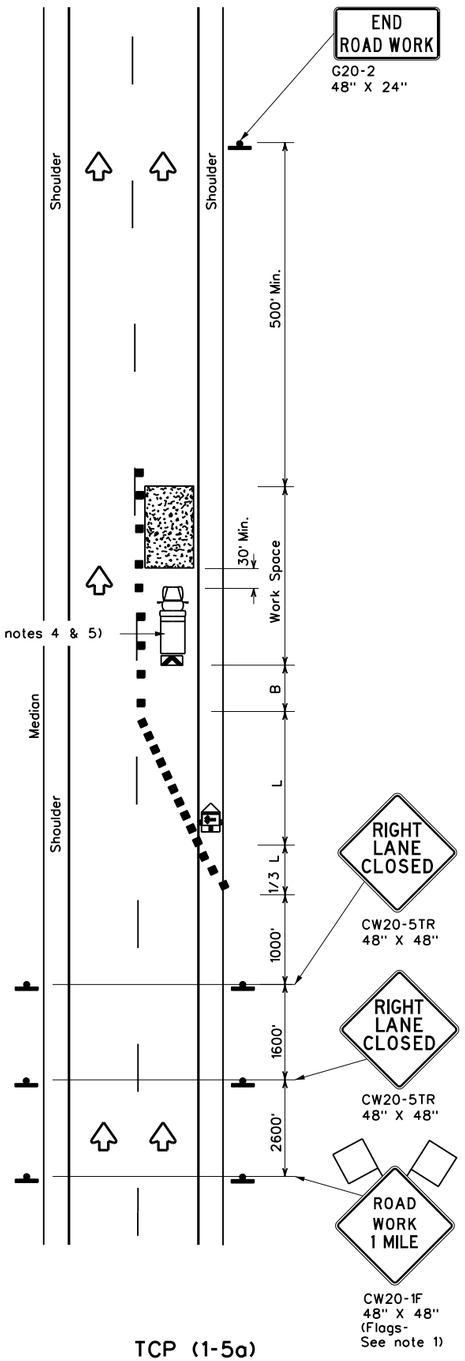
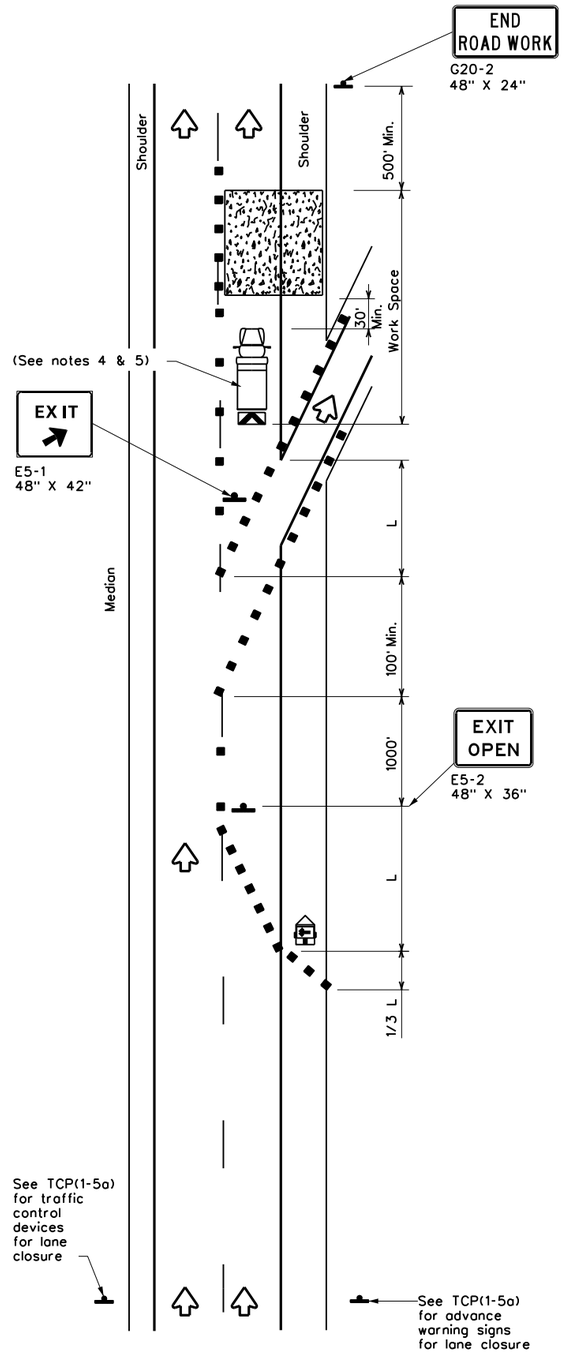


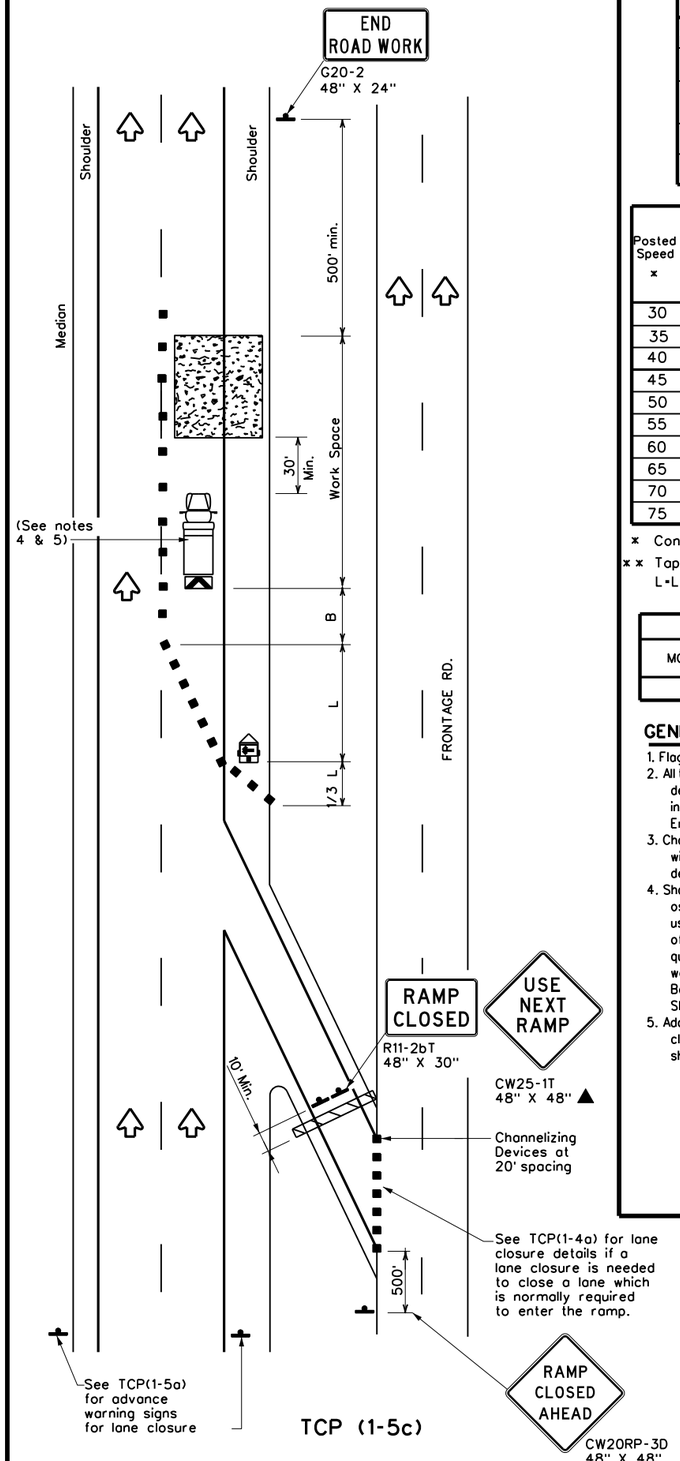
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

LEGEND

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-18

FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
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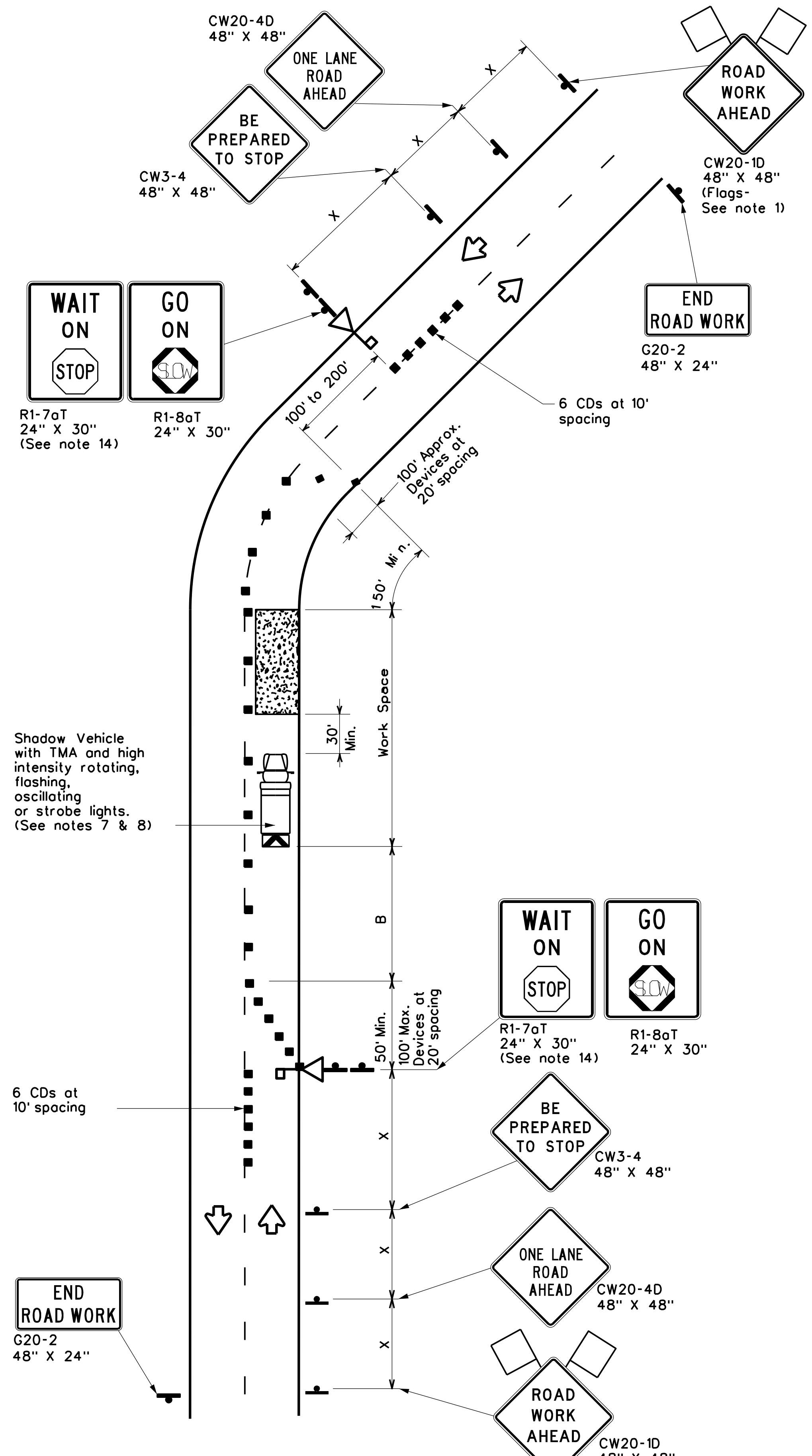
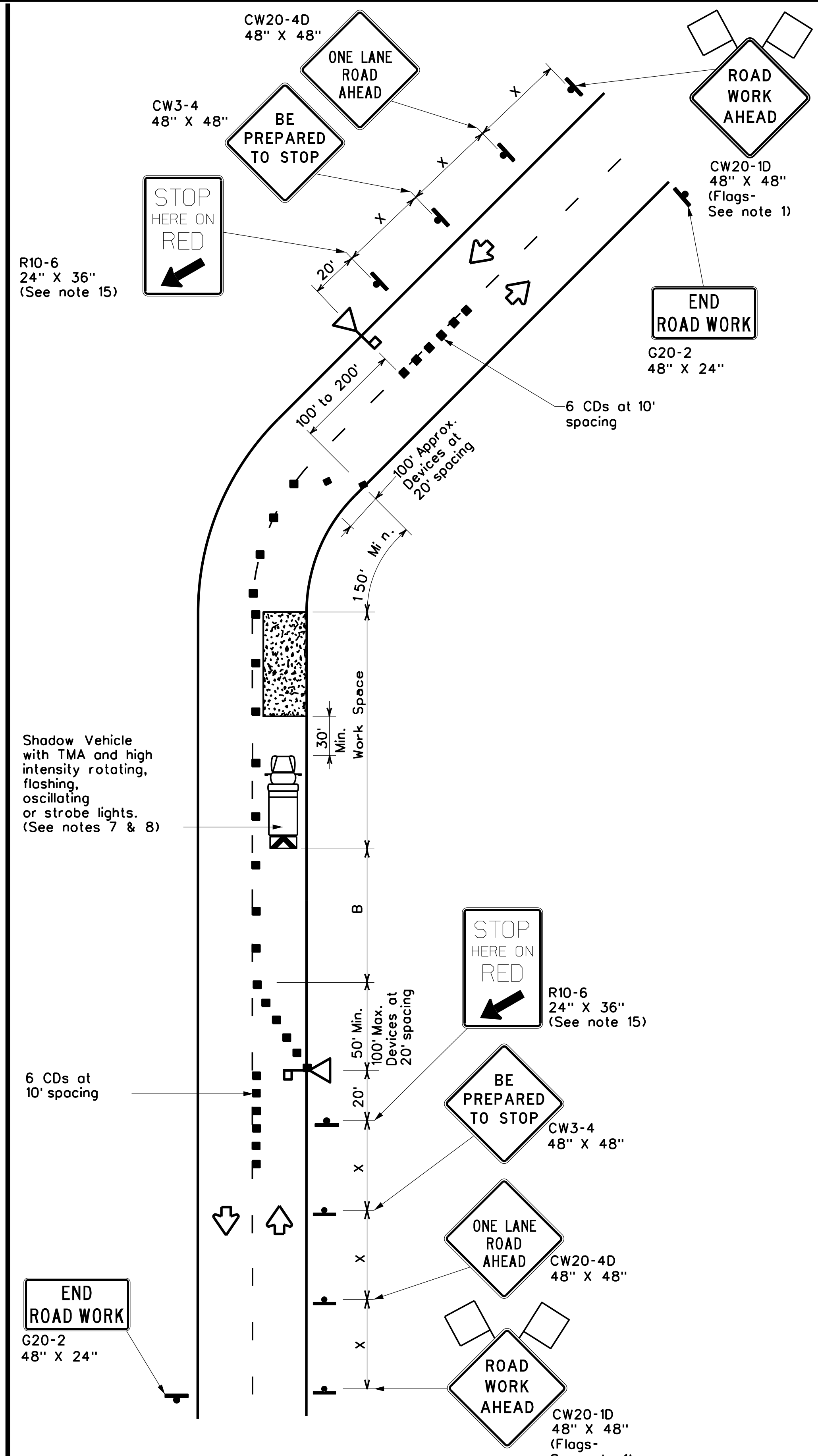
	DIST	COUNTY		SHEET NO.
	SJT	KIMBLE, ETC.		63



TCP (1-6a)

ONE LANE TWO-WAY CONTROL WITH STOP/SLOW AFADs



TCP (1-6b)

ONE LANE TWO-WAY CONTROL WITH RED/YELLOW LENS AFADs

LEGEND

	Type 3 Barricade		Channelizing Devices (CDs)
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Automated Flagger Assistance Device (AFAD)		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

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

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. AFADs shall only be used in situations where there is one lane of approaching traffic in the direction to be controlled.
3. Adequate stopping sight distance must be provided to each AFAD location for approaching traffic. (See table above).
4. Each AFAD shall be operated by a qualified/certified flagger. Flaggers operating AFADs shall not leave them unattended while they are in use.
5. One flagger may operate two AFADs only when the flagger has an unobstructed view of both AFADs and of the approaching traffic in both directions.
6. When pilot cars are used, a flagger controlling traffic shall be located on each approach. AFADs shall not be operated by the pilot car operator.
7. All AFADs shall be equipped with gate arms with an orange or fluorescent red-orange flag attached to the end of the gate arm. The flag shall be a minimum of 16" square.
8. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
9. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
10. Flaggers should use two-way radios or other methods of communication to control traffic.
11. Length of work space should be based on the ability of flaggers to communicate.
12. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the AFAD.
13. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
14. The R1-7aT "WAIT ON STOP" sign and the R1-8aT "GO ON SLOW" sign shall be installed at the AFAD location on separate supports or they may be fabricated as one 48" x 30" sign. They shall not obscure the face of the STOP/SLOW AFAD.
15. The R10-6 "STOP HERE ON RED" arrow sign shall be offset so as not to obscure the lenses of the AFAD.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN AUTOMATED FLAGGER ASSISTANCE DEVICES (AFADS)

TCP(1-6)-18

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© TxDOT	February 2012	CONT	SECT	JOB		HIGHWAY
REVISIONS 2-18		6470	93	001		US 377, ETC.
		DIST		COUNTY		SHEET NO.
		SJT		KIMBLE, ETC.		64

156

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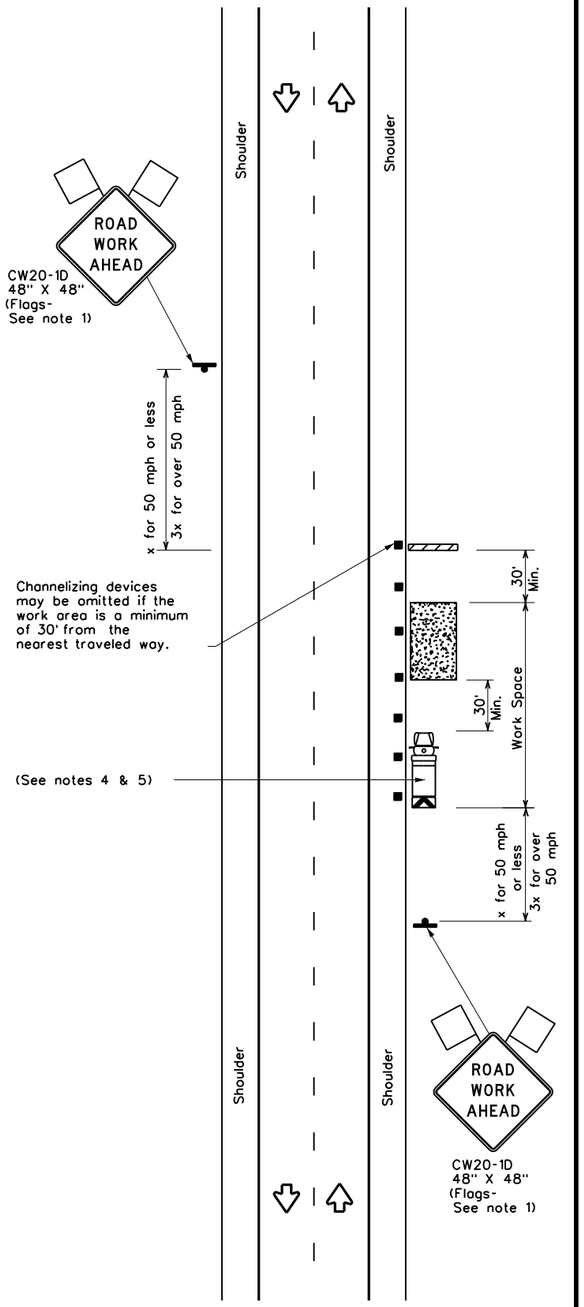
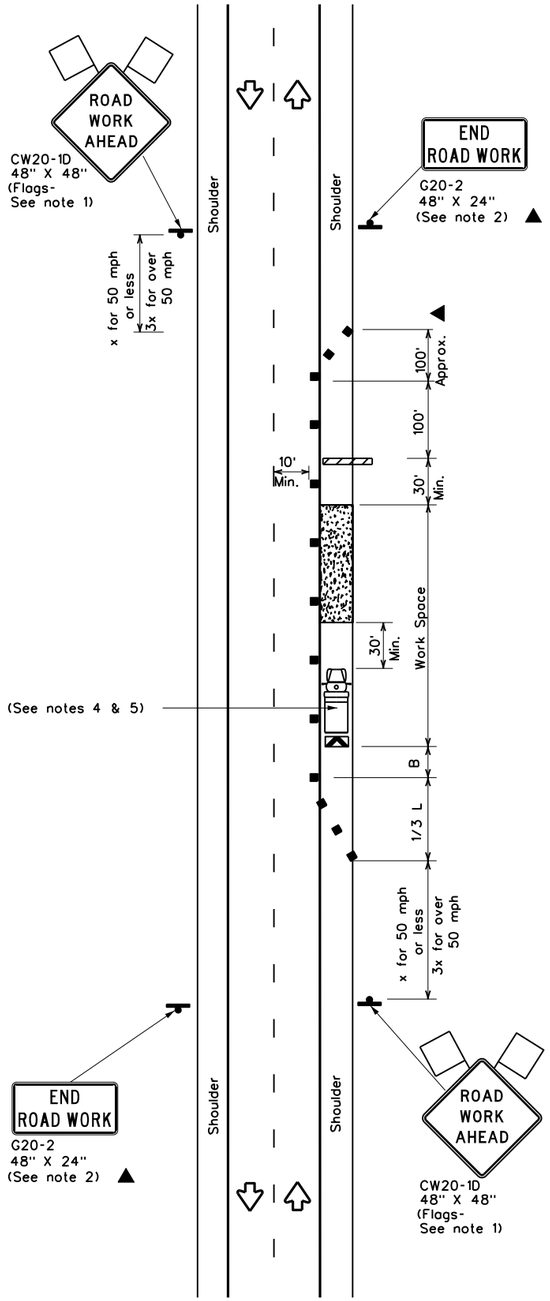


TCP (2-1a)

WORK SPACE NEAR SHOULDER

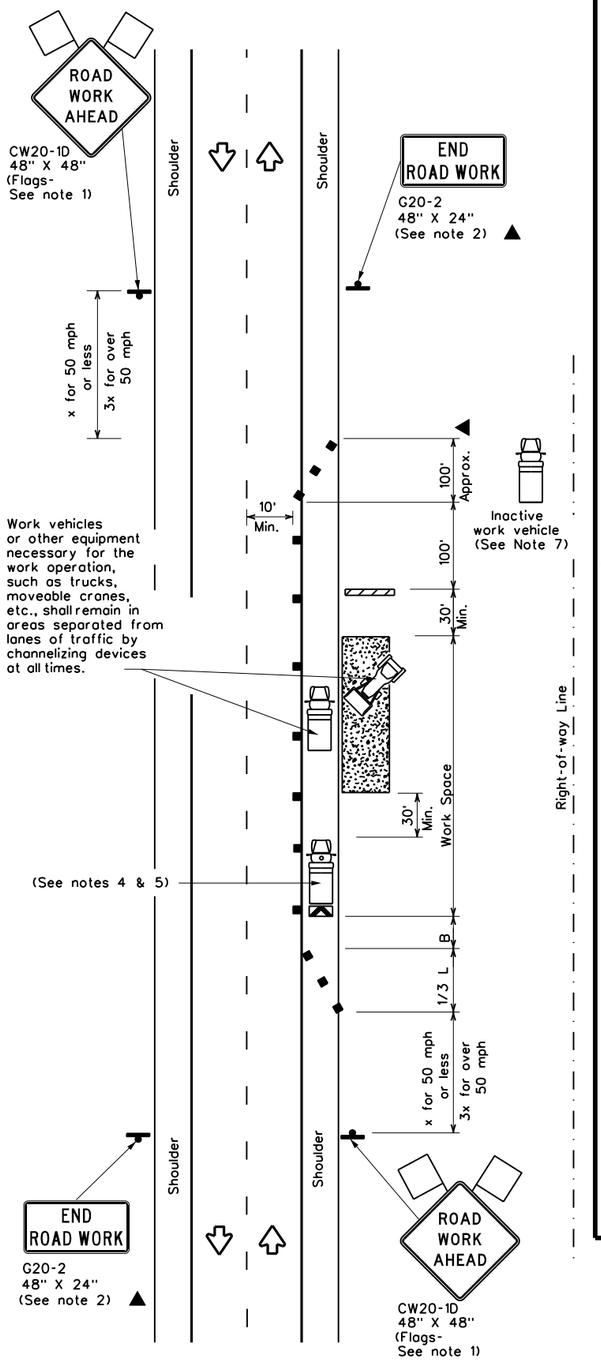
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER

Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER

Conventional Roads

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

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

x Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

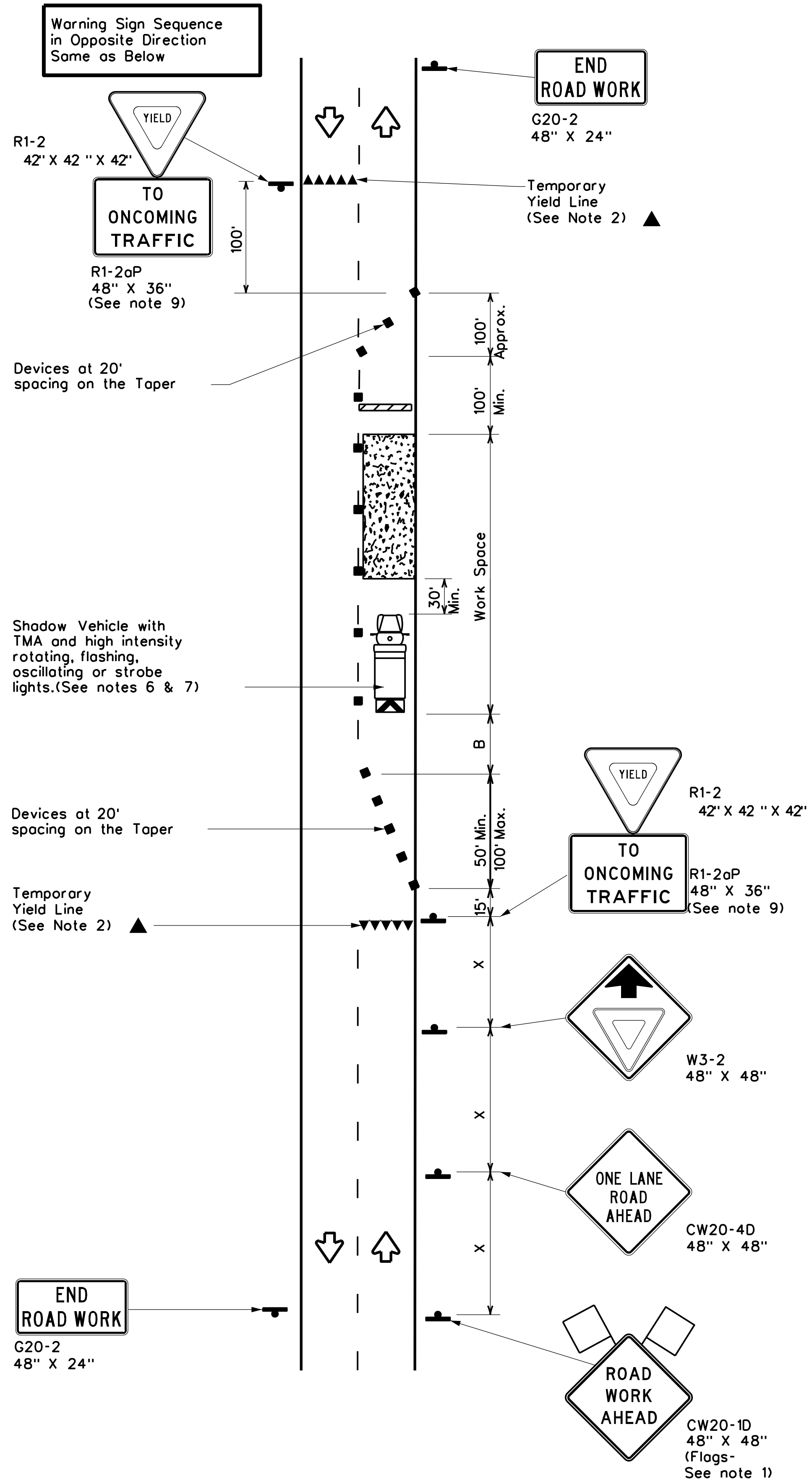
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	93	001	US 377, ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	SJT	KIMBLE, ETC.		65
1-97 2-18				

161



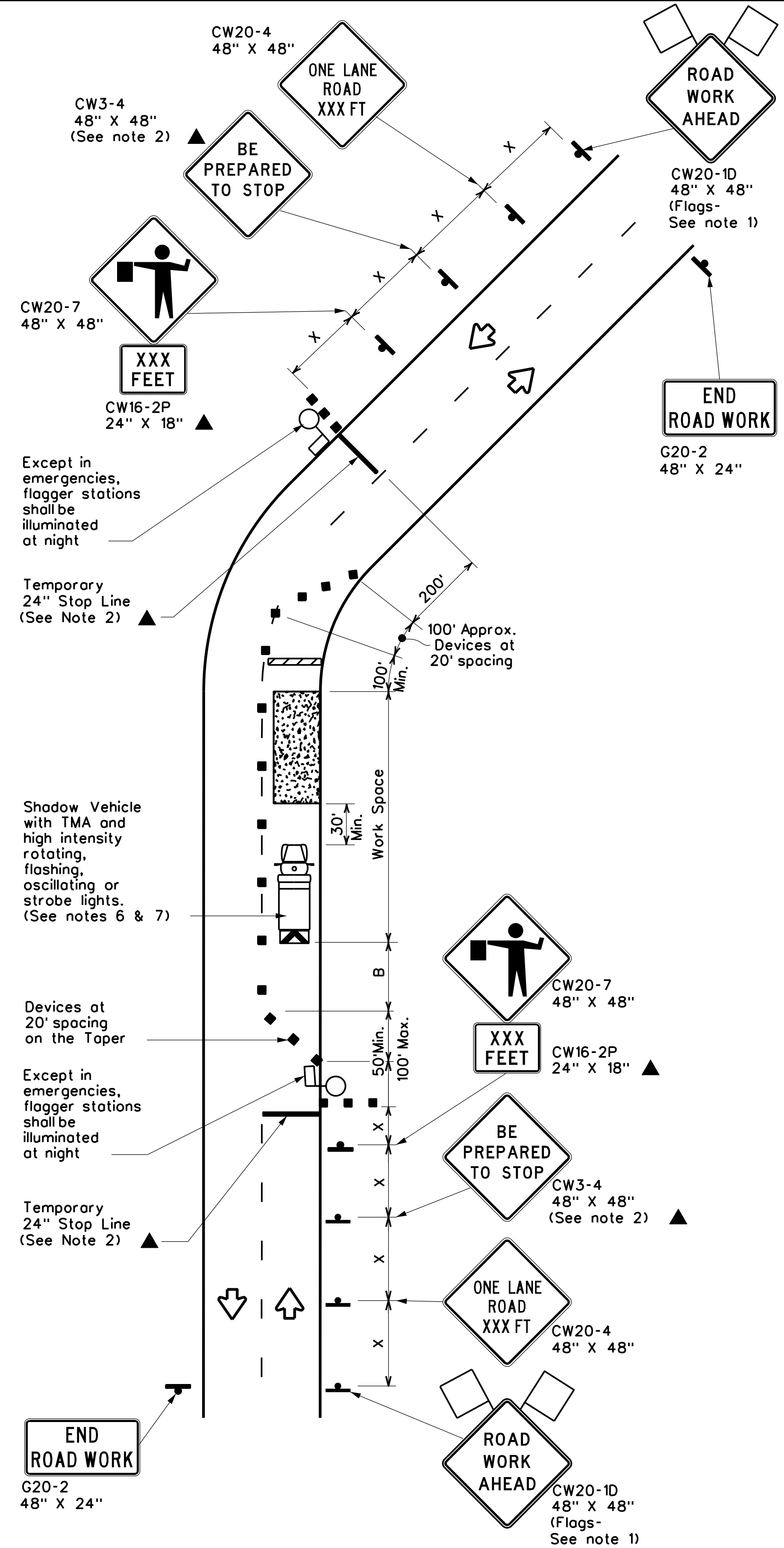
TCP (2-2a)

2-LANE ROADWAY WITHOUT PAVED SHOULDERS

ONE LANE TWO-WAY

CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See Note 9)



TCP (2-2b)

2-LANE ROADWAY WITHOUT PAVED SHOULDERS

ONE LANE TWO-WAY

CONTROL WITH FLAGGERS

LEGEND

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

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

* Conventional Roads Only

** Taper lengths have been rounded off.

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

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

GENERAL NOTES

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

TCP (2-2a)

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

TCP (2-2b)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT 6470	SECT 93	JOB 001	HIGHWAY US 377, ETC.
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	DIST SJT	COUNTY KIMBLE, ETC.		SHEET NO. 66

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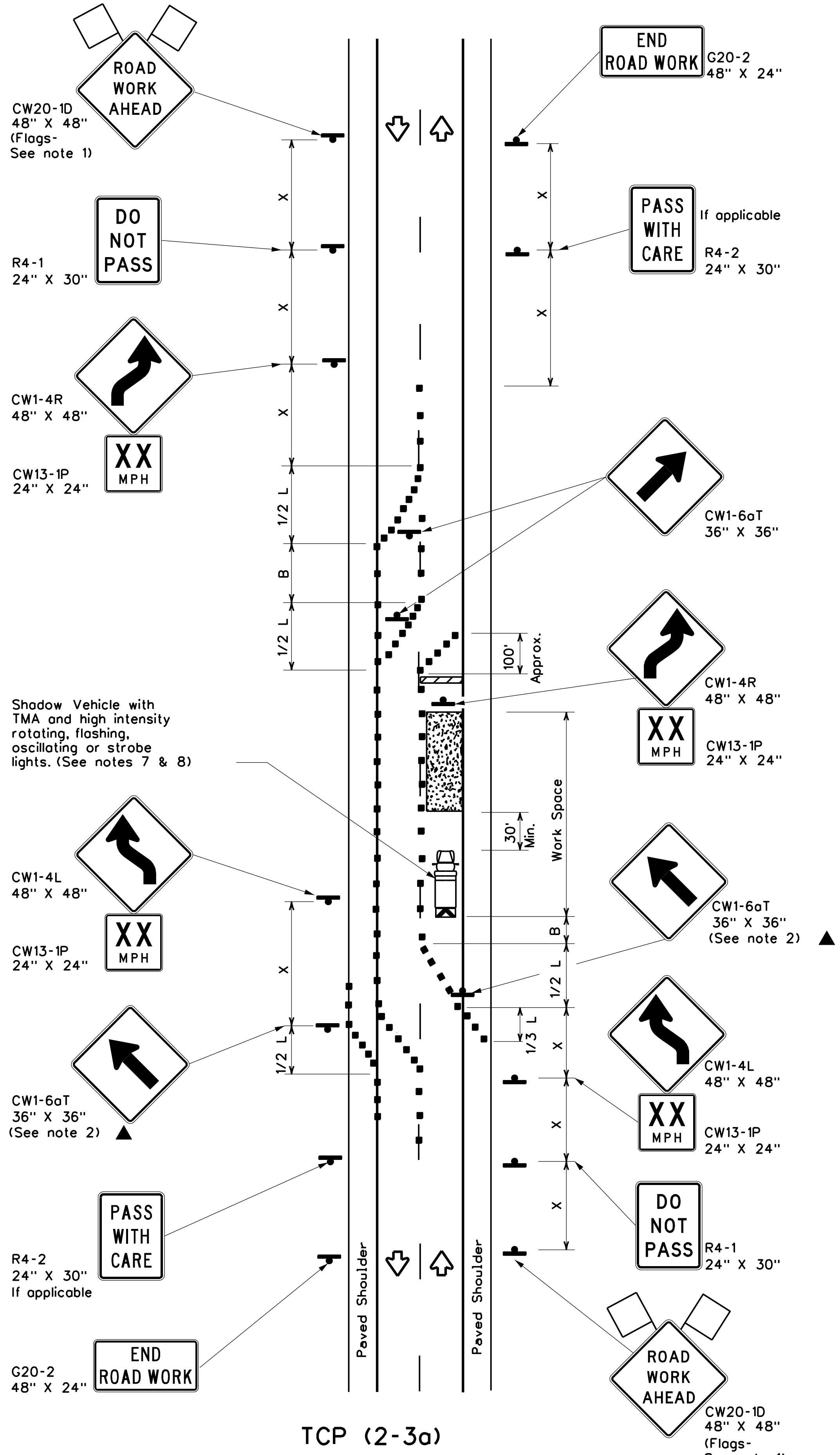
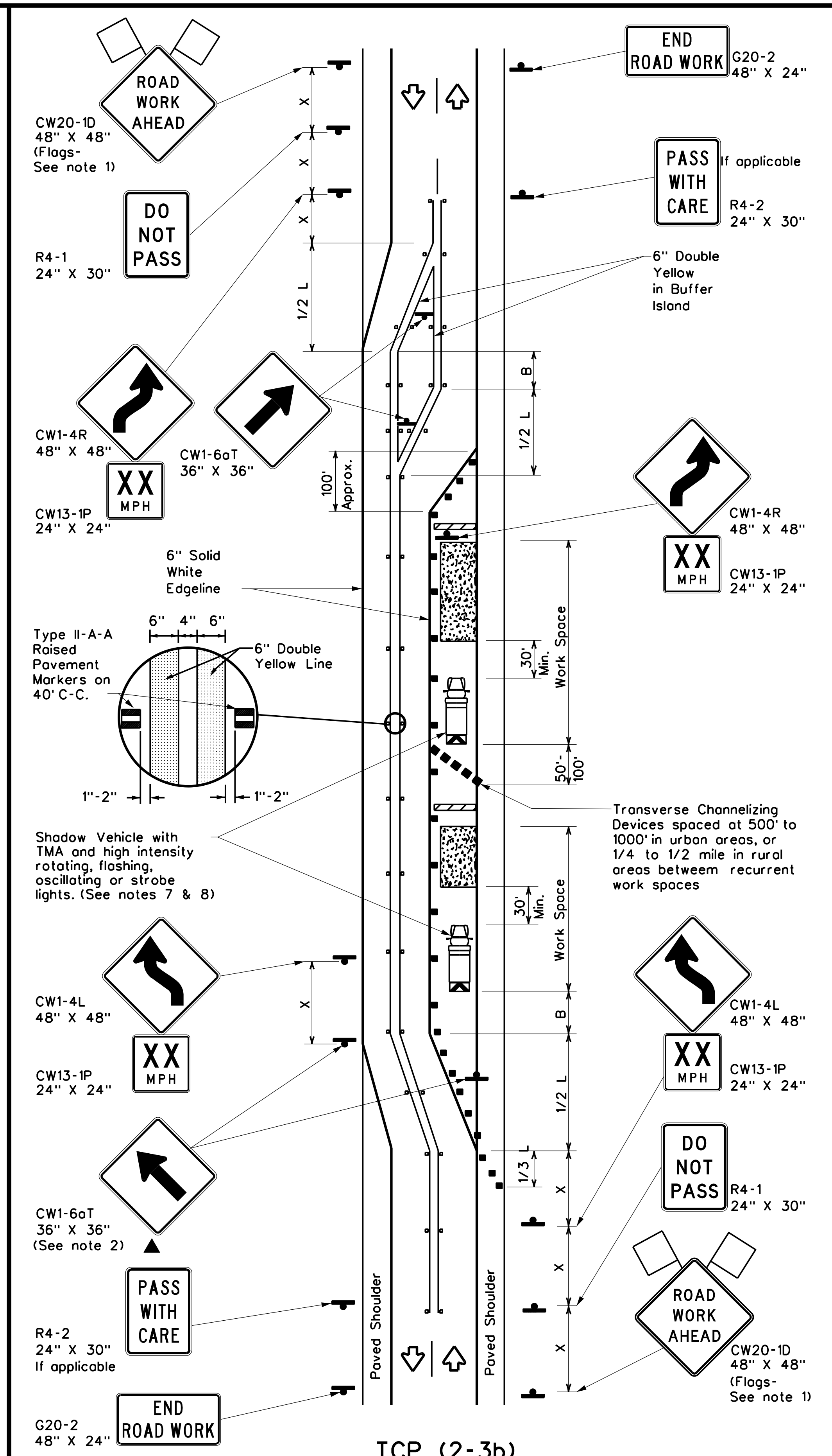


TCP (2-3a)

2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED

ADEQUATE FIELD OF VIEW



TCP (2-3b)

2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED

INADEQUATE FIELD OF VIEW

LEGEND

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

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

* Conventional Roads Only

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

TYPICAL USAGE

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

GENERAL NOTES

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

TCP (2-3a)

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

Texas Department of Transportation

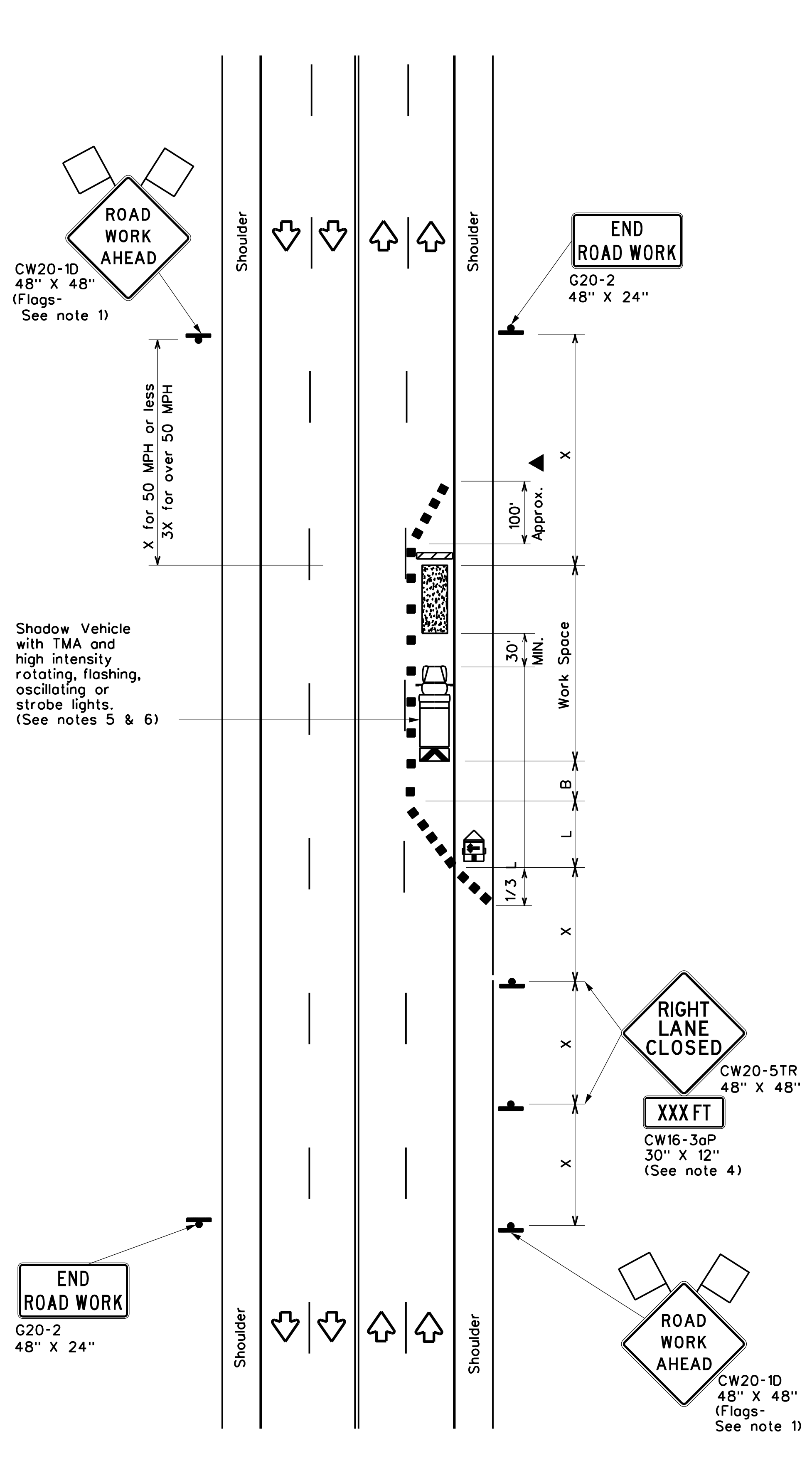
Traffic Safety Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

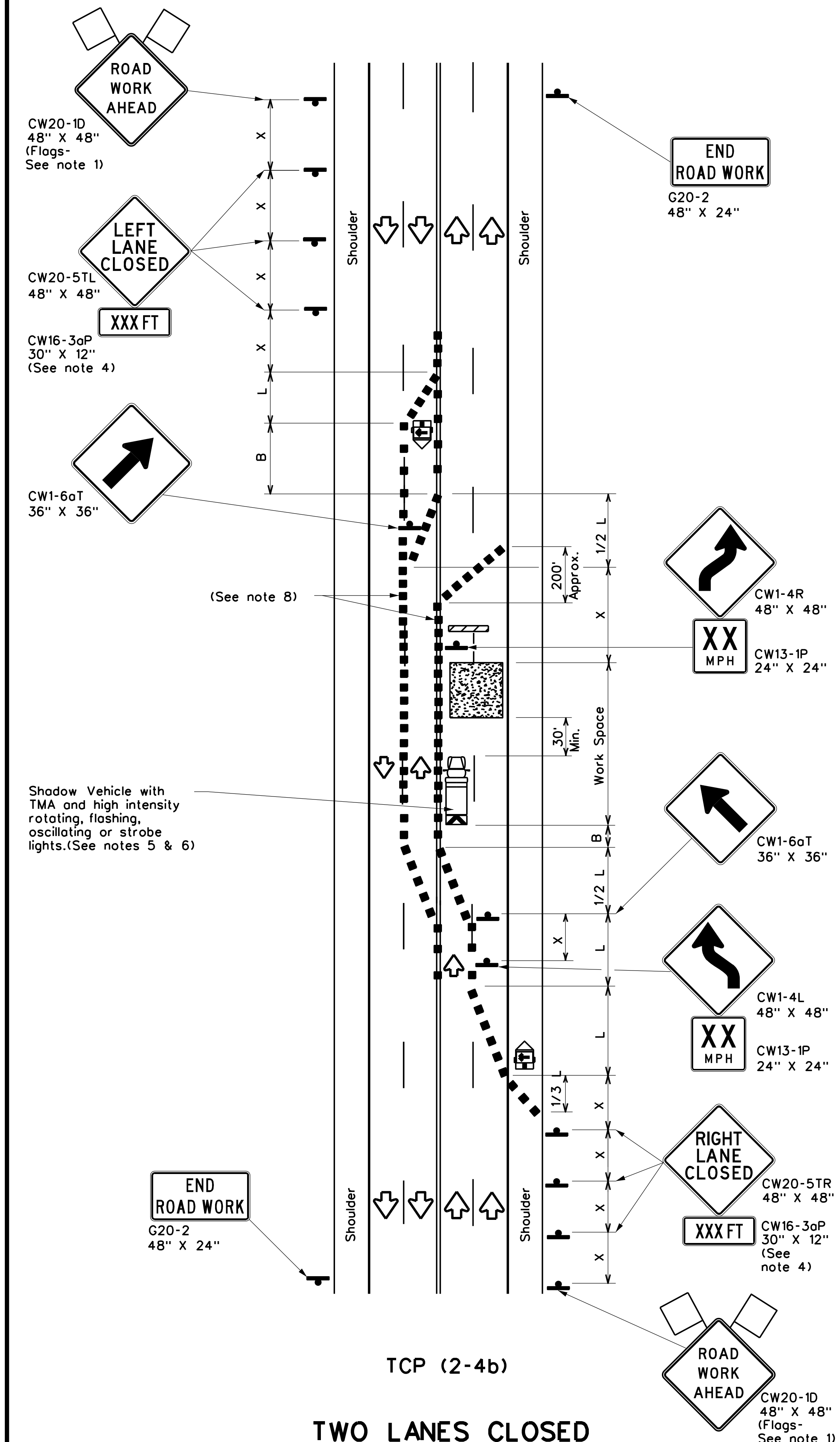
TCP(2-3)-23

FILE: tcp(2-3)-23.dgn	DN:	CK:	DW:	CK:
© TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-85 4-98 2-18 / 8-95 3-03 4-23 / 1-97 2-12	6470	93	001	US 377, ETC.
	DIST		COUNTY	SHEET NO.
	SJT		KIMBLE, ETC.	67

163



ONE LANE CLOSED



TWO LANES CLOSED

LEGEND

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

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

* Conventional Roads Only

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

TYPICAL USAGE

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-4a)

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

TCP (2-4b)

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

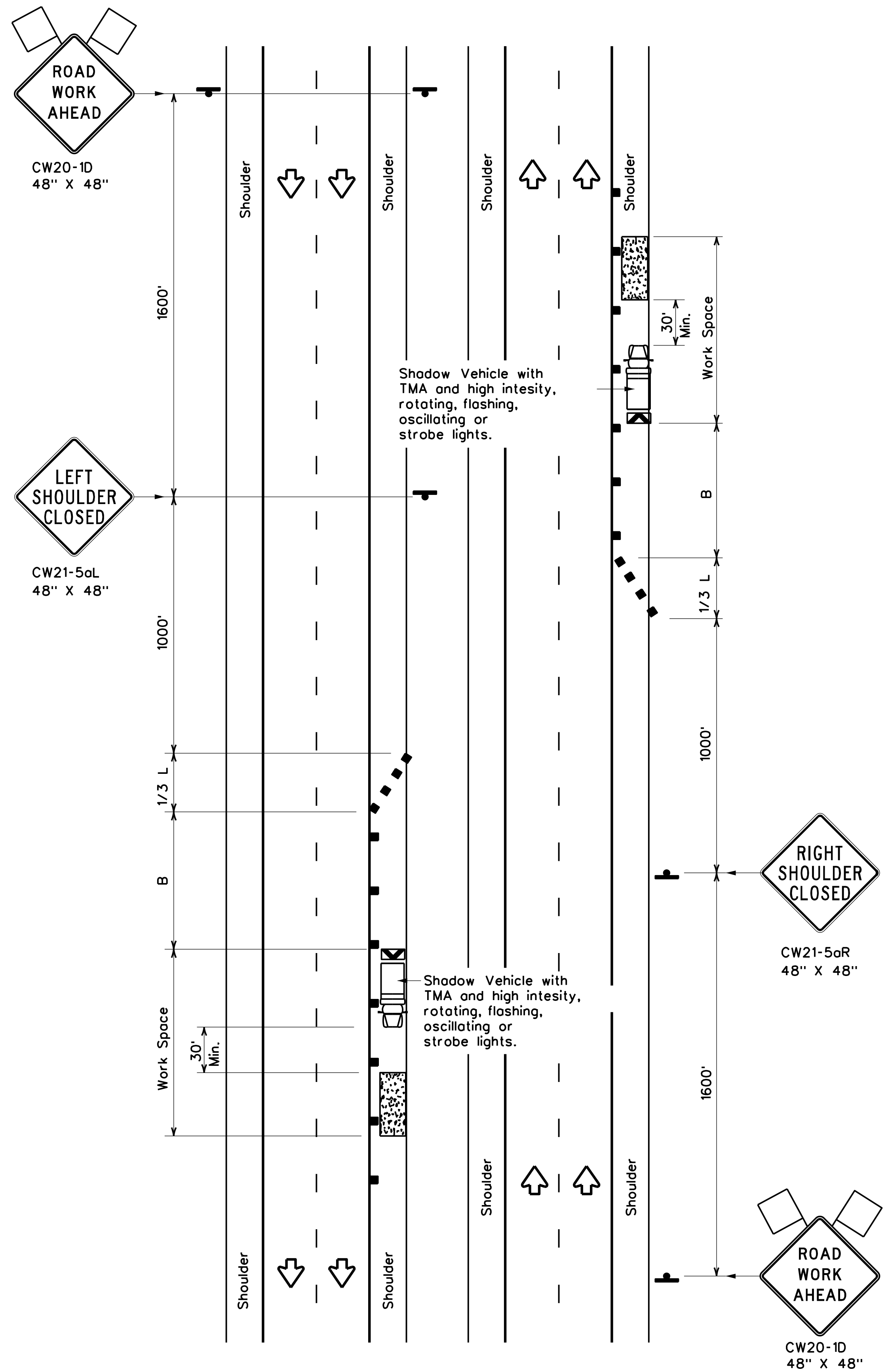
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

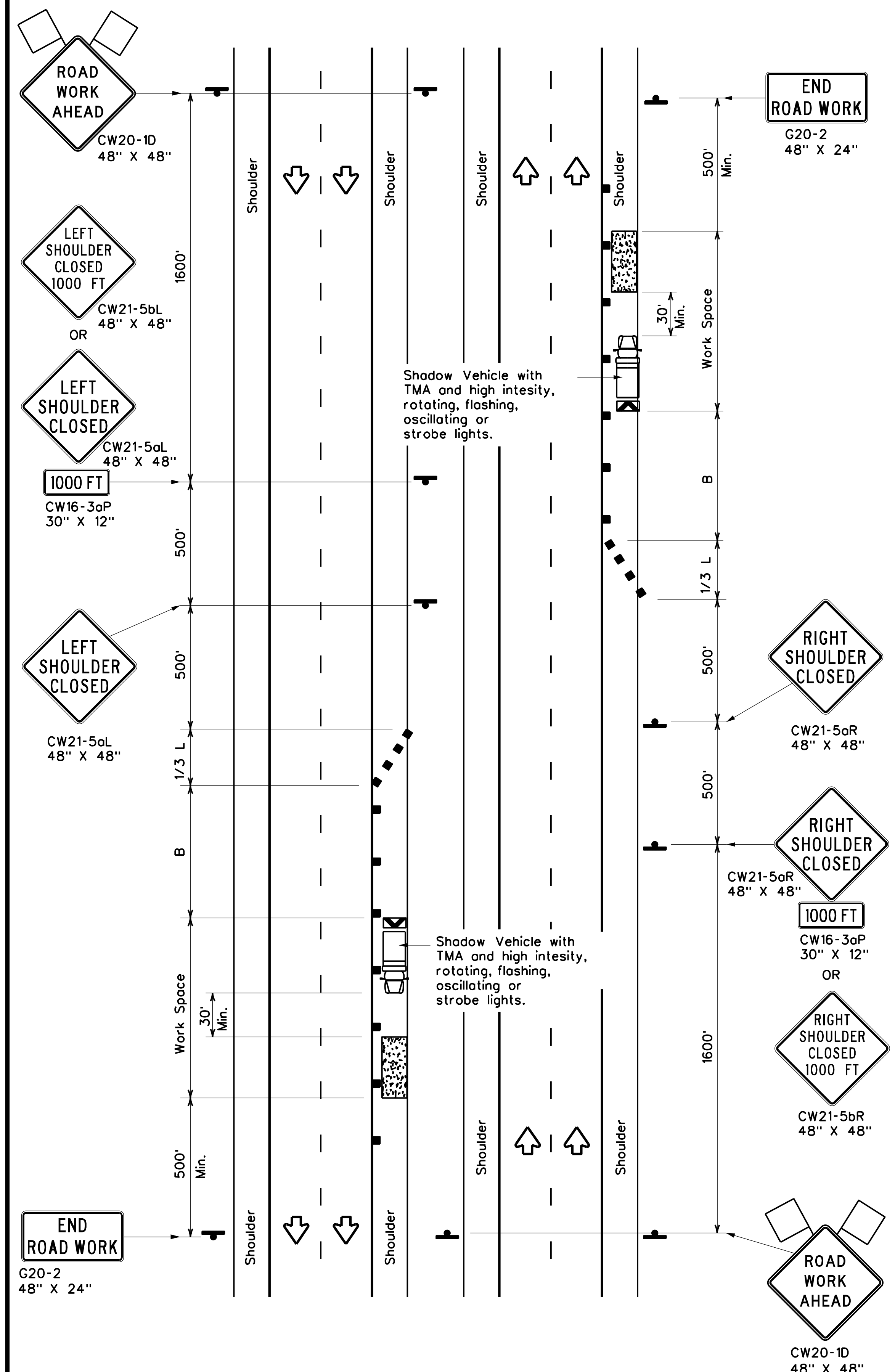
TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	6470	93	001	US 377, ETC.
	DIST	COUNTY		SHEET NO.
	SJT	KIMBLE, ETC.		68



TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

LEGEND

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

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

* Conventional Roads Only

** Taper lengths have been rounded off.

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

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

GENERAL NOTES

1. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30' to 100' in advance of the area of crew exposure without adversely effecting the performance or quality of the work. Type 3 barricades or drums may be substituted when workers on foot are no longer present when approved by the Engineer.

2. 28" tall or taller one-piece cones will be allowed only for Short Duration or Short Term stationary operations when workers are present to maintain the devices upright and in proper location. Intermediate Term stationary work areas should use Drums, Vertical Panels or 42" tall two-piece cones.

DATE: 9/9/2024 10:03:35 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT12/Documents/07 - SJT/Maintenance Projects/...

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

TCP(5-1)-18

FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	93	001	US 377, ETC.
2-18	DIST		COUNTY	SHEET NO.
	SJT		KIMBLE, ETC.	69

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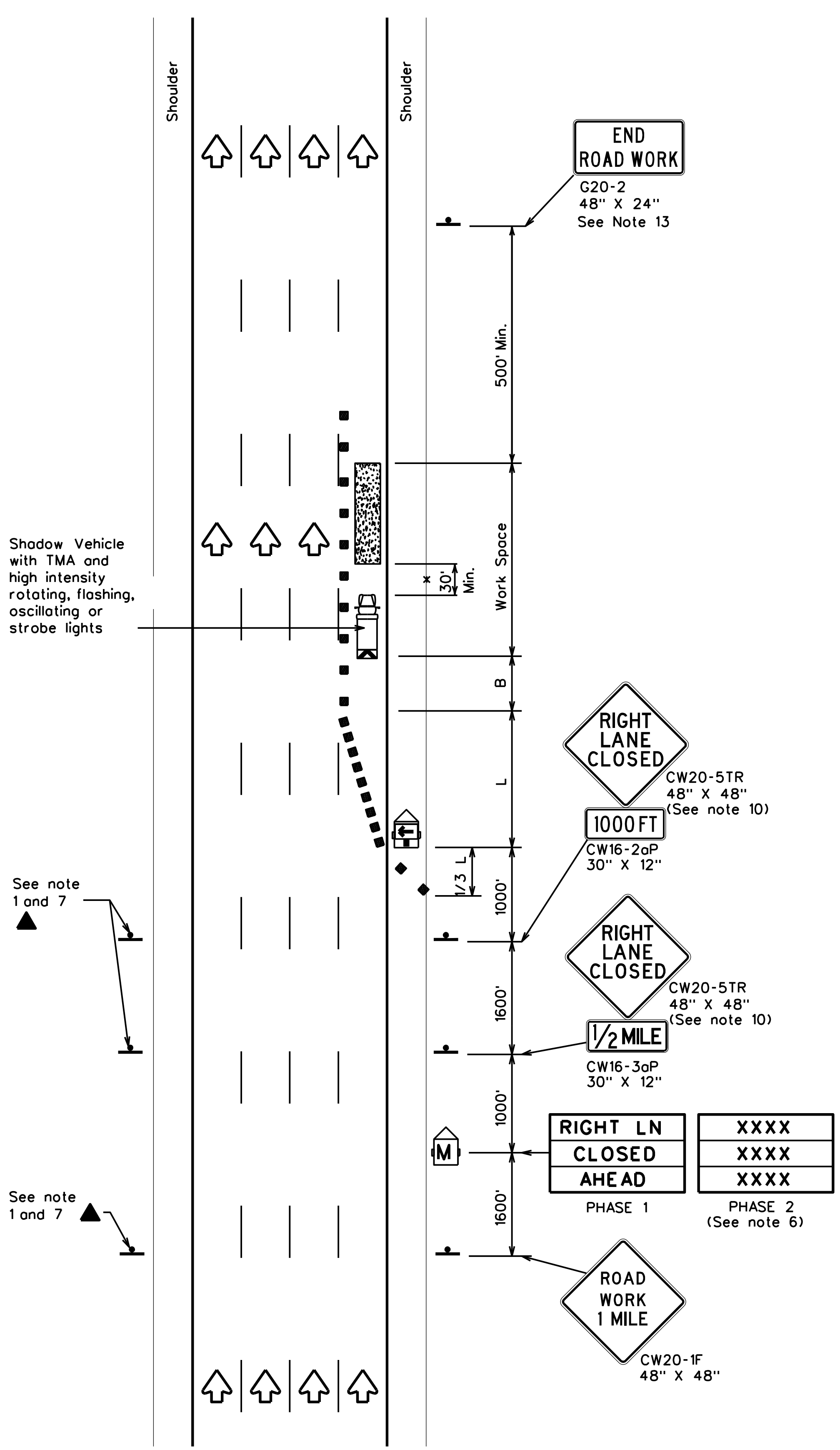
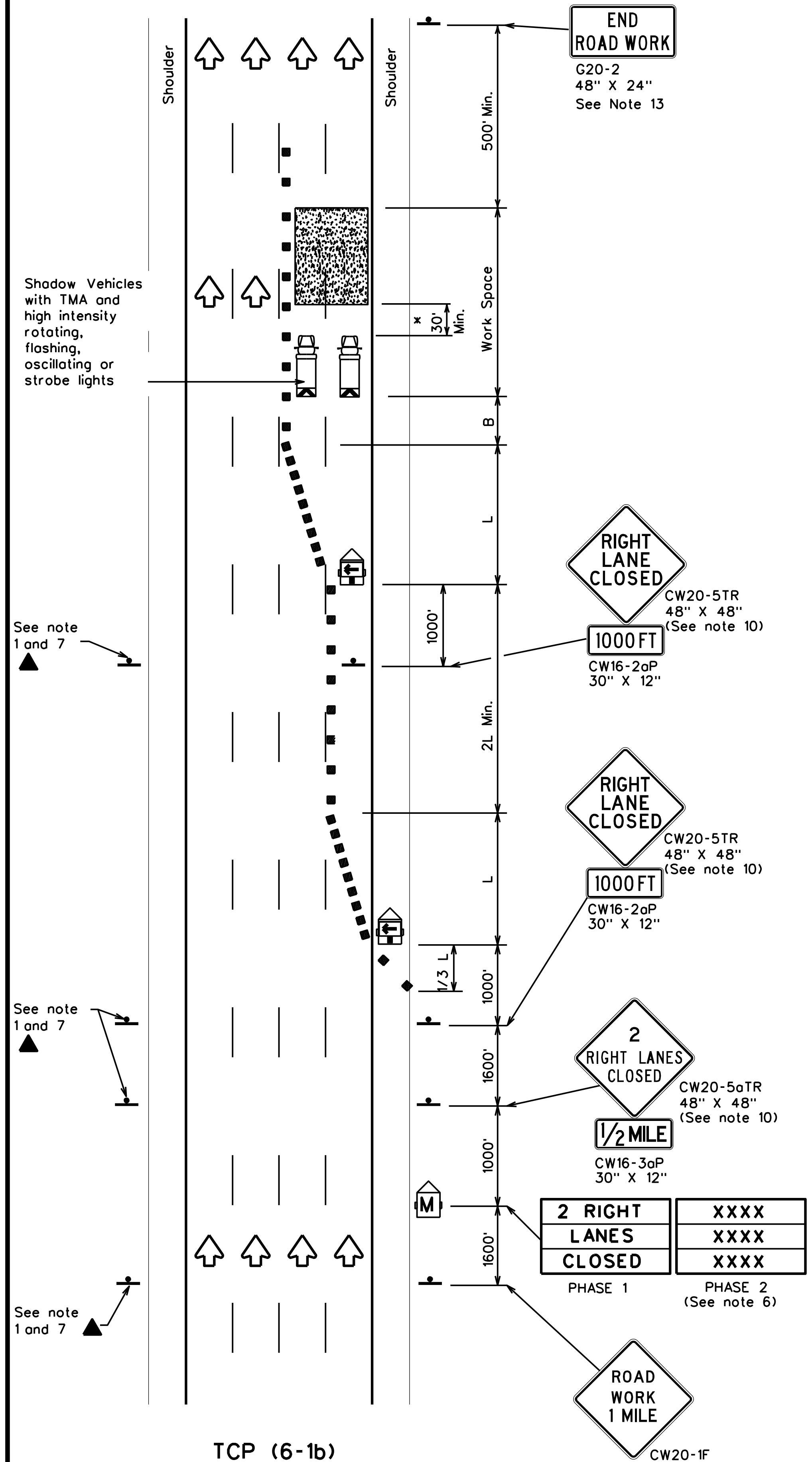


TCP (6-1a)

TYPICAL FREEWAY
ONE LANE CLOSURE



TCP (6-1b)

TYPICAL FREEWAY
TWO LANE CLOSURE

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

TCP(6-1)-12

FILE: tcp6-1.dgn		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY	
REVISIONS 8-12	6470	93	001	US 377, ETC.	
	DIST	COUNTY		SHEET NO.	
	SJT	KIMBLE, ETC.		70	

201

DATE: 9/9/2024 10:03:37 AM
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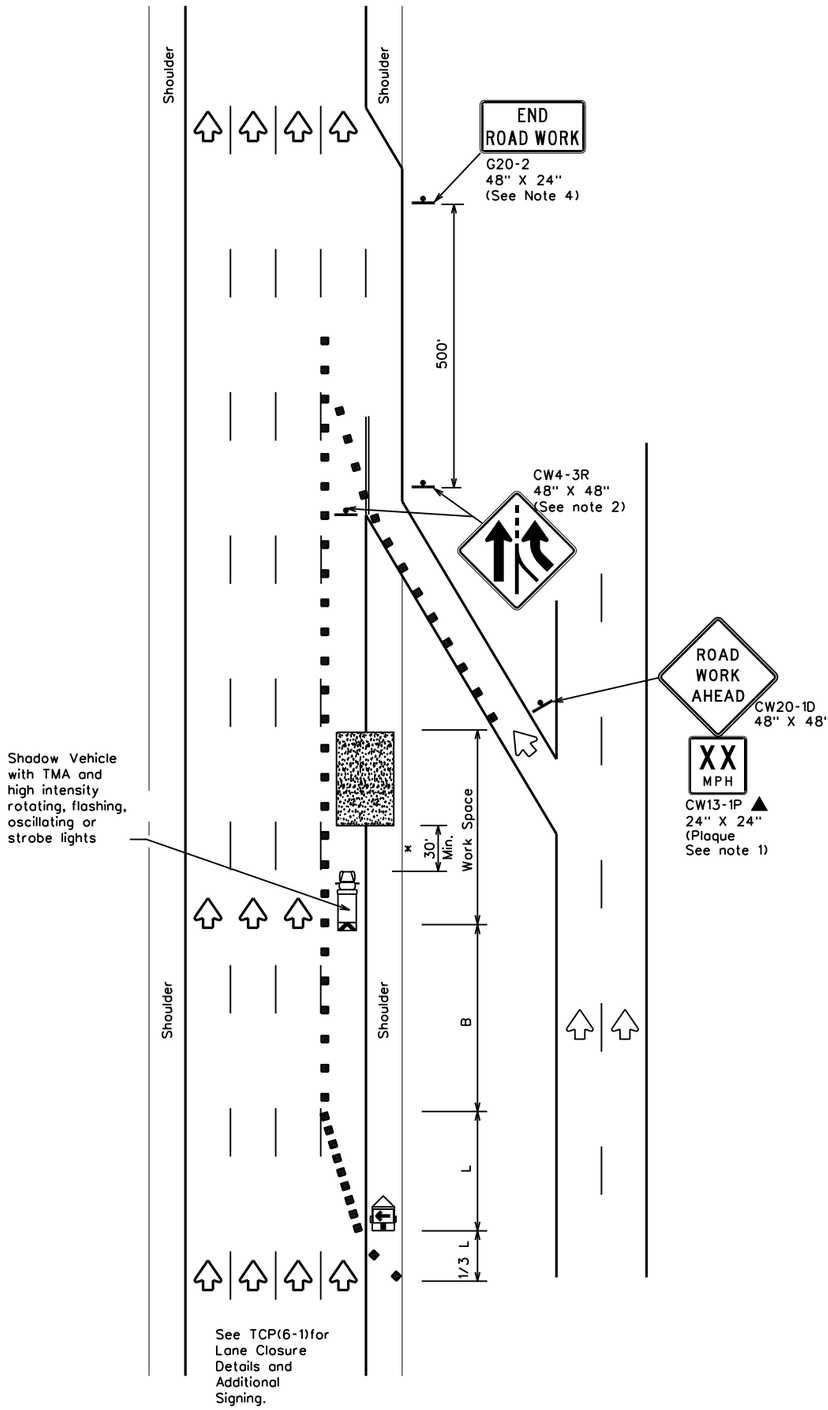
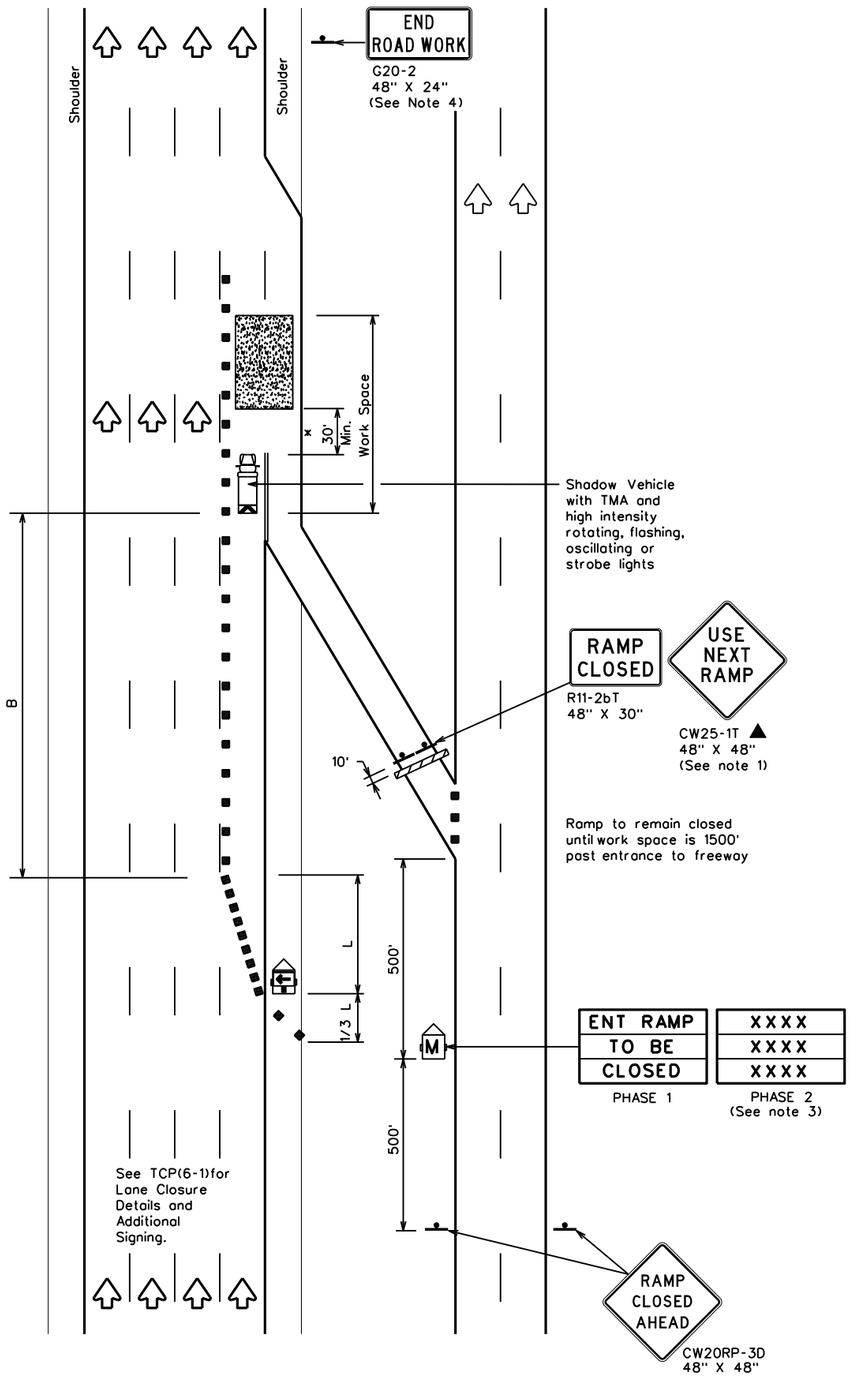


TCP (6-2a)

ENTRANCE RAMP OPEN
WORK WITHIN 500' OF RAMP



TCP (6-2b)

ENTRANCE RAMP CLOSED

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA NEAR RAMP

TCP(6-2)-12

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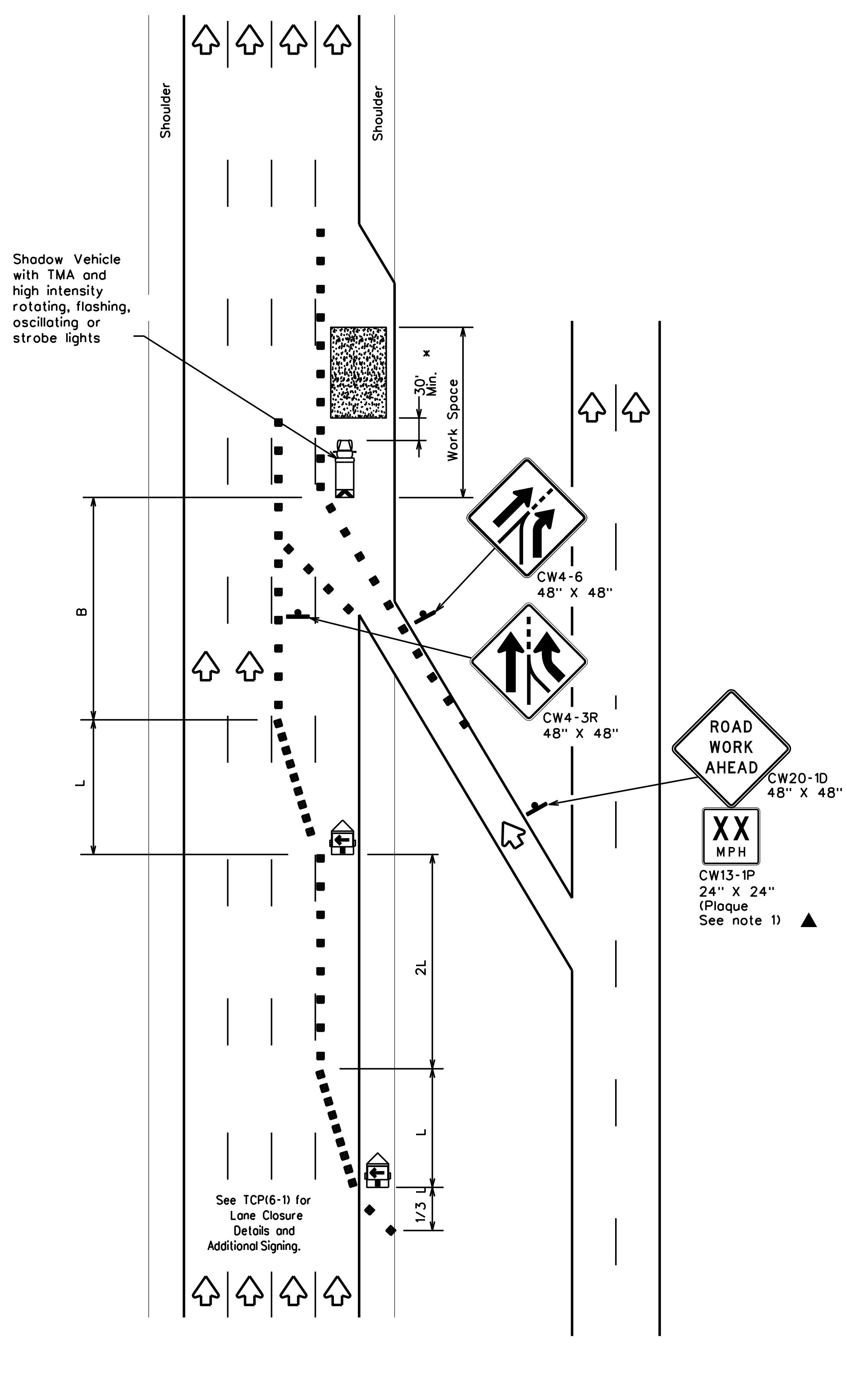
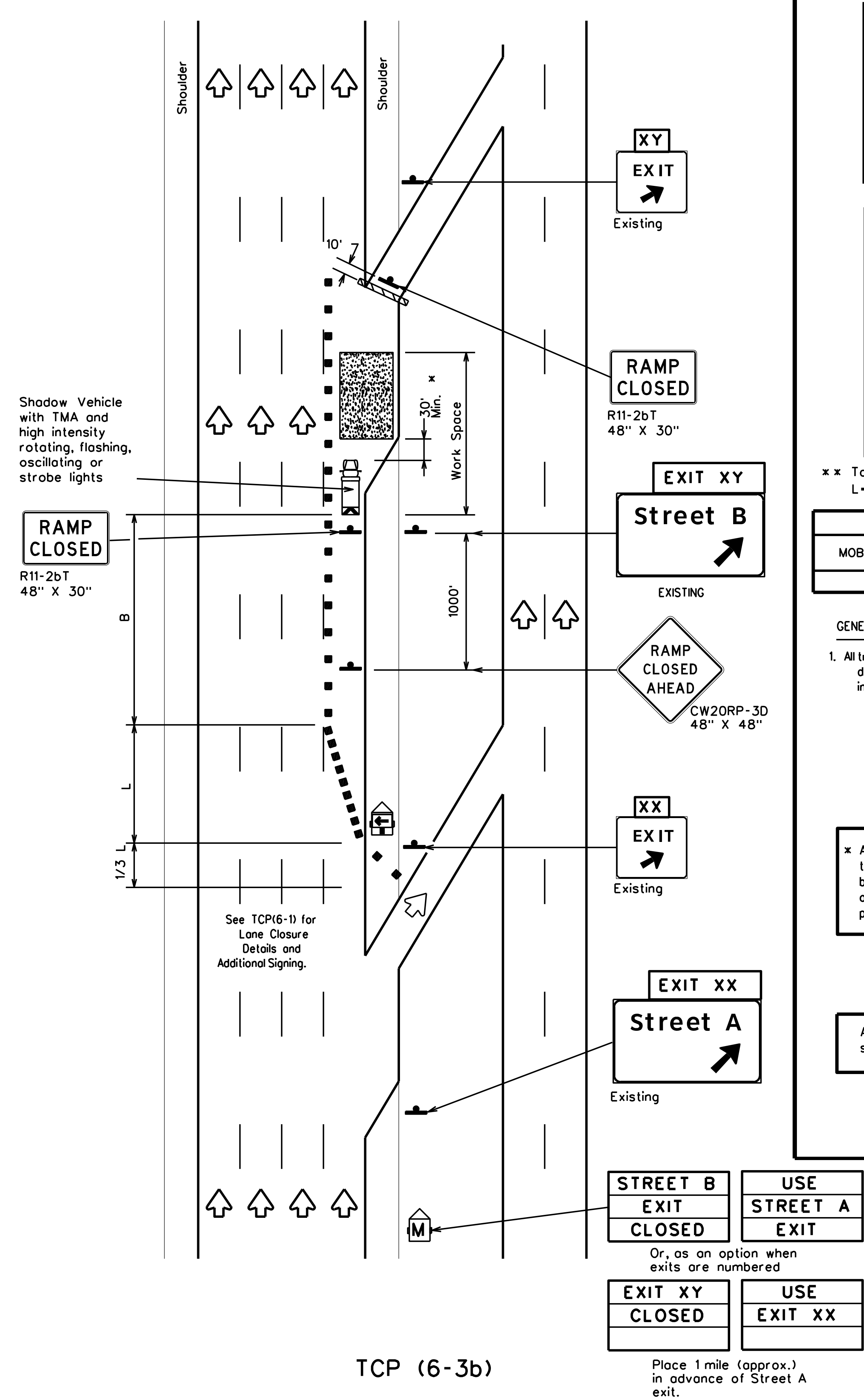
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	93	001	US 377, ETC.
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	SJT	KIMBLE, ETC.		71



TCP (6-3a)

ENTRANCE RAMP OPEN



TCP (6-3b)

EXIT RAMP CLOSED

TRAFFIC EXITS PRIOR TO CLOSED RAMP

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES:

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

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN WORK AREA BEYOND RAMP

TCP(6-3)-12

FILE: tcp6-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT 6470	SECT 93	JOB 001	HIGHWAY US 377, ETC.
REVISIONS 1-97 8-98 4-98 8-12	DIST SJT		COUNTY KIMBLE, ETC.	SHEET NO. 72

203

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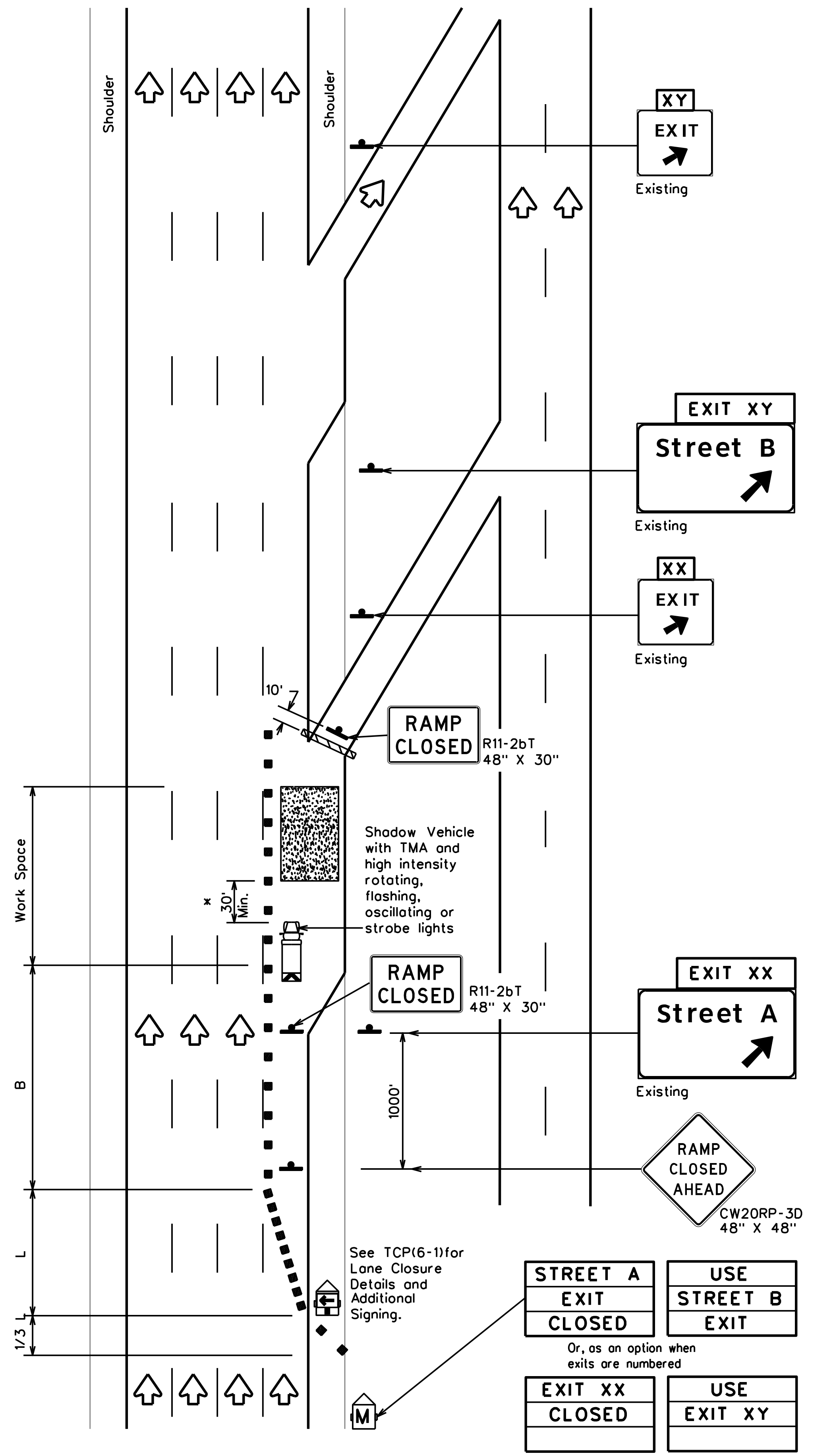
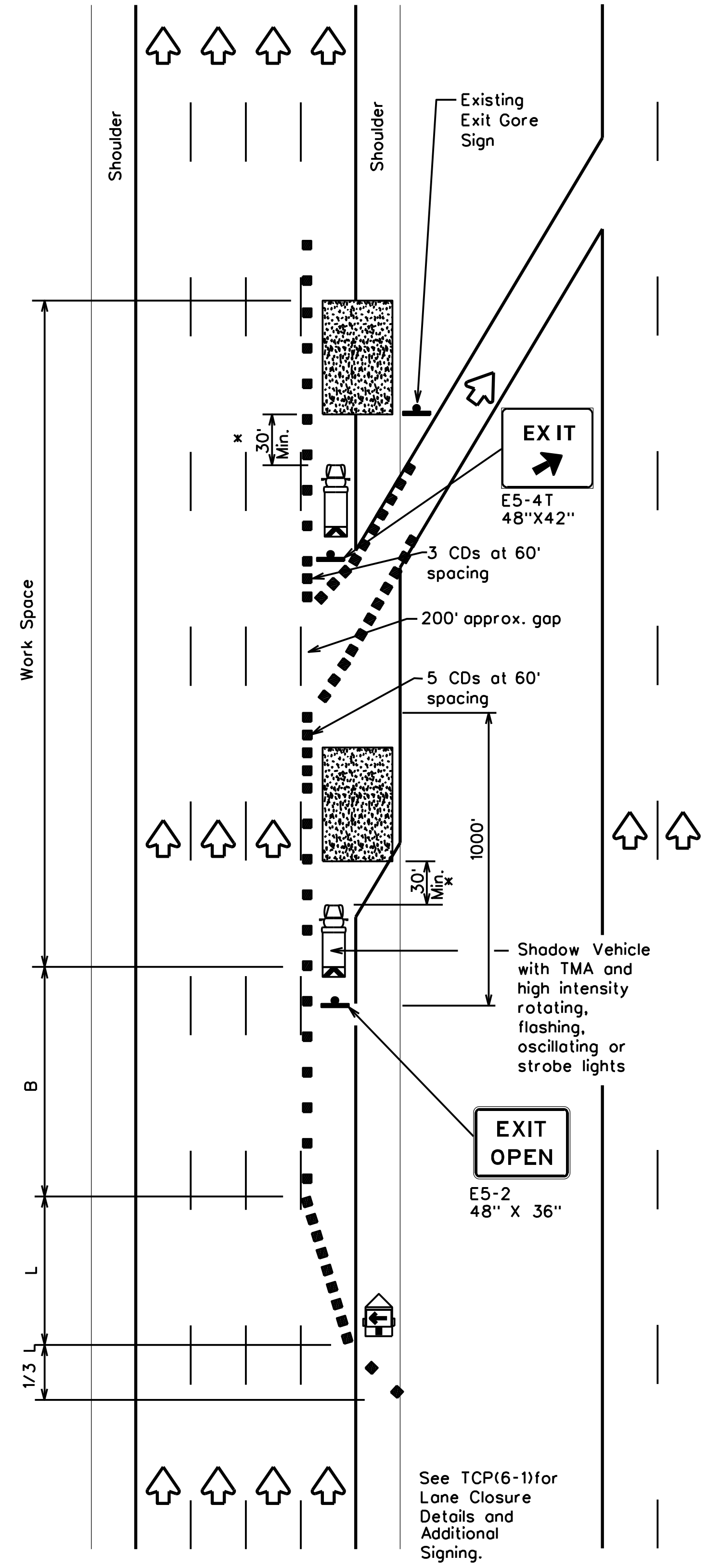


TCP (6-4a)

EXIT RAMP CLOSED

TRAFFIC EXITS PAST CLOSED RAMP



TCP (6-4b)

EXIT RAMP OPEN

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

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

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

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

GENERAL NOTES

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

2. See BC Standards for sign details.

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

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

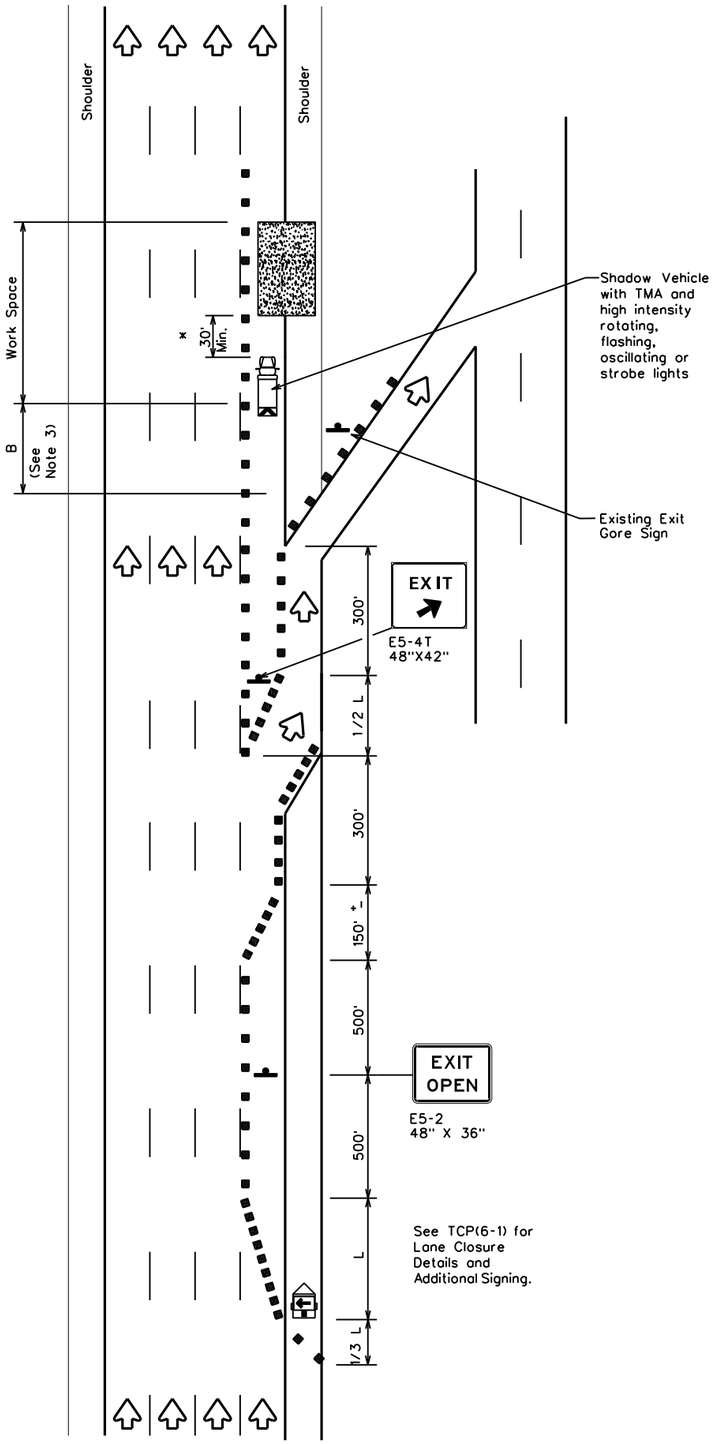
Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN WORK AREA AT EXIT RAMP

TCP(6-4)-12

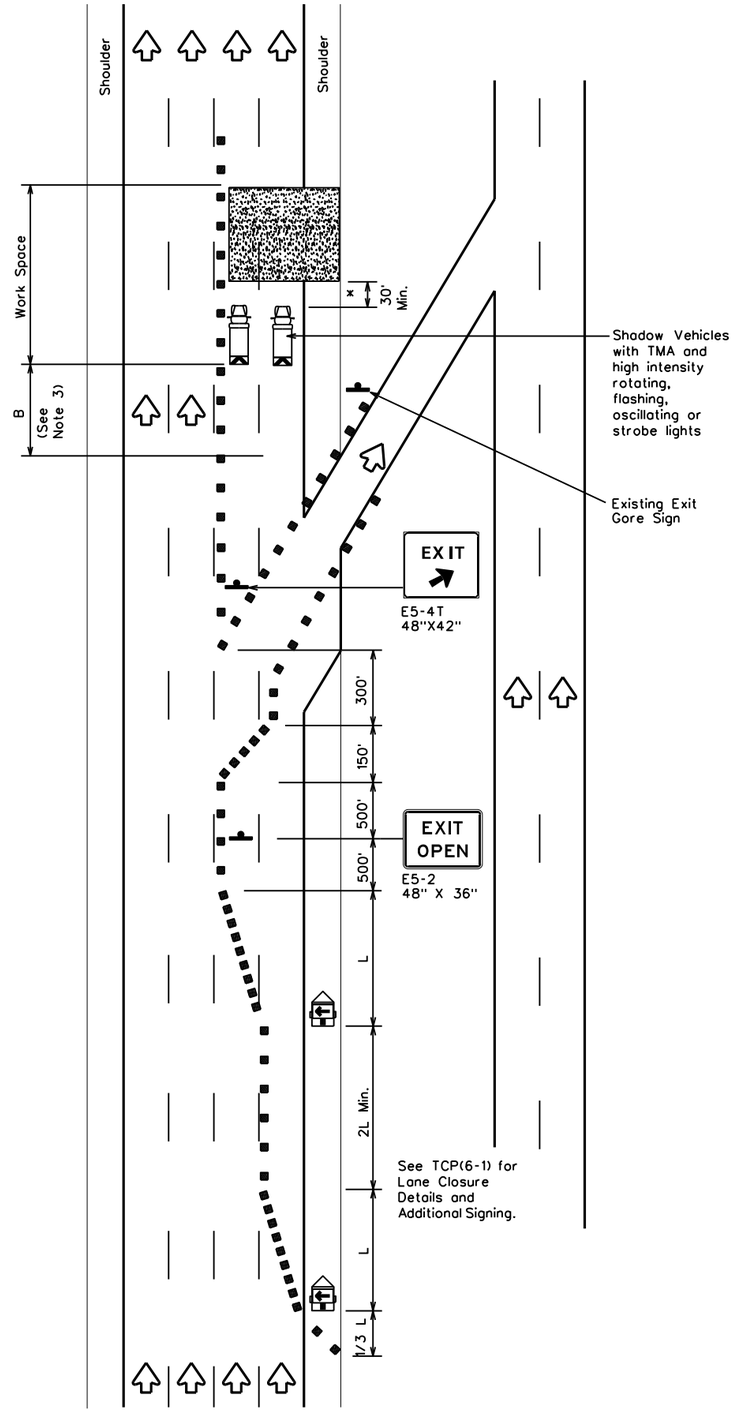
FILE: tcp6-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	93	001	US 377, ETC.
1-97 8-98	DIST		COUNTY	SHEET NO.
4-98 8-12	SJT		KIMBLE, ETC.	73

204



TCP (6-5a)

EXIT RAMP OPEN



TCP (6-5b)

EXIT RAMP OPEN
TWO LANE CLOSURE WITHIN 1500' PAST EXIT RAMP

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

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

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

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. See BC standards for sign details.
3. If adequate longitudinal buffer length "B" does not exist between the work space and the exit ramp, consideration should be given to closing the ramp.

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA BEYOND EXIT RAMP

TCP(6-5)-12

FILE: tcp6-5.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	93	001	US 377, ETC.
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	SJT	KIMBLE, ETC.		74

DATE: 9/9/2024 10:03:41 AM
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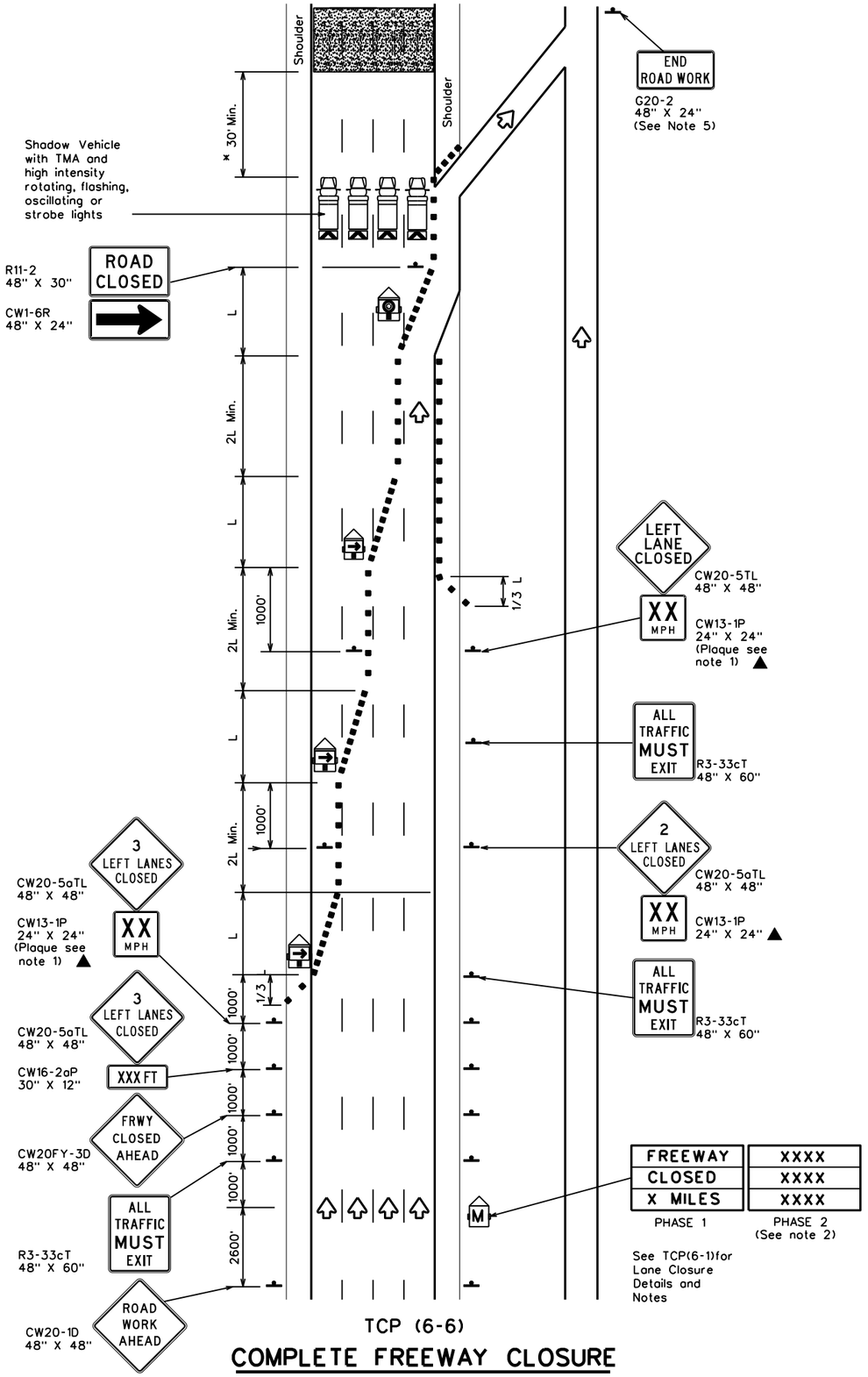


TCP (6-6)

COMPLETE FREEWAY CLOSURE

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

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

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

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. Phase 2 of the PCMS message should include appropriate information formatted as shown on BC(6), such as "MERGE RIGHT," recommended speed, delay, exit information, or other specific warnings.
3. Where queuing is anticipated beyond signing shown, additional PCMS signs, other warning signs, devices or Law Enforcement Officers should be available to warn approaching high speed traffic of the end of the queue, as directed by the Engineer.
4. Entrance ramps located from the advance warning area to the exit ramp should be closed whenever possible.
5. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

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

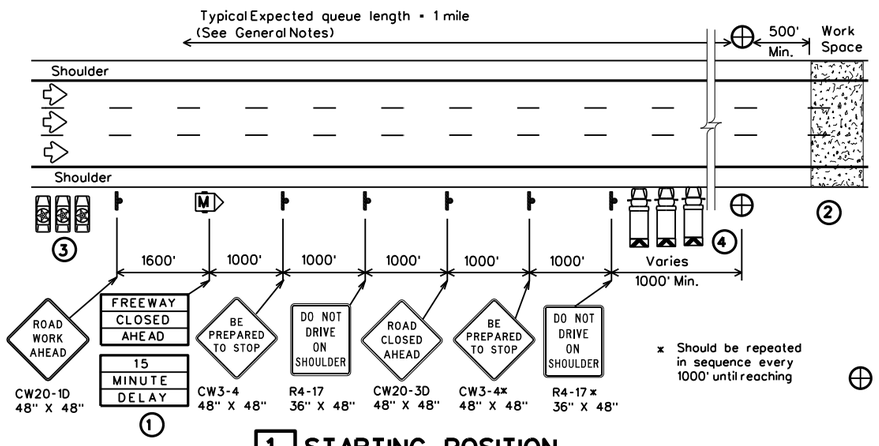
Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY CLOSURE

TCP(6-6)-12

FILE: tcp6-6.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	93	001	US 377, ETC.
1-97 8-98 4-98 8-12	DIST	COUNTY		SHEET NO.
	SJT	KIMBLE, ETC.		75



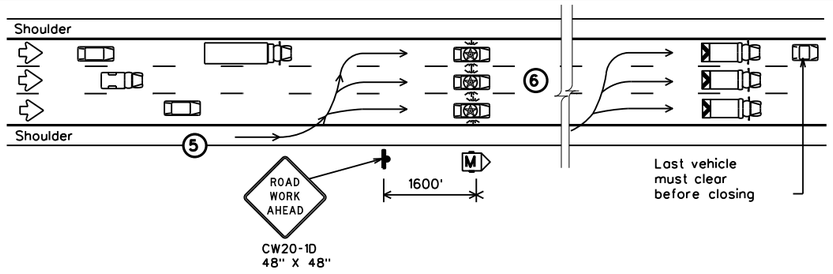
1 STARTING POSITION

(1) Traffic control devices should be installed or located near their intended position prior to beginning temporary roadway closure sequence. Duplicate signs should be erected on the median side of the roadway when median width permits. Warning signs should not be placed on the paved shoulders that will be used by the WARNING LEOV, or where movement of the LEOVs or barrier vehicles will be impeded.

(2) Prior to beginning the roadway closure sequence, all equipment, materials, personnel, and other items necessary to complete the work should be gathered near the work area. Entrance ramps located in the area where a queue is expected to build should be closed.

(3) There should be one LEOV for every lane to be controlled, plus a minimum of one to warn traffic approaching a queue. An additional lead law enforcement officer is desirable to remain with the Engineer's or Contractor's point of contact (POC) during the operation in order to improve communication with all LEOVs involved.

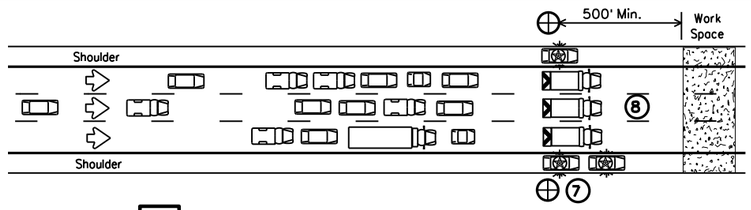
(4) One barrier vehicle with a Truck Mounted Attenuator and amber or blue and amber high intensity flashing/oscillating/strobe lighting shall be used for each lane to be closed.



2 REDUCING SPEED OPERATION

(5) Starting position of the LEOVs should be in advance of the most distant warning signs.

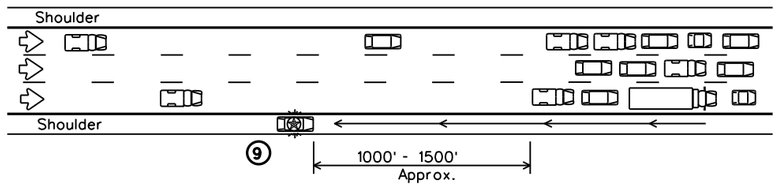
(6) Once the LEOVs have achieved an abreast blocking formation while traveling toward the CP, emergency lights and headlights should be turned "ON". The LEOVs should maintain formation, not allow traffic to pass, and begin to decelerate. The LEOVs should continue to decelerate, giving the barrier vehicles opportunity to be staged upstream of the work space after traffic has cleared. The LEOVs should then continue to decelerate slowly until bringing traffic to a stop near the barrier vehicles.



3 ALL TRAFFIC STOPPED AT CP

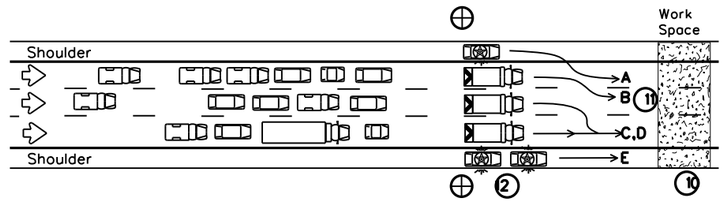
(7) Once traffic is stopped the LEOVs should park on the shoulders with emergency lighting "ON" in order to provide law enforcement presence at the closure and keep shoulders blocked ahead of the work space. They should stay in radio contact with the WARNING LEOV.

(8) The barrier vehicles should be parked, one in each lane, the parking brake set, with the high visibility flashing/oscillating/strobe lighting "ON," and the transmission in gear.



4 WARNING THE TRAFFIC QUEUE

(9) The WARNING LEOV should proceed to the right shoulder of the roadway, with emergency lights on approximately 1000' in advance of the traffic queue (stopped traffic) as the queue develops. When determined that limited sight distance situations (crest of hills, sharp roadway curvature, etc.) may occur to motorists approaching the queue, the WARNING LEOV may proceed 1/4 mile or more in advance of the queue.



5 RELEASING STOPPED TRAFFIC

(10) All equipment, materials, personnel, and other items should be removed from the roadway and maintain an adequate clear zone.

(11) When the roadway is clear for traffic, the LEOV should proceed forward from the left shoulder followed by the barrier vehicles, from left to right, as shown alphabetically in the plan view.

(12) The LEOV or LEOVs on the right shoulder may remain on the shoulder until satisfied that traffic is moving satisfactorily before merging or proceeding.

(13) LEOVs and barrier vehicles should re-group at their respective starting positions if necessary.

LEGEND			
■ ■	Channelizing Devices	⊕	Control Position (CP)
M	Portable Changeable Message Sign (PCMS)		Barrier Vehicle with Truck Mounted Attenuator
	Law Enforcement Officer's Vehicle(LEOV)		Traffic Flow

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

GENERAL NOTES

1. All traffic control devices shall conform with the latest edition of the Texas Manual on Uniform Traffic Control Devices (TMUTCD). Additional guidelines for traffic control devices may be found in the TMUTCD. Signs conflicting with the roadway closure sequence should be completely removed or covered. Additional traffic control devices may be required for closure of access roads, cross streets, exit and entrance ramps as directed by the Engineer.

2. Law enforcement officers and all workers involved should review and understand all procedures before the roadway closure sequence begins. Pre-work meetings may be held for this purpose. Local emergency services and media should have advance notification of roadway closure, expected dates and approximate times of closures.

3. Law enforcement officers shall be in uniform and have jurisdiction in the locale of the work area. An additional WARNING Law Enforcement Officer's Vehicle (LEOV) may be used on the median side of the roadway where median shoulder width permits (See sequence *9).

4. The roadway closure should be during off-peak hours, as shown in the plans, or as directed by the Engineer.

5. Work should be limited to approximately 15 minutes maximum duration unless otherwise directed by the Engineer based on existing roadway conditions. If the work is not complete within 15 minutes, or if the end of the traffic queue extends past the most distant advance warning signs, the work area should be cleared of all equipment, materials, personnel, and other items, and the roadway reopened. When the queue has dissipated and the traffic flow appears normal the roadway closure sequence may be repeated.

6. For traffic volumes greater than 1000 Passenger Cars Per Hour Per Lane (PCPHPL), or for roadway closures that exceed 15 minutes, see details elsewhere in the plan.

7. If traffic queues beyond the advance warning signs during one road closure sequence, the advance warning should be extended prior to repeating the road closure sequence. When possible, PCMS signs should be located in advance of the last available exit prior to the closure to allow motorists the choice of an alternate route.

THIS PLAN IS INTENDED TO BE USED AT LOCATIONS/TIMES WHEN TRAFFIC VOLUMES ARE LESS THAN 1000 PASSENGER CARS PER HOUR PER LANE.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHORT DURATION FREEWAY CLOSURE SEQUENCE

TCP(6-7)-12

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©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	93	001	US 377, ETC.
1-97 8-12	DIST	COUNTY		SHEET NO.
4-98	SJT	KIMBLE, ETC.		76

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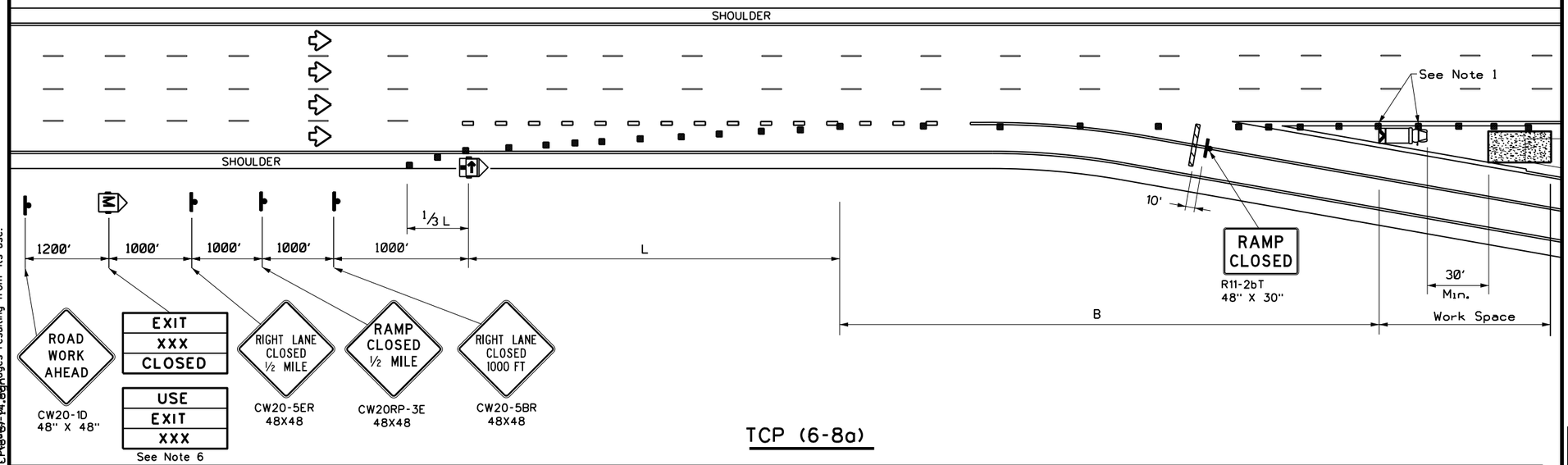
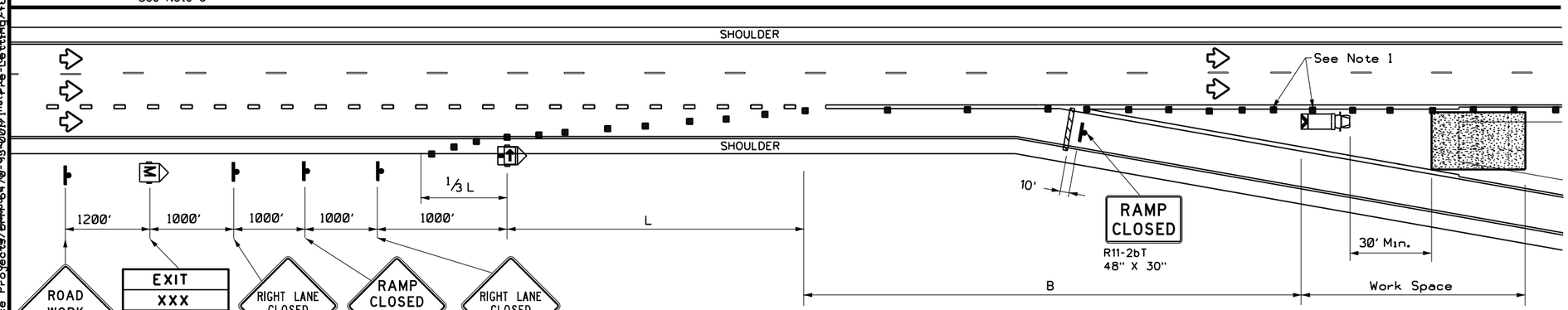


TCP (6-8a)



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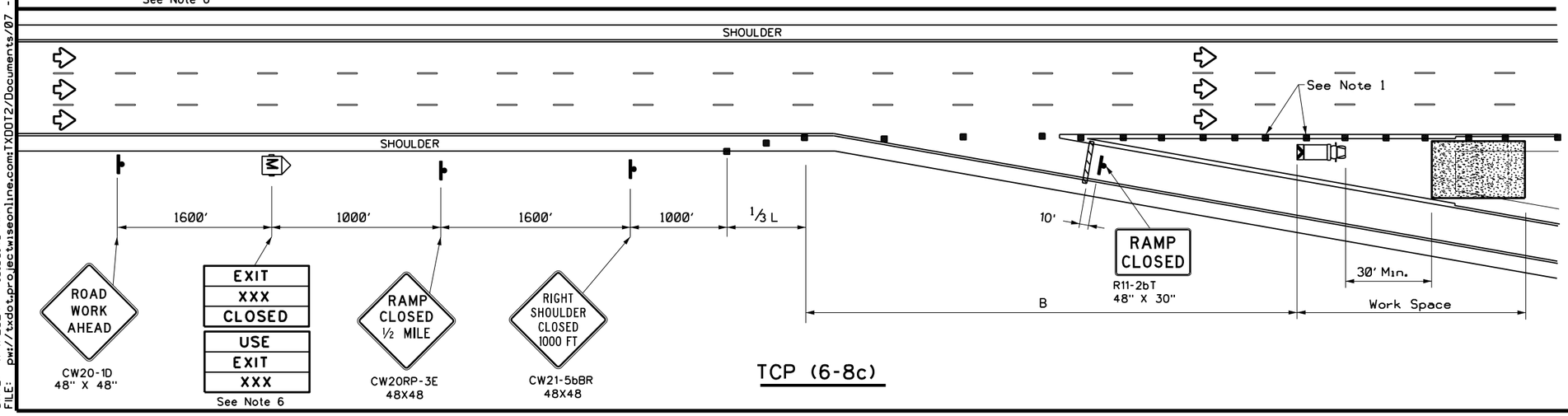

TCP (6-8c)

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. Place channelizing devices in the gore at 20' spacing.
2. See the Standard Highway Sign Design for Texas (SHSD) for sign details.
3. The PCMS may be omitted when a permanent DMS sign is available in an appropriate location to display a similar message as called for on the PCMS.
4. 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.
5. Truck mounted attenuator is required.
6. The PCMS may be omitted if replaced with a "RAMP CLOSED" AHEAD (CW20RP-3D) Sign.
7. Roadway ADT should be greater than 10,000.

Texas Department of Transportation

Traffic Operations Division Standard

WORK IN EXIT GORE FOR ADT GREATER THAN 10,000

TCP(6-8)-14

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© TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
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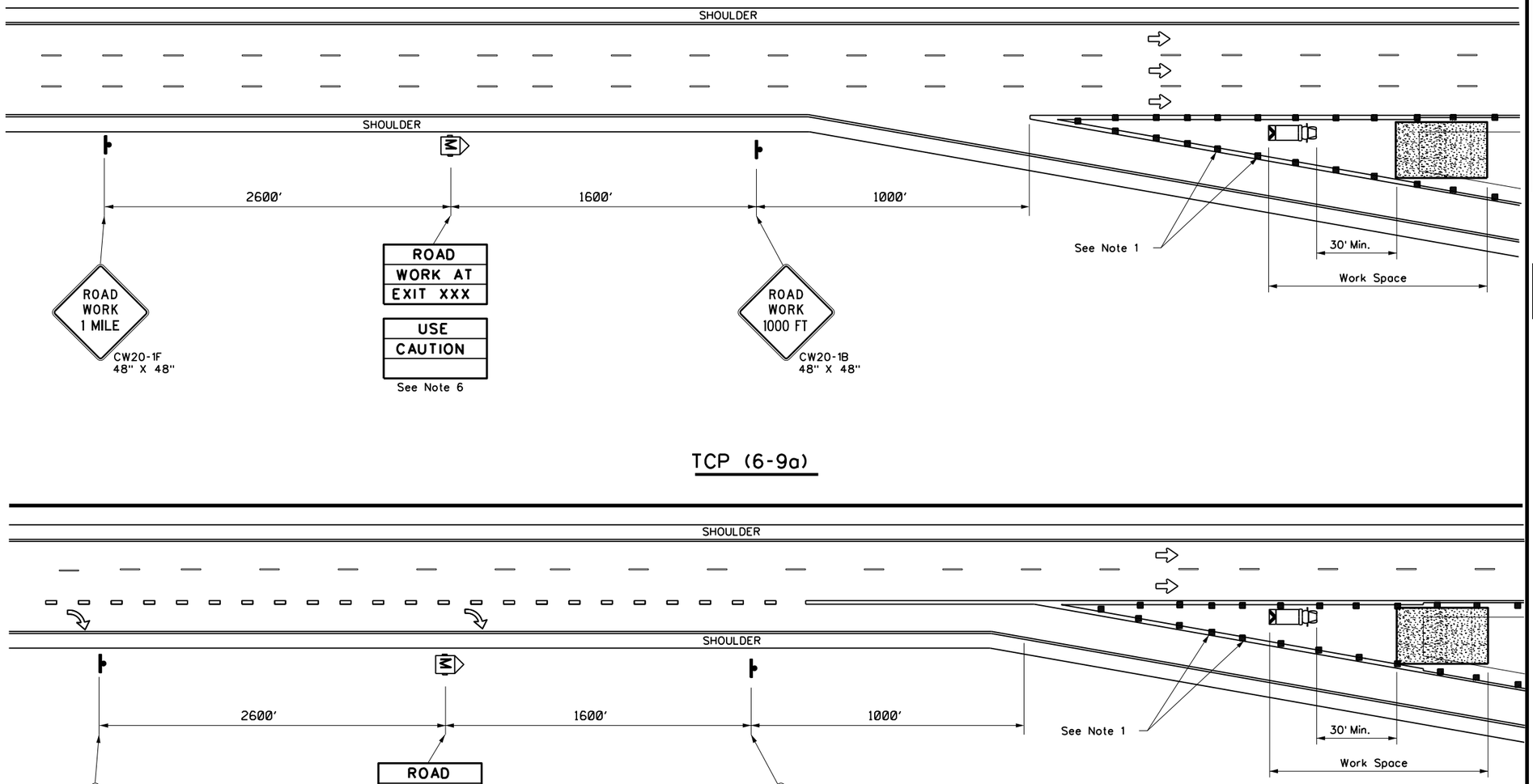

TCP (6-9a)

TCP (6-9b)

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. Place channelizing devices in the gore at 20' spacing.
2. See the Standard Highway Sign Design for Texas (SHSD) for sign details.
3. The PCMS may be omitted when a permanent DMS sign is available in an appropriate location to display a similar message as called for on the PCMS.
4. When it is determined that a through lane should be closed in addition to the exit ramp, refer to TCP(6-4) and TCP(6-8)for traffic control details.
5. Truck mounted attenuators are required.
6. The PCMS may be omitted if replaced with a "ROAD WORK ½ MILE" (CW20-1E).
7. Roadway ADT should be less than 10,000.

Texas Department of Transportation

Traffic Operations Division Standard

WORK IN EXIT GORE FOR ADT LESS THAN 10,000

TCP(6-9)-14

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©TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
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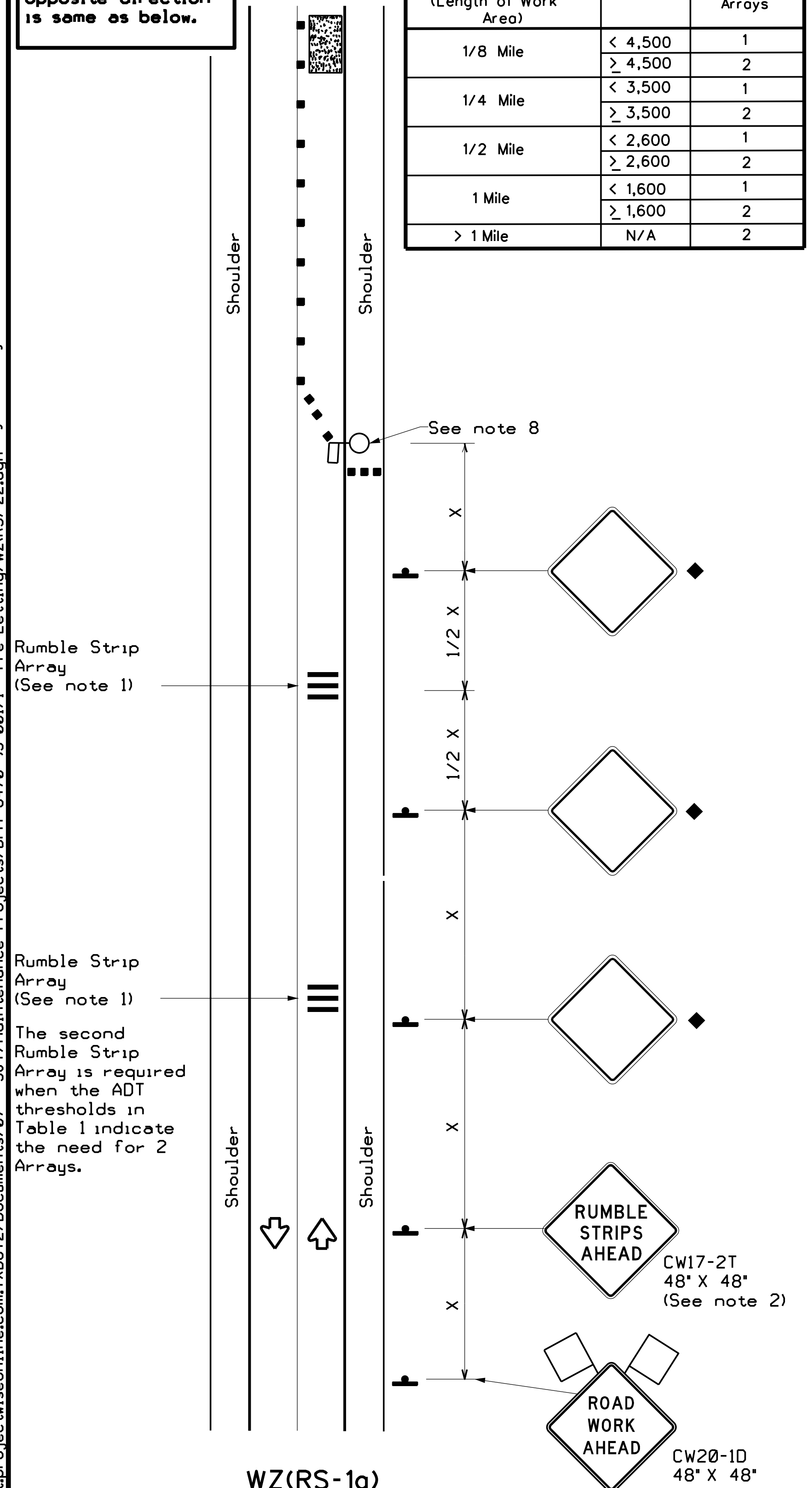
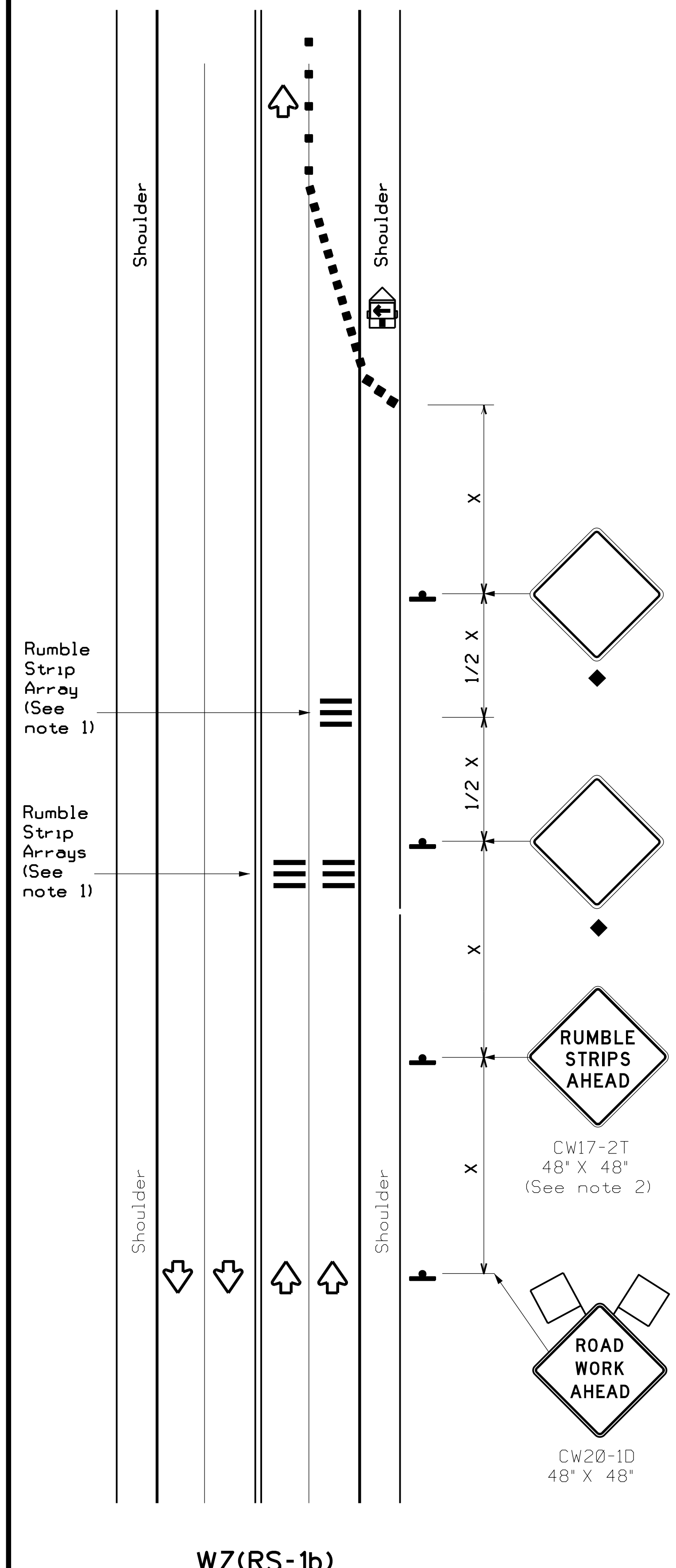
Warning sign and rumble strip sequence in opposite direction is same as below.

TABLE 1

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



RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

TABLE 2

Speed	Approximate distance between strips in an array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
= 60 MPH	20'
≥ 65 MPH	* 35'+

LEGEND

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

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

* Conventional Roads Only

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

TYPICAL USAGE

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

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

* **For posted speeds in excess of 65 MPH, it is recommended that spacing is increased as speed limits increase. Increasing space between rumble strips will improve effectiveness.**

Texas Department of Transportation — Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

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© TxDOT November 2012	CONT 6470	SECT 93	JOB 001	HIGHWAY US 377, ETC.
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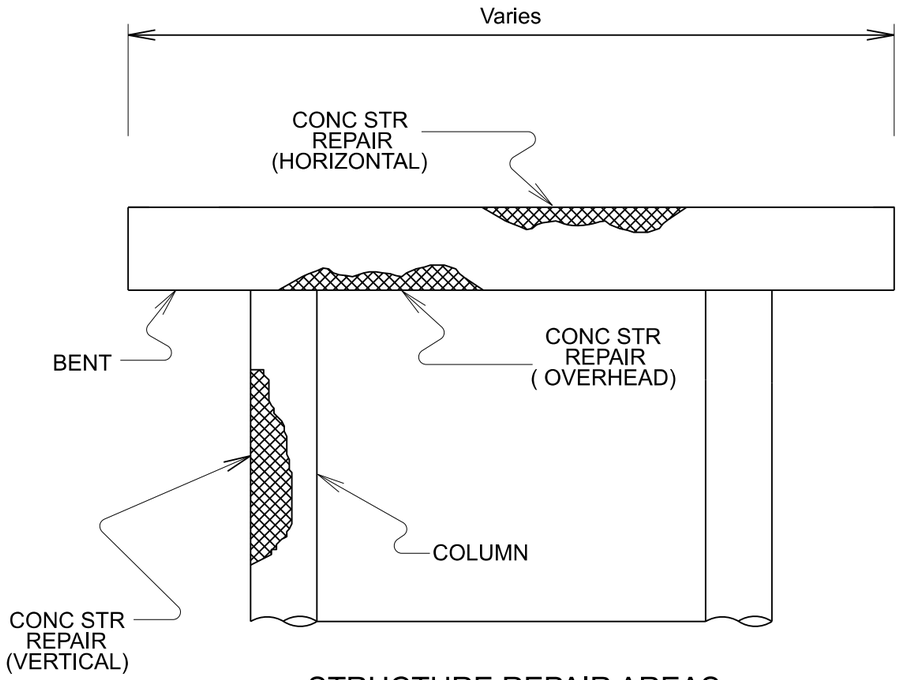
117



STRUCTURE REPAIR AREAS
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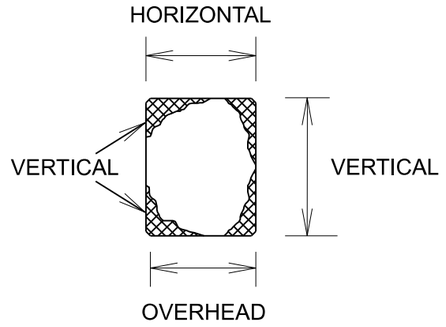

END OF BENT CAP
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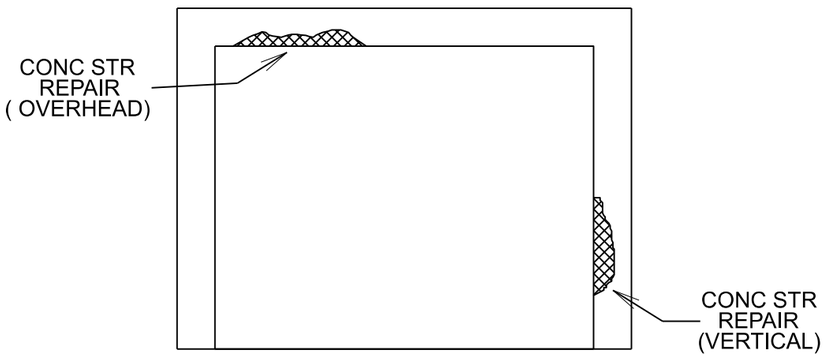

BOX CULVERT
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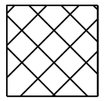
(TYPICAL)



TYPICAL AREAS OF SPALL REPAIR

GENERAL CONCRETE REPAIR NOTES:

- SEE ESTIMATED QUANTITIES FOR SCOPE OF BRIDGE REHABILITATION.

- LAYOUT, STATIONS, AND ELEVATIONS SHOWN ARE BASED ON AS-BUILT PLANS.

- REPAIR LOCATIONS NOTED ARE APPROXIMATE AND PHOTOS PROVIDED ARE INTENDED TO SHOW GENERAL CONDITIONS OF THE STRUCTURE. ACTUAL CONDITIONS MAY VARY. VERIFY LIMITS OF REPAIRS IN THE PRESENCE OF THE ENGINEER BEFORE BEGINNING WORK. ACTUAL REPAIR LOCATIONS TO BE APPROVED BY THE ENGINEER PRIOR TO BEGINNING REPAIR WORK.

- REMOVE EXISTING DAMAGE AND DELAMINATED CONCRETE AND REPAIR SPALLED CONCRETE IN ACCORDANCE WITH ITEM 429, "CONCRETE STRUCTURE REPAIR" AND CHAPTER 3, SECTION 2 OF THE TXDOT "CONCRETE REPAIR MANUAL." A COPY OF THE CONCRETE REPAIR MANUAL MUST BE AVAILABLE ONSITE DURING CONCRETE REPAIR OPERATIONS.

- ALL VERTICAL AND OVERHEAD AREAS SHOWN SHALL BE PAID UNDER BID ITEM 429 CONC STR REPAIR (VERTICAL & OVERHEAD). HORIZONTAL AREAS SHALL BE PAID FOR UNDER BID ITEM 429 CONC STR REPAIR (STANDARD).

- SOME AREAS MAY REQUIRE ADDITIONAL REINFORCEMENT AS DETAILED IN THE CONCRETE REPAIR MANUAL AND AS APPROVED BY THE ENGINEER. SEE AS-BUILT PLANS SHOWING EXISTING BRIDGE DETAILS. ADDITIONAL BRIDGE INFORMATION MAY BE PROVIDE UPON REQUEST.

9/9/2024

STATE OF TEXAS
JORDAN A SEFCIK
129853
LICENSED
PROFESSIONAL ENGINEER

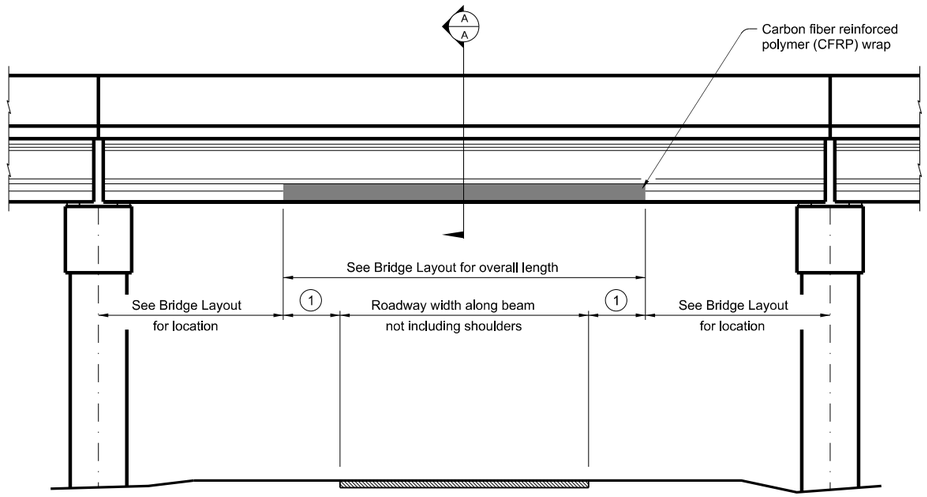
DocuSigned by:
Jordan A Sefcik
2926CE8D1B10401...

Texas Department of Transportation | Bridge Division

TYPICAL CONCRETE REPAIR DETAIL

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT 2024	CONT	SECT	JOB	HIGHWAY
SHEET REVISED	6470	93	001	US 377, ETC.
06 - 24	DIST	COUNTY		SHEET NO.
	SJT	KIMBLE, ETC.		80

DATE: 9/9/2024 10:03:46 AM
FILE: pw://txdot.projectwiseonline.com:TXDOT2/Documents/07 - SJT/Maintenance Projects/BPM 6470-93-001/1 - Pre-Letting/080 CONC REPAIR AND CFRP DETAILS



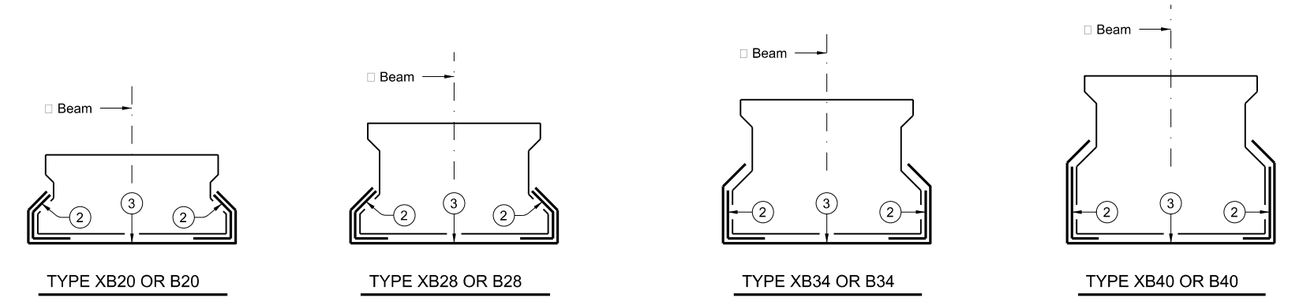
TYPICAL BRIDGE ELEVATION

CFRP TABLE	
BEAM / GIRDER TYPE	(SQ FT) AREA PER LF
4XB20 OR 4B20	5.8
5XB20 OR 5B20	6.8
4XB28 OR 4B28	6.0
5XB28 OR 5B28	7.0
4XB34 OR 4B34	7.0
5XB34 OR 5B34	8.0
4XB40 OR 4B40	8.0
5XB40 OR 5B40	9.0
4SB12 OR 4SB15	6.0
5SB12 OR 5SB15	7.0
6DS20, 7DS20 OR 8DS20	7.0
6DS23, 7DS23 OR 8DS23	7.5
U40 OR U54	6.6
Tx28, Tx34 OR Tx40	5.6
Tx46, Tx54, Tx62 OR Tx70	5.9

(1) 1'-0" Min, 3'-0" Max

(2) First layer - place 24" wide carbon fiber fabric sheets longitudinally on beams/girders, with fiber orientation parallel to beam/girder centerline. Locate sheets on bottom corners of beam/girder as shown. Overlap fabric sheets a minimum of 6" in the longitudinal direction to achieve full installation length.

(3) Second layer - place carbon fiber fabric sheets transversely on beam/girder, with fiber orientation perpendicular to beam/girder centerline. Wrap sheets on bottom and sides of beam/girder to limits shown. Wrap butt joints in the longitudinal direction to achieve full installation length.



SECTION A-A
(Showing typical beam sections.)

CONSTRUCTION NOTES:

- IF BEAMS OR GIRDERS ARE SPACED CLOSELY TOGETHER, INSTALL CFRP WRAP PRIOR TO BEAM ERECTION. FOR UNPAINTED BEAMS/GIRDERS, INSTALL APPROVED CFRP SYSTEM AND APPLY THE PROTECTIVE TOP COATING WITH COLOR AND TEXTURE TO MATCH ADJACENT CONCRETE. MASK ADJACENT CONCRETE PRIOR TO COATING.
- FOR PAINTED BEAMS/GIRDERS, INSTALL APPROVED CFRP SYSTEM AND APPLY THE PROTECTIVE TOP COATING PRIOR TO PAINTING. PAINT CONCRETE AND CFRP TO PRODUCE UNIFORM FINISH, AS SPECIFIED ELSEWHERE.

GENERAL NOTES:

- PROVIDE AND APPLY CFRP SYSTEM, INCLUDING PROTECTIVE TOP COATING, IN ACCORDANCE WITH ITEM 786, "CARBON FIBER REINFORCED POLYMER (CFRP)."
- INSTALL CFRP WRAP TO BEAMS/GIRDERS SHOWN ON THE LAYOUT, IN THE LOCATION AND TO THE LIMITS GIVEN.
- PAYMENT FOR THE BRIDGE PROTECTIVE BEAM WRAP IS IN ACCORDANCE WITH ITEM 786, "CARBON FIBER REINFORCED POLYMER (CFRP)." QUANTITY IS MEASURED BY THE SQUARE FOOT OF BEAM/GIRDER SURFACE AREA COVERED.

CARBON FIBER WRAP NOTES:

1. PREPARE CONCRETE SURFACE AND INSTALL CARBON FIBER POLYMER REINFORCEMENT(CFRP) PER ITEM 786, "CARBON FIBER REINFORCED POLYMER (CFRP)".
2. COAT COMPLETED CFRP WITH UV PROTECTIVE PAINT AS RECOMMENDED BY MANUFACTURER. MATCH COLOR TO SORROUNDING CONCRETE AS APPROVED BY THE ENGINEER.
3. CFRP IS FOR PROTECTION AND CONFINEMENT ONLY. NO WORKING DRAWINGS REQUIRED.
4. EXTEND CFRP AT LEAST 1 FOOT BEYOND SPALL REPAIR AS SHOWN.

9/9/2024

STATE OF TEXAS
JORDAN A. SEFCIK
129853
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Jordan A. Sefcik
2926CE8D1B10401...

Texas Department of Transportation | Bridge Division

TYPICAL CARBON FIBER REINFORCED POLYMER WRAP DETAIL

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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SHEET REVISED 06 - 24	6470	93	001	US 377, ETC.
	DIST	COUNTY		SHEET NO.
	SJT	KIMBLE, ETC.		81

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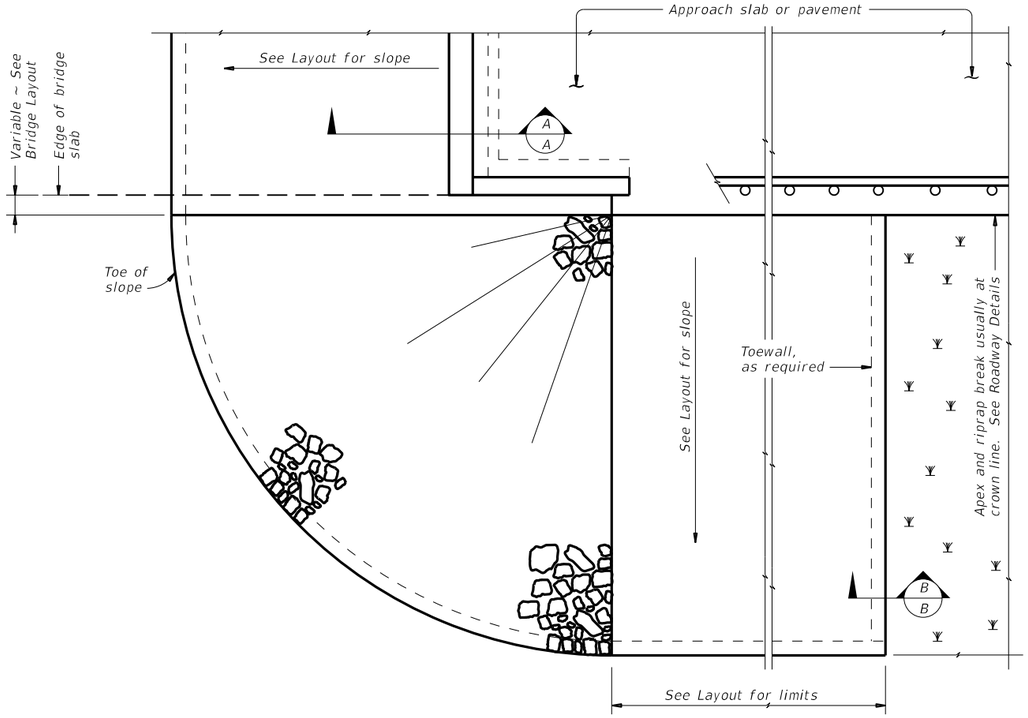
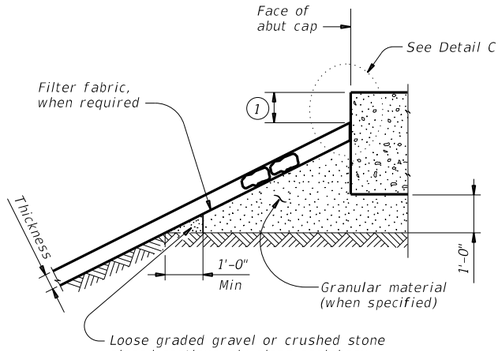
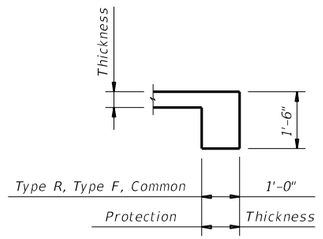


PLAN

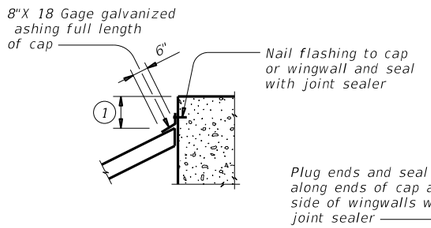


SECTION A-A AT CAP



SECTION B-B

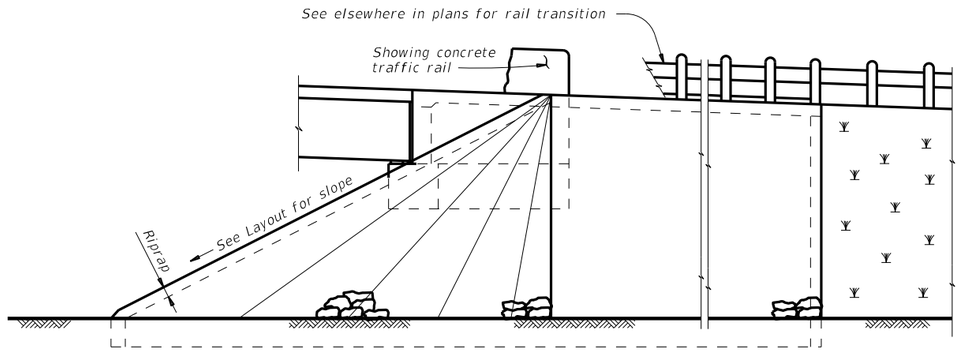
Provide toewall when shoulder drain is located adjacent to limits of stone riprap. Omit toewall when thickness of protection riprap is greater than 18".



CAP OPTION A

CAP OPTION B

DETAIL C



ELEVATION

GENERAL NOTES:
Refer to Item 432, "Riprap" for stone size and gradation, and construction details. See Layout for limits and thickness of riprap specified.
See elsewhere in plans for locations and details of shoulder drains.

(1) Top of cap to top of riprap dimension varies as directed by the Engineer. Provide 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE:	DN: AES	CK: JGD	DW: BWH	CK: AES
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REVISIONS	6470	93	001	US 377, ETC.
	DIST	COUNTY		SHEET NO.
	SJT	KIMBLE, ETC.		82

DATE: 9/9/2024 10:03:48 AM
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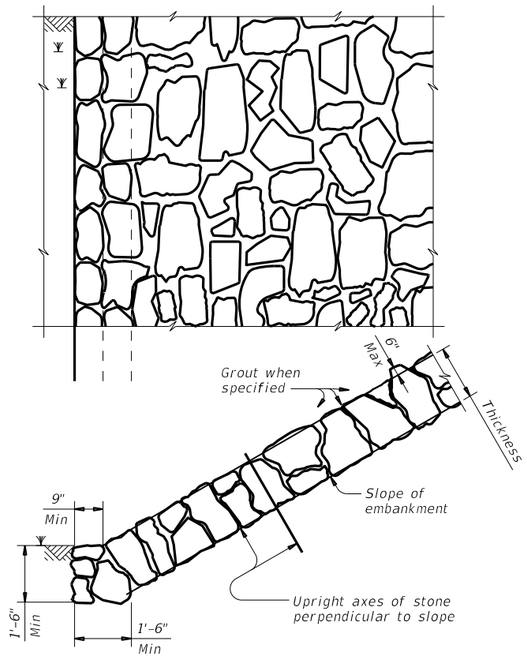


FIGURE 1 ~ TYPE R STONE RIPRAP
dry or grouted

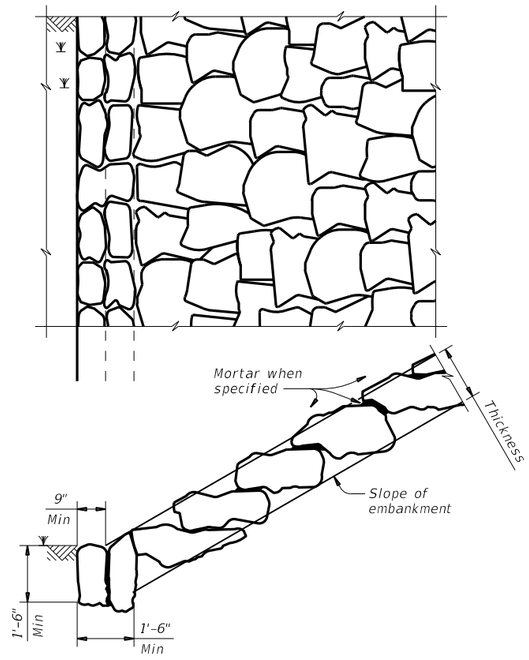


FIGURE 2 ~ TYPE F STONE RIPRAP
dry or mortared

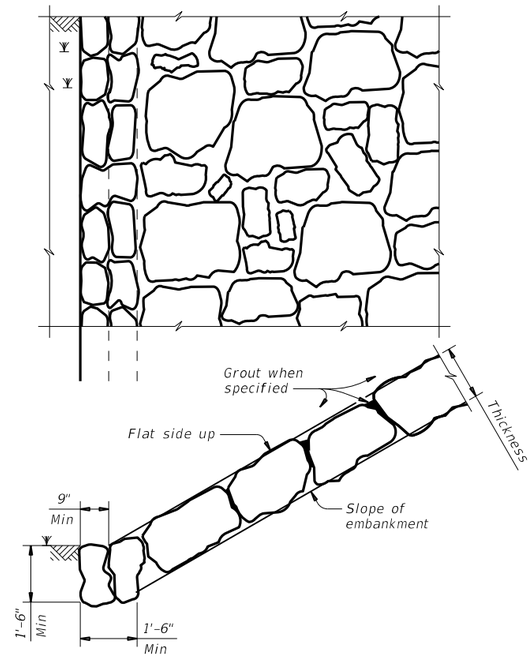


FIGURE 3 ~ TYPE F STONE RIPRAP
grouted

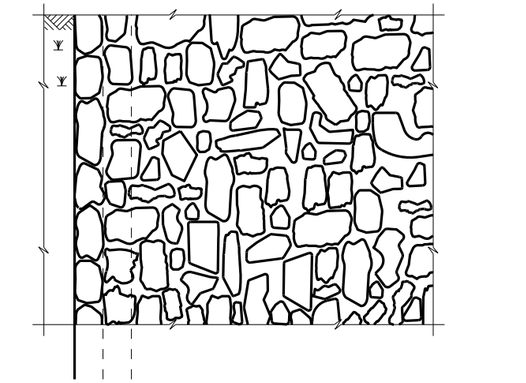


FIGURE 4 ~ COMMON STONE RIPRAP
dry or grouted

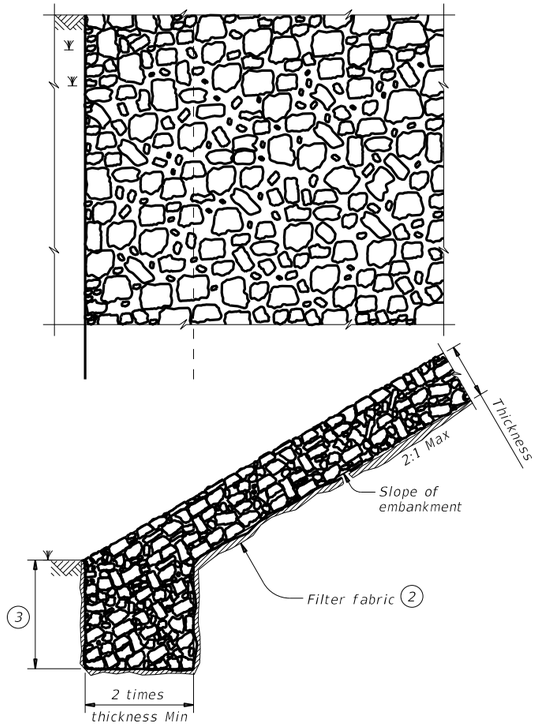


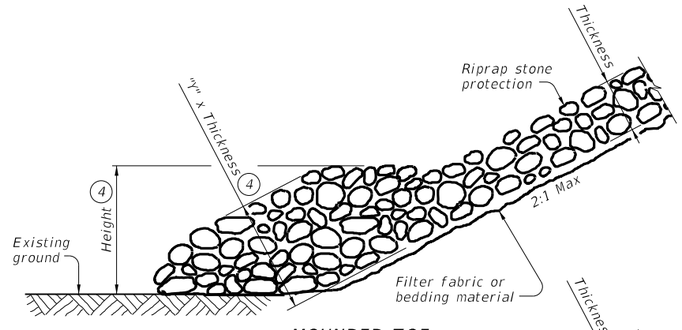
FIGURE 5 ~ PROTECTION STONE RIPRAP (5)

(2) Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.

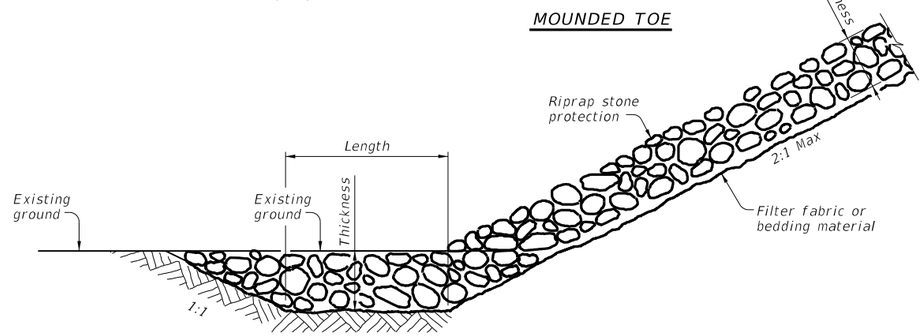
(3) Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.

(4) "Y" and Height need to be de ned. See layout or detail sheet for values if this option is used.

(5) List Stone Protection as size (XX inch) and thickness (YY inch) on the layout.
Example: Riprap (Stone Protection) XX inch, Thickness = YY inch.



MOUNDED TOE



EXTENDED ROCK FILLED TRENCH

PROTECTION STONE RIPRAP TOE OPTIONS (5)

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

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	DIST	COUNTY		SHEET NO.
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