

# STATE OF TEXAS

## DEPARTMENT OF TRANSPORTATION

### PLANS OF PROPOSED HIGHWAY ROUTINE MAINTENANCE CONTRACT

GRAPHICS FILE		MAINTENANCE PROJECT NO.		SHEET NO.
DN		BPM-647054001		1
CHECKED	STATE	STATE DIST.	COUNTY	
NP	TEXAS	DALLAS	DALLAS	
CHECKED	CONT.	SECT.	JOB	HIGHWAY NO.
DN	6470	54	001	IH0030

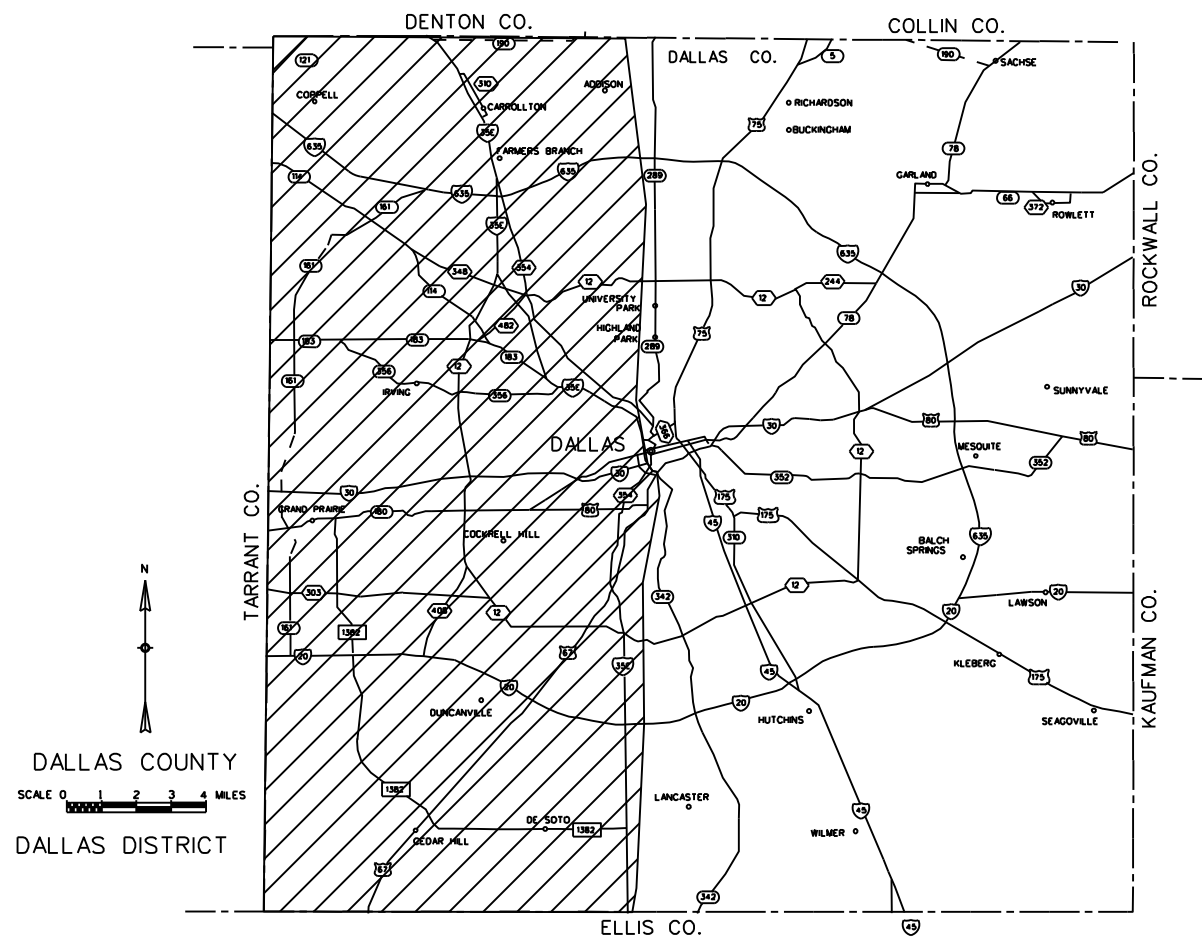
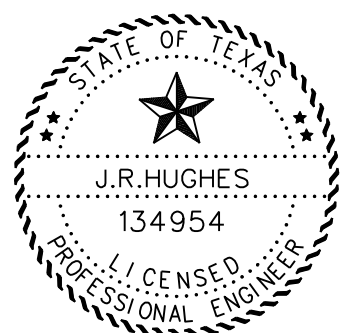
#### INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATE & QUANTITY SHEET
3A-3G	GENERAL NOTES
4	PROJECT LOCATION
5	QUANTITY SUMMARY
6	TCP NARRATIVE & DETOUR
7-21	IH 30 AT ST FRANCIS BRIDGE SHEETS
> 22-33	BC(1)-21 THRU BC(12)-21
> 34	TCP(5-1)-18
> 35-41	TCP(6-1)-12 THRU TCP(6-7)-12

#### TYPE OF WORK:

BRIDGE REPAIR

PROJECT NO. : BPM-647054001  
 HIGHWAY : IH0030  
 LIMITS : ON IH 30 IN THE EAST DALLAS MAINTENANCE SECTIONS



RECOMMENDED FOR LETTING

DocuSigned by:  
  
 91B8E2112C2C409  
 AREA ENGINEER 8/22/2024

RECOMMENDED FOR LETTING

DocuSigned by:  
  
 72258D0350B94E4  
 DISTRICT MAINTENANCE ENGINEER 8/26/2024

RECOMMENDED FOR LETTING

DocuSigned by:  
  
 345B765EB03F408  
 DIRECTOR OF OPERATIONS 8/27/2024

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

J.R. HUGHES, P.E. 08/20/2024  
 DATE

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION SEPTEMBER 1, 2024 AND SPECIAL SPECIFICATION ITEMS INCLUDED IN THE CONTRACT SHALL GOVERN ON THIS PROJECT.

© by Texas Department of Transportation 2024 : all rights reserved

LEVELS DISPLAYED
1 2 3 4



**CONTROLLING PROJECT ID** 6470-54-001

**DISTRICT** Dallas  
**HIGHWAY** IH0030

**COUNTY** Dallas

# Estimate & Quantity Sheet

<b>CONTROL SECTION JOB</b>				<b>6470-54-001</b>		TOTAL EST.	TOTAL FINAL
<b>PROJECT ID</b>				<b>A00211114</b>			
<b>COUNTY</b>				<b>Dallas</b>			
<b>HIGHWAY</b>				<b>IH0030</b>			
<b>ALT</b>	<b>BID CODE</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	EST.	FINAL		
	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	9.000		9.000	
	500-7001	MOBILIZATION	LS	1.000		1.000	
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	1.000		1.000	
	503-7002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	11.000		11.000	
	505-7001	TMA (STATIONARY)	DAY	77.000		77.000	
	780-7002	CNC CRACK REPAIR (DISCRETE)(INJECT)	LF	12.000		12.000	
	784-7002	REP STL BRIDGE MEMBER (BEAM)	EA	1.000		1.000	
	784-7003	REP STL BRIDGE MEMBER (DIAPHRAGM)	EA	2.000		2.000	
	784-7020	REP STL BRIDGE MBR (STRAIGHTEN MEMB)	EA	2.000		2.000	
	784-7022	REP STL BRIDGE MBR (WELD REPAIR)	EA	1.000		1.000	
	786-7002	CARBON FIBER REINF POLYMER STRENGTHNING	SF	85.000		85.000	

**Project Number:** BPM-647054001

**Control:** 6470-54-001

**County:** Dallas

**Highway:** IH0030

**General:**

This project consists of performing Bridge Repair on the roadway as detailed on the Summary Sheet in the East Dallas County Maintenance Section.

Work to be performed under this contract is Site Specific.

**TABLE 1**

REF NO.	COUNTY	HIGHWAY	LOCATION	NBI#
1	Dallas	IH 30	St Francis Ave	18-057-0-0009-11-196

The Department reserves the right to revise schedule as it deems necessary.

Provide and maintain a dedicated email address for receipt of work orders and correspondence throughout the term of this contract. Acknowledgement of emailed work order/callouts is required no more than 12 hr. from notification.

Contractor’s attention is called to the fact that all adjoining pavement sections will be protected during all phases of construction and any damages incurred due to Contractor’s operation will be repaired and replaced at the Contractor’s expense.

Coordinate work through:

Donnie Wyatt  
 4777 E. Highway 80  
 Mesquite, Texas 75150  
 972-225-2326

Bids will be received at 4777 E. Hwy 80, Mesquite, Texas 75150-6643.

Contractor questions on this project are to be addressed to the following individuals:

Nathan Petter, P.E.      [Nathan.Petter@txdot.gov](mailto:Nathan.Petter@txdot.gov)  
 Donnie Wyatt            [Donnie.Wyatt@txdot.gov](mailto:Donnie.Wyatt@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>

**Project Number:** BPM-647054001

**Control:** 6470-54-001

**County:** Dallas

**Highway:** IH0030

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.

Attention is directed to the possible presence of underground utilities owned by the Texas Department of Transportation (irrigation, signal, illumination and surveillance, communication, and control) on the right of way. Call the Department for locates at 214-320-6682 48 hr. in advance of excavation. Contact the appropriate department of the local city or town a minimum of 48 hr. in advance of excavation.

If overhead or underground power lines need to be de-energized, contact the electrical service provider to perform this work. Cost associated with de-energizing the power lines or other protective measures required are at no expense to the Department.

If working near power lines, comply with the appropriate sections of Texas State Law and Federal Regulations relating to the type of work involved.

**Item 2 – Instructions to Bidders:**

This project includes plan sheets that are not part of the bid proposal.

View or download plans at:

<http://www.dot.state.tx.us/business/plansonline/agreement.htm>

**Item 7 – Legal Relations and Responsibilities:**

Pre-construction safety meeting will be conducted with Contractor’s personnel prior to work beginning on a continuously prosecuted contract or before each callout work request.

Attendance of this meeting will not be paid directly but considered subsidiary to the various bid items.

Do not obtain law enforcement personnel without requesting in writing 48 hr. prior to need and the Engineer’s written approval. The Department may compensate the Contractor for providing full time, off-duty, uniformed, law enforcement personnel, and patrol car. The law enforcement personnel may be required for assistance with traffic control for lane or ramp closures or other situations that dictate the need for law enforcement officers as directed. Off-duty law enforcement

**Project Number:** BPM-647054001

**Control:** 6470-54-001

**County:** Dallas

**Highway:** IH0030

personnel will have transportation jurisdiction and full police powers. Law enforcement personnel will show proof of certification by the Texas Commission on Law Enforcement (TCOLE).

Patrol vehicles must be clearly marked to correspond with the officer’s agency and equipped with appropriate lights to identify them as law enforcement. For patrol vehicles not owned by a law enforcement agency, markings will be retroreflective and legible from 100 ft. from both sides and the rear of the vehicle. Lights will be high intensity and visible from all angles.

Holiday restrictions – the Engineer may decide that no lane closures or construction operations will be allowed during the restricted periods listed in the following holiday schedule. TxDOT has the right to lengthen, shorten, or otherwise modify these restricted periods as actual, or expected, traffic conditions may warrant. Working days will not be charged for these restricted periods. No additional compensation will be allowed for these restricted closures (i.e., overhead, delays, stand-by, barricades or any other associated cost impacts).

- New Year’s Eve and Day (noon on December 31 thru 10 P.M. January 1)
- Easter Holiday weekend (noon on Friday thru 10 P.M. Sunday)
- Memorial Day weekend (noon on Friday thru 10 P.M. Monday)
- Independence Day (noon on July 3 thru 10 P.M. on July 5)
- Labor Day weekend (noon on Friday thru 10 P.M. Monday)
- Thanksgiving Holiday (noon on Wednesday thru 10 P.M. Sunday)
- Christmas Holiday (noon on December 23 thru 10 P.M. December 26)

Holiday restrictions for Independence Day, Thanksgiving Holiday, and the Christmas Holiday may be extended for the “week of” due to the nature of work being performed and the work location at the discretion of the Engineer for safety of the traveling public.

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

Event Restrictions – No Lane Closures that restricts or interferes with traffic will be allowed for the regional events set forth below. This affects IH30, IH30 HOV, IH35E, IH35E HOV, IH45, IH345, SH352, and SS366. TxDOT has the right to lengthen, shorten, or otherwise modify these restrictions as actual traffic conditions may warrant. TxDOT also has the right to modify the list of major events as they are added, renamed, rescheduled, or as warranted.

- State Fair of Texas (no lane closures after 6 A.M. on Fridays through 9 P.M. on Sundays; no full closures for any direction of any facility from opening day through the closing day).
- The University of Texas vs. University of Oklahoma football game (no lane closures beginning 4 hr. prior to the event and ending 3 hr. following event completion).
- The First Responder Bowl (no lane closures beginning 3 hr. prior to the event and ending 2 hr. following the event completion).

**Project Number:** BPM-647054001

**Control:** 6470-54-001

**County:** Dallas

**Highway:** IH0030

- Dallas Mavericks Home Games (no lane closure beginning 2 hr. prior to the event and ending ½ hr. following event commencement with no full lane closures considered until 2 hr. following event completion).
- Dallas Stars Home Games (no lane closure beginning 2 hr. prior to the event and ending ½ hr. following event commencement with no full lane closures considered until 2 hr. following event completion).
- Texas Rangers Home Games (no lane closure beginning 2 hr. prior to the event and ending ½ hr. following event commencement with no full lane closures considered until 2 hr. following event completion).
- Dallas Cowboys Home Games (no lane closure beginning 2 hr. prior to the event and ending ½ hr. following event commencement with no full lane closures considered until 2 hr. following event completion).
- Major Events at the American Airline Center, Globe Life Park in Arlington, AT&T Stadium with expected attendance exceeding 15,000 (no lane closures beginning 2 hr. prior to event and ending ½ hr. following event commencement with no full closures considered until 2 hr. following event completion).
- Major Downtown Dallas Events (restrictions will be considered on a case-by-case basis). This category could include, but is not limited to, parades for sports championships, major political events, major Art District Events, and large athletic events such as marathons.

**Item 8 – Prosecution and Progress:**

Working days will be charged in accordance with Section 8.3.1.3, “Seven-Day Workweek”.

Nighttime work is required in accordance with Section 8.3.3.2.1. “Nighttime Work Only.”

The Lane Closure Assessment Fee is shown on the following table. The fee applies to the Contractor for closures or obstructions that overlap into restricted hour traffic for each hour or portion thereof, regardless of the duration of the lane closure or obstruction.

**Table 2**  
**Lane Closure Assessment Fee Table**

Roadway	Amount Per Lane Per Hour
IH 30/US 80	\$ 5,000
FULL TRAFFIC CLOSURE	\$35,000/HR

For this project, a “Full Traffic Closure” is defined as having all lanes (being either all main lanes or all frontage lanes) in any direction of travel for a given roadway being closed down, resulting in any vehicles needing to detour to an alternate route (either main lanes detoured to frontage lanes,

**Project Number:** BPM-647054001

**Control:** 6470-54-001

**County:** Dallas

**Highway:** IH0030

or frontage lanes detour to main lanes/alternate roadways) in order for the vehicles to continue in their original direction of travel.

Contractor will submit a bar chart or CPM chart for progress of schedule. Present work to begin no later than 7 calendar days from the work order letter unless otherwise approved.

**Item 9 – Measurement and Payment:**

Ensure material is readily available to meet the time requirements in the call out work order.

Submit invoices for material on hand (MOH) in accordance with this item.

Payment for police officer hours will be paid under “Force Account – Law Enforcement Personnel” and will not exceed the duration of the lane closure. Time will begin when set up operations commence and end when the closure is removed. TxDOT Form 318 will be utilized.

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

All work requiring lane closures will be performed Sunday through Saturday, between 9:00 P.M. and 5:00 A.M., unless otherwise approved.

Close no more than one lane at a time, unless otherwise approved. Provide proposed lane closure information to the Engineer by 1 P.M. on the day prior to the proposed closures. Furnish information for Monday closures or closures following a national or state holiday on the last office workday prior to the closures. Do not close lanes if the above reporting requirements have not been met.

Maximum length of lane closure will be 2 miles.

Traffic Control Plans with a lane closure causing backups of 10 minutes or greater in duration will be modified by the Engineer.

Erect barricades and signs in locations not obstructing the traveling public’s view of the normal roadway signing or necessary sight distance.

Provide sufficient and qualified staff and equipment to revise the traffic control as directed.

Trailer all slow-moving vehicles (designed to operate 25 mph or less) crossing freeway main lanes.

Additional Signs or Barricades for the TCP Detour maybe required beyond what is shown on the Plan Sheets. Install any additional Signs or Barricades as directed by the Engineer; Adjustments to the TCP Detour plan sheets must be approved by the Engineer prior to any adjustments being

**Project Number:** BPM-647054001

**Control:** 6470-54-001

**County:** Dallas

**Highway:** IH0030

performed in the field. Payment for any additional Signs or Barricades will not be paid for separately, but will considered subsidiary under Item 502.

**Item 503 – Portable Changeable Message Sign:**

Provide Portable Changeable Message Signs (PCMS) units as approved.

PCMS will be placed as directed.

**Item 505 – Truck Mounted Attenuator (TMA):**

The total number of truck mounted attenuators (TMAs) or trailer attenuators (TAs) required when utilizing the traffic control standards are shown in the tables below.

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

TCP 6 Series	Scenario		Required TMA/TA	
(6-1)-12	A	B	1	2
(6-2)-12 / (6-3)-12	All		1	
(6-4)-12	A	B	1	2
(6-5)-12	A	B	1	2
(6-6)-12 / (6-7)-12	All		1 Per Lane	

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

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

When TMAs are paid by the hour or day, “ready for operation” is defined as all equipment, material, personnel, etc. are present on the project ready to begin work.

**Project Number:** BPM-647054001

**Control:** 6470-54-001

**County:** Dallas

**Highway:** IH0030

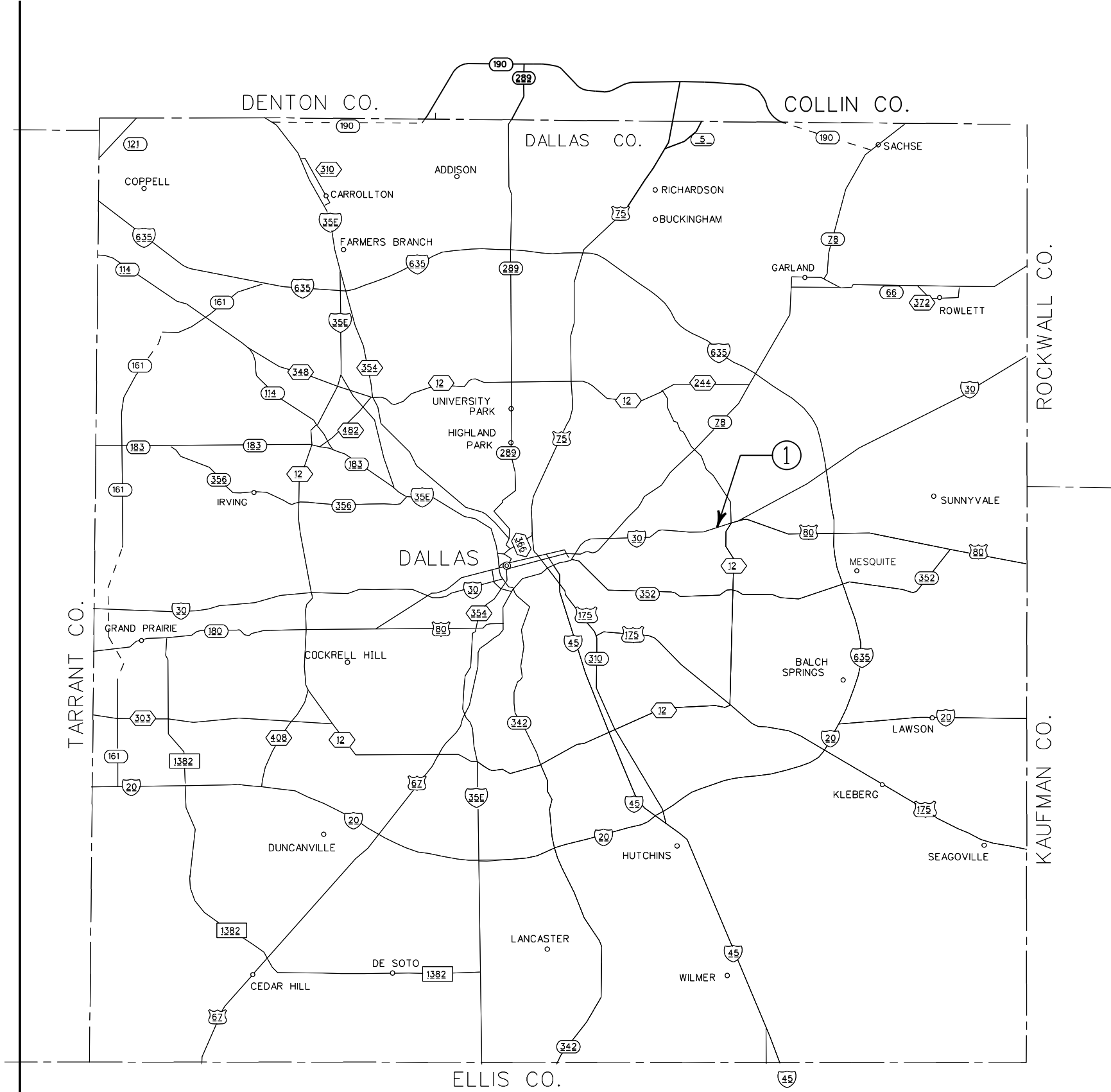
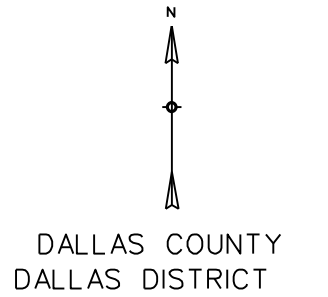
**Item 784 – Steel Member Repair:**

Submit shop drawings, working drawings, calculations, or other documents signed and sealed by a Professional Engineer to the Department within **5** working days.

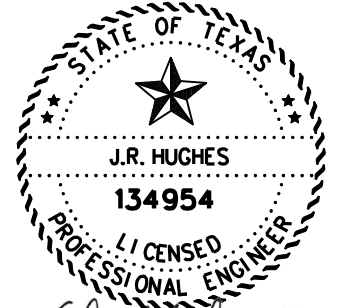
Failure to submit all required information within **5** working days will result in liquidated damages for each day charged over the **5** working days.

Time charges will be suspended upon receipt by the Department of all the above submittals.

After notification of approval of submittals, time charges will resume.



REF NO.	LOCATION
①	IH 30 AT ST. FRANCIS (NBI 18-057-0-0009-11-196)



*J.R. Hughes, P.E.* 08/19/2024



PROJECT LOCATION SHEET

N.T.S.

DESIGN	FED. RD. DIV. NO.	MAINTENANCE PROJECT		HIGHWAY NO.
DN	6	BPM-647054001		IH 30
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
DN	TEXAS	DALLAS	DALLAS	4
CHECK	NP	CONTROL	SECTION	
CHECK	NP	6470	54	001

DATE: 08/16/2024

SUMMARY OF EROSION CONTROL ITEMS										
LOCATION	REFERENCE MARKERS	ADT	429 7007	780 7002	784 7002	784 7003	784 7020	784 7022	786 7002	
			CONC STR REPAIR (VERTICAL & OVERHEAD)	CNC CRACK REPAIR (DISCRETE) (INJECT)	REP STL BRIDGE MEMBERS	REP STL BRIDGE MEMBER (DIAPHRAGM)	REP STL BRIDGE MEMBER (STRAIGHTEN MEMB)	REP STL BRDG MEMB (WELD REPAIR)	CARBON FIBER REINF POLYMER STRENGTHENING	*DAYS ALLOWED TO COMPLETE
			SF	LF	EA	EA	EA	EA	SF	DAYS
REF NO 1 - IH 30 AT ST. FRANCIS (NBI 18-057-0-0009-11-196)	52	141,448	9	12	1	2	2	1	85	
<b>PROJECT TOTALS</b>			<b>9</b>	<b>12</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>85</b>	<b>11</b>

DATE: 08/17/2024



SUMMARY SHEET

SHEET 1 OF 1

DESIGN DN	FED. RD. DIV. NO.	MAINTENANCE PROJECT		HIGHWAY NO.
GRAPHICS DN	6	BPM-647054001		IH0030
CHECK NP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK NP	TEXAS	DALLAS	DALLAS	5
	CONTROL	SECTION	JOB	
	6470	54	001	



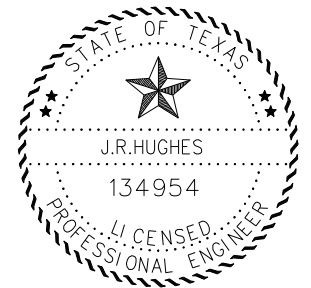
DNE:   
 CLK:   
 DME:   
 CXC:

**GENERAL NOTES:**

1. THE CONTRACTOR SHALL PLACE AND MAINTAIN ALL SIGNS, BARRICADES, PAVEMENT MARKINGS, AND OTHER WARNING DEVICES AS SHOWN IN THESE PLANS ACCORDING TO THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND ALL APPLICABLE STANDARDS. THE SIGNS, BARRICADES OR OTHER WARNING DEVICES SHOWN SHALL BE CONSIDERED A MINIMUM AND ADDITIONAL SIGNS, BARRICADES OR WARNING DEVICES DEEMED NECESSARY BY THE ENGINEER OR DICTATED BY FIELD CONDITIONS SHALL BE PROVIDED ACCORDING TO ALL APPLICABLE STANDARDS. ADDITIONAL SIGNS OR BARRICADES WILL NOT BE PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO THE BID ITEM 502 "BARRICADES, SIGNS, AND TRAFFIC HANDLING".
2. SUBMIT A DETAILED SCHEDULE OF WORK TO THE PROJECT ENGINEER FOR APPROVAL PRIOR TO THE BEGINNING OF CONSTRUCTION WHICH GENERALLY CONFORMS TO THE SEQUENCE SHOWN ON THE TCP SUGGESTED SEQUENCE OF CONSTRUCTION (SHOWN BELOW).
3. SUBMIT ANY REQUEST TO ALTER SEQUENCE OF OPERATION OF TRAFFIC CONTROL PLANS TO THE ENGINEER FOR WRITTEN APPROVAL PRIOR TO BEGIN OF CONSTRUCTION. ADDITIONAL COST OR TIME IS AT THE EXPENSE OF THE CONTRACTOR.
4. MAINTAIN TEMPORARY SIGNS WITHIN THE PROJECT LIMITS AND COVER OR REMOVE ANY EXISTING SIGN OR PAVEMENT MARKING THAT CONFLICTS WITH TCP TO AVOID CONFUSION FOR THE TRAVELING PUBLIC. TEMPORARY SIGNING SHALL BE PLACED AS NEEDED DURING ALL PHASES. PAYMENT FOR THIS WORK SHALL BE SUBSIDIARY TO ITEM 502 BARRICADES.
5. APPLY LANE CLOSURES AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH TCP STANDARD SHEETS AND TMUTCD AND/OR AS DIRECTED BY THE ENGINEER. THE COMPLETE CLOSURE OF ANY ROADWAY REQUIRES THE APPROVAL OF THE ENGINEER.
6. MAINTAIN TEMPORARY AND POSITIVE DRAINAGE THROUGHOUT ALL PHASES OF CONSTRUCTION. THIS WORK WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.

**SUGGESTED SEQUENCE OF CONSTRUCTION:**

1. COORDINATE WITH TXDOT TO REMOVE THE EXISTING NB ST FRANCIS LANE CLOSURE AND REPLACE THE TRAFFIC CONTROL DEVICES FOR THE NB ST FRANCIS OUTSIDE LANE CLOSURE; THIS CLOSURE WILL BE REQUIRED TO REMAIN IN PLACE FOR THE DURATION OF THE PROJECT. INSTALL THE SHOULDER & LANE CLOSURE SETUP ON IH30 ROADWAY IN ACCORDANCE TO THE MUTCD AND TCP STANDARDS.
2. PLACE ADVANCED WARNING SIGNS AND BARRICADES WHERE NECESSARY IN ACCORDANCE WITH BC STANDARD SHEETS; ADVANCED WARNING SIGNS ARE TO BE PLACED ON THE IH30 WESTBOUND AND US80 NORTHBOUND MAINLANES. HAVE ALL REQUIRED SIGNS IN PLACE FOR THE SHOULDER & LANE CLOSURES REQUIRED IN ORDER TO PERFORM THE BRIDGE REPAIRS SPECIFIED IN THE PLANS.
3. INSTALL ALL REQUIRED DETOUR SIGNAGE FOR FULL IH30 WESTBOUND LANE CLOSURES; DETOUR SIGNAGE WILL BE PLACED ON IH30, US80, AND ST. FRANCIS AVENUE. THE FULL CLOSURE DETOUR WILL BE USED FOR THE BEAM REPLACEMENT BRIDGE REPAIR WORK ONLY. FULL CLOSURE TIMEFRAME WILL BE LIMITED TO STARTING THE CLOSURE ON FRIDAY AT 9 PM, AND REMOVING THE CLOSURE & FULLY OPENING UP THE HIGHWAY AT 5 AM ON THE FOLLOWING MONDAY. ENGINEERS APPROVAL IS REQUIRED PRIOR TO INITIATING ANY FULL CLOSURE TCP FOR THE MAIN LANES OR FRONTAGE ROADS ALONG IH30 OR US80.
4. PRIOR TO PERFORMING & INSTALLING ALL BRIDGE STRUCTURE REPAIR ITEMS OF WORK, COORDINATE SHOULDER & LANE CLOSURES AROUND THE MOVEABLE BARRIERS WITH THE DALLAS DISTRICT MAINTENANCE ENGINEER; THIS SHALL BE PERFORMED PRIOR TO INSTALLING THE SUPPORTING STRUCTURE REQUIRED FOR THE BEAM REPLACEMENT BRIDGE REPAIR WORK, AS SPECIFIED IN THE PLANS.
5. PERFORM & INSTALL ALL BRIDGE STRUCTURE SUPPORT & REPAIR ITEMS OF WORK AS SHOWN IN THE PLANS.
6. PERFORM FINAL PROJECT CLEAN UP OPERATION AND REMOVAL OF ALL TCP DEVICES TO FULLY OPEN ROADWAY TO TRAFFIC.



*J.R. Hughes, P.E.* 08/20/2024  
 Signature of Registrant & Date

<b>IH30 &amp; ST FRANCIS</b>			
TCP NARRATIVE			
© TxDOT		SHEET 1 OF 3	
CONT	SECT	JOB	HIGHWAY
6470	54	001	IH0030
DIST	COUNTY	SHEET NO.	
DALLAS	DALLAS	6	

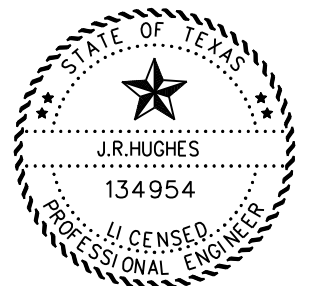
DATE: \$DATES  
 FILE: \$FILES  
 \$TIMES

DWG:   
 CHK:   
 DNE:



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

- NOTES**
1. All traffic control devices and barricades shall be installed in accordance to the applicable Traffic Control Plan (TCP) standards, as directed by the Engineer.
  2. 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.
  3. Entrance ramps located within the detours advanced warning area to the exit ramp should be closed whenever possible.
  4. Any changes to the Detour Traffic Control must be approved by the Engineer prior to any modifications being performed in the field.



*J.R. Hughes, P.E.* 08/20/2024  
 Signature of Registrant & Date

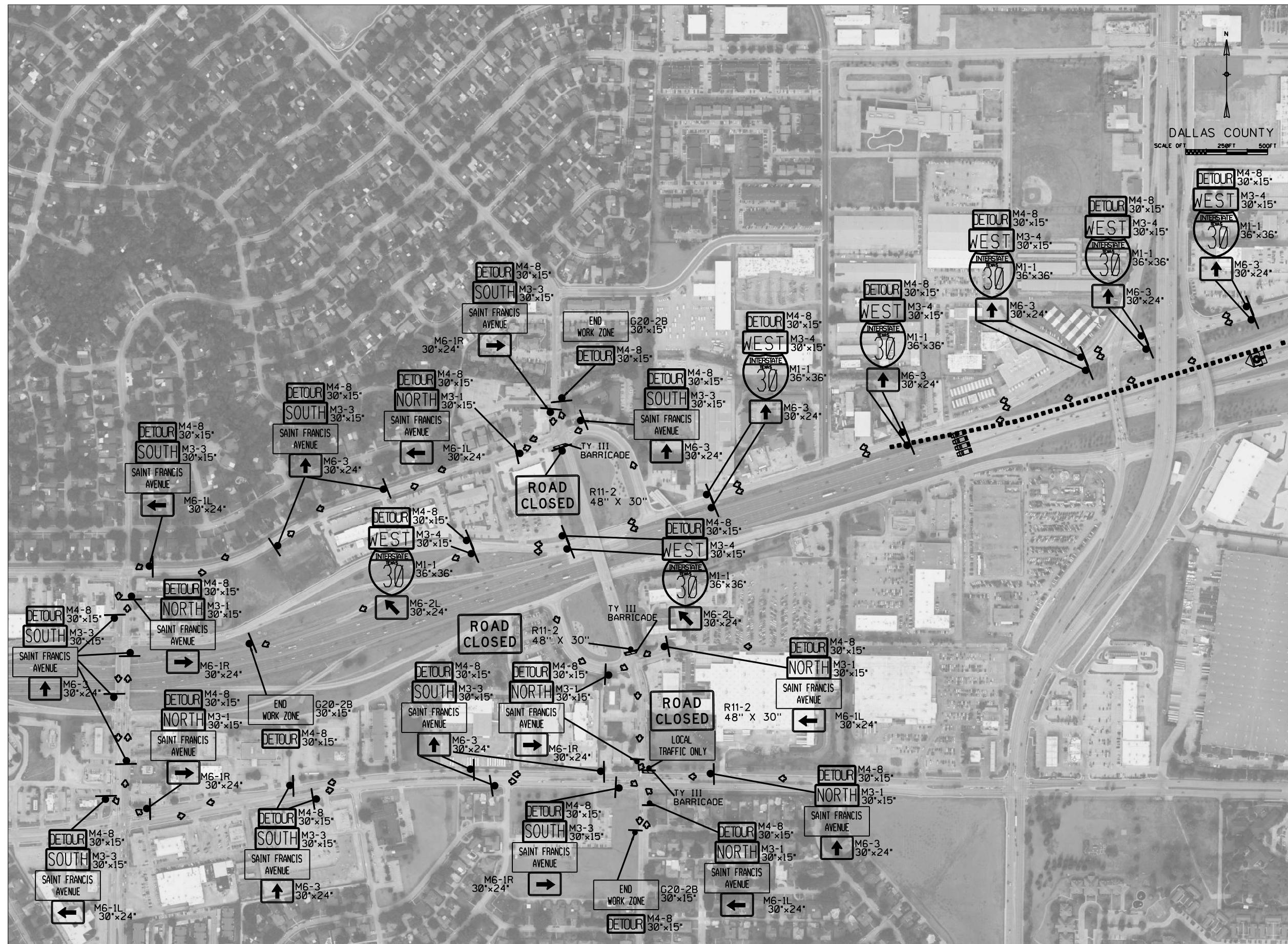
Texas Department of Transportation

IH30 & US80  
 TCP DETOUR

© TxDOT		SHEET 2 OF 3	
CONT	SECT	JOB	HIGHWAY
6470	54	001	IH0030
DIST	COUNTY	SHEET NO.	
DAL	DALLAS	6A	

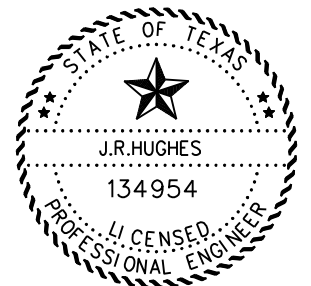
DATE: 2024/07/08  
 FILE: RMC-647054001

DWG:   
 CHK:   
 DNE:



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

- NOTES**
1. All traffic control devices and barricades shall be installed in accordance to the applicable Traffic Control Plan (TCP) standards, as directed by the Engineer.
  2. 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.
  3. Entrance ramps located within the detours advanced warning area to the exit ramp should be closed whenever possible.
  4. Any changes to the Detour Traffic Control must be approved by the Engineer prior to any modifications being performed in the field.



Signature of Registrant & Date 08/20/2024



**IH30 & ST FRANCIS**  
**TCP DETOUR**


© TxDOT		SHEET 3 OF 3	
CONT	SECT	JOB	HIGHWAY
6470	54	001	IH0030
DIST	COUNTY	SHEET NO.	
DAL	DALLAS	6B	

DATE: 2024/07/08  
 FILE: RMC-647054001

DATE: 8/19/2024 TIME: 9:39:43 AM FILE: T:\DALBRDG\Brdge Repair\18-057-0-0009-11-196\*IH30\*ST Francis\Incident Damage Repair\Drawings\Estimated Quantities.dwg

**ESTIMATED QUANTITIES**

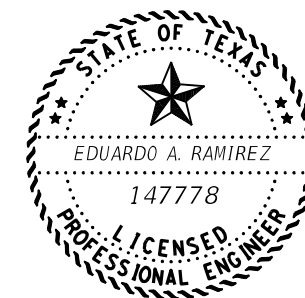
ITEM NO.	429	780	784	784	784	784	786
DESCRIPTION CODE	7007	7002	7002	7003	7020	7022	7002
ITEM DESCRIPTION	CONC STR REPAIR (VERTICAL & OVERHEAD)	CNC CRACK REPAIR (DISCRETE) (INJECT)	REP STL BRIDGE MEMBER (BEAM)	REP STL BRIDGE MEMBER (DIAPHRAGM)	REP STL BRIDGE MEMBER (STRAIGHTEN MEMB)	REP STL BRDG MEMB (WELD REPAIR)	CARBON FIBER REINF POLYMER STRENGTHNING
NBI NUMBER	SF	LF	EA	EA	EA	EA	SF
18-057-0-0009-11-196	9	12	1	2	2	1	85
TOTAL	9	12	1	2	2	1	85

 <b>Texas Department of Transportation</b>				<b>Dallas District Bridge</b>	
<p><b>IH 30</b>  <b>IH 30 WBML UNDERPASS</b>  <b>AT ST FRANCIS AVE</b>  <b>ESTIMATED QUANTITIES</b>  <b>NBI: 18-057-0-0009-11-196</b></p>					
FILE:	DN: ER	CK: RM	DW: ER	CK: RM/SI	
©TxDOT 2024	CONT	SECT	JOB	HIGHWAY	
REVISIONS	6470	54	001	IH 30	
	DIST	COUNTY	SHEET NO.		
	DAL	DALLAS	7		

DATE: 8/19/2024 TIME: 9:39:45 AM FILE: T:\DALBRDG\Brdge Repair\18-057-0-0009-11-196\*IH30\*ST Francis\Incident Damage Repair\Detail\Table of Repairs\Repar.txdot

**TABLE OF REPAIRS**

REPAIR NO.	ITEM	BID ITEM DESCRIPTION	UNIT	QUANTITY	REPAIR DESCRIPTION/LOCATOR	DETAILS/NOTES
SP1	0784 7002	REP STL BRIDGE MEMBER (BEAM)	EA	1	Remove and replace the damaged section of Beam A	See Beam Repair Details
SP2	0784 7003	REP STL BRIDGE MEMBER (DIAPHRAGM)	EA	1	Remove and replace the damaged section of the second diaphragm (Type B) from Pier 2, between Beam A and B.	See Beam Repair Details
SP3	0784 7003	REP STL BRIDGE MEMBER (DIAPHRAGM)	EA	1	Remove and replace the damaged section of the third diaphragm (Type C) from Pier 2, between Beam A and B.	See Beam Repair Details
SP4	0784 7020	REP STL BRIDGE MEMBER (STRAIGHTEN MEMB)	EA	1	Straighten deformed Beam C web and flange back to original form.	See Beam Repair Details
SP5	0784 7020	REP STL BRIDGE MEMBER (STRAIGHTEN MEMB)	EA	1	Straighten deformed Beam D web and flange back to original form.	See Beam Repair Details
SP6	0784 7022	REP STL BRDG MEMB (WELD REPAIR)	EA	1	Weld crack on the lower connection between the second diaphragm from Pier 2 and Beam C	See Beam Repair Details
SB1	0780 7002	CNC CRACK REPAIR (DISCRETE)(INJECT)	LF	12	Repair and seal cracks on Pier 3 on the East side of Cap.	Refer to the TXDOT Concrete Repair Manual Chapter 3, Section 5
SB2	0786 7002	CARBON FIBER REINF POLYMER STRENGTHNING	SF	85	Use CFRP to reinforce the damaged section of the East side of Pier 3 Cap.	See Cap Repair Detail
SB3	0429 7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	6	Repair spall on Pier 3 under Beam A bearing	Refer to Concrete & Overhead Repair detail
SB4	0429 7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	3	Repair spall on Pier 3 under Beam D bearing	Refer to Concrete & Overhead Repair detail

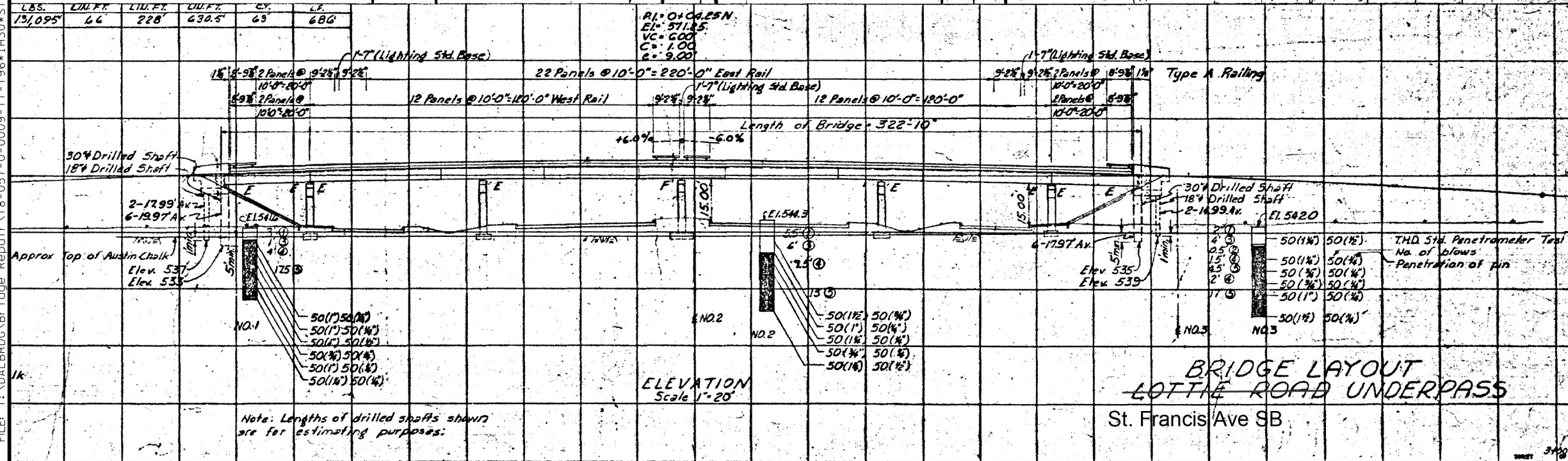
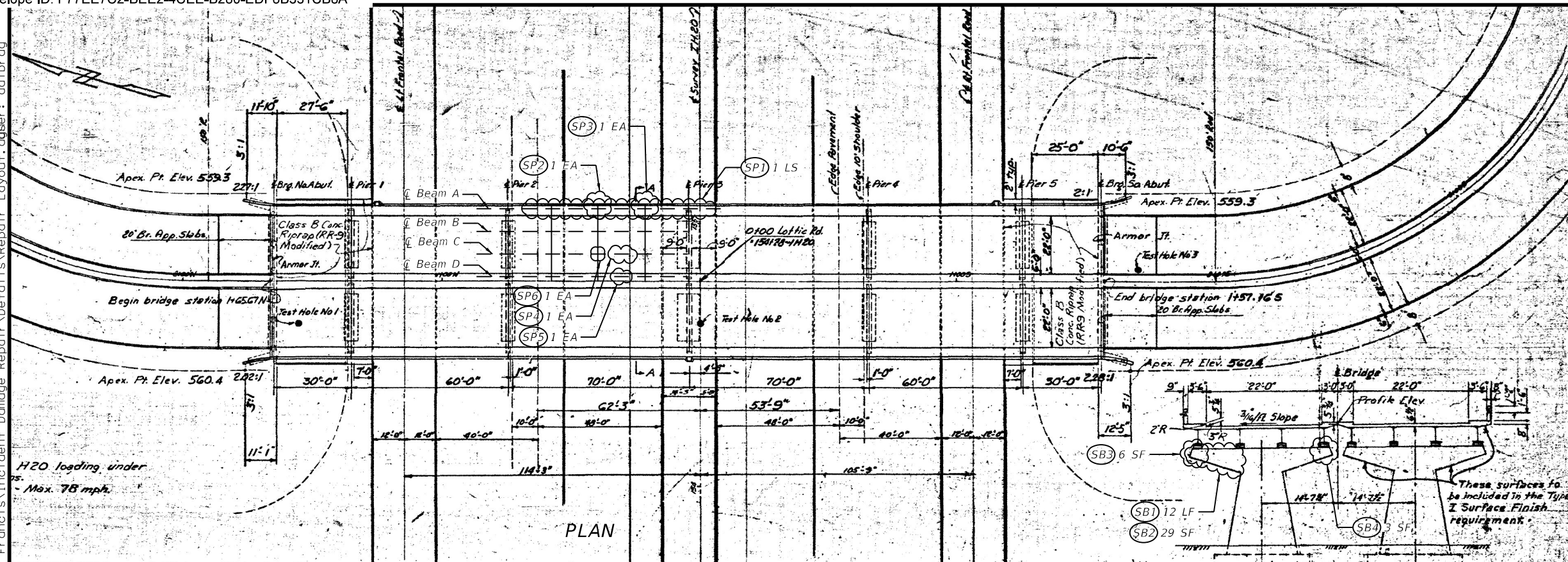


*Eduardo A. Ramirez*

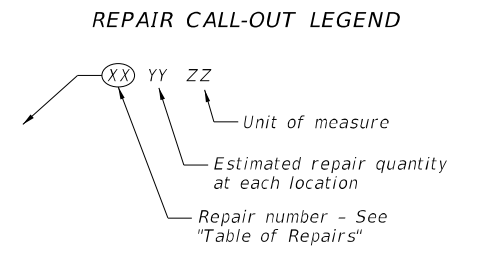
08/19/2024

		Dallas District Bridge	
<b>IH 30</b> <b>IH 30 WBML UNDERPASS</b> <b>AT ST FRANCIS AVE</b> <b>TABLE OF REPAIRS</b> NBI: 18-057-0-0009-11-196			
FILE:	DW: ER	CK: RM	DW: ER
© TXDOT 2024	CONT: 6470	SECT: 54	JOB: 001
REVISIONS	DIST: DAL		COUNTY: DALLAS
			SHEET NO.: 8

FILE: T:\DALBRDG\Bridges\18-057-0-0009-11-196\*IH30\*ST Francis\Incident Damage Repair\Detail\Repair Layout.dgser: dalbrdg  
 DATE: 6/12/2024 TIME: 9:02:05 PM

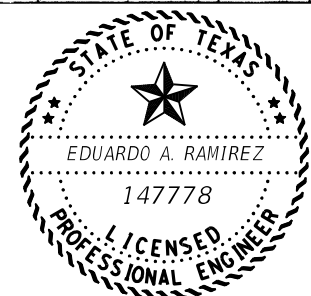


- GENERAL NOTES**
- Layout, stations, and elevations shown are based on as-built plans. Copies of available portions of as-built plans may be provided upon request.
  - Repair locations and quantities are based on Condition Survey dated (05/2024). Current conditions may vary. Field verify locations and extent of repairs in the presence of the Engineer prior to ordering materials.
  - Existing Load Rating:  
 HS11 (INV)  
 HS18.3 (OR)



SYMBOL	APPLICABLE REPAIR AREAS
D-#	Deck, joints, overhangs, approach slabs
R-#	Rails, approach MBGF
SP-#	Superstructure elements, bearings
SB-#	Substructure elements
M-#	Miscellaneous (Riprap, shoulder drains, etc)

**BRIDGE REPAIR LAYOUT**



*E. Ramirez*  
06/12/2024

Texas Department of Transportation  
 Dallas District Bridge  
**IH 30**  
**IH 30 WBML UNDERPASS**  
**AT ST FRANCIS AVE**  
**BRIDGE REPAIR LAYOUT**  
 NBI: 18-057-0-0009-11-196

FILE:	DN: ER	CK: RM	DW: ER	CK: RM/SI
©TxDOT	2024	CONTRACT	6470 54	JOB
REVISIONS		SECT	001	HIGHWAY
		DIST	DALLAS	SHEET NO.
				9

DATE: 6/12/2024 TIME: 9:02:40 PM FILE: T:\DALBRDG\Brdge Repair\18-057-0-0009-11-196\*IH30\*ST Francis\Incident Damage Repair\Detail\Repair Photos.dgser: dalbrdg



SP1 - Impact damage along Beam A with significant web and flange deformation



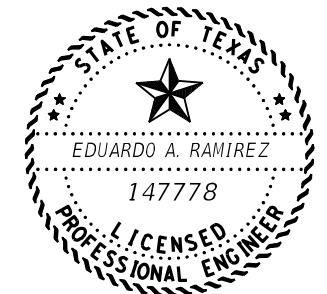
SP1 - Impact damage along Beam A with significant web and flange deformation



SP2 - Damaged diaphragm members and broken connection to beam A. Second diaphragm from Pier 2.



SP3 - Damaged diaphragm members and broken connection to beam A. Third diaphragm from Pier 2.



*Eduardo A. Ramirez*

06/12/2024

NOTE:  
Photographs are provided for contractor's information and are intended to show a generalized idea of the structure condition. Extent of damage may vary from what is shown in photos.

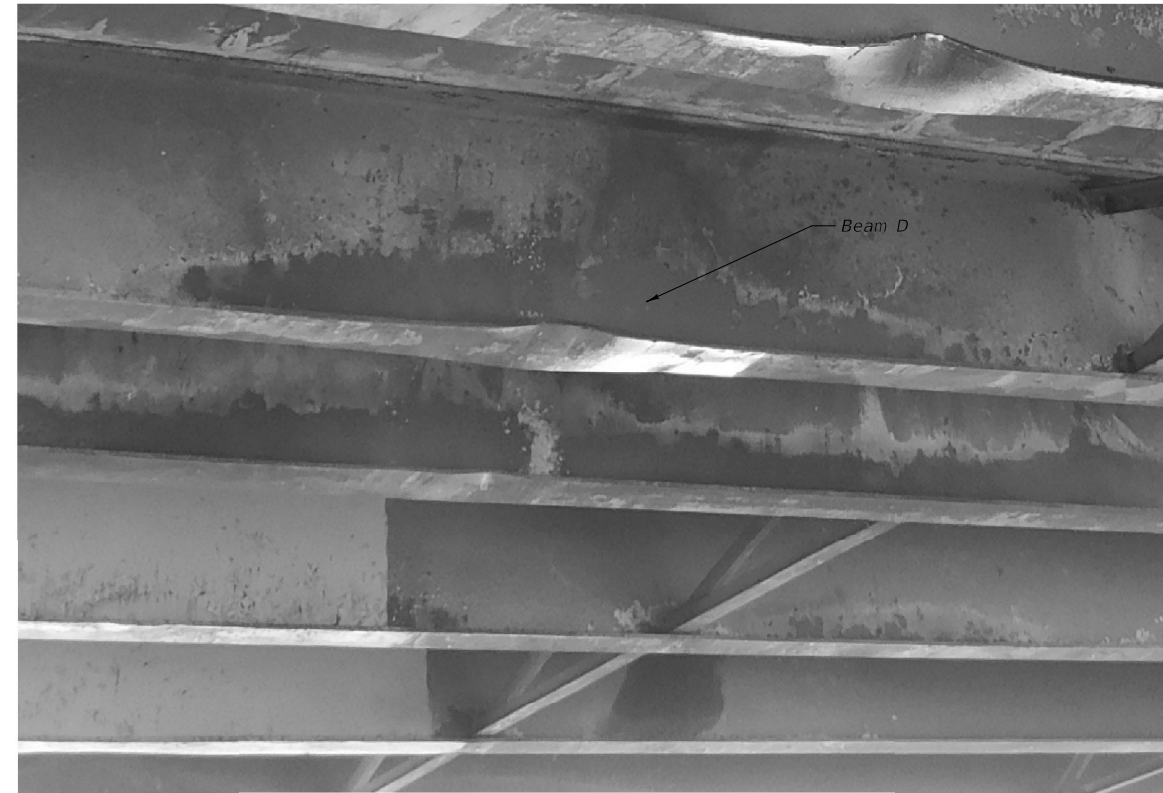
SHEET 1 OF 3

		Dallas District Bridge		
<b>IH 30</b> <b>IH 30 WBML UNDERPASS</b> <b>AT ST FRANCIS AVE</b> <b>REPAIR PHOTOS</b> NBI: 18-057-0-0009-11-196				
FILE:	DW: ER	CK: RM	DW: ER	CK: RM/SI
©TxDOT 2024	CONT 6470	SECT 54	JOB 001	HIGHWAY IH 30
REVISIONS	DIST DAL	COUNTY DALLAS	SHEET NO. 10	

DATE: 6/12/2024 TIME: 9:02:46 PM FILE: T:\DALBRDG\Brdge Repair\18-057-0-0009-11-196\*IH30\*ST Francis\Incident Damage Repair\Detail\Repair Photos.dgser: dalbrdg



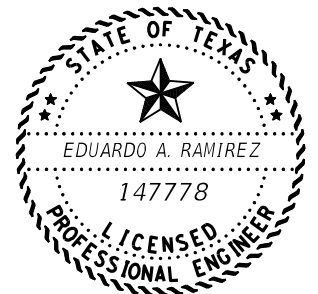
SP4 - Impact damage on Beam C with web and flange deformation



SP5 - Impact damage on Beam D with web and flange deformation



SP6 - Crack on the welded bottom connection between the second diaphragm from Pier 2 and Beam C



*Eduardo A. Ramirez*

06/12/2024

NOTE:  
Photographs are provided for contractor's information and are intended to show a generalized idea of the structure condition. Extent of damage may vary from what is shown in photos.

SHEET 2 OF 3

		Dallas District Bridge	
<b>IH 30</b> <b>IH 30 WBML UNDERPASS</b> <b>AT ST FRANCIS AVE</b> <b>REPAIR PHOTOS</b> <b>NBI: 18-057-0-0009-11-196</b>			
FILE:	DW: ER	CK: RM	DW: ER
©TxDOT 2024	CONT 6470	SECT 54	JOB 001
REVISIONS	DIST DAL		COUNTY DALLAS
			HIGHWAY IH 30
			SHEET NO. 11



DATE: 6/12/2024 TIME: 9:02:50 PM FILE: T:\DALBRDG\Brdge Repair\18-057-0-0009-11-196\*IH30\*ST Francis\Incident Damage Repair\Detrai\s\Repair Photos.dgser: dalbrdg



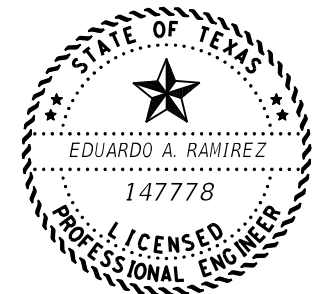
SB1 & SB2 - Crack along face of Pier 3 Cap



SB3 - Spall on Pier 3 under Beam A bearing



SB4 - Spall on Pier 3 under Beam D bearing



*Eduardo A. Ramirez*

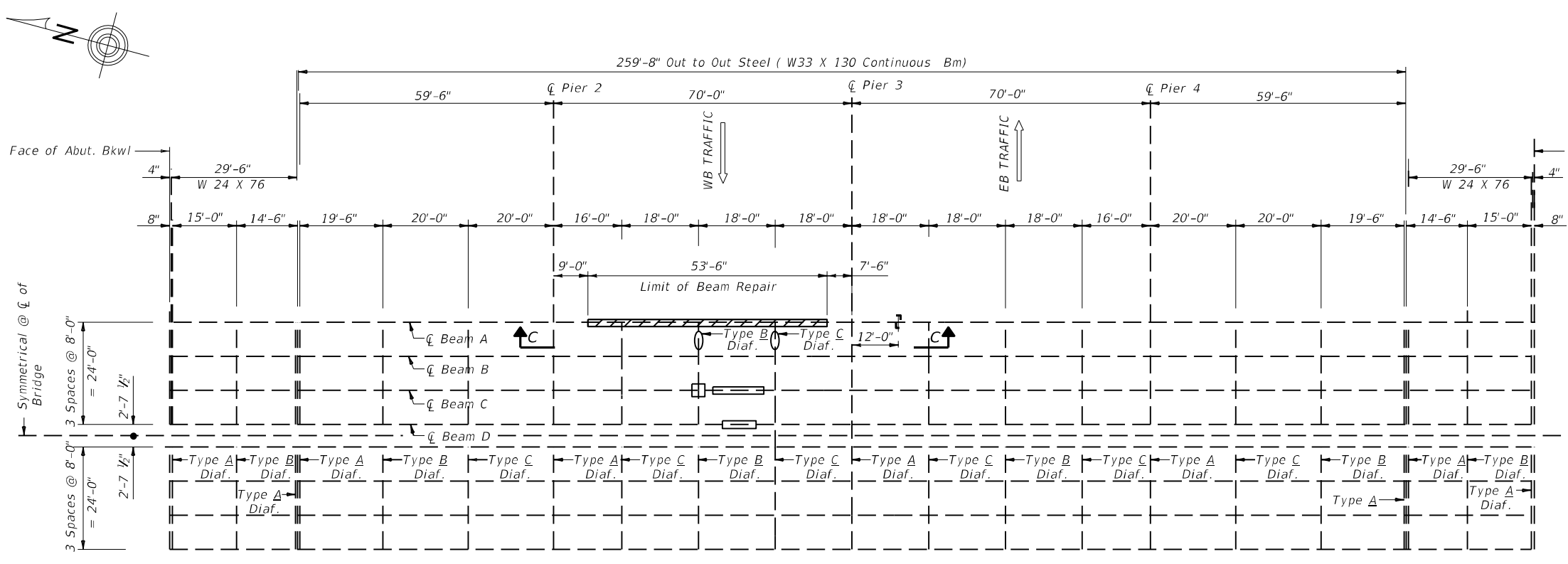
06/12/2024

NOTE:  
Photographs are provided for contractor's information and are intended to show a generalized idea of the structure condition. Extent of damage may vary from what is shown in photos.

SHEET 3 OF 3

		Dallas District Bridge	
<b>IH 30</b> <b>IH 30 WBML UNDERPASS</b> <b>AT ST FRANCIS AVE</b> <b>REPAIR PHOTOS</b> <b>NBI: 18-057-0-0009-11-196</b>			
FILE:	DW: ER	CK: RM	DW: ER
©TxDOT 2024	CONT 6470	SECT 54	JOB 001
REVISIONS	DIST DALLAS		HIGHWAY IH 30
	COUNTY DALLAS		SHEET NO. 12

FILE: T:\DALBRDG\Bridg Repair\18-057-0-0009-11-196\*IH30\*ST Francis\Incident Damage Repair\Detail\Beam Repair\_Details.dwg  
 DATE: 7/3/2024 TIME: 11:47:02 AM

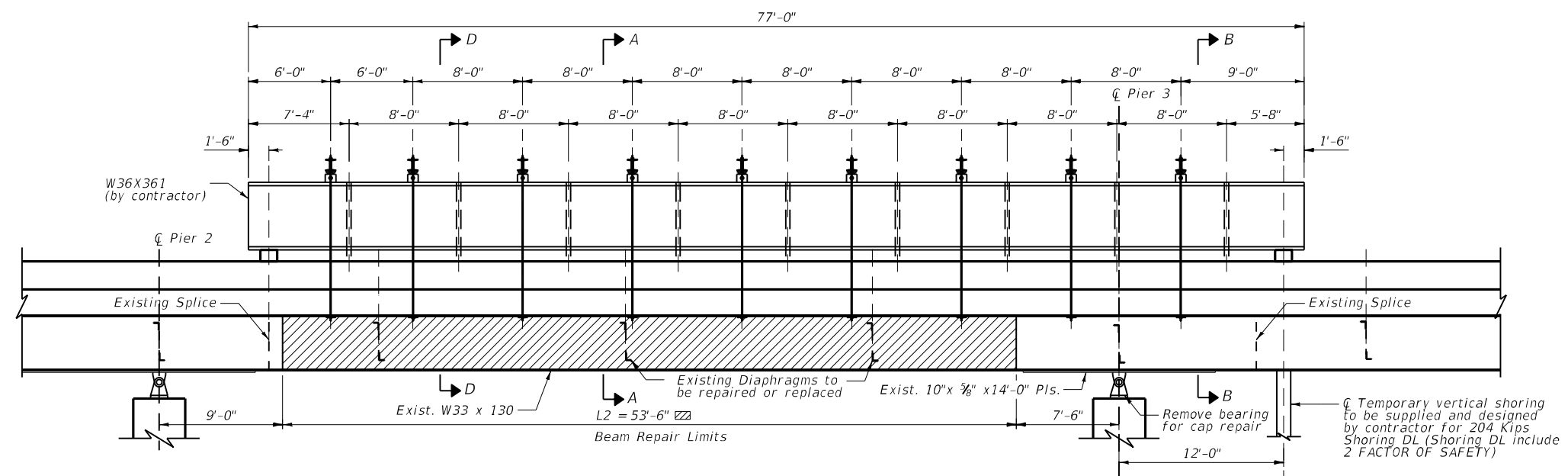


Dimensions and stations are from as-built plans. The contractor shall verify all dimensions (length of replaced beam sections) and elevations in the field before fabrication.

FRAMING PLAN SHOWING APPROXIMATE LIMITS OF WORK

NTS

- ~ Repair or Replace Type B & Type C diaphragms
- ~ Weld crack at diaphragm & beam connection
- ▭ ~ Heat-Straighten Beam
- ▨ ~ Resection Beam



VIEW C-C  
PARTIAL ELEVATION OF RESECTIONED BEAM A (LOOKING EAST) NB BRIDGE

NTS

GENERAL NOTES:

Notify TxDOT Bridge Division at least two weeks in advance by e-mailing BRG-F0-STL@txdot.gov prior to beginning work to allow for inspection of repairs by a Bridge Division structural steel inspector.

Set traffic control on IH 30 to maintain a safe work zone during repairs. Restrict all traffic on St. Francis from the lane(s) above any beam being repaired. Resume traffic after all repairs below the restricted traffic lane have been completed and epoxy has cured.

Damaged areas shown in details are for information only and are not accurate in size, length, or area. Carefully examine areas needing repairs prior to beginning work.

Repair damaged steel bridge members as shown in the plan and in accordance with Item 784, "Repair Steel Bridge Members."

At the Contractor's option, deformed diaphragm members may be replaced with new steel members of the same size at no additional cost to the Department. Provide ASTM A709 steel with minimum Grade 36 in accordance with Item 442, "Metal for Structures" for new diaphragms. Provide ASTM A-709 Grade 50 steel in accordance with Item 442, "Metal for Structures" for the new beam section that will replace the existing beam section.

Restore the paint protection for repaired beams and diaphragms with System II per Item 446, "Field Cleaning and Painting Steel," and as directed by the Engineer. Match the appearance coat with the existing structure. Assume existing paint coating contains hazardous materials, unless otherwise noted.

All Hanger rods shall be ASTM A-709 Grade 50 bar stock. Ends of hanger rods shall be threaded. Required length of threads and of hanger rods shall be determined in the field. Threads shall be the UNC Series as specified in ANSI B1.1 and shall have Class 2A tolerance. Hanger rods shall be doubled nutted both ends.

Check diaphragm welds in the vicinity of the damaged areas. Repair damaged welds as directed by the Engineer in accordance with Item 448, "Structural Field Welding."

Repair areas of incomplete bearing between the concrete slab and the top flange of the beam by epoxy injection in accordance with Item 780, "Epoxy Injection."

A certified welder must perform all welding involved in the repair work in accordance with Item 448. Welding will be inspected by a Bridge Division's Structural Steel Inspector. Make beam splices by full penetration groove welds. Perform radiographic testing on all welds connecting the replaced portion of the beam with the existing beam.

Contractor shall use due care to avoid damage to other existing structural members. Any additional damage done shall be at the contractor's expense.

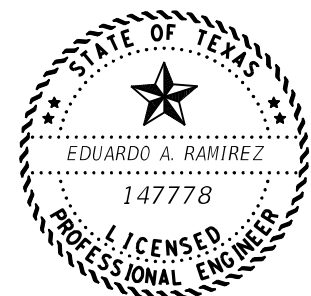
Remove beam A bearing at Pier 3 to perform cap repairs. Reinstall bearing after cap work is complete. Remove and Reinstallation of the bearing is subsidiary to item 784-7002.

Contractor must submit shop drawing for shoring including calculation and details signed and sealed by Texas professional Engineer to TxDOT for Approval prior to beginning work.

Remove and re-attach any existing electrical conduit and drainpipes system. The work performed will be incidental to item 784-7002.

Repair holes in deck after work is complete using flowable grout conforming to Item 421, "Mortar and Grout."

All work associated with beam resectioning will be paid for at the "each" price bid for Item 784-7002.



*Eduardo A. Ramirez*  
07/03/2024

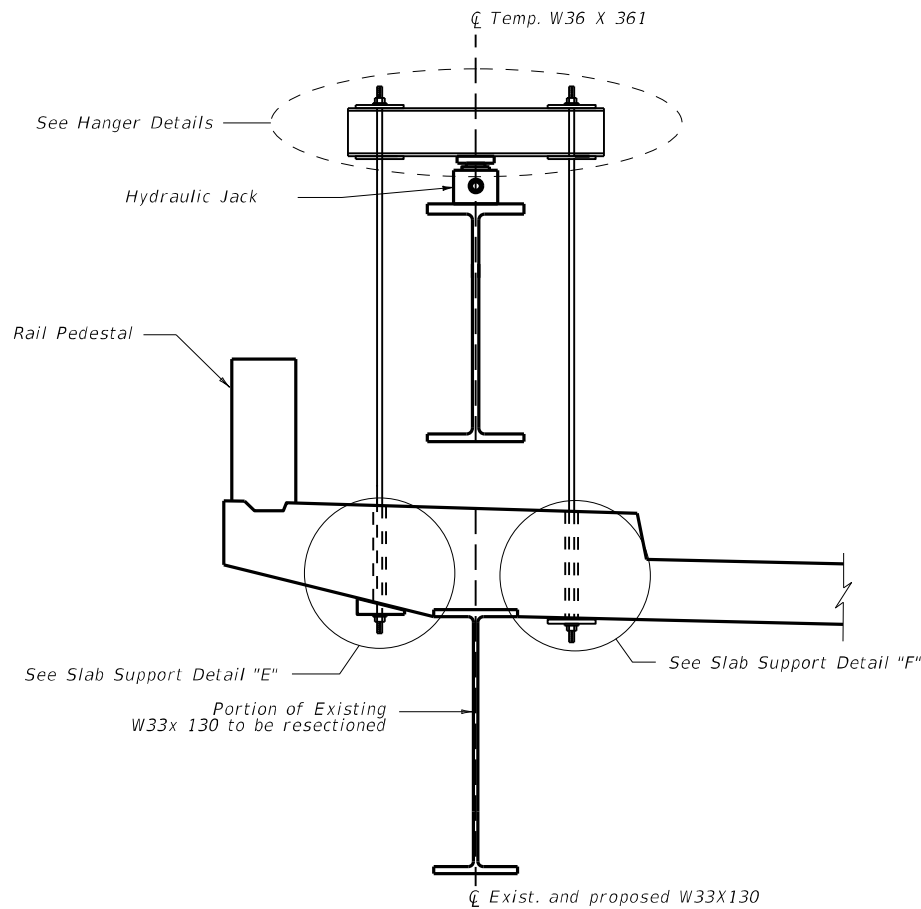
SHEET 1 OF 5

**Texas Department of Transportation**  
Dallas District Bridge

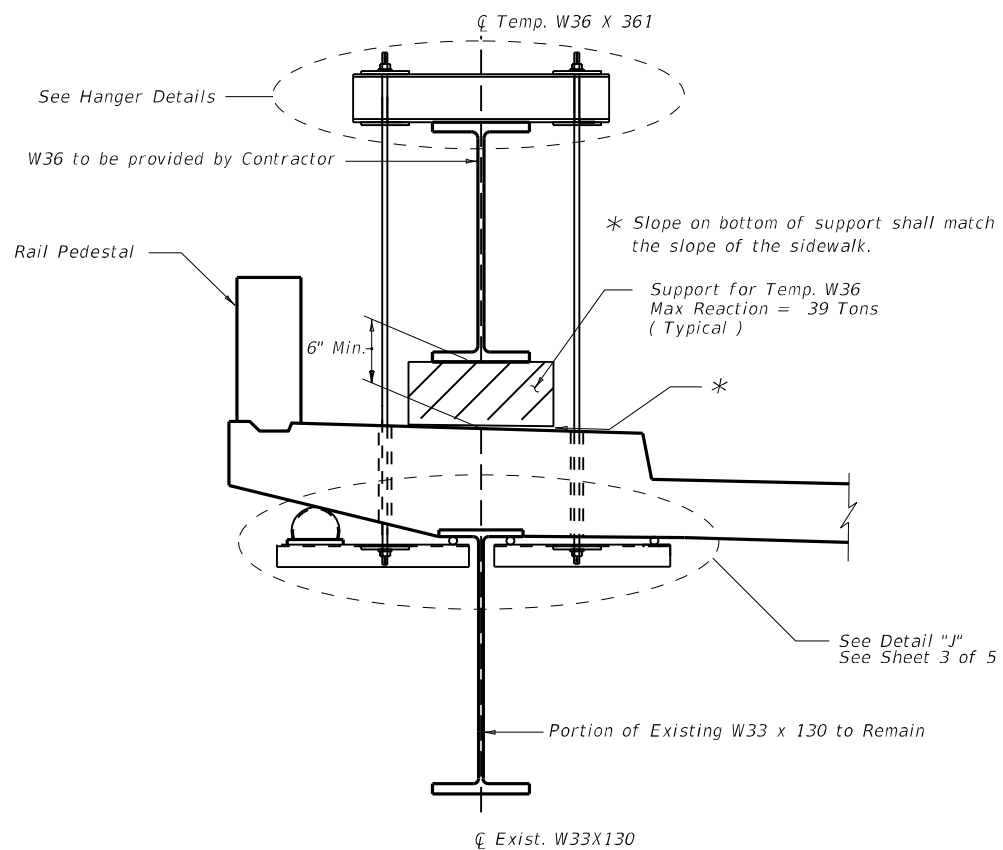
**IH 30**  
**IH 30 WBML UNDERPASS**  
**AT ST FRANCIS AVE**  
**BEAM REPAIR DETAILS**  
NBI: 18-057-0-0009-11-196

FILE:	DW: ER	CK: RM	DW: ER	CK: RM/SL
©TxDOT 2024	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	54	001	IH 30
	DIST	COUNTY	SHEET NO.	
	DAL	DALLAS	13	

DATE: 7/3/2024 TIME: 11:47:03 AM FILE: T:\DALBRDG\BRIDGE REPAIR\18-057-0-0009-11-196\*IH30\*ST FRANCIS\Incident Damage Repair\Details\Beam Repair Details.dgn

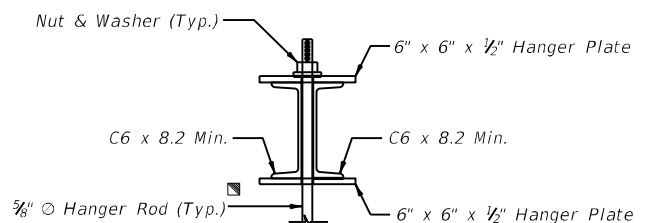


SECTION A-A  
NTS

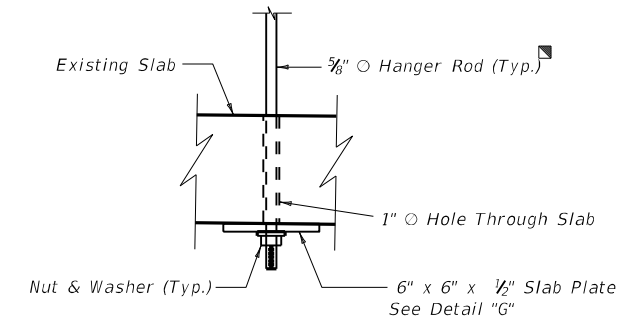


SECTION B-B  
NTS

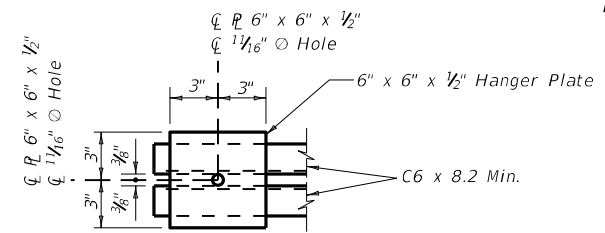
"All-Thread" or other tie rod as proposed with the Approval by the Engineer



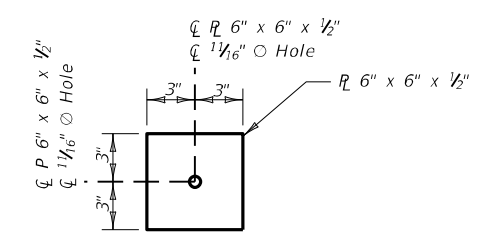
SECTION C-C  
Scale: 1" = 1'-0"



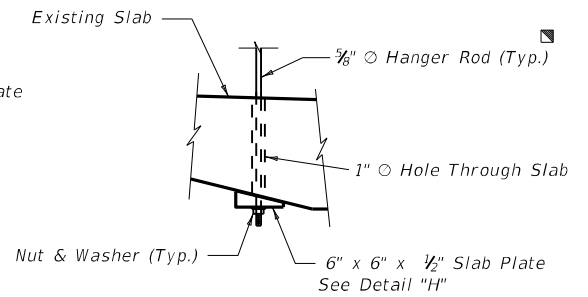
SLAB SUPPORT DETAIL "F"  
Scale: 1" = 1'-0"



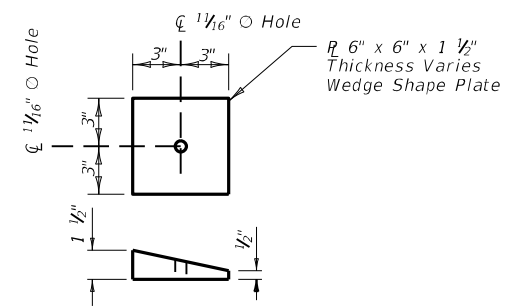
DETAIL "D"  
(Typical for all Hanger Plates)  
Scale: 1" = 1'-0"



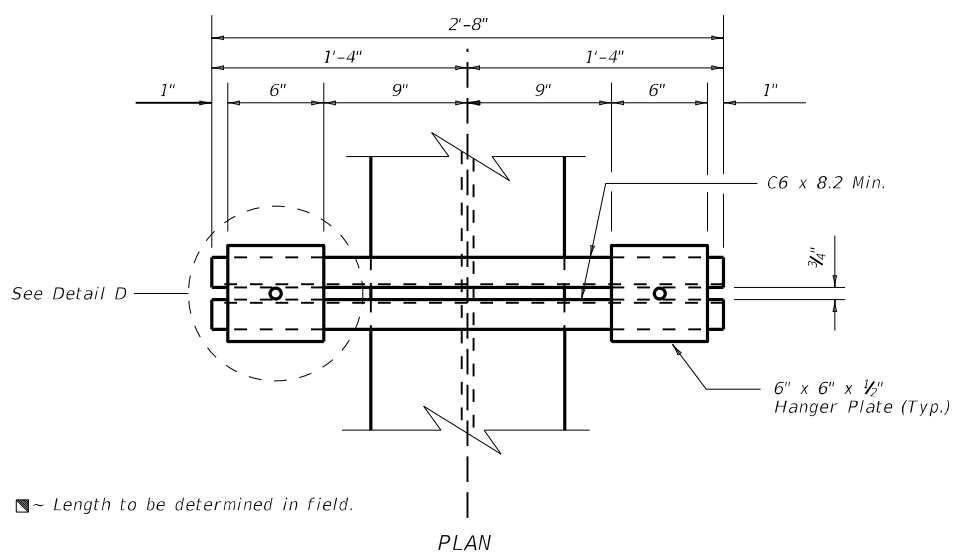
SLAB PLATE DETAIL "G"  
Scale: 1" = 1'-0"



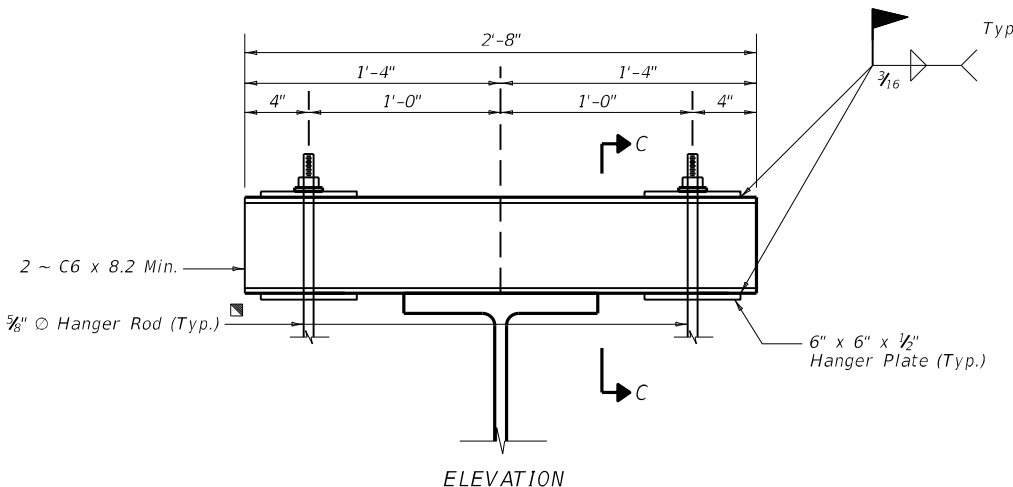
SLAB SUPPORT DETAIL "E"  
Scale: 1" = 1'-0"



SLAB PLATE DETAIL "H"  
Scale: 1" = 1'-0"



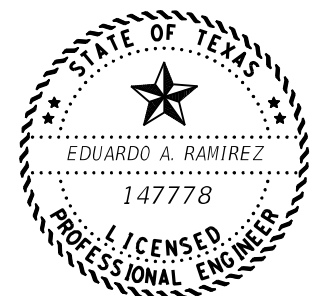
PLAN



ELEVATION  
HANGER DETAILS  
Scale: 1" = 1'-0"

BEAM RESECTION PROCEDURE:

1. Restrict traffic from traveling on deck in lane above the beam A.
2. Temporarily close the bridge when welding operation takes place.
3. Install temporary slab support framing and vertical shoring. Ensure existing beam A and its bearing on Pier 3 are relieved from all loads before starting removal.
4. Remove the bearing for beam A on Pier 3 to allow for cap repairs.
5. Remove diaphragms between Beam A & Beam B within the resection area.
6. Cut out Damaged Beam at limit specified.
7. Resection portion of the W33x130 removed.
8. Reinstall removed bearing after cap repairs are complete.
9. Remove temporary slab support framing and patch holes.
10. Reattach Diaphragms.
11. Epoxy grout shall be injected between top beam flange and slab where separation has occurred to ensure complete contact between the beam and slab. This work shall be performed in accordance with Item 780 "Concrete Crack Repair" only after the beam has been replaced. This work is subsidiary to pay item 784-7002.
12. Clean up and re-painting (spot-painting) shall be as directed by the Engineer. Clean and repaint the new beam is subsidiary to pay item 784-7002.
13. Contractor may adjust sequence as needed subject to Engineer's approval.

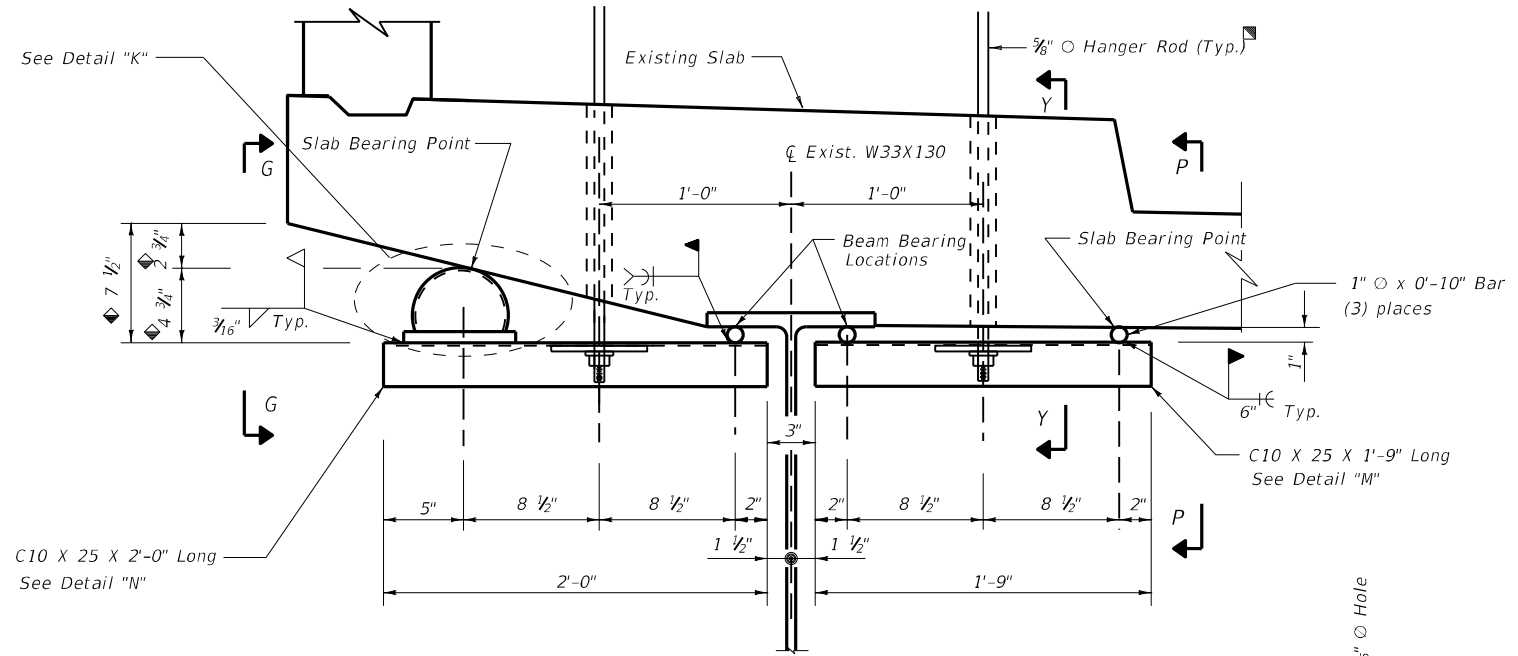


*Eduardo A. Ramirez*  
07/03/2024

SHEET 2 OF 5

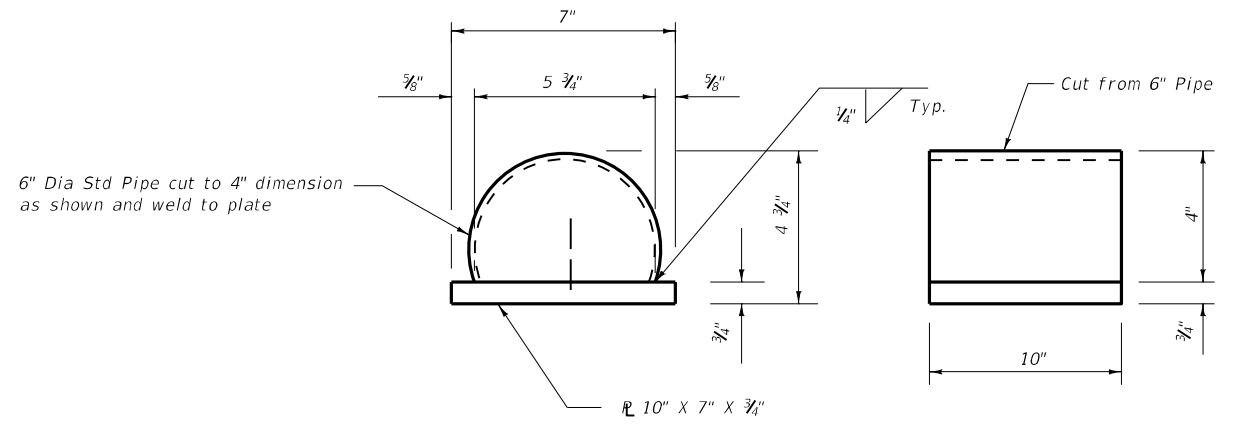
Texas Department of Transportation		Dallas District Bridge		
<b>IH 30</b> <b>IH 30 WBML UNDERPASS</b> <b>AT ST FRANCIS AVE</b> <b>BEAM REPAIR DETAILS</b> NBI: 18-057-0-0009-11-196				
FILE:	DN: ER	CK: RM	DW: ER	CK: RM/SL
©TxDOT	2024	CONTRACT	6470	SECTION
REVISIONS	54	JOB	001	HIGHWAY
		DIST	DALLAS	SHEET NO.
				14

DATE: 6/12/2024 TIME: 9:03:00 PM FILE: T:\DALBRDG\Bridg Repair\18-057-0-0009-11-196\*IH30\*ST Francis\Incident Damage Repair\Detail\Beam Repair Details.dgn

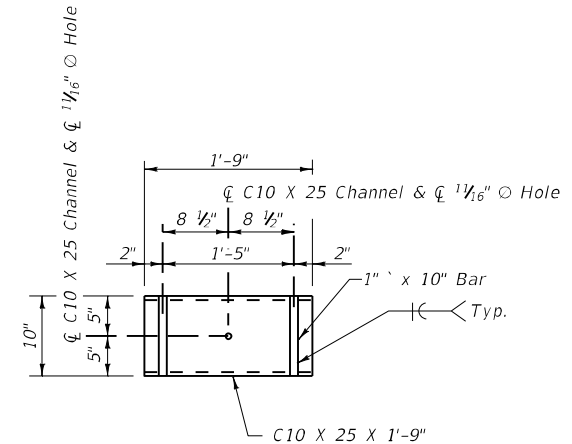


**DETAIL "J" BEAM SUPPORT DETAIL**  
Scale: 1" = 1'-0"

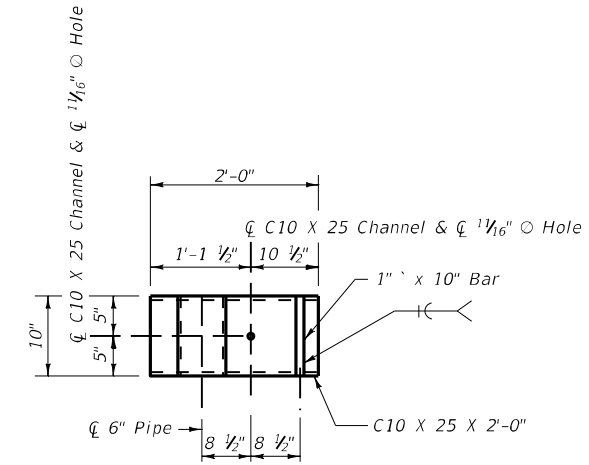
~ Dimension varies due to field condition. Contractor re-adjust in the field by shimming to obtain full bearing between pipe and slab bearing area.



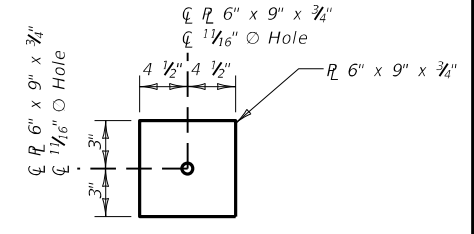
**DETAIL "K"**  
Scale: 1" = 2'-0"



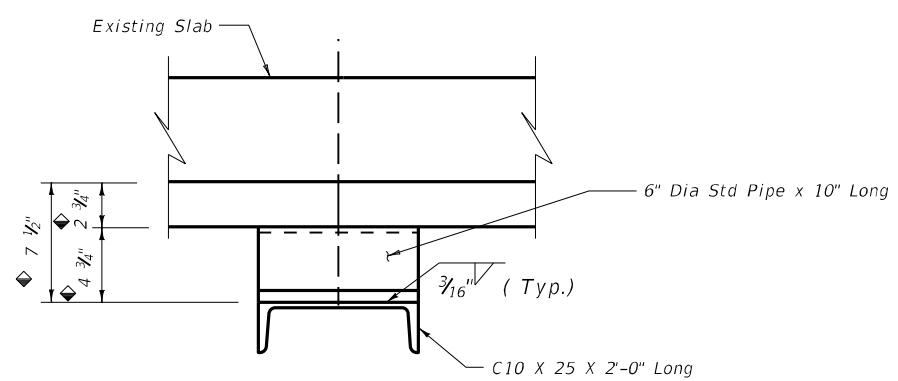
**DETAIL "M"**  
Scale: 1" = 1'-0"



**DETAIL "N"**  
Scale: 1" = 1'-0"

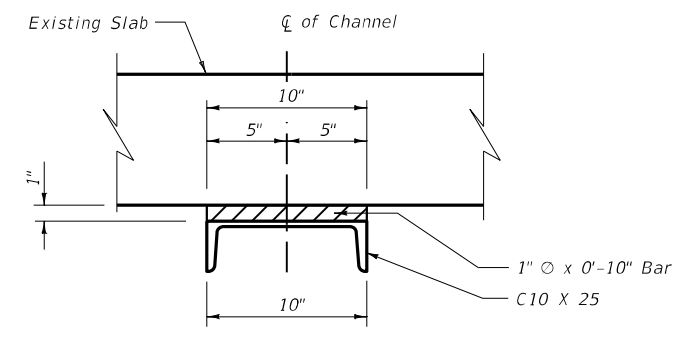


**PLATE DETAIL "X"**  
Scale: 1" = 1'-0"

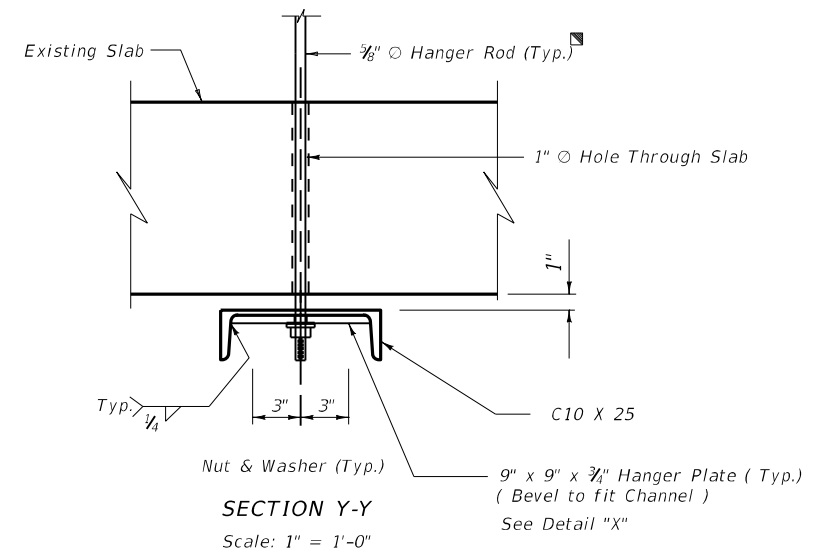


**SECTION G-G**  
Scale: 1" = 1'-0"

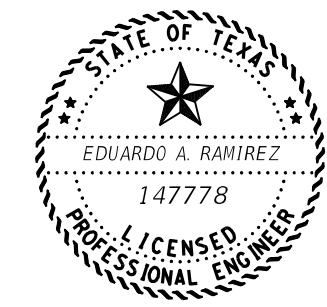
~ Length to be determined in field.



**SECTION P-P (TYP AT 1" BAR)**



**SECTION Y-Y**  
Scale: 1" = 1'-0"

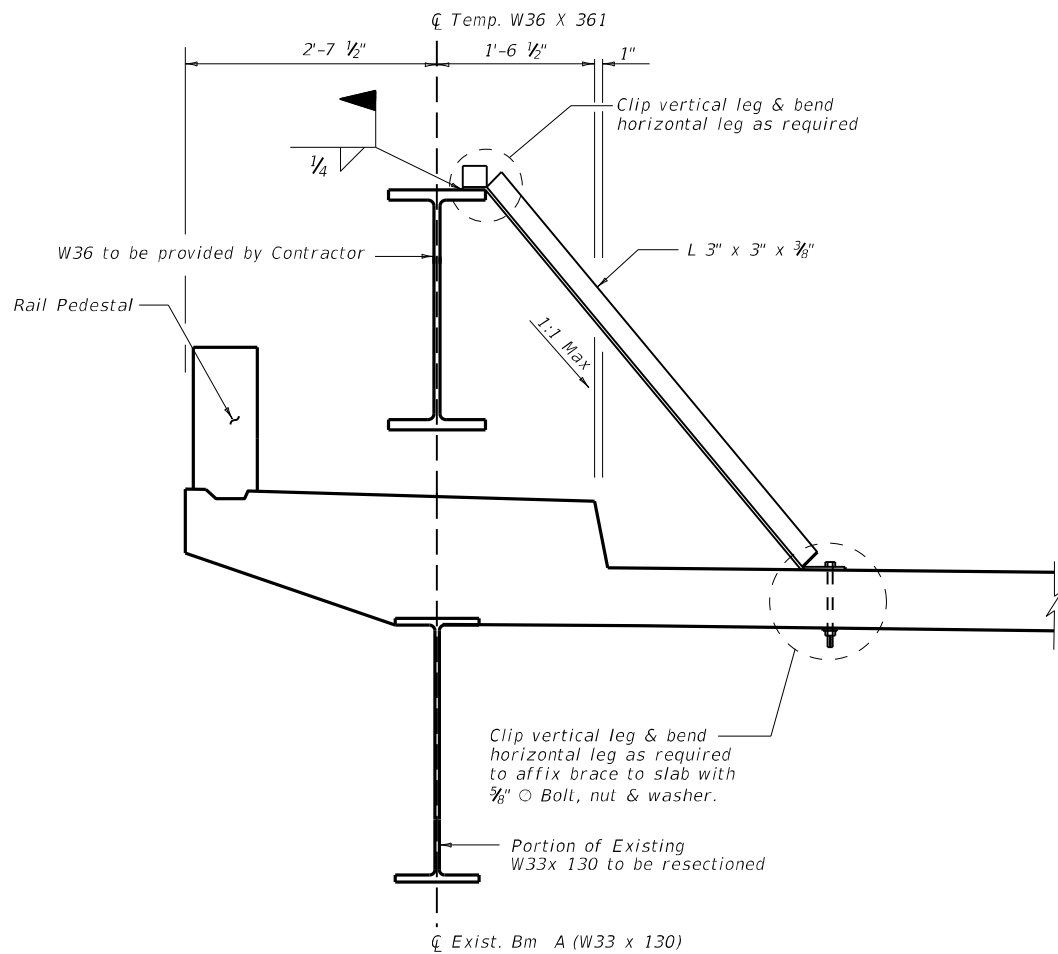


*E. Ramirez*  
06/12/2024

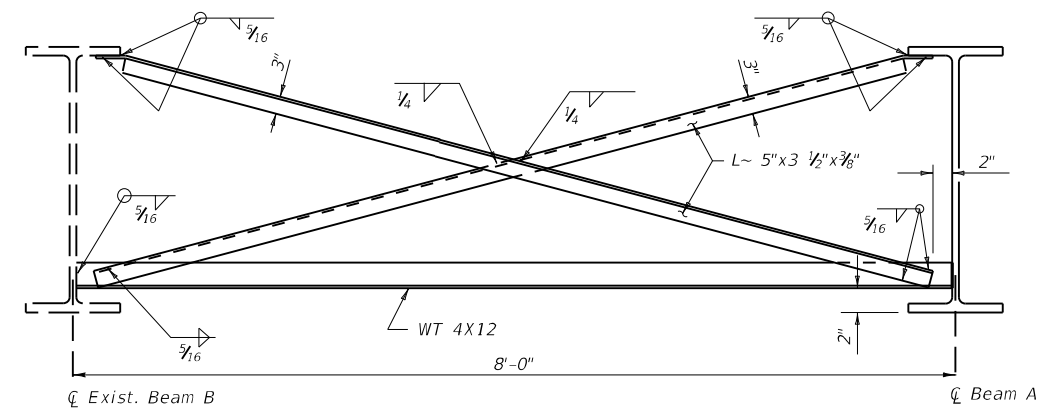
SHEET 3 OF 5

Texas Department of Transportation		Dallas District Bridge	
<b>IH 30</b>			
<b>IH 30 WBML UNDERPASS AT ST FRANCIS AVE</b>			
<b>BEAM REPAIR DETAILS</b>			
NBI: 18-057-0-0009-11-196			
FILE:	DW: ER	CK: RM	DW: ER
© TXDOT	2024	6470	54
REVISIONS	CONTRACT	SECTION	JOB
DIST	COUNTY	SHEET NO.	
DAL	DALLAS	15	

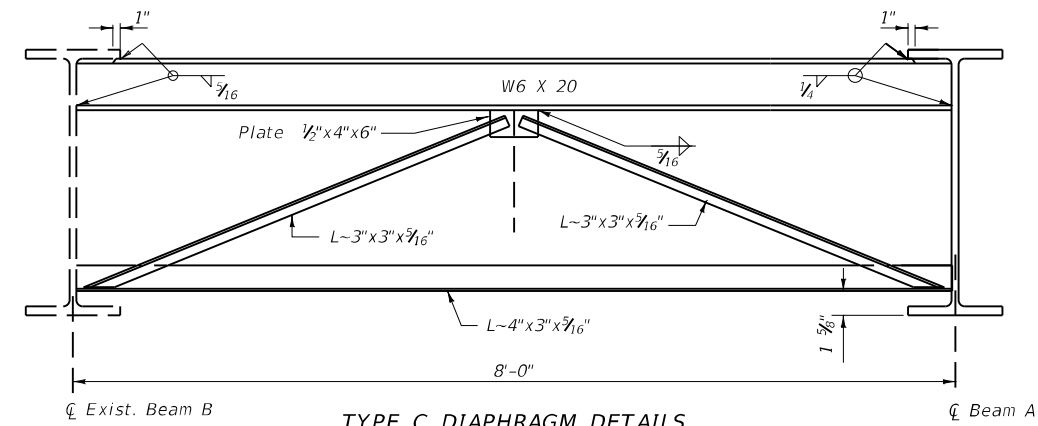
DATE: 6/12/2024 TIME: 9:03:01 PM FILE: T:\DALBRDG\Brdge Repair\18-057-0-0009-11-196\*IH30\*ST Francis\Incident Damage Repair\Detail\Beam Repair Details.dgn brdg



SECTION D-D  
(Showing Bracing Condition for Temp. Beam )  
NTS

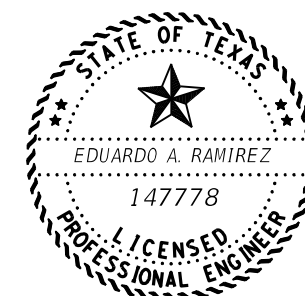


TYPE B DIAPHRAGM DETAILS  
NTS



TYPE C DIAPHRAGM DETAILS  
NTS

SHEET 4 OF 5

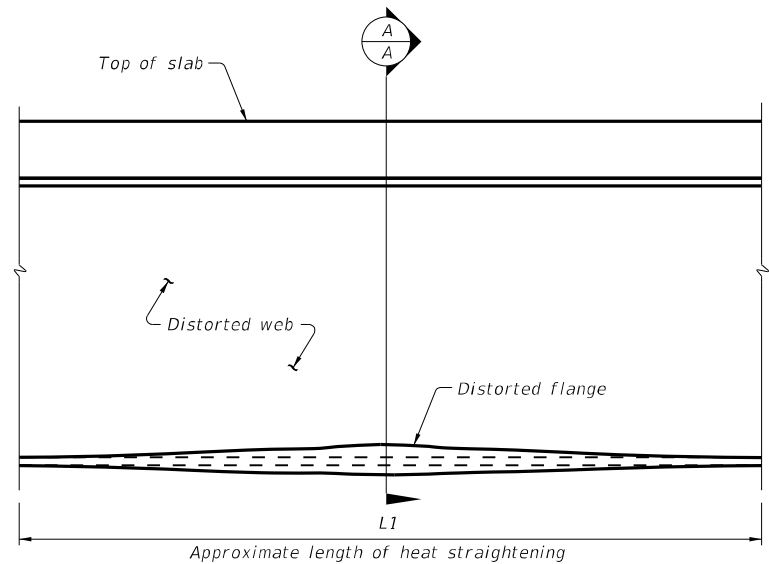


*Eduardo A. Ramirez*

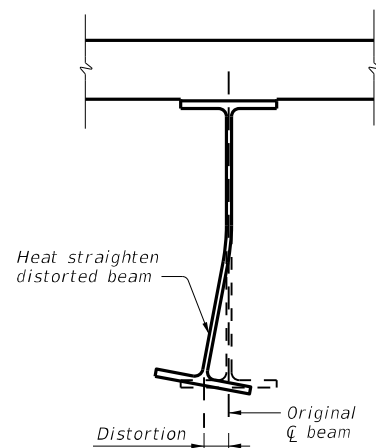
06/12/2024

		Dallas District Bridge	
<b>IH 30</b> <b>IH 30 WBML UNDERPASS</b> <b>AT ST FRANCIS AVE</b> <b>BEAM REPAIR DETAILS</b> NBI: 18-057-0-0009-11-196			
FILE:	DW: ER	CK: RM	DW: ER
©TxDOT 2024	CONT: 6470	SECT: 54	JOB: 001
REVISIONS:	DIST: DAL		COUNTY: DALLAS
	SHEET NO.:		16

DATE: 7/3/2024 TIME: 11:47:04 AM FILE: T:\DALBRDG\Brdge Repair\18-057-0-0009-11-196\*IH30\*ST Francis\Incident Damage Repair\Detail\Beam Repair Details.dgn\brdg



BEAM ELEVATION



SECTION A-A

HEAT STRAIGHTENING

TABLE OF REPAIRS				
NBI	BEAM #	BID CODE	LENGTH OF HEAT STRAIGHTENING	LENGTH OF SECTION REPLACEMENT
			L1(ft)	L2(ft)
18-057-0-0009-11-196	A	784-7002		53.5
	C	784-7020	10	
	D	784-7020	5	

GENERAL NOTES:

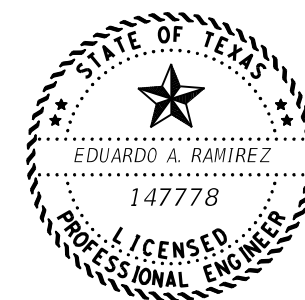
Use heat-straightening to repair and restore the shape of beams and diaphragms. Heat-straighten the members in accordance with Item 784, "Steel Member Repair." Apply sufficient force combined with heat to accomplish work but do not fracture member. Repair additional damage caused by Contractor's operations at no additional cost to the Department.

Provide Type IX epoxy for gap injection in accordance with DMS 6100 "Epoxies and Adhesives."

HEAT-STRAIGHTENING PROCEDURE:

1. Set traffic control. Close lanes on top of the bridge as directed by the Engineer.
2. Check gap (if any) between top of top flange and bottom of deck for any debris and clear to allow complete contact to occur.
3. Remove the diaphragms, if necessary, for heat straightening.
4. Heat-straighten distorted beam in accordance with Item 784, "Steel Member Repair."
5. Remove defects and grind the flange smooth in the damaged area as shown and as described in the Cracked Beam Repair and Defect Removal Procedures.
6. Repair/replace/re-weld damaged diaphragms as shown in the detail after the beam is restored in both shape and alignment.
7. Clean and paint the repair area as directed by the Engineer.
8. Inject epoxy into any remaining gap between top flange and deck. The length of flange separation that must be injected is approximately 3 feet.
9. Open the roadways to normal traffic as directed by the Engineer.

SHEET 5 OF 5





*Eduardo A. Ramirez*  
07/03/2024

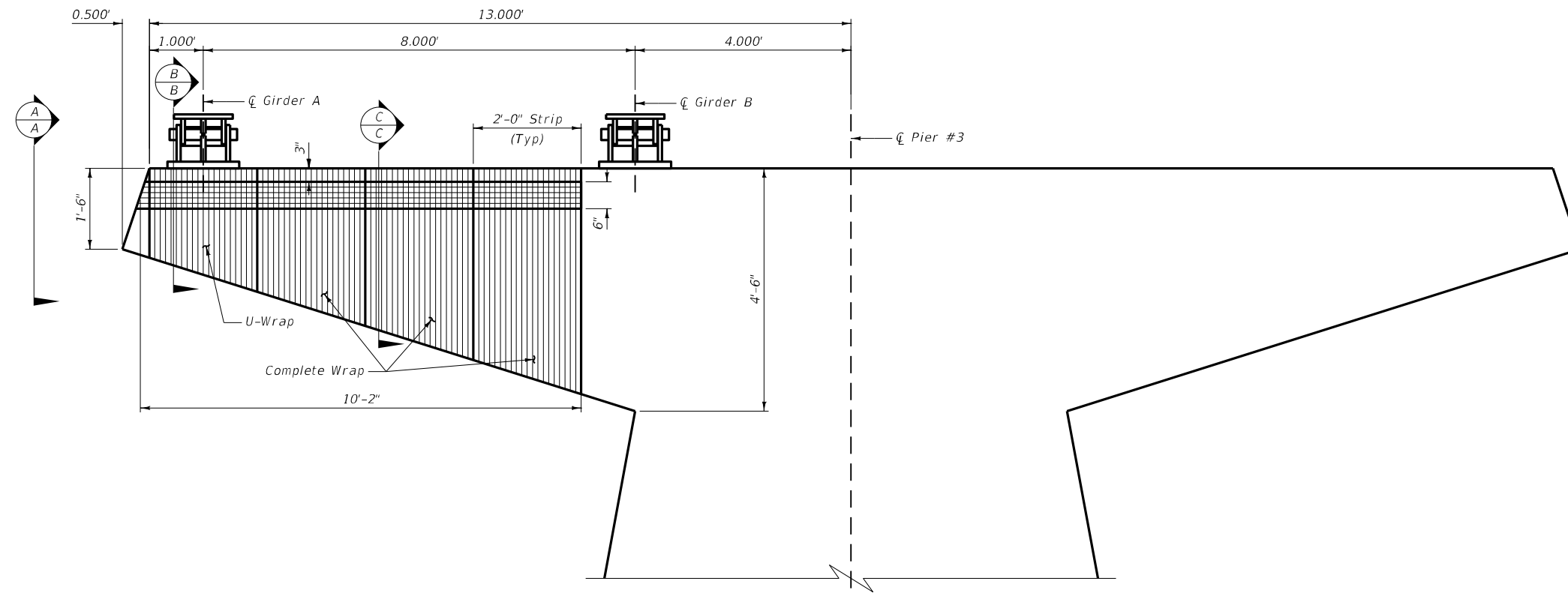
		Dallas District Bridge	
IH 30 IH 30 WBML UNDERPASS AT ST FRANCIS AVE BEAM REPAIR DETAILS NBI: 18-057-0-0009-11-196			
FILE:	DW: ER	CK: RM	DW: ER
©TxDOT 2024	CONT	SECT	JOB
REVISIONS	6470	54	IH 30
	DIST	COUNTY	SHEET NO.
	DAL	DALLAS	17

DATE: 6/12/2024 TIME: 9:03:04 PM FILE: T:\DALBRDG\Brdge Repair\18-057-0-0009-11-196\*IH30\*ST Francis\Incident Damage Repair\Detail\Cop Repair\_Detail\sedgrad\brdg

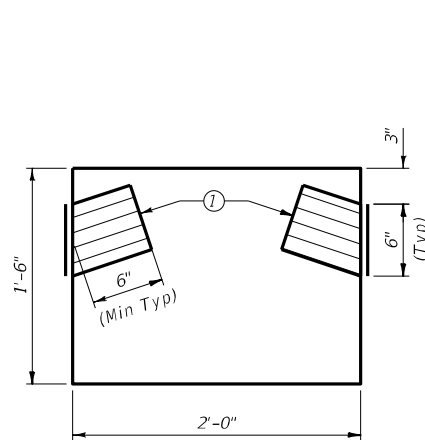
ADDITIONAL CAPACITIES TO BE PROVIDED BY STRENGTHENING

Vn, kips	Mn, kip-ft
109	-277

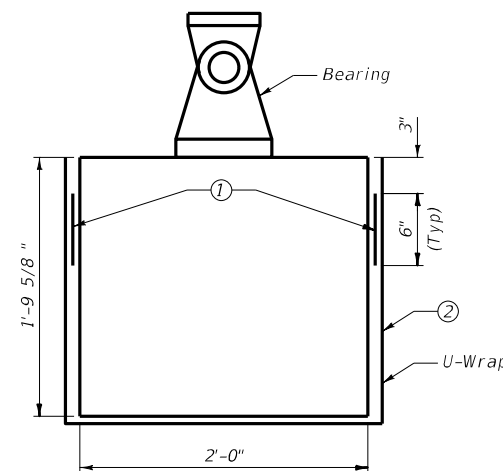
-  Flexural CFRP - Fiber in horizontal direction
-  Shear CFRP - Fiber in vertical direction



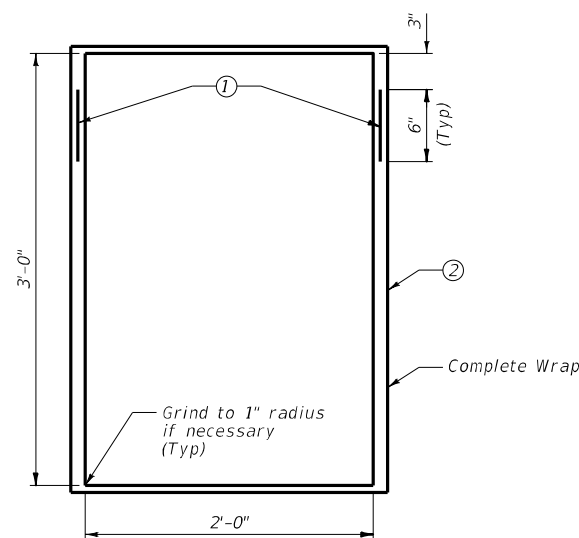
ELEVATION  
N.T.S.



SECTION A-A



SECTION B-B



SECTION C-C

- ① First layer (1 layer) - place 6" wide carbon fiber fabric sheets longitudinally on cap, with fiber orientation parallel to cap centerline.
- ② Second & Third layers (2 layers) - place 24" wide carbon fiber fabric sheets transversely on cap at 24" center to center spacing, with fiber orientation perpendicular to cap centerline. Wrap sheets on bottom, top and sides of cap to limits shown.

CAP REPAIR NOTES:

Identify and mark all repair locations prior to beginning work. Verify areas and quantities with the Engineer. Provide access for the Engineer to inspect and verify repair areas.

Prepare a detailed repair procedure for each location. Provide photographs in the repair procedure in order to verify locations. Repair cracks in accordance with Item 780, Concrete Crack Repair" and according to the Concrete Repair Manual Chapter 3, Section 5. Repair spalls according to the "Concrete and Overhead Repair Details".

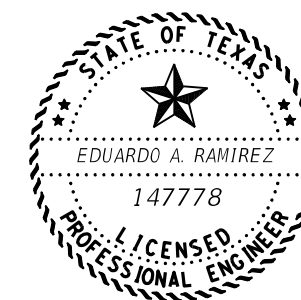
Contractor to submit work plan and supporting calculations showing that the CFRP system meets the strengthening requirements.

Provide working drawings and calculations signed and sealed by a licenced professional engineer for concrete member strengthening.

Repairs are paid as per Item 780, "Concrete Crack Repair", Item 429, "Vertical & Overhead" and Item 786, "Carbon Fiber Reinforced Polymer".


Repair spalls per Item 429 and Inject and seal cracks present in bent cap per Item 780 prior to CFRP application following epoxy manufacturer's recommended guidelines.

Paint CFRP with UV protective paint that matches or is similar to the cap's color. Follow manufacturer's instructions for applying paint.



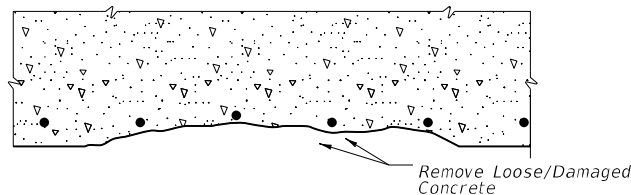
*Eduardo A. Ramirez*

06/12/2024

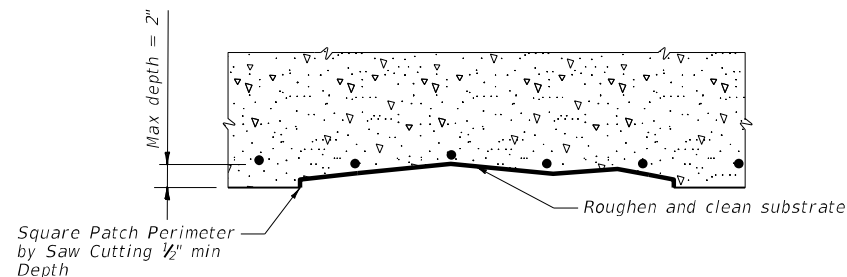
		Dallas District Bridge	
<b>IH 30</b>			
<b>IH 30 WBML UNDERPASS</b>			
<b>AT ST FRANCIS AVE</b>			
<b>CAP REPAIR DETAIL</b>			
<b>NBI: 18-057-0-0009-11-196</b>			
FILE:	DW: ER	CK: RM	DW: ER
©TxDOT	2024	CONT	SECT
REVISIONS	6470	54	001
DIST	COUNTY	SHEET NO.	
DAL	DALLAS	18	

MINOR SPALL REPAIR DETAIL

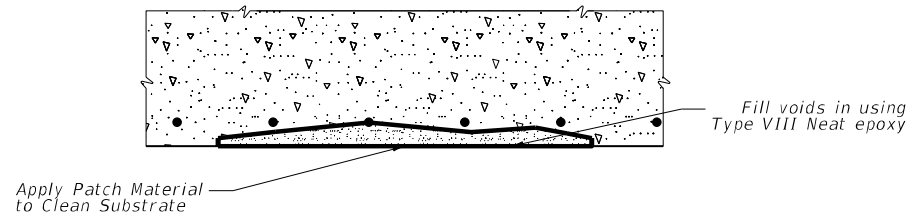
See bridge repair layouts for estimated quantities and locations.



SHOWING DAMAGED CONDITION



SHOWING EXCAVATION & PREPARATION



SHOWING PATCHING

MINOR SPALL REPAIR DETAIL

**Condition:**

Minor spalls are those with no exposed reinforcement or strands and that are no more than 2" deep

**Repair procedure:**

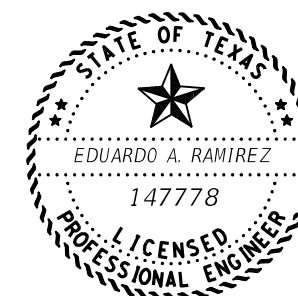
1. Remove delaminated, loose, and unsound concrete. Avoid damage to sound concrete that is to remain in place by saw cutting the perimeter of the repair area. Do not damage reinforcement or strands that is to remain in place. Use only hand tools or power-driven chipping hammers (15 lb. max) to remove concrete and to excavate behind reinforcing bars.
2. Some repair areas indicated do not exhibit visible spalling and will need to be identified by sounding the concrete with hammers to determine the location and limits of repairs.
3. Sound all surfaces to identify and mark all delaminated areas for review and approval by the Engineer. Confirm square footage of repair areas prior to commencing removal and notify Engineer of any discrepancies. Provide access to Engineer for verification.
4. Remove rust, oil, and other contaminants from concrete and reinforcing steel surfaces. Prior to patching, blast the area using a high-pressure air compressor equipped with filters to remove all oils from the compressed air.
5. Treat spalls with exposed reinforcement or strands as intermediate spalls.
6. Roughen and clean substrate to promote bond at patch material.
7. It is not necessary to install dowels or provide other mechanical anchorage in applications less than 2 inch thick.
8. Fill voids using neat Type VIII epoxy (no sand) according to DMS 6100 to help protect against deterioration caused by exposure to the water, chlorides, and other contaminants. Use materials from TxDOT's preapproved list.

**VERTICAL & OVERHEAD REPAIR GENERAL NOTES:**

1. Submit detailed repair procedures, including proposed proprietary materials, for approval prior to commencing work.
2. See "Concrete Repair Manual" for details not shown.
3. All details shown herein shall be paid under pay item 0429-7007 "CONC STR REPAIR (VERTICAL & OVERHEAD)"

DATE: 7/3/2024 TIME: 11:47:06 AM FILE: T:\DALBRDG\Brdge Repair\18-057-0-0009-11-196\*IH30\*ST Francis\Incident Damage Repair\Detail\Concrete and Overhead Repair.dwg

SHEET 1 OF 3



*Eduardo A. Ramirez*

07/03/2024

				Dallas District Bridge	
<b>IH 30</b> <b>IH 30 WBML UNDERPASS</b> <b>AT ST FRANCIS AVE</b> <b>CONCRETE AND OVERHEAD</b> <b>REPAIR DETAILS</b> NBI: 18-057-0-0009-11-196					
FILE:	DN: ER	CK: RM	DW: ER	CK: RM/SL	
©TxDOT 2024	CONT	SECT	JOB	HIGHWAY	
REVISIONS	6470	54	001	IH 30	
	DIST	COUNTY	SHEET NO.		
	DAL	DALLAS	19		



INTERMEDIATE SPALL REPAIR DETAIL

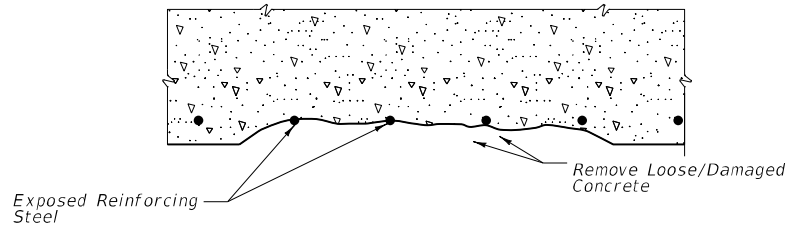
See bridge repair layouts for estimated quantities and locations.

**Condition:**

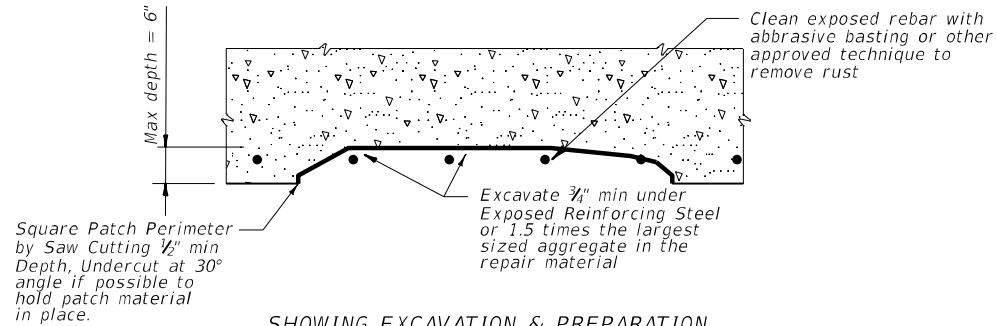
1. The damage exposes a reinforcing bar or strand circumference, or the damage is greater than 2" deep.
2. The maximum depth of an intermediate spall is 6 inches.
3. No significant stresses are likely to develop in or immediately around the repair material due to service loads.

**Repair procedure:**

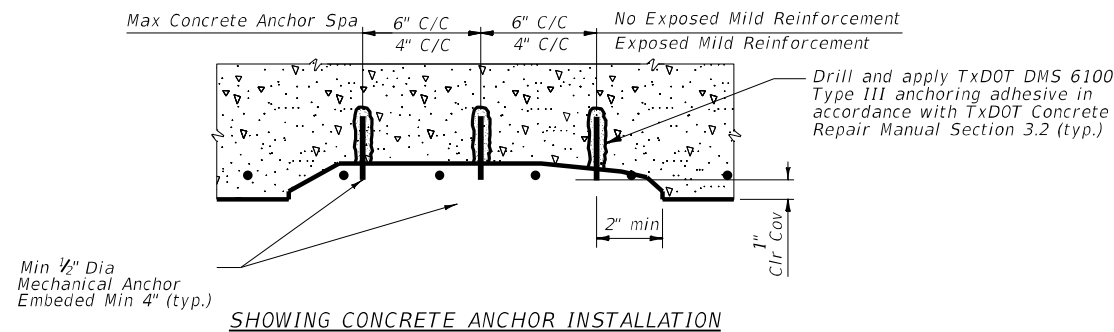
1. Remove delaminated, loose, and unsound concrete. Avoid damage to sound concrete that is to remain in place by saw cutting the perimeter of the repair area. Do not damage reinforcement or strands that is to remain in place. Use only hand tools or power-driven chipping hammers (15 lb. max) to remove concrete and to excavate behind reinforcing bars.
2. Some repair areas indicated do not exhibit visible spalling and will need to be identified by sounding the concrete with hammers to determine the location and limits of repairs.
3. Sound all surfaces to identify and mark all delaminated areas for review and approval by the Engineer. Confirm square footage of repair areas prior to commencing removal and notify Engineer of any discrepancies. Provide access to Engineer for verification.
4. If any mild reinforcement is exposed or if the exposed bar exhibits significant corrosion, remove the concrete from around the entire bar. Provide  $\frac{3}{4}$  inch clearance or 3 times the largest sized aggregate in the repair material, whichever is greater, between the steel and surrounding concrete to permit adequate flow of the repair material.
5. Do not chip around prestressing strand that is exposed anywhere away from the immediate end of the member. Consult the Engineer when repairing an area in which prestressing strands have been exposed. When repair dictates that chipping occur around exposed strands, the Contractor must avoid striking the strands directly or otherwise causing damage that could lead to wire or strand breaks.
6. Saw-cut the repair perimeters to eliminate feathered edges and to ensure that the repair material will be applied in depths no less than 1/2 inch. Do not damage reinforcement or strands that is to remain in place.
7. Handheld grinders or saws may be used to square the repair perimeters. When practical, undercut the repair perimeter at an approximate angle of 30 degrees such that the profile will help hold the repair material in place.
8. Roughen the substrate to ensure that there will be a mechanical bond between the repair material and the parent concrete. Contractor should attempt to attain a minimum surface roughness profile of 1/8 inch or CSP (Concrete Surface Profile) 6 per ICRI.
9. Embed mechanical tie (1/2" diameter minimum) with Type III anchoring adhesives, meeting the requirements of DMS-6100, "Epoxyes and Adhesives". Make the drilled hole deep enough to permit a minimum 4-inch embedment of the dowel. Follow Manufacturer's directions for installing the epoxyed mechanical tie. Contractor to scan for existing concrete reinforcing before drilling.
10. Notify Engineer once existing concrete is removed and repair areas for each structure elements have been prepared. Provide access to the Engineer for verification of prepared repair areas.
11. Where anchors are installed, ensure that there will be a minimum cover of 1/2 inch for stainless steel and 1 inch for non-stainless steel after the repair material is applied.
12. Substrates must be clean and sound. Remove any contaminants, including laitance, oil, dust, debris, or other foreign particles.
13. just prior to repairing, blast the repair area using a high-pressure air compressor equipped with filters to remove all oil from the compressed air. Use abrasive blasting to remove rust from exposed steel surfaces.
14. Obtain an Saturated Surface Dry (SSD) condition using the following method: Several minutes before repairing, apply pressure water blast to the surface for a brief period (at least 15 minutes depending on the porosity of the concrete). An SSD condition is achieved if the surface remains damp until the repair material is applied. Surface may be damp, but must be free of standing water.
15. Ensure maximum aggregate size is no larger than 1/3 of the clear space between reinforcement or the cover. For small repair area, the largest of the coarse aggregate can be removed using a sieve to allow the material to flow adequately in the confined repair spaces.



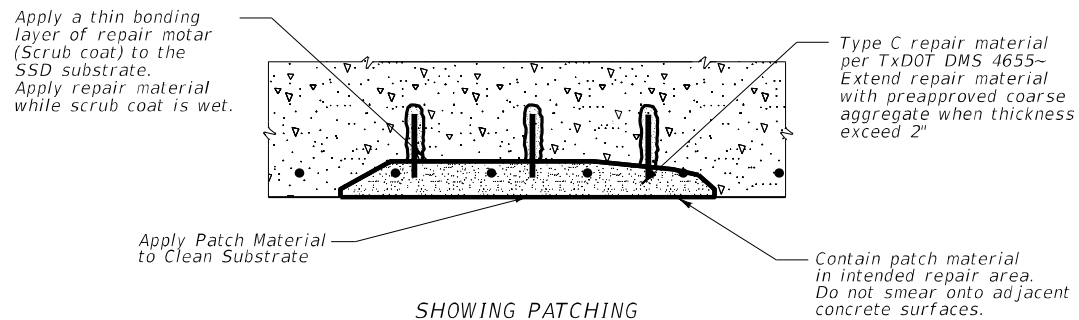
SHOWING DAMAGED CONDITION



SHOWING EXCAVATION & PREPARATION



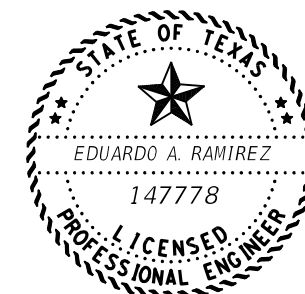
SHOWING CONCRETE ANCHOR INSTALLATION



SHOWING PATCHING

INTERMEDIATE SPALL REPAIR DETAIL

SHEET 2 OF 3



*E. Ramirez*

06/12/2024

Texas Department of Transportation		Dallas District Bridge			
<p>IH 30</p> <p>IH 30 WBML UNDERPASS</p> <p>AT ST FRANCIS AVE</p> <p>CONCRETE AND OVERHEAD</p> <p>REPAIR DETAILS</p> <p>NBI: 18-057-0-0009-11-196</p>					
FILE:	DW: ER	CK: RM	DW: ER	CK: RM/SI	
©TxDOT	2024	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	54	001	IH 30	
	DIST	COUNTY	SHEET NO.		
	DAL	DALLAS	20		

FILE: T:\DALBRDG\Bridg Repair\18-057-0-0009-11-196\*IH30\*ST Francis\*Incident Damage Repair\Detail\Concrete and Overhead Repair\Detail\Intermediate Spall Repair Detail.dwg

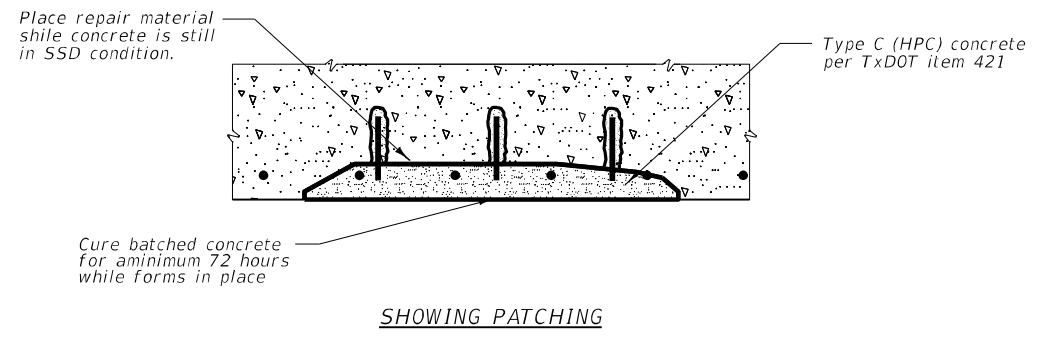
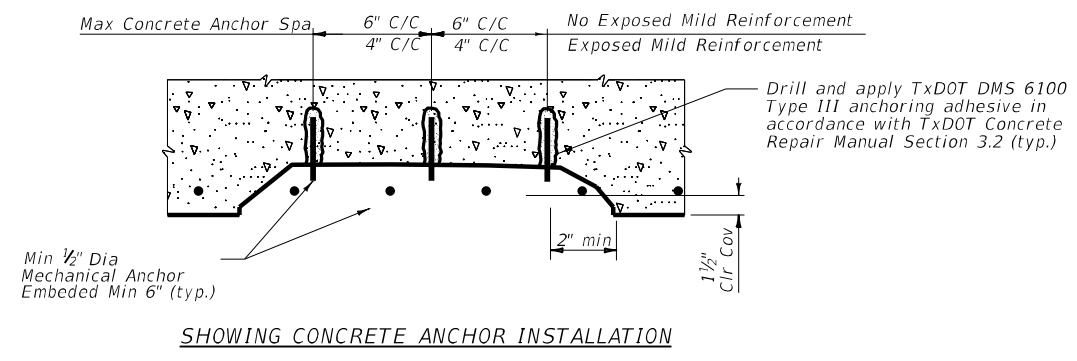
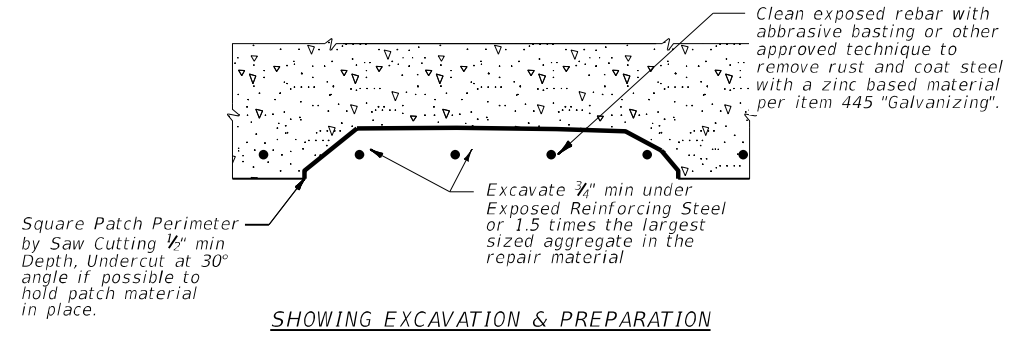
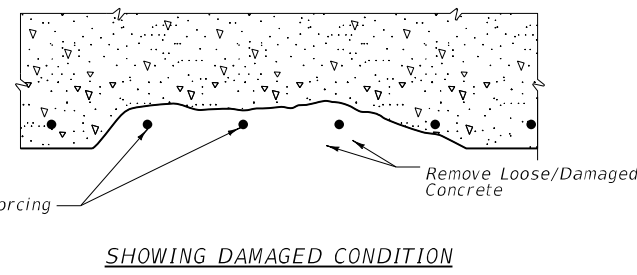
DATE: 6/12/2024

TIME: 9:03:07 PM

FILE: T:\DALBRDG\Bridg Repair\18-057-0-0009-11-196\*IH30\*ST Francis\Incident Damage Repair\Detail\Concrete and Overhead\Detail\

See bridge repair layouts for estimated quantities and locations.

**MAJOR SPALL REPAIR DETAIL**



**MAJOR SPALL REPAIR DETAIL**

**Condition:**

1. Damage extend well beyond the outer layer of reinforcement.
2. Significant stresses are likely to develop in or immediately around the repair material due to service loads.

**Repair procedure:**

1. Remove delaminated, loose, and unsound concrete. Avoid damage to sound concrete that is to remain in place by saw cutting the perimeter of the repair area. Do not damage reinforcement or strands that is to remain in place. Use only hand tools or power-driven chipping hammers (15 lb. max) to remove concrete and to excavate behind reinforcing bars.
2. Some repair areas indicated do not exhibit visible spalling and will need to be identified by sounding the concrete with hammers to determine the location and limits of repairs.
3. Sound all surfaces to identify and mark all delaminated areas for review and approval by the Engineer. Confirm square footage of repair areas prior to commencing removal and notify Engineer of any discrepancies. Provide access to Engineer for verification.
4. If any mild reinforcement is exposed or if the exposed bar exhibits significant corrosion, remove the concrete from around the entire bar. Provide 3/4 inch clearance or 3 times the largest sized aggregate in the repair material, whichever is greater, between the steel and surrounding concrete to permit adequate flow of the repair material.
5. Do not chip around prestressing strand that is exposed anywhere away from the immediate end of the member. Consult the Engineer when repairing an area in which prestressing strands have been exposed. When repair dictates that chipping occur around exposed strands, the Contractor must avoid striking the strands directly or otherwise causing damage that could lead to wire or strand breaks.
6. Saw-cut the repair perimeters to eliminate feathered edges and to ensure that the repair material will be applied in depths no less than 1/2 inch. Do not damage reinforcement or strands that is to remain in place.
7. Handheld grinders or saws may be used to square the repair perimeters. When practical, undercut the repair perimeter at an approximate angle of 30 degrees such that the profile will help hold the repair material in place.
8. Roughen the substrate to ensure that there will be a mechanical bond between the repair material and the parent concrete. Contractor should attempt to attain a minimum surface roughness profile of 1/8 inch or CSP (Concrete Surface Profile) 6 per ICRI.
9. Embed mechanical tie (1/2" diameter minimum) with Type III anchoring adhesives, meeting the requirements of DMS-6100, "Epoxyes and Adhesives". Make the drilled hole deep enough to permit a minimum 6-inch embedment of the dowel. Follow Manufacture's directions for installing the epoxied mechanical tie. Contractor to scan for existing concrete reinforcing before drilling.
10. Notify Engineer once existing concrete is removed and repair areas for each structure elements have been prepared. Provide access to the Engineer for verification of prepared repair areas.
11. Where anchors are installed, ensure that there will be a minimum cover of 1 inch for stainless steel and 1 1/2 inch for non-stainless steel after the repair material is applied.
12. Substrates must be clean and sound. Remove any contaminants, including laitance, oil, dust, debris, or other foreign particles.
13. just prior to repairing, blast the repair area using a high-pressure air compressor equipped with filters to remove all oil from the compressed air. Use abrasive blasting to remove rust from exposed steel surfaces.
14. Obtain an Saturated Surface Dry (SSD) condition using the following method: Several minutes before repairing, apply pressure water blast to the surface for a brief period (at least 15 minutes depending on the porosity of the concrete). An SSD condition is achieved if the surface remains damp until the repair material is applied. Surface may be damp, but must be free of standing water.
15. Prepare and install the forms prior to mixing the repair material. Ensure that forms are tight enough to prevent grout leakage. Place the repair material in the forms while the concrete substrate is still SSD. If the parent concrete is no longer SSD, remove the forms and re-spray the surface with a high-pressure water blast.

16. Consolidate the material adequately. Do not over-vibrate the mix. Do not vibrate self-consolidating concrete.
17. Cure batched concrete repairs for a minimum of 72 hours. The material should be cured by leaving the forms in place during the entire curing period. Place wet mats on exposed sections and over the openings. Do not allow concrete surfaces to become dry. Ensure that wet mats are kept wet during the entire cycle.
18. Ensure the maximum coarse aggregate does not exceed 1/3 of the smallest dimension, including reinforcement clearance. Remove large aggregate by wet sieving when necessary.



SHEET 3 OF 3

Texas Department of Transportation		Dallas District Bridge	
<b>IH 30</b>			
<b>IH 30 WBML UNDERPASS</b>			
<b>AT ST FRANCIS AVE</b>			
<b>CONCRETE AND OVERHEAD</b>			
<b>REPAIR DETAILS</b>			
<b>NBI: 18-057-0-0009-11-196</b>			
FILE:	DN: ER	CK: RM	DW: ER
©TxDOT	2024	CONT	SECT
REVISIONS	6470	54	001
DIST	COUNTY		SHEET NO.
DAL	DALLAS		21

**BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:**

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
10. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.
11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.
12. The Engineer has the final decision on the location of all traffic control devices.
13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

**WORKER SAFETY NOTES:**

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

**COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES**

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

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

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

DATE: 7/10/2024 4:38:32 PM  
 FILE: T:\DALAD\DALNEAD\Maint\_Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0. Data Standards\bc-21.dgn

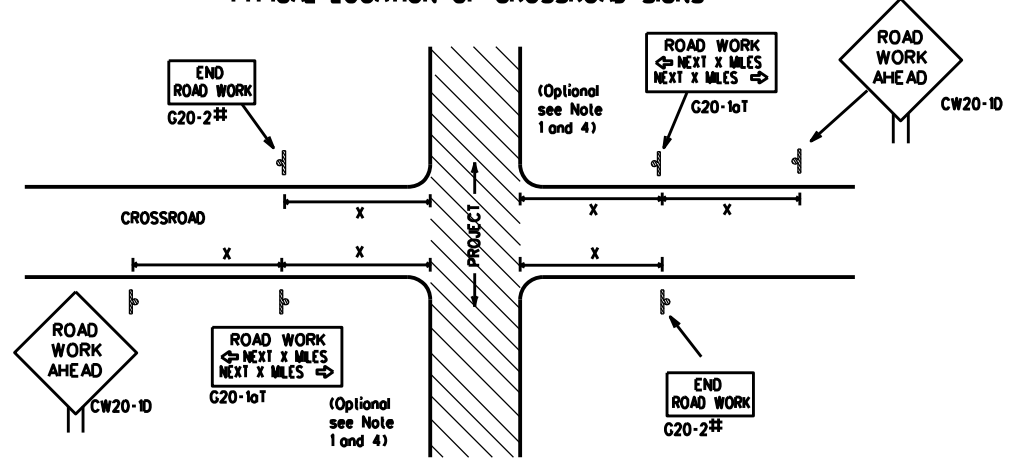


**BARRICADE AND CONSTRUCTION  
GENERAL NOTES  
AND REQUIREMENTS**

**BC(1)-21**

FILE:	bc-21.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	54	SECT	001	JOB	IH0030	HIGHWAY	
REVISIONS		DIST	COUNTY		SHEET NO.				
4-03	7-13	DAL	DALLAS		22				
9-07	8-14								
5-10	5-21								

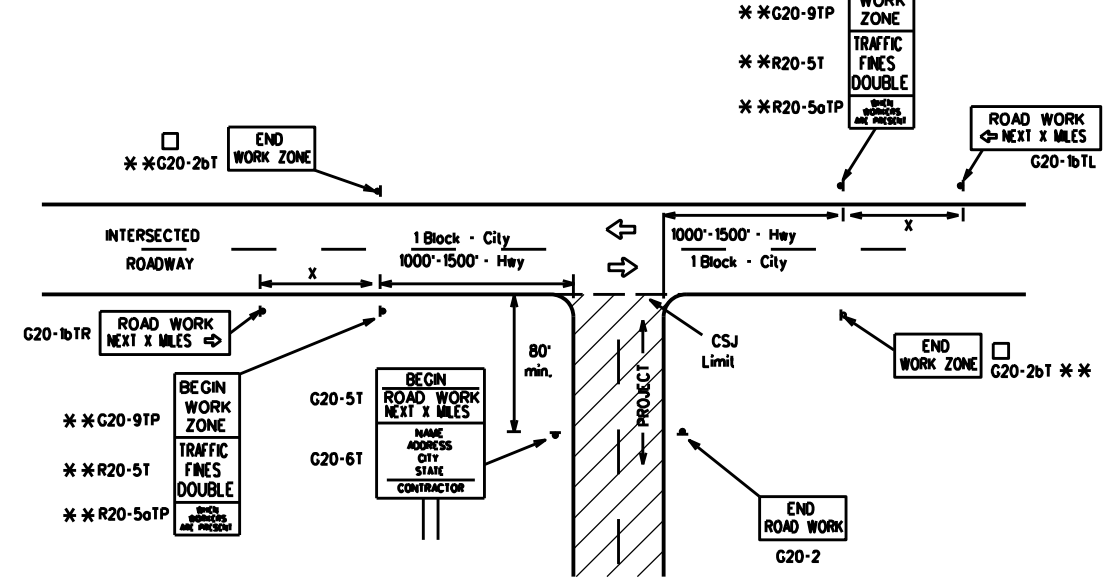
**TYPICAL LOCATION OF CROSSROAD SIGNS**



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

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

**T-INTERSECTION**



**CSJ LIMITS AT T-INTERSECTION**

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

**TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING** 1.5.6

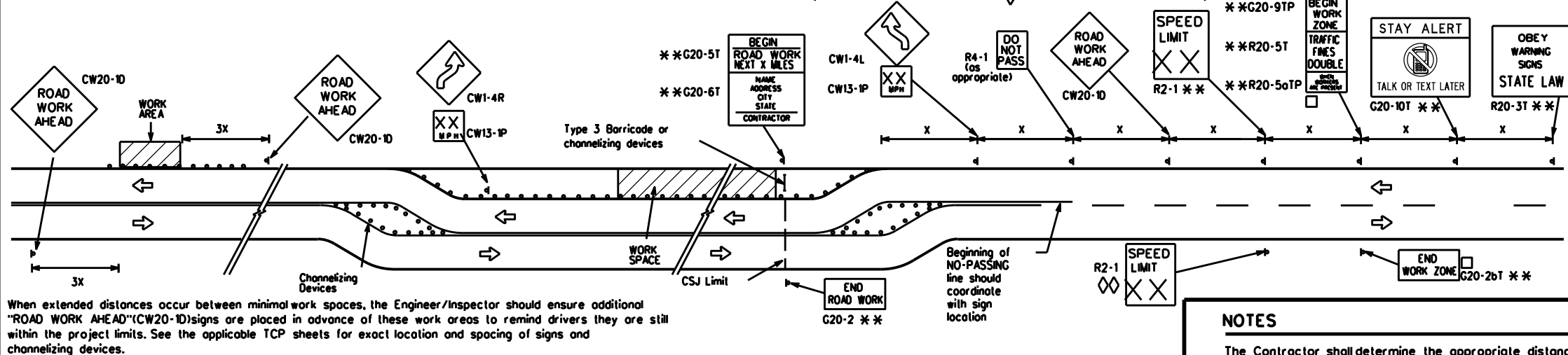
Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed MPH	Sign Spacing "X" Feet (Apprx.)
CW20 <sup>4</sup>	48" x 48"	48" x 48"	30	120
CW21			35	160
CW23			40	240
CW25			45	320
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	50	400
CW3, CW4, CW5, CW6, CW8-3, CW10,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

- For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.
- Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

**GENERAL NOTES**

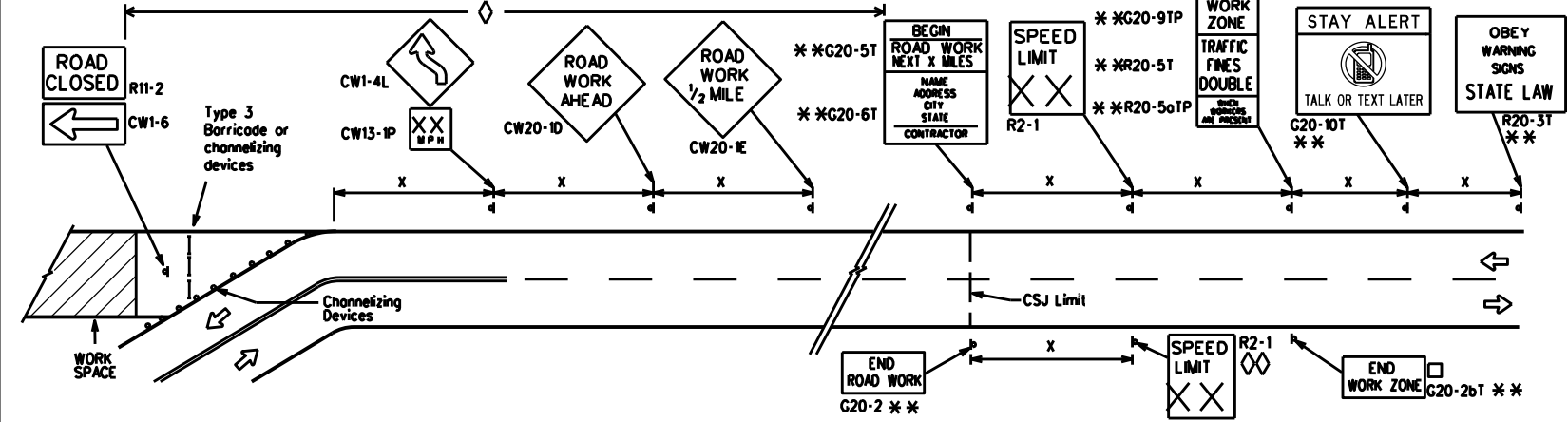
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

**WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS**

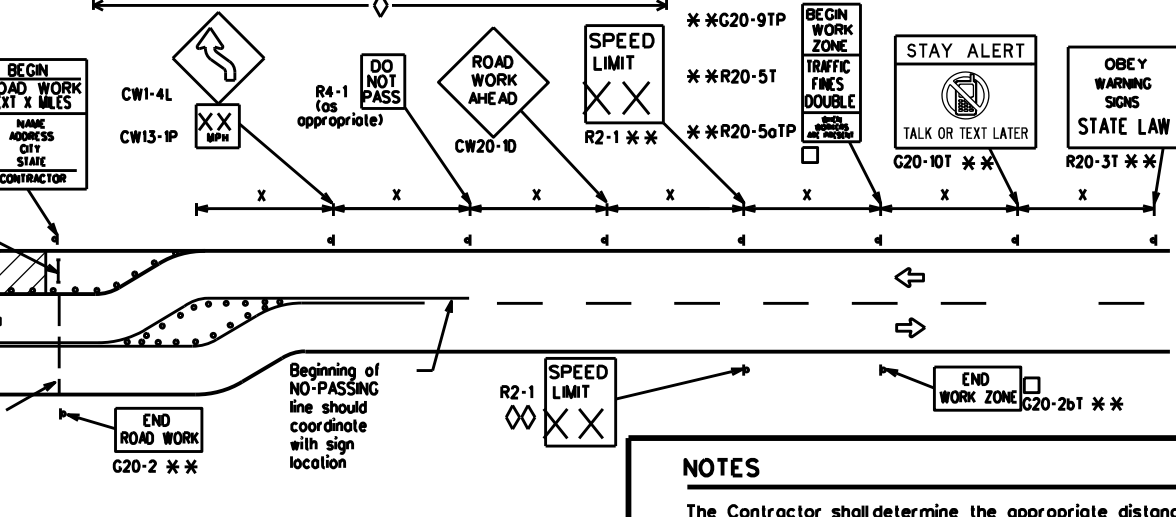


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

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



**SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS**



**NOTES**

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

**LEGEND**

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

SHEET 2 OF 12



**BARRICADE AND CONSTRUCTION PROJECT LIMIT**

**BC(2)-21**

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT: 54	SECT: 001	JOB: IH0030	HIGHWAY: 7-13
REVISIONS: 9-07 8-14	DIST: DAL	COUNTY: DALLAS	SHEET NO.: 23	

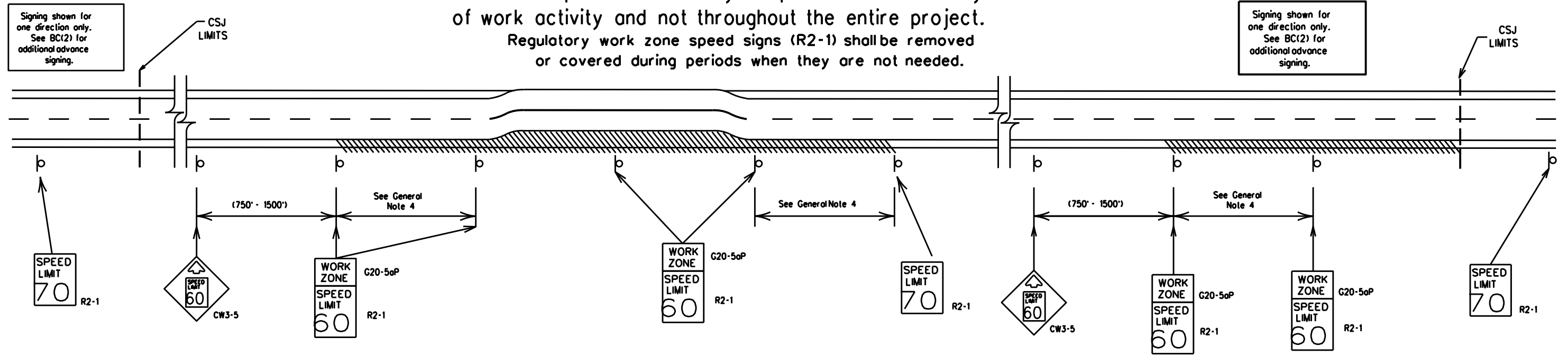
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for incorrect results or damages resulting from its use.

DATE: 7/10/2024 4:41:37 PM  
 FILE: T:\DAL\AD\AL\HEAD\Meint\_Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0.001\BC(2)-21.dgn

# TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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



## GUIDANCE FOR USE:

### LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- other conditions readily apparent to the driver

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

### SHORT TERM WORK ZONE SPEED LIMITS

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

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

## GENERAL NOTES

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

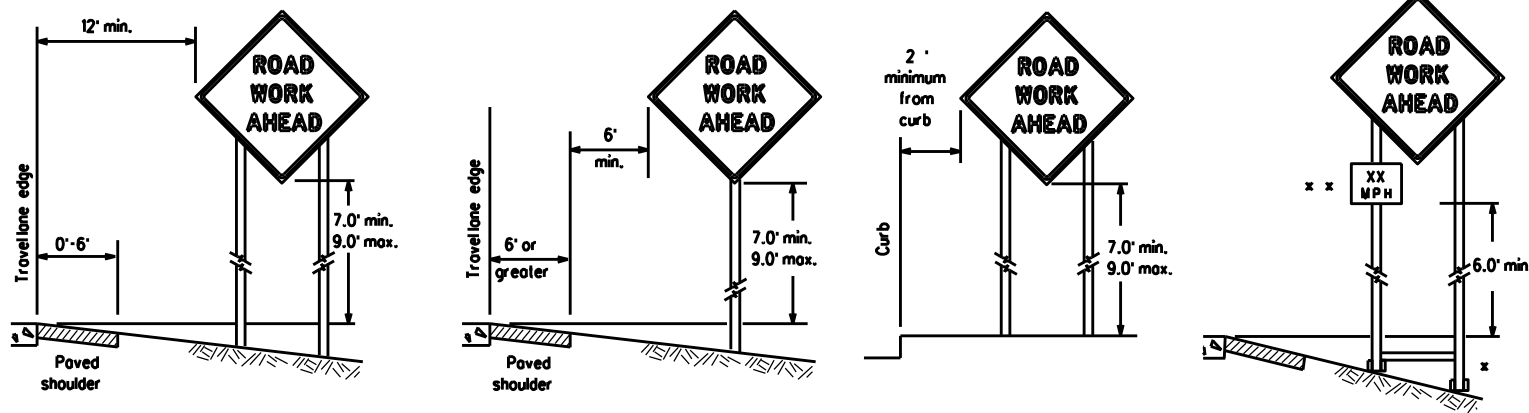
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act." No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for incorrect results or damages resulting from its use.

DATE: 7/10/2024 4:41:37 PM  
FILE: T:\DAL\AD\DAL\NEAD\Meint\_Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0.001.dgn

SHEET 3 OF 12

		Traffic Safety Division Standard	
<h2>BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT</h2>			
<h3>BC(3)-21</h3>			
FILE:	bc-21.dgn	DN: TxDOT	CK: TxDOT
© TxDOT	November 2002	CONT	SECT
REVISIONS	6470	54	001
9-07	8-14	DIST	COUNTY
7-13	5-21	DAL	DALLAS
			SHEET NO.
			24

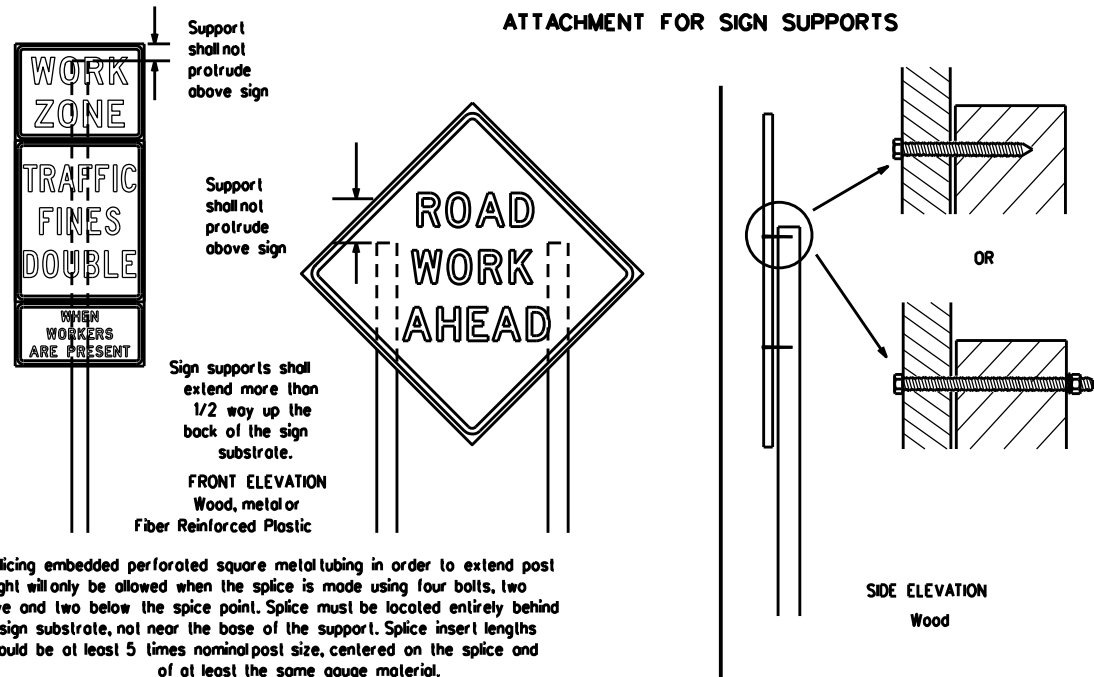
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



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



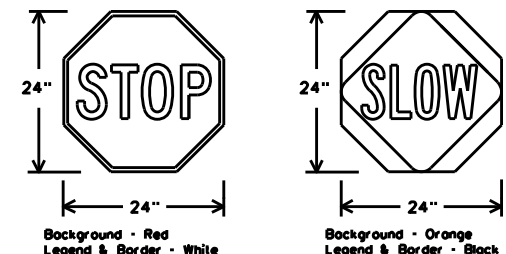
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



SHEETING REQUIREMENTS (WHEN USED AT NIGHT)		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	ORANGE	TYPE B <sub>TL</sub> OR C <sub>TL</sub> SHEETING
LEGEND & BORDER	WHITE	TYPE B OR C SHEETING
LEGEND & BORDER	BLACK	ACRYLIC NON-REFLECTIVE FILM

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, specific service (LOGO), or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition. For details for covering large guide signs see the TS-CD standard.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC standard sheets, TLRS standard sheets or the CWZTCO 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" (CWZTCO) 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 CWZTCO lists each substrate that can be used on the different types and models of sign supports.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
3. All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
2. White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type B or Type C<sub>TL</sub>, 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 CWZTCO list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

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

Texas Department of Transportation Traffic Safety Division Standard

## BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

### BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	54	001	IH0030
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	DAL	DALLAS	25	

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

DATE: 7/10/2024 4:41:38 PM FILE: T:\DAL\AD\ALNEAD\Meint\_Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\01.DGN\Standards\bc-21.dgn



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**

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

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

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

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

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

**Other Condition List**

FRONTAGE ROAD CLOSED
SHOULDER CLOSED XXX FT
RIGHT LN CLOSED XXX FT
RIGHT X LANES OPEN
DAYTIME LANE CLOSURES
I-XX SOUTH EXIT CLOSED
EXIT XXX CLOSED X MILE
RIGHT LN TO BE CLOSED
X LANES CLOSED TUE - FRI

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

**Phase 2: Possible Component Lists**

**Action to Take/Effect on Travel List**

MERGE RIGHT
DETOUR NEXT X EXITS
USE EXIT XXX
STAY ON US XXX SOUTH
TRUCKS USE US XXX N
WATCH FOR TRUCKS
EXPECT DELAYS
REDUCE SPEED XXX FT
USE OTHER ROUTES
STAY IN LANE

**Location List**

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

**Warning List**

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

**\* Advance Notice List**

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

\* \* See Application Guidelines Note 6.

**APPLICATION GUIDELINES**

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

**WORDING ALTERNATIVES**

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

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

**FULL MATRIX PCMS SIGNS**

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



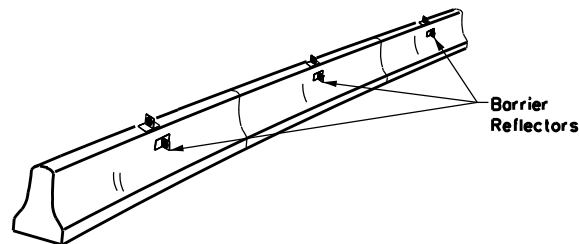
**BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)**

**BC(6)-21**

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	54	001	IH0030
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	DAL	DALLAS	27	

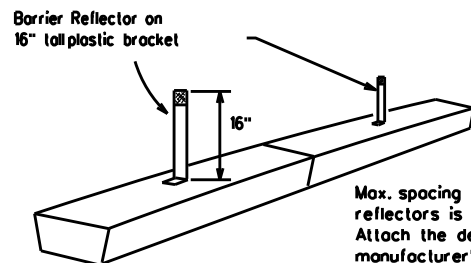


- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



**CONCRETE TRAFFIC BARRIER (CTB)**

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

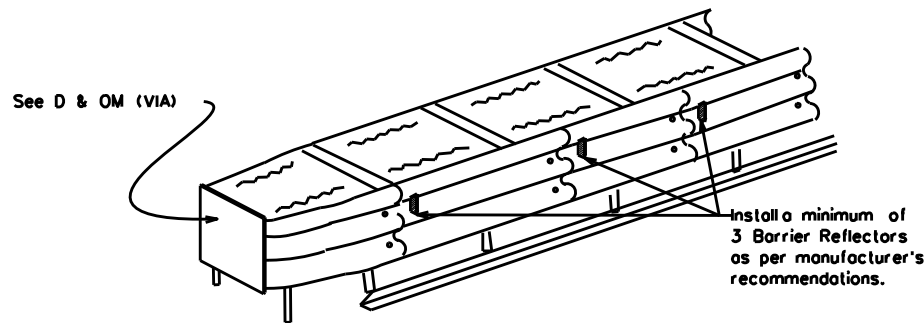


**LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES**

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

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

**LOW PROFILE CONCRETE BARRIER (LPCB)**



**DELINEATION OF END TREATMENTS**

**END TREATMENTS FOR CTB'S USED IN WORK ZONES**

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

**BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS**

**WARNING LIGHTS**

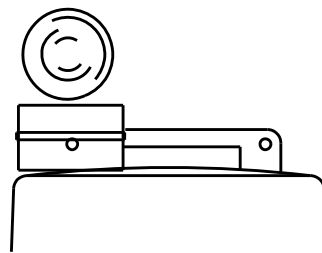
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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

**WARNING LIGHTS MOUNTED ON PLASTIC DRUMS**

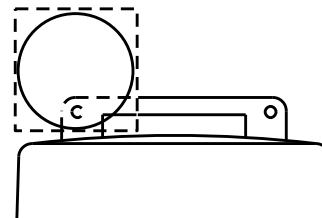
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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

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

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



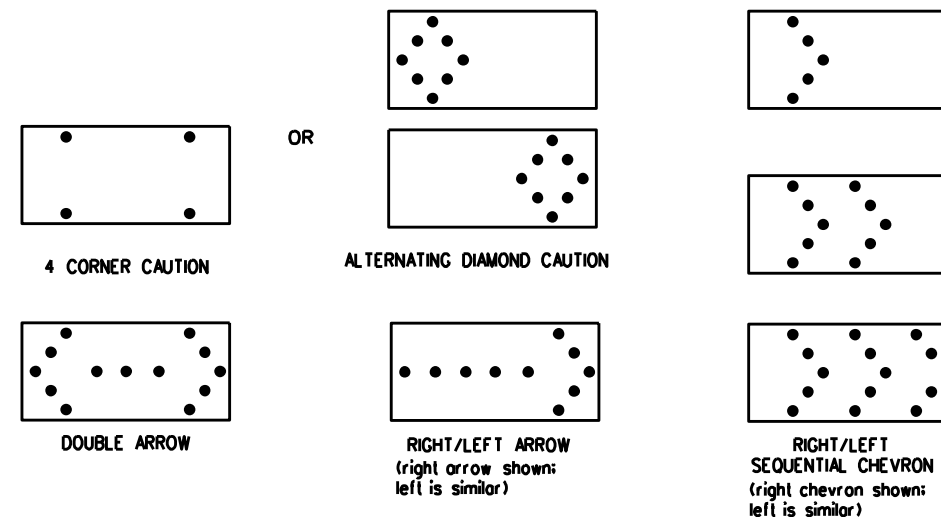
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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

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



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

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

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

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

**FLASHING ARROW BOARDS**

SHEET 7 OF 12

**TRUCK-MOUNTED ATTENUATORS**

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



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

**BC(7)-21**

FILE:	bc-21.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		6470	54	001	IH0030				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	DAL	DALLAS	28					

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

DATE: 7/10/2024 4:38:34 PM  
FILE: T:\DAL\AD\ALNEAD\Meint\_Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0.DGN\Standards\bc-21.dgn

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.  
 DATE: 7/10/2024 4:38:34 PM  
 FILE: T:\DALAD\DALNEAD\Meint\_Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0.DGNs\Standards\bc-21.dgn

**GENERAL NOTES**

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

**GENERAL DESIGN REQUIREMENTS**

Pre-qualified plastic drums shall meet the following requirements:

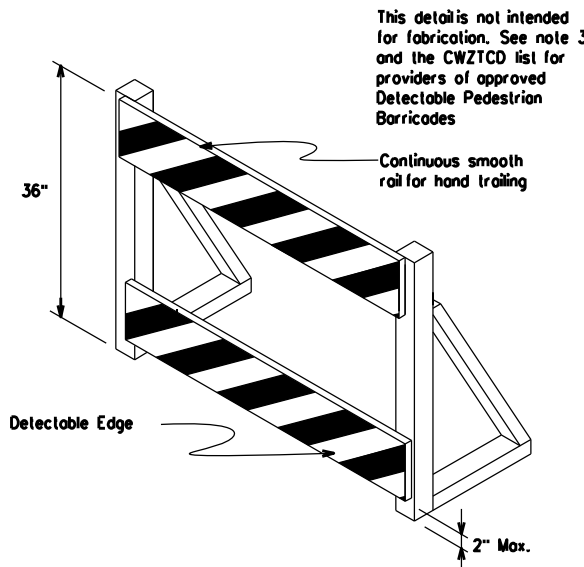
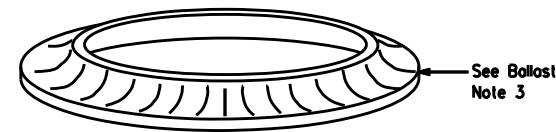
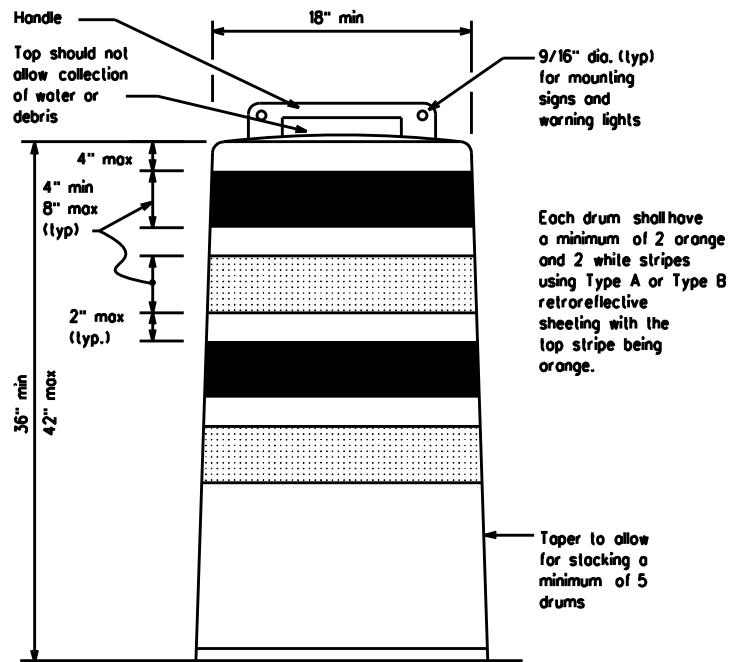
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

**RETROREFLECTIVE SHEETING**

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

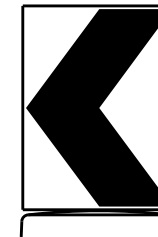
**BALLAST**

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

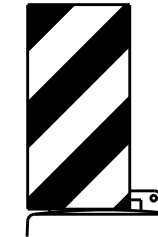


**DETECTABLE PEDESTRIAN BARRICADES**

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



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



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

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

**SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS**

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

SHEET 8 OF 12



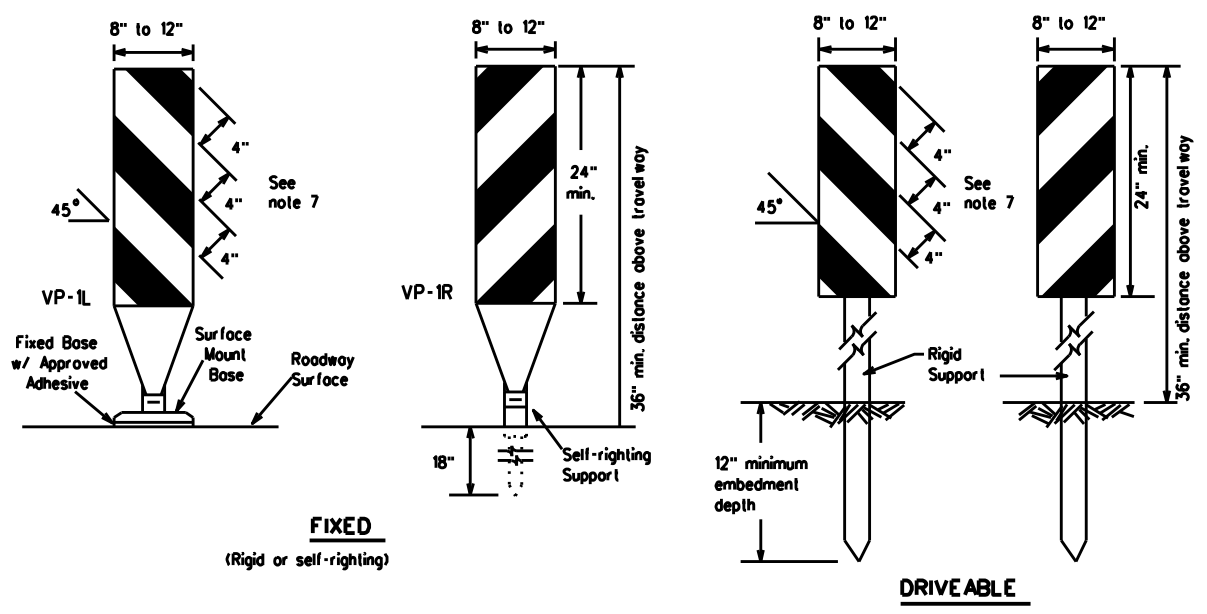
**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC(8)-21**

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	54	001	IH0030
4-03 8-14	DIST	COUNTY	SHEET NO.	
9-07 5-21	DAL	DALLAS	29	
7-13				

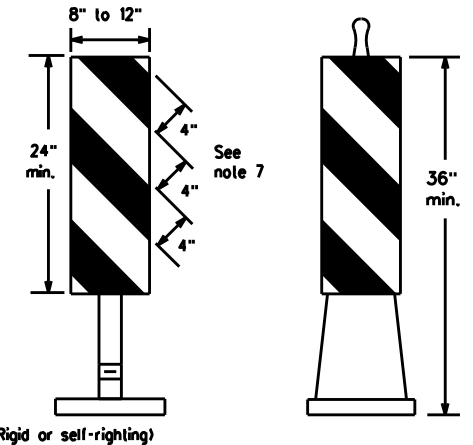
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 7/10/2024 4:38:34 PM  
 FILE: T:\DAL\AD\AL\NEAD\Meint\_Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0.DGNs\Standards\bc-21.dgn



**FIXED**  
(Rigid or self-righting)

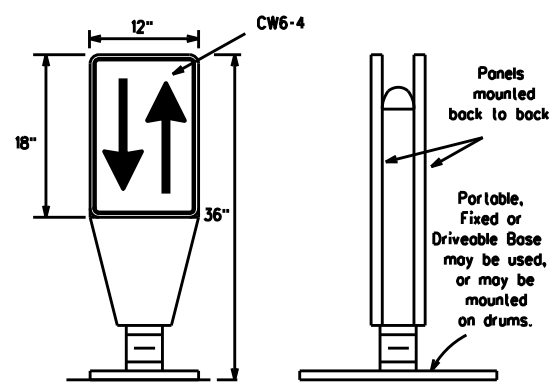
**DRIVEABLE**



**PORTABLE**

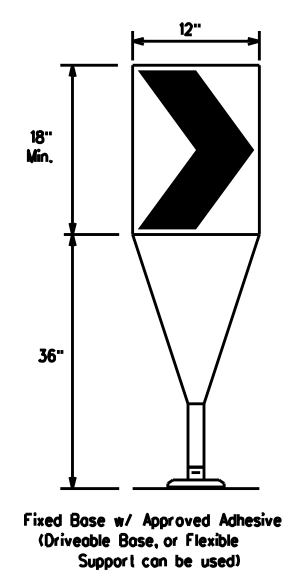
**VERTICAL PANELS (VPs)**

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



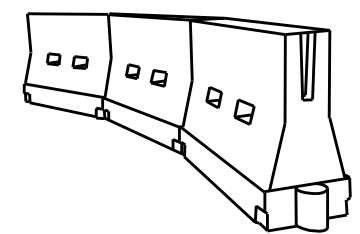
**OPPOSING TRAFFIC LANE DIVIDERS (OTLD)**

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



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

**CHEVRONS**



**LONGITUDINAL CHANNELIZING DEVICES (LCD)**

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

**WATER BALLASTED SYSTEMS USED AS BARRIERS**

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

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

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

**GENERAL NOTES**

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

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

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

**SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS**

SHEET 9 OF 12



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

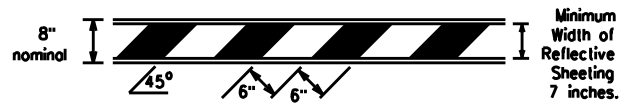
**BC(9)-21**

FILE:	bc-21.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT:	SECT:	JOB:	SECT:	JOB:	SECT:	JOB:	SECT:
REVISIONS		6470	54	001		HH0030			
9-07	8-14	DIST:	COUNTY:	SHEET NO.:					
7-13	5-21	DAL	DALLAS	30					

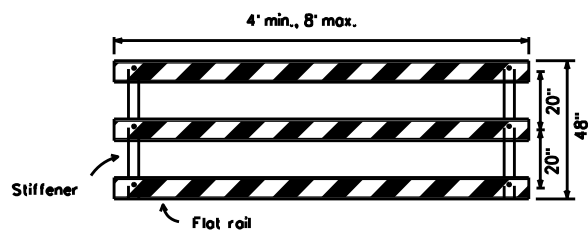
**TYPE 3 BARRICADES**

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

Barricades shall NOT be used as a sign support.

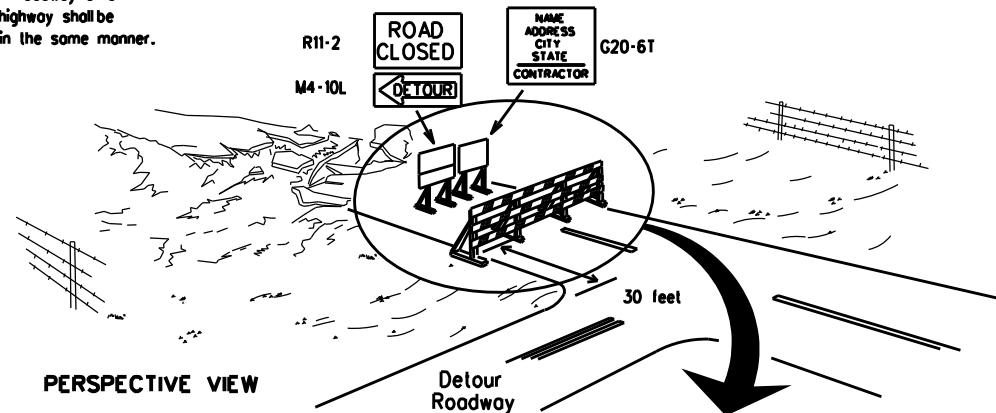


**TYPICAL STRIPING DETAIL FOR BARRICADE RAIL**



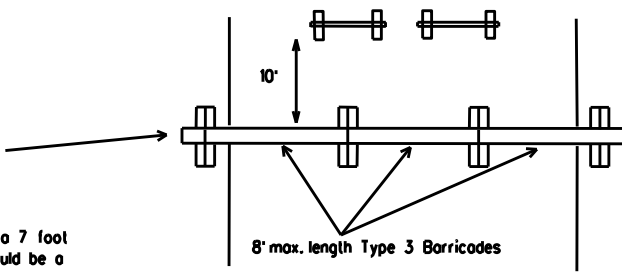
**TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES**

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



PERSPECTIVE VIEW

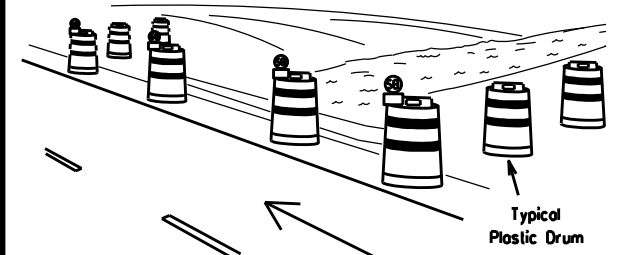
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



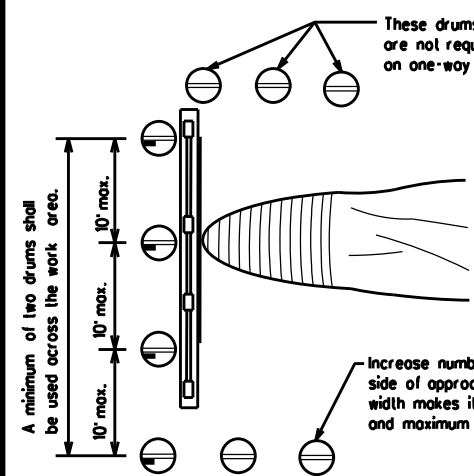
PLAN VIEW

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

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



PERSPECTIVE VIEW

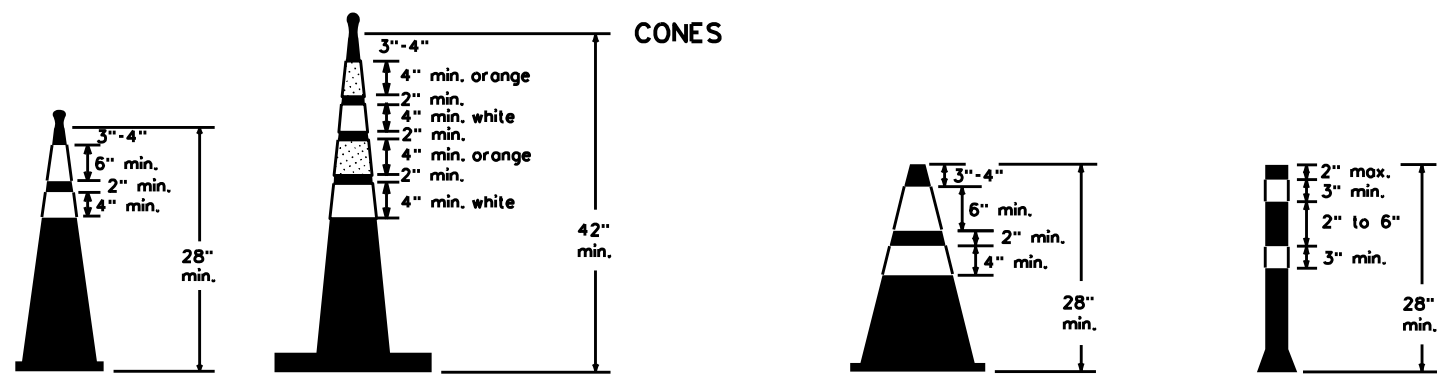


PLAN VIEW

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

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

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

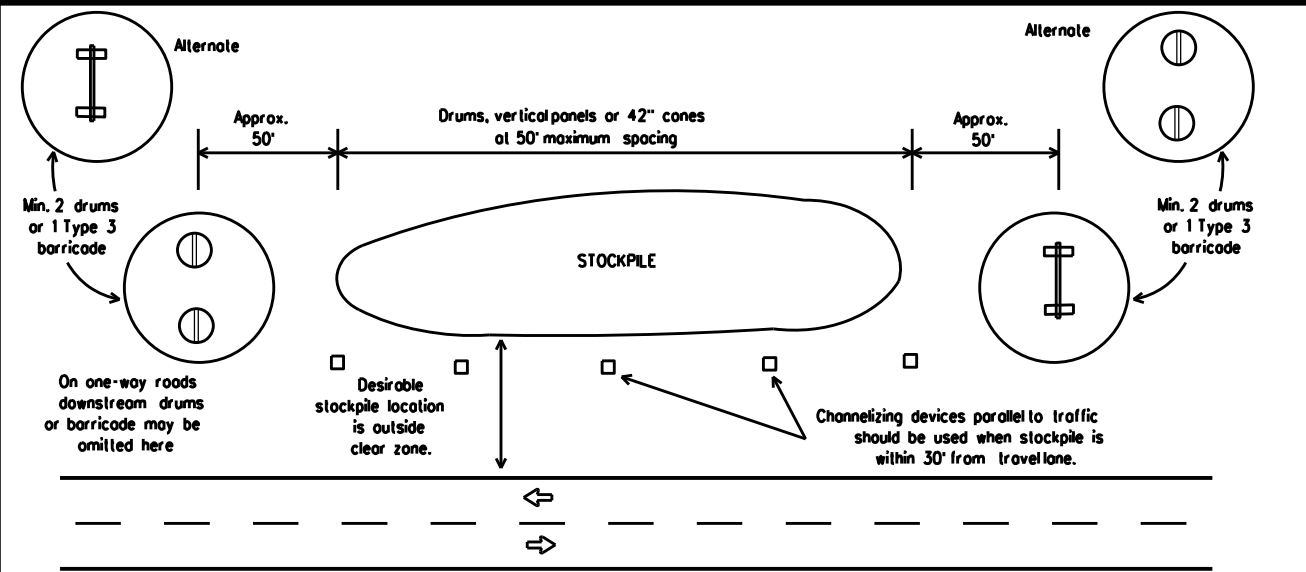


Two-Piece cones

One-Piece cones

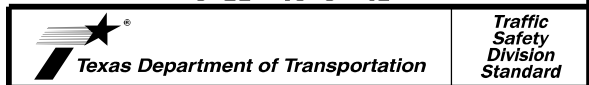
Tubular Marker

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



**TRAFFIC CONTROL FOR MATERIAL STOCKPILES**

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



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC(10)-21**

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	54	001	IH0030
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	DAL	DALLAS	31	

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

DATE: 7/10/2024 4:38:34 PM  
 FILE: T:\DAL\AD\ALNEAD\Meint\_Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0.DGN\Standards\bc-21.dgn

## WORK ZONE PAVEMENT MARKINGS

### GENERAL

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

### RAISED PAVEMENT MARKERS

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

### PREFABRICATED PAVEMENT MARKINGS

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

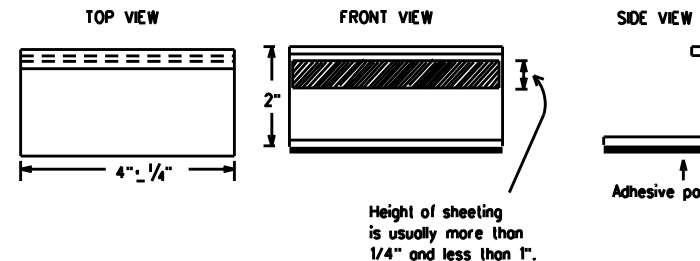
### MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

### REMOVAL OF PAVEMENT MARKINGS

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

## Temporary Flexible-Reflective Roadway Marker Tabs



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

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

### RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

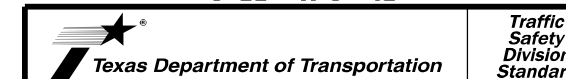
- Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
- All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
- Adhesive for guidemarks shall be bituminous material hot applied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

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

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

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

SHEET 11 OF 12



## BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

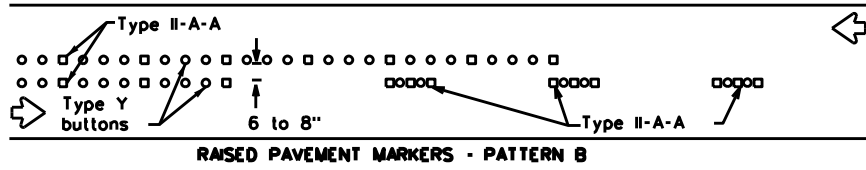
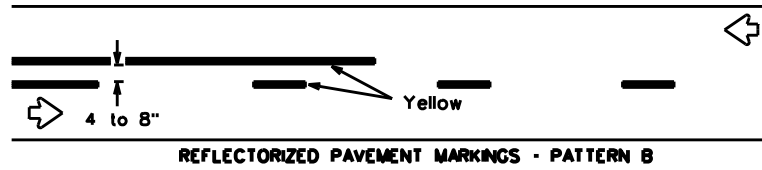
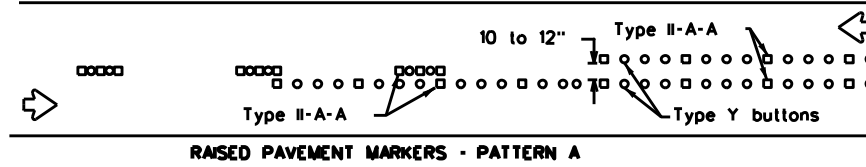
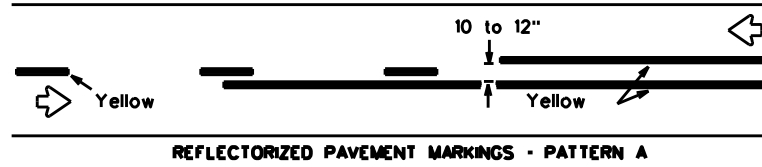
BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	54	001	IH0030
2-98 9-07 5-21	DIST	COUNTY	SHEET NO.	
1-02 7-13	DAL	DALLAS	32	
11-02 8-14				

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

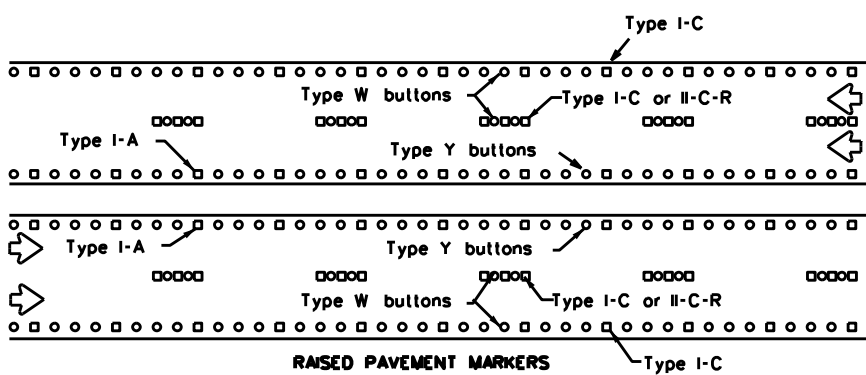
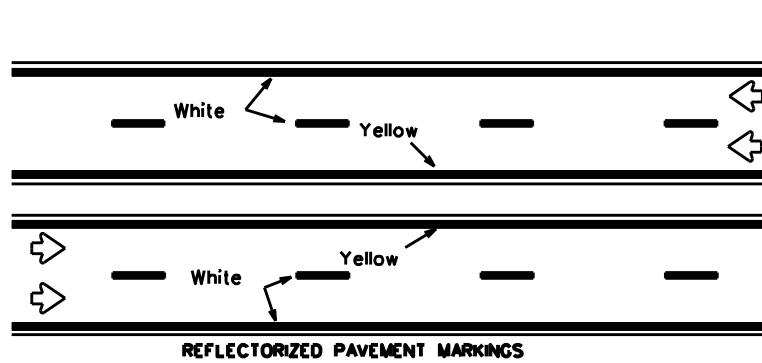
DATE: 7/10/2024 4:38:35 PM  
 FILE: T:\DALAD\DALNEAD\Maint\_Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0. DGNs\Standards\bc-21.dgn

### PAVEMENT MARKING PATTERNS



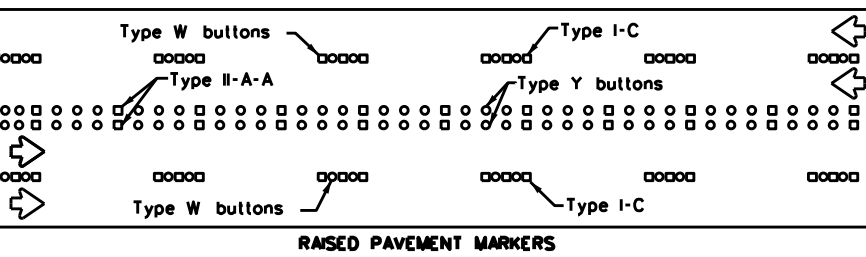
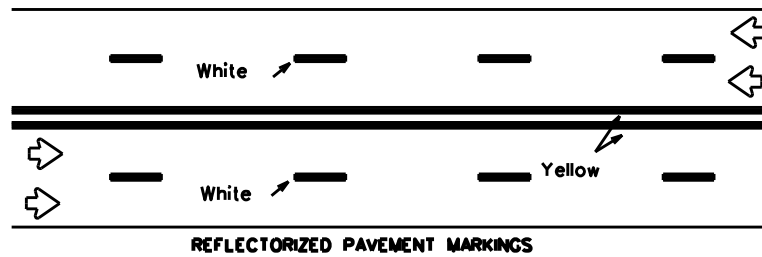
Pattern A is the TxDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectorized pavement markings.

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



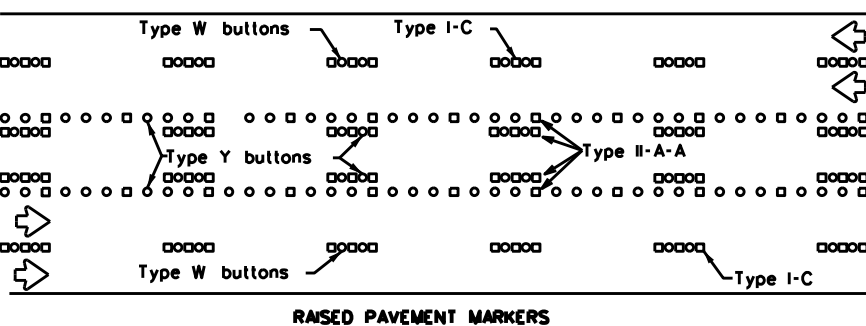
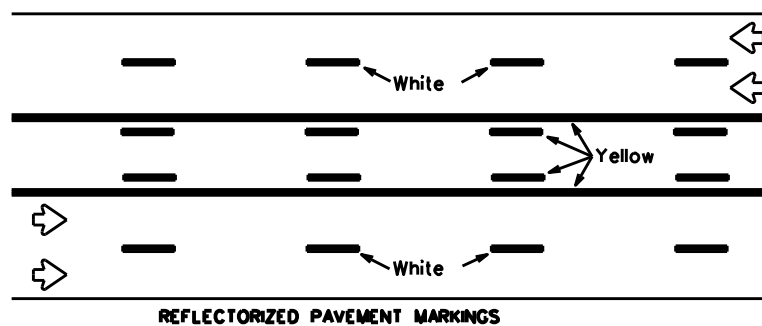
Prefabricated markings may be substituted for reflectorized pavement markings.

### EDGE & LANE LINES FOR DIVIDED HIGHWAY



Prefabricated markings may be substituted for reflectorized pavement markings.

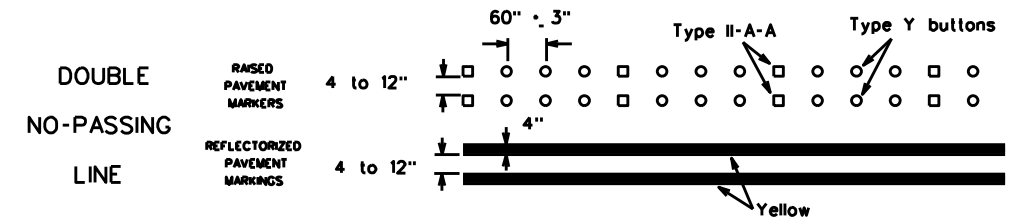
### LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



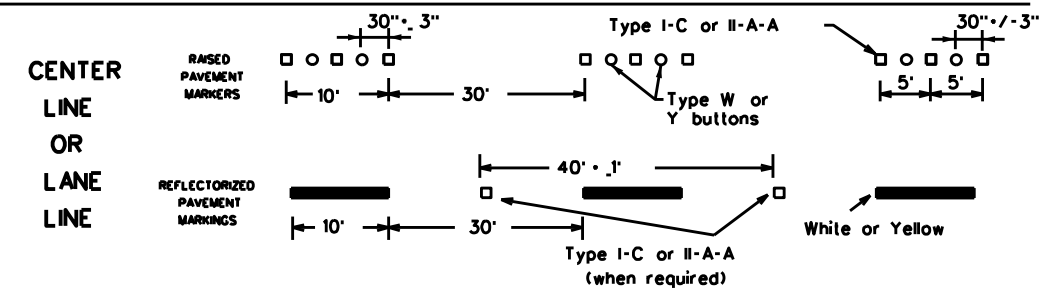
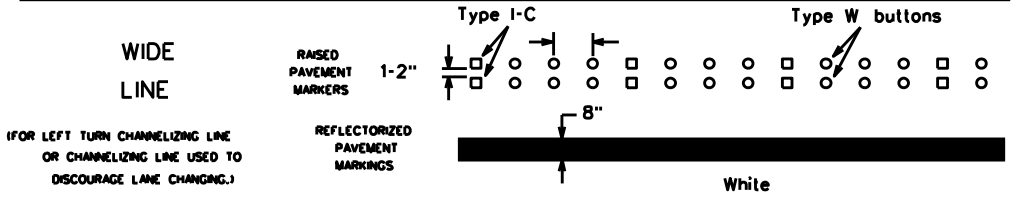
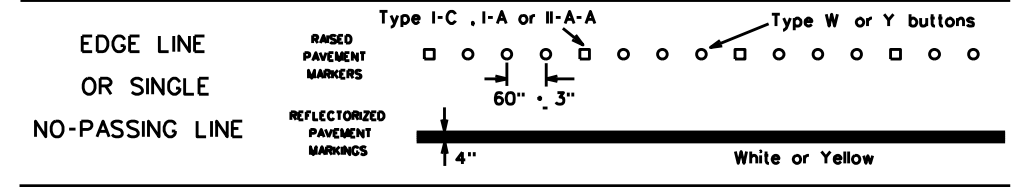
Prefabricated markings may be substituted for reflectorized pavement markings.

### TWO-WAY LEFT TURN LANE

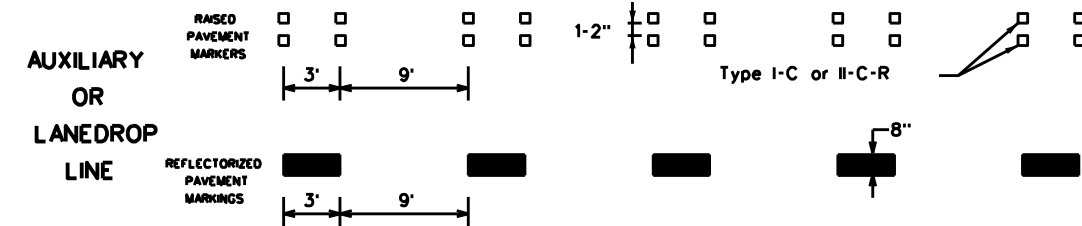
### STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



### SOLID LINES

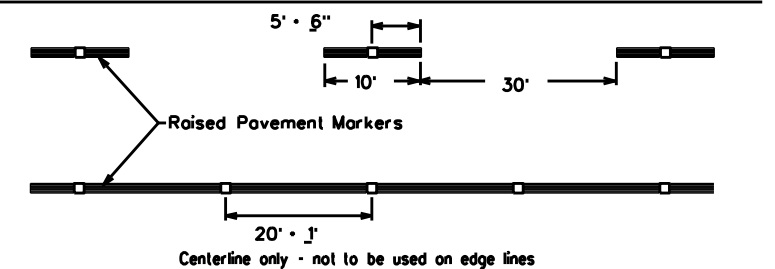


### BROKEN LINES



### REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



SHEET 12 OF 12



### BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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

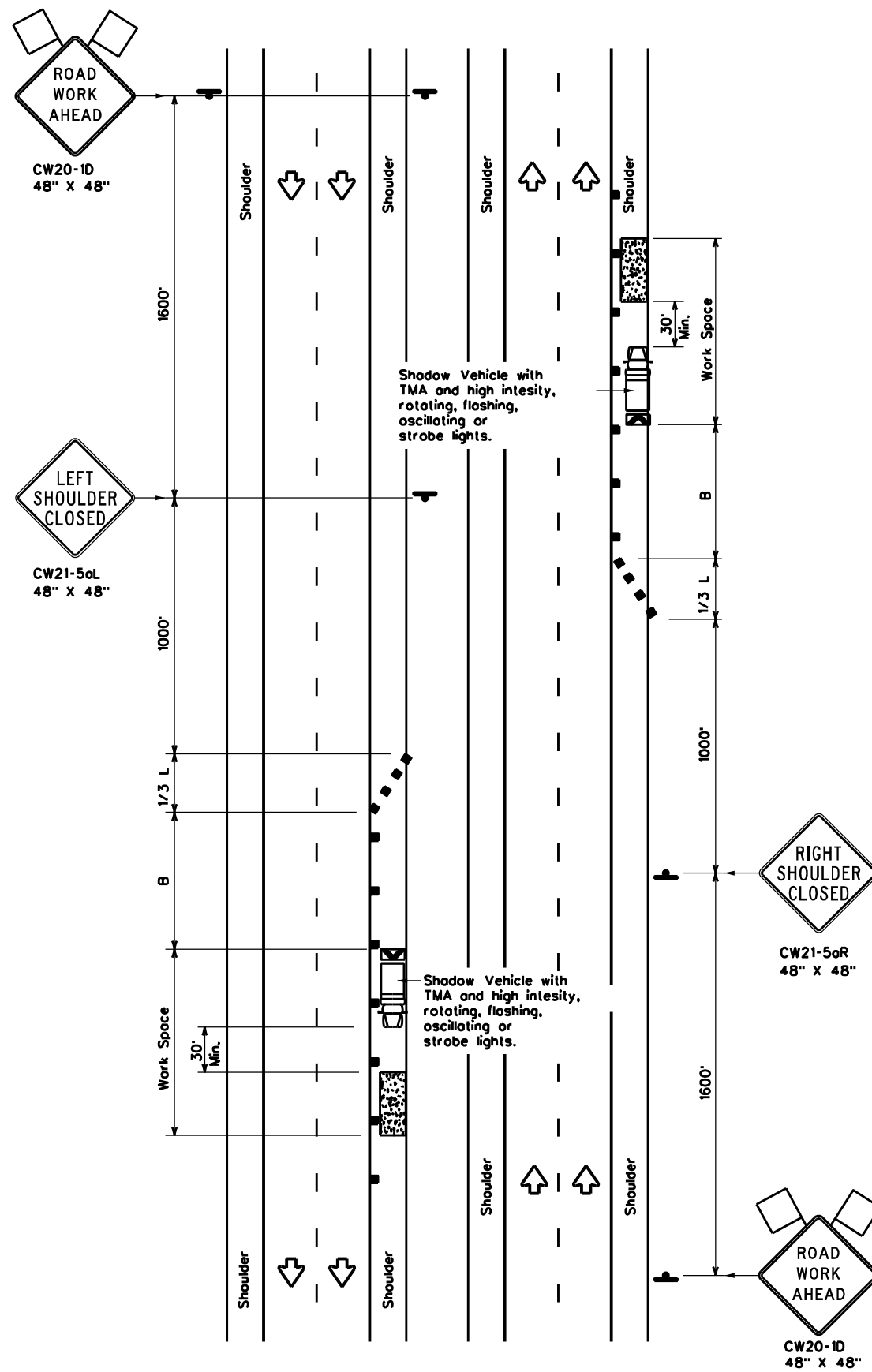
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	54	001	IH0030
1-97 9-07 5-21	DIST	COUNTY	SHEET NO.	
2-98 7-13	DAL	DALLAS	33	
11-02 8-14				

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

DATE: 7/10/2024 4:36:48 PM  
FILE: T:\DALAD\ADALNEAD\Maint\_Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0.DGN\Standards\bc-21.dgn

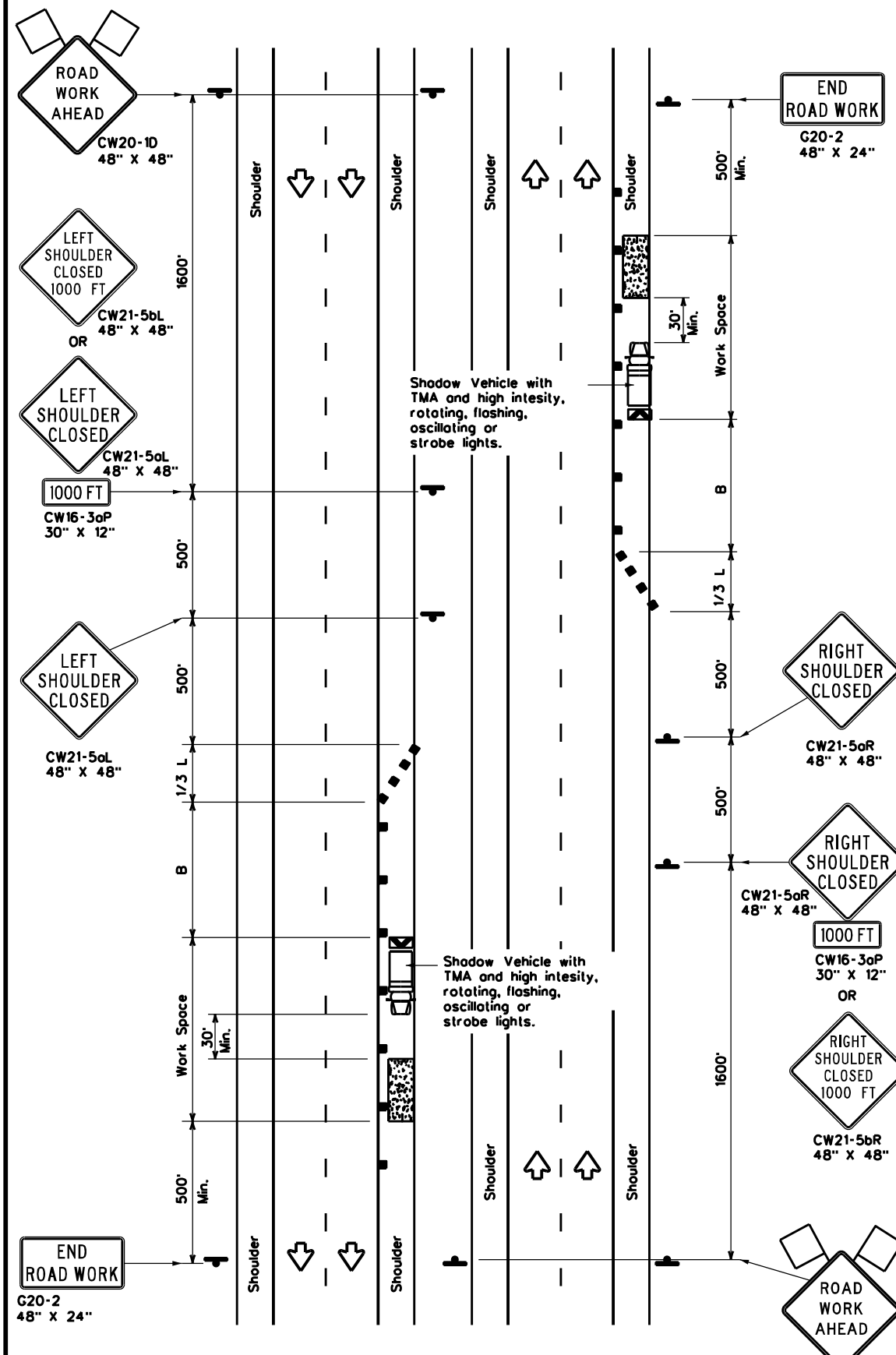
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of this standard for purposes not intended by the original author.

DATE: 7/10/2024 4:58:31 PM  
 FILE: T:\DAL\AD\ALNEAD\Meint\_Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0. BUNTS Signs\CP-5-1-18.dgn



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 x	Formula	Minimum Desirable Taper Lengths x x			Suggested Maximum Spacing of Channelizing Devices		Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent	
30	L = WS <sup>2</sup> / 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'

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

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	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 affecting the performance or quality of the work. Type 3 barricades or drums may be substituted when workers on foot are no longer present when approved by the Engineer.
2. 28" tall or taller one-piece cones will be allowed only for Short Duration or Short Term stationary operations when workers are present to maintain the devices upright and in proper location. Intermediate Term stationary work areas should use Drums, Vertical Panels or 42" tall two-piece cones.



**TRAFFIC CONTROL PLAN  
 SHOULDER WORK FOR  
 FREEWAYS / EXPRESSWAYS**

**TCP(5-1)-18**

FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	54	001	IH0030
2-18	DIST	COUNTY	SHEET NO.	
	DAL	DALLAS	34	

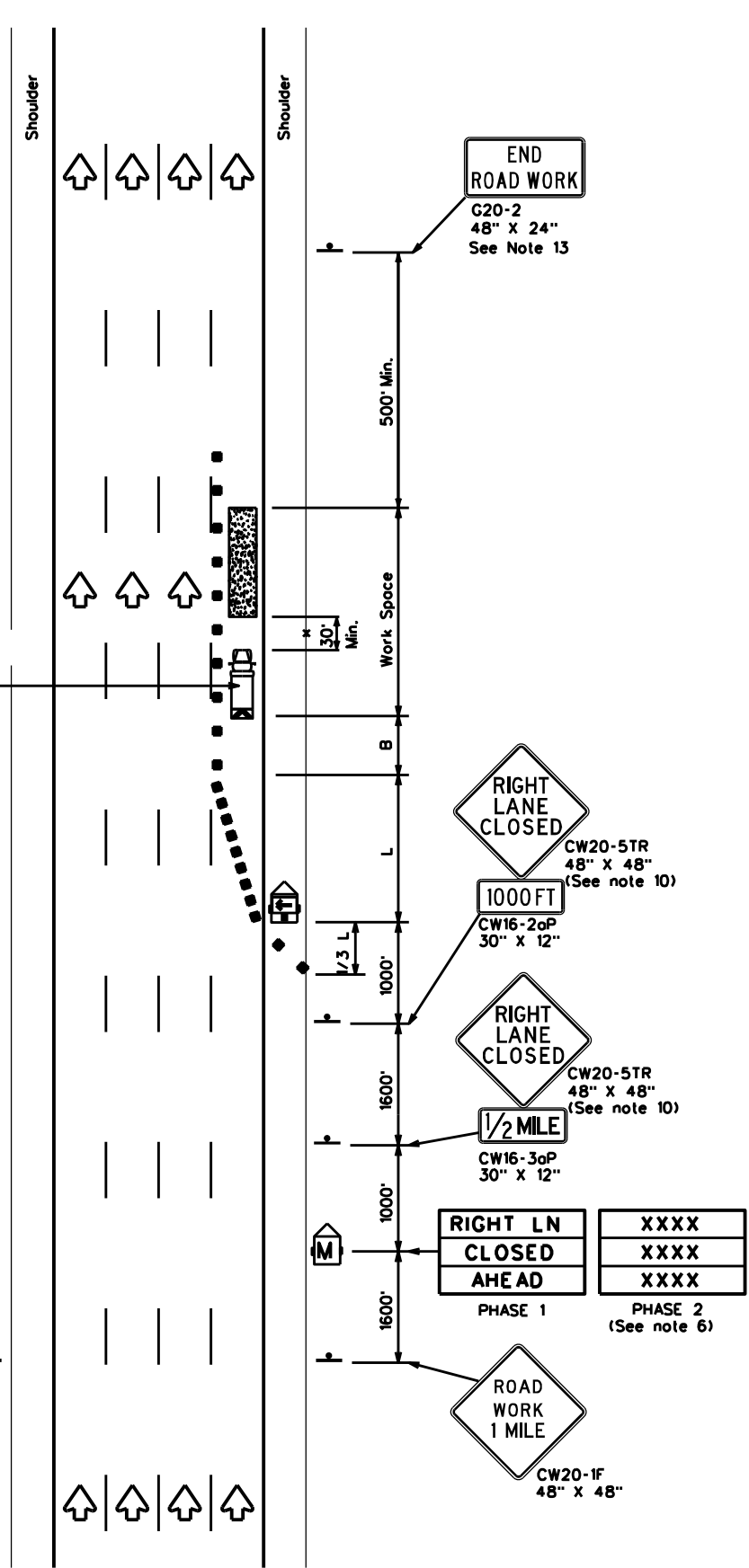
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for incorrect results or damages resulting from its use.

DATE: 7/10/2024 4:58:32 PM  
 FILE: T:\DAL\AD\ALNEAD\Meint\_Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0. B1115 Signs\Signs\Signs - Traffic Control Plans

Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights

See note 1 and 7

See note 1 and 7



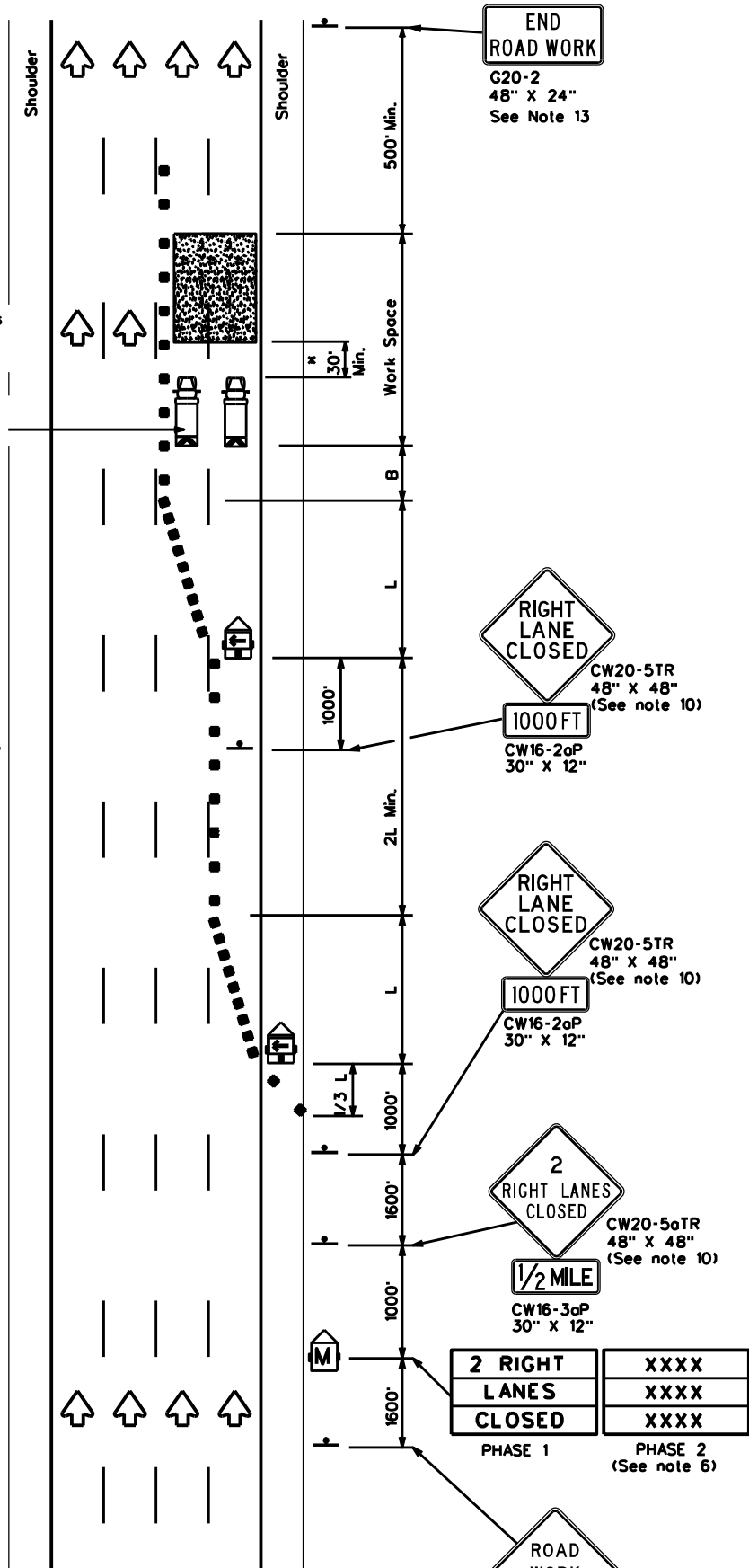
TCP (6-1a)  
**TYPICAL FREEWAY ONE LANE CLOSURE**

Shadow Vehicles with TMA and high intensity rotating, flashing, oscillating or strobe lights

See note 1 and 7

See note 1 and 7

See note 1 and 7



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**

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

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

Texas Department of Transportation  
 Traffic Operations Division Standard

**TRAFFIC CONTROL PLAN  
 FREEWAY LANE CLOSURES**

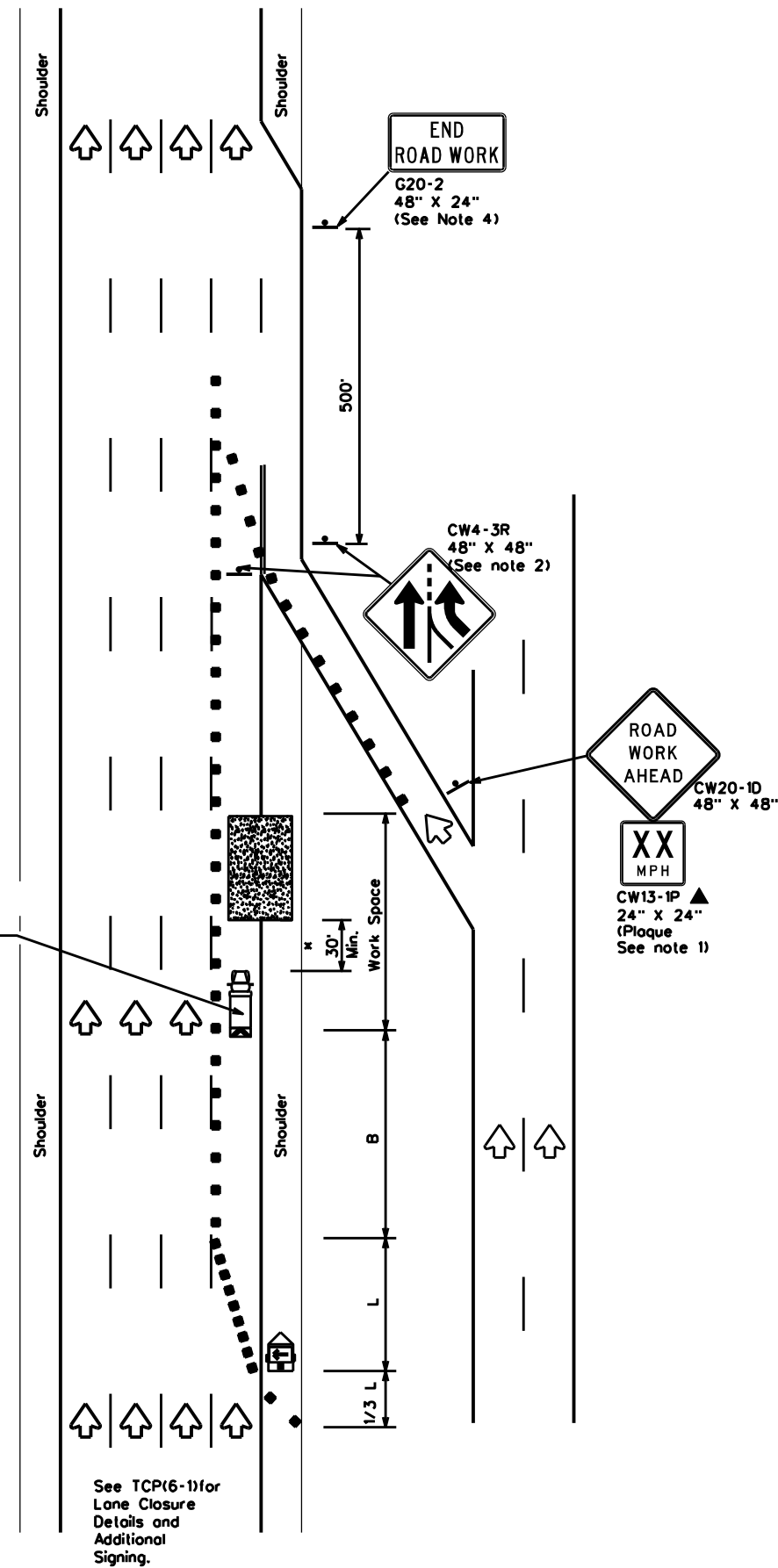
**TCP(6-1)-12**

FILE:	tcp6-1.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	February 1998	CONT:	SECT:	JOB:	HIGHWAY:				
8-12	REVISIONS:	6470	54	001	IH0030				
		DIST:	COUNTY:		SHEET NO.:				
		DAL	DALLAS		35				

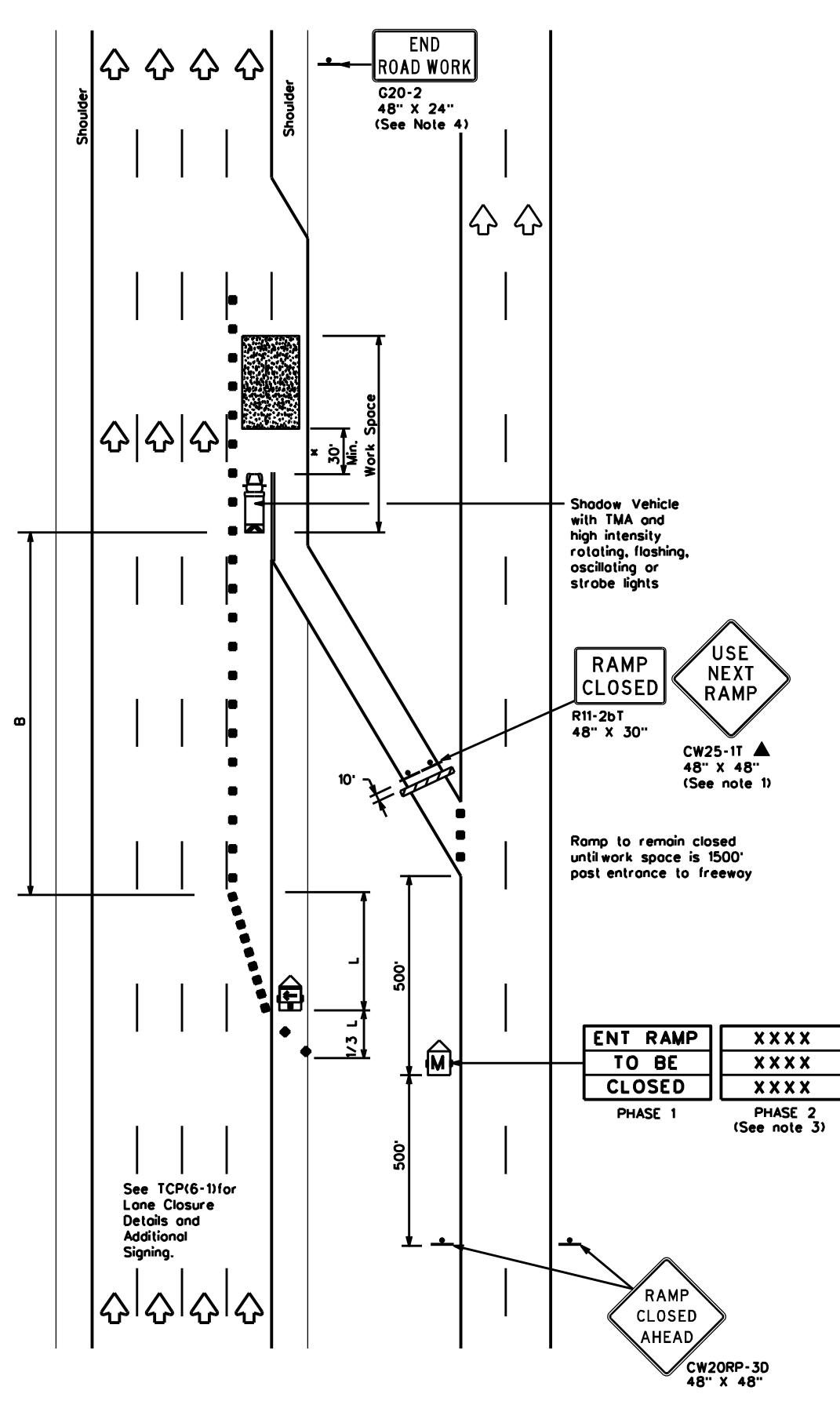


DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for incorrect results or damages resulting from its use.

DATE: 7/10/2024 4:58:32 PM  
FILE: T:\DALAD\ADALNEAD\Maint\_Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0. B0115 Signage for 6470-54-001.dgn



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



**TCP (6-2b)**  
**ENTRANCE RAMP CLOSED**

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

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

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

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

**GENERAL NOTES**

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

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

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



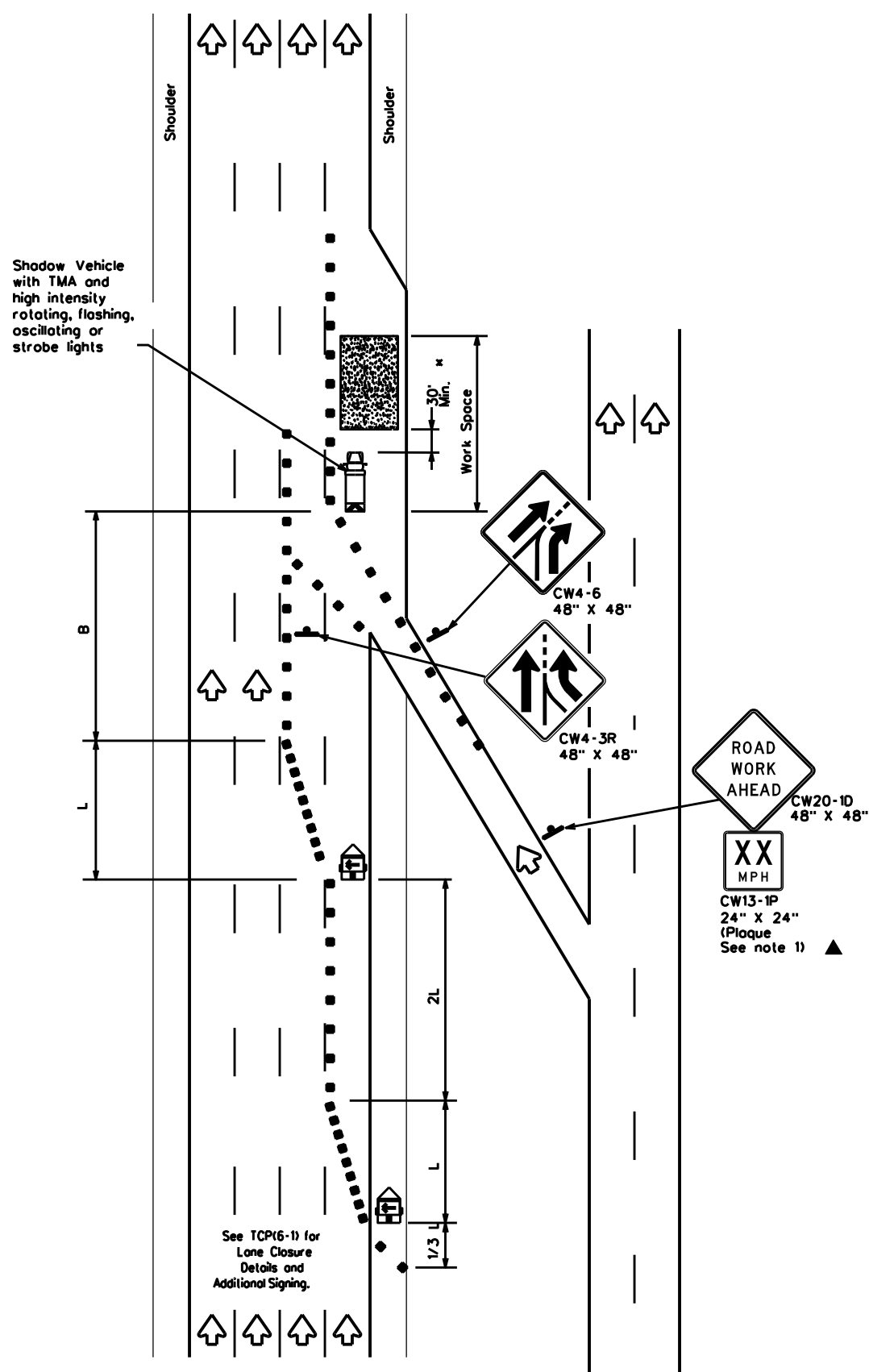
**TRAFFIC CONTROL PLAN**  
**WORK AREA NEAR RAMP**

**TCP(6-2)-12**

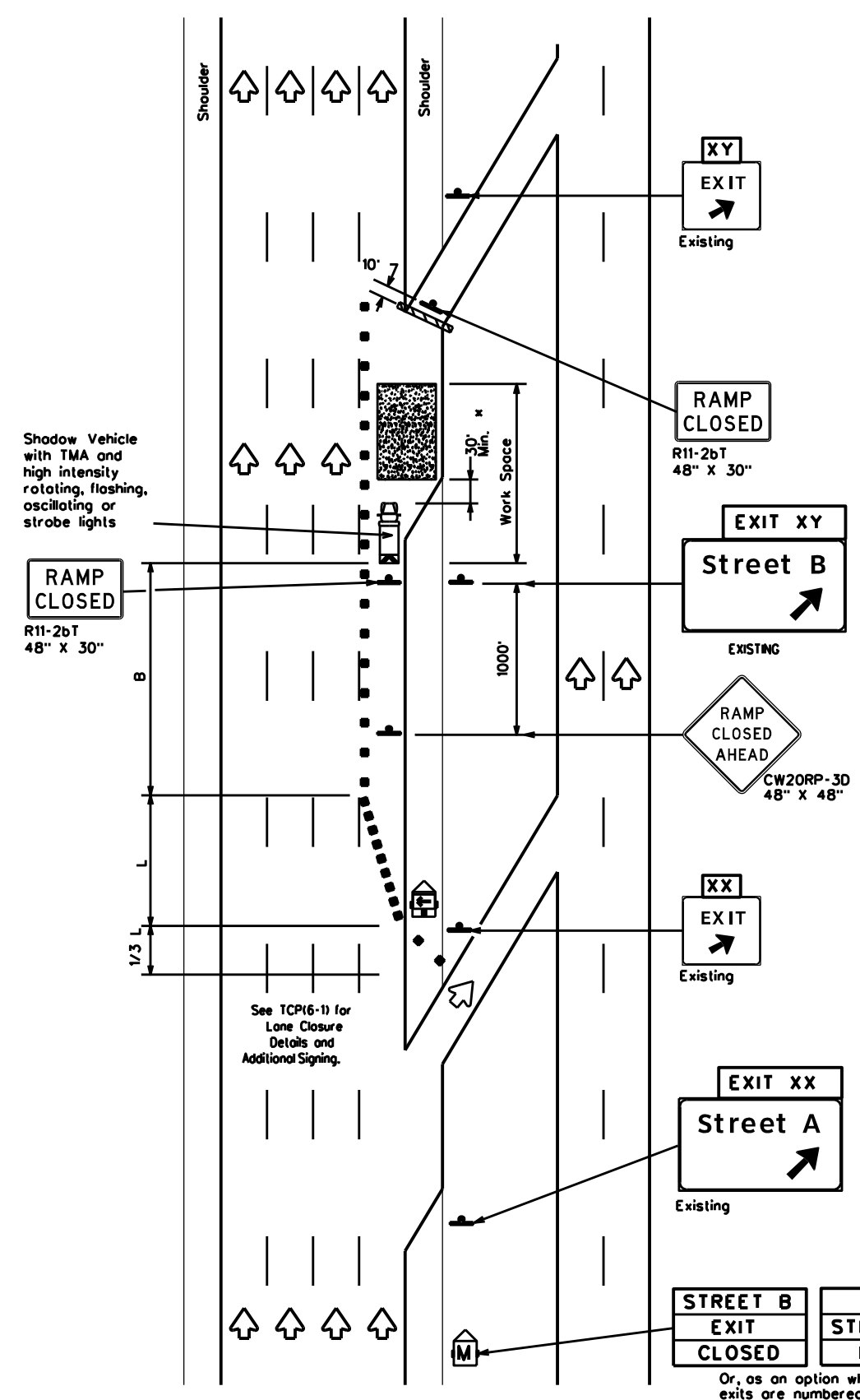
FILE: tcp6-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	54	001	IH0030
1-97 8-98	DIST	COUNTY	SHEET NO.	
4-98 8-12	DAL	DALLAS	36	

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

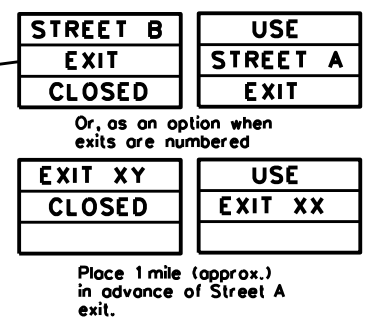
DATE: 7/10/2024 4:58:33 PM  
 FILE: T:\DAL\AD\ALNEAD\Maint\_Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0. BUNTS Signs\Signs for 6470-54-001.dwg



TCP (6-3a)  
**ENTRANCE RAMP OPEN**



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



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

Posted Speed	Formula	Minimum Desirable Taper Lengths "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(F) W-Width of Offset(F) 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.



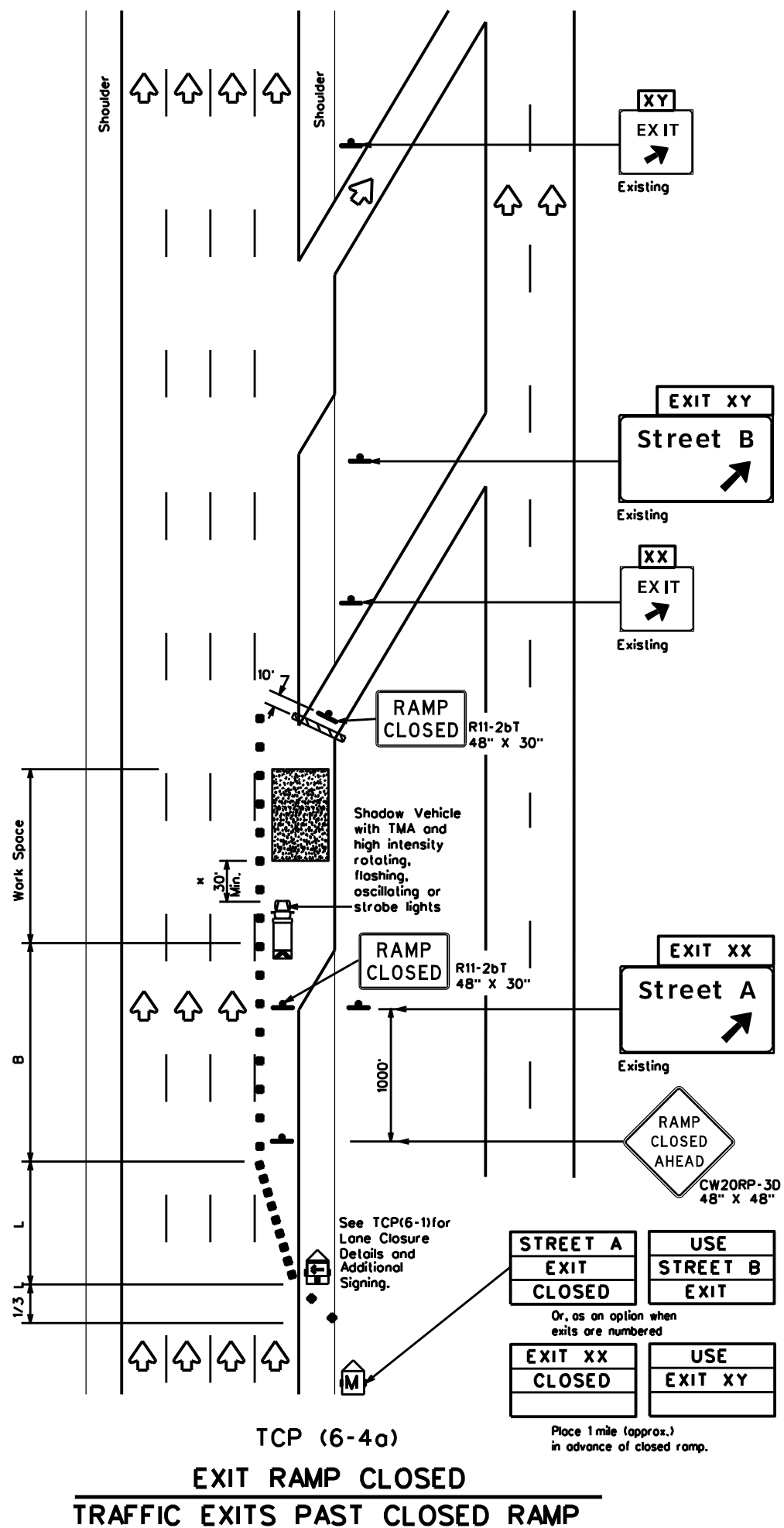
**TRAFFIC CONTROL PLAN**  
**WORK AREA BEYOND RAMP**

**TCP(6-3)-12**

FILE: tcp6-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1994	CONT SECT	JOB	HIGHWAY	
REVISIONS	6470 54	001	IH0030	
1-97 8-98	DIST	COUNTY	SHEET NO.	
4-98 8-12	DAL	DALLAS	37	

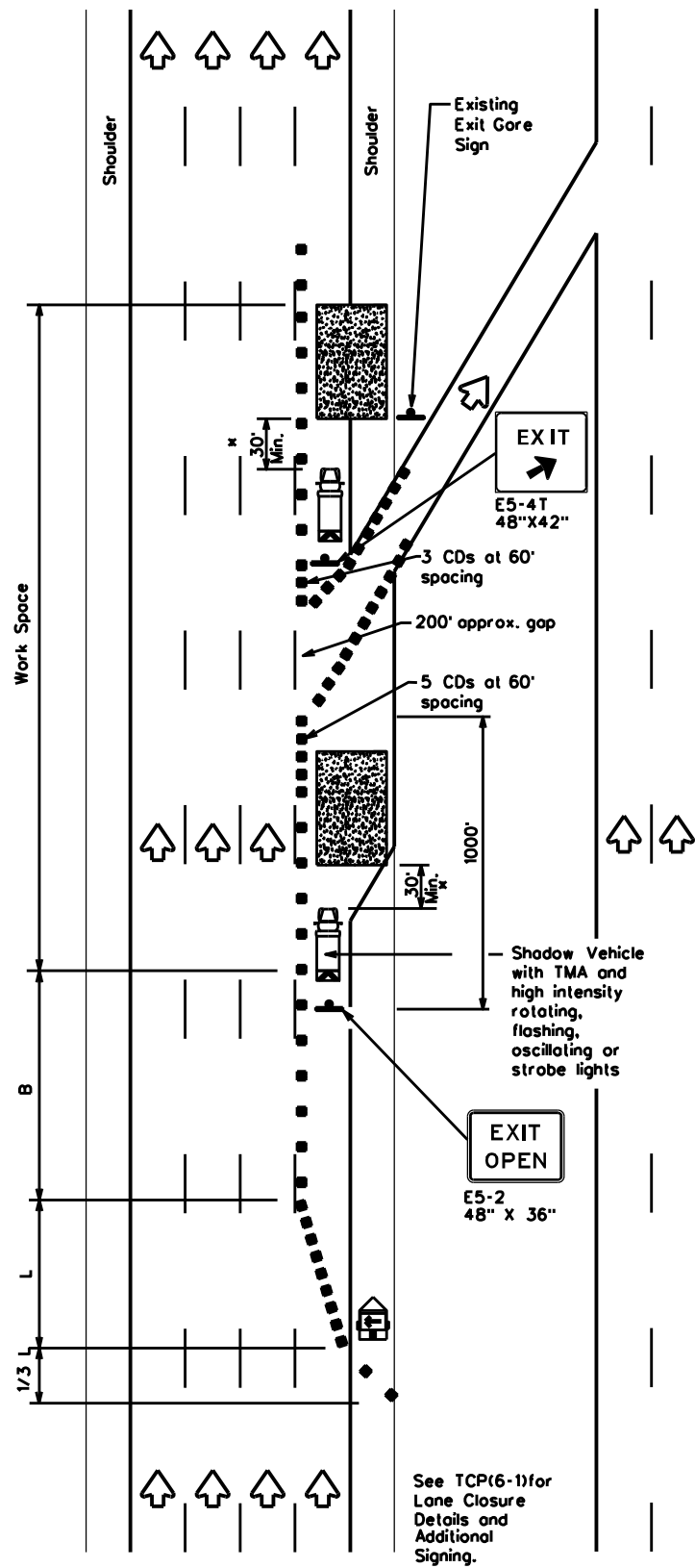
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for incorrect results or damages resulting from its use.

DATE: 7/10/2024 4:58:33 PM  
 FILE: T:\DAL\AD\ALNEAD\Maint\_Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0\_0001\0\_0001.dwg



TCP (6-4a)

**EXIT RAMP CLOSED  
TRAFFIC EXITS PAST CLOSED RAMP**



TCP (6-4b)

**EXIT RAMP OPEN**

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

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

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

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

**GENERAL NOTES**

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

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

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

Texas Department of Transportation  
 Traffic Operations Division Standard

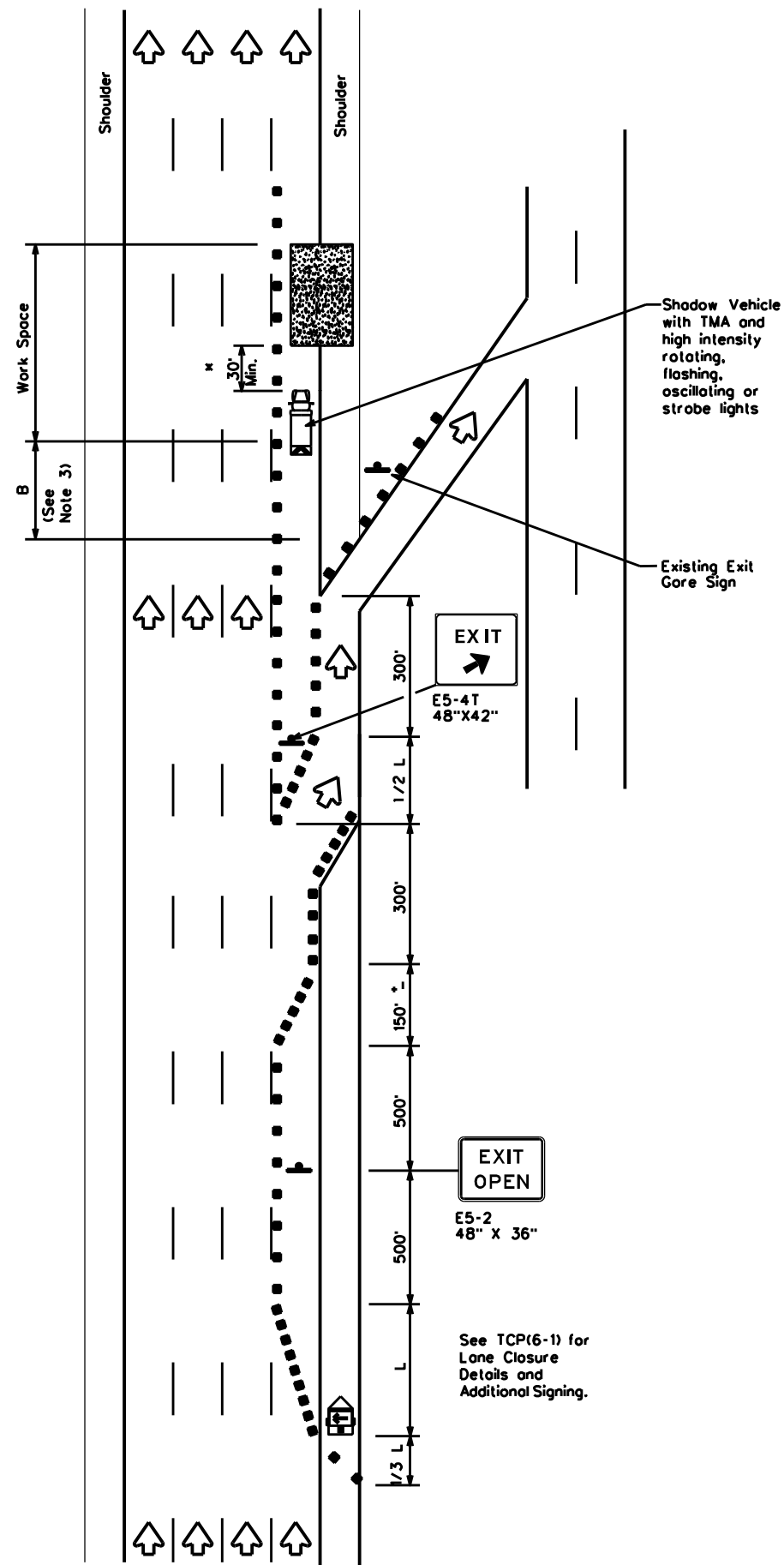
**TRAFFIC CONTROL PLAN  
WORK AREA AT EXIT RAMP**

**TCP(6-4)-12**

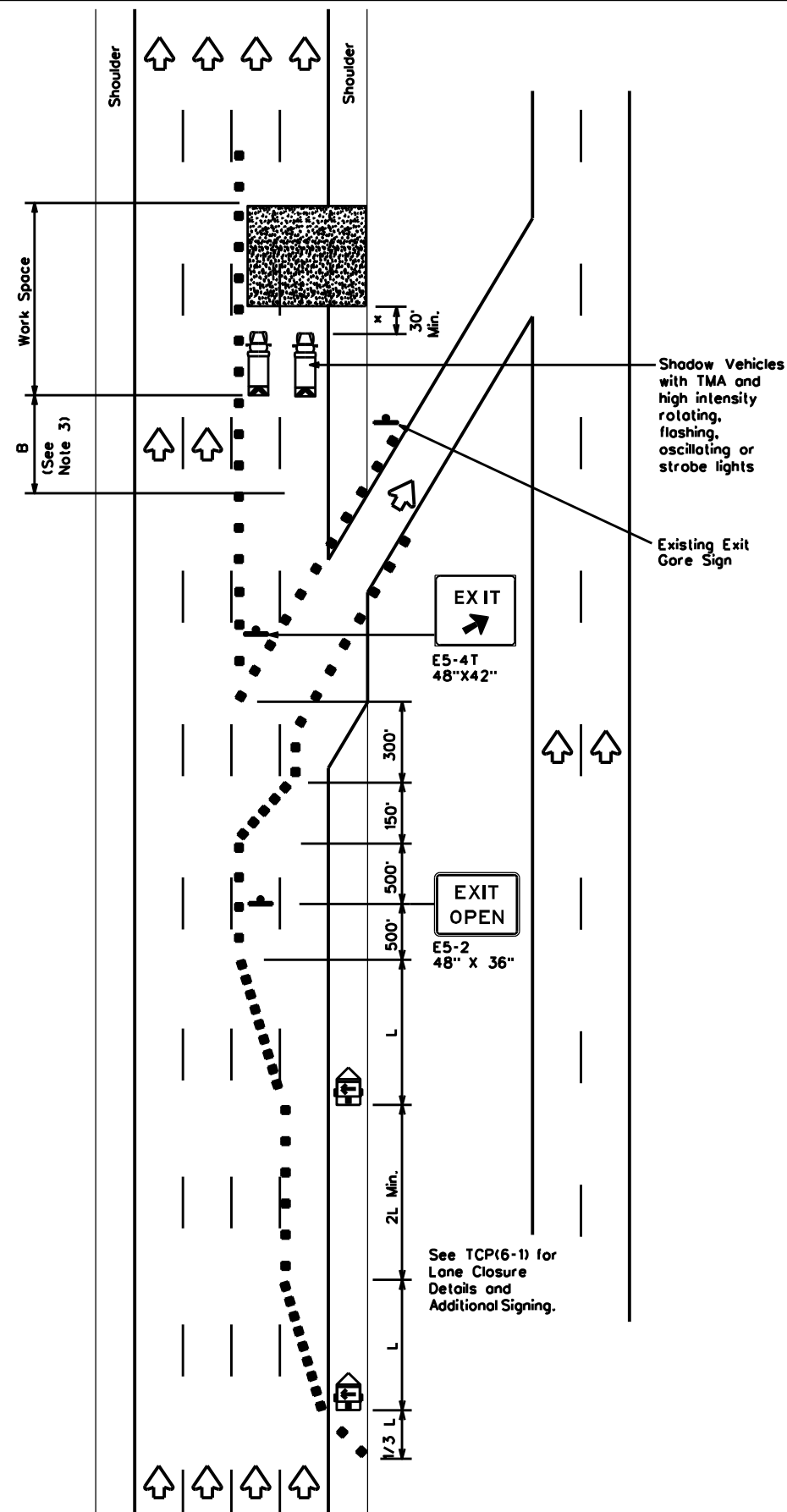
FILE: tcp6-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	54	001	IH0030
1-97 8-98	DIST	COUNTY	SHEET NO.	
4-98 8-12	DAL	DALLAS	38	

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

DATE: 7/10/2024 4:58:34 PM  
 FILE: T:\DAL\AD\ALNEAD\Maint\_Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0.001\Signage\Signage.dwg



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		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'

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

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

**GENERAL NOTES**

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



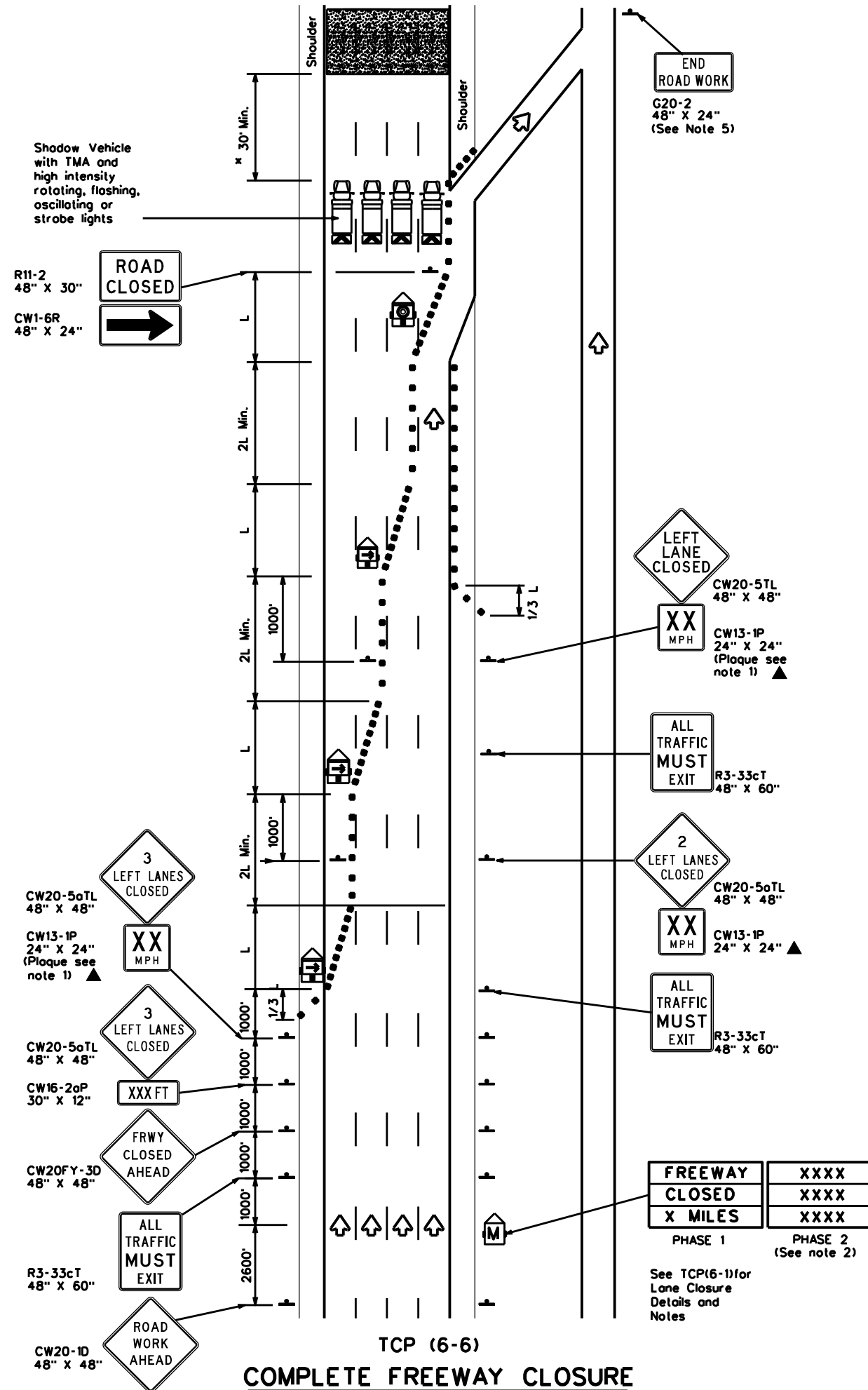
**TRAFFIC CONTROL PLAN  
 WORK AREA BEYOND EXIT RAMP**

**TCP(6-5)-12**

FILE: tcp6-5.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT SECT	JOB	HIGHWAY	
REVISIONS	6470 54	001	IH0030	
1-97 8-98	DIST	COUNTY	SHEET NO.	
4-98 8-12	DAL	DALLAS	39	

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

DATE: 7/10/2024 4:58:34 PM  
 FILE: T:\DAL\AD\DALNEAD\Meint\_Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0. BUNTS\Signage\CP\CP 6470-54-001.dwg



LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		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**

- All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
- 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.
- 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.
- Entrance ramps located from the advance warning area to the exit ramp should be closed whenever possible.
- 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.

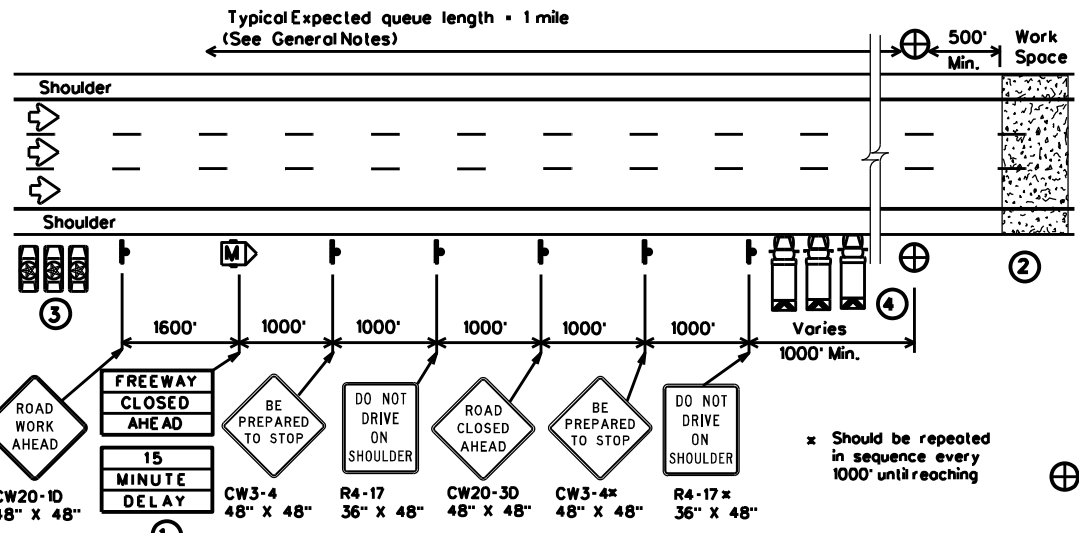
**Texas Department of Transportation**  
 Traffic Operations Division Standard

**TRAFFIC CONTROL PLAN**  
**FREWAY CLOSURE**

**TCP(6-6)-12**

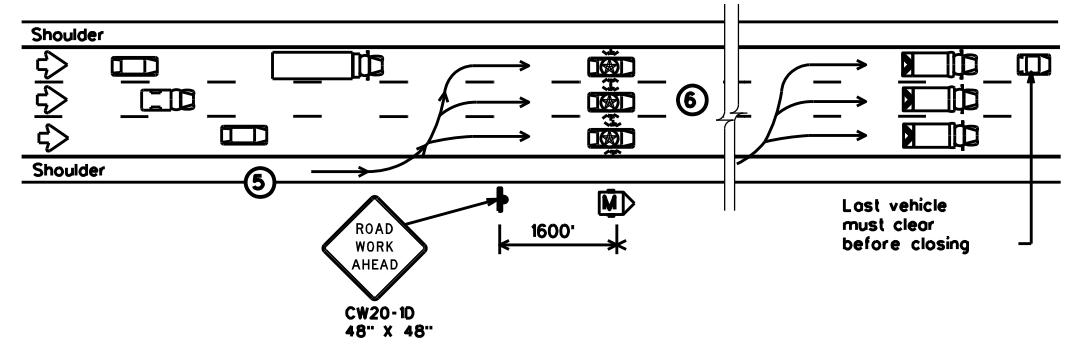
FILE: tcp6-6.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	54	001	IH0030
1-97 8-98	DIST	COUNTY	SHEET NO.	
4-98 8-12	DAL	DALLAS	40	

DATE: 7/10/2024 4:58:35 PM  
 FILE: T:\DALAD\DALNEAD\Meint. Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0. BMS Signs\Signs-Flags-Flags-Figures-Figures  
 Folder\BPM\BPM 6470-54-001\0. BMS Signs\Signs-Flags-Flags-Figures-Figures  
 RMC Folder\BPM\BPM 6470-54-001\0. BMS Signs\Signs-Flags-Flags-Figures-Figures  
 Contracts\2025 RMC Folder\BPM\BPM 6470-54-001\0. BMS Signs\Signs-Flags-Flags-Figures-Figures  
 DISCLAMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other units or for incorrect results or damages resulting from its use.



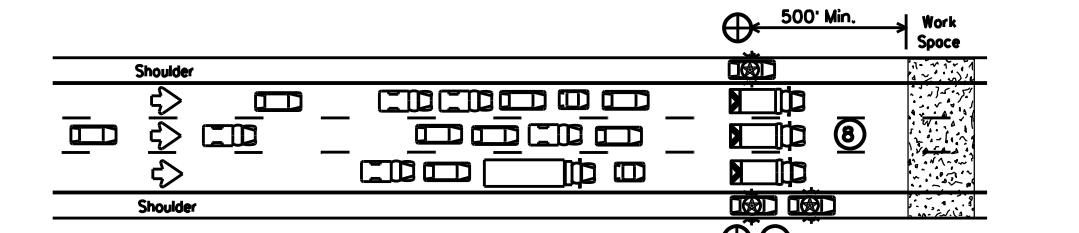
**1 STARTING POSITION**

- 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 low 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.



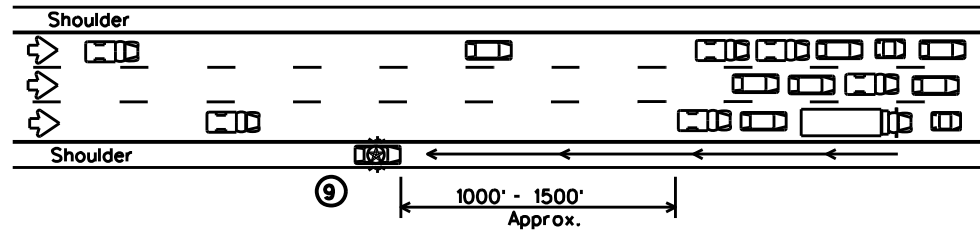
**2 REDUCING SPEED OPERATION**

- 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.



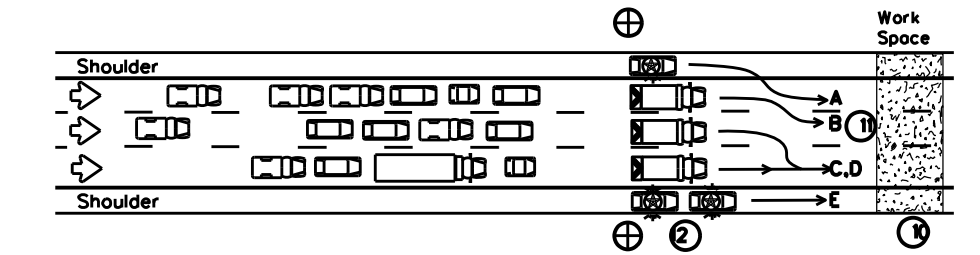
**3 ALL TRAFFIC STOPPED AT CP**

- 7 Once traffic is stopped the LEOVs should park on the shoulders with emergency lighting "ON" in order to provide low enforcement presence of 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**

- 1 All equipment, materials, personnel, and other items should be removed from the roadway and maintain an adequate clear zone.
- 1 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.
- 2 The LEOV or LEOVs on the right shoulder may remain on the shoulder until satisfied that traffic is moving satisfactorily before merging or proceeding.
- 3 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
LEOV	Low 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. Low 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. Low enforcement officers shall be in uniform and have jurisdiction in the locale of the work area. An additional WARNING Low 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.



**TRAFFIC CONTROL PLAN  
SHORT DURATION FREEWAY  
CLOSURE SEQUENCE**

**TCP(6-7)-12**

FILE: tcp6-7.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	6470	54	001	IH0030
1-97 8-12	DIST	COUNTY	SHEET NO.	
4-98	DAL	DALLAS	41	