FED. RD. DIV. NO.	FEDERAL PROJECT NO.			SHEET NO.
6	F 2022(426)			1
STATE	STATE DIST.	COUNTY		
TEXAS	AMA	POTTER		
CONT.	SECT.	JOB	HIGHWAY NO.	
0904	00	199	VARIOUS	

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

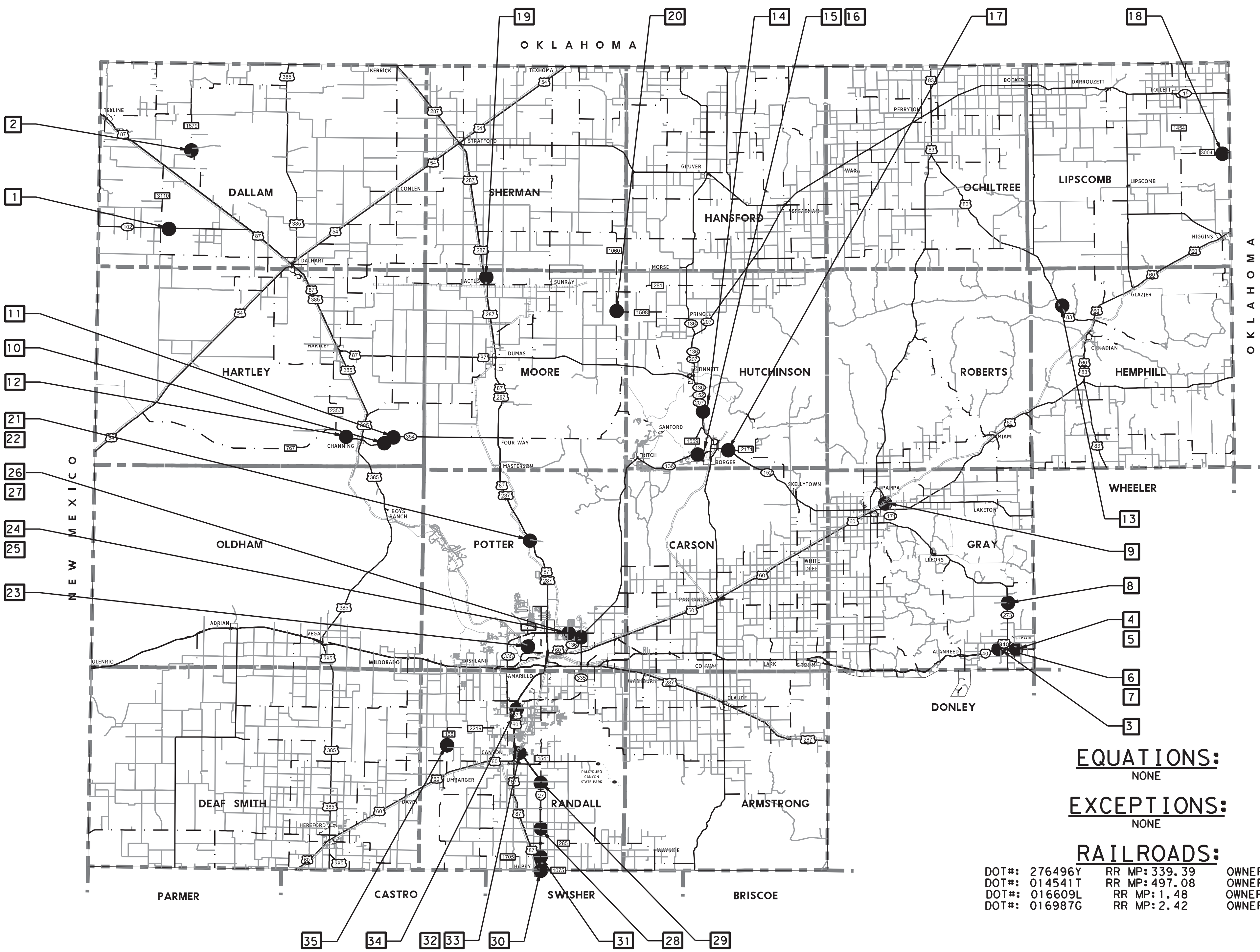
FEDERAL PROJECT: F 2022(426)

HIGHWAY - VARIOUS

COUNTY - POTTER

CONTROL: 0904-00-199

FOR THE CONSTRUCTION OF: BRIDGE REPAIR TYPE WORK



BRIDGES			
REF #	COUNTY	LOCATION	NBI #
1	DALLAM	SH 102 AT CARRIZO CREEK	04-056-0-1141-02-008
2	DALLAM	FM 1879 AT RITA BLANCA CREEK	04-056-0-1811-01-001
3	GRAY	BI 40 EB AT IH 40	04-091-0-0275-11-141
4	GRAY	IH 40 WB AT IH 40 FRONTAGE RD CONN	04-091-0-0275-11-145
5	GRAY	IH 40 EB AT IH 40 FRONTAGE RD CONN	04-091-0-0275-11-146
6	GRAY	IH 40 WB AT IH 40 FRONTAGE RD CONN	04-091-0-0275-11-149
7	GRAY	IH 40 EB AT IH 40 FRONTAGE RD CONN	04-091-0-0275-11-150
8	GRAY	SH 273 AT MCCLELLAN CREEK	04-091-0-0560-02-025
9	GRAY	LP 171 AT BNSF RR	04-091-0-2403-01-001
10	HARTLEY	SH 354 AT WEST CHEYENNE CREEK	04-104-0-0041-03-050
11	HARTLEY	SH 354 AT EAST CHEYENNE CREEK	04-104-0-0041-03-051
12	HARTLEY	FM 767 AT LOS REDOS CREEK	04-104-0-1108-01-002
13	HEMPHILL	US 83 AT HORSE CREEK	04-107-0-0030-05-028
14	HUTCHINSON	SH 136 NB AT CANADIAN RIVER	04-118-0-0356-01-014
15	HUTCHINSON	SH 136 WB AT FM 1559 AND ATSF RR	04-118-0-0379-01-024
16	HUTCHINSON	SH 136 EB AT FM 1559 AND ATSF RR	04-118-0-0379-01-025
17	HUTCHINSON	SH 152 EB AT DIXON CREEK	04-118-0-0455-01-011
18	LIPSCOMB	FM 3004 AT MAMMOTH CREEK	04-148-0-3076-01-001
19	MOORE	US 287 SB AT N. PALO DURO CREEK	04-171-0-0066-04-023
20	MOORE	FM 1060 AT SOUTH PALO DURO CREEK	04-171-0-1244-01-004
21	POTTER	US 87 NB AT CANADIAN RIVER	04-188-0-0041-05-064
22	POTTER	US 87 SB AT CANADIAN RIVER	04-188-0-0041-05-092
23	POTTER	FM 1719 AT BNSF RR	04-188-0-1624-01-003
24	POTTER	LP 335 WB AT EASTERN ST	04-188-0-2635-01-012
25	POTTER	LP 335 EB AT EASTERN ST	04-188-0-2635-01-013
26	POTTER	LP 335 NB AT ABANDONED RR	04-188-0-2635-01-014
27	POTTER	LP 335 SB AT ABANDONED RR	04-188-0-2635-01-015
28	RANDALL	CR 237 (DOWLEN RD) AT IH 27	04-191-0-0067-17-106
29	RANDALL	CR 226 (CEMETERY RD) AT IH 27	04-191-0-0067-17-108
30	RANDALL	FM 1075 AT IH 27	04-191-0-0067-17-124
31	RANDALL	CR 233 (HALEY RD) AT IH 27	04-191-0-0067-17-126
32	RANDALL	IH 27 SB AT P.D.T. FORK RED RIVER	04-191-0-0067-17-142
33	RANDALL	IH 27 NB AT P.D.T. FORK RED RIVER	04-191-0-0067-17-143
34	RANDALL	CR 163 (SUNDOWN LN) AT IH 27	04-191-0-0168-09-061
35	RANDALL	FM 168 AT PALO DURO CREEK	04-191-0-2495-01-002

EQUATIONS:
NONE

EXCEPTIONS:
NONE

RAILROADS:

DOT#: 276496Y	RR MP: 339.39	OWNER: BNSF
DOT#: 014541T	RR MP: 497.08	OWNER: BNSF
DOT#: 016609L	RR MP: 1.48	OWNER: BNSF
DOT#: 016987G	RR MP: 2.42	OWNER: PNRR

2022 Texas Department of Transportation

RECOMMENDED FOR LETTING: DocuSigned by: Bernardo Lenal, PE 25B59152F691499... DATE: 2/1/2022

APPROVED FOR LETTING: DocuSigned by: Blair Johnson 8B80E3AEB2BC43A... DATE: 2/2/2022

DocuSigned by: Kit Black 9B5A6EA6AE8B46E... DATE: 2/2/2022 PLANNING & DEVELOPMENT

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, MAY 2012).

INDEX OF SHEETS

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED
PROFESSIONAL ENGINEER

Casey B. Stripling

01-24-2022

AMA FY 22 DBIP

INDEX OF SHEETS

2022 Texas Department of Transportation

SHEET 1 OF 1

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		2

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GENERAL NOTES

General

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

TO:	Dumas Area Engineer	Bernardo.Ferrel@txdot.gov
CC:	Assistant Area Engineer	Ofelia.Garbalena@txdot.gov
	Director of Construction	Kenneth.Petr@txdot.gov
	Construction Manager	Thomas.Nagel@txdot.gov

Contractor questions will be accepted through email, phone, or in person by the above individuals.

All Contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address.

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

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

There are no "reference markers" within the project limits.

See Railroad Scope of Work sheet for insurance and/or other requirements.

If portions of the right-of-way is used to store materials, equipment, and other uses with the approval of the Engineer, materials, equipment, etc., must either be located outside the *30* feet traffic safety clearance zone or be adequately protected.

Any work necessary to provide temporary ingress and egress during construction (such as building gravel ramps, etc.) Will not be paid for directly, but will be considered as subsidiary work to the various bid items.

Item 7 Legal Relations and Responsibilities

No significant traffic generator events identified.

Item 8 Prosecution and Progress

Create, maintain, and submit for approval, a Critical Path Method (CPM) project schedule and a Project Schedule Summary Report (PSSR) using computer software that is fully compatible with the latest version of Primavera Systems, Inc. or Primavera P6.

Item 427 Surface Finishes for Concrete

An Epoxy Waterproof Finish (TY X) is required on all interior bridge rail posts for
NBI: 04-188-0-0041-05-064 US 87 NB at Canadian River

Item 432 Riprap

24" tie bars (#3 bars at 18" c-c) are to be used across all construction joints. Tie bars should be 12'' into each side of the construction joint. When tying new riprap into existing riprap drill and epoxy grout 8" minimum into existing concrete. This is to be considered subsidiary to the payment for riprap.

Item 454 Bridge Expansion Joints

Use Sealtite Bridge Joint Sealant 50N or Chase Construction products Phyzite 380 premolded preformed compressible joint material or approved equal. Install per manufacturer's recommendation.

For Expansion Joints SPS 400 and SF 400 type SEJ's are not to be utilized.

For Asphalt-Plug Expansion Joints, the following systems are approved: Matrix 501, Matrix 502, Matrix 502 Asphalt Plug, Wabo-Expandex, Fibrejoint Asphaltic Plug Joint.

Item 502 Barricades, Signs, and Traffic Handling

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

Temporary rumble strips will be required as shown on WZ(RS)-22 regardless of loose gravel, and/or soft or bleeding asphalt. Adjust the traffic control setup such that rumble strips are not placed in areas of heavily rutted pavements, unpaved surfaces, or horizontal curves. Temporary rumble strips will not be allowed on interstate highway.

The Contractor is to have the option of using either plastic drums, vertical panels, grabber cones or a combination where drums are shown as channelizing devices, as approved by the Engineer. Plastic drums are to be used in all transition areas in accordance with BC(8)-21.

Contractor is to use the Texas Manual on Uniform Traffic Control Devices to ensure that no traffic will be stopped within the Rail Road Right of Way. Contractor is to ensure all TCP and construction remain out of the Rail Road Right of Way.

Item 712 Cleaning and Sealing Joints and Cracks

Use Cap Option A with 20 GA metal flashing for concrete riprap in contact with the abutment and wingwalls.

Item 713 Crack Cleaning and Sealing

Use joint sealant class 4, 5, 7, or 8 for crack repair. Do not use backer rod for riprap cracks.

Item 4002 Elastromeric Baring Pads

Prior to installation of the bearing pads, ensure the bearing seats are level. If work is needed to make the seats level, this will not be paid for directly, but will be considered subsidiary to the bearing pad installation.

Install a Type V epoxy per DMS-6100, “Epoxies and Adhesives,” once the bearing seats have been determined level. Place the bonding epoxy on a clean, dry surface, and place the bearing pad while the epoxy is still tacky, or in accordance with the manufacturer’s recommendations.

Item 6001 Portable Changeable Message Sign

Supply *2* Portable Changeable Message Signs (Type II – Lamp Matrix) for this project. This work will be paid at the unit price bid for each unit, which will include any moving, maintenance, and removing of the PCMS. No payment will be made for removing and replacing damaged PCMS. The Portable Changeable Message Signs will become property of the Contractor at the completion of the project.

If the Contractor chooses to have more than one lane closure set-up at a time, provide additional PCMS in accordance with TCP at no additional charge to the department.

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

In addition to the shadow vehicles with truck mounted attenuator (TMA) that are specified as being required on the traffic control plan for this project, provide 0 additional shadow vehicle(s) with TMA for TCP (2-1)-18, (2-2)-18, (2-3)-18, (2-4)-18, (3-1)-13, (3-2)-13, (6-1)-12, (6-1)-12, (6-3)-12 & (6-4)-12 as detailed on the General Notes of this standard sheets.

Therefore, 2 total shadow vehicles with TMA will be required for this type of work. 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 needed for the project

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0904-00-199 **DISTRICT** Amarillo **COUNTY** Potter
HIGHWAY Various

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0904-00-199**			
		PROJECT ID		**A00176413**			
		COUNTY		**Potter**			
		HIGHWAY		**Various**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	104-6009	REMOVING CONC (RIPRAP)	SY	83.000		83.000	
	401-6001	FLOWABLE BACKFILL	CY	31.000		31.000	
	427-6007	EPOXY WATERPROOF FINISH (TY X)	SF	492.000		492.000	
	432-6001	RIPRAP (CONC)(4 IN)	CY	10.000		10.000	
	438-6001	CLEANING AND SEALING EXISTING JOINTS	LF	3,854.000		3,854.000	
	454-6003	ARMOR JOINT	LF	2.000		2.000	
	454-6007	HEADER TYPE EXPANSION JOINT	LF	895.000		895.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	8.000		8.000	
	712-6001	JT / CRCK SEAL (POLY MOD ASPH EMULSION)	LF	556.000		556.000	
	713-6005	CRACK CLEANING AND SEALING (JCP)	LF	334.000		334.000	
	778-6001	CONCRETE RAIL REPAIR (IN-KIND)	LF	87.000		87.000	
	4001-6001	ASPHALT PLUG EXP JOINT	LF	334.000		334.000	
	4002-6001	REPLACE ELASTOMERIC BEARING PADS	EA	29.000		29.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000		2.000	
	6185-6002	TMA (STATIONARY)	DAY	128.000		128.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	

SUMMARY OF BRIDGE ITEMS

LOCATION	104 6009 REMOVING CONC (RIPRAP) SY	401 6001 FLOWABLE BACKFILL CY	427 6007 EPOXY WATERPROOF FINISH (TY X) SF	432 6001 RIPRAP (CONC) (4IN) CY	438 6001 CLEANING AND SEALING EXISTING JOINTS LF	454 6003 ARMOR JOINT LF	454 6007 HEADER TYPE EXPANSION JOINT LF
CLEAN AND SEAL JOINTS DETAIL SHEET 4 OF 5					2,559		
CLEAN AND SEAL JOINTS DETAIL SHEET 5 OF 5					1,295		
BRIDGE JOINT REPAIR DETAIL SHEET 7 OF 7						2	895
EROSION UNDERMINING REPAIR DETAIL SHEET 1 OF 1	83	31		10			
BRIDGE RAIL REPAIR DETAIL SHEET 1 OF 1			492				
PROJECT TOTAL'S	**83**	**31**	**492**	**10**	**3,854**	**2**	**895**

SUMMARY OF BRIDGE ITEMS (CONT'D)

LOCATION	712 6001 JT / CRK SEAL (POLY MOD ASPH EMULSION) LF	713 6005 CRACK CLEANING AND SEALING (JCP) LF	778 6001 CONCRETE RAIL REPAIR (IN-KIND) LF	4001 6001 ASPHALT PLUG EXP JOINT LF	4002 6001 REPLACE ELASTOMERIC BEARING PADS EA
BRIDGE JOINT REPAIR DETAIL SHEET 7 OF 7				334	
RIPRAP REPAIR DETAIL SHEET 1 OF 1		334			
BRIDGE RAIL REPAIR DETAIL SHEET 1 OF 1			87		
CONCRETE RIPRAP JOINT SEAL FLASHING DETAIL SHEET 1 OF 1	556				
BEARING PAD REPLACEMENT DETAIL SHEET 1 OF 4					6
BEARING PAD REPLACEMENT DETAIL SHEET 2 OF 4					10
BEARING PAD REPLACEMENT DETAIL SHEET 3 OF 4					10
BEARING PAD REPLACEMENT DETAIL SHEET 4 OF 4					3
PROJECT TOTAL'S	**556**	**334**	**87**	**334**	**29**

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AMA FY 22 DBIP

PROJECT SUMMARY

2022 Texas Department of Transportation

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		5

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0904	00	199	VARIOUS
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	AMA	POTTER		6
5-10 5-21				

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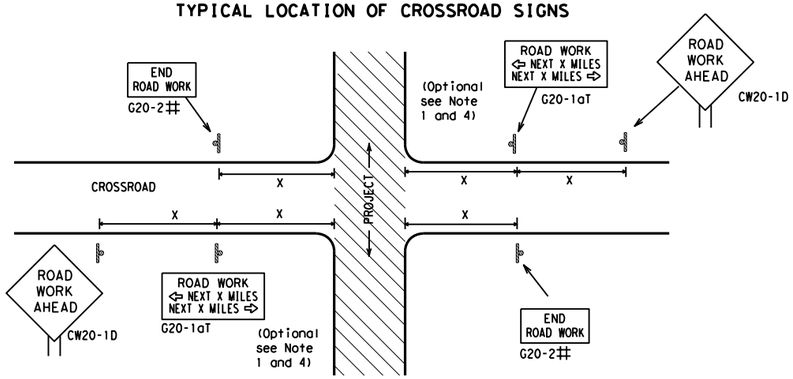
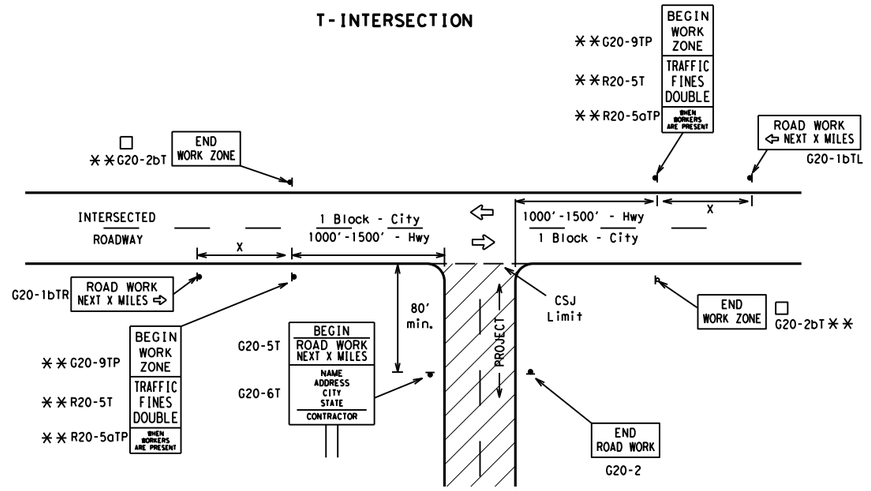
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

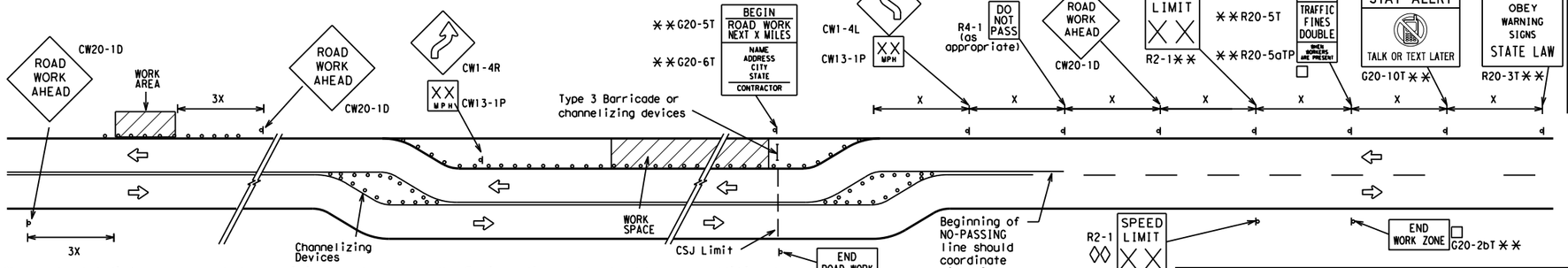
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

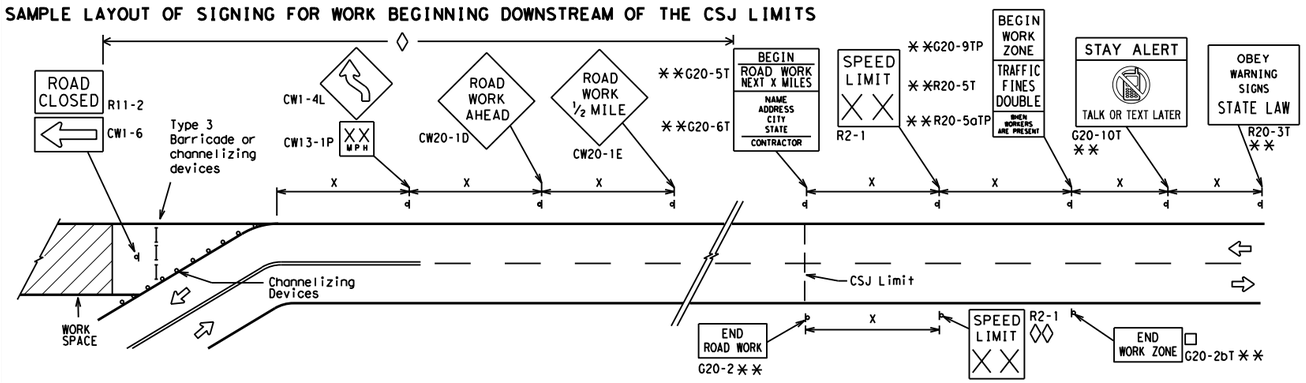
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

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

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

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

LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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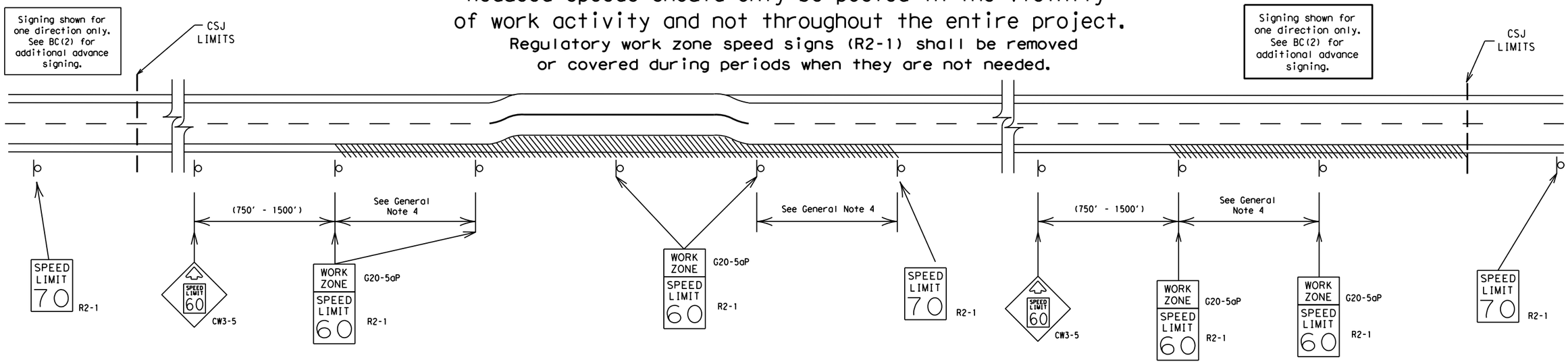
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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SHEET 3 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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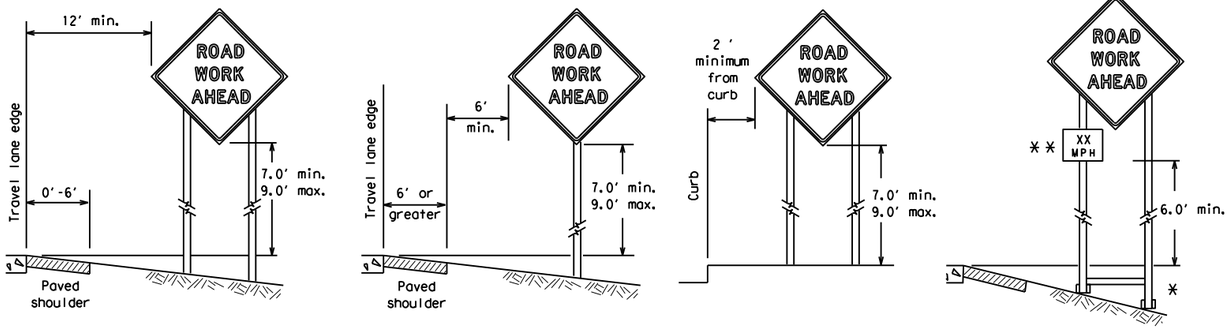
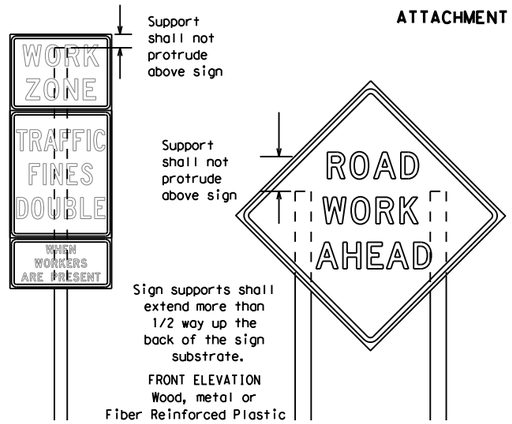
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

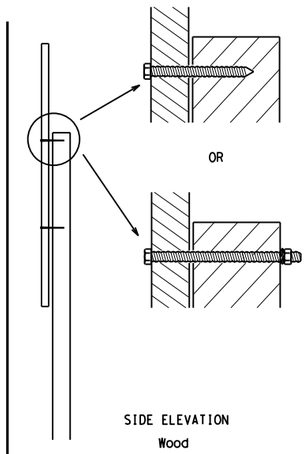


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





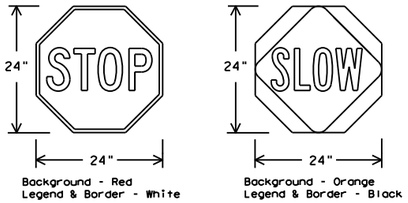
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

1. The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the 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_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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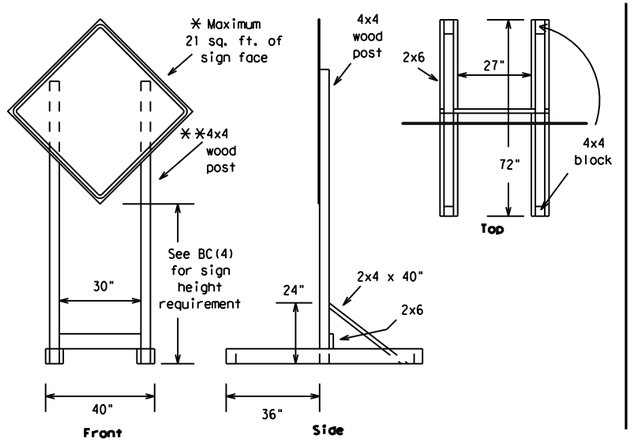
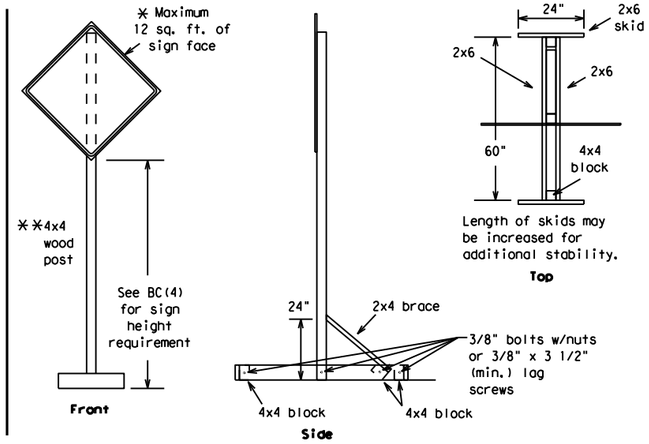
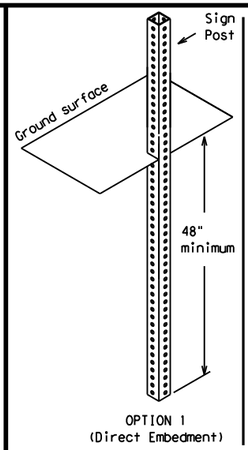
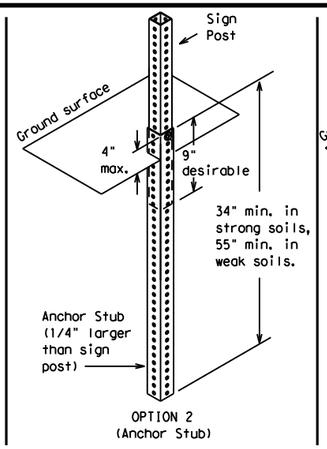


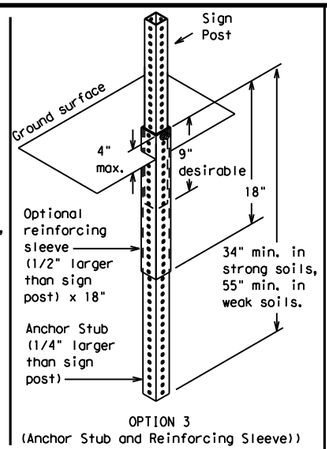


SKID MOUNTED WOOD SIGN SUPPORTS

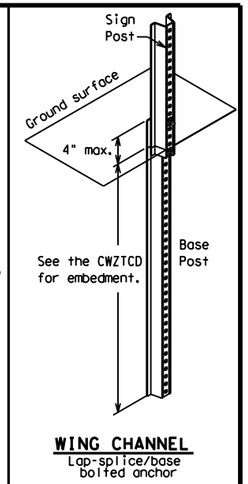
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS





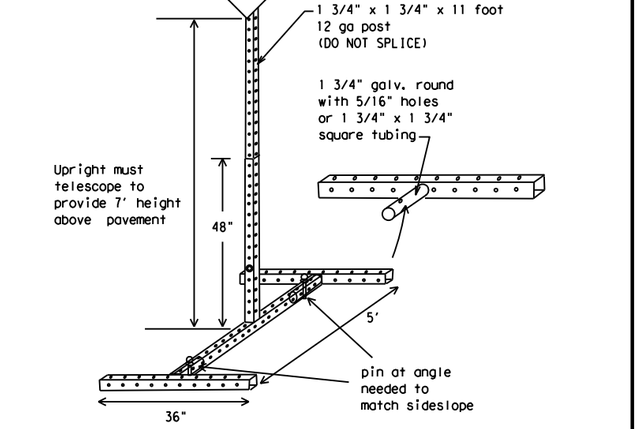


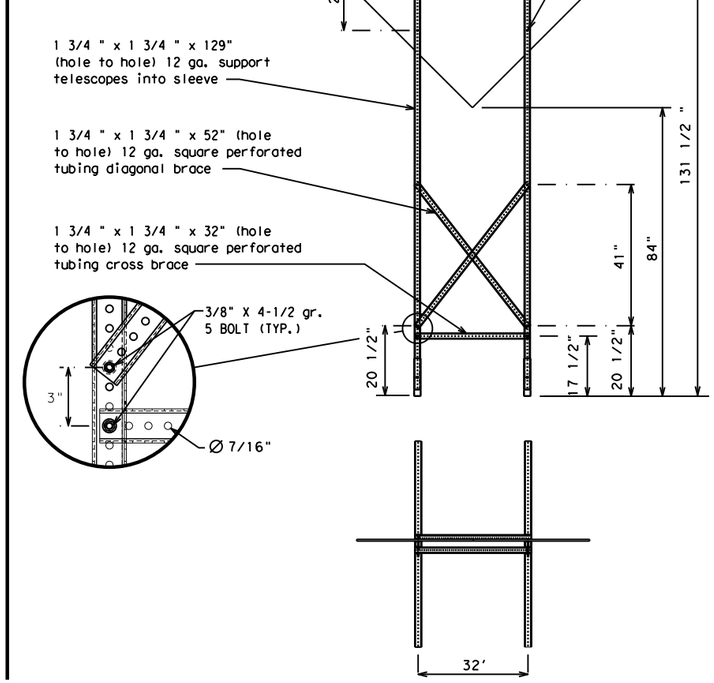
PERFORATED SQUARE METAL TUBING

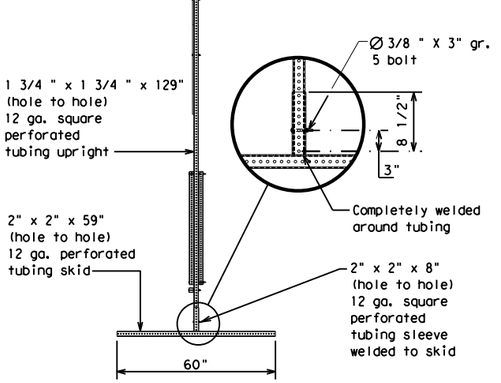


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

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Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

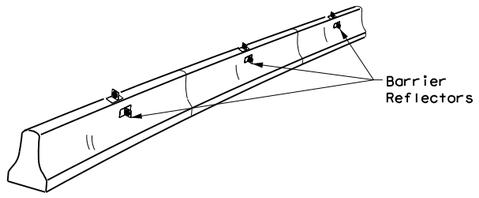
BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0904	00	199	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	AMA	POTTER		11

100

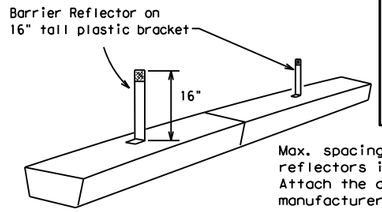
DATE: 1/21/2022 10:40:09 AM
FILE: T:\AMA\PDV\Construction Projects\0904-00\199 - FY 22 Bridge Improvements\4 - Design\Plan Set\2. TCP\Standards\bc-21.dgn

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



CONCRETE TRAFFIC BARRIER (CTB)

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

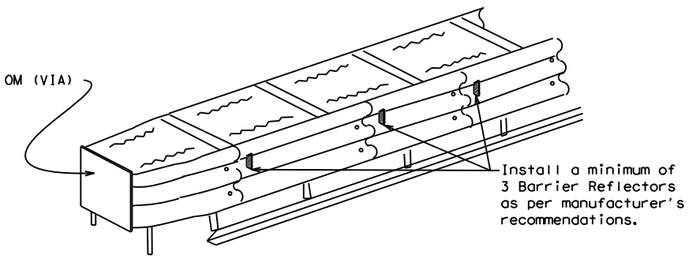


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) 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.

LOW PROFILE CONCRETE BARRIER (LPCB)

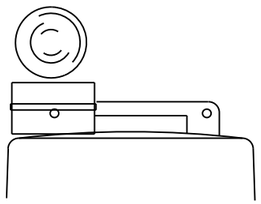


DELINEATION OF END TREATMENTS

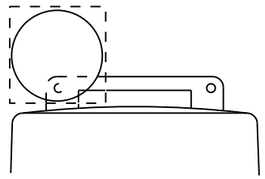
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

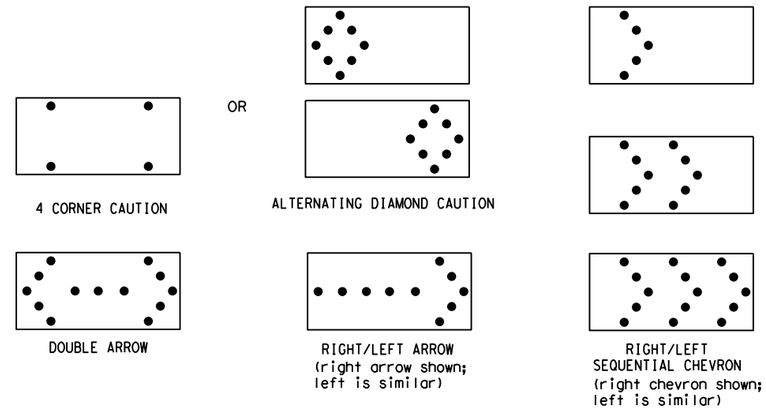
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

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

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation — Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0904	00	199	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	AMA	POTTER		12

DATE: 1/21/2022 10:40:12 AM
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

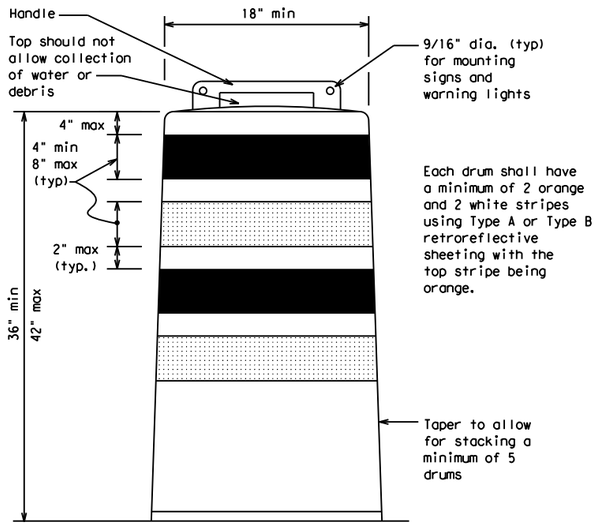
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

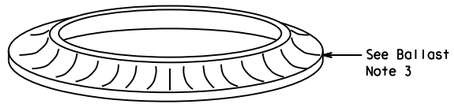
RETROREFLECTIVE SHEETING

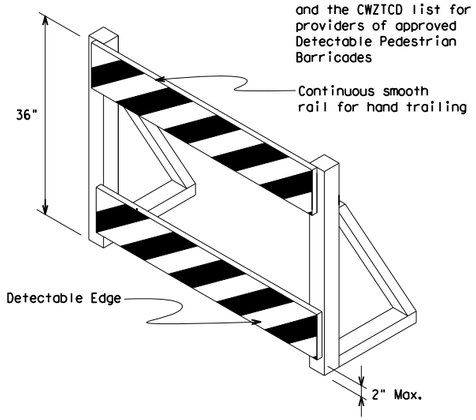
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

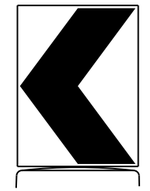




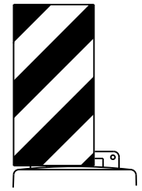


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

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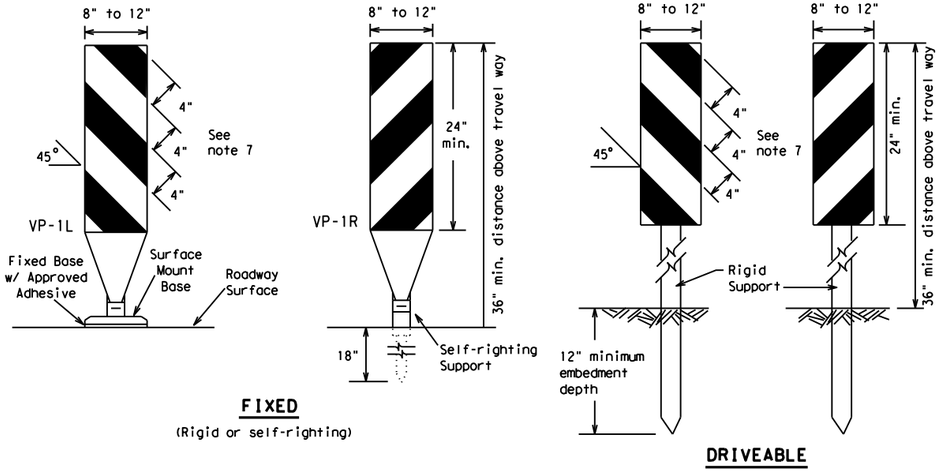
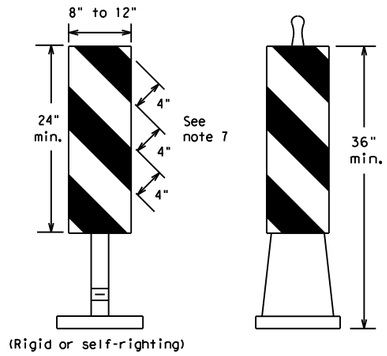


FIXED
(Rigid or self-righting)

DRIVEABLE

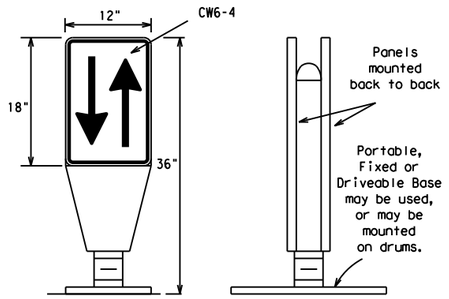


(Rigid or self-righting)

PORTABLE

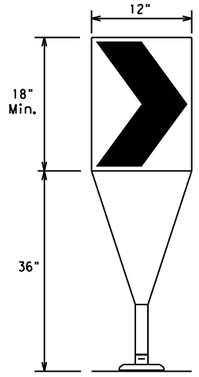
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



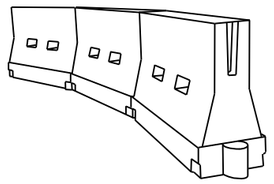
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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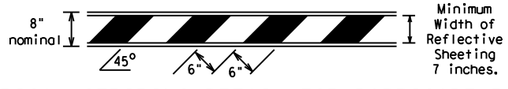
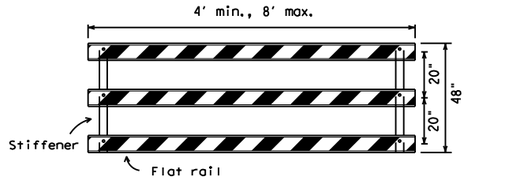
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



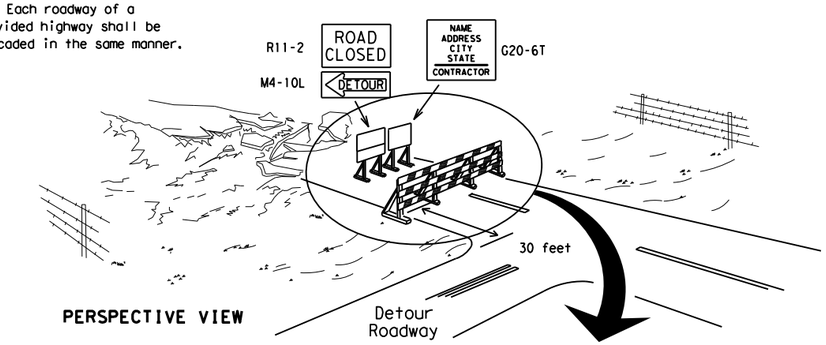
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

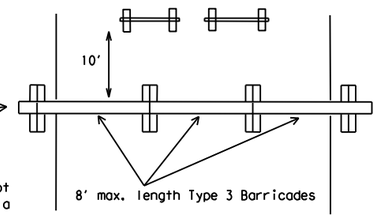
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

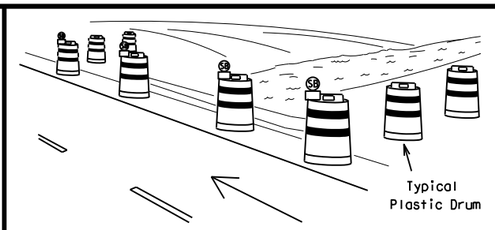
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

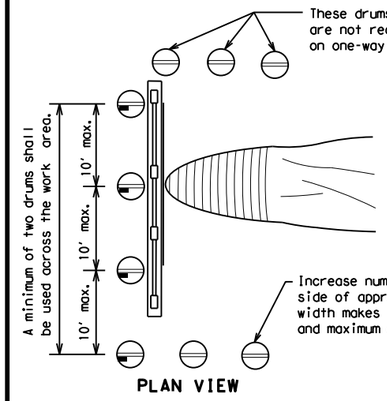
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

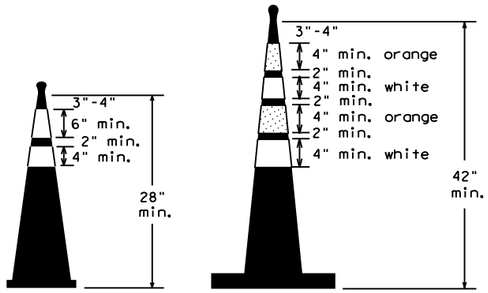
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

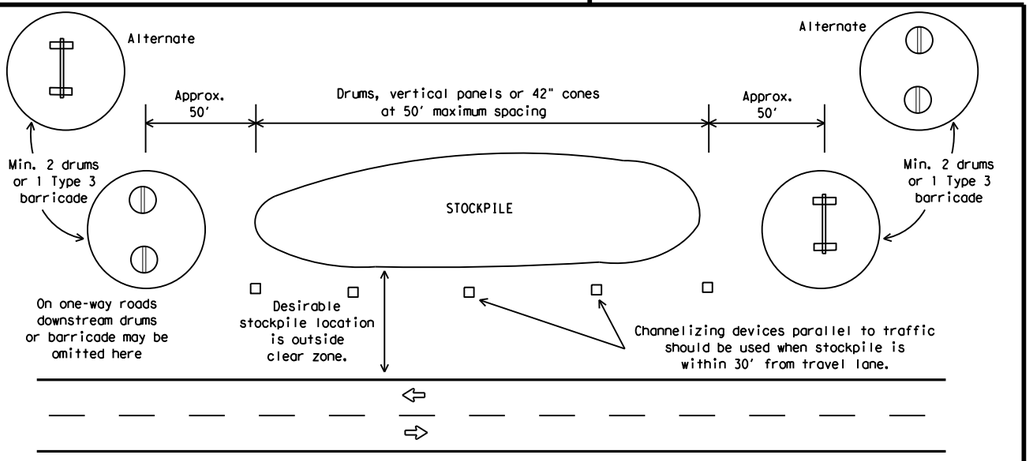
PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

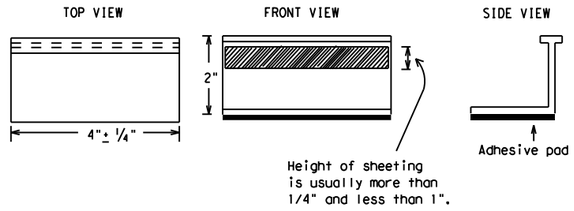
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

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BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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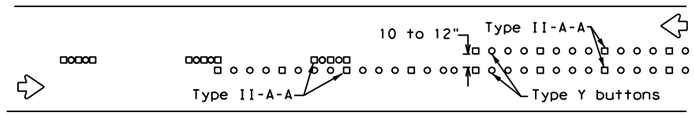
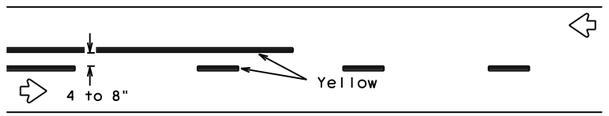
PAVEMENT MARKING PATTERNS

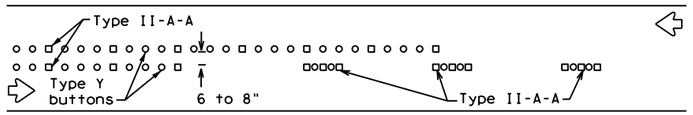
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



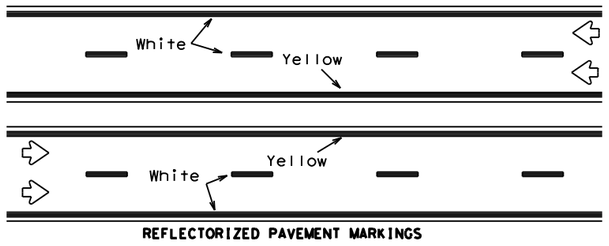
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



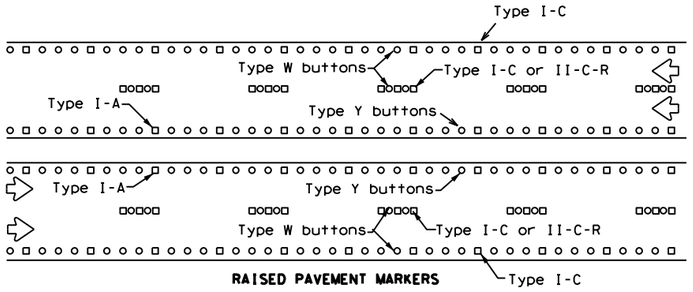
RAISED PAVEMENT MARKERS - PATTERN B

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

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



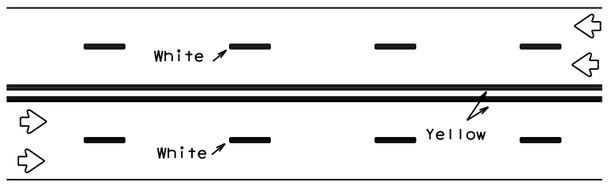
REFLECTORIZED PAVEMENT MARKINGS



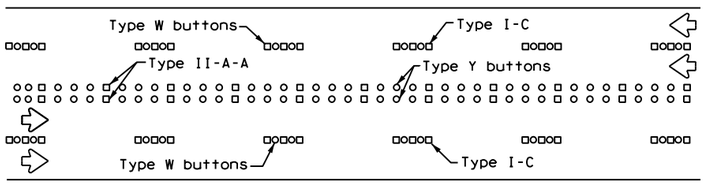
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



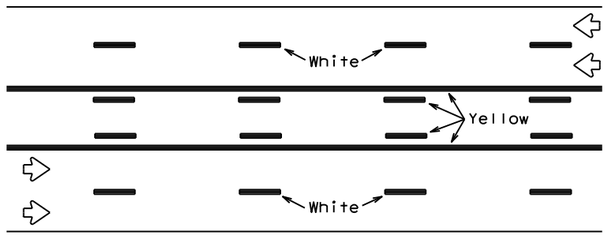
REFLECTORIZED PAVEMENT MARKINGS



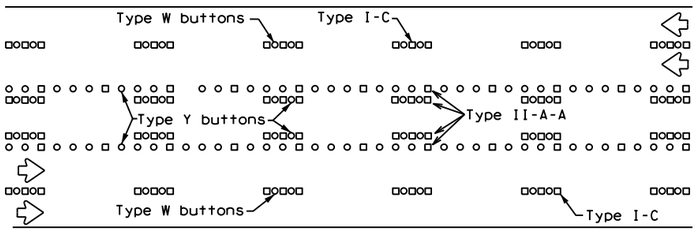
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

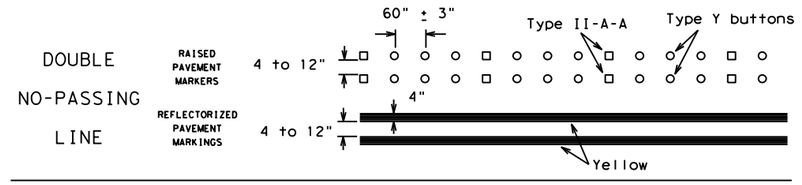
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

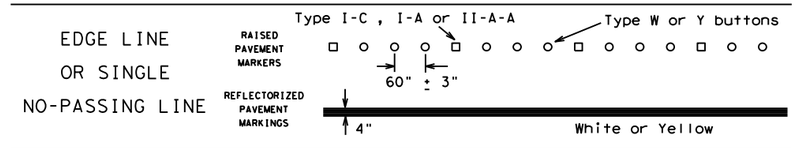
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

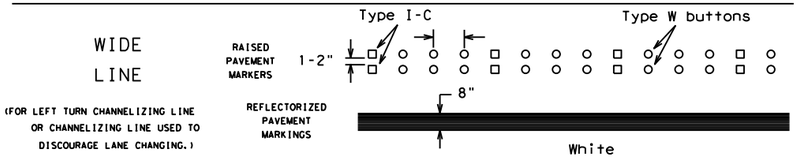


EDGE LINE OR SINGLE NO-PASSING LINE



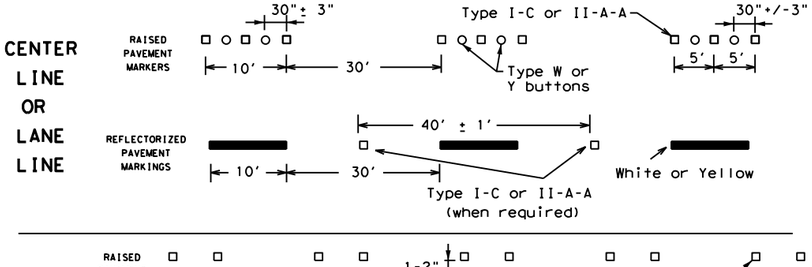
WIDE LINE

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

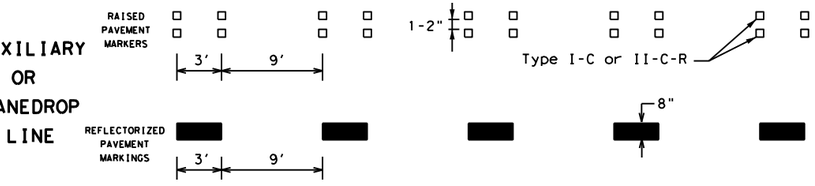


BROKEN LINES

CENTER LINE OR LANE LINE

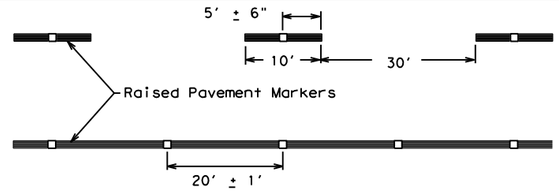


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0904	00	199	VARIOUS
	DIST	COUNTY		SHEET NO.
	AMA	POTTER		17

DATE: 1/21/2022 10:40:29 AM
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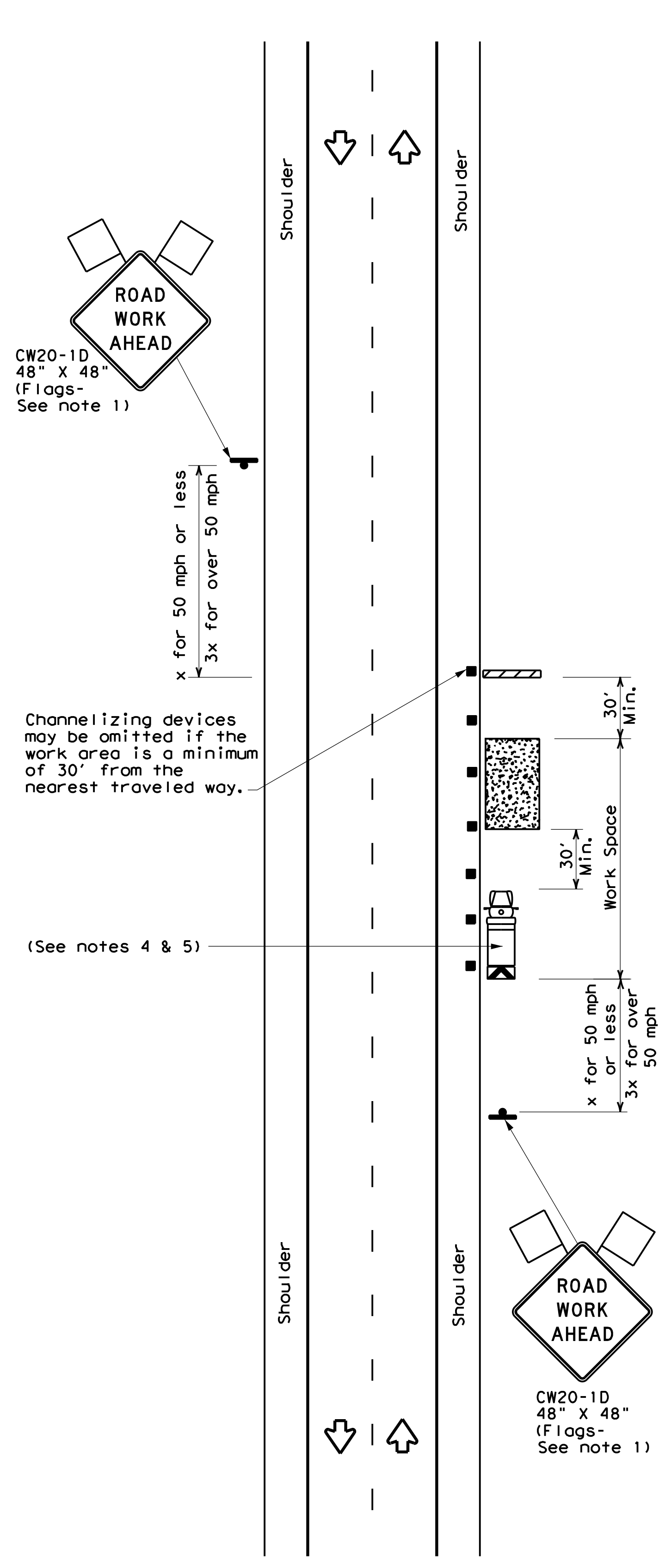
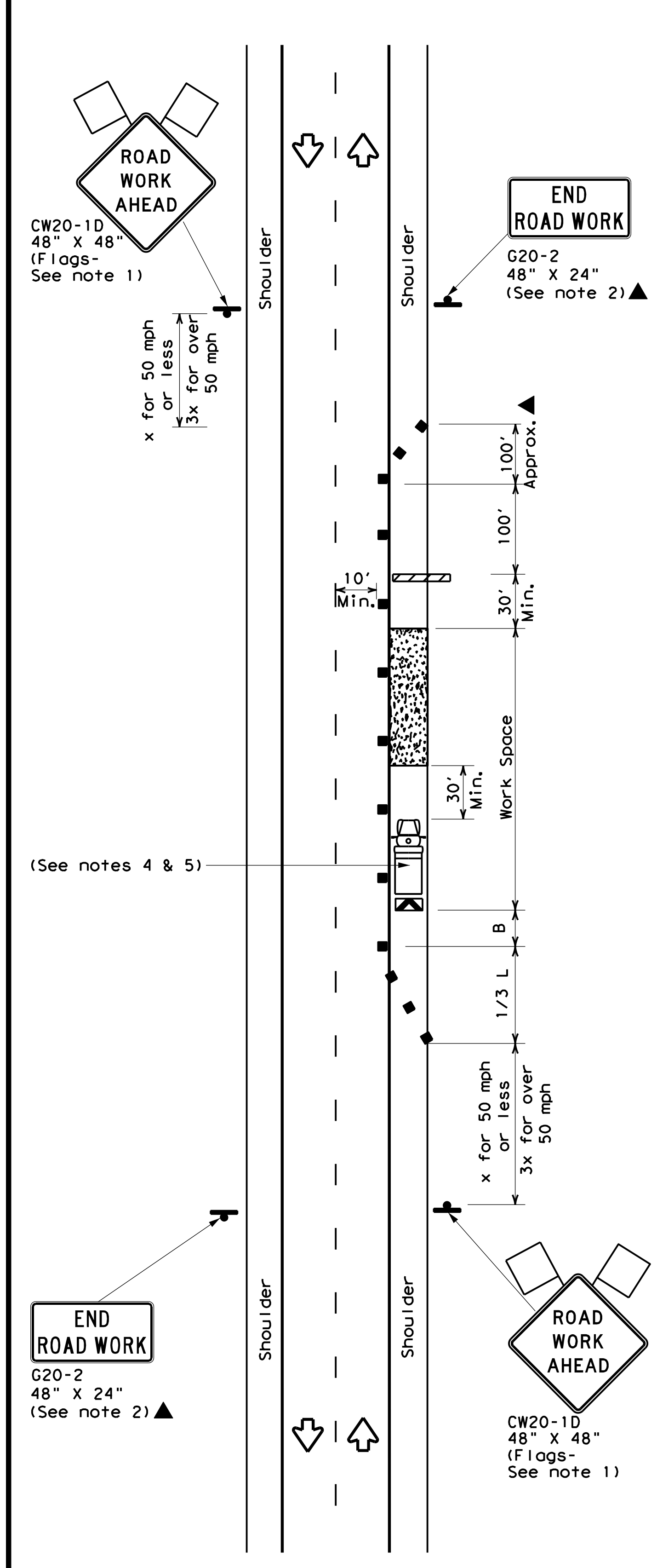


TCP (2-1a)

WORK SPACE NEAR SHOULDER

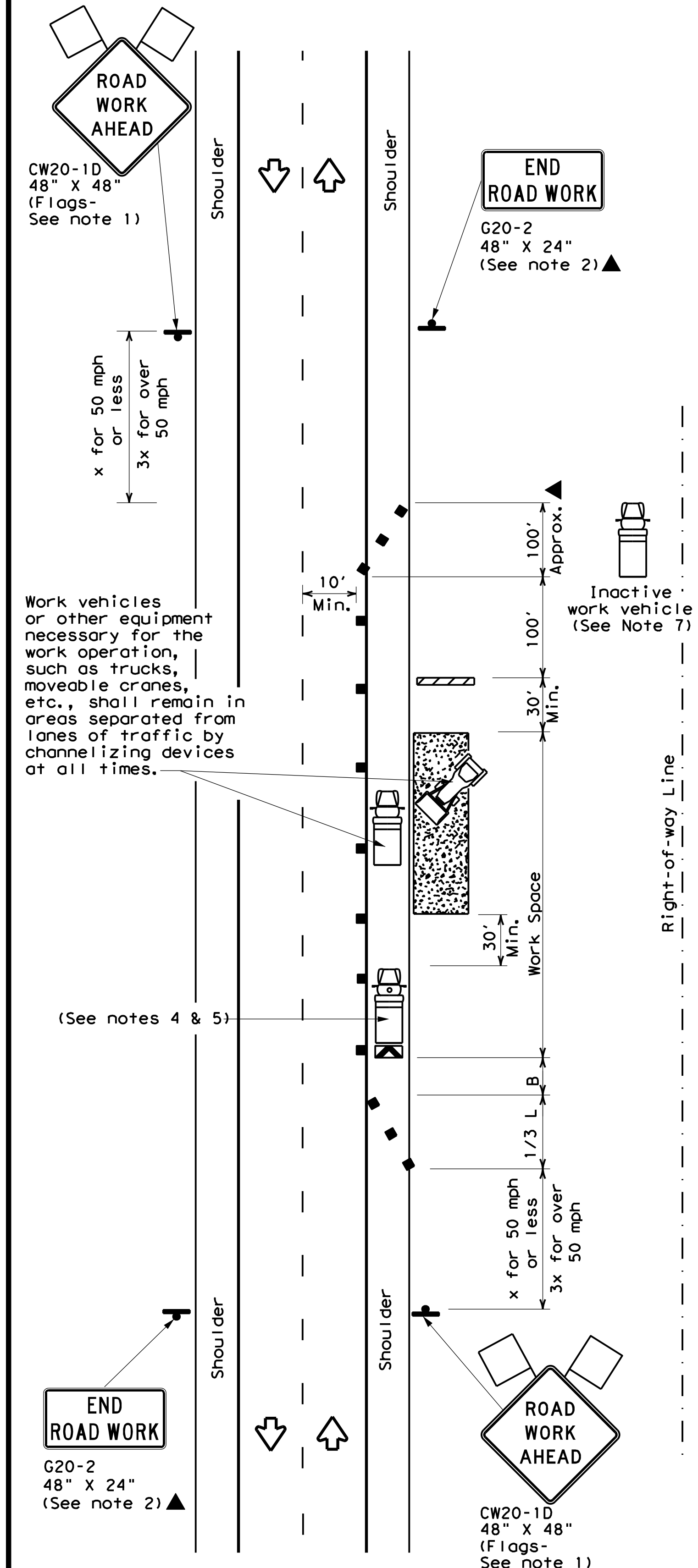
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER

Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER

Conventional Roads

LEGEND

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

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

* Conventional Roads Only

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

TYPICAL USAGE

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0904	00	199	VARIOUS
	DIST	COUNTY		SHEET NO.
	AMA	POTTER		18

DATE: 1/21/2022 10:40:33 AM
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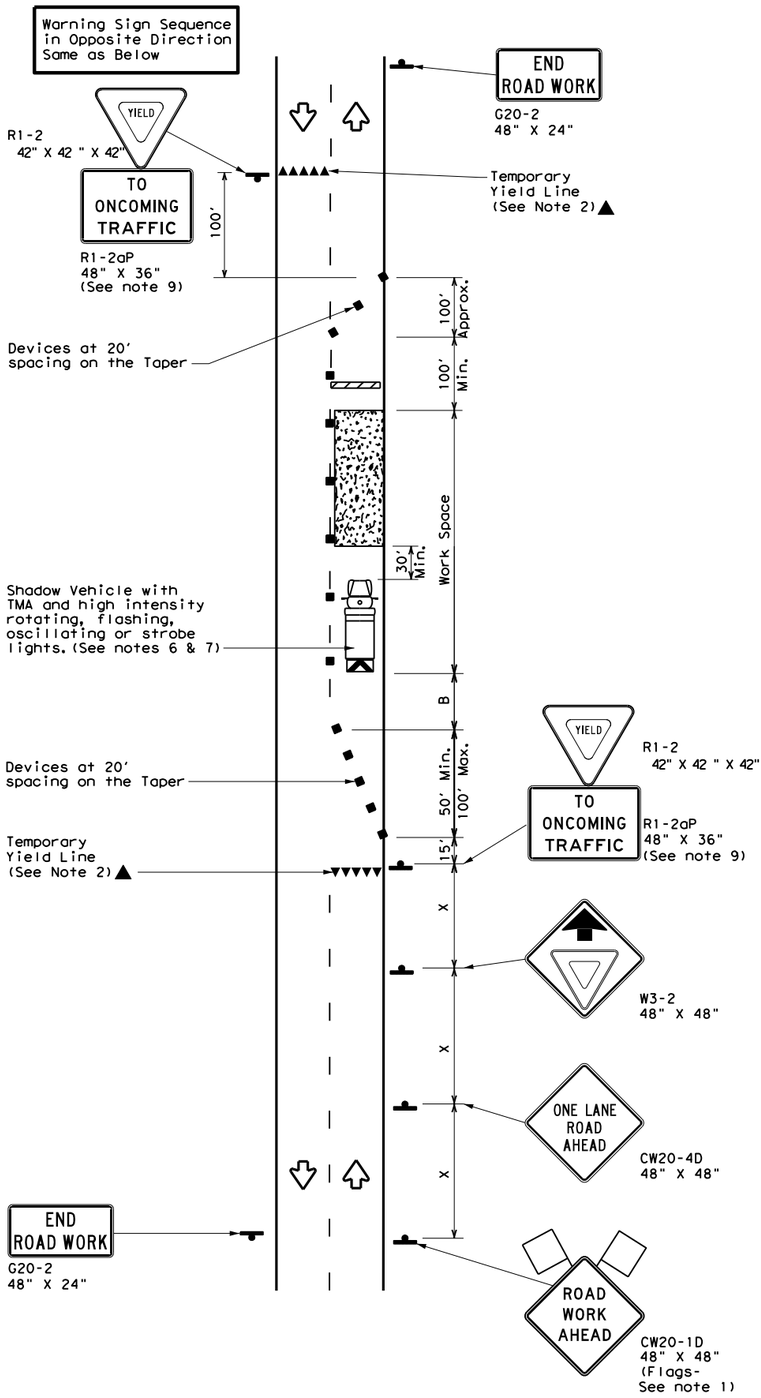
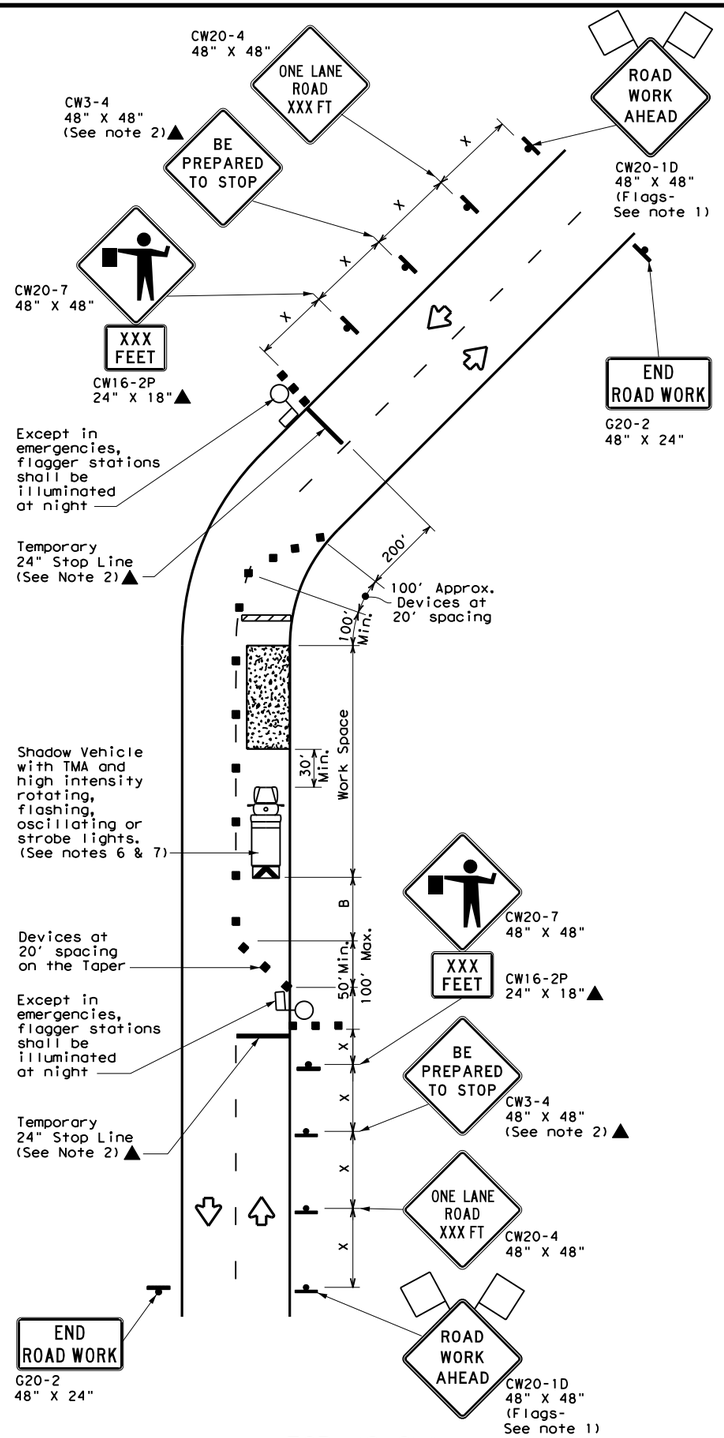


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

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

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

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

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

GENERAL NOTES

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

TCP (2-2a)

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

TCP (2-2b)

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0904	00	199	VARIOUS
	DIST	COUNTY		SHEET NO.
	AMA	POTTER		19

DATE: 1/21/2022 10:40:38 AM
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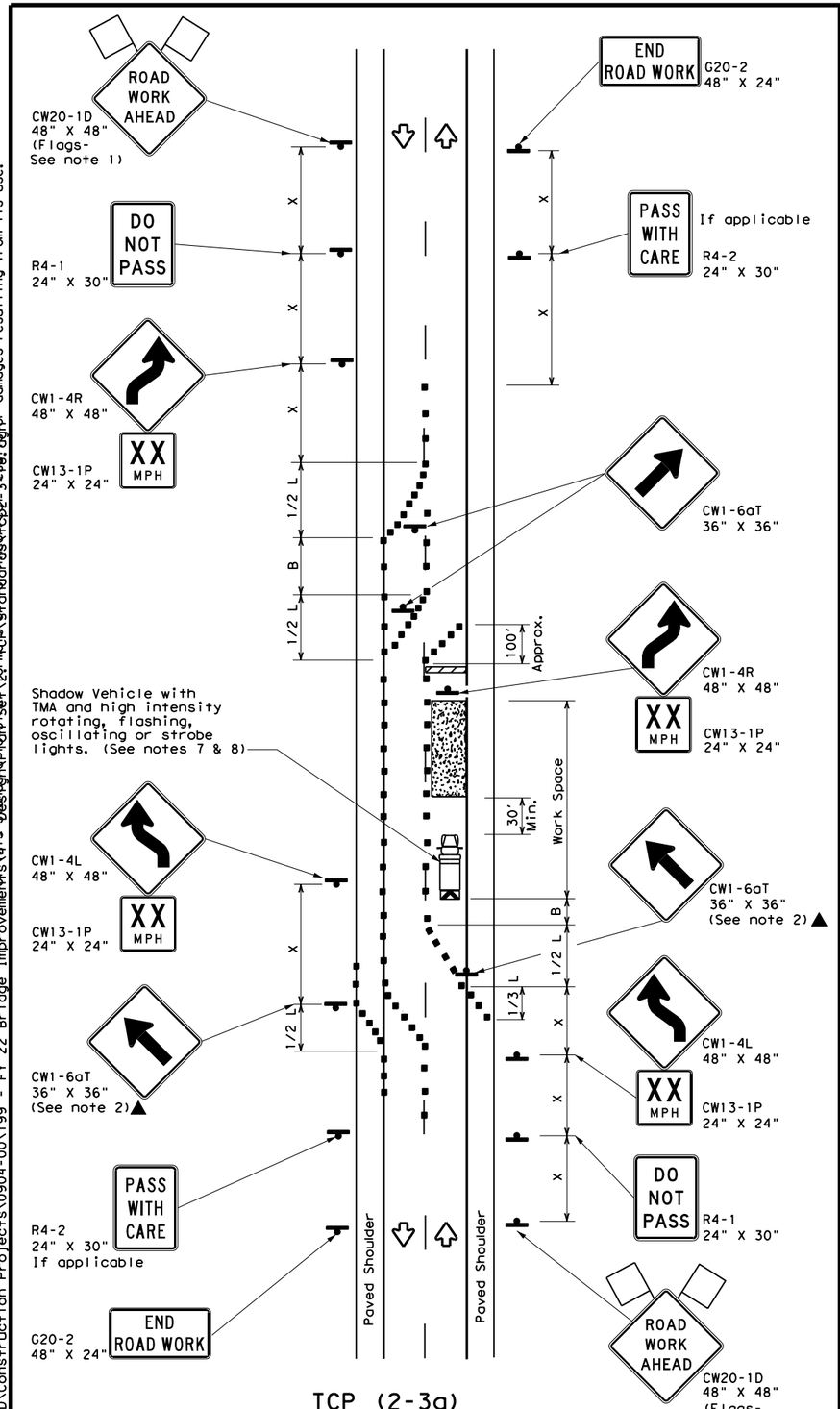
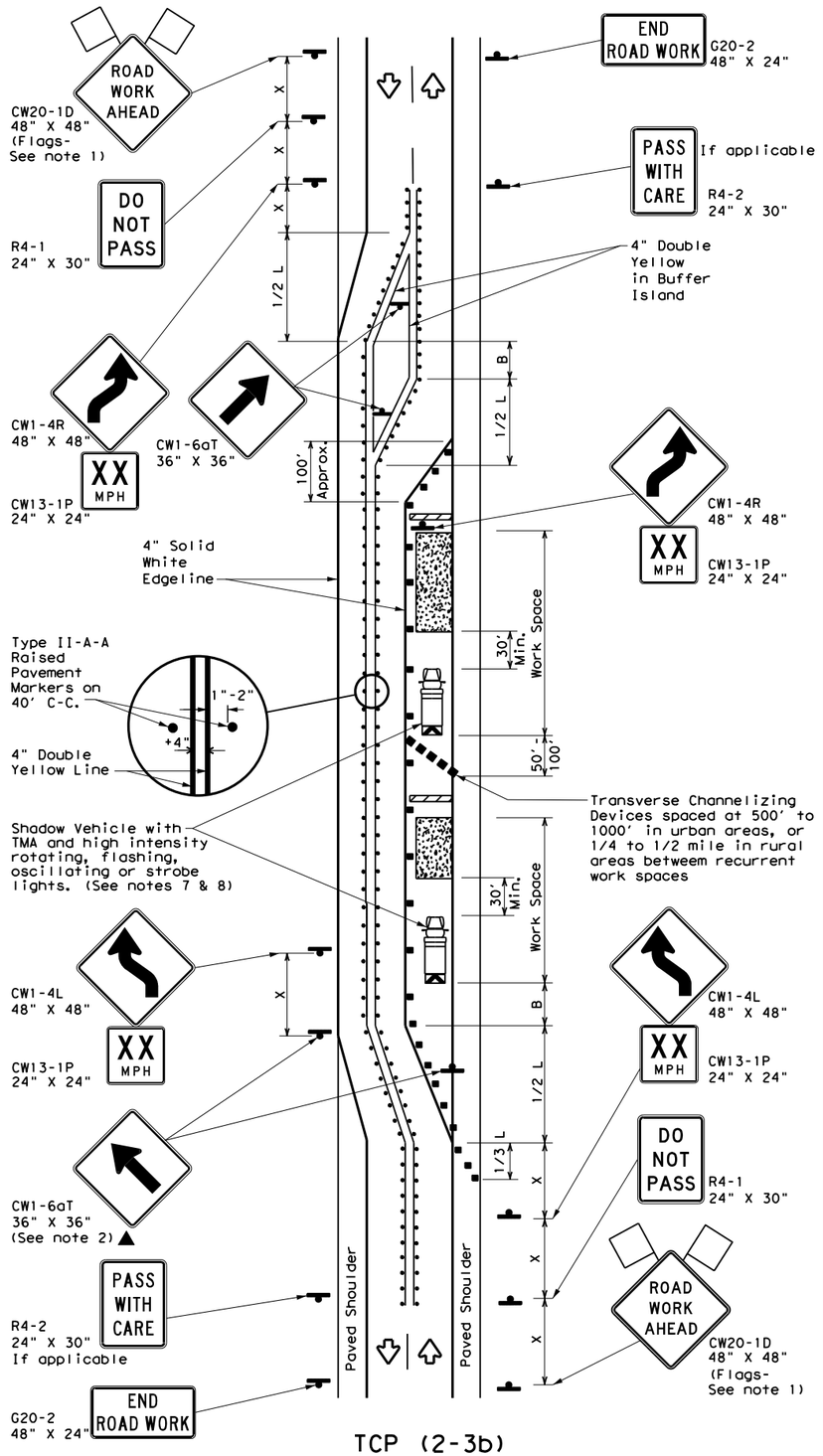


TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-3a)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-18

FILE: tcp(2-3)-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0904	00	199	VARIOUS
8-95 3-03	DIST	COUNTY		SHEET NO.
1-97 2-12	AMA	POTTER		20
4-98 2-18				

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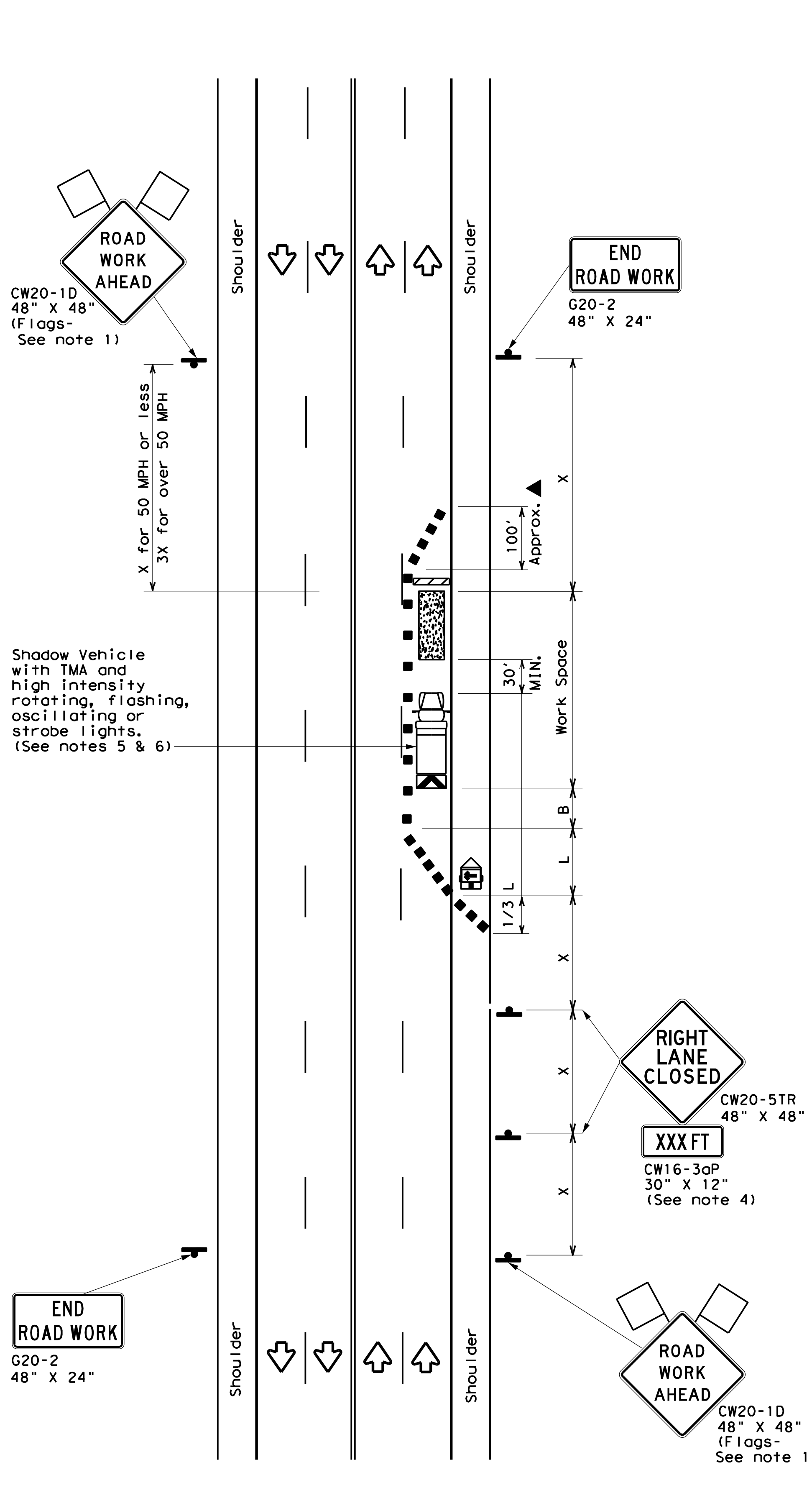
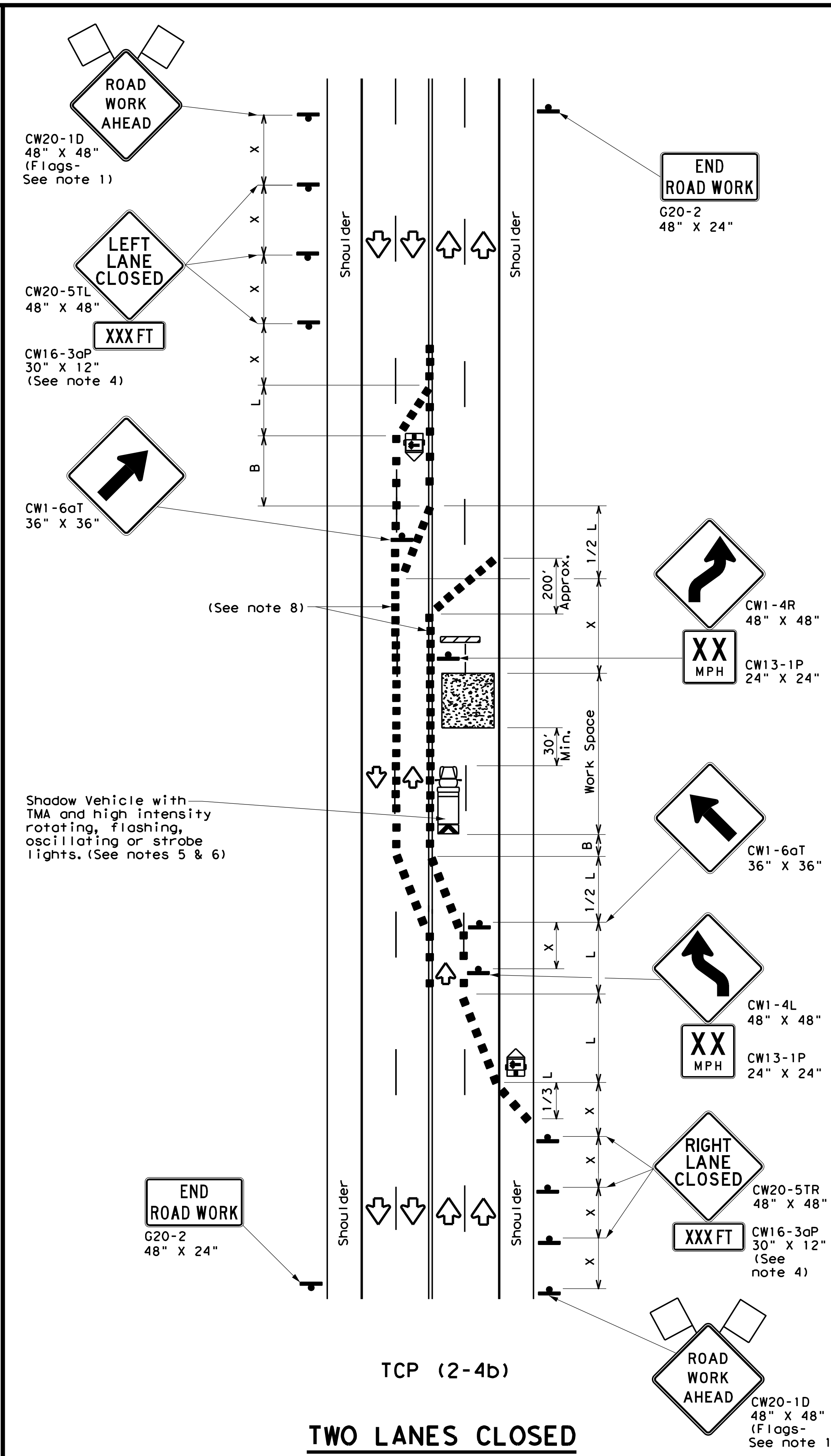


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

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

* Conventional Roads Only

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

TYPICAL USAGE

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0904	00	199	VARIOUS
	DIST		COUNTY	SHEET NO.
	AMA		POTTER	21

DATE: 1/21/2022 10:40:47 AM
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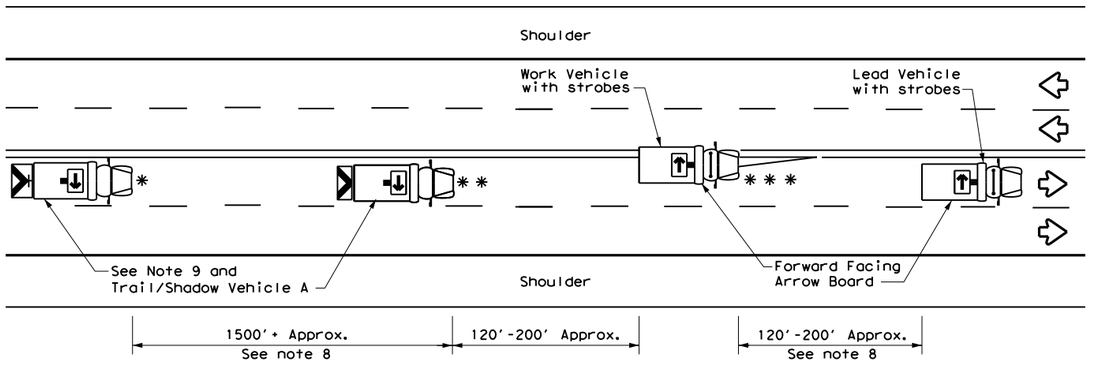
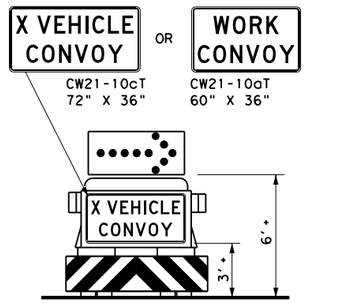


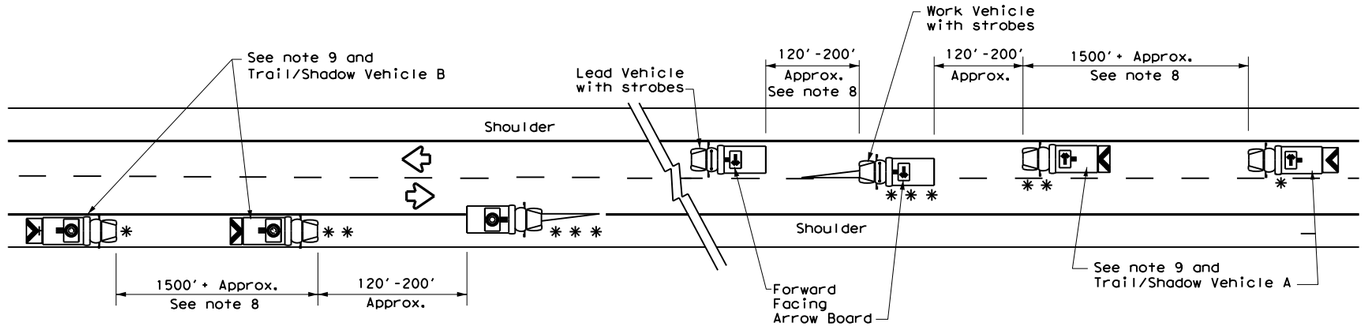
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

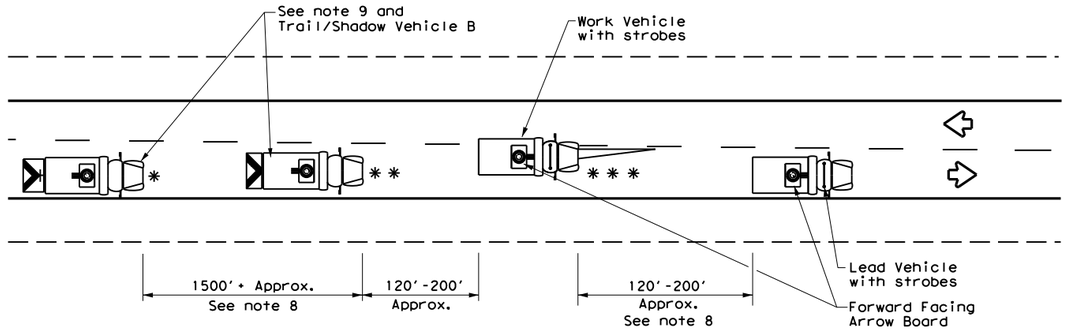


WORK ON SHOULDER

WORK ON TRAVEL LANE

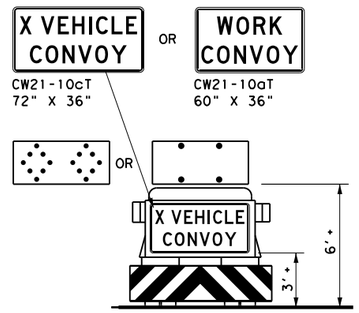
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

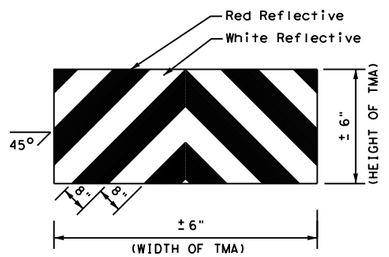
with Flashing Arrow Board in CAUTION display

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

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. "X VEHICLE CONVOY" (CW21-10cT) or "WORK CONVOY" (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped "WORK CONVOY"(CW21-10T) or "X VEHICLE CONVOY" (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0904	00	199	VARIOUS
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	AMA	POTTER		22

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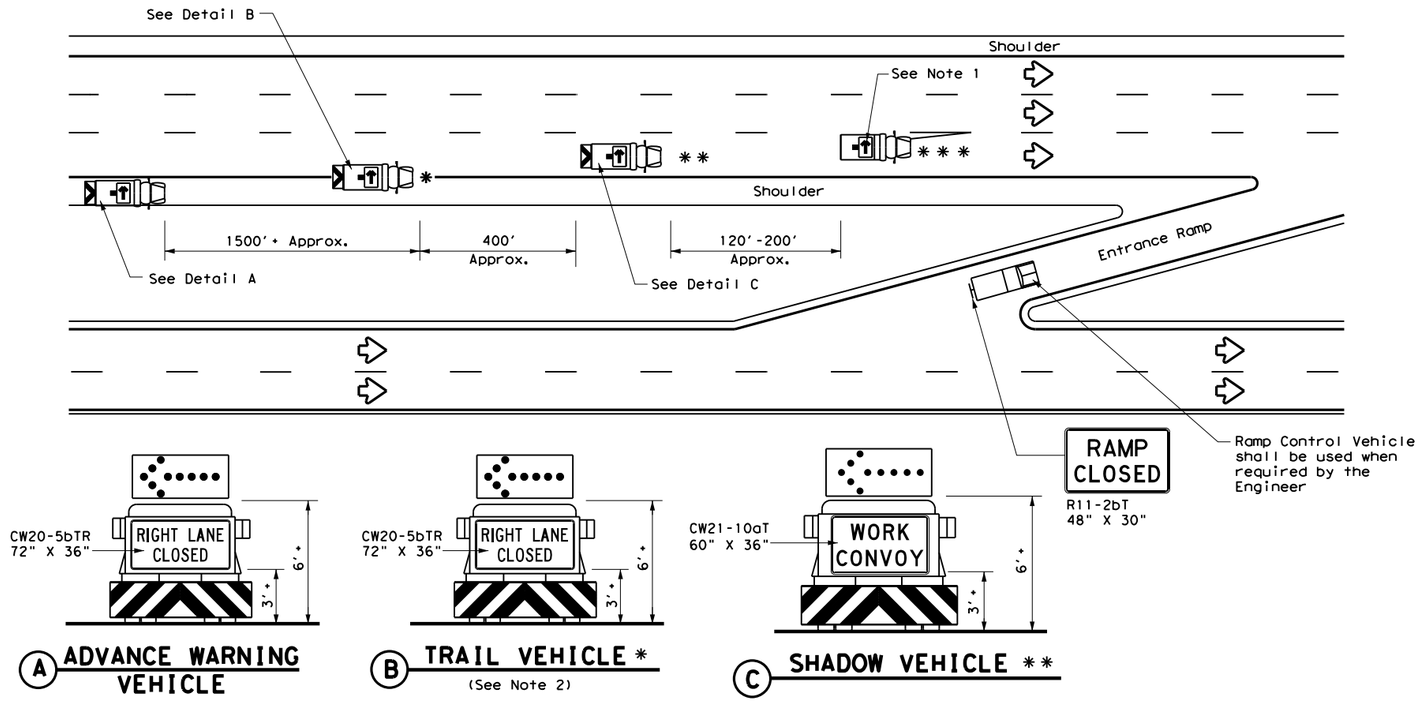
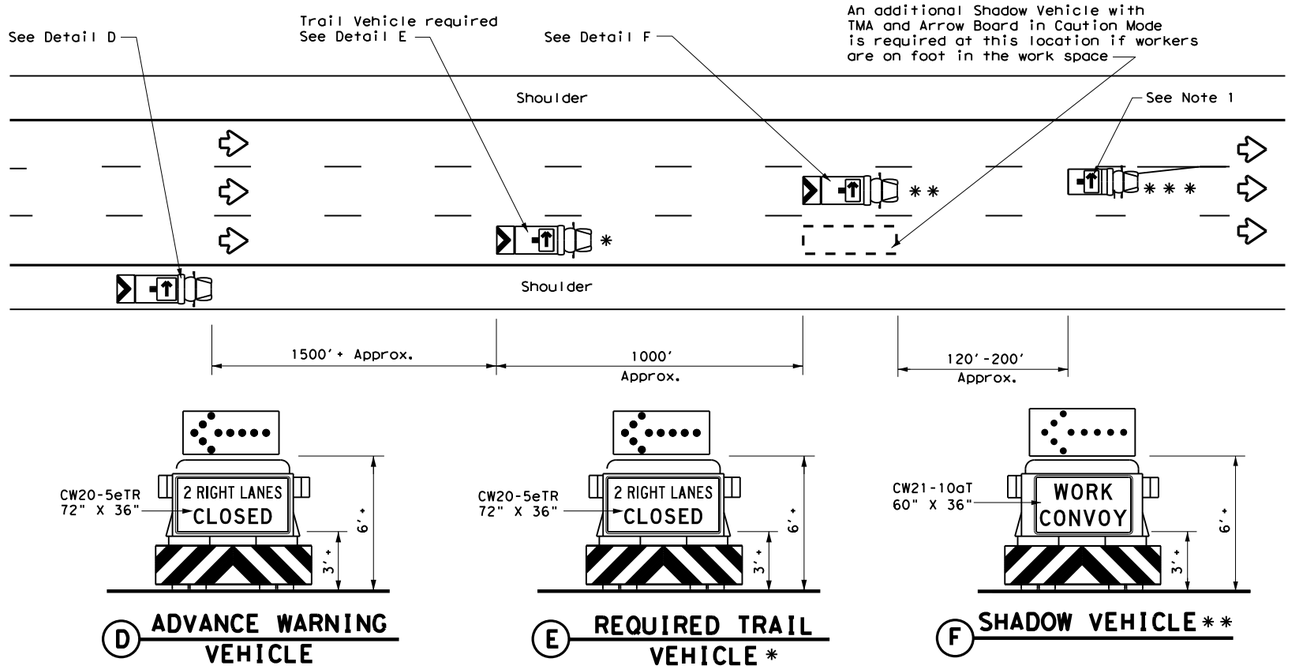


RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



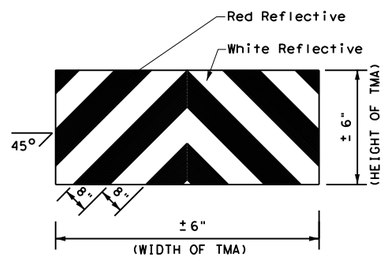
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0904	00	199	VARIOUS
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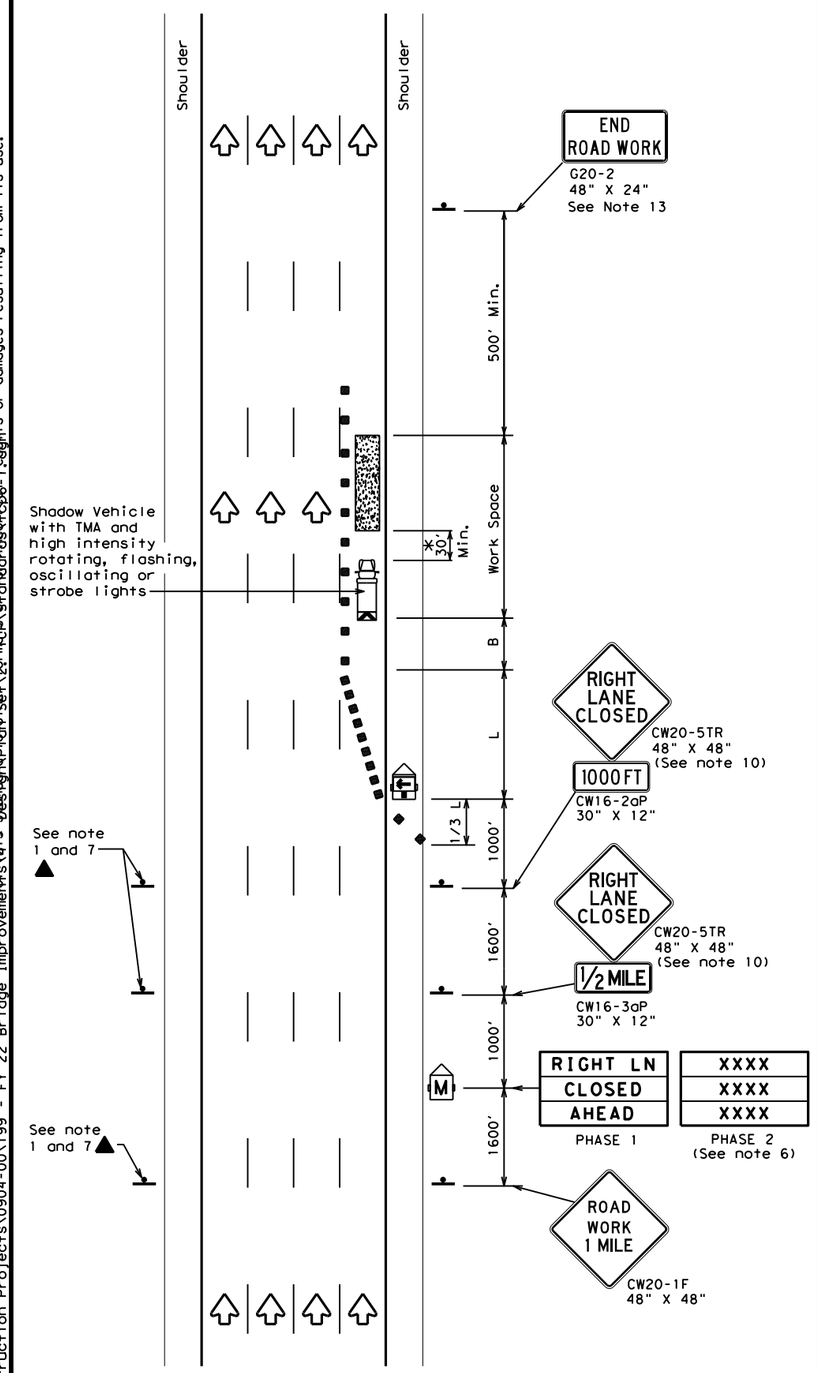
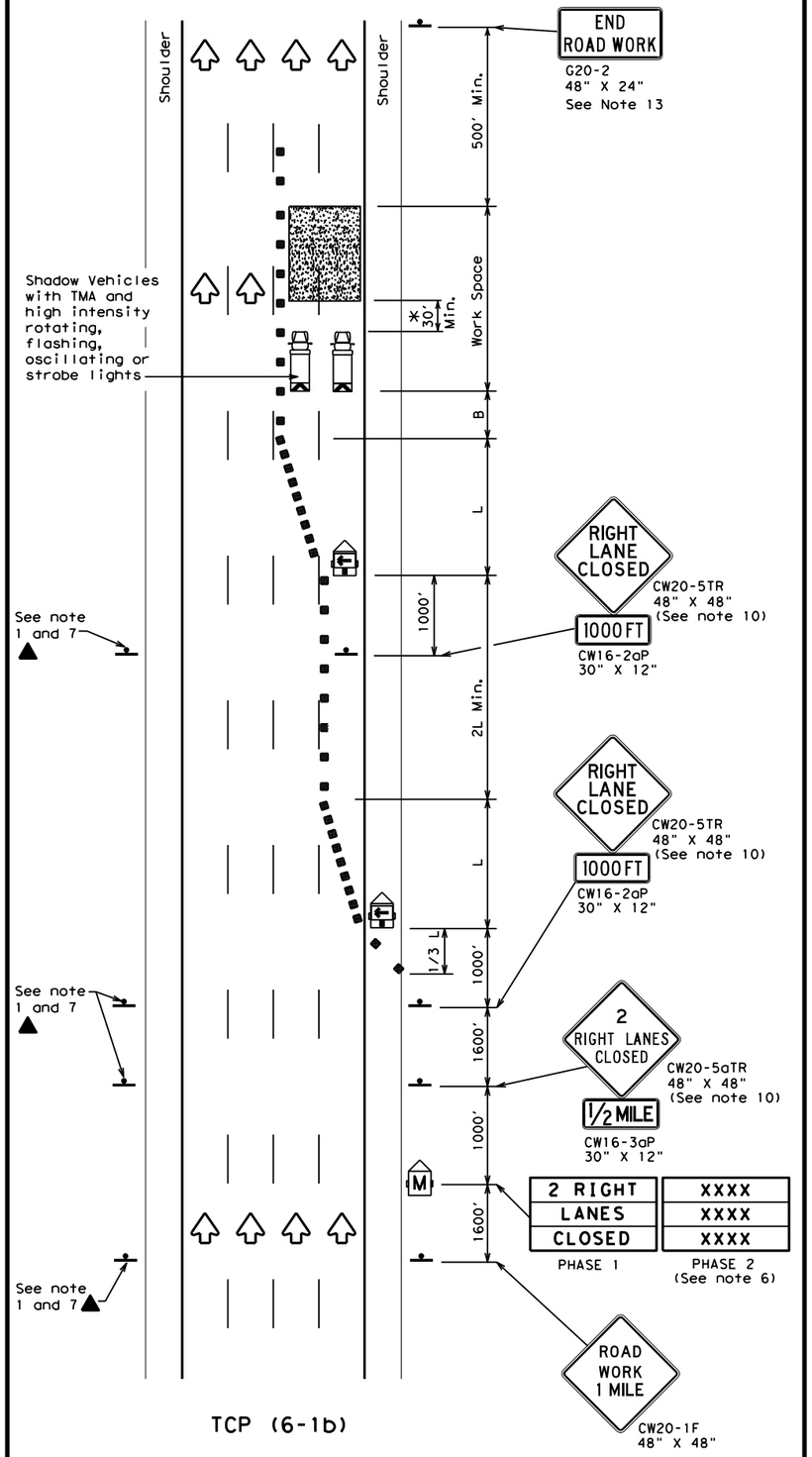
	AMA	POTTER		23

176



TCP (6-1a)

TYPICAL FREEWAY ONE LANE CLOSURE



TCP (6-1b)

TYPICAL FREEWAY TWO LANE CLOSURE

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

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

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

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

GENERAL NOTES

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

TCP(6-1)-12

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©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0904	00	199	VARIOUS
8-12	DIST	COUNTY		SHEET NO.
	AMA	POTTER		24

201

DATE: 1/21/2022 10:40:56 AM
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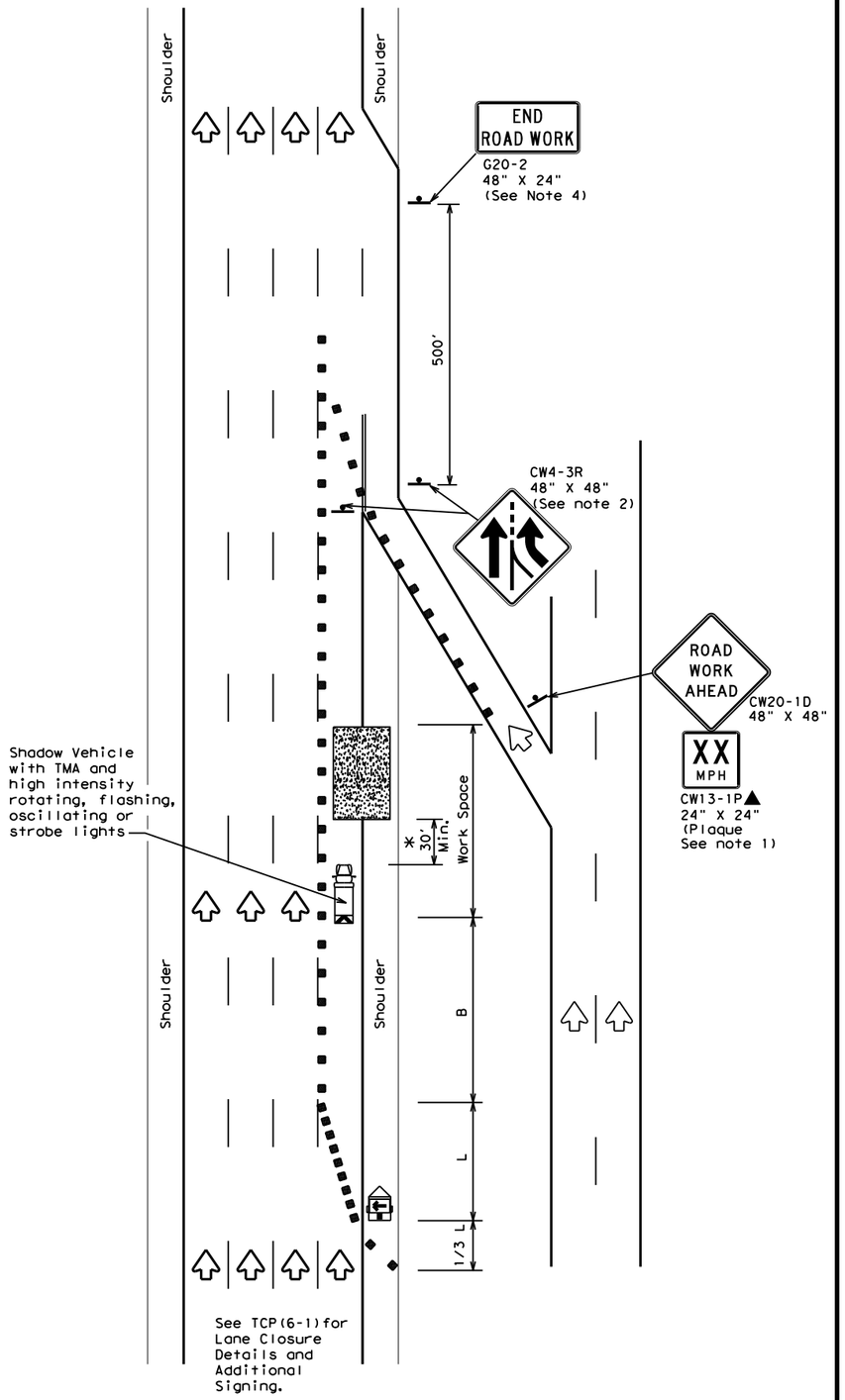
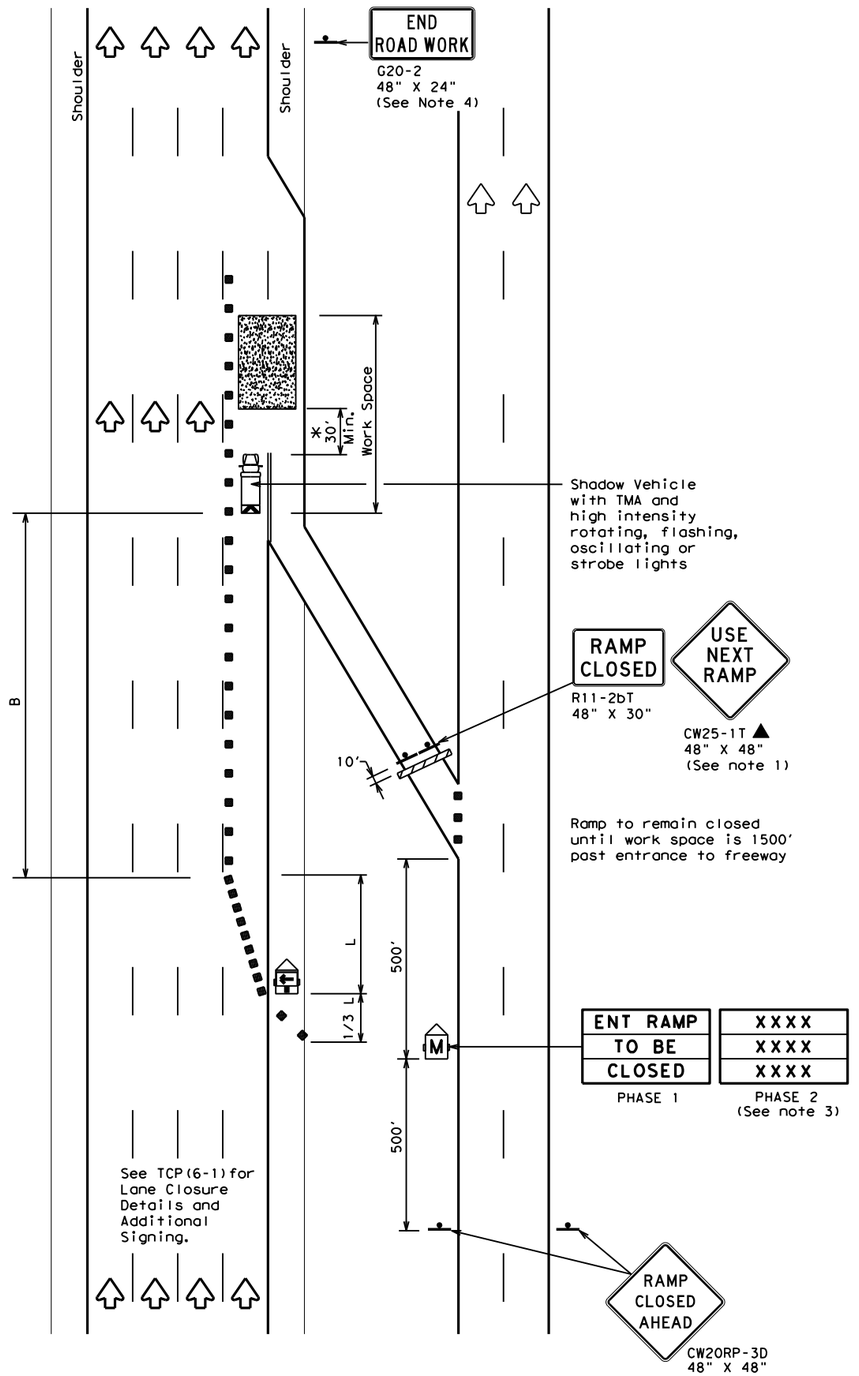


TCP (6-2a)

ENTRANCE RAMP OPEN
WORK WITHIN 500' OF RAMP



TCP (6-2b)

ENTRANCE RAMP CLOSED

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA NEAR RAMP

TCP(6-2)-12

FILE: tcp6-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0904	00	199	VARIOUS
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	AMA	POTTER		25

DATE: 1/21/2022 10:41:06 AM
FILE: T:\AMATPD\Construction Projects\0904-00\199 - FY 22 Bridge Improvements\...

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	M	Portable Changeable Message Sign (PCMS)
┻	Sign	⇦	Traffic Flow
◇	Flag	○	Flagger

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

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

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

GENERAL NOTES:

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

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA BEYOND RAMP

TCP(6-3)-12

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© TxDOT	February 1994	CONT	SECT	JOB	HIGHWAY
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1-97 8-98 4-98 8-12		DIST	COUNTY		SHEET NO.
		AMA	POTTER		26

203

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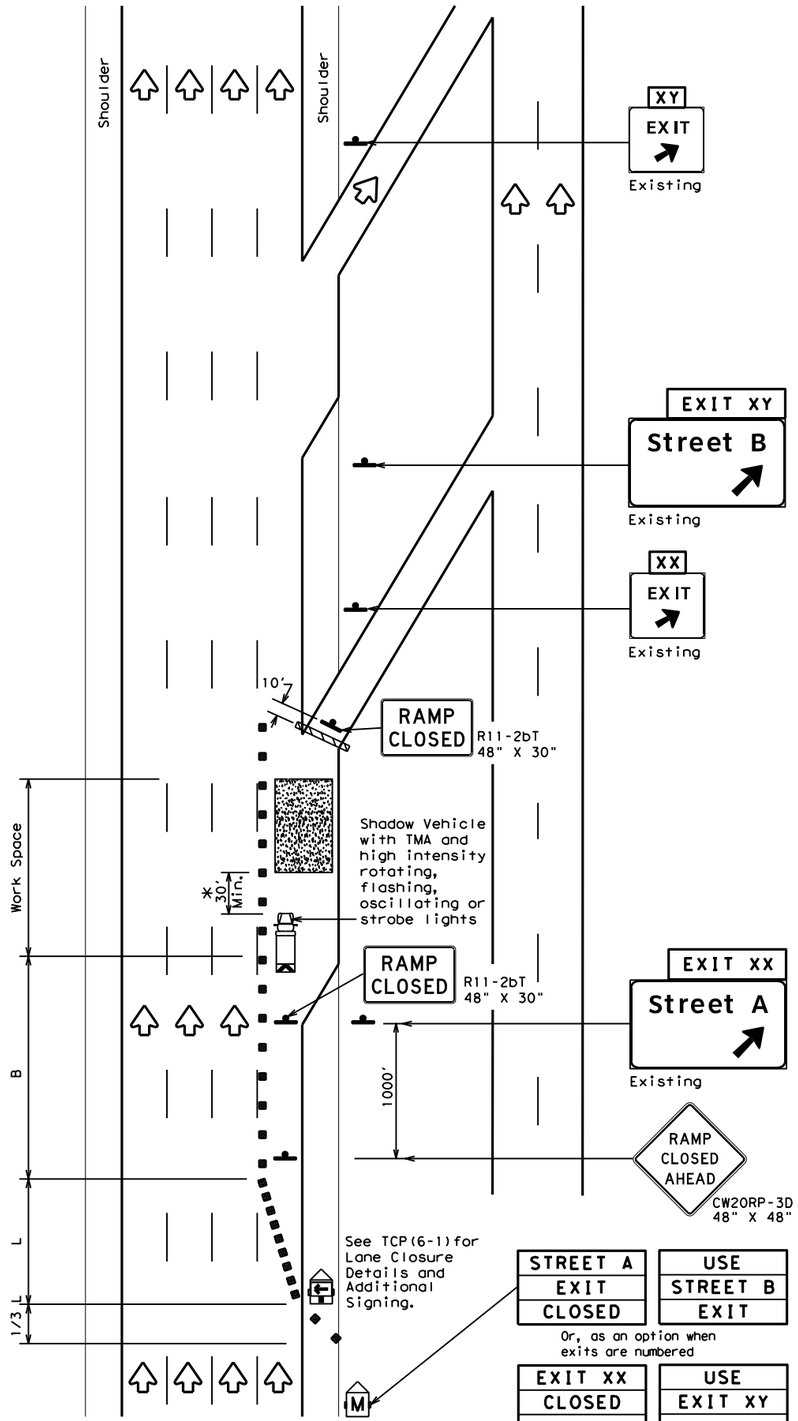
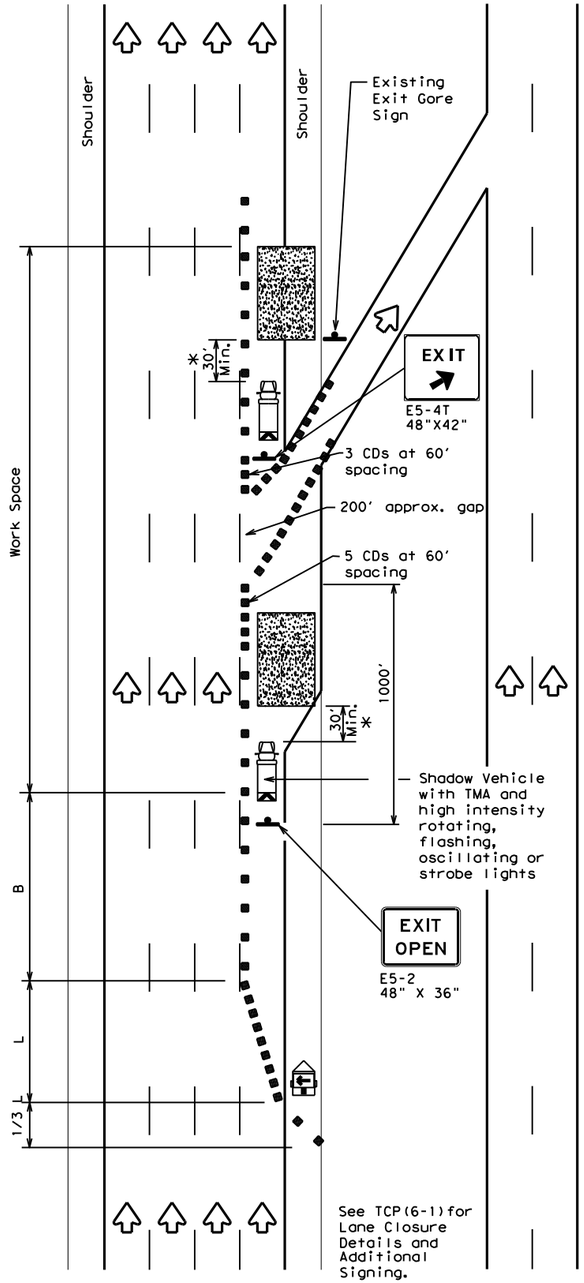


TCP (6-4a)

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	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA AT EXIT RAMP

TCP(6-4)-12

FILE: tcp6-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0904	00	199	VARIOUS
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	AMA	POTTER		27

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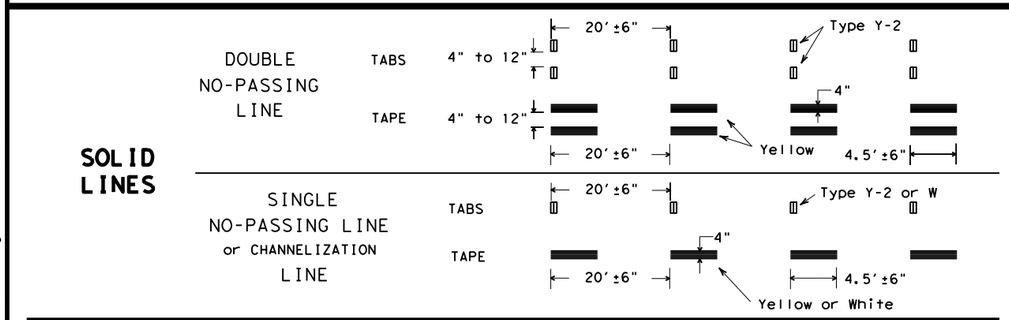
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



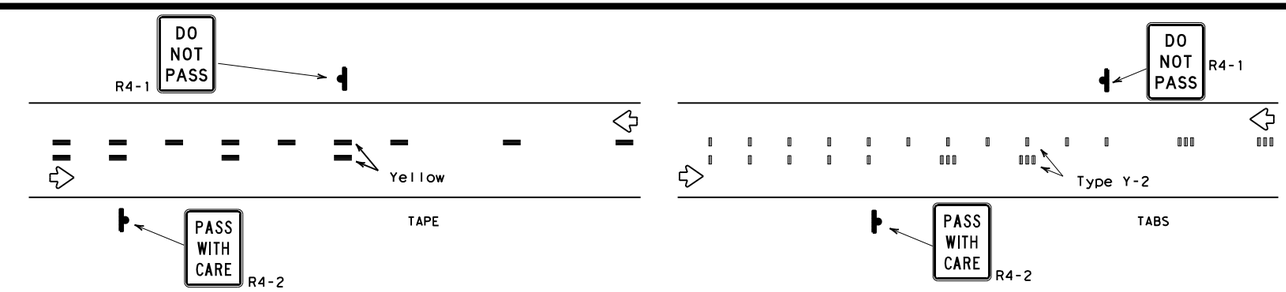
NOTES:

1. Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible-reflective roadway marker tabs unless otherwise specified elsewhere in plans.
2. Short term pavement markings shall NOT be used to simulate edge lines.
3. Dimensions indicated on this sheet are typical and approximate. Variations in size and height may occur between markers or devices made by manufacturers, by as much as 1/4 inch, unless otherwise noted.
4. Temporary flexible-reflective roadway marker tabs will require normal maintenance replacement when used on roadways with an ADT per lane of up to 7500 vehicles with no more than 10% truck mix. When roadways exceed these values, additional maintenance replacement of devices should be planned.
5. No segment of roadway open to traffic shall remain without permanent pavement markings for a period greater than 14 calendar days. The Contractor will be responsible for maintaining short term pavement markings until permanent pavement markings are in place. When the Contractor is responsible for placement of permanent pavement markings, no segment of roadway shall remain without permanent pavement markings for a period greater than 14 calendar days unless weather conditions prohibit placement. Permanent pavement markings shall be placed as soon as weather permits.
6. For two lane, two-way roadways, DO NOT PASS signs shall be erected to mark the beginning of sections where passing is prohibited and PASS WITH CARE signs shall be erected to mark the beginning of sections where passing is permitted. Signs shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and may be used to indicate the limits of no-passing zones for up to 14 calendar days. Permanent pavement markings should then be placed.
7. For low volume two lane, two-way roadways of 4000 ADT or less, no-passing lines may be omitted when approved by the Engineer. DO NOT PASS and PASS WITH CARE signs shall be erected (see note 6).
8. For exit gores where a lane is being dropped place wide gore markings or retroreflective channelizing devices to guide motorist through the exit. If channelizing devices are to be used it should be noted elsewhere in the plans. One piece cones are not allowed for this purpose.

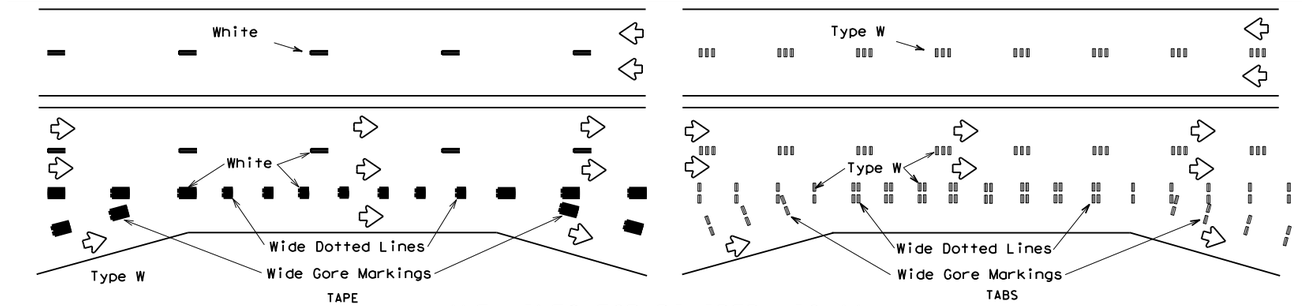
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

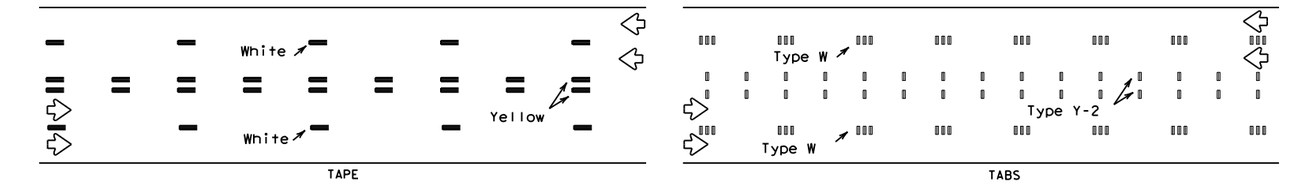
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



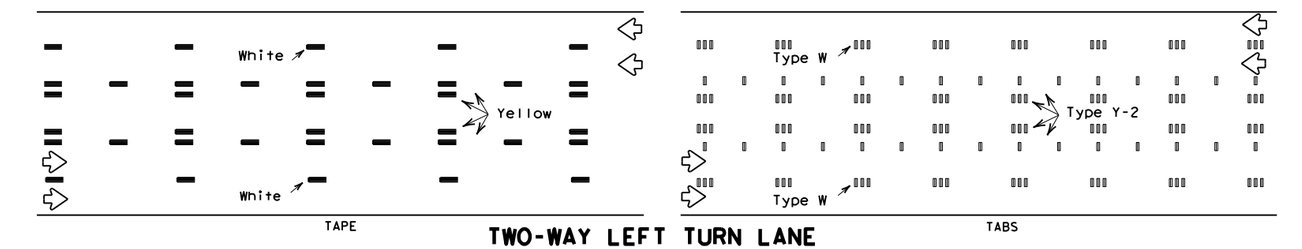
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



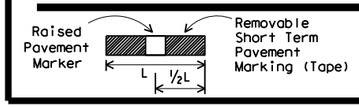
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



If raised pavement markers are used to supplement REMOVABLE short term markings, the markers shall be applied to the top of the tape at the approximate mid length of the tape. This allows an easier removal of raised markers and tape.

PREFABRICATED PAVEMENT MARKINGS

1. Temporary Removable Prefabricated Pavement Markings shall meet the requirements of DMS-8241.
2. Non-removable Prefabricated Pavement Markings shall meet the requirements of either DMS-8240 "Permanent Prefabricated Pavement Markings" or DMS-8243 "Temporary Costruction-Grade Prefabricated Pavement Markings."

RAISED PAVEMENT MARKERS

1. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and DMS-4200.

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

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

FILE:	wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS		0904	00	199	VARIOUS
1-97		DIST	COUNTY		SHEET NO.
3-03		AMA	POTTER		28
7-13					

DATE:
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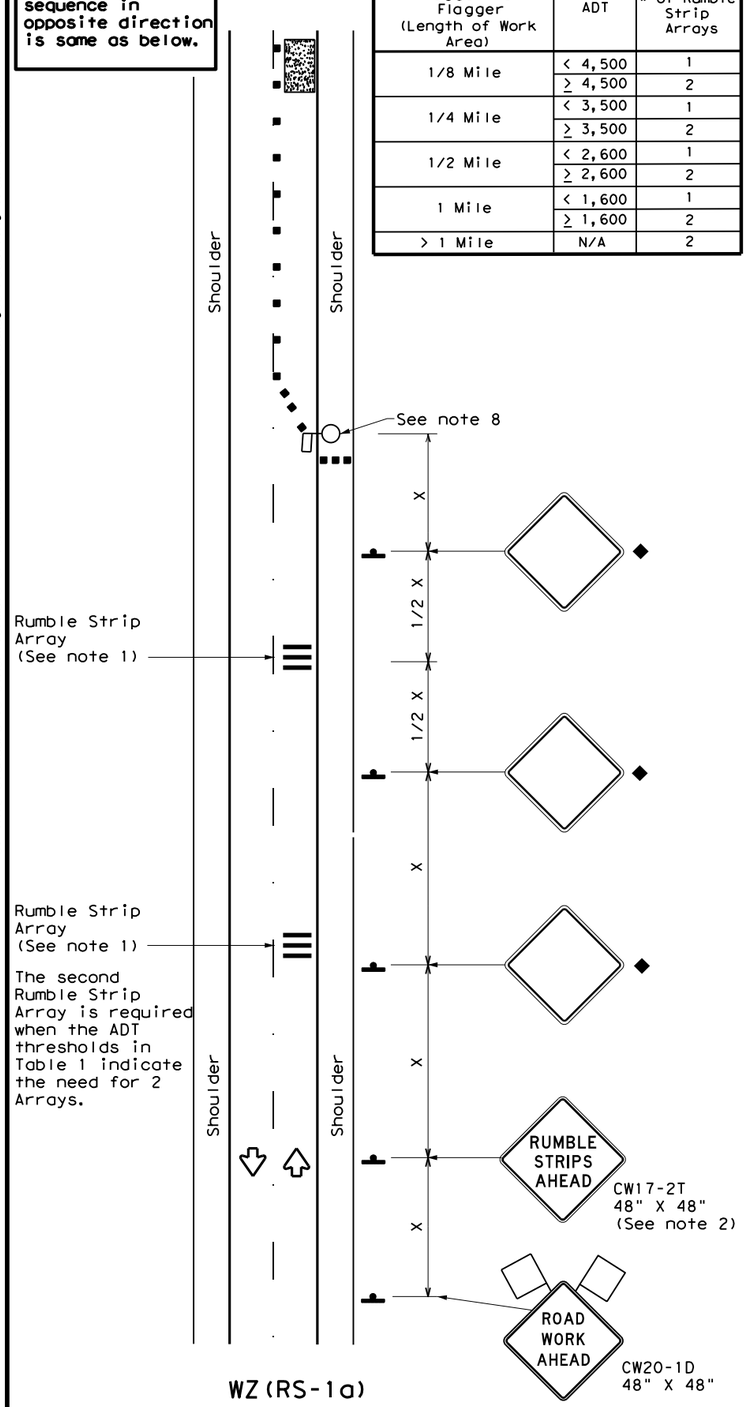
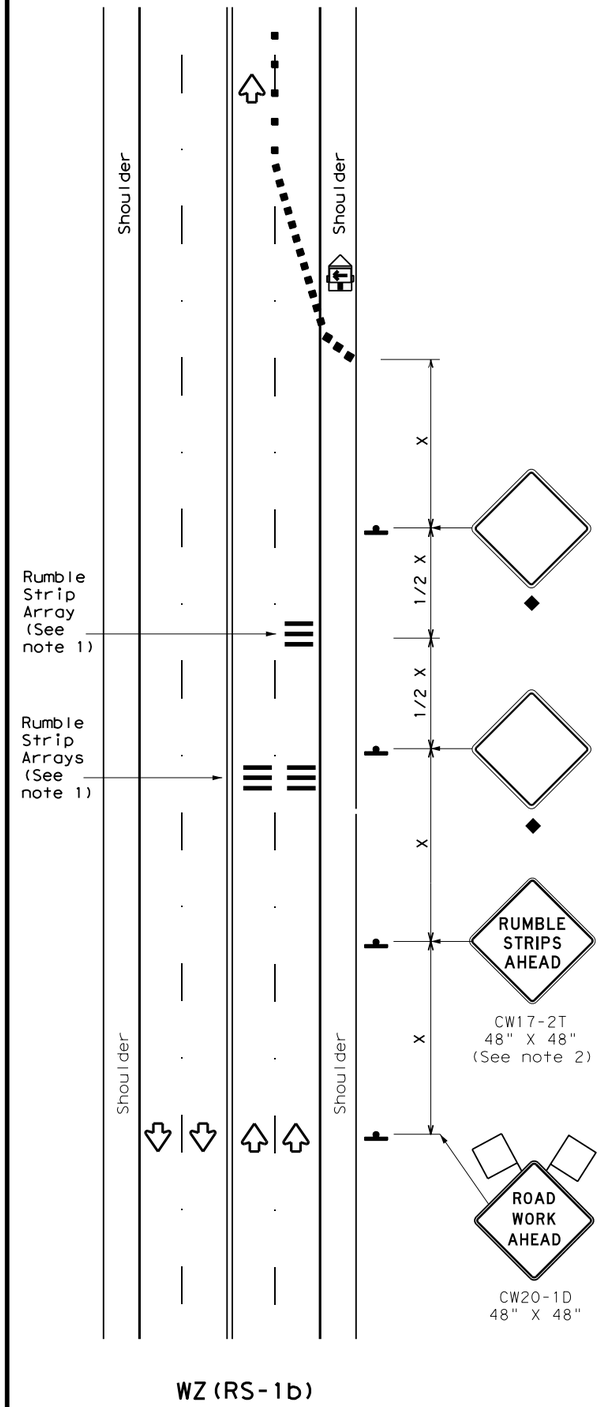
Warning sign and rumble strip sequence in opposite direction is same as below.

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



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

* Conventional Roads Only

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

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

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

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

TABLE 2	
Speed	Approximate distance between strips in an array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
= 60 MPH	20'
≥ 65 MPH	* 35' +

Texas Department of Transportation

Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	AMA	POTTER		29

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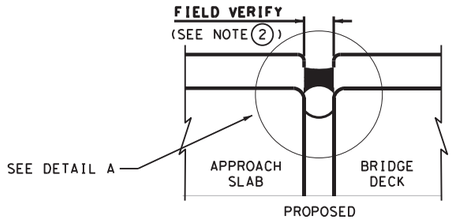
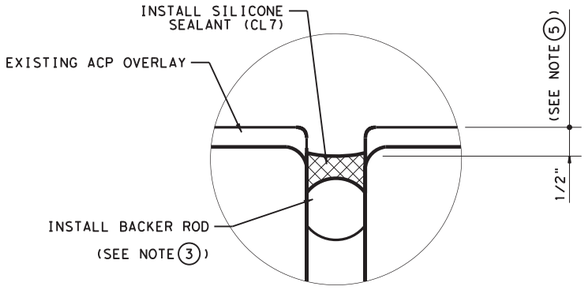


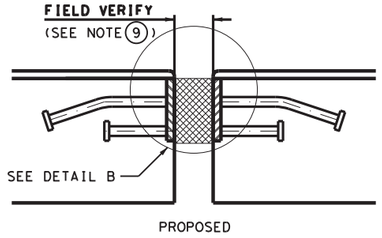
TYPE A
JOIN WITH SILICONE SEAL



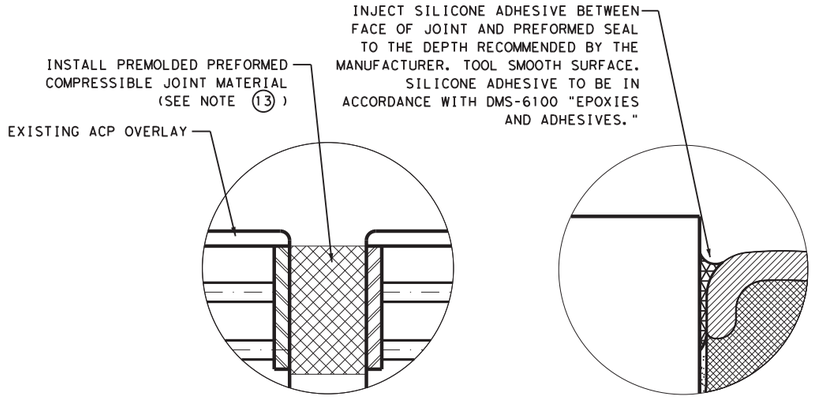
DETAIL A

PROCEDURE FOR CLEANING AND SEALING EXISTING JOINT WITH SILICONE SEAL

1. CLEAN JOINT OPENING OF ALL OLD EXPANSION MATERIALS/DEVICES, DIRT, AND ALL OTHER DELETERIOUS MATERIALS IN ACCORDANCE WITH ITEM 438. "CLEANING AND SEALING JOINTS." CLEAN JOINT OUT FULL DEPTH OF THE JOINT DOWN TO THE CAPS. REMOVE ALL DEBRIS FROM CAPS, SUBSIDIARY TO ITEM 438.
2. CONTRACTOR IS REQUIRED TO VERIFY THE BRIDGE JOINT OPENING WIDTHS PRIOR TO ORDERING MATERIALS.
3. OBTAIN APPROVAL OF CLEANED JOINT PRIOR TO PROCEEDING WITH JOINT SEALING OPERATION.
4. PLACE BACKER ROD INTO JOINT OPENING 1" BELOW THE TOP OF CONCRETE. THE BACKER ROD MUST BE 25% LARGER THAN JOINT OPENING AND MUST BE COMPATIBLE WITH THE SEALANT. WHEN SEALING JOINTS FOR SLAB SPANS, PAN GIRDER SPANS, OR BOX BEAM SPANS, FILL VOID BELOW BACKER ROD WITH EXTRUDED POLYSTYRENE FOAM. USE OF MULTIPLE PIECES TO CREATE A BACKER ROD CROSS SECTION IS NOT PERMITTED. TOP OF BACKER ROD MUST BE CONVEX AS SHOWN.
5. SEAL THE JOINT OPENING WITH A CLASS 7 SILICONE. RECESS SEAL 1/2" BELOW TOP OF CONCRETE IN TRAVEL LANES AND 1/8" BELOW TOP OF CONCRETE IN SHOULDERS.
6. REFER TO CLEAN AND SEAL JOINTS DETAIL PAGE 2 OF 2 FOR JOINT SEALANT TERMINATION DETAIL.
7. APPROVED MATERIALS LISTED IN THE MATERIALS PRODUCER LIST FOR DMS-6310 "JOINT SEALANT AND FILLERS". INSTALL PER MANUFACTURER'S RECOMMENDATION.



TYPE B
ARMOR JOINT

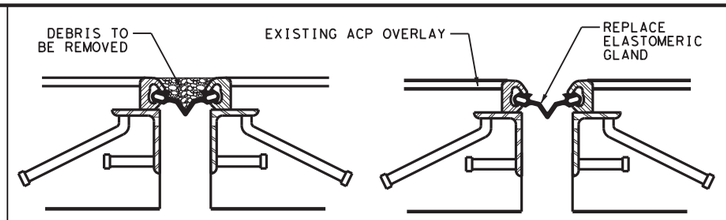


DETAIL B

DETAIL F

PROCEDURE FOR CLEANING AND SEALING EXISTING ARMOR JOINTS

8. CLEAN JOINT OPENING OF ALL OLD EXPANSION MATERIALS/DEVICES, DIRT, AND ALL OTHER DELETERIOUS MATERIALS IN ACCORDANCE WITH ITEM 438. "CLEANING AND SEALING JOINTS." CLEAN JOINT OUT FULL DEPTH OF THE JOINT DOWN TO THE CAPS. REMOVE ALL DEBRIS FROM CAPS, SUBSIDIARY TO ITEM 438.
9. CONTRACTOR IS REQUIRED TO VERIFY THE BRIDGE JOINT OPENING WIDTHS PRIOR TO ORDERING MATERIALS
10. ABRASIVE BLAST CLEAN TO EXISTING STEEL SURFACE WHERE PREMOLDED PREFORMED COMPRESSIBLE JOINT MATERIAL IS TO BE PLACED.
11. WIPE DOWN JOINT SURFACES TO REMOVE CONTAMINATES.
12. OBTAIN APPROVAL OF CLEANED JOINT PRIOR TO PROCEEDING WITH JOINT SEALING OPERATION.
13. CORRECTLY SIZE JOINT SEAL BASED ON FIELD MEASUREMENT AND IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. MULTIPLE SEAL WIDTHS MAY BE REQUIRED. ENSURE PROPER SEAL IS SELECTED FOR EACH JOINT. PROVIDE PREMOLDED PREFORMED COMPRESSIBLE JOINT MATERIAL 25% LARGER THAN THE JOINT OPENING.
14. REFER TO CLEAN AND SEAL JOINTS DETAIL PAGE 2 OF 2 FOR JOINT SEALANT TERMINATION DETAIL.
15. MASK AREAS ADJACENT TO JOINT OPENING SUFFICIENTLY TO KEEP EPOXY OFF DECK SURFACE.
16. APPLY EPOXY TO JOINT OPENING SIDE SURFACES AS PER MANUFACTURER'S RECCOMENDATIONS. EPOXY TO BE IN ACCORDANCE WITH DMS-6100 "EPOXIES AND ADHESIVES."
17. WHILE EPOXY IS STILL TACKY, REMOVE SHRINK WRAP FROM SEAL AND INSTALL IN JOINT OPENING.
18. RECESS TOP OF JOINT SEAL 1/2" IN TRAVEL LANES AND 1/4" IN SHOULDERS.
19. INJECT SILICONE ADHESIVE ALONG TOP INTERFACE SEAL WITH JOINT SIDE SURFACE ACCORDING TO MANUFACTURER'S RECOMENDATION. TOOL TO SPREAD ADHESIVE AS NECESSARY. SEE DETAIL F.



TYPE C CLEAN AND SEAL SEJ JOINT DETAIL

PROCEDURE FOR CLEANING AND SEALING EXISTING ARMOR JOINTS

20. CLEAN JOINT OPENING OF ALL OLD EXPANSION MATERIALS/DEVICES, DIRT, AND ALL OTHER DELETERIOUS MATERIALS IN ACCORDANCE WITH ITEM 438. "CLEANING AND SEALING JOINTS." CLEAN JOINT OUT FULL DEPTH OF THE JOINT DOWN TO THE CAPS. REMOVE ALL DEBRIS FROM CAPS, SUBSIDIARY TO ITEM 438.
21. CONTRACTOR IS REQUIRED TO VERIFY THE BRIDGE JOINT OPENING WIDTHS PRIOR TO ORDERING MATERIALS.
22. CORRECTLY SIZE ELASTOMERIC GLAND BASED ON FIELD MEASURMENT AND IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. MULTIPLE SEAL WIDTHS MAY BE REQUIRED. ENSURE PROPER SEAL IS SELECTED FOR EACH JOINT.
23. ABRASIVE BLAST CLEAN TO EXISTING STEEL SURFACE WHERE ELASTOMERIC GLAND IS TO BE PLACED.
24. WIPE DOWN JOINT SURFACES TO REMOVE CONTAMINATES.
25. OBTAIN APPROVAL OF CLEANED JOINT PRIOR TO PROCEEDING WITH JOINT SEALING OPERATION.
26. INSTALL ELASTOMERIC GLAND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS
27. REFER TO CLEAN AND SEAL JOINTS DETAIL PAGE 2 OF 2 FOR JOINT SEALANT TERMINATION DETAIL

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED
PROFESSIONAL ENGINEER

Casey B. Stripling

01-24-2022

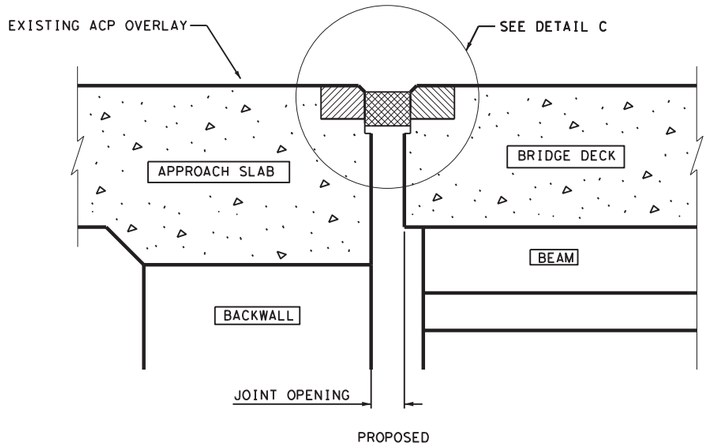
AMA FY 22 DBIP

CLEAN AND SEAL JOINTS DETAIL

SCALE: NTS

2022 Texas Department of Transportation

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		30

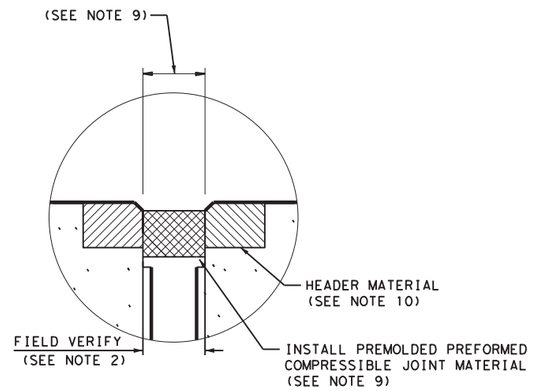


TYPE D HEADER JOINT

NTS

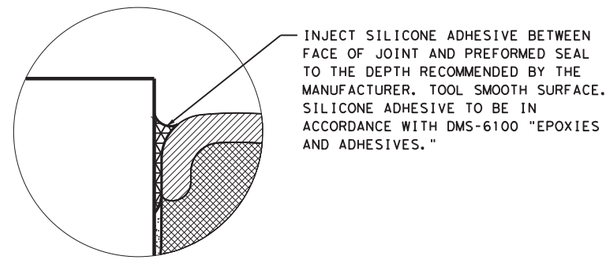
PROCEDURE FOR CLEANING AND SEALING HEADER JOINT WITH PRECOMPRESSIBLE JOINT MATERIAL

1. CLEAN JOINT OPENING OF ALL OLD EXPANSION MATERIALS/DEVICES, DIRT, AND ALL OTHER DELETERIOUS MATERIALS IN ACCORDANCE WITH ITEM 438. "CLEANING AND SEALING JOINTS." CLEAN JOINT OUT FULL DEPTH OF THE JOINT DOWN TO THE CAPS. REMOVE ALL DEBRIS FROM CAPS, SUBSIDIARY TO ITEM 438.
2. CONTRACTOR IS REQUIRED TO VERIFY THE BRIDGE JOINT OPENING WIDTHS PRIOR TO ORDERING MATERIALS
3. CLEAN THE VOIDED REGION OF ALL MATERIALS THAT COULD INHIBIT THE BOND BETWEEN HEADER MATERIAL AND CONCRETE OR STEEL.
4. MASK AREAS ADJACENT TO JOIN OPENING SUFFICIENTLY TO KEEP EPOXY OFF DECK SURFACE.
5. APPLY EPOXY TO JOINT OPENING SIDE SURFACES.
6. WHILE EPOXY IS STILL TACKY, REMOVE SHRINK WRAP FROM SEAL AND INSTALL IN JOINT OPENING.
7. RECESS TOP OF JOINT SEAL 1/2" IN TRAVEL LANES AND 1/4" IN SHOULDERS.
8. INJECT SILICONE ADHESIVE ALONG TOP INTERFACE SEAL WITH JOINT SIDES SURFACE ACCORDING TO MANUFACTURER'S RECOMMENDATION. TOOL TO SPREAD ADHESIVE AS NECESSARY SEE DETAIL "F". SILICONE ADHESIVE TO BE IN ACCORDANCE WITH DMS-6100 "EPOXIES AND ADHESIVES."



DETAIL C

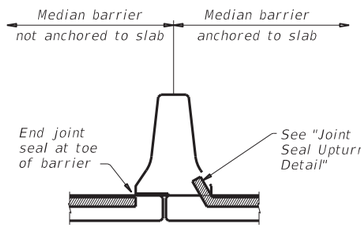
NTS



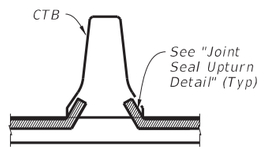
DETAIL F

GENERAL NOTES

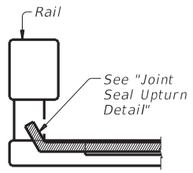
9. PREMOLDED PREFORMED COMPRESSIBLE JOINT MATERIAL SHALL BE 25% LARGER THAN JOINT OPENING. CONTRACTOR TO VERIFY JOINT OPENINGS PRIOR TO ORDERING MATERIALS:
   (3 1/8" FOR 2 1/2" OPENING)
   (3 3/4" FOR 3" OPENING)
   PRODUCT USED SHALL BE:
   SEALTITE BRIDGE JOINT SEALANT 50 N OR CHASE CONSTRUCTION PRODUCTS PHYZITE 380 OR APPROVED EQUAL
   INSTALL PER MANUFACTURER'S RECOMMENDATION
10. CLEANING AND SEALING EXISTING HEADER JOINTS DOES NOT NECESSITATE REPLACEMENT OF EXISTING HEADER MATERIAL. IF REPLACEMENT OF HEADER MATERIAL IS NECESSARY, AS DETERMINED BY THE ENGINEER, IT WILL BE PAID AND CONSTRUCTED IN ACCORDANCE TO ITEM 454.
11. EXTEND SEALANT UP INTO RAIL OR CURB 4 INCHES ON LOW SIDE OR SIDES OF DECK. IF THE CLASS 7 SEALANT CANNOT BE EFFECTIVELY PLACED IN THE VERTICAL POSITION, A CLASS 4 SEALANT COMPATIBLE WITH THE CLASS 7 SEALANT IS ALLOWED FOR THE EXTENSION OF THE SEAL INTO THE CURB OR RAIL. PREPARE SURFACES WHERE SEALANT IS TO BE PLACED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. SEE JOINT SEALANT TERMINATION DETAILS.



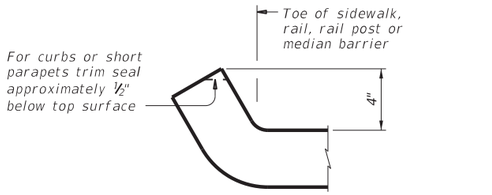
WITH OPEN DECK JOINT BELOW MEDIAN BARRIER



AT CONCRETE TRAFFIC BARRIER



AT CONCRETE BRIDGE RAIL



JOINT SEAL UPTURN DETAIL

(See Note D)

JOINT SEALANT TERMINATION DETAILS

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED
PROFESSIONAL ENGINEER

Casey B. Stripling

01-24-2022

AMA FY 22 DBIP

CLEAN AND SEAL JOINTS DETAIL

SCALE: NTS

2022 Texas Department of Transportation

SHEET 2 OF 4

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		31

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BRIDGE CLEANING AND SEALING ITEMS

REF #	COUNTY	LOCATION	NBI#	ABUTMENT 1 LOCATION	JOINT REPAIR LOCATION	JOINT TYPE	438 6001 CLEANING AND SEALING EXISTING JOINTS LF
1	DALLAM	SH 102 AT CARRIZO CREEK	04-056-0-1141-02-008	EAST END OF BRIDGE	ABUTMENT 1	TYPE C	65
					BENT 3	TYPE C	65
					ABUMENT 5	TYPE C	65
2	DALLAM	FM 1879 AT RITA BLANCA CREEK	04-056-0-1811-01-001	WEST END OF BRIDGE	ABUTMENT 1	TYPE A	25
					BENT 2	TYPE A	25
					BENT 3	TYPE A	25
					BENT 4	TYPE A	25
					BENT 5	TYPE A	25
					BENT 6	TYPE A	25
					BENT 7	TYPE A	25
					BENT 8	TYPE A	25
					BENT 9	TYPE A	25
					BENT 10	TYPE A	25
					BENT 11	TYPE A	25
					BENT 12	TYPE A	25
					ABUTMENT 13	TYPE A	25
3	GRAY	BI 40 EB AT IH 40	04-091-0-0275-11-141	NORTH EAST END OF BRIDGE	ABUTMENT 1	TYPE B	58
					ABUTMENT 5	TYPE B	58
4	GRAY	IH 40 WB AT IH 40 FRONTAGE ROAD CONN	04-091-0-0275-11-145	EAST END OF BRIDGE	ABUTMENT 1	TYPE B	42 *
					ABUTMENT 5	TYPE B	44
5	GRAY	IH 40 EB AT IH 40 FRONTAGE ROAD CONN	04-091-0-0275-11-146	EAST END OF BRIDGE	ABUTMENT 1	TYPE B	44
					ABUTMENT 5	TYPE B	44
6	GRAY	IH 40 WB AT IH 40 FRONTAGE ROAD CONN	04-091-0-0275-11-149	EAST END OF BRIDGE	ABUTMENT 1	TYPE B	52
					ABUTMENT 5	TYPE B	52
7	GRAY	IH 40 EB AT IH 40 FRONTAGE ROAD CONN	04-091-0-0275-11-150	EAST END OF BRIDGE	ABUTMENT 1	TYPE B	52
					ABUTMENT 5	TYPE B	52
9	GRAY	LP 171 AT BNSF RR	04-091-0-2403-01-001	SOUTH END OF BRIDGE	ABUTMENT 1	TYPE B	55
					BENT 2	TYPE B	55
					BENT 3	TYPE B	55 *
					BENT 4	TYPE B	55 *
					BENT 5	TYPE B	40 *
					BENT 6	TYPE B	40
					ABUTMENT 7	TYPE B	40
10	HARTLEY	SH 354 AT WEST CHEYENNE CREEK	04-104-0-0041-03-050	WEST END OF BRIDGE	ABUTMENT 1	TYPE A	48
					BENT 2	TYPE A	48
					BENT 3	TYPE A	48
					BENT 4	TYPE A	48
					ABUTMENT 5	TYPE A	48
11	HARTLEY	SH 354 AT EAST CHEYENNE CREEK	04-104-0-0041-03-051	WEST END OF BRIDGE	ABUTMENT 1	TYPE A	48
					BENT 2	TYPE A	48
					BENT 3	TYPE A	48
					ABUTMENT 4	TYPE A	48
12	HARTLEY	FM 767 AT LOS REDOS CREEK	04-104-0-1108-01-002	WEST END OF BRIDGE	ABUTMENT 1	TYPE A	27
					BENT 2	TYPE A	27
					BENT 3	TYPE A	27
					BENT 4	TYPE A	27
					BENT 5	TYPE A	27
					BENT 6	TYPE A	27
					BENT 7	TYPE A	27
					BENT 8	TYPE A	27
					BENT 9	TYPE A	27
					BENT 10	TYPE A	27
					ABUTMENT 11	TYPE A	27
13	HEMPHILL	US 83 AT HORSE CREEK	04-107-0-0030-05-028	WEST END OF BRIDGE	ABUTMENT 1	TYPE B	47
					BENT 2	TYPE B	47
					BENT 3	TYPE B	47
					BENT 4	TYPE B	47
					BENT 5	TYPE B	47
					BENT 6	TYPE B	47
					BENT 7	TYPE B	47
					BENT 8	TYPE B	47
					BENT 9	TYPE B	47
					ABUTMENT 10	TYPE B	47
						TOTAL'S	**2,557**

* TOTAL LENGTH OF JOINT MATERIAL TO BE ORDERED WILL BE THE SUMMATION OF CLEANING AND SEALING JOINT QUANTITY PLUS ITEM 454 QUANTITY FOUND IN BRIDGE JOINT REPAIR DETAIL FOR EACH RESPECTIVE JOINT.

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED
PROFESSIONAL ENGINEER

Casey B. Stripling

01-24-2022

AMA FY 22 DBIP

CLEAN AND SEAL JOINTS DETAIL

SCALE: NTS

2022 Texas Department of Transportation

SHEET 3 OF 4

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		32

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BRIDGE CLEANING AND SEALING ITEMS (CONT'D)

REF #	COUNTY	LOCATION	NBI#	ABUTMENT 1 LOCATION	JOINT REPAIR LOCATION	JOINT TYPE	438 6001 CLEANING AND SEALING EXISTING JOINTS LF
18	LIPSCOMB	FM 3004 AT MAMMOTH CREEK	04-148-0-3076-01-001	WEST END OF BRIDGE	ABUTMENT 1	TYPE A	29
					BENT 2	TYPE A	29
					BENT 3	TYPE A	29
					BENT 4	TYPE A	29
					BENT 5	TYPE A	29
					BENT 6	TYPE A	29
					BENT 7	TYPE A	29
					BENT 8	TYPE A	29
					ABUTMENT 9	TYPE A	29
19	MOORE	US 287 SB AT NORTH PALO DURO CREEK	04-171-0-0066-04-023	SOUTH END OF BRIDGE	BENT 2	TYPE D	58
					BENT 4	TYPE D	55 *
21	POTTER	US 87 NB AT CANADIAN RIVER	04-188-0-0041-05-064	SOUTH END OF BRIDGE	ABUTMENT 1	TYPE D	41
					BENT 4	TYPE D	41
					BENT 8	TYPE D	41
					ABUTMENT 9	TYPE D	41
22	POTTER	US 87 SB AT CANADIAN RIVER	04-188-0-0041-05-092	SOUTH END OF BRIDGE	ABUTMENT 1	TYPE D	41
					BENT 3	TYPE D	41
					ABUTMENT 8	TYPE D	41
24	POTTER	LP 335 WB AT EASTERN ST	04-188-0-2635-01-012	EAST END OF BRIDGE	ABUTMENT 1	TYPE D	22 *
					ABUTMENT 4	TYPE D	41
25	POTTER	LP 335 EB AT EASTERN ST	04-188-0-2635-01-013	EAST END OF BRIDGE	ABUTMENT 1	TYPE D	41
					ABUTMENT 4	TYPE D	22 *
26	POTTER	LP 335 NB AT ABANDONED RR	04-188-0-2635-01-014	SOUTH END OF BRIDGE	ABUTMENT 1	TYPE D	40
					ABUTMENT 4	TYPE D	40
27	POTTER	LP 335 SB AT ABANDONED RR	04-188-0-2635-01-015	SOUTH END OF BRIDGE	ABUTMENT 1	TYPE D	42 *
					ABUTMENT 4	TYPE D	38 *
32	RANDALL	IH 27 SB AT P.D.T. FORK RED RIVER	04-191-0-0067-17-142	SOUTH END OF BRIDGE	BENT 2	TYPE C	58
					BENT 6	TYPE C	58
					BENT 9	TYPE C	58
33	RANDALL	IH 27 NB AT P.D.T. FORK RED RIVER	04-191-0-0067-17-143	SOUTH END OF BRIDGE	BENT 2	TYPE C	58
					BENT 6	TYPE C	58
					BENT 9	TYPE C	58
						TOTAL'S	**1,295**
					CSJ: 0904-00-199	**TOTAL'S**	**3,854**

* TOTAL LENGTH OF JOINT MATERIAL TO BE ORDERED WILL BE THE SUMMATION OF CLEANING AND SEALING JOINT QUANTITY PLUS ITEM 454 QUANTITY FOUND IN BRIDGE JOINT REPAIR DETAIL FOR EACH RESPECTIVE JOINT.

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CLEAN AND SEAL JOINTS DETAIL

SCALE: NTS

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SHEET 4 OF 4

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		33

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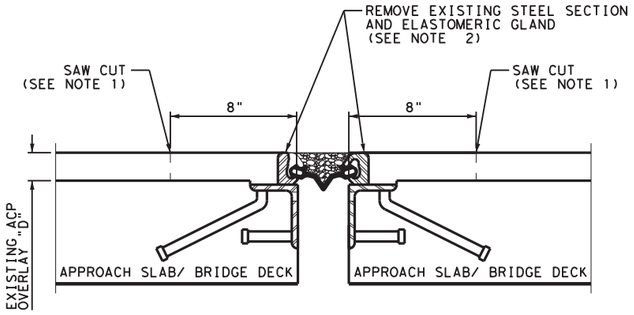

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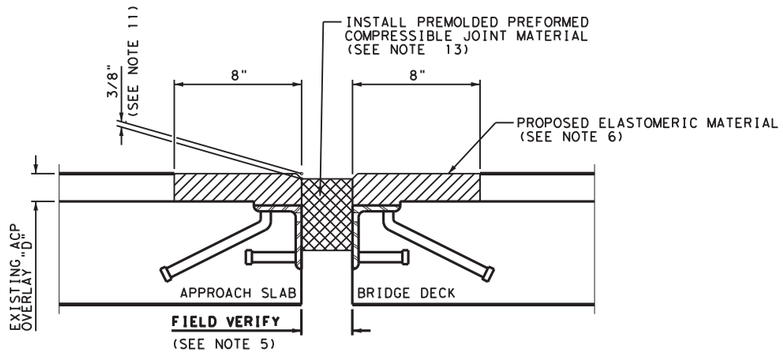


PROPOSED

TYPE A
REPLACING EXISTING SEJ JOINT WITH PROPOSED HEADER JOINT

PROCEDURE FOR REPLACING EXISTING SEJ JOINTS WITH PROPOSED HEADER JOINT

1. TO CREATE THE HEADER JOINT BLOCKOUT SAW CUT EDGES OF REPAIR AREA DOWN TO THE BRIDGE DECK SURFACE. MILL OFF ALL THE EXISTING OVERLAY BETWEEN THE SAW CUTS DOWN TO THE TOP OF THE BRIDGE DECK. CARE SHOULD BE TAKEN TO NOT DAMAGE ANY STEEL THAT IS TO REMAIN DURING THE MILLING PROCESS. MILLING WILL BE SUBSIDIARY TO ITEM 454.

2. REMOVE EXISTING STEEL SECTIONS. REMOVAL BY TORCHING WILL NOT BE PERMITTED AS THE HIGH TEMPERATURES ARE LIKELY TO CAUSE DAMAGE TO THE CONCRETE UNDERNEATH THE STEEL.

3. SAND BLAST BRIDGE DECK SURFACE TO REMOVE ALL MATERIAL THAT COULD INHIBIT THE BOND BETWEEN THE HEADER MATERIAL, AND CONCRETE OR STEEL. SAND BLASTING WILL BE SUBSIDIARY TO ITEM 785.

4. CLEAN JOINT OPENING OF ALL OLD EXPANSION MATERIALS, DEVICES, DIRT, AND ALL OTHER DELETERIOUS MATERIALS IN ACCORDANCE WITH ITEM 438, "CLEANING AND SEALING JOINTS." CLEAN JOINT OUT FULL DEPTH OF THE JOINT DOWN TO THE CAPS. REMOVE ALL DEBRIS FROM CAPS. REMOVE ALL OXIDATION FROM STEEL SURFACES BY SAND BLASTING, SUBSIDIARY TO ITEM 785.

5. CONTRACTOR IS REQUIRED TO VERIFY THE BRIDGE JOINT OPENING WIDTHS PRIOR TO ORDERING MATERIALS.

6. INSTALL ELASTORMERIC HEADER MATERIAL AS PER MANUFACTURERS RECOMMENDATIONS, THIS WORK WILL BE PAID UNDER ITEM 454.

7. ALLOW ELASTOMERIC HEADER MATERIAL TO CURE AS PER MANUFACTURER'S RECCOMENDATIONS PRIOR TO PROCEEDING WITH JOINT REPLACEMENT OPERATION.

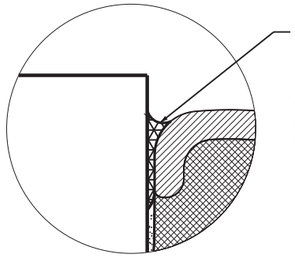
8. MASK AREAS ADJACENT TO JOINT OPENING SUFFICIENTLY TO KEEP EPOXY OFF DECK SURFACE.

9. APPLY EPOXY TO JOINT OPENING SIDE SURFACES.

10. WHILE EPOXY IS STILL TACKY, REMOVE SHRINK WRAP FROM SEAL AND INSTALL IN JOINT OPENING.

11. RECESS TOP OF JOINT SEAL 3/8"

12. INJECT SILICONE ADHESIVE ALONG TOP OF INTERFACE SEAL WITH JOINT SIDES SURFACE ACCORDING TO MANUFACTURER'S RECOMMENDATION. TOOL TO SPREAD ADHESIVE AS NECESSARY SEE DETAIL "F". SILICONE ADHESIVE TO BE IN ACCORDANCE WITH DMS-6100 "EPOXIES AND ADHESIVES."



DETAIL F

GENERAL NOTES

13. PREMOLDED PREFORMED COMPRESSIBLE JOINT MATERIAL SHALL BE 25% LARGER THAN JOINT OPENING. CONTRACTOR TO VERIFY JOINT OPENINGS PRIOR TO ORDERING MATERIALS:
    (3 1/8" FOR 2 1/2" OPENING)
    (3 3/4" FOR 3" OPENING)
    PRODUCT USED SHALL BE:
    SEALTITE BRIDGE JOINT SEALANT 50 N OR CHASE CONSTRUCTION PRODUCTS PHYZITE 380 OR APPROVED EQUAL
    INSTALL PER MANUFACTURER'S RECOMMENDATION
    PREMOLDED PREFORMED COMPRESSIBLE JOINT MATERIAL WILL BE SUBSIDIARY TO ITEM 454.

14. EXTEND SEALANT UP INTO RAIL OR CURB 4 INCHES ON LOW SIDE OR SIDES OF DECK. IF THE CLASS 7 SEALANT CANNOT BE EFFECTIVELY PLACED IN THE VERTICAL POSITION, A CLASS 4 SEALANT COMPATIBLE WITH THE CLASS 7 SEALANT IS ALLOWED FOR THE EXTENSION OF THE SEAL INTO THE CURB OR RAIL. PREPARE SURFACES WHERE SEALANT IS TO BE PLACED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. SEE JOINT SEALANT TERMINATION DETAILS.

STATE OF TEXAS
CASEY B. STRIPLING
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PROFESSIONAL ENGINEER

Casey B. Stripling

01-24-2022

AMA FY 22 DBIP

BRIDGE JOINT REPAIR DETAIL

SCALE: NTS

2022 Texas Department of Transportation

SHEET 1 OF 7

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		34

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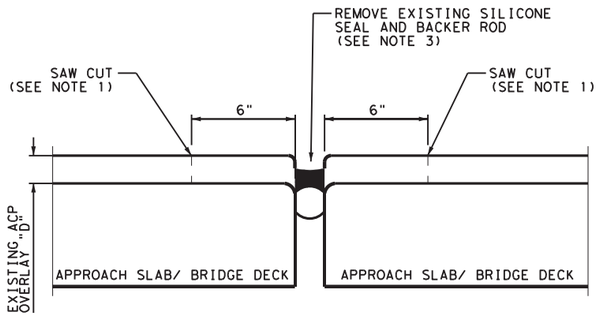

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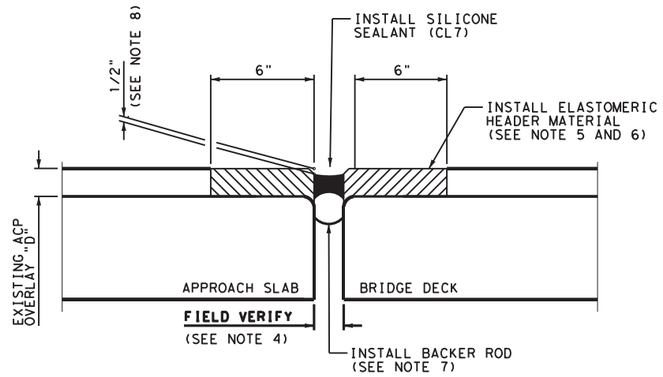

PROPOSED

TYPE B
REPLACING EXISTING TYPE A JOINT WITH PROPOSED HEADER JOINT

PROCEDURE FOR REPLACING EXISTING TYPE A JOINTS WITH PROPOSED HEADER JOINT

1. TO CREATE THE HEADER JOINT BLOCKOUT SAW CUT EDGES OF REPAIR AREA DOWN TO THE BRIDGE DECK SURFACE. MILL OFF ALL THE EXISTING OVERLAY BETWEEN THE SAW CUTS DOWN TO THE TOP OF THE BRIDGE DECK.

2. SAND BLAST BRIDGE DECK SURFACE TO REMOVE ALL MATERIAL THAT COULD INHIBIT THE BOND BETWEEN THE HEADER MATERIAL, AND CONCRETE OR STEEL. SAND BLASTING WILL BE SUBSIDIARY TO ITEM 454.

3. CLEAN JOINT OPENING OF ALL OLD EXPANSION MATERIALS, DEVICES, DIRT, AND ALL OTHER DELETERIOUS MATERIALS IN ACCORDANCE WITH ITEM 438, "CLEANING AND SEALING JOINTS." CLEAN JOINT OUT FULL DEPTH OF THE JOINT DOWN TO THE CAPS. REMOVE ALL DEBRIS FROM CAPS.

4. CONTRACTOR IS REQUIRED TO VERIFY THE BRIDGE JOINT OPENING WIDTHS PRIOR TO ORDERING MATERIALS.

5. INSTALL ELASTORMERIC HEADER MATERIAL AS PER MANUFACTURERS RECOMMENDATIONS. THIS WORK WILL BE PAID FOR UNDER ITEM 454.

6. ALLOW ELASTOMERIC HEADER MATERIAL TO CURE AS PER MANUFACTURER'S RECCOMENDATIONS PRIOR TO PROCEEDING WITH JOINT REPLACEMENT OPERATION.

7. PLACE BACKER ROD INTO JOINT OPENING 1" BELOW THE TOP OF CONCRETE. THE BACKER ROD MUST BE 25% LARGER THAN JOINT OPENING AND MUST BE COMPATIBLE WITH THE SEALANT. WHEN SEALING JOINTS FOR SLAB SPANS, PAN GIRDER SPANS, OR BOX BEAM SPANS FILL BOID BELOW BACKER ROD WITH EXTRUDED POLYSTRENE FOAM. USE OF MULTIPLE PIECES TO CREATE A BACKER ROD CROSS SECTION IS NOT PERMITTED. TOP OF BACKER ROD MUST BE CONVEX AS SHOWN.

8. SEAL THE JOINT OPENING WITH CLASS 7 SILICONE. RECESS SEAL 1/2" BELOW TOP OF CONCRETE IN TRAVEL LANES AND 1/8" BELOW TOP OF CONCRETE IN SHOULDERS.

9. REFER TO CLEAN AND SEAL JOINTS DETAIL PAGE 2 OF 4 FOR JOINT SEALANT TERMINATION DETAIL.

10. APPROVED MATERIALS LISTED IN THE MATERIALS PRODUCER LIST FOR DMS-6310 "JOINT SEALANT AND FILLERS". INSTALL PER MANUFACTURER'S RECOMMENDATION.

GENERAL NOTES

11. EXTEND SEALANT UP INTO RAIL OR CURB 4 INCHES ON LOW SIDE OR SIDES OF DECK. IF THE CLASS 7 SEALANT CANNOT BE EFFECTIVELY PLACED IN THE VERTICAL POSITION, A CLASS 4 SEALANT COMPATIBLE WITH THE CLASS 7 SEALANT IS ALLOWED FOR THE EXTENSION OF THE SEAL INTO THE CURB OR RAIL. PREPARE SURFACES WHERE SEALANT IS TO BE PLACED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. SEE JOINT SEALANT TERMINATION DETAILS.

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED
PROFESSIONAL ENGINEER

Casey B. Stripling

01-24-2022

AMA FY 22 DBIP

BRIDGE JOINT REPAIR DETAIL

SCALE: NTS

2022 Texas Department of Transportation

SHEET 2 OF 7

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		35

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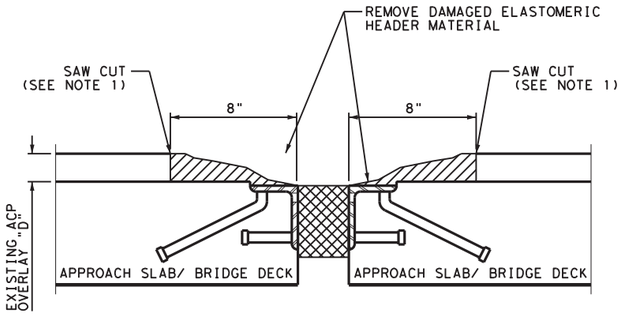

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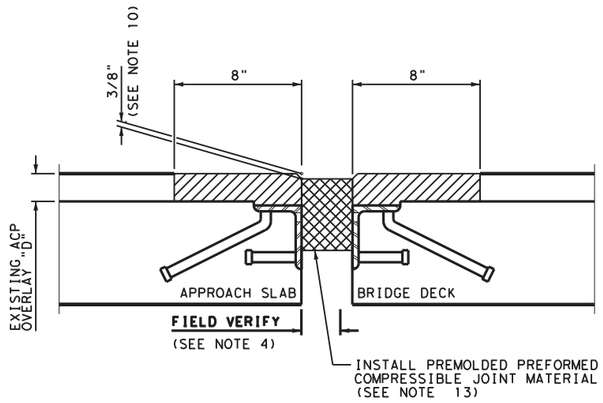


PROPOSED

TYPE C
REPAIRING EXISTING HEADER JOINT

PROCEDURE FOR REPAIRING EXISTING HEADER JOINT

1. TO CREATE THE HEADER JOINT BLOCKOUT SAW CUT EDGES OF REPAIR AREA DOWN TO THE BRIDGE DECK SURFACE. REMOVE DAMAGED ELASTOMERIC HEADER MATERIAL. CARE SHOULD BE TAKEN TO NOT DAMAGE ANY STEEL THAT IS TO REMAIN IN PLACE. ELASTOMERIC HEADER MATERIAL REMOVAL WILL BE SUBSIDIARY TO ITEM 454.

2. SAND BLAST BRIDGE DECK SURFACE TO REMOVE ALL MATERIAL THAT COULD INHIBIT THE BOND BETWEEN THE HEADER MATERIAL, AND CONCRETE OR STEEL. SAND BLASTING WILL BE SUBSIDIARY TO ITEM 785.

3. CLEAN JOINT OPENING OF ALL OLD EXPANSION MATERIALS, DEVICES, DIRT, AND ALL OTHER DELETERIOUS MATERIALS IN ACCORDANCE WITH ITEM 438, "CLEANING AND SEALING JOINTS." CLEAN JOINT OUT FULL DEPTH OF THE JOINT DOWN TO THE CAPS. REMOVE ALL DEBRIS FROM CAPS. REMOVE ALL OXIDATION FROM STEEL SURFACES BY SAND BLASTING, SUBSIDIARY TO ITEM 785.

4. CONTRACTOR IS REQUIRED TO VERIFY THE BRIDGE JOINT OPENING WIDTHS PRIOR TO ORDERING MATERIALS.

5. INSTALL ELASTORMERIC HEADER MATERIAL AS PER MANUFACTURERS RECOMMENDATIONS.

6. ALLOW ELASTOMERIC HEADER MATERIAL TO CURE AS PER MANUFACTURER'S RECCOMENDATIONS PRIOR TO PROCEEDING WITH JOINT REPLACEMENT OPERATION.

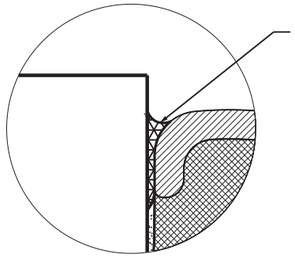
7. MASK AREAS ADJACENT TO JOINT OPENING SUFFICIENTLY TO KEEP EPOXY OFF DECK SURFACE.

8. APPLY EPOXY TO JOINT OPENING SIDE SURFACES.

9. WHILE EPOXY IS STILL TACKY, REMOVE SHRINK WRAP FROM SEAL AND INSTALL IN JOINT OPENING.

10. RECESS TOP OF JOINT SEAL 3/8"

11. INJECT SILICONE ADHESIVE ALONG TOP OF INTERFACE SEAL WITH JOINT SIDES SURFACE ACCORDING TO MANUFACTURER'S RECOMMENDATION. TOOL TO SPREAD ADHESIVE AS NECESSARY SEE DETAIL "F". SILICONE ADHESIVE TO BE IN ACCORDANCE WITH DMS-6100 "EPOXIES AND ADHESIVES."



DETAIL F

GENERAL NOTES

12. PREMOLDED PREFORMED COMPRESSIBLE JOINT MATERIAL SHALL BE 25% LARGER THAN JOINT OPENING. CONTRACTOR TO VERIFY JOINT OPENINGS PRIOR TO ORDERING MATERIALS:
    (3 1/8" FOR 2 1/2" OPENING)
    (3 3/4" FOR 3" OPENING)
    PRODUCT USED SHALL BE:
    SEALTITE BRIDGE JOINT SEALANT 50 N OR CHASE CONSTRUCTION PRODUCTS PHYZITE 380 OR APPROVED EQUAL
    INSTALL PER MANUFACTURER'S RECOMMENDATION
    PREMOLDED PREFORMED COMPRESSIBLE JOINT MATERIAL WILL BE SUBSIDIARY TO ITEM 454.

13. EXTEND SEALANT UP INTO RAIL OR CURB 4 INCHES ON LOW SIDE OR SIDES OF DECK. IF THE CLASS 7 SEALANT CANNOT BE EFFECTIVELY PLACED IN THE VERTICAL POSITION, A CLASS 4 SEALANT COMPATIBLE WITH THE CLASS 7 SEALANT IS ALLOWED FOR THE EXTENSION OF THE SEAL INTO THE CURB OR RAIL. PREPARE SURFACES WHERE SEALANT IS TO BE PLACED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. SEE JOINT SEALANT TERMINATION DETAILS.

Casey B. Stripling

01-24-2022

AMA FY 22 DBIP

BRIDGE JOINT REPAIR DETAIL

SCALE: NTS

2022 Texas Department of Transportation

SHEET 3 OF 7

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		36

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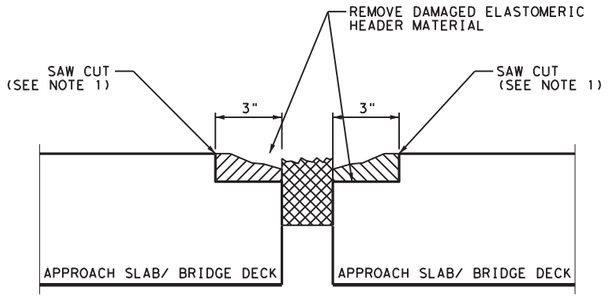

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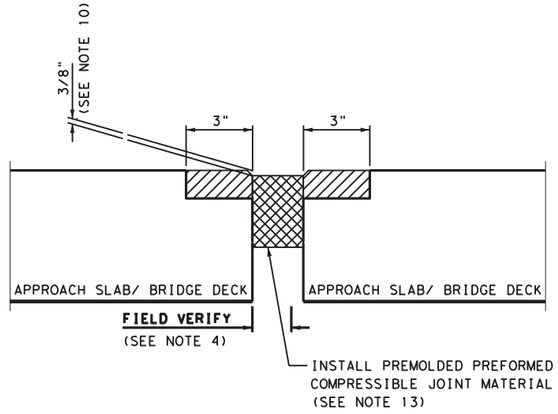


PROPOSED

TYPE D
REPAIRING EXISTING HEADER JOINT

PROCEDURE FOR REPAIRING EXISTING HEADER JOINT

1. TO CREATE THE HEADER JOINT BLOCKOUT SAW CUT EDGES OF REPAIR AREA DOWN TO THE BRIDGE DECK SURFACE. REMOVE DAMAGED ELASTOMERIC HEADER MATERIAL. CARE SHOULD BE TAKEN TO NOT DAMAGE ANY STEEL THAT IS TO REMAIN IN PLACE. ELASTOMERIC HEADER MATERIAL REMOVAL WILL BE SUBSIDIARY TO ITEM 454.

2. SAND BLAST BRIDGE DECK SURFACE TO REMOVE ALL MATERIAL THAT COULD INHIBIT THE BOND BETWEEN THE HEADER MATERIAL, AND CONCRETE OR STEEL. SAND BLASTING WILL BE SUBSIDIARY TO ITEM 785.

3. CLEAN JOINT OPENING OF ALL OLD EXPANSION MATERIALS, DEVICES, DIRT, AND ALL OTHER DELETERIOUS MATERIALS IN ACCORDANCE WITH ITEM 438, "CLEANING AND SEALING JOINTS." CLEAN JOINT OUT FULL DEPTH OF THE JOINT DOWN TO THE CAPS. REMOVE ALL DEBRIS FROM CAPS.

4. CONTRACTOR IS REQUIRED TO VERIFY THE BRIDGE JOINT OPENING WIDTHS PRIOR TO ORDERING MATERIALS.

5. INSTALL ELASTORMERIC HEADER MATERIAL AS PER MANUFACTURERS RECOMMENDATIONS.

6. ALLOW ELASTOMERIC HEADER MATERIAL TO CURE AS PER MANUFACTURER'S RECCOMENDATIONS PRIOR TO PROCEEDING WITH JOINT REPLACEMENT OPERATION.

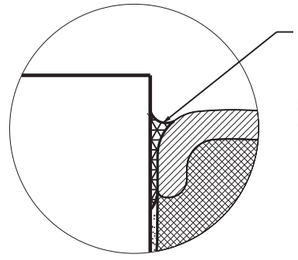
7. MASK AREAS ADJACENT TO JOINT OPENING SUFFICIENTLY TO KEEP EPOXY OFF DECK SURFACE.

8. APPLY EPOXY TO JOINT OPENING SIDE SURFACES.

9. WHILE EPOXY IS STILL TACKY, REMOVE SHRINK WRAP FROM SEAL AND INSTALL IN JOINT OPENING.

10. RECESS TOP OF JOINT SEAL 3/8"

11. INJECT SILICONE ADHESIVE ALONG TOP OF INTERFACE SEAL WITH JOINT SIDES SURFACE ACCORDING TO MANUFACTURER'S RECOMMENDATION. TOOL TO SPREAD ADHESIVE AS NECESSARY SEE DETAIL "F". SILICONE ADHESIVE TO BE IN ACCORDANCE WITH DMS-6100 "EPOXIES AND ADHESIVES."



DETAIL F

GENERAL NOTES

12. PREMOLDED PREFORMED COMPRESSIBLE JOINT MATERIAL SHALL BE 25% LARGER THAN JOINT OPENING. CONTRACTOR TO VERIFY JOINT OPENINGS PRIOR TO ORDERING MATERIALS:
    (3 1/8" FOR 2 1/2" OPENING)
    (3 3/4" FOR 3" OPENING)
    PRODUCT USED SHALL BE:
    SEALTITE BRIDGE JOINT SEALANT 50 N OR CHASE CONSTRUCTION PRODUCTS PHYZITE 380 OR APPROVED EQUAL
    INSTALL PER MANUFACTURER'S RECOMMENDATION
    PREMOLDED PREFORMED COMPRESSIBLE JOINT MATERIAL WILL BE SUBSIDIARY TO ITEM 454.

13. EXTEND SEALANT UP INTO RAIL OR CURB 4 INCHES ON LOW SIDE OR SIDES OF DECK. IF THE CLASS 7 SEALANT CANNOT BE EFFECTIVELY PLACED IN THE VERTICAL POSITION, A CLASS 4 SEALANT COMPATIBLE WITH THE CLASS 7 SEALANT IS ALLOWED FOR THE EXTENSION OF THE SEAL INTO THE CURB OR RAIL. PREPARE SURFACES WHERE SEALANT IS TO BE PLACED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. SEE JOINT SEALANT TERMINATION DETAILS.

Casey B. Stripling

01-24-2022

AMA FY 22 DBIP

BRIDGE JOINT REPAIR DETAIL

SCALE: NTS

2022 Texas Department of Transportation

SHEET 4 OF 7

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		37

DATE: 1/21/2022 10:42:02 AM
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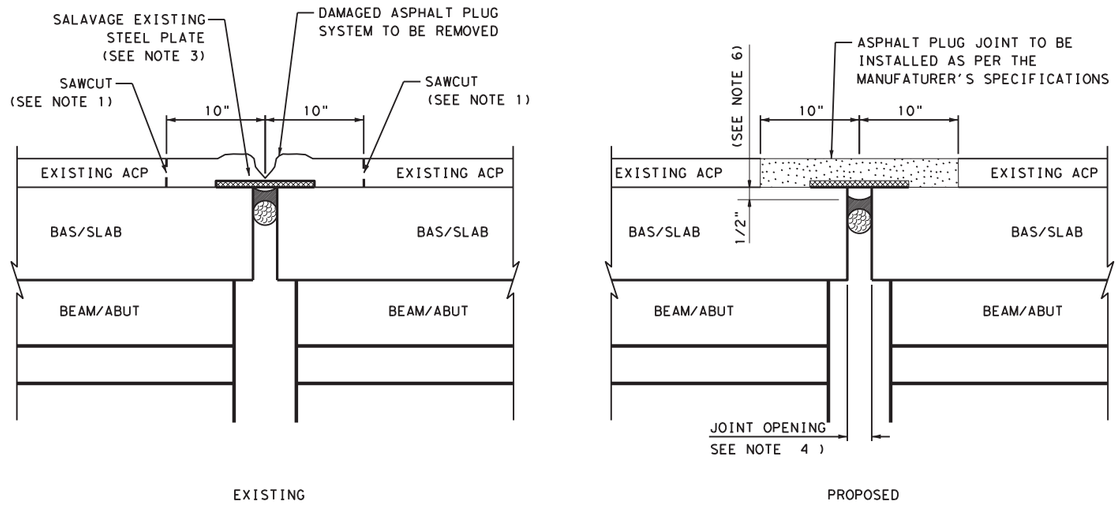

TYPE E
ASPHALT PLUG JOINT

NTS

PROCEDURE FOR CLEANING AND SEALING EXISTING ASPHALT PLUG JOINTS

1. SAW CUT EDGES OF REPAIR AREA DOWN TO THE BRIDGE DECK SURFACE. BREAK OUT AND REMOVE ALL MATERIAL BETWEEN THE SAW CUTS DOWN TO THE CONCRETE DECK SURFACE. JOINT WIDTHS WILL BE 20 INCHES WIDE CENTERED OVER THE EXPANSION JOINT. THIS WORK WILL BE SUBSIDIARY TO ITEM 4001.

2. CLEAN JOINT OPENING OF ALL OLD EXPANSION MATERIALS/DEVICES, DIRT, AND ALL OTHER DELETERIOUS MATERIALS IN ACCORDANCE WITH ITEM 438. "CLEANING AND SEALING JOINTS." CLEAN JOINT OUT FULL DEPTH OF THE JOINT DOWN TO THE CAPS. REMOVE ALL DEBRIS FROM CAPS, SUBSIDIARY TO ITEM 438. ALL BLOCKOUT SURFACES SHALL BE DRY, THEN ABRASIVELY BLASTED TO REMOVE CONTAMINANTS AND LOOSE AGGREGATE.

3. IF EXISTING STEEL PLATE CANNOT BE SALVAGED, THE CONTRACTOR WILL PROVIDE A NEW STEEL PLATE AT NO ADDITIONAL COST, PLATE SIZE 3/8" x 8"

4. CONTRACTOR IS REQUIRED TO VERIFY THE BRIDGE JOINT OPENING WIDTHS PRIOR TO ORDERING MATERIALS.

5. OBTAIN APPROVAL OF CLEANED JOINT PRIOR TO PROCEEDING WITH JOINT SEALING OPERATION.

6. PLACE BACKER ROD INTO JOINT OPENING 1" BELOW THE TOP OF THE CONCRETE BRIDGE DECK. THE BACKER ROD MUST BE COMPATIBLE WITH THE SEALANT. WHEN SEALING JOINTS FOR SLAB SPANS, PAN GIRDER SPANS, OR BOX BEAM SPANS, FILL VOID BELOW BACKER ROD WITH POLYSTYRENE FOAM. USE OF MULTIPLE PIECES TO CREATE A BACKER ROD CROSS SECTION IS NOT PERMITTED. TOP OF BACKER ROD MUST BE CONVEX AS SHOWN.

7. POUR HEATED ELASTOMERIC BINDER OVER THE BACKER ROD IN THE JOINT OPENING TO SEAL THE GAP. THIS BINDER SHALL BE POURED LEVEL WITH THE BLOCKOUT, AND APPLIED OVER THE ENTIRE BLOCKOUT (BASE AND SIDEWALLS) TO FORM A MONOLITHIC MEMBRANE TO A THICKNESS AS PER MANUFACTURER'S RECOMMENDATIONS.

8. PLACE THE SALVAGED, OR NEW STEEL PLATE CENTERED OVER THE JOINT OPENING, END TO END ALONG THE JOINT, WITH NO OVERLAPPING. INSTALL CENTERING PINS AT THE PRE-DRILLED HOLES AND INSERTED DIRECTLY INTO THE MODIFIED BINDER PLUG. HEATED ELASTOMERIC BINDER SHALL BE POURED OVER THE STEEL PLATE TO ENCAPSULATE IT.

9. MIX A BLEND OF ELASTOMERIC BINDER, AND AGGREGATE. POUR THE MIXTURE INTO THE BLOCKOUT IN LIFTS AS PER MANUFACTURER'S RECOMMENDATIONS UNTIL FLUSH WITH THE ROAD SURFACE, AND LEVEL THE MIXTURE USING RAKES.

10. COMPACT THE COMPLETED JOINT USING METHODS RECOMMENDED BY THE MANUFACTURER SUCH THAT THE FINAL GRADE OF THE JOINT AFTER COMPACTION MATCHES THE FINISHED GRADE OF THE DECK.

11. HEAT THE TOP OF THE COMPACTED MIXTURE WITH A HEAT LANCE, AND SPREAD A THIN LAYER OF ELASTOMERIC BINDER OVER THE MIXTURE SURFACE. IMMEDIATELY APPLY A LAYER OF SURFACING AGGREGATE INTO THE ELASTOMERIC BINDER, COMPACT THE AGGREGATE INTO THE SURFACE. ALLOW THE JOINT TO TO COOL, AND SWEEP UP ANY LOOSE AGGREGATE PRIOR TO OPENING THE ROADWAY TO TRAFFIC.

LEGEND

4001 6001 PLUG EXP JOINT

STATE OF TEXAS
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Casey B. Stripling

01-24-2022

AMA FY 22 DBIP

BRIDGE JOINT REPAIR DETAIL

SCALE: NTS

2022 Texas Department of Transportation

SHEET 5 OF 7

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		38

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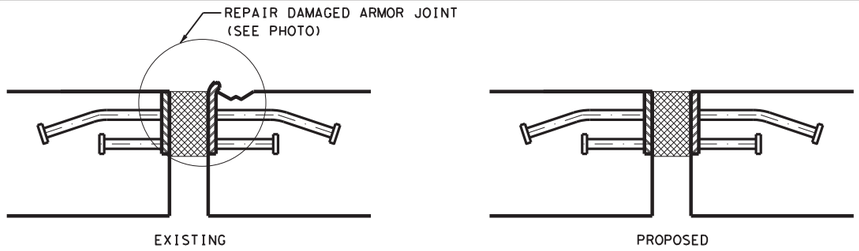
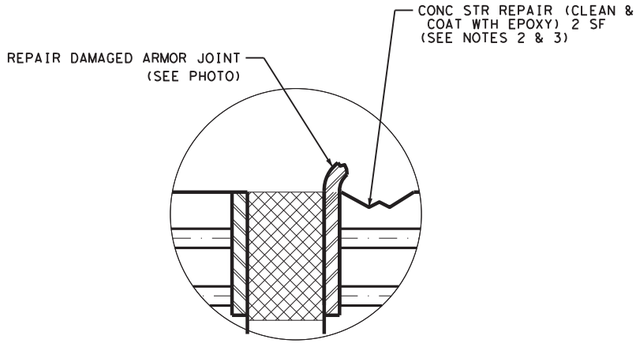


TYPE F
ARMOR JOINT
NTS



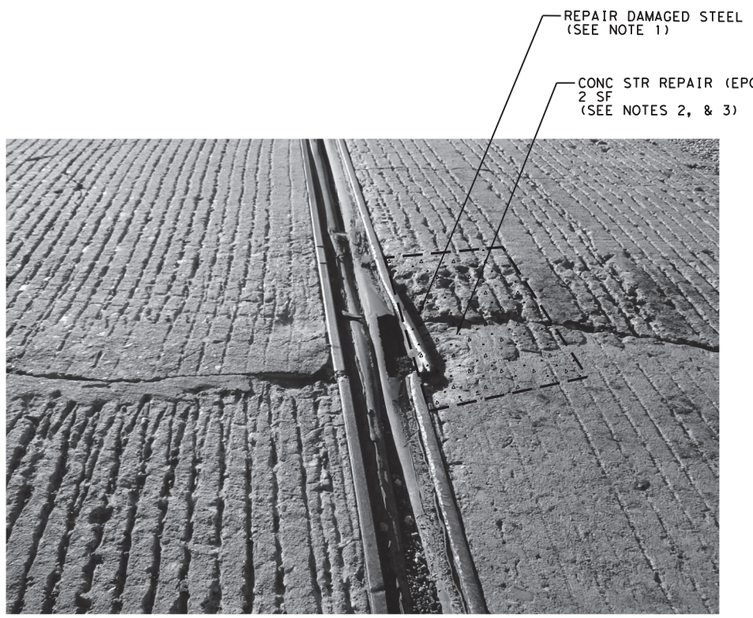
DETAIL B

PROCEDURE FOR CLEANING
AND SEALING EXISTING
ARMOR JOINTS

1. REPAIR ARMOR JOINT BY HEATING DAMAGED STEEL AND BENDING BACK TO ITS ORIGINAL POSITION. GRIND THE TOP OF THE REPAIRED STEEL SO IT IS FLUSH WITH THE ADJACENT STEEL. THIS WORK WILL BE PAID UNDER ITEM 454.

2. REMOVE ANY DAMAGED OR LOOSE CONCRETE, CLEAN REPAIR AREA OF ALL DIRT, AND ALL OTHER DELETRIOUS MATERIAL.

3. REPAIR SURFACE MUST BE DRY AND CLEAN PRIOR TO THE APPLICATION OF EPOXY MORTAR. APPLY EPOXY MORTAR AS PER MANUFACTURER'S RECOMMENDATION, AND IN ACCORDANCE WITH THE TXDOT CONCRETE REPAIR MANUAL. THIS WORK WILL BE SUBSIDIARY TO ITEM 454.



NBI: 04-091-0-0275-11-145

DAMAGED ARMOR JOINT AT EAST ABUTMENT JOINT
PHOTO TAKEN NOVEMBMER 2020

STATE OF TEXAS
CASEY B. STRIPLING
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Casey B. Stripling

01-24-2022

AMA FY 22 DBIP

BRIDGE JOINT REPAIR DETAIL

SCALE: NTS

2022 Texas Department of Transportation

SHEET 6 OF 7

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		39

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BRIDGE JOINT REPAIR ITEMS

REF#	COUNTY	LOCATION	NBI#	ABUTMENT 1 LOCATION	JOINT REPAIR LOCATION	BRIDGE JOINT REPAIR TYPE	DEPTH (D)	454 6003 ARMOR JOINT	454 6007 HEADER TYPE EXPANSION JOINT	4001 6001 ASPHALT PLUG EXP JOINT
							IN	LF	LF	LF
4	GRAY	IH 40 WB AT IH 40 FRONTAGE ROAD CONN	04-091-0-0275-11-145	EAST END OF BRIDGE	ABUTMENT 1	TYPE F		2 *		
8	GRAY	SH 273 AT MCCLELLAN CREEK	04-091-0-0560-02-025	SOUTH END OF BRIDGE	BENT 2	TYPE A	2		43	
					BENT 6	TYPE A	2		43	
					BENT 10	TYPE A	2		43	
					BENT 14	TYPE A	2		43	
9	GRAY	LP 171 AT BNSF RR	04-091-0-2403-01-001	SOUTH END OF BRIDGE	BENT 5	TYPE C	2		15 *	
					BENT 6	TYPE C	2		15 *	
					ABUTMENT 7	TYPE C	2		15 *	
15	HUTCHINSON	SH 136 WB AT FM 1559 & ASTF RR	04-118-0-0379-01-024	WEST END OF BRIDGE	ABUTMENT 1	TYPE A	2		61	
					ABUTMENT 5	TYPE A	2		61	
16	HUTCHINSON	SH 136 EB AT FM 1559 & ASTF RR	04-118-0-0379-01-025	WEST END OF BRIDGE	ABUTMENT 1	TYPE A	2		61	
					ABUTMENT 5	TYPE A	2		61	
19	MOORE	US 287 SB AT NORTH PALO DURO CREEK	04-171-0-0066-04-023	SOUTH END OF BRIDGE	BENT 4	TYPE C	2		3 *	
20	MOORE	FM 1060 AT SOUTH PALO DURO CREEK	04-171-0-1244-01-004	SOUTH END OF BRIDGE	ABUTMENT 1	TYPE E	2			51
					ABUTMENT 4	TYPE E	2			51
22	POTTER	US 87 SB AT CANADIAN RIVER	04-188-0-0041-05-092	SOUTH END OF BRIDGE	BENT 6	TYPE D	2		41	
23	POTTER	FM 1719 AT BNSF RR	04-188-0-1624-01-003	SOUTH END OF BRIDGE	BENT 2	TYPE A	2		52	
					BENT 3	TYPE A	2		52	
24	POTTER	LP 335 WB AT EASTERN ST	04-188-0-2635-01-012	EAST END OF BRIDGE	ABUTMENT 1	TYPE C	2		19 *	
25	POTTER	LP 335 EB AT EASTERN ST	04-188-0-2635-01-013	EAST END OF BRIDGE	ABUTMENT 4	TYPE C	2		19 *	
26	POTTER	LP 335 NB AT ABANDONED RR	04-188-0-2635-01-014	SOUTH END OF BRIDGE	ABUTMENT 1	TYPE C	2		10	
					ABUTMENT 4	TYPE C	2		10	
27	POTTER	LP 335 SB AT ABANDONED RR	04-188-0-2635-01-015	SOUTH END OF BRIDGE	ABUTMENT 1	TYPE C	2		8 *	
					ABUTMENT 4	TYPE C	2		12 *	
28	RANDALL	CR 237 (DOWLEN RD) AT IH 27	04-191-0-0067-17-106	WEST END OF BRIDGE	ABUTMENT 1	TYPE E	2			36
					ABUTMENT 5	TYPE E	2			36
29	RANDALL	CR 226 (CEMETERY RD) AT IH 27	04-191-0-0067-17-108	WEST END OF BRIDGE	ABUTMENT 1	TYPE E	2			40
					ABUTMENT 5	TYPE E	2			40
30	RANDALL	FM 1075 AT IH 27	04-191-0-0067-17-124	WEST END OF BRIDGE	BENT 2	TYPE E	2			40
					BENT 4	TYPE E	2			40
31	RANDALL	CR 233 (HALEY RD) AT IH 27	04-191-0-0067-17-126	WEST END OF BRIDGE	BENT 2	TYPE A	2		37	
					BENT 4	TYPE A	2		37	
34	RANDALL	CR 163 (SUNDOWN LN) AT IH 27	04-191-0-0168-09-061	WEST END OF BRIDGE	BENT 2	TYPE A	2		37	
					BENT 6	TYPE A	2		37	
35	RANDALL	FM 168 AT PALO DURO CREEK	04-191-0-2495-01-002	SOUTH END OF BRIDGE	ABUTMENT 1	TYPE B	2		30	
					ABUTMENT 4	TYPE B	2		30	
							TOTAL'S	**2**	**895**	**334**

* TOTAL LENGTH OF JOINT MATERIAL TO BE ORDERED WILL BE THE SUMMATION OF ITEM 454 PLUS CLEANING AND SEALING JOINT QUANTITY FOUND IN THE CLEAN AND SEAL JOINT DETAIL SHEETS FOR EACH RESPECTIVE JOINT.

STATE OF TEXAS
CASEY B. STRIPLING
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PROFESSIONAL ENGINEER

Casey B. Stripling

01-24-2022

AMA FY 22 DBIP

BRIDGE JOINT REPAIR DETAIL

SCALE: NTS

2022 Texas Department of Transportation

SHEET 7 OF 7

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		40

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LP 335 NB AT ABANDONED RR
EROSION AT TOP EDGE OF RIPRAP AT NW CORNER

FACING EAST
PHOTO TAKEN AUGUST 2019

SH 152 EB AT DIXON CREEK
EMBANKMENT EROSION AT SW CORNER

FACING NORTHWEST
PHOTO TAKEN NOVEMBER 2019

IH-27 NB AT P.D.T FORK
RED RIVER EROSION AT ABUTMENT 1

FACING EAST
PHOTO TAKEN DECEMBER 2021

LP 335 NB AT ABANDONED RR
RIPRAP HAS SETTLED AND FRACTURED AT SE CORNER

FACING SOUTH
PHOTO TAKEN AUGUST 2019

LP 335 WB AT EASTERN ST
UNDERMINING EROSION ALONG NW RIPRAP

FACING WEST
PHOTO TAKEN DECEMBER 2021

SUMMARY OF EROSION UNDERMINING

REF #	COUNTY	LOCATION	NBI#	104 6009 REMOVING CONC (RIPRAP) SY	401 6001 FLOWABLE BACKFILL CY	432 6001 RIPRAP (CONC) (4IN) CY
17	HUTCHINSON	SH 152 EB AT DIXON CREEK	04-118-0-0455-01-011		5	
24	POTTER	LP 335 WB AT EASTERN ST	04-188-0-2635-01-012		5	
26	POTTER	LP 335 NB AT ABANDONED RR	04-188-0-2635-01-014	60	5	7
27	POTTER	LP 335 SB AT ABANDONED RR	04-188-0-2635-01-015	23	15	3
33	RANDALL	IH 27 NB AT P.D.T. FORK RED RIVER	04-191-0-0067-17-143		1	
			SHEET TOTALS:	**83**	**31**	**10**

STATE OF TEXAS
CASEY B. STRIPLING
136887
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Casey B. Stripling

01-24-2022

AMA FY 22 DBIP

EROSION UNDERMINING REPAIR DETAIL

SCALE: NTS

2022 Texas Department of Transportation

SHEET 1 OF 1

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		41

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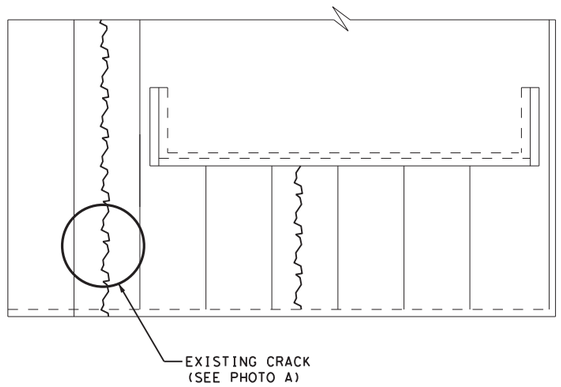
CRACK CLEANING AND SEALING (JCP)
(SEE CONCRETE RAPAIR NOTES)

PHOTO A

PHOTO SHOWING TYPICAL CONCRETE CRACKING REPAIR AREA FOR RIPRAP.
PHOTO TAKEN NOVEMBER 2021
FACING WEST



EXISTING TYPICAL RIPRAP PLAN VIEW

NTS

CONCRETE REPAIR NOTES

1. DAMAGED LOCATIONS AND QUANTITIES ARE BASED ON 12/01/21 CONDITION ASSESSMENT. IMMEDIATELY NOTIFY TXDOT IF ANY DISCREPANCIES ARE NOTED BETWEEN THE PLANS AND ACTUAL CONDITIONS.

2. SUBMIT DETAILED REPAIR PROCEDURES, INCLUDING PROPOSED PROPRIETARY MATERIALS, FOR APPROVAL PRIOR TO COMENCING WORK.

3. CONCRETE CRACK REPAIRS ARE CONSIDERED "CRACK REPAIR - SURFACE SEALING" AND SHALL BE REPAIR FOLLOWING CHAPTER 3 SECTION 7 OF THE TXDOT CONCRETE REPAIR MANUAL

LEGEND

713 6005 CRACK CLEANING AND SEALING(JCP)

SUMMARY OF RIPRAP REPAIR ITEMS

REF #	COUNTY	LOCATION	NBI#	RIPRAP REPAIR LOCATION	713 6005 CRACK CLEANING AND SEALING (JCP) LF
24	POTTER	LP 335 WB AT EASTERN ST	04-188-0-2635-01-012	ABUTMENT 1	75
				ABUTMENT 4	147
25	POTTER	LP 335 EB AT EASTERN ST	04-188-0-2635-01-013	ABUTMENT 1	112
				SHEET TOTALS:	**334**

STATE OF TEXAS
L. CLINT HARMS
124794
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2/28/2022

AMA FY 22 DBIP

RIPRAP REPAIR DETAIL

SCALE: NTS

2022 Texas Department of Transportation

SHEET 1 OF 1

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		42

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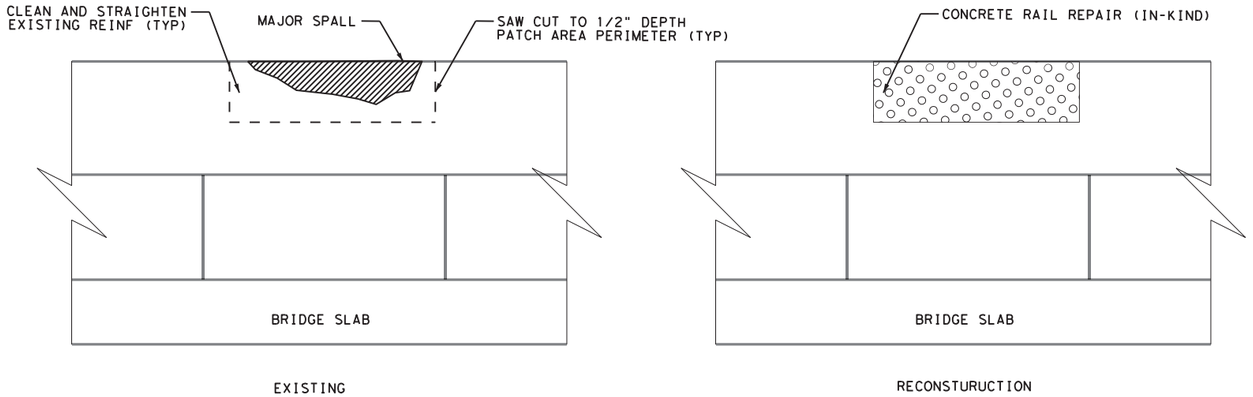
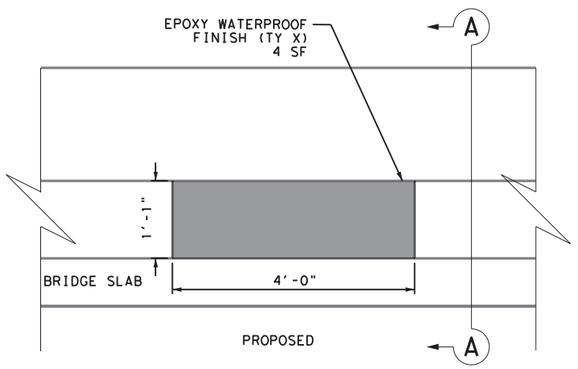


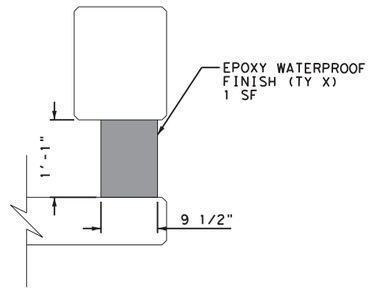
TYPICAL BRIDGE RAIL REPAIR DETAIL

NTS



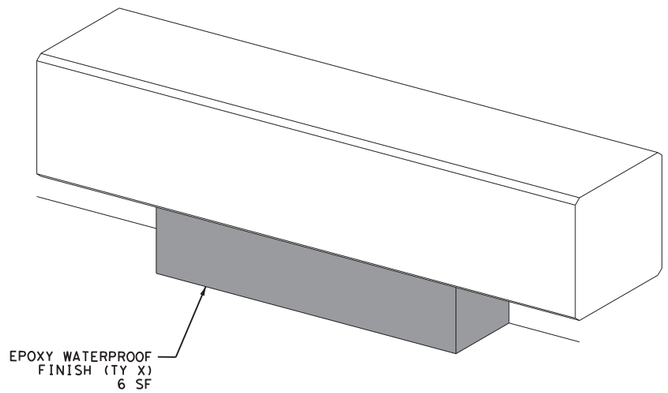
US 87 NB AT CANADIAN RIVER BRIDGE RAIL REPAIR DETAIL

NTS



SECTION A-A

NTS



US 87 NB AT CANADIAN RIVER BRIDGE RAIL ISOMETRIC VIEW

NTS

NOTES

1. REPAIR SPALLING AS NEEDED. DO NOT EXPOSE REINFORCING BARS

CONCRETE REPAIR NOTES

2. SUBMIT DETAILED REPAIR PROCEDURES, INCLUDING PROPOSED PROPRIETARY MATERIALS, FOR APPROVAL PRIOR TO COMMENCING WORK. PERFORM ALL CONCRETE REPAIRS IN ACCORDANCE WITH TXDOT CONCRETE REPAIR MANUAL.

LEGEND

778 6001
CONCRETE RAIL REPAIR (IN-KIND)

427 6007
EPOXY WATERPROOF FINISH (TY X)

SUMMARY OF BRIDGE RAIL REPAIR

REF #	COUNTY	LOCATION	NBI#	427 6007 EPOXY WATERPROOF FINISH (TY X) SF	778 6001 CONCRETE RAIL REPAIR (IN-KIND) LF
21	POTTER	US 87 NB AT CANADIAN RIVER	04-188-0-0041-05-064	492	
24	POTTER	LP 335 WB AT EASTERN ST	04-188-0-2635-01-012		17
25	POTTER	LP 335 EB AT EASTERN ST	04-188-0-2635-01-013		13
26	POTTER	LP 335 NB AT ABANDONED RR	04-188-0-2635-01-014		10
27	POTTER	LP 335 SB AT ABONDONED RR	04-188-0-2635-01-015		35
32	RANDALL	IH 27 SB AT P.D.T. FORK RED RIVER	04-191-0-0067-17-142		7
33	RANDALL	IH 27 NB AT P.D.T. FORK RED RIVER	04-191-0-0067-17-143		5
			SHEET TOTALS:	492	87

STATE OF TEXAS
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01-24-2022

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BRIDGE RAIL REPAIR DETAIL

SCALE: NTS

2022 Texas Department of Transportation

SHEET 1 OF 1

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		43

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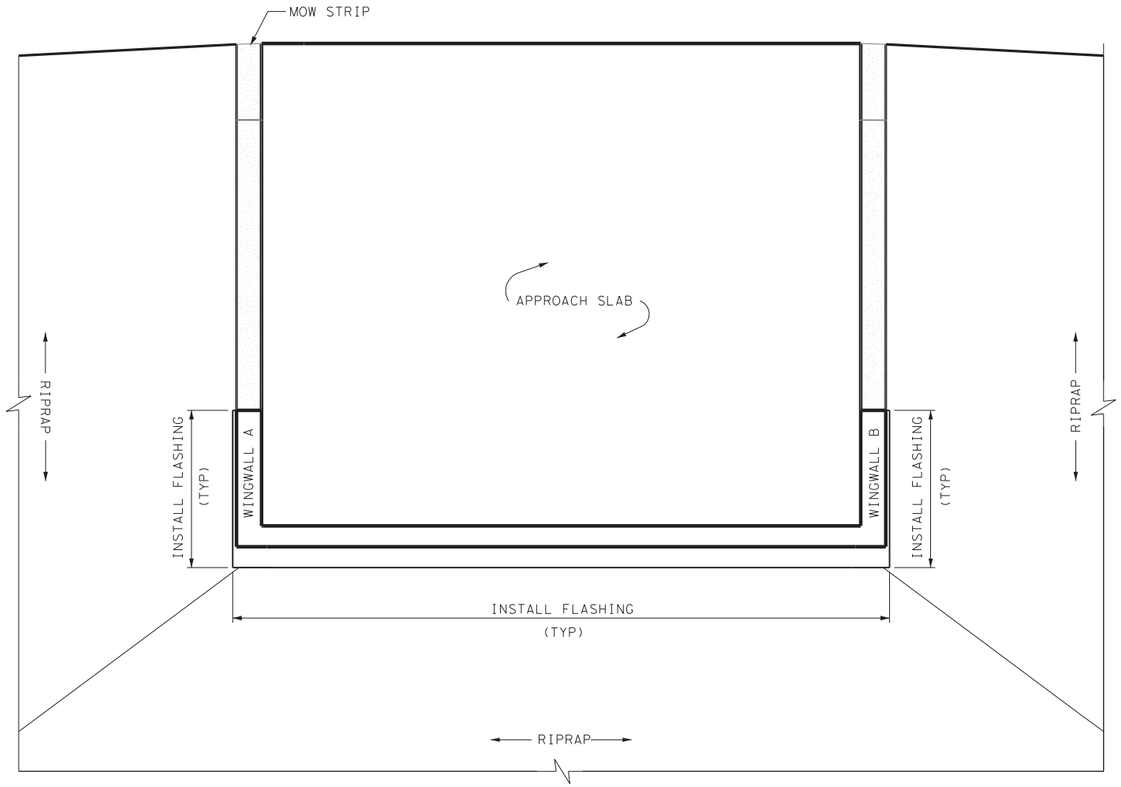
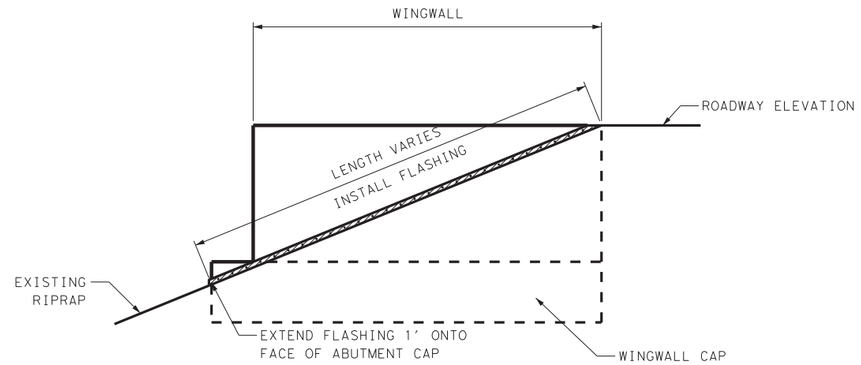


ABUTMENT PLAN VIEW: SHOWING RIPRAP (TYP)



WINGWALL ELEVATION VIEW (TYP): SHOWING RIPRAP

FLASHING INSTALLATION NOTES:

1. FLASHING WILL BE PAID UNDER ITEM 712.
2. REMOVE ANY EXISTING JOINT MATERIAL AND CLEAN ANY DEBRIS AND VEGETATION BETWEEN THE RIPRAP AND ABUTMENT JOINT. THIS IS SUBSIDIARY TO ITEM 712 AND WILL NOT BE PAID FOR SEPARATELY.
3. REFER TO CAP OPTION A ON CRR STANDARD FOR ANY PERTINENT DETAILS NOT SHOWN ON THIS SHEET.

SUMMARY OF FLASHING ITEMS

REF #	COUNTY	LOCATION	NBI#	712 6001 JT / CRK SEAL (POLY MOD ASPH EMULSION) LF
24	POTTER	LP 335 WB AT EASTERN ST	04-188-0-2635-01-012	140
25	POTTER	LP 335 EB AT EASTERN ST	04-188-0-2635-01-013	140
26	POTTER	LP 335 NB AT ABANDONED RR	04-188-0-2635-01-014	138
27	POTTER	LP 335 SB AT ABANDONED RR	04-188-0-2635-01-015	138
			SHEET TOTALS:	**556**

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED
PROFESSIONAL ENGINEER

Casey B. Stripling

01-24-2022

AMA FY 22 DBIP

CONCRETE RIPRAP JOINT SEAL FLASHING DETAIL

SCALE: NTS

2022 Texas Department of Transportation

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		44

DATE: 1/21/2022 10:43:02 AM
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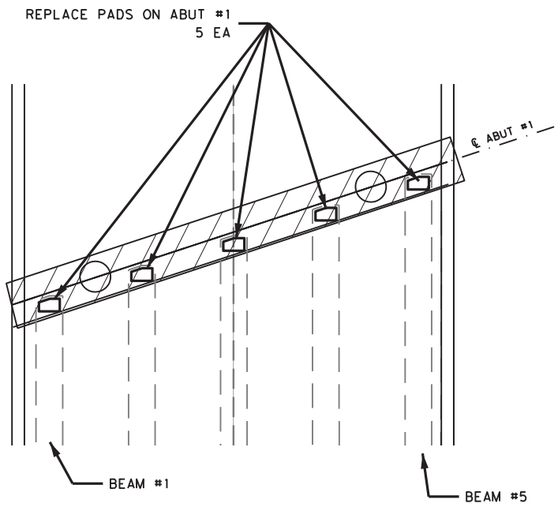
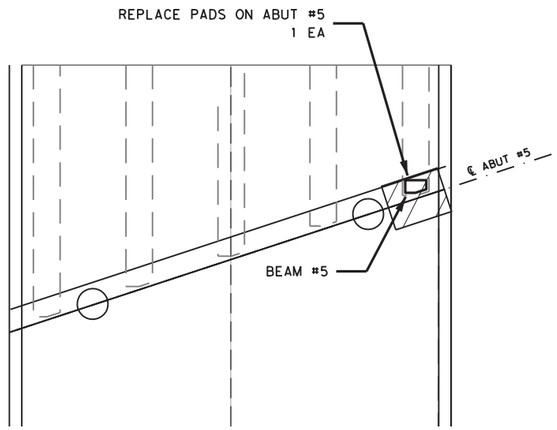
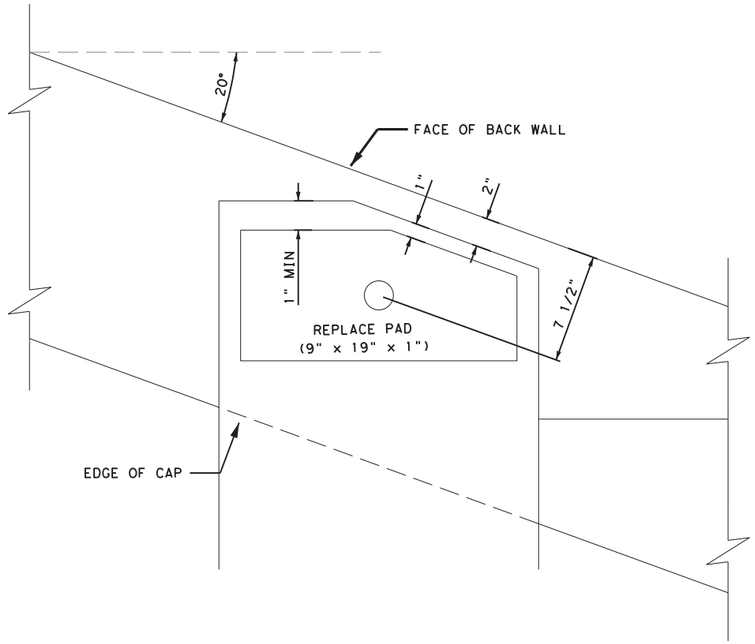


ELASTOMERIC BEARING PADS AT ABUTMENT 1



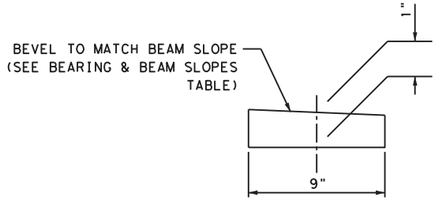
ELASTOMERIC BEARING PADS AT ABUTMENT 5

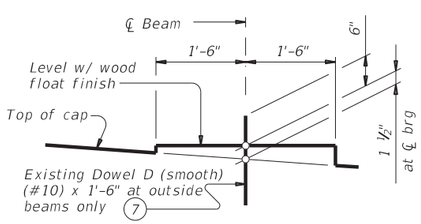


BEARING PAD LAYOUT DIMENSIONS AT ABUTMENTS

NOTES:

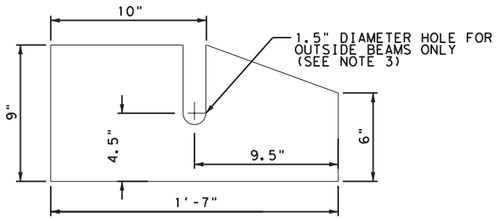
1. APPLY WITH TYPE V EPOXY, THIS WORK WILL BE SUBSIDIARY TO ITEM 4002.
2. RAISING EXISTING STRUCTURE IS SUBSIDIARY TO ITEM 4002.
3. A SLOT IS TO BE CUT INTO BEARING PADS BEING INSTALLED ON OUTSIDE BEAMS ONLY. THE SLOT WILL ALLOW THE BEARING PADS TO SLIDE PAST THE EXISTING DOWEL ROD THAT IS EMBEDDED INTO THE BENT CAP/ ABUTMENT CAP.





BEARING SEAT DETAIL

(Bearing surface must be clean and free of all loose material before placing bearing pad.)



PLAIN BEARING (70 DUROMETER)

NBI: 04-091-0-0275-11-146 BEARING & BEAM SLOPES		
SPAN	1	4
BEAM	SLOPE	
1	0.00631	
2	0.00642	
3	0.00653	
4	0.00663	
5	0.00674	-0.00003

VALUES WITHIN THE TABLE OBTAINED FROM AS BUILTS
CSJ: 0275-11-049

IH 40 EB AT IH 40 FRONTAGE RD CONN. BEARING PAD REPLACEMENT SUMMARY					
REF#	COUNTY	LOCATION	NBI#	ABUTMENT 1 LOCATION	4002 6001 REPLACE ELASTOMERIC BEARING PADS EA
5	GRAY	IH 40 EB AT IH 40 FRONTAGE RD CONN	04-091-0-0275-11-146	EAST END OF BRIDGE	6

NBI: 04-091-0-0275-11-146

STATE OF TEXAS
CASEY B. STRIPLING
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Casey B. Stripling

01-24-2022

AMA FY 22 DBIP

BEARING PAD REPLACEMENT DETAIL

SCALE: 1" = 100'

2022 Texas Department of Transportation

SHEET 1 OF 4

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		45

DATE: 1/21/2022 10:43:13 AM
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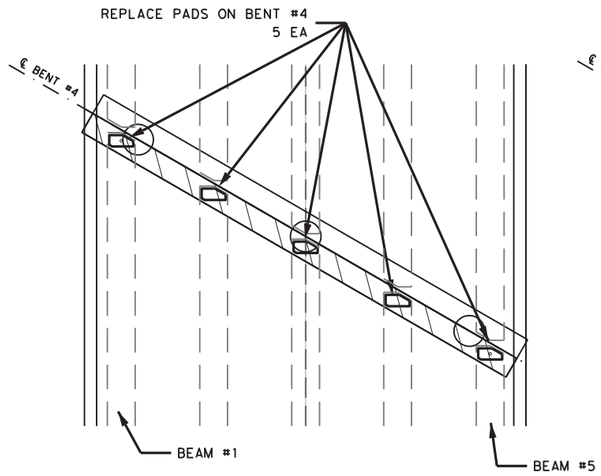
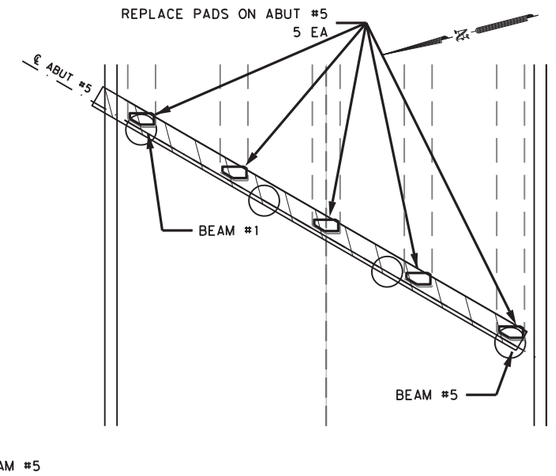
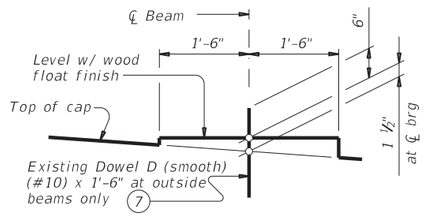


ELASTOMERIC BEARING PADS
AT BENT #4

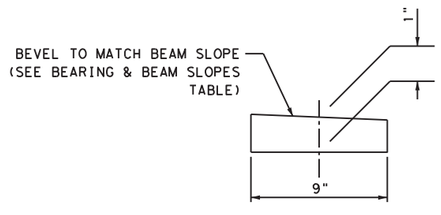


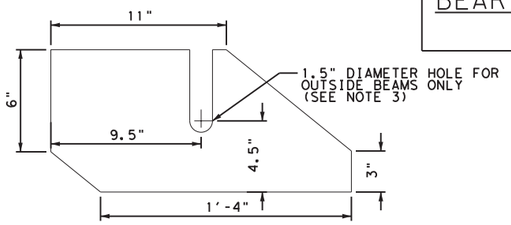
ELASTOMERIC BEARING PADS
AT ABUTMENT #5



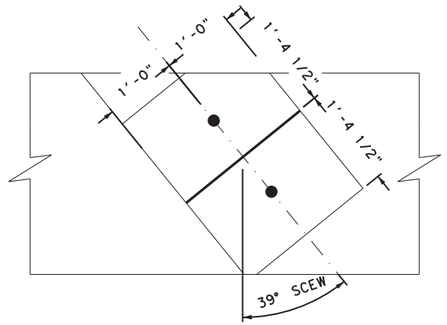
BEARING SEAT DETAIL ABUTMENT #5

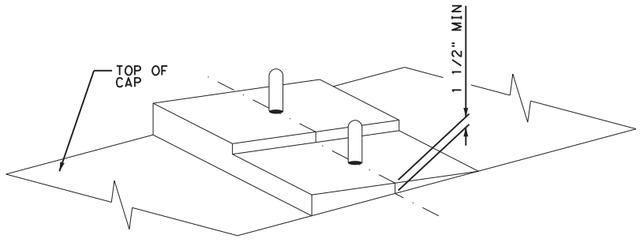
(Bearing surface must be clean and free of all loose material before placing bearing pad.)



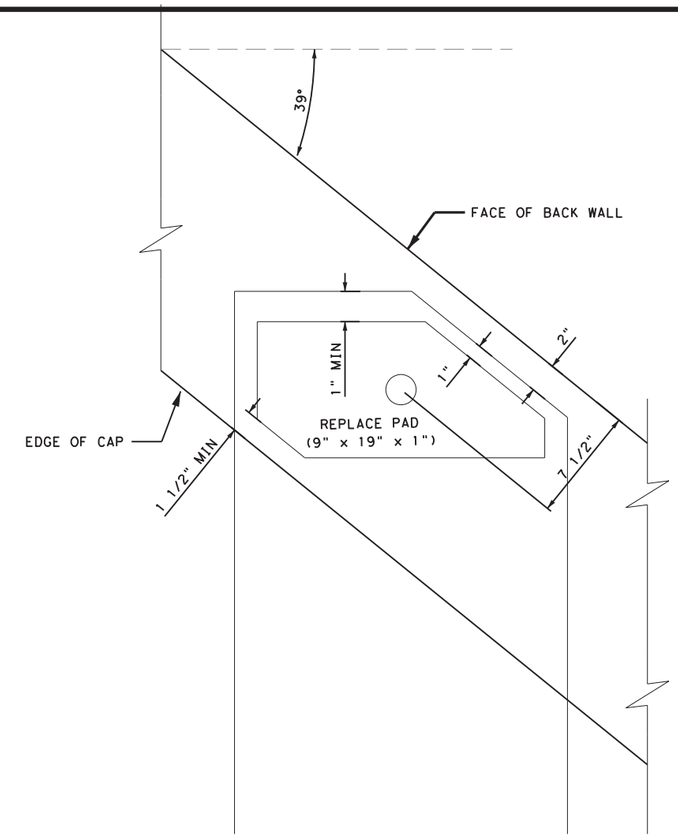


PLAIN BEARING (70 DUROMETER)





BEARING SEAT DETAIL BENT #4



BEARING PAD LAYOUT DIMENSIONS AT ABUTMENTS/ BENT CAPS

NOTES:

1. APPLY WITH TYPE V EPOXY, THIS WORK WILL BE SUBSIDIARY TO ITEM 4002.
2. RAISING EXISTING STRUCTURE IS SUBSIDIARY TO ITEM 4002.
3. A SLOT IS TO BE CUT INTO BEARING PADS BEING INSTALLED ON OUTSIDE BEAMS ONLY. THE SLOT WILL ALLOW THE BEARING PADS TO SLIDE PAST THE EXISTING DOWEL ROD THAT IS EMBEDDED INTO THE BENT CAP/ ABUTMENT CAP.

NBI: 04-091-0-0275-11-149 BEARING & BEAM SLOPES	
SPAN	4
BEAM	SLOPE
1	0.00477
2	0.00495
3	0.00515
4	0.00533
5	0.00553

VALUES WITHIN THE TABLE OBTAINED FROM AS BUILTS
CSJ: 0275-11-049

IH 40 WB AT IH 40 FRONTAGE RD CONN. BEARING PAD REPLACEMENT SUMMARY					
					4002
					6001
REF#	COUNTY	LOCATION	NBI#	ABUTMENT 1 LOCATION	REPLACE ELASTOMERIC BEARING PADS
					EA
6	GRAY	IH 40 WB AT IH 40 FRONTAGE RD CONN	04-091-0-0275-11-149	EAST END OF BRIDGE	10

NBI: 04-091-0-0275-11-149

STATE OF TEXAS
CASEY B. STRIPLING
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Casey B. Stripling
01-24-2022

AMA FY 22 DBIP

BEARING PAD REPLACEMENT DETAIL

SCALE: 1" = 100'

2022 Texas Department of Transportation

SHEET 2 OF 4

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		46

DATE: 1/21/2022 10:43:16 AM
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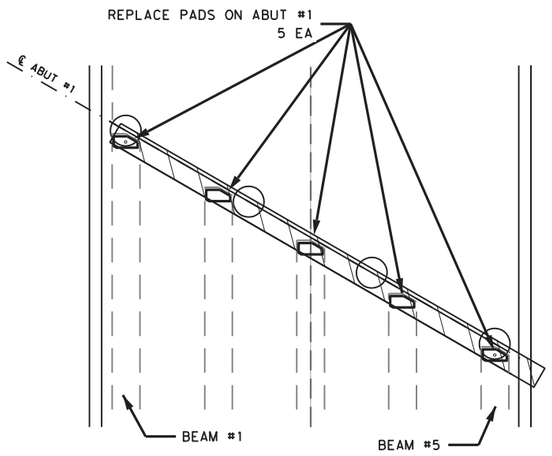
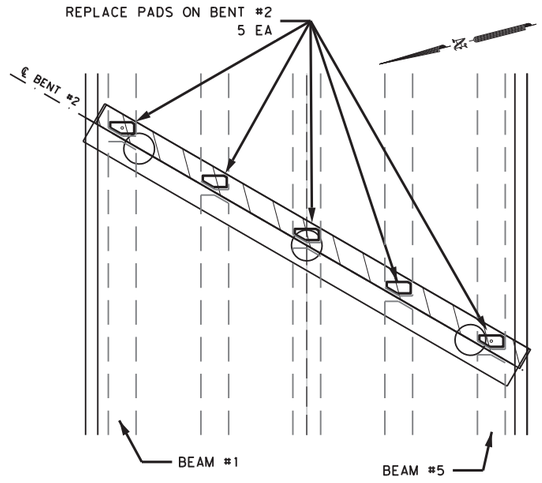
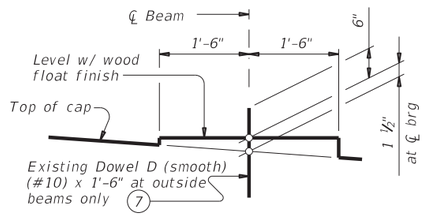


ELASTOMERIC BEARING PADS
AT ABUTMENT #1

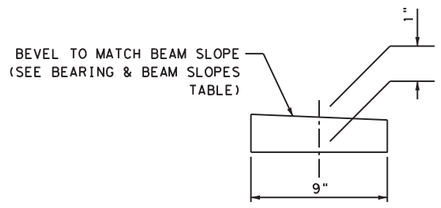


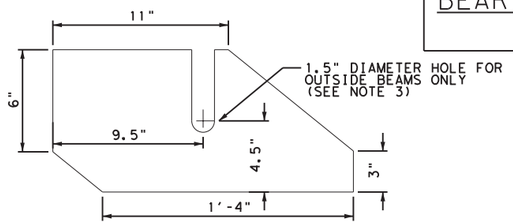
ELASTOMERIC BEARING PADS
AT BENT #2



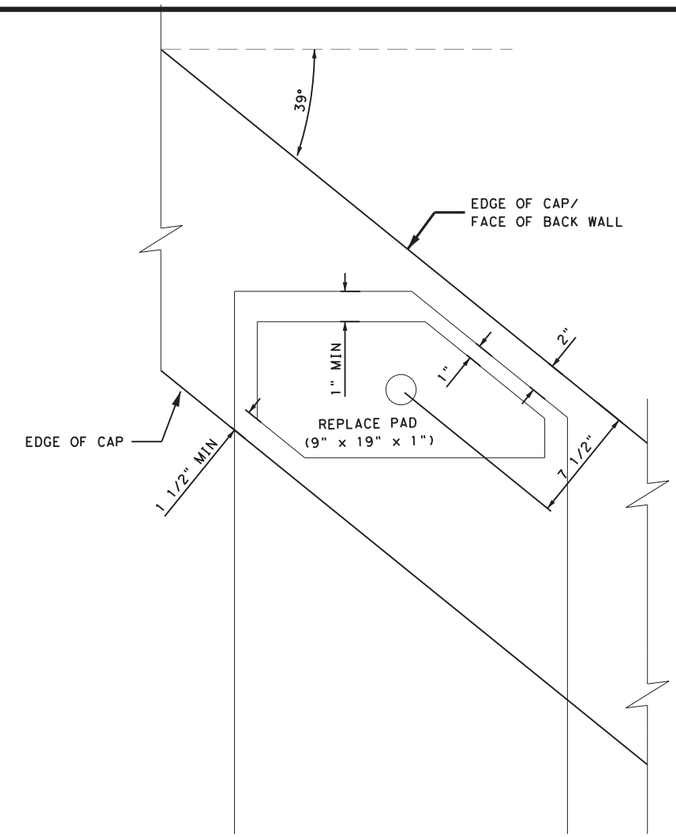
BEARING SEAT DETAIL ABUTMENT #1

(Bearing surface must be clean and free of all loose material before placing bearing pad.)





PLAIN BEARING (70 DUROMETER)



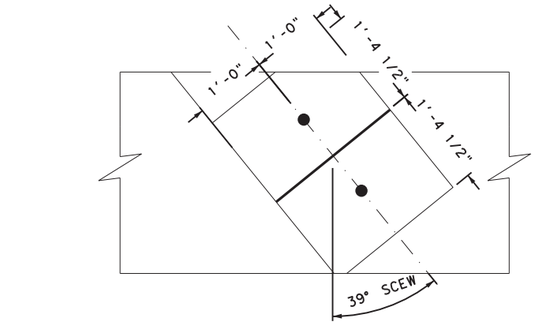
BEARING PAD LAYOUT DIMENSIONS AT ABUTMENTS/ BENT CAPS

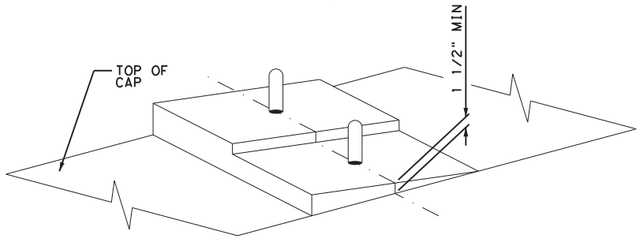
NOTES:

1. APPLY WITH TYPE V EPOXY, THIS WORK WILL BE SUBSIDIARY TO ITEM 4002.
2. RAISING EXISTING STRUCTURE IS SUBSIDIARY TO ITEM 4002.
3. A SLOT IS TO BE CUT INTO BEARING PADS BEING INSTALLED ON OUTSIDE BEAMS ONLY. THE SLOT WILL ALLOW THE BEARING PADS TO SLIDE PAST THE EXISTING DOWEL ROD THAT IS EMBEDDED INTO THE BENT CAP/ ABUTMENT CAP.

NBI: 04-091-0-0275-11-150 BEARING & BEAM SLOPES	
SPAN	1
BEAM	SLOPE
1	0.00877
2	0.00859
3	0.00839
4	0.0082
5	0.00801

VALUES WITHIN THE TABLE OBTAINED FROM AS BUILTS
CSJ: 0275-11-049





BEARING SEAT DETAIL BENT #2

IH 40 EB AT IH 40 FRONTAGE RD CONN. BEARING PAD REPLACEMENT SUMMARY					
REF#	COUNTY	LOCATION	NBI#	ABUTMENT 1 LOCATION	4002 6001 REPLACE ELASTOMERIC BEARING PADS EA
7	GRAY	IH 40 EB AT IH 40 FRONTAGE RD CONN	04-091-0-0275-11-150	EAST END OF BRIDGE	10

NBI: 04-091-0-0275-11-150

STATE OF TEXAS
CASEY B. STRIPLING
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PROFESSIONAL ENGINEER
Casey B. Stripling
01-24-2022

AMA FY 22 DBIP

BEARING PAD REPLACEMENT DETAIL

SCALE: 1" = 100'

2022 Texas Department of Transportation

SHEET 3 OF 4

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		47

DATE: 1/21/2022 10:43:20 AM
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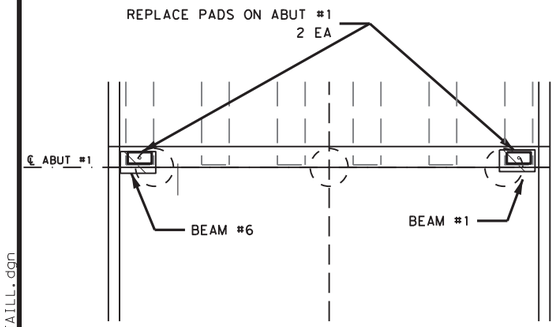
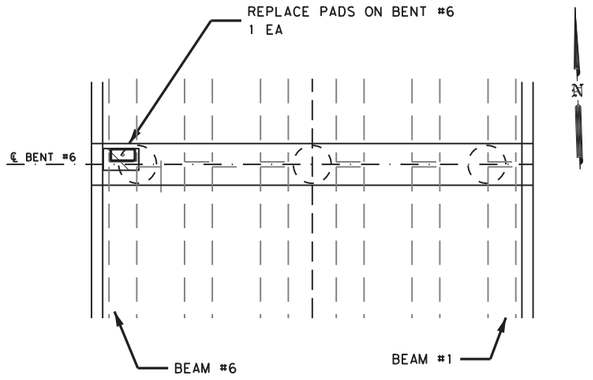
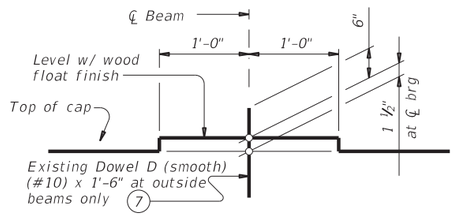


ELASTOMERIC BEARING PADS
AT ABUTMENT #1

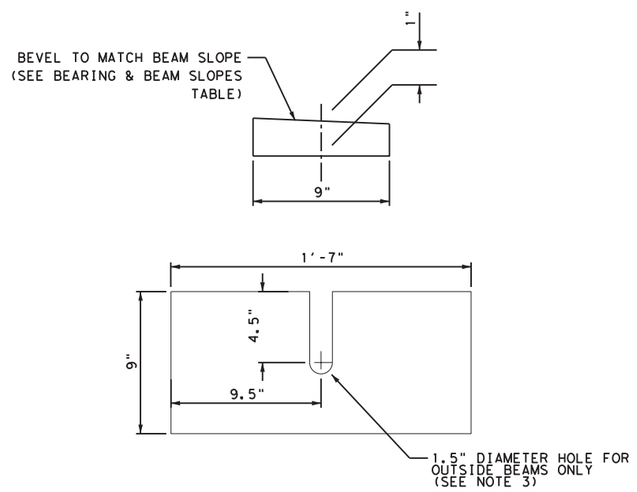


ELASTOMERIC BEARING PADS
AT BENT #2



BEARING SEAT DETAIL

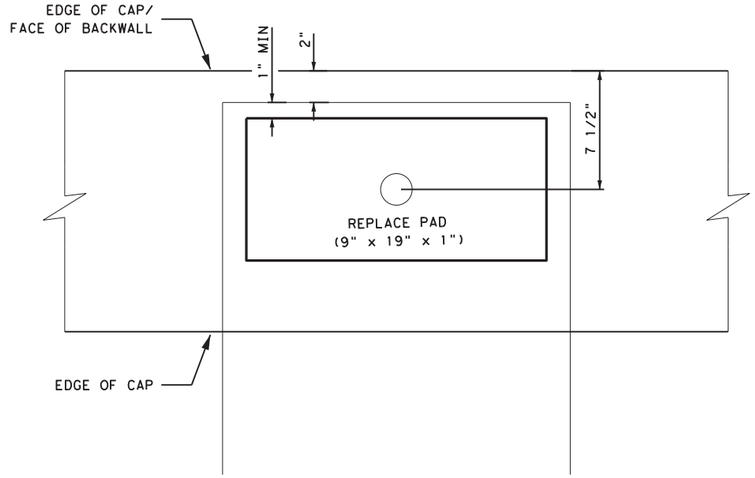
(Bearing surface must be clean and free of all loose material before placing bearing pad.)



PLAIN BEARING (70 DUROMETER)

NOTES:

1. APPLY WITH TYPE V EPOXY, THIS WORK WILL BE SUBSIDIARY TO ITEM 4002.
2. RAISING EXISTING STRUCTURE IS SUBSIDIARY TO ITEM 4002.
3. A SLOT IS TO BE CUT INTO BEARING PADS BEING INSTALLED ON OUTSIDE BEAMS ONLY. THE SLOT WILL ALLOW THE BEARING PADS TO SLIDE PAST THE EXISTING DOWEL ROD THAT IS EMBEDDED INTO THE BENT CAP/ ABUTMENT CAP.



BEARING PAD LAYOUT DIMENSIONS AT ABUTMENTS/ BENT CAPS

NBI: 04-118-0356-01-014 BEARING & BEAM SLOPES		
SPAN	1	5
BEAM	SLOPE	
1	0.023	
2		
3		
4		
5		
6	0.023	0.1

VALUES WITHIN THE TABLE OBTAINED FROM AS BUILTS
CSJ: 0356-01-066

SH 136 NB AT CANADIAN RIVER BEARING PAD REPLACEMENT SUMMARY					
REF#	COUNTY	LOCATION	NBI#	ABUTMENT 1 LOCATION	4002 6001 REPLACE ELASTOMERIC BEARING PADS EA
14	HUTCHINSON	SH 136 NB AT CANADIAN RIVER	04-118-0-0356-01-014	SOUTH END OF BRIDGE	3

NBI: 04-118-0-0356-01-014

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED PROFESSIONAL ENGINEER
Casey B. Stripling
01-24-2022

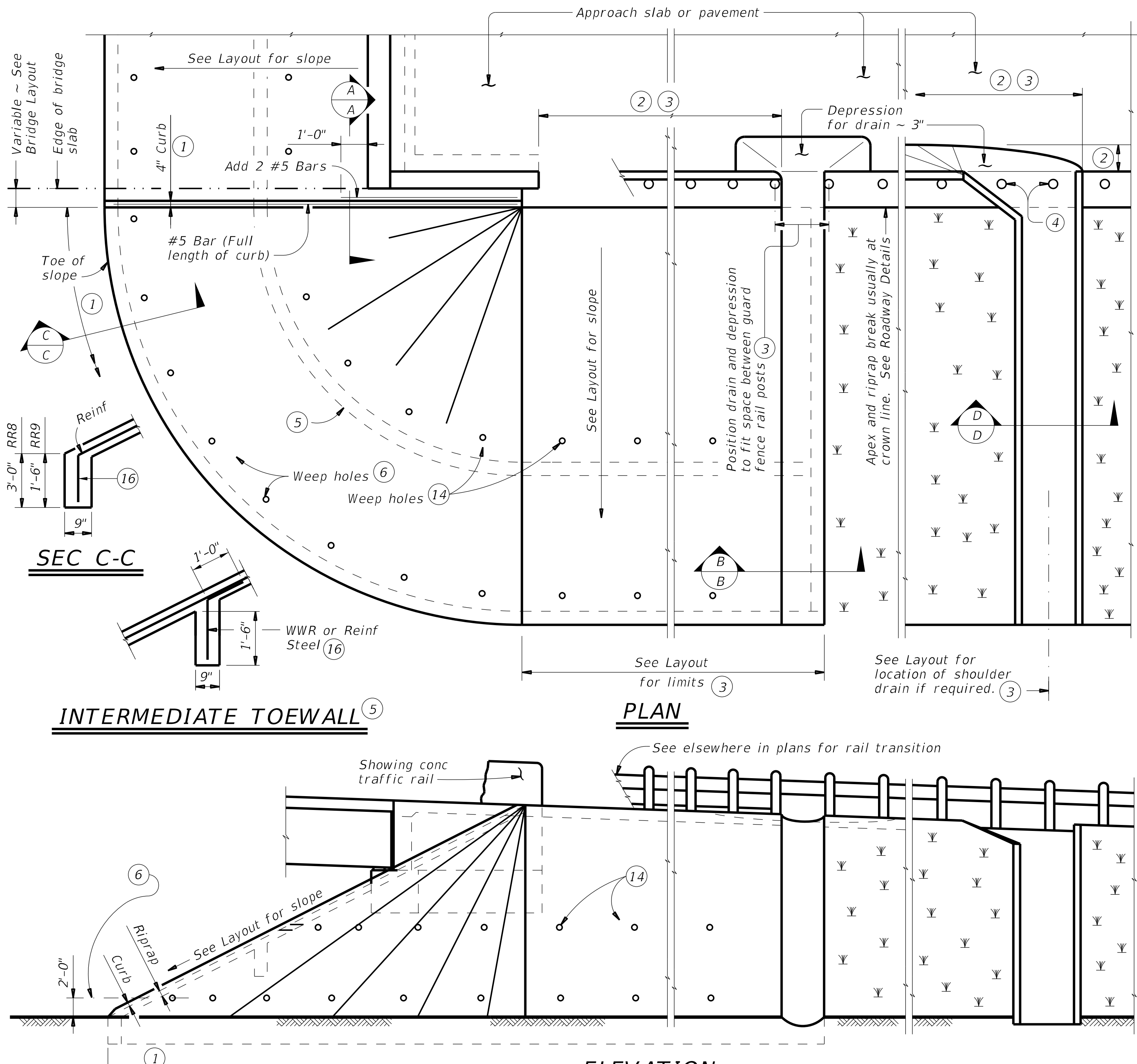
AMA FY 22 DBIP

BEARING PAD REPLACEMENT DETAIL

SCALE: NTS

2022 Texas Department of Transportation

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		48

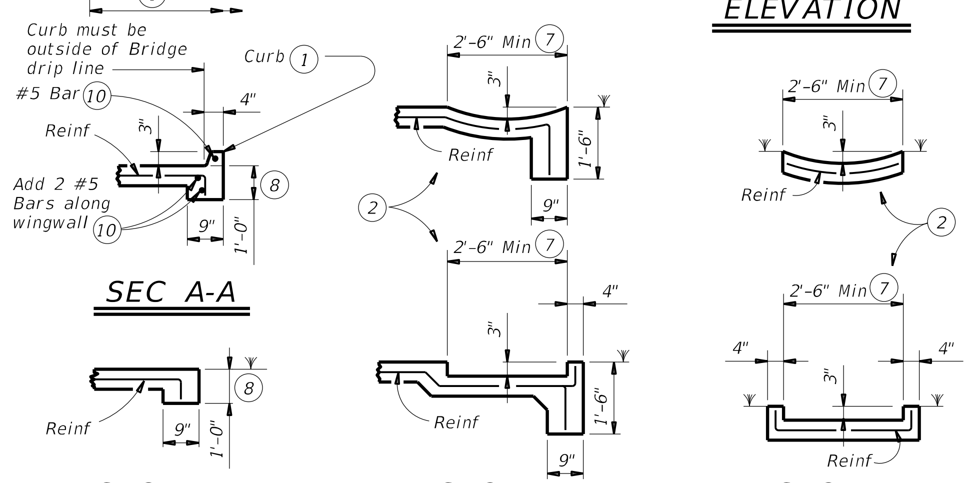


SEC C-C

INTERMEDIATE TOEWALL (5)

PLAN

ELEVATION



SEC A-A

SEC B-B

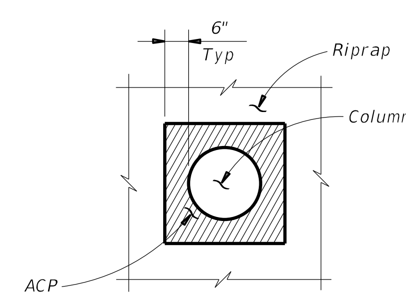
(No drain)

SEC B-B

(Shoulder drain integral with riprap)

SEC D-D

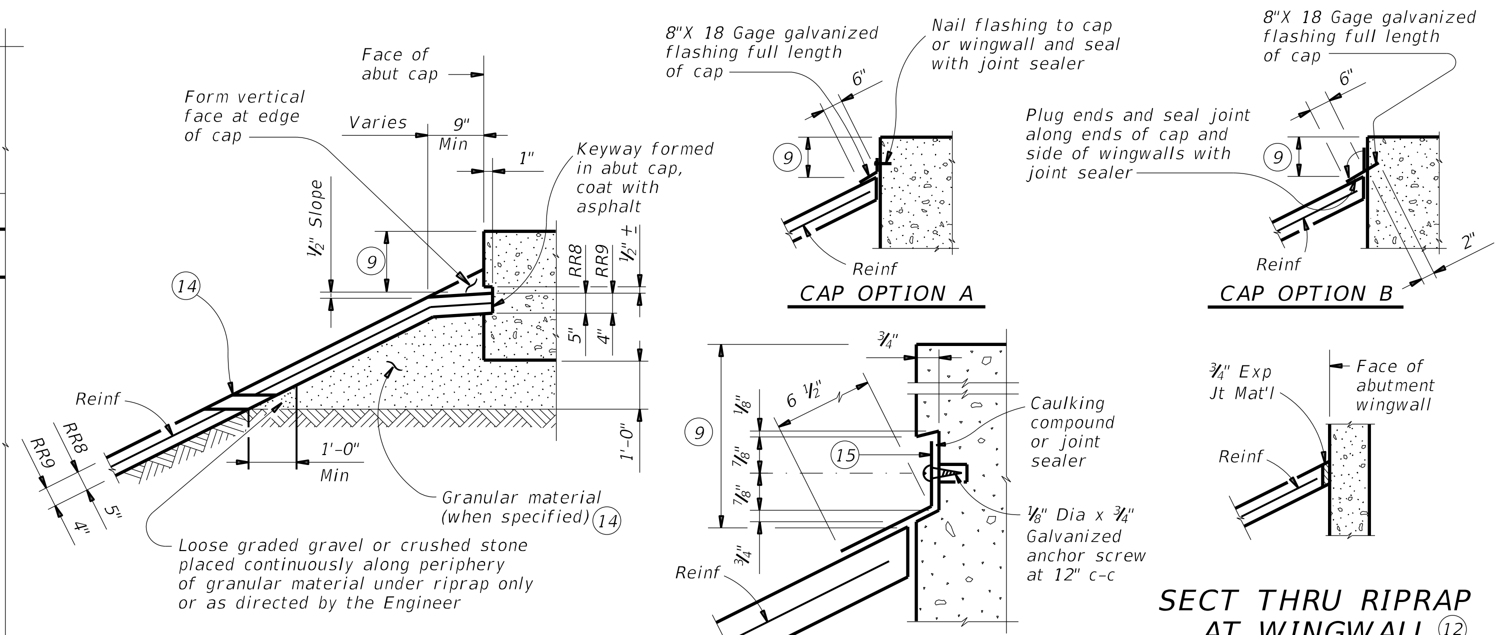
(Shoulder drain)



Riprap blockout to be filled with ACP. (Subsidiary to riprap)

RIPRAP DETAIL AT COLUMNS

(As directed by the Engineer)



SHOWING KEYWAY OPTION

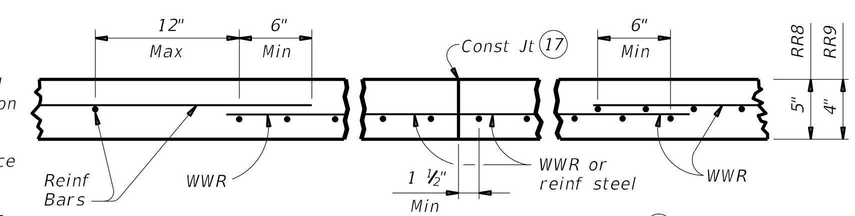
CAP OPTION A

CAP OPTION B

CAP OPTION C

SECT THRU RIPRAP AT WINGWALL (12)

SECTIONS THRU RIPRAP AT CAP (11)



REINFORCEMENT DETAILS (13)

See General Notes for optional synthetic fiber reinforcement.

(1) When riprap is shown extended around header on layout, extend slab and toewall as shown and eliminate 4" curb.

(2) Limits and configuration of drains and depressions are as shown elsewhere in plans or as directed by the Engineer.

(3) Location of shoulder drain must consider limitations imposed by rail transition. Do not locate shoulder drains at expansion joints between approach slab and concrete pavement.

(4) See details elsewhere in plans for installation of guard fence posts through concrete riprap.

(5) Provide intermediate toewall only when designated elsewhere in the plans or included in the specifications.

(6) Provide lower level of 2" Dia weep holes at 10' c-c backed by 1 CF packet of gravel and galvanized hardware cloth at all locations unless directed by the Engineer to eliminate.

(7) Use wider or other drain configurations if shown elsewhere in plans or if directed by the Engineer.

(8) Wall extension may be reduced or modified if approved by the Engineer. Increase wall extension to 1'-6" whenever the optional intermediate toewall is called for in the plans.

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

(10) #5 bars shown are required even when synthetic fiber reinforcing option is selected.

(11) Provide sealing option for joint between the face of cap and riprap as designated by the Engineer or as shown elsewhere on plans.

(12) Flashing (shown in Cap Option A) may be used at wingwall in addition to Exp Jt Mat'l if shown on plans or directed by the Engineer.

(13) Provide #3 reinforcing bars at 18" Spa c-c. Provide Welded Wire Reinforcement (WWR) as 6x6-D2.9xD2.9 or D3xD3. Combinations of WWR and reinforcing bars may be used if both are permitted. Use lap splices of a minimum 6 inches, measured from the transverse wire of WWR, and the ends of reinforcing bars.

(14) If granular material is specified, provide upper level of 2" Dia weep holes at 10' c-c backed by galvanized hardware cloth.

(15) 8" x 18 Gage Galv Sheet Metal

(16) Provide WWR or #3 bars, with 1'-0" extension into slope.

(17) WWR or reinforcing steel is continuous through riprap construction joints. Provide WWR or reinforcing steel that extends 1'-1" minimum into adjacent riprap on each side of construction joint even if synthetic reinforcing fiber is utilized.

FOR CONTRACTOR'S INFORMATION ONLY:
5" of RR8 = 0.015 CY/SF
4" of RR9 = 0.012 CY/SF
#3 Reinf at 18" c-c = 0.501 Lbs/SF
6x6-D3xD3 = 0.408 Lbs/SF

GENERAL NOTES:

Provide Class "B" concrete (f'c = 2,000 psi) unless noted elsewhere in plans.

Provide Grade 60 reinforcing steel.

Provide deformed welded wire reinforcement (WWR) meeting ASTM A1064, unless otherwise shown.

Provide reinforcing bars, deformed WWR, or any suitable combination of both types for riprap reinforcing, unless specified elsewhere in the plans.

Optionally synthetic fibers may be used if approved by the Engineer. Provide synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) in lieu of steel reinforcing in riprap concrete.

Install construction joints or grooved joints extending the full slant slope height at intervals of approximately 20 feet unless otherwise directed by the Engineer.

Hardware cloth, loose grade stone behind weep holes, flashing, or other sealing material are subsidiary to the bid item "Riprap".

See Layout for limits of riprap.

RR8 is to be used on stream crossings.

RR9 is to be used on other embankments.

Texas Department of Transportation — Bridge Division Standard

CONCRETE RIPRAP AND SHOULDER DRAINS
EMBANKMENTS AT BRIDGE ENDS (TYPES RR8 & RR9)

CRR

FILE: crrstde1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0904	00	199	VARIOUS
	DIST		COUNTY	SHEET NO.
	AMA		POTTER	49

DATE: 1/21/2022 10:43:28 AM
FILE: T:\AMATPD\Construction Projects\0904-00\199 - FY 22 Bridge Improvements\4 - Design\Plan Set\7. Bridge\Standards\CRR.dgn

PART 1 - GENERAL

1.01 DESCRIPTION

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

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

1.02 REQUEST FOR INFORMATION / CLARIFICATION

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

1.03 PLANS / SPECIFICATIONS

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

PART 2 - UTILITIES AND FIBER OPTIC

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

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

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

3.05 RAILROAD SAFETY ORIENTATION

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

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

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

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR)and 14'-0" (KCS) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0904	00	199	VARIOUS
	DIST	COUNTY		SHEET NO.
	AMA	POTTER		50

3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
   1. Pre-construction meetings.
   2. Pile driving/drilling of caissons or drilled shafts.
   3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
   4. Erection of precast concrete or steel bridge superstructure.
   5. Placement of waterproofing (prior to placing ballast on bridge deck).
   6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

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

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

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

3.13 TRAFFIC CONTROL

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

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

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

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

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

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

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

3.15 RAILROAD FLAGGING

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

3.16 CLEANING OF RIGHT-OF-WAY

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

Texas Department of Transportation — Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0904	00	199	VARIOUS
	DIST	COUNTY		SHEET NO.
	AMA	POTTER		51

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

DOT #: 276496Y
Crossing Type: ** PUBLIC
RR Company Owning Track at Crossing: BNSF
Operating RR Company at Track: BNSF
RR MP: 339.39
RR Subdivision: DALHART
City: AMARILLO
County: POTTER
CSJ at this Crossing: 1624-01
Highway/Roadway name crossing the railroad: FM 1719
# of regularly scheduled trains per day at this crossing: 15
# of switching movements per day at this crossing: 0
% of estimated contract cost of work within railroad ROW: $6,675

Scope of Work at this Crossing to Be Performed by State Contractor:
Repair steel armour at bent joints. Clean and reseal joints.

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

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

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

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: ____

On this project, night or weekend flagging is:

☐ Expected
☒ Not Expected

Flagging services will be provided by:

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

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

Contact Information for Flagging:

☐ UPRR - UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- UP.request@nrssinc.net
Call Center 877-984-6777

☐ BNSF - BNSF.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ KCS - KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS _____

Contractor must incorporate Construction Inspection into anticipated construction schedule.

☒ Not Required

☐ Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

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

☐ Required
☒ Not Required

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

V. RAILROAD INSURANCE REQUIREMENTS

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

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

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

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

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

Railroad Protective Liability		
☐	Not Required	
☒	Non - Bridge Projects	$2,000,000 / $6,000,000
☐	Bridge Projects	$5,000,000 / $10,000,000
☐	Other	

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

On this project, an ROE agreement is:

☒ Not Required

☐ Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)

☐ Required: UPRR Maintenance Consent Letter. TxDOT CST to assist.

☐ Required: Contractor to obtain (see Item 5, Article 8.4)
With the following railroad companies: _____

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

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

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

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

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

☒ Not Required
☐ Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

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

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call BNSF
Railroad Emergency Line at 1(800)832-5452
Location: DOT 276496Y
RR Milepost 339.39
Subdivision DALHART

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK

PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:		
©TxDOT June 2014	CONT	SECT	JOB	HIGHWAY		
REVISIONS 9/2021	0904	00	199	VARIOUS		
	DIST	COUNTY		SHEET NO.		
	AMA	POTTER		52		

DATE: $DATE$ $TIME$
FILE: $DOCUMENT NAME$

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

DOT #: 014541T
Crossing Type: ** PUBLIC
RR Company Owning Track at Crossing: BNSF
Operating RR Company at Track: BNSF
RR MP: 497.08
RR Subdivision: PANHANDLE
City: PAMPA
County: GRAY
CSJ at this Crossing: 2403-01
Highway/Roadway name crossing the railroad: LP 171
# of regularly scheduled trains per day at this crossing: 82
# of switching movements per day at this crossing: 0
% of estimated contract cost of work within railroad ROW: $4,980

Scope of Work at this Crossing to Be Performed by State Contractor:
Clean and reseal Joint. Repair joint headers.

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

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

DOT #: 016609L
Crossing Type: PUBLIC
RR Company Owning Track at Crossing: BNSF
Operating RR Company at Track: BNSF
RR MP: 1.48
RR Subdivision: PAMPA INDUSTRI
City: PAMPA
County: GRAY
CSJ at this Crossing: 2403-01
Highway/Roadway name crossing the railroad: SL 171
# of regularly scheduled trains per day at this crossing: 1
# of switching movements per day at this crossing: 0
% of estimated contract cost of work within railroad ROW: $4,980

Scope of Work at this Crossing to Be Performed by State Contractor:
Clean and reseal Joint. Repair joint headers.

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

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

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

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: ____
On this project, night or weekend flagging is:
☐ Expected
☒ Not Expected
Flagging services will be provided by:
☐ Railroad Company: TxDOT will pay flagging invoices
☐ Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT

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

Contact Information for Flagging:

☐ UPRR - UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- UP.request@nrssinc.net
Call Center 877-984-6777

☒ BNSF - BNSF.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ KCS - KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS

Contractor must incorporate Construction Inspection into anticipated construction schedule.

☒ Not Required

☐ Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:
☐ Required
☒ Not Required

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

V. RAILROAD INSURANCE REQUIREMENTS

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

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

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

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

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

Railroad Protective Liability		
☐	Not Required	
☒	Non - Bridge Projects	$2,000,000 / $6,000,000
☐	Bridge Projects	$5,000,000 / $10,000,000
☐	Other	

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

On this project, an ROE agreement is:
☒ Not Required

☐ Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)

☐ Required: UPRR Maintenance Consent Letter. TxDOT CST to assist.

☐ Required: Contractor to obtain (see Item 5, Article 8.4)
With the following railroad companies: _____

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

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

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

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

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:
☒ Not Required
☐ Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

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

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call BNSF
Railroad Emergency Line at 1 (800) 832-5452
Location: DOT 014541T, 016609L
RR Milepost 497.08, 1.48
Subdivision PANHANDLE, PAMPA INDUSTRI

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
© TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS 9/2021	0904	00	199	VARIOUS
	DIST	COUNTY		SHEET NO.
	AMA	POTTER		53

DATE: $DATE$ $TIME$
FILE: $DOCUMENT NAME$

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

DOT #: 016987G
Crossing Type: ** PUBLIC
RR Company Owning Track at Crossing: PNRR
Operating RR Company at Track: PNRR
RR MP: 2.42
RR Subdivision: BORGER
City: BORGER
County: HUTCHINSON
CSJ at this Crossing: 0379-01
Highway/Roadway name crossing the railroad: SH 136
# of regularly scheduled trains per day at this crossing: 4
# of switching movements per day at this crossing: 0
% of estimated contract cost of work within railroad ROW: $12,700

Scope of Work at this Crossing to Be Performed by State Contractor:
Repair east abutment joints. Clean and seal joints.

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

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

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

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: ____

On this project, night or weekend flagging is:

☐ Expected
☒ Not Expected

Flagging services will be provided by:

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

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

Contact Information for Flagging:

☐ UPRR - UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- UP.request@nrssinc.net
Call Center 877-984-6777

☐ BNSF - BNSF.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ KCS - KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS _____

Contractor must incorporate Construction Inspection into anticipated construction schedule.

☒ Not Required

☐ Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

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

☐ Required
☒ Not Required

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

V. RAILROAD INSURANCE REQUIREMENTS

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

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

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

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

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

Railroad Protective Liability		
☐	Not Required	
☒	Non - Bridge Projects	$2,000,000 / $6,000,000
☐	Bridge Projects	$5,000,000 / $10,000,000
☐	Other	

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

On this project, an ROE agreement is:

☒ Not Required

☐ Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)

☐ Required: UPRR Maintenance Consent Letter. TxDOT CST to assist.

☐ Required: Contractor to obtain (see Item 5, Article 8.4)
With the following railroad companies: _____

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

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

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

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

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

☒ Not Required
☐ Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

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

IX. EMERGENCY NOTIFICATION

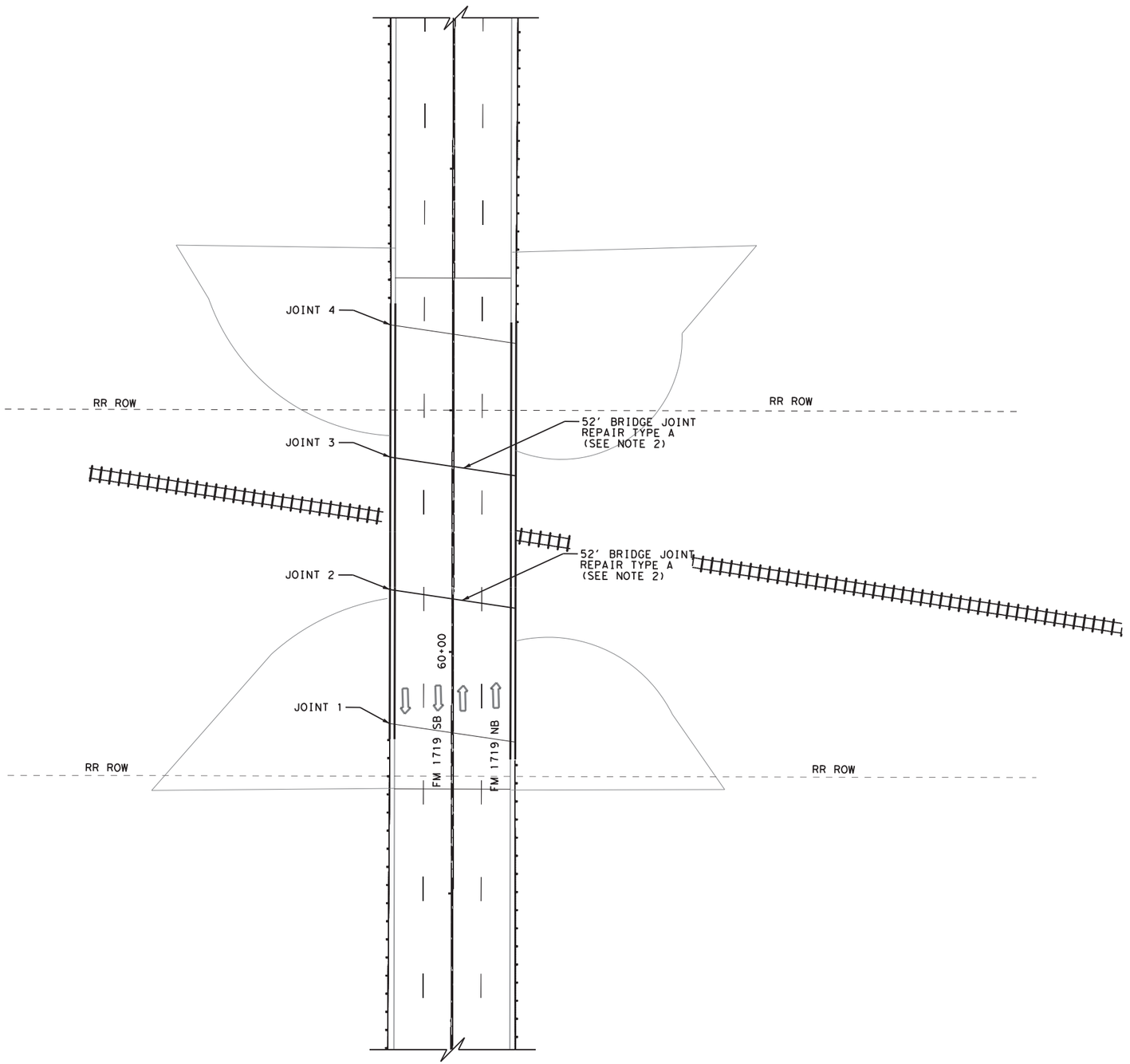
In Case of Railroad Emergency
Call PNRR
Railroad Emergency Line at 1(800) 533-9416
Location: DOT 016987G
RR Milepost 2.42
Subdivision BORGER

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:		
©TxDOT June 2014	CONT	SECT	JOB	HIGHWAY		
REVISIONS 9/2021	0904	00	199	VARIOUS		
	DIST	COUNTY		SHEET NO.		
	AMA	POTTER		54		

DATE: $DATE$ $TIME$
FILE: $DOCUMENT NAME$



NOTES

1. REFER TO CLEAN AND SEAL BRIDGE JOINTS DETAIL FOR MORE INFORMATION.
2. REFER TO BRIDGE JOINT REPAIR DETAIL FOR MORE INFORMATION.

N

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED
PROFESSIONAL ENGINEER

Casey B. Stripling

01-24-2022

FM 1719 AT BNSF RR
EXHIBIT A
DOT# 276496Y

SCALE: 1" = 50'

2022 Texas Department of Transportation

SHEET 1 OF 1

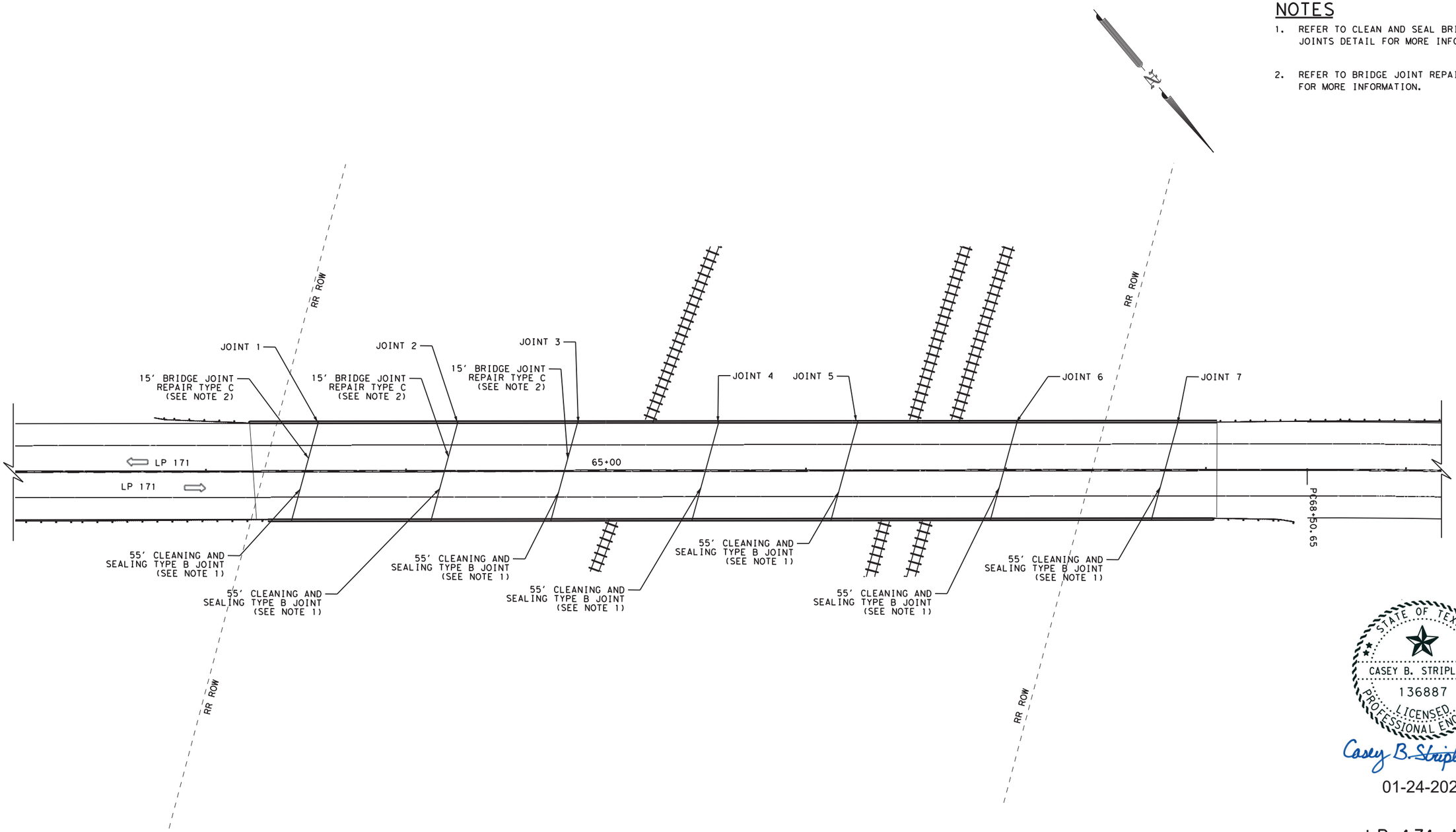
DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		55

FM 1719 AT BNSF RR

DATE: 1/21/2022 10:44:59 AM
FILE: I:\AMA\PD\Construction Projects\0904-00\199 - FY 22 Bridge Improvements\4 - Design\Plan Set\8a. Railroad\199_RAILROAD_EXHIBITS.dgn

NOTES

1. REFER TO CLEAN AND SEAL BRIDGE JOINTS DETAIL FOR MORE INFORMATION.
2. REFER TO BRIDGE JOINT REPAIR DETAIL FOR MORE INFORMATION.



LP 171 AT BNSF RR

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED
PROFESSIONAL ENGINEER

Casey B. Stripling

01-24-2022

LP 171 AT BNSF RR

EXHIBIT B
DOT# 014541T
DOT# 016609L

SCALE: 1" = 50'

2022 Texas Department of Transportation

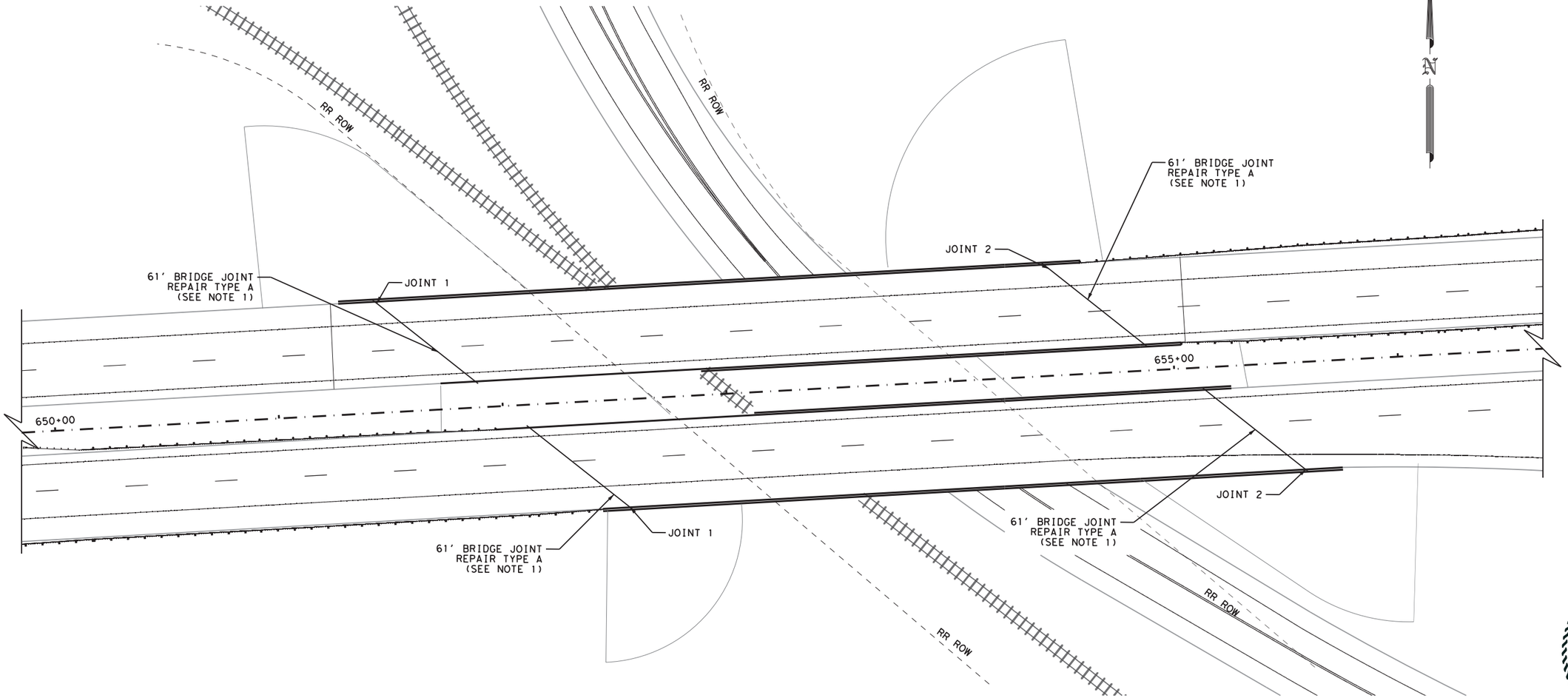
SHEET 1 OF 1

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		56

DATE: 1/21/2022 10:45:03 AM
FILE: T:\AMA\PD\Construction Projects\0904-00\199 - FY 22 Bridge Improvements\4 - Design\Plan Set\8a. Railroad\199_RAILROAD_EXHIBITS.dgn

NOTES

1. REFER TO BRIDGE JOINT REPAIR DETAIL FOR MORE INFORMATION.



STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED
PROFESSIONAL ENGINEER

Casey B. Stripling

01-24-2022

SH 136 AT FM 1559 & ATSF RR
EXHIBIT C
DOT# 016987G

SCALE: 1" = 50'

2022 Texas Department of Transportation

SHEET 1 OF 1

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		57

SH 136 AT FM 1559 & ATSF RR

DATE: 1/21/2022 10:45:06 AM
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SITE DESCRIPTION

PROJECT LIMITS: 32 BRIDGES IN 9 COUNTIES IN THE AMARILLO DISTRICT. SEE TITLE SHEET FOR LOCATIONS.

PROJECT DESCRIPTION: BRIDGE REPAIR TYPE WORK INCLUDING CLEANING AND SEALING JOINTS, MBGF REPAIR, RIPRAP REPAIR

MAJOR SOIL DISTURBING ACTIVITIES:

TOTAL PROJECT AREA:

TOTAL AREA TO BE DISTURBED: 0 ACRES

WEIGHTED RUNOFF COEFFICIENT
(BEFORE CONSTRUCTION):
(AFTER CONSTRUCTION):

EXPLANATION OF THE TECHNICAL BASIS USED TO SELECT THE PRACTICES TO CONTROL POLLUTION WHERE FLOWS EXCEED PRE-DEVELOPMENT LEVELS:

EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER: 90% GRASS AND NATURAL VEGETATION

NAME OF RECEIVING WATERS: NO GROUND DISTURBING ACTIVITIES WILL BE INCLUDED IN THIS PROJECT, THEREFORE, NO RECEIVING WATERS WILL BE IMPACTED.

EROSION AND SEDIMENT CONTROLS

SOIL STABILIZATION PRACTICES:

	TEMPORARY SEEDING
	PERMANENT PLANTING, SODDING, OR SEEDING
	MULCHING
	SOIL RETENTION BLANKET
	BUFFER ZONES
X	PRESERVATION OF NATURAL RESOURCES

OTHER:

EROSION AND SEDIMENT CONTROLS (CONT.)

STRUCTURAL PRACTICES:

Permanent	Temporary	
		SILT FENCES
		HAY BALES
		ROCK BERMS
		DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
		DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
		DIVERSION DIKE AND SWALE COMBINATIONS
		PIPE SLOPE DRAINS
		PAVED FLUMES
		ROCK BEDDING AT CONSTRUCTION EXIT
		TIMBER MATTING AT CONSTRUCTION EXIT
		CHANNEL LINERS
		SEDIMENT TRAPS
		SEDIMENT BASINS
		STORM INLET SEDIMENT TRAP
		STONE OUTLET STRUCTURES
		CURBS AND GUTTERS
		STORM SEWERS
		VELOCITY CONTROL DEVICES
		EROSION CONTROL LOGS

OTHER:

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES:

STORM WATER MANAGEMENT: CARE SHOULD BE TAKEN TO DISTURB AS LITTLE OF THE NATURAL AREA AS POSSIBLE.

DESCRIPTION OF ANY MEASURES INSTALLED DURING THE CONSTRUCTION PROCESS TO CONTROL STORM WATER DISCHARGES AFTER CONSTRUCTION OPERATIONS HAVE BEEN COMPLETED:

OTHER EROSION AND SEDIMENT CONTROLS:

MAINTENANCE:

INSPECTION:

WASTE MATERIALS:

HAZARDOUS WASTE (INCLUDING SPILL REPORTING): AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS: PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, CONCRETE CURING COMPOUNDS AND ADDITIVES. IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS, THE SPILL COORDINATOR SHOULD BE CONTACTED IMMEDIATELY AT (806) 356-3200.

SANITARY WASTE: ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

OFF SITE VEHICLE TRACKING:

	HAUL ROADS DAMPENED FOR DUST CONTROL
X	LOADED HAUL TRUCKS TO BE COVERED WITH TARPAULIN
	EXCESS DIRT ON ROAD REMOVED DAILY
	STABILIZED CONSTRUCTION ENTRANCE

OTHER:

REMARKS:

STATE OF TEXAS
CASEY B. STRIPLING
136887
LICENSED
PROFESSIONAL ENGINEER

Casey B. Stripling

01-24-2022

AMA FY 22 DBIP

TxDOT STORM WATER POLLUTION PREVENTION PLAN (SW3P)

2022 Texas Department of Transportation

SHEET 1 OF 1

DSN	CK	CONT	SECT	JOB	HIGHWAY
EF	CS	0904	00	199	VARIOUS
DRWN	CK	DIST	COUNTY		SHEET NO.
JR	JR	AMA	POTTER		58

DATE: 1/21/2022 10:45:13 AM
FILE: T:\AMATPD\Construction Projects\0904-00\199 - FY 22 Bridge Improvements\4 - Design\Plan Set\9. Environmental\199_SW3P.dgn

DATE: 1/21/2022
FILE: T:\AMATPD\Construction Projects\0904-00\199 - FY 22 Bridge Improvements\4 - Design\Plan Set\9. Environmental\199_EPIC.dgn

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1. COMPLY WITH CONSTRUCTION GENERAL PERMIT AND IMPLEMENT PROJECT SW3P'S. POST A CONSTRUCTION SITE NOTICE IN THE PROJECT AREA.

☐ No Action Required ☒ Required Action

Comply with the City of Amarillo MS4 permit on projects in the Amarillo city limits, Referece #s 23, 24, 25, 26.

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

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

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

☒ **No Permit Required**

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

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

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

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

1.

2.

3.

4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

☐ No Action Required ☒ **Required Action**

Action No.

1. IN THE EVENT THAT UNANTICIPATED ARCHEOLOGICAL DEPOSITS ARE ENCOUNTERED DURING CONSTRUCTION, WORK IN THE IMMEDIATE AREA WILL CEASE AND TXDOT ARCHEOLOGICAL STAFF WILL BE CONTACTED TO INITIATE POST-REVIEW DISCOVERY PROCEDURES.

IV. VEGETATION RESOURCES

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

☒ No Action Required ☐ **Required Action**

Action No.

1. NO REQUIRED ACTION ITEMS SINCE NO RESEEDING WILL BE TAKING PLACE.

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

☐ No Action Required ☒ **Required Action**

Action No.

1. IF ANY SPECIES ON THE COUNTY'S THREATENED & ENDANGERED LISTS IS SIGHTED IN THE PROJECT AREA DURING CONSTRUCTION, STOP CONSTRUCTION AND NOTIFY THE AREA ENGINEER. THESE COUNTIES INCLUDE DALLAM GRAY, HARTLEY, HEMPHILL, HUTCHINSON, LIPSCOMB, MOORE, POTTER, AND RANDALL.

2. EASTERN SPOTTED SKUNK, SWIFT FOX: CONTRACTORS WILL BE ADVISED OF POTENTIAL OCCURRENCE IN THE PROJECT AREA, AND TO AVOID HARMING THE SPECIES IF ENCOUNTERED, AND TO AVOID UNNECESSARY IMPACTS TO DENS.

3. WOODHOUSE'S TOAD, TEXAS HORNED LIZARD, WESTERN BOX TURTLE, WESTERN HOGNOSE SNAKE, WESTERN MASSASAUGA, PRAIRIE RATTLESNAKE: CONTRACTORS WILL BE ADVISED OF POTENTIAL OCCURRENCE IN THE PROJECT AREA, AND TO AVOID HARMING THE SPECIES IF ENCOUNTERED. THIS SHOULD INCLUDE AVOIDING HARVESTER ANT BEDS IN THE SELECTION OF PROJECT SPECIFIC LOCATIONS (PSL'S).

4. BIRD BMP'S: A) DO NOT DISTURB, DESTROY, OR REMOVE ACTIVE NESTS, INCLUDING GROUND NESTING BIRDS, DURING THE NESTING SEASON; B) AVOID THE REMOVAL OF UNOCCUPIED, INACTIVE NESTS, AS PRACTICABLE; C) DO NOT COLLECT, CAPTURE, RELOCATE, OR TRANSPORT BIRDS, EGGS, YOUNG, OR ACTIVE NESTS WITHOUT A PERMIT.

5. THE MIGRATORY BIRD TREATY ACT OF 1918 STATES THAT IT IS UNLAWFUL TO KILL, CAPTURE, COLLECT, POSSESS, BUY, SELL, TRADE, OR TRANSPORT ANY MIGRATORY BIRD, NEST, YOUNG, FEATHER, EGG IN PART OR IN WHOLE, WITHOUT A FEDERAL PERMIT ISSUED IN ACCORDANCE WITHIN THE ACT'S POLICIES AND REGULATIONS. IN THE EVENT THAT MIGRATORY BIRDS ARE ENCOUNTER ON-SITE DURING PROJECT CONSTRUCTION, ADVERSE IMPACTS ON PROTECTED BIRDS, ACTIVE NESTS, EGGS, AND/OR YOUNG WOULD BE AVOIDED.

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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

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

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

Contact the Engineer if any of the following are detected:

* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

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

☐ Yes ☒ **No**

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

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

☐ Yes ☒ **No**

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

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

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

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

☒ **No Action Required** ☐ Required Action

Action No.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ **No Action Required** ☐ Required Action

Action No.

1. NO REQUIRED ACTION ITEMS.

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	0904	00	199	VARIOUS
	DIST	COUNTY		SHEET NO.
	AMA	POTTER		59