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**STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION**

**PLANS OF PROPOSED
ROUTINE MAINTENANCE**

BPM - 647207001

CSJ 6472-07-001

HIDALGO COUNTY

LIMITS: US 281, RUSSEL RD., & EXPRESSWAY 281

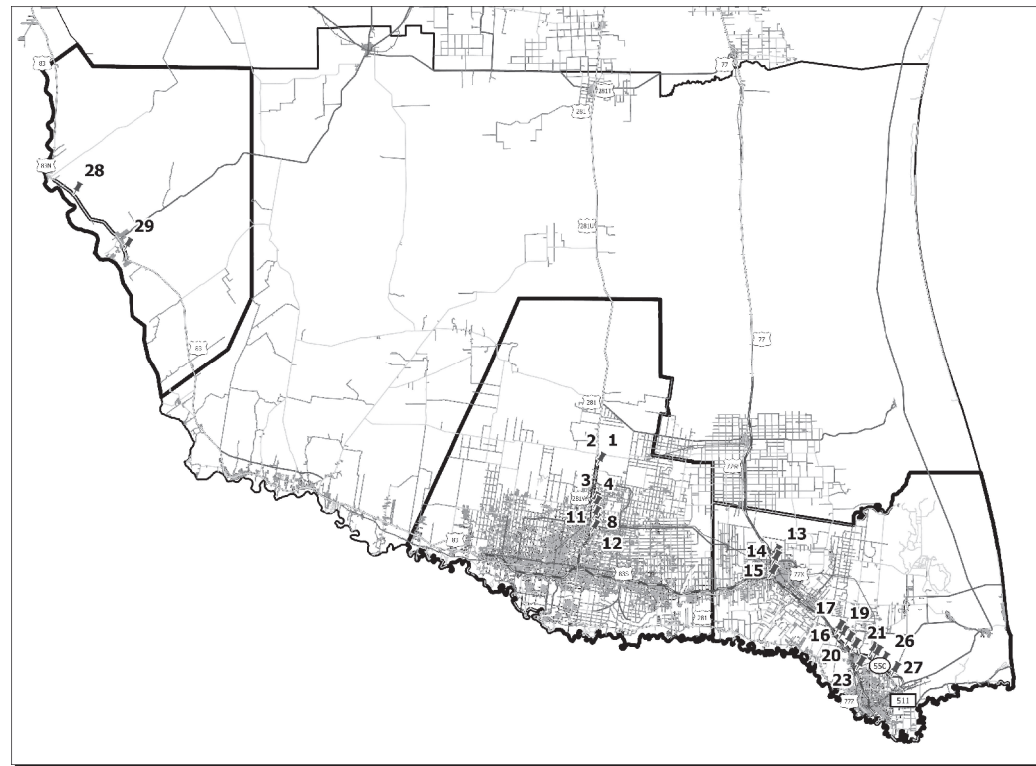
CAMERON COUNTY

LIMITS: US 77, US 83, SH 550, FM 511, & FRONTAGE RD.

ZAPATA COUNTY

LIMITS: US 83

PROJECT DESCRIPTION:
BRIDGE JOINT REPAIRS



LOCATION MAP NOT TO SCALE

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

RECOMMENDED
FOR LETTING:

DATE: 7/26/2024

SUBMITTED
FOR LETTING:

DATE: 7/26/2024

DocuSigned by:

Pedro R. Alvarez

EADA935C2DA440C
DISTRICT ENGINEER

DocuSigned by:

Andree Espinoza P.E.

028E4CCF224D42E
AREA ENGINEER

CONT	SECT	JOB	HIGHWAY
6472	07	001	VARIOUS
DIST	COUNTY		SHEET NO.
PHR	VARIOUS		1

DESIGN SPEED

MAIN LANES: ML MPH
FRONTAGE ROADS: FR MPH
RAMPS: RM MPH

A.D.T.

20XX: VARIOUS VPD
20XX: VARIOUS VPD

FINAL PLANS

DATE OF LETTING: _____

DATE WORK BEGAN: _____

DATE WORK COMPLETED: _____

DATE WORK ACCEPTED: _____

FINAL CONTRACT COST: \$ _____

CONTRACTOR: _____

LIST OF APPROVED FIELD CHANGES, CHANGE ORDERS
& SUPPLEMENTAL AGREEMENTS:

THIS IS TO CERTIFY THAT ALL CONSTRUCTION SUBSTANTIAL
WORK WAS PERFORMED IN ACCORDANCE WITH THE PLANS
SPECIFICATIONS AND CONTRACT. ALL PROPOSED CONSTRUCTION
WAS COMPLETED UNLESS OTHERWISE NOTED.

FRANK CANTU, P.E.
DISTRICT MAINTENANCE

DATE

TDLR INSPECTION NOT REQUIRED

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF
TRANSPORTATION ON SEPTEMBER 1, 2024 AND SPECIFICATION ITEMS
LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT:
SPECIAL LABOR PROVISIONS FOR STATE PROJECTS (000---005).

SHEET NO. DESCRIPTION

GENERAL

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- 2 INDEX OF SHEETS
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DocuSigned by:

X *Juan A. Sustaite Jr*
E050D62C04B2433...

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

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TEXAS DEPARTMENT OF TRANSPORTATION

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STATE	STATE DIST. NO.	COUNTY	CONTROL	SECTION	JOB	ROUTE NO.
TX	21	VARIOUS	6472	07	001	VARIOUS

Project Number: 6472-07-001

County: Various

Control: 6472-07-001

Highway: Various

2024 SPECS GENERAL NOTES:

General Requirements and Covenants to ITEMS 1 thru 9:

For all pits or quarries, comply with the “Texas Aggregate Quarry and Pit Safety Act.”

Provide on a weekly basis a list of equipment, including idle equipment, utilized on the project that week.

The 1-800 call services for utility locations do not include TxDOT facilities. Contact the Pharr District Signal Section (956-702-6225) for coordination regarding TxDOT underground lines.

ITEM 2: Instructions to Bidders

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

Francisco Cantu, P.E., District Maintenance; Francisco.J.Cantu@txdot.gov

Contractor questions will be accepted through email, phone, and in person by the above individuals. Questions may also be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:

<https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors>

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

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

Information found on TxDOT's FTP server will be considered for informational purposes only. [Index of /pub/txdot-info/Pre-Letting Responses/Pharr District/21-Pharr District \(Construction\) \(state.tx.us\)](#)

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County: Various

Control: 6472-07-001

Highway: Various

ITEM 4: Scope of Work

This Contract includes non-site-specific work. Multiple work orders will be used to procure work of the type identified in the contract at locations that have not yet been determined.

ITEM 7: Legal Relations and Responsibilities

In accordance with Article 7.2.4. of the standard specifications, roadway, or lane closures during the following key dates and/or special events are prohibited:

- National Holidays
- The day before a National Holiday
- During emergency events such as natural disasters or as directed by the Engineer

ITEM 8: Prosecution and Progress

TxDOT is required to provide 10 working days advanced written notice of all proposed bridge widening, rehabilitation, or demolition work to the Texas Department of State Health Services (TDSHS) to allow them the opportunity to both verify information provided regarding asbestos containing materials and abatement and observe the demolition/renovation work. Considering that this notice will be provided TDSHS at the beginning of the project for all affected bridge work based on start and finish dates included in the Contractor's original submitted work schedule, any schedule changes proposed by the Contractor shall be submitted to TxDOT at least 15 days prior to the revised or original start date to accommodate the required coordination with TDSHS.

Working days will be computed and charged in accordance with Article 8.3.1.6. defined as follows:

Work and time charges will continue until the start of the bird nesting season. Upon the start of the bird nesting season, work and time charges will stop for a maximum period of 120-Working days for the bird nesting season delay to be completed. Time charges in accordance with Article 8.3.1.4. will resume at the end of the 120-day bird nesting season delay or earlier if mutually agreed in writing by the Engineer and Contractor.

Prepare progress schedules as a Bar Chart.

Project Number: 6472-07-001

County: Various

Highway: Various

Control: 6472-07-001

ITEM 502: Barricades, Signs, and Traffic Handling

Replace/relocate all regulatory signs removed due to construction operations with the same sign on fixed support(s) immediately upon its removal. First obtain Project Engineer approval before removing any regulatory roadway sign. Required flaggers are to be available to direct traffic during sign intermediate down time.

Relocate any Directional Sign Assemblies removed during construction operations immediately upon their removal.

These signs shall be relocated to a location in accordance with the Latest Version of the "Texas Manual on Uniform Traffic Control Devices". In no case will a sign be removed without a replacement sign and support(s) being readily available and a location established. Removal and relocation of these signs required for traffic control will not be paid for directly but shall be considered subsidiary to Item 502.

From the beginning to the end of the project, all traffic control devices need to be in acceptable condition as per the Texas Quality Guidelines for Work Zone Traffic Control Devices.

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 "Safety Contingency" is not intended to be used in lieu of bid Items established by the contract.

Remove and dispose of all litter, debris, objectionable material, excess materials that accumulate at the base of all traffic control devices as directed by the Engineer.

ITEM 504: Field Office and Laboratory

For this project a field office will not be required at the project site.

ITEM 505: 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 the project, provide 0 additional shadow vehicle(s) with TMA.

Therefore, 3 total shadow vehicles with TMA will be required on this project for the type of work as shown on the plans. The Contractor will be responsible for determining if one or more of

Project Number: 6472-07-001

County: Various

Highway: Various

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Control: 6472-07-001

his construction operations will be ongoing at the same time and thus determine the total number of TMAs needed for the project.

ITEM 5088: Bird Exclusion Methods
5088-1

Contractor's attention is directed to the plan's EPIC sheets, Bird Exclusion Detail standard sheets and shall refer to the Migratory Bird Treaty Act requirements. Also, refer to the TPWD BMPSS sheets for specific adherence to the environmental requirements of the Best Management Practices.

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DATE:
FILE:

HIDALGO COUNTY ESTIMATED QUANTITIES								
BRIDGE NO.	NBI	HIGHWAY	CROSSED FEATURE/ROADWAY	BENT NO.	REPAIR LENGTH	TOTAL (LF)	TOTAL NO. OF REPAIR BENTS	CLEANING AND SEALING EXIST JOINTS
								438
								7001
								LF
1	0255-07-294	US 281 SB	RAYMONDVILLE DRAIN	1	57	114	2	114
				4	57			
2	0255-07-293	US 281 NB	RAYMONDVILLE DRAIN	4	57	57	1	57
3	0255-07-046	US 281 NB	BU 281 NB	1	68	332	5	332
				2	69			
				3	68			
				4	65			
				5	62			
4	0255-07-048	FM 1925 NB	MONTE CRISTO RD	ALL	45	180	4	180
5	0255-07-050	US 281 NB	CHAPIN ST	ALL	74	296	4	296
6	0255-07-049	US 281 SB	CHAPIN ST	ALL	60	240	4	240
7	0255-07-043	US 281 SB	UPRR (ABANDONED)	ALL	58	348	6	348
8	0255-07-044	US 281 NB	UPRR (ABANDONED)	1	72	494	6	494
				2	74			
				3	78			
				4	83			
				5	90			
				6	97			
9	0255-07-053	US 281 SB	SH 107	ALL	70	280	4	280
10	0255-07-054	US 281 NB	SH 107	ALL	70	280	4	280
11	0255-08-061	US 281 SB	FREDDY GONZALEZ DR	5	70	70	1	70
12	0255-08-060	US 281 NB	FREDDY GONZALEZ DR	3	70	140	2	140
				4	70			
SUB TOTAL								2831


CAMERON COUNTY ESTIMATED QUANTITIES								
BRIDGE NO.	NBI	HIGHWAY	CROSSED FEATURE/ROADWAY	BENT NO.	REPAIR LENGTH	TOTAL (LF)	TOTAL NO. OF REPAIR BENTS	CLEANING AND SEALING EXIST JOINTS
								438
								7001
								LF
13	0039-07-125	US 77 NB	UPRR, BUS 77 & PRIMERA RD.	ALL	34	782	23	782
14	0039-07-206	US 77 NB	DRAINAGE DITCH, BUS 77 RR, & MATZ AVE.	1	43	258	6	258
				2				
				3				
				4				
				5				
				6				
15	0039-19-289	US 83	RVSC & PALM COURT DR.	1	56	122	2	122
4	66							
16	0039-08-233	US 77 SB	ROBERTA RD.	1	55	110	2	110
4								
17	0039-08-232	US 77 NB	ROBERTA RD.	1	55	110	2	110
4								
18	0039-08-355	US 77 SB	CARMEN RD.	1	56	112	2	112
4								
19	0039-08-354	US 77 NB	CARMEN RD.	1	56	112	2	112
4								
20	0039-08-353	US 77 SB	RANCHO VIEJO DR.	1	56	112	2	112
4								
21	0039-08-226	US 77 SB	FM 511	1	72	144	2	144
4								
22	0039-08-227	US 77 NB	FM 511	1	72	144	2	144
4								
23	0039-08-239	US 77 NB	OLD ALICE RD	1	56	112	2	112
4								
24	0684-01-247	SH 550 NB	DRAINAGE DITCH	1	40	80	2	80
4								
25	0684-01-250	SH 550 NB	FM 1847	1	86	86	1	86
26	0684-01-253	SH 550 NB	UPRR *2 SPUR	1	49	98	2	98
4								
27	0684-01-256	FM 511 NB	SH 550	4	49	49	1	49
SUB TOTAL								2431

GENERAL NOTES:

Refer to Item 438 for application instruction.

Refer to CLEAN AND SEAL JOINTS Sheets for locations and quantities.

Perform Traffic Control Operations as per TCP(6-6)-12.



ESTIMATED QUANTITIES

1 OF 2

FILE:	DN: RRE	CK:	DW: RRE	CK:
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	6472	07	001	VARIOUS
	DIST	COUNTY	SHEET NO.	
	PHR	VARIOUS	5	


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DATE:
 FILE:

ZAPATA COUNTY ESTIMATED QUANTITIES								
BRIDGE NO.	NBI	HIGHWAY	CROSSED FEATURE/ ROADWAY	BENT NO.	REPAIR LENGTH	TOTAL (LF)	TOTAL NO. OF REPAIR BENTS	CLEANING AND SEALING EXIST JOINTS
								438
								7001
								LF
28	0038-04-058	US 83 SB	ARROYO BURRO	1	28	380	11	308
				4				
				8				
				12				
				16				
				24				
				27-28				
				30-31				
29	0038-04-095	US 83	ARROYO VELENO	1	82	574	7	574
				3				
				6				
				9				
				12				
				15				
17								
SUB TOTAL								882

SUMMARY OF ESTIMATED QUANTITIES			
BARRICADES, SIGNS AND TRAFFIC HANDLING	MOBILIZATION	TMA (MOBILE OPERATION)	CLEANING AND SEALING EXIST JOINTS
502	500	505	438
7001	7001	7003	7001
MO	LS	DAY	LF
6	1	240	6,144

GENERAL NOTES:
 Refer to Item 438 for application instruction.
 Refer to CLEAN AND SEAL JOINTS Sheets for locations and quantities.
 Perform Traffic Control Operations as per TCP(6-6)-12.



ESTIMATED QUANTITIES

2 OF 2

FILE:	DN: RRE	CK:	DW: RRE	CK:
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	6472	07	001	VARIOUS
	DIST	COUNTY	SHEET NO.	
	PHR	VARIOUS	6	



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 6472-07-001

DISTRICT Pharr
HIGHWAY US0077

COUNTY Cameron

CONTROL SECTION JOB				6472-07-001		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00211809			
COUNTY				Cameron			
HIGHWAY				US0077			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	438-7001	CLEANING AND SEALING EXISTING JOINTS	LF	6,144.000		6,144.000	
	500-7001	MOBILIZATION	LS	1.000		1.000	
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	6.000		6.000	
	505-7003	TMA (MOBILE OPERATION)	DAY	240.000		240.000	

DISTRICT	COUNTY	CCSJ	SHEET
Pharr	Cameron	6472-07-001	

GENERAL NOTES AND SPECIFICATIONS DATA:

USE A POWER-BROOM WHEN CLEANING THE ROADWAY AS NEEDED.

REMOVE & DISPOSE ALL MATERIAL NOT DEEMED SALVAGEABLE BY THE ENGINEER, UNLESS OTHERWISE SHOWN ON THE PLANS.

ON EXISTING PAVEMENT THAT WILL REMAIN IN PLACE, SAND BLAST OR SURFACE TREAT IN ORDER TO REMOVE EXISTING STRIPING.

DO NOT BLOCK DRAINAGE WHEN HANDLING & STOCKPILING EXCAVATED MATERIAL.

MAINTAIN ACCESS TO DRIVEWAYS AND INTERSECTIONS THROUGH ALL PHASES OF CONSTRUCTION.

MAINTAIN POSITIVE DRAINAGE DURING ALL PHASES OF CONSTRUCTION.

TRAFFIC CONTROL DEVICES:

AT THE COMMENCEMENT OF THE PROJECT, ALL TRAFFIC CONTROL DEVICES SHALL BE IN ACCEPTABLE CONDITION, AND MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT, AS PER GUIDELINES FOR TEMPORARY TRAFFIC CONTROL DEVICES AND FEATURES.

NOTIFY THE AREA ENGINEER(AE) IN WRITING(E-MAIL IS ACCEPTABLE) ONCE THE TRAFFIC CONTROL PLAN(TCP) AND ALL TRAFFIC CONTROL DEVICES HAVE BEEN INSTALLED AS PER PLANS ON THE PROJECT SO THAT THE DEPARTMENT'S RESPONSIBLE PERSON ACCOMPANIED BY THE CONTRACTOR'S RESPONSIBLE PERSON CAN CONDUCT A NIGHT INSPECTION ON THE SAID TCP AND TRAFFIC CONTROL DEVICES. COMMENCEMENT OF WORK WILL NOT BE AUTHORIZED NOR ALLOWED UNTIL THE AE NOTIFIES THE CONTRACTOR IN WRITING(E-MAIL IS ACCEPTABLE) TO PROCEED WITH THE WORK.

CONTRACTOR SHALL HAVE A SUFFICIENT AMOUNT OF TRAFFIC CONTROL DEVICES IN ACCEPTABLE CONDITION TO REPLACE ANY DAMAGED TRAFFIC CONTROL DEVICE WITHIN 24 HOURS OF NOTIFICATION.

PROVIDE ADDITIONAL SIGNS AND BARRICADES AS NECESSARY TO ADDRESS FIELD CONSTRUCTIBILITY & VISIBILITY. THESE ADDITIONAL SIGNS WILL BE CONSIDERED SUBSIDIARY TO ITEM 502.

REMOVE OR COMPLETELY COVER ALL EXISTING SIGNS WHICH ARE IN CONFLICT WITH THE TRAFFIC CONTROL PLAN.

ADJUST STOP SIGNS AS NEEDED ON INTERSECTING STREETS DURING THE VARIOUS CONSTRUCTION PHASES. DO NOT REMOVE ANY EXISTING STOP SIGNS UNTIL TEMPORARY SIGNS ARE IN PLACE.

COORDINATE THE TRAFFIC CONTROL PLAN AND THE VARIOUS SEQUENCES OF CONSTRUCTION WITH ADJACENT CONSTRUCTION PROJECTS IF APPLICABLE, TO ENSURE THE UNINTERRUPTED AND SAFE FLOW OF TRAFFIC.

NOTIFY THE ENGINEER IN WRITING WHEN MAJOR TRAFFIC CHANGES ARE TO BE MADE. NOTIFICATIONS MUST BE GIVEN A MINIMUM OF THREE WORKING DAYS PRIOR TO THE CHANGE.

SAFETY:

PROTECT EXPOSED PITS THAT MUST REMAIN OPEN DURING NON-WORKING HOURS AS PER OSHA REQUIREMENTS.

PROJECT SPECIFIC NOTES:

EXAMPLES:

1. DRAINAGE & IRRIGATION CROSSING WORK DESCRIPTION AND APPLICABLE TCP STATE STANDARDS.
2. TREATMENT OF PAVEMENT DROP-OFF IN WORK ZONE NOTES AS APPLICABLE.

ADD PROJECT SPECIFIC NOTES AS NEEDED. SIGN & SEAL STANDARD WHEN USING PROJECT SPECIFIC NOTES


MAINTENANCE REQUIRING ROAD CLOSURES SHALL BE DURING NIGHTTIME HOURS. DURING THE PEAK HOURS, OFF-PEAK HOURS, AND WEEKEND HOURS THE CONTRACTOR SHALL MAINTAIN THE MINIMUM LANES TO BE OPEN TO TRAFFIC.

FOR THE PURPOSES OF THIS TRAFFIC CONTROL PLAN, THE FOLLOWING DEFINITIONS SHALL APPLY:

- PEAK HOURS
 - MON.-FRI. 6:00 A.M. TO 8:30 A.M.
 - MON.-FRI. 4:00 P.M. TO 7:00 P.M.
- OFF-PEAK HOURS
 - MON.-FRI. 9:00 A.M. TO 4:00 P.M.
- NIGHTTIME HOURS
 - MON.-FRI. 7:00 P.M. TO 6:00 A.M.
- WEEKEND HOURS
 - FRI. 9:00 A.M. TO MON. 6:00 A.M.

TRAFFIC CONTROL
PLAN NOTES
SHEET 1 OF 1 SHEETS

PHARR DISTRICT STANDARD

 Texas Department of Transportation ©TxDOT 2017		FEDERAL AID PROJECT NO.			SHEET NO.	
STATE	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.			SHEET NO.	
TEXAS	6				8	
DIST.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.	
PHR	VARIOUS	6472	07	001	VARIOUS	

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THE CONTRACTOR MAY OPT TO SUBMIT AN ALTERNATE CONSTRUCTION SEQUENCE AND TRAFFIC CONTROL PLAN, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF TEXAS. SUCH PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR CONSIDERATION. HOWEVER, THE CONTRACTOR MUST FOLLOW THE TCP CONSTRUCTION PHASES AS SHOWN ON THE TCP PLANS.

THE CONTRACTOR SHALL BE PROHIBITED FROM WORKING SIMULTANOUSLY ON MULTIPLE PHASES. THE CONTRACTOR SHALL COMPLETE ALL STEPS IN EACH PHASE PRIOR TO INITIATING AND COMMENCING THE SUBSEQUENT CONSTRUCTION PHASE.

IN ADDITION TO THE GENERAL NOTES REQUIREMENTS, THE FOLLOWING PROVISIONS GOVERN THIS CONTRACT.

SEQUENCE OF CONSTRUCTION.

CONSTRUCT THE VARIOUS ROADWAY IMPROVEMENTS IN SIXTEEN (16) MAIN PHASES AS NOTED IN THIS NARRATIVE.

INSTALL PROJECT LIMIT SIGNS, ADVANCE WARNING SIGNS, AND CROSSROAD BARRICADES/SIGNS AS SHOWN ON THE TRAFFIC CONTROL PLANS (TCP), AND IN ACCORDANCE WITH THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD), LATEST EDITION, AND/OR AS DIRECTED BY THE ENGINEER. THESE SIGNS SHALL BE ERECTED AND PLACED PRIOR TO COMMENCING ANY PROPOSED ROADWAY CONSTRUCTION AND SHALL REMAIN IN PLACE FOR THE DURATION OF THE PROJECT AND UNTIL FINAL ACCEPTANCE OF THE PROJECT BY TxDOT. PORTABLE CHANGEABLE MESSAGE BOARDS SHALL BE PLACED TO NOTIFY TRAVELING PUBLIC ON PLANNED ROADWAY CLOSURE DATE(S) OR MOVEMENTS RESTRICTIONS A MINIMUM OF FIVE (5) WORKING DAYS IN ADVANCE OF ROADWAY CLOSURE.

PHASE I: US 281 (I 69C) NORTHBOUND (3.0 MILES):


LOCATIONS:
 LOCATION 8 - NBI: 0255-07-044 CROSSING UPRR (ABANDONED)
 LOCATION 10 - NBI: 0255-07-054 CROSSING SH 107 (UNIVERSITY DR.)
 LOCATION 12 - NBI: 0255-07-060 CROSSING FREDDY GONZALEZ DR.

1. INSTALL THE DETOUR SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE STANDARDS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL.
2. DETOUR TRAFFIC THROUGH 25TH AVE, FRONTAGE RD., AND EXPRESSWAY 281.
3. DURING THIS PHASE, ACCESS TO US 281 (I 69C) NORTHBOUND SHALL NOT BE ALLOWED FROM CANTON RD. TO MILE 17½ RD. CONTRACTOR SHALL PLACE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES.
4. ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU TRAFFIC DURING. THRU TRAFFIC WILL NOT BE ALLOWED MONDAY - FRIDAY 7:00 P.M. TO 6:00 A.M.
5. CLEAN AND SEAL EXISTING JOINTS AS SHOWN ON PLANS.
6. REMOVE ROAD CLOSURE SETUPS AND PROCEED TO NEXT PHASE.

PHASE 2: US 281 (I 69C) NORTHBOUND (4.0 MILES):

LOCATIONS:
 LOCATION 3 - NBI: 0255-07-046 CROSSING BU 281 NORTHBOUND.
 LOCATION 4 - NBI: 0255-07-048 CROSSING FM1925 (MONTE CRISTO RD.)
 LOCATION 5 - NBI: 0255-07-050 CROSSING CHAPIN ST.

1. INSTALL THE DETOUR SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE STANDARDS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL.
2. DETOUR TRAFFIC THROUGH 25TH AVE, FRONTAGE RD., AND EXPRESSWAY 281.
3. DURING THIS PHASE, ACCESS TO US 281 (I 69C) NORTHBOUND SHALL NOT BE ALLOWED FROM FM 107 (UNIVERSITY DR) TO DAVIS RD. CONTRACTOR SHALL PLACE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES.
4. ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU TRAFFIC. THRU TRAFFIC WILL NOT BE ALLOWED MONDAY - FRIDAY 7:00 P.M. TO 6:00 A.M.
5. CLEAN AND SEAL EXISTING JOINTS AS SHOWN ON PLANS.
6. REMOVE ROAD CLOSURE SETUPS AND PROCEED TO NEXT PHASE.

 Texas Department of Transportation				Bridge Division Standard	
<h2 style="margin: 0;">CLEAN AND SEAL JOINTS</h2> <h3 style="margin: 0;">SEQUENCE OF CONSTRUCTION</h3> <p style="margin: 0;">1 OF 6</p>					
FILE:	DN: RRE	CK:	DW: RRE	CK:	
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY	
REVISIONS	6472	07	001	VARIOUS	
	DIST	COUNTY		SHEET NO.	
	PHR	VARIOUS		9	

PHASE 3: US 281 (I 69C) BOTH DIRECTIONS (6.0 MILES):

LOCATIONS:

LOCATION 1 - NBI: 0255-07-294 CROSSING RAYMONDVILLE DRAINAGE DITCH.
 LOCATION 2 - NBI: 0255-07-293 CROSSING RAYMONDVILLE DRAINAGE DITCH.

1. INSTALL THE DETOUR SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE STANDARDS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL.
2. DETOUR TRAFFIC THROUGH EXPRESSWAY 281 (FRONTAGE RD.).
3. DURING THIS PHASE, ACCESS TO US 281 (I 69C) NORTH BOUND AND SOUTHBOUND SHALL NOT BE ALLOWED FROM EL CIBOLO RD TO FM 490. CONTRACTOR SHALL PLACE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES.
4. ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU TRAFFIC. THRU TRAFFIC WILL NOT BE ALLOWED MONDAY - FRIDAY 7:00 P.M. TO 6:00 A.M.
5. CLEAN AND SEAL EXISTING JOINTS AS SHOWN ON PLANS.
6. REMOVE ROAD CLOSURE SETUPS AND PROCEED TO NEXT PHASE.

PHASE 4: US 281 (I 69C) SOUTHBOUND (1.0 MILES):

LOCATIONS:

LOCATION 6 - NBI: 0255-07-049 CROSSING CHAPIN ST.
 LOCATION 7 - NBI: 0255-07-043 CROSSING UPRR (ABANDONED)

1. INSTALL THE DETOUR SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE STANDARDS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL.
2. DETOUR TRAFFIC THROUGH FRONTAGE RD. (EXPRESSWAY 281).
3. DURING THIS PHASE, ACCESS TO US 281 (I 69C) SOUTHBOUND SHALL NOT BE ALLOWED FROM RUSSEL RD. (MILE 17½ RD.) TO RICHARDSON RD. CONTRACTOR SHALL PLACE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES.
4. ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU TRAFFIC. THRU TRAFFIC WILL NOT BE ALLOWED MONDAY - FRIDAY 7:00 P.M. TO 6:00 A.M.
5. CLEAN AND SEAL EXISTING JOINTS AS SHOWN ON PLANS.
6. REMOVE ROAD CLOSURE SETUPS AND PROCEED TO NEXT PHASE.

PHASE 5: US 281 (I 69C) SOUTHBOUND (2.0 MILES):


LOCATIONS:

LOCATION 9 - NBI: 0255-07-053 CROSSING SH 107 (UNIVERSITY DR.)
 LOCATION 11 - NBI: 0255-07-061 CROSSING FREDDY GONZALEZ DR.

1. INSTALL THE DETOUR SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE STANDARDS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL.
2. DETOUR TRAFFIC THROUGH FRONTAGE RD. (24TH AVE.).
3. DURING THIS PHASE, ACCESS TO US 281 (I 69C) SOUTHBOUND SHALL NOT BE ALLOWED FROM SCHUNIOR. TO IOWA RD. CONTRACTOR SHALL PLACE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES.
4. ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU TRAFFIC. THRU TRAFFIC WILL NOT BE ALLOWED MONDAY - FRIDAY 7:00 P.M. TO 6:00 A.M.
5. CLEAN AND SEAL EXISTING JOINTS AS SHOWN ON PLANS.
6. REMOVE ROAD CLOSURE SETUPS AND PROCEED TO NEXT PHASE.

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<h2 style="margin: 0;">CLEAN AND SEAL JOINTS</h2> <h3 style="margin: 0;">SEQUENCE OF CONSTRUCTION</h3> <p style="margin: 0;">2 OF 6</p>					
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©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY	
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PHASE 6: US 77 (I 69E) NORTHBOUND (1.4 MILES):

LOCATIONS:

LOCATION 13 - NBI: 0039-07-125 CROSSING UPRR, BUS 77, PRIMERA RD.
 LOCATION 14 - NBI: 0039-07-206 CROSSING UPRR, BUS 77, MATZ RD., DRAINAGE DITCH.

1. INSTALL THE DETOUR SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE STANDARDS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL.
2. DETOUR TRAFFIC THROUGH FRONTAGE RD AND LOOP 499.
3. DURING THIS PHASE, ACCESS TO US 77 (I 69E) SOUTHBOUND SHALL NOT BE ALLOWED FROM WILSON RD. TO TEXAS AVE. CONTRACTOR SHALL PLACE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES.
4. ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU TRAFFIC. THRU TRAFFIC WILL NOT BE ALLOWED MONDAY - FRIDAY 7:00 P.M. TO 6:00 A.M.
5. CLEAN AND SEAL EXISTING JOINTS AS SHOWN ON PLANS.
6. REMOVE ROAD CLOSURE SETUPS AND PROCEED TO NEXT PHASE.

PHASE 7: US 83 (I 2) WESTBOUND (3.0 MILES):

LOCATIONS:

LOCATION 15 - NBI: 0039-19-289 CROSSING RVSC, PALM COURT DR.

1. INSTALL THE DETOUR SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE STANDARDS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL.
2. DETOUR TRAFFIC THROUGH FRONTAGE RD. (24TH AVE.).
3. DURING THIS PHASE, ACCESS TO US 83 (I 2) SOUTHBOUND SHALL NOT BE ALLOWED FROM EXIT 26B TOWARD MCALLEN. (NORTHBOUND AND SOUTHBOUND HWY 77 (I 69E)) TO LEWIS LANE. CONTRACTOR SHALL PLACE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES.
4. ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU TRAFFIC. THRU TRAFFIC WILL NOT BE ALLOWED MONDAY - FRIDAY 7:00 P.M. TO 6:00 A.M.
5. CLEAN AND SEAL EXISTING JOINTS AS SHOWN ON PLANS.
6. REMOVE ROAD CLOSURE SETUPS AND PROCEED TO NEXT PHASE.

PHASE 8: US 77 (I 69E) SOUTHBOUND (3.0 MILES):


LOCATIONS:

LOCATION 16 - NBI: 0039-08-233 CROSSING ROBERTA RD.
 LOCATION 19 - NBI: 0039-08-354 CROSSING CARMEN RD.
 LOCATION 20 - NBI: 0039-08-353 CROSSING RANCHO VIEJO DR.

1. INSTALL THE DETOUR SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE STANDARDS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL.
2. DETOUR TRAFFIC THROUGH FRONTAGE RD.
3. DURING THIS PHASE, ACCESS TO US 77 (I 69E) SOUTHBOUND SHALL NOT BE ALLOWED FROM EXIT 13 (ROBERTA RD) TO RANCHO VIEJO DR. CONTRACTOR SHALL PLACE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES.
4. ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU TRAFFIC. THRU TRAFFIC WILL NOT BE ALLOWED MONDAY - FRIDAY 7:00 P.M. TO 6:00 A.M.
5. CLEAN AND SEAL EXISTING JOINTS AS SHOWN ON PLANS.
6. REMOVE ROAD CLOSURE SETUPS AND PROCEED TO NEXT PHASE.

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<h2 style="margin: 0;">CLEAN AND SEAL JOINTS</h2> <h3 style="margin: 0;">SEQUENCE OF CONSTRUCTION</h3> <p style="margin: 0;">3 OF 6</p>					
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PHASE 9: US 77 (I 69E) (2.0 MILES):

LOCATIONS:

LOCATION 21 - NBI: 0039-08-226 CROSSING FM 511.
 LOCATION 23 - NBI: 0039-08-239 CROSSING OLD ALICE RD.

1. INSTALL THE DETOUR SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE STANDARDS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL.
2. DETOUR TRAFFIC THROUGH FRONTAGE RD.
3. DURING THIS PHASE, ACCESS TO US 77 (I 69E) SOUTHBOUND SHALL NOT BE ALLOWED FROM EXIT 10A (PORT OF BROWNSVILLE). TO LA ROCHE ST.

 ACCESS TO US 77 (I 69E) NORTHBOUND SHALL NOT BE ALLOWED FROM EXIT 7 (STILLMAN RD. AND OLD ALICE RD.). TO ON RAMP NORTH OF OLD ALICE RD.

 CONTRACTOR SHALL PLACE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES.
4. ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU TRAFFIC. THRU TRAFFIC WILL NOT BE ALLOWED MONDAY - FRIDAY 7:00 P.M. TO 6:00 A.M.
5. CLEAN AND SEAL EXISTING JOINTS AS SHOWN ON PLANS.
6. REMOVE ROAD CLOSURE SETUPS AND PROCEED TO NEXT PHASE.

PHASE 10: FM 511 NORTHBOUND (0.6 MILES):

LOCATIONS:

LOCATION 27 - NBI: 0684-01-256 CROSSING FM 550

1. INSTALL THE DETOUR SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE STANDARDS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL.
2. DETOUR TRAFFIC THROUGH SH 48 (BROWNSVILLE-PORT ISABEL HWY) AND SH 550.
3. DURING THIS PHASE, ACCESS TO FM 511 NORTHBOUND SHALL NOT BE ALLOWED FROM DES MOINES AVE TO OLD PORT ISABEL RD. CONTRACTOR SHALL PLACE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES.
4. ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU TRAFFIC. THRU TRAFFIC WILL NOT BE ALLOWED MONDAY - FRIDAY 7:00 P.M. TO 6:00 A.M.
5. CLEAN AND SEAL EXISTING JOINTS AS SHOWN ON PLANS.
6. REMOVE ROAD CLOSURE SETUPS AND PROCEED TO NEXT PHASE.


PHASE 11: SH 550 NORTHBOUND (3.5 MILES):

LOCATIONS:

LOCATION 25 - NBI: 0684-01-250 CROSSING FM 1847 (PAREDES LANE RD.).
 LOCATION 26 - NBI: 0684-01-253 CROSSING UPRR #2 SPUR.

1. INSTALL THE DETOUR SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE STANDARDS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL.
2. DETOUR TRAFFIC THROUGH FM 3248 (DR. HUGH EMERSON RD.).
3. DURING THIS PHASE, ACCESS TO SH 550 NORTHBOUND SHALL NOT BE ALLOWED FROM FM 3248 (DR. HUGH EMERSON RD.) TO FM 1847 (PAREDES LANE RD.). CONTRACTOR SHALL PLACE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES.
4. ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU TRAFFIC. THRU TRAFFIC WILL NOT BE ALLOWED MONDAY - FRIDAY 7:00 P.M. TO 6:00 A.M.
5. CLEAN AND SEAL EXISTING JOINTS AS SHOWN ON PLANS.
6. REMOVE ROAD CLOSURE SETUPS AND PROCEED TO NEXT PHASE.

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PHASE 12: FM 511 NORTHWESTBOUND (0.9 MILES):

LOCATIONS:

LOCATION 24 - NBI: 0684-01-247 CROSSING DRAINAGE DITCH.

1. INSTALL THE DETOUR SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE STANDARDS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL.
2. DETOUR TRAFFIC THROUGH FM 1847 (PAREDES LANE RD.) AND SH 550.
3. DURING THIS PHASE, ACCESS TO FM 511 NORTHWESTBOUND SHALL NOT BE ALLOWED FROM FM 1847 (PAREDES LANE RD.) TO RANCHO ALTO DR. CONTRACTOR SHALL PLACE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES.
4. ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU TRAFFIC. THRU TRAFFIC WILL NOT BE ALLOWED MONDAY - FRIDAY 7:00 P.M. TO 6:00 A.M.
5. CLEAN AND SEAL EXISTING JOINTS AS SHOWN ON PLANS.
6. REMOVE ROAD CLOSURE SETUPS AND PROCEED TO NEXT PHASE.

PHASE 13: US 77 (I 69E) NORTHBOUND (0.8 MILES):

LOCATIONS:

LOCATION 22 - NBI: 0039-08-227 CROSSING FM 511.

1. INSTALL THE DETOUR SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE STANDARDS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL.
2. DETOUR TRAFFIC THROUGH FRONTAGE RD.
3. DURING THIS PHASE, ACCESS TO US 77 (I 69E) NORTHWESTBOUND SHALL NOT BE ALLOWED FROM EXIT 10A (PORT OF BROWNSVILLE) TO SH 550. CONTRACTOR SHALL PLACE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES.
4. ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU TRAFFIC. THRU TRAFFIC WILL NOT BE ALLOWED MONDAY - FRIDAY 7:00 P.M. TO 6:00 A.M.
5. CLEAN AND SEAL EXISTING JOINTS AS SHOWN ON PLANS.
6. REMOVE ROAD CLOSURE SETUPS AND PROCEED TO NEXT PHASE.

PHASE 14: US 77 (I 69E) NORTHBOUND (1.7 MILES):


LOCATIONS:

LOCATION 17 - NBI: 0039-08-232 CROSSING ROBERTA RD.

LOCATION 18 - NBI: 0039-08-355 CROSSING CARMEN RD.

1. INSTALL THE DETOUR SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE STANDARDS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL.
2. DETOUR TRAFFIC THROUGH FRONTAGE RD.
3. DURING THIS PHASE, ACCESS TO US 77 (I 69E) SOUTHBOUND SHALL NOT BE ALLOWED FROM EXIT 12 (CARMEN AVE.) TO ROBERTA RD. CONTRACTOR SHALL PLACE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES.
4. ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU TRAFFIC. THRU TRAFFIC WILL NOT BE ALLOWED MONDAY - FRIDAY 7:00 P.M. TO 6:00 A.M.
5. CLEAN AND SEAL EXISTING JOINTS AS SHOWN ON PLANS.
6. REMOVE ROAD CLOSURE SETUPS AND PROCEED TO NEXT PHASE.

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PHASE 15: US 83 SOUTHBOUND (0.7 MILES):

LOCATIONS:

LOCATION 28 - NBI: 0038-04-058 CROSSING ARROYO BURRO

1. INSTALL THE DETOUR SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE STANDARDS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL.
2. DETOUR TRAFFIC THROUGH FRONTAGE RD.
3. DURING THIS PHASE, ACCESS TO US 83 SOUTHBOUND SHALL NOT BE ALLOWED FROM WILSON RD. TO TEXAS AVE. CONTRACTOR SHALL PLACE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES.
4. ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU TRAFFIC. THRU TRAFFIC WILL NOT BE ALLOWED MONDAY - FRIDAY 7:00 P.M. TO 6:00 A.M.
5. CLEAN AND SEAL EXISTING JOINTS AS SHOWN ON PLANS.
6. REMOVE ROAD CLOSURE SETUPS AND PROCEED TO NEXT PHASE.

PHASE 16: US 83 NORTH BOUND AND SOUTHBOUND (0.8 MILES):


LOCATIONS:

LOCATION 29 - NBI: 0038-04-095 CROSSING ARROYO VELENO

1. INSTALL THE DETOUR SIGNS, TRAFFIC CONTROL DEVICES, AND SW3P ELEMENTS AS SHOWN ON THE STANDARDS OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION WORK SHALL NOT BEGIN UNTIL THE ENGINEER HAS PROVIDED WRITTEN APPROVAL.
2. DETOUR TRAFFIC THROUGH FRONTAGE RD.
3. DURING THIS PHASE, ACCESS TO US 83 SHALL NOT BE ALLOWED FROM MADISON AVE. TO IOWA ST. CONTRACTOR SHALL PLACE DETOUR SIGNS AND TRAFFIC CONTROL DEVICES.
4. ROADWAY SHALL BE CLOSED DURING CONSTRUCTION TO THRU TRAFFIC. THRU TRAFFIC WILL NOT BE ALLOWED MONDAY - FRIDAY 7:00 P.M. TO 6:00 A.M.
5. CLEAN AND SEAL EXISTING JOINTS AS SHOWN ON PLANS.
6. REMOVE ROAD CLOSURE SETUPS AND PROCEED TO NEXT PHASE.

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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).

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

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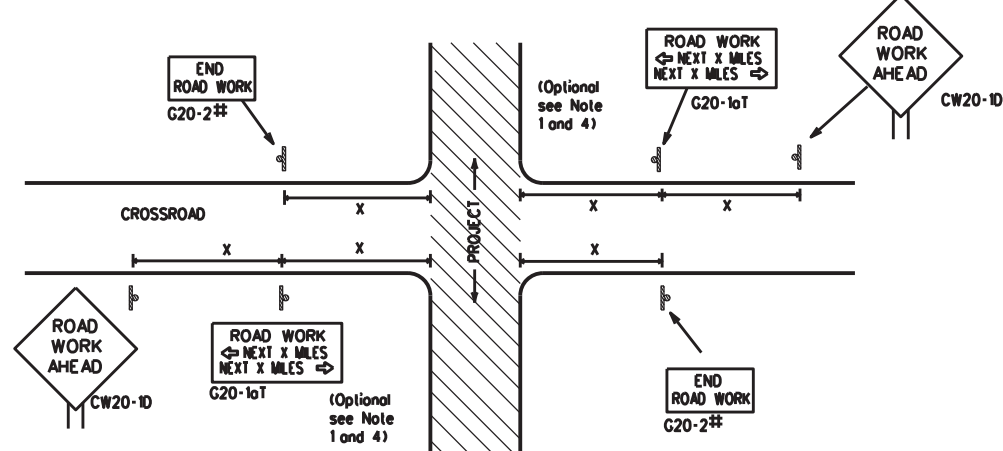


**BARRICADE AND CONSTRUCTION
GENERAL NOTES
AND REQUIREMENTS**

BC(1)-21

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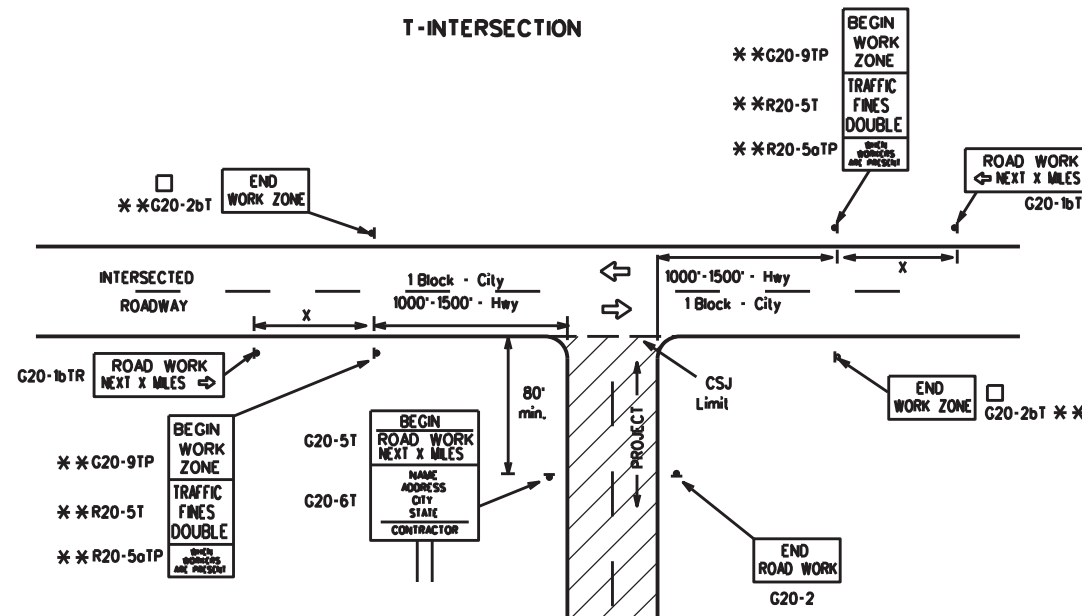
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING

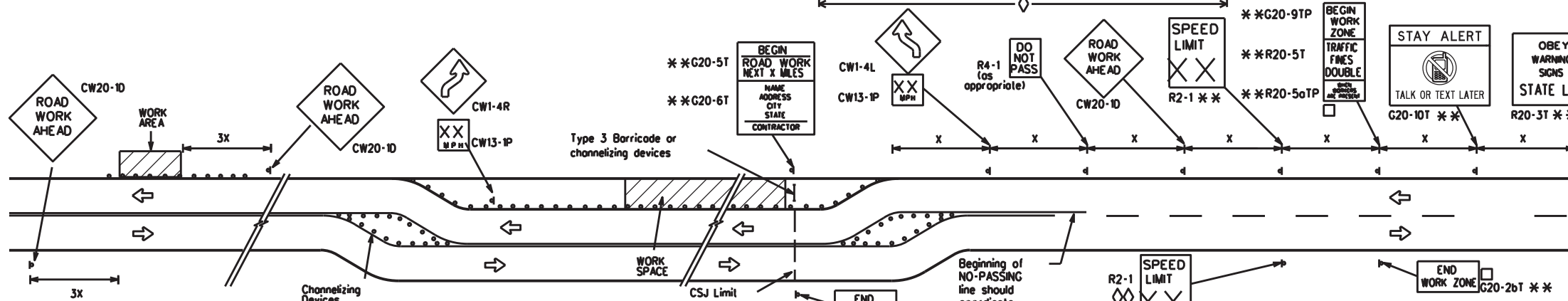
Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed MPH	Sign Spacing "X" Feet (Apprx.)
CW20 ⁴	48" x 48"	48" x 48"	30	120
CW21			35	160
CW23			40	240
CW25			45	320
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	50	400
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48"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

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

GENERAL NOTES

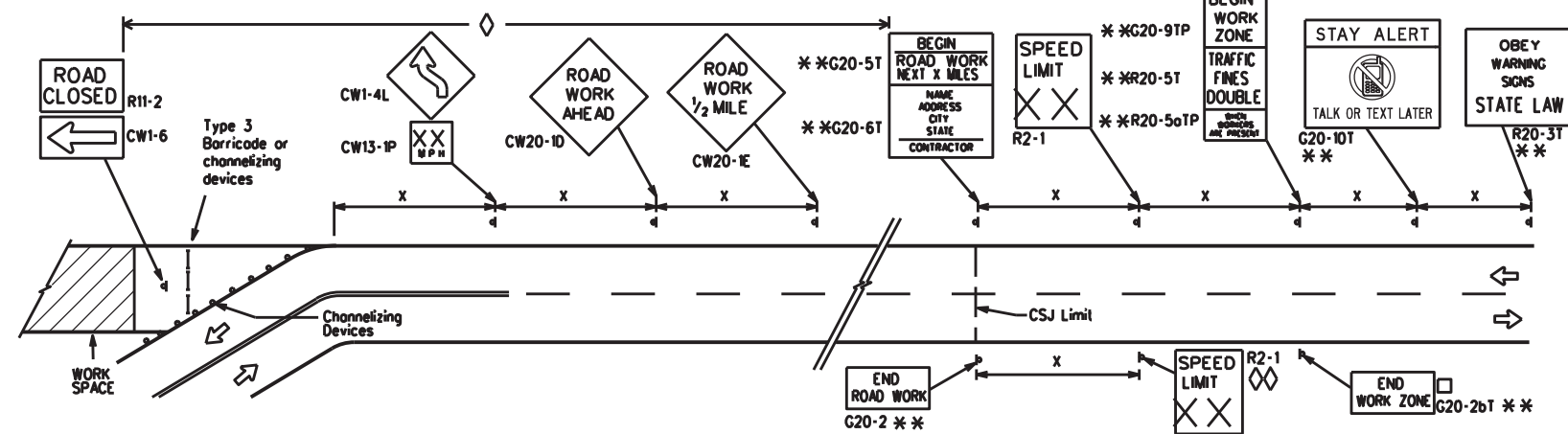
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

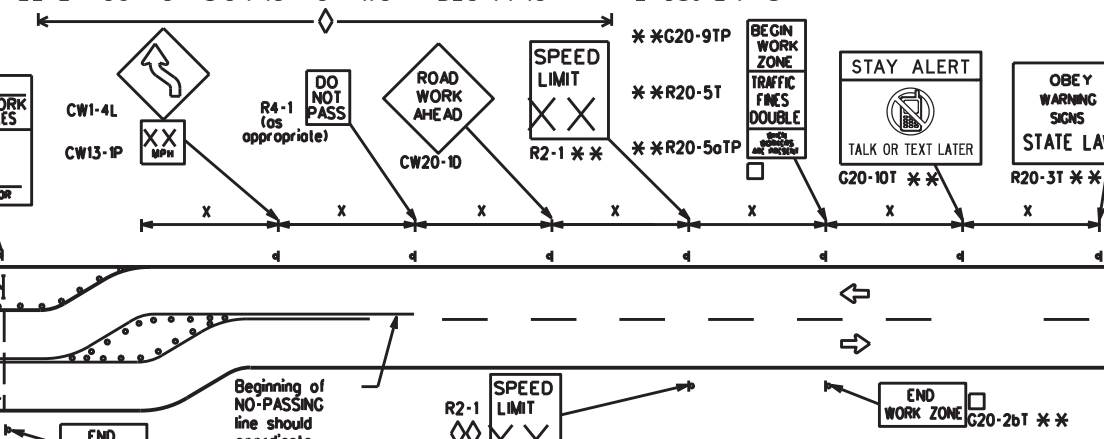


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



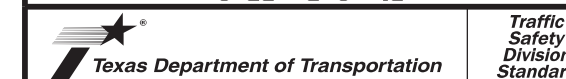
NOTES

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

LEGEND

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

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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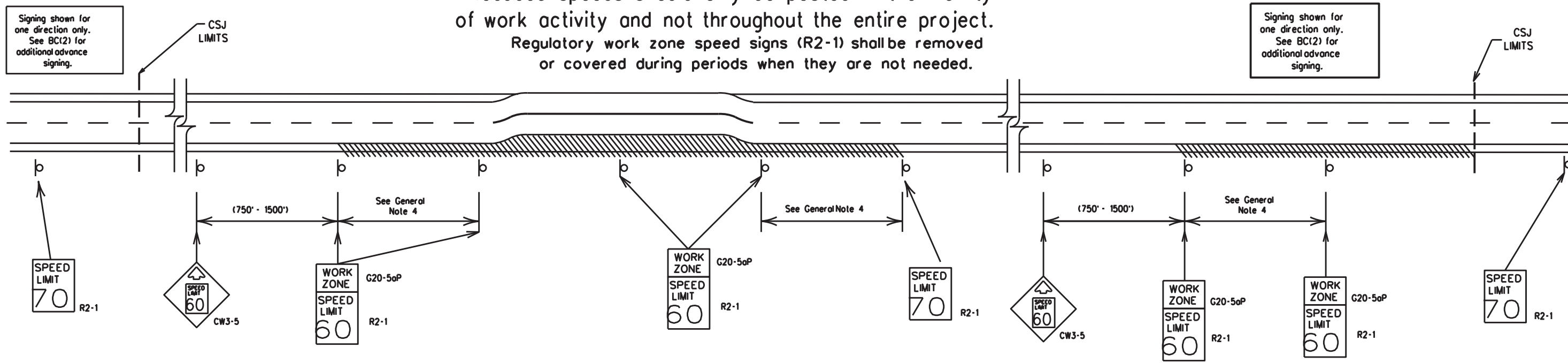
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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SHEET 3 OF 12

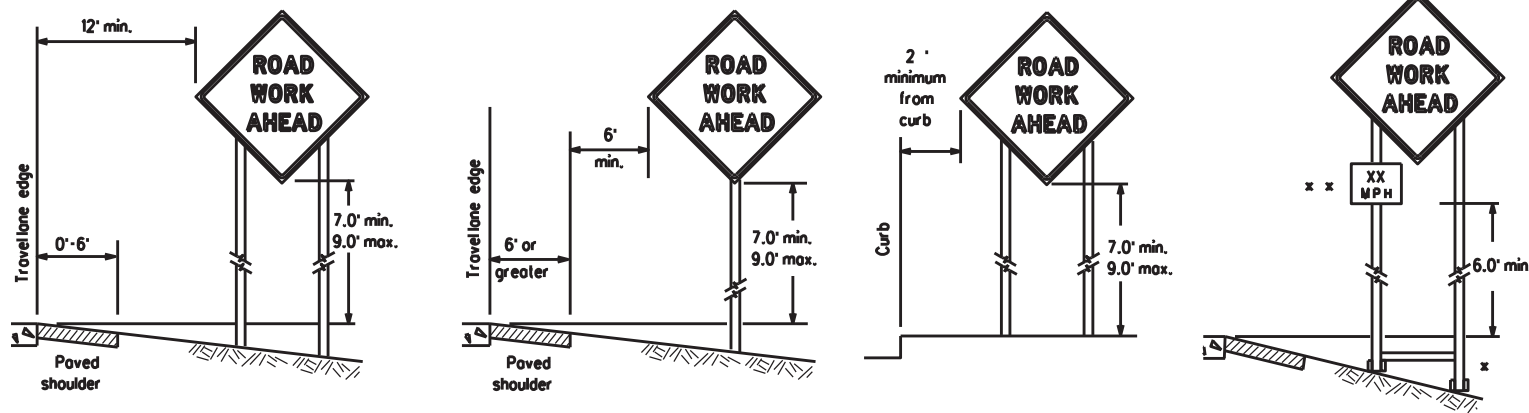


BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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REVISIONS		6472	07	001	VARIOUS				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	PHR	VARIOUS	17					

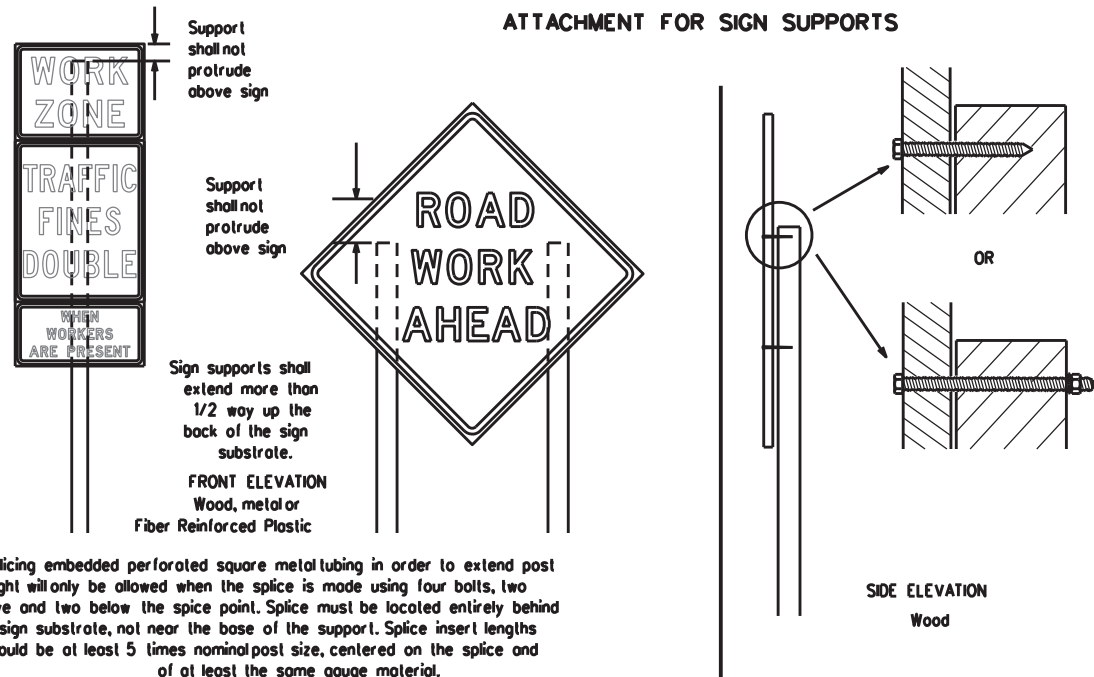
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* 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

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

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

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GENERAL NOTES FOR WORK ZONE SIGNS

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
- Wooden sign posts shall be painted white.
- Barricades shall NOT be used as sign supports.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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)

- 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.
 - Long-term stationary - work that occupies a location more than 3 days.
 - 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.
 - Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
 - Short duration - work that occupies a location up to 1 hour.
 - Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

- 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.
- 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.
- Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
- 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.
- 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

- 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

- 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.
- "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
- 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

- 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).
- White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
- Orange sheeting, meeting the requirements of DMS-8300 Type B or Type C, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

- 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

- When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
- 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.
- 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.
- 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.
- Burlap shall NOT be used to cover signs.
- Duct tape or other adhesive material shall NOT be affixed to a sign face.
- Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

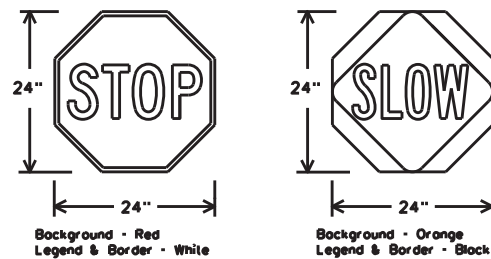
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
- 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.
- 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.
- 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.
- Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

- 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.

STOP/SLOW PADDLES

- STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24".
- STOP/SLOW paddles shall be retroreflectized when used at night.
- STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
- 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 _{TL} OR C _{TL} 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

- 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.
- 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.
- When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
- 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.
- 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.
- 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.

Texas Department of Transportation Traffic Safety Division Standard

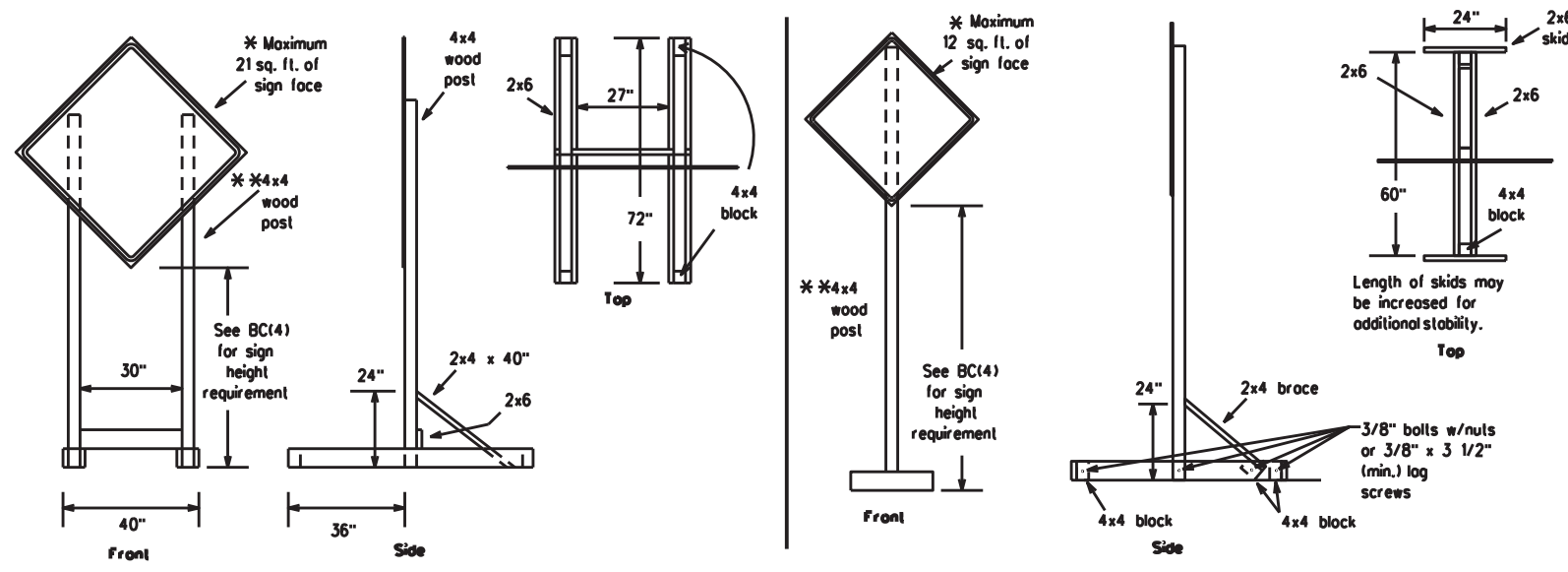
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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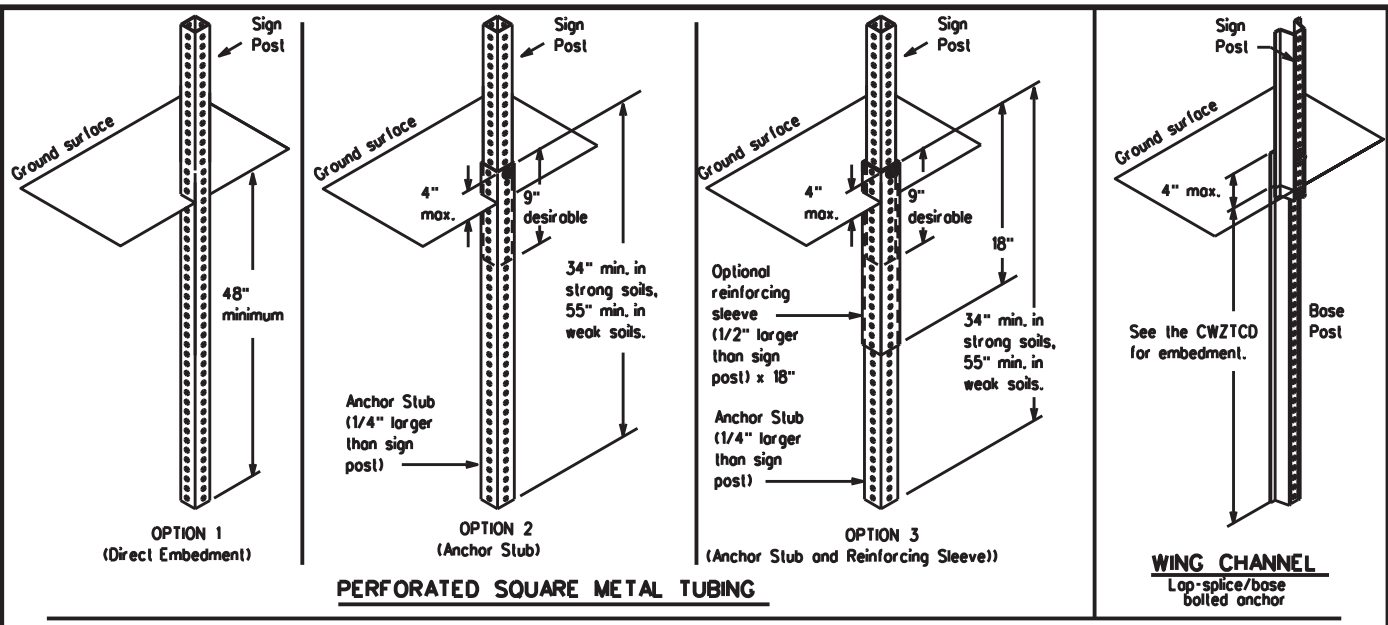
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SKID MOUNTED WOOD SIGN SUPPORTS

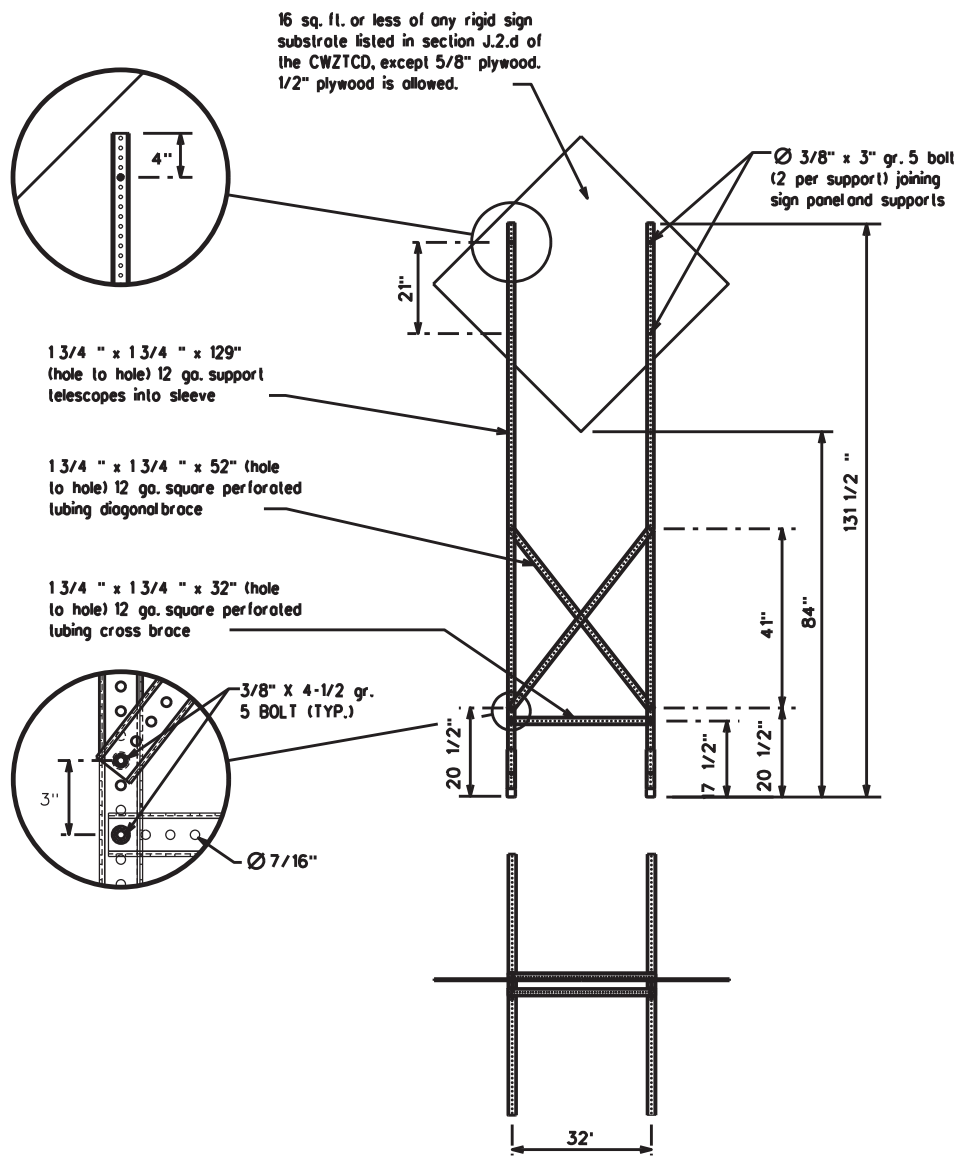
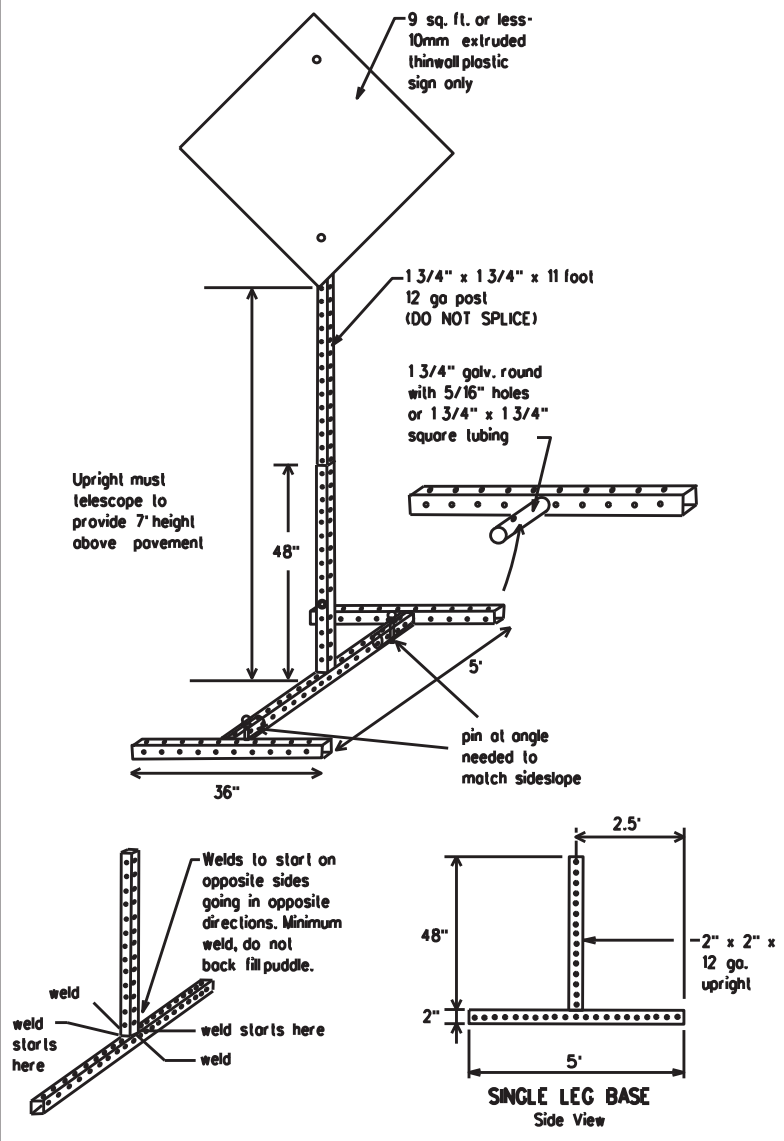
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS



PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

Refer to the CWZTC 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 CWZTC 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 CWZTC 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 CWZTC for the type of sign substrate that can be used for each approved sign support.

SHEET 5 OF 12



BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

*** Advance Notice List**

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

* See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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



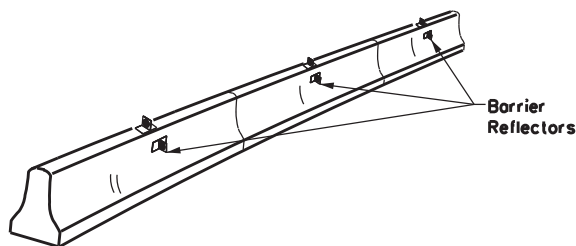
BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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7-13 5-21	PHR	VARIOUS	20	

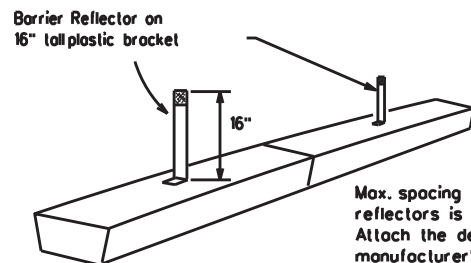
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



CONCRETE TRAFFIC BARRIER (CTB)

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



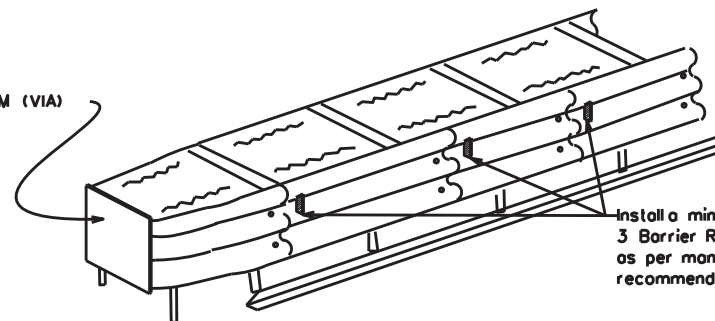
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

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

LOW PROFILE CONCRETE BARRIER (LPCB)

See D & OM (VIA)



DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

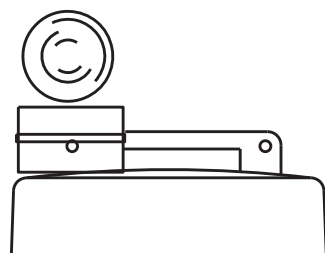
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

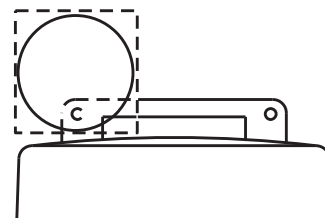
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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

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

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



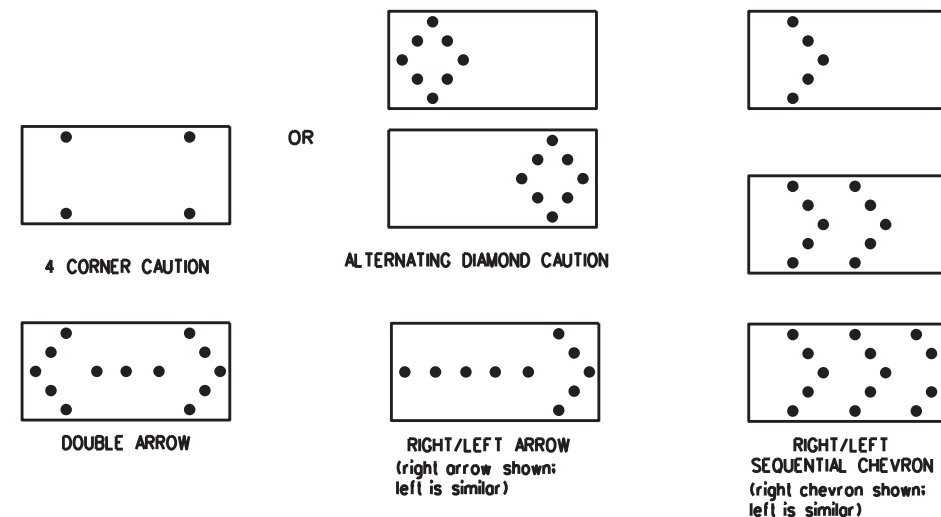
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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

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



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

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

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

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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



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

BC(7)-21

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9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	PHR	VARIOUS	21					

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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:

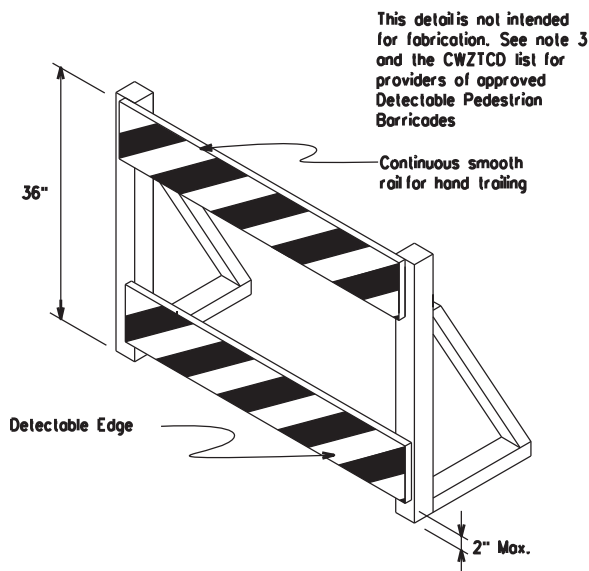
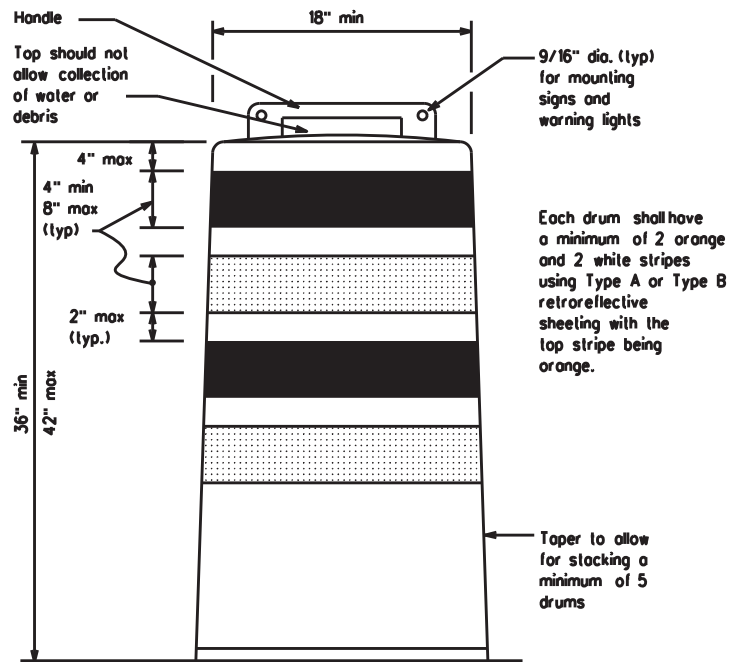
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

SHEET 8 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

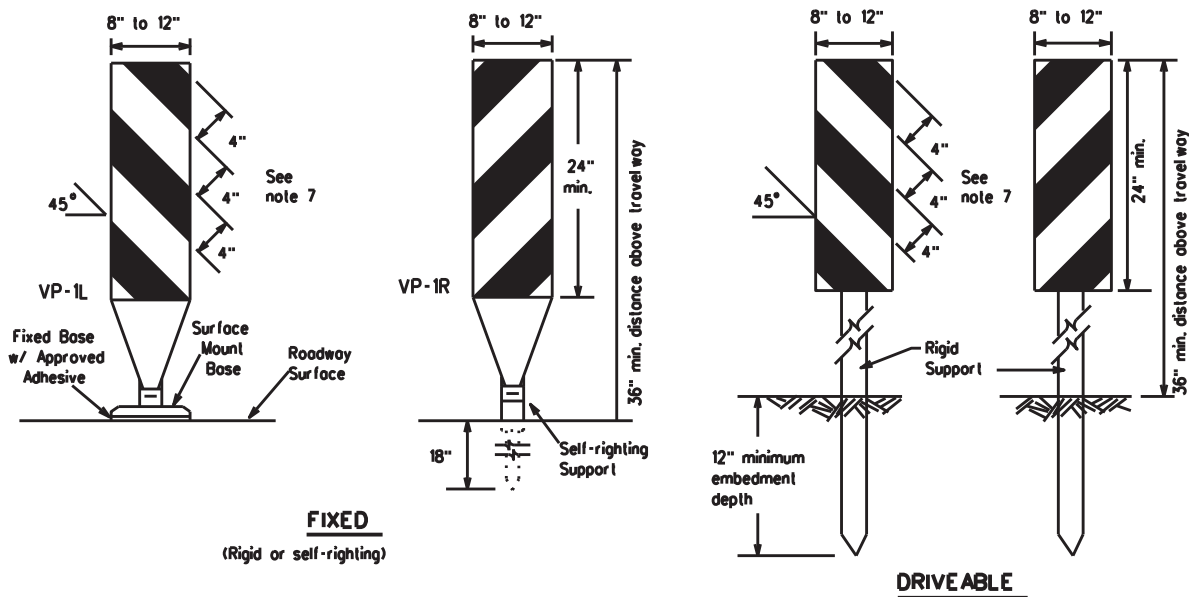
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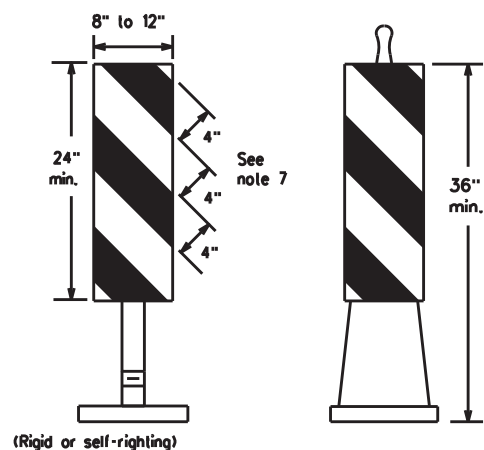
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FIXED
(Rigid or self-righting)

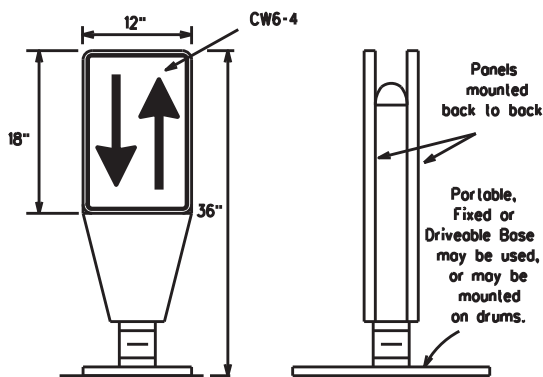
DRIVEABLE



PORTABLE

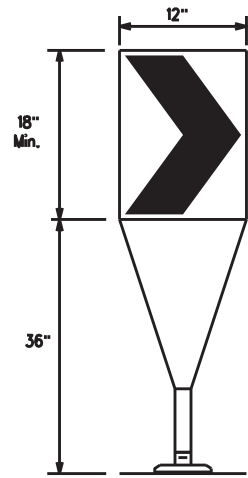
VERTICAL PANELS (VPs)

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



OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

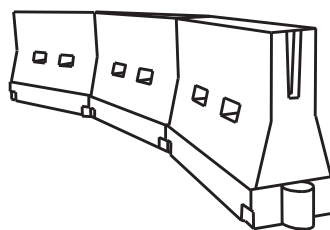
- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base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



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

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

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

GENERAL NOTES

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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REVISIONS: 9-07 8-14	DIST: PHR	COUNTY: VARIOUS	SHEET NO.: 23	
7-13 5-21				

DATE: FILE:

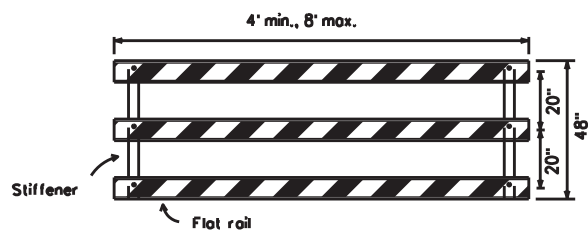
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.

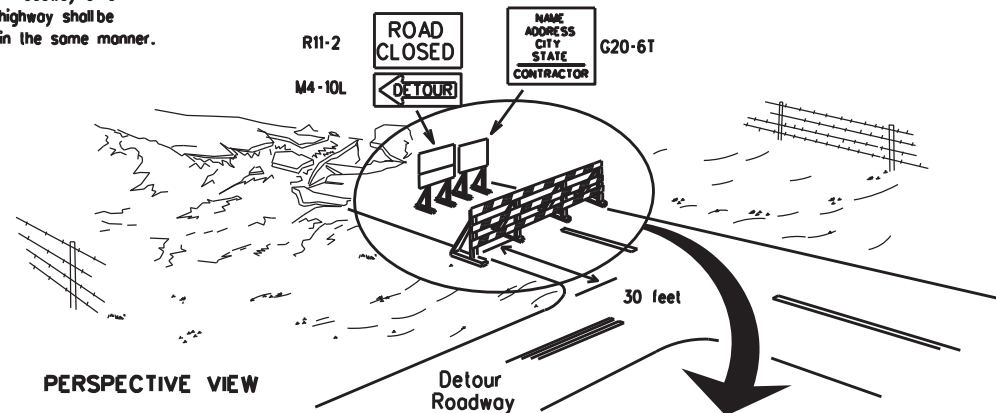


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



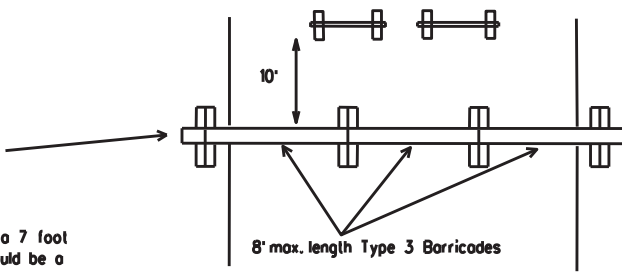
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

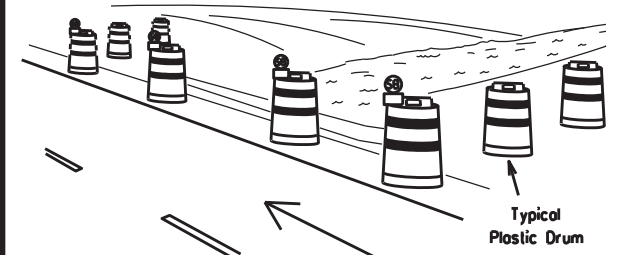
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



PLAN VIEW

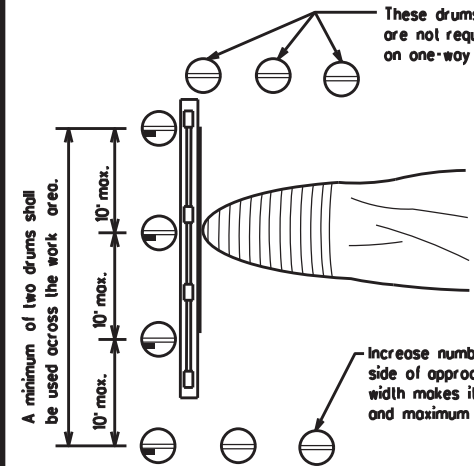
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

These drums are not required on one-way roadway



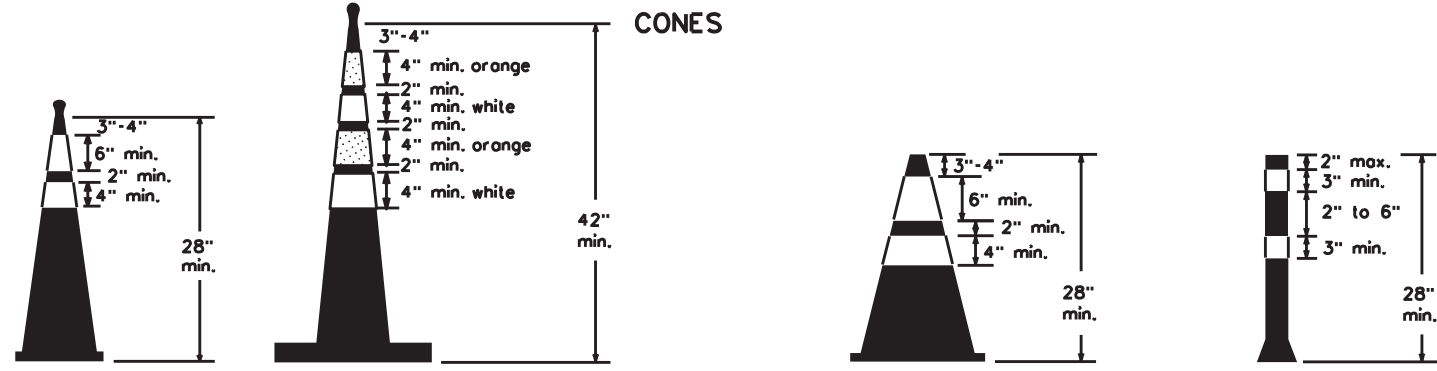
PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

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

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

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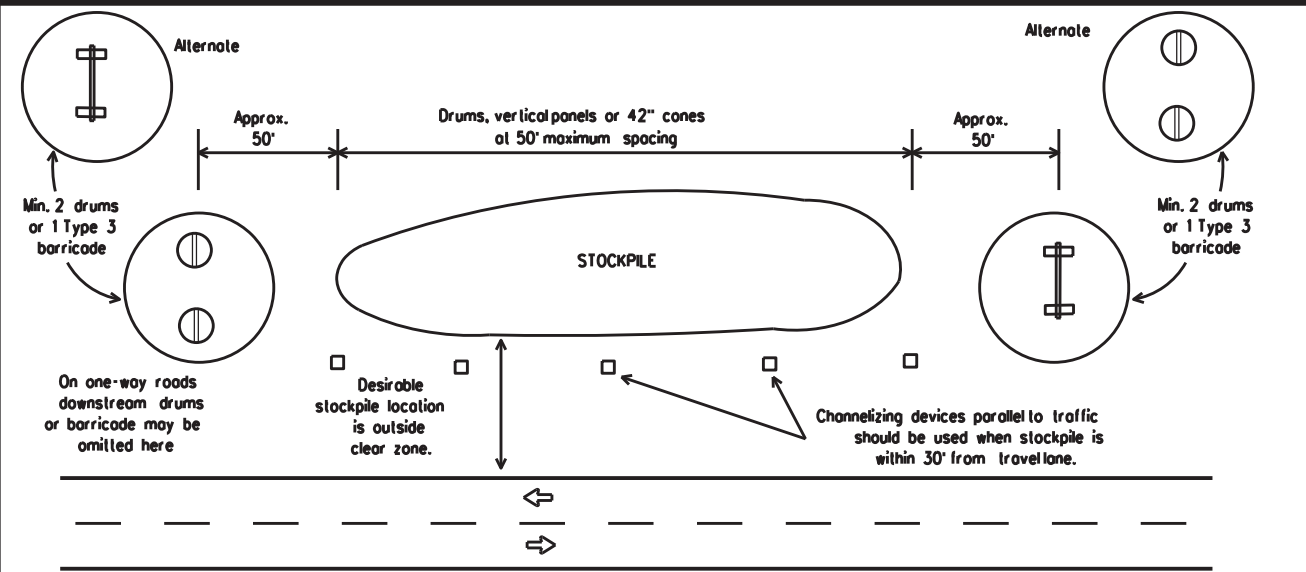


Two-Piece cones

One-Piece cones

Tubular Marker

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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7-13 5-21	DIST: PHR	COUNTY: VARIOUS	SHEET NO.: 24	

DATE: FILE:

WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

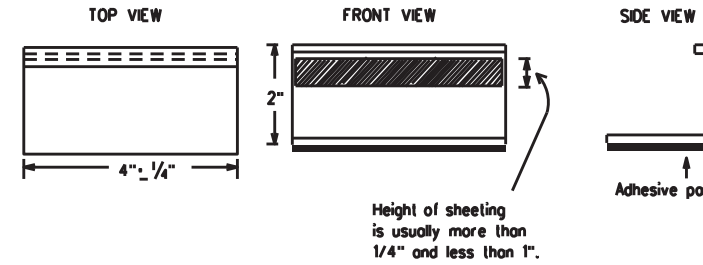
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

SHEET 11 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

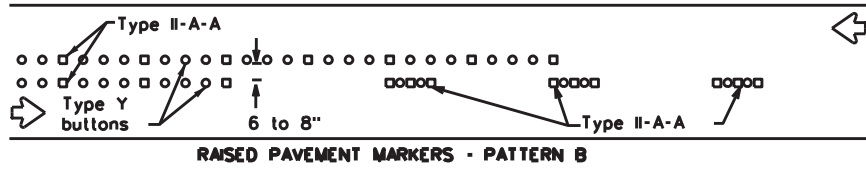
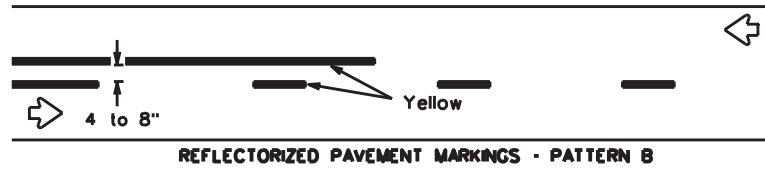
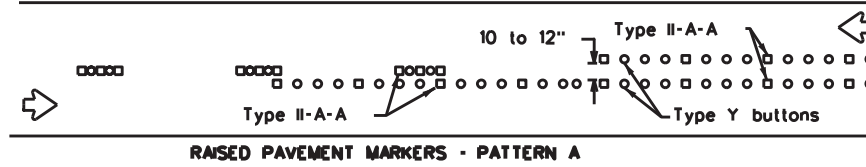
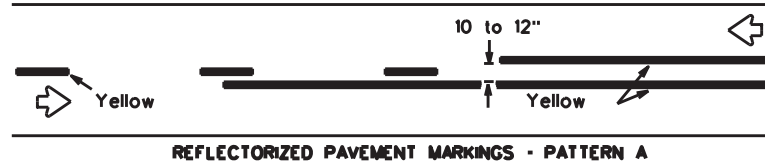
BC(11)-21

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	6472	07	001	VARIOUS
REVISIONS	DIST	COUNTY	SHEET NO.	
2-98 9-07 5-21				
1-02 7-13				
11-02 8-14	PHR	VARIOUS	25	

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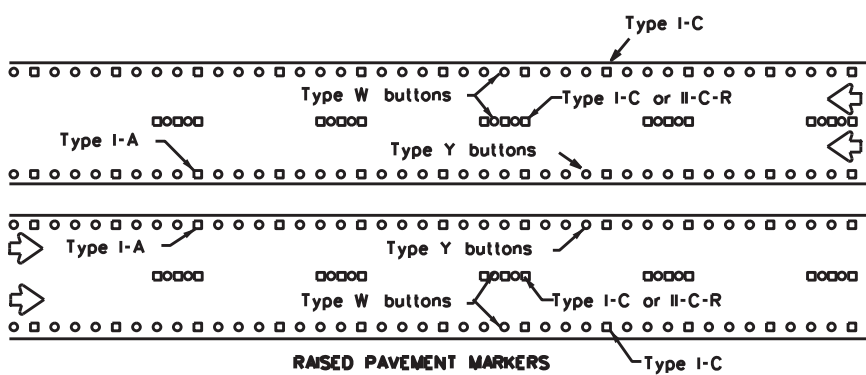
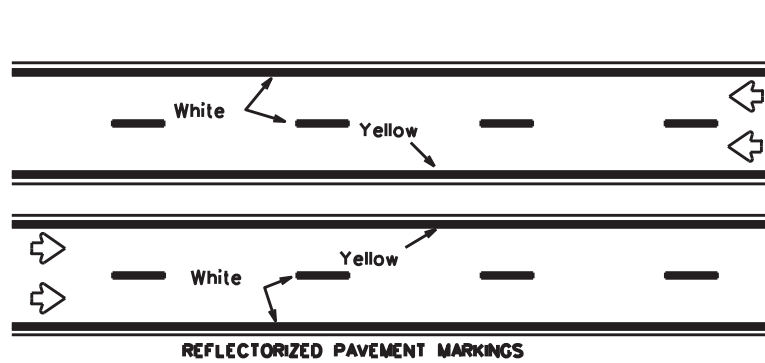
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PAVEMENT MARKING PATTERNS



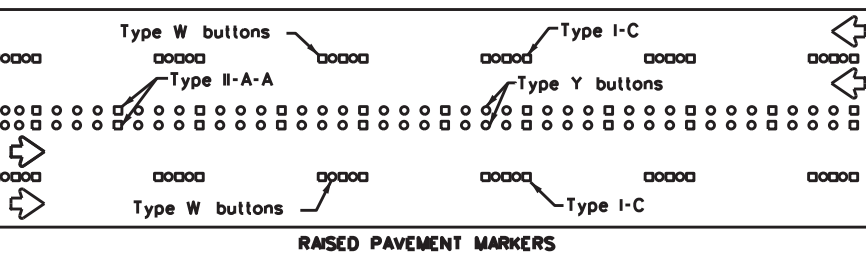
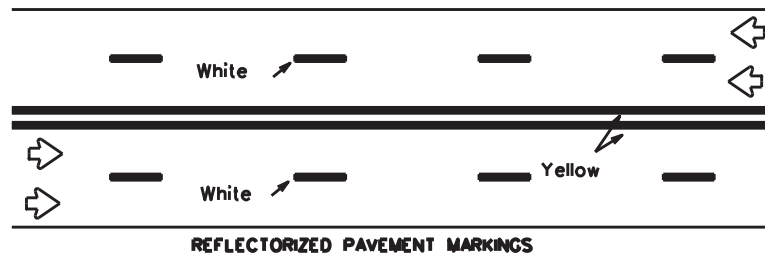
Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectorized pavement markings.

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



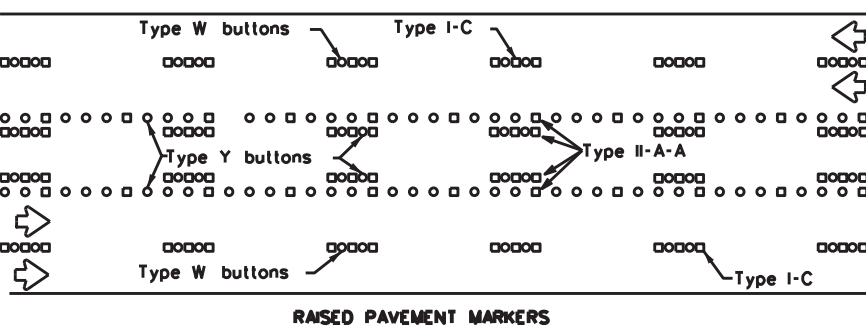
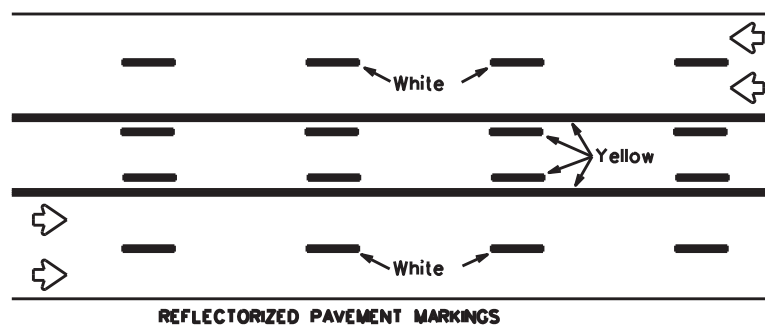
Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



Prefabricated markings may be substituted for reflectorized pavement markings.

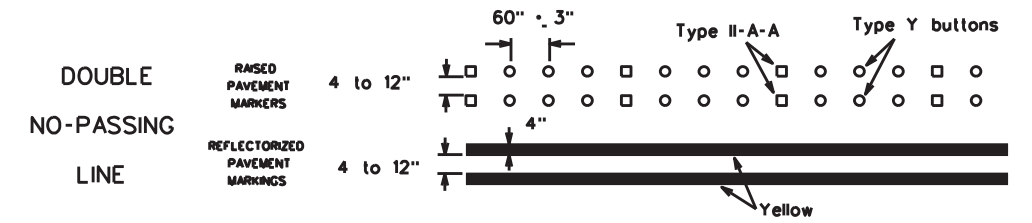
LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



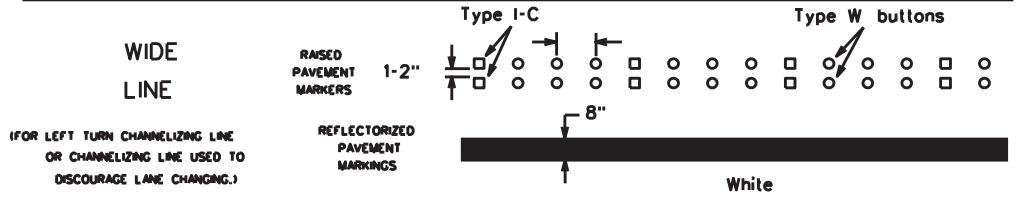
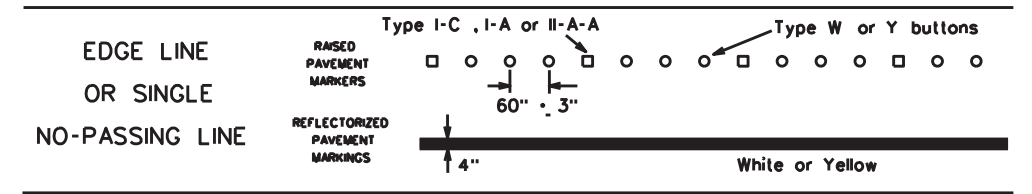
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

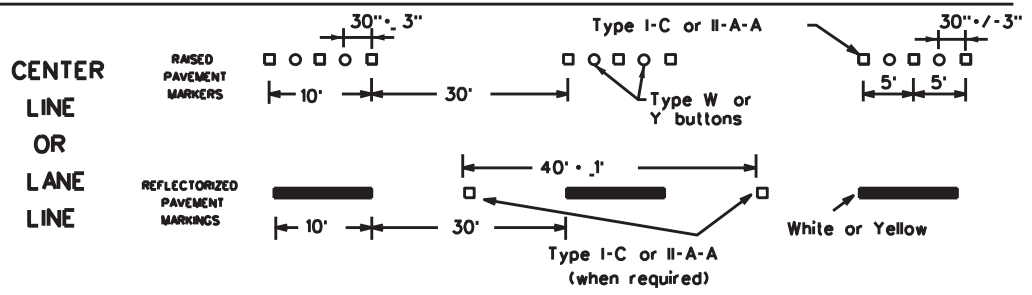
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



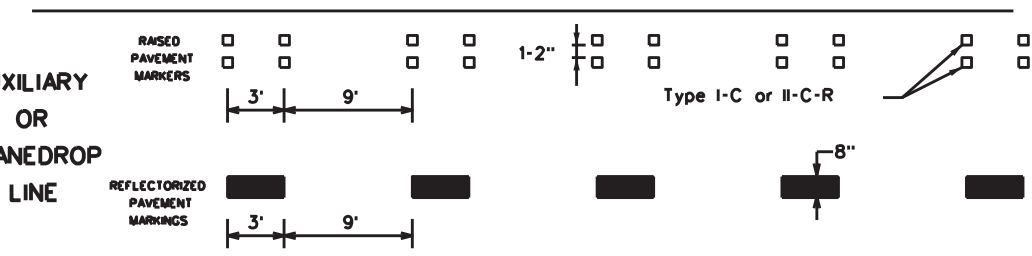
SOLID LINES



CENTER LINE OR LANE LINE

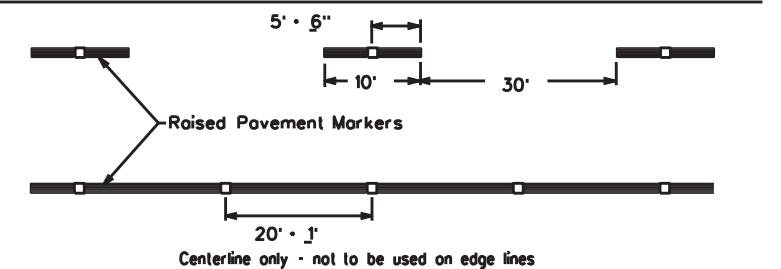


BROKEN LINES



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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

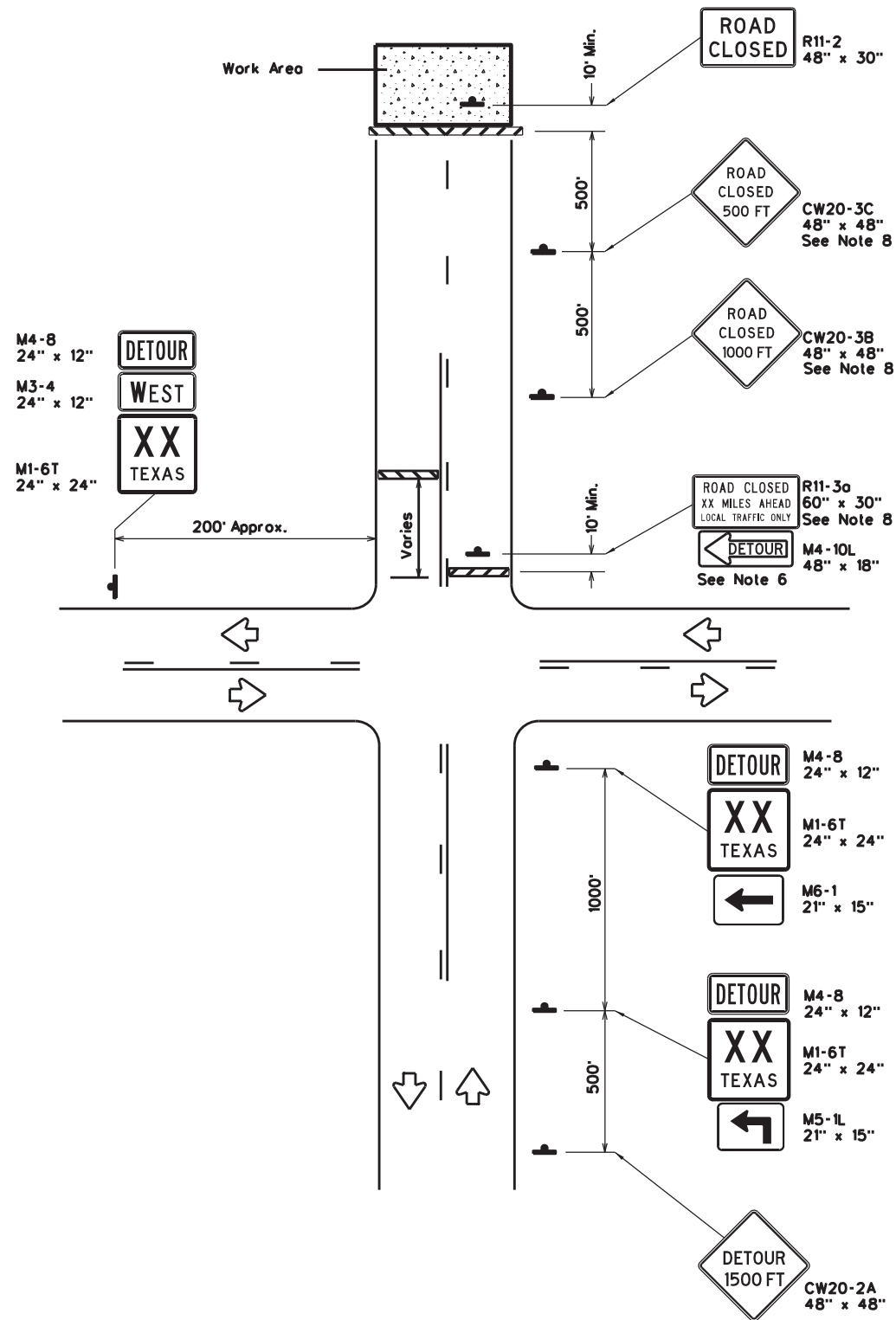
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© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	6472	07	001	VARIOUS
1-97 9-07 5-21	DIST	COUNTY	SHEET NO.	
2-98 7-13	PHR	VARIOUS	26	
11-02 8-14				

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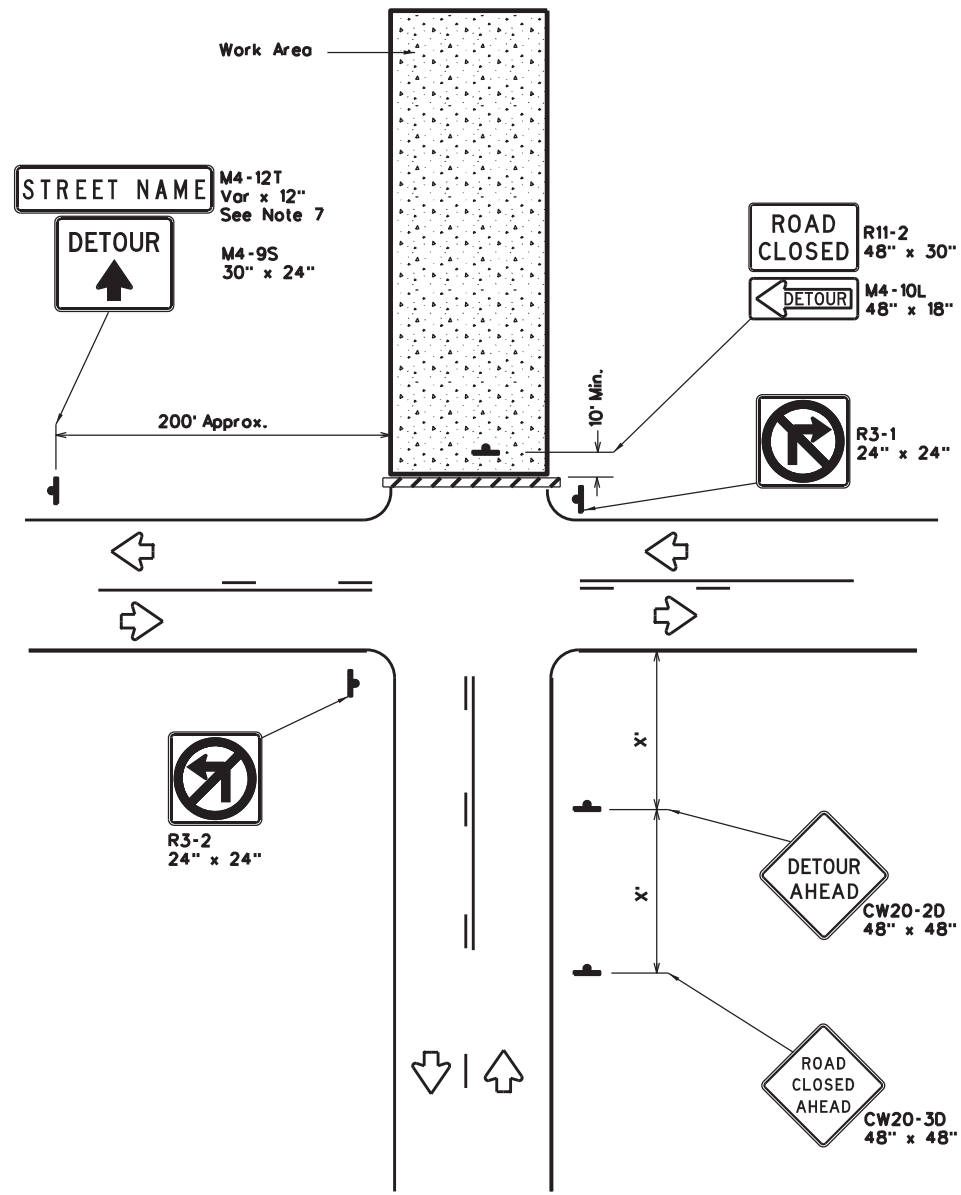
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ROAD CLOSURE BEYOND THE INTERSECTION
Signing for a Numbered Route with an Off-Site Detour



ROAD CLOSURE AT THE INTERSECTION
Signing for an Un-numbered Route with an Off-Site Detour

LEGEND	
	Type 3 Barricade
	Sign

Posted Speed *	Minimum Sign Spacing "x" Distance
30	120'
35	160'
40	240'
45	320'
50	400'
55	500'
60	600'
65	700'
70	800'
75	900'

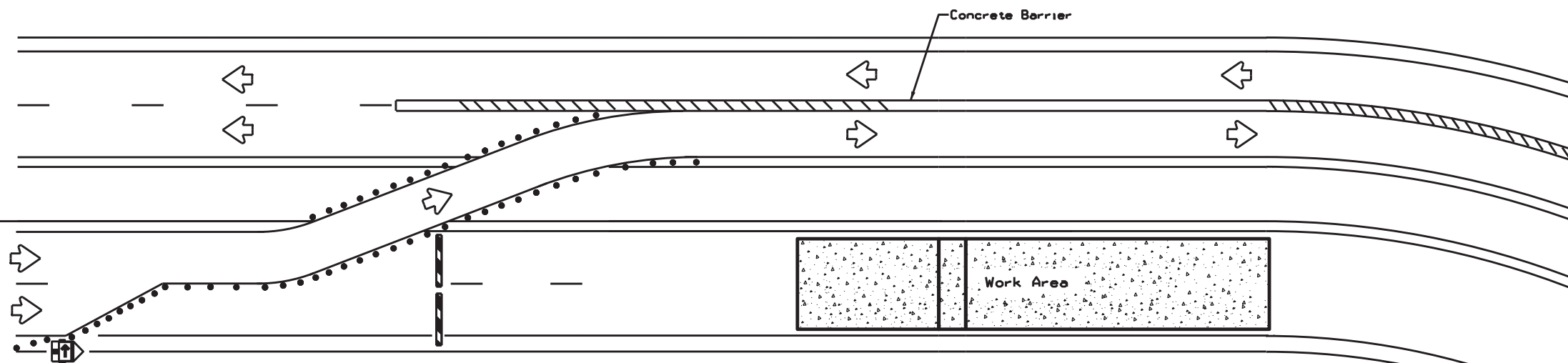
* Conventional Roads Only

GENERAL NOTES

- This sheet is intended to provide details for temporary work zone road closures. For permanent road closure details see the D&OM standards.
- Barricades used shall meet the requirements shown on Barricade and Construction Standard BC(10) and listed on the Compliant Work Zone Traffic Control Devices list (CWZTCD).
- Stockpiled materials shall not be placed on the traffic side of barricades.
- Barricades at the road closure should extend from pavement edge to pavement edge.
- Detour signing shown is intended to illustrate the type of signing that is appropriate for numbered routes or un-numbered routes as labeled. It does not indicate the full extent of detour signing required. Detour routes should be signed as shown elsewhere in the plans.
- If the road is open for a significant distance beyond the intersection or there are significant origin/destination points beyond the intersection, the signs and barricades at this location should be located at the edge of the traveled way.
- The Street Name (M4-12T) sign is to be placed above the DETOUR (M4-9S) sign.
- For urban areas where there is a shorter distance between the intersection and the actual closure location, the ROAD CLOSED XX MILES AHEAD (R11-3a) sign may be replaced with a ROAD CLOSED TO THRU TRAFFIC (R11-4) sign. If adequate space does not exist between the intersection and the closure a single ROAD CLOSED AHEAD (CW20-3D) sign spaced as per the table above may replace the ROAD CLOSED 1000 FT (CW20-3B) and ROAD CLOSED 500 FT (CW20-3C) signs.
- Signs and barricades shown shall be subsidiary to Item 502. Locations where these details will be required shall be as shown elsewhere in the plans.

		Traffic Operations Division Standard	
WORK ZONE ROAD CLOSURE DETAILS			
WZ(RCD)-13			
FILE: wzrcd-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
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REVISIONS	6472	07	001
1-97 4-98 7-13	DIST: PHR	COUNTY: VARIOUS	SHEET NO.: 27
2-98 3-03	PHR	VARIOUS	27

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NOTES:

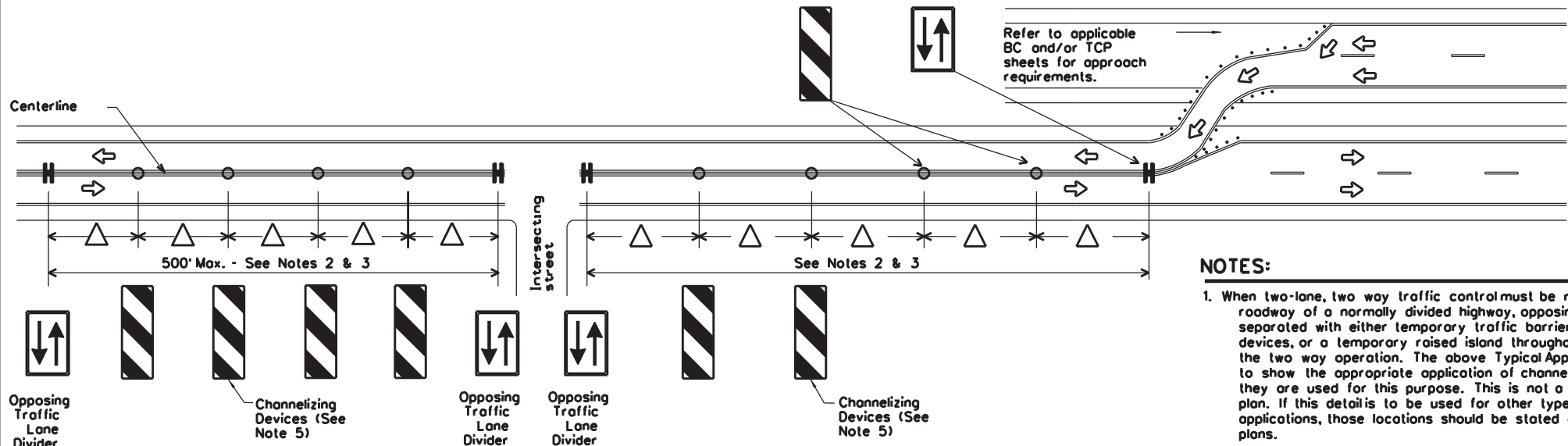
1. Length of Safety Glare screen will be specified elsewhere in the plans.
2. The cumulative nominal length of the modular safety glare screen units shall equal the length of the individual sections of temporary concrete traffic barrier on which they are installed so the joint between barrier sections will not be spanned by any one safety glare screen unit.
3. Screen Panel/blades will be designed such that reflective sheeting conforming with Departmental Material Specification DMS-8300, Sign Face Materials, Type B or C Yellow, minimum size of 2 inches by 12 inches can be attached to the edge of the panel/blade. The sheeting shall be attached to one glare screen panel/blade per section of concrete barrier not to exceed a spacing of 30 feet. Barrier reflectors are not necessary when panel/blades are installed with reflective sheeting as described.
4. Payment for these devices will be under statewide Special Specification "Modular Glare Screens for Headlight Barrier."
5. This detail is only intended to show types of locations where Glare Screens would be appropriate. Required signing and other devices shall be as shown elsewhere in the plans.

BARRIER DELINEATION WITH MODULAR GLARE SCREENS

LEGEND	
	Type 3 Barricade
	Channelizing Devices
	Trailer Mounted Flashing Arrow Board
	Sign
	Safety glare screen

DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600
MODULAR GLARE SCREENS FOR HEADLIGHT BARRIER	DMS-8610

Only pre-qualified products shall be used. A copy of the Compliant Work Zone Traffic Control Devices List (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
<http://www.txdot.gov/business/resources/producer-list.html>



NOTES:

1. When two-lane, two way traffic control must be maintained on one roadway of a normally divided highway, opposing traffic shall be separated with either temporary traffic barriers, channelizing devices, or a temporary raised island throughout the length of the two way operation. The above Typical Application is intended to show the appropriate application of channelizing devices when they are used for this purpose. This is not a traffic control plan. If this detail is to be used for other types of roads or applications, those locations should be stated elsewhere in the plans.
2. Space devices according to the Tangent Spacing shown on the Device Spacing table on BC(9) but not exceeding 100'.
3. Every fifth device should be an OTLD except when spaced closer to accommodate an intersection. An OTLD should be the first device on each side of intersecting streets or roads.
4. Locations where surface mount bases with adhesives or self-righting devices will be required in order to maintain them in their proper position should be noted elsewhere in the plans.
5. Channelizing devices are to be vertical panels, 42" cones or tubular markers that are at least 36" tall. Tubular markers used to separate traffic should have a rubber base weighing at least 30 pounds. Tubular markers that are 42" tall or more shall have four bands of reflective material as detailed for 42" cones on BC(10). Tubular markers less than 42" but at least 36" tall shall have three bands of 3" wide white reflective material spaced 2" apart. Reflective material shall meet DMS-8300, Type A.

VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS (OTLD) SEPARATING TWO-WAY TRAFFIC ON NORMALLY DIVIDED HIGHWAYS



TRAFFIC CONTROL PLAN TYPICAL DETAILS

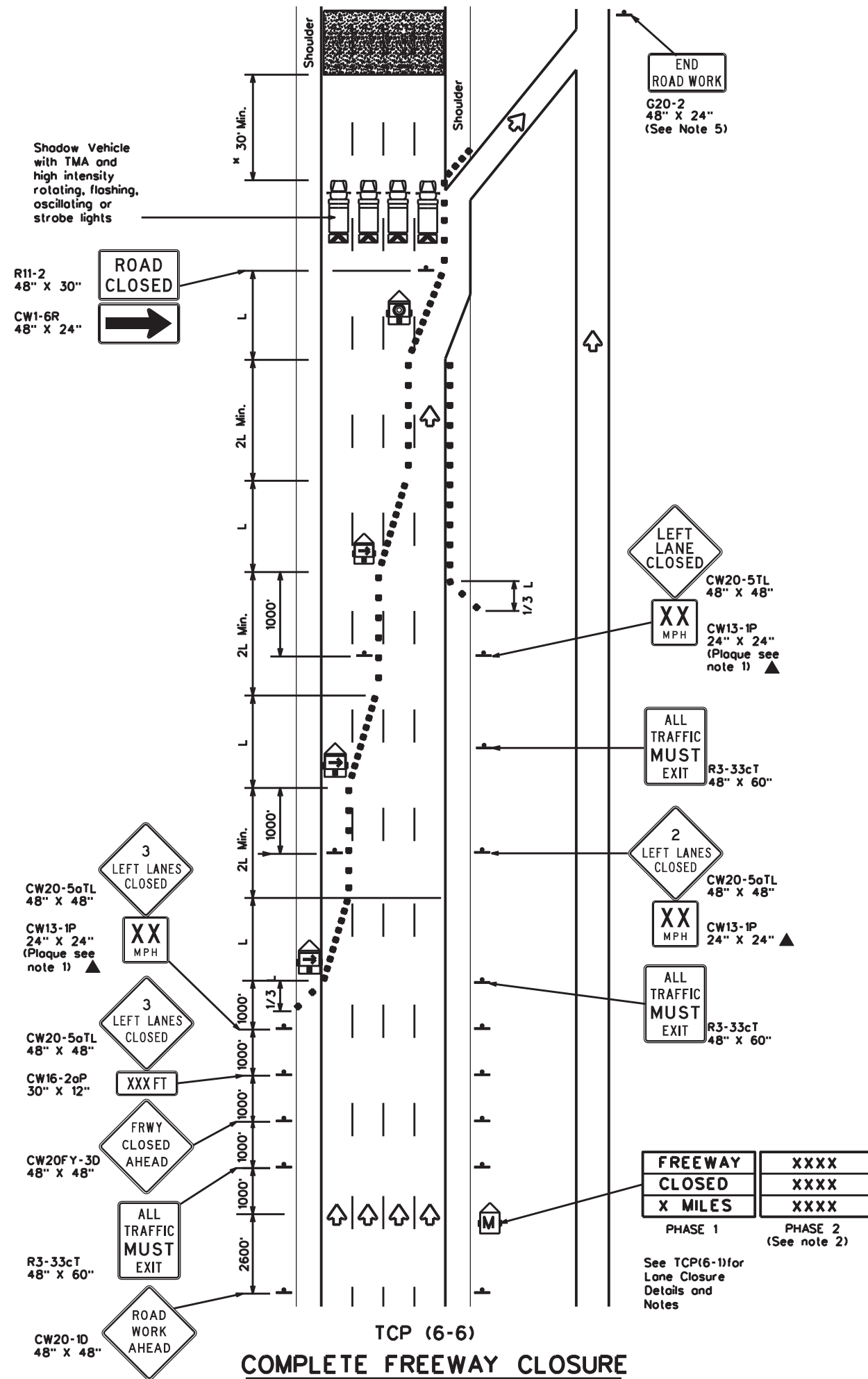
WZ(TD)-17

FILE: wzt17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	6472	07	001	VARIOUS
4-98	2-17			
3-03				
7-13				
	DIST	COUNTY	SHEET NO.	
	PHR	VARIOUS	28	

DATE:
FILE:

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DATE: FILE:



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

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

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

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

GENERAL NOTES

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

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

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

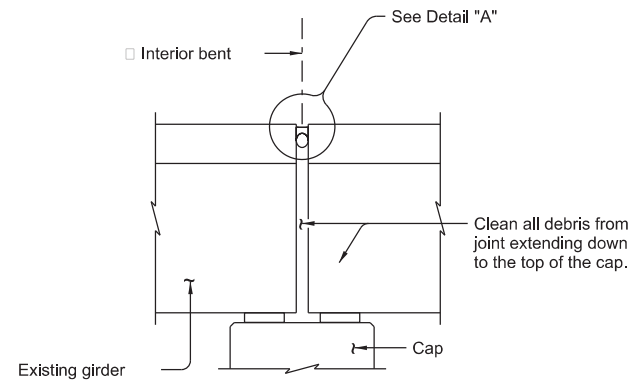


**TRAFFIC CONTROL PLAN
FREEWAY CLOSURE**

TCP(6-6)-12

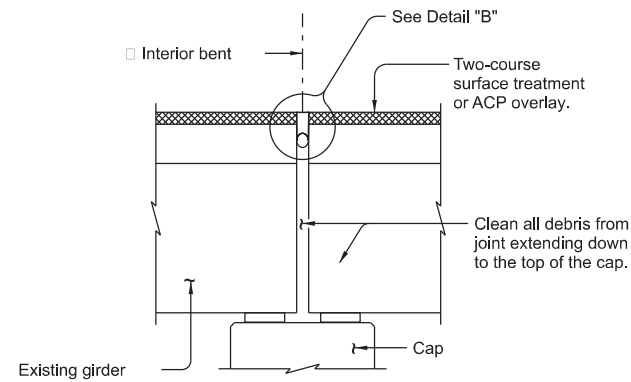
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©TxDOT February 1994	CONT: 6472	SECT: 07	JOB: 001	HIGHWAY: VARIOUS
REVISIONS	DIST: PHR	COUNTY: VARIOUS	SHEET NO. 29	
1-97 8-98 4-98 8-12				

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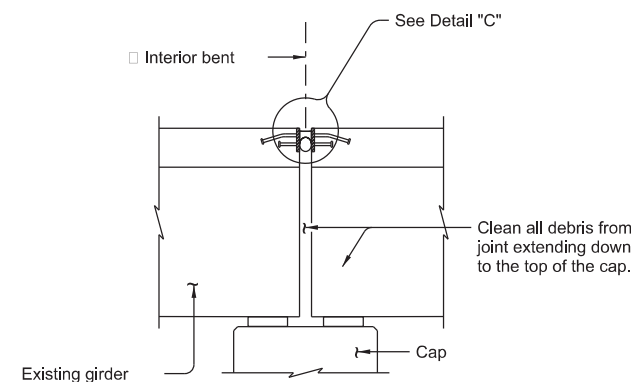
JOINT WITH SILICONE SEAL

(Used without ACP overlay)



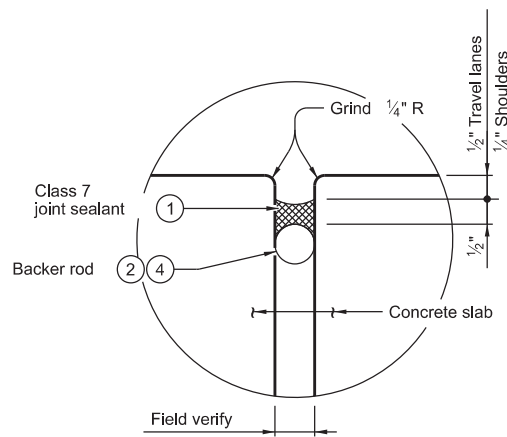
JOINT W/ HOT-POURED RUBBER SEAL

(Used with ACP overlay)

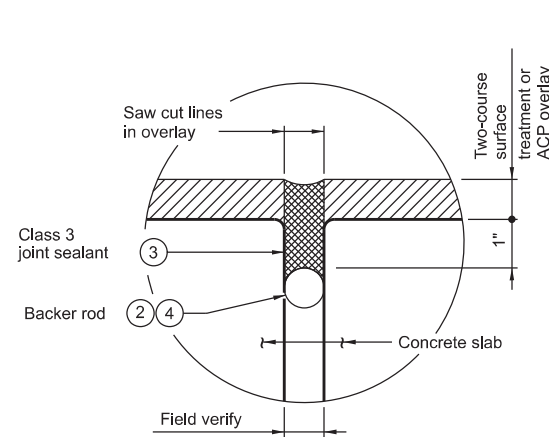


ARMOR JOINT

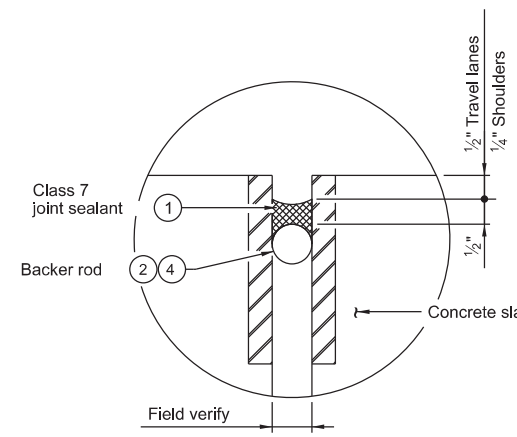
(Used with ACP overlay)



DETAIL "A"



DETAIL "B"



DETAIL "C"

(Stud anchors not shown for clarity.)

- ① Use Class 7 joint sealant in accordance with DMS-6310, "Joint Sealants and Fillers." Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Joints."
- ② Provide backer rod 25% larger than joint opening and compatible with the sealant. Use of multiple pieces to create a backer rod cross section is not permitted. Top of backer rod must be convex as shown.
- ③ Use Class 3 joint sealant in accordance with DMS-6310, "Joint Sealants and Fillers". Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Joints."
- ④ Backer rod must be compatible with the hot poured rubber sealant and rated for a minimum of 400°F.

GENERAL NOTES:

Cleaning existing joint opening (full depth) of all debris, providing and placing backer rod, saw-cutting asphalt overlay, and sealing joint is paid for by Item 438, "Cleaning and Sealing Joints" and measured by the linear foot. Obtain approval for all tools, equipment, materials and techniques proposed to clean and seal the joint. Provide Class 3 joint sealant in accordance with DMS-6310, "Joint Sealants and Fillers" for joints in asphalt overlay. Provide Class 7 joint sealant in accordance with DMS-6310, "Joint Sealants and Fillers" for joints in concrete. Extend sealant up into rail or curb 3 inches on low side or sides of deck. If the Class 7 joint sealant cannot be effectively placed in the vertical position, a Class 4 joint sealant compatible with the Class 7 joint 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.

SHEET 1 OF 3

Texas Department of Transportation		Bridge Division	
<h2 style="margin: 0;">CLEANING AND SEALING EXISTING BRIDGE JOINTS</h2>			
FILE:	DWS: RE	CK:	DWS: RE
©TxDOT December 2023	CONT	SECT	HIGHWAY
REVISIONS	6472	07	001
DWS: RE	PHR	COUNTY	SHEET NO.
PHR	VARIOUS	VARIOUS	30

PROCEDURE FOR CLEANING AND SEALING EXISTING JOINT WITH SILICONE SEAL:

- 1) Clean joint opening of all existing 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.
- 2) Obtain approval of cleaned joint prior to proceeding with joint sealing operation.
- 3) Place backer rod into joint opening 1" below the top of concrete. When sealing joints for slab spans, slab beam spans, or box beam spans, fill void below backer rod with extruded polystyrene foam before placing backer rod.
- 4) Seal the joint opening with a Class 7 joint sealant. Recess seal 1/2" below top of concrete in travel lanes and 1/4" below top of concrete in shoulders.

PROCEDURE FOR CLEANING AND SEALING EXISTING JOINT WITH HOT-POURED RUBBER SEAL:

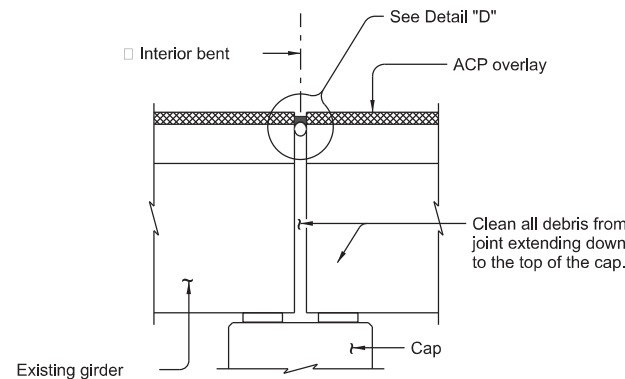
- 1) Saw cut through the asphalt at the centerline of joint. Make multiple saw cuts to create a 1/2" minimum joint opening or match the existing joint opening. Clean joint opening of all old expansion materials/devices, bituminous materials, dirt, grease and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints." Clean joint out full depth of the joint.
- 2) Obtain approval of cleaned joint prior to proceeding with joint sealing operation.
- 3) Place backer rod into joint opening 1" below the top of concrete. When sealing joints for slab spans, slab beam spans, or box beam spans, fill void below backer rod with extruded polystyrene foam before placing backer rod.
- 4) Seal the joint opening with a Class 3 joint sealant. Seal flush to the top of the asphaltic concrete pavement.

PROCEDURE FOR CLEANING AND SEALING EXISTING ARMOR JOINTS:

- 1) Remove existing seal, if present. Clean joint opening of all dirt and other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints." Clean joint out full depth of the joint.
- 2) Abrasive blast clean existing steel surface where silicone seal is to be placed.
- 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. When sealing joints for slab spans, slab beam spans, or box beam spans, fill void below backer rod with extruded polystyrene foam before placing backer rod.
- 5) Seal the joint opening with a Class 7 joint sealant. Recess seal 1/2" below top of concrete in travel lanes and 1/4" below top of concrete in shoulders.

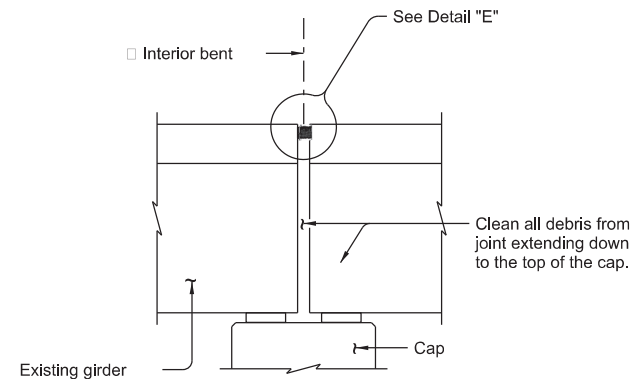
DATE:
FILE:

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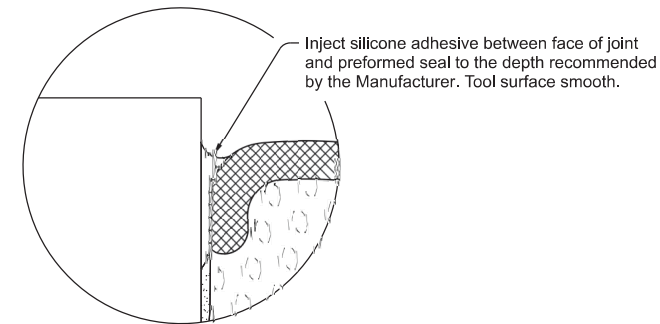
HEADER JOINT WITH SILICONE SEAL

(used with ACP overlay with joints more than 100 ft apart)

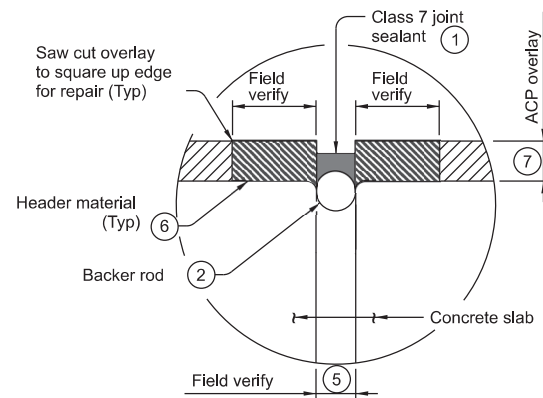


JOINT WITH PRECOMPRESSED FOAM AND SILICONE SEAL

(used without ACP overlay)



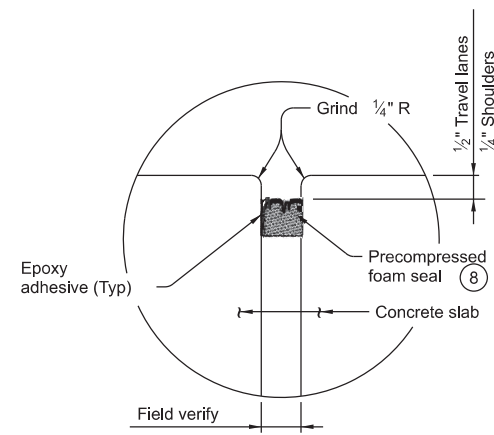
SILICONE INJECTION



DETAIL "D"

PROCEDURE FOR CLEANING AND SEALING HEADER JOINT WITH SILICONE SEAL AND HEADER JOINT REPAIR

- 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."
- 2) Saw cut and remove damaged portions of existing header material to neat lines. Repair deck joint spalls greater than 2" deep in accordance with Item 785, "Bridge Joint Repair or Replacement." Shallower spalls may be filled with header material.
- 3) Clean the voided region of all materials that could inhibit the bond between header material and concrete or steel.
- 4) Form the joint opening to the required width and place header material to fill voided region. Repair header material in accordance with Item 785, "Bridge Joint Repair or Replacement."
- 5) Place backer rod into joint opening 1" below the top of header material. When sealing joints for slab spans, slab beam spans, or box beam spans, fill void below backer rod with extruded polystyrene foam before placing backer rod.
- 6) Seal the joint opening with a Class 7 joint sealant. Recess seal 1/2" below top of header in travel lanes and 1/4" below top of header in shoulders.



DETAIL "E"

PROCEDURE FOR CLEANING AND SEALING JOINT WITH PRECOMPRESSED FOAM AND 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." When sealing joints for slab spans, slab beam spans, pan girder spans, or box beam spans, fill void below proposed seal with extruded polystyrene foam.
- 2) Correctly size joint seal based on field measurement and in accordance with Manufacturer's specifications. Multiple seal widths may be required. Ensure proper seal is selected for each joint.
- 3) Abrasive blast clean existing joint surfaces where seal is to be applied.
- 4) Wipe down joint surfaces to remove contaminants.
- 5) Mask areas adjacent to joint opening sufficiently to keep epoxy off deck surface.
- 6) Apply epoxy to joint opening side surfaces.
- 7) While epoxy is still tacky, remove shrink wrap from seal and install in joint opening.
- 8) Recess top of joint seal 1/2" in travel lanes and 1/4" in shoulders.
- 9) Inject silicone adhesive along top interface of seal with joint side surface according to Manufacturer's recommendations. Tool to spread adhesive as necessary. See Silicone Injection detail.

- 1) Use Class 7 joint sealant in accordance with DMS-6310, "Joint Sealants and Fillers." Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Joints."
- 2) Provide backer rod 25% larger than joint opening and compatible with the sealant. Use of multiple pieces to create a backer rod cross section is not permitted. Top of backer rod must be convex as shown.
- 5) Match existing joint opening or set at a minimum:
 - a. 1" at 70°F when the distance between joints is 150 ft or less
 - b. 2" at 70°F when the distance between joints is greater than 150 ft.
 - c. As directed by the Engineer.
- 6) 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, use header material in accordance with DMS-6140, "Polymer Concrete for Bridge Joint Systems." Match the thickness of the header material with the thickness of the overlay as shown in the plans, but do not exceed 4". Place header material flush with roadway surface. Do not cantilever header material over the joint opening. Repair of header material will be paid for in accordance with Item 785-6006, "Bridge Joint Repair (Header)."
- 7) Maximum thickness is 4".
- 8) See table of Approved Precompressed Foam Seal Manufacturers on Sheet 3 of 3.



CLEANING AND SEALING EXISTING BRIDGE JOINTS

FILE:	DNS RE	CK:	DW: RE	CK:
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REVISIONS	6472	07	001	VARIOUS
	DIST	COUNTY		SHEET NO.
	PHR	VARIOUS		31

DATE:
FILE:

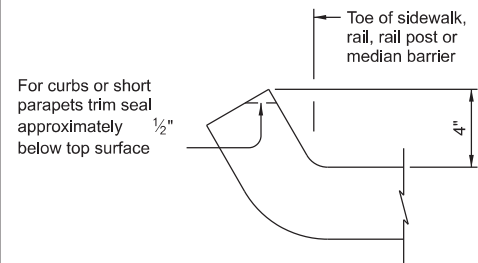
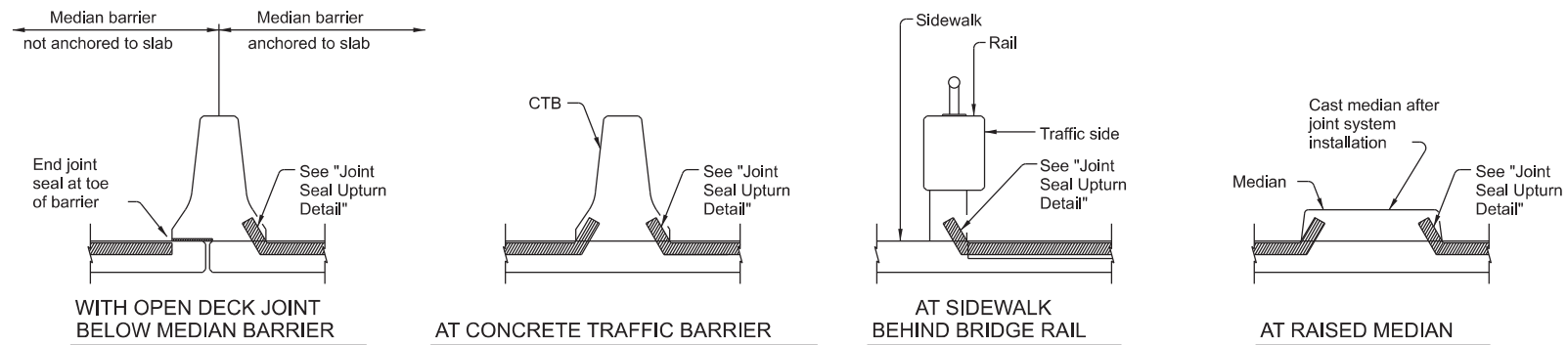
APPROVED PRECOMPRESSED FOAM SEAL MANUFACTURERS

MANUFACTURER	SEAL TYPE
Watson Bowman Acme	Wabo FS
SSI	Silspec SES
Seallite	Seallite 50N
EMSEAL	BEJS

TABLE OF ESTIMATED QUANTITIES

STRUCTURE NUMBER (FEATURE CROSSED)	JOINT TYPE	ITEM	DESCRIPTION	NUMBER OF JOINTS	QUANTITY (LF)
21-109-0255-07-043	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	6	348
21-109-0255-07-044	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	6	494
21-109-0255-07-046	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	5	332
21-109-0255-07-048	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	4	180
21-109-0255-07-049	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	4	240
21-109-0255-07-050	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	4	288
21-109-0255-07-053	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	4	280
21-109-0255-07-054	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	4	280
21-109-0255-07-055	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	7	287
21-109-0255-07-293	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	1	57
21-109-0255-07-294	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	2	114
21-109-0255-07-295	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	2	114
21-109-0255-07-296	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	2	114
21-109-0255-08-060	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	2	140
21-109-0255-08-061	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	1	70
21-109-0255-08-232	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	2	110
21-031-0039-08-233	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	2	110
21-031-0039-08-226	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	2	144
21-031-0039-08-227	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	2	144
21-031-0039-08-353	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	2	112
21-031-0039-08-354	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	2	112
21-031-0039-08-355	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	2	112
21-031-0039-19-289	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	2	122
21-031-0684-01-247	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	2	80
21-031-0684-01-250	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	1	86
21-031-0684-01-253	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	2	98
21-031-0684-01-256	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	1	98
21-031-0039-08-239	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	2	112
21-031-0039-07-125	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	23	782
21-253-0038-04-058	EXPANSION	4 38-6002	CLEANING AND SEALING EXIST JOINTS(CL3)	9	252
21-253-0038-04-095	EXPANSION	4 38-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	7	574

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JOINT SEAL UPTURN DETAIL

JOINT SEALANT TERMINATION DETAILS

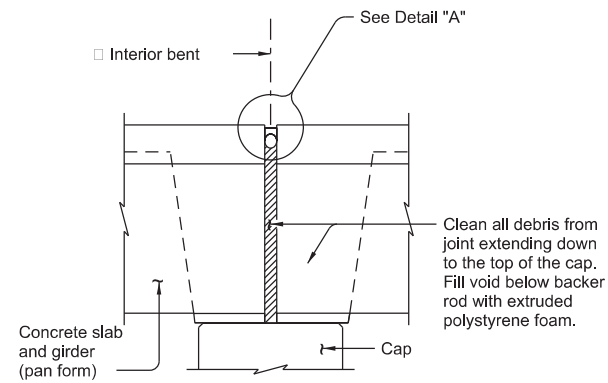
⑨ 1 1/2" for precompressed foam and silicone seal

SHEET 3 OF 3

		Bridge Division	
<p>CLEANING AND SEALING EXISTING BRIDGE JOINTS</p>			
FILE:	DWG: RE	CHK:	DWG: RE
©TxDOT December 2023	CONT	SECT	JOB
REVISIONS	6472	07	001
DIST	COUNTY		SHEET NO.
PHR	VARIOUS		32

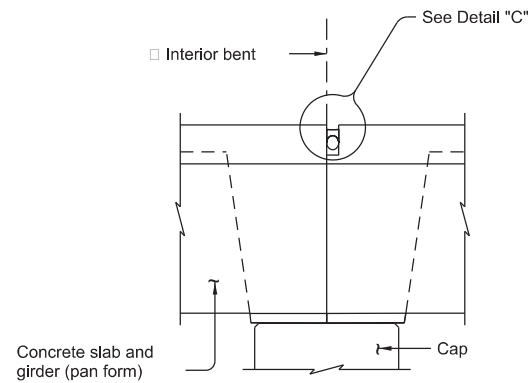
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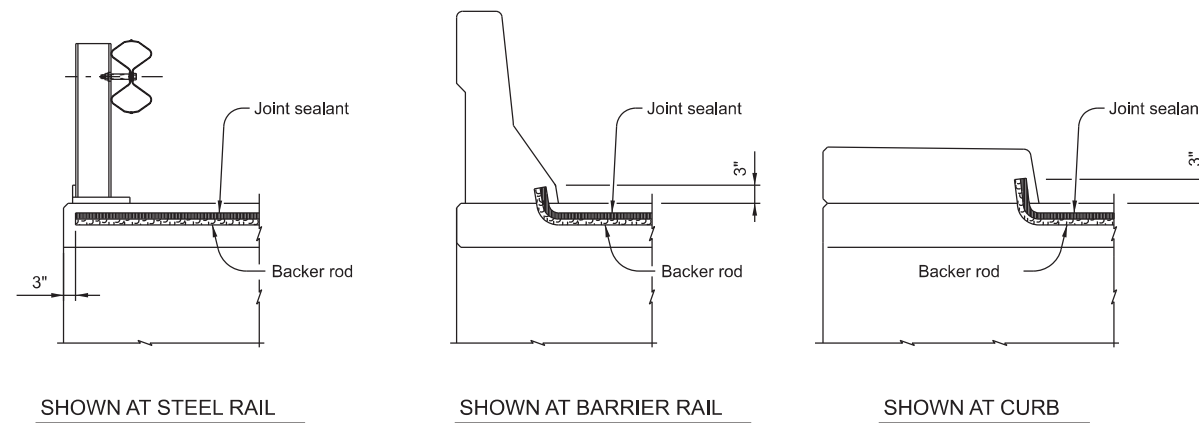


JOINT WITH SILICONE SEAL

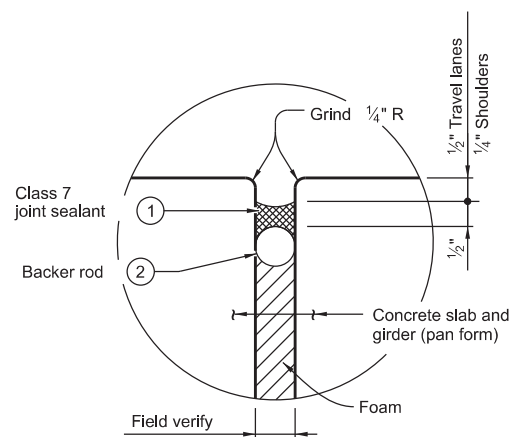
(Used without ACP overlay)



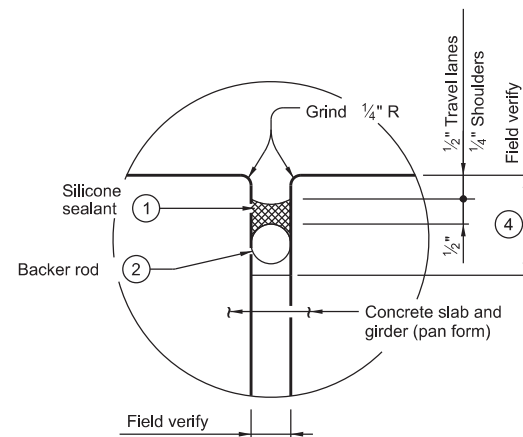
FIXED JOINT



JOINT SEALANT TERMINATION DETAILS



DETAIL "A"



DETAIL "C"

PROCEDURE FOR CLEANING AND SEALING EXISTING CONCRETE GIRDER JOINT WITH SILICONE SEAL:

- 1) Clean joint opening of all existing 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.
- 2) Obtain approval of cleaned joint prior to proceeding with joint sealing operation.
- 3) Fill void with extruded polystyrene foam.
- 4) Place backer rod into joint opening 1" below the top of concrete.
- 5) Seal the joint opening with a Class 7 joint sealant. Recess seal 1/2" below top of concrete in travel lanes and 1/4" below top of concrete in shoulders.

PROCEDURE FOR CLEANING AND SEALING EXISTING FIXED JOINTS:

- 1) Remove existing seal and debris from recess.
- 2) Abrasive blast clean existing surfaces where silicone seal is to be placed.
- 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.
- 5) Seal the joint opening with a Class 7 joint sealant. Recess seal 1/2" below top of concrete in travel lanes and 1/4" below top of concrete in shoulders.

- 1) Use Class 7 joint sealant. Prepare joint and seal in accordance with Item 438, "Cleaning and Sealing Joints."
- 2) Provide backer rod 25% larger than joint opening and compatible with the sealant. Use of multiple pieces to create a backer rod cross section is not permitted. Top of backer rod must be convex as shown.
- 3) Backer rod may be omitted if existing joint depth is less than 1 1/2".
- 4) Backer rod must be compatible with the hot poured rubber sealant and rated for a minimum of 400°F.

GENERAL NOTES:

Cleaning existing joint opening (full depth) of all debris, providing and placing backer rod, saw-cutting asphalt overlay, and sealing joint is paid for by Item 438, "Cleaning and Sealing Joints" and measured by the linear foot. Obtain approval for all tools, equipment, materials and techniques proposed to clean and seal the joint. Provide Class 7 joint sealant in accordance with DMS-6310, "Joint Sealants and Fillers" for joints in concrete. Extend sealant up into rail or curb 3 inches on low side or sides of deck. If the Class 7 joint sealant cannot be effectively placed in the vertical position, a Class 4 joint sealant compatible with the Class 7 joint 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.

DATE:
 FILE:

		Bridge Division	
CLEANING AND SEALING EXISTING BRIDGE JOINTS (PAN GIRDER BRIDGES)			
FILE:	DNS: RE	CK:	DW: RE
©TxDOT December 2023	CONT	SECT	JOB
REVISIONS	6472	07	001
	DIST	COUNTY	SHEET NO.
	PHR	VARIOUS	33

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HIDALGO COUNTY LOCATION MAP

HIDALGO COUNTY BRIDGE LOCATIONS

BRIDGE NO.	NBI	HIGHWAY	CROSSED FEATURE/ROADWAY	GPS COORDINATES
1	0255-07-294	US 281 SB	RAYMONDVILLE DRAIN	26° 25'41.99"N, 98° 08'07.84"W
2	0255-07-293	US 281 NB	RAYMONDVILLE DRAIN	26° 25'38.88"N, 98° 08'07.51"W
3	0255-07-046	US 281 NB	BU 281 NB	26° 20'37.32"N, 98° 08'51.45"W
4	0255-07-048	FM 1925 NB	MONTE CRISTO RD	26° 20'7.25"N, 98° 08'42.34"W
5	0255-07-050	US 281 NB	CHAPIN ST	26° 18'49.96"N, 98° 08'47.83"W
6	0255-07-049	US 281 SB	CHAPIN ST	26° 18'48.90"N, 98° 08'48.34"W
7	0255-07-043	US 281 SB	UPRR (ABANDONED)	26° 18'37.42"N, 98° 08'46.89"W
8	0255-07-044	US 281 NB	UPRR (ABANDONED)	26° 18'34.32"N, 98° 08'45.83"W
9	0255-07-053	US 281 SB	SH 107	26° 17'58.28"N, 98° 08'49.20"W
10	0255-07-054	US 281 NB	SH 107	26° 17'55.83"N, 98° 08'48.81"W
11	0255-08-061	US 281 SB	FREDDY GONZALEZ DR	26° 17'5.36"N, 98° 08'58.39"W
12	0255-08-060	US 281 NB	FREDDY GONZALEZ DR	26° 17'3.08"N, 98° 08'57.96"W



CLEAN AND SEAL JOINTS

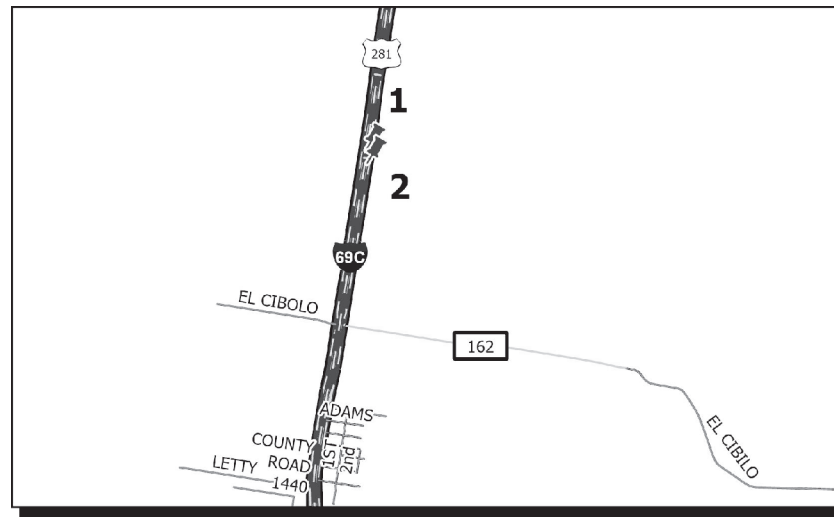
HIDALGO COUNTY LOCATION MAP

FILE:	DN: RRE	CK:	DW: RRE	CK:
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	6472	07	001	VARIOUS
	DIST	COUNTY	SHEET NO.	
	PHR	VARIOUS	34	

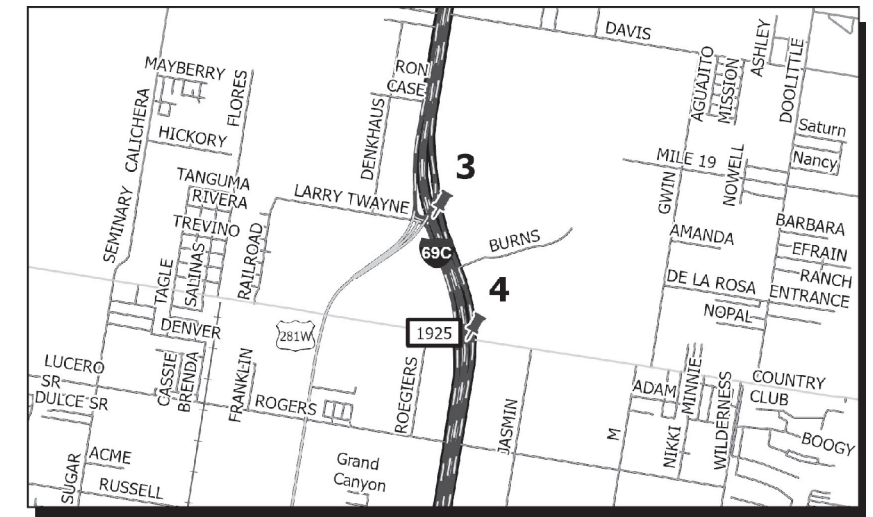
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HIDALGO COUNTY ESTIMATED QUANTITIES

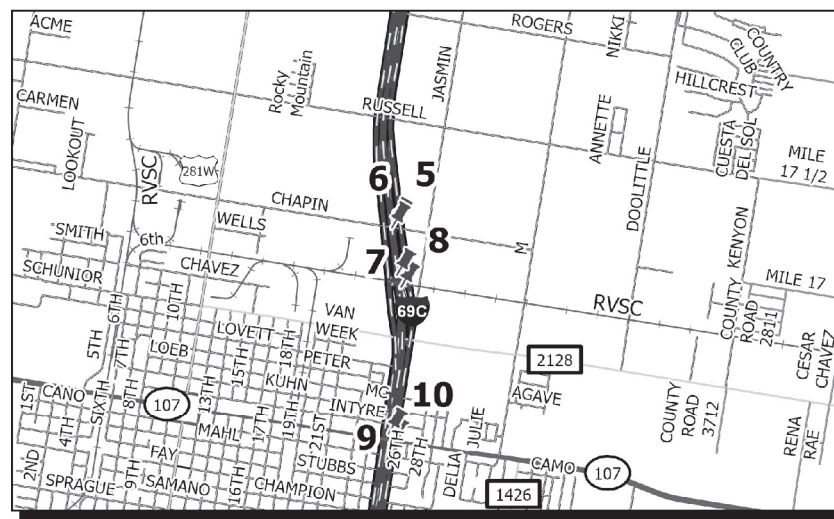
BRIDGE NO.	NBI	HIGHWAY	CROSSED FEATURE/ROADWAY	BENT NO.	REPAIR LENGTH	TOTAL (LF)	TOTAL NO. OF REPAIR BENTS	CLEANING AND SEALING EXIST JOINTS
								438
								7001
								LF
1	0255-07-294	US 281 SB	RAYMONDVILLE DRAIN	1	57	114	2	114
				4	57			
2	0255-07-293	US 281 NB	RAYMONDVILLE DRAIN	4	57	57	1	57
3	0255-07-046	US 281 NB	BU 281 NB	1	68	332	5	332
				2	69			
				3	68			
				4	65			
				5	62			
4	0255-07-048	FM 1925 NB	MONTE CRISTO RD	ALL	45	180	4	180
5	0255-07-050	US 281 NB	CHAPIN ST	ALL	74	296	4	296
6	0255-07-049	US 281 SB	CHAPIN ST	ALL	60	240	4	240
7	0255-07-043	US 281 SB	UPRR (ABANDONED)	ALL	58	348	6	348
8	0255-07-044	US 281 NB	UPRR (ABANDONED)	1	72	494	6	494
				2	74			
				3	78			
				4	83			
				5	90			
				6	97			
9	0255-07-053	US 281 SB	SH 107	ALL	70	280	4	280
10	0255-07-054	US 281 NB	SH 107	ALL	70	280	4	280
11	0255-08-061	US 281 SB	FREDDY GONZALEZ DR	5	70	70	1	70
12	0255-08-060	US 281 NB	FREDDY GONZALEZ DR	3	70	140	2	140
				4	70			
TOTAL								2861



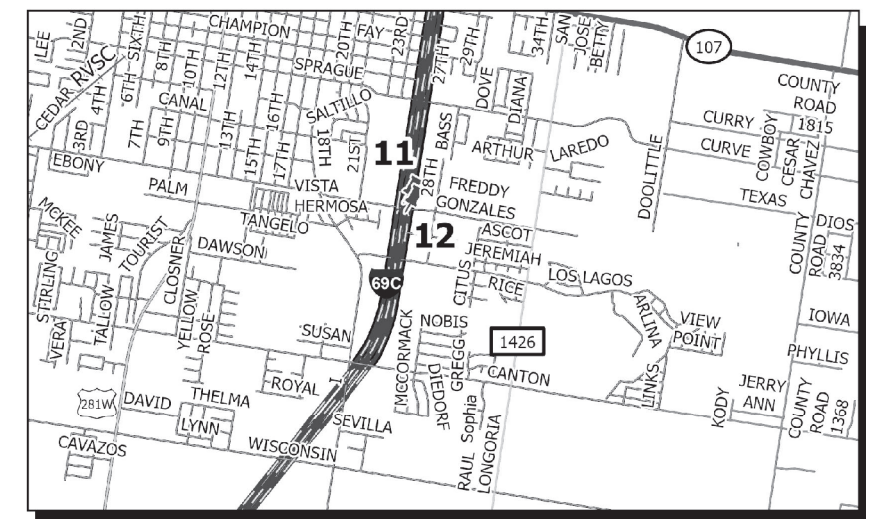
LOCATION 1 - 2



LOCATION 3 - 4



LOCATION 5 - 10



LOCATION 11 - 12

SEQUENCE OF CONSTRUCTION:

1. SETUP TCP.
2. PREPARE AND CLEAN JOINTS AS PER PLANS & SPEC.
3. SEAL JOINTS AS PER PLANS & SPEC.
4. REMOVE TCP ONCE SEAL HAS DRIED.
5. MOVE TO NEXT LOCATION/PHASE.

GENERAL NOTES:

Refer to Item 438 for application instructions
 Perform Traffic Control Operations as per TCP(6-6)-12

N.T.S



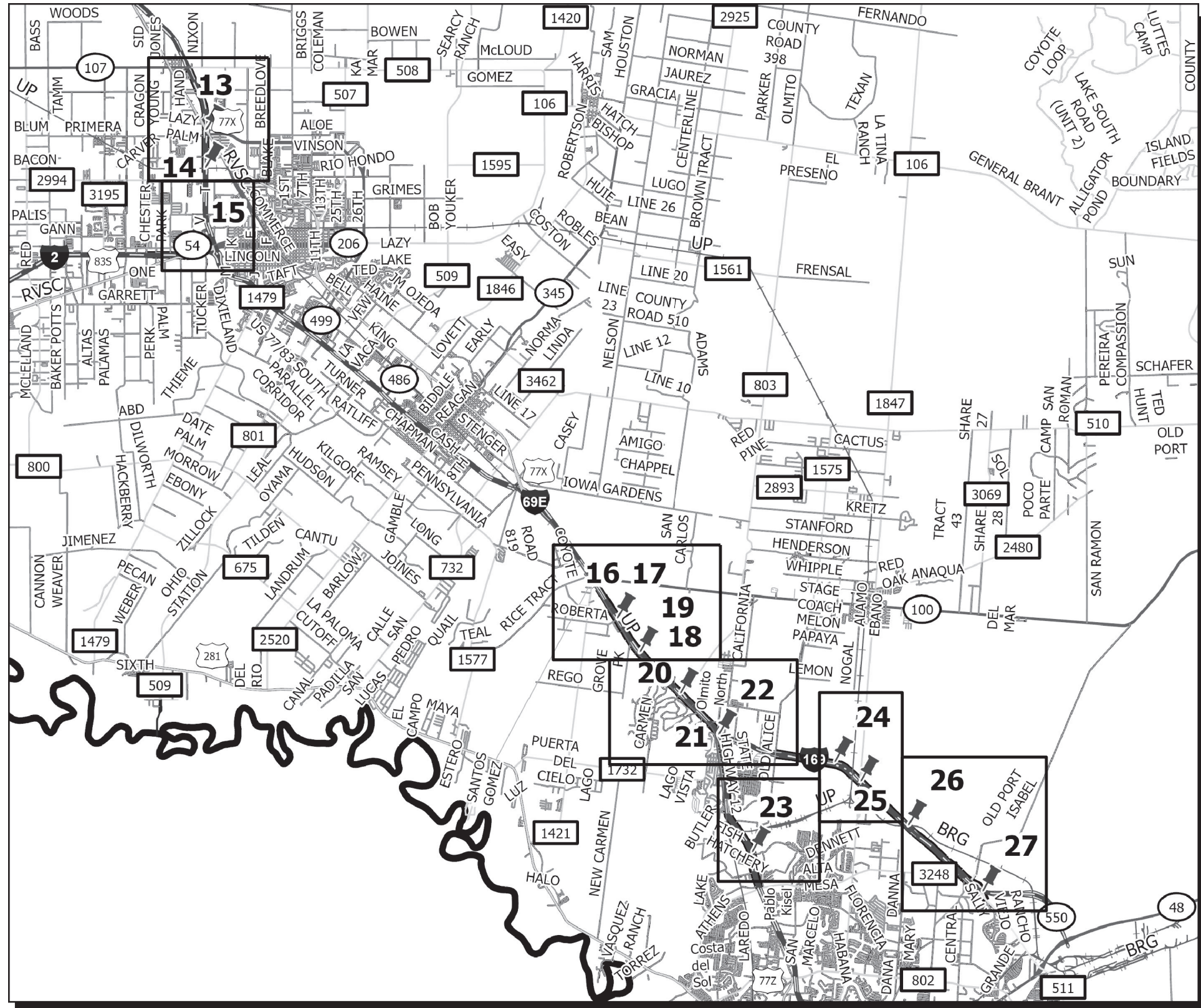
CLEAN AND SEAL JOINTS HIDALGO COUNTY

FILE:	DN: RRE	CK:	DW: RRE	CK:
©TxDOT August 2017	CONT SECT	JOB	HIGHWAY	
REVISIONS	6472 07	001	VARIOUS	
	DIST	COUNTY	SHEET NO.	
	PHR	VARIOUS	35	

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CAMERON COUNTY LOCATION MAP

CAMERON COUNTY BRIDGE LOCATIONS				
BRIDGE NO.	NBI	HIGHWAY	CROSSED FEATURE / ROADWAY	GPS COORDINATES
13	0039-07-125	US 77 NB	UPRR, BUS 77 & PRIMERA RD.	26° 13'40.01"N, 97° 43'15.53"W
14	0039-07-206	US 77 NB	DRAINAGE DITCH, BUS 77 RR, & MATZ AVE.	26° 12'54.80"N, 97° 43'16.01"W
15	0039-19-289	US 83	RVSC & PALM COURT DR.	26° 11'11.78"N, 97° 43'43.32"W
16	0039-08-233	US 77 SB	ROBERTA RD.	26° 04'2.96"N, 97° 34'13.68"W
17	0039-08-232	US 77 NB	ROBERTA RD.	26° 04'2.29"N, 97° 34'12.43"W
18	0039-08-355	US 77 SB	CARMEN RD.	26° 03'23.25"N, 97° 33'43.97"W
19	0039-08-354	US 77 NB	CARMEN RD.	26° 03'22.62"N, 97° 33'44.22"W
20	0039-08-353	US 77 SB	RANCHO VIEJO DR.	26° 02'34.15"N, 97° 32'49.89"W
21	0039-08-226	US 77 SB	FM 511	26° 01'44.93"N, 97° 32'0.35"W
22	0039-08-227	US 77 NB	FM 511	26° 01'44.57"N, 97° 31'59.48"W
23	0039-08-239	US 77 NB	OLD ALICE RD	25° 59'25.83"N, 97° 31'15.48"W
24	0684-01-247	SH 550 NB	DRAINAGE DITCH	26° 01'12.21"N, 97° 29'26.60"W
25	0684-01-250	SH 550 NB	FM 1847	26° 00'49.45"N, 97° 28'52.52"W
26	0684-01-253	SH 550 NB	UPRR *2 SPUR	25° 59'57.46"N, 97° 27'49.65"W
27	0684-01-256	FM 511 NB	SH 550	25° 58'39.52"N, 97° 26'11.96"W

N.T.S.

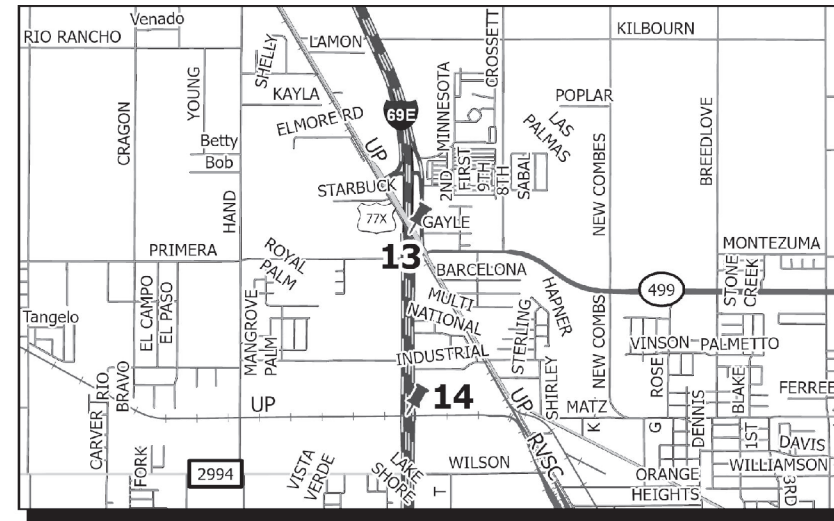


CLEAN AND SEAL JOINTS
CAMERON COUNTY
LOCATION MAP

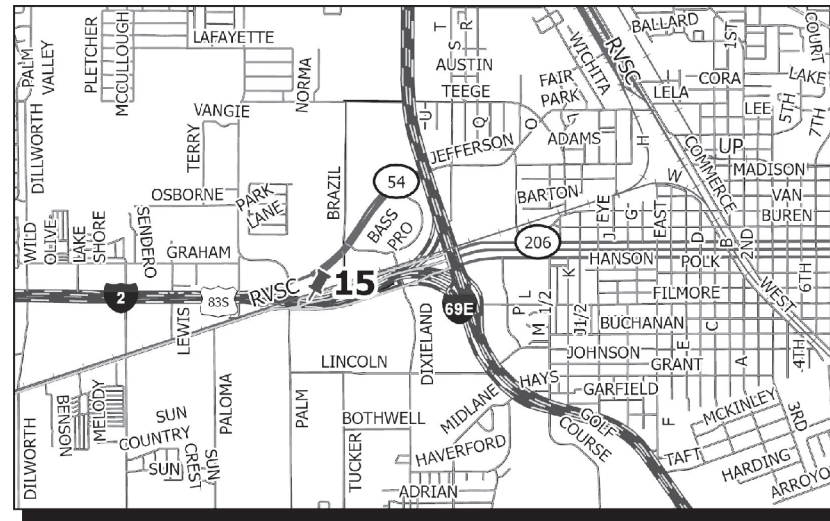
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©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	6472	07	001	VARIOUS
	DIST	COUNTY	SHEET NO.	
	PHR	VARIOUS	36	

DATE:
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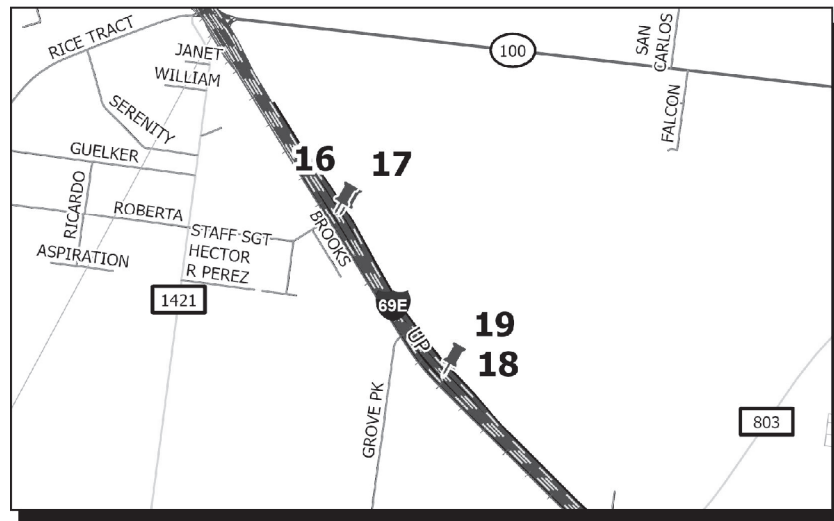
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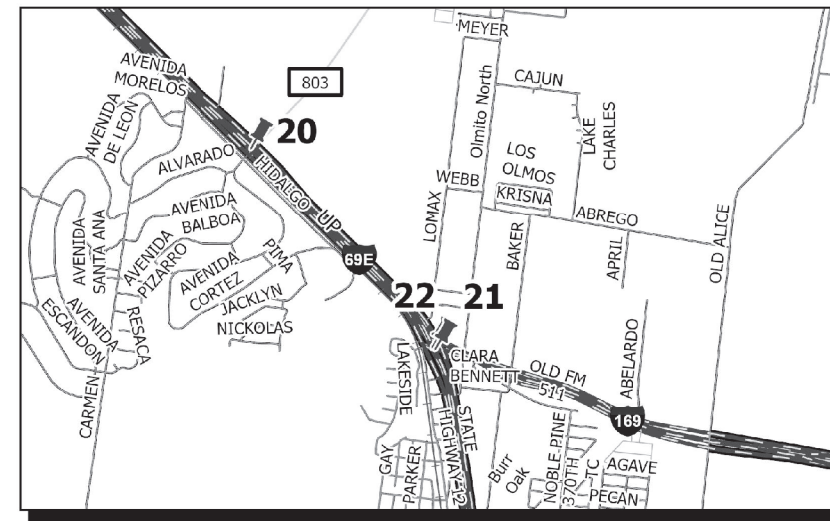
LOCATION 13 - 14



LOCATION 15



LOCATION 16 - 19



LOCATION 20 - 22

CAMERON COUNTY ESTIMATED QUANTITIES								
BRIDGE NO.	NBI	HIGHWAY	CROSSED FEATURE/ ROADWAY	BENT NO.	REPAIR LENGTH	TOTAL (LF)	TOTAL NO. OF REPAIR BENTS	CLEANING AND SEALING EXIST JOINTS
13	0039-07-125	US 77 NB	UPRR, BUS 77 & PRIMERA RD.	ALL	34	782	23	782
14	0039-07-206	US 77 NB	DRAINAGE DITCH, BUS 77 RR & MATZ AVE.	1	43	258	6	258
				2				
				3				
				4				
				5				
15	0039-19-289	US 83	RVSC & PALM COURT DR.	1	56	122	2	122
				4	66			
16	0039-08-233	US 77 SB	ROBERTA RD.	1	55	110	2	110
				4				
17	0039-08-232	US 77 NB	ROBERTA RD.	1	55	110	2	110
				4				
18	0039-08-355	US 77 SB	CARMEN RD.	1	56	112	2	112
				4				
19	0039-08-354	US 77 NB	CARMEN RD.	1	56	112	2	112
				4				
20	0039-08-353	US 77 SB	RANCHO VIEJO DR.	1	56	112	2	112
				4				
21	0039-08-226	US 77 SB	FM 511	1	72	144	2	144
				4				
22	0039-08-227	US 77 NB	FM 511	1	72	144	2	144
				4				
SHEET TOTAL							2006	2006

- SEQUENCE OF CONSTRUCTION:
1. SETUP TCP.
 2. PREPARE AND CLEAN JOINTS AS PER PLANS & SPEC.
 3. SEAL JOINTS AS PER PLANS & SPEC.
 4. REMOVE TCP ONCE SEAL HAS DRIED.
 5. MOVE TO NEXT LOCATION/PHASE.

GENERAL NOTES:
 Refer to Item 438 for application instructions
 Perform Traffic Control Operations as per TCP(6-6)-12



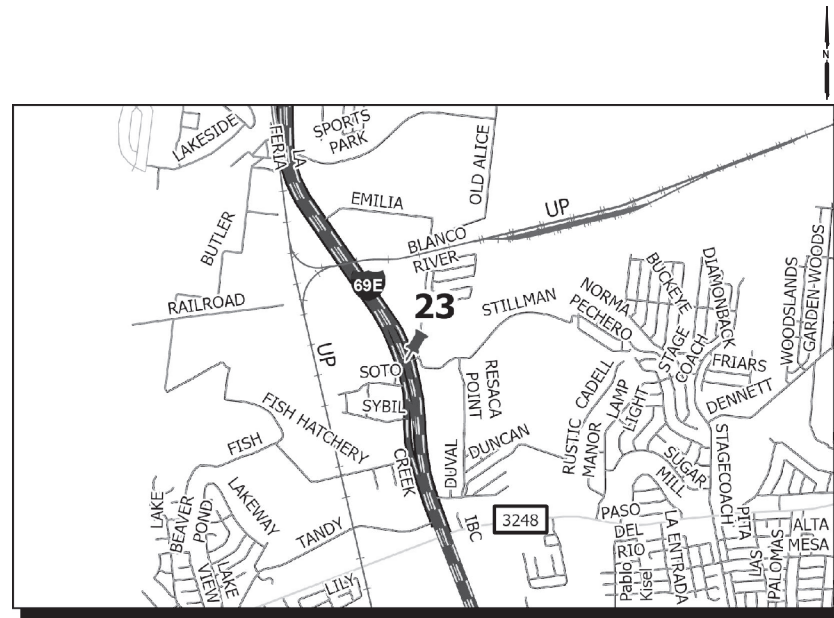
CLEAN AND SEAL JOINTS
 CAMERON COUNTY

1 OF 2

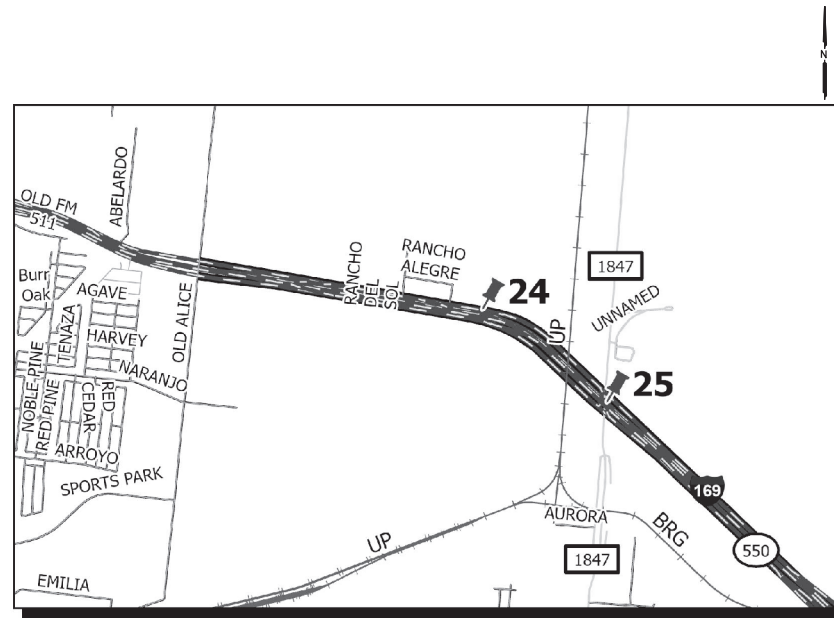
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©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	6472	07	001	VARIOUS
	DIST	COUNTY	SHEET NO.	
	PHR	VARIOUS	37	

DATE:
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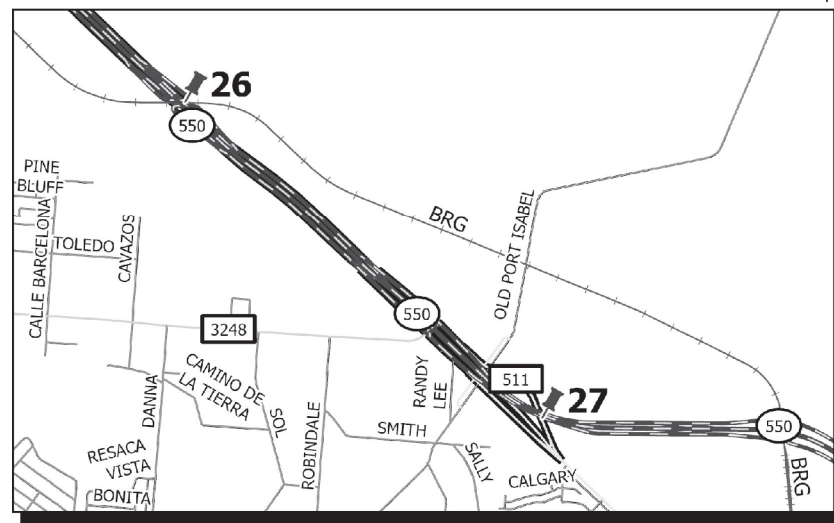
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LOCATION 23



LOCATION 24 - 25



LOCATION 26 - 27

CAMERON COUNTY ESTIMATED QUANTITIES								
BRIDGE NO.	NBI	HIGHWAY	CROSSED FEATURE/ ROADWAY	BENT NO.	REPAIR LENGTH	TOTAL (LF)	TOTAL NO. OF REPAIR BENTS	CLEANING AND SEALING EXIST JOINTS
								438
								7001
								LF
23	0039-08-239	US 77 NB	OLD ALICE RD	1 4	56	112	2	112
24	0684-01-247	SH 550 NB	DRAINAGE DITCH	1 4	40	80	2	80
25	0684-01-250	SH 550 NB	FM 1847	1	86	86	1	86
26	0684-01-253	SH 550 NB	UPRR #2 SPUR	1 4	49	98	2	98
27	0684-01-256	FM 511 NB	SH 550	4	49	49	1	49
SHEET TOTAL								425

SEQUENCE OF CONSTRUCTION:

1. SETUP TCP.
2. PREPARE AND CLEAN JOINTS AS PER PLANS & SPEC.
3. SEAL JOINTS AS PER PLANS & SPEC.
4. REMOVE TCP ONCE SEAL HAS DRIED.
5. MOVE TO NEXT LOCATION/PHASE.

GENERAL NOTES:

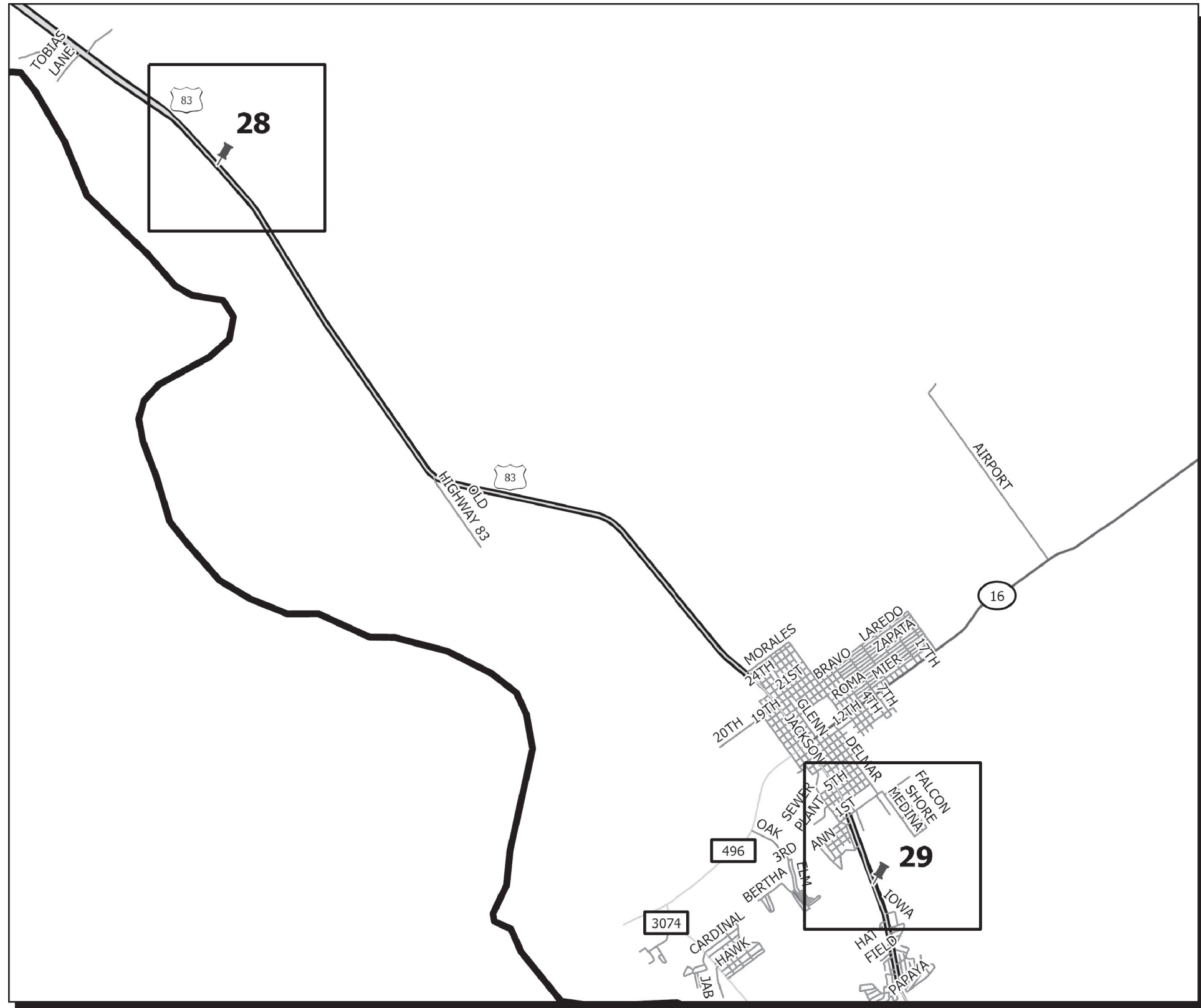
Refer to Item 438 for application instructions
Perform Traffic Control Operations as per TCP(6-6)-12

N.T.S

				Bridge Division Standard	
<h2>CLEAN AND SEAL JOINTS</h2> <h3>CAMERON COUNTY</h3>					
2 OF 2					
FILE:	DN: RRE	CK:	DW: RRE	CK:	
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY	
REVISIONS	6472	07	001	VARIOUS	
	DIST	COUNTY	SHEET NO.		
	PHR	VARIOUS	38		

DATE:
FILE:

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ZAPATA COUNTY LOCATION MAP

ZAPATA COUNTY BRIDGE LOCATIONS				
BRIDGE NO.	NBI	HIGHWAY	CROSSED FEATURE / ROADWAY	GPS COORDINATES
28	0038-04-058	US 83 SB	ARROYO BURRO	27° 00'7.13"N, 99° 22'46.27"W
29	0038-04-095	US 83	ARROYO VELENO	26° 53'4.65"N, 99° 15'34.04"W

DATE:
FILE:

N.T.S

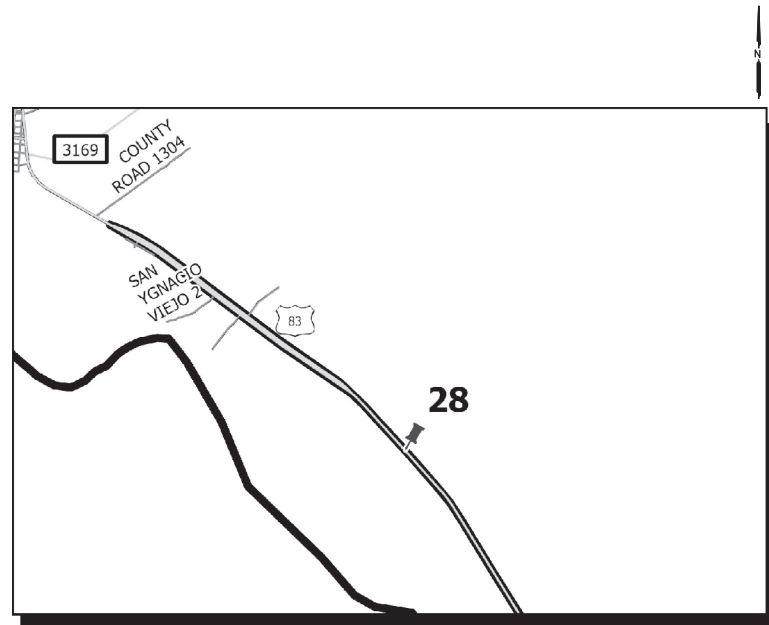


CLEAN AND SEAL JOINTS
ZAPATA COUNTY
LOCATION MAP

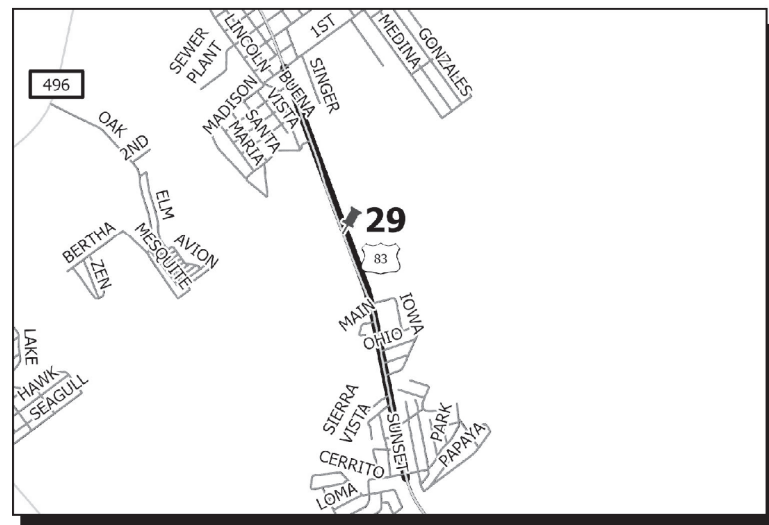
FILE:	DN: RRE	CK:	DW: RRE	CK:
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	6472	07	001	VARIOUS
	DIST	COUNTY		SHEET NO.
	PHR	VARIOUS		39

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DATE:
FILE:



LOCATION 30



LOCATION 31

ZAPATA COUNTY ESTIMATED QUANTITIES

BRIDGE NO.	NBI	HIGHWAY	CROSSED FEATURE / ROADWAY	BENT NO.	REPAIR LENGTH	TOTAL (LF)	TOTAL NO. OF REPAIR BENTS	CLEANING AND SEALING EXIST JOINTS
								438
28	0038-04-058	US 83 SB	ARROYO BURRO	1	28	308	11	7001
				4				LF
				8				
				12				
				16				
				24				
				27-28				
				30-31				
29	0038-04-095	US 83	ARROYO VELENO	1	82	574	7	
				3				
				6				
				9				
				12				
				15				
				17				
TOTAL								882

SEQUENCE OF CONSTRUCTION:

1. SETUP TCP.
2. PREPARE AND CLEAN JOINTS AS PER PLANS & SPEC.
3. SEAL JOINTS AS PER PLANS & SPEC.
4. REMOVE TCP ONCE SEAL HAS DRIED.
5. MOVE TO NEXT LOCATION/PHASE.

GENERAL NOTES:

Refer to Item 438 for application instructions
 Perform Traffic Control Operations as per TCP(6-6)-12

N.T.S

Bridge Division Standard				
<h2 style="margin: 0;">CLEAN AND SEAL JOINTS</h2> <h3 style="margin: 0;">ZAPATA COUNTY</h3>				
FILE:	DN: RRE	CK:	DW: RRE	CK:
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	6472	07	001	VARIOUS
	DIST	COUNTY		SHEET NO.
	PHR	VARIOUS		40

During the planning phase of project development, the following Environmental Permits, Issues and Commitments have been developed during coordination with resource agencies, local governmental entities and the general public. Any change orders and/or deviations from the final design must be reported to the Engineer prior to the commencement of construction activities as additional environmental clearances may be required.

I. Clean Water Act, Section 402: Stormwater Pollution Prevention

Action Items Required : No Action Required

1. The contractor must implement the SW3P by installing Best Management Practices (BMPs) as indicated in the construction plans and maintained appropriately throughout construction. BMPs must be in place prior to the start of construction. The SW3P may need to be revised as necessary as construction progresses.
2. For all construction PSL's off the ROW, the contractor must certify compliance with all applicable laws, rules and regulations pertaining to the preservation of cultural resources, natural resources and the environment.
3. Based on the acreage of impact, select the appropriate box below:
 - This project will disturb less than 1 acre of soil and is not part of a larger common plan of development; therefore, a NOI and TPDES Site Notice are not required for this project.
 - or
 - This project will disturb equal to or more than 1 acre of soil but less than 5 acres; therefore a NOI is not required but a TPDES Site Notice is required. The Construction Site Notice (CSN) is required to be posted at the construction site in a publicly accessible location for review by the public, TCEQ, EPA and other Inspectors.
 - or
 - This project will disturb equal to or more than 5 acres of soil and will require a NOI and TPDES Site Notice. The NOI and Site Notice are required to be posted at the construction site in a publicly accessible location.
4. Need to address MS4 requirements (Cameron & Hidalgo Counties only) MS4 requirements not needed

II. Clean Water Act, Sections 401 and 404 Compliance

Action Items Required : No Action Required

1. Filling, dredging or excavating in any water bodies, rivers, creeks, streams, wetlands or wet areas is prohibited unless specified in the USACE permit and approved by the Engineer. The contractor shall adhere to all agreements, mitigation plans, and BMPs required by the NWP as regulated by the USACE.

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 (1/10th to <1/2 acre, 1/3 in tidal waters)
 - Individual 404 Permit Required
 - Other Nationwide Permit Required: NWP* _____
2. The contractor is responsible for obtaining new or revised Section 404 permit(s) for Contractor initiated changes in construction methods that change impacts to Waters Of The U.S., including wetlands. The Contractor will ensure that the water quality of the State will be maintained and not degraded.
3. Best Management Practices for applicable Section 401 General Conditions:

General Condition 12 - Categories I and II BMPs required

Category I (Erosion Control)

- | | | |
|---|--|--|
| <input type="checkbox"/> Temporary Vegetation | <input type="checkbox"/> Interceptor Swale | <input type="checkbox"/> Mulch Filter Berms and/or Socks |
| <input type="checkbox"/> Blankets, Matting | <input type="checkbox"/> Diversion Dike | <input type="checkbox"/> Compost Filter Berms and/or Socks |
| <input type="checkbox"/> Mulch | <input type="checkbox"/> Erosion Control Compost | <input type="checkbox"/> Compost Blankets |
| <input type="checkbox"/> Sodding | | |

Category II (Sedimentation Control)

- | | | |
|---|--|--|
| <input type="checkbox"/> Silt Fence | <input type="checkbox"/> Hay (Straw) Bale Dike | <input type="checkbox"/> Mulch Filter Berms and/or Socks |
| <input type="checkbox"/> Rock Berm | <input type="checkbox"/> Brush Berms | <input type="checkbox"/> Compost Filter Berms and/or Socks |
| <input type="checkbox"/> Triangular Filter Dike | <input type="checkbox"/> Sediment Basins | <input type="checkbox"/> Stone Outlet Sediment Traps |
| <input type="checkbox"/> Sand Bag Berm | <input type="checkbox"/> Erosion Control Compost | |

General Condition 21 - Category III BMPs required

Category III (Post-Construction TSS Control)

- | | | |
|---|---|--|
| <input type="checkbox"/> Vegetative Filter Strips | <input type="checkbox"/> Wet Basins | <input type="checkbox"/> Mulch Filter Berms and/or Socks |
| <input type="checkbox"/> Retention/Irrigation | <input type="checkbox"/> Grassy Swales | <input type="checkbox"/> Compost Filter Berms and/or Socks |
| <input type="checkbox"/> Extended Detention Basin | <input type="checkbox"/> Vegetation-Lined Ditches | <input type="checkbox"/> Sand Filter Systems |
| <input type="checkbox"/> Constructed Wetlands | <input type="checkbox"/> Erosion Control Compost | <input type="checkbox"/> Sedimentation Chambers |

III. Clean Water Act, Sections 401 and 404 Compliance - Continued:

4. The Contractor's designated and qualified Contractor Responsible Person Environmental (CRPe) will monitor the project site daily to ensure compliance with SW3P and TPDES General Permit TXR 150000. Daily Monitoring Reports shall be provided to TxDOT within 48 hours, in accordance with Item 506.3.1.
5. Other Project Specific Actions:
 - 1.
 - 2.

III. Cultural Resources

Action Items Required : No Action Required

1. Refer to the 2014 TxDOT Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges, Item 7.7.1., 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.
2. Other Project Specific Actions:
 - 1.
 - 2.

IV. Vegetation Resources

Action Items Required : No Action Required

1. In accordance with the 2014 TxDOT Standard Specifications; Item 164 - Seeding For Erosion Control; provide and install temporary or permanent seeding for erosion control as shown on the plans or as directed by the Engineer for all seeding and replanting of right of way where possible. (Required for Urban Settings)
2. In accordance with Executive Order 13112 on invasive species and the Executive Memorandum on Beneficial Landscaping, native species of plants shall be used for all seeding and replanting of right of way where possible for rural roadways. (Required for Rural Settings)
3. Preserve vegetation where possible throughout the project and minimize clearing, grubbing and excavation within stream banks, bed and approach sections.
4. Other Project Specific Actions:
 - 1.
 - 2.

Pharr District Contact No. 956-702-6100

Revised 01/30/2017

List of Abbreviations

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DSHS: Texas Department of State Health Services	SPCC: Spill Prevention Control and Countermeasure
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ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
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V. Federal Listed, and Proposed Threatened and Endangered Species, Critical Habitat, State Listed Species, Candidate Species and Migratory Birds

Action Items Required : No Action Required

1. Under the Migratory Bird Treaty Act (MBTA) of 1918, codified at 16 U.S.C. 703-712 and as enforced by the USFWS, the proposed construction work will not remove active nests from bridges, trees, ground and other structures during migratory bird nesting season, (February 1st. through October 1st.). If the Contractor needs to perform work within the right of way during nesting season, a qualified Biologist shall conduct a survey to determine if active nests are present. If present, the Contractor shall maintain a buffer zone around the nest(s) as directed by the Biologist. The buffer zone will be protected from clearing and disturbance until such time as the Biologist has determined that the nest(s) is no longer active. Prior to the nesting season, existing bridges and culverts should be treated against migratory bird nesting by utilizing Bird Exclusion Methods. Bird Exclusion Methods should be monitored and maintained throughout the nesting season. Refer to Standard Bird Exclusion Details.
2. There is the potential for the presence of state-listed species & species of concern in the project area and state law prohibits the taking (incidental or otherwise) of state-listed species. Taking is defined as the collection, hooking, hunting, netting, shooting, or share by any means or devices. If any listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately.
3. Other Project Specific Actions:
 - 1.
 - 2.
 - 3.

VI. Hazardous Materials on Contamination Issues

Action Items Required : No Action Required

General (applies to all projects):

Comply with the Hazard Communication Act (HCA) 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 HCA.

Maintain an adequate supply of on-site spill response materials as indicated in the MSDS. In the event of a spill, take immediate action to mitigate the spill as indicated in the MSDS and in accordance with safe work practices. Contact the TxDOT Pharr 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 (identified as not normal)
- Trash piles, drums, canisters, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of contaminant substances

Any other evidence indicating possible hazardous materials or contamination discovered on site.

1. If potentially hazardous material and/or contaminated media (i.e.: soil, groundwater, surface water, sediment, building materials) are unexpectedly encountered during construction, assure that such materials and contamination are handled according to applicable federal and state regulations, cease work in the immediate area and contact the Engineer immediately.

VI. Hazardous Materials on Contamination Issues - Continued:

2. 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 required.
If "Yes", then TxDOT is responsible for completing an asbestos assessment/inspection.

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

Yes No

If "Yes", then TxDOT must retain a Texas Department of State Health Services (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 abatement activities and/or demolition.

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

4. The Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and an Asbestos Consultant in order to minimize construction delays and subsequent claims.

VII. Other Environmental Issues

Action Items Required : No Action Required

1. Noise

Contractor shall make every reasonable effort to minimize construction noise through abatement measures such as work hour controls and proper maintenance of equipment mufflers.

2. Air

Contractor shall practice common dust control techniques such as surface chemical treatment or watering of unpaved road surfaces and vehicle speed reduction shall be implemented to minimize and prevent airborne dust during construction.

Contractor should minimize MSAT by utilizing measures to encourage use of EPA required cleaner diesel fuels, limits on idling, increase use of cleaner burning diesel engines, and other emission limitation techniques, as appropriate.

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ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
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TPWD BMPs

Under Section 12.0011 of the Texas Parks and Wildlife Code, Texas Parks and Wildlife Department (TPWD) is charged with "providing recommendations that will protect fish and wildlife resources to local, state, and federal agencies that approve, permit, license, or construct developmental projects" and "providing information on fish and wildlife resources to any local, state, and federal agencies or private organizations that make decisions affecting those resources."

The purpose of this section is to provide beneficial management practices (BMP) that should be implemented during construction, and maintenance activities statewide for transportation projects with the goal of avoidance and minimization of impacts to natural resources. Statewide Standard BMP pertain to all fish and wildlife species, including state-listed species and other Species of Greatest Conservation Need (SGCN). Implementing the recommendations as outlined below will improve conservation of species and their habitat.

General Design/Construction BMPs

- Prior to start of construction, information will be provided to personnel of the potential for all state-listed threatened species or other SGCN to occur within the project area and should be advised of relevant rules and regulations to protect plants, fish, and wildlife.
- Contractor should avoid harming all wildlife species if encountered and allow them to safely leave the project site. Due diligence should be used to avoid killing or harming any wildlife species in the implementation of transportation projects.
- Contractors should install wildlife exclusion fencing and should examine the inside of the exclusion area daily to determine if any wildlife species have been trapped inside the area of impact and provide safe egress opportunities prior to initiation of construction activities.
- Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas around wetlands and in riparian areas.
- Contractor should use woven natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic netting should be avoided.
- Project staging areas, stockpiles, temporary construction easements, and other project related sites should be situated in previously disturbed areas to avoid or minimize impacts to sensitive or unique habitats including intact native vegetation, floodplains, riparian corridors, wetlands, playa lakes, and habitat for wildlife species.
- When lighting is added, consider wildlife impacts from light pollution and incorporating dark-sky practices into design strategies. Minimize sky glow by focusing light downward, with full cutoff luminaires to avoid light emitting above the horizontal. The minimum amount of night-time lighting needed for safety and security should be used.

Vegetation BMPs

- Minimize the amount of vegetation cleared. Removal of native vegetation, particularly mature native trees and shrubs should be avoided. Impacted vegetation should be replaced with in-kind on-site replacement /restoration of native vegetation.
- It is strongly recommended that trees greater than 12 inches in diameter at breast height (DBH) that are removed be replaced. TPWD's experience indicates that for ecologically effective replacement, a ratio of three trees for every one (3:1) lost should be provided to either on-site or off-site. Trees less than 12 inches DBH should be replaced at a 1:1 ratio.
- The use of any non-native vegetation in landscaping and revegetation is discouraged. Locally adapted native species should be used.
- The use of seed mix that contains seeds from only regional ecotype native species is recommended

Invasive Species BMPs

- For all work in water bodies designated as $\frac{3}{32}$ infested $\frac{5}{32}$ or $\frac{3}{32}$ positive $\frac{7}{32}$ for invasive zebra (Dreissena polymorpha) OR quagga mussels (Dreissena bugensis) as well as waters downstream of these lakes, all machinery, equipment, vessels, or vehicles coming in contact with such waters should be cleaned prior to leaving the site to remove any mud, plants, organisms, or debris, water drained (if applicable), and dried completely before use in another water body to prevent the potential spread of invasive mussels.
- Care should be taken to prevent the spread of aquatic and terrestrial invasive plants during construction activities.
- Care should be taken to avoid the spread of aquatic invasive plants such as giant Salvinia (Salvinia molesta), common salvinia (Salvinia minima), hydrilla (Hydrilla verticillata), water hyacinth (Eichhornia spp.), Eurasian watermilfoil (Myriophyllum spicatum), water lettuce (Pistia stratiotes), and alligatorweed (Alternanthera philoxeroides) from infested water bodies into areas not currently infested. All machinery, equipment, vessels, boat trailers, or vehicles coming in contact with waters containing aquatic invasive plant species should be cleaned prior to leaving the site to remove all aquatic plant material and dried completely before use on another water body to prevent the potential spread of invasive plants. Removed plants should be transported for disposal in a secure manner to prevent dispersal.
- Only native or non-invasive plants should be planted. Care should be taken to avoid mowing invasive giant reed (Arundo donax), which spreads by fragmentation, and to clean equipment if inadvertently mowed to prevent spread. If using hay bales for sediment control, use locally grown weed-free hay to prevent the spread of invasive species. Leave the hay bales in place and allow them to break down, as this acts as mulch assisting in revegetation.

Stream Crossings BMPs

- Riparian buffer zones should remain undisturbed.

Dewatering BMPs

- Impact avoidance measures for aquatic organisms, including all native fish and freshwater mussel species, regardless of state-listing status, should be considered during project planning and construction activities.

Wildlife Crossing BMPs

- Incorporate wildlife crossings with fencing, particularly in areas that bisect wildlife travel corridors or seasonal movement routes to avoid further habitat fragmentation and minimize wildlife-vehicle interactions.

Rare Plant BMPs

- Avoid impacts and minimize unavoidable impacts. Plant locations should be protected with temporary barrier fencing and contractors should be instructed to avoid protected areas. Conducting construction outside of the growing season or after a plant has produced mature fruit is the preferred way to avoid/minimize impacts to SGCN plant populations. Staging areas, stockpiles, and other project related sites on TxDOT ROW should not impact SGCN plant populations. After construction begins, minimize herbicide use near SGCN plant populations (if possible, use hand-held spot sprayers, several meters from rare plants, on still or days with little wind).

Rare Plants BMPs (Continued)

- If there are unintended impacts to SGCN populations, these impacts should be reported to TPWD Transportation Staff.
- During project period, conduct work during times of the year when plants are dormant and/or conditions minimize disturbance of the habitat.

Bird BMPs

- Avoid vegetation clearing activities during the general bird nesting season, February 15th to October 1st to minimize adverse impacts to birds.
- Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.
- Minimize extended human presence near nesting birds during construction and maintenance activities. Protect sensitive habitat areas with temporary barriers or fencing to limit human foot-traffic and off-road vehicle use to alert and discourage contractors from causing any unintentional impacts.
- Minimize construction noise above ambient levels during general bird nesting season to minimize adverse impacts on birds.
- Minimize construction lighting during the general bird nesting season by scheduling work activities between dawn and dusk.

Rookeries BMPs

- In general, nesting dates for herons and egrets range from early February to late August in Texas, depending on the species. Great blue herons (GBHE) (Ardea herodias) are usually the first to nest. When GBHE get disrupted from the nest and abandon nesting, then the other species of herons and egrets may not attempt to nest at the colony that year.
- If rookeries are encountered, avoid and minimize disturbance during nesting to protect rookery species and their habitat.
- Vegetation clearing in a primary buffer area of 300 meters (984 feet) from a rookery or heronry periphery should be avoided. Utilizing areas that have already been cleared within this buffer area may be acceptable depending on site-specific characteristics. Additionally, human foot-traffic or machinery use should not occur within this buffer area during the nesting season.
- Clearing activities or construction using heavy machinery in a secondary buffer area of 1000 meters (3281 feet) from the heronry periphery should be avoided during the breeding season (courting and nesting).

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Revised 02/24/2022

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EPIC SHEET SUPPLEMENTALS
TPWD BMPs

SHEET 1 OF 3

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
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Fish BMPs

- The following Fish BMP apply to projects for all fish species in waters of the state to minimize impacts to water quality and aquatic passage from transportation projects.
- For projects in waters of the state and work is adjacent to water: follow Water Quality and Stream Crossing BMPs.
- For projects in waters of the state and work is in the water: follow Water Quality, Stream Crossing, and Dewatering BMP.

Aquatic Invertebrate BMPs

- For projects within the range of a SGCN or state-listed species and work is adjacent to water: Water Quality and Stream Crossing BMP
- For projects within the range of a SGCN or state-listed species and work is in the water: Water Quality, Stream Crossing, and Dewatering BMP.
- For spring-seep associated caddisflies (*Cheumatopsyche morsei*, *Chimarra holzenthali*, and *Hydrotilla ouachita*): Avoid or minimize impacts to the natural riparian buffer along stream channel including native shrubs and trees.

Crayfish BMP

- For projects within the range of a SGCN or state-listed species and work is adjacent to water: Water Quality and Stream Crossing BMP.
- For projects within the range of a SGCN or state-listed species and work is in the water: Water Quality, Stream Crossing, and Dewatering BMP.
- Avoid or minimize impacts to the natural riparian buffer that provides terrestrial and aquatic plant matter for the diet of most crayfish species.

Freshwater Mussel BMP

- In addition to Water Quality and Stream Crossing BMP, follow the most recent, 1/32 TPWD 9/32 TxDOT Annual Work Plan for Pre-Construction Surveys, Aquatic Resources Relocations, and Other Best Management Practices to Avoid, Minimize, and Mitigate Impacts to Freshwater Resources. 9/32
- When work is adjacent to the water: Water Quality BMP implemented as part of the Texas Commission on Environmental Quality (TCEQ) Stormwater Pollution Prevention Plan (SWPPP) for a construction general permit or any conditions of the 401 Water Quality Certification for the project will be implemented.

Insect Pollinator BMP

- Deep soil disturbances, such as, tilling or deep disking in areas that host aggregations of ground-nesting bees should be avoided. Tilling and disking also may promote the invasion or germination of non-native plants. Different species of native ground-nesting bees prefer different soil conditions, although research suggests that many ground-nesting bees prefer sandy, loamy sand or sandy loam soils. In areas with these soil types consider leaving open patches of soil.
- Allow dead trees to stand (so long as they do not pose a risk to property or people) and protect shrubs and herbaceous plants with pithy or hollow stems (e.g., cone fruits, sumac, elderberry), as these provide nesting habitat for tunnel-nesting native bees. Retain dead or dying branches whenever it is safe and practical at the edges of the ROW. Wood-boring beetle larvae often fill dead trees and branches with narrow tunnels into which tunnel-nesting bees will establish nests. Additionally, bumble bees may choose to nest in wood piles.
- Retain rotting logs at edges of the ROW where some bee species may burrow tunnels in which to nest.

Insect Pollinator BMP (Continued)

- Protect sloped or well-drained ground sites where plants are sparse and direct access to soils available. These are the areas where ground-nesting bees may dig nests. Turning the soil destroys all ground nests that are present at that depth and hinders the emergence of bees that are nesting deeper in the ground.
- Protect grassy thickets, or other areas of dense, low cover from mowing or other disturbance. These are the sites where bumble bees might find the nest cavities they need, as well as annual and perennial wildflowers that can provide important food resources.
- Where available and economical, native plants and seed should be procured from local eco-type providers. Seed mixes should be diverse and include as many ecoregion natives as possible ensuring full season floral resources. Species by Texas ecoregion can be found in the Texas Management Recommendations for Native Insect Pollinators in Texas document: https://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_w7000_1813.pdf
- Planting at least three different native flowering plants within each of three blooming periods are recommended (spring, summer, early fall) in high rainfall regions of Texas. In drier regions of the state, a target of three native flowering plants within each of two blooming periods can be used.

Small Mammal BMP

- For Coues' rice rat (*Oryzomys couesii* aquaticus):
- Minimize impacts to wetland, resaca, oxbow Conversion of property containing cave or cliff features to transportation purposes should be avoided. lake, and marsh habitats
 - Water Quality BMP

Fossorial Mammal BMP

- When a construction zone is adjacent to active BTPD burrows or pocket gopher mounds, erect barriers to discourage individuals moving through or into the construction area.
- When seeding or revegetation is planned in an area adjacent to BTPD burrows or pocket gopher mounds, a vegetative barrier should be considered in the planting to discourage dispersal into the ROW.

Bat BMP

- For activities that have the potential to impact structures, cliffs or caves, or trees: a qualified biologist will perform a habitat assessment and occupancy survey of the feature(s) with roost potential as early in the planning process as possible or within one year before project letting.
- For roosts where occupancy is strongly suspected but unconfirmed during the initial survey, revisit feature(s) at most four weeks prior to scheduled disturbance to confirm absence of bats.
- If bats are present or recent signs of occupation (i.e., piles of guano, distinct musky odor, or staining and rub marks at potential entry points) are observed, take appropriate measures to ensure that bats are not harmed, such as implementing non-lethal exclusion activities or timing or phasing of construction.
- Exclusion devices can be installed by a qualified individual between September 1 and March 31. Exclusion devices should be used for a minimum of seven days when minimum nighttime temperatures are above 50°F AND minimum daytime temperatures are above 70°F. Prior to exclusion, ensure that alternate roosting habitat is available in the immediate area. If no suitable roosting habitat is available, installation of alternate roosts is recommended to replace the loss of an occupied roost. If alternate roost sites are not provided, bats may seek shelter in other inappropriate sites, such as buildings, in the surrounding area.

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Bat BMP (Continued)

- If feature(s) used by bats are removed as a result of construction, replacement structures should incorporate bat-friendly design or artificial roosts should be constructed to replace these features.
- Avoid unnecessary removal of dead fronds on native and ornamental palm trees in south Texas (Cameron, Hidalgo, Willacy, Kenedy, Brooks, Kleberg, Nueces, and San Patricio counties) from April 1 through October 31. If removal of dead fronds is necessary at other times of the year, limit frond removal to extended warm periods (nighttime temperatures = 55°F for at least two consecutive nights), so bats can move away from the disturbance and find new roosts.
- Large hollow trees, snags (dead standing trees), and trees with shaggy bark should be surveyed for colonies and, if found, should not be disturbed until the bats are no longer occupying these features. Post-occupancy surveys should be conducted by a qualified biologist prior to tree removal from the landscape.
- Retain mature, large diameter hardwood forest species and native/ornamental palm trees.
- In all instances, avoid harm or death to bats. Bats should only be handled as a last resort and after communication with TPWD.

Aquatic Amphibian and Reptile BMP

- For projects within existing right-of-way (ROW) when work is in water or will permanently impact a water feature and potential habitat exists for the target species complete the following:
- Minimize impacts to wetlands, temporary and permanent open water features, including depressions, and riverine habitats.
 - Maintain the existing hydrologic regime and any connections between wetlands and other aquatic features.
 - Use barrier fencing to direct animal movements away from construction activities and areas of potential wildlife-vehicle collisions in construction areas directly adjacent, or that may directly impact, potential habitat for the target species.
 - Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas around wetlands and in riparian areas. If erosion control blankets or mats will be used, the product should not contain netting, but should only contain loosely woven natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic netting should be avoided.
 - Project specific locations (PSLs) proposed within state-owned ROW should be located in uplands away from aquatic features.
 - When work is directly adjacent to the water, minimize impacts to shoreline basking sites (e.g., downed trees, sand bars, exposed bedrock) and refugia/overwinter sites (e.g., brush and debris piles, crayfish burrows, aquatic logjams, and leaf packs).

Revised 02/24/2022

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TPWD BMPs

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Aquatic Amphibian and Reptile BMP (Continued)

- If gutters and curbs are part of the roadway design, install gutters that do not include the side box inlet and include sloped (i.e., mountable) curbs to allow small animals to leave roadway. If this modification to the entire curb system is not possible, install sections of sloped curb on either side of the storm water drain for several feet to allow small animals to leave the roadway. Priority areas for these design recommendations are those with nearby wetlands or other aquatic features.

For projects that require acquisition of additional ROW and work within that new ROW is in water or will permanently impact a water feature, implement BMP for projects within existing ROW above plus those below:

- For sections of roadway adjacent to wetlands or other aquatic features, install wildlife barriers that prevent climbing. Barriers should terminate at culvert openings in order to funnel animals under the road. The barriers should be of the same length as the adjacent feature or 80 feet long in each direction, or whichever is the lesser of the two.
- For culvert extensions and culvert replacement/installation, incorporate measures to funnel animals toward culverts such as concrete wingwalls and barrier walls with overhangs.
- When riprap or other bank stabilization devices are necessary, their placement should not impede the movement of terrestrial or aquatic wildlife through the water feature. Biotechnical streambank stabilization methods using live native vegetation, or a combination of vegetative and structural materials should be used.

Terrestrial Amphibian and Reptile BMP

- For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1:1) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling.
- Avoid or minimize disturbing or removing cover objects, such as downed trees, rotting stumps, brush piles, and leaf litter. If avoidance or minimization is not practicable, consider removing cover objects prior to the start of the project and replace them at project completion.
- Examine heavy equipment stored on site before use, particularly after rain events when reptile and amphibian movements occur more often, to ensure use will not harm individuals that might be seeking temporary refuge.
- Due to increased activity (mating) of reptiles and amphibian during the spring, construction activities like clearing or grading should attempt to be scheduled outside of the spring (March-May) season. Also, timing ground disturbing activities before October when reptiles and amphibians become less active and may be using burrows in the project area is also encouraged.
- If Texas tortoises (*Gopherus berlandieri*) or box turtles (*Terrepene* spp.) are present in a project area, they should be removed from the area and relocated between 100 and 200 meters from the project area. After removal of the individuals, the area that will be disturbed during active construction and project specific locations should be fenced off to exclude reentry by turtles, tortoises, and other reptiles. The exclusion fence should be constructed and maintained as follows:
 - The exclusion fence should be constructed with metal flashing or drift fence material.
 - Rolled erosion control mesh material should not be used.
 - The exclusion fence should be buried at least 6 inches deep and be at least 24 inches high.
 - The exclusion fence should be maintained for the life of the project and only removed after the construction is completed and the disturbed site has been revegetated.

Terrestrial Amphibian and Reptile BMP (Continued)

- After project is complete, revegetate disturbed areas with an appropriate locally sourced native seed mix. If erosion control blankets or mats will be used, the product should not contain nylon netting, but should only contain loosely woven natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic netting should be avoided.

Black-spotted newt/Mexican Burrowing toad/ Mexican treefrog/ Strecker's chorus frog/White-lipped frog/Woodhouse's toad

- Aquatic Amphibian and Reptile BMP
- Terrestrial Amphibian and Reptile BMP
- Water Quality BMP
- Vegetation BMP

Sheep Frog

- Minimize disturbance to burrows or downed woody debris
- Aquatic Amphibian and Reptile BMP
- Terrestrial Amphibian and Reptile BMP
- Water Quality BMP
- Vegetation BMP

South Texas Siren (Large Form)

- Minimize impacts to warm, shallow waters with vegetative cover such as ponds and ditches
- Aquatic Amphibian and Reptile BMP
- Water Quality BMP

Black-striped snake/ Eastern box turtle/Northern cat-eyed snake/Plateau spot-tailed earless lizard/ Reticulate collared lizard/ Slender glass lizard/ Speckler racer/Tamaulipan spot-tailed earless lizard/ Texas Indigo snake/ Western box turtle/Western hognose snake/Western massasauga

- Terrestrial Amphibian and Reptile BMP
- Vegetation BMP

Rio Grande River Cooter

- Aquatic Amphibian and Reptile BMP
- Water Quality BMP

Texas Horned Lizard

- Avoid harvester ant mounds in the selection of Project Specific Locations (PSLs).
- Terrestrial Amphibian and Reptile BMP
- Vegetation BMP

Texas Tortoise

- Utility trenches should be covered overnight or visually inspected before filling to avoid burial of the species
- Terrestrial Amphibian and Reptile BMP
- Vegetation BMP

OTHER PERTINENT INFORMATION

Trifold Available

- Ocelot information
- Pelican information
- Ashy dogweed

Stockcards Available

- Mitigatory Bird Treaty Act
- Texas Tortoise
- Harvester Ants and Horn Lizards

Pharr District Contact No. 956-702-6100

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List of Abbreviations

BMP: Best Management Practice
 CGP: Construction General Permit
 CRPe: Contractor Responsible Person Environmental
 DSHS: Texas Department of State Health Services
 FEMA: Federal Emergency Management Agency
 FHWA: Federal Highway Administration
 MOA: Memorandum of Agreement
 MOU: Memorandum of Understanding
 MS4: Municipal Separate Stormwater Sewer System

MSAT: Mobile Source Air Toxic
 MBTA: Migratory Bird Treaty Act
 NOI: Notice of Intent
 NOT: Notice of Termination
 NWP: Nationwide Permit
 PCN: Pre-Construction Notification
 PSL: Project Specific Location
 SPCC: Spill Prevention Control and Countermeasure
 SW3P: Storm Water Pollution Prevention Plan

TCEQ: Texas Commission on Environmental Quality
 THC: Texas Historical Commission
 TPDES: Texas Pollutant Discharge Elimination System
 TPWD: Texas Parks and Wildlife Department
 TxDOT: Texas Department of Transportation
 T&E: Threatened and Endangered Species
 USACE: U.S. Army Corp of Engineers
 USFWS: U.S. Fish and Wildlife Service



**EPIC SHEET SUPPLEMENTALS
 TPWD BMPs**

SHEET 3 OF 3

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6			VARIOUS
STATE	DISTRICT	COUNTY	
TEXAS	PHR	VARIOUS	
CONTROL	SECTION	JOB	SHEET NO.
6472	07	001	45