SEE SHEET 2 FOR
INDEX OF SHEETS

STATE MAINTENANCE PROJECT NO.			
6435-88-001			
CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		1

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED

HIGHWAY ROUTINE MAINTENANCE CONTRACT

REQUIRED SIGNS SHALL BE IN ACCORDANCE WITH BC (1)- 21 THRU BC (12)- 21 AND THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

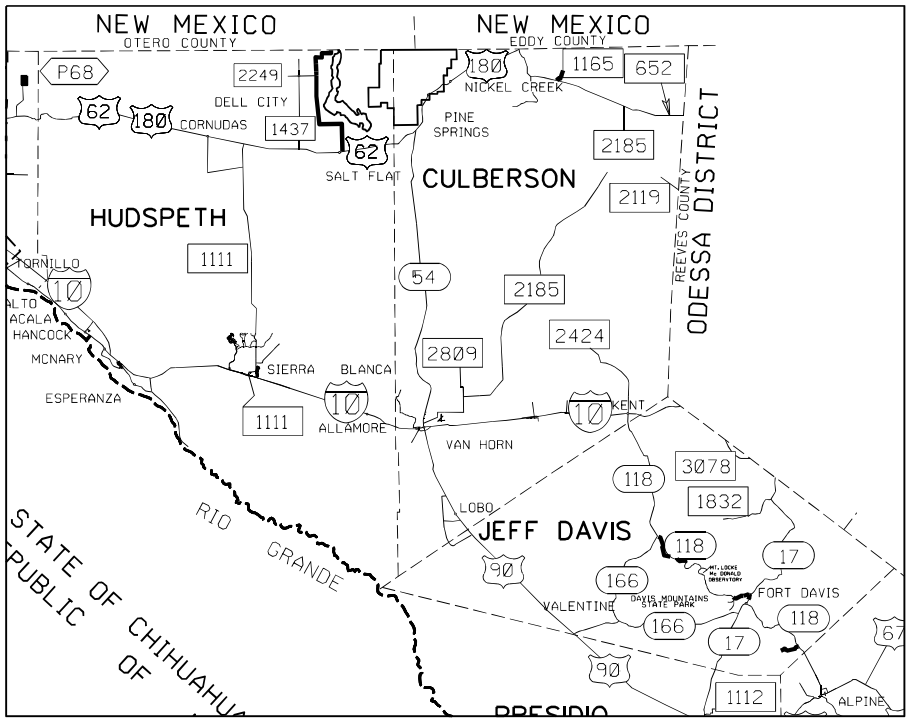
TYPE OF WORK:

FY 2025

BRIDGE PREVENTATIVE MAINTENANCE

PROJECT NO.: RMC 6435-88-001
BRIDGE MAINTENANCE

HIGHWAY: IH 10, ETC.
LIMITS OF WORK: VARIOUS



EXCEPTIONS: N/A
EQUATIONS: N/A
RAILROAD CROSSINGS: N/A

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

Texas Department of Transportation

RECOMMENDED FOR LETTING: 7/29/2024
DocuSigned by:
Norma Duran
MAINTENANCE ENGINEER/CONTRACT MANAGER
3582418IEB4D451...

APPROVED FOR LETTING: 7/29/2024
DocuSigned by:
Quan Medrid, P.E.
2D8D99B8F780...DIRECTOR OF MAINTENANCE

DATE: 7/22/2024 1:35:50 PM
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INDEX OF SHEETS

STATE OF TEXAS
26 THRO. 5010
125506
LICENSED PROFESSIONAL ENGINEER

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH A "&" HAVE BEEN ISSUED BY ME OR UNDER MY SUPERVISION AND ARE APPLICABLE TO THIS PROJECT.

NAME 07/23/2024 DATE

STATE OF TEXAS
EVELYNE PERALES
153345
LICENSED PROFESSIONAL ENGINEER

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH A "&" HAVE BEEN ISSUED BY ME OR UNDER MY SUPERVISION AND ARE APPLICABLE TO THIS PROJECT.

Evelyne Perales, P.E. 07/23/2024

NAME DATE

GENERAL

INDEX OF SHEETS

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		2

DATE: 7/22/2024 2:00:24 PM
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DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1.

2.

☒ No Action Required ☐ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000

2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.

3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.

4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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

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

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

☒ No Permit Required

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

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

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

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

1.

2.

3.

4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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

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

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

Contact the Engineer if any of the following are detected:
- Dead or distressed vegetation (not identified as normal)
- Trash piles, drums, canister, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of substances

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

☐ Yes ☒ No

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

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

☐ Yes ☐ No

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

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

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

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

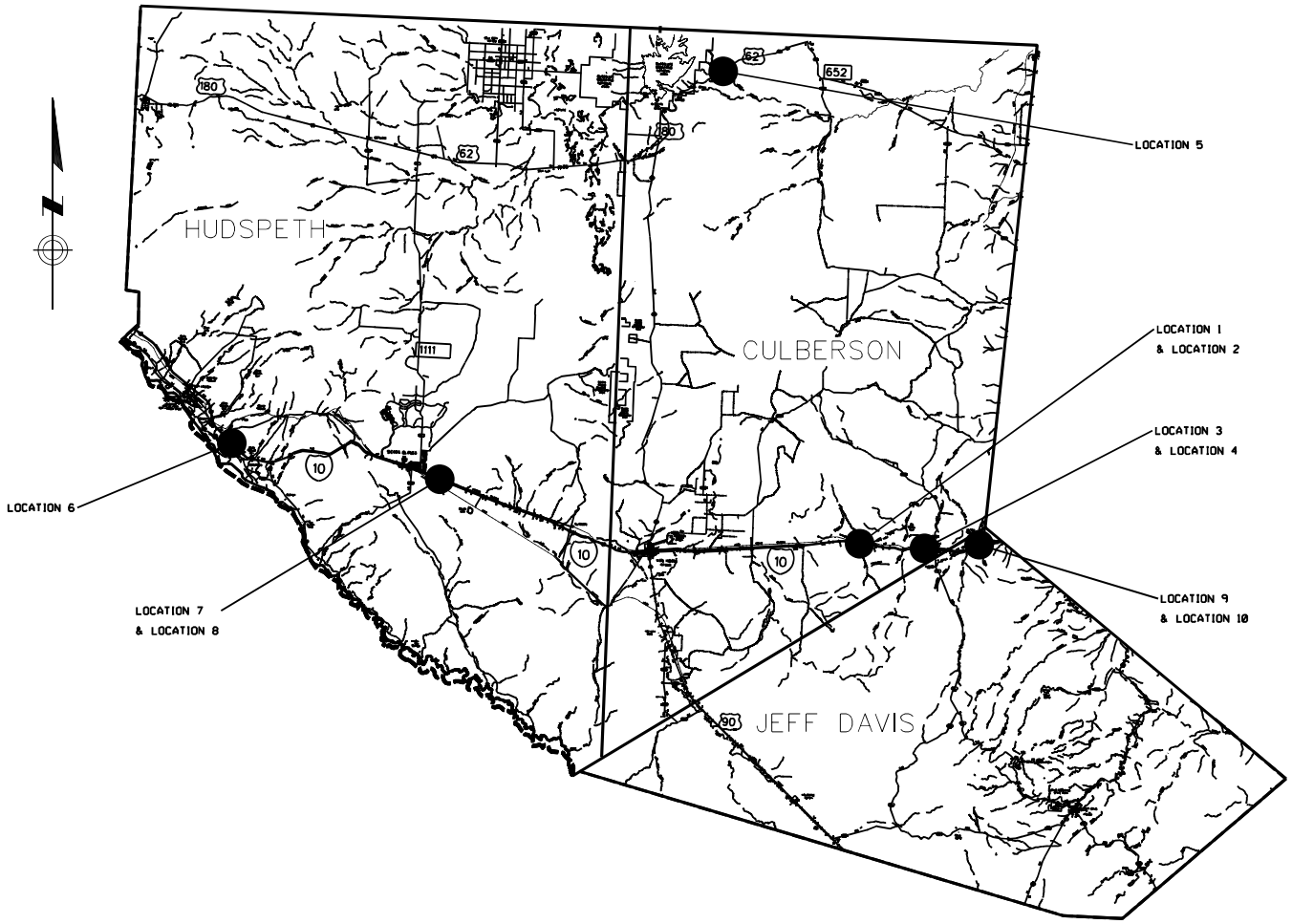
3.

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	6435	88	001	IH 10, ETC.
12-12-2011 (DS) 06-07-14 ADDED NOTE SECTION BY. 01-23-2015 SECTION I CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	DIST	COUNTY		SHEET NO.
	ELP	CULBERSON, ETC.		3



LOCATION	NBI #	FACILITY CARRIED	FEATURE CROSSED	LOCATION	LATITUDE	LONGITUDE	RM	MP
1	24-055-0-0003-03-110	IH 10 WB	BORACHO DRAW	9.55 MI W OF SH 118	31.07047499	-104.37721748	0166+00557	0.719
2	24-055-0-0003-03-111	IH 10 EB	BORACHO DRAW	9.55 MI W OF SH 118	31.07039199	-104.37722448	0166+00557	0.719
3	24-055-0-0003-03-121	IH 10 WB	DRAW	1.15 MI W OF SH 118	31.06636500	-104.23661400	0175+00037	9.196
4	24-055-0-0003-03-122	IH 10 EB	DRAW	1.15 MI W OF SH 118	31.06594525	-104.23680407	0175+00037	9.196
5	24-055-0-0233-01-041	US 62	X-T CANYON	11.50 MI SW OF FM 652	31.93784948	-104.71517337	0136+00631	7.253
6	24-116-0-0002-05-149	FM 2217	IH 10	JCT FM 2217 & IH 10	31.20375689	-105.74389866	0366-00117	0.072
7	24-116-0-0002-08-108	IH 10 WB	ARISPE DRAW	4.20 MI E OF RM 1111	31.15565433	-105.29090013	0111+00017	49.557
8	24-116-0-0002-08-109	IH 10 EB	ARISPE DRAW	4.20 MI E OF RM 1111	31.15547534	-105.29094313	0111+00017	49.557
9	24-123-0-0003-04-101	IH 10 WB	ANTELOPE DRAW	3.91 MI E CULBERSON C/L	31.07701700	-104.11858200	0182+00380	3.91
10	24-123-0-0003-04-102	IH 10 EB	ANTELOPE DRAW	3.91 MI E CULBERSON C/L	31.07657300	-104.11852210	0182+00380	3.91

FY 2025 BPM

GENERAL

LOCATION MAP

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		4

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General Requirements

Maintain the entire project area in a neat and orderly manner throughout the duration of the work. Remove all construction litter and undesirable vegetation within the right of way inside the project limits. This work will be subsidiary to the various bid items.

General Project Description – This project consists of performing Bridge Preventative Maintenance (BPM) on various structures along various roadways in the Culberson, Hudspeth, and Jeff Davis counties.

The project will be managed by the Alpine Area Office with participating Area Engineers (AE) and Maintenance Section Supervisors (MSS) listed below:

Armando Ramirez, P.E., Alpine AE
2400 N HWY 118
Alpine, Texas 79830
(432) 837-7804
Armando.Ramirez2@txdot.gov

Rene Romero, P.E., East AE
1430 Joe Battle Blvd.
El Paso, Texas 79936
(915) 849-5552
Rene.Romero@txdot.gov

Rudy Valdez, MSS
2101 Van Horn Dr
Van Horn, Texas 79855
(432) 283-2501
Rudy.Valdez@txdot.gov

Manuel Molina Jr, MSS
1430 Joe Battle, Blvd.
El Paso, Texas 79936
(915) 857-5041
Manuel.Molina@txdot.gov

Javier Castillo, MSS
600 South Main
Dell City, Texas 79837
(915) 849-5573
Javier.Castillo@txdot.gov

Item 2 – Instructions to Bidders

Plans required for this contract (illumination & fiber optic lighting maintenance & repair, traffic management & traffic signal maintenance (2-year contract), specialty maintenance project.

Questions may be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:

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

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

The Letting Pre-Bid Q&A web page for each project can be accessed by using the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the

controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

Item 3 – Award and Execution of Contract

Work order may be issued until August 31, 2025. Time charges and work will start on the date stated on the Work Authorization letter. The Contract will be in effect until the work on the last callout is completed.

Item 4 – Scope of Work

Schedule and perform all work to ensure proper drainage during construction or maintenance operations. All labor, tools, equipment, and supervision required, to ensure drainage, removal, and handling of water shall be considered incidental work.

Item 7 – Legal Relations and Responsibilities

Comply with all requirements of the Environmental Permits Issues and Commitments (EPIC) Sheet.

Do not discharge any liquid pollutant from vehicles onto the roadside. Immediately clean spills and dispose in compliance with local, state, and federal regulations to the satisfaction of the Engineer at no additional cost to the Department.

Occupational Safety & Health Administration (OSHA) regulations prohibit operations that bring people or equipment within 10 ft. of an energized electrical line. Where workers and/or equipment may be close to an energized electrical line, notify the electrical power company and make all necessary adjustments to ensure the safety of workers near the energized line.

No significant traffic generator events identified.

Law Enforcement Personnel

Coordinate with TxDOT Engineer for off-duty Law enforcement assistance when needed to direct traffic during significant closures and detours, as approved unless otherwise directed by the engineer. The officer shall monitor or direct traffic during the closure as directed by the Engineer. Patrol vehicles must be clearly marked to correspond with the officer's agency and equipped with appropriate lights to identify them as law enforcement. For patrol vehicles not owned by a law enforcement agency, markings will be retroreflective and legible from 100 ft. from both sides and the rear of the vehicle. Lights will be high intensity and visible from all angles.

Contractor to submit a written request at least 48 hrs prior to the need for law enforcement to the Engineer. The Engineer will make arrangements with the respective entity to formally request the services.

Fees resulting from contractor-initiated cancellations shall be the Contractor's responsibility.

The method used to direct traffic at signalized intersections shall be as approved. Additional officers and vehicles may be provided when approved or directed.

Show proof of certification by the Texas Commission on Law Enforcement Standards.

Complete the daily tracking form provided by the department and submit proof of payment such as cancelled checks for the approved invoices that have been billed to the project no later than 30 days from the invoice date.

No payment will be made for law enforcement personnel needed for moving equipment or payment for drive time to/from the event site.

Minimums, scheduling fees, etc. will not be paid; TxDOT will consider paying cancellation fees on a case-by-case basis.

Item 8 – Prosecution and Progress

Working days will be calculated in accordance with Section 8.3.1., "Standard Workweek."

Create and maintain a bar chart schedule.

Provide a Project Schedule Summary Report on a monthly basis along with the monthly progress schedule.

Item 9 – Measurement and Payment

Monthly progress payments will be made for items of work completed by the 27th day of each month. Any work completed after the 27th will be included for payment in the subsequent monthly progress payment.

Submit Material on Hand (MOH) payment requests at least **two (2)** working days prior to the 27th of the month for payment consideration on that month's estimate.

Item 104 – Removing Concrete

All work items described under item 104.3 required to saw-cut, as shown on the plans, or as directed is considered subsidiary to this Item.

Item 354 – Planing and Texturing Pavement

When a bridge deck is planed and textured, remove excess material. Do not broom to the sides of the bridge, under guardrail, etc. Cover or protect all sealed expansion joints, rails on bridge, and all railroad tracks encountered as approved by the engineer. Clean all these features if they weren't properly protected. This work is subsidiary work to applicable bid items. Refer to Item 438, "Cleaning and Sealing Joints", for procedures and methods.

Contractor shall furnish flood light towers at stockpile locations for work performed during night hours. Provide sufficient equipment to stockpile materials during the milling operations at the designated locations shown on plans or as directed by the engineer.

Construct a taper with an asphaltic mixture at all uneven transverse joints left by planing operation. Transitions shall be at 10 feet for every 1 inch. Asphaltic material will be subsidiary to this item of work.

Department will retain ownership of planed materials. The asphalt removed under this item shall be salvaged and stockpiled in separate stockpiles as directed by the Engineer at the location listed below. RAP generated through the required work on the contract is available for the Contractor's use when shown under Item 134 or the HMA items of work, if applicable.

TxDOT East Area Office

1430 Joe Battle Blvd.

El Paso, TX 79936

Contact the East Area Maintenance Supervisor at (915) 849-5555 for coordination prior to delivery of materials. Stack in piles 12 to 13 feet maximum height. Place silt fence along the perimeter of stockpiled material. Silt fence will be paid under Item 506, "Temporary Erosion, Sedimentation, and Environmental Controls". Final quantity of silt fence to be approved by the engineer prior to stockpiling. Hauling of material and incidentals to complete this work is subsidiary to this Item.

Alpine Area Office

2400 N HWY 118

Alpine, TX 79830

Contact the Alpine Area Maintenance Supervisor at (432) 837-7800 for coordination prior to delivery of materials. Stack in piles 12 to 13 feet maximum height. Place silt fence along the perimeter of stockpiled material. Silt fence will be paid under Item 506, "Temporary Erosion, Sedimentation, and Environmental Controls". Final quantity of silt fence to be approved by the engineer prior to stockpiling. Hauling of material and incidentals to complete this work is subsidiary to this Item.

Item 429 – Concrete Structure Repair

Use Department approved products to accomplish full depth, horizontal and vertical concrete repairs. Follow the procedures outlined in the Concrete Repair Manual unless approved otherwise. Submit for approval all materials and methods of application at least 3 weeks before beginning any repair work.

Maintain bridge components so that they shall remain free of all debris during construction. This work will not be paid for directly but shall be considered subsidiary to the pertinent items.

Item 432 – Riprap

Wire mesh and fibers for concrete will not be allowed for concrete riprap in accordance with item 432.3.1, "Concrete Riprap" on this project for this Item. Reinforce all concrete riprap using bar reinforcement conforming to Item 440, "Reinforcement for Concrete," as shown on the plans, or as directed.

Finish concrete riprap with a smooth (wood float) finish, unless otherwise directed.

Item 442 – Metal for Structures

Prepare and submit the field erection drawings in accordance with Item 441 3.1.6, "Drawings" for approval prior to construction. Field erection drawing will include details for additional temporary lateral bracing to be used to secure plate girders from wind loads during erection and construction.

Additional temporary shoring may include, but is not limited to guy wires with dead-man anchors, etc. Temporary lateral bracing shall be removed upon approval. Temporary lateral bracing will not be measured or paid for directly but is subsidiary to this Item.

Item 500 – Mobilization

The Contractor will be paid in accordance with the associated Item based on work performed. This will fully compensate the Contractor for all associated activities.

Item 502 – Barricades, Signs, and Traffic Handling

Prior to beginning construction, the Engineer will approve the routing of traffic and sequence of work.

Additional signs and barricades, placed as directed, will be considered subsidiary to this Item.

In accordance with Section 7.2.6.1, designate, in writing, a Contractor Responsible Person (CRP) and a CRP alternate to take full responsibility for the set-up, maintenance, and necessary corrective measures of the traffic control plan. The CRP or CRP alternate must be present at site and implement the initial set up of every traffic control phase/stage, at each location, and/or each call out, for the entire duration of the project.

At the written request of the Engineer, immediately remove the CRP or CRP alternate from the project if, in the opinion of the Engineer, is not competent, not present at initial TCP set-ups, or does not perform in a proper, skillful, or safe manner. These individuals shall not be reinstated without written consent of the Engineer.

CRP and CRP alternate must be trained using Department approved training. Provide a copy of the certificate of completion to the Engineer for project records.

All contractor workers involved with the traffic control implementation and maintenance must participate and complete a department approved training course. Provide a copy of the certificate of completion to the Engineer for project records. Refer to "Traffic Control Training" Material Producer List https://ftp.txdot.gov/pub/txdot-info/cmd/mpl/tct.pdf for Department approved training.

Contractor may choose to train workers involved with the traffic control implementation and maintenance with a contractor developed training in lieu of Department approved training. Contractor developed training must be equivalent to the Department approved training. Provide the Engineer a copy of the course curriculum for pre-approval, prior to conducting the contractor developed training. Provide the Engineer a copy of the log of attendees after training completion for project records.

Existing regulatory signs, route marker auxiliaries, guide signs, and warning signs that must be removed due to widening shall be relocated temporarily and erected on approved supports at locations shown in the plans, or as directed. This work will not be paid for directly but is considered subsidiary to this Item.

Notify the Department officials when major traffic changes are to be made, such as detours. Coordinate with the Department on all traffic changes. Advance notification for the following week's work must be made by 5 P.M. on Wednesdays.

If Law Enforcement Personnel is required by the Engineer, coordinate with local law enforcement as directed or agreed. Complete the weekly tracking form provided by the Department and submit invoices with 5% allowance for Law Enforcement payments by Contractor that agree with the tracking form for payment at the end of each month where approved services were provided.

Provide access to intersecting side roads and driveways at all times, unless otherwise directed.

Any approved change to the sequence of work or TCP, must be signed and sealed by a Contractor's Licensed Professional Engineer assuming full responsibility for any additional barricade signs and devices needed.

Use striping operations to channelize traffic into the newly completed roadway, as directed. Maintain shoulders and median areas in a condition capable of serving as emergency paths, as approved. This work will be subsidiary to this Item.

Use portable changeable message signs (PCMS) to alert public of construction two weeks prior to construction.

Use flaggers when directed. Provide two-way radio communication for all flaggers.

Place and maintain sufficient additional warning signs, beacons, delineators, and barricades to warn and guide the public of all hazards in the construction zone limits at all times, and as directed.

Use flashing arrow boards on all tapers for each lane closure.

Some signs, barricades, and channelization devices may not be shown at the precise or measured position. Place the barricades, devices, or signs, with approval, in positions to meet field conditions.

Use Type A flashing warning lights or delineators to mark open excavation, footings, foundations, or other obstructions near lanes that may be open to traffic, as directed.

Remove or cover signs that do not apply to current conditions at the end of each day's work.

Repair or replace all signs damaged by the public or due to weather events.

All project signs shall be maintained free of litter, debris, or sediment build up at the base supports. This work is subsidiary to this item of work.

Safety Contingency

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

Item 505 – Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

All TMA Operators must participate in a TMA workshop to be conducted by the El Paso District Safety Office on the proper use of TMAs, prior to work. All TMA Operators must participate in a TMA workshop provided by the Department or equivalent approved by the Engineer. A truck mounted attenuator completion card will be issued to TMA Operators that successfully complete the TMA workshop. The workshop completion card must be carried by TMA Operators at all times while working on Department right of way.

Acquire the TCP and TMA Operator's workshop completion prior to the authorization to begin work. No time suspension will be granted, and no traffic control work will be allowed without the workshop completion card.

Refer to the Basis of Estimate for the TMAs required for this type of work. TMAs will be used and positioned per the applicable Traffic Control Plan standard or as directed by the Engineer. Additional TMAs required due to changes in project phasing by contractor or the Engineer will be provided by the contractor.

The supporting vehicle for the TMA shall have a minimum gross (i.e., ballasted) vehicular weight of 19,000 pounds.

Basis of Estimate for Stationary TMAs				
		TMA(Stationary)		
Location	Standard	Required	Additional	TOTAL
1	TCP(5-1B)	1	-	1
2	TCP(6-1A)	1	-	1
3	TCP(6-1A)	1	-	1
4	TCP(6-1A)	1	-	1
5	TCP(5-1B)	1	-	1
6	TCP(5-1B)	1	-	1
7	TCP(6-1A)	1	-	1
8	TCP(6-1A)	1	-	1
9	TCP(6-1A)	1	-	1
10	TCP(6-1A)	1	-	1

Item 506 – Temporary Erosion, Sedimentation, and Environmental Controls

Refer to SWP3 Sheets for total acres of disturbed area. Establish the authorization requirements for Storm Water Discharges for soil disturbed area in this project, all project locations in the Contract, and Contractor Project Specific Locations (PSLs), within one mile of the project limits. Both the Department and the Contractor shall obtain an authorization to discharge storm water from TCEQ for the construction activities shown on the plans. Obtain required authorization from the TCEQ for any Contractor PSLs for construction support activities on or off the right of way.

Best Method Practices (BMP's) may be adjusted to meet field conditions, or as directed. The Engineer will verify all locations prior to placement of BMPs. Keep all inlets functional within the project limits throughout the entire length of the project to accept storm water as part of the Storm Water Pollution Prevention Plan (SWP3), as directed.

Place rain gauge(s) at locations as designated.

Grading operations will be limited to the catch point of the proposed cross-section.

Preserve any vegetation outside these limits.

The Storm Water Pollution Prevention Plan (SWP3) consists of temporary erosion control measures needed and provided for under this Item. The disturbed area is less than one acre and

use of erosion control measures is not anticipated. If physical conditions encountered at the job site require necessary controls, BMP installation, maintenance, and removal will be paid as extra work on a force account basis per *Articles 4.4 and 9.7.*

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 6435-88-001 **DISTRICT** El Paso **COUNTY** El Paso
HIGHWAY IH0010

			CONTROL SECTION JOB	**6435-88-001**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00194327**			
			COUNTY	**El Paso**			
			HIGHWAY	**IH0010**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	104-7006	REMOV CONC (RIPRAP)	SY	1,290.000		1,290.000	
	429-7003	CONC STR REPAIR(DECK REP(PART DEPTH))	SF	184.000		184.000	
	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	1,434.000		1,434.000	
	432-7001	RIPRAP (CONC)(4 IN)	CY	74.000		74.000	
	442-7008	STR STEEL (MISCELLANEOUS BRIDGE)	LB	560.000		560.000	
	454-7010	JOINT SEALANT	LF	148.000		148.000	
	459-7008	GABION MATTRESSES (GALV)(18 IN)	SY	252.000		252.000	
	459-7010	GABIONS (3' X 3')(GALV)	CY	448.000		448.000	
	500-7001	MOBILIZATION	LS	1.000		1.000	
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	5.000		5.000	
	503-7002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000		2.000	
	505-7001	TMA (STATIONARY)	DAY	100.000		100.000	
	506-7043	BIODEG EROSN CONT LOGS (INSTL) (8")	LF	200.000		200.000	
	506-7046	BIODEG EROSN CONT LOGS (REMOVE)	LF	200.000		200.000	
	760-7001	DITCH CLEANING AND RESHAPING (FOOT)	LF	176.000		176.000	
	780-7002	CNC CRACK REPAIR (DISCRETE)(INJECT)	LF	25.000		25.000	
	785-7002	BRIDGE JOINT REPAIR (HEADER)	LF	498.000		498.000	
	785-7011	BRIDGE JOINT REPLACEMENT (SEJ)	LF	84.000		84.000	

BRIDGE MAINTENANCE ITEMS

SPEC ITEM #	0104 7006	0429 7003	0429 7007	0432 7001	0442 7008	0454 7010	0459 7008	0459 7010	0760 7001	0780 7002	785 7002	0785 7011
ITEM DESCRIPTION	REMOV CONC (RIPRAP)	CONC STR REPAIR (DECK REP (PART DEPTH))	CONC STR REPAIR (VERTICAL & OVERHEAD)	RIPRAP (CONC)(4 IN)	STR STEEL (MISCELLANEOUS BRIDGE)	JOINT SEALANT	GABION MATTRESSES (GALV)(18 IN)	GABIONS (3' X 3')(GALV)	DITCH CLEANING AND RESHAPING (FOOT)	CNC CRACK REPAIR (DISCRETE)(INJECT)	BRIDGE JOINT REPAIR (HEADER)	BRIDGE JOINT REPLACEMENT (SEJ)
UNITS	SY	SF	SF	CY	LB	LF	SY	CY	LF	LF	LF	LB
24-055-0-0003-03-110			76		56							
24-055-0-0003-03-111			369		56						126	
24-055-0-0003-03-121			286		56				88		84	
24-055-0-0003-03-122	28		122	4	56				88		84	
24-055-0-0233-01-041	744				56		252	448				
24-116-0-0002-05-149	167		3	27	56	70				25		
24-116-0-0002-08-108	14		92	4	56	78					120	
24-116-0-0002-08-109	4	184	66	1	56							
24-123-0-0003-04-101			150		56						84	
24-123-0-0003-04-102	333		270	38	56							84
TOTAL	1290	184	1434	74	560	148	252	448	176	25	498	84

EROSION CONTROL ITEMS

SPEC ITEM #	0506 7043	0506 7046
ITEM DESCRIPTION	BIODEG EROSN CONT LOGS (INSTL) (8")	BIODEG EROSN CONT LOGS (REMOVE)
UNITS	LF	LF
EROSION CONTROL	200	200
TOTAL	200	200

TRAFFIC CONTROL ITEMS

SPEC ITEM #	0500 7001	0502 7001	0503 7002	0505 7001	
ITEM DESCRIPTION	MOBILIZATION	BARRICADES, SIGNS AND TRAFFIC HANDLING	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	DAYS PER TMA
UNITS	LS	MO	EA	EA	DAYS
TCP	1	5	2	1	100
TOTAL	1	5	2	1	100

FY 2025
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GENERAL

QUANTITY SUMMARY

SHEET 1 OF 1

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		7

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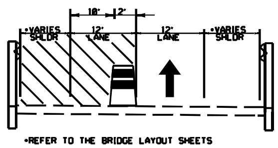
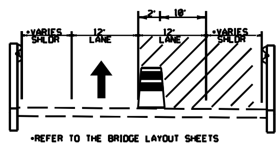
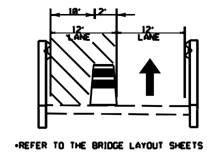


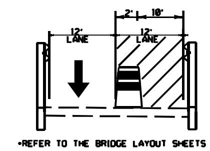
TWO-LANE ONE-WAY TYPICAL SECTION
OUTSIDE LANE CLOSURE



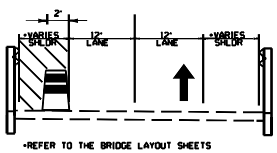
TWO-LANE ONE-WAY TYPICAL SECTION
INSIDE LANE CLOSURE



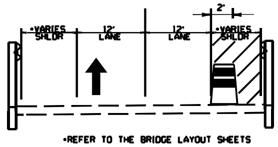
ONE-LANE TWO-WAY TYPICAL SECTION
OUTSIDE LANE CLOSURE



ONE-LANE TWO-WAY TYPICAL SECTION
INSIDE LANE CLOSURE



TWO-LANE ONE-WAY TYPICAL SECTION
OUTSIDE SHOULDER CLOSURE



TWO-LANE ONE-WAY TYPICAL SECTION
INSIDE SHOULDER CLOSURE

LOCATION	DESCRIPTION	NBI #	LAT/LONG	PROPOSED WORK	TCP NARRATIVE	PROPOSED TCP STANDARDS
1	IH 10 WB OVER BORACHO DRAW	240550000303110	31.07047499/ -104.37721748	1. REPAIR CONCRETE STRUCTURE	1. ALL WORK TO BE PERFORMED UNDER BRIDGE. 2. SHOULDER CLOSURE OF IH 10.	1. TCP (5-1B)-2018
2	IH 10 EB OVER BORACHO DRAW	240550000303111	31.07039199/ -104.37722448	1. REPAIR CONCRETE STRUCTURE 2. REPAIR BRIDGE JOINTS	1. ONE LANE AND SHOULDER CLOSURE OF IH 10 REQUIRED TO ACCESS BRIDGE JOINTS.	1. TCP (6-1A)-2012
3	IH 10 WB OVER DRAW	240550000303121	31.066365/ -104.236614	1. REPAIR CONCRETE STRUCTURE 2. REPAIR BRIDGE JOINT 3. RESHAPE CHANNEL	1. ONE LANE AND SHOULDER CLOSURE OF IH 10 REQUIRED TO ACCESS BRIDGE JOINTS.	1. TCP (6-1A)-2012
4	IH 10 EB OVER DRAW	240550000303122	31.06594525/ -104.23680407	1. REPAIR CONCRETE STRUCTURE 2. REPAIR BRIDGE JOINT 3. REPAIR CONCRETE RIPRAP 4. RESHAPE CHANNEL	1. ONE LANE AND SHOULDER CLOSURE OF IH 10 REQUIRED TO ACCESS BRIDGE JOINTS.	1. TCP (6-1A)-2012
5	US 62 OVER X-T CANYON	240550023301041	31.93784948/ -104.71517337	1. REMOVE CONCRETE RIPRAP 2. INSTALL GABIONS	1. ALL WORK TO BE PERFORMED UNDER BRIDGE. 2. SHOULDER CLOSURE OF US 62.	1. TCP (5-1B)-2018
6	FM 2217 OVER IH 10	241160000205149	31.20375689/ -105.74389866	1. REPAIR CONCRETE STRUCTURE 2. REPAIR CONCRETE RIPRAP 3. CLEAN AND SEAL RIPRAP JOINTS 4. SEAL CONCRETE CRACKING	1. ALL WORK TO BE PERFORMED UNDER BRIDGE. 2. SHOULDER CLOSURE OF IH 10.	1. TCP (5-1B)-2018

STATE OF TEXAS
EVELYNE PERALES
153345
LICENSED
PROFESSIONAL ENGINEER

Evelyne Perales, P.E.
07/23/2024

FY 2025
BPM

TRAFFIC CONTROL PLAN

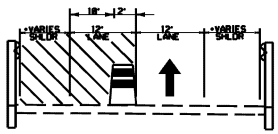
TCP NARRATIVE
AND TYPICALS

SHEET 1 OF 2

Texas Department of Transportation

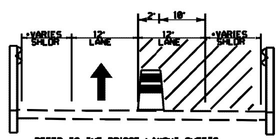
CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		8

DATE:
FILE:



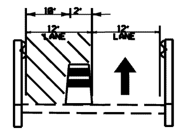
*REFER TO THE BRIDGE LAYOUT SHEETS

TWO-LANE ONE-WAY TYPICAL SECTION
OUTSIDE LANE CLOSURE



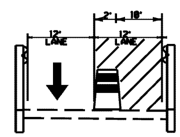
*REFER TO THE BRIDGE LAYOUT SHEETS

TWO-LANE ONE-WAY TYPICAL SECTION
INSIDE LANE CLOSURE



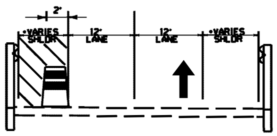
*REFER TO THE BRIDGE LAYOUT SHEETS

ONE-LANE TWO-WAY TYPICAL SECTION
OUTSIDE LANE CLOSURE



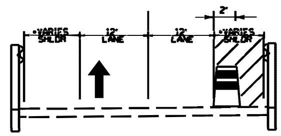
*REFER TO THE BRIDGE LAYOUT SHEETS

ONE-LANE TWO-WAY TYPICAL SECTION
INSIDE LANE CLOSURE



*REFER TO THE BRIDGE LAYOUT SHEETS

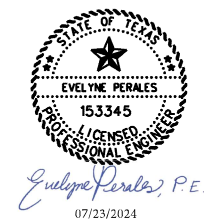
TWO-LANE ONE-WAY TYPICAL SECTION
OUTSIDE SHOULDER CLOSURE



*REFER TO THE BRIDGE LAYOUT SHEETS

TWO-LANE ONE-WAY TYPICAL SECTION
INSIDE SHOULDER CLOSURE

LOCATION	DESCRIPTION	NBI #	LAT/LONG	PROPOSED WORK	TCP NARRATIVE	PROPOSED TCP STANDARDS
7	IH 10 WB OVER ARISPE DRAW	241160000208108	31.15565433/ -105.29090013	1. REPAIR CONCRETE STRUCTURE 2. REPAIR BRIDGE JOINTS 3. CLEAN AND SEAL RIPRAP JOINTS 4. REPAIR RIPRAP 5. REMOVE ASPHALT OVERLAY	1. ONE LANE AND SHOULDER CLOSURE OF IH 10 REQUIRED TO ACCESS BRIDGE JOINT AND REMOVAL OF OVERLAY.	1. TCP (6-1A)-2012
8	IH 10 EB OVER ARISPE DRAW	241160000208109	31.15547534/ -105.29094313	1. REPAIR CONCRETE STRUCTURE 2. REPAIR RIPRAP 3. REMOVE ASPHALT OVERLAY	1. ONE LANE AND SHOULDER CLOSURE OF IH 10 REQUIRED FOR REMOVAL OF OVERLAY.	1. TCP (6-1A)-2012
9	IH 10 WB OVER ANTELOPE DRAW	241230000304101	31.077017/ -104.118582	1. REPAIR CONCRETE STRUCTURE 2. REPAIR BRIDGE JOINTS	1. ONE LANE AND SHOULDER CLOSURE OF IH 10 REQUIRED TO ACCESS BRIDGE JOINTS.	1. TCP (6-1A)-2012
10	IH 10 EB OVER ANTELOPE DRAW	241230000304102	31.076573/ -104.1185221	1. REPAIR CONCRETE STRUCTURE 2. REPAIR RIPRAP 3. REPLACE BRIDGE JOINTS	1. ONE LANE AND SHOULDER CLOSURE OF IH 10 REQUIRED TO ACCESS BRIDGE JOINTS.	1. TCP (6-1A)-2012



FY 2025
BPM

TRAFFIC CONTROL PLAN

TCP NARRATIVE
AND TYPICALS

SHEET 2 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	08	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		9

DATE:
FILE:

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

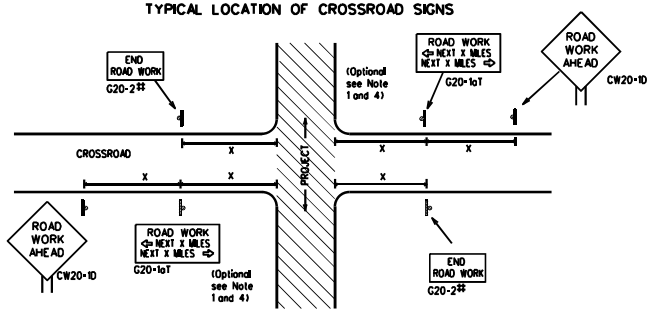
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6435	88	001	IH 10, ETC.
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	ELP	CULBERSON, ETC.		10
5-10 5-21				

95

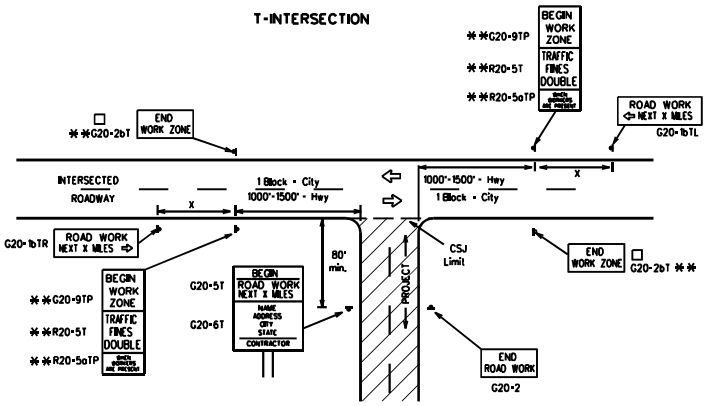
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

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

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

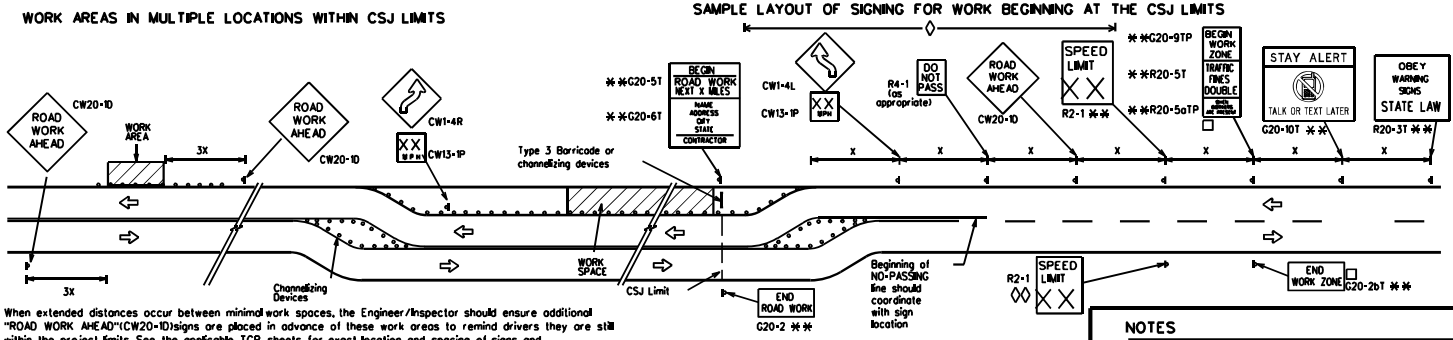
GENERAL NOTES

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

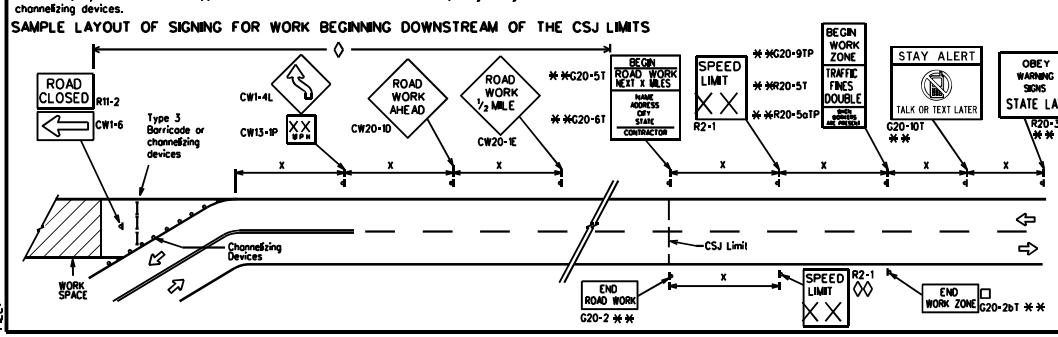
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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



NOTES

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

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

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

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

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

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

SHEET 2 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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96

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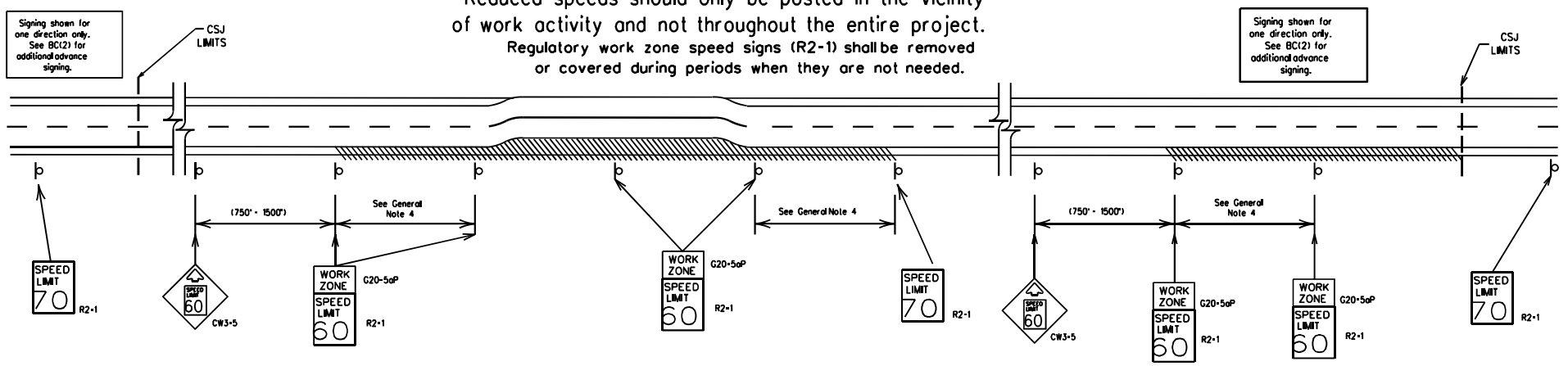
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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SHEET 3 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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97

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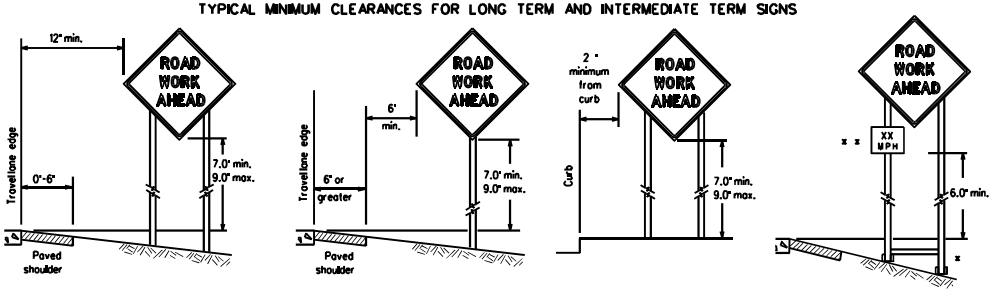
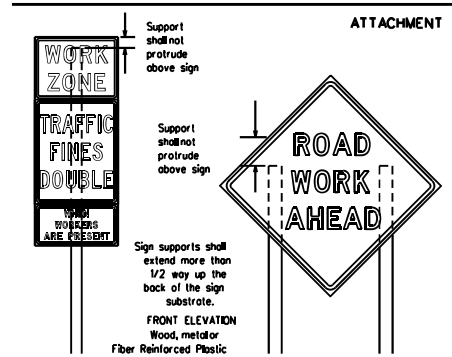
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



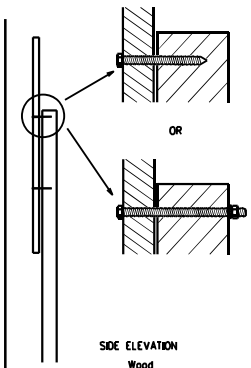
x When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS



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

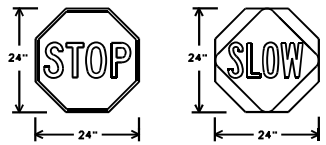


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

STOP/SLOW PADDLES

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



Background - Red
Legend & Border - White

Background - Orange
Legend & Border - Black

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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

SHEET 4 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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98

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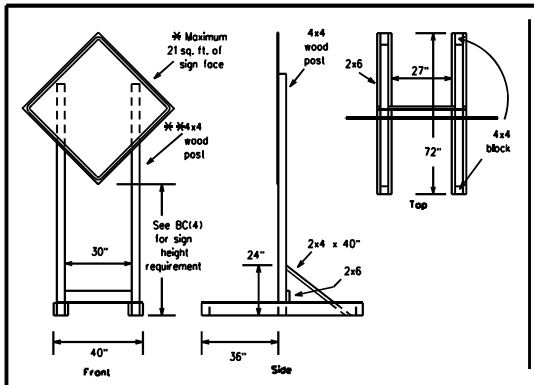
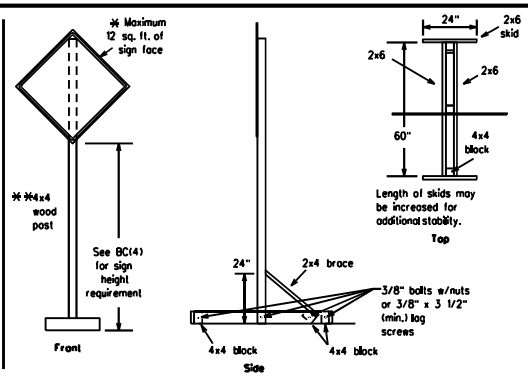
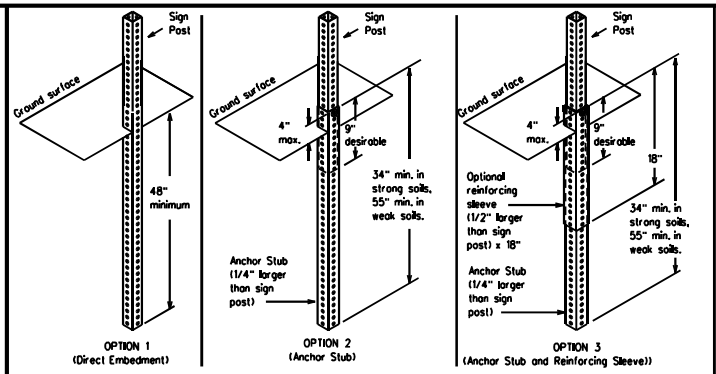




SKID MOUNTED WOOD SIGN SUPPORTS

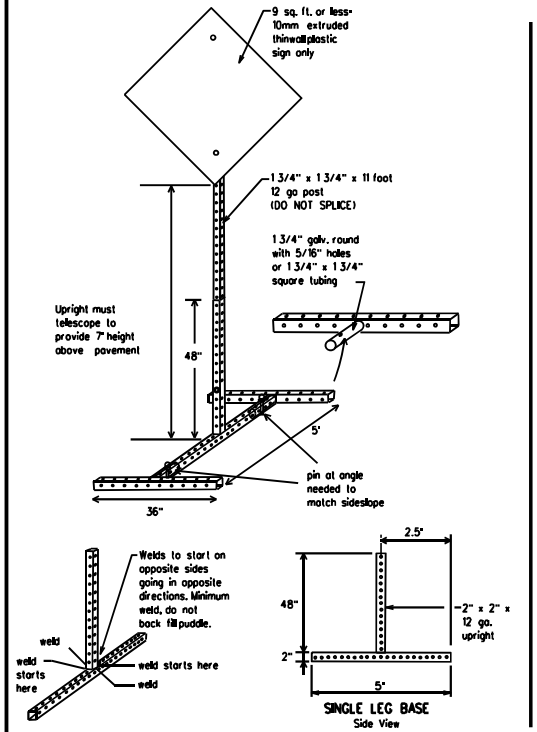
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

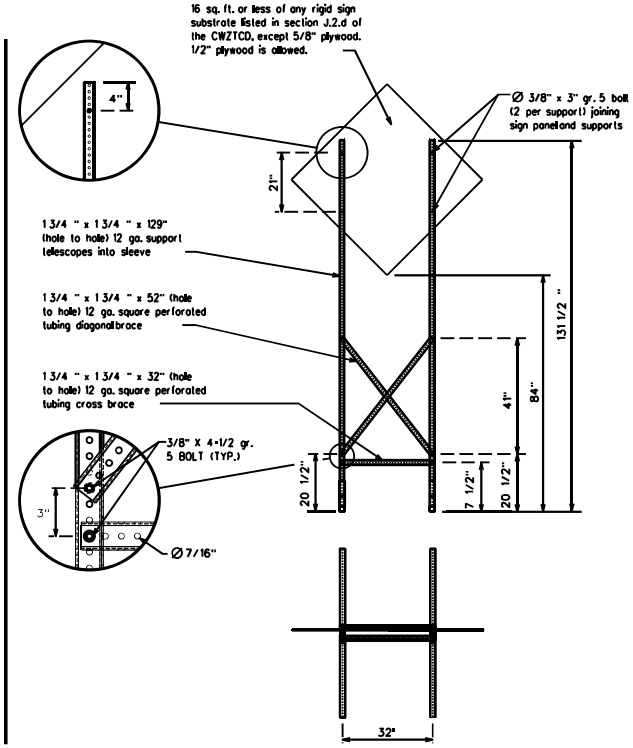


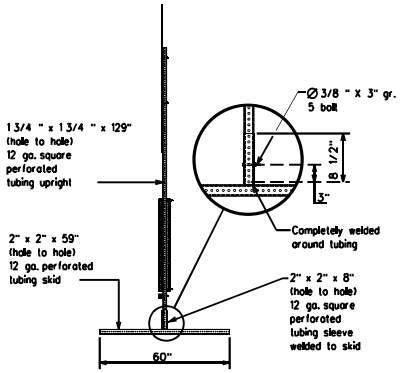
PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support. The maximum sign square footage shalladhere 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 steeland plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(1)).

OTHER DESIGNS

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

GENERAL NOTES

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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99

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED	ROADWORK XXX FT	ROAD REPAIRS XXXX FT
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT	FLAGGER XXXX FT	LANE NARROWS XXXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT	RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
RIGHT X LANES CLOSED	RIGHT X LANES OPEN	MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
CENTER LANE CLOSED	DAYTIME LANE CLOSURES	LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED	DETOUR X MILE	ROUGH ROAD XXXX FT
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE	ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
EXIT CLOSED	RIGHT LN TO BE CLOSED	BUMP XXXX FT	US XXX EXIT X MILES
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI	TRAFFIC SIGNAL XXXX FT	LANES SHIFT *
XXXXXXXX BLVD CLOSED			

Other Condition List

* 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		Location List	Warning List	** Advance Notice List
MERGE RIGHT	FORM X LINES RIGHT	AT FM XXXX	SPEED LIMIT XX MPH	TUE-FRI XX AM- X PM
DETOUR NEXT X EXITS	USE XXXXX RD EXIT	BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH	APR XX-XX X PM-X AM
USE EXIT XXX	USE EXIT I-XX NORTH	NEXT X MILES	MINIMUM SPEED XX MPH	BEGINS MONDAY
STAY ON US XXX SOUTH	USE I-XX E TO I-XX N	PAST US XXX EXIT	ADVISORY SPEED XX MPH	BEGINS MAY XX
TRUCKS USE US XXX N	WATCH FOR TRUCKS	XXXXXXX TO XXXXXXX	RIGHT LANE EXIT	MAY X-X XX PM - XX AM
WATCH FOR TRUCKS	EXPECT DELAYS	US XXX TO FM XXXX	USE CAUTION	NEXT FRI-SUN
EXPECT DELAYS	PREPARE TO STOP		DRIVE SAFELY	XX AM TO XX PM
REDUCE SPEED XXX FT	END SHOULDER USE		DRIVE WITH CARE	NEXT TUE AUG XX
USE OTHER ROUTES	WATCH FOR WORKERS			TONIGHT XX PM- XX AM
STAY IN LANE *				

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

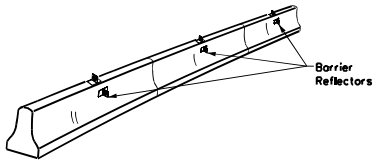
BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6435	88	001	IH 10, ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ELP	CULBERSON, ETC.		15

100

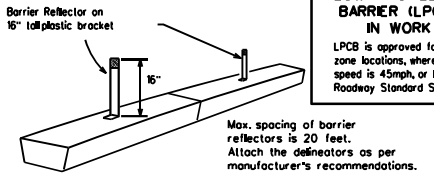
DATE:
FILE:

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



CONCRETE TRAFFIC BARRIER (CTB)

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

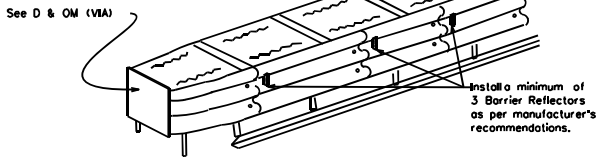


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

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.

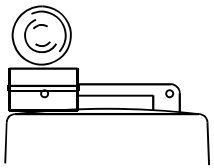


DELINEATION OF END TREATMENTS

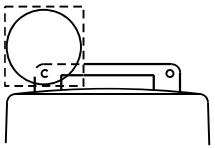
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

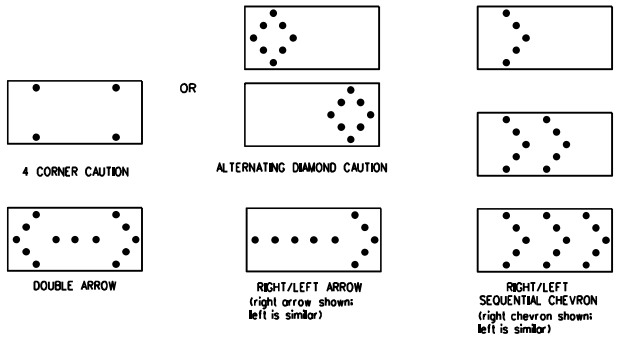
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	6435	88	001	IH 10, ETC.
	DIST	COUNTY		SHEET NO.
	ELP	CULBERSON, ETC.		16

101

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:

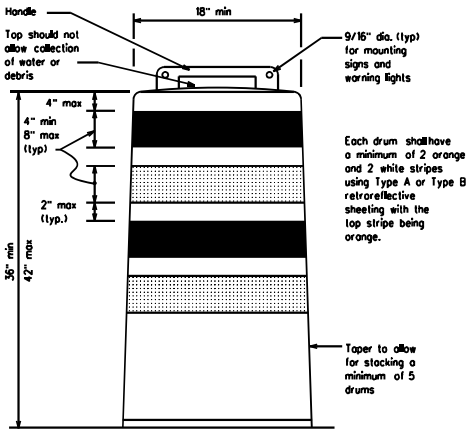
1. Plastic drums shall be a two-piece design: the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

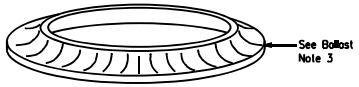
RETROREFLECTIVE SHEETING

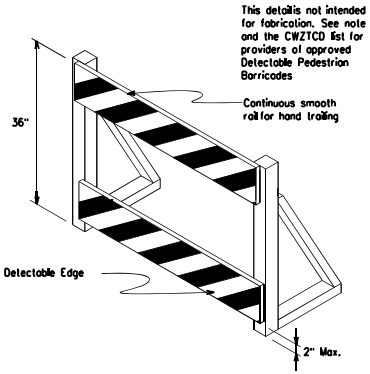
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Department Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall 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.

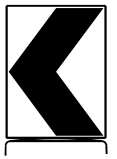




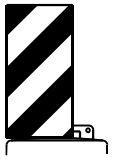


DETECTABLE PEDESTRIAN BARRICADES

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 travelway

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.

DATE:
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Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6435	88	001	IH 10, ETC.
4-03 8-14	DIST	COUNTY		SHEET NO.
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7-13				

102

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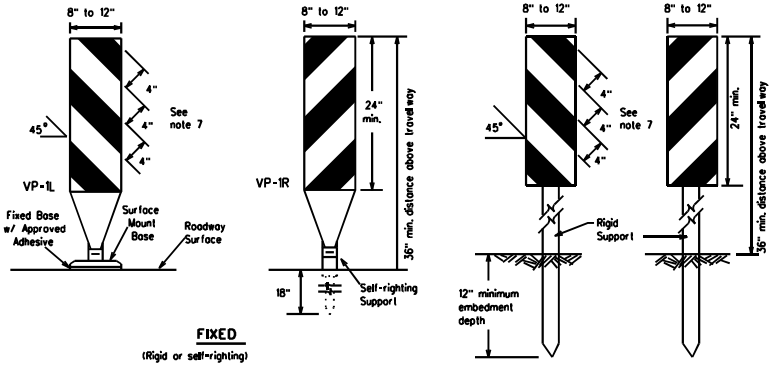
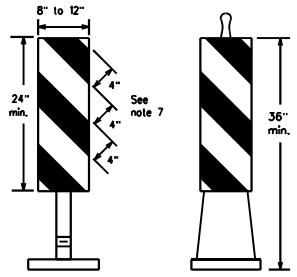


FIXED
(Rigid or self-righting)

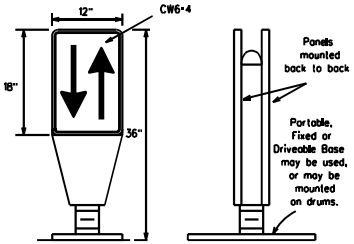
DRIVEABLE



PORTABLE

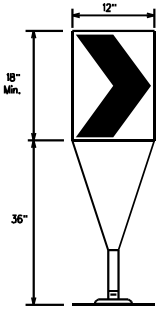
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



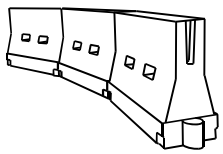
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ELP	CULBERSON, ETC.		18

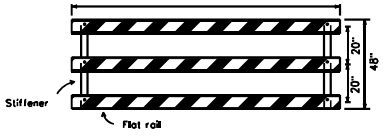
103

TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.

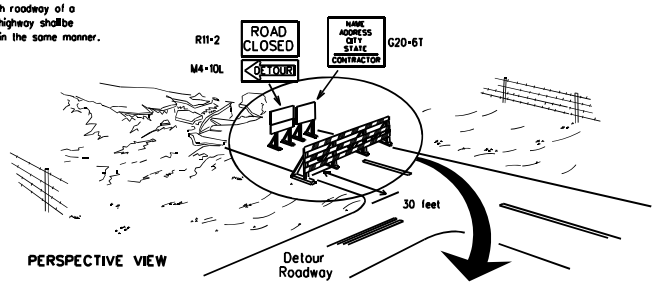
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

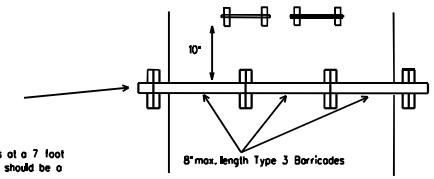
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

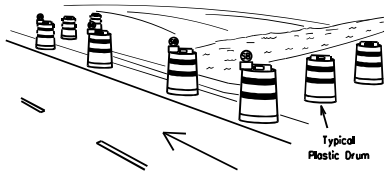
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

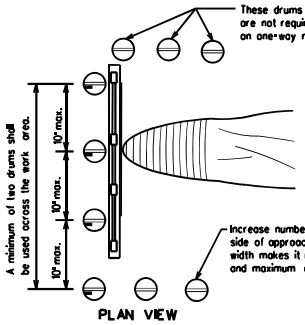
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

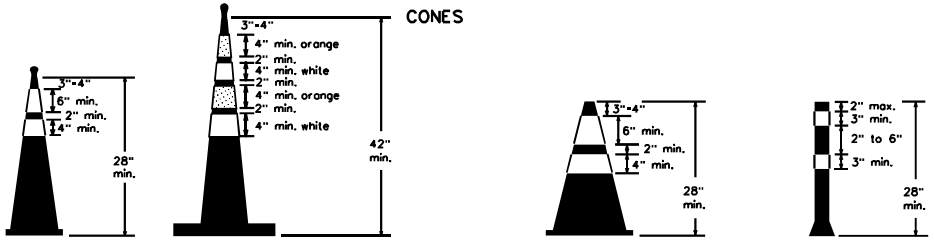
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



PLAN VIEW

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

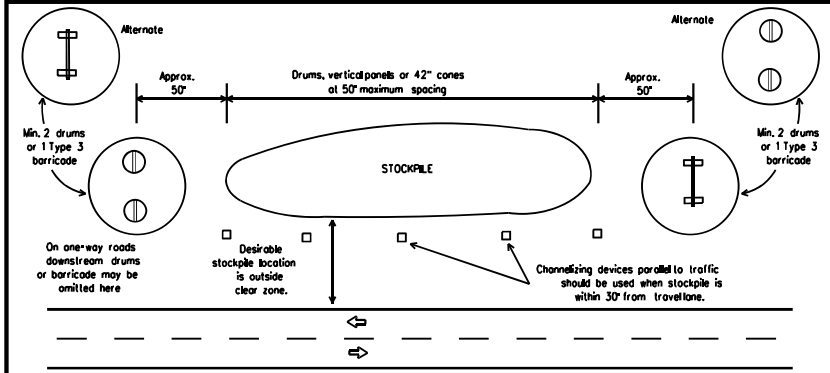
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones

One-Piece cones

Tubular Marker



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

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	ELP	CULBERSON, ETC.		19

104

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

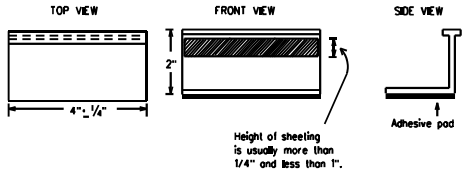
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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105

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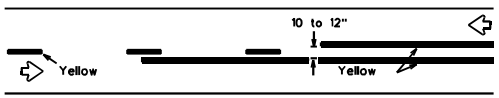
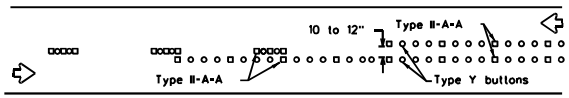
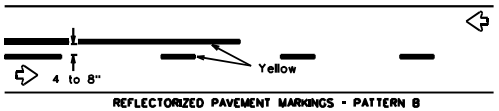
PAVEMENT MARKING PATTERNS



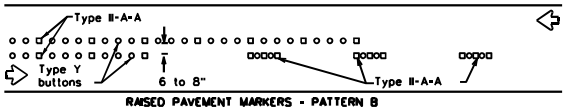
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



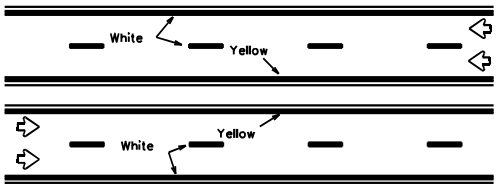
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



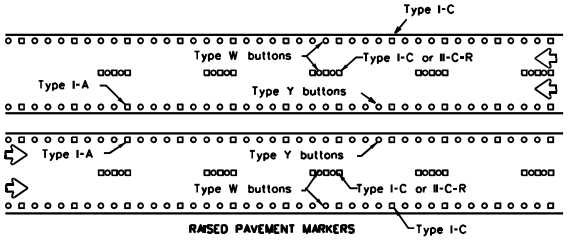
RAISED PAVEMENT MARKERS - PATTERN B

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

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



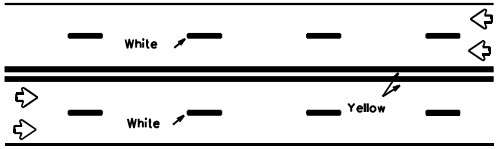
REFLECTORIZED PAVEMENT MARKINGS



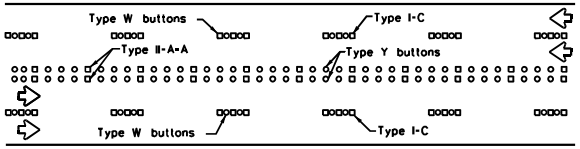
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



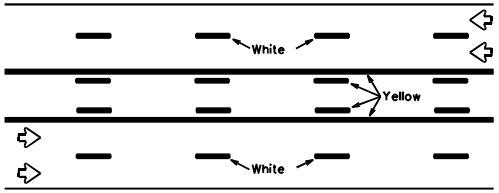
REFLECTORIZED PAVEMENT MARKINGS



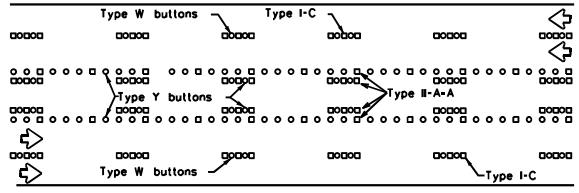
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

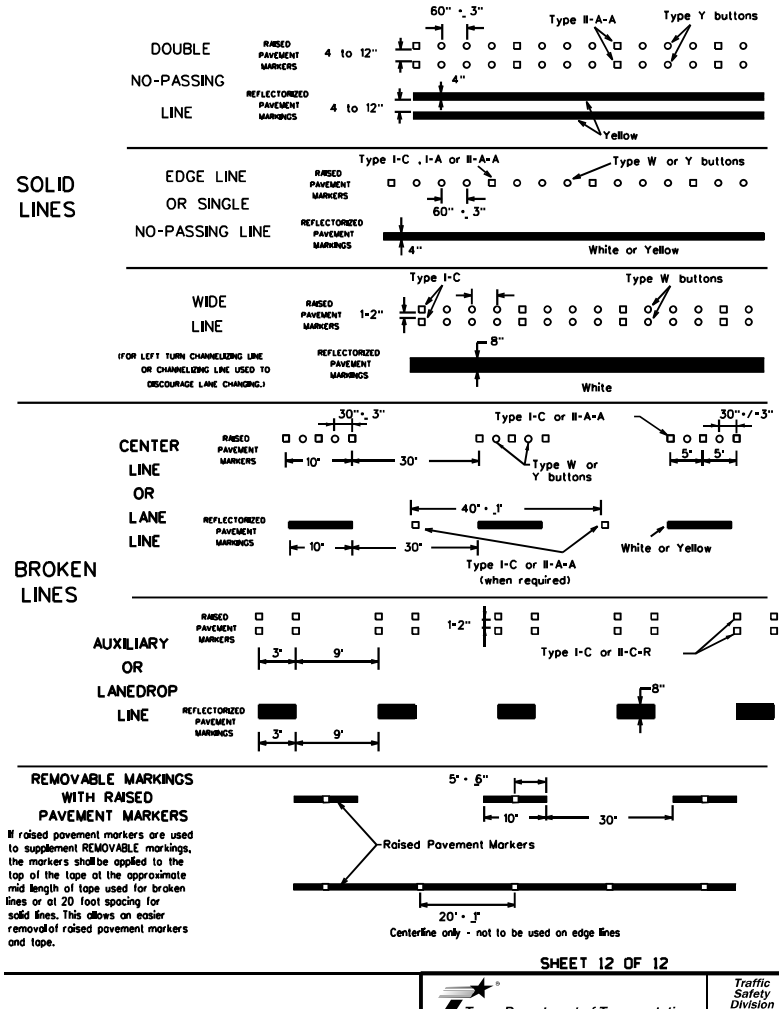


RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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

Centerline only - not to be used on edge lines

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

SHEET 12 OF 12

Texas Department of Transportation

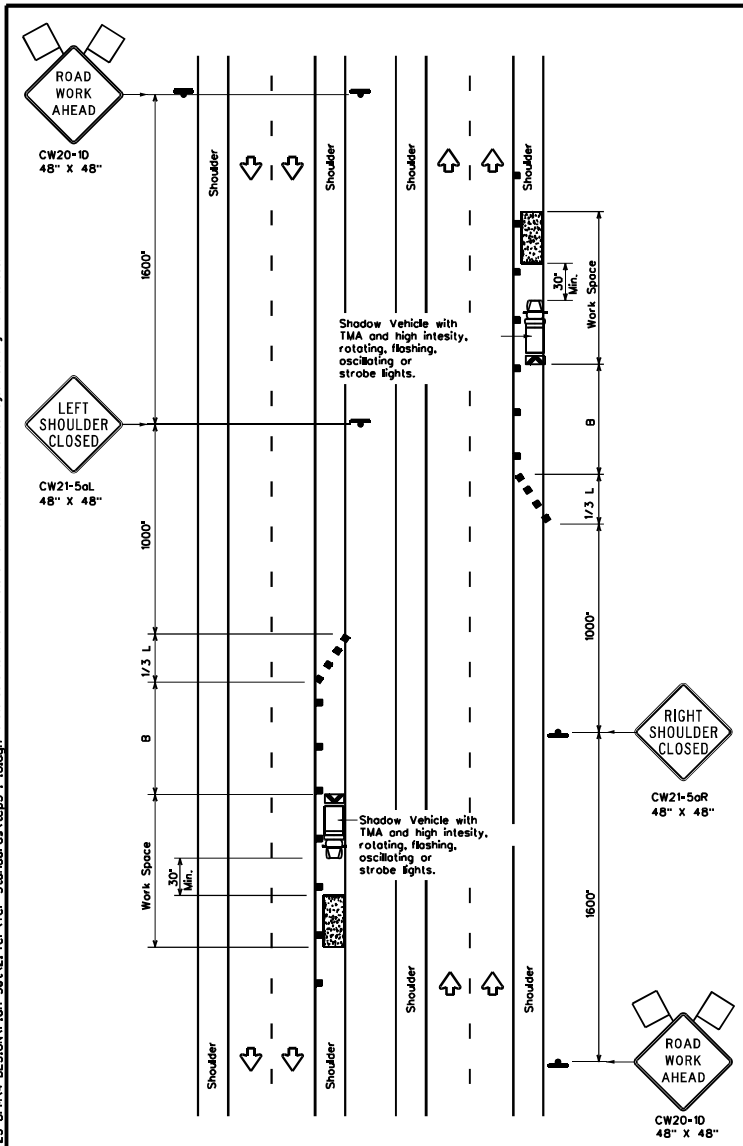
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

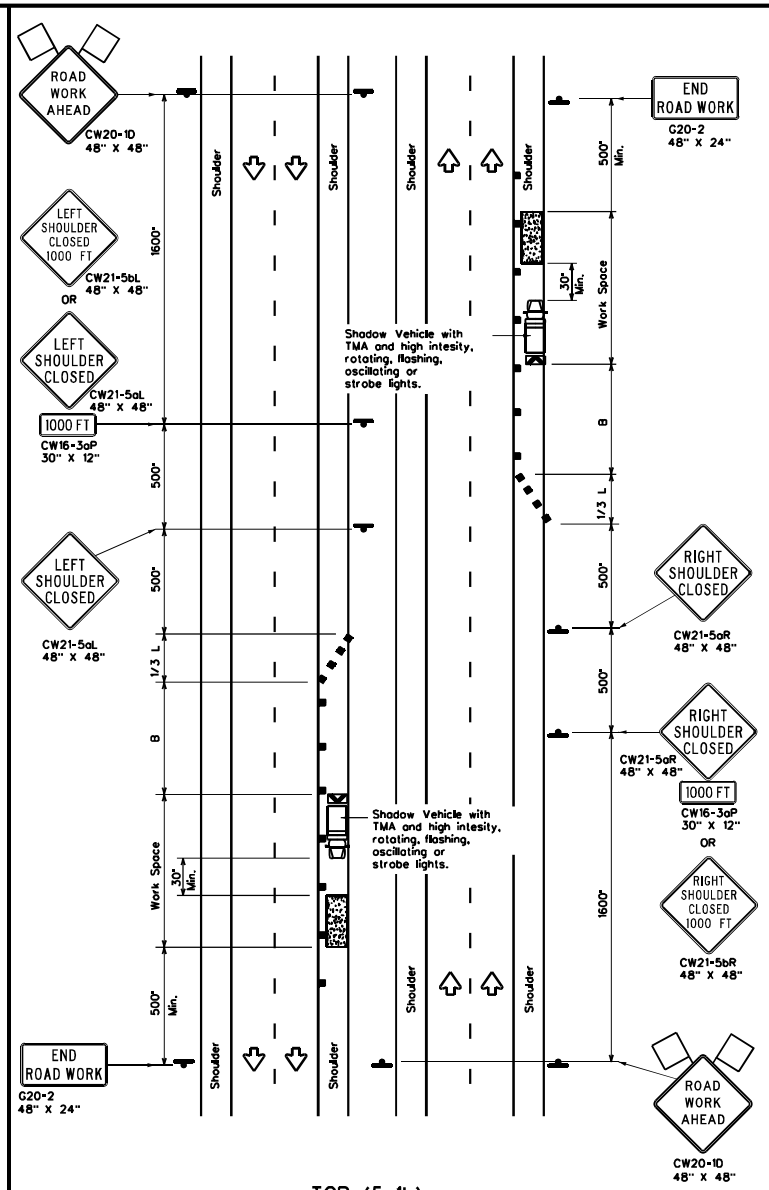
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	6435	88	001	IH 10, ETC.
	DIST	COUNTY		SHEET NO.
	ELP	CULBERSON, ETC.		21

106



TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

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

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

* Conventional Roads Only

* * Taper lengths have been rounded off.

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

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

GENERAL NOTES

1. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30' to 100' in advance of the area of crew exposure without adversely effecting the performance or quality of the work. Type 3 barricades or drums may be substituted when workers on foot are no longer present when approved by the Engineer.
2. 28" tall or taller one-piece cones will be allowed only for Short Duration or Short Term stationary operations when workers are present to maintain the devices upright and in proper location. Intermediate Term stationary work areas should use Drums, Vertical Panels or 42" tall two-piece cones.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

TCP(5-1)-18

FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	6435	88	001	IH 10, ETC.
	DIST	COUNTY		SHEET NO.
	ELP	CULBERSON, ETC.		22

190

DATE: 7/22/2024 1:36:00 PM
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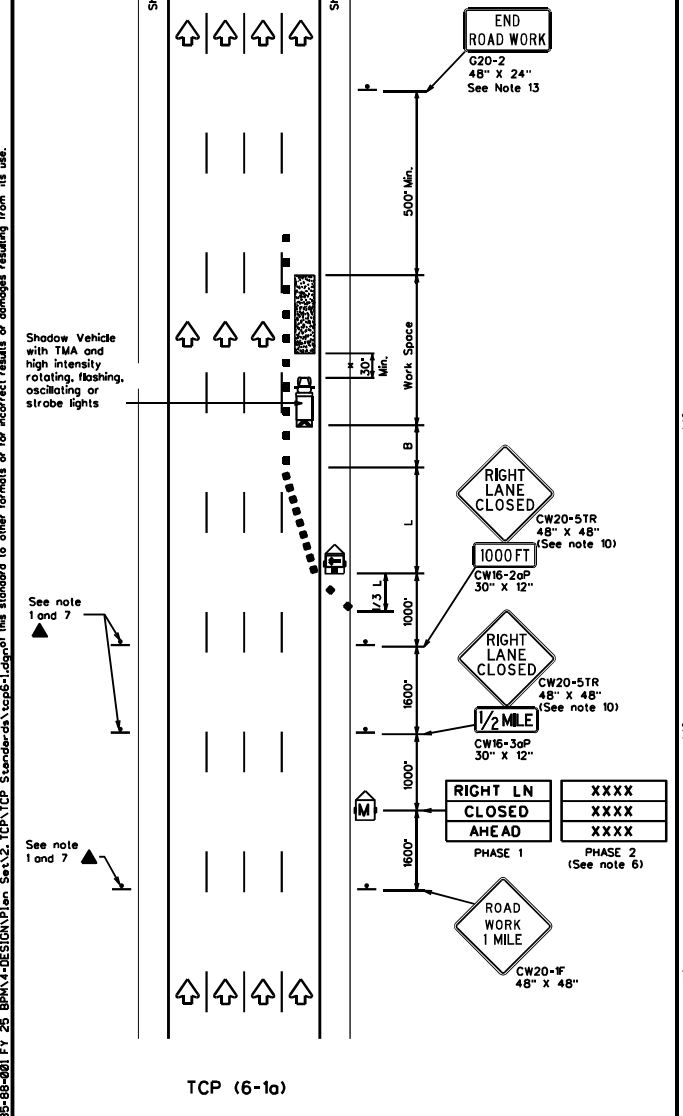
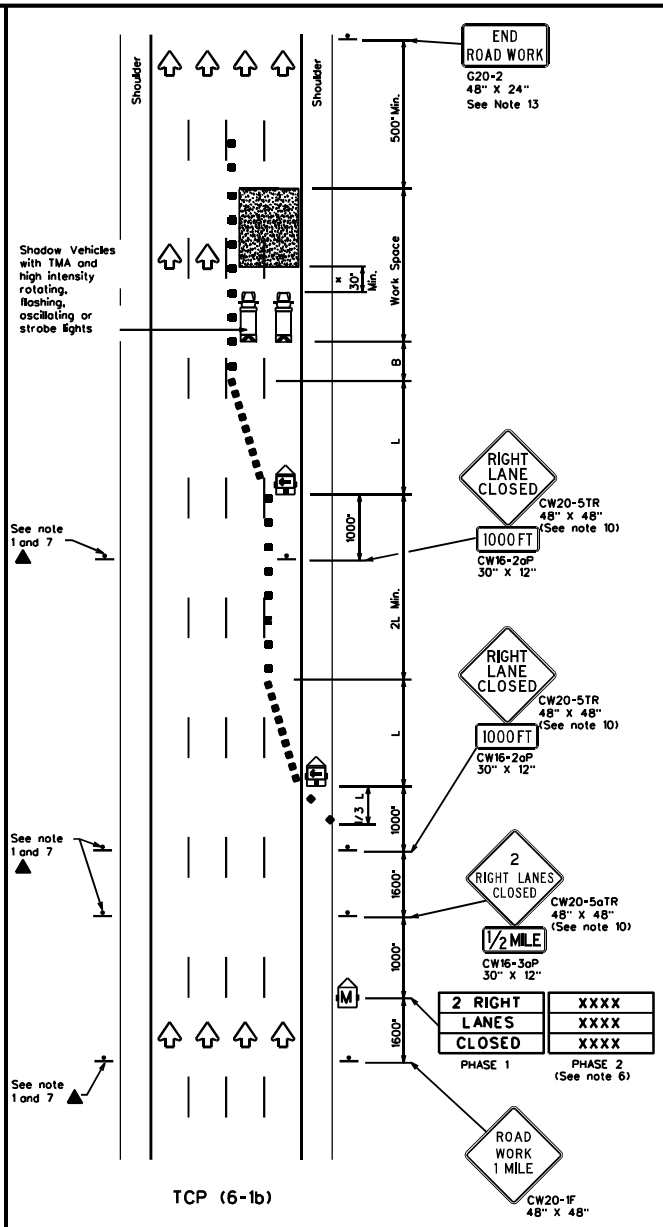


TCP (6-1a)

TYPICAL FREEWAY ONE LANE CLOSURE



TCP (6-1b)

TYPICAL FREEWAY TWO LANE CLOSURE

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

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

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

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

GENERAL NOTES

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

TCP(6-1)-12

FILE: tcp6-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-12	6435	88	001	IH 10, ETC.
	DIST	COUNTY		SHEET NO.
	ELP	CULBERSON, ETC.		23

201

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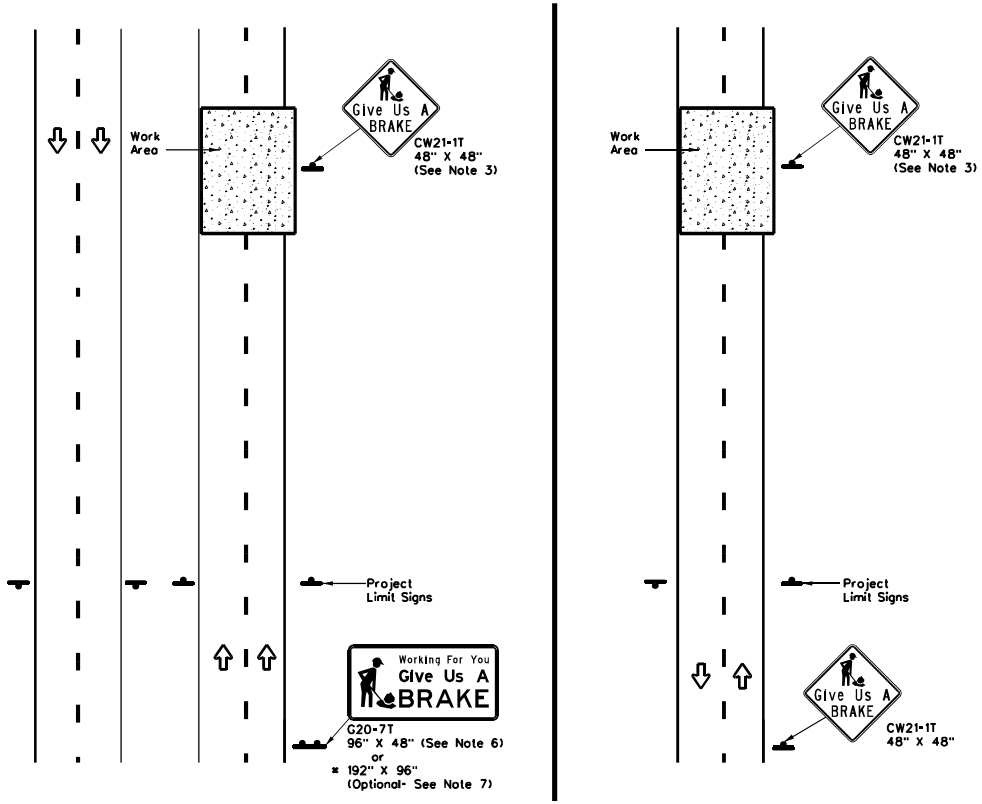

DIVIDED HIGHWAY

UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

* When the optional larger WORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" x 96" sign is required, the locations shall be noted elsewhere in the plans.

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL			DRILLED SHAFT 24" DIA. (LF)
						Size	(LF) ①	(LF) ②	
Orange	G20-7T	Working For You Give Us A BRAKE	96" X 48"	Type B_{FL} or C_{FL}	32	▲	▲	▲	▲
Orange	G20-7T	Working For You Give Us A BRAKE	192" X 96"	Type B_{FL} or C_{FL}	128	W8x18	16	17	12

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL}
BLACK	LEGEND & BORDERS	NON-REFLECTIVE ACRYLIC FILM

GENERAL NOTES

1. See BC and SMD sheets for additional sign support details.
2. Sign locations shall be approved by the Engineer.
3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
5. Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
6. The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
   - Item 636 - Aluminum Signs
   - Item 647 - Large Roadside Sign Supports and Assemblies.
   - Item 416 - Drilled Shaft Foundations
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.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	6435	88	001	IH 10, ETC.
6-96 5-98 7-13 8-96 3-03	DIST	COUNTY		SHEET NO.
	ELP	CULBERSON, ETC.		24

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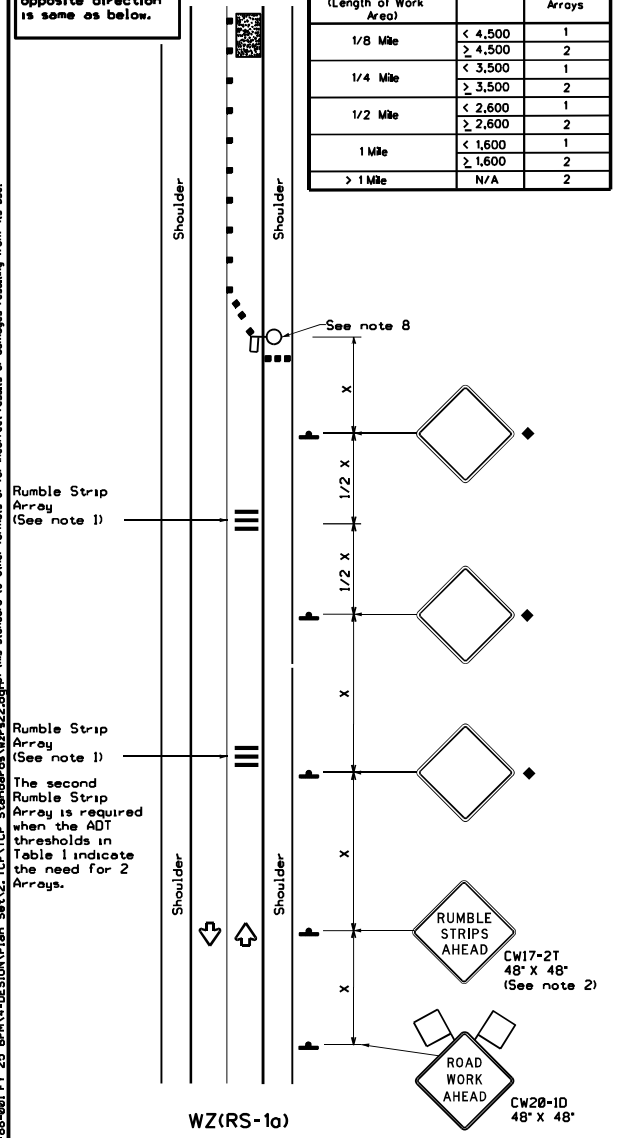
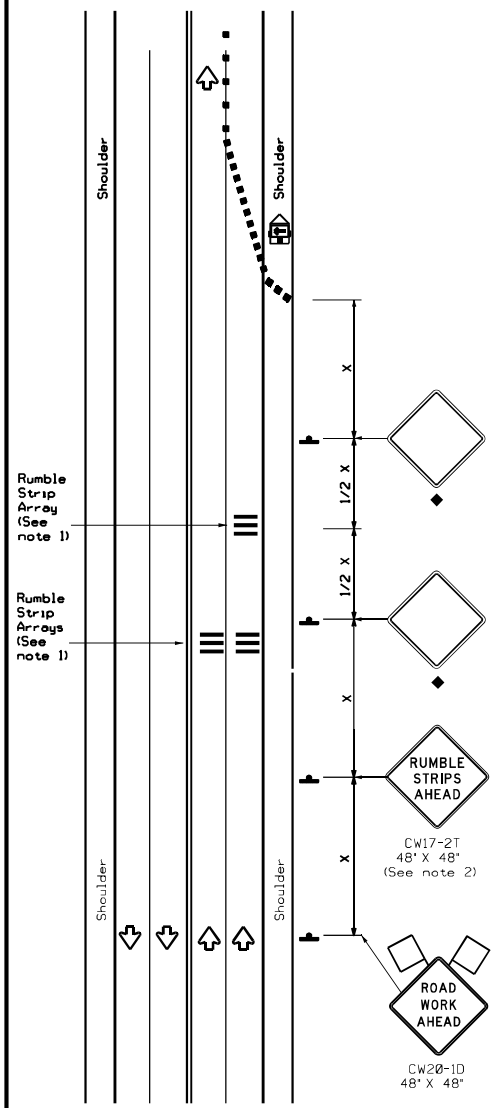
Warning sign and rumble strip sequence in opposite direction is same as below.

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



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

* Conventional Roads Only

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

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

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

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

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

Texas Department of Transportation

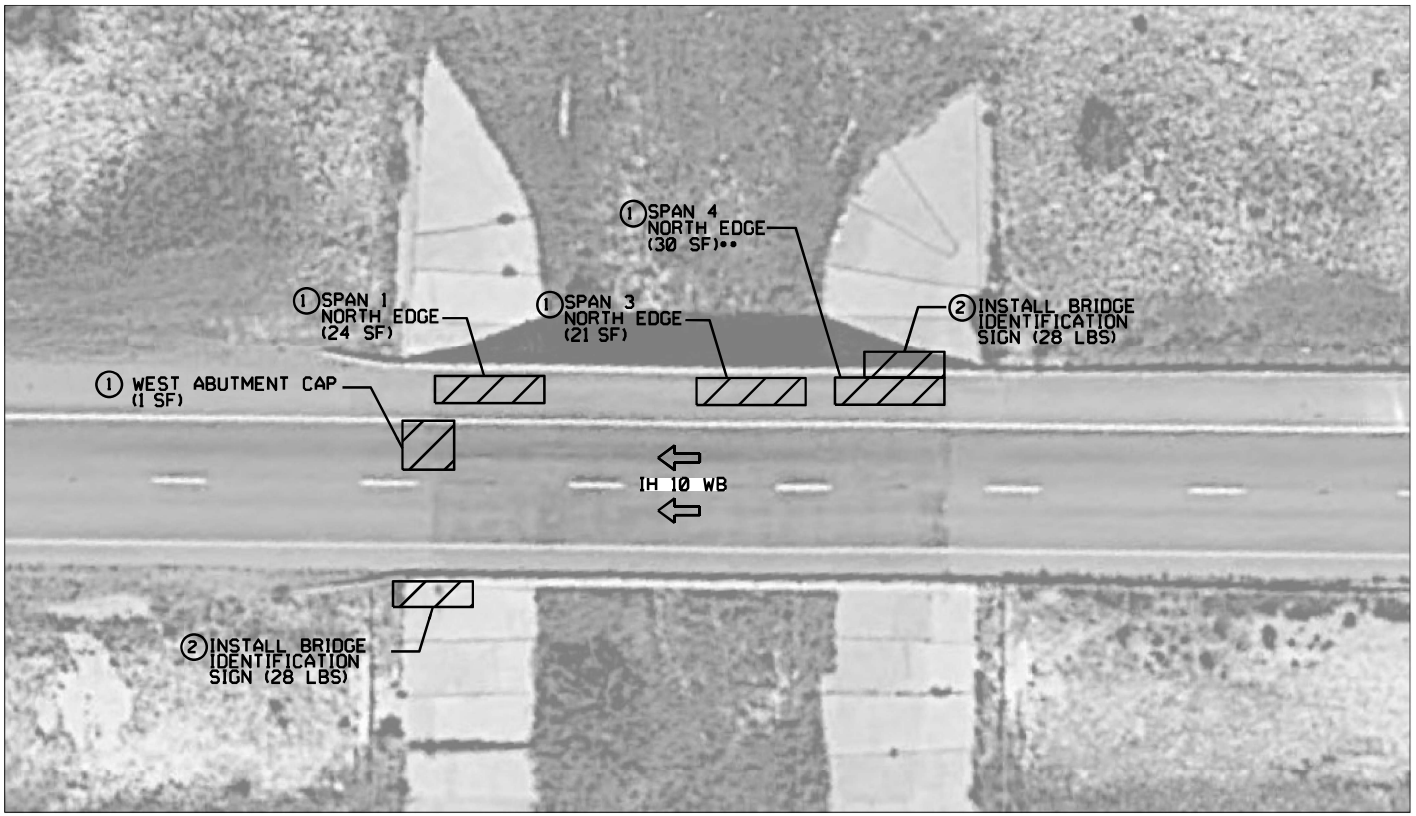
Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	6435	88	001	IH 10, ETC.
	DIST	COUNTY		SHEET NO.
	ELP	CULBERSON, ETC.		25

117



REPAIR CALL-OUT LEGEND

(ID) DESCRIPTION
(XX UNIT)

ESTIMATED QUANTITIES					
ID	ITEM	CODE	DESCRIPTIONS	UNIT	QTY
1	429	7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	76
2	442	7008	STR STEEL (MISCELLANEOUS BRIDGE)	LB	56

NOTES:

1. CONCRETE REPAIRS SHALL BE DONE IN ACCORDANCE WITH ITEM 429 AND AS SHOWN ON "CONCRETE REPAIR DETAIL" SHEETS.
2. DAMAGE TO SOUND CONCRETE OR TO REINFORCEMENT OUTSIDE THE REPAIR AREA WILL BE REPAIRED AT NO COST TO THE DEPARTMENT.
3. APPROVAL FROM THE ENGINEER SHALL BE OBTAINED FOR ALL MATERIAL AND METHODS OF APPLICATION PRIOR TO THE BEGINNING OF THE REPAIR WORK
4. QUANTITIES ARE APPROXIMATE AND SHALL BE FIELD VERIFIED PRIOR TO BEGINNING WORK.
5. ALL WORK MUST BE DONE WITHIN THE SCHEDULED TIME OR AS APPROVED BY THE ENGINEER.

••NOT PHOTOGRAPHED

STATE OF TEXAS
ZULTHAN O. SOTO
125506
PROFESSIONAL ENGINEER
, P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 1

IH 10 WB OVER BORACHO DRAW
NBI 24-055-0-0003-03-110

SHEET 1 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		26

DATE: 7/22/2024 1:36:02 PM
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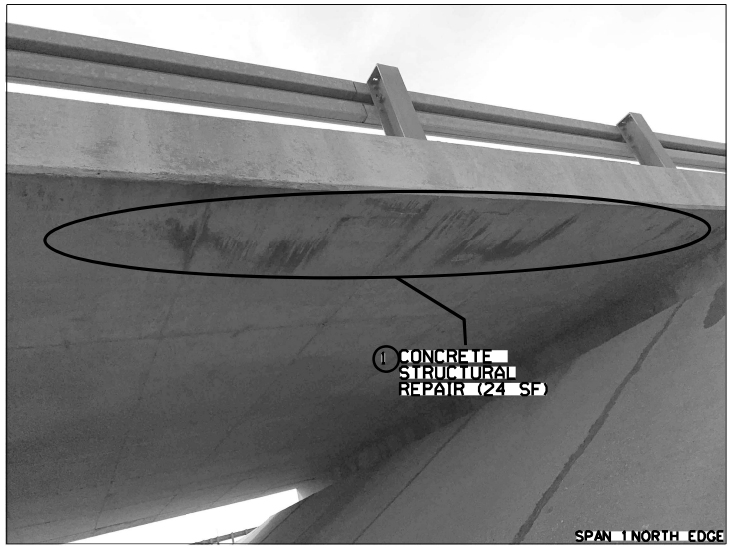
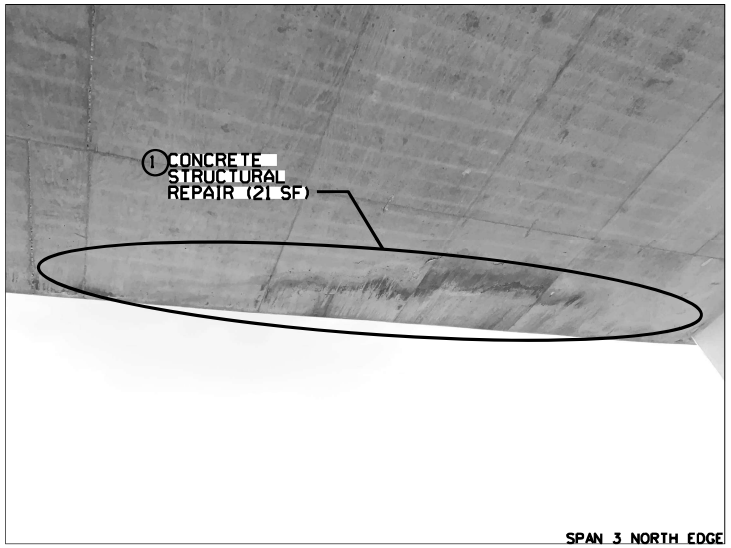
SPANS 1 & 3 AND WEST ABUTMENT

CONCRETE STURCTURE REPAIR





STATE OF TEXAS
ZULTHAIO. SOTO
125506
PROFESSIONAL ENGINEER
P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 1
IH 10 WB OVER BORACHO DRAW
NBI 24-055-0-0003-03-110

SHEET 2 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		27

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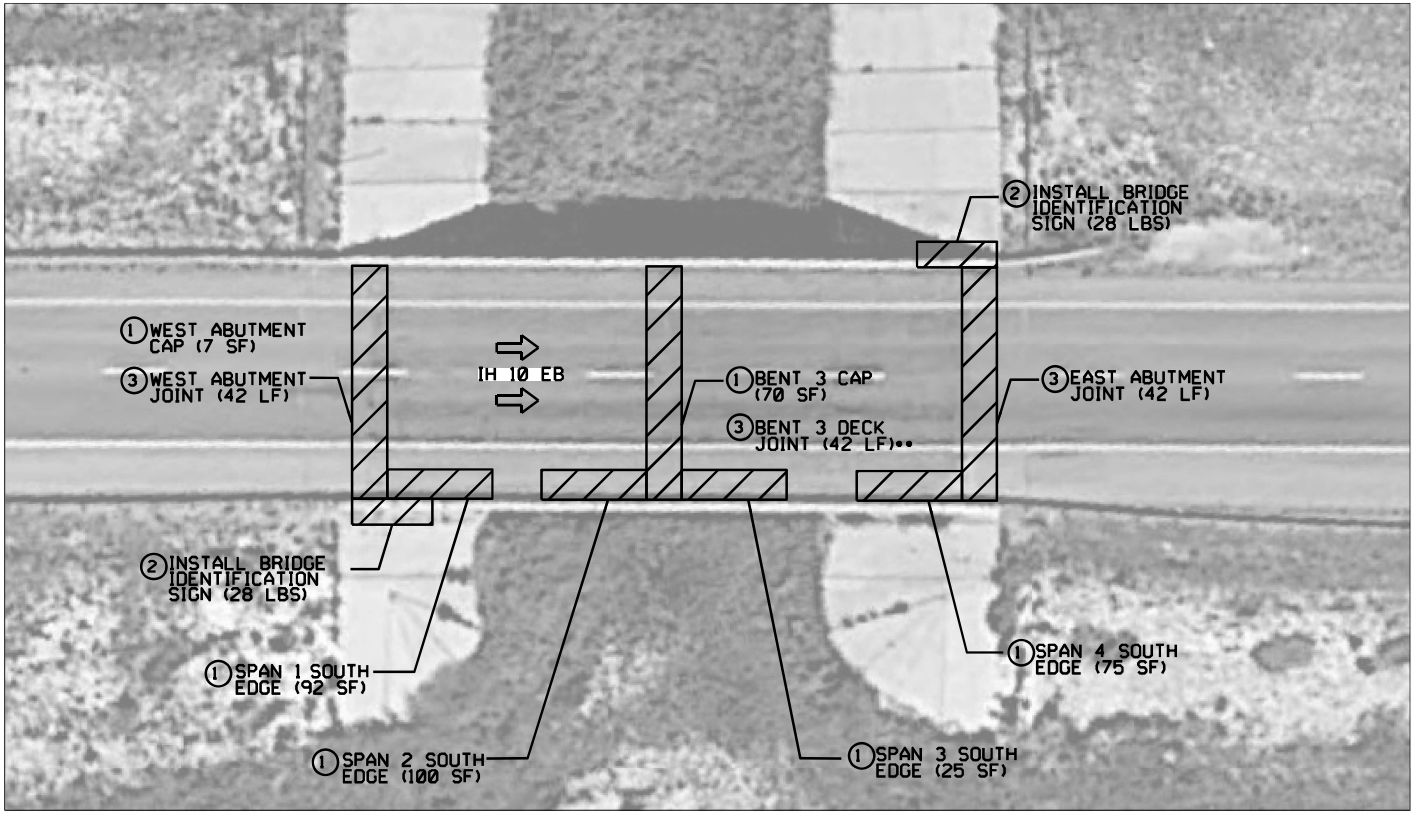

REPAIR CALL-OUT LEGEND

(ID) DESCRIPTION (XX UNIT)

ESTIMATED QUANTITIES					
ID	ITEM	CODE	DESCRIPTIONS	UNIT	QTY
1	429	7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	369
2	442	7008	STR STEEL (MISCELLANEOUS BRIDGE)	LB	56
3	785	7002	BRIDGE JOINT REPAIR (HEADER)	LF	126

NOTES:

1. CONCRETE REPAIRS SHALL BE DONE IN ACCORDANCE WITH ITEM 429 AND AS SHOWN ON "CONCRETE REPAIR DETAIL" SHEETS.
2. DAMAGE TO SOUND CONCRETE OR TO REINFORCEMENT OUTSIDE THE REPAIR AREA WILL BE REPAIRED AT NO COST TO THE DEPARTMENT.
3. APPROVAL FROM THE ENGINEER SHALL BE OBTAINED FOR ALL MATERIAL AND METHODS OF APPLICATION PRIOR TO THE BEGINNING OF THE REPAIR WORK
4. SEE BRIDGE JOINT REPAIR DETAILS FOR JOINT HEADER REPAIR WORK.
5. QUANTITIES ARE APPROXIMATE AND SHALL BE FIELD VERIFIED PRIOR TO BEGINNING WORK.
6. ALL WORK MUST BE DONE WITHIN THE SCHEDULED TIME OR AS APPROVED BY THE ENGINEER.

••NOT PHOTOGRAPHED

STATE OF TEXAS
ZULTHANO SOTO
125506
LICENSED
PROFESSIONAL ENGINEER
, P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT LOCATION 2

IH 10 EB OVER BORACHO DRAW
NBI 24-055-0-0003-03-111

SHEET 1 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		28

DATE: 7/22/2024 1:36:12 PM
FILE: M:\6435-88-001 FY 25 BPM\4-DESIGN\Plan Set\7. BRIDGE\L2_Layout.dgn

SPANS 1, 2, 3, & 4 FROM WEST

CONCRETE STURCTURE REPAIR

STATE OF TEXAS
ZOLTHAN O. SOTO
125506
LICENSED
PROFESSIONAL ENGINEER
P.E.

07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 2

IH 10 EB OVER BORACHO DRAW
NBI 24-055-0-0003-03-111

SHEET 2 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		29

DATE: 7/22/2024 1:36:17 PM
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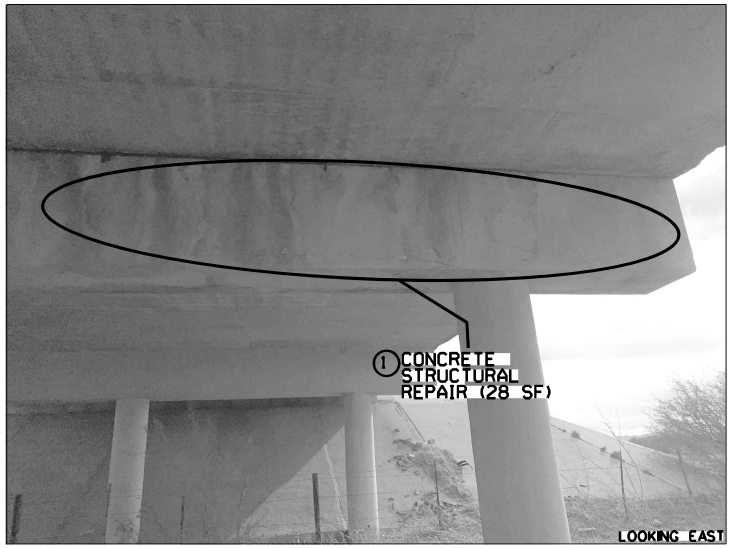
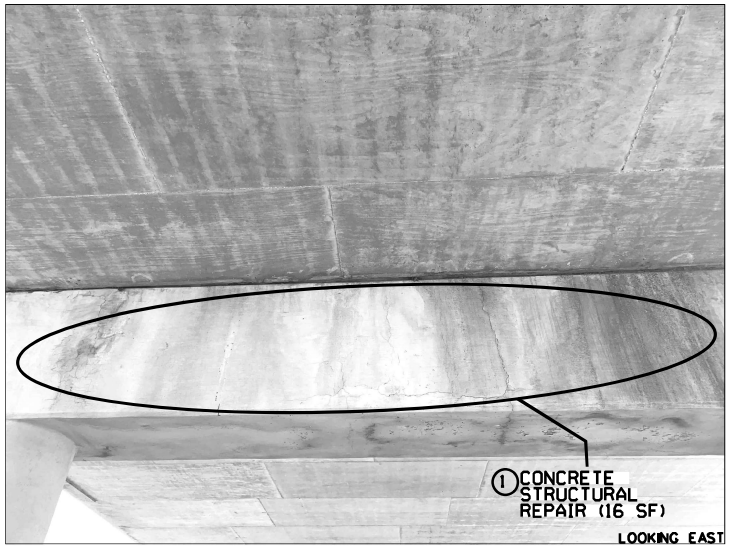
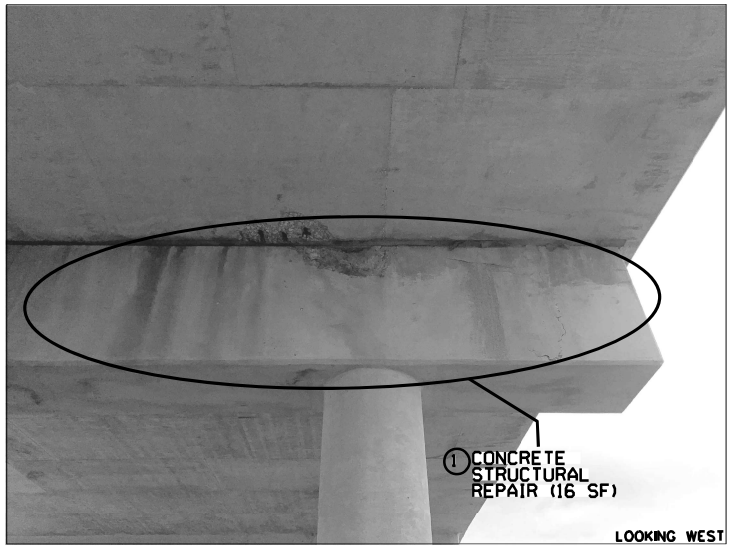
BENT CAP 3 FROM WEST

CONCRETE STURCTURE REPAIR







STATE OF TEXAS
ZOLTHAN O. SOTO
125506
PROFESSIONAL ENGINEER
R.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 2
IH 10 EB OVER BORACHO DRAW
NBI 24-055-0-0003-03-111

SHEET 3 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		30

DATE: 7/22/2024 1:36:25 PM
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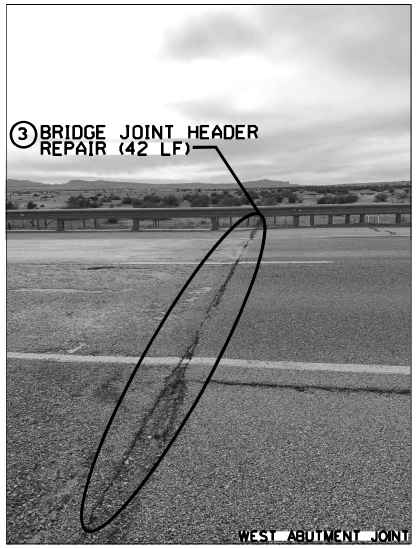
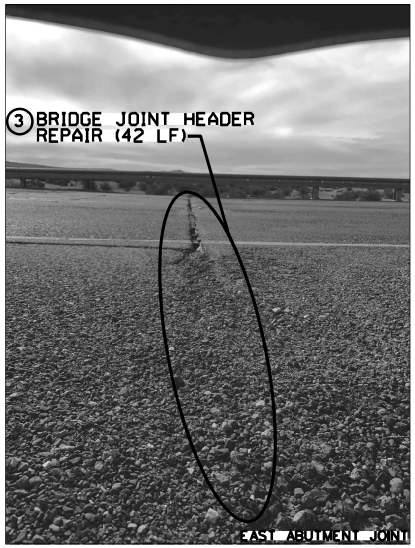
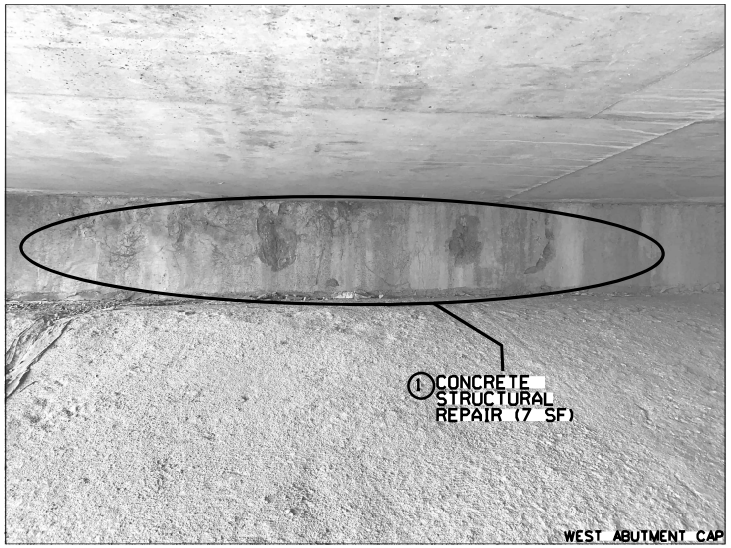
WEST AND EAST ABUTMENTS

CONCRETE STURCTURE REPAIR
BRIDGE JOINT HEADER REPAIR







STATE OF TEXAS
ZULTHANO. SOTO
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PROFESSIONAL ENGINEER
, P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 2
IH 10 EB OVER BORACHO DRAW
NBI 24-055-0-0003-03-111

SHEET 4 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		31

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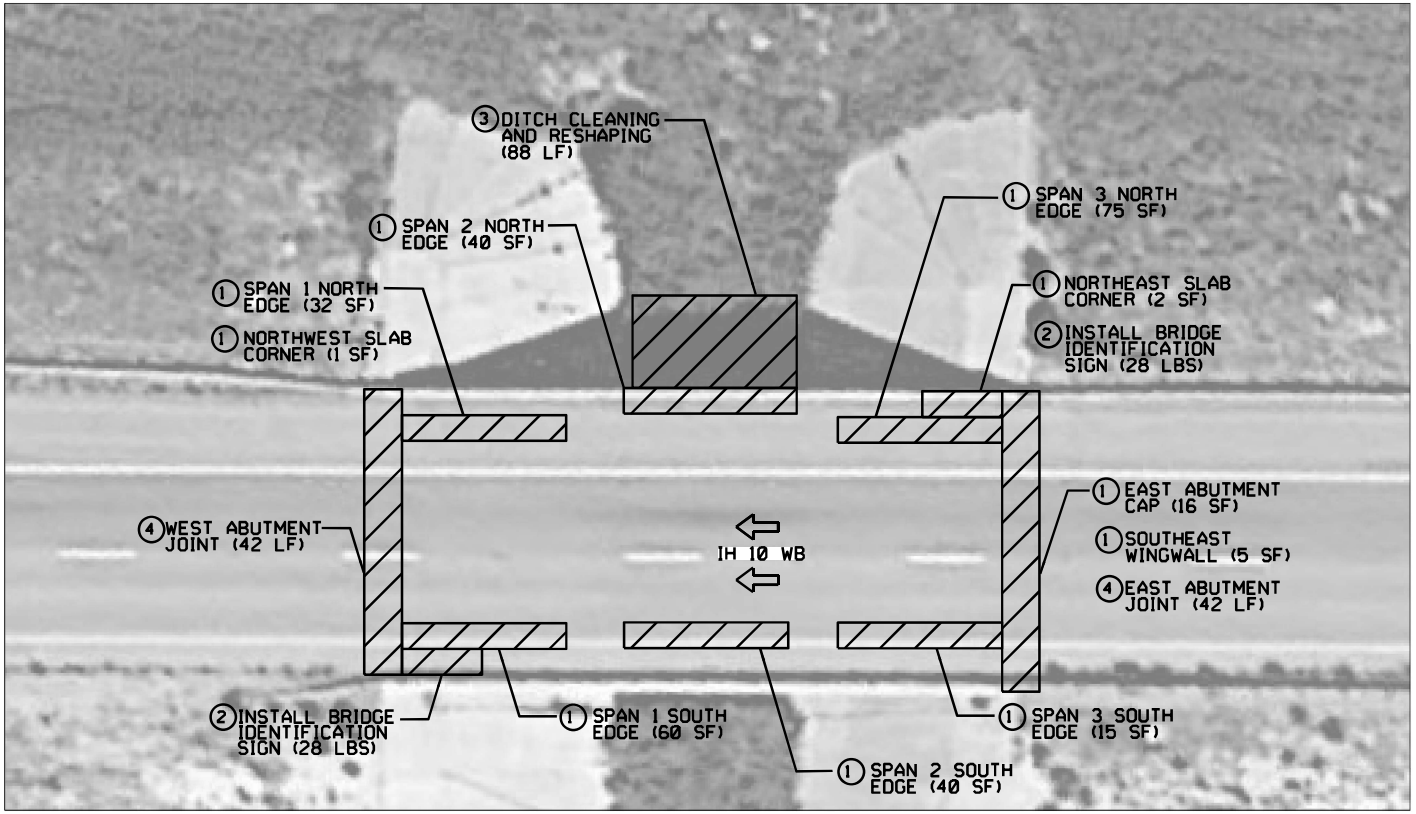

REPAIR CALL-OUT LEGEND

(ID) DESCRIPTION (XX UNIT)

ESTIMATED QUANTITIES					
ID	ITEM	CODE	DESCRIPTIONS	UNIT	QTY
1	429	7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	286
2	442	7008	STR STEEL (MISCELLANEOUS BRIDGE)	LB	56
3	760	7001	DITCH CLEANING AND RESHAPING (FOOT)	LF	88
4	785	7002	BRIDGE JOINT REPAIR (HEADER)	LF	84

NOTES:

1. CONCRETE REPAIRS SHALL BE DONE IN ACCORDANCE WITH ITEM 429 AND AS SHOWN ON "CONCRETE REPAIR DETAIL" SHEETS.
2. DAMAGE TO SOUND CONCRETE OR TO REINFORCEMENT OUTSIDE THE REPAIR AREA WILL BE REPAIRED AT NO COST TO THE DEPARTMENT.
3. APPROVAL FROM THE ENGINEER SHALL BE OBTAINED FOR ALL MATERIAL AND METHODS OF APPLICATION PRIOR TO THE BEGINNING OF THE REPAIR WORK
4. SEE BRIDGE JOINT REPAIR DETAILS FOR JOINT HEADER REPAIR WORK.
5. QUANTITIES ARE APPROXIMATE AND SHALL BE FIELD VERIFIED PRIOR TO BEGINNING WORK.
6. ALL WORK MUST BE DONE WITHIN THE SCHEDULED TIME OR AS APPROVED BY THE ENGINEER.

STATE OF TEXAS
ZOLTHAN O. SOTO
125506
LICENSED PROFESSIONAL ENGINEER
P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT LOCATION 3

IH 10 WB OVER DRAW
NBI 24-055-0-0003-03-121

SHEET 1 OF 5

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		32

DATE: 7/22/2024 1:36:36 PM
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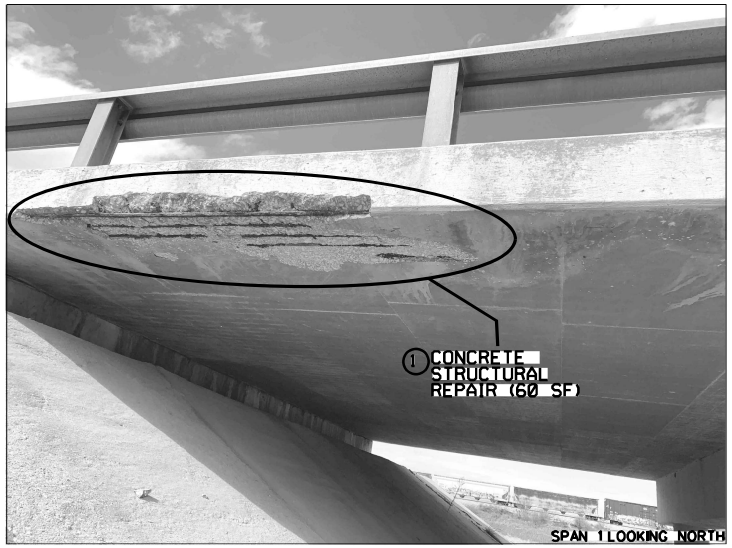
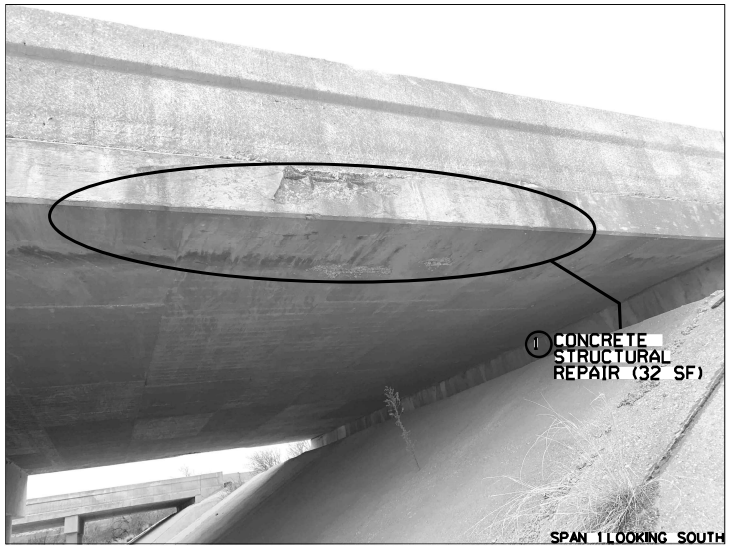
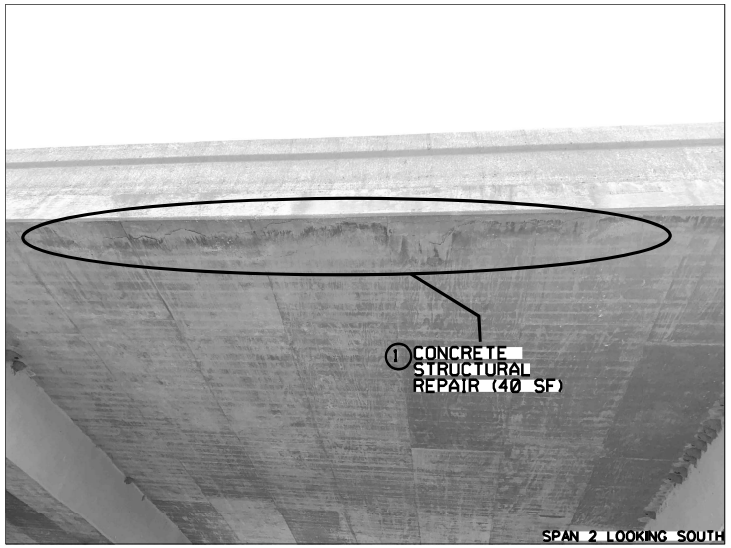
SPANS 1 & 2 FROM WEST

CONCRETE STURCTURE REPAIR







STATE OF TEXAS
ZULTHAN O. SOTO
125506
LICENSED PROFESSIONAL ENGINEER
P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 3
IH 10 WB OVER DRAW
NBI 24-055-0-0003-03-121

SHEET 2 OF 5

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		33

DATE: 7/22/2024 1:36:42 PM
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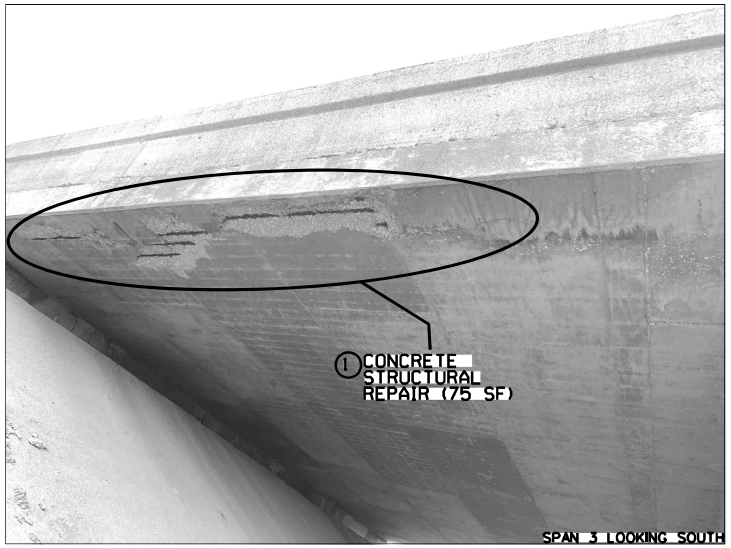
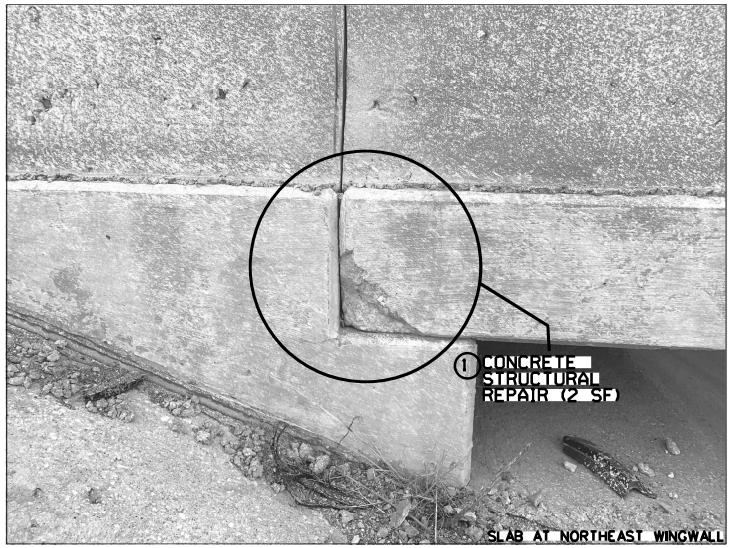
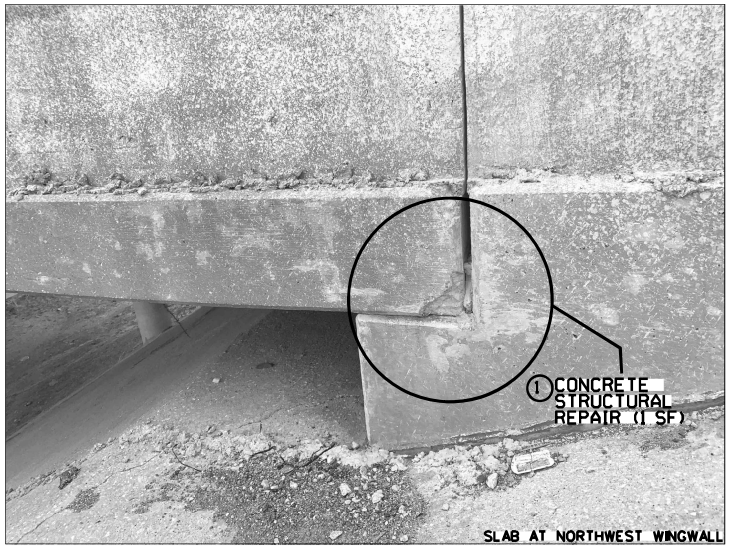
SLAB AT SPAN 3 AND ABUTMENTS

CONCRETE STURCTURE REPAIR







STATE OF TEXAS
ZOLTHAN O. SOTO
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PROFESSIONAL ENGINEER
, P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 3
IH 10 WB OVER DRAW
NBI 24-055-0-0003-03-121

SHEET 3 OF 5

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		34

DATE: 7/22/2024 1:36:49 PM
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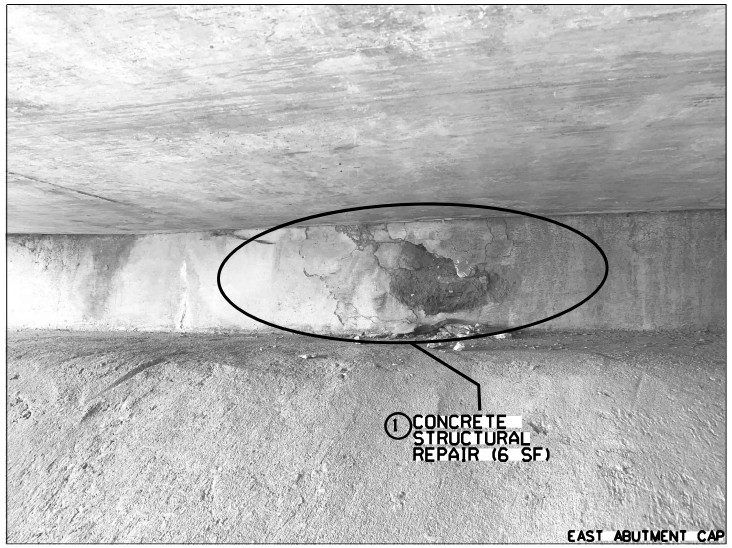
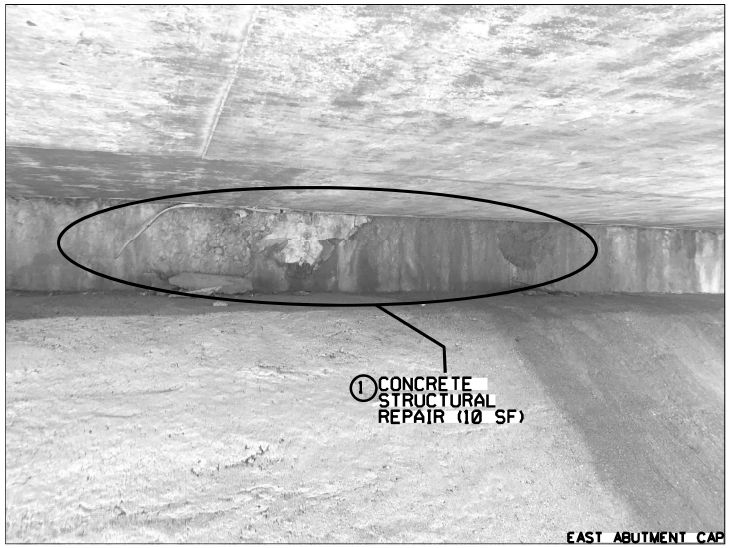
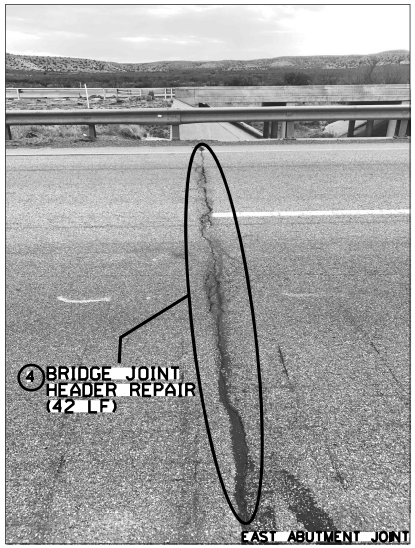
EAST ABUTMENT

CONCRETE STURCTURE REPAIR







STATE OF TEXAS
ZOLTHAN O. SOTO
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PROFESSIONAL ENGINEER
P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 3
IH 10 WB OVER DRAW
NBI 24-055-0-0003-03-121

SHEET 4 OF 5

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		35

DATE: 7/22/2024 1:36:56 PM
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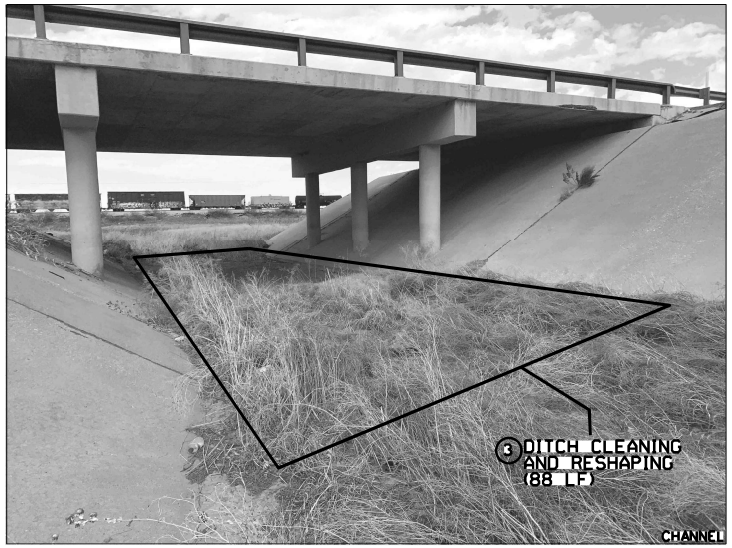
WEST ABUTMENT JOINT AND CHANNEL

CONCRETE STURCTURE REPAIR
DITCH CLEANING AND RESHAPING



STATE OF TEXAS
ZOLTHAN O. SOTO
125506
LICENSED PROFESSIONAL ENGINEER
P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 3
IH 10 WB OVER DRAW
NBI 24-055-0-0003-03-121

SHEET 5 OF 5

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		36

DATE: 7/22/2024 1:37:03 PM
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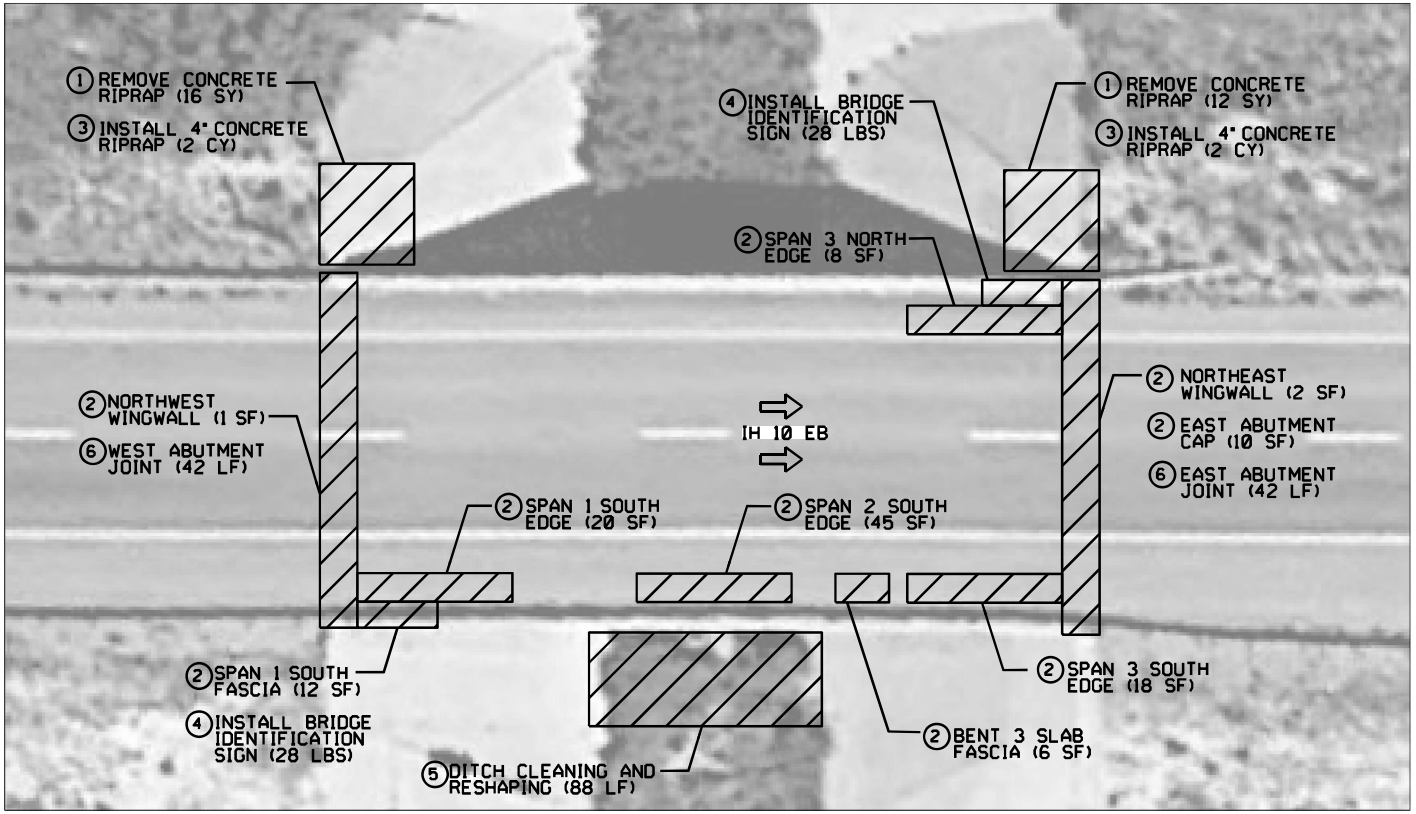


REPAIR CALL-OUT LEGEND

(ID) DESCRIPTION (XX UNIT)

STATE OF TEXAS
ZULTHAN O. SOTO
125506
PROFESSIONAL ENGINEER
P.E.
07/23/2024

ESTIMATED QUANTITIES					
ID	ITEM	CODE	DESCRIPTIONS	UNIT	QTY
1	104	7006	REMOV CONC (RIPRAP)	SY	28
2	429	7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	122
3	432	7001	RIPRAP (CONC)(4 IN)	CY	4
4	442	7008	STR STEEL (MISCELLANEOUS BRIDGE)	LB	56
5	760	7001	DITCH CLEANING AND RESHAPING (FOOT)	LF	88
6	785	7002	BRIDGE JOINT REPAIR (HEADER)	LF	84

NOTES:

1. CONCRETE REPAIRS SHALL BE DONE IN ACCORDANCE WITH ITEM 429 AND AS SHOWN ON "CONCRETE REPAIR DETAIL" SHEETS.
2. DAMAGE TO SOUND CONCRETE OR TO REINFORCEMENT OUTSIDE THE REPAIR AREA WILL BE REPAIRED AT NO COST TO THE DEPARTMENT.
3. APPROVAL FROM THE ENGINEER SHALL BE OBTAINED FOR ALL MATERIAL AND METHODS OF APPLICATION PRIOR TO THE BEGINNING OF THE REPAIR WORK
4. SEE BRIDGE JOINT REPAIR DETAILS FOR JOINT HEADER REPAIR WORK.
5. QUANTITIES ARE APPROXIMATE AND SHALL BE FIELD VERIFIED PRIOR TO BEGINNING WORK.
6. ALL WORK MUST BE DONE WITHIN THE SCHEDULED TIME OR AS APPROVED BY THE ENGINEER.

FY 2025 BPM

BRIDGE LAYOUT LOCATION 4

IH 10 EB OVER DRAW
NBI 24-055-0-0003-03-122

SHEET 1 OF 5

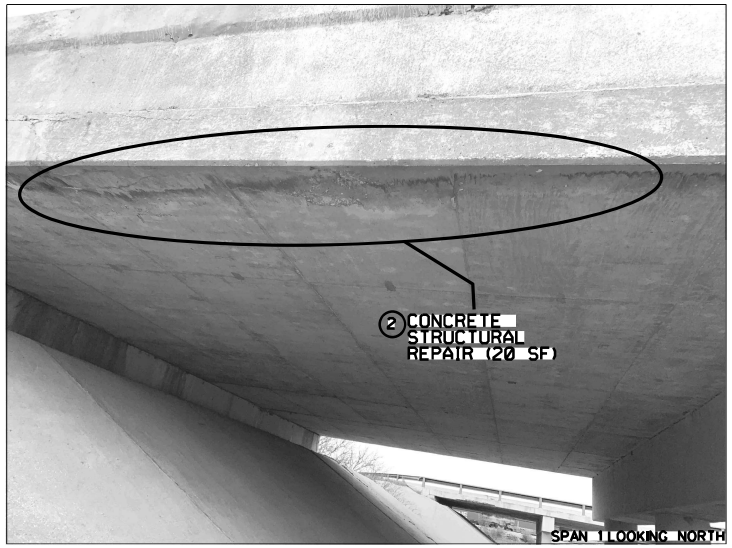
Texas Department of Transportation

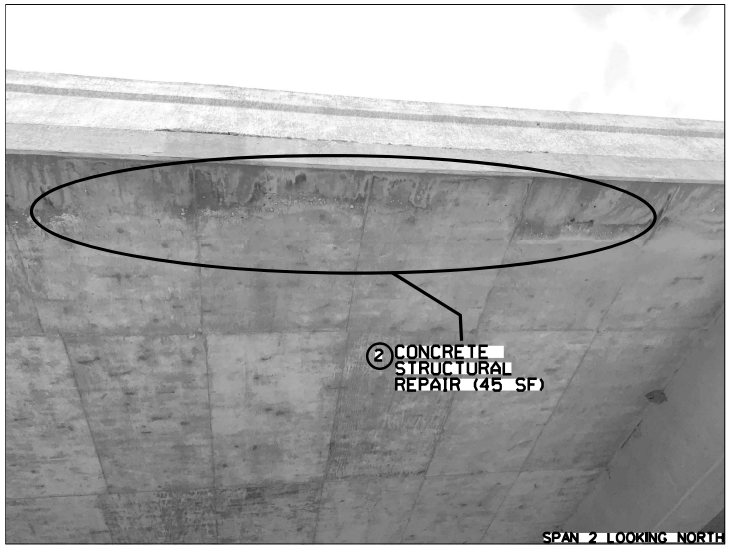
CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		37

DATE: 7/22/2024 4:21:04 PM
FILE: M:\6435-88-001 FY 25 BPM\4-DESIGN\Plan Set\7. BRIDGE\L4_Layout.dgn

SPANS 1, 2, & 3 FROM WEST

CONCRETE STURCTURE REPAIR





STATE OF TEXAS
ZULTHAN O. SOTO
125506
LICENSED
PROFESSIONAL ENGINEER
P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 4
IH 10 EB OVER DRAW
NBI 24-055-0-0003-03-122

SHEET 2 OF 5

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		38

DATE: 7/22/2024 1:37:13 PM
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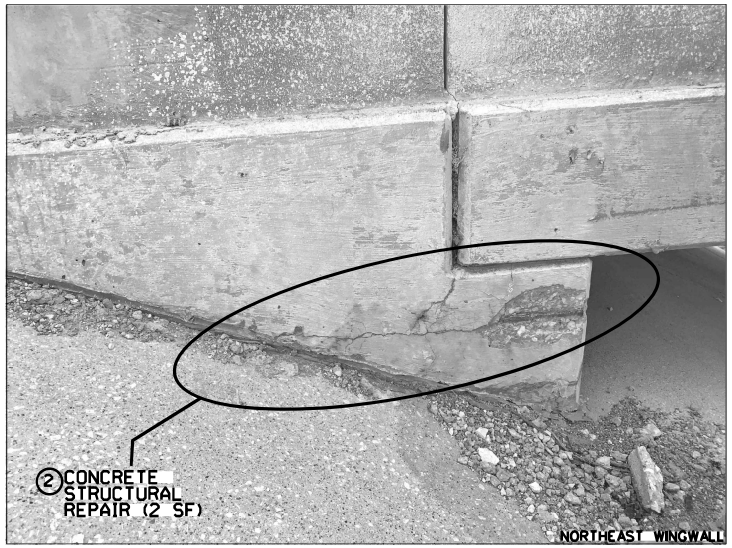
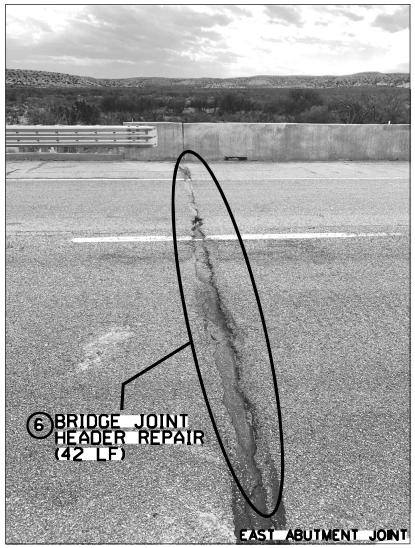
EAST ABUTMENT

CONCRETE STURCTURE REPAIR





STATE OF TEXAS
ZULTHANO. SOTO
125506
LICENSED
PROFESSIONAL ENGINEER
R.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 4
IH 10 EB OVER DRAW
NBI 24-055-0-0003-03-122

SHEET 3 OF 5

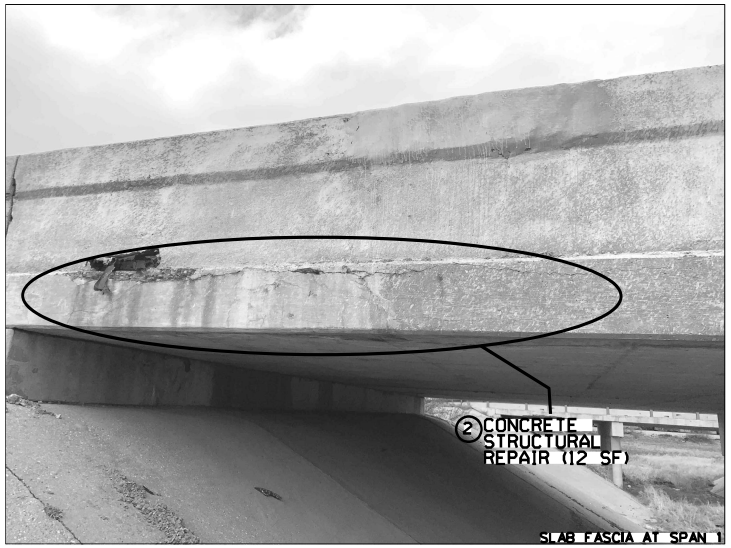
Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		39

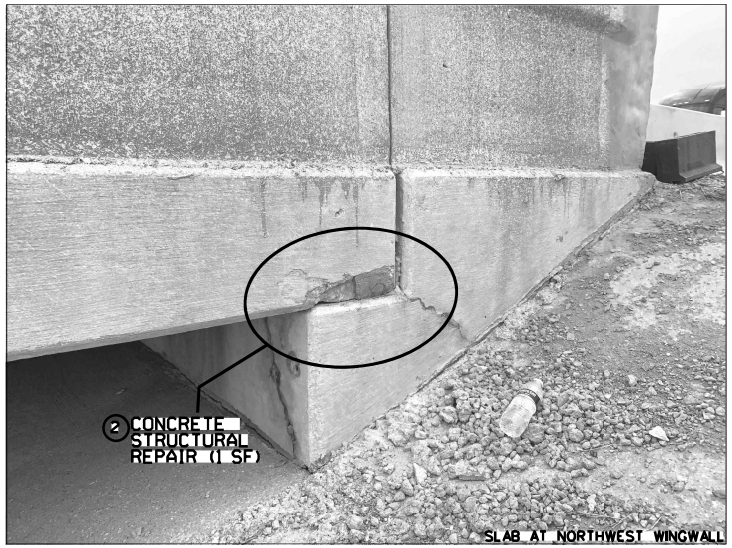
DATE: 7/22/2024 1:37:19 PM
FILE: M:\6435-88-001 FY 25 BPM\4-DESIGN\Plan Set\7.BRIDGE\L4_Pictures 2.dgn

SLAB AND WEST ABUTMENT
CONCRETE STURCTURE REPAIR

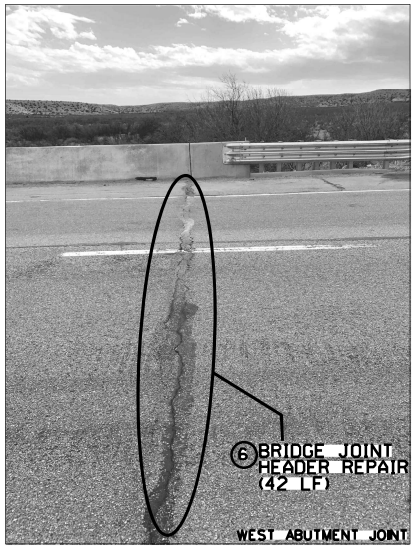
SLAB FASCIA AT BENT 3



SLAB FASCIA AT SPAN 1



SLAB AT NORTHWEST WINGWALL



WEST ABUTMENT JOINT

STATE OF TEXAS
ZULTHAN O. SOTO
125506
PROFESSIONAL LICENSED ENGINEER
P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 4
IH 10 EB OVER DRAW
NBI 24-055-0-0003-03-122

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		40

DATE: 7/22/2024 1:37:26 PM
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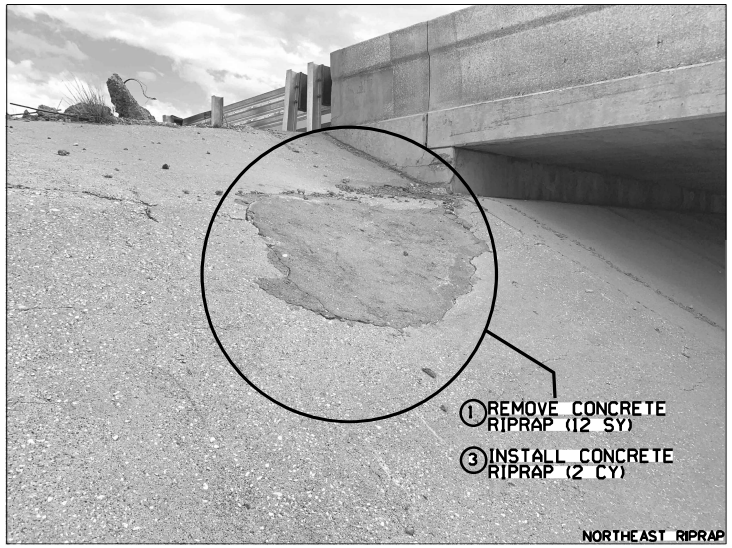
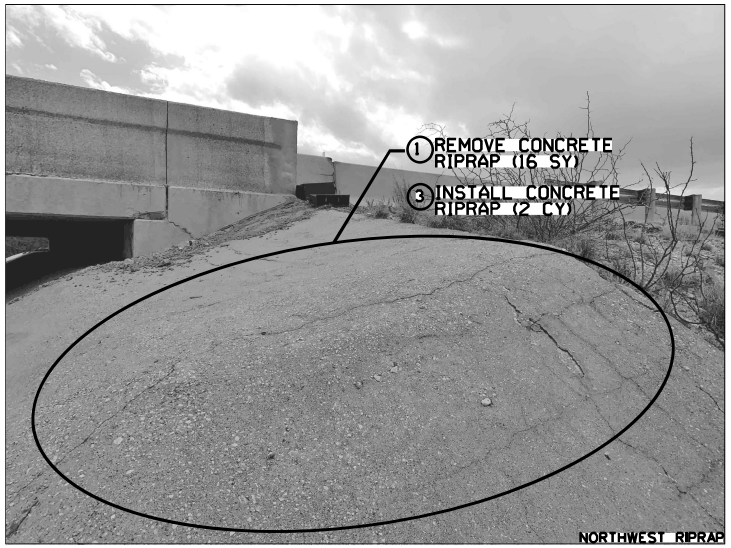
RIPRAP AND CHANNEL

CONCRETE RIPRAP REPAIR
DITCH CEALNING AND RESHAPING





STATE OF TEXAS
ZOLTHAN O. SOTO
125506
LICENSED
PROFESSIONAL ENGINEER
P.E.
07/23/2024

FY 2025 BPM

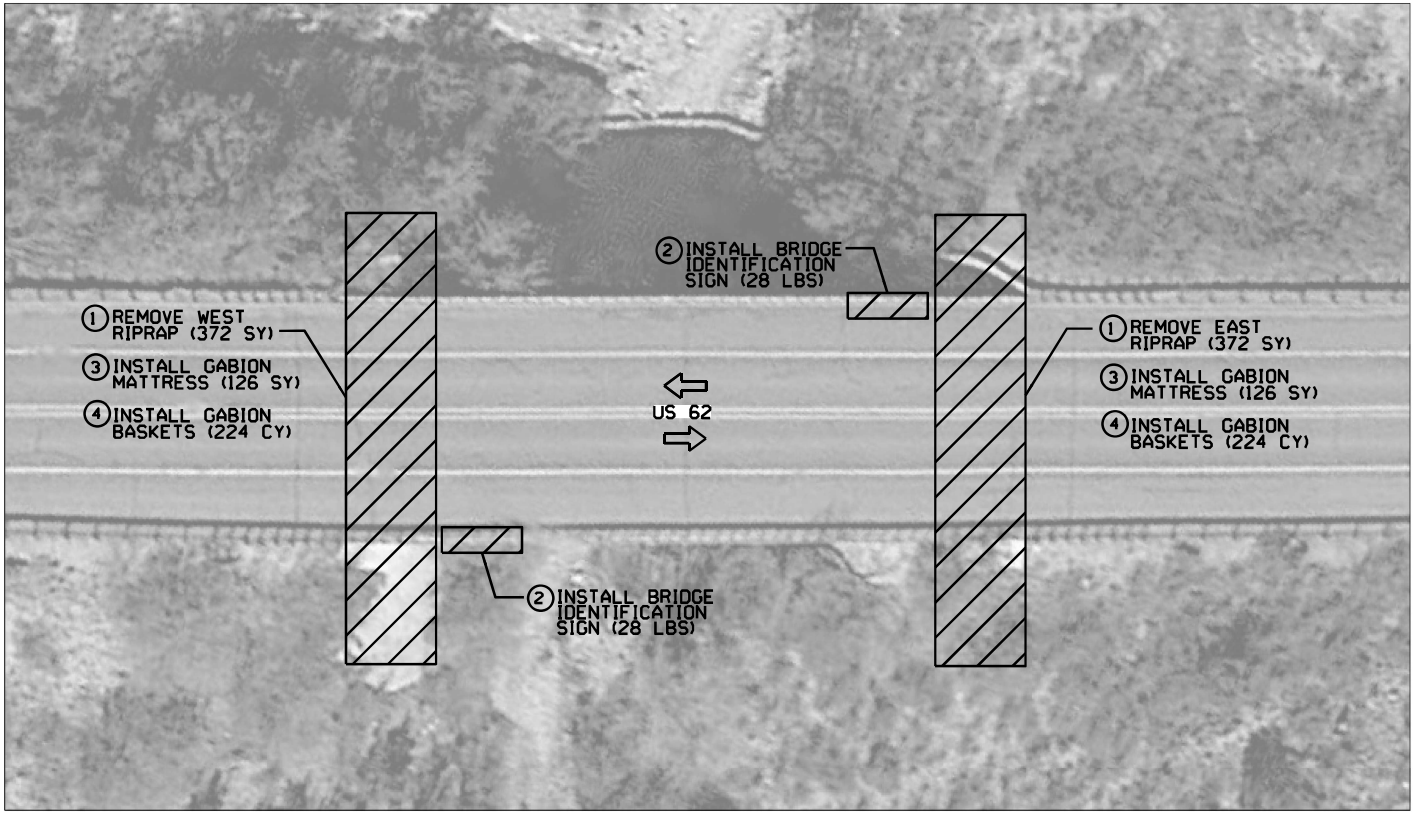
BRIDGE LAYOUT
LOCATION 4
IH 10 EB OVER DRAW
NBI 24-055-0-0003-03-122

SHEET 5 OF 5

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		41

DATE: 7/22/2024 1:37:33 PM
FILE: M:\6435-88-001 FY 25 BPM\4-DESIGN\Plan Set\7.BRIDGE\L4_Pictures 4.dgn



REPAIR CALL-OUT LEGEND

(ID) DESCRIPTION (XX UNIT)

STATE OF TEXAS
ZOLTHAN O. SOTO
125506
PROFESSIONAL ENGINEER
P.E.
07/23/2024

ESTIMATED QUANTITIES					
ID	ITEM	CODE	DESCRIPTIONS	UNIT	QTY
1	104	7006	REMOV CONC (RIPRAP)	SY	744
2	442	7008	STR STEEL (MISCELLANEOUS BRIDGE)	LB	56
3	459	7008	GABION MATRRESSES(GALV)(18 IN)	SY	252
4	459	7010	GABIONS(3*3)(GALV)	CY	448

NOTES:

1. APPROVAL FROM THE ENGINEER SHALL BE OBTAINED FOR ALL MATERIAL AND METHODS OF APPLICATION PRIOR TO THE BEGINNING OF THE REPAIR WORK
2. QUANTITIES ARE APPROXIMATE AND SHALL BE FIELD VERIFIED PRIOR TO BEGINNING WORK.
3. ALL WORK MUST BE DONE WITHIN THE SCHEDULED TIME OR AS APPROVED BY THE ENGINEER.
4. COORDINATE ANY ACCESS AND FENCE LINES WITH ADJACENT PROPERTY OWNER AND THE ENGINEER.

FY 2025 BPM

BRIDGE LAYOUT LOCATION 5

US 62 OVER X-T CANYON
NBI 24-055-0-0233-01-041

SHEET 1 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		42

DATE: 7/22/2024 1:37:39 PM
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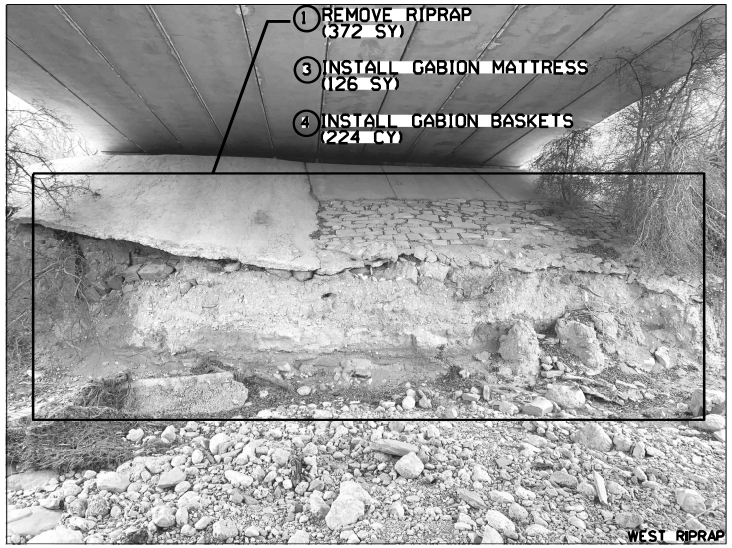
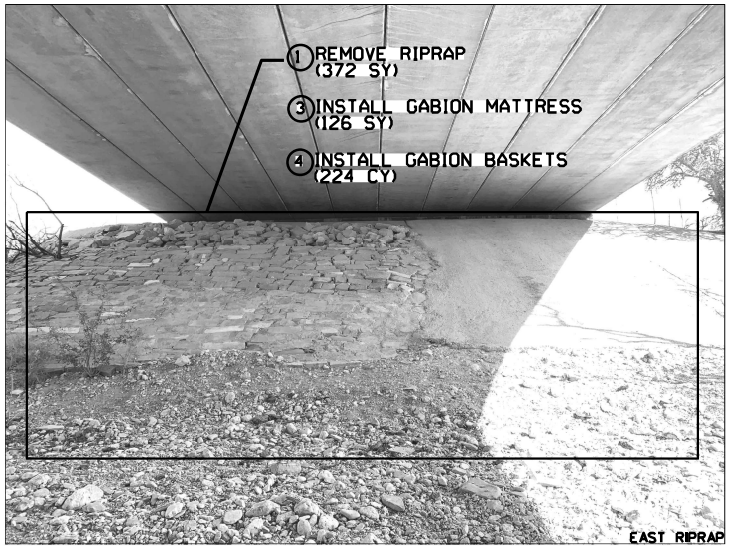
RIPRAP

RIPRAP REPAIR





STATE OF TEXAS
ZULTHANO. SOTO
125506
PROFESSIONAL ENGINEER
P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 5
US 62 OVER X-T CANYON
NBI 24-055-0-0233-01-041

SHEET 2 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		43

DATE: 7/22/2024 1:37:43 PM
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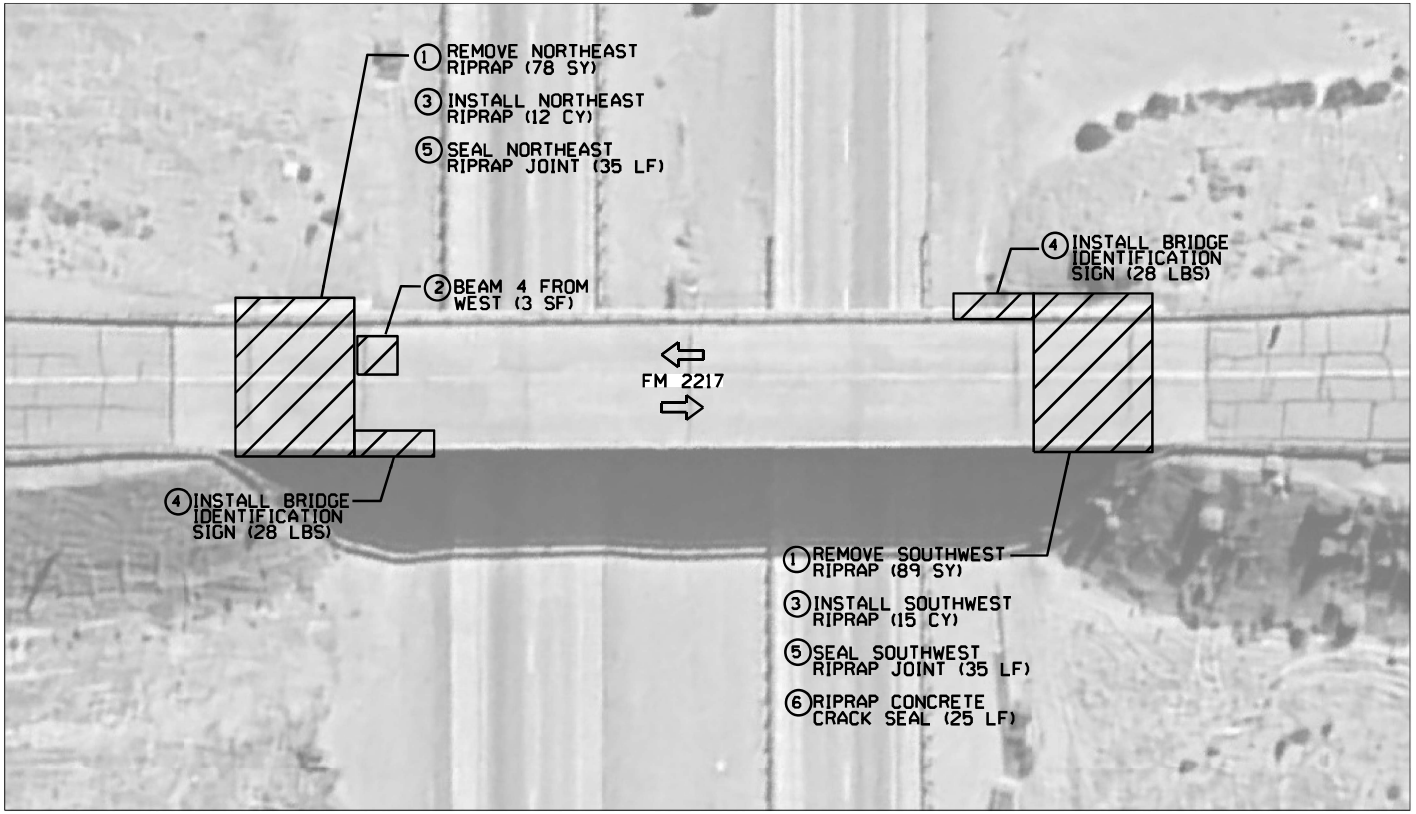


REPAIR CALL-OUT LEGEND

(ID) DESCRIPTION (XX UNIT)

STATE OF TEXAS
ZOLTHAN O. SOTO
125506
PROFESSIONAL ENGINEER
LICENSED
P.E.
07/23/2024

ESTIMATED QUANTITIES					
ID	ITEM	CODE	DESCRIPTIONS	UNIT	QTY
1	104	7006	REMOV CONC (RIPRAP)	SY	167
2	429	7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	3
3	432	7001	RIPRAP (CONC)(4 IN)	CY	27
4	442	7008	STR STEEL (MISCELLANEOUS BRIDGE)	LB	56
5	454	7010	JOINT SEALANT	LF	70
6	780	7002	CNC CRACK REPAIR (DISCRETE)(INJECT)	LF	25

NOTES:

1. CONCRETE REPAIRS SHALL BE DONE IN ACCORDANCE WITH ITEM 429 AND AS SHOWN ON "CONCRETE REPAIR DETAIL" SHEETS.
2. DAMAGE TO SOUND CONCRETE OR TO REINFORCEMENT OUTSIDE THE REPAIR AREA WILL BE REPAIRED AT NO COST TO THE DEPARTMENT.
3. APPROVAL FROM THE ENGINEER SHALL BE OBTAINED FOR ALL MATERIAL AND METHODS OF APPLICATION PRIOR TO THE BEGINNING OF THE REPAIR WORK
4. QUANTITIES ARE APPROXIMATE AND SHALL BE FIELD VERIFIED PRIOR TO BEGINNING WORK.
5. ALL WORK MUST BE DONE WITHIN THE SCHEDULED TIME OR AS APPROVED BY THE ENGINEER.

FY 2025 BPM

BRIDGE LAYOUT LOCATION 6

FM 2217 OVER IH 10
NBI 24-116-0-0002-05-149

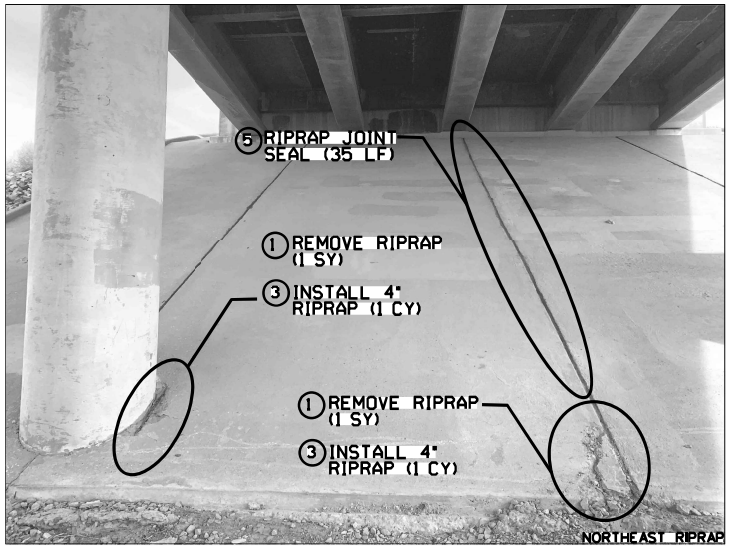
Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		44

DATE: 7/22/2024 4:24:33 PM
FILE: M:\6435-88-001 FY 25 BPM\4-DESIGN\Plan Set\7. BRIDGE\L6_Layout.dgn

NORTHEAST RIPRAP AND BEAM

RIPRAP REPAIR
BEAM REPAIR



STATE OF TEXAS
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P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 6
FM 2217 OVER IH 10
NBI 24-116-0-0002-05-149

SHEET 2 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		45

DATE: 7/22/2024 1:37:52 PM
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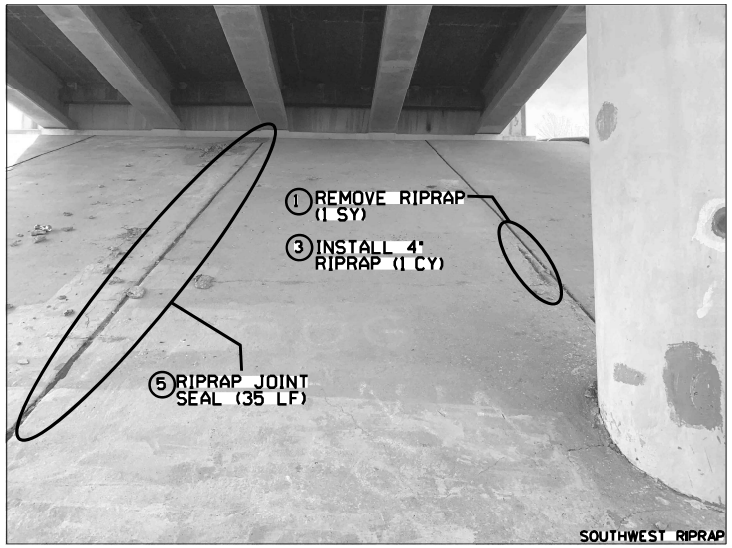
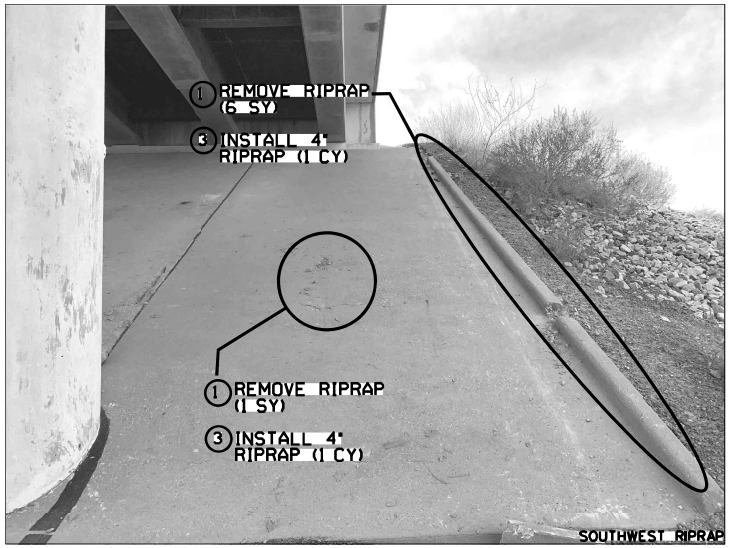
SOUTHWEST RIPRAP

RIPRAP REPAIR





STATE OF TEXAS
ZOLTHAN O. SOTO
125506
PROFESSIONAL ENGINEER
R.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 6
FM 2217 OVER IH 10
NBI 24-116-0-0002-05-149

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		46

DATE: 7/22/2024 1:37:58 PM
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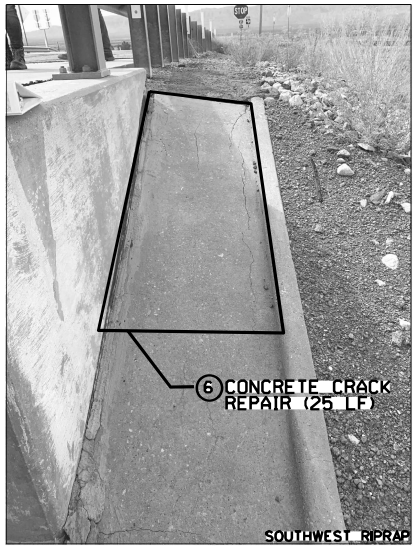
SOUTHWEST RIPRAP

RIPRAP REPAIR



STATE OF TEXAS
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PROFESSIONAL ENGINEER
P.E.

07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 6
FM 2217 OVER IH 10
NBI 24-116-0-0002-05-149

SHEET 4 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		47

DATE: 7/22/2024 1:38:05 PM
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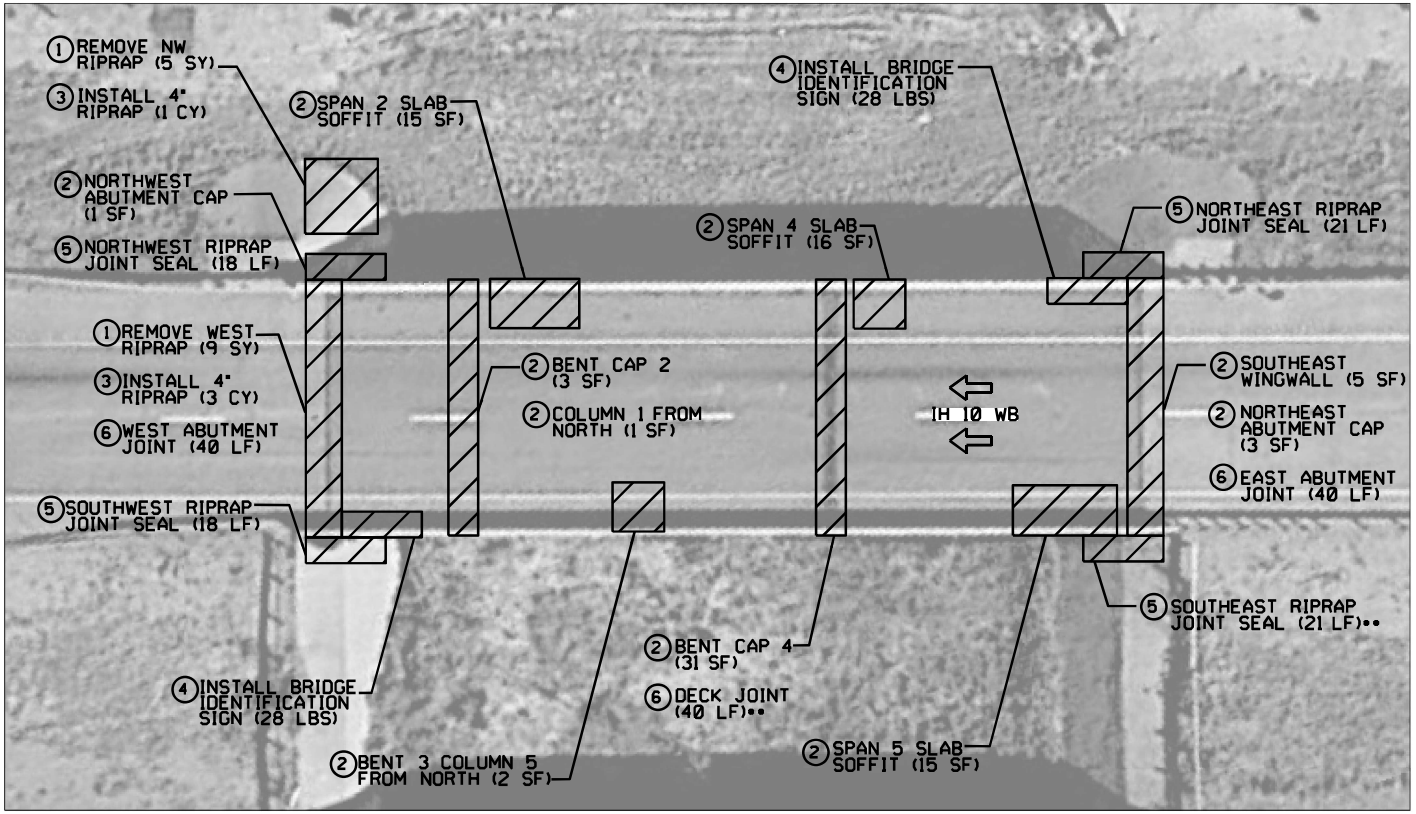


REPAIR CALL-OUT LEGEND

(ID) DESCRIPTION (XX UNIT)

STATE OF TEXAS
ZULTHAN O. SOTO
125506
LICENSED PROFESSIONAL ENGINEER
P.E.
07/23/2024

ESTIMATED QUANTITIES					
ID	ITEM	CODE	DESCRIPTIONS	UNIT	QTY
1	104	7006	REMOV CONC (RIPRAP)	SY	14
2	429	7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	92
3	432	7001	RIPRAP (CONC)(4 IN)	CY	4
4	442	7008	STR STEEL (MISCELLANEOUS BRIDGE)	LB	56
5	454	7010	JOINT SEALANT	LF	78
6	785	7002	BRIDGE JOINT REPAIR (HEADER)	LF	120

NOTES:

1. CONCRETE REPAIRS SHALL BE DONE IN ACCORDANCE WITH ITEM 429 AND AS SHOWN ON "CONCRETE REPAIR DETAIL" SHEETS.
2. DAMAGE TO SOUND CONCRETE OR TO REINFORCEMENT OUTSIDE THE REPAIR AREA WILL BE REPAIRED AT NO COST TO THE DEPARTMENT.
3. APPROVAL FROM THE ENGINEER SHALL BE OBTAINED FOR ALL MATERIAL AND METHODS OF APPLICATION PRIOR TO THE BEGINNING OF THE REPAIR WORK
4. SEE BRIDGE JOINT REPAIR DETAILS FOR JOINT HEADER REPAIR WORK.
5. QUANTITIES ARE APPROXIMATE AND SHALL BE FIELD VERIFIED PRIOR TO BEGINNING WORK.
6. ALL WORK MUST BE DONE WITHIN THE SCHEDULED TIME OR AS APPROVED BY THE ENGINEER.

••NOT PHOTOGRAPHED

FY 2025 BPM

BRIDGE LAYOUT LOCATION 7

IH 10 WB OVER ARISPE DRAW
NBI 24-116-0-0002-08-108

SHEET 1 OF 7

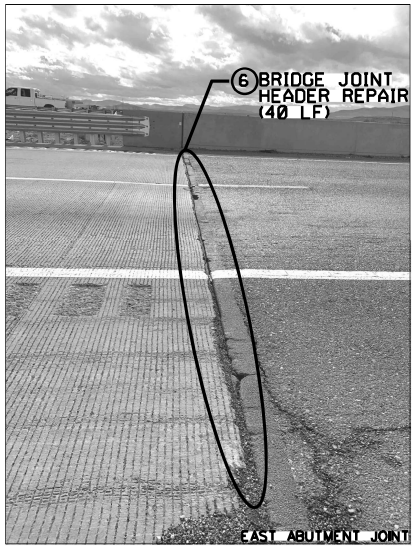
Texas Department of Transportation

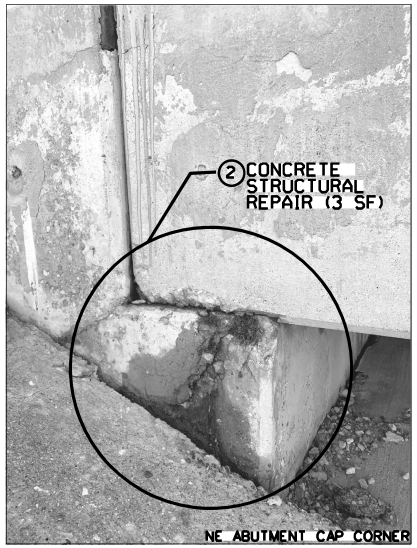
CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		48

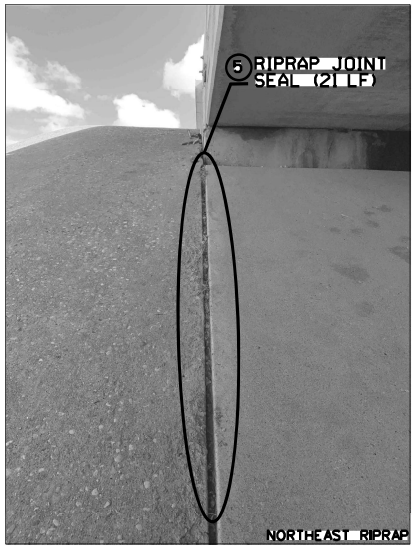
DATE: 7/22/2024 1:38:08 PM
FILE: M:\6435-88-001 FY 25 BPM\4-DESIGN\Plan Set\7.BRIDGE\L7_Layout.dgn

EAST ABUTMENT

BRIDGE JOINT REPAIR
CONCRETE REPAIR
RIPRAP JOINT SEAL







STATE OF TEXAS
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07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 7
IH 10 WB OVER ARISPE DRAW
NBI 24-116-0-0002-08-108

SHEET 2 OF 7

Texas Department of Transportation

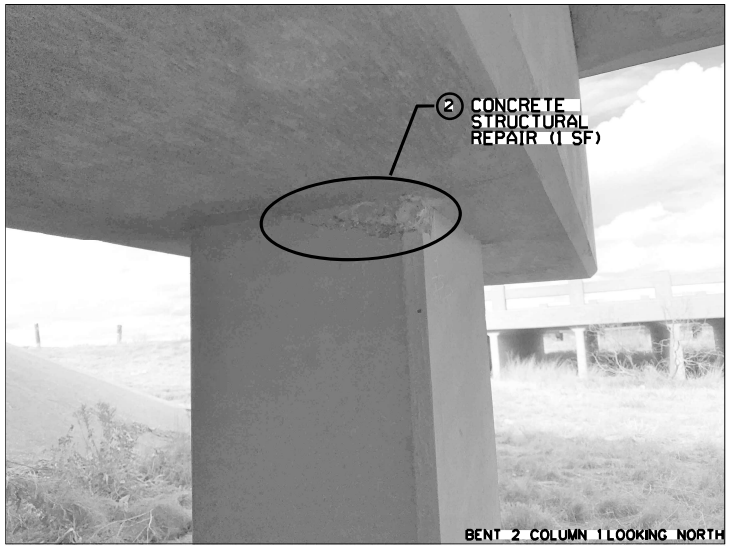
CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		49

DATE: 7/22/2024 1:38:14 PM
FILE: M:\6435-88-001 FY 25 BPM\4-DESIGN\Plan Set\7.BRIDGE\L7_Pictures.idgn

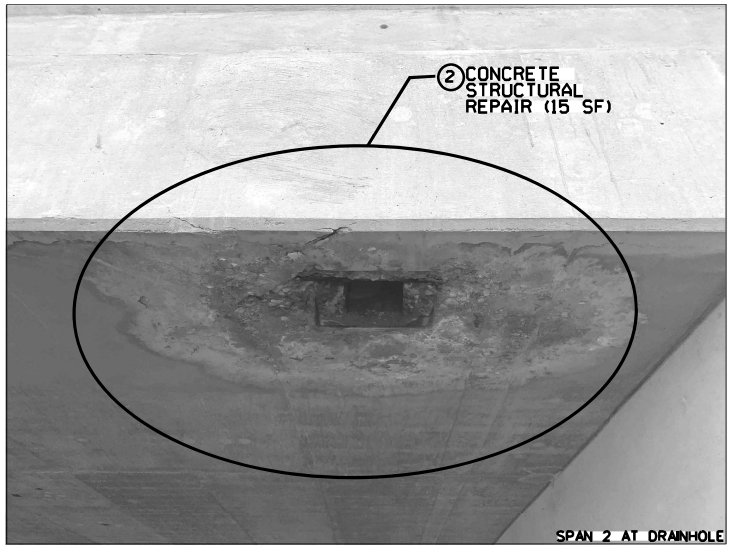
BENTS 2 & 3 AND SPAN 2

CONCRETE STRUCTURE REPAIR

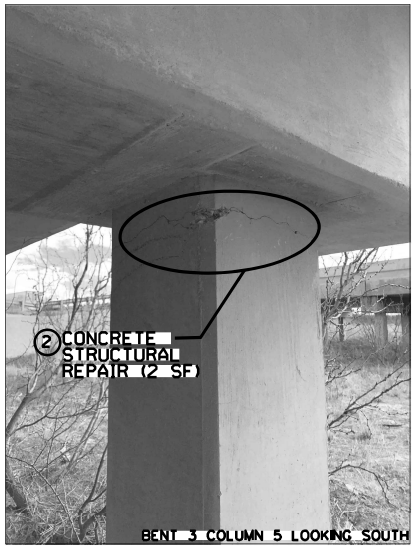
BENT CAP 2 LOOKING WEST



BENT 2 COLUMN 1 LOOKING NORTH



SPAN 2 AT DRAINHOLE



BENT 3 COLUMN 5 LOOKING SOUTH

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07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 7
IH 10 WB OVER ARISPE DRAW
NBI 24-116-0-0002-08-108

SHEET 3 OF 7

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		50

DATE: 7/22/2024 1:38:19 PM
FILE: M:\6435-88-001 FY 25 BPM\4-DESIGN\Plan Set\7_BRIDGE\L7_Pictures 2.dgn

BENT CAP 4

CONCRETE STRUCTURE REPAIR

STATE OF TEXAS
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07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 7
IH 10 WB OVER ARISPE DRAW
NBI 24-116-0-0002-08-108

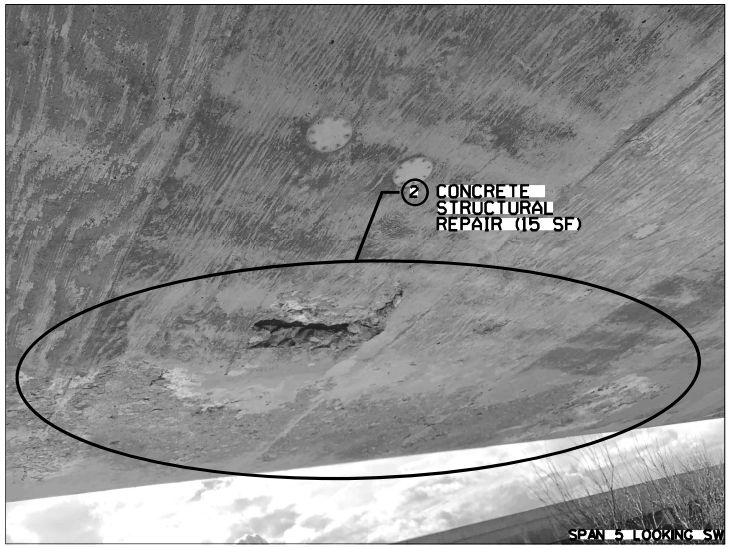
SHEET 4 OF 7

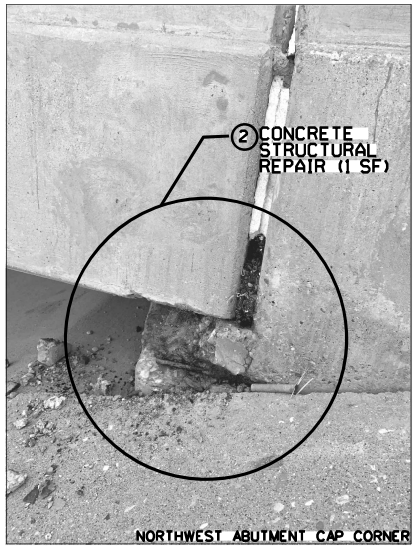
Texas Department of Transportation

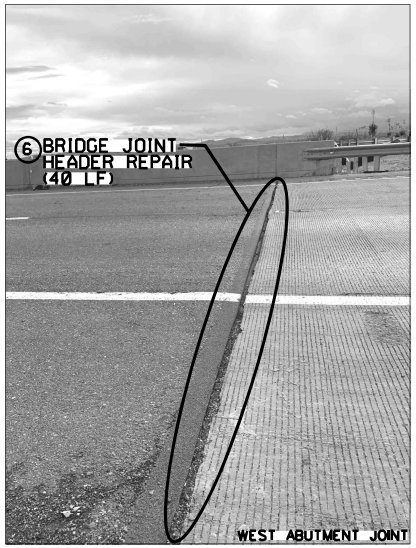
CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		51

DATE: 7/22/2024 1:38:26 PM
FILE: M:\6435-88-001 FY 25 BPM\4-DESIGN\Plan Set\7.BRIDGE\L7_Pictures 3.dgn

SPAN 4 & 5 AND WEST ABUTMENT
CONCRETE STRUCTURE REPAIR







STATE OF TEXAS
ZULTHANO. SOTO
125506
PROFESSIONAL ENGINEER
P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 7
IH 10 WB OVER ARISPE DRAW
NBI 24-116-0-0002-08-108

SHEET 5 OF 7

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		52

DATE: 7/22/2024 1:38:32 PM
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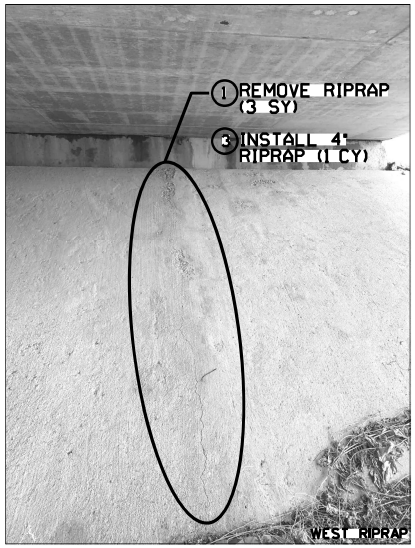
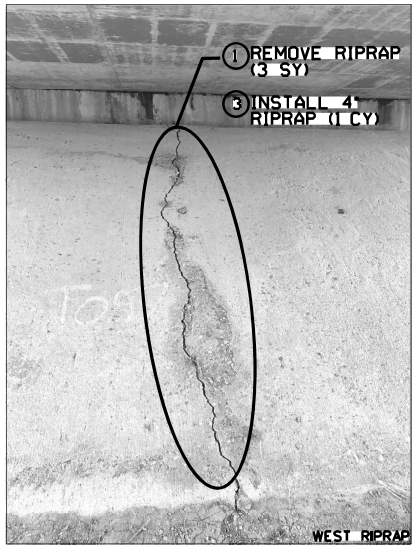
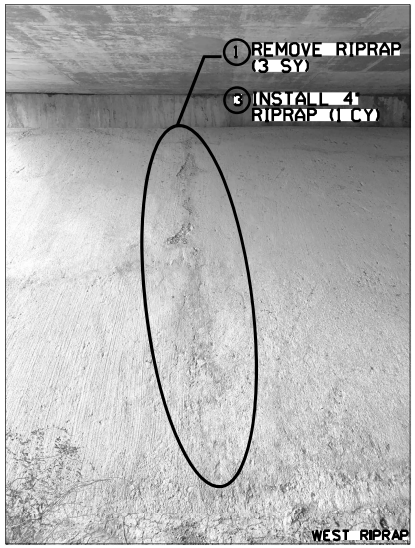
WEST RIPRAP

RIPRAP REPAIR







STATE OF TEXAS
ZULTHAN O. SOTO
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, P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 7
IH 10 WB OVER ARISPE DRAW
NBI 24-116-0-0002-08-108

SHEET 6 OF 7

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		53

DATE: 7/22/2024 1:38:38 PM
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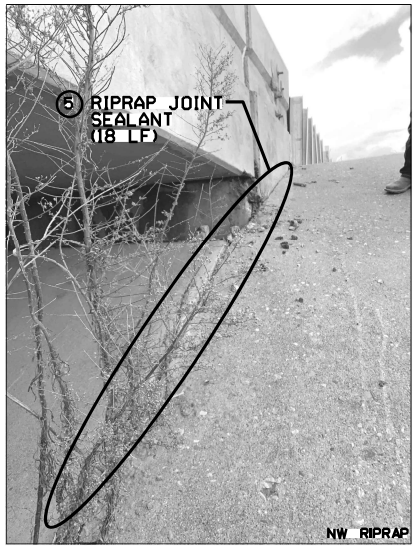
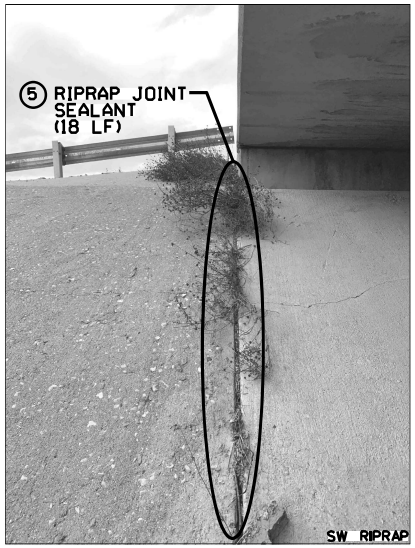
WEST RIPRAP

RIPRAP JOINT SEAL





STATE OF TEXAS
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P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 7
IH 10 WB OVER ARISPE DRAW
NBI 24-116-0-0002-08-108

SHEET 7 OF 7

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		54

DATE: 7/22/2024 1:38:43 PM
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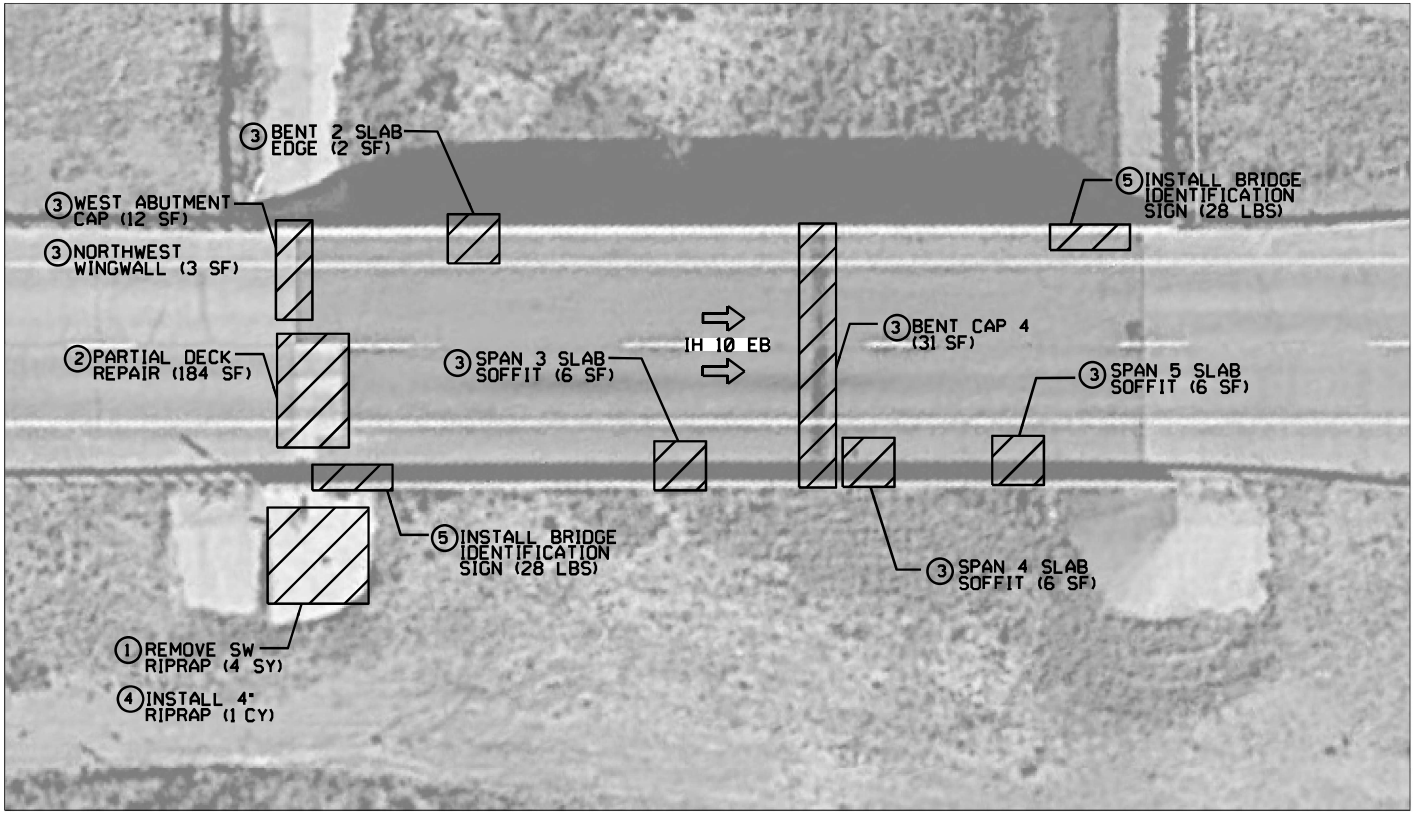


REPAIR CALL-OUT LEGEND

(ID) DESCRIPTION (XX UNIT)

ESTIMATED QUANTITIES					
ID	ITEM	CODE	DESCRIPTIONS	UNIT	QTY
1	104	7006	REMOV CONC (RIPRAP)	SY	4
2	429	7003	CONC STR REPAIR (DECK REP (PART DEPTH))	SF	184
3	429	7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	66
4	432	7001	RIPRAP (CONC)(4 IN)	CY	1
5	442	7008	STR STEEL (MISCELLANEOUS BRIDGE)	LB	56

NOTES:

1. CONCRETE REPAIRS SHALL BE DONE IN ACCORDANCE WITH ITEM 429 AND AS SHOWN ON "CONCRETE REPAIR DETAIL" SHEETS.
2. DAMAGE TO SOUND CONCRETE OR TO REINFORCEMENT OUTSIDE THE REPAIR AREA WILL BE REPAIRED AT NO COST TO THE DEPARTMENT.
3. APPROVAL FROM THE ENGINEER SHALL BE OBTAINED FOR ALL MATERIAL AND METHODS OF APPLICATION PRIOR TO THE BEGINNING OF THE REPAIR WORK
4. QUANTITIES ARE APPROXIMATE AND SHALL BE FIELD VERIFIED PRIOR TO BEGINNING WORK.
5. ALL WORK MUST BE DONE WITHIN THE SCHEDULED TIME OR AS APPROVED BY THE ENGINEER.

STATE OF TEXAS
ZULTHAN O. SOTO
125506
LICENSED PROFESSIONAL ENGINEER
P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT LOCATION 8

IH 10 EB OVER ARISPE DRAW
NBI 24-116-0-0002-08-109

SHEET 1 OF 4

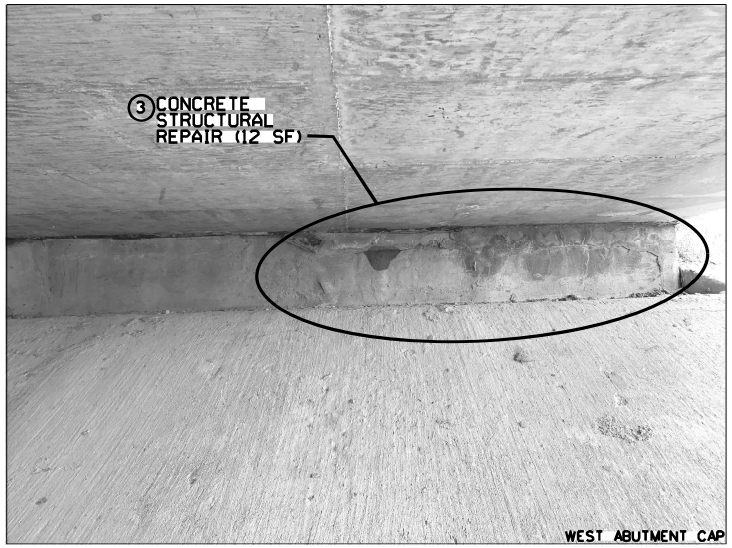
Texas Department of Transportation

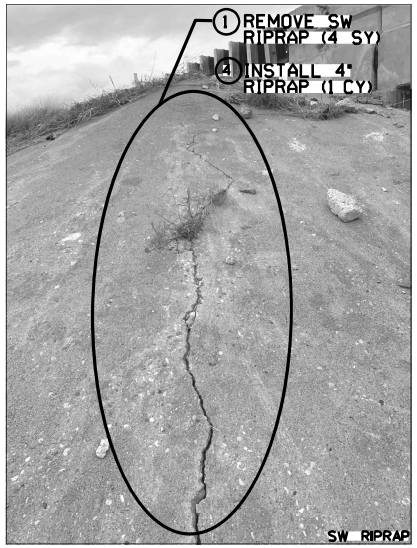
CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		55

DATE: 7/22/2024 1:38:46 PM
FILE: M:\6435-88-001 FY 25 BPM\4-DESIGN\Plan Set\7. BRIDGE\L8_Layout.dgn

WEST ABUTMENT AND RIPRAP

CONCRETE STRUCTURE REPAIR
RIPRAP REPAIR





STATE OF TEXAS
ZULTHAN O. SOTO
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, P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 8
IH 10 EB OVER ARISPE DRAW
NBI 24-116-0-0002-08-109

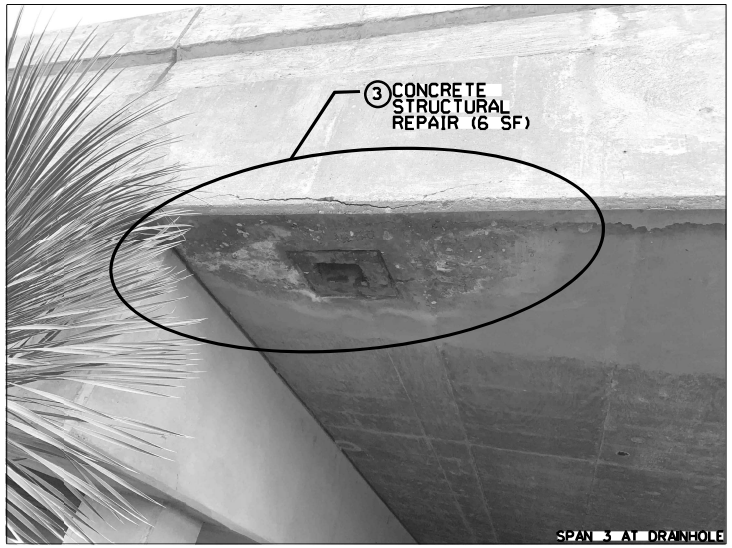
Texas Department of Transportation

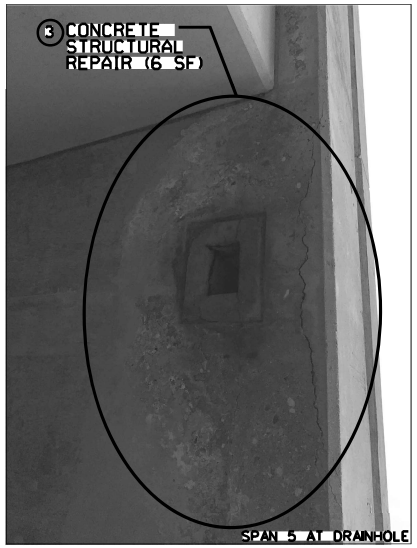
CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		56

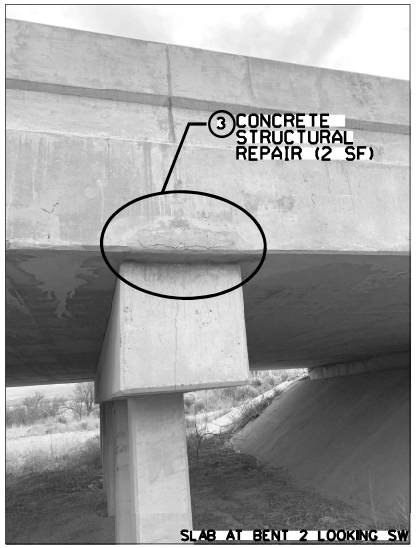
DATE: 7/22/2024 1:39:39 PM
FILE: M:\6435-88-001 FY 25 BPM\4-DESIGN\Plan Set\7. BRIDGE\L8_Pictures.dgn

SLAB

CONCRETE STRUCTURE REPAIR







STATE OF TEXAS
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125506
LICENSED
PROFESSIONAL ENGINEER
P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 8
IH 10 EB OVER ARISPE DRAW
NBI 24-116-0-0002-08-109

SHEET 3 OF 4

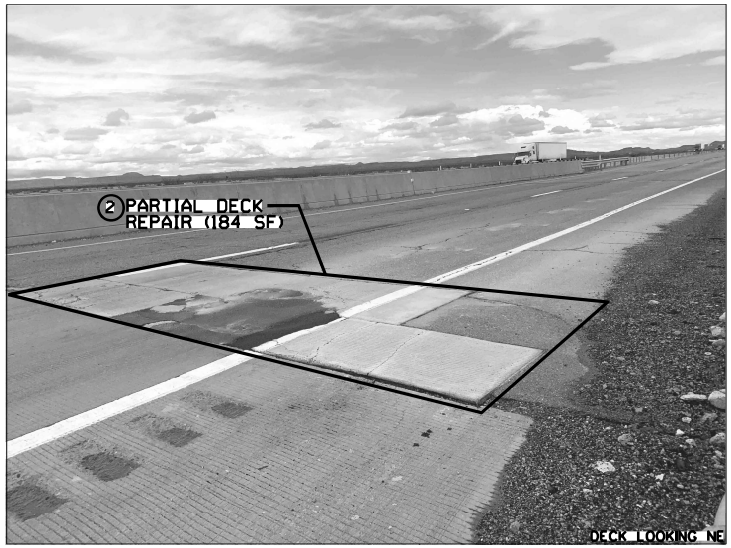
Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		57

DATE: 7/22/2024 1:39:44 PM
FILE: M:\6435-88-001 FY 25 BPM\4-DESIGN\Plan Set\7. BRIDGE\L8_Pictures 2.dgn

BENT CAP 4 AND DECK

CONCRETE STRUCTURE REPAIR
PARTIAL DEPTH DECK REPAIR



STATE OF TEXAS
ZOLTHAN O. SOTO
125506
LICENSED
PROFESSIONAL ENGINEER
P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 8
IH 10 EB OVER ARISPE DRAW
NBI 24-116-0-0002-08-109

SHEET 4 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		58

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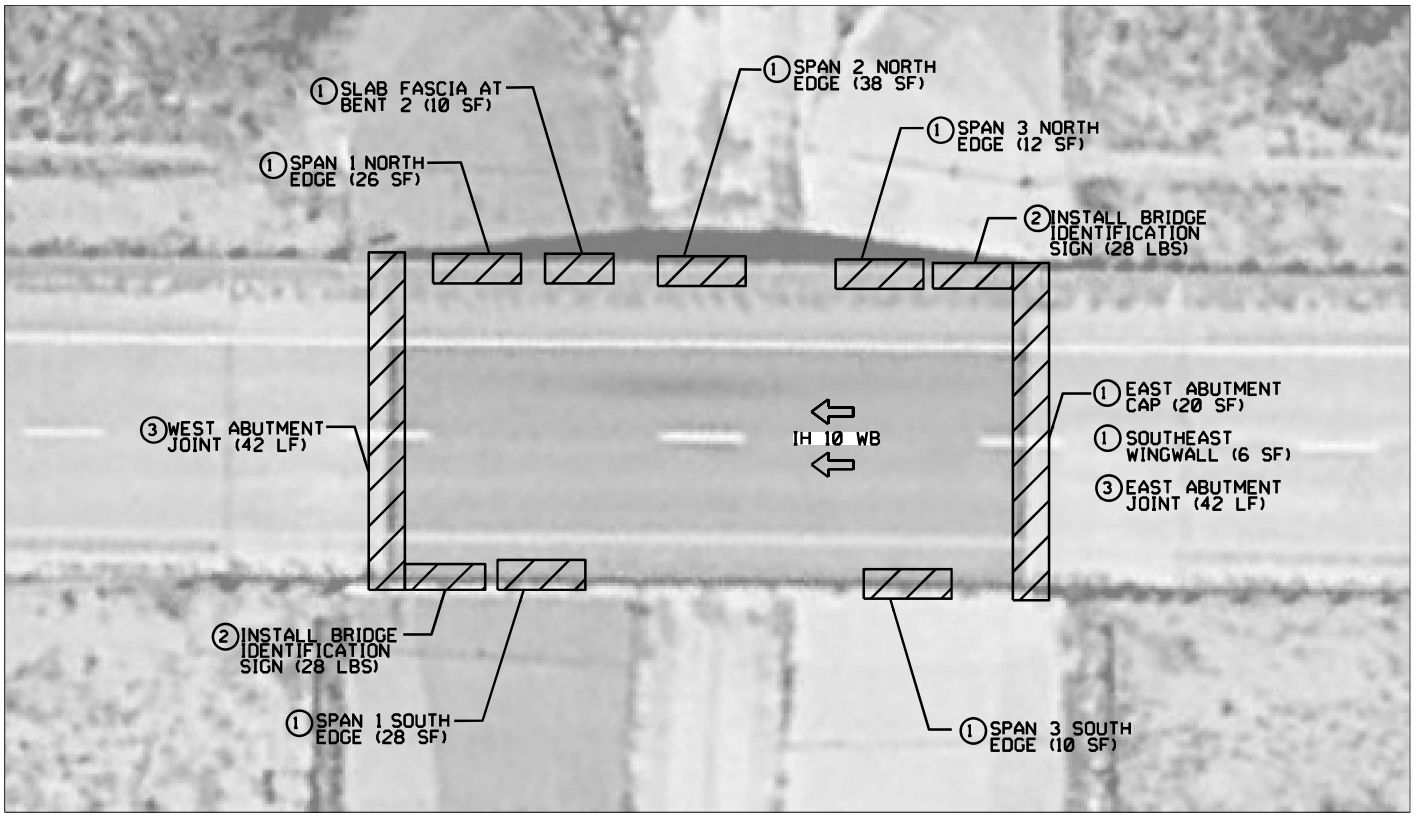

REPAIR CALL-OUT LEGEND

(ID) DESCRIPTION (XX UNIT)

ESTIMATED QUANTITIES					
ID	ITEM	CODE	DESCRIPTIONS	UNIT	QTY
1	429	7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	150
2	442	7008	STR STEEL (MISCELLANEOUS BRIDGE)	LB	56
3	785	7002	BRIDGE JOINT REPAIR (HEADER)	LF	84

NOTES:

1. CONCRETE REPAIRS SHALL BE DONE IN ACCORDANCE WITH ITEM 429 AND AS SHOWN ON "CONCRETE REPAIR DETAIL" SHEETS.
2. DAMAGE TO SOUND CONCRETE OR TO REINFORCEMENT OUTSIDE THE REPAIR AREA WILL BE REPAIRED AT NO COST TO THE DEPARTMENT.
3. APPROVAL FROM THE ENGINEER SHALL BE OBTAINED FOR ALL MATERIAL AND METHODS OF APPLICATION PRIOR TO THE BEGINNING OF THE REPAIR WORK
4. SEE BRIDGE JOINT REPAIR DETAILS FOR JOINT HEADER REPAIR WORK.
5. QUANTITIES ARE APPROXIMATE AND SHALL BE FIELD VERIFIED PRIOR TO BEGINNING WORK.
6. ALL WORK MUST BE DONE WITHIN THE SCHEDULED TIME OR AS APPROVED BY THE ENGINEER.

STATE OF TEXAS
ZOLTHAN O. SOTO
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07/23/2024

FY 2025 BPM

BRIDGE LAYOUT LOCATION 9

IH 10 WB OVER ANTELOPE DRAW
NBI 24-123-0-0003-04-101

SHEET 1 OF 4

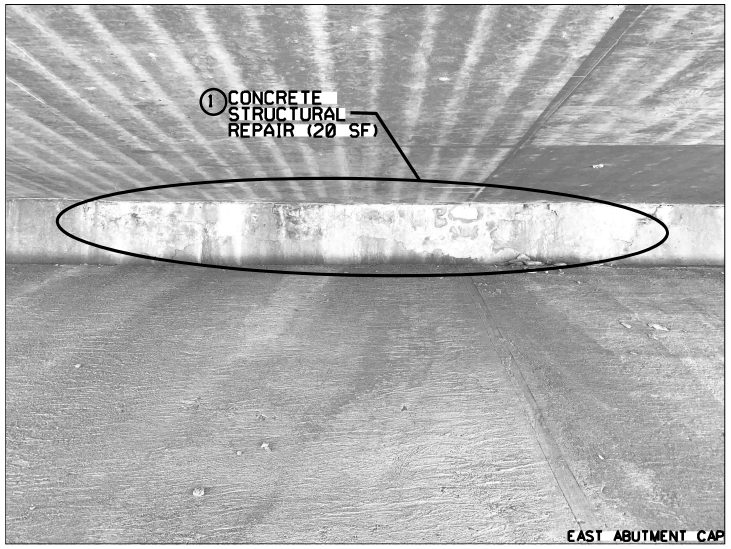
Texas Department of Transportation

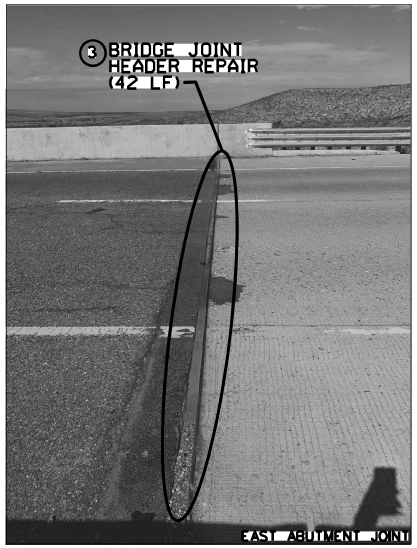
CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		59

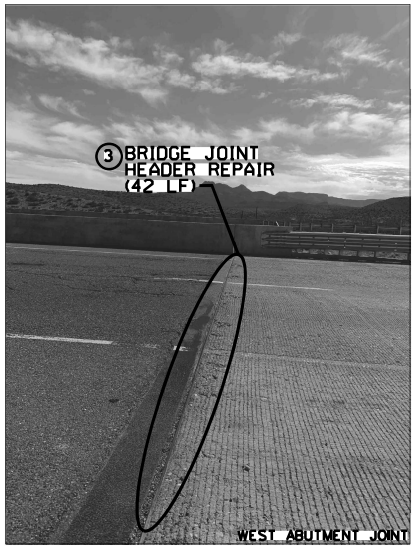
DATE: 7/22/2024 1:39:57 PM
FILE: M:\6435-88-001 FY 25 BPM\4-DESIGN\Plan Set\7. BRIDGE\L9_Layout.dgn

EAST AND WEST ABUTMENT

CONCRETE STRUCTURE REPAIR
JOINT HEADER REPAIR







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, P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 9
IH 10 WB OVER ANTELOPE DRAW
NBI 24-123-0-0003-04-101

SHEET 2 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		60

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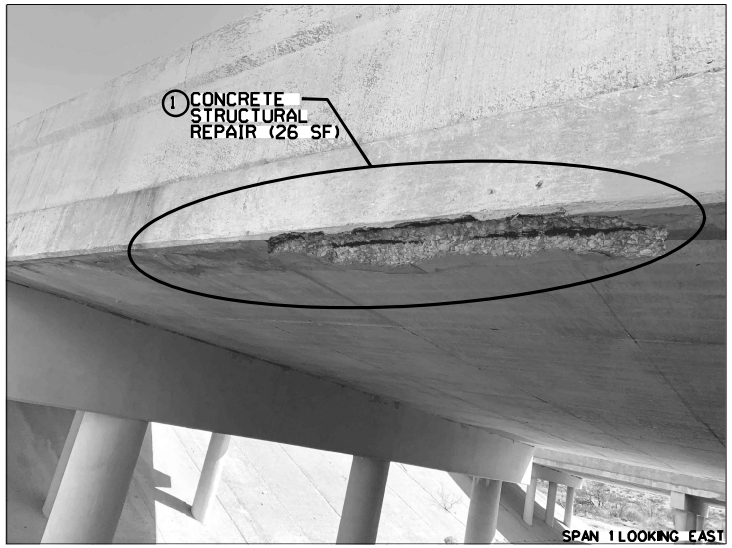
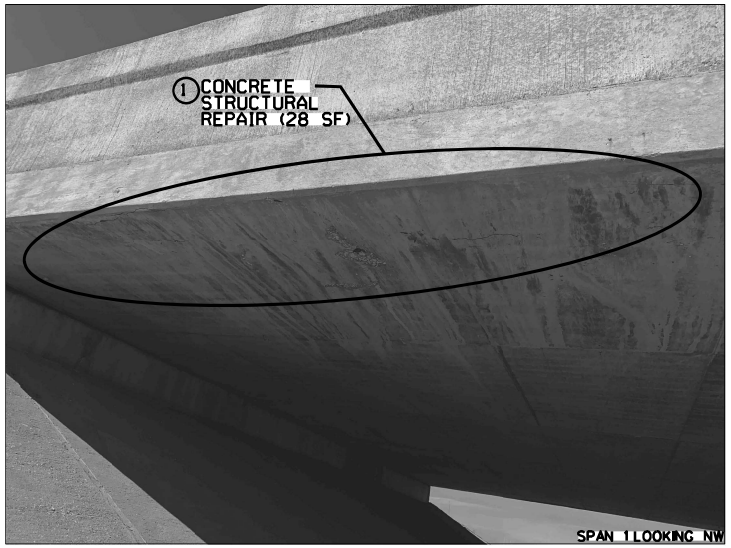
SPANS 1 AND 2

CONCRETE STRUCTURE REPAIR





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PROFESSIONAL ENGINEER
, P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 9
IH 10 WB OVER ANTELOPE DRAW
NBI 24-123-0-0003-04-101

SHEET 3 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		61

DATE: 7/22/2024 1:40:09 PM
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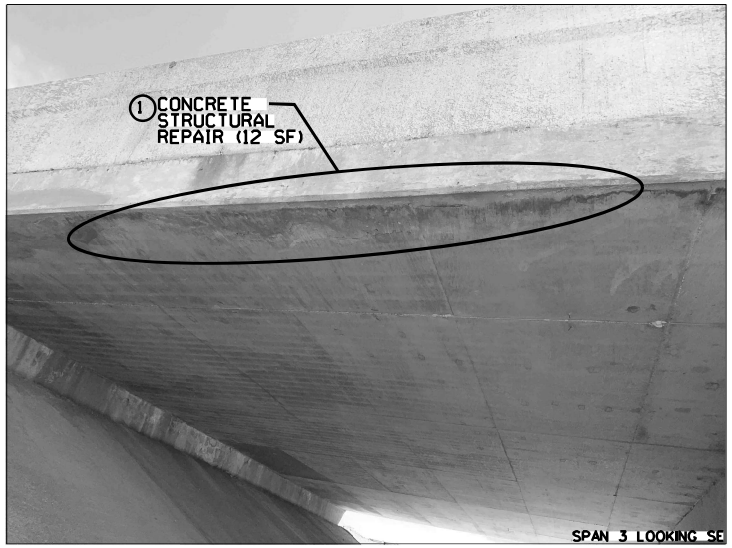
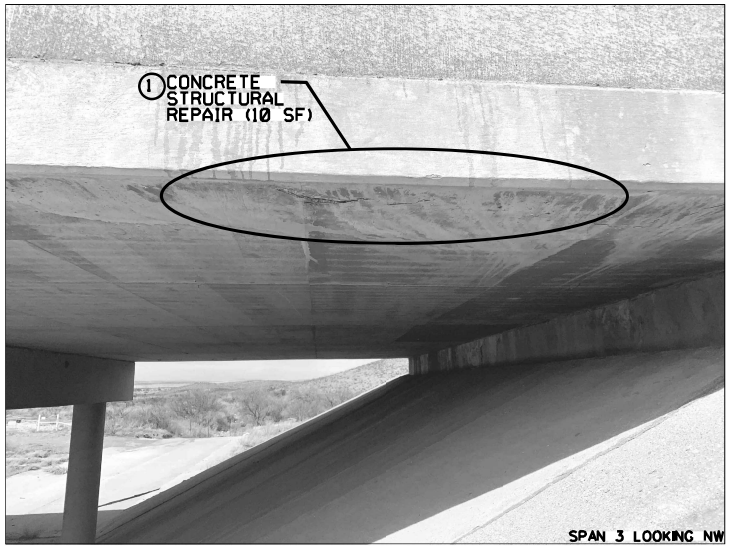
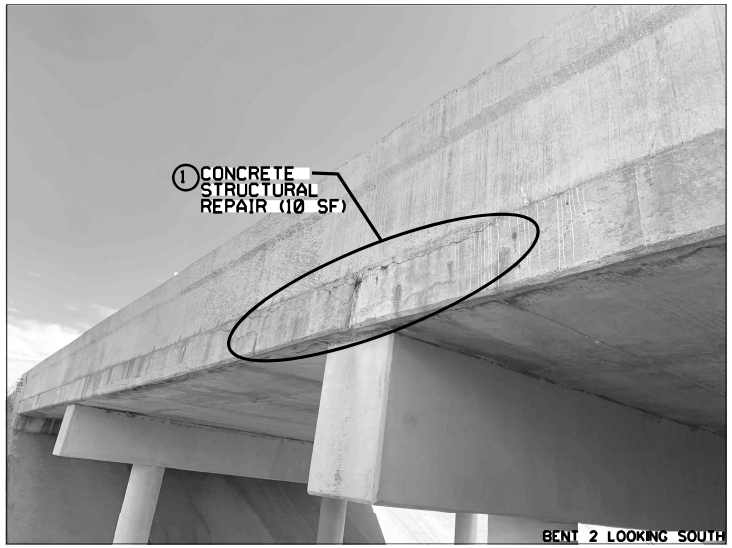
SLAB AT SPAN 3 AND BENT 2

CONCRETE STRUCTURE REPAIR







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07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 9
IH 10 WB OVER ANTELOPE DRAW
NBI 24-123-0-0003-04-101

SHEET 4 OF 4

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		62

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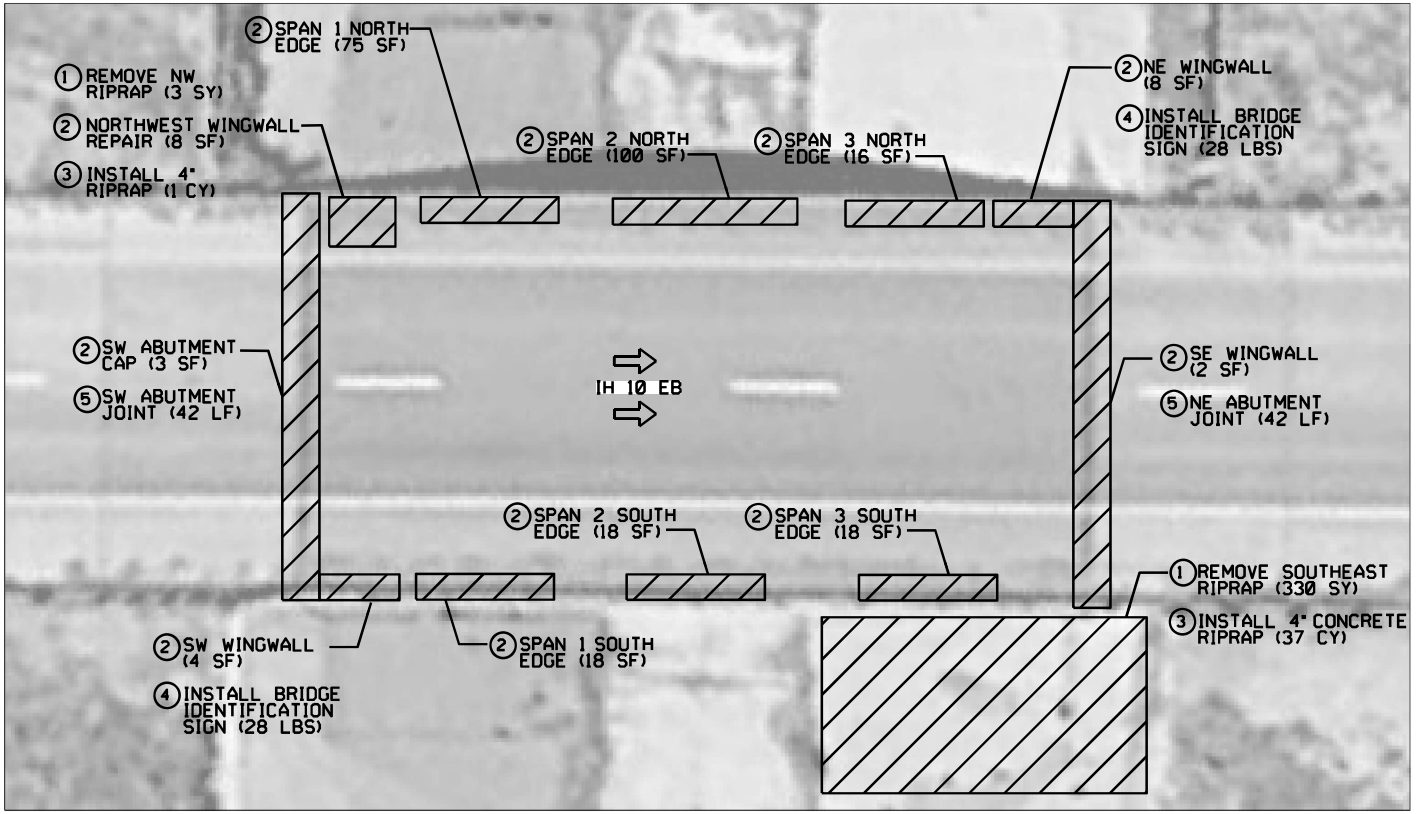

REPAIR CALL-OUT LEGEND

(ID) DESCRIPTION (XX UNIT)

STATE OF TEXAS
ZULTHAN O. SOTO
125506
PROFESSIONAL ENGINEER
LICENSED
, P.E.
07/23/2024

ESTIMATED QUANTITIES					
ID	ITEM	CODE	DESCRIPTIONS	UNIT	QTY
1	104	7006	REMOV CONC (RIPRAP)	SY	333
2	429	7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	270
3	432	7001	RIPRAP (CONC)(4 IN)	CY	38
4	442	7008	STR STEEL (MISCELLANEOUS BRIDGE)	LB	56
5	785	7011	BRIDGE JOINT REPLACEMENT (SEJ)	LF	84

NOTES:

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5. QUANTITIES ARE APPROXIMATE AND SHALL BE FIELD VERIFIED PRIOR TO BEGINNING WORK.
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FY 2025 BPM

BRIDGE LAYOUT LOCATION 10

IH 10 EB OVER ANTELOPE DRAW
NBI 24-123-0-0003-04-102

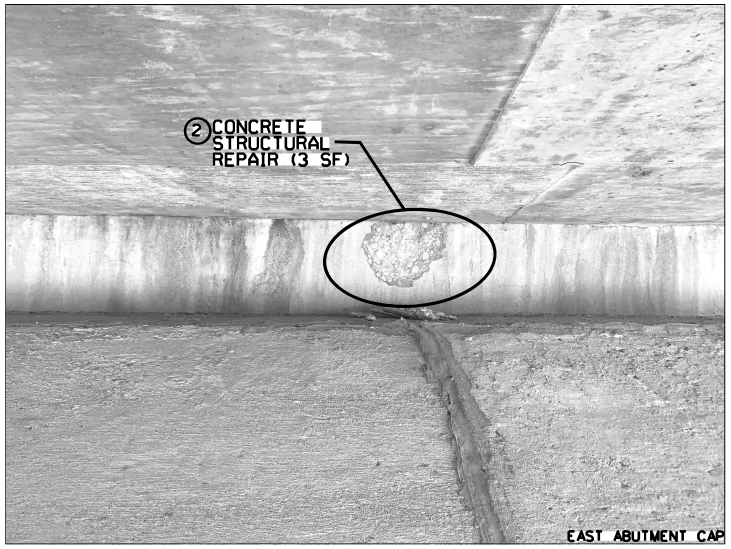
Texas Department of Transportation

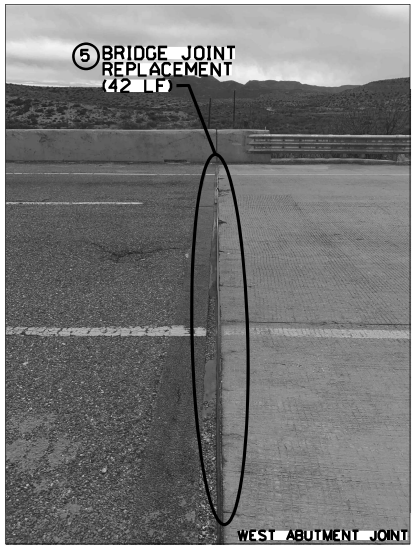
CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		63

DATE: 7/22/2024 1:40:19 PM
FILE: M:\6435-88-001 FY 25 BPM\4-DESIGN\Plan Set\7. BRIDGE\I10_Layout.dgn

WEST ABUTMENT

CONCRETE STRUCTURE REPAIR
BRIDGE JOINT REPLACEMENT





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07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 10
IH 10 EB OVER ANTELOPE DRAW
NBI 24-123-0-0003-04-102

SHEET 2 OF 5

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		64

DATE: 7/22/2024 1:40:24 PM
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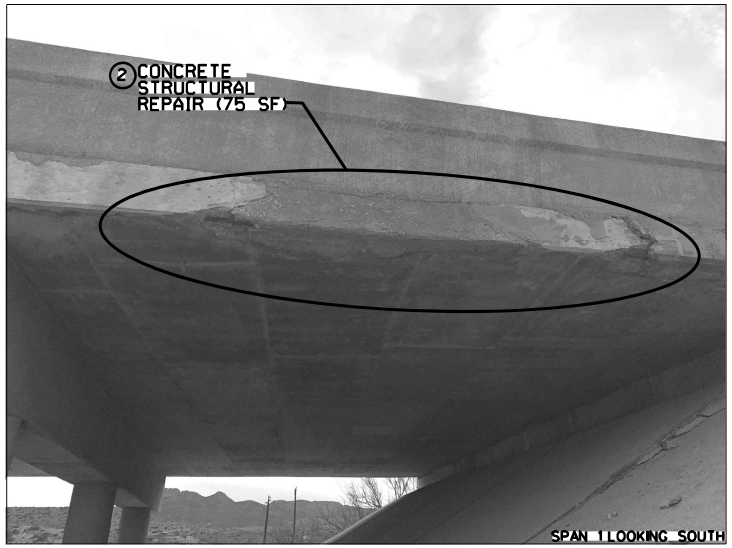
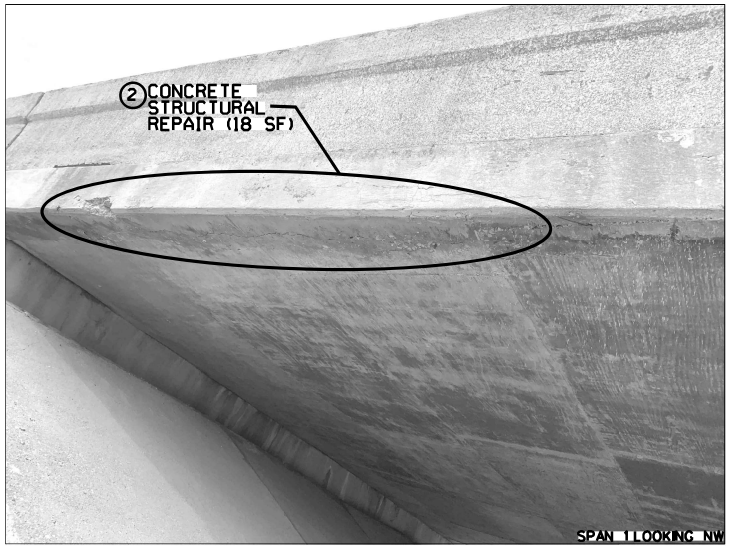
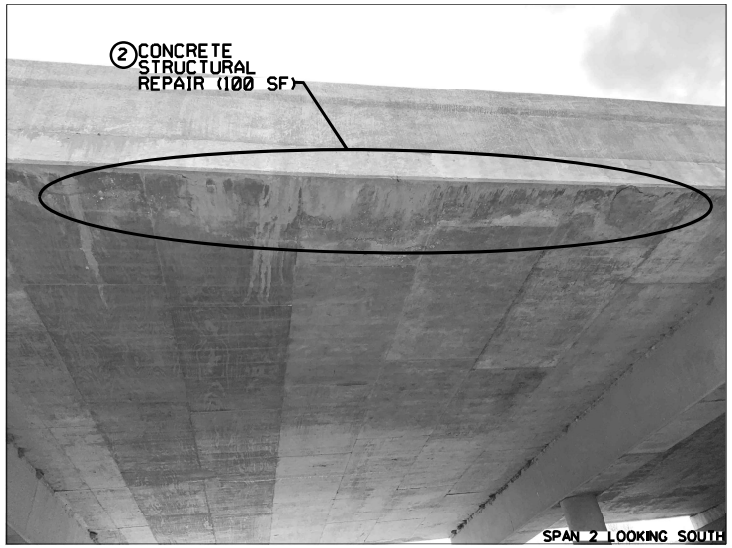
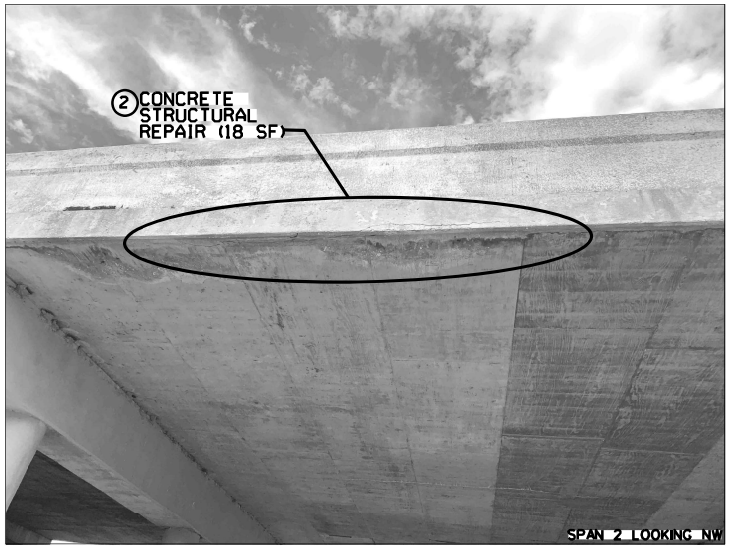
SPANS 1 AND 2

CONCRETE STRUCTURE REPAIR









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07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 10
IH 10 EB OVER ANTELOPE DRAW
NBI 24-123-0-0003-04-102

SHEET 3 OF 5

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		65

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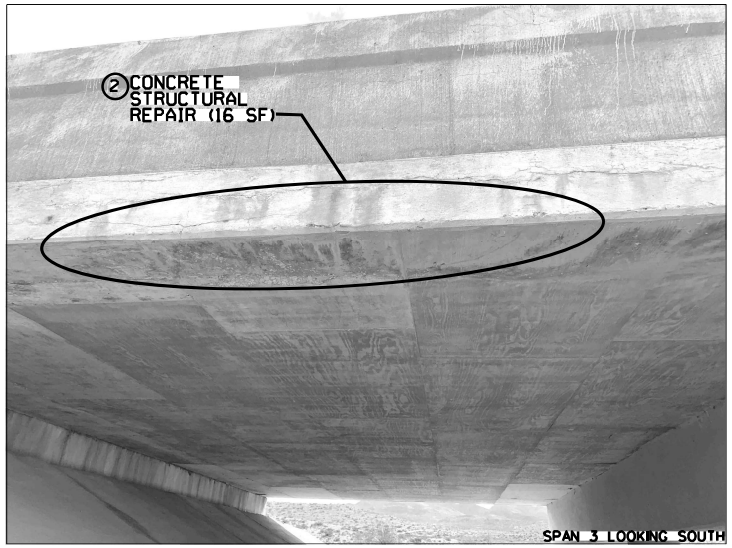
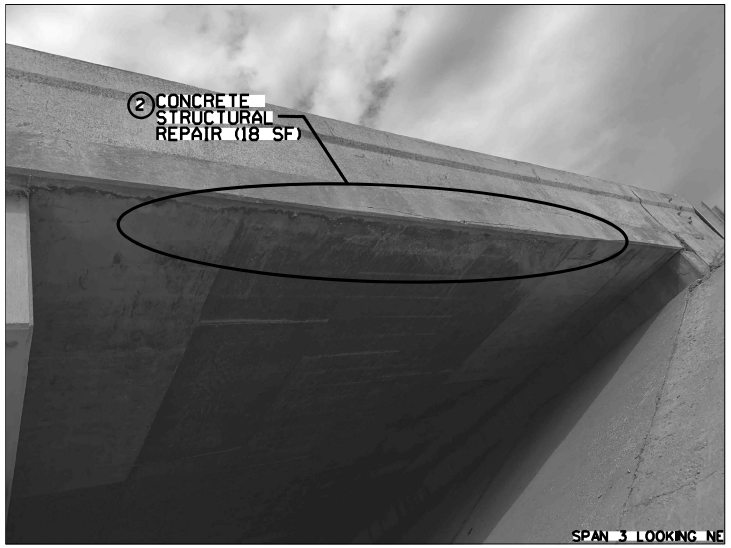
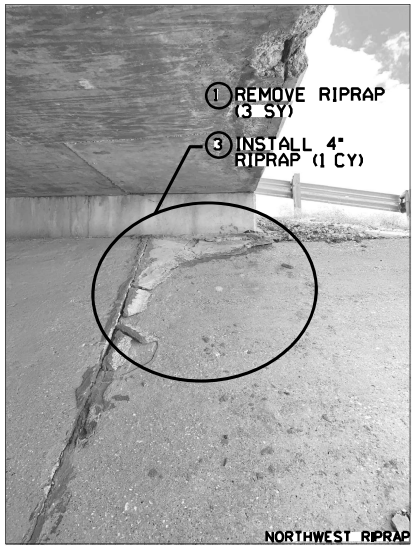
SPAN 3 AND RIPRAP

CONCRETE STRUCTURE REPAIR
RIPRAP REPAIR







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P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 10
IH 10 EB OVER ANTELOPE DRAW
NBI 24-123-0-0003-04-102

SHEET 4 OF 5

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		66

DATE: 7/22/2024 1:40:37 PM
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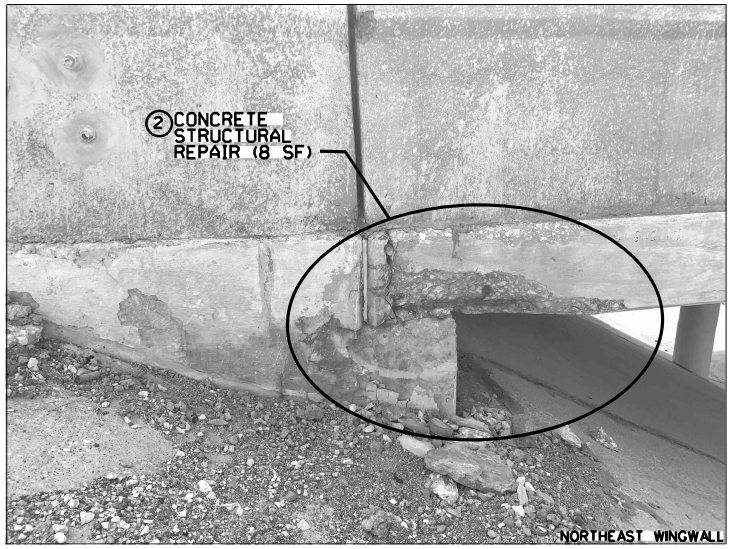
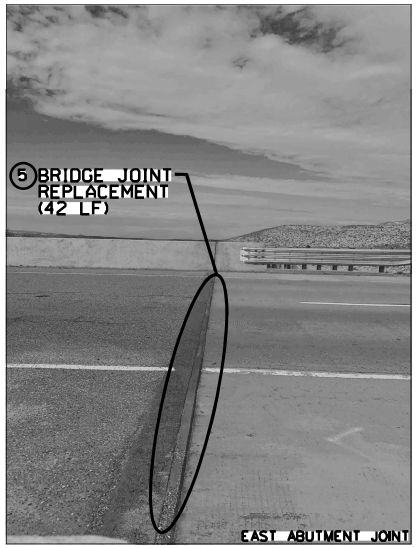
EAST ABUTMENT

CONCRETE STRUCTURE REPAIR
BRIDJE JOINT REPLACEMENT





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PROFESSIONAL ENGINEER
P.E.
07/23/2024

FY 2025 BPM

BRIDGE LAYOUT
LOCATION 10
IH 10 EB OVER ANTELOPE DRAW
NBI 24-123-0-0003-04-102

SHEET 5 OF 5

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		67

DATE: 7/22/2024 1:40:44 PM
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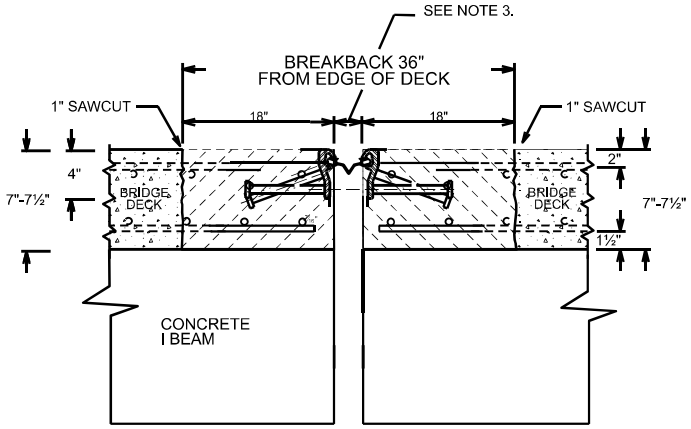


PROPOSED SEJ-M AT BENT

NOTES:

1. This work to be paid for with Item 785, "Bridge Joint Repair or Replacement".

2. Missing or deteriorated tranverse and longitudinal reinforcement to be replaced subsidiary to Item 785 "Bridge Joint Repair or Replacement".

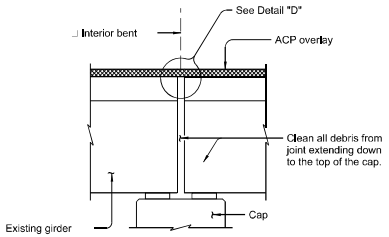
3. See SEJ-M Standard for joint opening and joint armor details.

4. Removing existing joint and seal; breaking back and repairing concrete and asphalt damaged for joint removal and replacement; removing and replacing additional concrete as shown on the plans; furnishing and placing all materials, cleaning and sealing the joints, disposal of all materials removed, additional sealant required to extend into concrete rail or curb, additional material that may be required due to existing asphalt and concrete removal being more than estimate on the plans; and for all labor, tools, equipment, and incidentals necessary to complete the work is paid for by Item 785, "Bridge Joint Repair or Replacement" and measured by the linear foot.
Provide Polymer Concrete in accordance with DMS-6140, "Polymer Concrete for Bridge Joint Systems" for header joint repair.
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.

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."

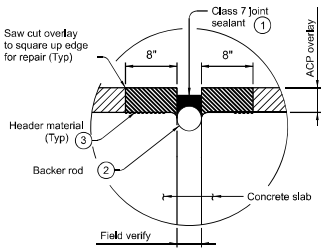
2. Provide backer rod 25% larger than joint opening and compatible with the sealant. Use of multiple pieces to create a backer rod cross section is not permitted. Top of backer rod must be convex as shown.

3. Use Polymer Concrete in accordance with DMS-6140, "Polymer Concrete for Bridge Joint Systems". Break back 8" from edges of deck at joint.



HEADER JOINT
WITH ASPHALT OVERLAY

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



PROPOSED JOINT HEADER REPAIR

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 ½" below top of header in travel lanes and ¼" below top of header in shoulders.

07/23/2024

BRIDGE JOINT REPAIR DETAILS

SHEET 1 OF 1

2024 Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		68

DATE: 7/22/2024 1:40:48 PM
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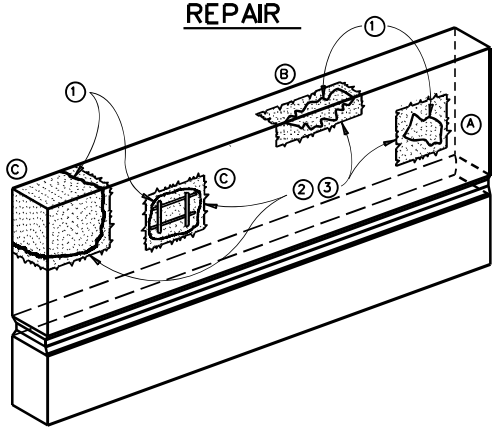
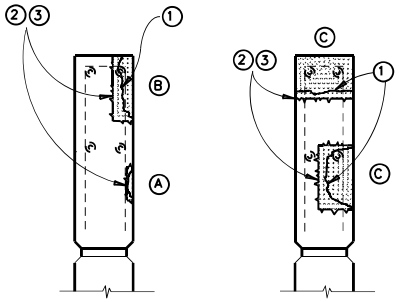
CONCRETE STRUCTURE REPAIR





CONCRETE STRUCTURE REPAIR NOTES:

(A) LESS THAN 1" - SHALLOW REPAIRS NOT EXTENDING TO THE REINFORCING STEEL.

(B) 1" TO 6" - MID-DEPTH REPAIR EXTENDING TO OR SLIGHTLY BELOW THE REINFORCING STEEL.

(C) OVER 6" - DEEP REPAIR EXTENDING WELL BEYOND THE REINFORCING STEEL, UP TO FULL DEPTH.

FOR ALL REPAIRS OVER TRAFFIC, WITH OR WITHOUT ADDITIONAL REINFORCEMENT, ANCHORS ARE REQUIRED.

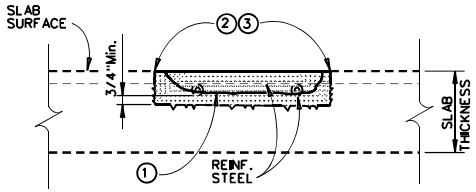
GENERAL REPAIR NOTES:

(1) - FRACTURE LINE, SHADED PORTION TO BE REMOVED

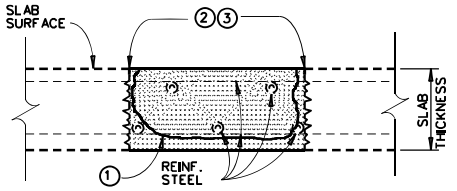
(2) - LAY OUT A SYMMETRIC SAW CUT LINE OUTSIDE OF EXTREME EDGE OF FRACTURED CONCRETE.

(3) - SAW CUT ½" DEEP ALONG THE LAYOUT LINE INTO SOUND CONCRETE. CARE SHALL BE TAKEN NOT TO CUT OR DAMAGE REINFORCING STEEL, SEE GENERAL NOTES.

CONCRETE BRIDGE DECK REPAIR



TYPE 1 SLAB REPAIR



TYPE 2 SLAB REPAIR

CONCRETE BRIDGE DECK REPAIR NOTES:

ALL WORK WILL CONFORM TO ITEM 439 & 429.

TYPE 1 - TO HALF DEPTH OF SLAB.
TYPE 2 - FULL DEPTH OF SLAB.

FULL DEPTH REPAIR OF A DECK WITH PRECAST PANELS IS PROHIBITED. THE DEPTH OF REPAIR WILL NOT EXTEND BELOW THE TOP OF THE PRECAST PANEL.

WORK TO BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING:

ITEM 420 "CONCRETE SUBSTRUCTURES"
ITEM 421 "HYDRAULIC CEMENT CONCRETE"
ITEM 429 "CONCRETE STRUCTURE REPAIR"
ITEM 431 "PNEUMATICALLY PLACED CONCRETE"
ITEM 439 "BRIDGE DECK OVERLAYS"
ITEM 440 "REINFORCEMENT FOR CONCRETE"
ITEM 448 "STRUCTURAL FIELD WELDING"
ITEM 780 "CONCRETE CRACK REPAIR"
DMS 4655 "CONCRETE REPAIR MATERIALS"
PAYMENT WILL BE AS PER ITEM 429 UNLESS SPECIFIED OTHERWISE IN THE PLANS.

NOTES:

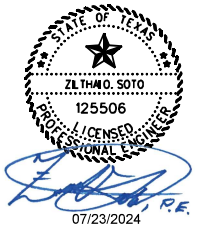
1. ALL CONCRETE REPAIR MATERIALS WILL MEET REQUIREMENTS SPECIFIED IN THE PLANS AS FOLLOWS: RAPID - RETURN TO SERVICE WITHIN 2 HOURS OF PLACEMENT (f'c = 2000 psi min.) PROMPT - RETURN TO SERVICE WITHIN 24 HOURS OF PLACEMENT (f'c = 3600 psi min.) NORMAL - RETURN TO SERVICE WHEN REQUIRED CURE TIME AND MIN. 7 DAY COMPRESSIVE STRENGTH HAS BEEN ATTAINED AS SPECIFIED IN ITEMS 429 OR 439. IF NOT SPECIFIED IN THE PLANS, A MATERIAL MEETING A NORMAL "RETURN TO SERVICE" WILL BE USED. AIR ENTRAINMENT IS NOT REQUIRED.

2. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR WILL VERIFY ALL EXISTING DIMENSIONS, LIMITS OF CONCRETE REPAIR, AND DETERMINE REPAIR METHOD FOR CONCRETE REPAIRS AS OUTLINED IN THE "CONCRETE REPAIR MANUAL" AND AS APPROVED BY THE ENGINEER.

3. REMOVAL OF CONCRETE WILL BE PERFORMED AS SPECIFIED IN ITEMS 429 AND 439. MINIMUM CLEARANCE BETWEEN EXPOSED STEEL AND SURROUNDING CONCRETE IS ½" OR 2 TIMES THE MAXIMUM AGGREGATE SIZE. ANY DAMAGE TO THE CONCRETE SUBSTRATE, REINFORCING STEEL OR BOND BETWEEN THE TWO WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. DAMAGED REINFORCING STEEL WILL BE REPLACED. LAP SPLICES FOR ALL MAIN REINFORCMENT WILL BE AS REQUIRED BY ITEM 440, MECHANICAL COUPLERS OR WELDED SPLICES ARE PERMITTED. IF A WELDED SPLICE IS USED, THE EXISTING AND REPLACEMENT STEEL MUST MEET ALL MATERIAL REQUIREMENTS OF ITEM 448. ALL REINFORCINGSTEEL WILL BE GRADE 60.

4. EPOXY INJECTION MAY BE USED TO REPAIR MINOR NON-STRUCTURAL CRACKS 1/16" OR LESS IN WIDTH AS APPROVED BY THE ENGINEER.

5. WHEN WORKING OVER A STREAM OR ANY OTHER BODY OF WATER, THE CONTRACTOR IS RESPONSIBLE FOR CONTAINMENT AND REMOVAL OF ALL DEBRIS ASSOCIATED WITH THE REPAIR, TO INCLUDE ALL AREAS UNDER THE BRIDGE AND THE TOP OF BENT CAPS. IF CONTAINMENT IS REQUIRED, DEBRIS MAY BE CAPTURED ON TARPS OR BY OTHER METHODS APPROVED BY THE ENGINEER. MATERIAL WILL BE DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE STATE AND FEDERAL REGULATIONS.



07/23/2024

CONCRETE REPAIR DETAILS

SHEET 1 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		69

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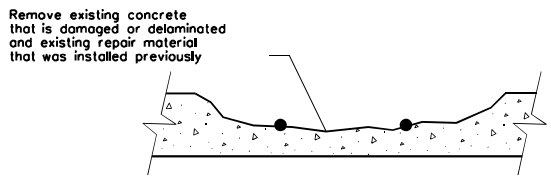
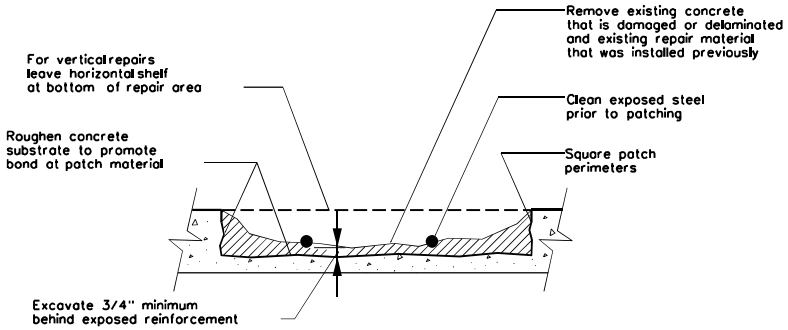
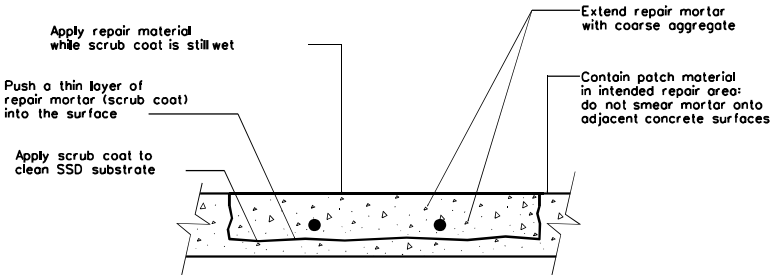


Damaged Condition



Step 1

Excavation and Preparation



Step 2

Patch Damaged Area

CONCRETE REPAIR NOTES:

1. PERFORM WORK IN ACCORDANCE WITH ITEM 429, "CONCRETE STRUCTURE REPAIR". USE A TYPE A-4 REPAIR MATERIAL PER DMS 4655, "CONCRETE REPAIR MATERIALS." REFER TO THE "CONRETE REPAIR MATERIAL", MATERIAL PRODUCER LIST (MPL) FOR A LIST OF PRE-APPROVED TYPE A-4 MATERIALS.

2. SURFACE PREPARATION: REMOVE ANY DAMAGED OR LOOSE CONCRETE OR PREVIOUSLY APPLIED REPAIR MATERIAL, UNLESS OTHERWISE APPROVED BY THE ENGINEER. USE ONLY HAND TOOLS OR POWER DRIVEN CHIPPING HAMMERS (15 LB. CLASS MAXIMUM) TO REMOVE CONCRETE. SQUARE THE PATHC PERIMETERS USING HANDHELD GRINDERS OR SAWS; DO NOT OVER-CUT PATCH PERIMETERS AT THE CORNERS OF THE REPAIR AREAS. ROUGHEN THE SUBSTRATE TO ENSURE THERE WILL BE A MECHANICAL BOND BETWEEN THE PATCH MATERIAL AND PARENT CONCRETE. REMOVE RUST, OIL AND OTHER CONTAMINANTS FROM EXPOSED STEEL REINFORCEMENT. JUST PRIOR TO PATCHING BLAST THE REPAIR AREA USING A HIGH-PRESSURE AIR COMPRESSOR EQUIPPED WITH FILTERS TO REMOVE OIL FROM THE COMPRESSED AIR.

3. MIXING: USE MEASURING CUPS OR BUCKETS TO DETERMINE THE PROPER QUANTITY OF EACH COMPONENT PER THE MANUFACTURER'S REQUIREMENTS, THEN DISPENSE INTO A CLEAN CONTAINER. DO NOT "EYEBALL" OR GUESS AT THE PROPER AMOUNTS WHILE ADDING DIFFERENT COMPONENTS. MIX THE COMPONENTS THROUGHLY UNTIL THEY ARE WELL-BLENDED (3MINUTES MINIMUM) USING A LOW-SPEED ELECTRIC DRILL AND A CLEAN "JIFFY" TYPE MIXING PADDLE. IN NO CASE WILL MIXING BY HAND BE PERMITTED. EXTEND THE REPAIR MORTAR WITH COARSE AGGREGATE IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS. DO NOT ATTEMPT TO MAKE THE MATERIAL WORKABLE BY OVER-MIXING OR ADDING ADDITIONAL LIQUID AFTER IT HAS BEGUN TO SET.

4. APPLICATION: OBTAIN A SATURATED SURFACE-DRY (SSD), SUBSTRATE JUST PRIOR TO PATCHING USING A HIGH-PRESSURE WATER BLAST FOR A BRIEF PERIOD (1 MINUTE MINIMUM) OR OTHER APPROVED METHOD. SURFACE MAY BE DAMP BUT MUST BE FREE OF STANDING WATER. APPLY A BONDING COAT CONSISTING OF A THIN LAYER OF NON-EXTENDED REPAIR MORTAR SCRUBBED INTO THE SUBSTRATE. APPLY REPAIR CONCRETE WHILE THE SCRUB COAT IS STILL WET. DO NOT EXCEED THE MAXIMUM LIFT DEPTH PERMITTED BY THE MANUFACTURER. IN MULTIPLE LIFT APPLICATIONS ROUGHEN THE SURFACE OF THE PRECEDING LIFT BEFORE IT REACHES INITIAL SET. WET THE SURFACE JUST PRIOR TO APPLYING THE NEXT LIFT.

5. CURING : MOIST CURE PATCH MATERIAL FOR A MINIMUM OF 72 HOURS USING SET MATS, WATER SPRAY, PONDING OR OTHER METHOD APPROVED BY THE ENGINEER.

STATE OF TEXAS
ZULTHAN O. SOTO
125506
LICENSED
PROFESSIONAL ENGINEER
P.E.
07/23/2024

CONCRETE REPAIR DETAILS

SHEET 2 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		70

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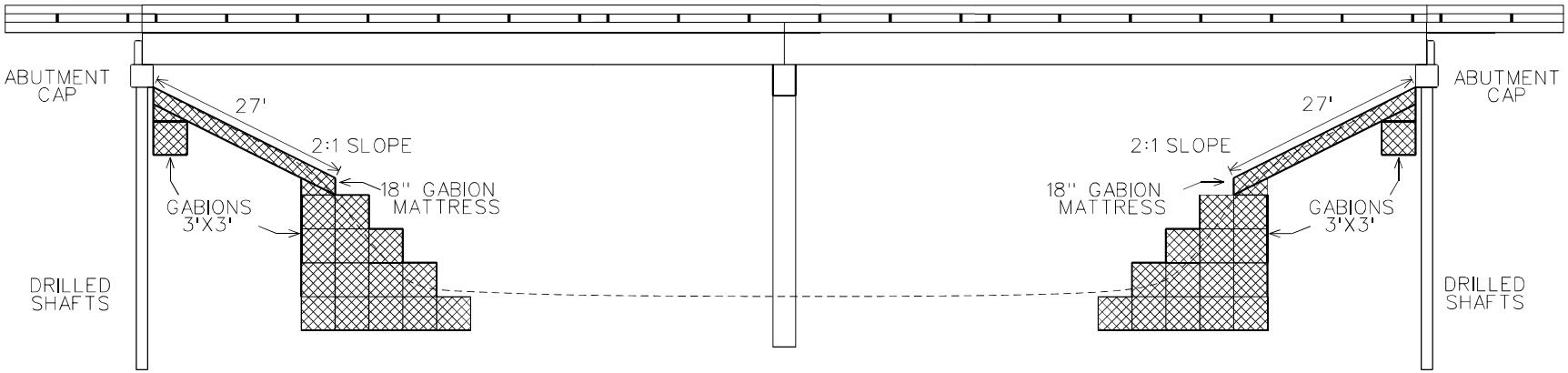
LEGEND

GABION MATTRESS/BASKET

GROUNDLINE



PROFILE VIEW

N.T.S

NOTES:

1. THIS WORK TO BE PAID FOR ITEM 459, "GABIONS AND GABION MATTRESSES". THIS INCLUDES PAYMENT FOR WIRE BASKETS, STONE FILL, LACING AND FASTENERS, FILTER FABRIC, FILTER MATERIAL, EXCAVATION, GRADING AND BACKFILL, MATERIALS, TOOLS, EQUIPMENT, LABOR, AND INCIDENTALS.

2. COORDINATE ANY ACCESS AND FENCE LINES WITH ADJACENT PROPERTY OWNER AND THE ENGINEER.

STATE OF TEXAS
ZELTH O. SOTO
125506
LICENSED PROFESSIONAL ENGINEER
, P.E.
07/23/2024

GABION DETAIL

SHEET 1 OF 3

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		71

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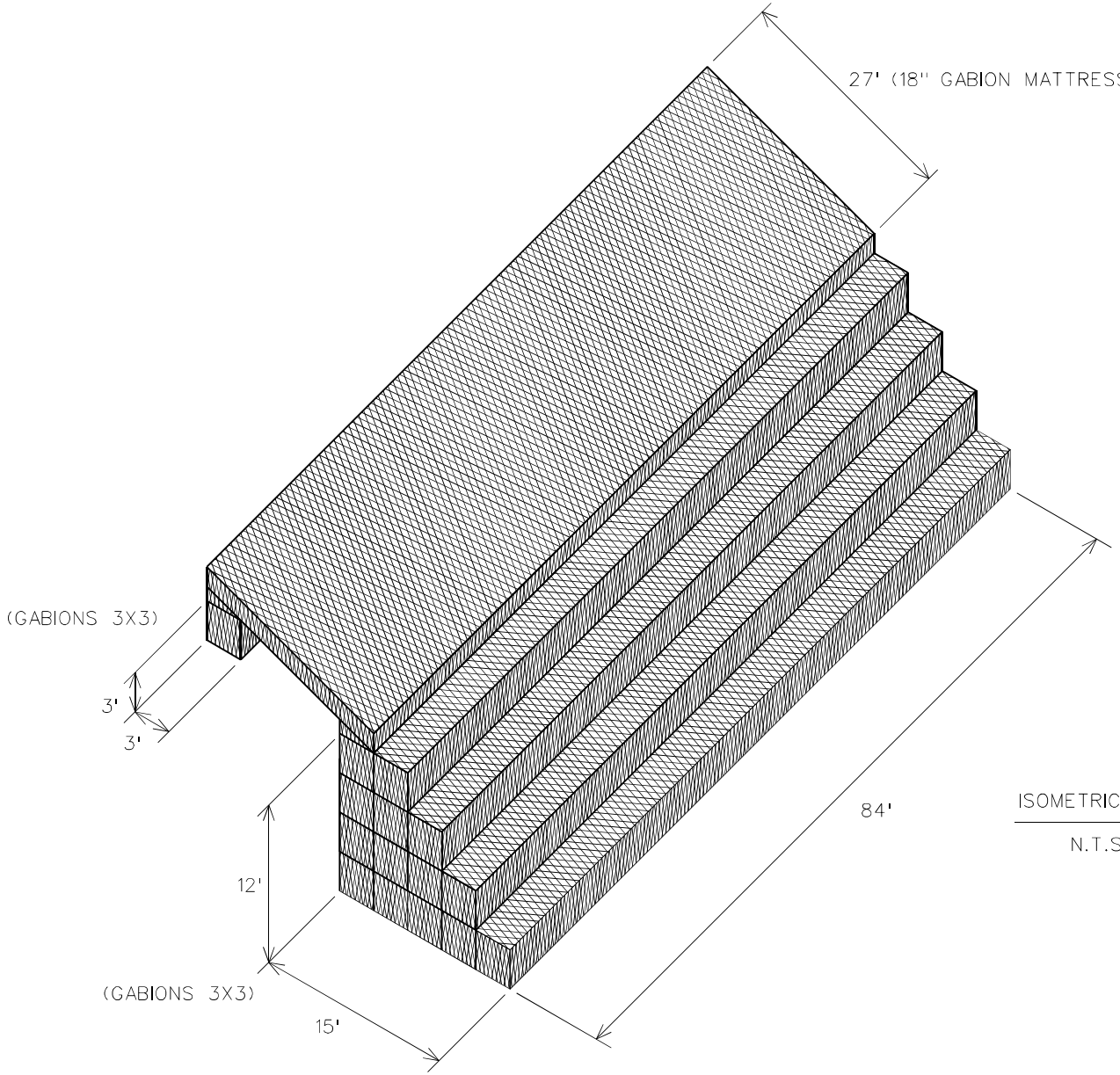

ISOMETRIC VIEW

N.T.S

LEGEND

GABION MATTRESS/BASKET

NOTES:

1. THIS WORK TO BE PAID FOR ITEM 459, "GABIONS AND GABION MATTRESSES". THIS INCLUDES PAYMENT FOR WIRE BASKETS, STONE FILL, LACING AND FASTENERS, FILTER FABRIC, FILTER MATERIAL, EXCAVATION, GRADING AND BACKFILL, MATERIALS, TOOLS, EQUIPMENT,LABOR, AND INCIDENTALS.

2. COORDINATE ANY ACCESS AND FENCE LINES WITH ADJACENT PROPERTY OWNER AND THE ENGINEER.

STATE OF TEXAS
ZILTHA O. SOTO
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LICENSED
PROFESSIONAL ENGINEER
, P.E.
07/23/2024

GABION DETAIL

SHEET 2 OF 3

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
6435	88	001	IH 10, ETC.
DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		72

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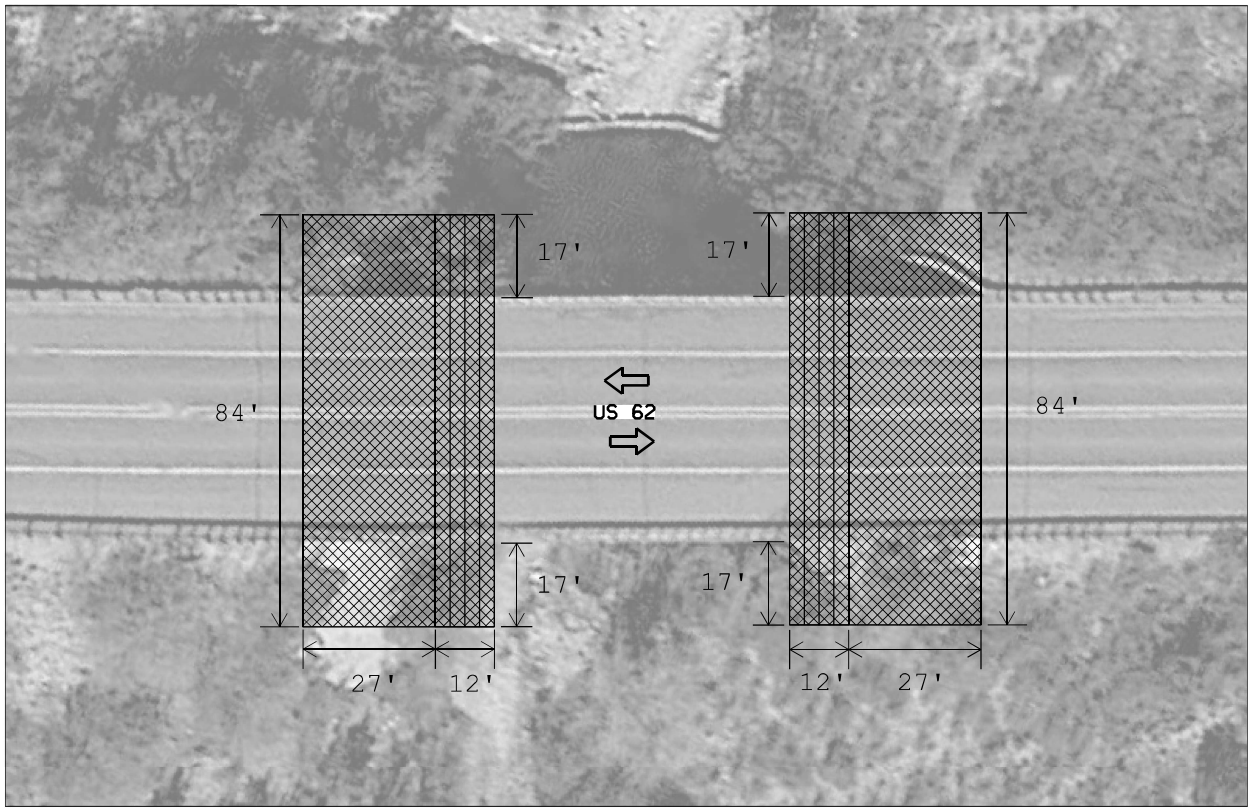

LAYOUT VIEW

N.T.S

LEGEND

GABION MATTRESS/BASKET

NOTES:

1. THIS WORK TO BE PAID FOR ITEM 459, "GABIONS AND GABION MATTRESSES". THIS INCLUDES PAYMENT FOR WIRE BASKETS, STONE FILL, LACING AND FASTENERS, FILTER FABRIC, FILTER MATERIAL, EXCAVATION, GRADING AND BACKFILL, MATERIALS, TOOLS, EQUIPMENT,LABOR, AND INCIDENTALS.

2. COORDINATE ANY ACCESS AND FENCE LINES WITH ADJACENT PROPERTY OWNER AND THE ENGINEER.

STATE OF TEXAS
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PROFESSIONAL ENGINEER
P.E.
07/23/2024

GABION DETAIL

SHEET 3 OF 3

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.
ELP	CULBERSON, ETC.		73

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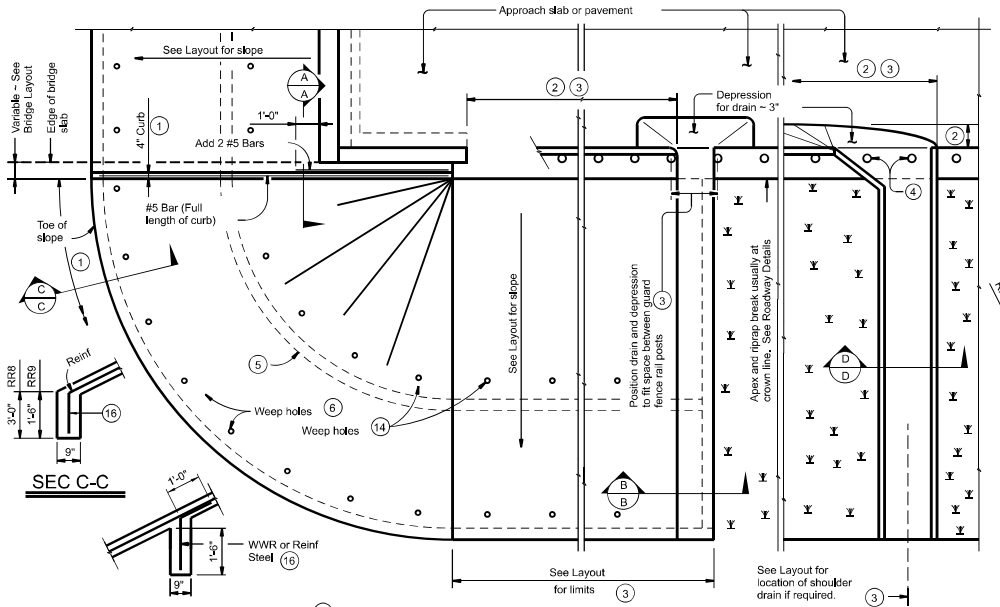
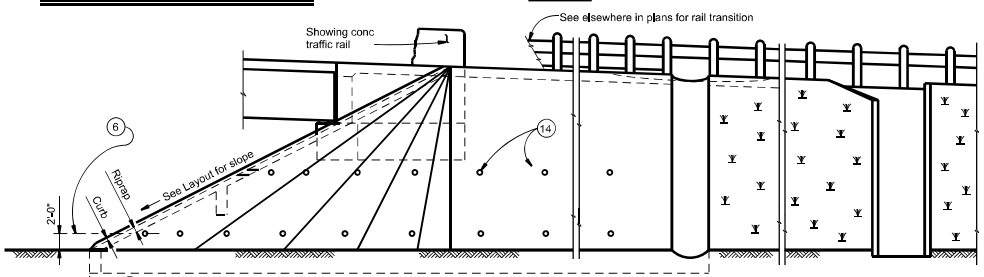


PLAN



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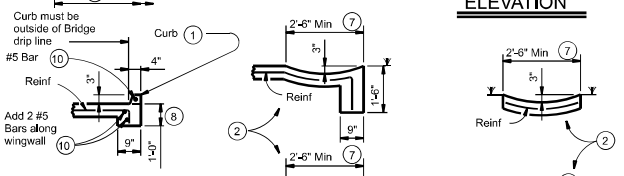
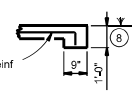
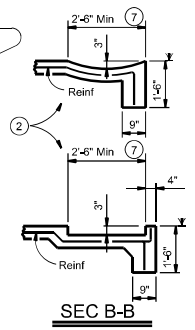


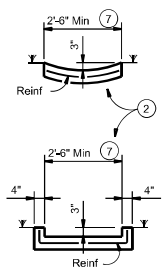
SEC A-A



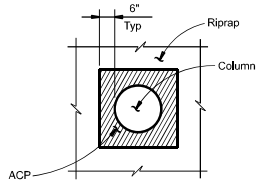
SEC B-B
(No drain)



SEC B-B
(Shoulder drain integral with riprap)

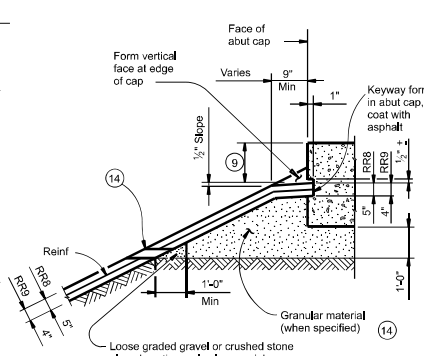


SEC D-D
(Shoulder drain)

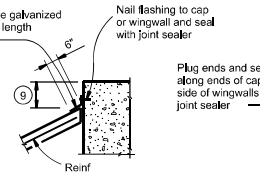


Riprap blockout to be filled with ACP. (Subsidiary to riprap)

RIPRAP DETAIL AT COLUMNS
(As directed by the Engineer)

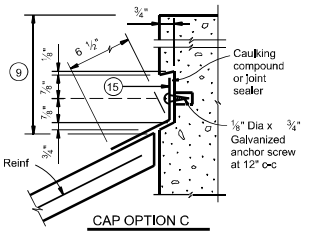


SHOWING KEYWAY OPTION

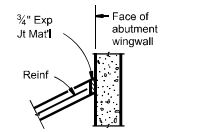


CAP OPTION A

CAP OPTION B

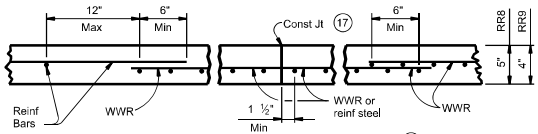


CAP OPTION C



SECT THRU RIPRAP AT WINGWALL

SECTIONS THRU RIPRAP AT CAP



REINFORCEMENT DETAILS

See General Notes for optional synthetic fiber reinforcement.

SECTION C-C

INTERMEDIATE TOEWALL

1. When riprap is shown extended around header on layout, extend slab and toewall as shown and eliminate 4" curb.
2. Limits and configuration of drains and depressions are as shown elsewhere in plans or as directed by the Engineer.
3. Location of shoulder drain must consider limitations imposed by rail transition. Do not locate shoulder drains at expansion joints between approach slab and concrete pavement.
4. See details elsewhere in plans for installation of guard fence posts through concrete riprap.
5. Provide intermediate toewall only when designated elsewhere in the plans or included in the specifications.
6. Provide lower level of 2" Dia weep holes at 10' c-c backed by 1 CF packet of gravel and galvanized hardware cloth at all locations unless directed by the Engineer to eliminate.
7. Use wider or other drain configurations if shown elsewhere in plans or if directed by the Engineer.
8. Wall extension may be reduced or modified if approved by the Engineer. Increase wall extension to 1'-6" whenever the optional intermediate toewall is called for in the plans.
9. Top of cap to top of riprap dimension varies as directed by the Engineer. Should be 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.
10. #5 bars shown are required even when synthetic fiber reinforcing option is selected.
11. Provide sealing option for joint between the face of cap and riprap as designated by the Engineer or as shown elsewhere on plans.
12. Flashing (shown in Cap Option A) may be used at wingwall in addition to Exp Jt Mat'l if shown on plans or directed by the Engineer.
13. Provide #3 reinforcing bars at 18" Spa c-c. Provide Welded Wire Reinforcement (WWR) as 6x6-D2.9xD2.9 or D3xD3. Combinations of WWR and reinforcing bars may be used if both are permitted. Use lap splices of a minimum 6 inches, measured from the transverse wire of WWR, and the ends of reinforcing bars.
14. If granular material is specified, provide upper level of 2" Dia weep holes at 10' c-c backed by galvanized hardware cloth.
15. 8" x 18 Gage Galv Sheet Metal
16. Provide WWR or #3 bars, with 1'-0" extension into slope.
17. WWR or reinforcing steel is continuous through riprap construction joints. Provide WWR or reinforcing steel that extends 1'-1" minimum into adjacent riprap on each side of construction joint even if synthetic reinforcing fiber is utilized.

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

GENERAL NOTES:
Provide Class "B" concrete (f'c = 2,000 psi) unless noted elsewhere in plans.
Provide Grade 60 reinforcing steel.
Provide deformed welded wire reinforcement (WWR) meeting ASTM A1064, unless otherwise shown.
Provide reinforcing bars, deformed WWR, or any suitable combination of both types for riprap reinforcing, unless specified elsewhere in the plans.
Optionally synthetic fibers may be used if approved by the Engineer. Provide synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) in lieu of steel reinforcing in riprap concrete. Install construction joints or grooved joints extending the full slant slope height at intervals of approximately 20 feet unless otherwise directed by the Engineer.
Hardware cloth, loose grade stone behind weep holes, flashing, or other sealing material are subsidiary to the bid item "Riprap".
See Layout for limits of riprap.
RR8 is to be used on stream crossings.
RR9 is to be used on other embankments.

Texas Department of Transportation
Bridge Division Standard

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

CRR

FILE: crrstde19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	6435	88	001	IH 10, ETC.
	DIST	COUNTY		SHEET NO.
	ELP	CULBERSON, ETC.		74

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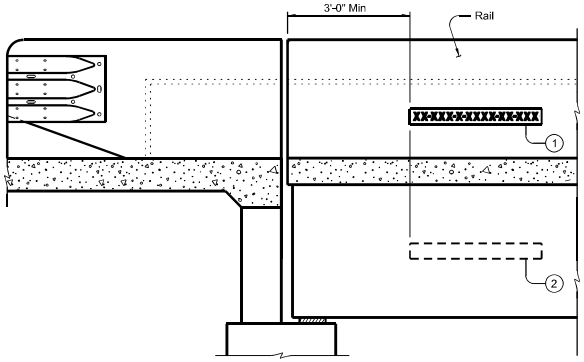

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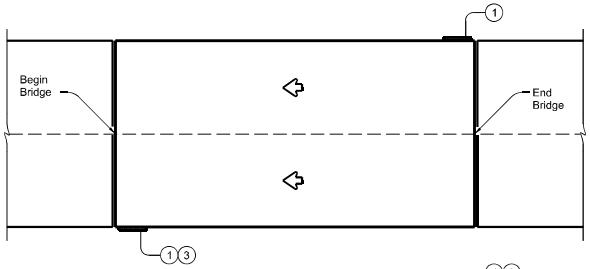
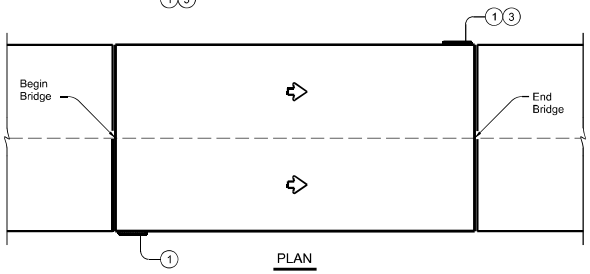
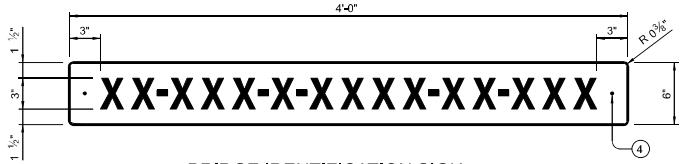


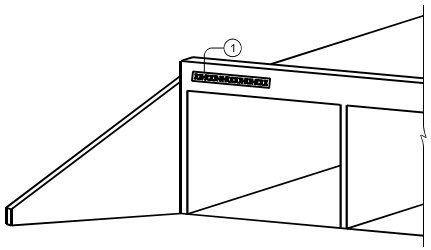


PLAN

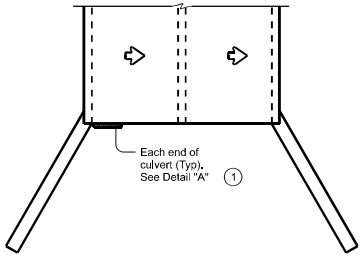
BRIDGE SIGN LOCATIONS



BRIDGE IDENTIFICATION SIGN

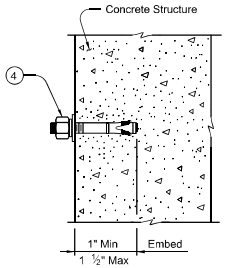


DETAIL "A"



PLAN

BRIDGE CLASS CULVERT SIGN PLACEMENT



ANCHOR DETAIL

SHEETING REQUIREMENTS		
Usage	Color	Sign Face Material
Background	White	Type B or C Sheeting
Letters and Symbols	Black	Type B or C Sheeting

(1) Bridge identification sign location

(2) Alternate sign placement location for exterior concrete beams.

(3) If adjacent bridges are less than 2 feet apart, these signs may be omitted.

(4) ¼" Diameter stainless steel expansion anchor with hex nut, washer, and spring-lock washer.

SIGN NOTES:

Standard sign designs can be found in the Standard Highway Sign Designs for Texas (SHSD).

Use the Clearview Alphabet CV-2W for the letters and symbols.

MATERIAL NOTES:

Provide lateral spacing between letters and numerals conforming with the SHSD, and any approved changes thereto. Provide a balanced appearance when spacing is not shown.

Provide aluminum sign blanks with a minimum thickness of 0.080" that meet the requirements of DMS-7110.

Provide sign face materials that meet the requirements of DMS-8300 and the sheeting requirements shown in the table.

Provide ¼" diameter stainless steel expansion anchors with one hex head nut, one flat washer, and one helical spring-lock washer each.

Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). Provide anchor products that have a designated ICC-ES Evaluation Report number. The approval status must be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.

Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.

Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environments, provide both stainless steel anchor bodies and expansion wedges.

GENERAL NOTES:

Prior to hole drilling, locate rebar to ensure clearing of existing reinforcement and/or strands.

Prior to installation, obtain approval of sign locations from the Engineer. Avoid placement of sign over travel lanes and pedestrian walkways. Submit proposed installation method to Engineer prior to beginning work. Install anchors as shown on plans and in accordance with the anchor manufacturer's published installation instructions.

Do not install anchors sections of members under tension.

For new construction, the signs and anchors are subsidiary to the bridge. For installations on existing structures, the signs and anchors are paid under Item 442, "Metal for Structures." Each sign weighs 28 lbs.

Texas Department of Transportation

Bridge Division Standard

NBI
BRIDGE IDENTIFICATION SIGN STANDARD

NBIS

FILE: MS-NBIS-23.dgn	DN: TAR	CK: TxDOT	DW: JER	CK: TAR
©TxDOT March 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	6435	88	001	IH 10, ETC.
	DIST	COUNTY		SHEET NO.
	ELP	CULBERSON, ETC.		75

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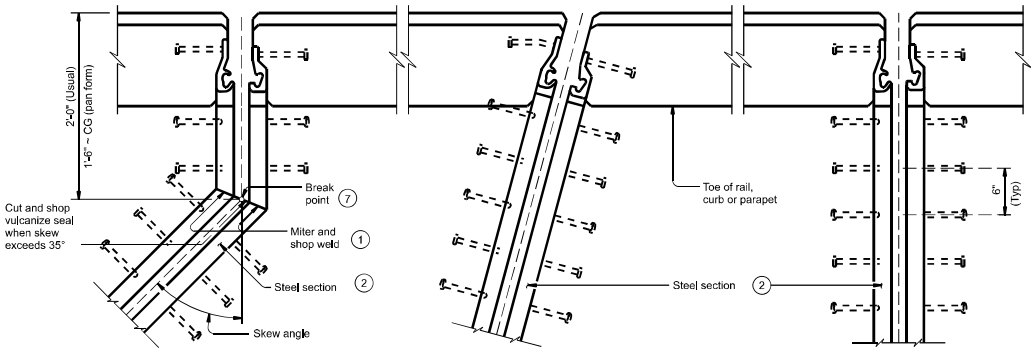
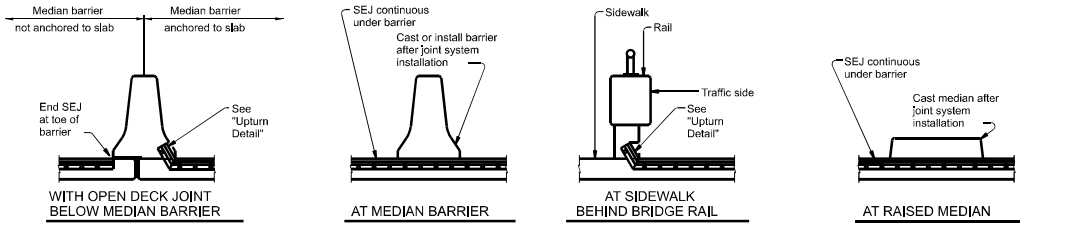


SHOWING SKEWS WITH SLAB BREAKBACKS

SHOWING SKEWS WITHOUT SLAB BREAKBACKS

SHOWING WITHOUT SKEWS AND SLAB BREAKBACKS

PLANS OF END CONDITIONS



WITH OPEN DECK JOINT BELOW MEDIAN BARRIER

AT MEDIAN BARRIER

AT SIDEWALK BEHIND BRIDGE RAIL

AT RAISED MEDIAN

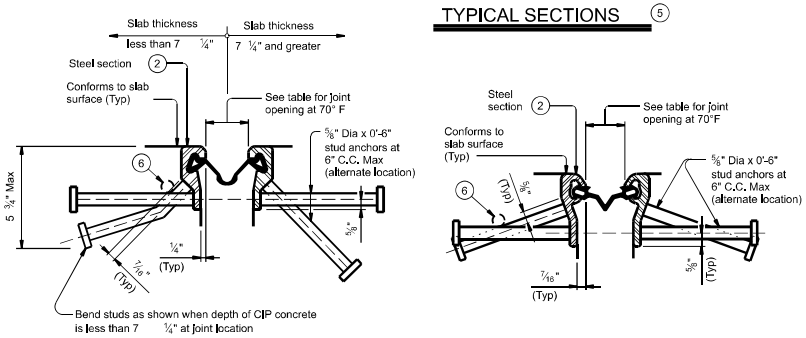
WITH OPEN DECK JOINT ADJACENT TO MEDIAN BARRIER

AT CONCRETE BRIDGE RAIL

AT SIDEWALK

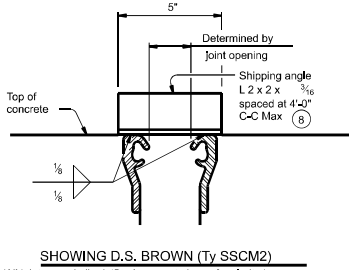
AT STEEL POST BRIDGE RAIL

TYPICAL SECTIONS (5)



SECTION THRU WATSON BOWMAN ACME (SE-400 OR SE-500) JOINTS

SECTION THRU D.S. BROWN (A2R-400 OR A2R-XTRA) JOINTS



SHOWING D.S. BROWN (Ty SSCM2)
(All joints are similar.) (Studs are not shown for clarity.)

SHIPPING ANGLE

An alternate method of securing joint sections may be used if approved by the Bridge Division. Erection bolts are not allowed.

TABLE OF SEALED EXPANSION JOINT INFORMATION

MANUFACTURER	STEEL SECTION (2)	STRIP SEAL			
		4" JOINT		5" JOINT	
		Seal Type	Joint Opening (3)	Seal Type	Joint Opening (3)
D.S. Brown	Type SSCM2	A2R-400	1 ¾"	A2R-XTRA	2"
Watson Bowman Acme	Type R	SE-400	1 ¾"	SE-500	2"

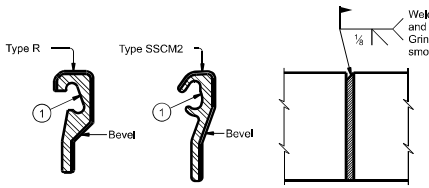
REDUCED LONGITUDINAL MOVEMENT RANGE

SKEW (deg)	JOINT SIZE	
	4"	5"
0	4.0"	5.0"
15	4.0"	5.0"
30	3.5"	4.3"
45	2.8"	3.5"

DESIGN NOTES:

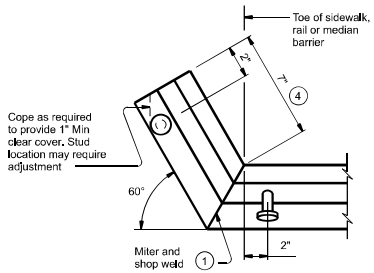
Joints installed on a skew have reduced ability to accommodate longitudinal movement. Use table values to determine the correct joint size for skewed installations.

For other skews over 25 degrees, calculate reduced movement range by multiplying joint size by cosine (skew).



WELD LIMITS WELD LIMITS REAR VIEW

FIELD SPLICE DETAIL



UPTURN DETAIL

1. Remove all burrs which will be in contact with seal prior to making splice.
2. Shape of steel section shown is typical. Variations in sections must be approved by the Engineer.
3. These openings are also the recommended minimum installation openings.
4. Reduce for sidewalk or parapet heights less than 6".
5. Other conditions affecting the joint profile should be noted elsewhere.
6. Move transverse bars that are in conflict with SEJ studs, in either the bridge slab or approach slab, to rest at the junction of the studs.
7. See Span details for location of break point.
8. Align shipping angle perpendicular to joint.

FABRICATION NOTES:

Temporarily shop assemble corresponding sections of sealed expansion joints (SEJ), check for fit, and match mark for shipment. Secure corresponding sections together for shipment with shipping angle. Do not use erection bolts.

The seal must be continuous and included in the price bid for sealed expansion joint.

Ship steel sections in convenient lengths of 10'-0" Min and 24'-0" Max unless necessary for staged construction or widenings. One shop splice is permitted in each shipping length provided no piece is less than 2'-0" long and sufficient studs are added to limit the stud to shop splice distance to 2" Min and 4" Max.

Weld studs in accordance with AWS D1.1.

Butt weld all shop and field splices and grind smooth areas in contact with seal. Make all necessary field splice joint preparations in the shop.

Paint the entire steel section with System II or IV primer in accordance with Item 446, "Field Cleaning and Painting Steel", unless required to galvanize when shown in the plans. Provide galvanizing in accordance with Item 445, "Galvanizing". Provide paints in accordance with Item 446.2. Prepare steel and apply paint in accordance with Item 446.4.7.3 and 446.4.7.4.

Shop drawings for the fabrication of sealed expansion joints will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.

CONSTRUCTION NOTES:

Secure the sealed expansion joint in position and place to the proper grade and alignment by welding braces to adjacent reinforcing steel, to prestressed beam stirrups, or to anchors cast in concrete diaphragms. Include cost of temporary bracing in the price bid for sealed expansion joint.

Remove shipping angle immediately after each joint half is secured in place. Grind smooth, and touch up with organic zinc-rich paint.

Clean and prepare seal cavity for seal installation as per the Manufacturer's installation procedures.

GENERAL NOTES:

Provide sealed expansion joints in the size and at locations shown on the plans.

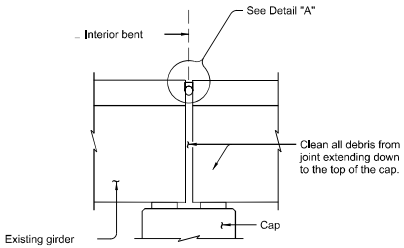
Minimum slab and overhang thickness required for the use of SEJ-M is 6 ½".

Texas Department of Transportation — Bridge Division Standard

SEALED EXPANSION JOINT
TYPE M
WITHOUT OVERLAY

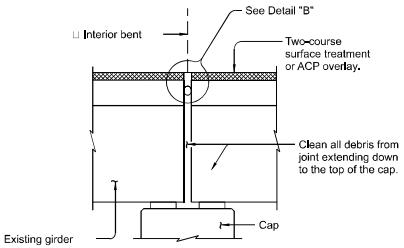
SEJ-M

FILE:	sejmste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT	April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS		6435	88	001	IH 10, ETC.
		DIST	COUNTY		SHEET NO.
		ELP	CULBERSON, ETC.		76



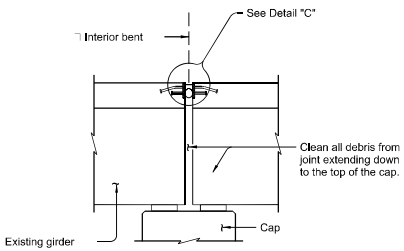
JOINT WITH SILICONE SEAL

(Used without ACP overlay)



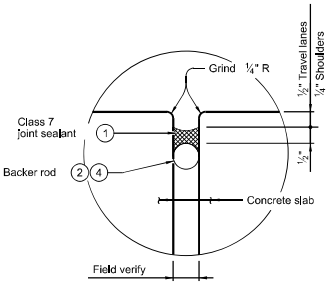
JOINT W/ HOT-POURED RUBBER SEAL

(Used with ACP overlay)

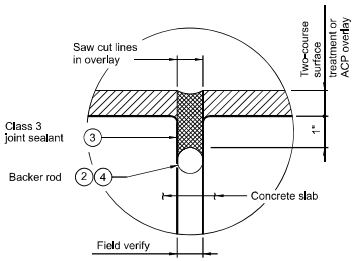


ARMOR JOINT

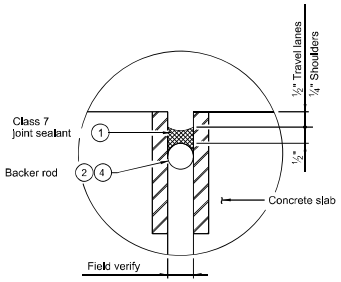
(Shown without ACP overlay. Armor joint with ACP overlay similar.)



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.

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 ½" below top of concrete in travel lanes and ¼" 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 ½" 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 ½" below top of concrete in travel lanes and ¼" below top of concrete in shoulders.

STATE OF TEXAS
ZILTHALO. SOTO
125506
LICENSED
PROFESSIONAL ENGINEER
, P.E.
07/23/2024

SHEET 1 OF 2

Texas Department of Transportation — Bridge Division

CLEANING AND SEALING EXISTING BRIDGE JOINTS

FILE: WD-CSBJ-22.dgn	DN:	CK:	DW:	CK:
©TxDOT August 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	5435	88	001	IH 10, ETC.
	DIST	COUNTY		SHEET NO.
	ELP	CULBERSON, ETC.		77

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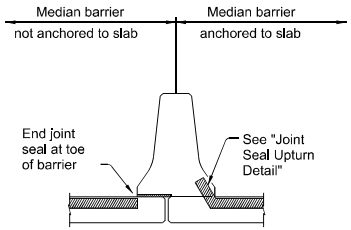
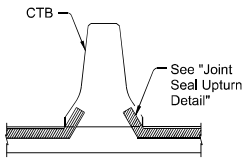
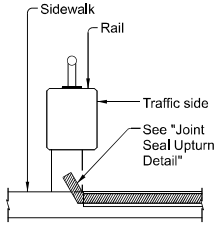


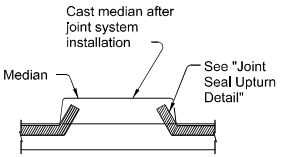
WITH OPEN DECK JOINT
BELOW MEDIAN BARRIER



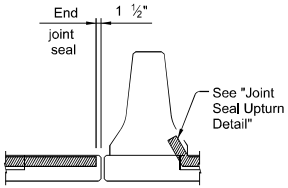
AT CONCRETE TRAFFIC BARRIER



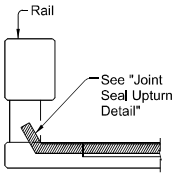
AT SIDEWALK
BEHIND BRIDGE RAIL



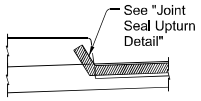
AT RAISED MEDIAN



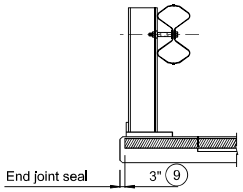
WITH OPEN DECK JOINT
ADJACENT TO MEDIAN BARRIER



AT CONCRETE BRIDGE RAIL



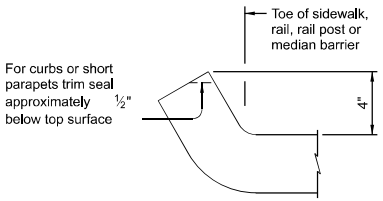
AT SIDEWALK



AT STEEL POST BRIDGE RAIL

JOINT SEALANT TERMINATION DETAILS

(9) 1 ½" for precompressed foam and silicone seal



JOINT SEAL UPTURN DETAIL

SHEET 2 OF 2

STATE OF TEXAS
ZULTHAI O. SOTO
125506
LICENSED
PROFESSIONAL ENGINEER
P.E.
07/23/2024

Texas Department of Transportation — Bridge Division

CLEANING AND SEALING EXISTING BRIDGE JOINTS

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©TxDOT August 2022	CONT	SECT	JOB	HIGHWAY
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	ELP	CULBERSON, ETC.		78

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STORMWATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with the TPDES Construction General Permit TXR150000 (CGP). The Texas Department of Transportation (TxDOT) ensures that project specifications include adequate best management practices (BMPs) for this project.

For all projects with soil disturbing activity and for projects that have Environmental, Permits, Issues, and Commitments (EPICs) dependent on stormwater controls and water quality measures TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office, Area Office, or electronically.

This SWP3 is consistent with requirements specified in applicable stormwater plans and the projects environmental permits, issues, and commitments (EPICs). A copy of the CGP is included in Attachment 2.12 of the SWP3 binder.

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
6435-88-001

1.2 PROJECT LIMITS:
From: Various locations

To: Various locations

1.3 PROJECT COORDINATES:
BEGIN: (Lat) N/A ,(Long) N/A

END: (Lat) N/A ,(Long) N/A

1.4 TOTAL PROJECT AREA (Acres): N/A

1.5 TOTAL AREA TO BE DISTURBED (Acres): N/A

1.6 NATURE OF CONSTRUCTION ACTIVITY:

1.7 MAJOR SOIL TYPES:

Soil Type	Description
N/A	N/A

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

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

Type	Sheet #s

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

1.9 CONSTRUCTION ACTIVITIES:
(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.5.)

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

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

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

Tributaries	Classified Waterbody

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

1.12 ROLES AND RESPONSIBILITIES: TxDOT

- ☒ Development of plans and specifications
- ☒ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
- ☒ Post Construction Site Notice
- ☒ Submit NOI/CSN to local MS4
- ☒ Perform SWP3 inspections
- ☒ Maintain SWP3 records and update to reflect daily operations
- ☒ Complete and submit Notice of Termination to TCEQ
- ☒ Maintain SWP3 records for 3 years
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

- ☒ Day To Day Operational Control
- ☒ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
- ☒ Post Construction Site Notice
- ☒ Submit NOI/CSN to local MS4
- ☒ Maintain schedule of major construction activities
- ☒ Install, maintain and modify BMPs
- ☒ Complete and submit Notice of Termination to TCEQ
- ☒ Maintain SWP3 records for 3 years
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

1.14 LOCAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OPERATOR COORDINATION:

MS4 Entity

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

 July 2023 Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			79
STATE	STATE DIST.	COUNTY	
TEXAS	ELP	CULBERSON, ETC.	
CONT.	SECT.	JOB	HIGHWAY NO.
6435	88	001	IH 10, ETC.

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

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

2.2 SEDIMENT CONTROL BMPs:

T / P

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

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

Sediment control BMPs requiring design capacity calculations (See SWP3 Attachment 1.3.):

T / P

- ☐ ☐ Sediment Trap
  - ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
  - ☐ 3,600 cubic feet of storage per acre drained
- ☐ ☐ Sedimentation Basin
  - ☐ Not required (<10 acres disturbed)
  - ☐ Required (>10 acres) and implemented.
    - ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
    - ☐ 3,600 cubic feet of storage per acre drained
  - ☐ Required (>10 acres), but not feasible due to:
    - ☐ Available area/Site geometry
    - ☐ Site slope/Drainage patterns
    - ☐ Site soils/Geotechnical factors
    - ☐ Public safety
    - ☐ Other: _____

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

- ☐ Chemical Management
- ☒ Concrete and Materials Waste Management
- ☒ Debris and Trash Management
- ☒ Dust Control
- ☐ Sanitary Facilities
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 DEWATERING:

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

2.9 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

When dewatering activities are present, a daily inspection will be conducted once per day during those activities and documented in accordance with CGP and TxDOT requirements.

2.10 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

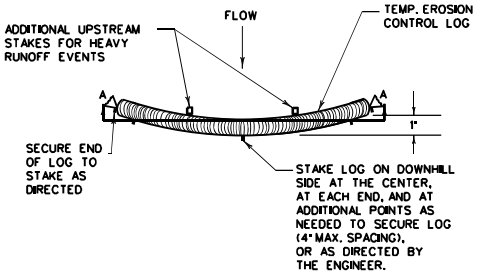
STORMWATER POLLUTION PREVENTION PLAN (SWP3)

July 2023 Sheet 2 of 2

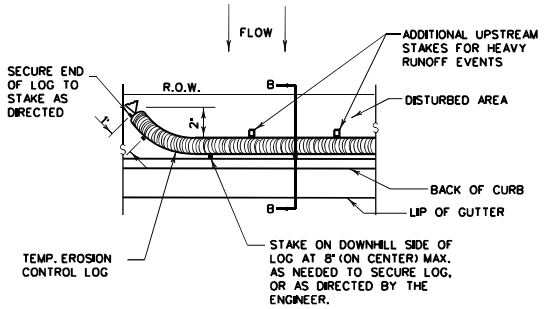
Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			80
STATE	STATE DIST.	COUNTY	
TEXAS	ELP	CULBERSON, ETC.	
CONT.	SECT.	JOB	HIGHWAY NO.
6435	88	001	IH 10, ETC.

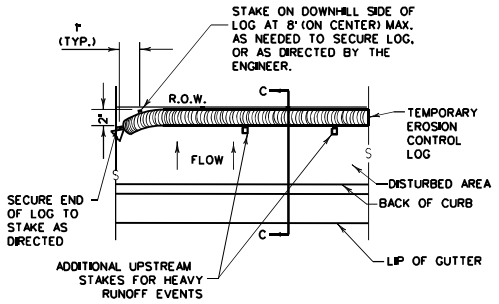
DATE:
FILE:



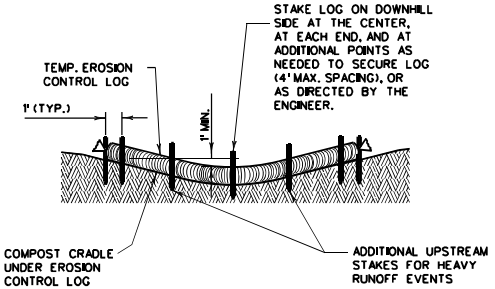
PLAN VIEW



PLAN VIEW



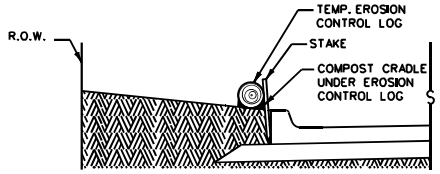
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

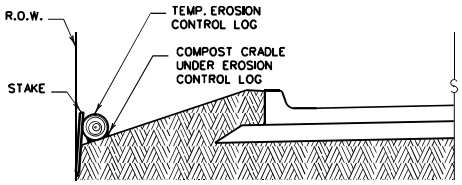
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



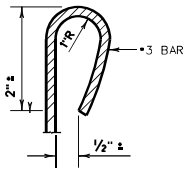
SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW

LEGEND

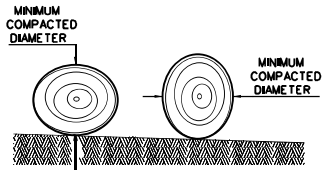
- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET



REBAR STAKE DETAIL

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	ELP	CULBERSON, ETC.		81

DATE:
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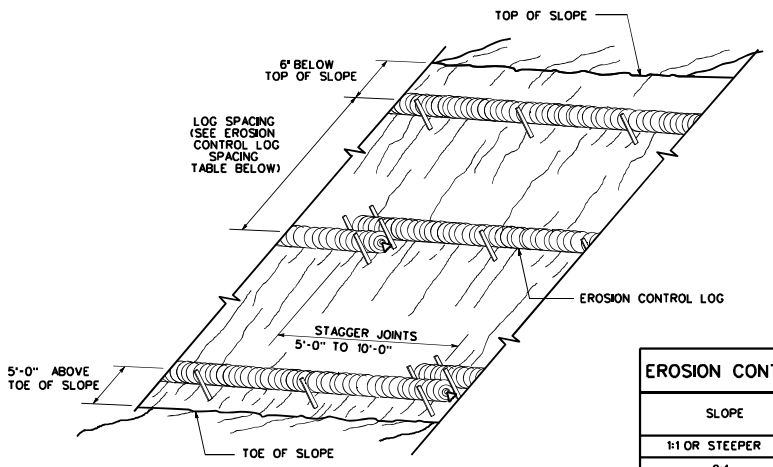
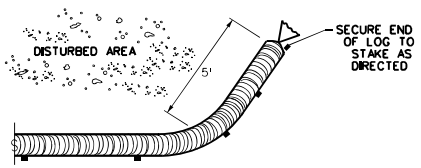


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

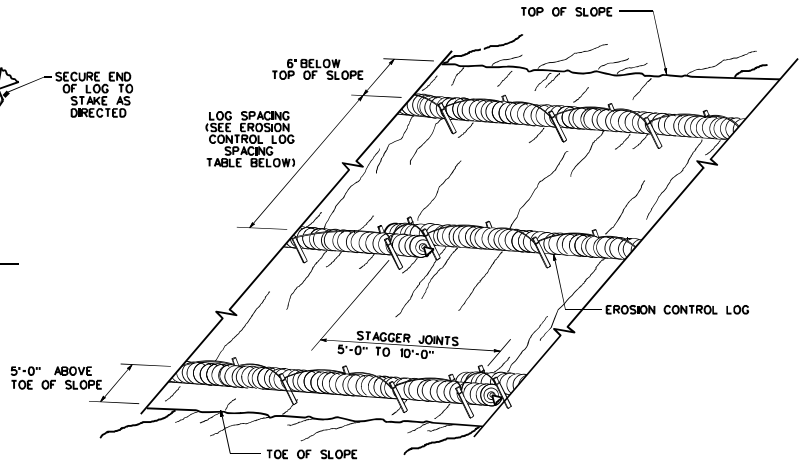
CL-SST



END SECTION RAP DETAIL

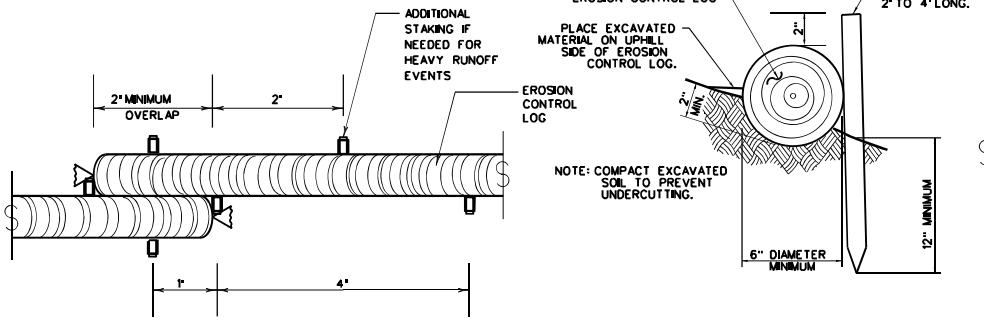
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER:
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

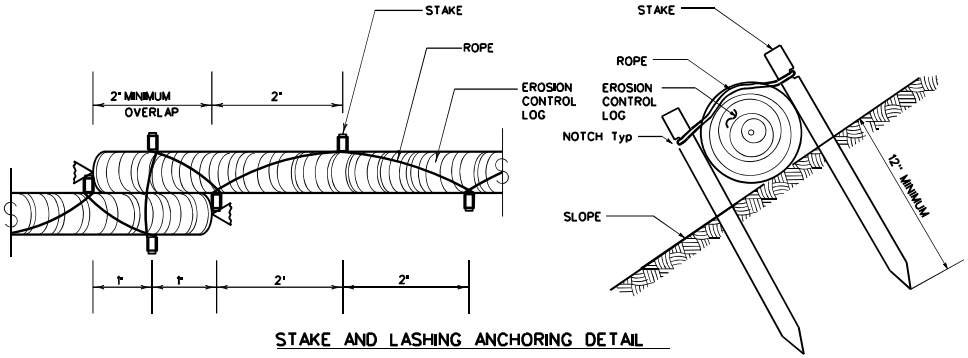
CL-SSL



STAKE AND TRENCHING ANCHORING DETAIL

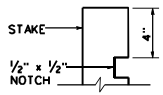
CL-SST

TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"



STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

SHEET 2 OF 3

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
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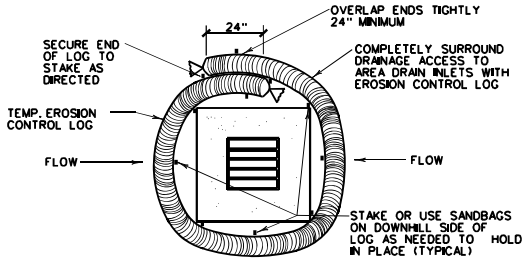
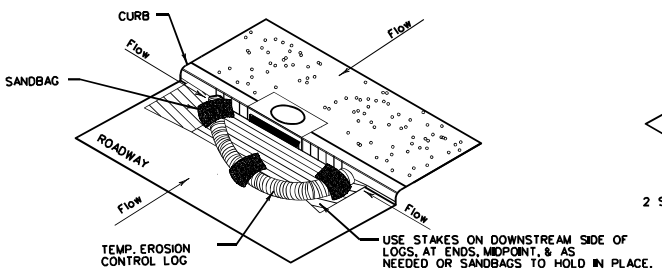
	DIST	COUNTY		SHEET NO.
	ELP	CULBERSON, ETC.		82



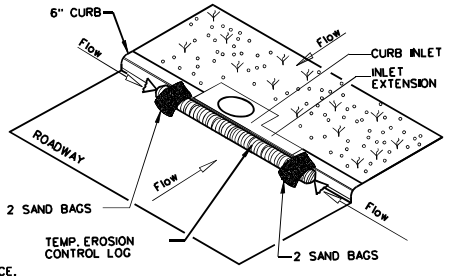
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

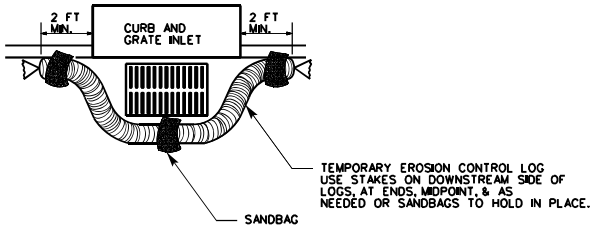
CL-CI



EROSION CONTROL LOG AT CURB INLET

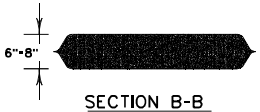
CL-CI

NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.

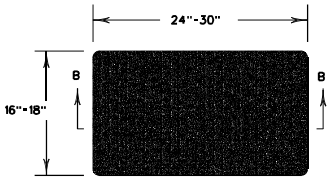


EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI



SECTION B-B



SANDBAG DETAIL

DATE:
FILE:

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916			DN: TxDOT	CK: KM	DW: LS/PT	CK: LS	
© TxDOT: JULY 2016			CONT	SECT	JOB	HIGHWAY	
REVISIONS			6435	88	001	IH 10, ETC.	
			DIST	COUNTY		SHEET NO.	
			ELP	CULBERSON, ETC.		83	