INDEX OF SHEETS

SEE SHEET 2

THE DISTRICT TRAFFIC SAFETY COMMITTEE HAS REVIEWED THE TRAFFIC CONTROL PLAN FOR THIS PROJECT AND IT IS IN COMPLIANCE WITH CURRENT TRAFFIC CONTROL STANDARDS.

DocuSigned by:
Casey McGee 9/20/2022
COMMITTEE CHAIRMAN DATE

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

PROJECT NO. F 2023(165)

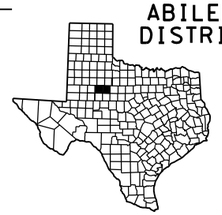
VARIOUS
TAYLOR CO.

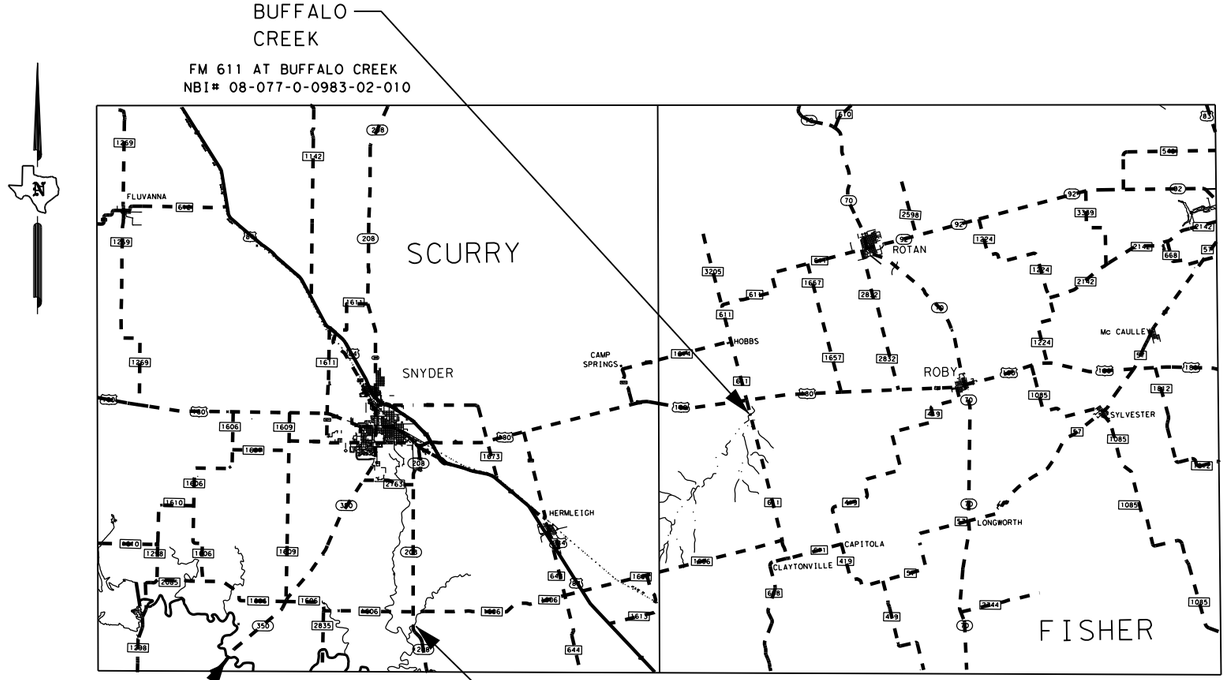
LIMITS: VARIOUS

FOR THE CONSTRUCTION OF: BRIDGE MAINTENANCE

CONSISTING OF: BRIDGE MAINTENANCE

ABILENE DISTRICT





NTS

DESIGN SPEED :	N/A
CURRENT A.D.T. :	N/A
PROJECTED A.D.T.:	N/A
FUNCTIONAL CLASS:	N/A
PROPOSED NBI# :	N/A

FHWA TEXAS DIVISION	PROJECT NO.		SHEET NO.
	F 2023(165)		1
STATE	DISTRICT	COUNTY	
TEXAS	ABL	TAYLOR, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0908	00	112	VARIOUS

FINAL PLANS

LETTING DATE: DECEMBER 2022

DATE CONTRACTOR BEGAN WORK: _____

DATE WORK WAS COMPLETED: _____

DATE WORK WAS ACCEPTED: _____

FINAL CONTRACT COST: $ _____

CONTRACTOR : _____

CERTIFICATION FOR FINAL PLANS

THIS PROJECT WAS BUILT ACCORDING TO THE PLANS AND SPECIFICATIONS. THESE FINAL PLANS REFLECT THE WORK DONE AND THE QUANTITIES SHOWN THEREON AND ON THE FINAL ESTIMATE ARE FINAL QUANTITIES.

AREA ENGINEER DATE

Texas Department of Transportation

SUBMITTED FOR LETTING: 9/20/2022
DocuSigned by: Michael Roethelli
MICHAEL R. ROETHELI, P.E.
PROJECT MANAGER

RECOMMENDED FOR LETTING: 9/21/2022
DocuSigned by: Stephen T. Jones, P.E.
STEPHEN T. JONES, P.E.
DISTRICT DESIGN ENGINEER

RECOMMENDED FOR LETTING: 9/21/2022
DocuSigned by: Stewart J. Chapman, P.E.
STEWART J. CHAPMAN, P.E.
AREA ENGINEER

RECOMMENDED FOR LETTING: 9/21/2022
DocuSigned by: Daniel P. Richardson, P.E.
DANIEL P. RICHARDSON, P.E.
DIRECTOR OF MAINTENANCE

APPROVED FOR LETTING: 9/21/2022
DocuSigned by: Thomas D. Allbritton, P.E.
THOMAS D. ALLBRITTON, P.E.
DISTRICT ENGINEER

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, JULY 5, 2022).

EQUATIONS: N/A
RAILROAD CROSSINGS: N/A

PENTABLE:
DATE: $DATE$
FILE: $FILE$

INDEX OF SHEETS

STATE OF TEXAS
MAXIE W. ALLEN
96883
LICENSED
PROFESSIONAL ENGINEER

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THIS SHEET WITH A # HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

DocuSigned by:
Maxie Allen
3000A1282A5242B...

MAXIE W. ALLEN , P.E. 9/20/2022
DATE

INDEX OF SHEETS

 Texas Department of Transportation

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		VARIOUS
STATE	COUNTY		SHEET NO.
TEXAS	TAYLOR, ETC.		2
DISTRICT	CONTROL	SECTION	JOB
ABL	0908	00	112

$FILE$ $TIME$
$DATE$

ABILENE DISTRICT GENERAL NOTES
2014 SPECIFICATIONS

General

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

Stewart Chapman, P.E.: Stewart.Chapman@txdot.gov
Maxie Allen, P.E.: Maxie.Allen@txdot.gov
(Snyder Area Office)

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

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:
https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/

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

Failure to make necessary corrections to traffic control items based on barricade inspections will be cause for withholding the monthly estimate until such corrections have been made.

Provide ingress/egress to the adjacent properties in areas under construction. Phased construction of driveways and streets shall be required to provide uninterrupted access to adjacent properties. Coordinate work with the property owners before beginning any construction in the vicinity of the drive.

Cut neat, straight lines with vertical faces along pavement edges or along joints between existing asphalt or concrete pavement and new pavement perpendicular or parallel to the direction of traffic by methods described in applicable bid items, or as directed. Provide clean edges or joints without jagged appearance or chunks broken out. This work is considered subsidiary to various bid items.

Environmental

Endangered and Protected Species Migratory Birds

a. **Bird nesting season is typically 15Feb through 15Sep annually.**

CCSJ: 0908-00-112
County: Taylor, etc.
Highway: Various

b. The Contractor will avoid disturbing, destroying, removing, or relocating migratory birds and active nests found in trees, culverts, bridges, on the ground, or anywhere they are encountered.
c. Perform all tree trimming and other vegetation clearing activities during the non-breeding season (typically 15Sep-15Feb annually). Perform any inactive nest removal and bird exclusion methods to prevent birds from establishing nests. Phasing of work during construction may be necessary to stay in compliance.
d. When active nests are unexpectedly encountered on-site during construction, the Contractor will stop work and immediately notify the Engineer. Take measures to avoid disturbance of these birds, their occupied nest, eggs, and/or young, in accordance with the Migratory Bird Treaty Act, Texas Parks and Wildlife Code, and TxDOT policy.
e. The Engineer will notify the Contractor when work may resume.
f. The Contractor should be prepared to prevent migratory birds from building nests by utilizing nest prevention methods, such as bird-deterrent netting and bird-repelling sprays and/or gels, between 15Feb and 15Sep. The Contractor can discuss other preventative measures with the Engineer and/or District Environmental Staff.

Best Management Practices

1. Bird BMPs
   a. Not disturbing, destroying, or removing active nests, including ground nesting birds, during the nesting season.
   b. Avoiding the removal of unoccupied, inactive nests, as practicable.
   c. Preventing the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair.
   d. Not collecting, capturing, relocating, or transporting birds, eggs, young, or active nests without a permit.

Item 5, "Control of Work"
Make necessary arrangements with utility owners regarding temporary protections such as bracing power poles, and de-energizing power lines. The Department will not reimburse the cost of such temporary protections to the Contractor, unless the Engineer determines that inadequate information was available at the time the project was bid. **"Call Before You Dig" "Call 811"**

Item 6, "Control of Materials"
The use of flame or saw-cutting to dismantle the steel beams will not be allowed. Unbolting, shearing or other method approved by the Engineer will be allowed.

CONT	SECT	JOB	HIGHWAY
0908	00	112	VARIOUS
DIST	COUNTY		SHEET NO.
ABL	TAYLOR, ETC.		3

GENERAL NOTES

CCSJ: 0908-00-112
County: Taylor, etc.
Highway: Various

Item 6, "Control of Materials" Cont.
To comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law, the contractor must submit a notarized original of the TxDOT Construction Material Buy America Certification Form for all items classified as construction materials. This form is not required for materials classified as a manufactured product.

Refer to the Buy America Material Classification Sheet for clarification on material categorization.

The Buy America Material Classification Sheet is located at the below link.
https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html for clarification on material categorization.

Item 7, "Legal Relations and Responsibilities"
The total area disturbed for this project is 0 acres. The disturbed area in this project, all project locations in the Contract, and the Contractor project specific locations (PSLs), within 1 mile of the project limits, for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the ROW. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the ROW to the Engineer and to the government that operates a separate storm sewer system.

No significant traffic generator events identified.

Hard hats are required at all times during construction when construction personnel are in TxDOT Right-of-Way.

Item 8 "Prosecution and Progress"
Each contract awarded by the Department stands on its own and as such, is separate from other contracts. A Contractor awarded multiple contracts must be capable and sufficiently staffed to concurrently process and/or execute all contracts at the same time.

Coordinate and update the work schedule with the project inspector daily. Give a minimum of 24 hours of notice to project inspector if work requiring inspection or testing is to be performed. Failure to do so may cause that work to be delayed or postponed if TxDOT personnel are not available. Work performed without suitable inspection, as determined by the Engineer, may be ordered removed and replaced at Contractor's expense.

CCSJ: 0908-00-112
County: Taylor, etc.
Highway: Various

Item 9, "Measurement and Payment"
The progress payment period shall end on the 25th of each month, unless directed by the Area Office Engineer. Material on Hand (MOH) is due two business days before estimate cut off.

Item 429, "Concrete Structure Repair"
Areas to be repaired at each location shall be marked in the field by the Engineer.

Areas to be repaired at each location shall be repaired in accordance with the Department's Concrete Repair Manual. The Contractor must prepare and submit formal procedures outlining repair plans and which proprietary implementation so the Engineer has sufficient time to review. The Engineer must approve in writing any procedures that differ from those in the Concrete Repair Manual or materials that are not included in one of TxDOT's MPLS materials they plan to utilize. Submit the package a minimum of two weeks prior to.

For Vertical and Overhead repairs use preapproved Type C Repair Material. For Deck repairs use preapproved Type B Ultra-Rapid Extended Repair Material.
Item 429, "Concrete Structure Repair"Cont.
Refer to the plans for layout requirement for boundary of repair areas.

Item 432, "Riprap"
Provide tooled contraction joints at a maximum spacing of 25 feet and ½" fiber board every 150 feet when constructing riprap. The depth for tooled joints shall be sufficient to ensure cracking at the joints. The depth for fiber board joints shall be the full depth of the riprap

Provide conventionally reinforced concrete in areas shown in the plans including replacement of concrete riprap at SH 350 abutments.

When using conventional reinforcement, meet all requirements in accordance with Article 432.3.1. Concrete Riprap with exception that Class A Concrete is required.

Item 446, "Cleaning and Painting Steel"
Provide a System II Paint with a Federal Standard 595C #35630 color.

Item 448, "Structural Field Welding"
All welding and steel repairs to be performed by Bridge Certified Welder in accordance with item 448.

Item 502, "Barricades, Signs and Traffic Handling"
Additional signs, barricades and traffic handling may be necessary to complete the work shown herein and will be provided by the contractor as required and will be considered subsidiary to this item.

Provide separate attenuators for each work area within a common lane closure as approved or directed by the Engineer.

CONT	SECT	JOB	HIGHWAY
0908	00	112	VARIOUS
DIST	COUNTY		SHEET NO.
ABL	TAYLOR, ETC.		4

GENERAL NOTES

Item 502, "Barricades, Signs and Traffic Handling" Cont.
In sections where traffic is restricted to one lane, two-way traffic, flaggers will be stationed at each end of that section with two-way communication devices and a pilot car will control operations.

Pilot car is subsidiary to item 502.

Relocate existing roadside signs to temporary supports as approved by the engineer.

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

Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

The Contractor's person responsible for TCP compliance must be available by local telephone and have a response time within 45 minutes.

Work will not be allowed on both sides of the roadbed at the same time.

Equip all work vehicles within 30 feet of the traveled way with a functioning amber strobe light or rotating beacon visible from all directions.

Repair barricades within the timeline shown on the barricade inspection report. Failure to comply will cease all work until barricades are repaired to the satisfaction of the Department.

Replace all damaged traffic control devices immediately. Remove any damaged traffic control devices from the project within 24 hours.

Item 506, "Temporary Erosion, Sedimentation, and Environmental Controls"
On site concrete washout shall not be allowed on this project.

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.

CCSJ: 0908-00-112
County: Taylor, etc.
Highway: Various

Item 6185, "Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)"
Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA) will not be considered a major item of work on this project.

TMA,s will only be paid while workers are present or to protect a blunt object.

BASIS OF ESTIMATE FOR STATIONARY TMAs				
		TMA (Stationary)		
Phase	Standard	Required	Additional	TOTAL
1,2,3	TCP (1-1)-18			1
1,2,3	TCP (1-2)-18			1
1,2,3	TCP (1-3)-18			1

BASIS OF ESTIMATE FOR MOBILE TMAs				
		TMA (Mobile)		
Phase	Standard	Required	Additional	TOTAL
NA				NA

The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project. The Contractor must get approval from the Engineer for any changes in the number of TMA as shown in the plans.

If a TMA is used for both mobile and stationary traffic control on the same day, it will be paid for as stationary for that day.

CONT	SECT	JOB	HIGHWAY
0908	00	112	VARIOUS
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GENERAL NOTES

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0908-00-112 **DISTRICT** Abilene **COUNTY** Taylor
HIGHWAY Various

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0908-00-112**			
		PROJECT ID		**A00183012**			
		COUNTY		**Taylor**			
		HIGHWAY		**Various**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	104-6009	REMOVING CONC (RIPRAP)	SY	18.000		18.000	
	132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	180.000		180.000	
	156-6001	BULLDOZER WORK	HR	20.000		20.000	
	401-6001	FLOWABLE BACKFILL	CY	25.000		25.000	
	428-6001	PENETRATING CONCRETE SURFACE TREATMENT	SY	1,418.000		1,418.000	
	429-6004	CONC STR REPAIR(RAPID DECK REP(PRT DPT)	SF	400.000		400.000	
	429-6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	1,680.000		1,680.000	
	432-6008	RIPRAP (CONC)(CL B)(RR8&RR9)	CY	4.000		4.000	
	432-6023	RIPRAP (STONE COMMON)(DRY)(8 IN)	CY	120.000		120.000	
	432-6038	BEDDING MATERIAL (3 IN)	CY	5.000		5.000	
	438-6002	CLEANING AND SEALING EXIST JOINTS(CL3)	LF	387.000		387.000	
	442-6007	STR STEEL (MISC NON - BRIDGE)	LB	472.000		472.000	
	442-6011	STR STEEL (PEDESTAL)	LB	2,489.000		2,489.000	
	446-6024	CLEAN & PAINT EXIST PILING (SYSTEM II)	LS	1.000		1.000	
	454-6008	HEADER TYPE EXPANSION JOINT	CF	8.000		8.000	
	454-6009	JOINT SEALANT	LF	52.000		52.000	
	483-6019	MICROMILLING CONCRETE SLAB (2 IN)	SY	800.000		800.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	10.000		10.000	
	780-6001	CNC CRACK REPAIR (DISCRETE)(GRAVITY)	LF	300.000		300.000	
	780-6004	CNC CRCK REPAR(DISCRETE)(ROUT AND SEAL)	LF	500.000		500.000	
	784-6192	REPAIR STEEL (CORROSION MITIGATION)	EA	12.000		12.000	
	4106-6003	POLYESTER POLYMER CONC OVERLAY (2")	SY	800.000		800.000	
	4207-6001	STEEL BRIDGE ZONE PAINTING REF STR #1	EA	1.000		1.000	
	4207-6002	STEEL BRIDGE ZONE PAINTING REF STR #2	EA	1.000		1.000	
	6185-6002	TMA (STATIONARY)	DAY	180.000		180.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	

SUMMARY OF BRIDGES

CSJ	BRIDGE NBI #		BRIDGE LOCATION	STATION		LENGTH	CLEAR RDWY WIDTH	104-6009 REMOVING CONC (RIPRAP)	401-6001 (FLOWABLE BACKFILL)	428-6001 PENETRATING CONCRETE SURFACE TREATMENT	429-6004 CONC STR REPAIR (RAPID DECK REP) (PART DEPTH)	429-6007 CONC STRUCTURE REPAIR(VERTICAL & OVERHEAD)	432-6008 RIPRAP (CONC) (CL B)(RR8 & RR9)
	EXISTING	PROPOSED		BEGIN	END	FT	FT	SY	CY	SF	SF	SF	CY
0908-00-112	08-077-0-0983-02-010	08-077-0-0983-02-010	FM 611 AT BUFFALO CREEK	41+65	42+96	131	24						
0908-00-112	08-208-0-0332-01-012	08-208-0-0332-01-012	SH 208 AT BIG SULPHUR CREEK	141+95	143+75	180	40			804	400	490	
0908-00-112	08-208-0-0693-03-007	08-208-0-0693-03-007	SH 350 AT COLORADO RIVER	61+84	65+16	331	52	18	25	614		1190	4
TOTALS								**18**	**25**	**1418**	**400**	**1680**	**4**

CSJ	432-6023 RIPRAP (STONE COMMON) (DRY)(8 IN)	432-6038 BEDDING MATERIAL (3 IN)	438-6002 CLEANING AND SEALING EXISTING JOINTS (CL3)	442-6007 STR STEEL (MISC NON-BRIDGE)	442-6011 STR STEEL (PEDESTAL)	446-6024 CLEAN & PAINT EXISTING PILING (SYSTEM II)	454-6008 HEADER TYPE EXPANSION JOINT	454-6009 JOINT SEALANT	483-6019 MICROMILLING CONCRETE SLAB (2IN)	780-6001 CONC CRACK REPAIR (DISCRETE GRAVITY)
	CY	CY	LF	LB	LB	LS	CF	LF	SY	LF
0908-00-112			130	472						
0908-00-112			205		2489				800	300
0908-00-112	120	5	52			1	8	52		
TOTALS	**120**	**5**	**387**	**472**	**2489**	**1**	**8**	**52**	**800**	**300**

CSJ	780-6004 CONC CRACK REPAIR (DISCREET) (ROUT AND SEAL)	784-6192 REPAIR STEEL (CORROSION MITIGATION)	4106-6003 POLYESTER POLYMER CONC OVERLAY (2")	4207-6001 STEEL BRIDGE ZONE PAINTING REF STR #1	4207-6002 STEEL BRIDGE ZONE PAINTING REF STR #2
	LF	EA	SY	EA	EA
0908-00-112		12		1	
0908-00-112			800		
0908-00-112	250				1
TOTALS	**250**	**12**	**800**	**1**	**1**

SUMMARY OF ROADWAY & WORK ZONE ITEMS

LOCATION	132 6003 EMBANKMENT (FINAL)(ORD COMP)(TY B)	156 6001 BULLDOZER WORK	6185 6002 TMA (STATIONARY)
	CY	HR	DAY
FM 611	0	0	39
SH 208	0	0	81
SH 350	180	20	60
TOTALS	**180**	**20**	**180**

BRIDGE SUMMARY

Texas Department of Transportation

NO SCALE

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		VARIOUS
STATE	COUNTY		SHEET NO.
TEXAS	TAYLOR, ETC.		7
DISTRICT	CONTROL	SECTION	JOB
ABL	0908	00	112

$FILE$
$DATE$

SUGGESTED SEQUENCE OF WORK

FM 611 AT BUFFALO CREEK

PHASE 1 PERFORM STEEL REPAIRS FOR WEST 1/2 OF ROADWAY USING TCP (1-2B)-18 DURING DAYTIME OPERATIONS. OPEN ROADWAY TO TRAFFIC AT THE END OF EACH DAY.

PHASE 2 PERFORM STEEL REPAIRS FOR REMAINING EAST 1/2 OF ROADWAY USING TCP (1-2B)-18 DURING DAYTIME OPERATIONS.

PHASE 3 CLEAN AND SEAL BRIDGE JOINTS FOR 1/2 OF ROADWAY USING TCP(1-2B)-18 DURING DAYTIME OPERATIONS.

CLEAN AND SEAL BRIDGE JOINTS FOR REMAINING 1/2 OF ROADWAY DURING DAYTIME OPERATIONS.

SH 208 AT BIG SULPHUR CREEK

PHASE 1 PERFORM CONCRETE STRUCTURE REPAIR AND INSTALL STEEL PEDESTALS FOR WEST 1/2 ROADWAY USING TCP (1-2B)-18 DURING DAYTIME OPERATIONS. OPEN ROADWAY TO TRAFFIC AT THE END OF EACH DAY.

PERFORM PARTIAL DECK REPAIR FOR WEST 1/2 ROADWAY USING TCP (1-2B)-18 DURING DAYTIME OPERATIONS.

CLEAN AND SEAL BRIDGE JOINTS FOR WEST 1/2 OF ROADWAY USING TCP(1-2B)-18 DURING DAYTIME OPERATIONS.

PHASE 2 PERFORM CONCRETE STRUCTURE REPAIR AND INSTALL STEEL PEDESTALS FOR EAST 1/2 ROADWAY USING TCP (1-2B)-18 DURING DAYTIME OPERATIONS. OPEN ROADWAY TO TRAFFIC AT THE END OF EACH DAY.

PERFORM PARTIAL DECK REPAIR FOR EAST 1/2 ROADWAY USING TCP (1-2B)-18 DURING DAYTIME OPERATIONS.

CLEAN AND SEAL BRIDGE JOINTS FOR EAST 1/2 OF ROADWAY USING TCP(1-2B)-18 DURING DAYTIME OPERATIONS.

SH 350 AT COLORADO RIVER

PHASE 1 PERFORM CONCRETE STRUCTURE REPAIR FOR EAST 1/2 ROADWAY USING TCP (1-2B)-18 DURING DAYTIME OPERATIONS. OPEN ROADWAY TO TRAFFIC AT THE END OF EACH DAY.

PERFORM EROSION REPAIRS ON ROADWAY APPROACHES.

CLEAN AND PAINT STEEL PILINGS.

APPLY PENETRATING CONCRETE SURFACE TREATMENT.

CLEAN AND SEAL BRIDGE JOINTS USING TCP (1-2B)-18 DURING DAYTIME OPERATIONS..

PHASE 2 PERFORM CONCRETE STRUCTURE REPAIR FOR WEST 1/2 ROADWAY USING TCP (1-2B)-18 DURING DAYTIME OPERATIONS. OPEN ROADWAY TO TRAFFIC AT THE END OF EACH DAY.

PLACE FLOWABLE FILL TO FILL VOID UNDER ABUTMENT 7.

CLEAN AND PAINT STEEL PILINGS.

APPLY PENETRATING CONCRETE SURFACE TREATMENT.

CLEAN AND SEAL BRIDGE JOINTS USING TCP (1-2B)-18 DURING DAYTIME OPERATIONS.

STATE OF TEXAS
MAXIE W. ALLEN
96883
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Maxie Allen
300044282A5242B...

9/8/2022

FILE: $FILE$ $TIME$
DATE: $DATE$

Texas Department of Transportation

TCP NARRATIVE

SHEET 1 OF 1

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		VARIOUS
STATE	COUNTY		SHEET NO.
TEXAS	TAYLOR, ETC.		8
DISTRICT	CONTROL	SECTION	JOB
ABL	0908	00	112

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

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REVISIONS	0908	00	112	VARIOUS
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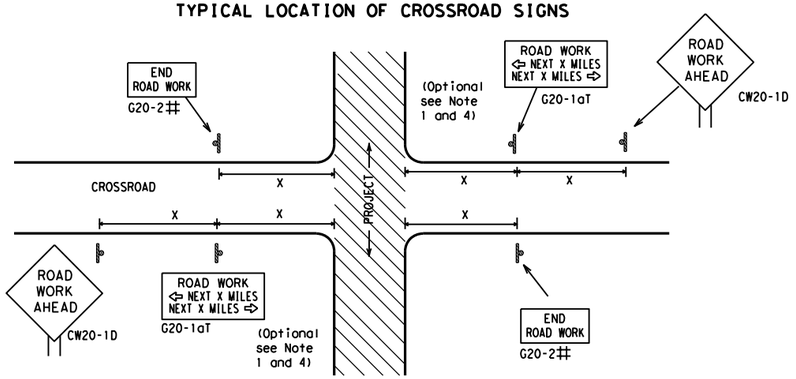
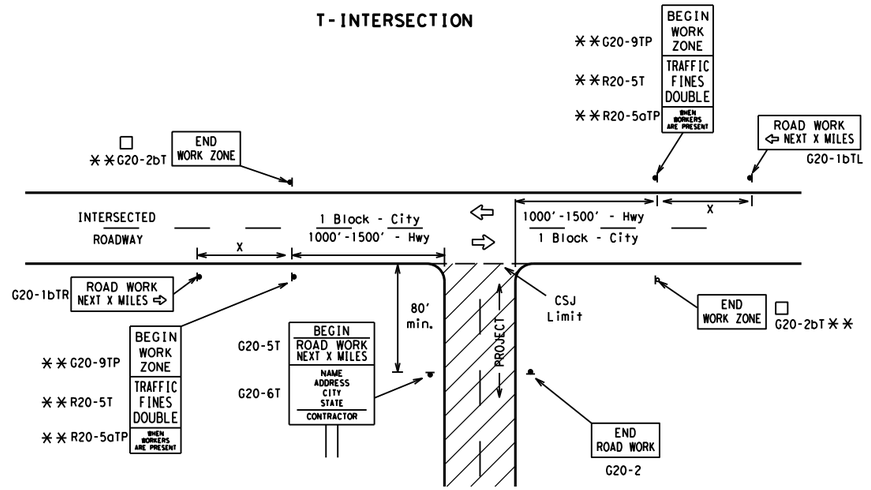
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

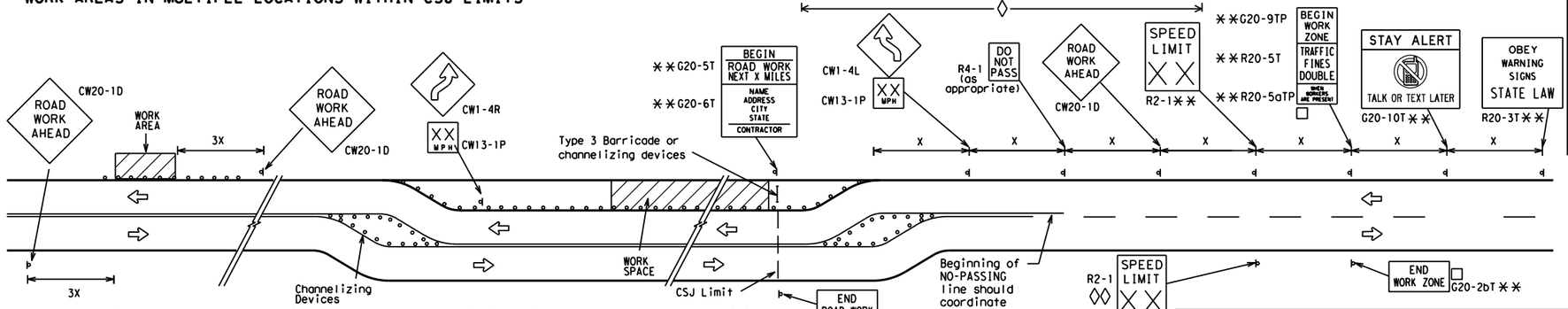
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

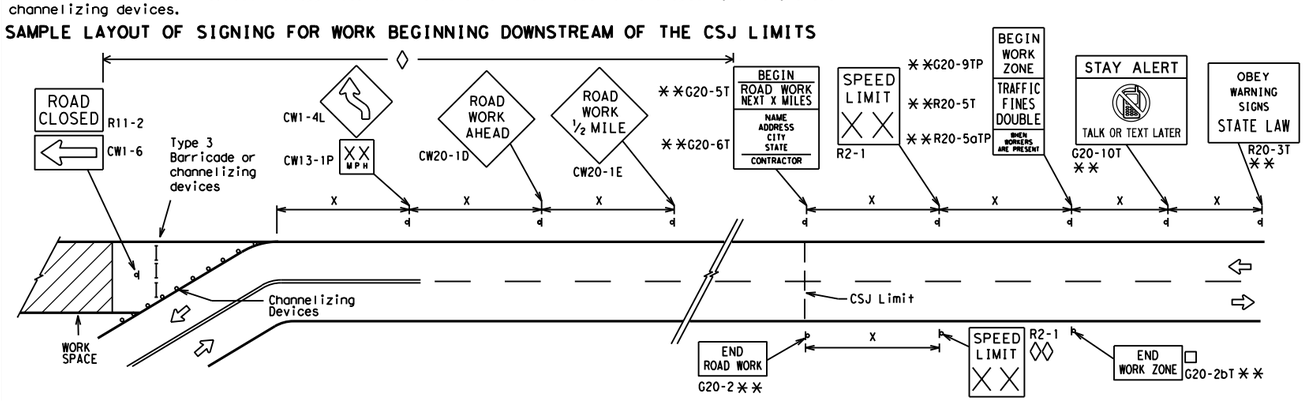
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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7-13 5-21	ABL	TAYLOR		10

DATE:
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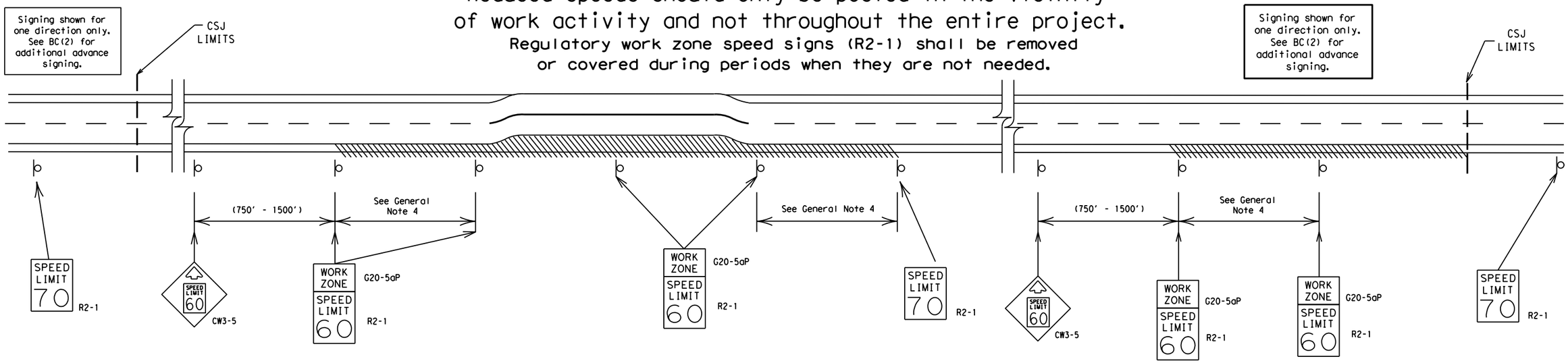
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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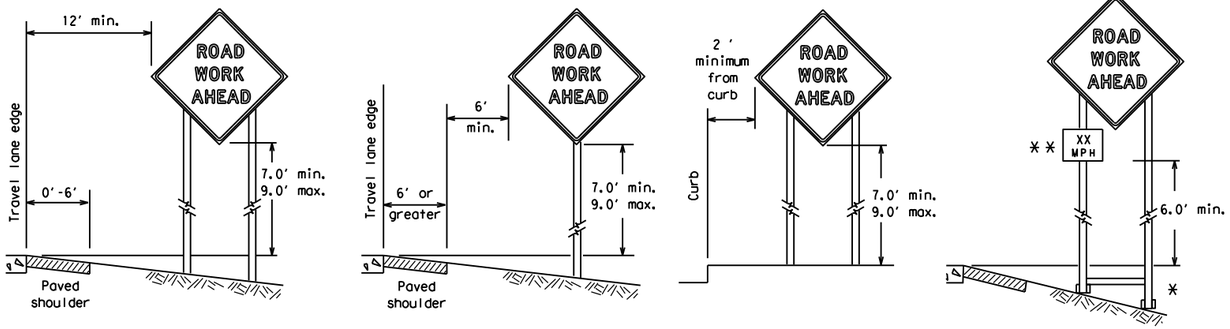
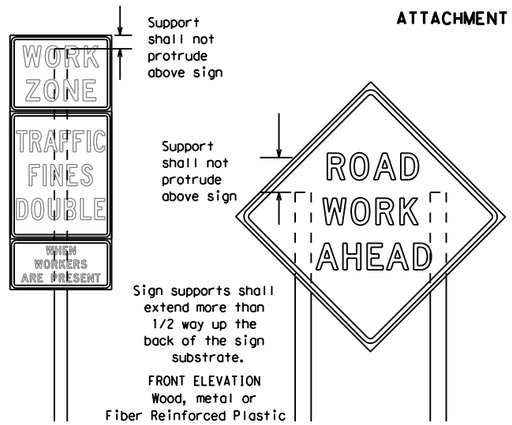
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

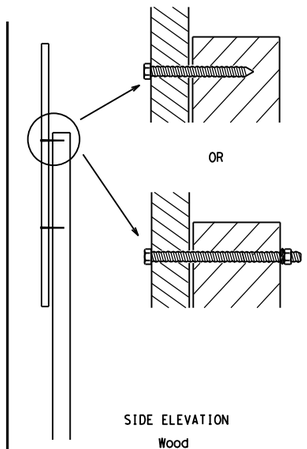


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





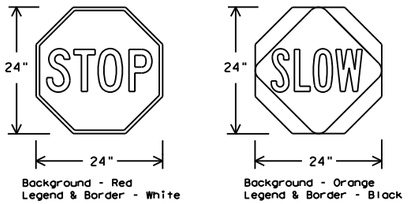
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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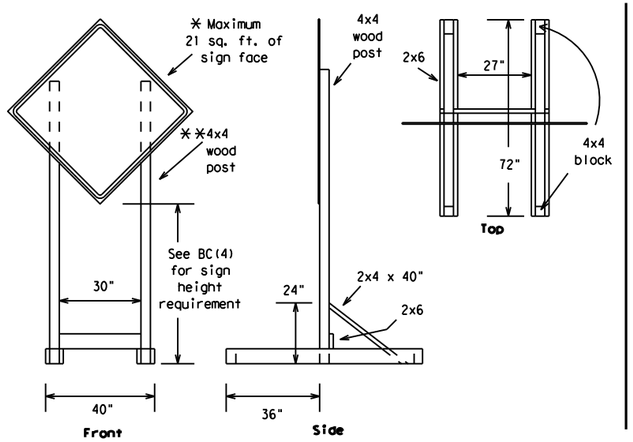
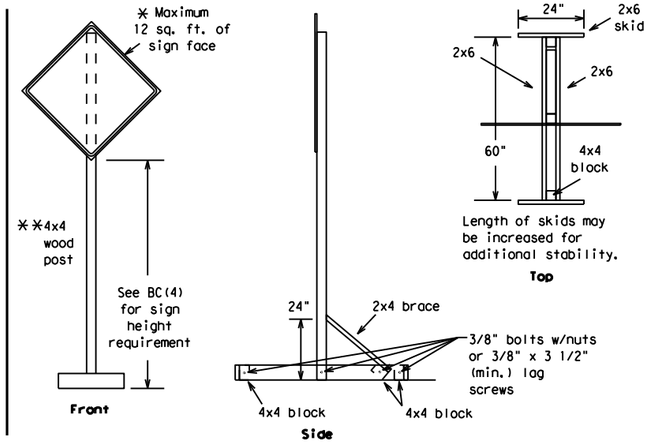
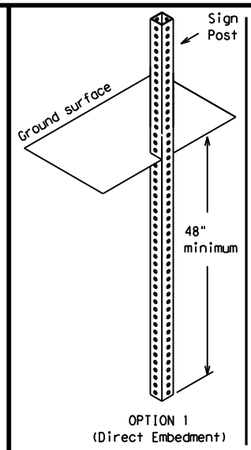
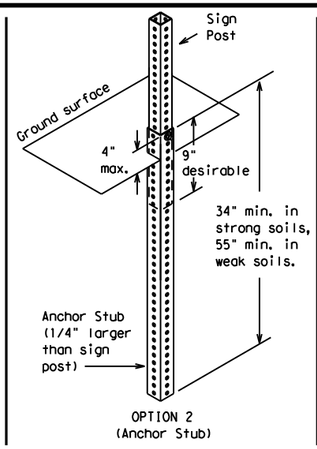


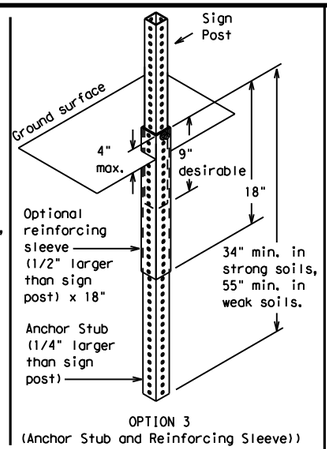


SKID MOUNTED WOOD SIGN SUPPORTS

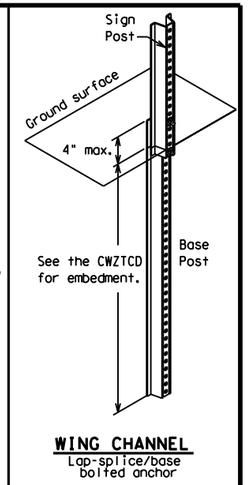
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS







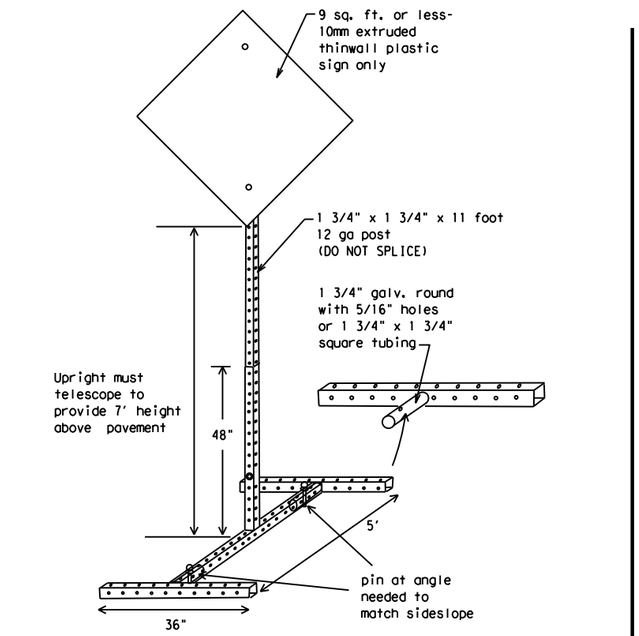
PERFORATED SQUARE METAL TUBING

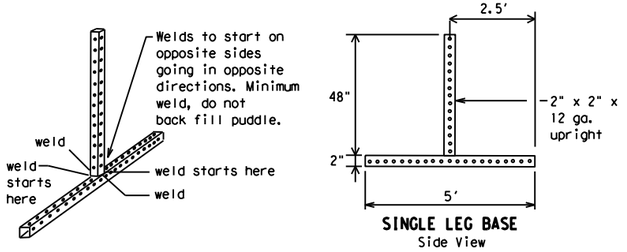


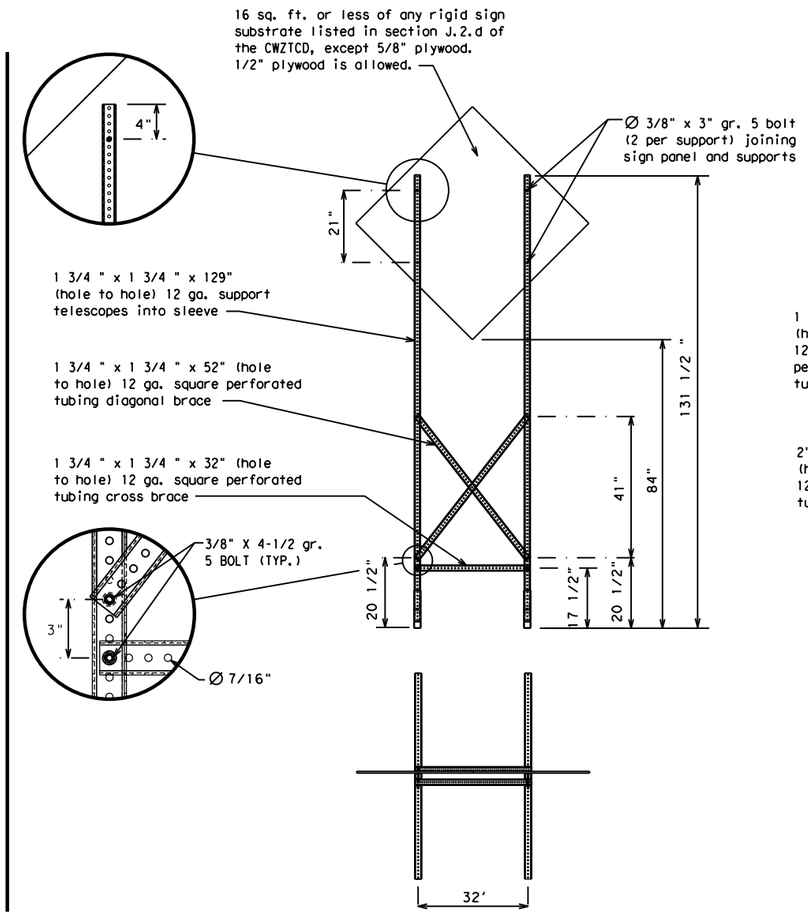
WING CHANNEL
Lap-splice/base bolted anchor

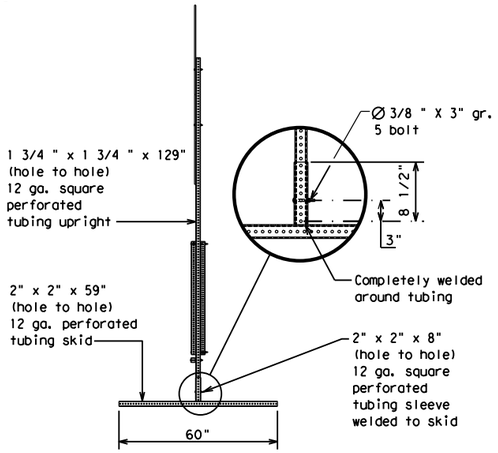
GROUND MOUNTED SIGN SUPPORTS

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









SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

SHEET 5 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	00	112	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ABL	TAYLOR		13

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

** 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	0908	00	112	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ABL	TAYLOR		14

100

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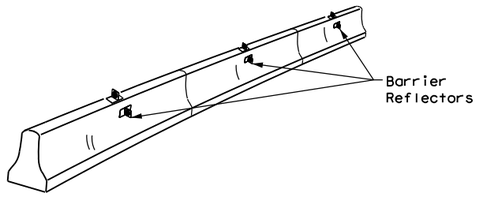
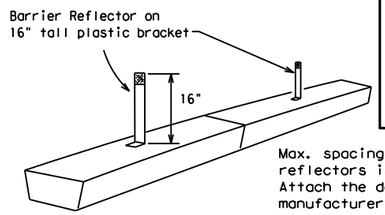
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



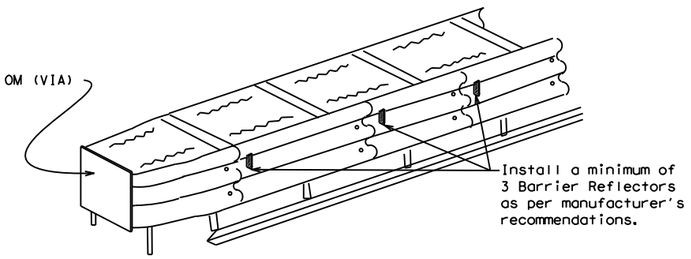
CONCRETE TRAFFIC BARRIER (CTB)

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



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

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

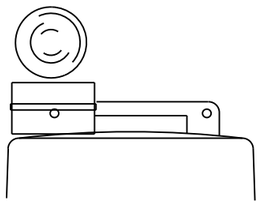
LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

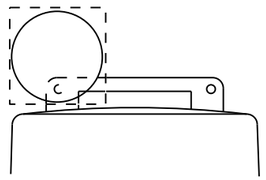


Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

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



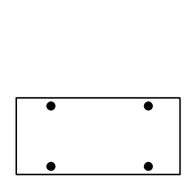
Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

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

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

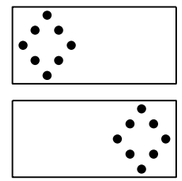
Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

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

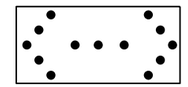


4 CORNER CAUTION

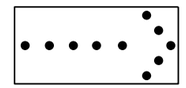
OR



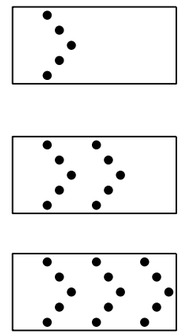
ALTERNATING DIAMOND CAUTION



DOUBLE ARROW



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



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

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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	00	112	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ABL	TAYLOR		15

DATE:
FILE:

GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

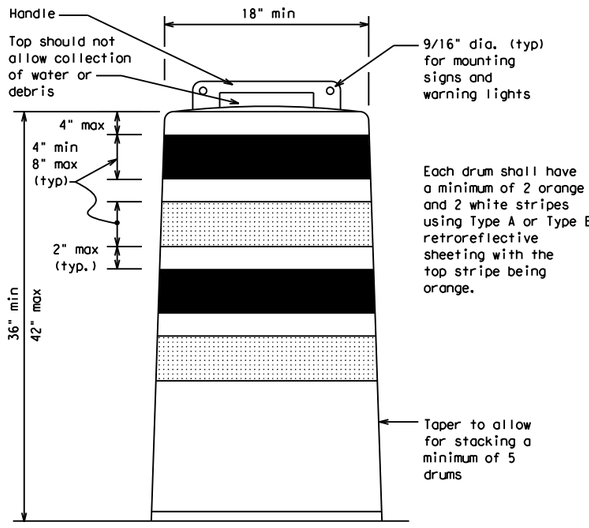
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

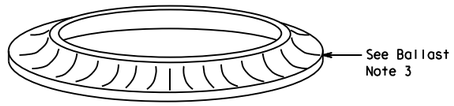
RETROREFLECTIVE SHEETING

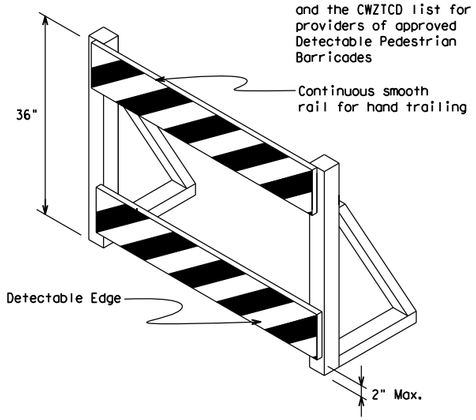
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

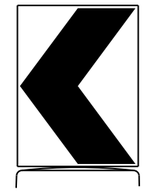




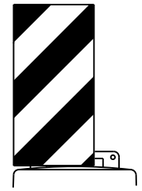


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

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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	0908	00	112	VARIOUS
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	ABL	TAYLOR		16
7-13				

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DATE:
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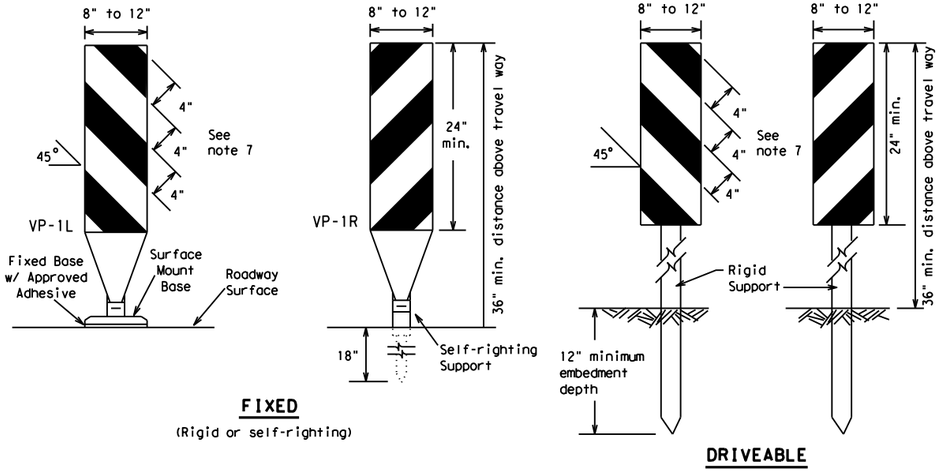
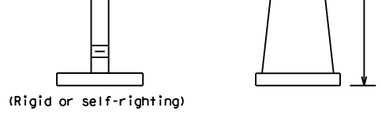


FIXED
(Rigid or self-righting)

DRIVEABLE

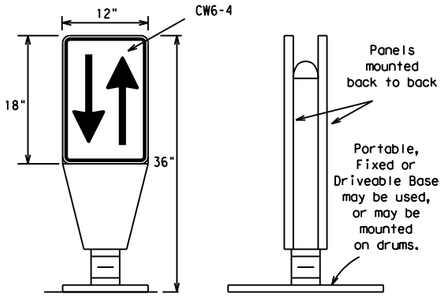


(Rigid or self-righting)

PORTABLE

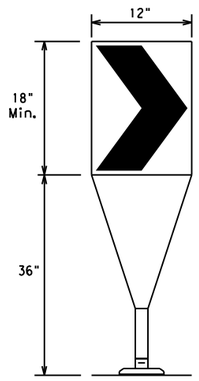
VERTICAL PANELS (VPs)

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



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



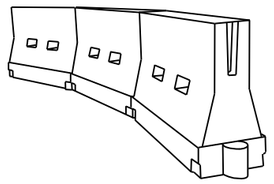
Fixed Base w/ Approved Adhesive
(Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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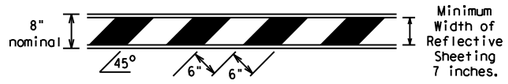
REVISIONS	0908	00	112	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ABL	TAYLOR		17

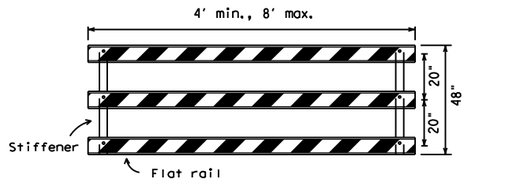
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



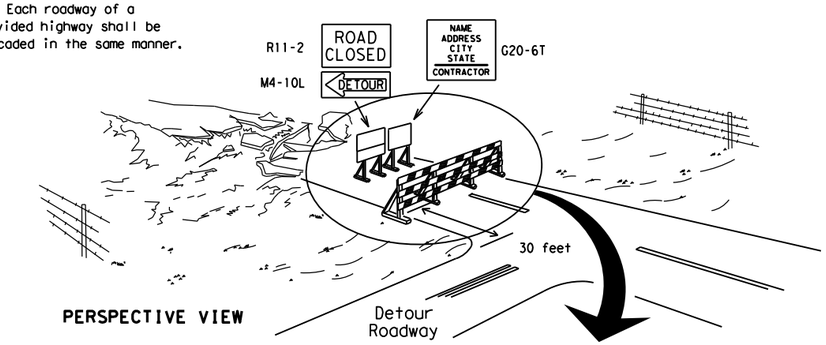
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

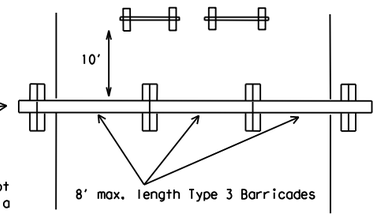
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

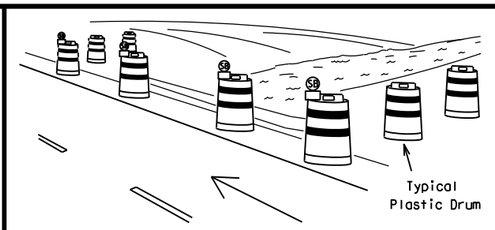
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

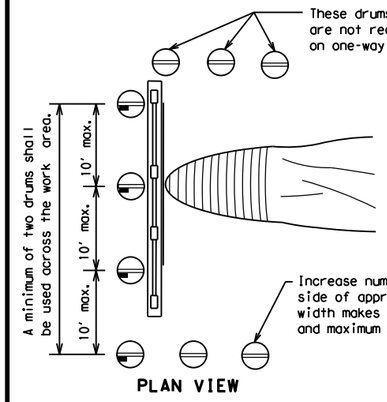
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

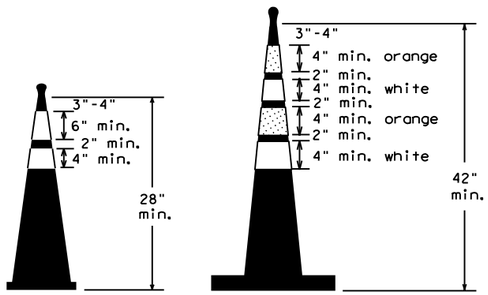
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

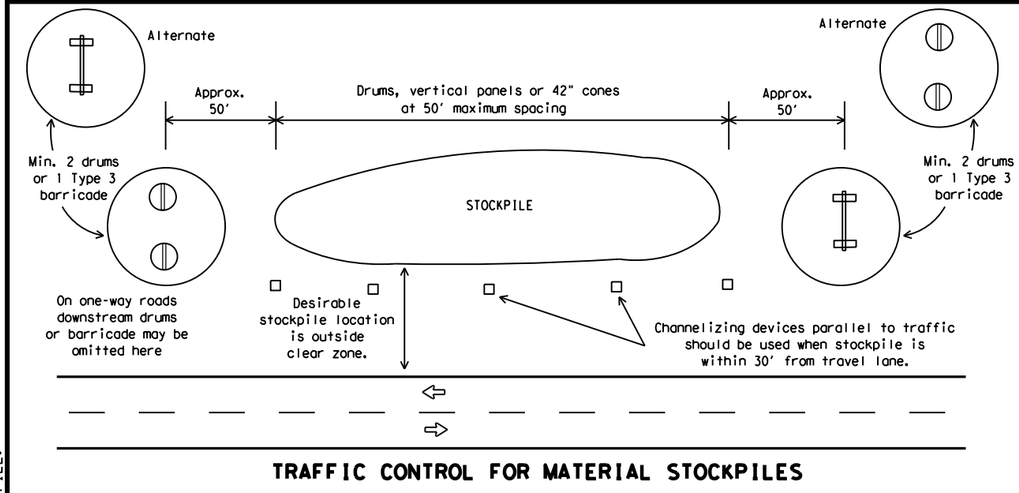
PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

DATE:
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SHEET 10 OF 12

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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REVISIONS	0908	00	112	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
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DATE:
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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.

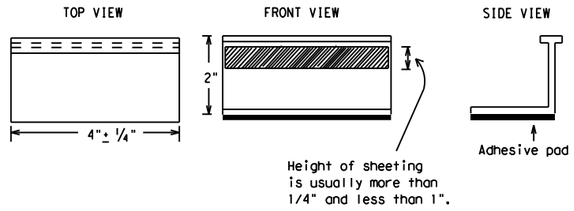
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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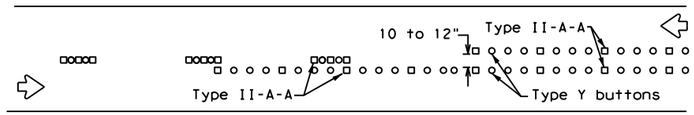
REVISIONS	0908	00	112	VARIOUS
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	ABL	TAYLOR		19
11-02 8-14				

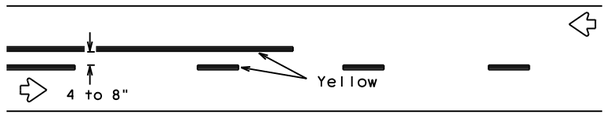
DATE:
FILE:

PAVEMENT MARKING PATTERNS

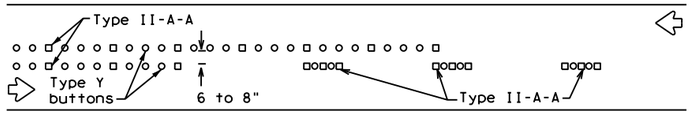
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



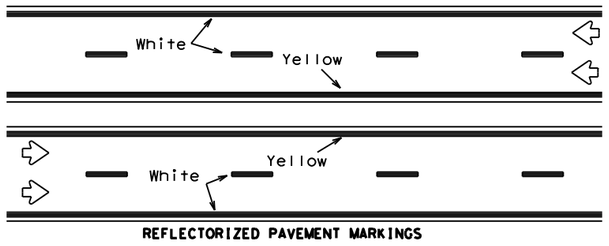
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



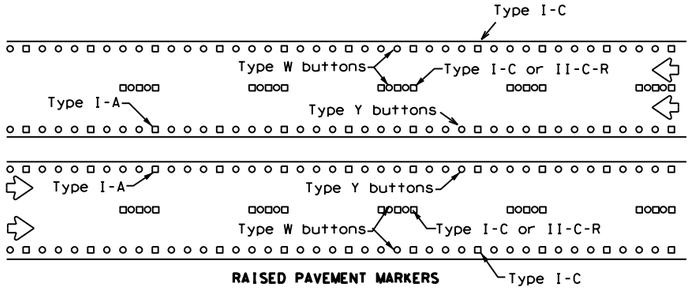
RAISED PAVEMENT MARKERS - PATTERN B

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

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



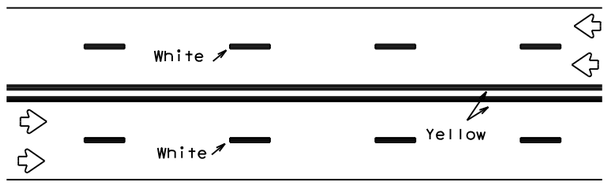
REFLECTORIZED PAVEMENT MARKINGS



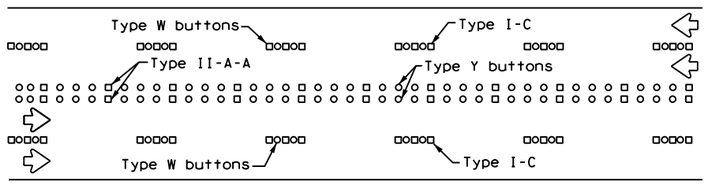
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



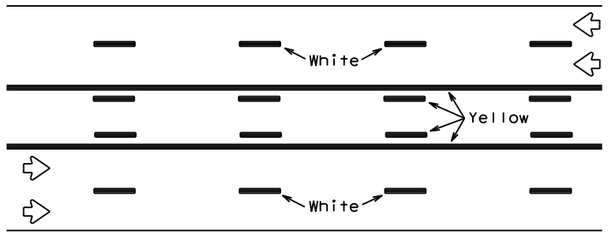
REFLECTORIZED PAVEMENT MARKINGS



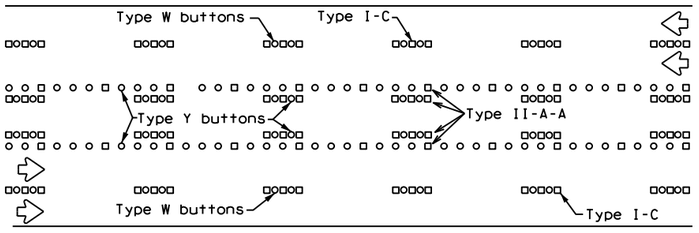
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

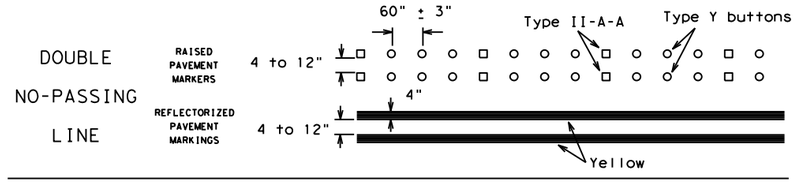
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

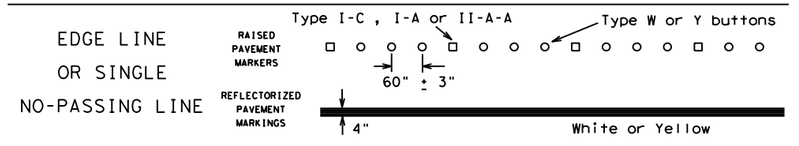
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

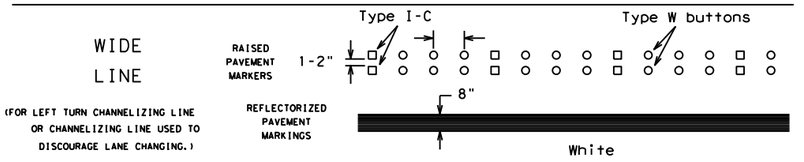


EDGE LINE OR SINGLE NO-PASSING LINE



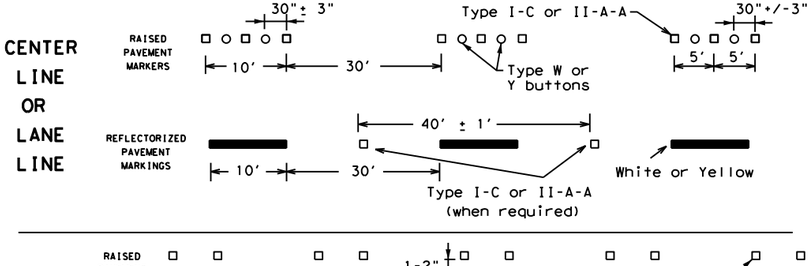
WIDE LINE

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

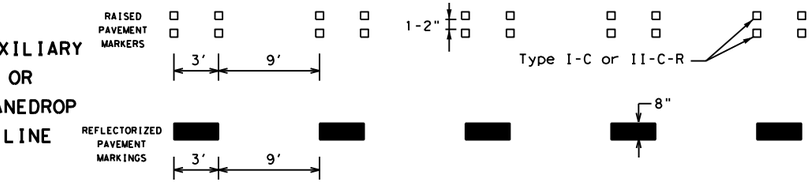


BROKEN LINES

CENTER LINE OR LANE LINE

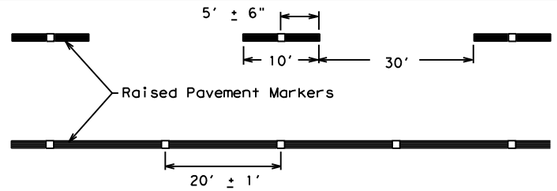


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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1-97 9-07 5-21	DIST	COUNTY		SHEET NO.
2-98 7-13	ABL	TAYLOR		20
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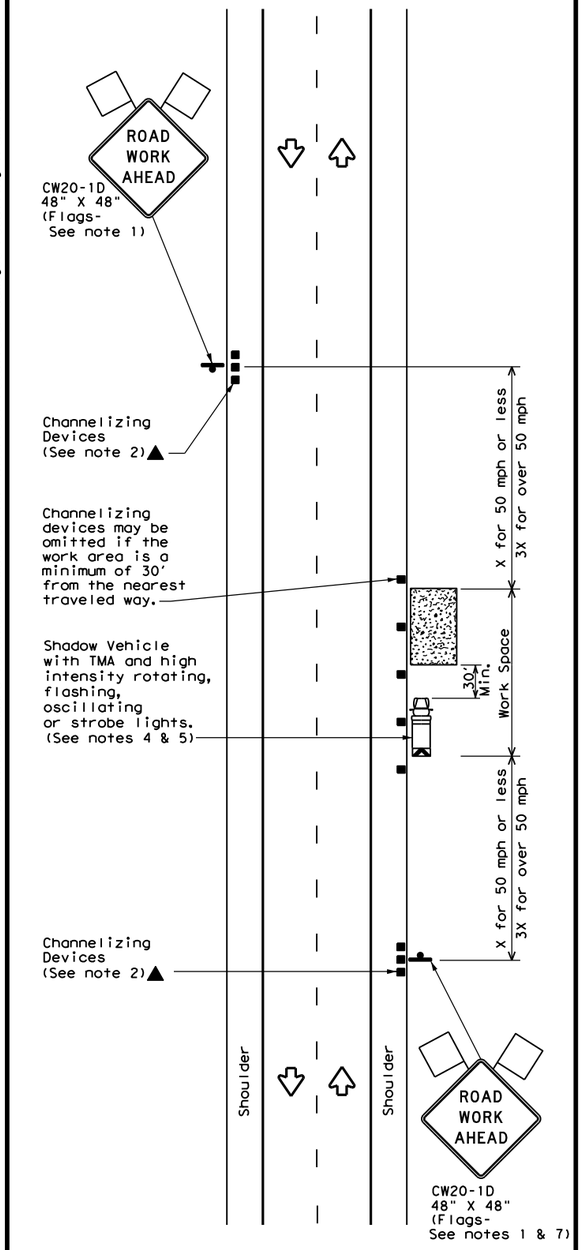
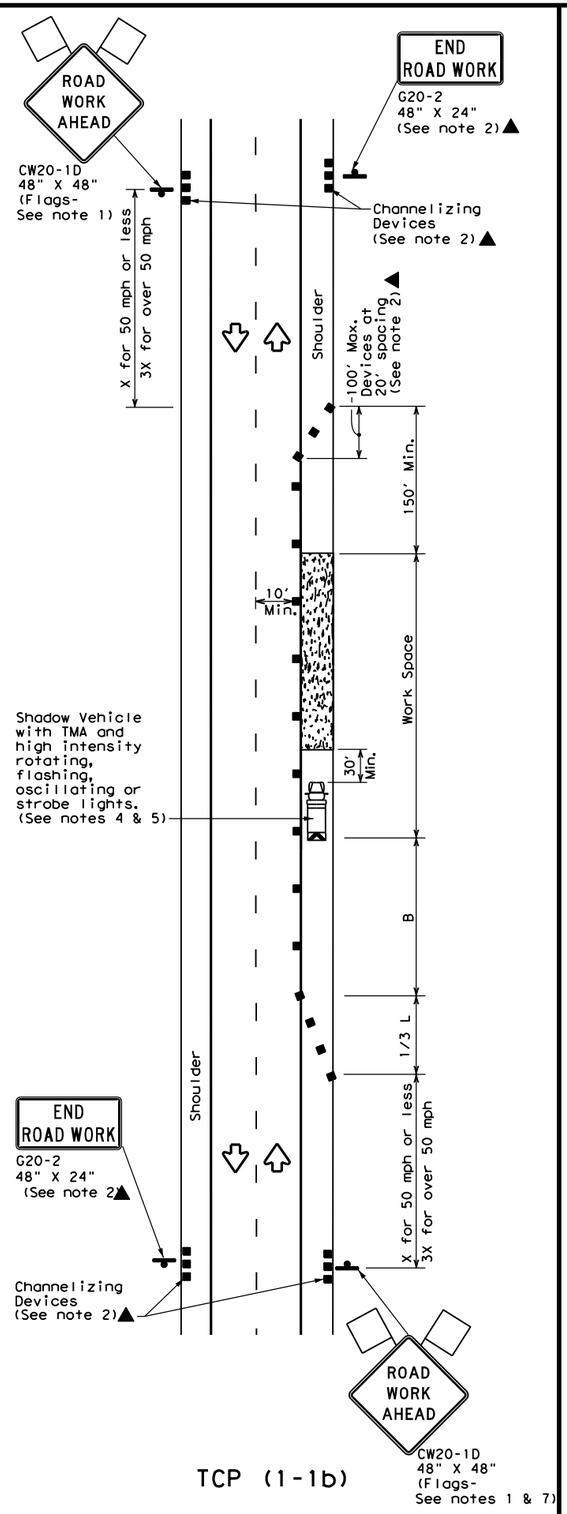


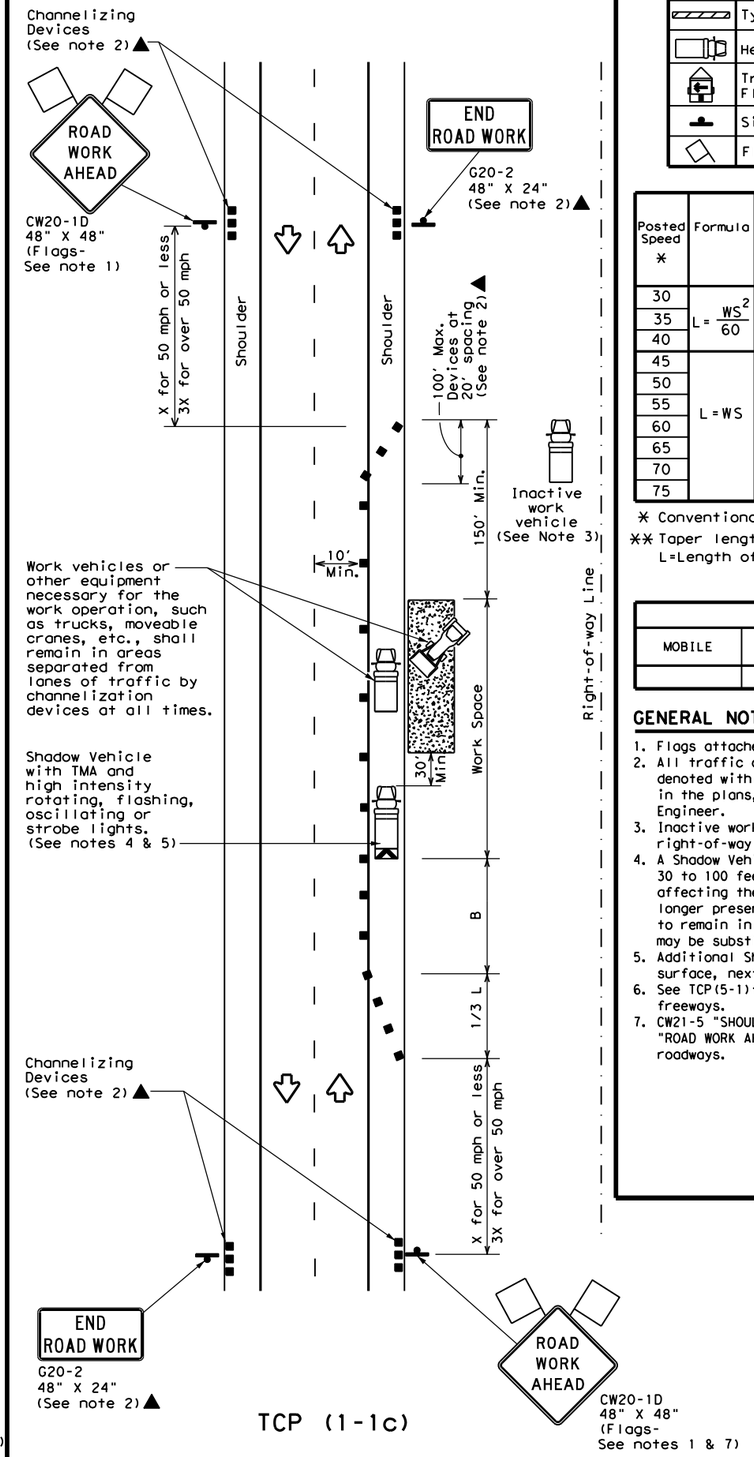
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0908	00	112	VARIOUS
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	ABL	TAYLOR		21

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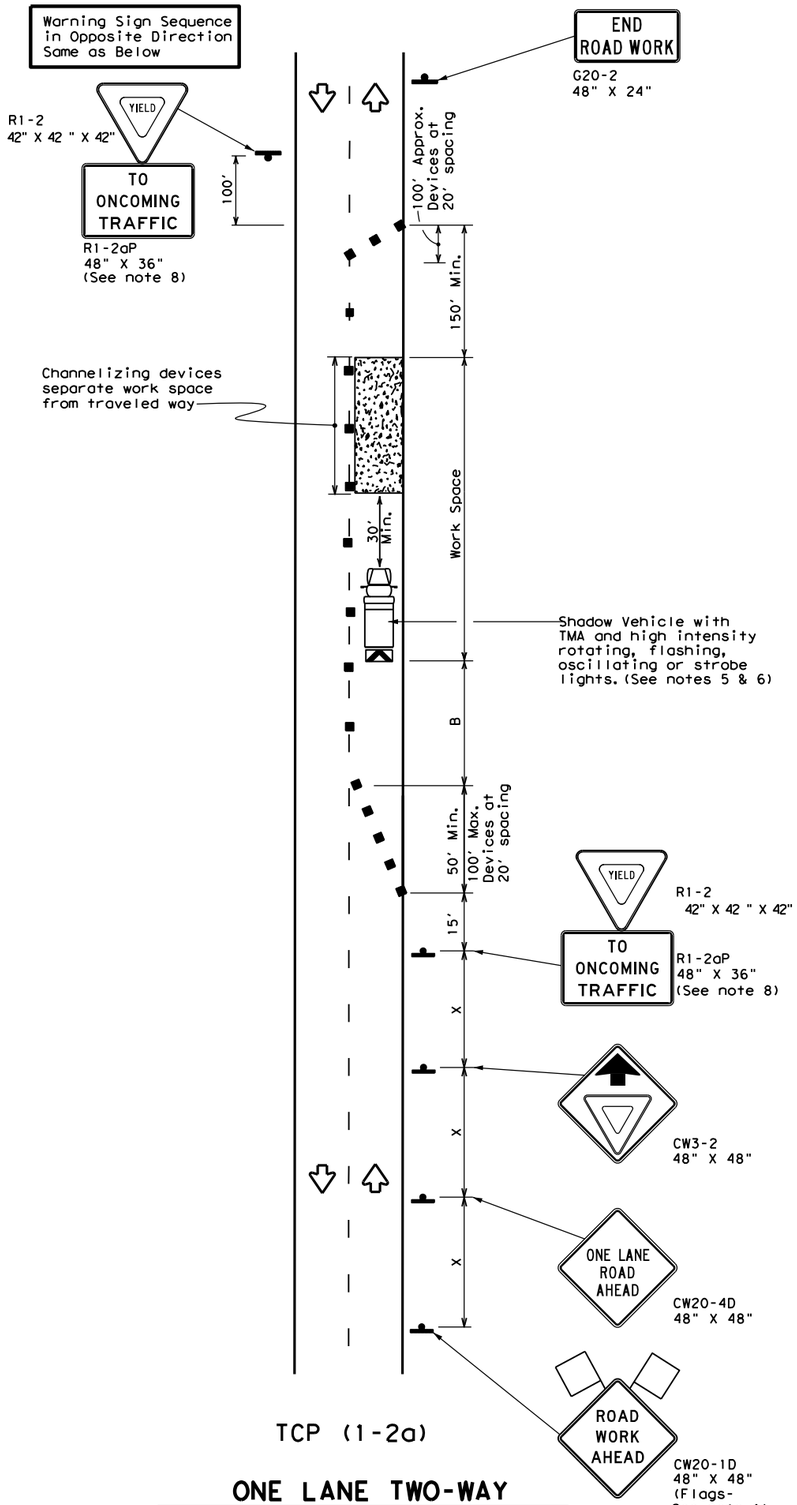
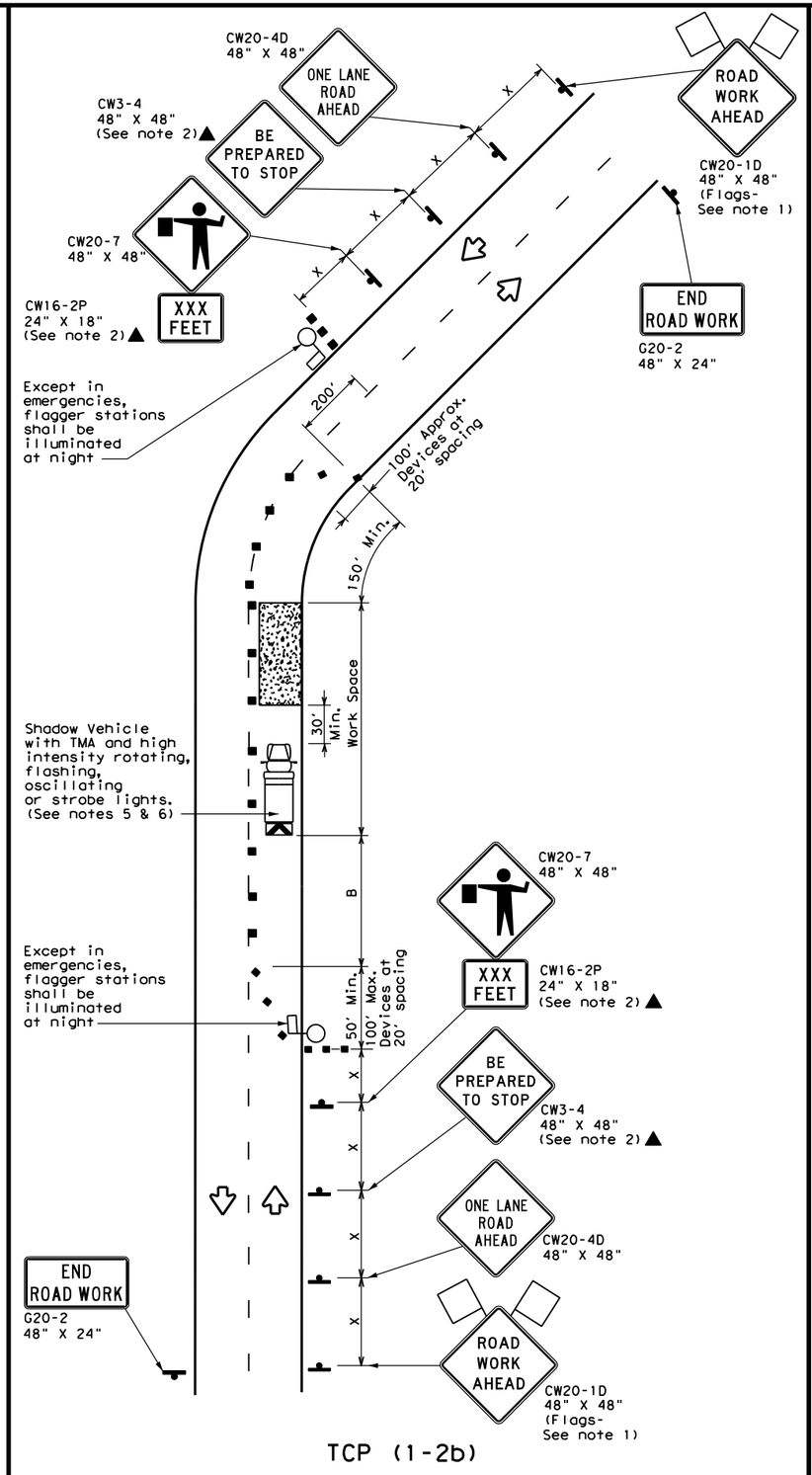


TCP (1-2a)

ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

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

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

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

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

GENERAL NOTES

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

TCP (1-2a)

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

TCP (1-2b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(1-2)-18

FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
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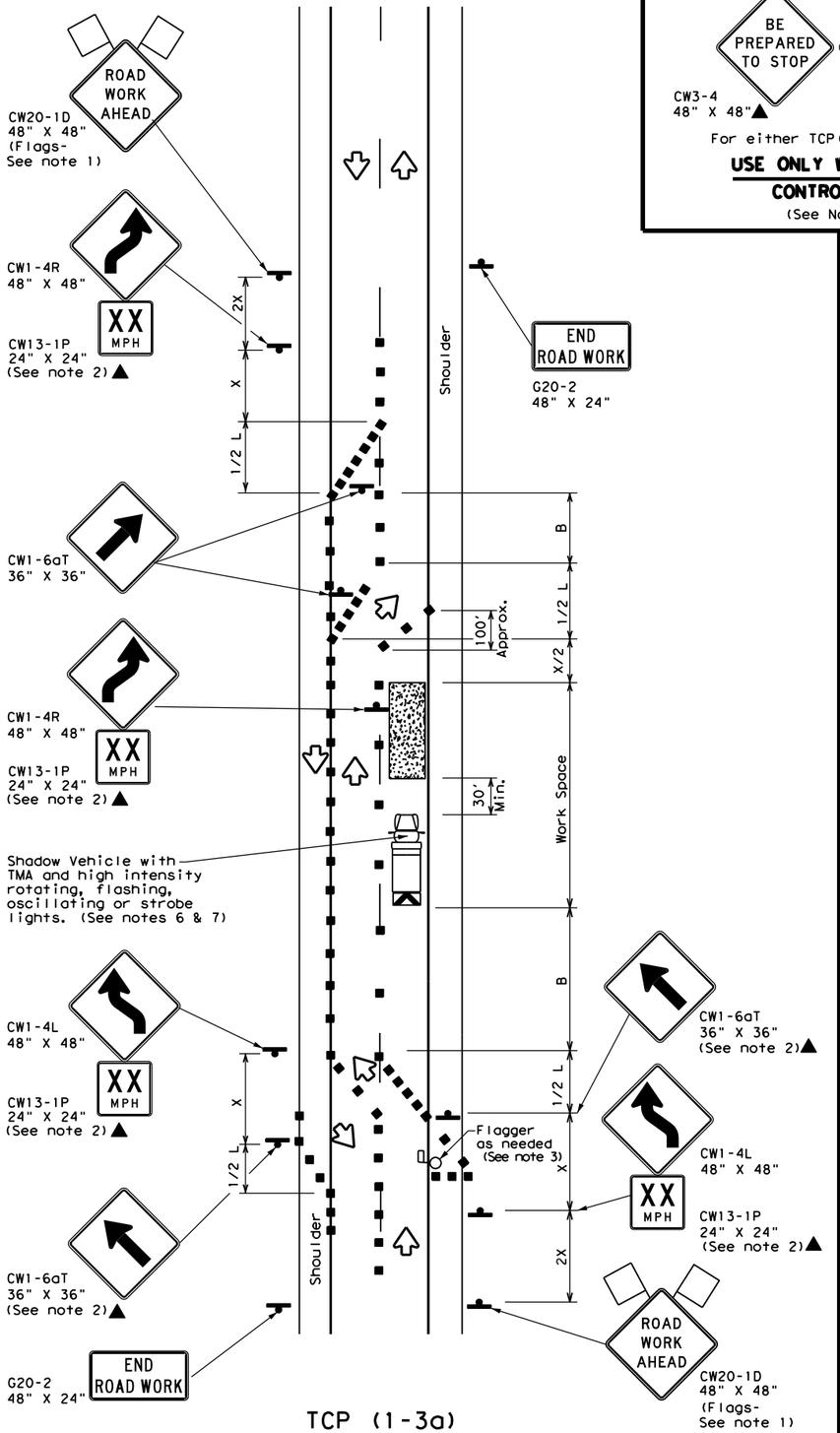
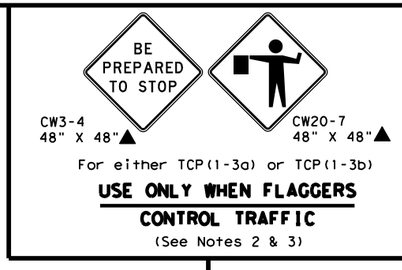
REVISIONS 4-90 4-98	0908	00	112	VARIOUS
2-94 2-12	DIST	COUNTY		SHEET NO.
1-97 2-18	ABL	TAYLOR		22

DATE:
FILE:



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

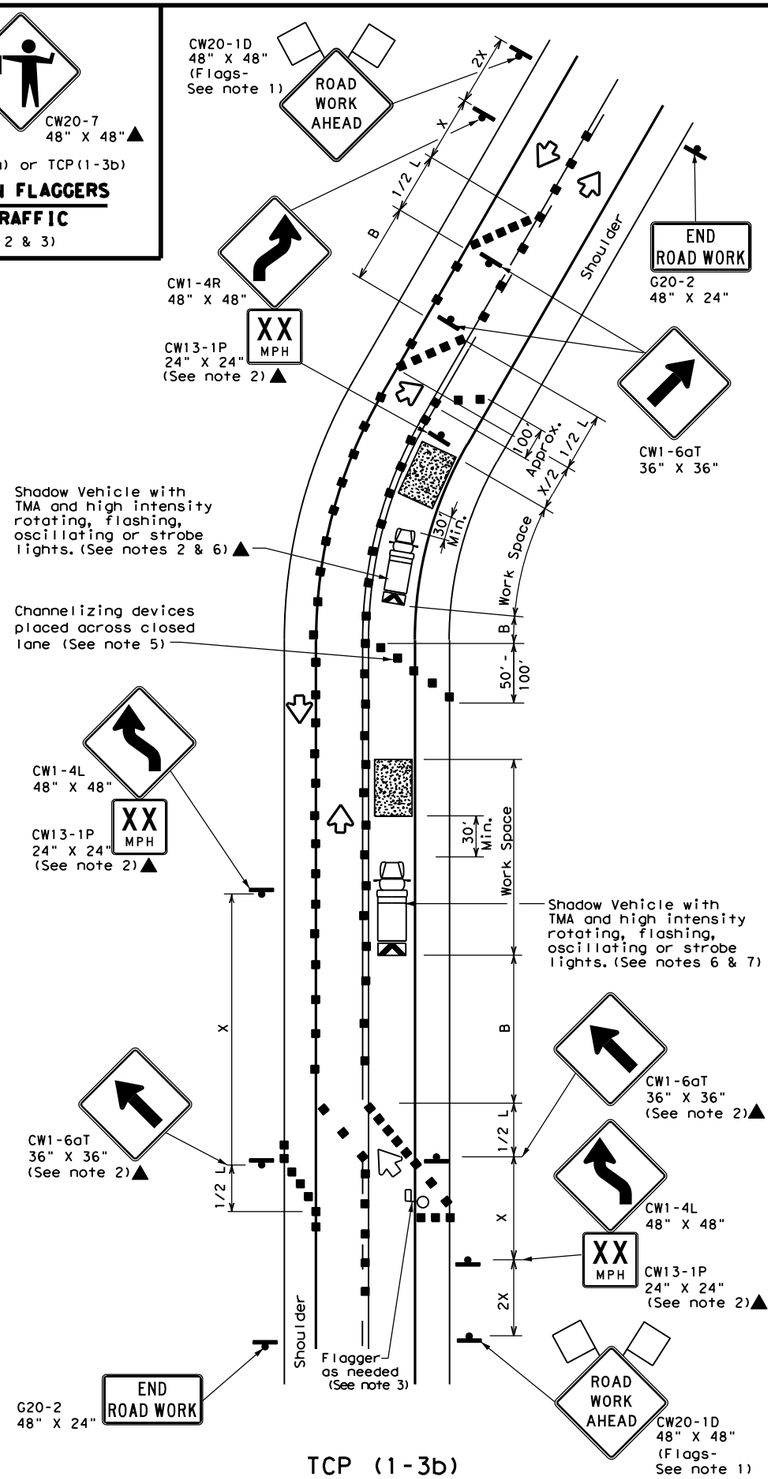
ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



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

USE ONLY WHEN FLAGGERS CONTROL TRAFFIC

(See Notes 2 & 3)



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

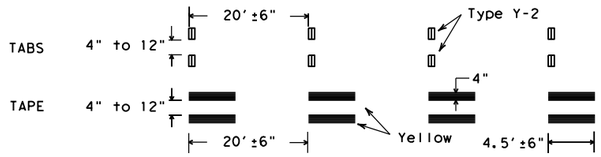
FILE: tcp1-3-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	00	112	VARIOUS
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	ABL	TAYLOR		23
1-97 2-18				

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

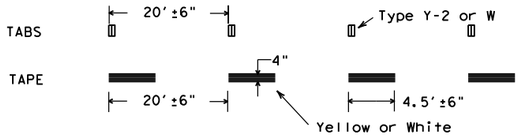
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

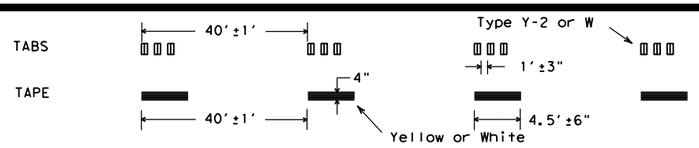


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



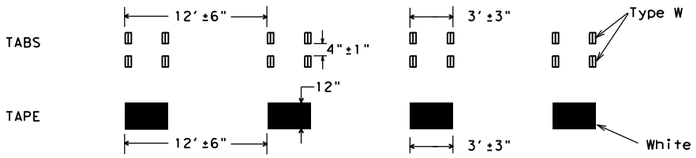
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

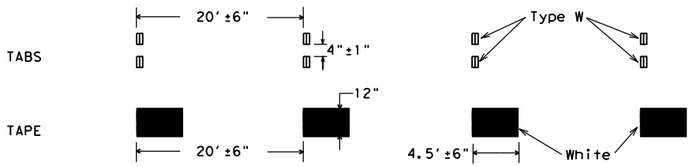


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



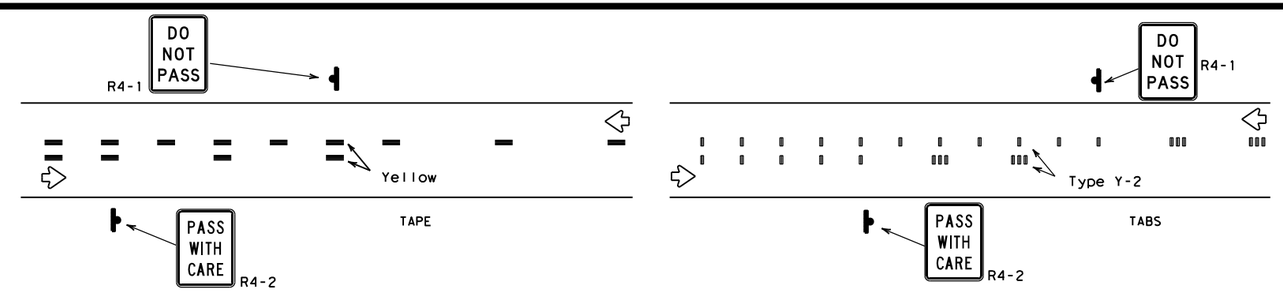
NOTES:

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

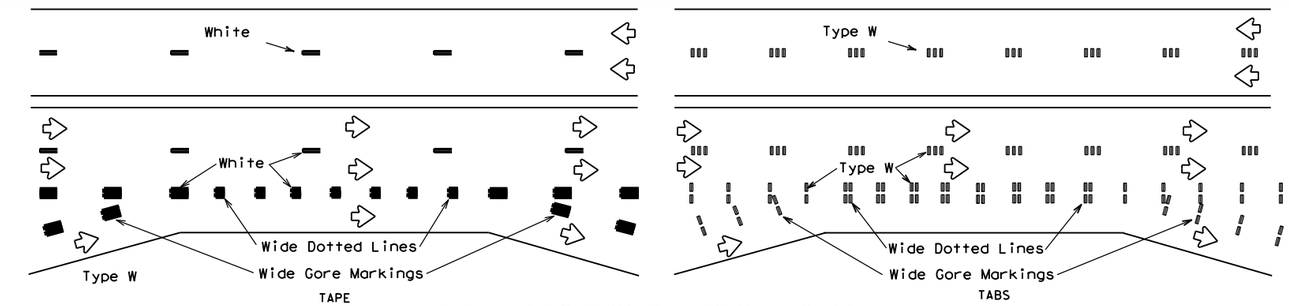
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

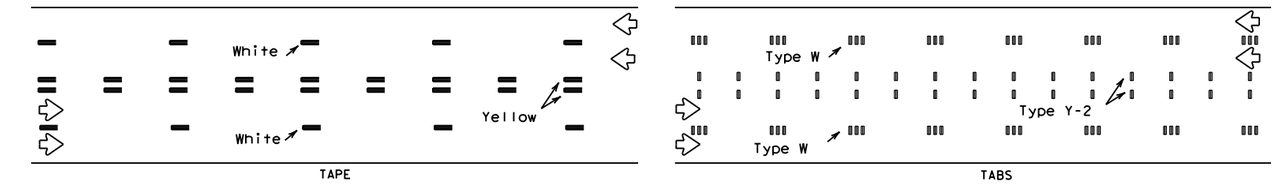
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



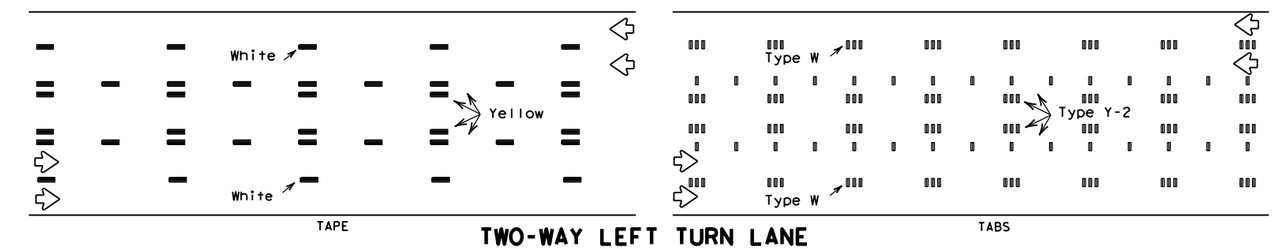
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



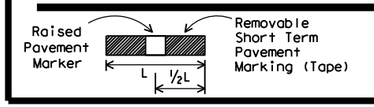
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

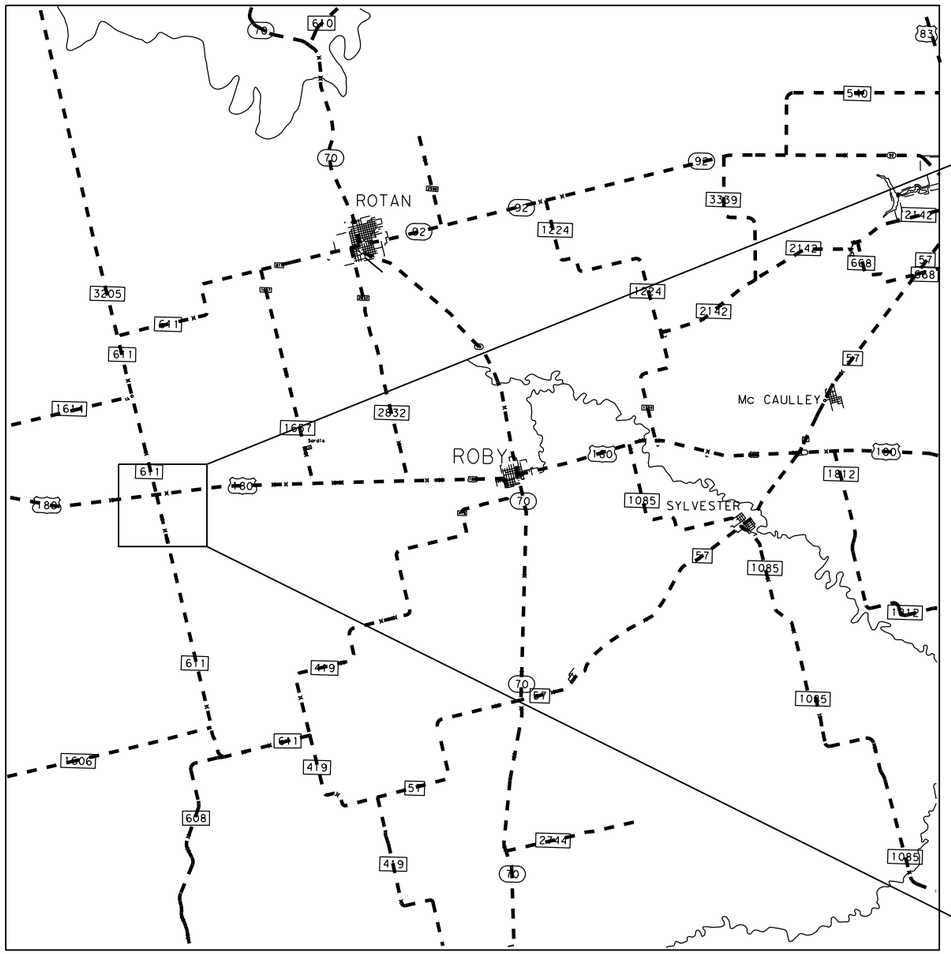
FILE: wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	00	112	VARIOUS
1-97	DIST	COUNTY		SHEET NO.
3-03	ABL	TAYLOR		24
7-13				

111

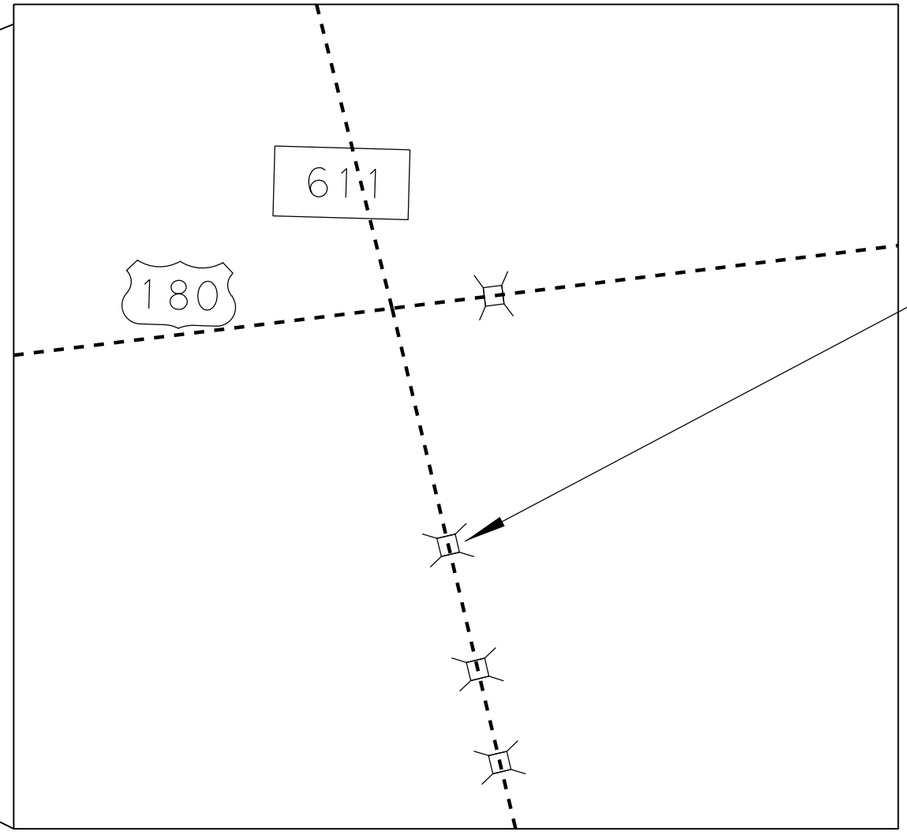
FM 611

BUFFALO CREEK

NBI # 08-077-0-0983-02-010



FISHER COUNTY



LOCATION MAP

08-077-0-0983-02-010

LAT/LONG: 32.723675/-100.57488055

STATE OF TEXAS
MAXIE W. ALLEN
96883
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Maxie Allen
300044282A5242B...
9/9/2022

LIMITS: AT BUFFALO CREEK BRIDGE

CONSISTING OF: PERFORM STRUCTURE REPAIR.

DESCRIPTION: 6- SIMPLE SPAN STEEL I-BEAM BRIDGE ON CONCRETE BENTS, 30 DEGREE SKEW.

BRIDGE LENGTH: 130'

OVERALL WIDTH: 25'-6"

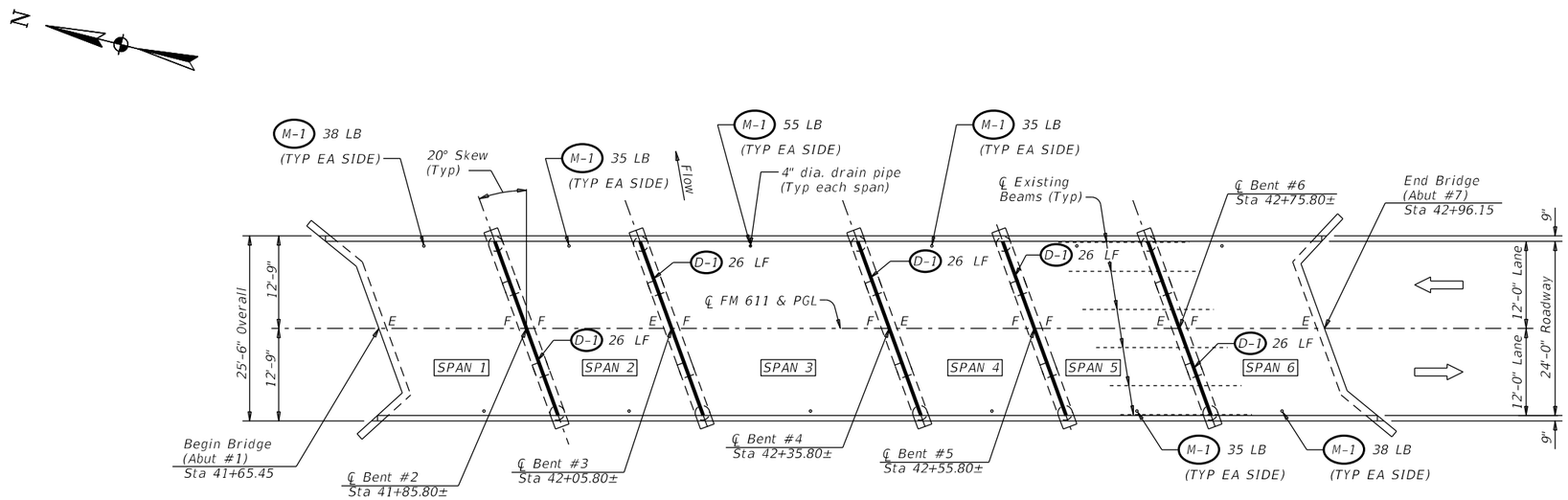
BUFFALO CREEK LOCATION MAP

Texas Department of Transportation

SCALE: NTS SHEET 1 OF 1

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		VARIOUS
STATE	COUNTY		SHEET NO.
TEXAS	TAYLOR, ETC.		25
DISTRICT	CONTROL	SECTION	JOB
ABL	0908	00	112

FILE: $FILE$ $TIME$
DATE: $DATE$



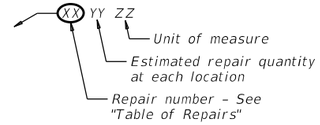
PLAN

Scale: 1" = 20'

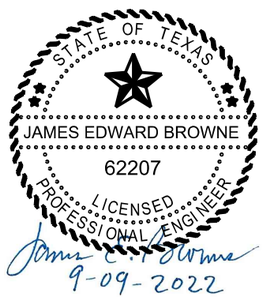
GENERAL NOTES

1. Layout and stations shown are based on as-built plans. "E" denotes expansion end of span. "F" denotes fixed end of span. Copies of available portions of as-built plans will be provided upon request.
2. Repair locations and quantities are based on March 2022 repair inspection. Current conditions may vary. Field verify locations and confirm steel repair quantities with the Engineer prior to ordering materials.
3. Existing Load Rating (September 2021, by others):
   HS 13.3 (IR)
   HS 22.2 (OR)
4. Refer to "Steel Beam Repair Location Plan" for steel beam repair locations and quantities.
5. The thickness of the existing asphalt overlay is approximately 2".

REPAIR CALL-OUT LEGEND



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



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9330 LBJ Frwy, Ste. 1150
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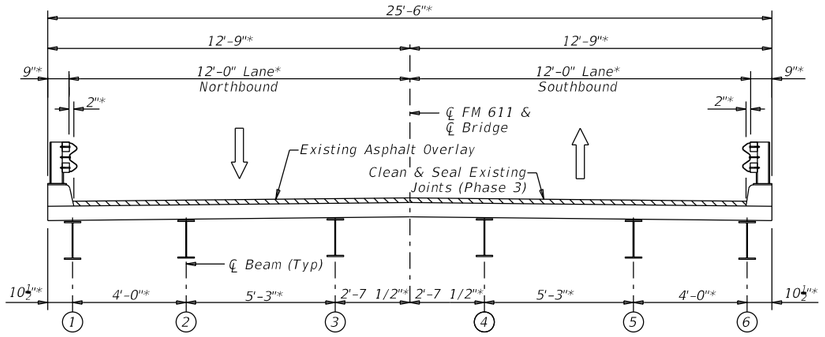
Texas Department of Transportation

BRIDGE REPAIR LAYOUT

NBI No. 08-077-0-0983-02-010

FM 611
BUFFALO CREEK

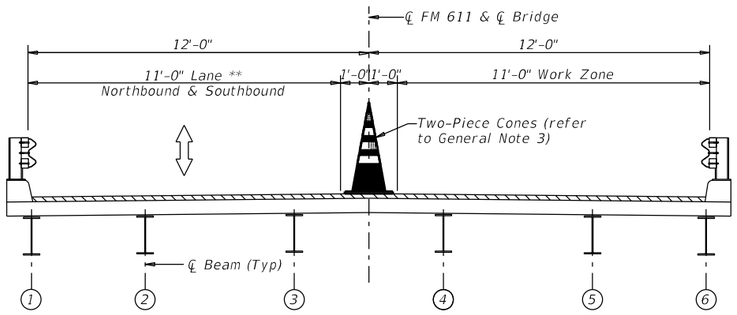
	DN: CJC	CK: JEB	DW: TAA	CK: JEB
©TxDOT: September 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	00	112	VARIOUS
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC		26



* Dimensions are from existing plans.

EXISTING BRIDGE, PHASE 3A & 3B REPAIRS & FINAL BRIDGE SECTION

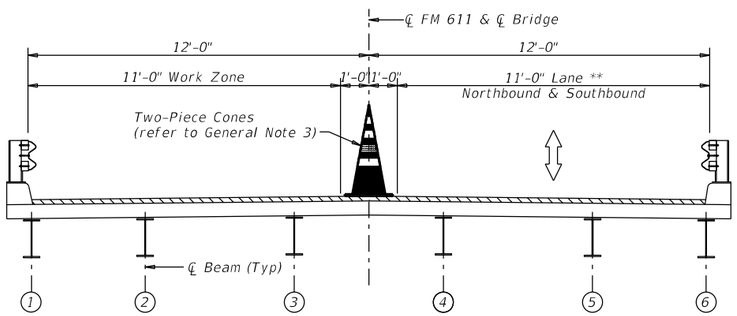
Scale: 3/16" = 1'-0"
(Looking Ahead Station)
(Showing Existing & Final Traffic Lanes)



** Using temporary traffic signal to alternate NB & SB traffic.

CONSTRUCTION PHASE 1 BRIDGE SECTION

Scale: 3/16" = 1'-0"



** Using temporary traffic signal to alternate NB & SB traffic.

CONSTRUCTION PHASE 2 BRIDGE SECTION

Scale: 3/16" = 1'-0"

GENERAL NOTES:

1. Steel repairs include structural repairs and steel bridge zone painting. Structural repairs include grinding, or cutting, grinding and welding. Steel bridge zone painting is not considered structural repair.

2. Structural repairs (Type 1, Type 2 and Type 3) shall be completed in phase 1 and phase 2.

3. Refer to Barricade and Construction standard sheet "BC(8)-21" for information on two-piece traffic cones

4. Phase 1 structural repairs shall be completed prior to performing phase 2 repairs.

5. Daily one lane two-way control with flaggers is required each day that repairs are performed (refer to TCP standard "TCP(1-2)-18"). Reopen lane after work is completed each day.

6. Use two-piece cones (42" height) to close one lane and channelize traffic to the other lane. Traffic is not allowed over beams during structural repairs.

7. Phase 1:
   Close the southbound lane and channelize traffic to the northbound lane. Repair Beams 4, 5 or 6.

   Type 1 and Type 2 Repairs: multiple locations can be repaired simultaneously.

   Type 3 Repairs: perform repairs one beam at a time. Complete each repair prior to beginning repair on another beam. Provide temporary support as required in the repair details. Do not remove temporary support until repair for that beam is complete.

8. Phase 2:
   Close the northbound lane and channelize traffic to the southbound lane. Repair Beams 1, 2 or 3.

   Type 1 and Type 2 Repairs: multiple locations can be repaired simultaneously.

   Type 3 Repairs: perform repairs one beam at a time. Complete each repair prior to beginning repair on another beam. Provide temporary support as required in the repair details. Do not remove temporary support until repair for that beam is complete.

9. Phase 3A:
   Close the northbound lane and channelize traffic to the southbound lane. Repair bridge joints at the northbound lane.

10. Phase 3B:
    Close the southbound lane and channelize traffic to the northbound lane. Repair bridge joints at the southbound lane.

STATE OF TEXAS
JAMES EDWARD BROWNE
62207
LICENSED PROFESSIONAL ENGINEER
9-09-2022

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TBPE Firm Registration No. 6981

Texas Department of Transportation

CONSTRUCTION PHASING

NBI No. 08-077-0-0983-02-010

FM 611
BUFFALO CREEK

	DN: CJC	CK: JEB	DW: TAA	CK: JEB
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REVISIONS	0908	00	112	VARIOUS
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC		27

TABLE OF REPAIRS

REPAIR NO.	ITEM	BID ITEM DESCRIPTION	UNIT	QUANTITY	REPAIR DESCRIPTION/LOCATOR	DETAILS/NOTES	FUA No. & Notes ①	
D-1	0438	CLEANING AND SEALING EXIST JOINTS (CL3)	LF	130	Clean and seal existing joints at Bents 2 thru 6.	See sheet "Cleaning and Sealing Existing Bridge Joints".		②
SP-1	0784	REPAIR STEEL (CORROSION MITIGATION)	EA	4	Grind out areas of 100% section loss in steel beam bottom flanges at locations shown.	See Type 1 Repair on sheet "Steel Beam Repair Details".	1 ③	
SP-2A	0784	REPAIR STEEL (CORROSION MITIGATION)	EA	1	Cut out areas of significant section loss in steel beam webs by coping and grinding.	See Type 2A Repair on sheet "Steel Beam Repair Details".	1 ③	
SP-2B	0784	REPAIR STEEL (CORROSION MITIGATION)	EA	2	Chip out portion of existing concrete end diaphragm for access; cut out areas of significant section loss in web by coping and grinding.	See Type 2B Repair on sheet "Steel Beam Repair Details".	1 ③	
SP-3	0784	REPAIR STEEL (CORROSION MITIGATION)	EA	5	Chip out portion of existing concrete end diaphragm for access; cut out areas of significant section loss in web; prepare web for bevel groove weld; weld repair plate in opening cut in web at locations shown.	See Type 3 Repair on sheet "Steel Beam Repair Details".	1 ③	1 ④
SP-4	4207	STEEL BRIDGE ZONE PAINTING REF STR #1	EA	1	Clean and paint all beam ends at abutments and bents. Clean and paint inside face of all exterior beams at deck drain locations.	See "Zone Painting Details" sheet for additional information.	1 ③	2 ④
M-1	0442	STRUCTURAL STEEL (MISC NON-BRIDGE)	LB	472	Install fabricated drain splash guards (2 per span) at locations shown.	See "Bridge Repair Layout" sheet and "Drain Splash Guard" sheet.		②

GENERAL NOTES

① Follow-Up Action (FUA) items are taken from Bridge Inspection Record dated 7/23/2019 and/or Bridge Inspection Record dated 7/21/2021. Notify the Engineer after repair of each FUA is completed. All other references to FUA are for the Engineer's information only. The Engineer will then notify the County Maintenance Supervisor who will update the Maintenance Module.

② Repair is included to extend the life of other repairs that address FUAs.

③ Repair addresses FUA included in 7/23/2019 Bridge Inspection Record.

④ Repair addresses FUA included in 7/21/2021 Bridge Inspection Record.

STATE OF TEXAS
JAMES EDWARD BROWNE
62207
LICENSED PROFESSIONAL ENGINEER
James E. Browne
9-09-2022

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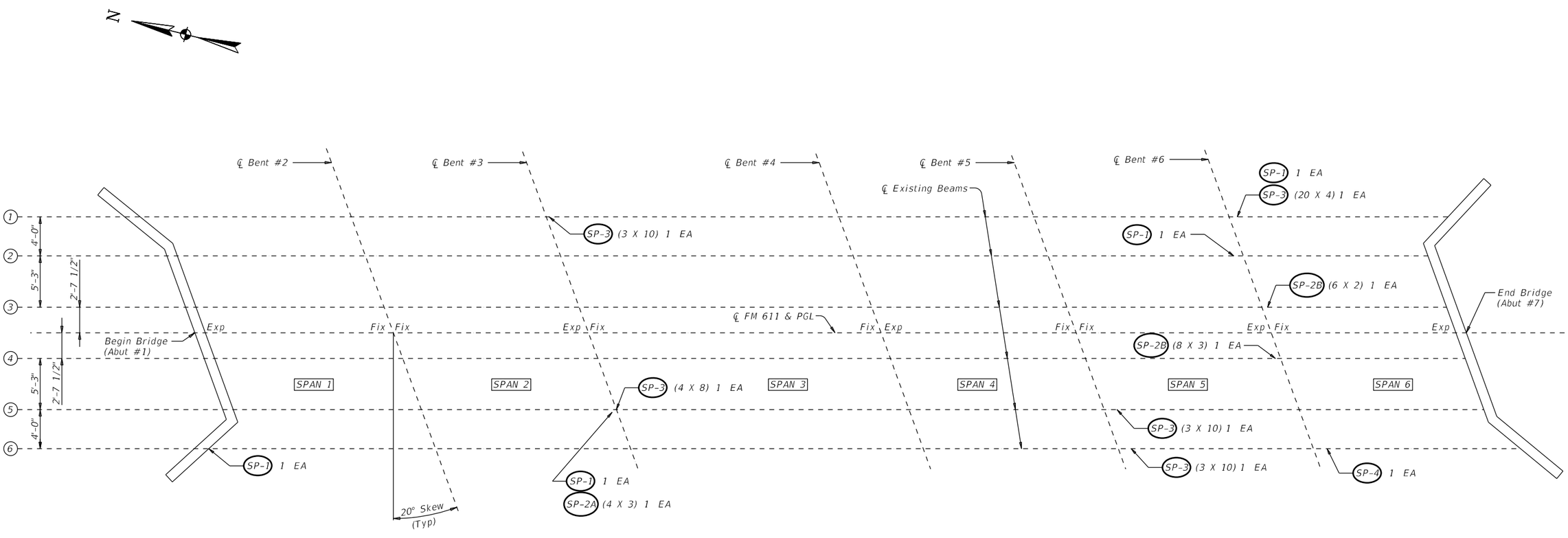
Texas Department of Transportation

SUMMARY OF REPAIRS

NBI No. 08-077-0-0983-02-010

FM 611
BUFFALO CREEK

	DN: CJC	CK: JEB	DW: TAA	CK: JEB
©TxDOT: September 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	00	112	VARIOUS
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC		28



PLAN

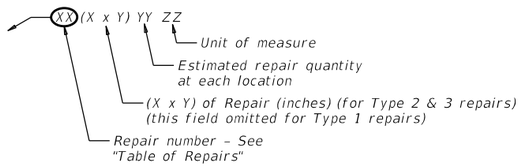
Scale: 3/32" = 1'-0"

EXISTING BEAM INFORMATION			
SPAN	Beam 1	Beam 2 thru 5	Beam 6
1	16 WF X 40	16" X 7" I-Beam	16 WF X 40
2	15" I x 42.9	16" x 7" I-Beam	15" I x 42.9
3	24 WF X 76	21" x 8" I-Beam	24 WF X 76
4	15" I x 42.9	16" x 7" I-Beam	15" I x 42.9
5	15" I x 42.9	16" x 7" I-Beam	15" I x 42.9
6	16 WF x 40	16" x 7" I-Beam	16 WF X 40

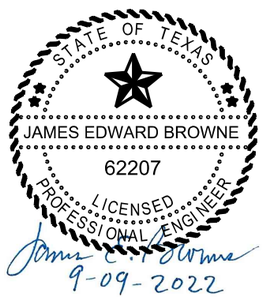
REPAIR NOTES:

1. Steel beam repairs include repairing severe section loss in bottom flanges and/or webs of various beams at the locations shown on this sheet.
2. Repairs are to be completed by construction phase. Refer to sheet 2, "Construction Phasing".
3. The Contractor shall remove lead based paint in affected areas prior to performing structural repairs including zone painting.
4. Type 1 and Type 2 repairs can be completed simultaneously (by phase).
5. Type 3 repairs at one beam shall be completed before beginning Type 3 repair at another beam.
6. Zone Painting can be implemented phase by phase after the steel repair work has been completed.
7. Restore concrete diaphragms with epoxy mortar following completion of Type 2B and Type 3 repairs and zone painting for each phase.

REPAIR CALL-OUT LEGEND



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



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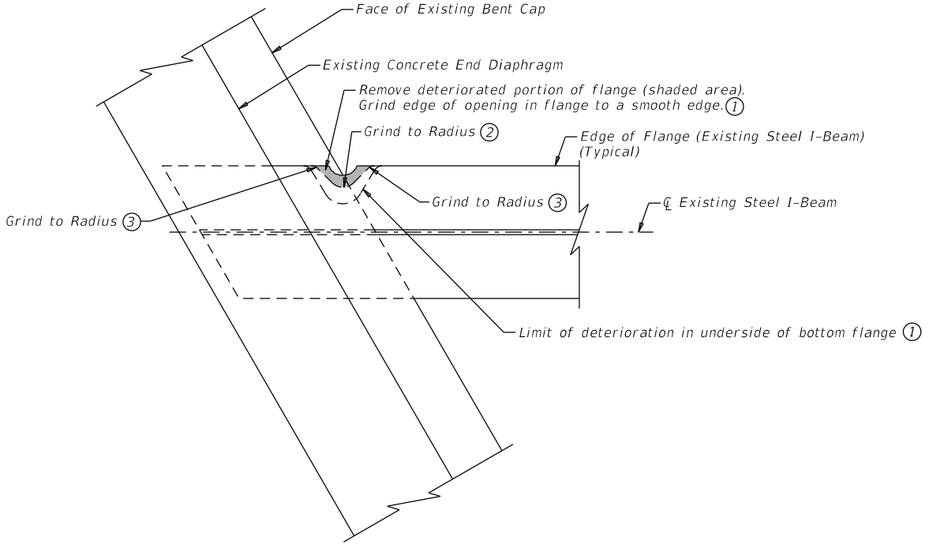
STEEL BEAM REPAIR LOCATION PLAN

NBI No. 08-077-0-0983-02-010

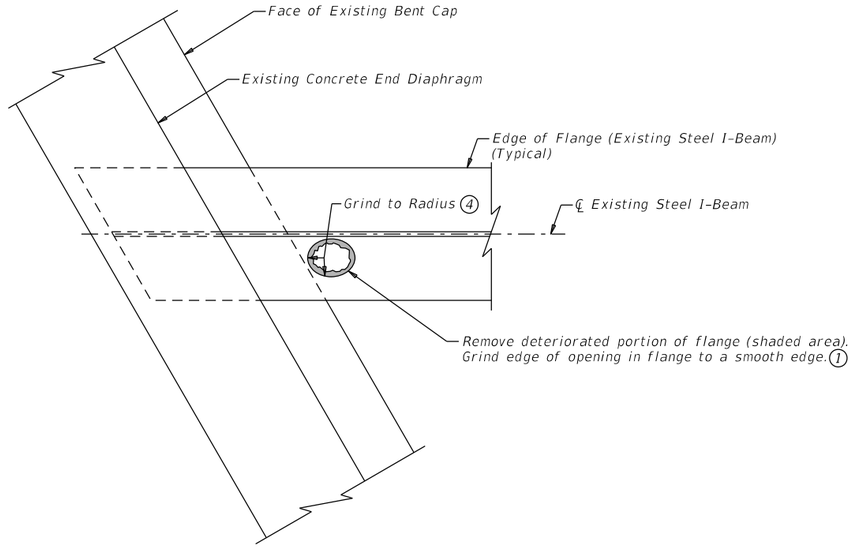
FM 611
BUFFALO CREEK

	DN: CJC	CK: JEB	DW: TAA	CK: JEB
©TxDOT: September 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	00	112	VARIOUS
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC		29



TYPE 1 STEEL BEAM REPAIR DETAIL

(Hole in Bottom Flange Intersecting Edge of Flange)
Scale: 1 1/2" = 1'-0"



TYPE 1 STEEL BEAM REPAIR DETAIL

(Hole in Bottom Flange Between Edge of Flange and Web)
Scale: 1 1/2" = 1'-0"

GENERAL NOTES:

1. Refer to sheet "Steel Beam Repair Location Plan" for location of Type 1 Repairs.
2. Perform repairs in accordance with Item 784, "Steel Member Repair".
3. Temporary support of beams not required for Type 1 Repair.

CONSTRUCTION NOTES:

(1) Remove areas of significant section loss in bottom flanges of steel beams near the end of span at locations shown on "Steel Beam Repair Location Plan" sheet. Removal flange material less than 3/16" in thickness.

(2) Provide a smooth transition in the re-entrant opening in the edge of the flange (1 1/2" minimum radius).

(3) Provide a reverse curve to transition to the edge of the flange (1" radius).

(4) Grind edge of opening to a smooth surface (1 1/2" min radius at ends and 3" radius at sides of elongated openings).

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STEEL BEAM REPAIR DETAILS

NBI No. 08-077-0-0983-02-010

FM 611
BUFFALO CREEK

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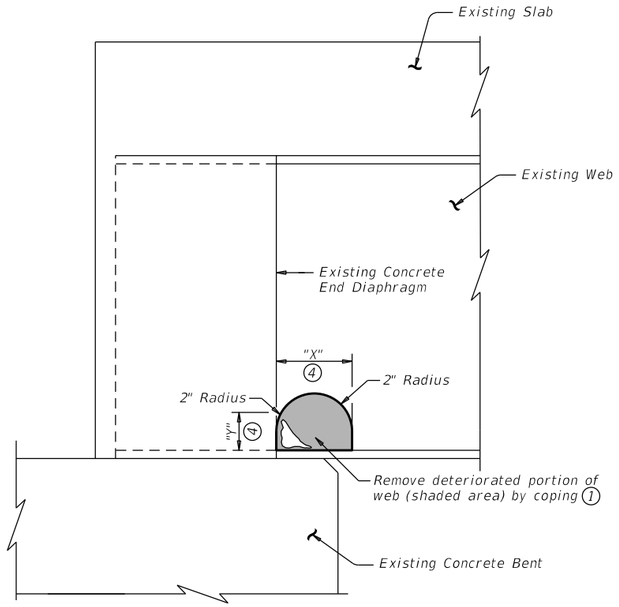
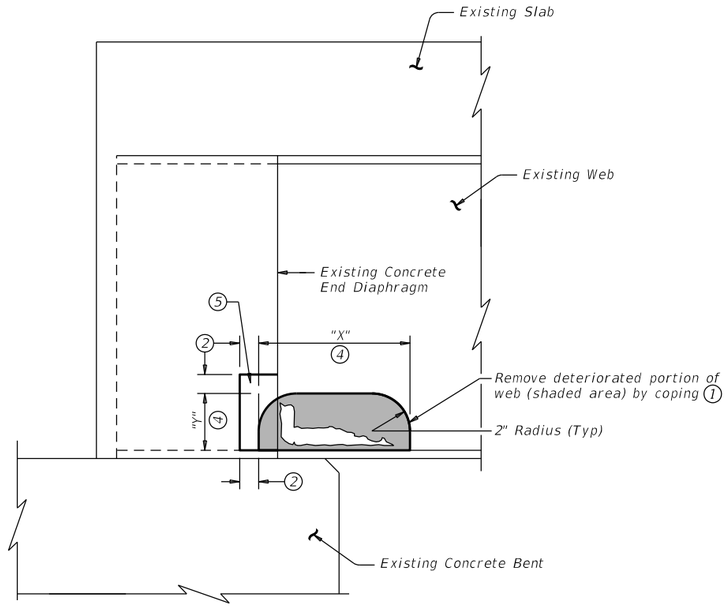
CONT	SECT	JOB	HIGHWAY
0908	00	112	VARIOUS

DIST	COUNTY	SHEET NO.
ABL	TAYLOR, ETC	30



TYPE 2A STEEL BEAM REPAIR DETAIL

(Web repair does not extend into Concrete End Diaphragm)
Scale: 1 1/2" = 1'-0"



TYPE 2B STEEL BEAM REPAIR DETAIL

(Web repair extends into Concrete End Diaphragm)
Scale: 1 1/2" = 1'-0"

GENERAL NOTES:

1. Refer to sheet "Steel Beam Repair Location Plan" for location of Type 2A, Type 2B and Type 3 Repairs.
2. Perform repairs in accordance with Item 784, "Steel Member Repair".
3. Temporary support of beams not required for Type 2A or Type 2B Repair.
4. Temporary support of beams is reguired for Type 3 Repair (do not raise the beams off the bents). Design and construction of temporary shoring shall be in accordance with Item 495, "Raising Existing Structures". Submit shoring plans and calculations to the Engineer for approval prior to construction. No payment will be made for temporary shoring of beams for Type 3 repairs. The cost shall be subsidiary to Type 3 Repair. Service load reactions at end of beam are provided below:

   Beam 1, Span 3 = 5,900 lbs
   Beam 5, Span 3 = 12,500 lbs
   Beam 1, Span 6 = 4,500 lbs
   Beam 5, Span 5 = 9,400 lbs
   Beam 6, Span 5 = 4,000 lbs

   Temporary shoring shall be installed prior to cutting webs for Type 3 repair of designated beams and shall remain in place until repair plate welds have been inspected and approved.
5. Repair plates for Type 3 repairs shall be 1/2" thick HYC (A36) meeting the requirements of Item 442, "Metal for Structures". Shop drawings and welding procedures for repairs and welding shall be submitted for approval by the Engineer prior to construction.

CONSTRUCTION NOTES:

(1) For Type 2A and 2B Repairs, remove deteriorated web material to provide a coped opening in the web. Provide a 2" radius at the end of the cope. Grind opening of cope to smooth surface.

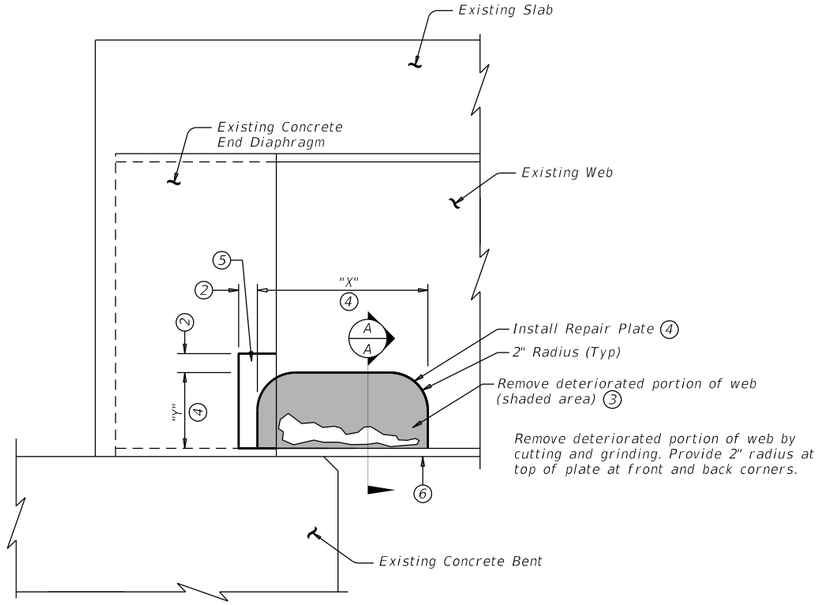
(2) For Type 2B and Type 3 Repairs, remove diaphragm concrete as necessary to allow repairs to extend into the end diaphragm. Maximum estimated embedment of repair is 1"±.

(3) For Type 3 Repairs, remove deteriorated web material to provide an opening for the steel repair plate. Clean the steel beam at/near the proposed welded joint to remove corrosion prior to welding.

(4) For repair dimensions "X" and "Y" refer to sheet "Steel Beam Repair Location Plan". Prepare edges of repair plate for double bevel groove weld (see weld detail).

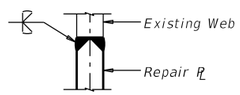
(5) Restore concrete end diaphragms to dimensions prior to partial removal with epoxy mortar (refer to TxDOT "Concrete Repair Manual", Chapter 3, Sections 2 and 3). Removing concrete and restoring concrete end diaphragms is subsidiary to steel repair.

(6) Provide temporary support of beam during repairs (see General Note 4 for shoring loads and requirements).



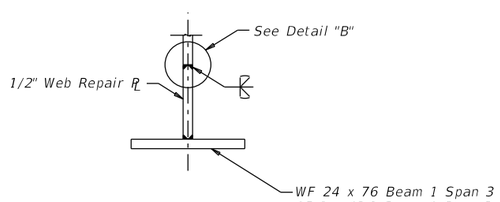
TYPE 3 STEEL BEAM REPAIR DETAIL

(Elevation View Showing Web Repair)
Scale: 1 1/2" = 1'-0"



DETAIL B

(Showing Weld Detail Between Repair Plate and Web)
(Weld Between Repair Plate and Bottom Flange is Similar)
Scale: Full Size



SECTION A-A

(Section Thru Existing Beam Showing Repair Plate)
Scale: 1 1/2" = 1'-0"

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STEEL BEAM REPAIR DETAILS

NBI No. 08-077-0-0983-02-010

FM 611
BUFFALO CREEK

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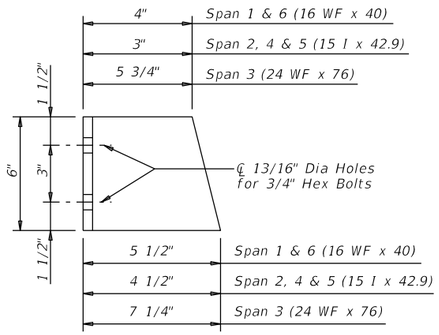
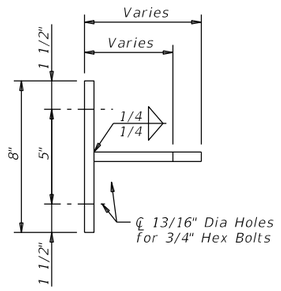
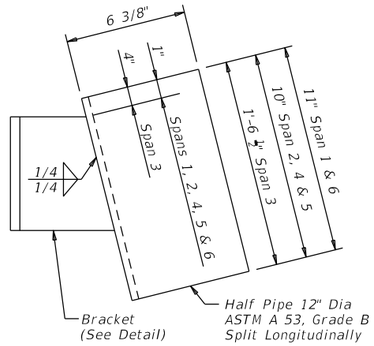
REVISIONS	0908	00	112	VARIOUS
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC		31



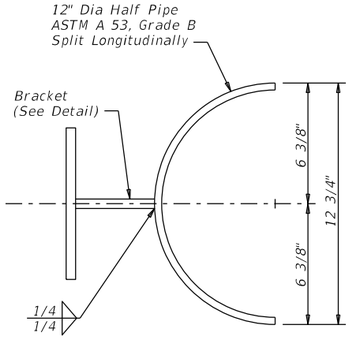
SIDE VIEW OF BRACKET



PLAN VIEW OF BRACKET



SIDE VIEW OF ASSEMBLY



SECTION THRU ASSEMBLY

FABRICATION DETAIL

Scale: 1 1/2" = 1'-0"

GENERAL NOTES:

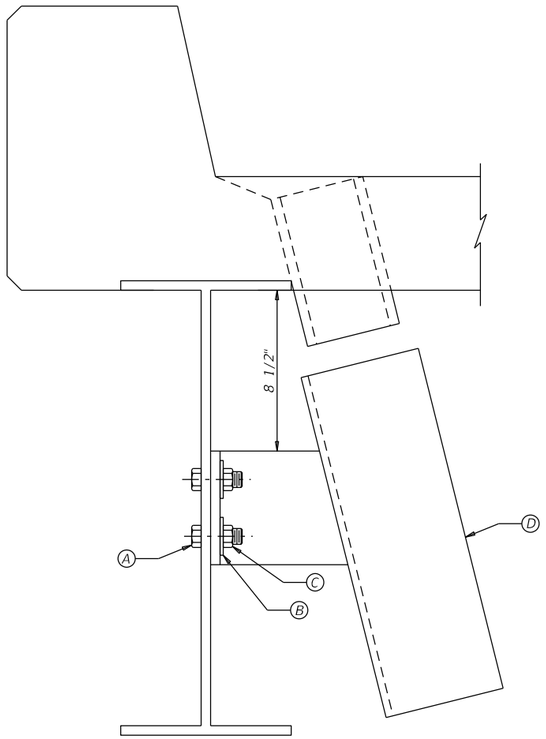
1. Install drain splash guard assemblies at the locations shown on the Bridge Repair Layout (repair M-1).
2. Install drain splash guards after zone painting has been completed.
3. Use templates for drilling holes in existing steel beams (drain splash guard assemblies shall not be used as drilling templates).

FABRICATION NOTES:

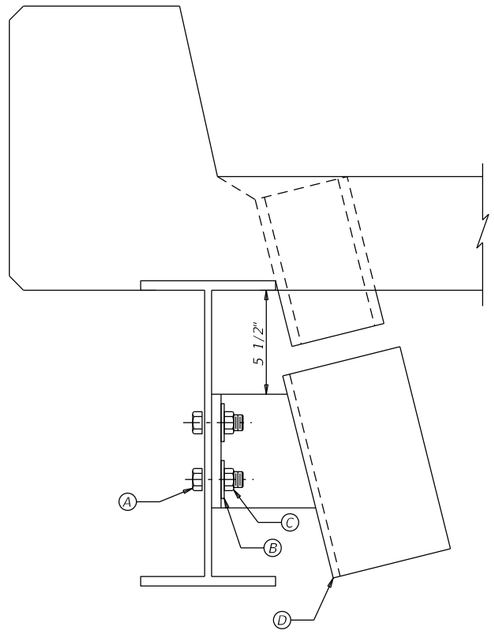
1. Structural Steel shall be HYC (A36) in accordance with Item 442, "Metal for Structures".
2. All plates shall be 1/2" thick, unless noted otherwise.
3. Fabrication shall be in accordance with Item 441, "Steel Structures".
4. Drain splash guard assembly and hardware (hex bolts, washers and hex nuts) shall be galvanized in accordance with Item 445, "Galvanizing".

CONSTRUCTION NOTES:

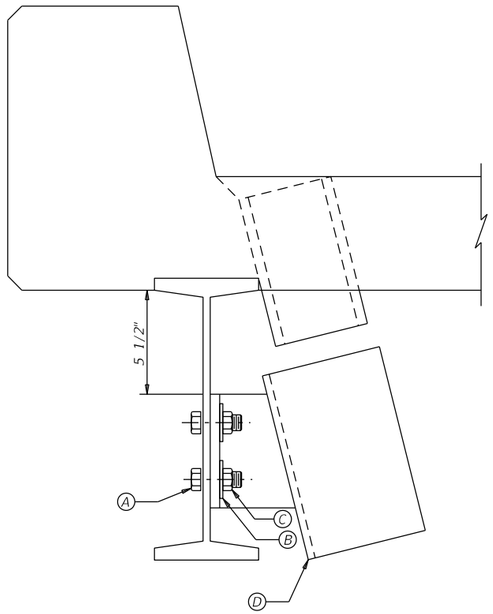
(A) 3/4" hex bolt (A307, Grade A).
(B) Standard washer (F844).
(C) 3/4" hex nut (A563, Grade 1) .
(D) Drain splash guard assembly.



SPAN 3 - 24 WF x 76



SPAN 1 & 6 - 16 WF x 40



SPAN 2, 4 & 5 - 15 I x 42.9

CONSTRUCTION DETAIL

Scale: 1 1/2" = 1'-0"

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9-09-2022

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DRAIN SPLASH GUARD

NBI No. 08-077-0-0983-02-010

FM 611
BUFFALO CREEK

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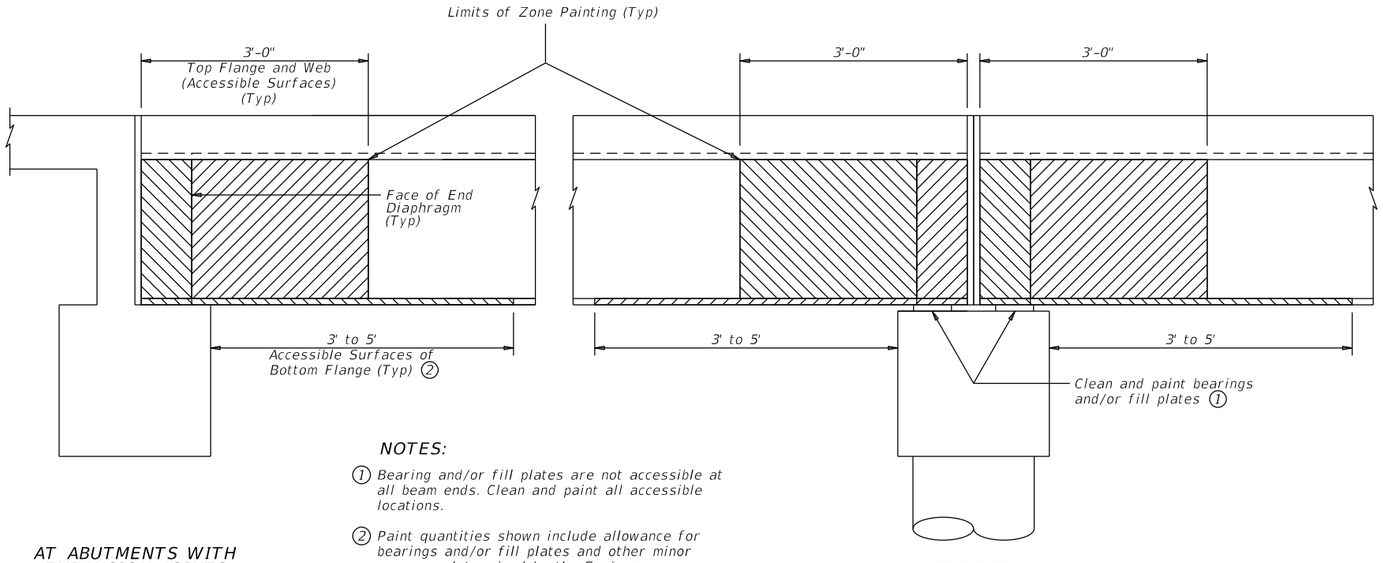
	ABL	TAYLOR, ETC		32

TABLE OF PAINT QUANTITIES

Hwy. No.	NBI	CROSSING	APPROX. AREA TO BE PAINTED (SF)
FM 611	08-077-0-0983-02-010	BUFFALO CREEK	850



AT ABUTMENTS WITH EXPANSION JOINTS

AT BENTS

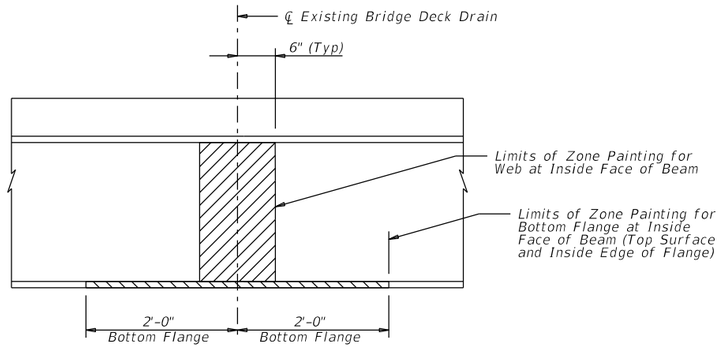
NOTES:

(1) Bearing and/or fill plates are not accessible at all beam ends. Clean and paint all accessible locations.

(2) Paint quantities shown include allowance for bearings and/or fill plates and other minor areas as determined by the Engineer.

PARTIAL ELEVATION OF STEEL BEAM

Showing minimum areas of paint application. Spot clean and paint other locations on the bridge as directed by the Engineer and by following Zone Painting Notes. Dimensions shown are basis of paint estimate but do not define exact limits of repainting. Address deteriorated paint as directed. Painting perimeter does not need to be a vertical plane except on exterior surfaces of exterior beams.



PARTIAL ELEVATION OF EXTERIOR STEEL BEAM AT BRIDGE DECK DRAINS

(View of Interior Face of Beam at Deck Drain Locations)

Showing minimum areas of paint application at bridge deck drains. Dimensions shown are basis of paint estimate. Clean and paint inside face of web and bottom flange of exterior beams prior to installing drain splash guard assembly.

GENERAL NOTES:

Clean and paint the structure in accordance with Special Specification 4207, "Steel Bridge Zone Painting."

Provide potable water for water blasting steel. Water from municipal supplies approved by the Texas Department of Health will not require testing. When water is provided from another source, test for chlorides and provide water with a maximum concentrate of 500 ppm (500 mg/L).

The Default Special Protection System includes:
- Penetrating Sealer (DMS-8101), apply 0.5 to 1.0 mil DFT
- Top Coat (DMS-8105), apply minimum 4.0 mil DFT

The Alternate Special Protection System includes:
- Epoxy Zinc Primer (DMS-8101), apply 3.5 to 10 mil DFT
- Top Coat (DMS-8105), apply minimum 4.0 mil DFT

Provide a High Ratio Calcium Sulfonate (HRCSA) top coat for bearings and/or fill plates. Apply an additional 14-18 mil WFT protection coat to all exposed bearing/fill plate surfaces after other coats.

Provide the penetrating sealer and top coat from the same manufacturer.

Tint the proposed paint system to match the existing bridge paint color. Select the proposed paint color from the Federal Standard Colors list. Submit proposed paint color samples to the Engineer for approval before paint purchase.

ZONE PAINTING NOTES:

Prepare the surfaces to be cleaned by using hand tools, vacuuming, and water blasting as described in Special Specification 4207, "Steel Bridge Zone Painting" for Default Special Protection System and water blast and SSPC SP10/SP11 (near white metal) for the Alternate Special Protection System.

Water blast all exposed surfaces of bearings and/or fill plates for a minimum of 1 minute each while moving nozzle to thoroughly clean all surfaces.

Use oil-free compressed air to blow out tightly confined locations.

REFERENCE STRUCTURE #1

Existing steel beams are embedded in concrete end diaphragms at abutments and interior bents. Clean steel surfaces to SSPC SP10/SP11 from face of concrete diaphragm to approximately 8" into the span. Extend the limit for SP10/SP11 cleaning at Type 2B and Type 3 repairs into the end diaphragms to the limit of concrete removal.

Apply the Alternate Special Protection System to surfaces within 8" of the face of end diaphragm.

Apply the Default Special Protection System to all other areas of steel beams within the Zone Painting Limits or as directed by the Engineer.

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STATE OF TEXAS
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9-09-2022

ZONE PAINTING DETAILS

NBI No. 08-077-0-0983-02-010

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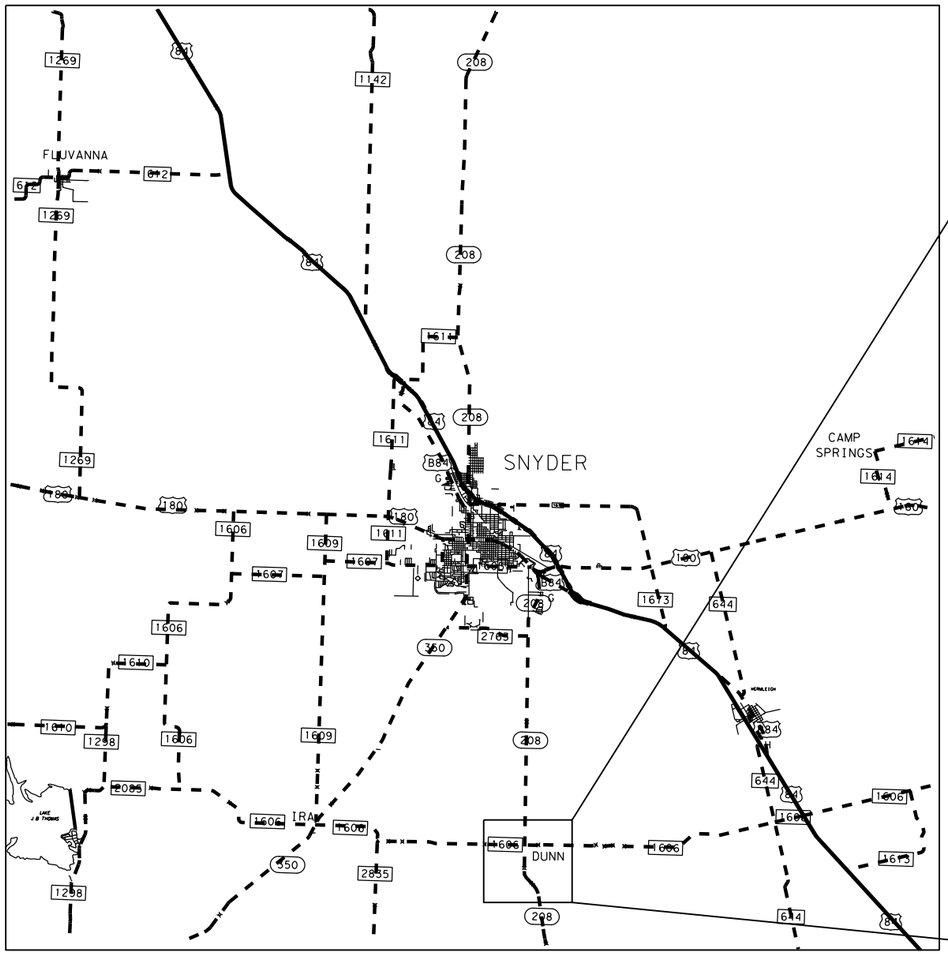
	DIST	COUNTY				SHEET NO.	
	ABL	TAYLOR, ETC				33	

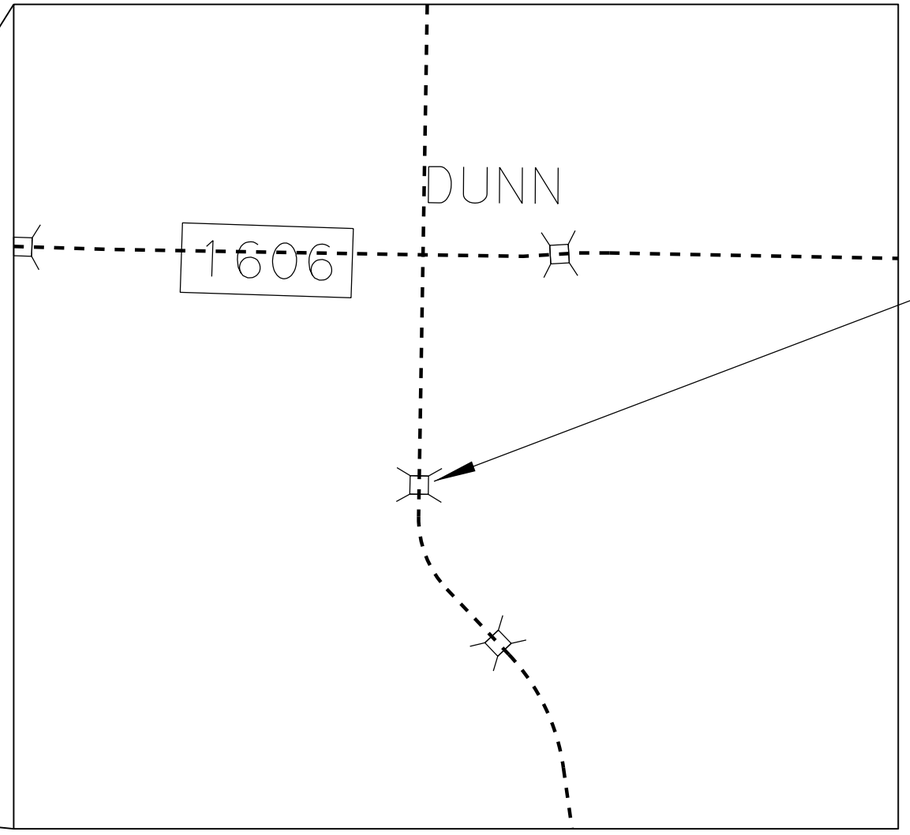
SH 208

BIG SULPHUR CREEK

NBI # 08-208-0-0332-01-012



SCURRY COUNTY



LOCATION MAP

08-208-0-0332-01-012

LAT/LONG: 32.56270278/-100.885875

STATE OF TEXAS
MAXIE W. ALLEN
96883
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Maxie Allen
300044282A5242B...

9/9/2022

LIMITS: AT BIG SULPHER CREEK BRIDGE

CONSISTING OF: PERFORM STRUCTURE REPAIR.

DESCRIPTION: 6- SIMPLE SPAN CONCRETE T-BEAMS ON CONCRETE SUBSTRUCTURE.

BRIDGE LENGTH: 180'

OVERALL WIDTH: 36'-4"

FILE: $FILE$ $TIME$

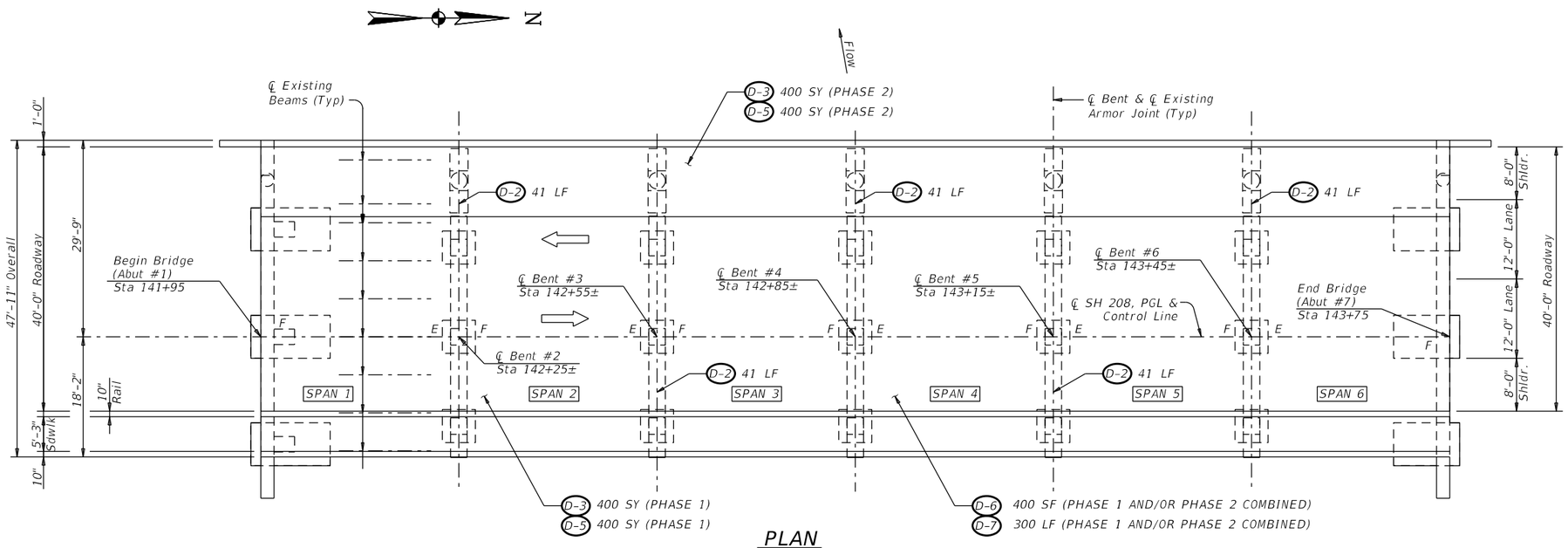
DATE: $DATE$

BIG SULPHUR CREEK LOCATION MAP

Texas Department of Transportation

SCALE: NTS SHEET 1 OF 1

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		VARIOUS
STATE	COUNTY		SHEET NO.
TEXAS	TAYLOR, ETC.		34
DISTRICT	CONTROL	SECTION	JOB
ABL	0908	00	112

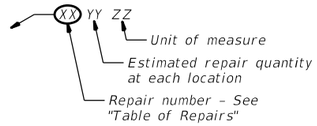


PLAN
Scale: 1" = 20'

GENERAL NOTES

1. Layout and stations shown are based on as-built plans. "E" denotes expansion end of span. "F" denotes fixed end of span. Copies of available portions of as-built plans may be provided upon request.
2. Repair locations and quantities are based on March 2022 repair inspection. Current conditions may vary. Field verify locations and extent of repairs in the presence of the Engineer prior to ordering materials.
3. Existing Load Rating (July 2021, by others):
   HS 18.9 (IR)
   HS 31.7 (OR)
4. Repairs are constructed in phases. Refer to "Construction Phasing" sheets for information.
5. Refer to "Steel Pedestal Location Plan" sheet for location of supplemental bearings.
6. The thickness of the existing dense concrete overlay is approximately 2".
7. See "Bent Repairs (Bents 2 Thru 6)" sheet for concrete structure repair locations and quantities.

REPAIR CALL-OUT LEGEND



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

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BRIDGE REPAIR LAYOUT

NBI No. 08-208-0-0332-01-012

SH 208
BIG SULPHUR CREEK

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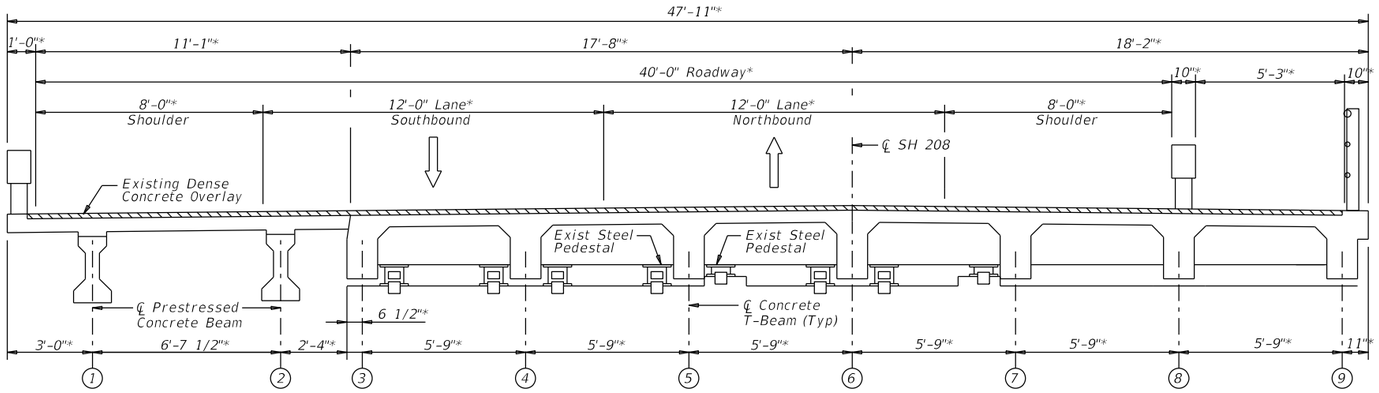
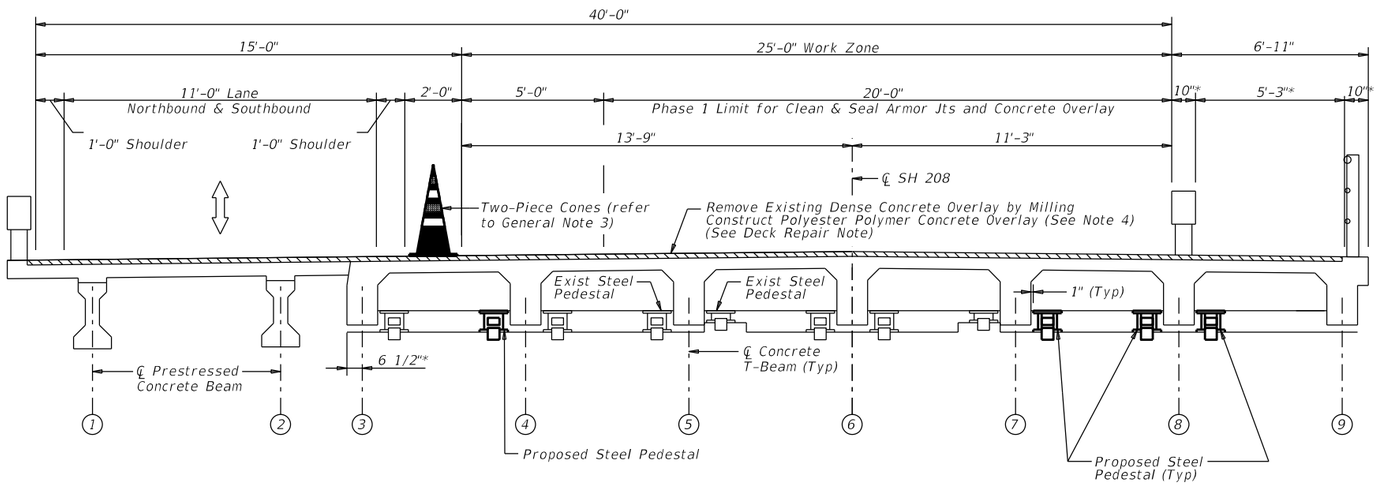
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC		35



*Dimensions are from existing plans.

EXISTING BRIDGE

Scale: 3/16" = 1'-0"
(Looking Ahead Station)
(Showing Existing Traffic Lanes)



CONSTRUCTION PHASE 1

Scale: 3/16" = 1'-0"

Deck Repair Note:
The cover for the top mat of reinforcing steel in the deck of the T-Beams is approximately 1/2". The deck was originally constructed with 1 1/2" cover in 1940. In 1987 the existing deck was scarified to a depth of 1" prior to placing the 2" dense concrete overlay. The Contractor shall exercise caution during deck repair to avoid damaging deck reinforcing steel.

GENERAL NOTES:

1. Construct bridge repairs in phases as set out herein.
2. Daily one-lane two-way traffic control with flaggers is required each day during repair work. Refer to Traffic Control Plans (TCP) standard sheet "TCP (1-2) 18" for information on taper, signs, channelizing, shadow vehicles, TMAs, etc.
3. Refer to Barricade and Construction standard sheet "BC(8)-21" for information on two-piece traffic cones
4. Construct Polyester Polymer Concrete Overlay meeting the following requirements:

   Special Specification 4106, "Polyester Polymer Concrete Bridge Deck Overlay".

   Surface preparation in accordance with Item 483, "Concrete Bridge Deck Surfacing".

   Trial applications shall be located 8 feet or more from armor joints unless approved by the Engineer.

   Completed overlay to be cured to traffic ready state within 4 hours or as approved by manufacturer and the Engineer. Method of validating overlay is ready for traffic shall be in accordance with manufacturer's recommendations and approved by the Engineer.
5. Phase 1:
   Close the northbound lane and channelize traffic to the west side of southbound lane.

   Perform concrete structure repair at Beams 4 through 8 at locations shown on sheet "Bent Repairs (Bents 2 Thru 6)" and as directed by the Engineer.

   Install proposed steel pedestals at the locations shown on sheet "Steel Pedestal Location Plan" at Beams 4 through 8.

   Remove existing dense concrete overlay by milling.

   Construct overlay (2 inch thickness).

   Inspect surface of milled deck after cleaning to determine if deck repairs are needed. If deck repairs are needed, repair minor spalls using polyester polymer concrete material. Repair spalls with exposed deck reinforcing using Item 429 "Concrete Structure Repair (Rapid Deck Repair) (Partial Depth)" material. Refer to Concrete Structure Repair Details for determining repair boundary and depth of removal below reinforcing steel. Repair cracks in the top of deck using Item 780, "Concrete Crack Repair (Discrete) (Gravity)".

   Clean and seal armor joints.

   Reopen the roadway to normal traffic at the end of each day after repair work is complete.

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CONSTRUCTION PHASING

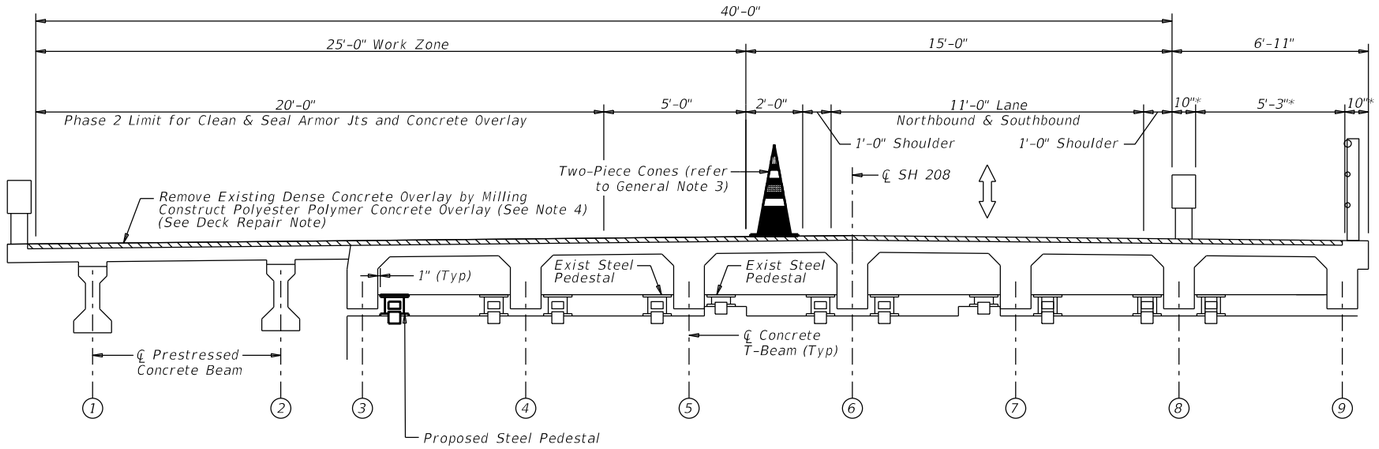
NBI No. 08-208-0-0332-01-012

SH 208
BIG SULPHUR CREEK

DN: CJC	CK: JEB	DW: TAA	CK: JEB

REVISIONS

CONT	SECT	JOB	HIGHWAY
0908	00	112	VARIOUS
DIST	COUNTY		SHEET NO.
ABL	TAYLOR, ETC		36



CONSTRUCTION PHASE 2

Scale: 3/16" = 1'-0"

Deck Repair Note:

The cover for the top mat of reinforcing steel in the deck of the T-Beams is approximately 1/2". The deck was originally constructed with 1 1/2" cover in 1940. In 1987 the existing deck was scarified to a depth of 1" prior to placing the 2" dense concrete overlay. The Contractor shall exercise caution during deck repair to avoid damaging deck reinforcing steel.

GENERAL NOTES:

See sheet 1 of 2 for notes 1 thru 5.

6. Phase 2:
   Close the southbound lane and channelize traffic to the east side of the northbound lane.

   Perform concrete structure repair at Beam 3 at locations shown on sheet "Bent Repairs (Bents 2 Thru 6)" and as directed by the Engineer.

   Install proposed steel pedestals at the locations shown on sheet "Steel Pedestal Location Plan" at Beam 3.

   Remove existing dense concrete overlay by milling.

   Inspect surface of milled deck after cleaning to determine if deck repairs are needed. If deck repairs are needed, repair minor spalls using polyester polymer concrete material. Repair spalls with exposed deck reinforcing using Item 429 "Concrete Structure Repair (Rapid Deck Repair) (Partial Depth)" material. Refer to Concrete Structure Repair Details for determining repair boundary and depth of removal below reinforcing steel. Repair cracks in the top of deck using Item 780, "Concrete Crack Repair (Discrete) (Gravity)".

   Construct overlay (2 inch thickness).

   Clean and seal armor joints.

   Reopen the roadway to normal traffic at the end of each day after repair work is complete.

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CONSTRUCTION PHASING

NBI No. 08-208-0-0332-01-012

SH 208
BIG SULPHUR CREEK

	DN: CJC		CK: JEB	DW: TAA		CK: JEB	
©TxDOT: September 2022	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0908	00	112		VARIOUS		
	DIST	COUNTY				SHEET NO.	
	ABL	TAYLOR, ETC				37	

TABLE OF REPAIRS

REPAIR NO.	ITEM	BID ITEM DESCRIPTION	UNIT	QUANTITY	REPAIR DESCRIPTION/LOCATOR	DETAILS/NOTES	FUA No. & Notes①	
D-2	0438	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	205	Clean and seal existing armor joints at Bents 2 through 6.	See sheets "Cleaning and Sealing Existing Armor Joints".		1 ④
D-3	0483	MICROMILLING CONCRETE SLAB (2 IN)	SY	800	Remove existing dense concrete overlay by milling.	Shot blast and clean top of deck after milling per Special Specification 4106. Perform work in phases.	1 ③	
D-5	4106	POLYESTER POLYMER CONCRETE OVERLAY (2")	SY	800	Construct polyester polymer concrete overlay in phases.	Inspect deck, determine if deck repairs are needed. Refer to Special Specification 4106. Repair deck prior to constructing overlay. Reopen roadway to normal traffic at the end of each workday.	1 ③	
D-6	0429	CONC STR REPAIR (RAPID DECK REP) (PART DEPTH)	SF	400	Construct partial depth rapid deck repairs in Phase 1 and/or Phase 2 as needed.	Inspect surface of milled deck after cleaning to determine if deck repairs are needed. Refer to sheets "Construction Phasing" and "Concrete Structure Repair" for additional information.	1 ③	
D-7	0780	CONC CRACK REPAIR (DISCRETE) (GRAVITY)	LF	300	Repair deck cracks in Phase 1 and/or Phase 2 as needed.	Inspect surface of milled deck after cleaning to determine if deck crack repairs are needed. Refer to sheets "Construction Phasing" and "Concrete Structure Repair" for additional information.	1 ③	
SP-5	0442	STR STEEL (PEDESTAL)	LB	2,489	Install steel pedestals at locations shown on sheet "Steel Pedestal Location Plan".	See sheets "Steel Pedestal Details" and "Construction Phasing".	2 ③	2 ④
SB-1	0429	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	490	Repair minor to intermediate spalls and delaminations at Bents 2 thru 6.	Refer to TxDOT Concrete Repair Manual, Chapter 3, Sections 1 and 2, Bent Repair sheets, and sheets "Concrete Structure Repair Details".		3 ④
SB-2	0780	CONC CRACK REPAIR (DISCRETE) (ROUT AND SEAL)	LF	250	Rout and seal various cracks at Bents 2 thru 6 as directed by the Engineer.	Refer to TxDOT Concrete Repair Manual, Chapter 3, Section 7.		3 ④
M-2	0428	PENETRATING CONCRETE SURFACE TREATMENT	SY	1,171	Apply silane to original bent caps at Bents 2 thru 6 and to top surface of concrete deck overlay.	See sheets "Bent Repairs Bents 2 Thru 6" and "Dense Concrete Overlay Repair".		1 ④

GENERAL NOTES

① Follow-Up Action (FUA) items are taken from Bridge Inspection Record dated 5/14/2019 and/or Bridge Inspection Record dated 5/26/2021. Notify the Engineer after repair of each FUA is completed. All other references to FUA are for the Engineer's information only. The Engineer will then notify the County Maintenance Supervisor who will update the Maintenance Module.

② Repair is included to extend the life of other repairs that address FUAs.

③ Repair addresses FUA included in 5/14/2019 Bridge Inspection Record.

④ Repair addresses FUA included in 5/26/2021 Bridge Inspection Record.

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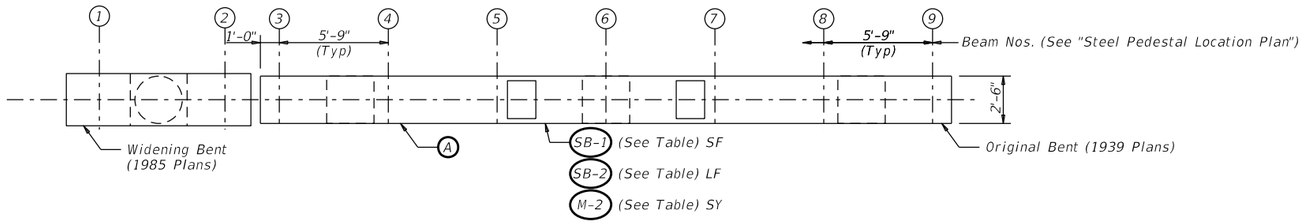
SUMMARY OF REPAIRS

NBI No. 08-208-0-0332-01-012

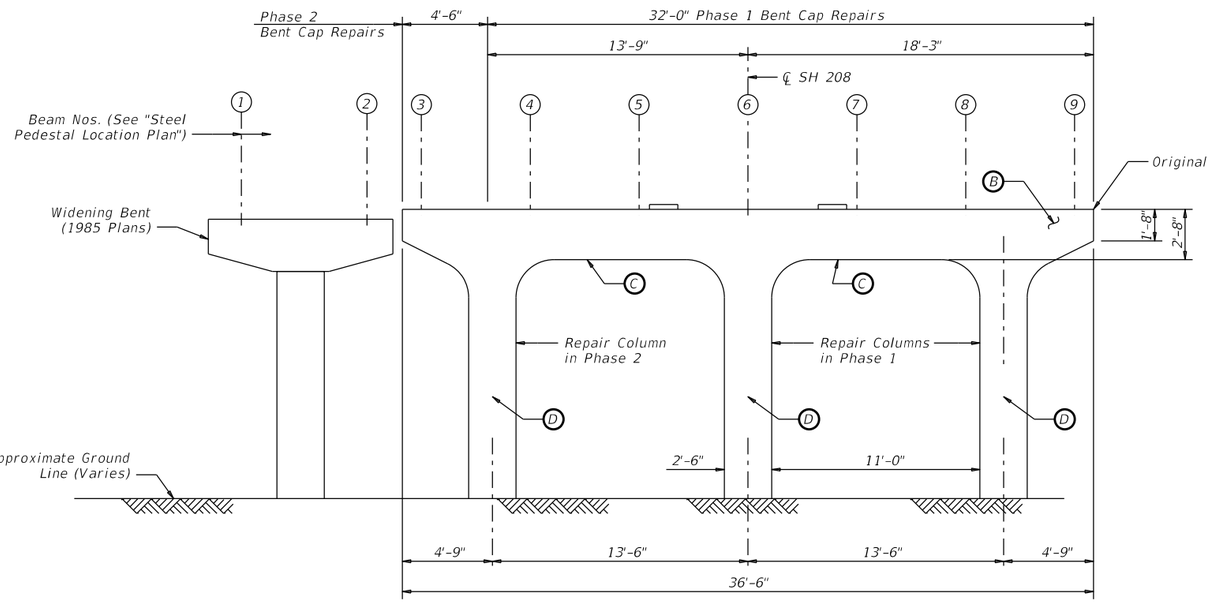
SH 208
BIG SULPHUR CREEK

	DN: CJC	CK: JEB	DW: TAA	CK: JEB
©TxDOT: September 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	00	112	VARIOUS
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC		38



PLAN VIEW

Scale: 1/8" = 1'-0"
(Showing Top of Cap, Looking Down)



ELEVATION VIEW

(South Face Shown, North Face Similar)
Scale: 1/8" = 1'-0"

ESTIMATED REPAIR QUANTITIES

BENT No.	REPAIR SB-1 CONC STR REPAIR (SF)	REPAIR SB-2 EPOXY CRACK REPAIR (LF)	REPAIR M-2 PEN CONC SURF TRTMT (SY)
2	35	25	76
3	90	50	79
4	100	50	76
5	90	50	73
6	175	75	63
Total	490	250	367

GENERAL NOTES

1. Concrete structure repair and crack repair shall be constructed in phases as set out on this sheet.
2. Repair spalls and delaminations on bent caps and columns of the original bent at areas indicated in "Repair SB-1 Notes".
3. Remove spalls and delamination to sound concrete. Notify the Engineer if deterioration extends under steel bearing assemblies of existing T-beams or under existing steel pedestals for evaluation.
4. Perform all concrete repair work in accordance with Item 429, "Concrete Structure Repair", the TxDOT Concrete Repair Manual, Chapter 3, Sections 1 and 2, and "Concrete Structure Repair Details" sheets.
5. Provide the following materials for concrete repair:

   Minor spall and delaminations: use Type VIII neat epoxy per DMS 6100 for repairs less than 1 in. thick.

   Intermediate spalls and delaminations: use Type C trowel-applied materials meeting the requirements of DMS 4655.
6. Perform rout and seal crack repair in accordance with Item 780, "Concrete Crack Repair" and TxDOT Concrete Repair Manual, Chapter 3, Section 7. Use Method 1 at locations directed by the Engineer.
7. Repair quanities are estimated and may be adjusted as directed by the Engineer.
8. Payment will be made for the work and materials for actual area of repairs completed in accordance with Item 429, "Concrete Structure Repair".

REPAIR SB-1 NOTES:

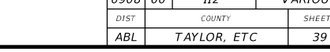
(A) Top of cap (accessible areas) of the top plane of the cap (primarily horizontal repair), but may include vertical side face of shear keys.

(B) Side faces of cap (vertical repair).

(C) Underside of cap between columns (overhead repair).

(D) Side faces of 2'-6" x 2'-6" columns (vertical repair).

REPAIR CALL-OUT LEGEND



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

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Texas Department of Transportation

STATE OF TEXAS
JAMES EDWARD BROWNE
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9-09-2022

BENT REPAIRS
BENTS 2 THRU 6

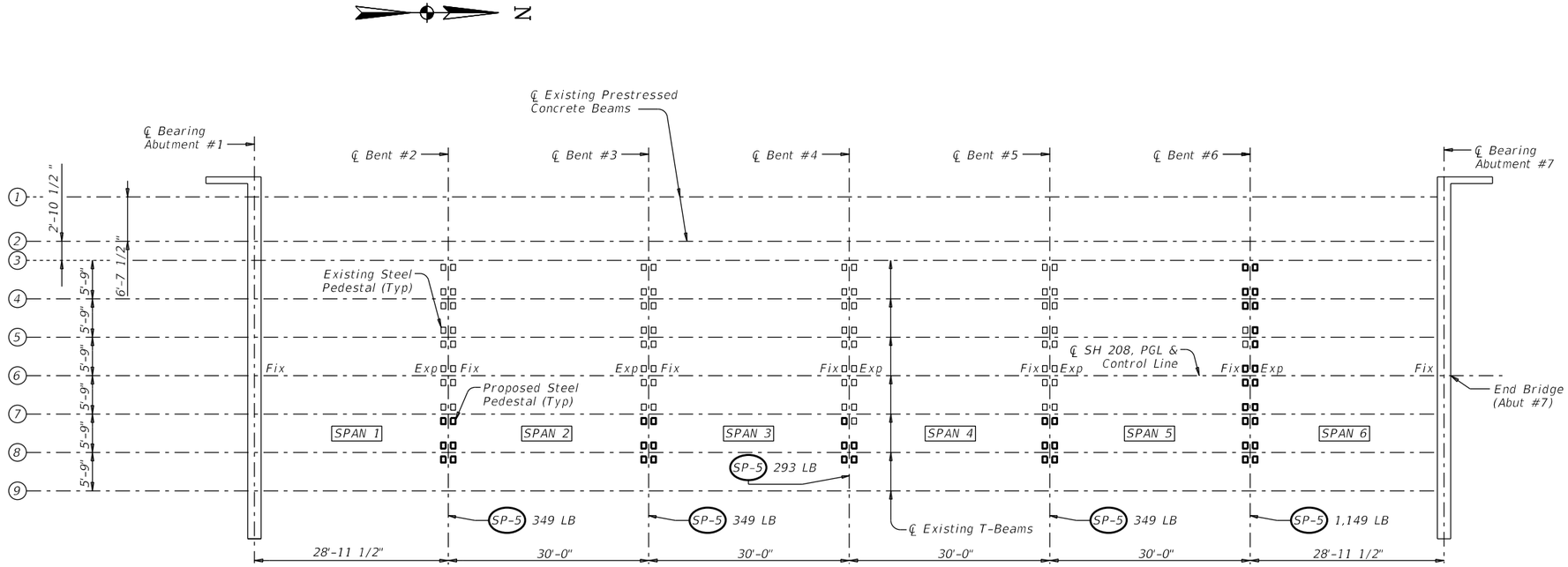
NBI No. 08-208-0-0332-01-012

SH 208
BIG SULPHUR CREEK

	DN: CJC	CK: JEB	DW: TAA	CK: JEB
©TxDOT: September 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	00	112	VARIOUS
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC		39

GENERAL NOTES

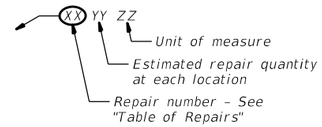
1. Install Steel Pedestals at the locations shown on this sheet.
2. Number of Steel Pedestals required is 43.
   Total weight of steel pedestals = 2,489 lbs.
3. Install Steel Pedestals in phases:
   Phase 1: install pedestals at T-Beams 4 through 8.
   Phase 2: install pedestals at T-Beam 3.
4. Refer to "Construction Phasing" sheet for additional information.



FRAMING PLAN

Scale: 1" = 20'

REPAIR CALL-OUT LEGEND



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

STATE OF TEXAS
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9-09-2022

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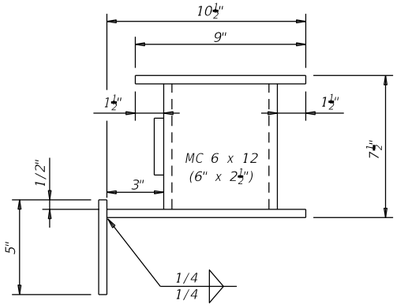
STEEL PEDESTAL LOCATION PLAN

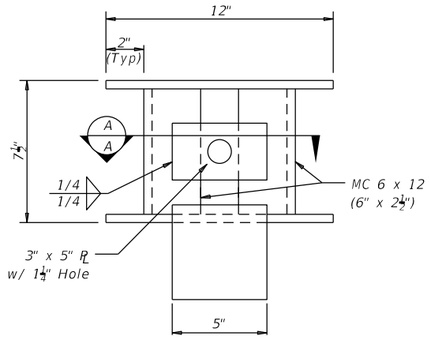
NBI No. 08-208-0-0332-01-012

SH 208
BIG SULPHUR CREEK

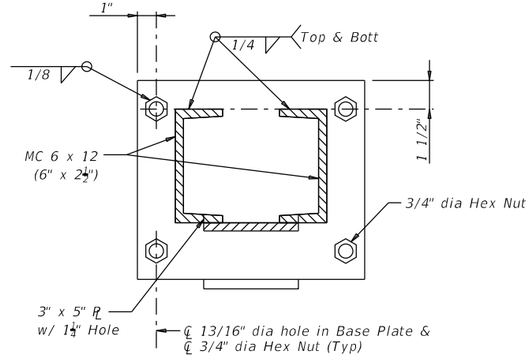
	DN: CJC	CK: JEB	DW: TAA	CK: JEB
©TxDOT: September 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	00	112	VARIOUS
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC		40



SIDE VIEW



ELEVATION



SECTION A-A

FABRICATION DETAIL

Scale: 1 1/2" = 1'-0"

GENERAL NOTES:

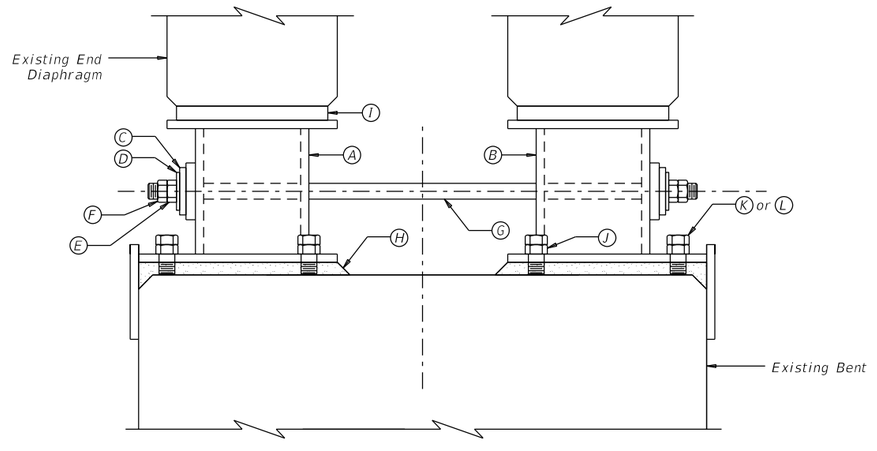
1. Pedestal heights shown are for typical pedestals and are based on existing plans. Pedestal heights may be shortened slightly and grout thickness may be increased to 1 1/4" max to achieve uniformity in pedestal heights at proposed pedestals. Adjustment of grout thickness will require increasing the length of leveling bolts.
2. Short pedestals are required at Beams 5R and 7L (at existing shear keys). The height of existing shear keys is 3" according to as-built plans.
3. The Contractor shall field verify pedestal heights prior to ordering materials.
4. Shop drawings for steel pedestals are required. A pedestal placement plan shall be included with the shop drawings.
5. The estimated weight for steel pedestals includes steel plates, channels, and hardware (nuts, threaded rods, plate washers and washers).
6. Elastomeric bearing pads shall be subsidiary to steel pedestals.

FABRICATION NOTES:

1. All steel shall be Structural Steel – HYC (A36).
2. All plates shall be 1/2" thick, unless noted otherwise.
3. Steel Pedestals and all hardware (threaded rods, plate washers, standard washers, hex nuts, jam nuts, leveling bolts and plug bolts) shall be galvanized after fabrication in accordance with Item 445.

INSTALLATION SEQUENCE:

1. Place steel pedestals in position on bent cap under existing concrete end diaphragms.
2. Place elastomeric bearing pad in position on steel pedestal.
3. Tighten leveling bolts to raise pedestal to obtain close contact between elastomeric bearing pad and bottom of existing concrete end diaphragm.
4. Place grout between bottom of base plate and top of concrete bent cap after leveling bolts have been adjusted to raise pedestal to final vertical position. Ensure there are no voids in grout.
5. Remove leveling bolts after grout has reached 4,000 psi compressive strength. Replace leveling bolt with plug bolts and tighten to snug tight.



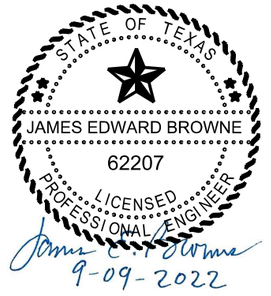
Note: Refer to Steel Pedestal Location Plan for Locations

CONSTRUCTION DETAIL

Scale: 1 1/2" = 1'-0"

CONSTRUCTION NOTES:

(A) Proposed steel pedestal assembly (see Fabrication Detail).
(B) Existing or proposed steel pedestal assembly.
(C) 2 1/2"x2 1/2"x1/4" PL washer w/ 13/16" dia. hole.
(D) Standard washer (F844).
(E) 3/4" hex nut (A563, Grade A).
(F) 3/4" jam nut (A563, Grade A).
(G) 3/4" dia. rod (A307, Grade A) w/ 3" threads at each end.
(H) 3/4" thick grout between steel pedestal and top of existing bent cap. Grout to be epoxy grout or proprietary bearing mortar per TxDOT DMS-4640). Grout thickness can be increased to 1 1/4" max (See General Note 1).
(I) 8"x10"x3/4" neoprene bearing pad (plain – 70 durometer).
(J) 3/4" hex nut welded to base plate.
(K) 3/4" hex leveling bolt (see Installation Sequence Note 3).
(L) 3/4" plug bolt (1 1/2" length) (see Installation Sequence Note 6).



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STEEL PEDESTAL DETAILS

NBI No. 08-208-0-0332-01-012

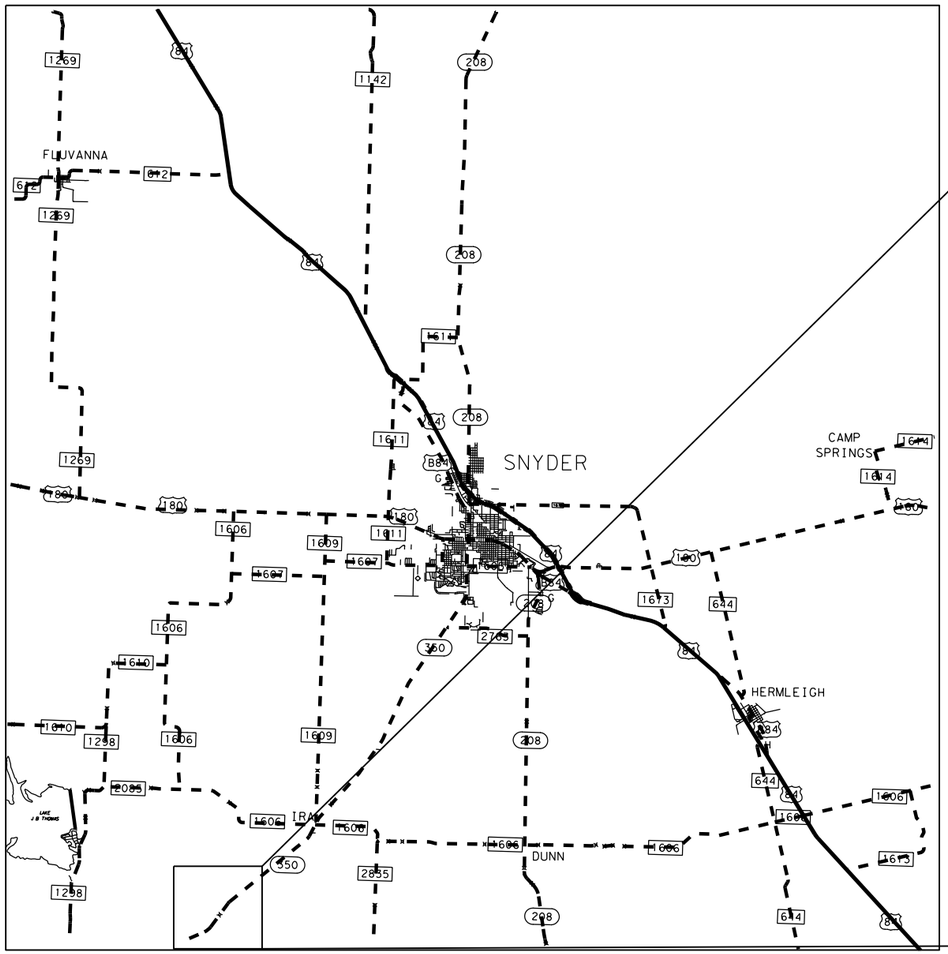
SH 208
BIG SULPHUR CREEK

	DN: CJC	CK: JEB	DW: TAA	CK: JEB
©TxDOT: September 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	00	112	VARIOUS
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC		41

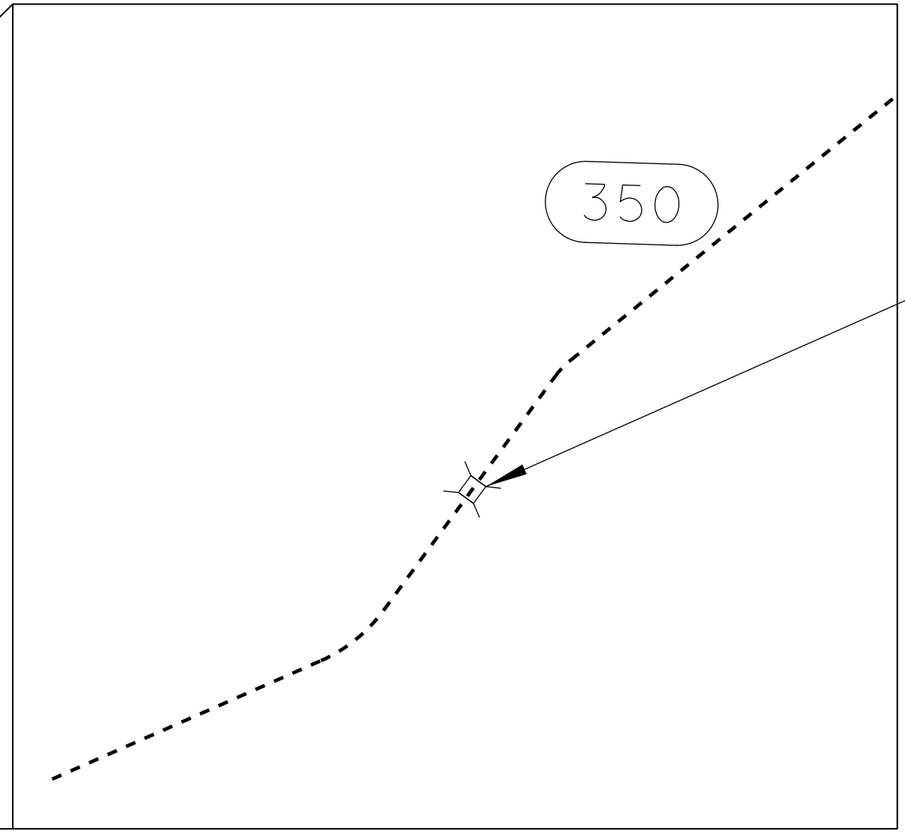
SH 350

COLORADO RIVER BRIDGE

NBI # 08-208-0-0693-03-007



SCURRY COUNTY



LOCATION MAP

08-208-0-0693-03-007

LAT/LONG: 32.56270278/-100.885875

STATE OF TEXAS
MAXIE W. ALLEN
96883
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Maxie Allen
300044282A5242B...

9/15/2022

COLORADO RIVER LOCATION MAP

LIMITS: AT COLORADO RIVER BRIDGE

CONSISTING OF: PERFORM STRUCTURE REPAIR.

DESCRIPTION: 6- SPAN STEEL I-BEAM BRIDGE ON CONCRETE AND STEEL SUBSTRUCTURE.

BRIDGE LENGTH: 331'-6"

OVERALL WIDTH: 54'-3"

Texas Department of Transportation

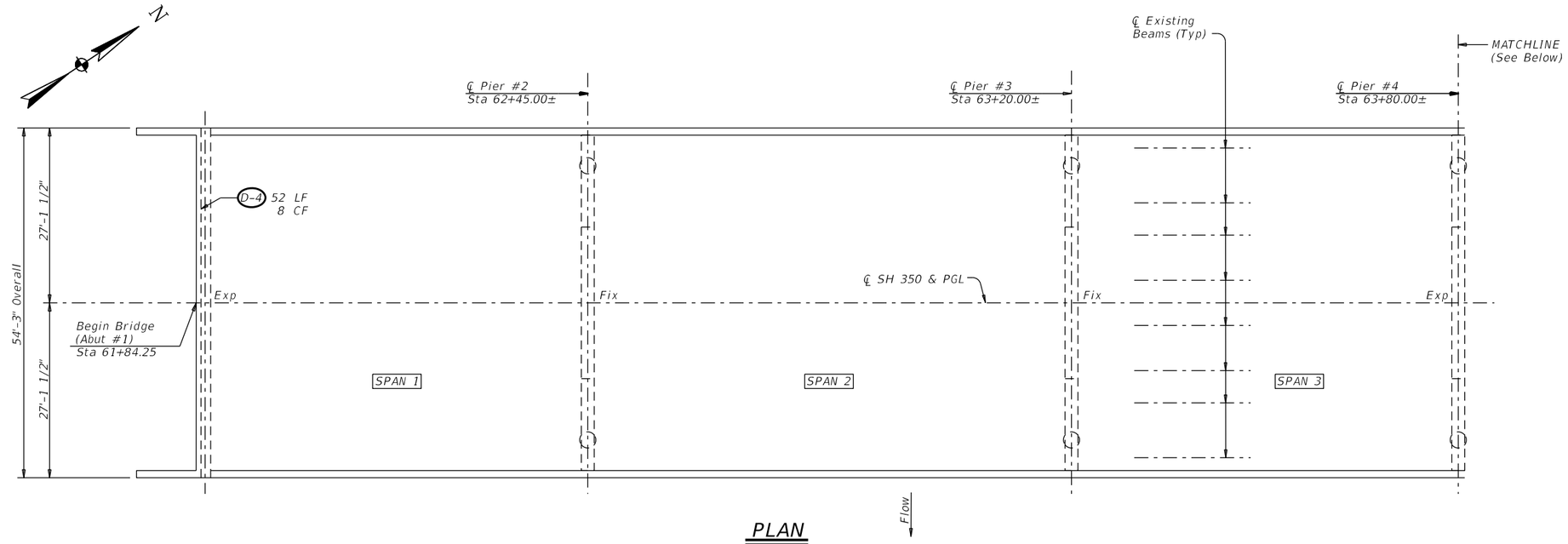
SCALE: NTS

SHEET 1 OF 1

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		VARIOUS
STATE	COUNTY		SHEET NO.
TEXAS	TAYLOR, ETC.		42
DISTRICT	CONTROL	SECTION	JOB
ABL	0908	00	112

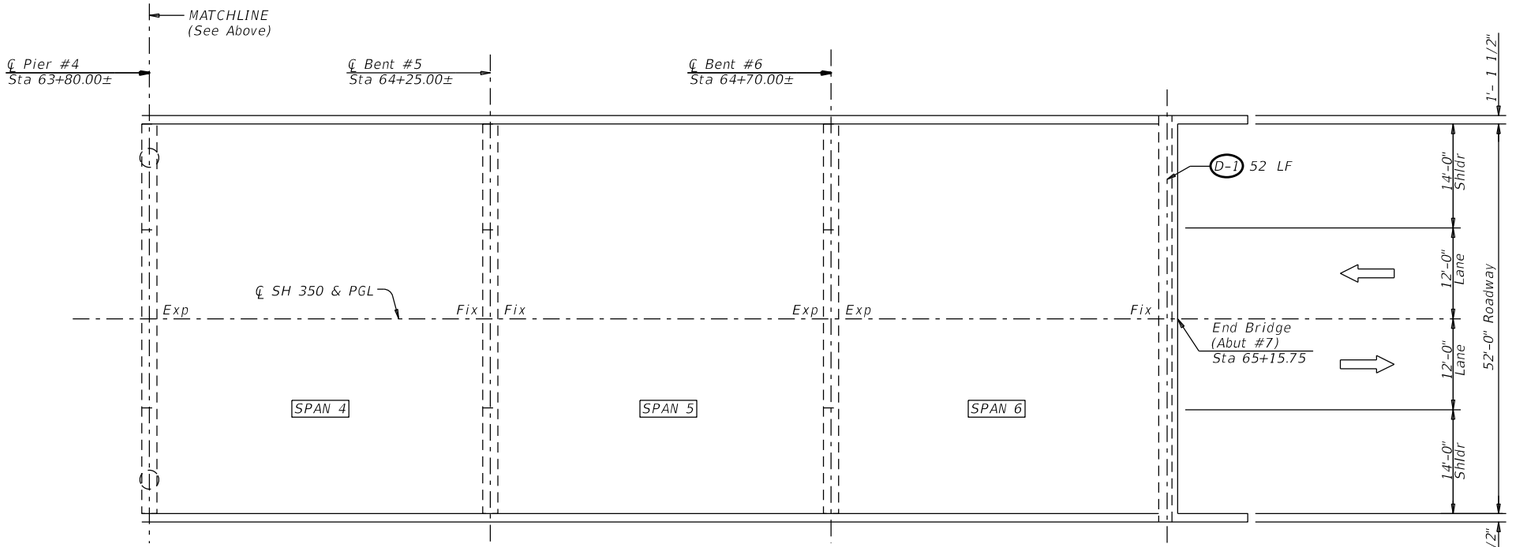
FILE: $FILE$ $TIME$

DATE: $DATE$



PLAN

Scale: 1" = 20'



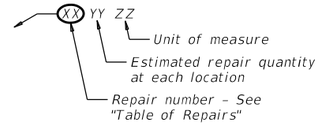
PLAN

Scale: 1" = 20'

GENERAL NOTES

1. Layout and stations shown are based on as-built plans. "Exp" denotes expansion end of span. "Fix" denotes fixed end of span. Copies of available portions of as-built plans may be provided upon request.
2. Repair locations and quantities are based on March 2022 Repair Inspection. Current conditions may vary. Field verify locations and extent of repairs in the presence of the Engineer prior to ordering materials.
3. Existing Load Rating (February 2022, by others):
   HS 18.3 (IR)
   HS 30.6 (OR)
4. The thickness of the existing asphalt overlay is approximately 2".
5. Repairs are constructed in phases. Refer to "Construction Phasing" sheets for information.
6. See "Erosion Repair" sheets for repair of areas of erosion and undermining of concrete riprap.
7. See abutment, pier and bent repair sheets for concrete structure repair locations and quantities.
8. See "Steel Piling Repairs" sheet for corrosion mitigation.

REPAIR CALL-OUT LEGEND



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

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BRIDGE REPAIR LAYOUT

NBI No. 08-208-0-0693-03-007

SH 350
COLORADO RIVER

STATE OF TEXAS
JAMES EDWARD BROWNE
62207
LICENSED PROFESSIONAL ENGINEER
James E. Browne
9-09-2022

	DN: CJC	CK: JEB	DW: TAA	CK: JEB
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REVISIONS	0908	00	112	VARIOUS
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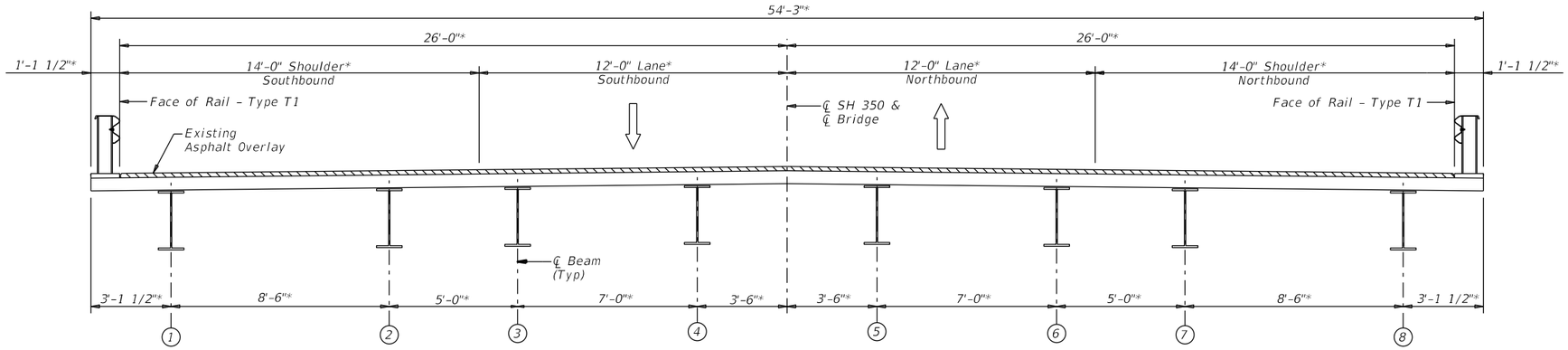
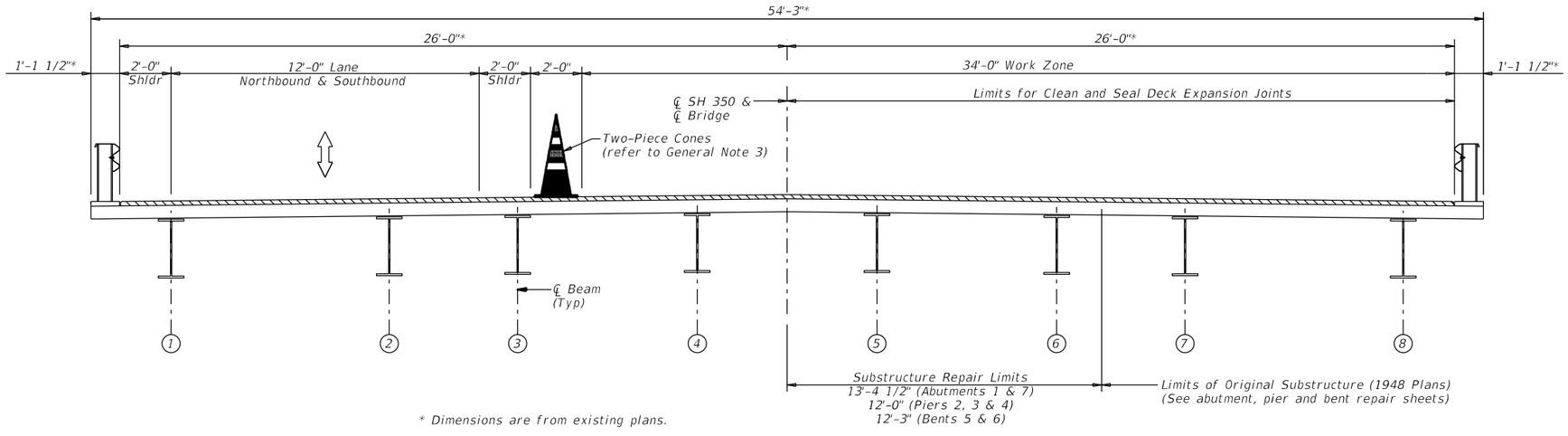
	ABL	TAYLOR, ETC		43



* Dimensions are from existing plans.

EXISTING BRIDGE & FINAL BRIDGE SECTION

Scale: 3/16" = 1'-0"
(Looking Ahead Station)
(Showing Existing Traffic Lanes)



* Dimensions are from existing plans.

CONSTRUCTION PHASE 1 BRIDGE SECTION

Scale: 3/16" = 1'-0"

GENERAL NOTES:

1. Construct bridge repairs in phases as set out herein.
2. Daily lane shifts are required each day during repair work. Refer to Traffic Control Plans (TCP) standard sheets "TCP (1-1) - 18" and "TCP (1-3) - 18" for information and requirements.
3. Refer to Barricade and Construction standard sheet "BC(8)-21" for information on two-piece traffic cones.
4. Daily one lane two-way control with flaggers is required each day that repairs are performed (refer to TCP standard "TCP(1-2)-18"). Reopen lane following completion of work each day.
5. Phase 1 Sequence of Work:

   Shift northbound and southbound traffic to the left (west side) of the bridge for repairs at the right (east side) of the bridge and ROW:

   Erosion repair at the south and north approaches.

   Clean and paint steel piling (corrosion mitigation) at Bents 5 & 6.

   Erosion repair at east edge of bridge along outside line of steel piling.

   Concrete structure repairs and crack repairs at Abutments, Piers, and Bents (repair limits as shown this sheet).

   Apply penetrating concrete surface treatment to repaired areas of abutments, piers and bents.

   Clean and seal deck expansion joints at Begin and End Bridge (repair limits as shown this sheet).

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CONSTRUCTION PHASING

NBI No. 08-208-0-0693-03-007

SH 350
COLORADO RIVER

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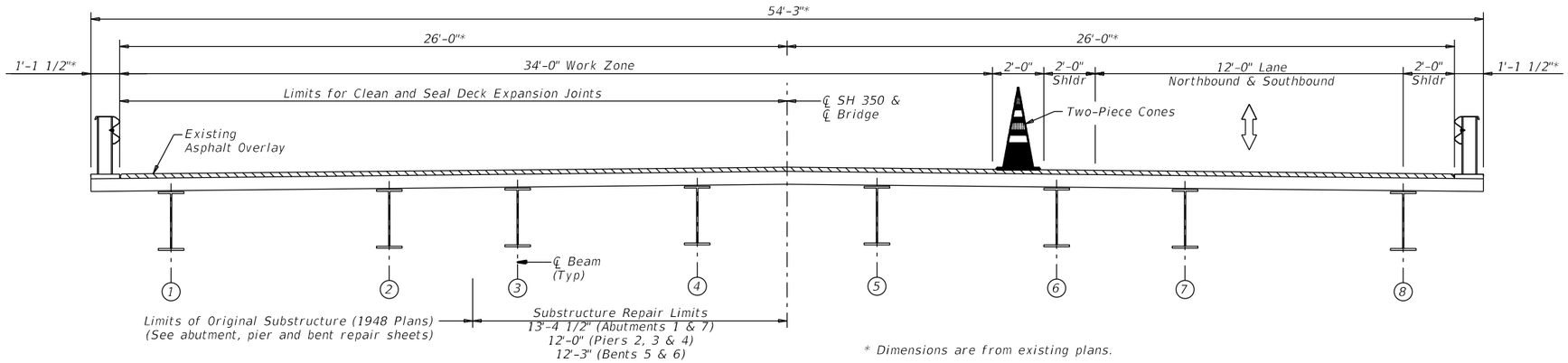
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC		44



* Dimensions are from existing plans.

CONSTRUCTION PHASE 2 BRIDGE SECTION

Scale: 3/16" = 1'-0"

GENERAL NOTES:

Refer to sheet 1 of 2 for additional General Notes.

6. Phase 2 Sequence of Work:

Shift northbound and southbound traffic to the right (east side) of the bridge for repairs at the left (west side) of the bridge and ROW:

Place flowable fill to fill the void under the riprap at Abutment 7.

Clean and paint steel piling (corrosion mitigation) at Bents 5 & 6.

Concrete structure repairs and crack repairs at Abutments, Piers, and Bents (repair limits as shown this sheet).

Apply penetrating concrete surface treatment to repaired areas of abutments, piers and bents.

Clean and seal deck expansion joints at Begin and End Bridge (repair limits as shown this sheet).

STATE OF TEXAS
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CONSTRUCTION PHASING

NBI No. 08-208-0-0693-03-007

SH 350
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	ABL	TAYLOR, ETC		45

TABLE OF REPAIRS

REPAIR NO.	ITEM	BID ITEM DESCRIPTION	UNIT	QUANTITY	REPAIR DESCRIPTION/LOCATOR	DETAILS/NOTES	FUA No. & Notes ①	
D-1	0438	CLEANING AND SEALING EXIST JOINTS (CL3)	LF	52	Clean and seal existing joints at Abutment 7.	See sheet "Cleaning and Sealing Existing Bridge Joints".		3 ④
D-4	0454	HEADER TYPE EXPANSION JOINT	CF	8	Install header type joint at Abutment 1.	See sheets "Cleaning and Sealing Existing Armor Joints".		3 ④
D-4	0454	JOINT SEALANT	LF	52	Seal header joint with a Class 7 silicone sealant.	See sheets "Cleaning and Sealing Existing Armor Joints".		3 ④
SB-1	0429	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	1,190	Repair minor to intermediate spalls and delaminations at Abutments, Piers, and Bents.	Refer to TxDOT Concrete Repair Manual, Chapter 3, Sections 1 and 2, and Abutment Repairs, Pier Repairs, and Bent Repair sheets, and sheets "Concrete Structure Repair Details".	1, 2 ③	1, 2, 4 ④
SB-2	0780	CONC CRCK REPR (DISCREET) (ROUT AND SEAL)	LF	250	Repair cracks at location as directed by the Engineer.	Refer to TxDOT Concrete Repair Manual, Chapter 3, Section 7, and Abutment Repairs, Pier Repairs, and Bent Repair sheets.		1, 2, 4 ④
SB-3	0446	CLEAN & PAINT EXIST PILING (SYSTEM II)	LS	1	Clean and paint existing steel piling at Bents 5 and 6 (8 piles total)	See sheet Bent Repairs, Bents 5 & 6 for location and limits. Color of appearance coat shall be as directed by the Engineer.	3 ③	4 ④
M-2	0428	PENETRATING CONCRETE SURFACE TREATMENT	SY	614	Apply silane to original (1948 plans) abutment caps and backwalls at Abutments 1 & 7, pier caps and walls at Piers 2 thru 4, and bent caps at Bents 5 & 6.	See Abutment Repairs, Pier Repairs and Bent Repairs sheets.		②
M-3	0432	RIPRAP (STONE COMMON) (DRY) (8 IN)	CY	104	Fill erosion as required. Install Riprap (Stone Common).	Refer to sheet "Erosion Repair", sheet 1 of 2.	5 ③	6 ④
M-3	0432	BEDDING MATERIAL (3 IN)	CY	16	Place bedding material in erosion.	Refer to sheet "Erosion Repair", sheet 1 of 2.	5 ③	6 ④
M-4	0156	BULLDOZER WORK	HR	20	Regrade area at east side of south approach to bridge to provide smooth grade as directed by the Engineer.	Refer to sheet "Erosion Repair", sheet 1 of 2.		②
M-5	0401	FLOWABLE BACKFILL	CY	25	Fill void beneath riprap at Abutment 7. Seal open construction joints and gaps between riprap and wingwalls.	Refer to sheet "Erosion Repair", sheet 2 of 2.	4 ③	
M-6	0132	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	CY	150	Place embankment to fill area of erosion at east side of bridge between Pier 4 and the toe of riprap for Abutment 7. Grade as directed by the Engineer.	Refer to sheet "Erosion Repair", sheet 2 of 2.		5 ④
M-6	0132	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	CY	30	Place embankment to repair erosion and undermining of edge of pavement in north approach at east side.	Refer to sheet "Erosion Repair", sheet 2 of 2.	6 ③	6 ④
M-7	0104	REMOVING CONC (RIPRAP)	SY	18	Remove portion of existing concrete riprap at Abutments 1 & 7 to provide access to repair abutment caps.	Refer to Abutment Repair sheets for location.		⑤
M-8	0432	RIPRAP (CONC) (CL B) (RR8 & RR9)	CY	4	Place concrete riprap (Type RR8, 5") at Abutments 1 & 7 after repair of abutment caps.	Refer to standard sheet "CRR".		⑤
SP-6	4207	STEEL BRIDGE ZONE PAINTING REF STR #2	EA	1	Clean and paint steel bearings for Beams 3 through 6 at Abutment 1.	See sheet "Abutment No. 1 Repairs".		1 ④

GENERAL NOTES

① Follow-Up Action (FUA) items are taken from Bridge Inspection Record dated 5/15/2019 and/or Bridge Inspection Record dated 5/27/2021. Notify the Engineer after repair of each FUA is completed. All other references to FUA are for the Engineer's information only. The Engineer will then notify the County Maintenance Supervisor who will update the Maintenance Module.

② Repair is included to extend the life of other repairs that address FUAs.

③ Repair addresses FUA included in 5/15/2019 Bridge Inspection Record.

④ Repair addresses FUA included in 5/27/2021 Bridge Inspection Record.

⑤ Removal and replacement of concrete riprap necessary for access to repair spalls at Abutment No. 1 and Abutment No. 7.

STATE OF TEXAS
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9-09-2022

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SUMMARY OF REPAIRS

NBI No. 08-208-0-0693-03-007

SH 350
COLORADO RIVER

	DN: CJC	CK: JEB	DW: TAA	CK: JEB
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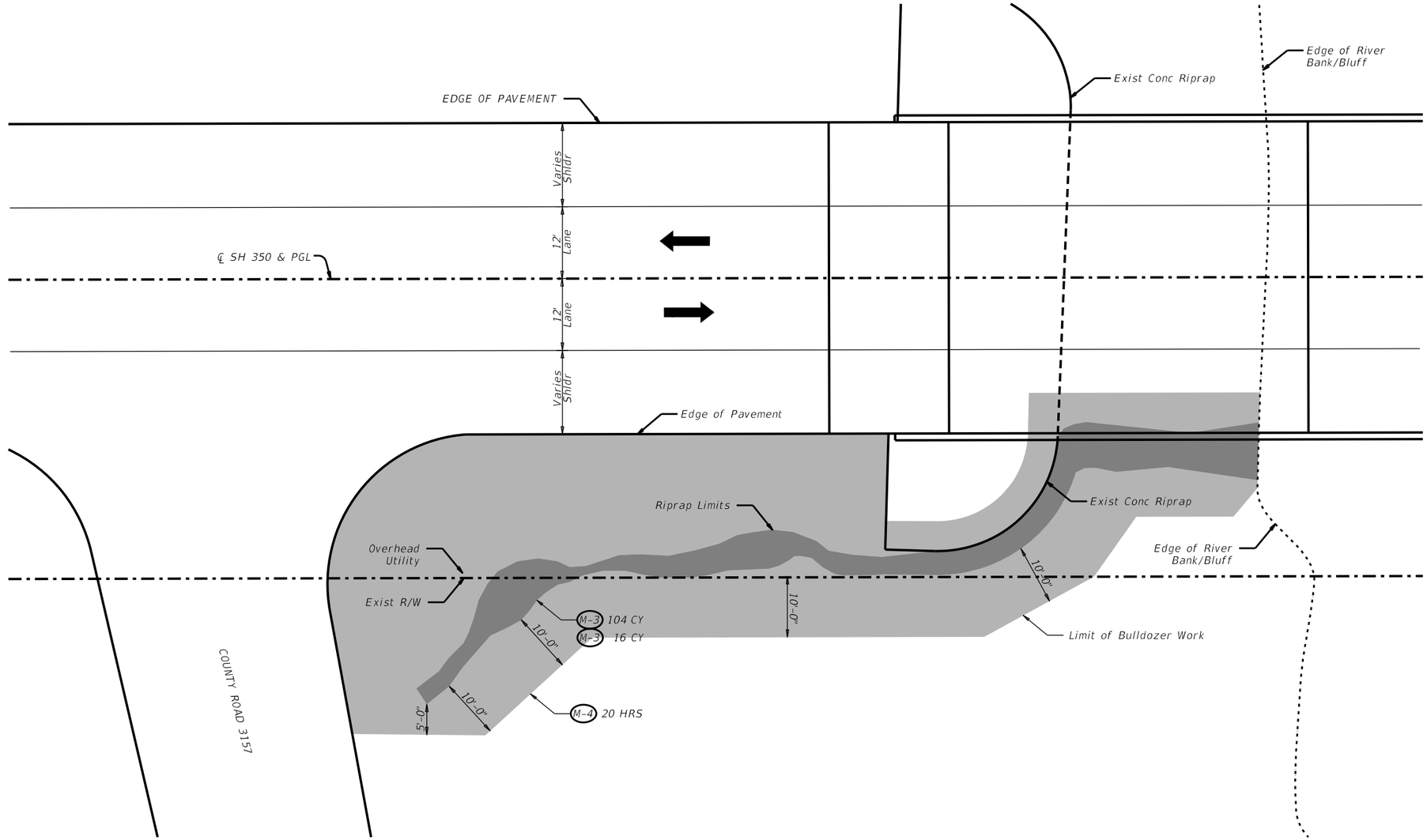
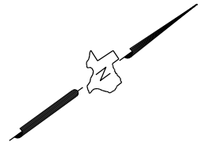
REVISIONS	0908	00	112	VARIOUS
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC		46

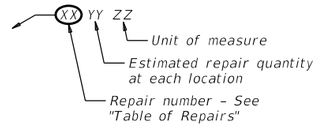




GENERAL NOTES

1. Repair M-3: Shape the bottom of erosion so it is approximately level (transverse to the erosion). Place a layer of bedding material in the bottom of the erosion. Place riprap stone to a tight fit using spalls and small stones and bedding material to fill open joints and voids in the stone riprap as directed by the Engineer.
2. Repair M-4: Grade the area to provide smooth surface and to provide for drainage to remain within TxDOT ROW as directed by the Engineer.

REPAIR CALL-OUT LEGEND



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

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EROSION REPAIR

NBI No. 08-208-0-0693-03-007

SH 350
COLORADO RIVER

STATE OF TEXAS
JAMES EDWARD BROWNE
62207
LICENSED PROFESSIONAL ENGINEER
James E. Browne
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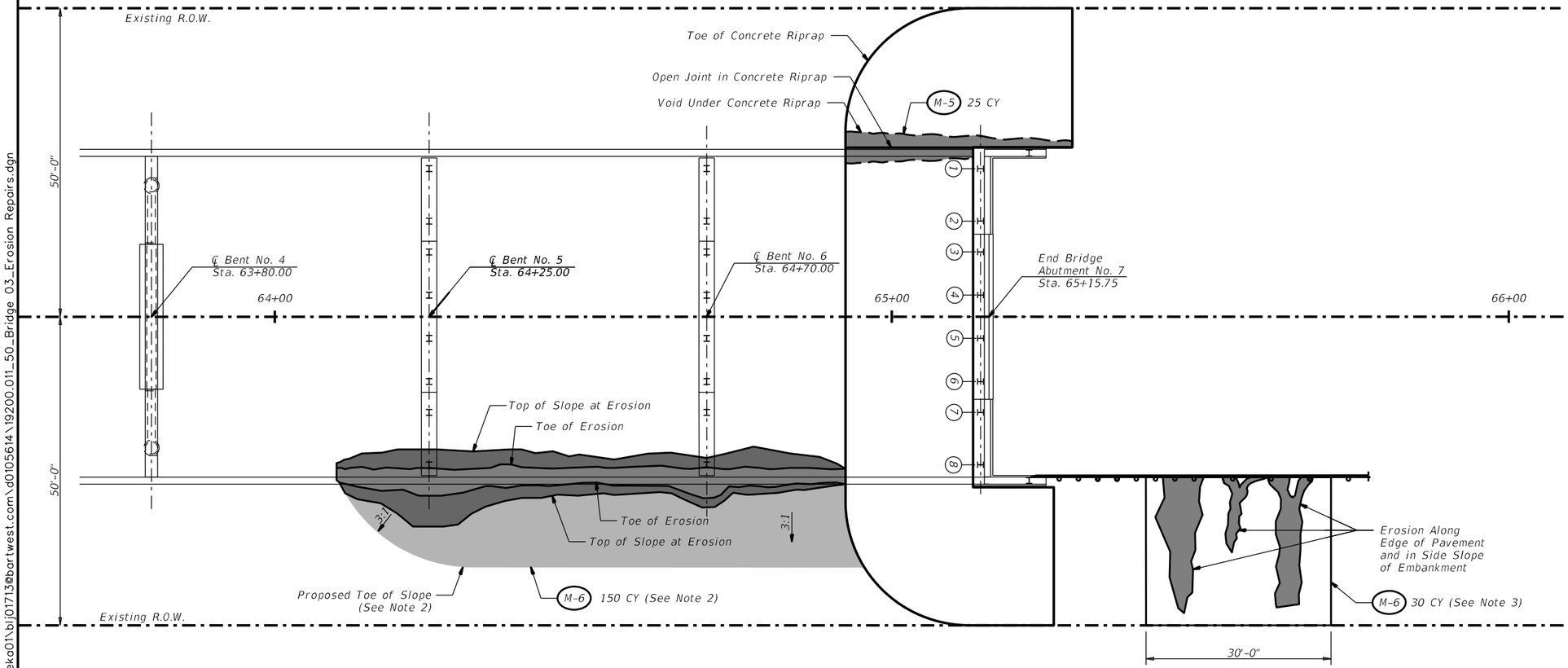
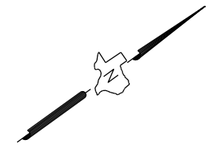
REVISIONS	0908	00	112	VARIOUS
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC		47

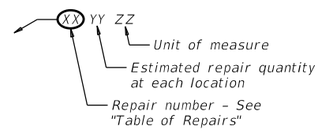




GENERAL NOTES

1. Repair M-5: Place Flowable Fill to fill void under Concrete Riprap as directed by the Engineer.
2. Repair M-6: Fill the area of erosion along the outside steel piling at Bents 5 and 6. Provide smooth grade approximating the longitudinal and transverse slopes of existing ground under the bridge. Place fill east of the erosion. Grade at 3:1 slope or as directed by the Engineer.
3. Repair M-6: Place embankment in level lifts starting at the bottom of side slope and working toward the top of the embankment. Use mechanical tamping equipment to place fill within 5 feet (horizontal) of the edge of pavement. Grade the side slope to a smooth slope as directed by the Engineer.

REPAIR CALL-OUT LEGEND



SYMBOL	APPLICABLE REPAIR AREAS
D-#	Deck, joints, overhangs, approach slabs
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EROSION REPAIR

NBI No. 08-208-0-0693-03-007

SH 350
COLORADO RIVER

SHEET 2 OF 2

STATE OF TEXAS
JAMES EDWARD BROWNE
62207
LICENSED PROFESSIONAL ENGINEER
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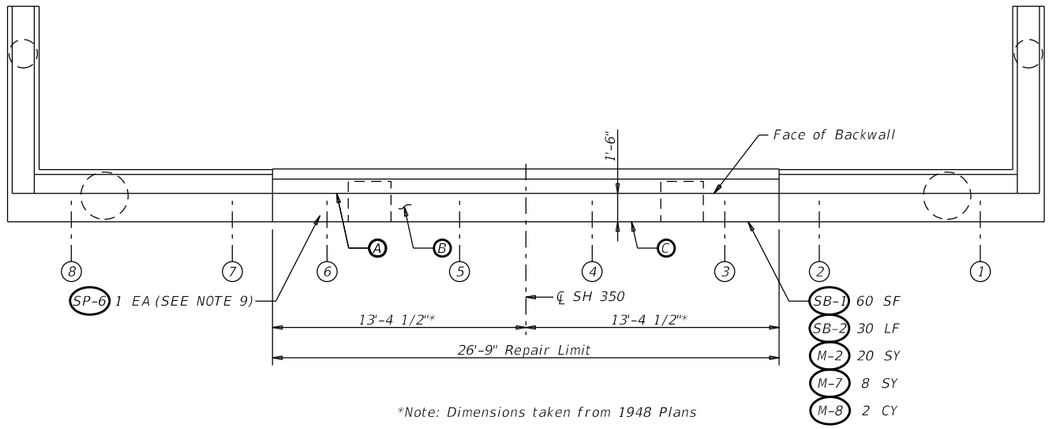
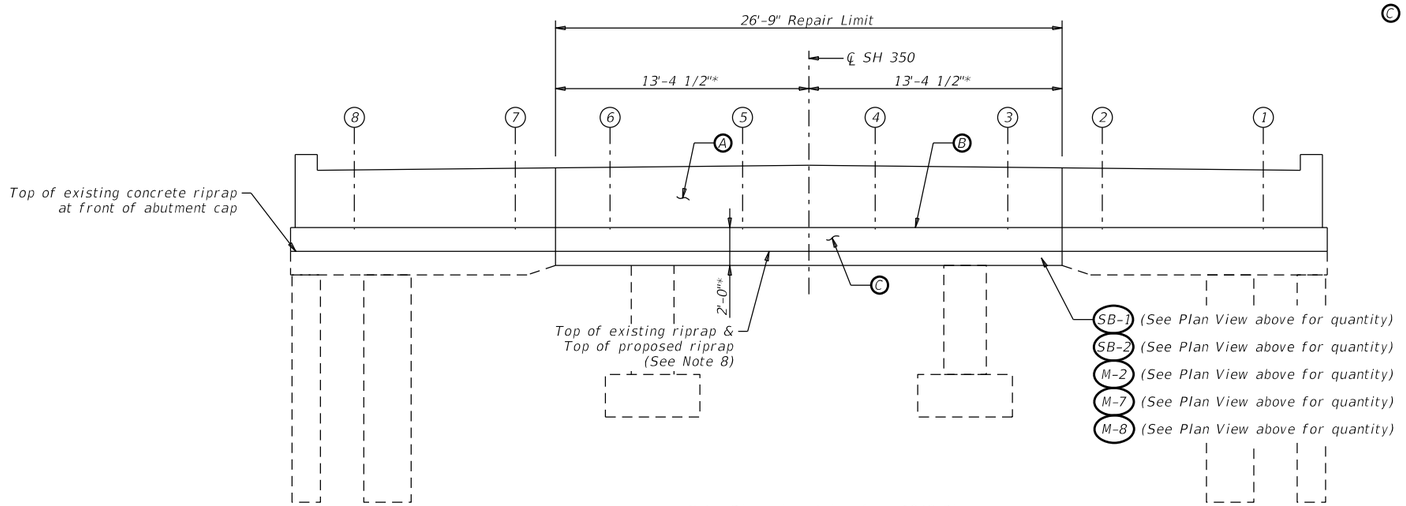
	ABL	TAYLOR, ETC		48



*Note: Dimensions taken from 1948 Plans

PLAN VIEW

(Showing Backwall, Wingwalls and Top of Cap, Looking Down)
Scale: 1/8" = 1'-0"

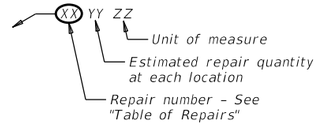


*Note: Dimensions taken from 1948 Plans

ELEVATION VIEW

(Looking Back Station)
Scale: 1/8" = 1'-0"

REPAIR CALL-OUT LEGEND



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

REPAIR SB-1 NOTES:

(A) Face of abutment backwall (vertical repair).

(B) Top of cap (primarily horizontal repair, but may include vertical sides of bearing seats).

(C) Side face of cap (vertical repair).

GENERAL NOTES

1. Repair spalls and delaminations on abutment cap at areas indicated in "Repair SB-1 Notes" and as directed by the Engineer.
2. Spalls and delaminations may extend under bearings. Remove spalls and delaminations to sound concrete. If unsound concrete extends more than 1½" behind the front edge of the bearing plate, stop removal and contact the Engineer for evaluation.
3. Perform all concrete repair work in accordance with Item 429, "Concrete Structure Repair", the TxDOT Concrete Repair Manual, Chapter 3, Sections 1 and 2, and "Concrete Structure Repair Details" sheets.
4. Provide the following materials for concrete repair:

   Minor spall and delaminations: use Type VIII neat epoxy per DMS 6100 for repairs less than 1 in. thick.

   Intermediate spalls and delaminations: use Type C trowel-applied materials meeting the requirements of DMS 4655.
5. Perform rout and seal crack repair in accordance with Item 780, "Concrete Crack Repair" and TxDOT Concrete Repair Manual, Chapter 3, Section 7. Use Method 1 at locations directed by the Engineer.
6. Repair quantities are estimated and may be adjusted as directed by the Engineer.
7. Payment will be made for the work and materials for actual area of repairs completed in accordance with Item 429, "Concrete Structure Repair".
8. Remove existing concrete riprap to provide access for repairing spalls and delaminations in the front face of the existing abutment cap. Construct new riprap Type RR8 (5" thick) after completion of abutment repairs. Refer to standard sheet CRR for information.
9. Clean and Paint Notes (Ref Str #2): Clean and paint all accessible surfaces of steel bearings for Beams 3 through 6 at Abutment 1 (4 total) as described in Special Specification 4207, "Steel Bridge Zone Painting". Clean bearings to SPCC SP10/SP11 and apply Alternate Special Protection System shown below.

   Alternate Special Protection System includes:
   - Epoxy Zinc Primer (DMS-8101), apply 3.5 to 10 mil DFT.
   - Top Coat (DMS-8105), apply minimum 4.0 mil DFT.

   Provide a High Ratio Calcium Sulfonate (HRCSA) top coat for bearings.

   Provide penetrating sealer and top coat from the same manufacturer.

   Tint the proposed paint system to match the existing bridge paint color. Select the proposed paint color from the Federal Standard Colors list. Submit proposed paint color samples to the Engineer for approval before paint purchase.

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ABUTMENT No. 1 REPAIRS

NBI No. 08-208-0-0693-03-007

SH 350
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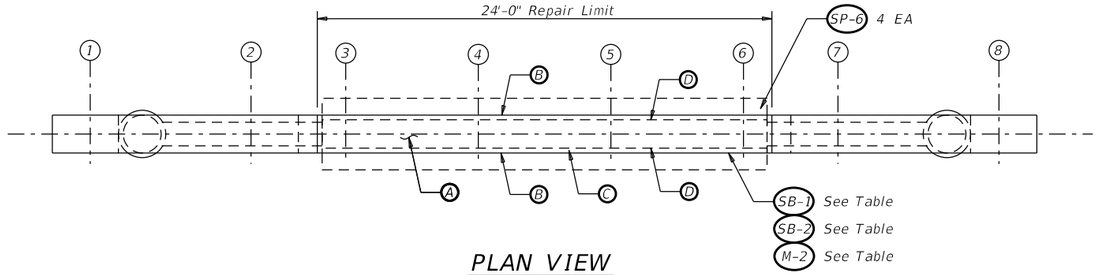
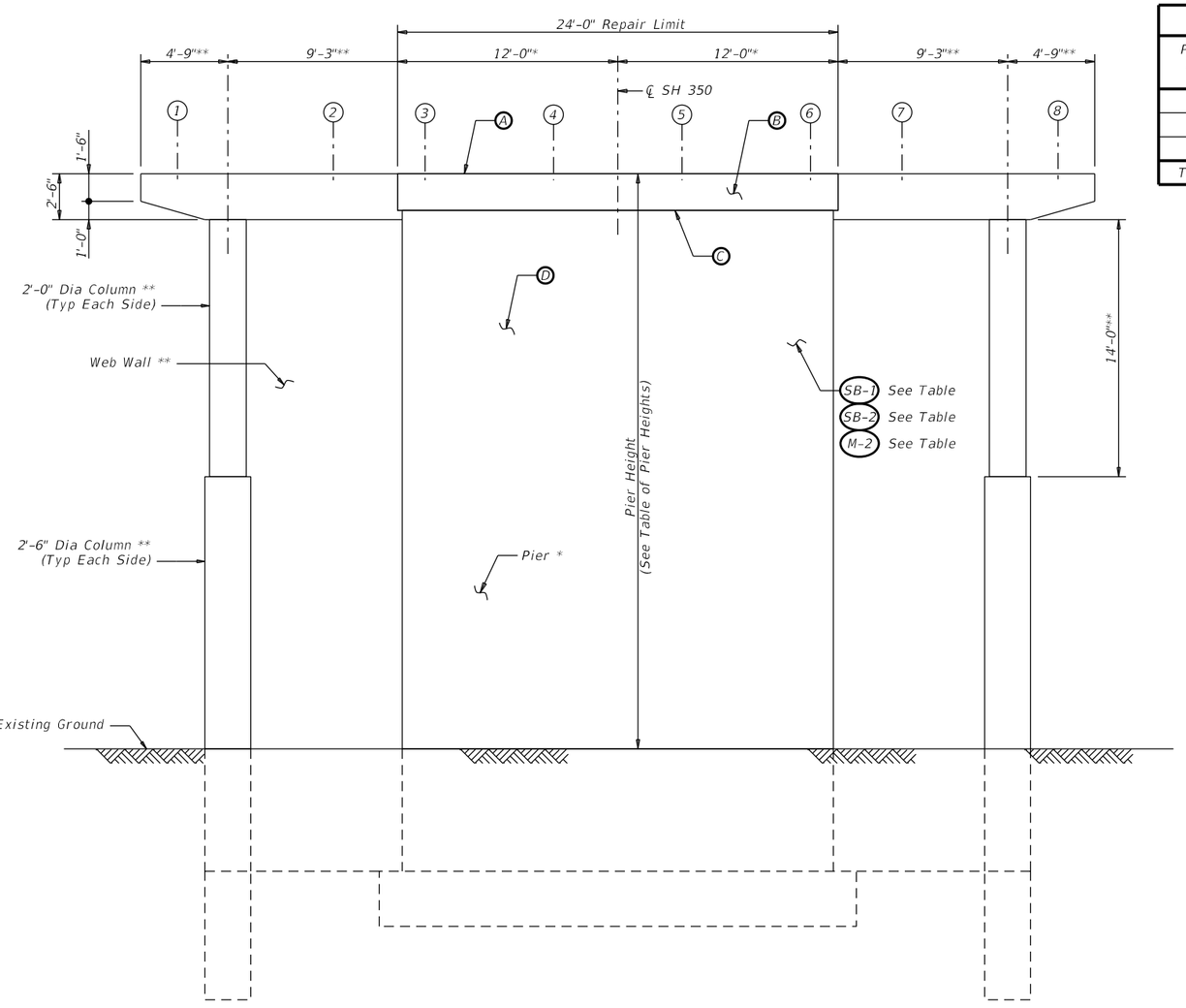
	ABL	TAYLOR, ETC		49



PLAN VIEW

Scale: 1/8" = 1'-0"
(Showing Top of Cap, Looking Down)



ELEVATION VIEW

(South Face Shown, North Face Similar)
Scale: 1/8" = 1'-0"

ESTIMATED REPAIR QUANTITIES

PIER No.	REPAIR SB-1 CONC STR REPAIR (SF)	REPAIR SB-2 EPOXY CRACK REPAIR (LF)	REPAIR M-2 PEN CONC SURF TRTMT (SY)
2	200	25	179
3	380	50	190
4	390	50	153
Total	970	150	522

GENERAL NOTES

1. Repair spalls and delaminations on pier cap and wall at areas indicated in "Repair SB-1 Notes" and as directed by the Engineer.
2. Spalls and delaminations may extend under bearings. Remove spalls and delaminations to sound concrete. If unsound concrete extends more than 1½" behind the front edge of the bearing plate, stop removal and contact the Engineer for evaluation.
3. Perform all concrete repair work in accordance with Item 429, "Concrete Structure Repair", the TxDOT Concrete Repair Manual, Chapter 3, Sections 1 and 2, and "Concrete Structure Repair Details" sheets.
4. Provide the following materials for concrete repair:

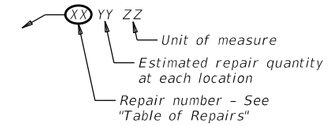
   Minor spall and delaminations: use Type VIII neat epoxy per DMS 6100 for repairs less than 1 in. thick.

   Intermediate spalls and delaminations: use Type C trowel-applied materials meeting the requirements of DMS 4655.
5. Perform rout and seal crack repair in accordance with Item 780, "Concrete Crack Repair" and TxDOT Concrete Repair Manual, Chapter 3, Section 7. Use Method 1 at locations directed by the Engineer.
6. Repair quantities are estimated and may be adjusted as directed by the Engineer.
7. Payment will be made for the work and materials for actual area of repairs completed in accordance with Item 429, "Concrete Structure Repair".

REPAIR SB-1 NOTES:

- (A) Top of cap (primarily horizontal repair, but may include vertical sides of bearing seats).
- (B) Side face of cap (vertical repair).
- (C) Underside of cap (overhead repair) between face of cap and face of pier.
- (D) Side face of pier (vertical repair).

REPAIR CALL-OUT LEGEND



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

PIER HEIGHTS

PIER	HEIGHT **
2	31'-4"
3	33'-5"
4	26'-4"

* Note: Dimensions taken from 1948 Plans
** Note: Dimensions taken from 1974 Plans

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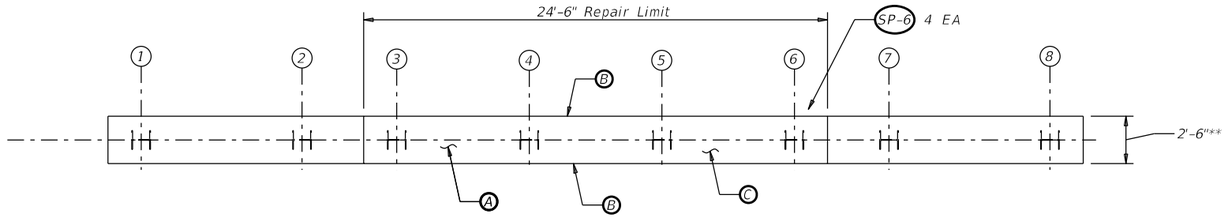
PIER REPAIRS
PIERS 2, 3 & 4

NBI No. 08-208-0-0693-03-007

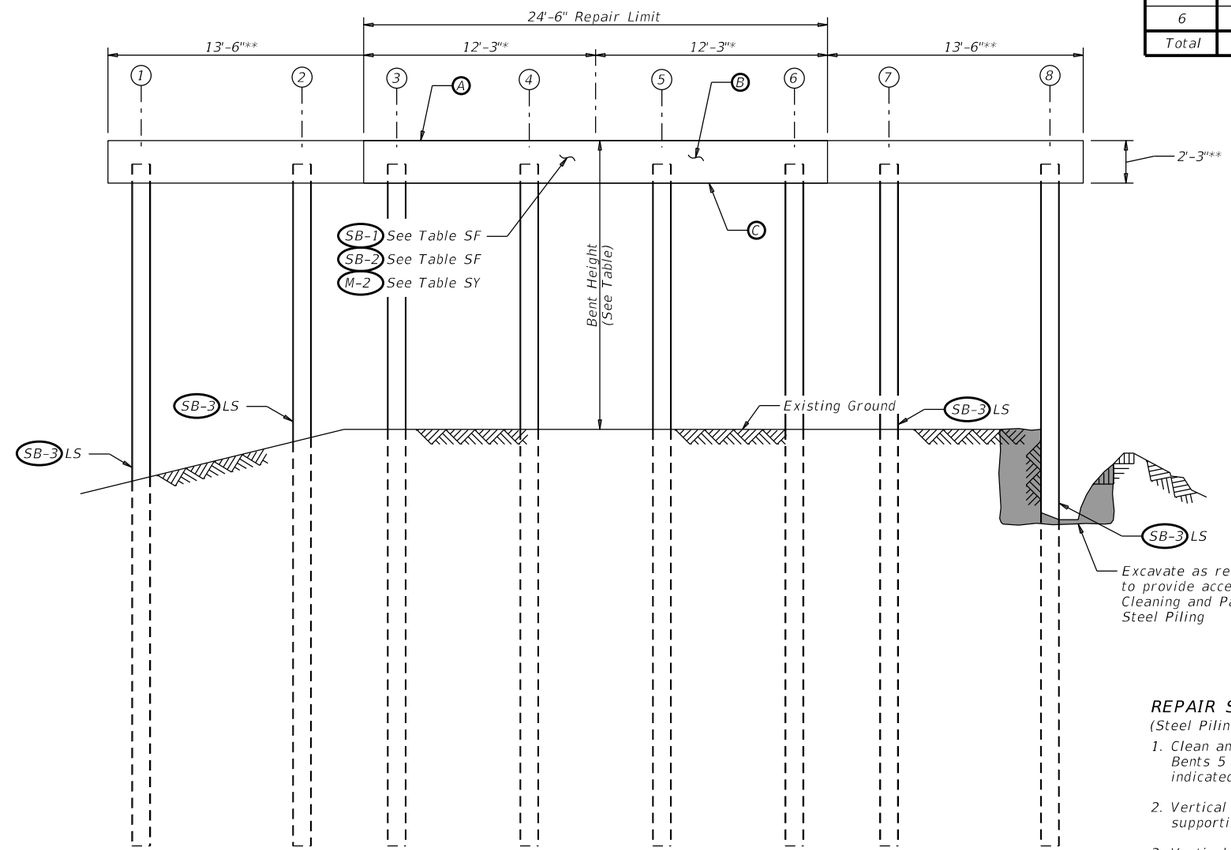
SH 350
COLORADO RIVER

DN: CJC	CK: JEB	DW: TAA	CK: JEB
©TxDOT: September 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	00	112	VARIOUS
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC		50



PLAN VIEW

Scale: 1/8" = 1'-0"
(Showing Top of Cap, Looking Down)



ELEVATION VIEW A-A

Scale: 1/8" = 1'-0"
(Looking Ahead Station)

ESTIMATED REPAIR QUANTITIES

PIER No.	REPAIR SB-1 CONC STR REPAIR (SF)	REPAIR SB-2 EPOXY CRACK REPAIR (LF)	REPAIR M-2 PEN CONC SURF TRTMT (SY)
5	60	25	26
6	60	25	26
Total	120	50	52

GENERAL NOTES

1. Repair spalls and delaminations on bent caps at areas indicated in "Repair SB-1 Notes" and as directed by the Engineer.
2. Spalls and delaminations may extend under bearings. Remove spalls and delaminations to sound concrete. If unsound concrete extends more than 1½" behind the front edge of the bearing plate, stop removal and contact the Engineer for evaluation.
3. Perform all concrete repair work in accordance with Item 429, "Concrete Structure Repair", the TxDOT Concrete Repair Manual, Chapter 3, Sections 1 and 2, and "Concrete Structure Repair Details" sheets.
4. Provide the following materials for concrete repair:

   Minor spall and delaminations: use Type VIII neat epoxy per DMS 6100 for repairs less than 1 in. thick.

   Intermediate spalls and delaminations: use Type C trowel-applied materials meeting the requirements of DMS 4655.
5. Perform rout and seal crack repair in accordance with Item 780, "Concrete Crack Repair" and TxDOT Concrete Repair Manual, Chapter 3, Section 7. Use Method 1 at locations directed by the Engineer.
6. Repair quantities are estimated and may be adjusted as directed by the Engineer.
7. Payment will be made for the work and materials for actual area of repairs completed in accordance with Item 429, "Concrete Structure Repair".

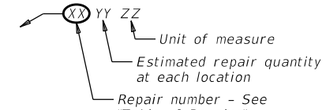
REPAIR SB-1 NOTES:

(A) Top of cap (primarily horizontal repair, but may include vertical sides of bearing seats).

(B) Side face of cap (vertical repair).

(C) Underside of cap (overhead repair).

REPAIR CALL-OUT LEGEND



BENT HEIGHTS

BENT	HEIGHT **
5	18'-9"
6	11'-8"

* Note: Dimensions taken from 1948 Plans
** Note: Dimensions taken from 1974 Plans

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

REPAIR SB-3 NOTES:

(Steel Piling Clean & Paint)

1. Clean and paint the steel piling at Bents 5 & 6 at the locations indicated.
2. Vertical limit is 3 feet at piling supporting Beams 1, 2 & 7.
3. Vertical limit at Bent 5 is 6 feet at the piling supporting Beam 8.
4. Vertical limit at Bent 6 is 5 feet at the piling supporting Beam 8.
5. See "Erosion Repair" sheet 2 of 2 for repair of erosion at outside steel piling (east side of bridge).

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BENT REPAIRS
BENTS 5 & 6

NBI No. 08-208-0-0693-03-007

SH 350
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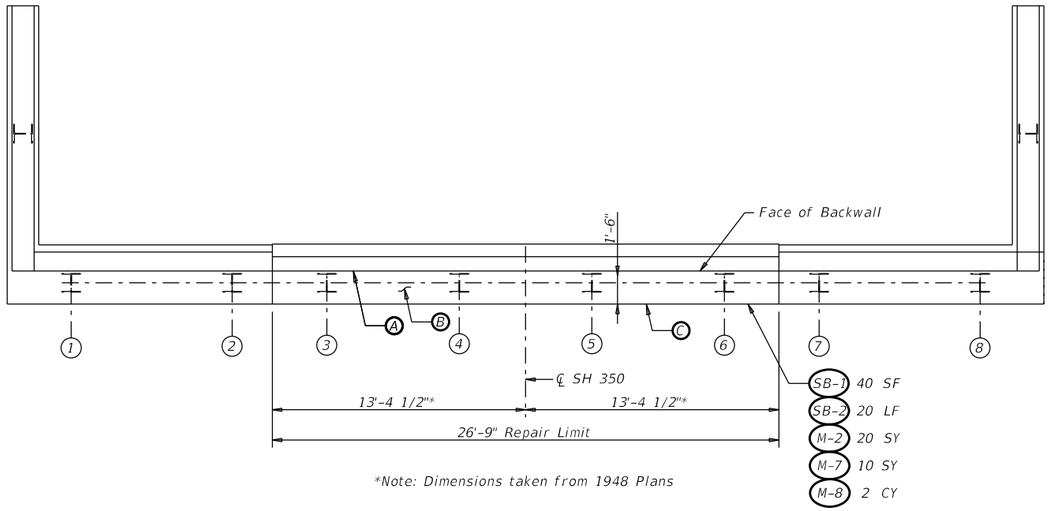
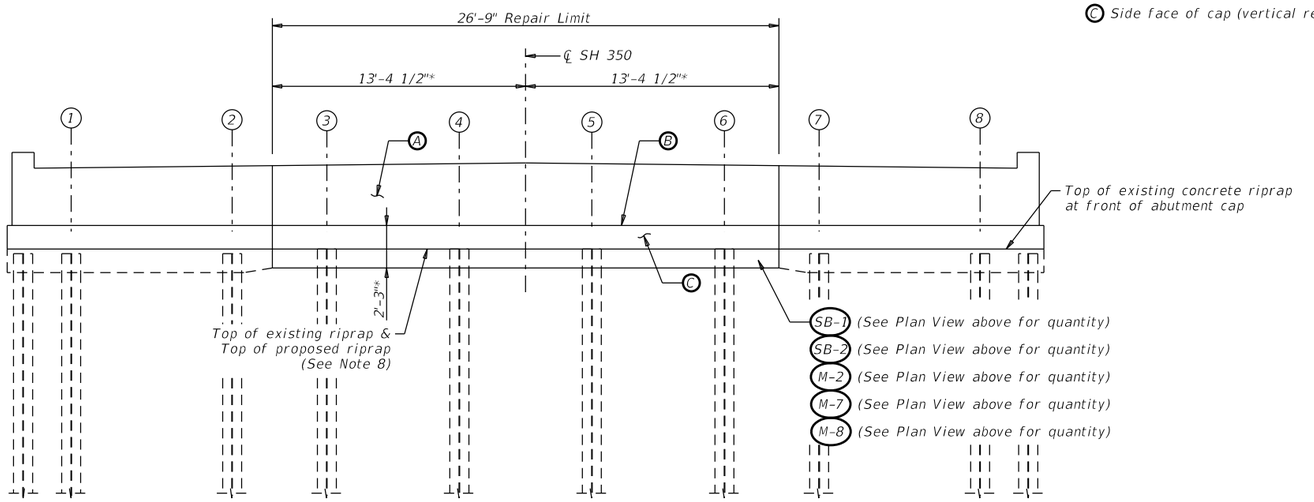


*Note: Dimensions taken from 1948 Plans

PLAN VIEW

Scale: 1/8" = 1'-0"
(Showing Top of Cap, Looking Down)



*Note: Dimensions taken from 1948 Plans

ELEVATION VIEW

Scale: 1/8" = 1'-0"
(Looking Ahead Station)

REPAIR SB-1 NOTES:

Ⓐ Face of abutment backwall (vertical repair).

Ⓑ Top of cap (primarily horizontal repair, but may include vertical sides of bearing seats).

Ⓒ Side face of cap (vertical repair).

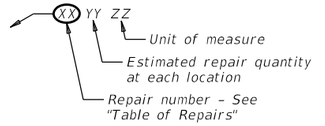
GENERAL NOTES

1. Repair spalls and delaminations on abutment cap at areas indicated in "Repair SB-1 Notes" and as directed by the Engineer.
2. Spalls and delaminations may extend under bearings. Remove spalls and delaminations to sound concrete. If unsound concrete extends more than 1½" behind the front edge of the bearing plate, stop removal and contact the Engineer for evaluation.
3. Perform all concrete repair work in accordance with Item 429, "Concrete Structure Repair", the TxDOT Concrete Repair Manual, Chapter 3, Sections 1 and 2, and "Concrete Structure Repair Details" sheets.
4. Provide the following materials for concrete repair:

   Minor spall and delaminations: use Type VIII neat epoxy per DMS 6100 for repairs less than 1 in. thick.

   Intermediate spalls and delaminations: use Type C trowel-applied materials meeting the requirements of DMS 4655.
5. Perform rout and seal crack repair in accordance with Item 780, "Concrete Crack Repair" and TxDOT Concrete Repair Manual, Chapter 3, Section 7. Use Method 1 at locations directed by the Engineer.
6. Repair quantities are estimated and may be adjusted as directed by the Engineer.
7. Payment will be made for the work and materials for actual area of repairs completed in accordance with Item 429, "Concrete Structure Repair".
8. Remove existing concrete riprap to provide access for repairing spalls and delaminations in the front face of the existing abument cap. Construct new riprap Type RR8 (5" thick) after completion of abutment repairs. Refer to standard sheet CRR for information.

REPAIR CALL-OUT LEGEND



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

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ABUTMENT No. 7 REPAIRS

NBI No. 08-208-0-0693-03-007

SH 350
COLORADO RIVER

STATE OF TEXAS
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9-09-2022

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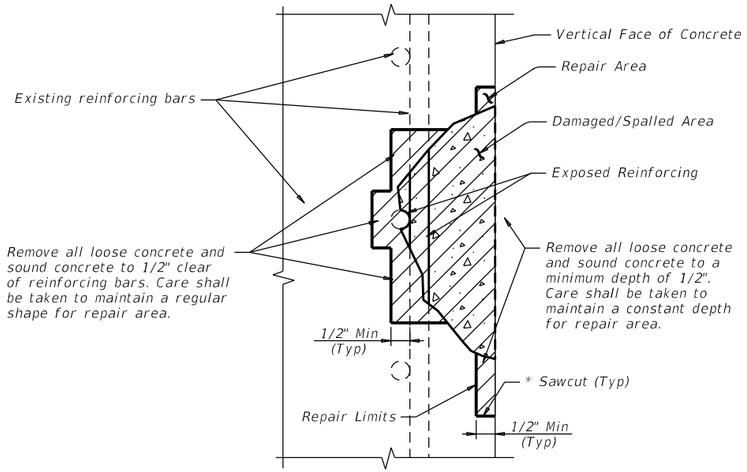
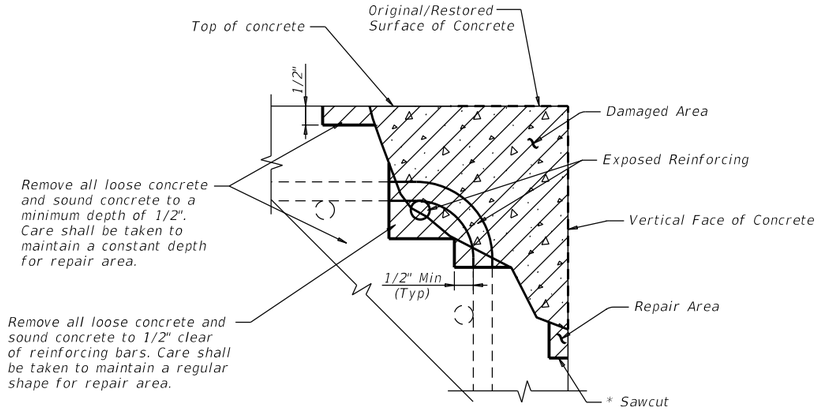
REVISIONS	0908	00	112	VARIOUS
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC		52



REPAIR ON ONE FACE
(Showing repair at vertical face)
(Repair at other surfaces similar)

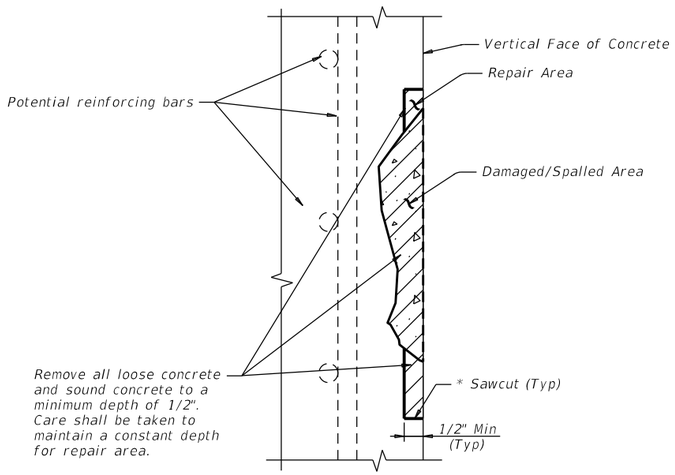


REPAIR ON MULTIPLE FACES
(Showing repair at corner between top surface and vertical face)
(Repair at other corners similar)

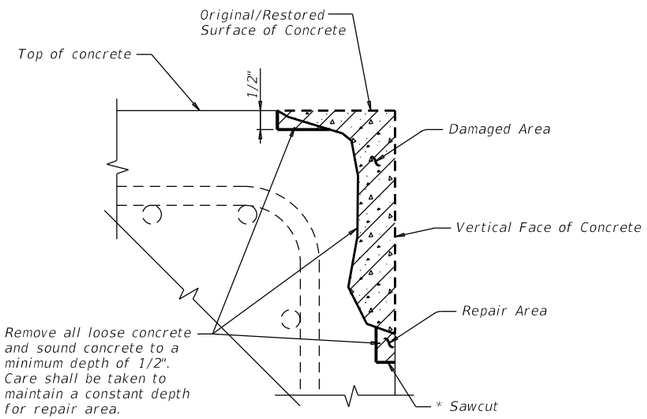
* Sawcut perimeter of each repair area in accordance with Item 429, "Concrete Structure Repair"

INTERMEDIATE SPALL REPAIR

1. Damage exposes more than 50% of the thickness of the outer layer of reinforcing bar or the damage is greater than 2" deep.
2. Maximimum depth of spall is 6".
3. If damage extends well beyond the outer layer of reinforcement after removal of unsound concrete the spall is classified as a major spall and requires immediate notification of the Engineer.



REPAIR ON ONE FACE
(Showing repair at vertical face)
(Repair at other surfaces similar)



REPAIR ON MULTIPLE FACES
(Showing repair at corner between intersecting horizontal and vertical faces)
(Repair at other corners similar)

* Sawcut perimeter of each repair area in accordance with Item 429, "Concrete Structure Repair"

MINOR SPALL REPAIR

1. Damage is less than 1" deep after removal of unsound concrete.
2. Damage covers an area less than 12 square inches after removal of unsound concrete.
3. Spalls up to 2" max depth can be categorized as minor provided the spall does not progress deeper than 1/2 of the thickness of the outer layer of reinforcing after removal of unsound concrete.

GENERAL NOTES:

1. Perform concrete structure repair in accordance with TxDOT Concrete Repair Manual.
2. Substructure Repairs: Perform concrete substructure repairs in accordance with TxDOT Concrete Repair Manual Chapter 3. Repair minor spalls in accordance with Section 1. Repair intermediate spalls in accordance with Section 2.
3. Spall Categories: definition and categorization of spalls included below supersede Chapter 2 Section 1 in the TxDOT Concrete Repair Manual.

   Minor Spalls: damage or deterioration is less than 1 inch deep and less than 50% of a reinforcing bar circumference is exposed.

   Intermediate Spalls: damage or deterioration exposes 50% or more of a reinforcing bar circumference and maximum depth of spall is not greater than 6 inches.
4. Determining repair boundary/limit for substructure repair:

   Minor spalls: lay out the repair boundary as a square, rectangle or polygon (angle between intersecting sides must be greater than 60 degrees).

   Intermediate spalls: lay out the repair boundary as a square or rectangle. Edges of repair shall be parallel or perpendicular to the edge of the member or exposed reinforcing. Adjacent sides of the repair boundary must intersect at 90 degrees.
5. Determining repair boundary for SH 208 Bridge Deck Repair:

   Inspect top of milled deck after cleaning to determine if deck repairs are needed. Deck repair boundaries shall be as follows:

   Minor spalls: lay out the repair boundary as a square, rectangle or polygon (angle between intersecting sides must be greater than 60 degrees). Repair minor spalls using Item 4106, "Polyester Polymer Concrete Bridge Deck Overlay" material. Spall repairs must be placed and cured prior to placement of polyester polymer concrete overlay.

   Intermediate spalls: lay out the repair boundary as a square or rectangle. Edges of repair shall be parallel or perpendicular to exposed deck reinforcing. Refer to details on sheets 1 & 2 for saw cutting the repair perimeter to provide proper repair shoulder, and for chipping behind deck reinforcing. Repair intermediate spalls using Item 429, "Concrete Structure Repair (Rapid Deck Repair) (Partial Depth)" material. Allow rapid deck repairs sufficient curing time so the repaired deck surface meets the dryness requirements in Article 4.3.3 of Item 4106, "Polyester Polymer Concrete Bridge Deck Overlay".

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CONCRETE STRUCTURE REPAIR DETAILS

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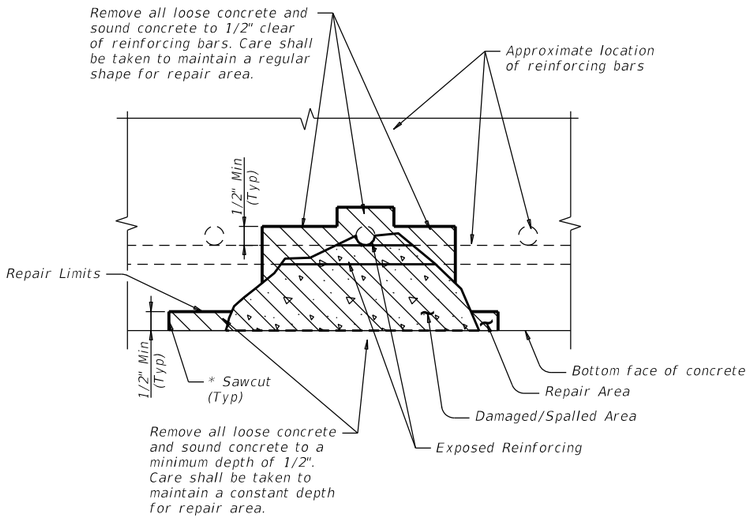
	ABL	TAYLOR, ETC		53

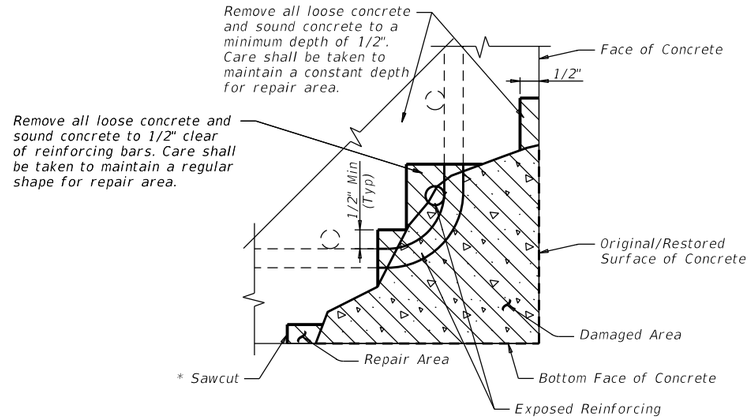
GENERAL NOTES:

Refer to sheet 1 of 2.



REPAIR ON ONE FACE

(Showing overhead repair)
(Repair on vertical surface similar)



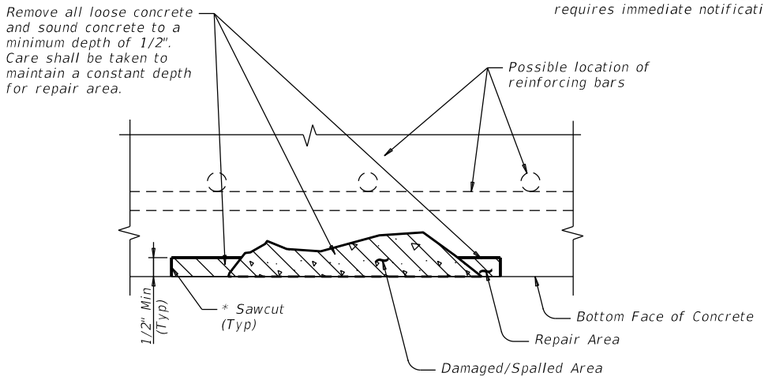
REPAIR ON MULTIPLE FACES

(Showing repair at corner between overhead surface and vertical surface)
(Repair at corner between vertical surfaces similar)

* Sawcut perimeter of each repair area in accordance with Item 429, "Concrete Structure Repair"

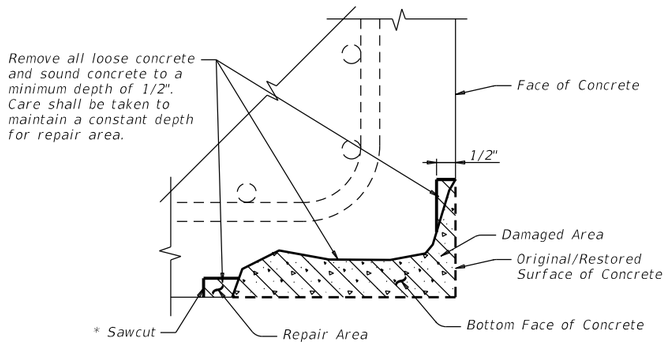
INTERMEDIATE SPALL REPAIR

1. Damage exposes more than 50% of the thickness of the outer layer of reinforcing bar or the damage is greater than 2" deep.
2. Maximimum depth of spall is 6".
3. If damage extends well beyond the outer layer of reinforcement after removal of unsound concrete the spall is classified as a major spall and requires immediate notification of the Engineer.



REPAIR ON ONE FACE

(Showing overhead repair)
(Repair on vertical surface similar)



REPAIR ON MULTIPLE FACES

(Showing repair at corner between overhead surface and vertical surfa
(Repair at corner between vertical surfaces similar)

* Sawcut perimeter of each repair area in accordance with Item 429, "Concrete Structure Repair"

MINOR SPALL REPAIR

1. Damage is less than 1" deep after removal of unsound concrete.
2. Damage covers an area less than 12 square inches after removal of unsound concrete.
3. Spalls up to 2" max depth can be categorized as minor provided the spall does not progress deeper than 1/2 of the thickness of the outer layer of reinforcing after removal of unsound concrete.

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CONCRETE STRUCTURE REPAIR DETAILS

SHEET 2 OF 2

	DN: CJC	CK: JEB	DW: TAA	CK: JEB
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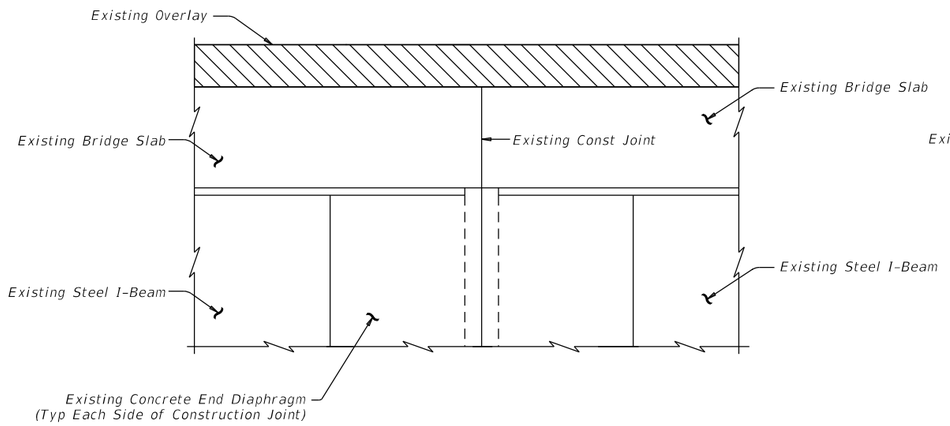
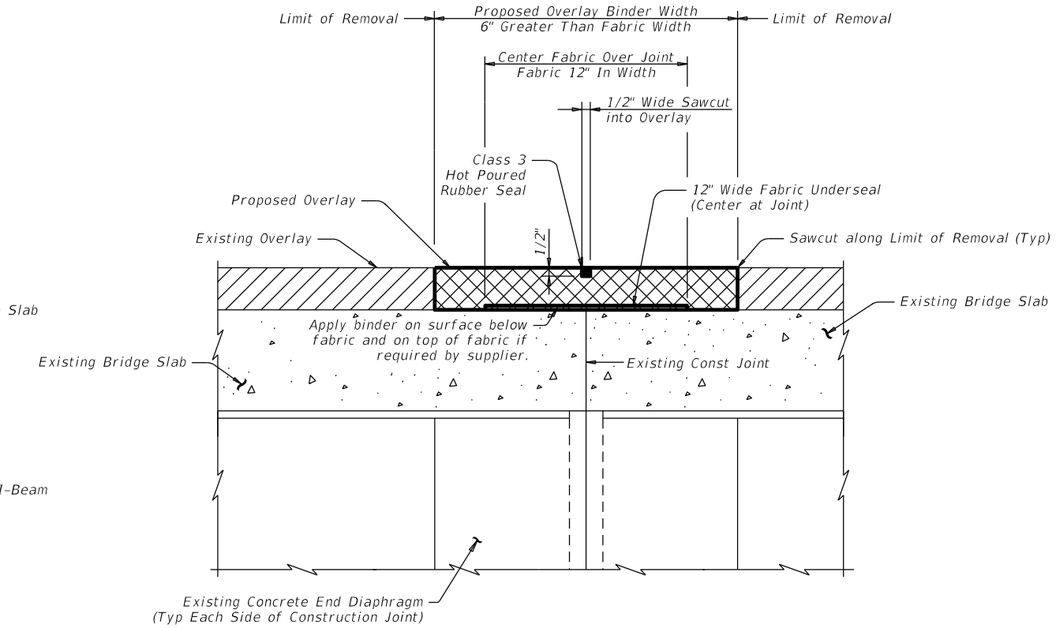
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC		54



EXISTING
Scale: 3/4" = 1'-0"



PROPOSED
Scale: 3/4" = 1'-0"

CLEANING AND SEALING EXISTING CONSTRUCTION JOINT

Notes:

1) Remove 9" of existing overlay from each side of the construction joint.

2) Clean top of existing slab where fabric joint underseal will be placed per Manufacturer's recommendations.

3) Place tack coat or binder as required by the fabric joint underseal Manufacturer's recommendations.

4) When using the self-adhesive type fabric underseal, pressure roll fabric joint underseal to improve adhesion.

5) Apply a two course surface treatment over existing deck prior to applying the 2-inch overlay over new fabric joint underseal.

6) Cleaning joint of all debris and sealing joint is paid for by Item 438, "Cleaning and Sealing Joints" and measured by the linear foot.

7) Providing and applying tack coat and providing and placing fabric joint underseal is paid for by Item 356, "Fabric Underseal" and paid by the linear foot. Obtain approval for all tools, equipment, materials, and techniques proposed for use to prepare the joint.

8) Provide the fabric underseal in accordance with DMS-6260 "Reinforced Fabric Underseal" and DMS-6220, "Fabric for Underseals".

9) Saw cut through the asphalt at the centerline of the joint. Make multiple saw cuts to create a 1/2" minimum joint opening. Clean joint opening of all deletrious material in accordance with Item 438, "Cleaning and Sealing Joints".

10) Obtain approval of cleaned joint prior to proceeding with sealing operation.

11) Seal the joint opening with a Class 3, "Hot Poured Rubber". Seal flush to the top of the overlay. Provide Class 3 joint sealant in accordance with DMS-6310, "Joint Sealers and Fillers".

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CLEANING AND SEALING EXISTING BRIDGE JOINTS

REVISIONS

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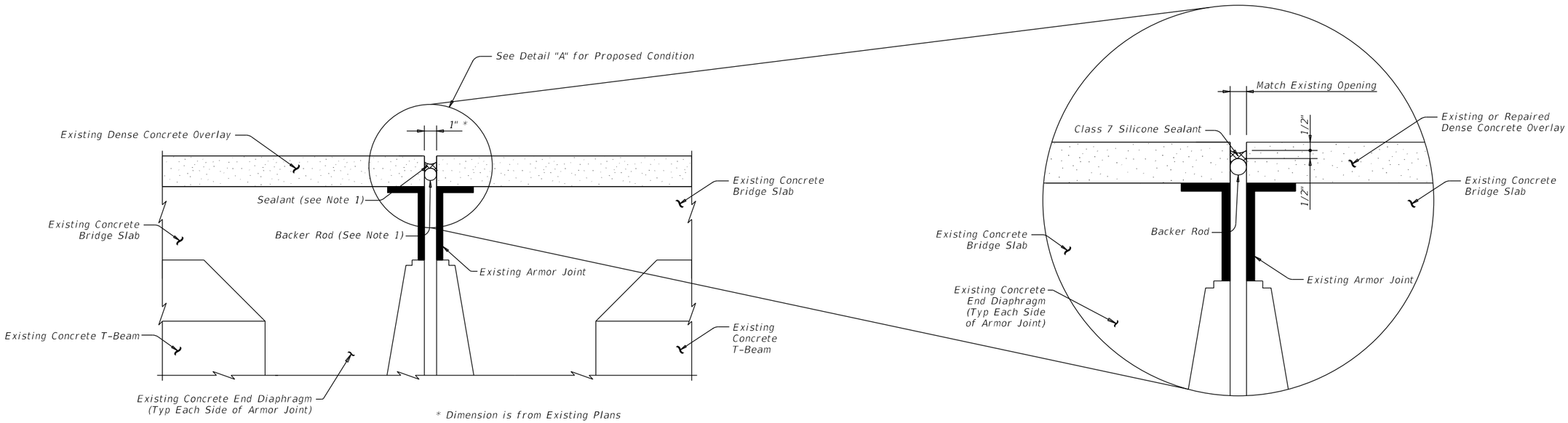
CONT	SECT	JOB	HIGHWAY
0908	00	112	VARIOUS
DIST	COUNTY		SHEET NO.
ABL	TAYLOR, ETC		55



EXISTING CONDITION

Scale: 3/4" = 1'-0"

DETAIL "A"

(Proposed Condition)
Scale: 1" = 1'-0"

CLEANING AND SEALING EXISTING ARMOR JOINT

(Armor Joint Repair at Dense Concrete Overlay)

Notes:

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."

2) Clean side faces of dense concrete overlay where silicone sealant is to be placed.

3) Obtain approval of cleaned joint prior to proceeding with joint sealing operation.

4) Set top of backer rod 1" below top of proposed header. Backer rod must be compatible with joint sealant. Use of multiple pieces to create a backer rod cross section is not permitted. Top of backer rod must be convex as shown.

5) Seal the joint opening with a Class 7 Silicone. Recess seal 1/2" below top of dense concrete overlay.

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CLEANING AND SEALING EXISTING ARMOR JOINTS

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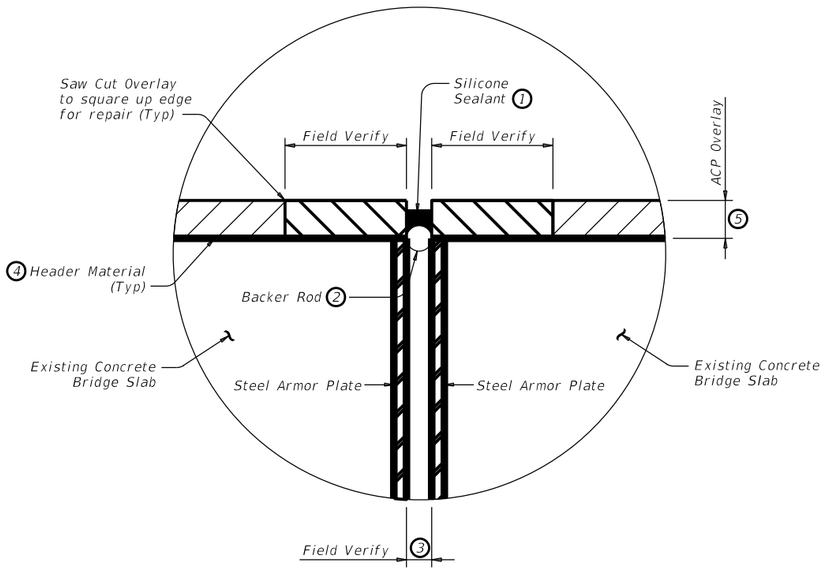
	ABL	TAYLOR, ETC		56			

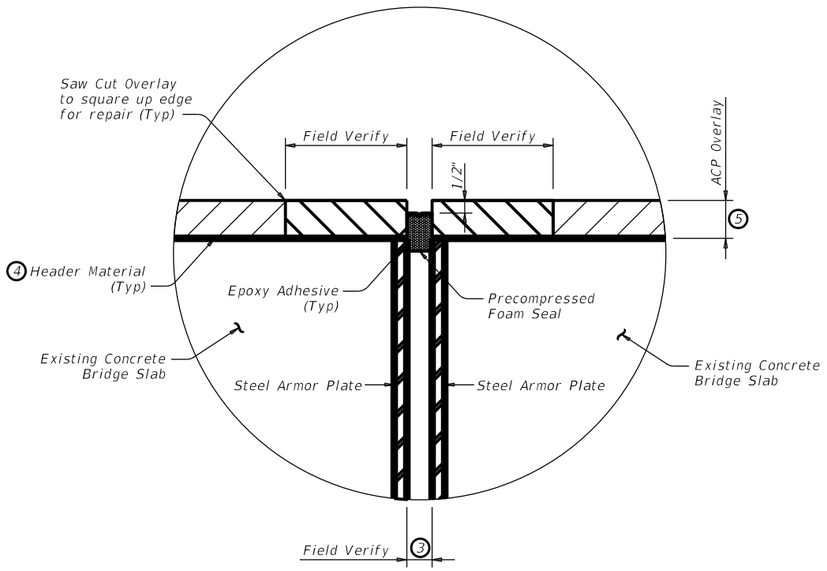


DETAIL "D"

(Proposed Condition)

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

1) Clean joint openeing of all old expansion material/devices, dirt, and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints".
2) Remove asphalt overlay and clean the voided region of all materials that could inhibit the bond between header material and concrete or steel.
3) Form the joint opening to the required width and place header material to fill voided region.
4) Place backer rod into joint opening 1" below the top of header material. The backer rod must be 25% larger than the joint opening.
5) Seal the joint opening with a Class 7 Silicone. Recess seal 1/2" below top of header in travel lanes and 1/8" below top of header in shoulders.

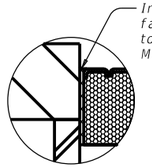


ALTERNATE DETAIL "D"

(Proposed Condition)

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

1) Clean joint openeing of all old expansion material/devices, dirt, and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints". When sealing joints for slab spans, pan girder spans, or box beam spans, fill void below proposed seal with extruded polystyrene foam.
2) Correctly size joint seal based on field measurement and in accordance with Manufacturer's specifications. Multiple seal widths may be required. Ensure proper seal is selected for each joint.
3) Abrasive blast clean existing joint surfaces where seal is to be applied.
4) Wipe down joint surfaces to remove contaminates.
5) Mask areas adjacent to joint opening sufficiently to keep epoxy off deck surface.
6) Apply epoxy to joint opening side surfaces.
7) While epoxy is still tacky, remove shrink wrap from seal and install in joint opening.
8) Recess top of joint seal 1/2" in travel lanes and 1/4" in shoulders.
9) Inject silicone adhesive along top interface of seal with joint side surface according to Manufacturer's recommendations. Tool to spread adhesive as necessary. See Detail "E".



DETAIL "E"

1) Use Class 7 silicone sealant in accordance with DMS-6310, "Joint Sealants and Fillers." Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Joints."
2) Backer rod must be 25% larger than joint opening and must be 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) Match existing joint opening or set at a minimum:
   a. 1" at 70°F when the distance between joints is 150 ft or less.
   b. 2" at 70°F when the distance between joints is greater than 150 ft.
   c. As directed by the Engineer.
4) Provide header material in accordance with DMS-6140, "Polymer Concrete for Bridge Joint Systems." Match the thickness of the header material with the thickness of the overlay as shown in the plans, but not to exceed 4". Place header material flush with roadway surface. Do not cantilever header material over the joint opening.
5) Estimated thickness is 2".

STATE OF TEXAS
JAMES EDWARD BROWNE
62207
LICENSED PROFESSIONAL ENGINEER
James E. Browne
9-09-2022

Bartlett&West
TEXAS FIRM REGISTRATION No. F-6499
4500 MERCANTILE PLAZA, SUITE 301
FORT WORTH, TX 76137
(817) 306-1980
WWW.BARTLETTWEST.COM

Civil Associates, Inc. — A Bartlett&West Company
9330 LBJ Frwy, Ste. 1150
Dallas, Texas 75243
TBPE Firm Registration No. 6981

Texas Department of Transportation

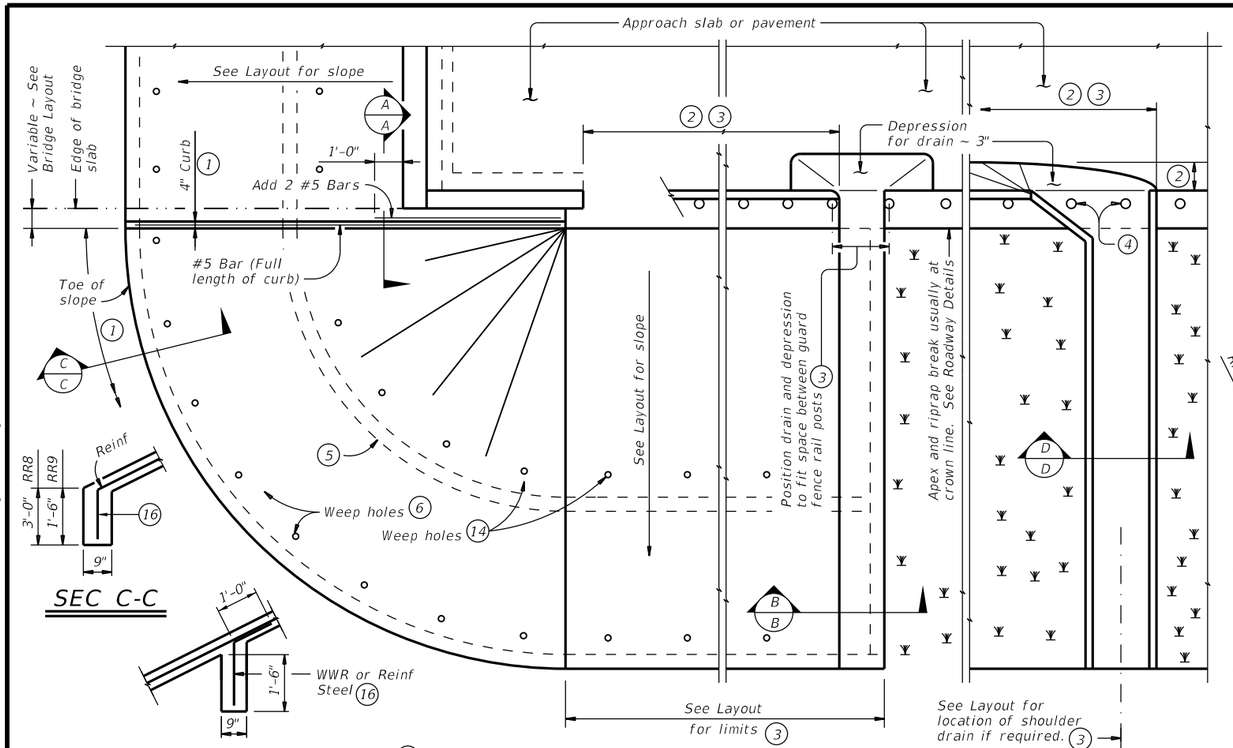
CLEANING AND SEALING EXISTING ARMOR JOINTS

DN: CJC	CK: JEB	DW: TAA	CK: JEB

REVISIONS

CONT	SECT	JOB	HIGHWAY
0908	00	112	VARIOUS
DIST	COUNTY		SHEET NO.
ABL	TAYLOR, ETC		57

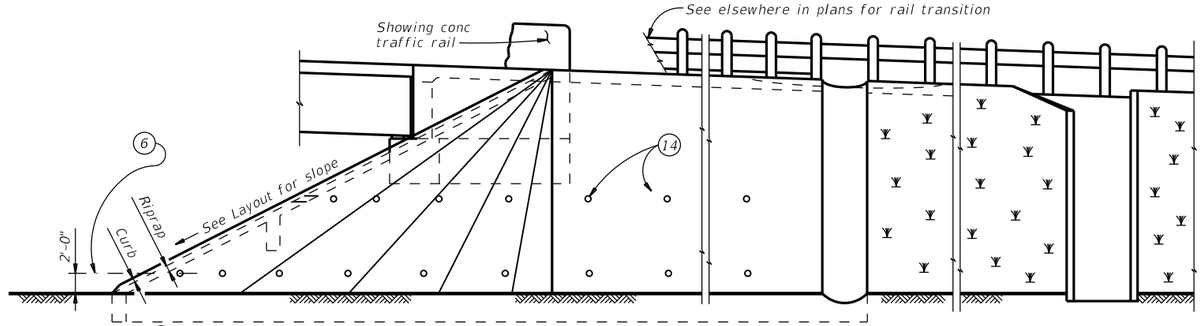
DATE: $DATE$ $TIME$
FILE: $FILE$



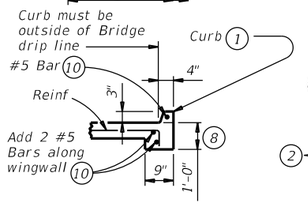
PLAN

SEC C-C

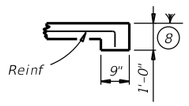
INTERMEDIATE TOEWALL (5)



ELEVATION

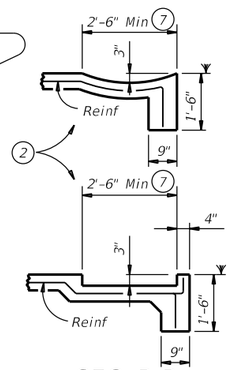


SEC A-A



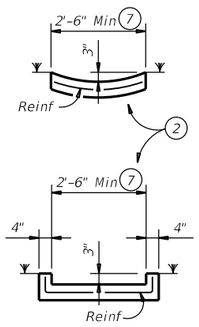
SEC B-B

(No drain)



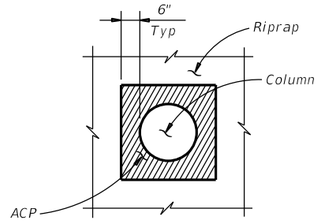
SEC B-B

(Shoulder drain integral with riprap)



SEC D-D

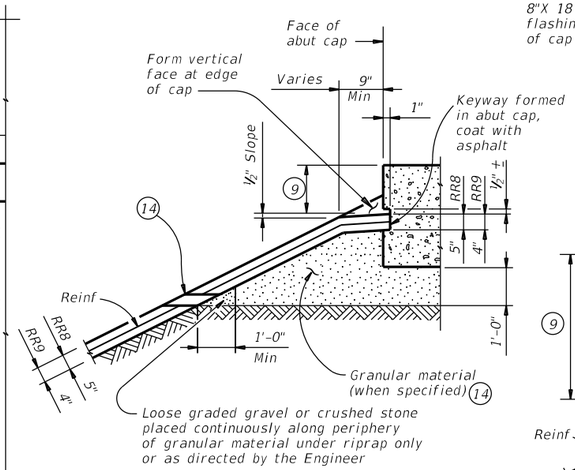
(Shoulder drain)



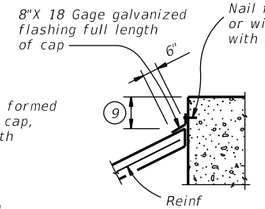
Riprap blockout to be filled with ACP. (Subsidiary to riprap)

RIPRAP DETAIL AT COLUMNS

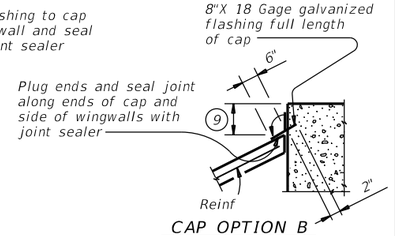
(As directed by the Engineer)



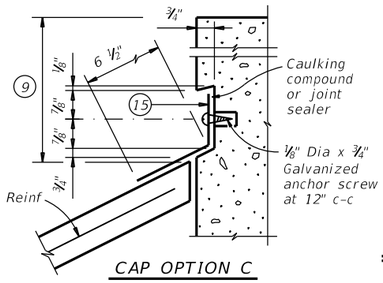
SHOWING KEYWAY OPTION



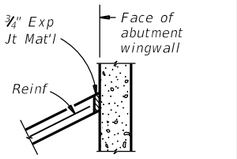
CAP OPTION A



CAP OPTION B

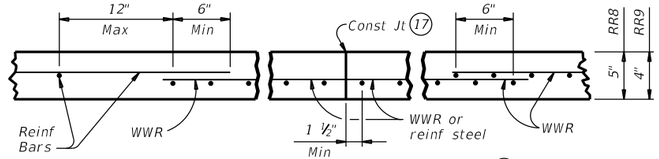


CAP OPTION C



SECT THRU RIPRAP AT WINGWALL (12)

SECTIONS THRU RIPRAP AT CAP (11)



REINFORCEMENT DETAILS (13)

See General Notes for optional synthetic fiber reinforcement.

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

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

GENERAL NOTES:

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

Provide Grade 60 reinforcing steel.

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

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

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

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

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

See Layout for limits of riprap.

RR8 is to be used on stream crossings.

RR9 is to be used on other embankments.

Texas Department of Transportation

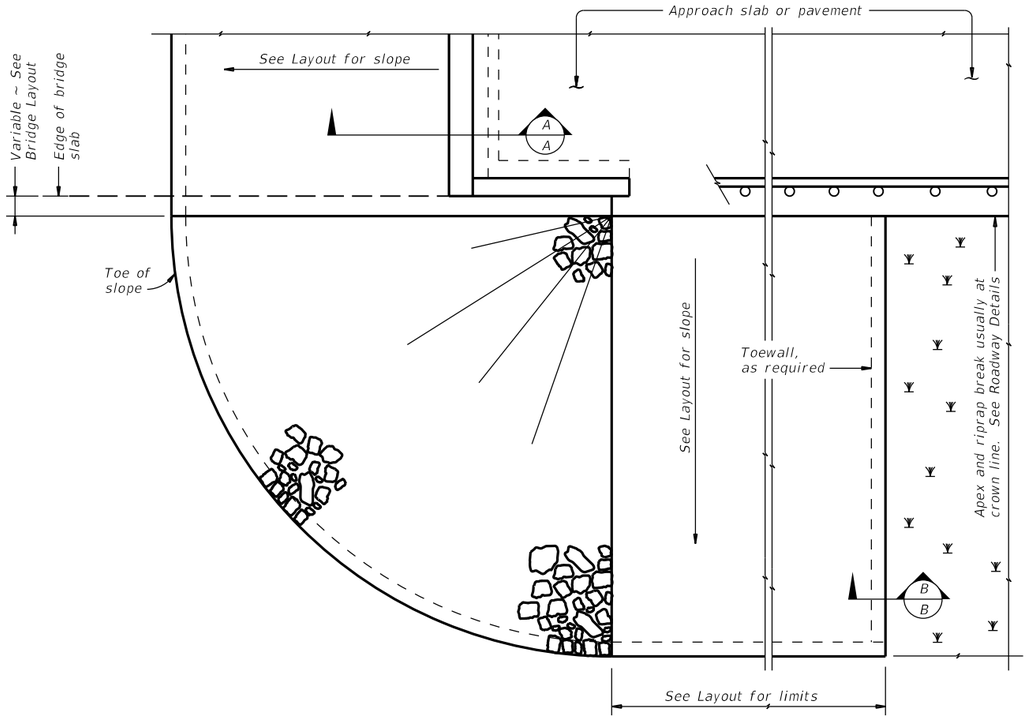
Bridge Division Standard

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

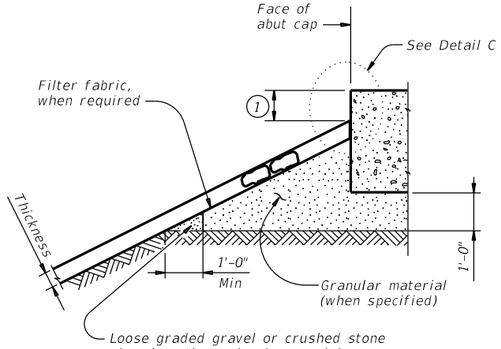
CRR

FILE: crrstde1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	00	112	VARIOUS
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, etc.		58

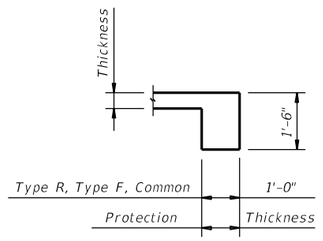
DATE:
FILE:



PLAN

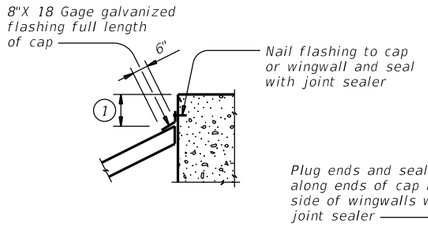


SECTION A-A AT CAP

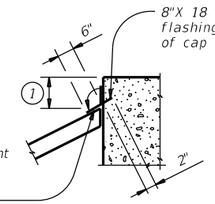


SECTION B-B

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

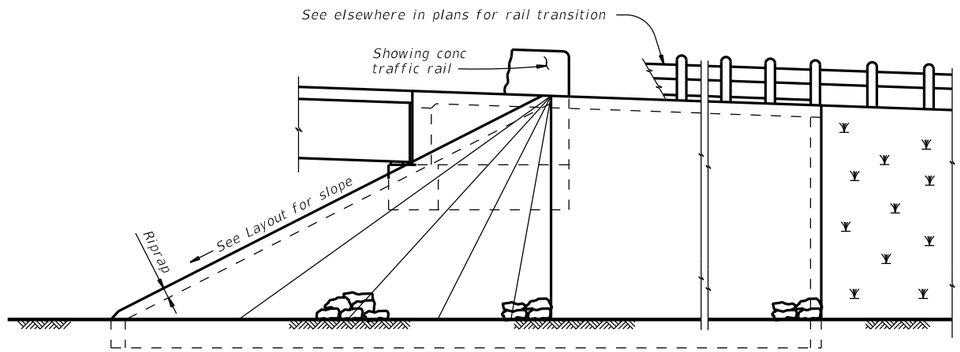


CAP OPTION A



CAP OPTION B

DETAIL C



ELEVATION

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

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

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	00	112	VARIOUS
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC.		59

DATE:
FILE:

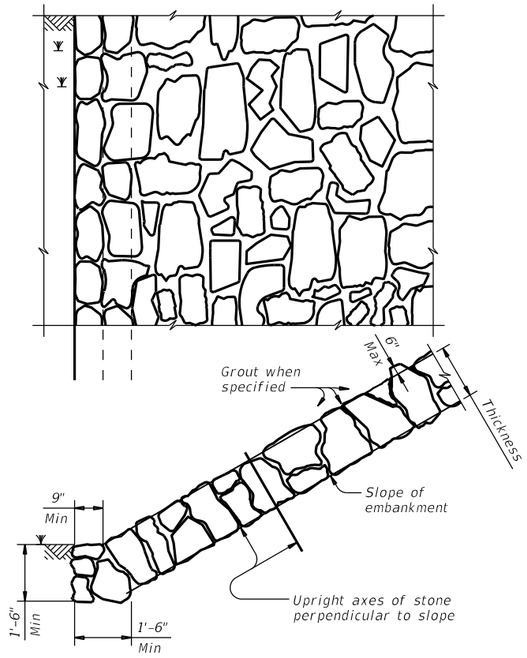


FIGURE 1 ~ TYPE R STONE RIPRAP

dry or grouted

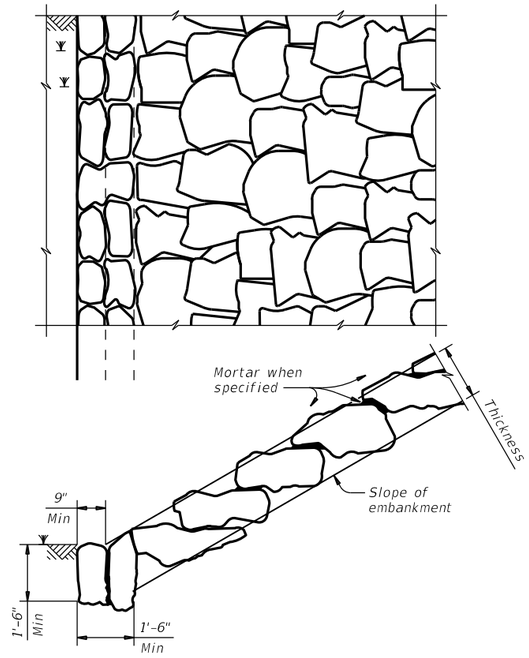


FIGURE 2 ~ TYPE F STONE RIPRAP

dry or mortared

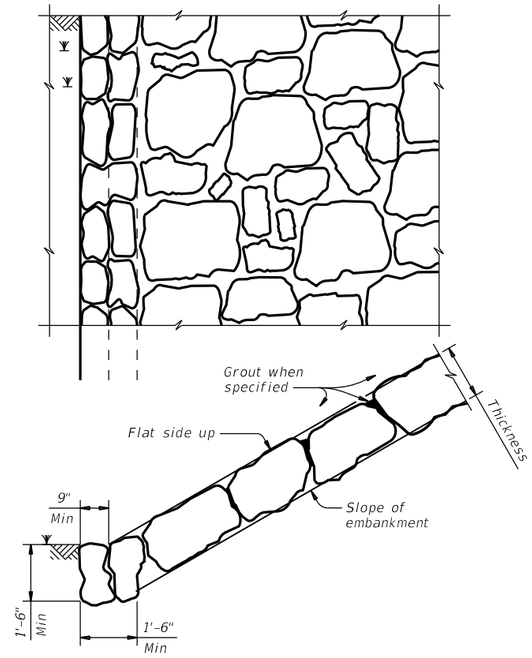


FIGURE 3 ~ TYPE F STONE RIPRAP

grouted

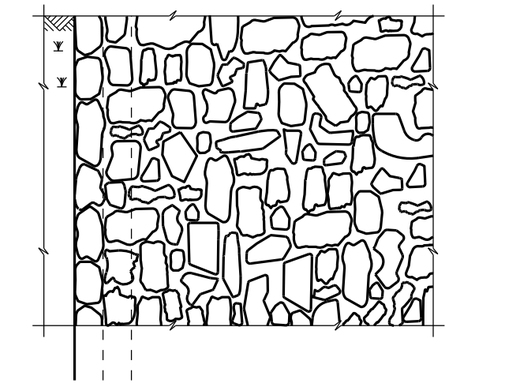


FIGURE 4 ~ COMMON STONE RIPRAP

dry or grouted

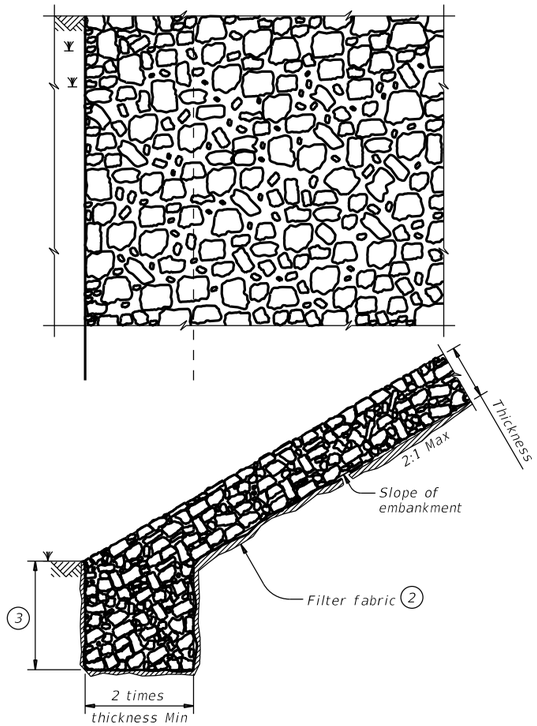


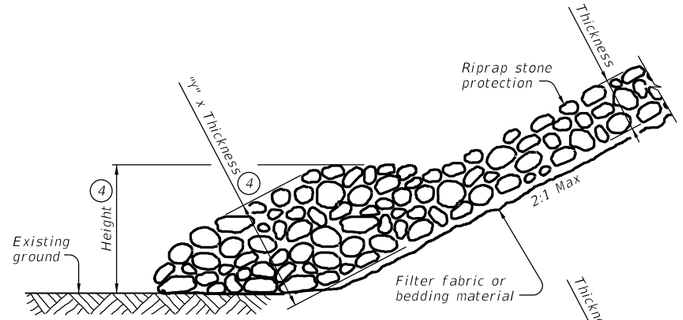
FIGURE 5 ~ PROTECTION STONE RIPRAP (5)

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

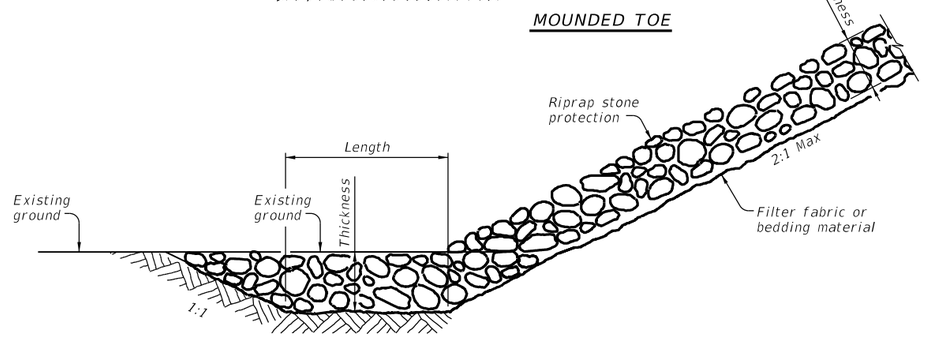
(3) Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.

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

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



MOUNDED TOE



EXTENDED ROCK FILLED TRENCH

PROTECTION STONE RIPRAP TOE OPTIONS (5)

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	00	112	VARIOUS
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR, ETC.		60

SITE DESCRIPTION

PROJECT LIMITS:
THE PROJECT LIMITS SHOWN ON THE TITLE SHEET AND LIMITS OF TXDOT RIGHT OF WAY SHALL ALSO BE THE LIMITS OF COVERAGE OF THE SW3P.

PROJECT LOCATION MAPS: TITLE SHEET

DRAINAGE PATTERNS: N/A

APPROX. SLOPES ANTICIPATED AFTER MAJOR GRADING AND AREAS OF SOIL DISTURBANCE: N/A

MAJOR CONTROLS AND LOCATIONS OF STABILIZATION PRACTICES: N/A

PROJECT SPECIFIC LOCATIONS: N/A

SURFACE WATERS AND DISCHARGE LOCATIONS: N/A

TYPICAL AREAS WHICH WILL NOT BE DISTURBED: N/A

ENDANGERED SPECIES, DESIGNATED CRITICAL HABITAT AND HISTORIC PROPERTY: EPIC SHEET

ESTIMATED START DATES AND DURATION OF ACTIVITIES IN THE INTENDED SCHEDULE/SEQUENCE OF EARTH-DISTURBING ACTIVITIES: CONTRACT TIME ESTIMATE

NATURE OF ACTIVITY: BRIDGE PREVENTIVE MAINTENANCE

MAJOR SOIL DISTURBING ACTIVITIES: NONE

TOTAL PROJECT AREA:
0.63 ACRES

TOTAL AREA TO BE DISTURBED (AT EACH SITE):
FM 611 0.0 ACRES
SH 208 0.0 ACRES
SH 350 0.167 ACRES

WEIGHTED RUNOFF COEFFICIENT BEFORE CONSTRUCTION:
N/A

WEIGHTED RUNOFF COEFFICIENT AFTER CONSTRUCTION:
N/A

EXISTING CONDITION OF SOIL & VEGETATIVE COVER:
N/A

% OF EXISTING VEGETATIVE COVER:
N/A

NAME OF RECEIVING WATERS:
SEE RECEIVING WATERWAY SUMMARY

$TIME$
$FILE$
$DATE$

EROSION AND SEDIMENT CONTROLS

USE "T" OR "P" IN THE BLANKS BELOW IF APPLICABLE (T= TEMPORARY, P= PERMANENT)

SOIL STABILIZATION PRACTICES:

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

OTHER:

FOR CONSTRUCTION PROJECTS, THIS DISTRICT OF THE TEXAS DEPARTMENT OF TRANSPORTATION USES SITEMANAGER, A COMPUTER BASED CONSTRUCTION RECORD-KEEPING SYSTEM, AS PART OF RECORD FOR PROJECT WORK INCLUDING ENVIRONMENTAL RELATED ACTIVITIES. DOCUMENTATION DESCRIBING MAJOR GRADING ACTIVITES, TEMPORARY OR PERMANENT CESSATION OF CONSTRUCTION AND STABILIZATION MEASURE IS PART OF THIS SYSTEM AND IS INCORPORATED BY REFERENCE INTO THIS SW3P.

STRUCTURAL PRACTICES:

	CHANNEL LINERS		DIVERSION DIKE AND SWALE COMBINATIONS
	CURBS AND GUTTERS		DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
	HAY BALES		DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
	PAVED FLUMES		ROCK BEDDING AT CONSTRUCTION EXIT
	PIPE SLOPE DRAINS		STONE OUTLET STRUCTURES
	STORM SEWERS		STORM INLET SEDIMENT TRAP
	SEDIMENT BASINS		TEMPORARY EROSION CONTROL LOGS (BIOLOGS)
	SEDIMENT TRAPS		TIMBER MATTING AT CONSTRUCTION EXIT
	SILT FENCES		VEGETATIVE FILTER STRIPS
	ROCK FILTER DAMS		VELOCITY CONTROL DEVICES
	EROSION CONTROL LOGS	T	LINED CONCRETE WASHOUT

OFFSITE VEHICLE TRACKING CONTROLS:

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

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

THE ORDER OF ACTIVITIES WILL BE AS FOLLOWS:
N/A

STORM WATER MANAGEMENT:
LINED CONCRETE WASHOUT WILL ONLY BE ALLOWED AT LOCATIONS AS DIRECTED BY THE ENGINEER.

STATE OF TEXAS
MAXIE W. ALLEN
96883
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Maxie Allen
300044282A5242B...

9/15/2022

OTHER EROSION AND SEDIMENT CONTROLS:

MAINTENANCE:
N/A

INSPECTION:
N/A

WASTE MATERIALS:
ALL WASTE MATERIALS WILL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER. THE DUMPSTER WILL MEET ALL STATE AND LOCAL CITY SOLID WASTE MANAGEMENT REGULATIONS. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER WILL BE EMPTIED AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION AND THE TRASH WILL BE HAULED TO A PERMITTED LANDFILL. NO CONSTRUCTION WASTE MATERIAL WILL BE BURIED ON SITE. CONSTRUCTION DEBRIS AND LITTER SHOULD BE PICKED UP ON A DAILY BASIS UNLESS OTHERWISE DIRECTED BY THE ENGINEER. WASTE AND DIRT PILES SHOULD BE REMOVED ON A WEEKLY BASIS.

HAZARDOUS WASTE (INCLUDING SPILL REPORTING):
NO LONG TERM WATER QUALITY IMPACTS ARE EXPECTED AS A RESULT OF THE PROPOSED PROJECT. SEE THE NEXT PLAN SHEET FOR A LIST OF POTENTIAL POLLUTANTS. IN THE EVENT OF A MAJOR SPILL, NOTIFY THE TXDOT ENGINEER IMMEDIATELY. ALL PERSONNEL WILL BE INSTRUCTED IN THE PROCEDURES FOR SPILL HANDLING AND DISPOSING OF ANY HAZARDOUS MATERIALS THEY WILL BE USING. ALL SPILLS, INCLUDING THOSE OF LESS THAN 25 GALLONS SHALL BE CLEANED IMMEDIATELY AND ANY CONTAMINATED SOIL SHALL BE IMMEDIATELY REMOVED FROM THE SITE AND BE DISPOSED OF PROPERLY. DESIGNATED AREAS SHALL BE DETERMINED BY THE AREA ENGINEER FOR SPOILS DISPOSAL AND MATERIAL STORAGE. THESE AREAS SHALL BE PROTECTED FROM RUN-ON AND RUN-OFF. MATERIALS RESULTING FROM THE DESTRUCTION OF EXISTING ROADS AND BEING REMOVED AND/OR DISPOSED OF BY THE CONTRACTOR WILL BE DONE SO IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL LAWS, ORDINANCES AND REGULATIONS AND WITH THE APPROVAL OF THE PROJECT ENGINEER. ANY CHANGES TO AMBIENT WATER QUALITY DURING CONSTRUCTION OF THE PROPOSED PROJECT SHALL BE PROHIBITED AND MAY RESULT IN ADDITIONAL WATER QUALITY CONTROL MEASURES, WHICH SHALL BE MITIGATED AS SOON AS POSSIBLE AND SHALL BE REPORTED TO THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) WITHIN 24 HOURS OF BECOMING AWARE OF IMPACTS.

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

REMARKS:
CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED BY THE CONTRACTOR IN A MANNER TO MINIMIZE THE RUNOFF OF POLLUTANTS.
ALL WATERWAYS SHALL BE CLEARED AS SOON AS PRACTICABLE OF TEMPORARY EMBANKMENT, TEMPORARY BRIDGES, MATTING, FALSEWORK PILING, DEBRIS OR OTHER OBSTRUCTIONS PLACED DURING CONSTRUCTION OPERATIONS THAT ARE NOT PART OF THE FINISHED WORK. DISPOSAL AREAS, STOCKPILES, AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL THE AMOUNT OF SEDIMENT THAT MAY ENTER RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WETLAND, WATER BODY OR STREAMBED.

Texas Department of Transportation

TxDOT STORM WATER POLLUTION PREVENTION PLAN (SW3P)

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		VARIOUS
STATE	COUNTY		SHEET NO.
TEXAS	TAYLOR, ETC.		61
DISTRICT	CONTROL	SECTION	JOB
ABL	0908	00	112

LIST OF POTENTIAL POLLUTANTS

POTENTIAL POLLUTANT	RELATED SOURCE	CONTROLS
CEMENTATEOUS MATERIAL AND CEMENTATEOUS AGGREGATES (BROKEN CONCRETE)	REMOVAL OF CONCRETE RIPRAP, CULVERT COMPONENTS, BRIDGE COMPONENTS, ETC.	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
MILLED ASPHALTIC CEMENT PAVEMENT (MILLINGS)	OBLITERATION OF ABANDONED ROAD AND PLANING OF ASPHALT	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
VIRGIN ASPHALTIC MATERIAL INCLUSIVE OF PRIME OILS, PRECOAT AGGREGATES, AND HOT MIX BITUMINOUS MIXTURES	APPLICATIONS OF PRIME COATS, SEAL COAT, AND PAVING OPERATIONS	THIS MATERIAL SHALL BE APPLIED AT APPROPRIATE RATES FOR CONSTRUCTION PURPOSES WHICH WILL PRECLUDE THESE MATERIALS FROM ENTERING RUNOFF. IN THE EVENT OF ANY UNINTENDED DISCHARGE, CONTROLS TO CONTAIN RUNOFF WILL BE IMMEDIATELY PLACED AND TCEQ WILL BE IMMEDIATELY NOTIFIED.
CONCRETE, REBAR, WIRE, WIRE FABRIC LUMBER, NAILS, STYROFOAM BLOCK, FIBERBOARD, CURING COMPOUND AND LINSEED OIL	CONSTRUCTION OF CONCRETE BRIDGE COMPONENTS SUCH AS DRILLED SHAFTS, CULVERTS, ABUTMENTS, BENTS, REINFORCED CONCRETE SLABS, RAIL, INLET, CONCRETE TRAFFIC BARRIERS, CURB AND GUTTER, RIPRAP AND SIGN FOUNDATIONS	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF. ANY TEMPORARY FILLS MUST BE REMOVED IN THEIR ENTIRETY AND THE AFFECTED AREAS RETURNED TO THEIR PREEXISTING CONDITION/ELEVATION.
MASONRY CONCRETE BLOCK, GEOGRID FABRIC, CARDBOARD, AND PLASTIC RAP	CONSTRUCTION OF MODULAR RETAINING WALL SYSTEMS	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
WOOD POSTS, STEEL POSTS, BARRELS, CONES, SIGN BOARDS (ALUMINUM AND PLYBOARD), FASTENERS, NUTS, BOLTS, AND WASHERS	PLACEMENT AND/OR REMOVAL OF BARRICADES, SIGNS AND TRAFFIC CONTROL DEVICES	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
WOOD POST, STEEL POST, STEEL FASTENERS, NUTS, BOLTS, AND WASHERS	CONSTRUCTION OF METAL BEAM GUARD FENCE	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
STRUCTURAL STEEL I-BEAM, SIGN BOARDS, AND CONCRETE FOUNDATIONS	REMOVAL OF ROADSIDE SIGN ASSEMBLIES LARGE AND SMALL	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
THERMOPLASTIC PAINT, GLASS BEADS, REFLECTIVE TABS, AND RAISED REFLECTIVE PAVEMENT MARKERS	APPLICATION OF PAVEMENT MARKINGS/MARKERS	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
PETROLEUM PRODUCTS (SMALL QUANTITIES INTRODUCED BY CONTRACTOR)	EQUIPMENT FAILURE, MAINTENANCE AND REPAIR	ALL EQUIPMENT AND VEHICLE MAINTENANCE SHALL BE PERFORMED IN A DESIGNATED AREA WITH APPROPRIATE MEASURES FOR CONTAINMENT AND PROPER DISPOSAL OF ALL WASTE MATERIALS INCLUDING HYDRAULIC OIL AND OTHER LIQUIDS IN ACCORDANCE STATE AND LOCAL WASTE MANAGEMENT REGULATIONS. ALL MATERIAL STORED PRIOR TO DISPOSAL SHALL BE CONTAINED IN A CONTAINER WITH A SECURE COVER MEETING ALL STATE AND LOCAL WASTE MANAGEMENT REGULATIONS.
ELIGIBLE NON-STORM WATER DISCHARGES INCLUDING BUT NOT LIMITED TO NON-POTABLE WATER AND NON-STORM WATER DISCHARGE	MOISTURE APPLICATIONS FOR DUST CONTROL, DENSITY, VEGETATION WATERING, NON-DETERGENT VEHICLE WASHING, AND AIR CONDITIONING CONDENSATE	THIS MATERIAL SHALL BE APPLIED AT APPROPRIATE RATES FOR CONSTRUCTION PURPOSES WHICH WILL PRECLUDE THESE MATERIALS FROM ENTERING RUNOFF. IN THE EVENT OF ANY UNINTENDED DISCHARGE, CONTROLS TO CONTAIN RUNOFF WILL BE IMMEDIATELY PLACED AND THE NON-POTABLE WATER WILL BE RECOVERED AND PROPERLY STORED FOR REUSE.
SURVEY STAKE, FLAGGING TAPE AND PAINT	SURVEY STAKING, ALIGNMENT ESTABLISHMENT	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
WASTEWATER	WASHOUT AND CLEANOUT OF STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
SOAPS AND SOLVENTS	VEHICLE AND EQUIPMENT WASHING	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
UNSUITABLE FILL MATERIAL	EXCAVATION - ROADWAY, SPECIAL AND EROSION CONTROL	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.

STATE OF TEXAS
MAXIE W. ALLEN
96883
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Maxie Allen
300044282A5242B...

9/15/2022

Texas Department of Transportation

TxDOT STORM WATER POLLUTION PREVENTION PLAN (SW3P)

REV. DATE: 02/27/2014

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		VARIOUS
STATE	COUNTY		SHEET NO.
TEXAS	TAYLOR, ETC.		
DISTRICT	CONTROL	SECTION	JOB
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$FILE$ $TIME$
$DATE$

COUNTY	HIGHWAY	PROJECT LIMITS	SEGMENT ID	SEGMENT NAME
FISHER	FM 611	BRIDGE AT BUFFALO CREEK	1232	CLEAR FORK BRAZOS RIVER
SCURRY	SH 208	BRIDGE AT BIG SULPHUR CREEK	1412	COLORADO RIVER BELOW LAKE J.B. THOMAS
SCURRY	SH 350	BRIDGE AT COLORADO RIVER	1412	COLORADO RIVER BELOW LAKE J.B. THOMAS

RECEIVING WATERS SUMMARY

Texas Department of Transportation

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		VARIOUS
STATE	COUNTY		SHEET NO.
TEXAS	TAYLOR, ETC.		63
DISTRICT	CONTROL	SECTION	JOB
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FILE: $FILE$ $TIME$
DATE: $DATE$

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.

PREPARED BY (NAME OF DESIGNER)
DATE: $DATE$
FILE: $FILE$

I. STORM WATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Storm water 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.

☐ No Action Required ☒ Required Action

Action No.

1. The project disturbs less than one acre of surface area. The contractor is responsible for the PSL as defined in the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (2014 Edition, Section 7.6., Page 44). The total disturbed acreage is the combined acreage to be disturbed on the project and the contractors PSL.
2. Prevent storm water pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
3. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
4. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
5. 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, WATER BODIES 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.

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	☐ Sedimentation Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw & Hay Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost/Mulch
☐ Erosion Control Compost	☐ Erosion Control Compost	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☐ Sand Filter Systems
☐ Temporary Erosion Control Logs (BIOLOGS)	☐ Temporary Erosion Control Logs (BIOLOGS)	☐ Temporary Erosion Control Logs (BIOLOGS)
☐ Preservation of Natural Resources	☐ Sediment Traps	☐ Permanent Vegetation (Planting, Sodding, or Seeding)
☐ Construction Exits	☐ 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.

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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.

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4.

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

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.

☒ No Action Required ☐ Required Action

Action No.

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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 Storm water 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. THE BRIDGES HAVE NOT BEEN TESTED FOR HAZARDOUS MATERIALS BUT SHALL BE TREATED AS IF THEY CONTAIN HAZARDOUS MATERIALS.
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.

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS EPIC

Texas Department of Transportation

NO SCALE SHEET 1 OF 1

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		VARIOUS
STATE	COUNTY		SHEET NO.
TEXAS	TAYLOR, ETC.		64
DISTRICT	CONTROL	SECTION	JOB
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REV. DATE: 02/2015