

FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.
6	0	1
STATE	STATE DIST.	COUNTY
TEXAS	YKM	VICTORIA, ETC.
CONT.	SECT.	JOB
6447	95	001, ETC US 77, ETC

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# STATE OF TEXAS TEXAS DEPARTMENT OF TRANSPORTATION

## PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

WORK CONSISTING OF EROSION REPAIR

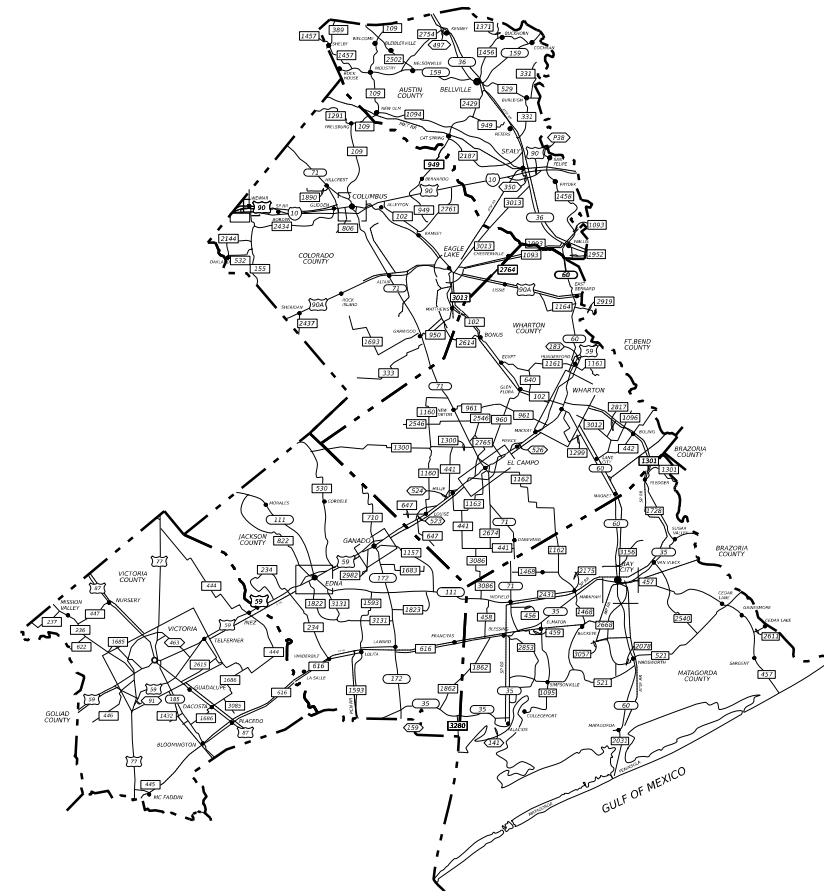
PROJECT NO: BPM 6447-95-001

COUNTY: VICTORIA, ETC.

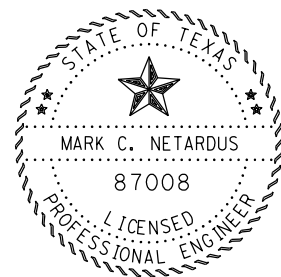
LIMITS: US 77, ETC.

CONTRACTOR: \_\_\_\_\_  
 DATE OF LETTING: \_\_\_\_\_  
 DATE WORK BEGAN: \_\_\_\_\_  
 DATE WORK COMPLETED: \_\_\_\_\_  
 DATE WORK ACCEPTED: \_\_\_\_\_  
 FINAL CONTRACT COST: \$ \_\_\_\_\_

LIST OF APPROVED FIELD CHANGES:



YOAKUM DISTRICT



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

*Mark C. Netardus*, P. E. 12-13-23  
 MAINTENANCE ENGINEER DATE

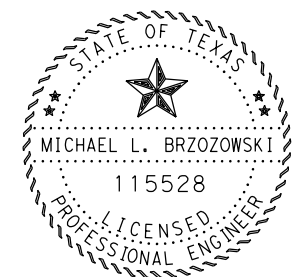
SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, OCTOBER 2023).

EXCEPTIONS: NONE  
 EQUATIONS: NONE  
 RAILROAD CROSSINGS: NONE

## AUSTIN, COLORADO, JACKSON, MATAGORDA, VICTORIA, AND WHARTON COUNTIES YOAKUM DISTRICT

THIS IS TO CERTIFY THAT THE CONSTRUCTION WORK WAS PERFORMED IN ACCORDANCE WITH THE PLANS, CONTRACT AND LISTED FIELD CHANGES.

\_\_\_\_\_, P. E. DATE  
 AREA ENGINEER



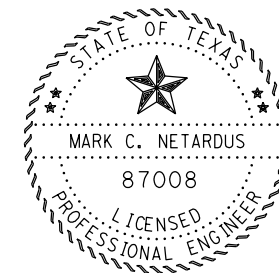
APPROVED FOR LETTING: 12-14-15  
*Michael Brzozowski* PE  
 DIRECTOR OF OPERATIONS



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LOCATION	COUNTY	ROADWAY	CROSSING	NBI NUMBER	REF MARK	STATION
1	Austin	SH 159	IVYS CREEK	13-008-0-0409-01-003	0644 + 01.330	475+20.00 TO 476+46.00
2	Austin	FM 2187	DRAW	13-008-0-2894-01-002	0472 + 00.826	289+88.74 TO 290+11.26
3	Colorado	SH 71	SKULL CREEK RELIEF	13-045-0-0266-04-031	0676 + 01.169	585+13.00 TO 587+40.62
4	Colorado	SH 71	DRAW	13-045-0-0266-04-033	0684 + 00.771	188+25.16 TO 188+63.75
5	Colorado	US 90A	WEST SANDY CREEK	13-045-0-0446-02-042	0606 + 01.730	1289+13.93 TO 1292+69.93
6	Colorado	FM 949	KOTZEBUE CREEK	13-045-0-1106-01-005	0624 + 01.929	118+85.86 TO 119+14.14
7	Colorado	FM 949	COUSHATTA CREEK	13-045-0-1106-04-007	0622 + 00.591	241+81.00 TO 242+42.28
8	Colorado	FM 2761	CHURCH CREEK	13-045-0-2715-01-002	0476 + 00.021	202+53.57 TO 202+98.43
9	Jackson	US 59 SB	W DRY CREEK	13-121-0-0089-03-072	0620 + 00.104	1166+96.50 TO 1167+87.50
10	Jackson	US 59	DEVERS CREEK	13-121-0-0089-04-167	0602 + 01.568	294+01.66 TO 294+56.34
11	Jackson	SH 172	DRAW	13-121-0-0420-02-003	0540 + 01.616	224+56.10 TO 224+83.43
12	Jackson	SH 172	DRAW	13-121-0-0420-02-004	0540 + 01.838	212+78.40 TO 213+05.90
13	Jackson	FM 530	BRUSHY CREEK	13-121-0-1090-01-010	0526 + 00.999	549+37.00 TO 549+91.00
14	Jackson	FM 3131	PALMETTO DAM E DRAIN	13-121-0-1756-01-003	0618 + 01.569	9+90.38 TO 11+54.75
15	Matagorda	FM 457	DEAD SLOUGH	13-158-0-0605-01-012	0662 + 01.161	874+79.00 TO 875+81.00
16	Matagorda	FM 521	COLORADO RIVER RELIEF	13-158-0-0846-03-017	0646 + 01.826	556+26.00 TO 561+16.00
17	Matagorda	FM 2668	LIVE OAK CREEK	13-158-0-2697-01-001	0528 + 00.291	49+39.50 TO 50+30.50
18	Victoria	SH 185	JIM BRANCH	13-235-0-0432-02-013	0586 + 00.527	102+53.82 TO 102+92.15
19	Victoria	FM 446	DRY CREEK	13-235-0-0841-01-007	0584 + 00.290	33+93.00 TO 34+95.00
20	Victoria	FM 1686	CHOCOLATE BAYOU	13-235-0-1132-01-006	0554 + 01.767	933+38.00 TO 933+88.00
21	Victoria	FM 1685	DRAW	13-235-0-1698-01-003	0580 + 01.932	35+27.10 TO 35+62.80
22	Wharton	US 59 NB	EAST MUSTANG CREEK	13-241-0-0089-06-179	0594 + 00.099	211+01.59 TO 212+60.87
23	Wharton	SH 71	DRAW	13-241-0-0266-06-038	0714 + 00.444	218+50.00 TO 218+76.50
24	Wharton	FM 441	STAGE STAND CREEK	13-241-0-0837-02-006	0630 + 01.727	57+39.52 TO 57+72.19
25	Wharton	FM 442	DRAW	13-241-0-0838-01-017	0650 + 01.676	150+25.00 TO 151+00.00
26	Wharton	FM 441	EAST CARANCAHUA CREEK	13-241-0-1302-03-008	0638 + 01.462	479+77.00 TO 480+17.00
27	Wharton	FM 1162	BLUE CREEK	13-241-0-1304-01-004	0516 + 00.759	252+74.00 TO 253+49.00

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FILE: Index\_of\_Sheets.dgn  
DATE: 12/14/2023



*Mark C. Netardus P.E.*

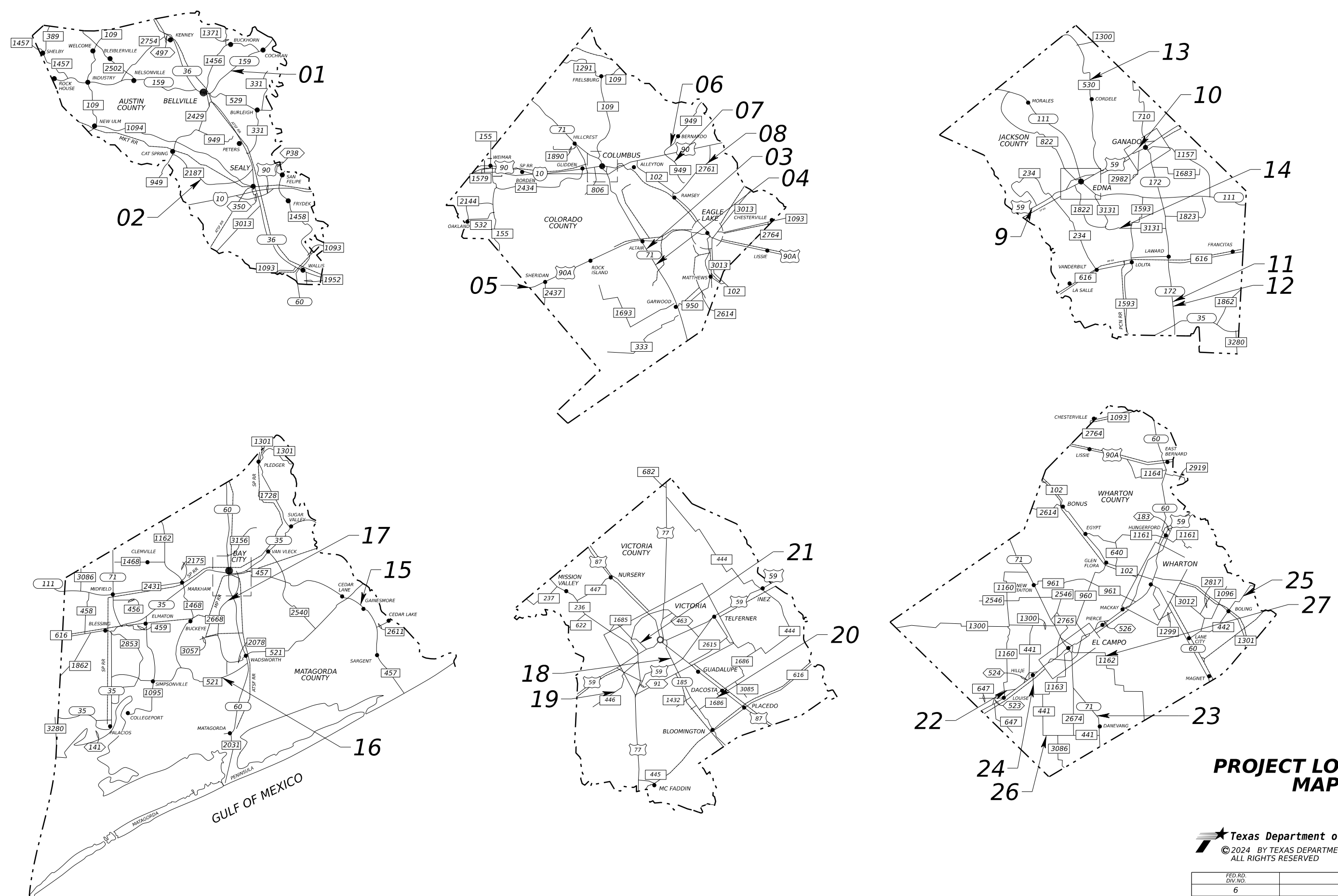
12/14/2023

## PROJECT SUMMARY

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SHEET 1 OF 1

FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	2



**PROJECT LOCATION MAP**

Texas Department of Transportation  
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 SHEET 1 OF 1

FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	3

PATH: C:\DESIGN\_PROJECTS\Worksets\YKM\Workset\_Template\Index\_of\_Sheets  
 FILE: Index\_of\_Sheets.dgn  
 DATE: 12/13/2023

**Project Number: BPM 6447-95-001**

**County: VICTORIA, ETC.**

**Highway: US 77, ETC.**

**GENERAL NOTES:**

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

Mark Netardus [Mark.Netardus@txdot.gov](mailto:Mark.Netardus@txdot.gov)  
Michael Brzozowski [Michael.Brzozowski@txdot.gov](mailto:Michael.Brzozowski@txdot.gov)

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

Questions may be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:  
<https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors>

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

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

Work two individual project locations through completion before beginning work at another location unless otherwise approved.

Remove and replace right-of-way fences at particular work sites, where necessary, at contractor's entire expense. Replace fences in a condition comparable to that at removal.

Do not work on the roadway before sunrise or after sunset.

Leave all traffic lanes open to traffic at night, weekends and holidays unless otherwise approved.

Furnish a certified copy of the legal gross weight of each vehicle hauling materials by weight and certified measurements for all trucks hauling material by volume.

Do not cross the median except at existing crossovers.

**Project Number: BPM 6447-95-001**

**County: VICTORIA, ETC.**

**Highway: US 77, ETC.**

Unless otherwise approved, maintain a minimum safety clearance from the edge of the travelway for material stockpiled in proximity of traffic lanes based on the current average traffic count of the particular highway as follows:

0 - 1500 = 16 feet  
Over 1500 = 30 feet

In the event the above requirements cannot be met, make arrangements to stockpile material off the right of way.

Do not store equipment or stockpile material in the median overnight unless otherwise approved.

The Department will provide the cylinder testing machine for this project. Deliver the test specimens to the engineer's curing facilities as directed.

Do not clean out concrete trucks within the right of way.

**ITEM 7: LEGAL RELATIONS AND RESPONSIBILITIES**

The Contractor's attention is directed to the fact that discharge of permanent or temporary fill material into the waters of the United States (U.S.) including jurisdictional wetlands, as necessary for construction, will require specific approval of the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act.

The Department will obtain the appropriate permit(s), Nationwide or Individual, when necessary as dictated by the proposed actions for the project and its potential to affect USACE jurisdictional areas. The Contractor may review the permitted plans at the office of the Area Engineer in charge of construction. The Department will hold the Contractor responsible for following all conditions of the approved permit. If the Contractor cannot work within the limits of this permit(s), then it becomes the Contractor's entire responsibility to consult with the USACE pertaining to the need for changes or amendments to the conditions of the existing permit(s) as originally obtained by the Department.

Particular importance is stressed on the fact that any impacts to USACE jurisdictional waters of the U.S., including jurisdictional wetlands, be the minimum necessary to complete the proposed work. The Contractor shall maintain near normal flow of any jurisdictional waters of the U.S. at all times during construction. If the Contractor needs further explanation of the conditions of the permit, including means of compliance, they may contact the TXDOT Yoakum District Environmental Coordinator.

**Project Number: BPM 6447-95-001**

**County: VICTORIA, ETC.**

**Highway: US 77, ETC.**

A NWP 3 will be used for the work within jurisdictional waters.

If the Contractor elects to work on a structure when the stream is flowing, near normal flow shall be maintained by a method approved by the Engineer. Labor and materials involved in this work will not be paid for directly, but will be considered subsidiary to the various bid items of the contract.

No significant traffic generator events identified.

**ITEM 8: PROSECUTION AND PROGRESS**

Provide progress schedule as a Bar Chart.

**ITEM 100: PREPARING RIGHT-OF-WAY**

Dispose of trees from the right-of-way within 24 hours of removal.

**ITEM 104: REMOVING CONCRETE**

Broken concrete removed under this contract may be used for the stone riprap item.

**ITEM 132: EMBANKMENT**

Furnish Type C embankment consisting of suitable earth material such as loam, clay or other such material that will form a stable embankment and has a plasticity index of at least 15 but not more than 40.

**ITEM 502: BARRICADES, SIGNS, AND TRAFFIC HANDLING**

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

**Project Number: BPM 6447-95-001**

**County: VICTORIA, ETC.**

**Highway: US 77, ETC.**

Use WZ(RS)-22 in conjunction with TCP(2-2) and TCP(2-4).

Use TCP(2-2b) for one-lane, two-way traffic control.

When using TCP(2-2b), a pilot car is required to lead traffic through the work space with or without channelizing devices on the center line unless otherwise approved.

When using TCP(2-2b), channelizing devices may be omitted during base, subgrade and seal coat operations unless otherwise directed. Flaggers will be required at public intersections when channelizing devices are omitted.

When using TCP(2-2b), arrow boards, displaying the caution mode, may be used to enhance the flagger stations. If used, place the arrow board in advance of the flagger station a distance of  $\frac{1}{2}X$ , the sign spacing distance shown on BC(2). Use arrow boards as shown on BC(7).

When using TCP(2-2b), the temporary 24" stop line and the CW16-2P plaques may be omitted.

When using TCP(2-2b), an additional "Road Work Ahead" and "Be Prepared To Stop" signs will be required on each end of the lane closure unless otherwise approved.

Provide suitable warning lights mounted high enough to be visible from all directions on all construction equipment, including pilot vehicles, and operate warning lights when the equipment is within the right of way. Equip other equipment such as trucks, trailers, autos, etc., with emergency flashers and use emergency flashers while within the work area.

Project limit traffic control devices will not be required for this project.

The contractor will be allowed to perform culvert work on one side of the roadway at a time, through completion, before starting on the opposite side unless otherwise approved.

**ITEM 506: TEMPORARY EROSION, SEDIMENTATION,  
AND ENVIRONMENTAL CONTROLS**

1. See SW3P plan sheet for total disturbed acreage.
2. The disturbed area in this project, all project locations in the contract, and contractor project specific locations (PSLs), within one (1) mile of the project limits, for the contract will further establish the authorization requirements for storm water discharges.

**Project Number: BPM 6447-95-001**

**County: VICTORIA, ETC.**

**Highway: US 77, ETC.**

**Project Number: BPM 6447-95-001**

**County: VICTORIA, ETC.**

**Highway: US 77, ETC.**

3. 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.
4. Obtain any required authorization from the TCEQ for any contractor PSLs for construction activities on or off right-of-way (ROW).
5. When the total disturbed area for all projects in the contract and PSLs within one (1) mile of the project limits exceeds five (5) acres, provide a copy of the contractor NOI for PSLs on the ROW to the Engineer.
6. Provide a signed sketch detailing the location of any contractor's PSLs on ROW or within one (1) mile of the project.

**ITEM 6185: TRUCK MOUNTED ATTENUATOR (TMA) AND TRAILER  
ATTENUATOR (TA)**

Shadow vehicle(s) with TMA are set up for stationary operations. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project.



# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 6447-95-001

DISTRICT Yoakum

COUNTY Victoria

HIGHWAY US0077

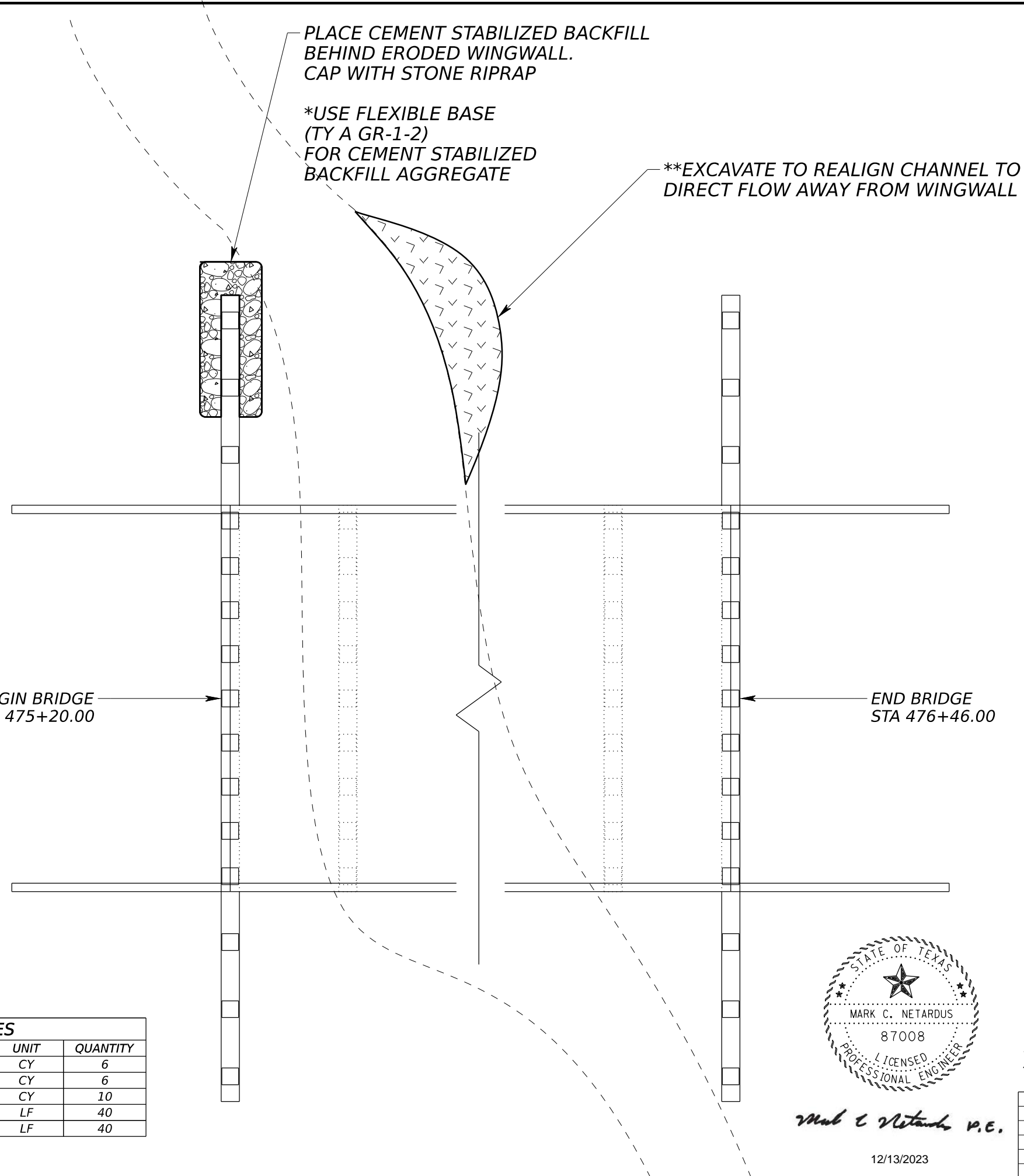
CONTROL SECTION JOB				6447-95-001		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00200183			
COUNTY				Victoria			
HIGHWAY				US0077			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	104-6009	REMOVING CONC (RIPRAP)	SY	12.000		12.000	
	132-6021	EMBANKMENT (VEHICLE)(ORD COMP)(TY C)	CY	93.000		93.000	
	400-6005	CEM STABIL BKFL	CY	6.000		6.000	
	401-6001	FLOWABLE BACKFILL	CY	44.000		44.000	
	432-6033	RIPRAP (STONE PROTECTION)(18 IN)	CY	1,051.000		1,051.000	
	480-6002	CLEAN EXIST CULVERTS	CY	794.000		794.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	3.000		3.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	510.000		510.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	890.000		890.000	
	6185-6002	TMA (STATIONARY)	DAY	27.000		27.000	
	7000-6001	REML & DISPL DRIFTWOOD & DEBRIS	CY	4.000		4.000	



**SOUTHWEST WINGWALL**



**SOUTHWEST WINGWALL**



PLACE CEMENT STABILIZED BACKFILL BEHIND ERODED WINGWALL. CAP WITH STONE RIPRAP

\*USE FLEXIBLE BASE (TY A GR-1-2) FOR CEMENT STABILIZED BACKFILL AGGREGATE

\*\*EXCAVATE TO REALIGN CHANNEL TO DIRECT FLOW AWAY FROM WINGWALL

\*USE FLEXIBLE BASE (TY A GR-1-2) FOR CEMENT STABILIZED BACKFILL AGGREGATE

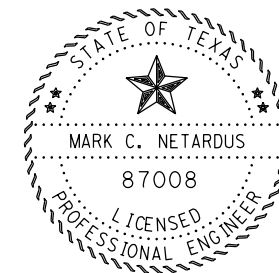
BEGIN BRIDGE STA 475+20.00

END BRIDGE STA 476+46.00

\*\*SILT REMOVED UPSTREAM TO BE PAID FOR USING ITEM 480-6002 CLEAN EXIST CULVERTS

LATITUDE: 29.99436224  
LONGITUDE: -96.19610672

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
400-6005	CEMENT STABILIZED BACKFILL	CY	6
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	6
480-6002	CLEAN EXIST CULVERTS	CY	10
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	40
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	40



*Mark C. Netardus P.E.*

12/13/2023

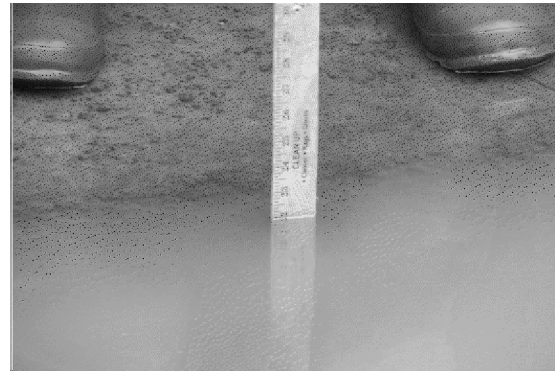
**EROSION REPAIR**  
IVY'S CREEK  
SH 159 - AUSTIN COUNTY  
NBI # 13-008-0-0409-01-003

NOT TO SCALE

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FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	8





**NORTH TOEWALL SCOUR**

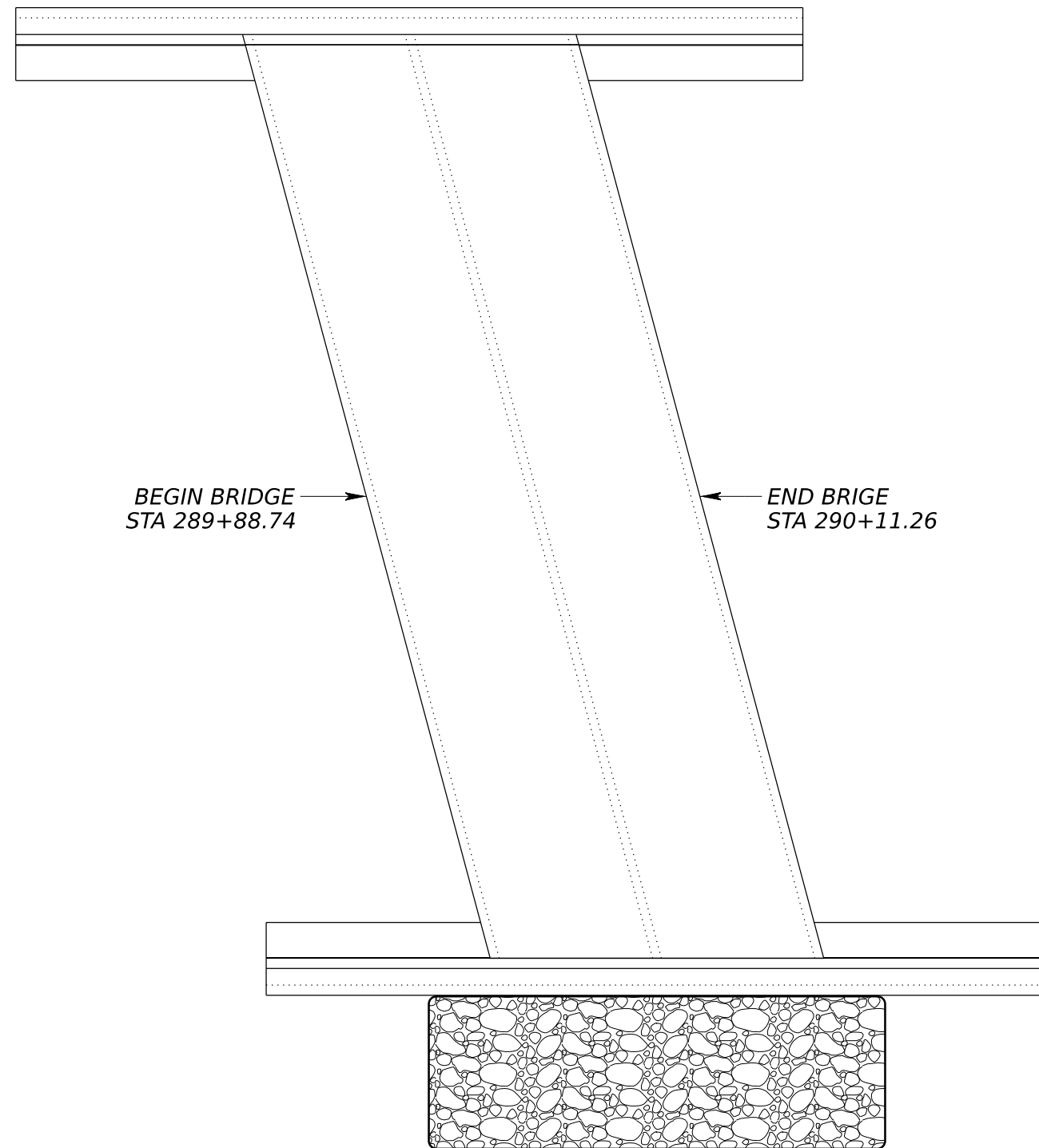


**NORTHEAST ABUTMENT**

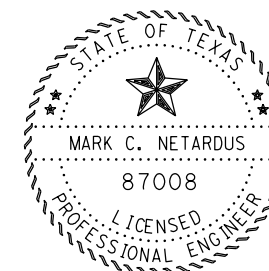
**\* THIS SITE WILL REQUIRE DE-WATERING. DE-WATERING IS CONSIDERED SUBSIDIARY TO ITEM 432-6033**

LATITUDE: 29.79603387  
LONGITUDE: -96.26867015

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	26
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	20
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	20



**\* PLACE STONE RIPRAP**



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
DRAW  
FM 2187 - AUSTIN COUNTY  
NBI # 13-008-0-2894-01-002

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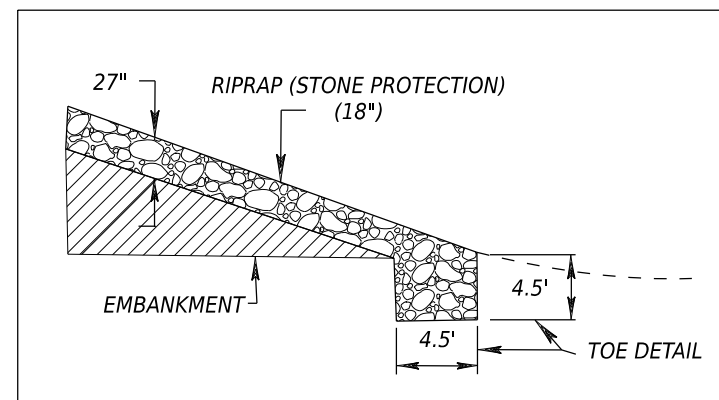
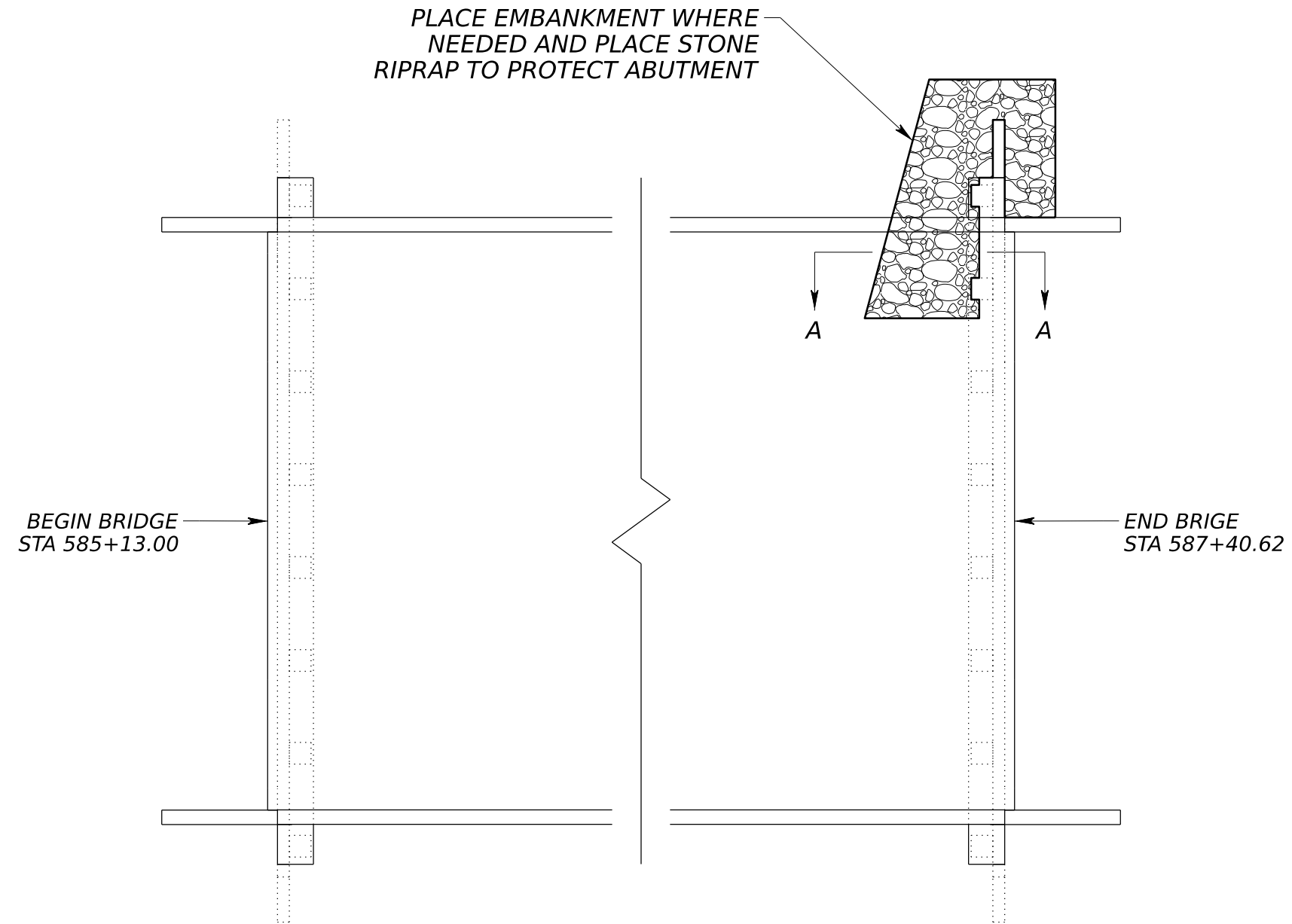
FED. RD. DIV. NO.		PROJECT NO.	
6			
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6447	95	001, ETC.	US 77, ETC.
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TEXAS	YKM	VICTORIA, ETC.	9



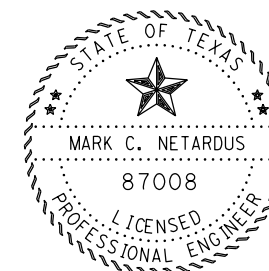
**NORTHWEST ABUTMENT**



**ROADWAY VIEW**



**SECTION A-A**



*Mark C. Netardus P.E.*

12/13/2023

LATITUDE: 29.53881656  
LONGITUDE: -96.44801743

**TABLE OF ESTIMATED QUANTITIES**

ITEM	DESCRIPTION	UNIT	QUANTITY
132-6021	EMBANKMENT (VEHICLE) (ORD COMP)(TY C)	CY	15
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	25
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	30
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	30

**EROSION REPAIR**  
SKULL CREEK RELIEF  
SH 71 - COLORADO COUNTY  
NBI # 13-045-0-0266-04-031

NOT TO SCALE

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FILE: 02\_COLORADO\_SH71\_SKULL\_CREEK\_RELIEF\_130450026604031.dgn  
DATE: 12/13/2023



**DOWNSTREAM TOEWALL**



**UPSTREAM**

PLACE STONE RIPRAP ALONG TOEWALL

REMOVE DEBRIS

BEGIN BRIDGE  
STA 188+25.16

END BRIDGE  
STA 188+63.75

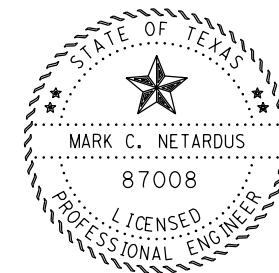
PLACE FLOWABLE BACKFILL UNDER CONC APRON

PLACE STONE RIPRAP

LATITUDE: 29.43929907  
LONGITUDE: -96.39858013

**TABLE OF ESTIMATED QUANTITIES**

ITEM	DESCRIPTION	UNIT	QUANTITY
401-6001	FLOWABLE BACKFILL	CY	7
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	40
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	40
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	40
7000-6001	REML & DISPL DRIFT & DEBRIS	CY	4



*Mark C. Netardus P.E.*

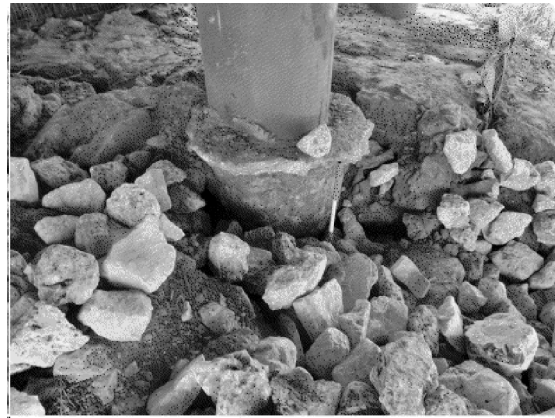
12/13/2023

**EROSION REPAIR**  
DRAW  
SH 71 - COLORADO COUNTY  
NBI # 13-045-0-0266-04-033

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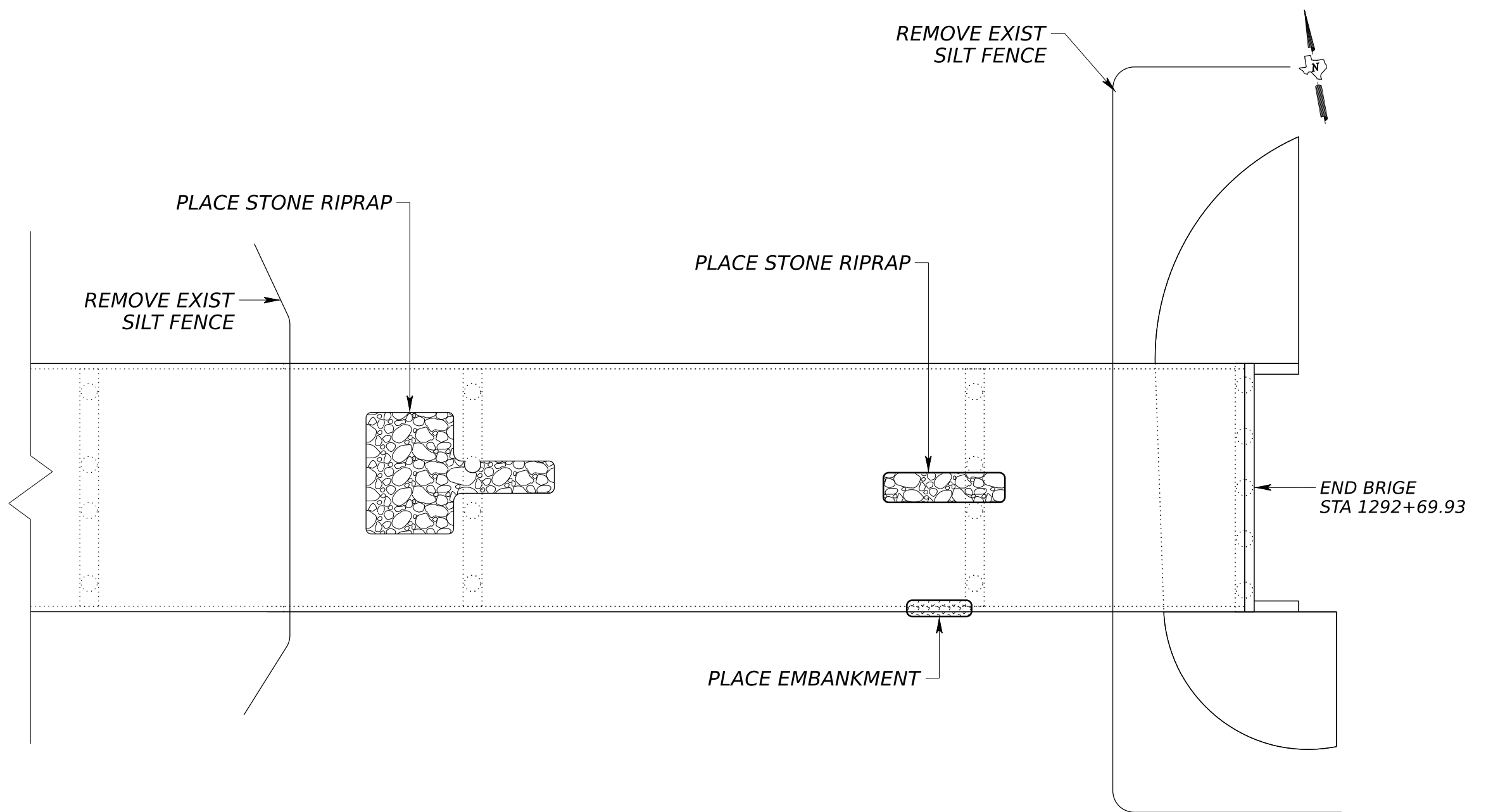
FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	11



WEST CHANNEL BANK



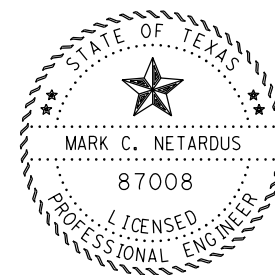
EAST CHANNEL BANK



LATITUDE: 29.48614444  
 LONGITUDE: -96.70273611

**TABLE OF ESTIMATED QUANTITIES**

ITEM	DESCRIPTION	UNIT	QUANTITY
132-6021	EMBANKMENT (VEHICLE) (ORD COMP)(TY C)	CY	5
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	36
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	20
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	500



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
 WEST SANDY CREEK  
 US 90A - COLORADO COUNTY  
 NBI # 13-045-0-0446-02-042

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FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	12



**NORTHWEST WINGWALL**

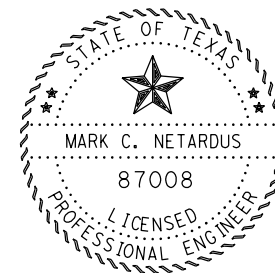
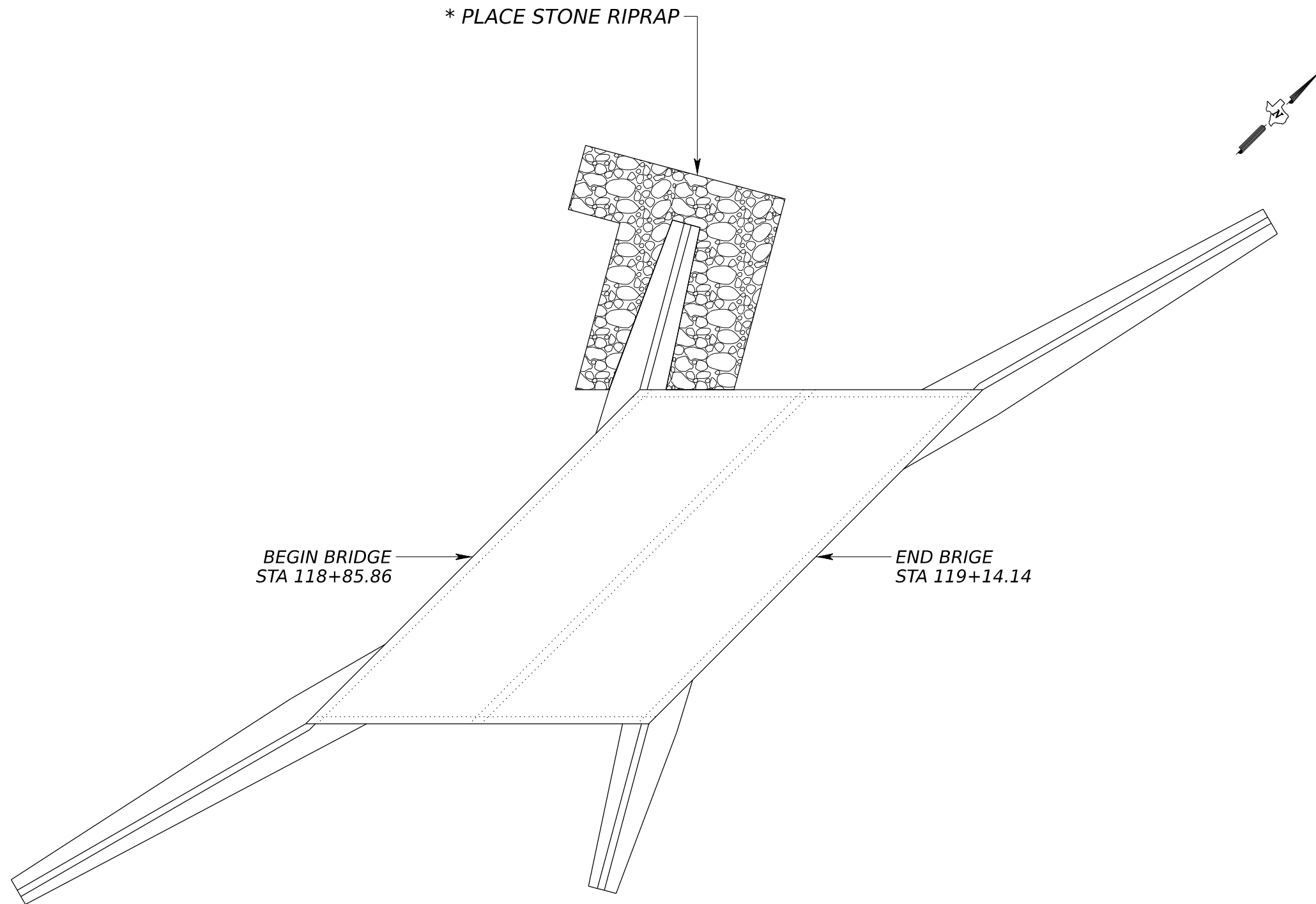


**ROADWAY VIEW**

**\* THIS SITE WILL REQUIRE DE-WATERING. DE-WATERING IS CONSIDERED SUBSIDIARY TO ITEM 432-6033**

LATITUDE: 29.7477574  
LONGITUDE: -96.40454856

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	20
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	10
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	10



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
KOTZEBUE CREEK  
FM 949 - COLORADO COUNTY  
NBI # 13-045-0-1106-01-005

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FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	13



**EROSION UPSTREAM END**



**ELEVATION LOOKING WEST**

\*SILT REMOVED DOWNSTREAM  
TO BE PAID FOR USING  
ITEM 480-6002 CLEAN EXIST CULVERTS

NOTE:  
CULVERT BOXES ARE 10'x9'

LATITUDE: 29.71411858  
LONGITUDE: -96.40432052

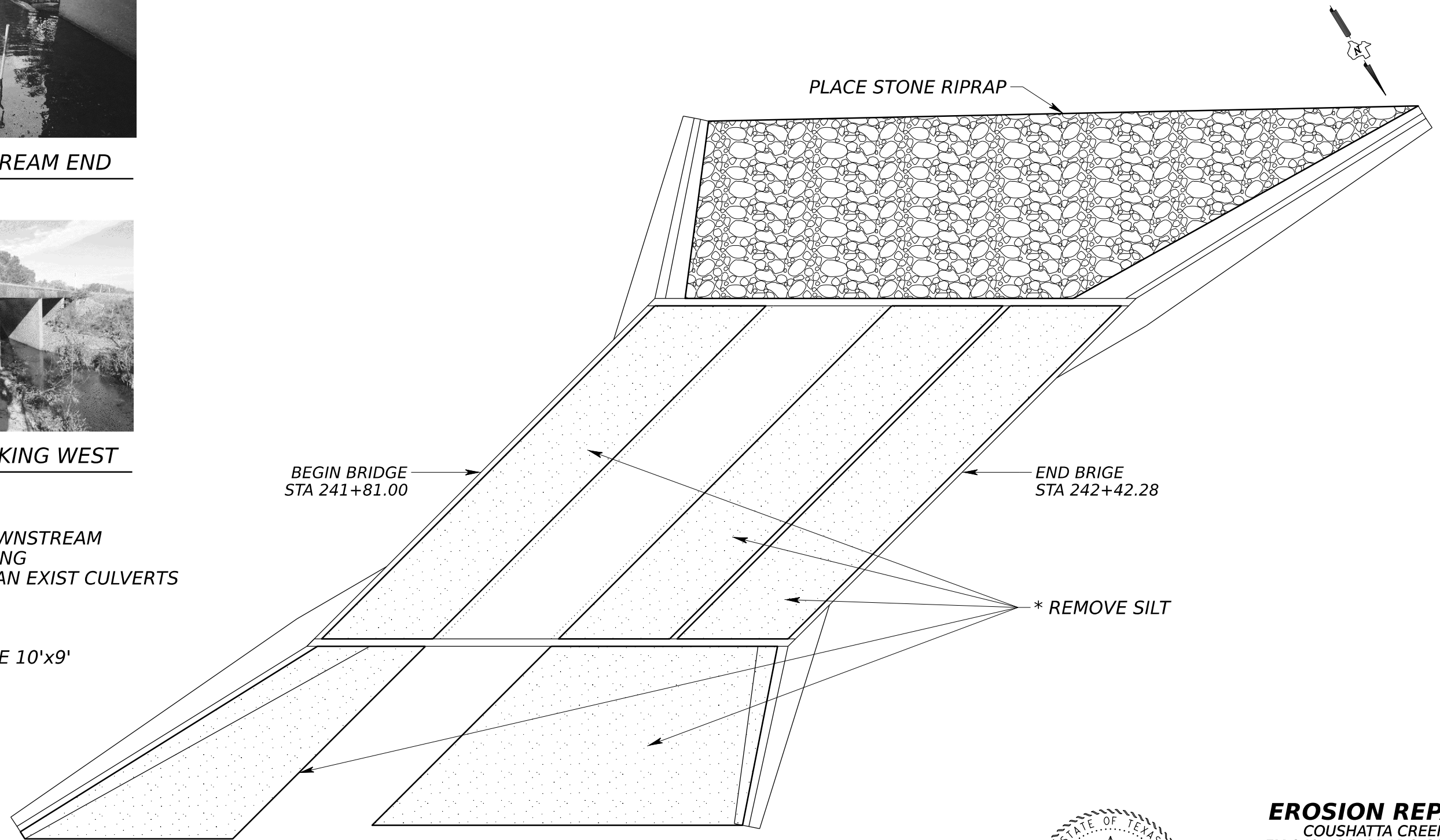
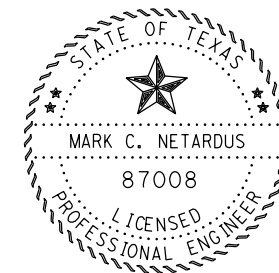


TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	70
480-6002	CLEAN EXIST CULVERTS	CY	180
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	40
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	40



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
COUSHATTA CREEK  
FM 949 - COLORADO COUNTY  
NBI # 13-045-0-1106-04-007

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FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	14



**NORTHWEST WINGWALL EROSION**



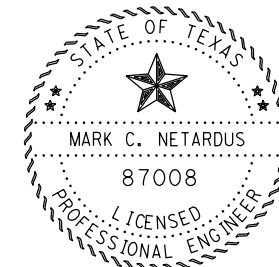
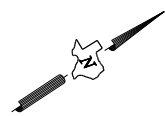
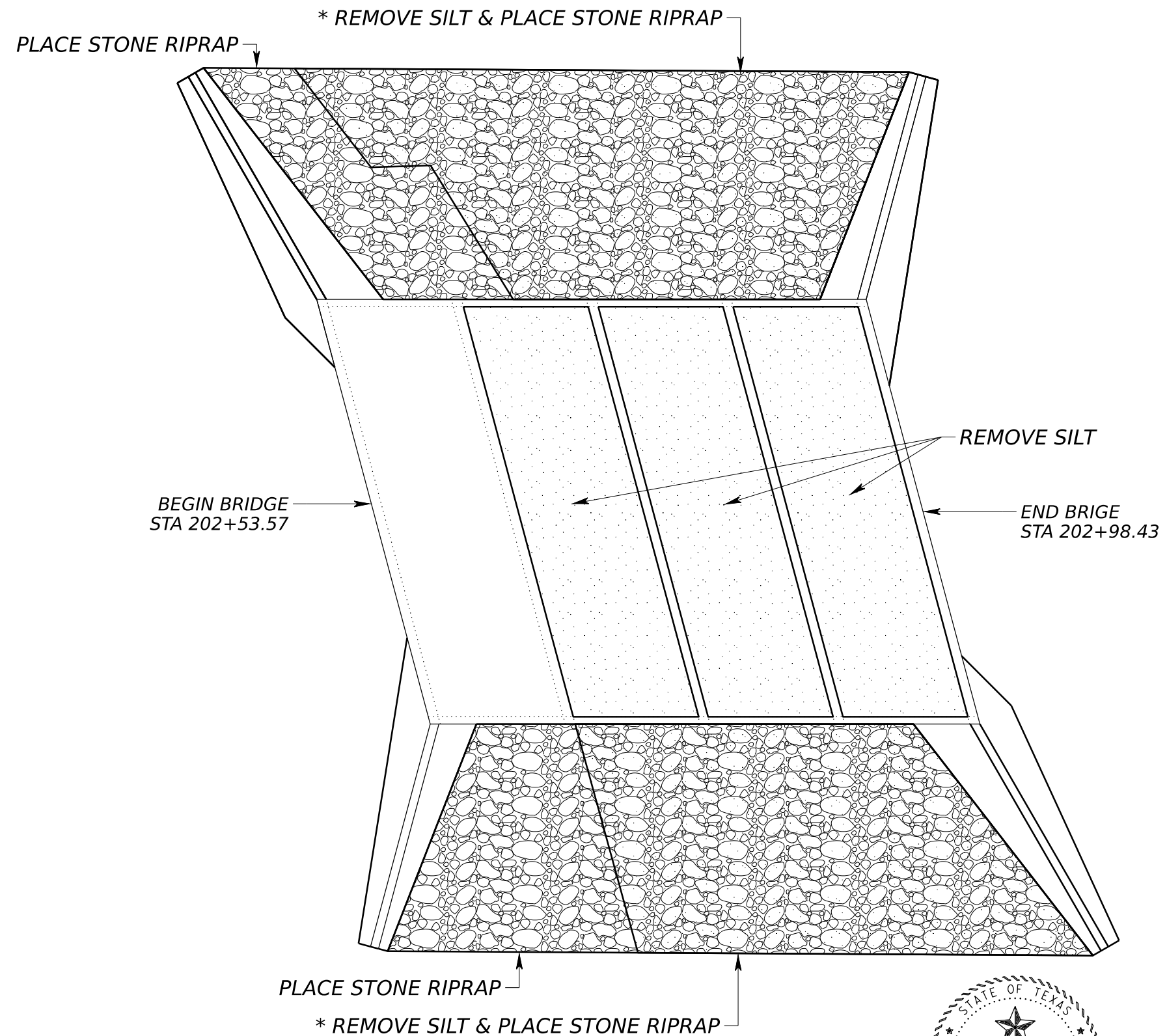
**SILT DEPOSIT**

\*SILT REMOVED UPSTREAM AND DOWNSTREAM TO BE PAID FOR USING ITEM 480-6002 CLEAN EXIST CULVERTS

NOTE:  
CULVERT BOXES ARE 10'x10'

LATITUDE: 29.71890465  
LONGITUDE: -96.34151199

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	140
480-6002	CLEAN EXIST CULVERTS	CY	130
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	40
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	40



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
CHURCH CREEK  
FM 2761 - COLORADO COUNTY  
NBI # 13-045-0-2715-01-002

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FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	15

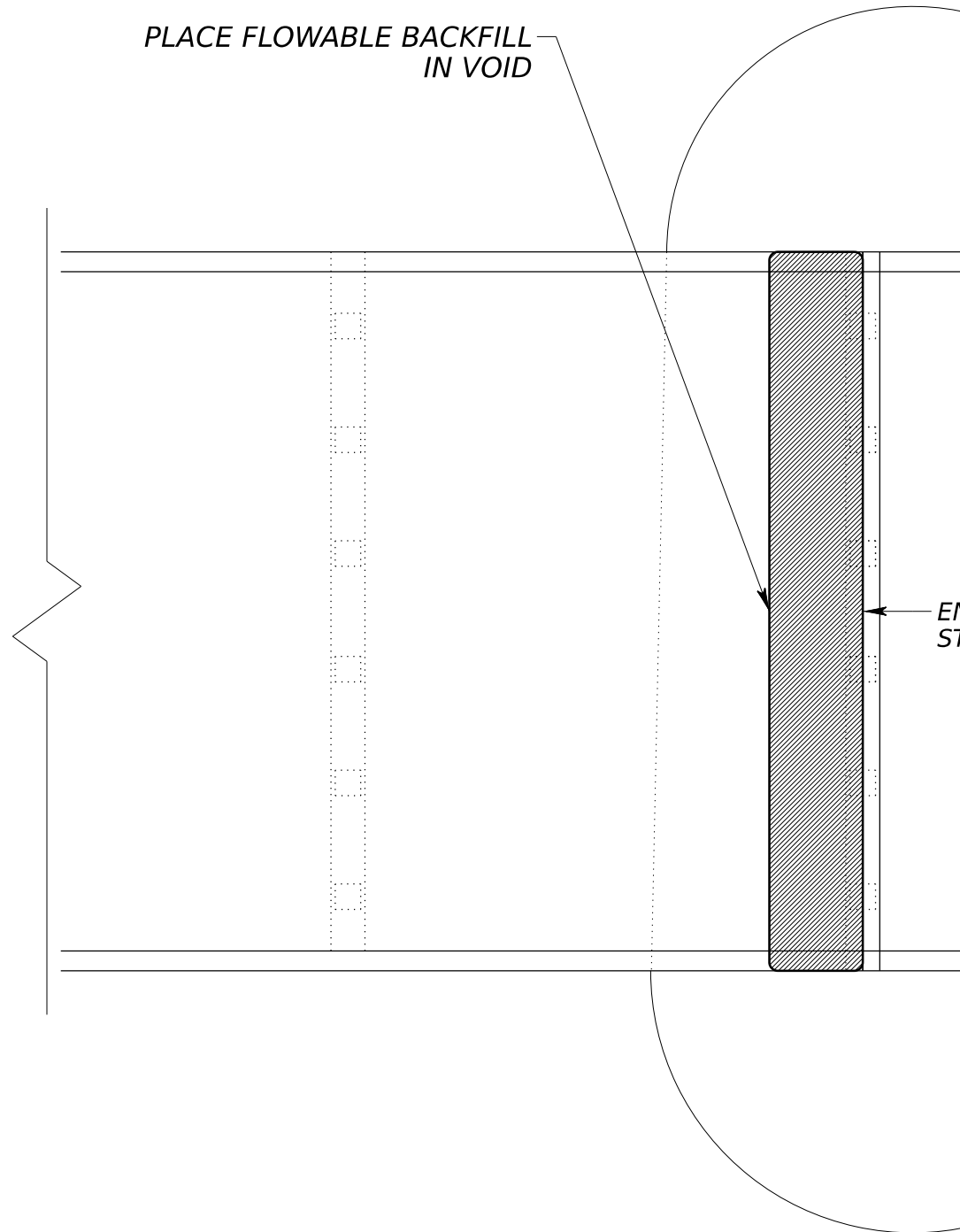


WEST ABUTMENT



ABUTMENT VOID

PLACE FLOWABLE BACKFILL  
IN VOID

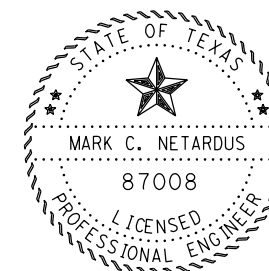


END BRIGE  
STA 1167+87.50

LATITUDE: 28.92310692  
LONGITUDE: -96.75503289

TABLE OF ESTIMATED QUANTITIES

ITEM	DESCRIPTION	UNIT	QUANTITY
401-6001	FLOWABLE BACKFILL	CY	3
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	10
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	10



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
W DRY CREEK  
US 59 SB - JACKSON COUNTY  
NBI # 13-121-0-0089-03-072

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FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	16

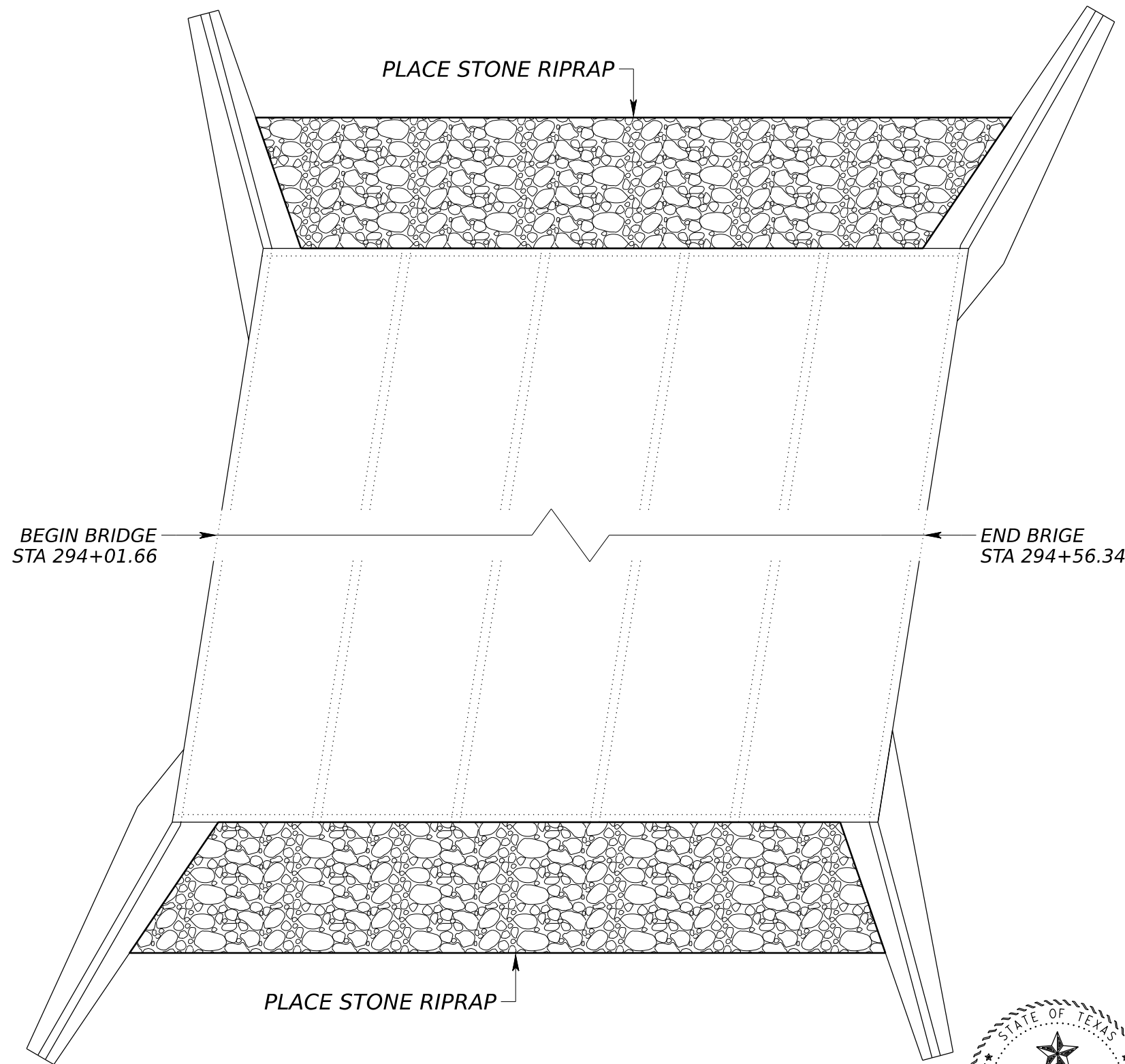




**DOWNSTREAM TOE WALL**

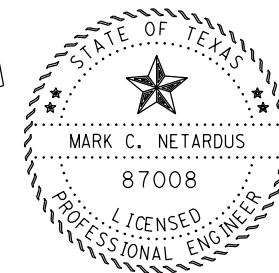


**UPSTREAM TOE WALL**



LATITUDE: 29.04238244  
 LONGITUDE: -96.52633614

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	88
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	40
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	40



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
 DEVERS CREEK  
 US 59 - JACKSON COUNTY  
 NBI # 13-121-0-0089-04-167

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FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	17



ROADWAY VIEW



SEDIMENT IN BARREL 4

\* THIS SITE WILL REQUIRE DE-WATERING. DE-WATERING IS CONSIDERED SUBSIDIARY TO ITEM 432-6033

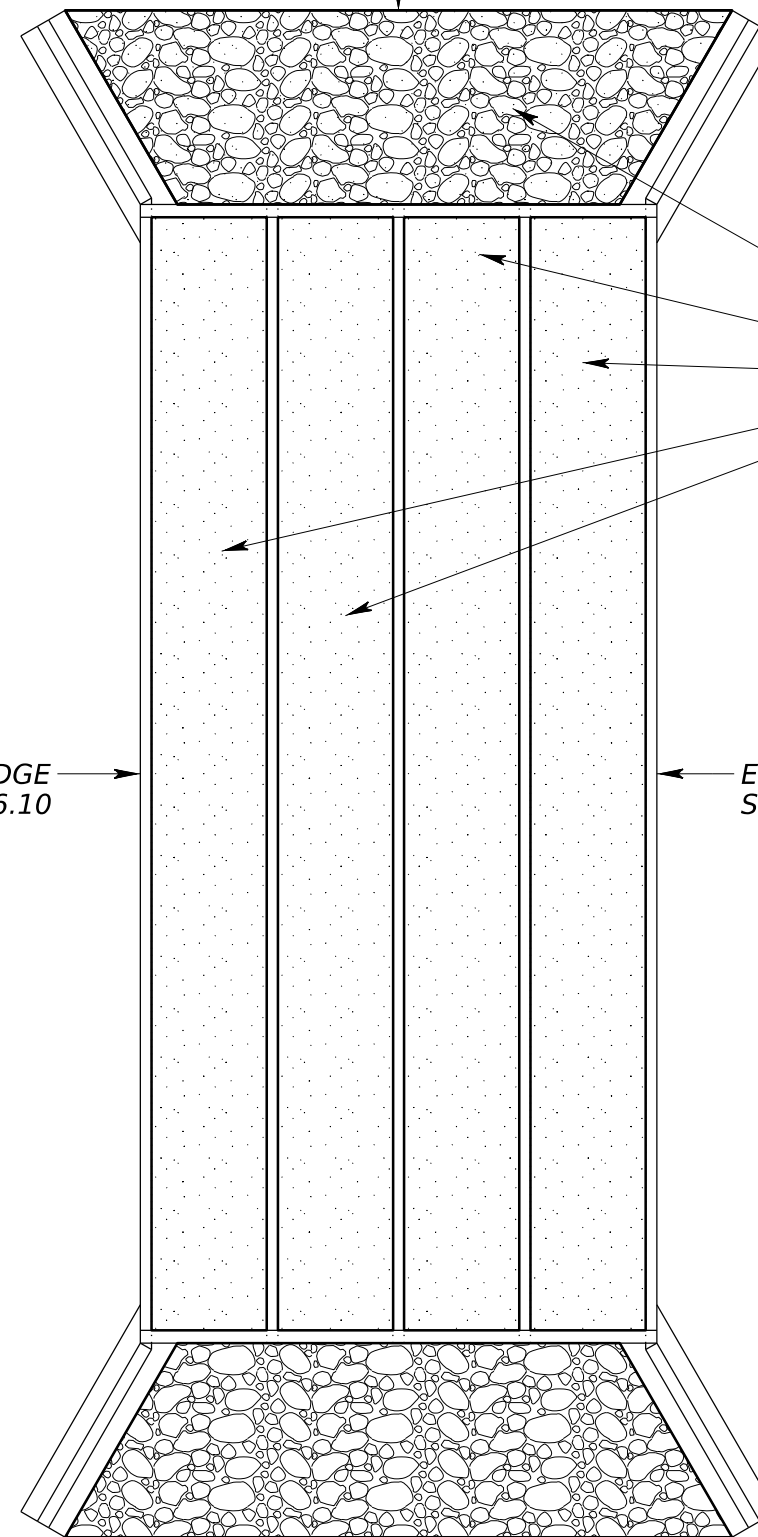
\*\* SILT REMOVED UPSTREAM TO BE PAID FOR USING ITEM 480-6002 CLEAN EXIST CULVERTS

NOTE:  
CULVERT BOXES ARE 6'x6'

LATITUDE: 28.76453288  
LONGITUDE: -96.4574094

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	50
480-6002	CLEAN EXIST CULVERTS	CY	184
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	10
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	10

\* PLACE STONE RIPRAP

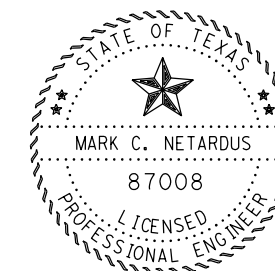


\*\* REMOVE SILT

BEGIN BRIDGE  
STA 224+56.10

END BRIDGE  
STA 224+83.43

\* PLACE STONE RIPRAP



Mark C. Netardus P.E.

12/13/2023

**EROSION REPAIR**  
DRAW  
SH 172 - JACKSON COUNTY  
NBI # 13-121-0-0420-02-003

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FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	18



WEST VIEW



EAST VIEW

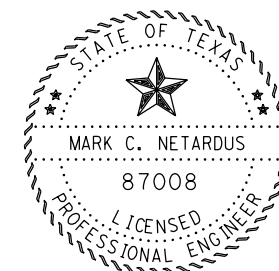
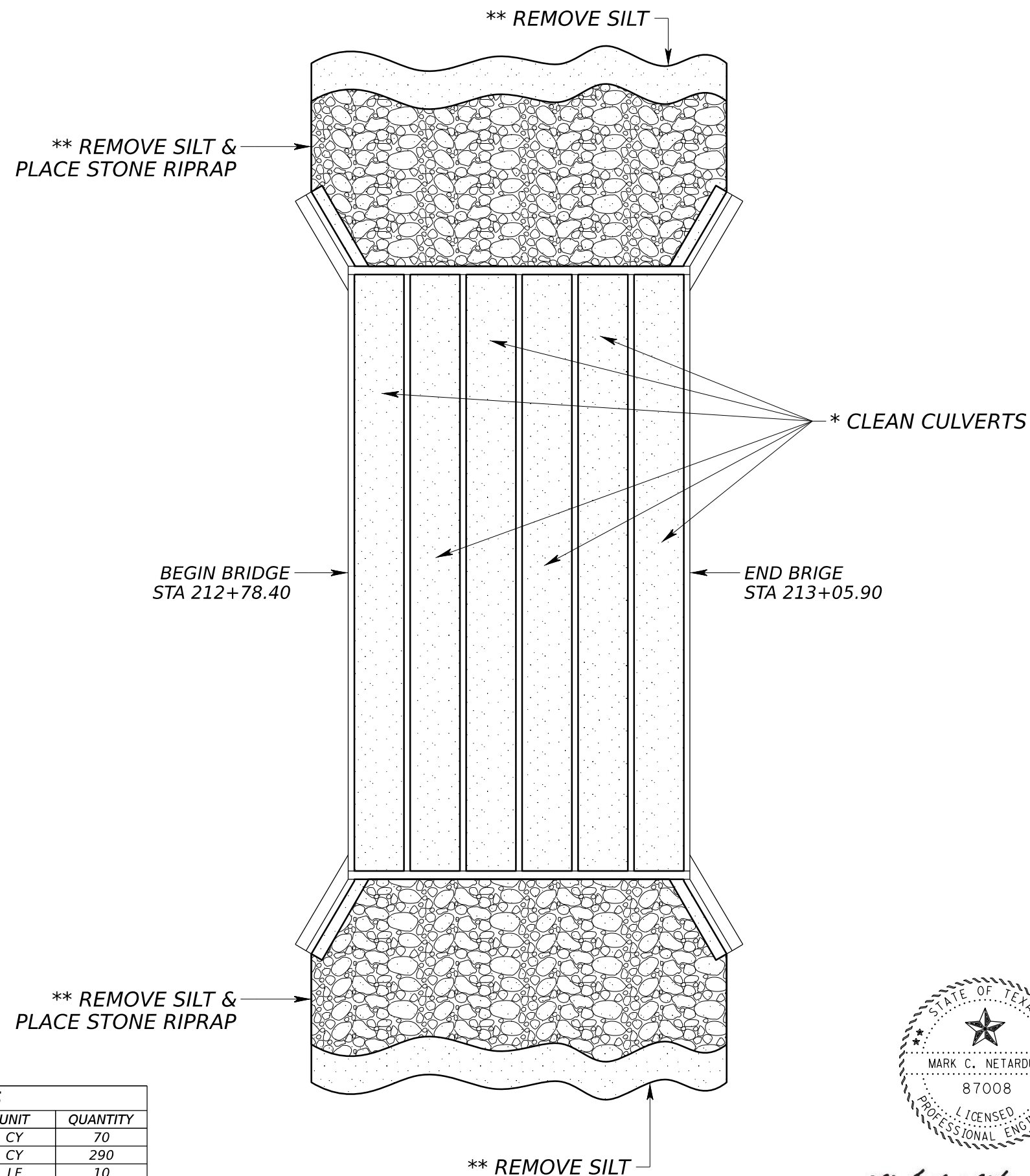
\* THIS SITE WILL REQUIRE DE-WATERING. DE-WATERING IS CONSIDERED SUBSIDIARY TO ITEM ITEM 480-6002

\*\* SILT REMOVED UPSTREAM AND DOWNSTREAM TO BE PAID FOR USING ITEM 480-6002 CLEAN EXIST CULVERTS

NOTE:  
CULVERT BOXES ARE 4'x4'

LATITUDE: 28.761308  
LONGITUDE: -96.45712442

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	70
480-6002	CLEAN EXIST CULVERTS	CY	290
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	10
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	10



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
DRAW  
SH 172 - JACKSON COUNTY  
NBI # 13-121-0-0420-02-004

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FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	19



WEST TOEWALL

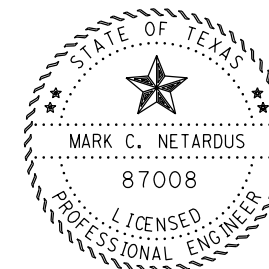
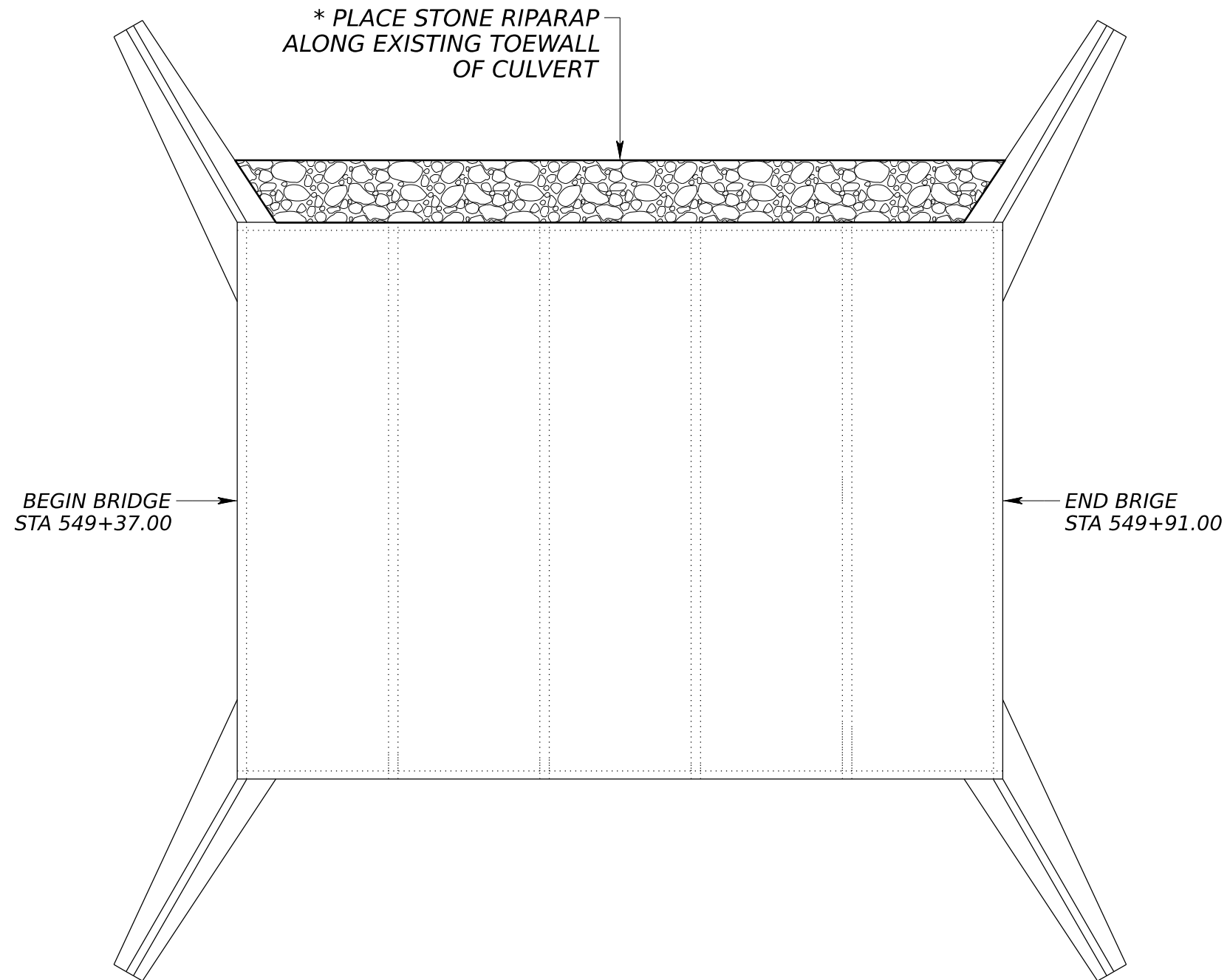


ROADWAY VIEW

\* THIS SITE WILL REQUIRE DE-WATERING. DE-WATERING IS CONSIDERED SUBSIDIARY TO ITEM 432-6033

LATITUDE: 29.13878681  
LONGITUDE: -96.63440861

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	25
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	30
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	30



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
BRUSHY CREEK  
FM 530 - JACKSON COUNTY  
NBI # 13-121-0-1090-01-010

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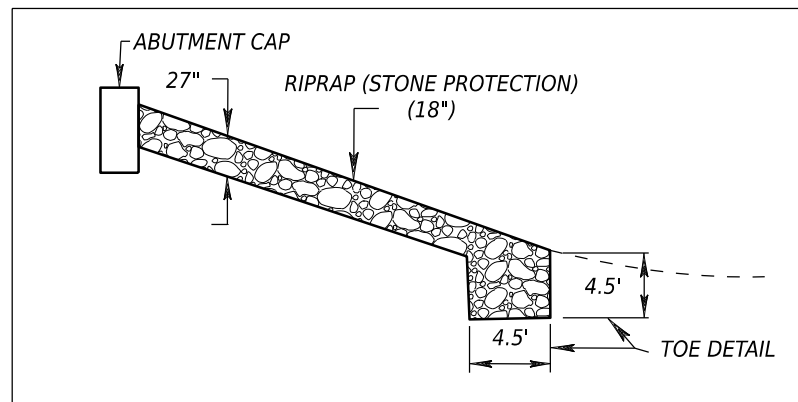
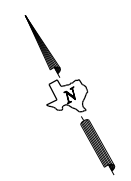
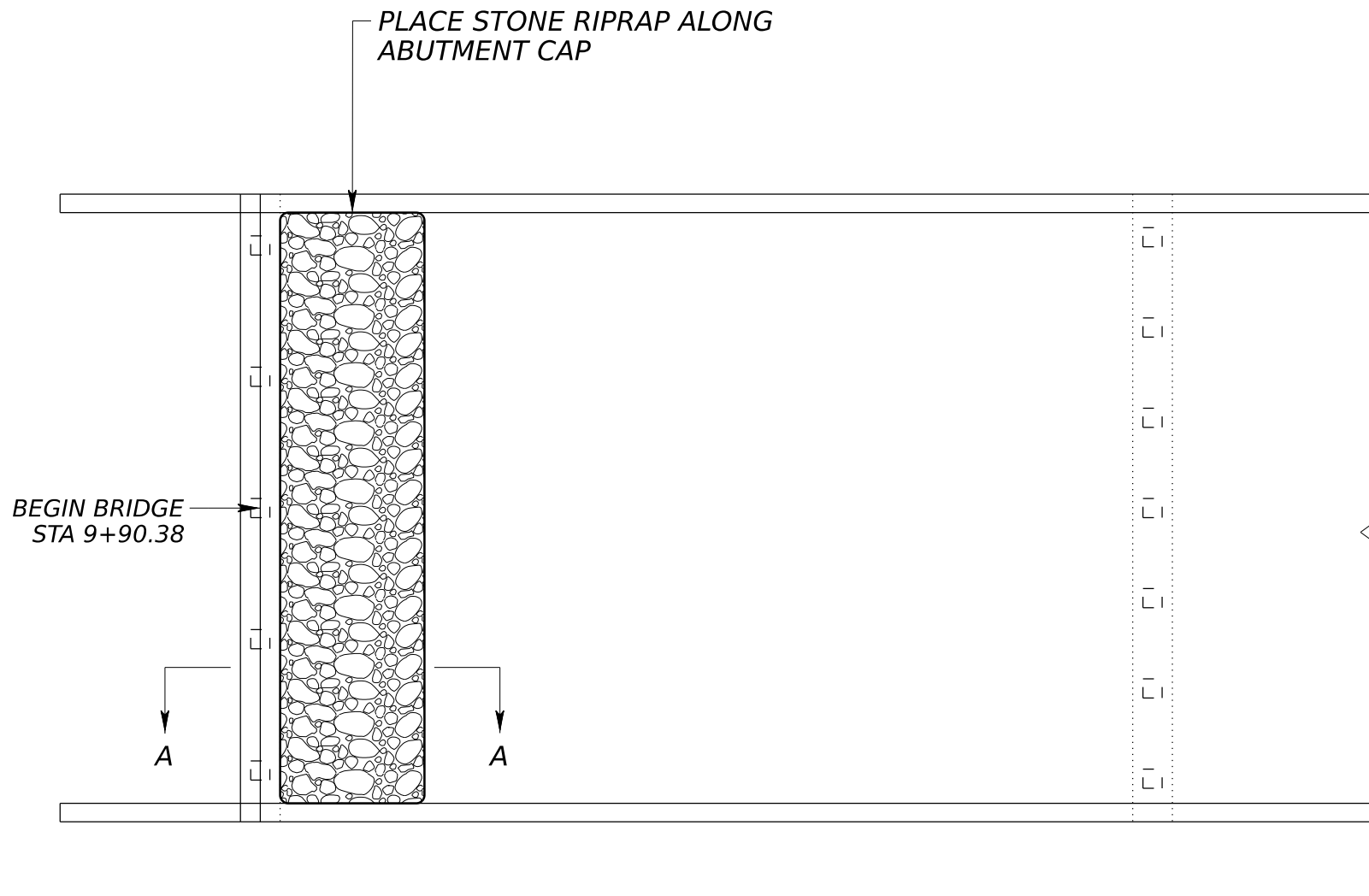
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6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	20



ABUTMENT 1



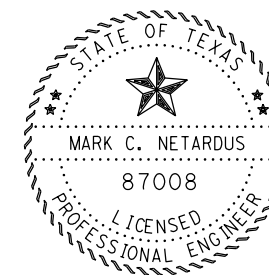
ROADWAY VIEW



SECTION A-A

LATITUDE: 28.88821764  
 LONGITUDE: -96.55369213

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	30
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	10
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	10



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
 PALMETTO DAM E DRAIN  
 FM 3131 - JACKSON COUNTY  
 NBI # 13-121-0-1756-01-003

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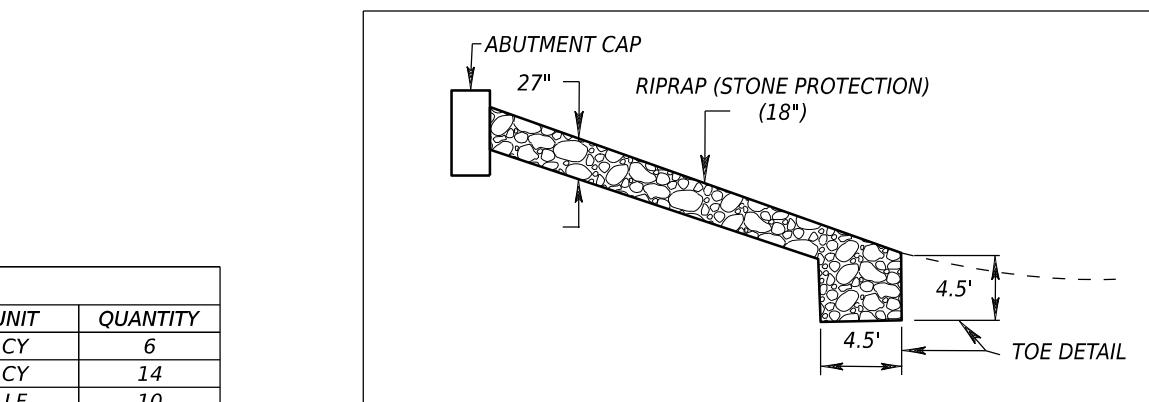
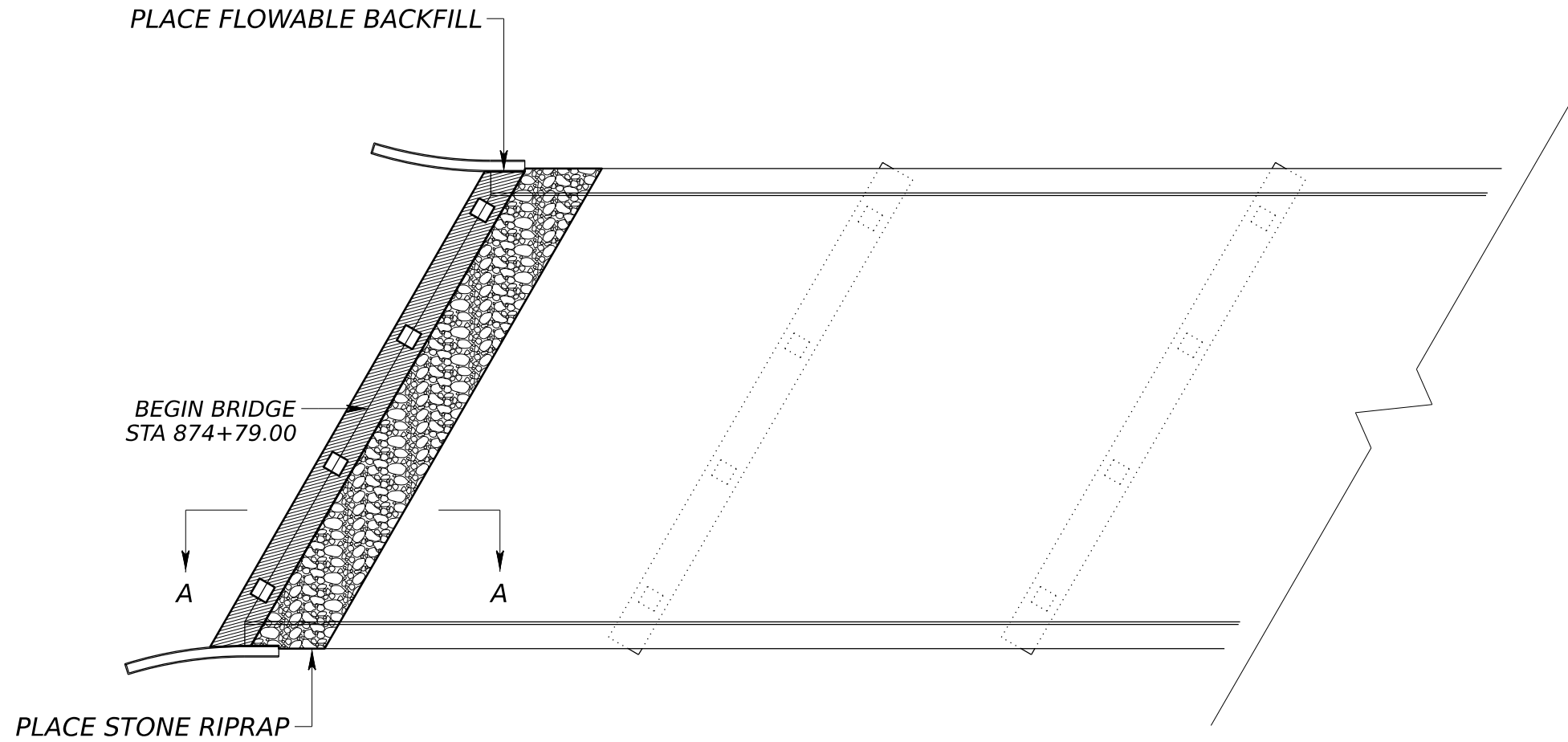
FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	21



NORTHWEST ABUTMENT



ROADWAY VIEW

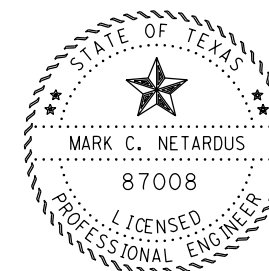


SECTION A-A

LATITUDE: 28.92592808  
 LONGITUDE: -95.70832163

TABLE OF ESTIMATED QUANTITIES

ITEM	DESCRIPTION	UNIT	QUANTITY
401-6001	FLOWABLE BACKFILL	CY	6
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	14
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	10
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	10



*Mark C. Netardus P.E.*

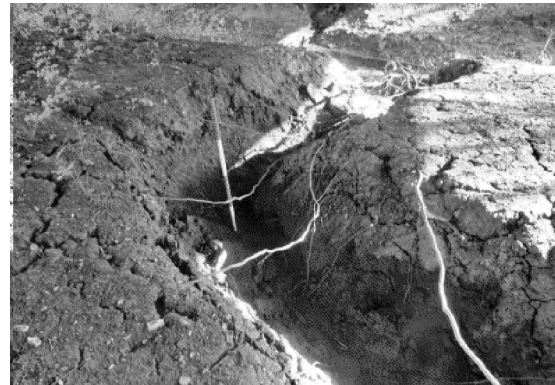
12/13/2023

**EROSION REPAIR**  
 DEAD SLOUGH  
 FM 457 - MATAGORDA COUNTY  
 NBI # 13-158-0-0605-01-012

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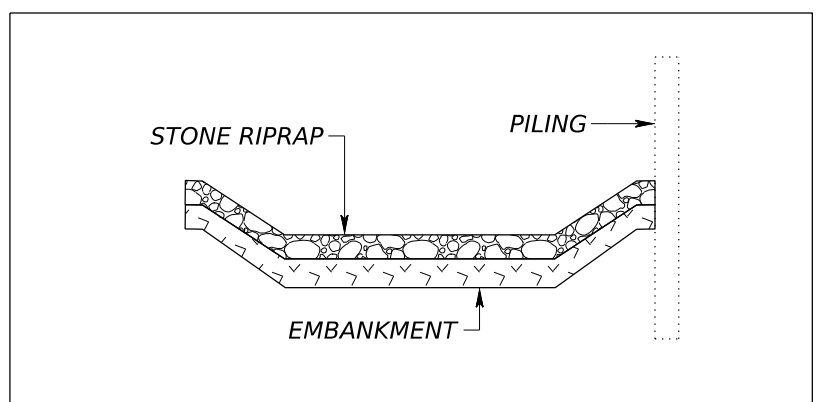
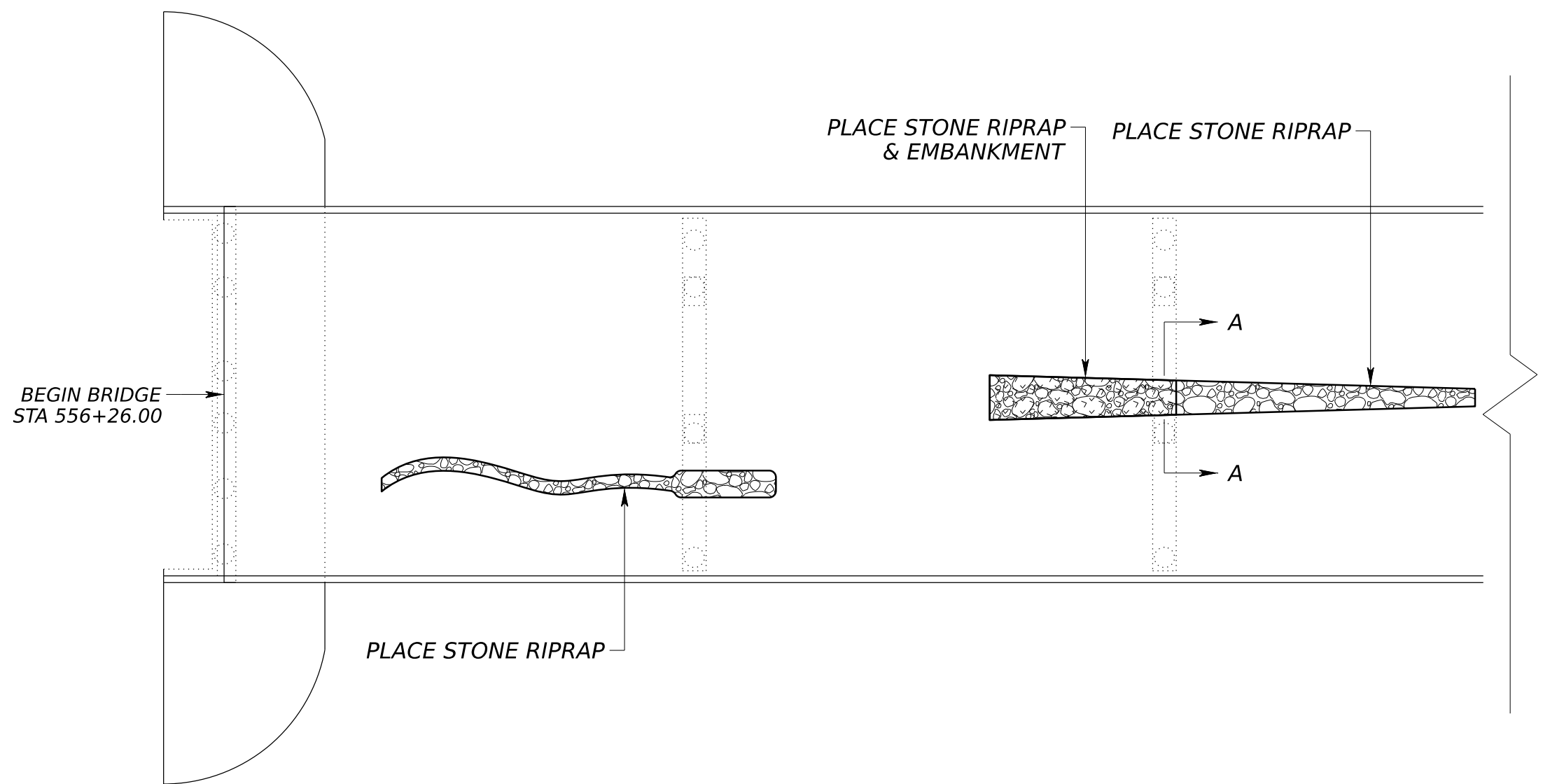
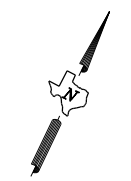
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6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	22



**SOUTHWEST BANK EROSION**

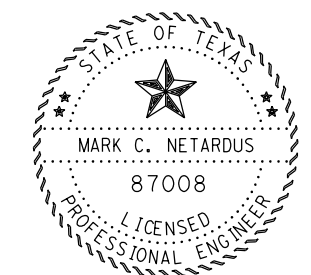


**NORTHEAST BANK EROSION**



LATITUDE: 28.79563700  
LONGITUDE: -95.98021600

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
132-6021	EMBANKMENT (VEHICLE) (ORD COMP)(TY C)	CY	17
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	20
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	20
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	20



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
COLORADO RIVER RELIEF  
FM 521 - MATAGORDA COUNTY  
NBI # 13-158-0-0846-03-017

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FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	23

PATH: T:\YK\TRAFFIC\Design Projects\FY 24\644795001\_BPM\_FY24\Plan\_Sheets\  
FILE: 25\_MATAGORDA\_FM521\_Colorado\_River\_Relief\_131580084603017.dgn  
DATE: 12/13/2023

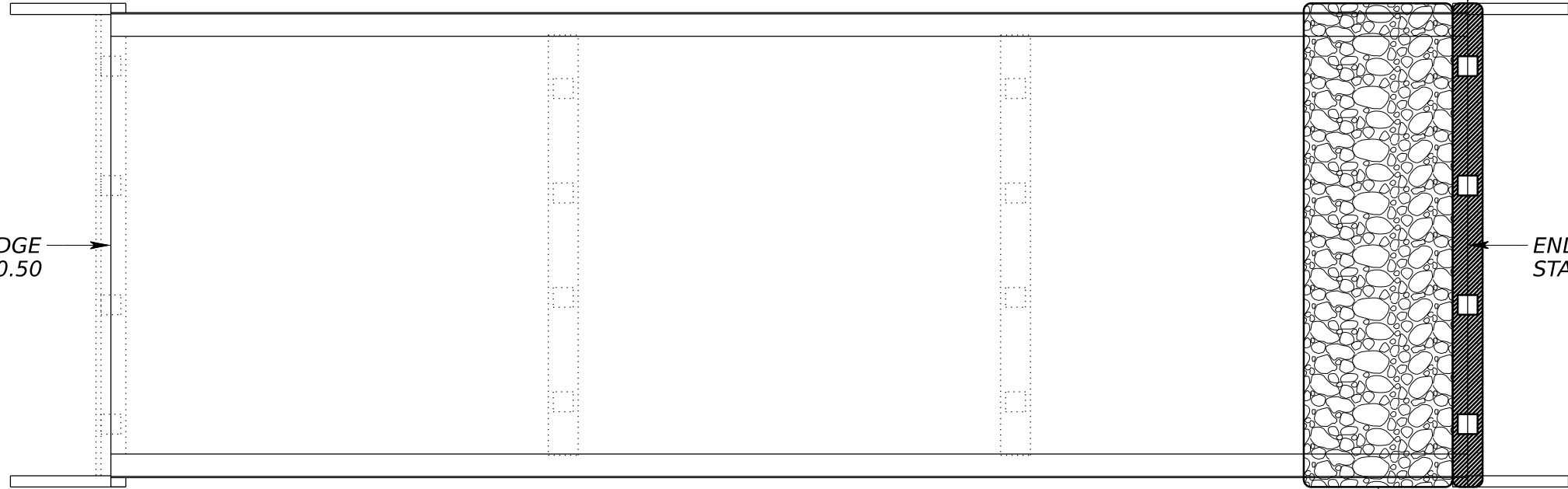


**SOUTHWEST ABUTMENT**



**ROADWAY VIEW**

BEGIN BRIDGE  
STA 49+30.50



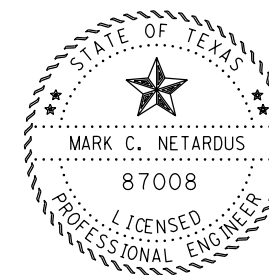
END BRIDGE  
STA 50+30.50

PLACE STONE RIPRAP  
ALONG ABUTMENT

LATITUDE: 28.93008200  
LONGITUDE: -95.97465000

**TABLE OF ESTIMATED QUANTITIES**

ITEM	DESCRIPTION	UNIT	QUANTITY
401-6001	FLOWABLE BACKFILL	CY	6
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	28
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	20
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	20



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
LIVE OAK CREEK  
FM 2668 - MATAGORDA COUNTY  
NBI # 13-158-0-2697-01-001

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FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	24



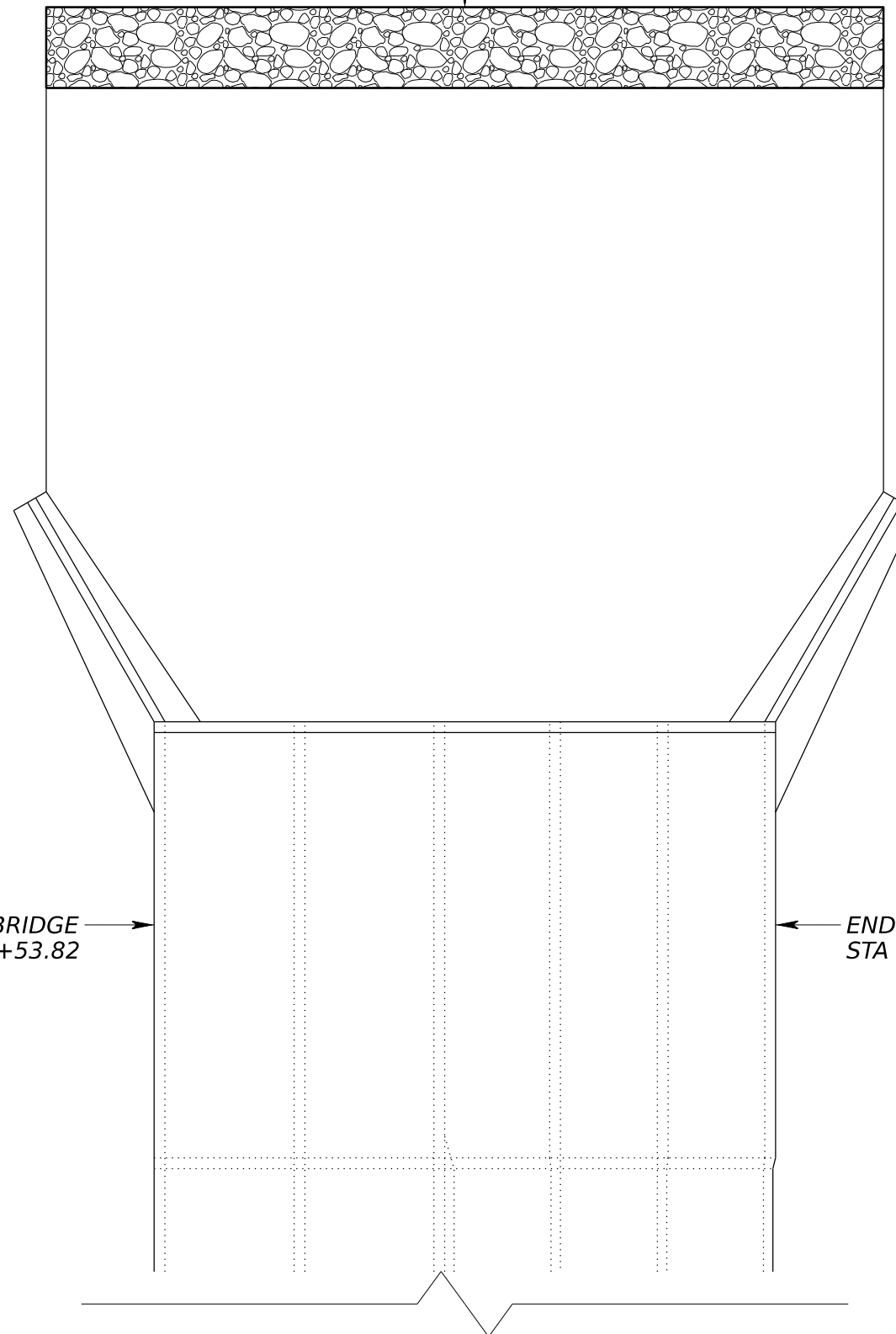


UPSTREAM APRON



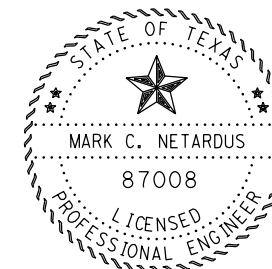
UPSTREAM APRON

PLACE STONE RIPRAP  
ALONG EXIST CONC APRON



LATITUDE: 28.77233500  
LONGITUDE: -96.98120400

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	22
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	10
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	10



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
JIM BRANCH  
SH 185 - VICTORIA COUNTY  
NBI # 13-235-0-0432-02-013

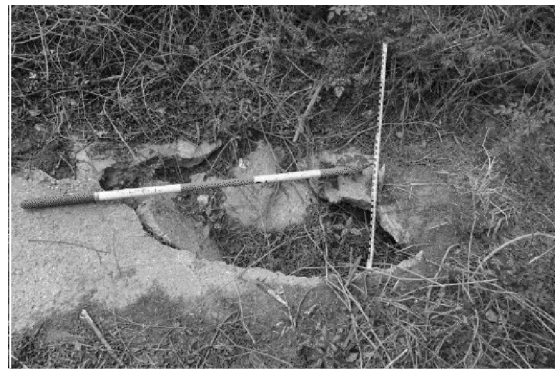
NOT TO SCALE

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FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	25

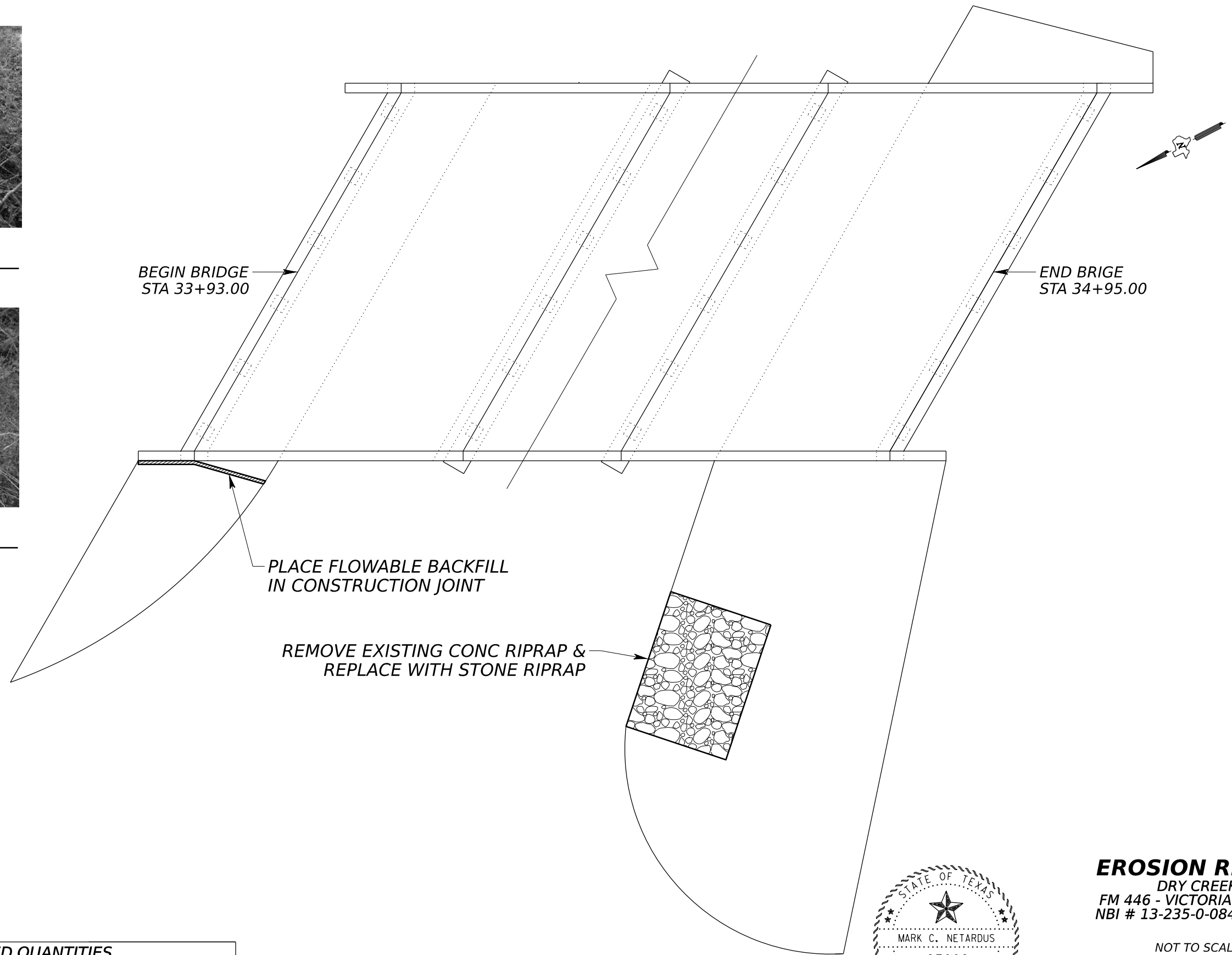


WEST RIPRAP HOLE



WEST RIPRAP HOLE

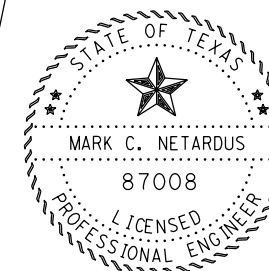
NOTE:  
BROKEN CONCRETE REMOVED  
UNDER THIS CONTRACT MAY BE  
USED FOR THE RIPRAP STONE  
PROTECTION ITEM.



LATITUDE: 28.76650379  
LONGITUDE: -97.05510484

TABLE OF ESTIMATED QUANTITIES

ITEM	DESCRIPTION	UNIT	QUANTITY
401-6001	FLOWABLE BACKFILL	CY	1
104-6009	REMOVING CONC (RIPRAP)	SY	12
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	10
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	10
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	10



*Mark C. Netardus P.E.*

12/14/2023

**EROSION REPAIR**  
DRY CREEK  
FM 446 - VICTORIA COUNTY  
NBI # 13-235-0-0841-01-007

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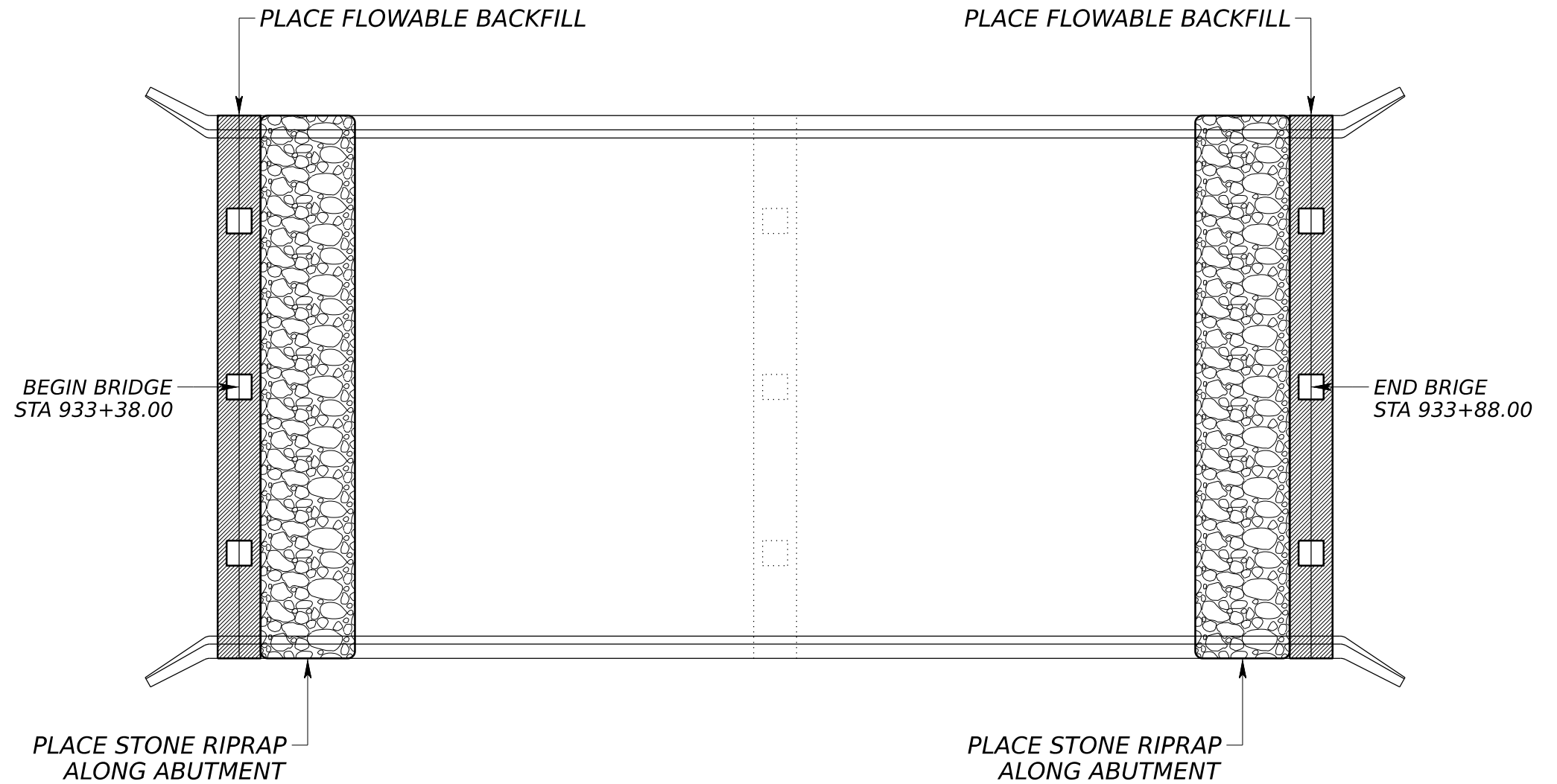
FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	26



NORTHEAST ABUTMENT

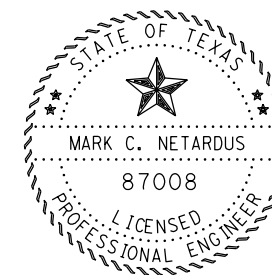


SOUTHWEST ABUTMENT



LATITUDE: 28.70169072  
 LONGITUDE: -96.89490269

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
401-6001	FLOWABLE BACKFILL	CY	8
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	42
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	20
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	20



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
 CHOCOLATE BAYOU  
 FM 1686 - VICTORIA COUNTY  
 NBI # 13-235-0-1132-01-006

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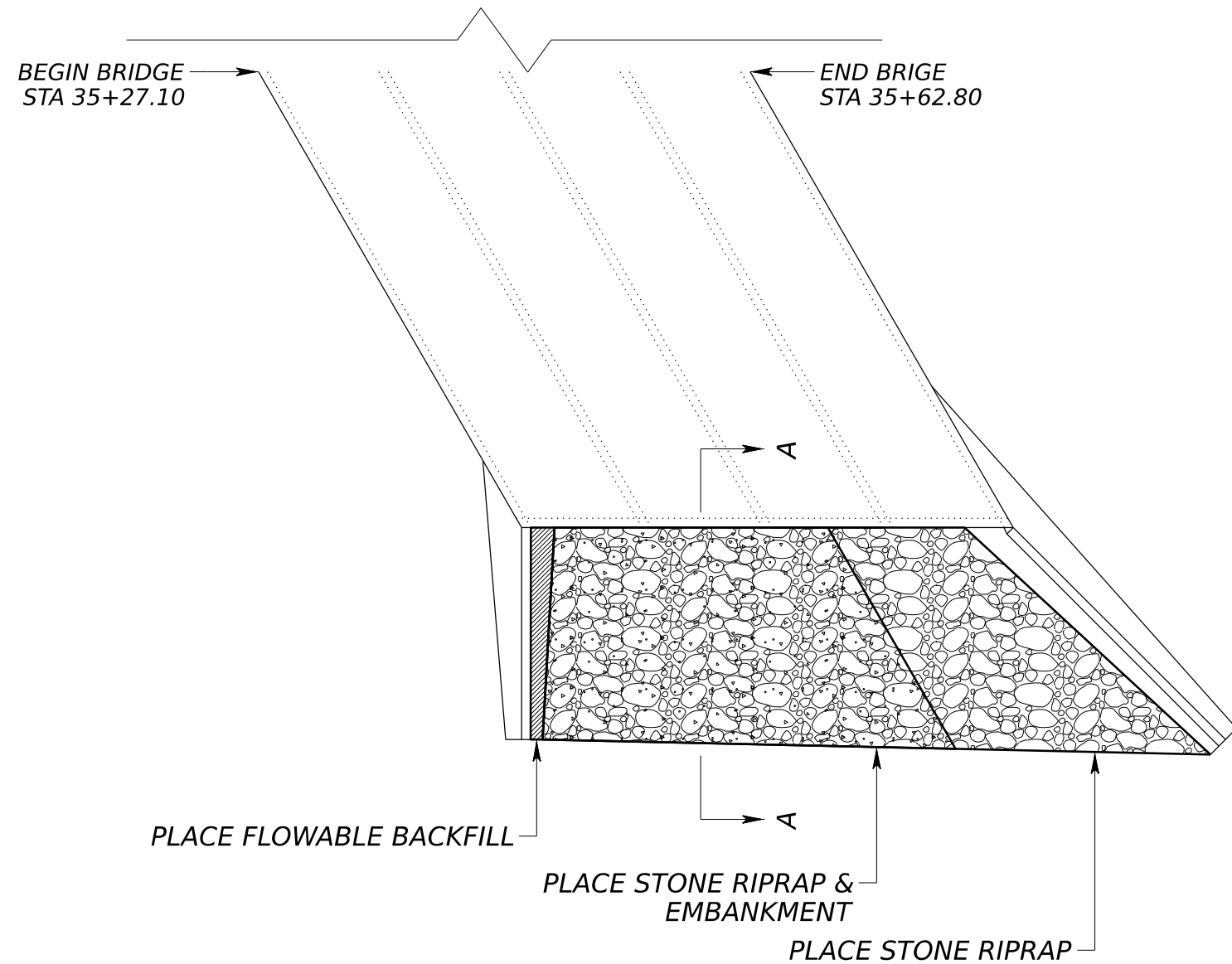
FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	27



**SOUTHWEST WINGWALL**

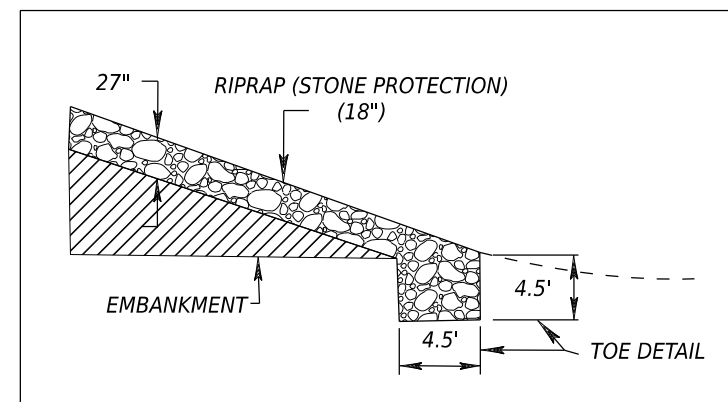


**SOUTHEAST WINGWALL**

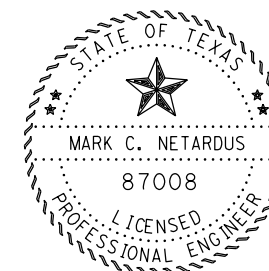


LATITUDE: 28.79758632  
 LONGITUDE: -97.03643304

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
132-6021	EMBANKMENT (VEHICLE) (ORD COMP)(TY C)	CY	56
401-6001	FLOWABLE BACKFILL	CY	4
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	88
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	20
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	20



**SECTION A-A**



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
 DRAW  
 FM 1685 - VICTORIA COUNTY  
 NBI # 13-235-0-1698-01-003

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FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	28

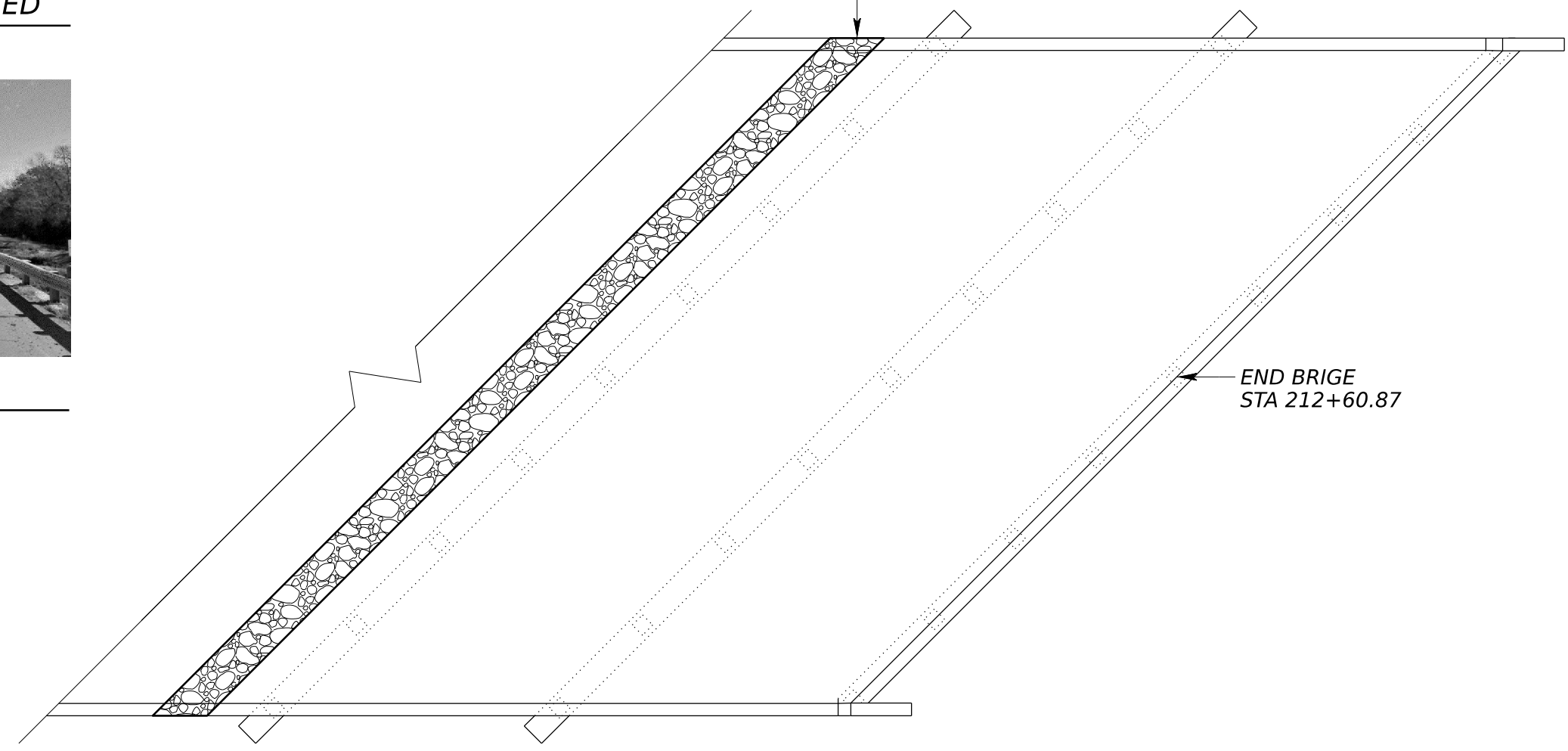


**EAST TOEWALL EXPOSED**



**ROADWAY VIEW**

PLACE STONE RIPRAP  
ALONG TOEWALL

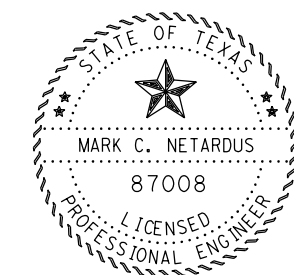


END BRIGE  
STA 212+60.87

\* THIS SITE WILL  
REQUIRE DE-WATERING.  
DE-WATERING IS  
CONSIDERED SUBSIDIARY  
TO ITEM 432-6033

LATITUDE: 29.12170278  
LONGITUDE: -96.4013291

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	20
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	10
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	10



*Mark C. Netardus P.E.*

12/13/2023

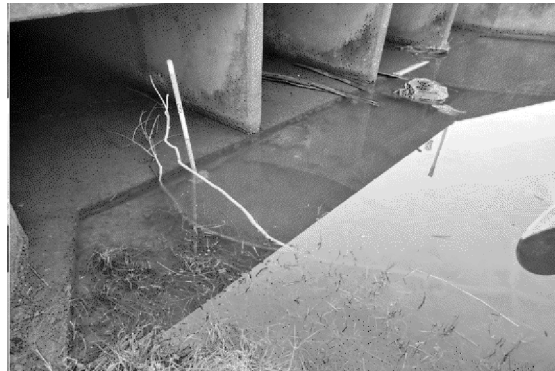
**EROSION REPAIR**  
EAST MUSTANG CREEK  
US 59 NB - WHARTON COUNTY  
NBI # 13-241-0-0089-06-179

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FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	29

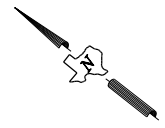
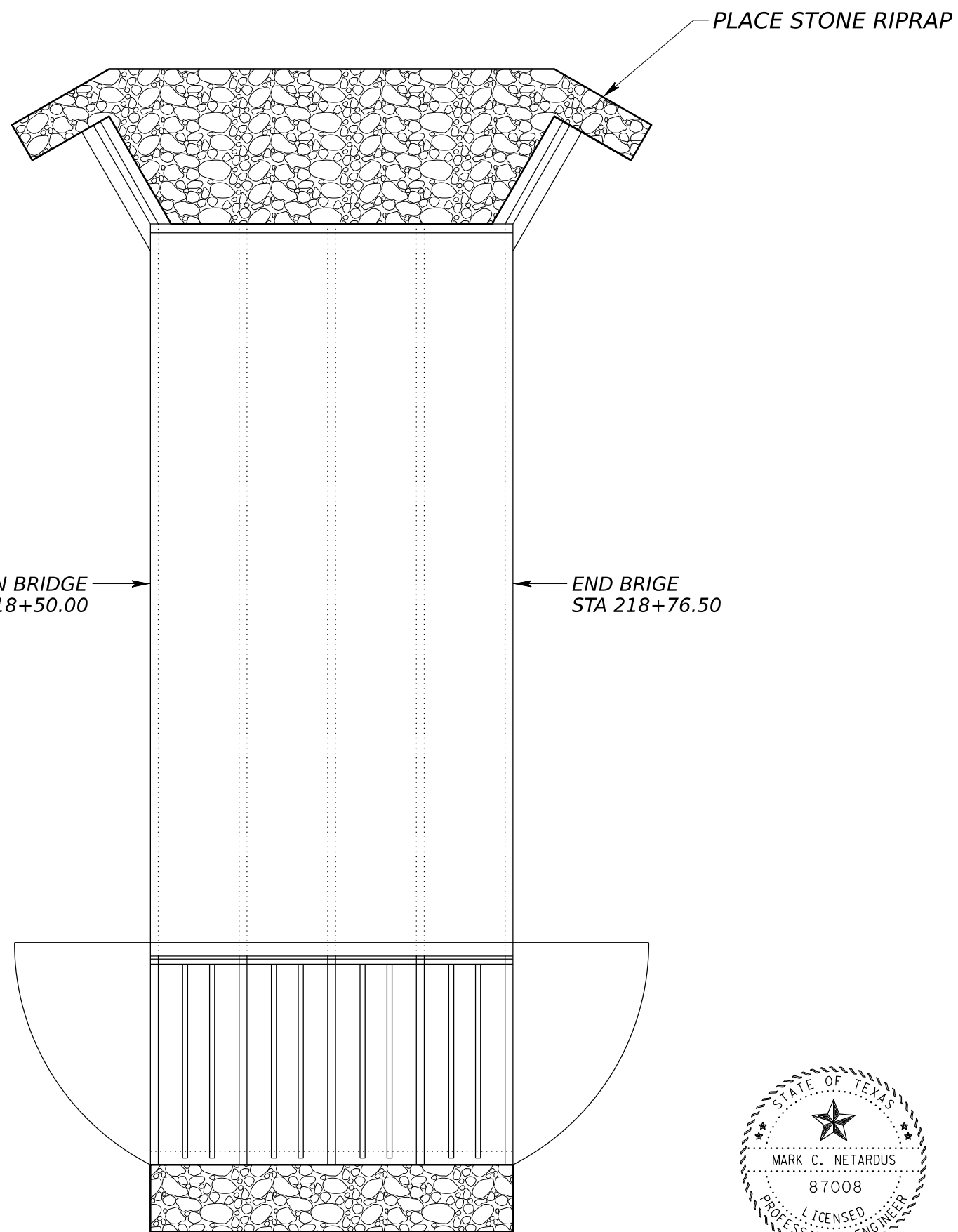
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DATE: 12/13/2023



**NORTHEAST SCOUR**

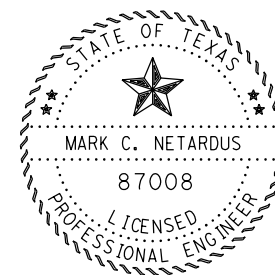


**NORTH CORNER**



LATITUDE: 29.07583022  
 LONGITUDE: -96.21271934

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	44
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	10
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	10



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
 DRAW  
 SH 71 - WHARTON COUNTY  
 NBI # 13-241-0-0266-06-038

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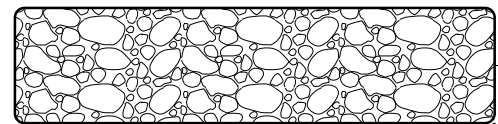
FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	30



NORTHEAST DITCH



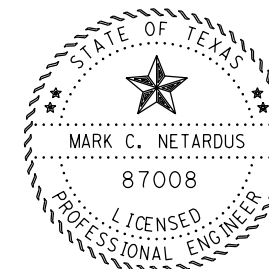
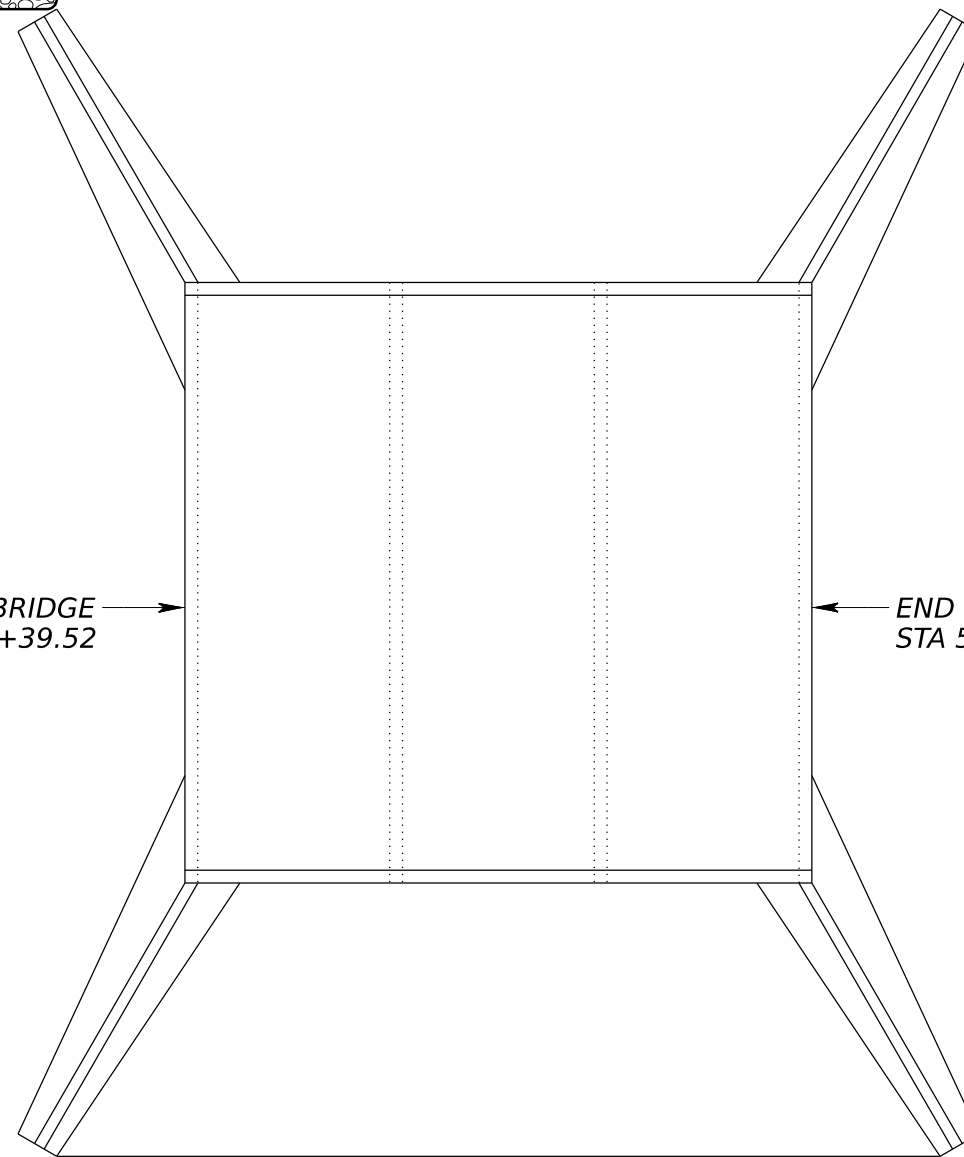
ROADWAY VIEW



PLACE STONE RIPRAP  
IN DITCH

BEGIN BRIDGE  
STA 57+39.52

END BRIDGE  
STA 57+72.19



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
STAGE STAND CREEK  
FM 441 - WHARTON COUNTY  
NBI # 13-241-0-0837-02-006

NOT TO SCALE

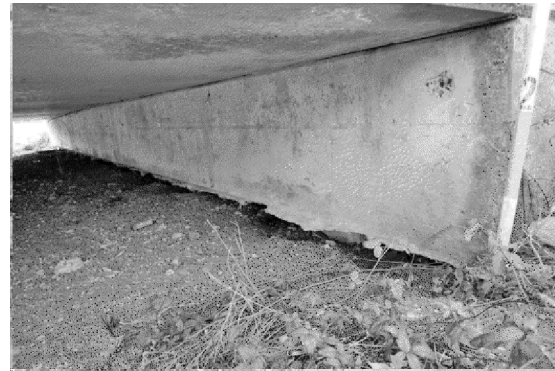
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LATITUDE: 29.13352284  
LONGITUDE: -96.34252641

**TABLE OF ESTIMATED QUANTITIES**

ITEM	DESCRIPTION	UNIT	QUANTITY
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	20
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	10
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	10

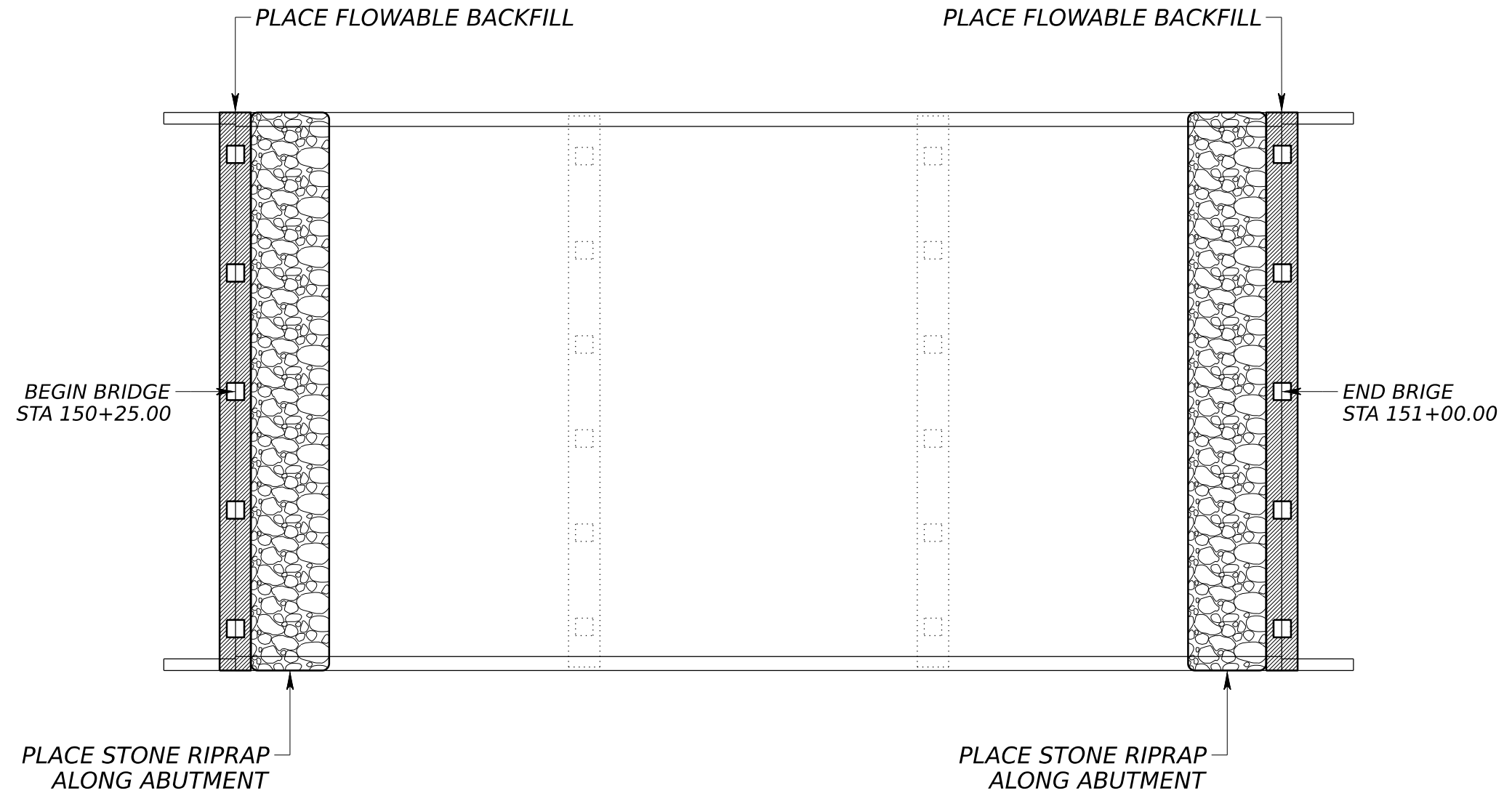
FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	31



NORTHEAST ABUTMENT

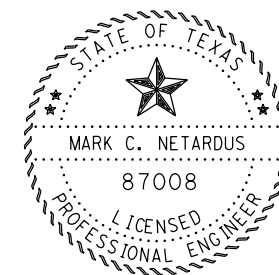


SOUTHWEST ABUTMENT



LATITUDE: 29.29267215  
 LONGITUDE: -95.91472653

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
401-6001	FLOWABLE BACKFILL	CY	10
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	38
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	20
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	20



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
 DRAW  
 FM 442 - WHARTON COUNTY  
 NBI # 13-241-0-0838-01-017

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FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	32

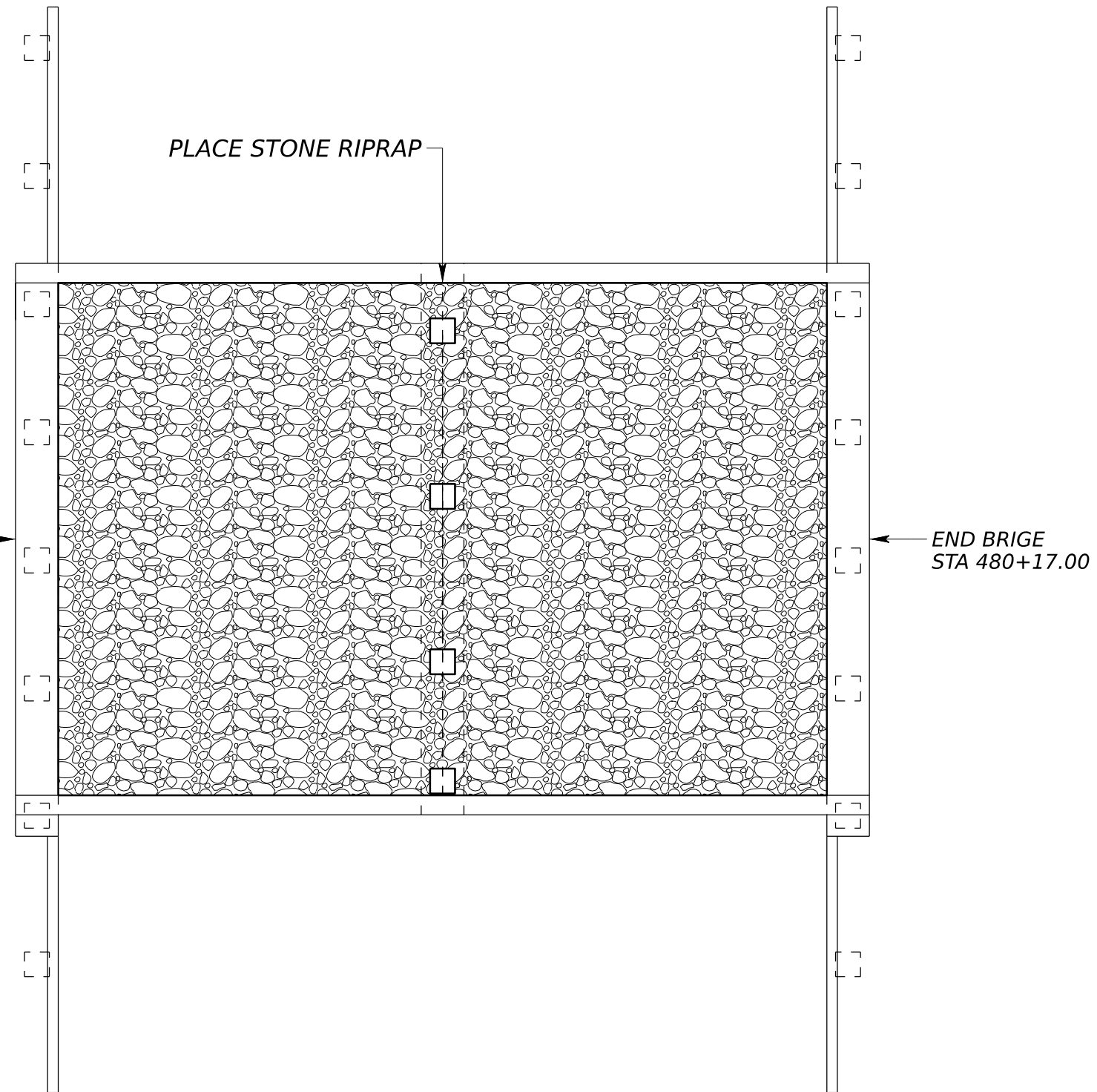




SCOUT AT BENT

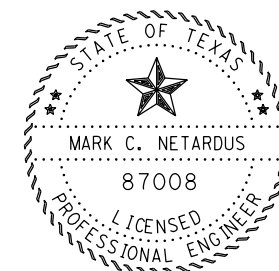


ABUTMENT WALLS



LATITUDE: 29.04093899  
 LONGITUDE: -96.31216326

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
432-6033	RIPRAP (STONE PROTECTION)(18")	CY	110
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	10
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	10



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
 EAST CARANCAHUA CREEK  
 FM 441 - WHARTON COUNTY  
 NBI # 13-241-0-1302-03-008

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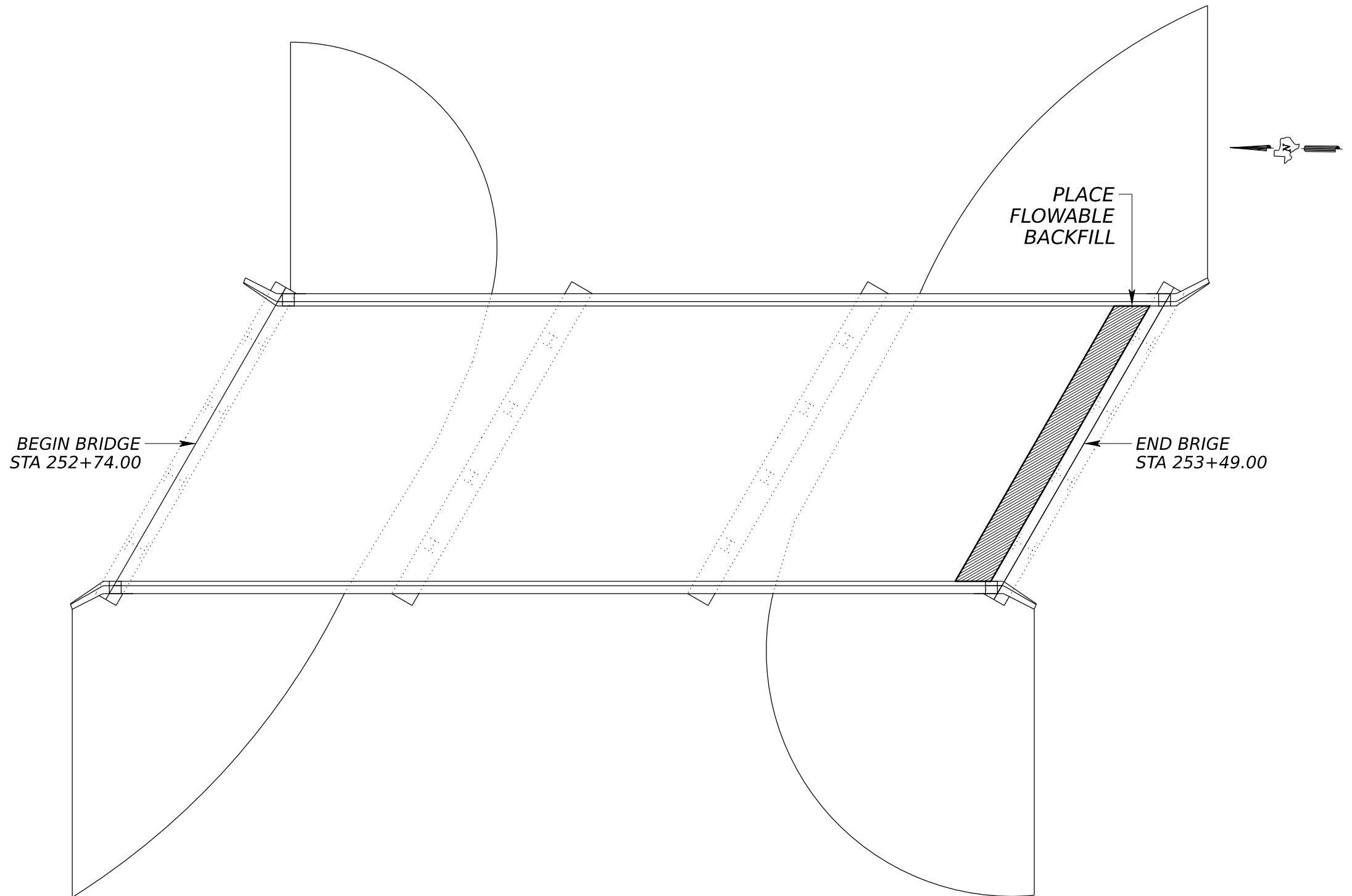
FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	33



**SOUTH ABUTMENT RIPRAP**

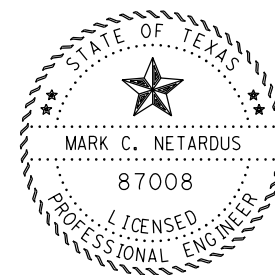


**ROADWAY VIEW**



LATITUDE: 29.17699595  
 LONGITUDE: -96.19461926

TABLE OF ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	UNIT	QUANTITY
401-6001	FLOWABLE BACKFILL	CY	3
506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	10
506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	10



*Mark C. Netardus P.E.*

12/13/2023

**EROSION REPAIR**  
 BLUE CREEK  
 FM 1162 - WHARTON COUNTY  
 NBI # 13-241-0-1304-01-004

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FED. RD. DIV. NO.		PROJECT NO.	
6			
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	YKM	VICTORIA, ETC.	34

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

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

DATE: 12/13/2023 \$TIME\$  
 FILE: \$FILES\$


**WORKER SAFETY NOTES:**

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

**COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES**

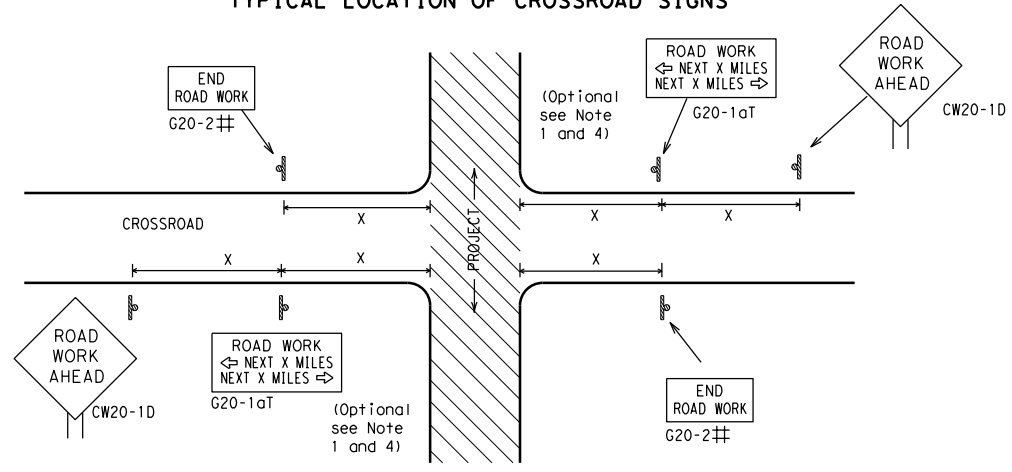
1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

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

 Texas Department of Transportation		Traffic Safety Division Standard	
<p><b>BARRICADE AND CONSTRUCTION          GENERAL NOTES          AND REQUIREMENTS</b></p> <p><b>BC (1) - 21</b></p>			
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	HW: TxDOT
© TxDOT November 2002	CONT	SECT	JOB
REVISIONS		6447 95	001, ETC. US 77, ETC.
4-03 7-13			
9-07 8-14			
5-10 5-21			
	DIST	COUNTY	SHEET NO.
	YKM	VICTORIA , ETC.	<b>35</b>

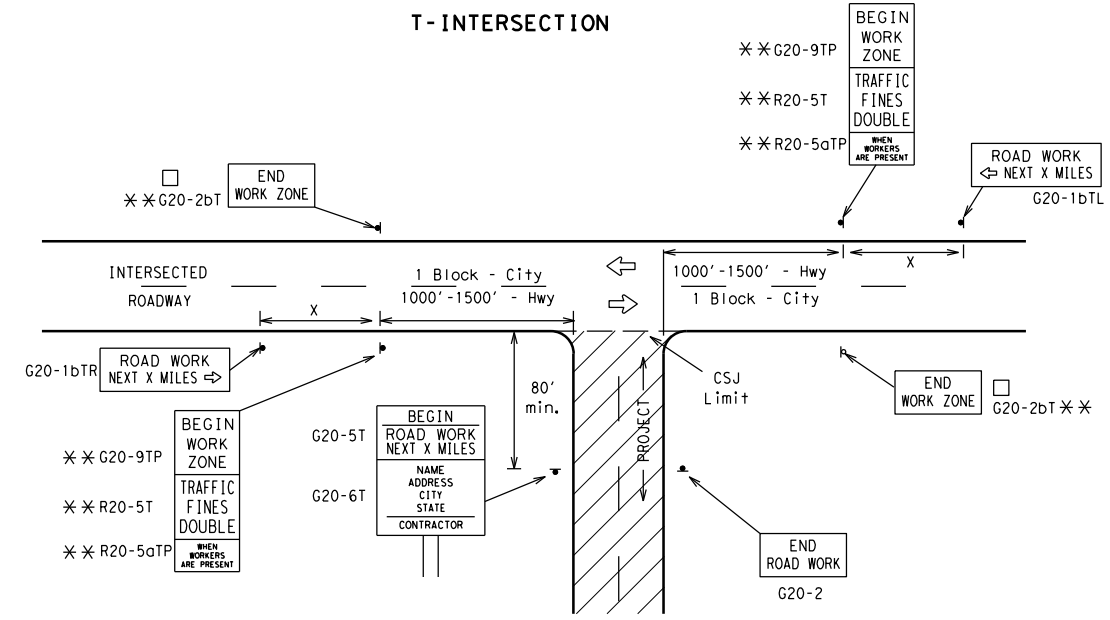
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**TYPICAL LOCATION OF CROSSROAD SIGNS**



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

**T-INTERSECTION**



**CSJ LIMITS AT T-INTERSECTION**

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

**TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING<sup>1,5,6</sup>**

Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed MPH	Sign Δ Spacing "X" Feet (Apprx.)
CW20 <sup>4</sup>	48" x 48"	48" x 48"	30	120
CW21			35	160
CW22			40	240
CW23			45	320
CW25			50	400
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	55	500 <sup>2</sup>
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"	60	600 <sup>2</sup>
			65	700 <sup>2</sup>
			70	800 <sup>2</sup>
			80	1000 <sup>2</sup>
*			*	* <sup>3</sup>

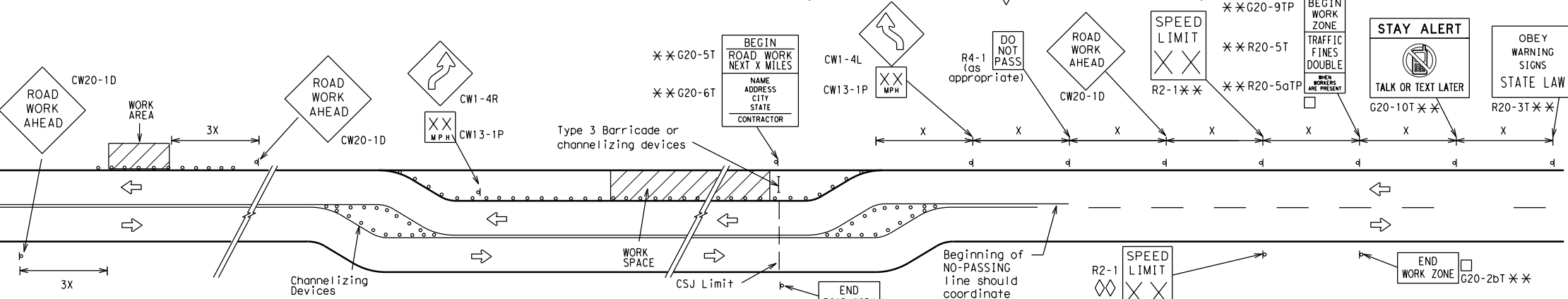
\* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

**GENERAL NOTES**

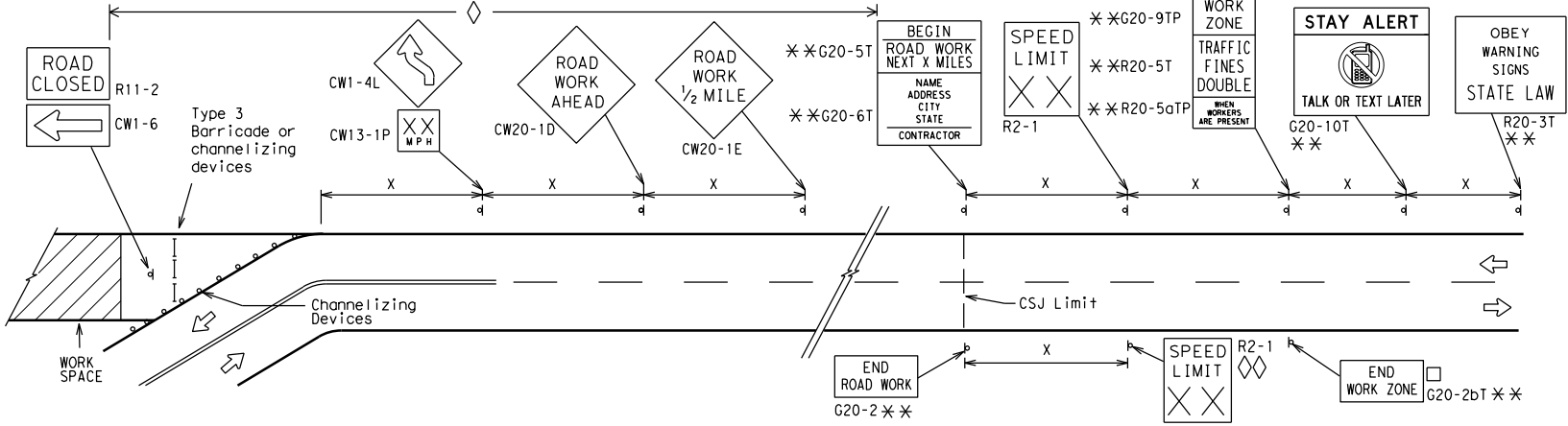
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

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

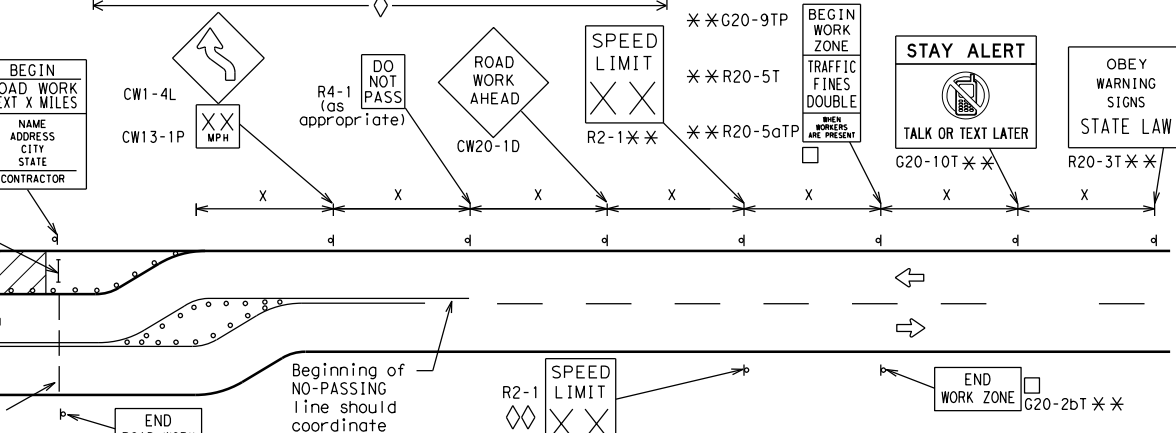


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

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



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



**NOTES**

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

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

SHEET 2 OF 12



**BARRICADE AND CONSTRUCTION PROJECT LIMIT**

**BC (2) - 21**

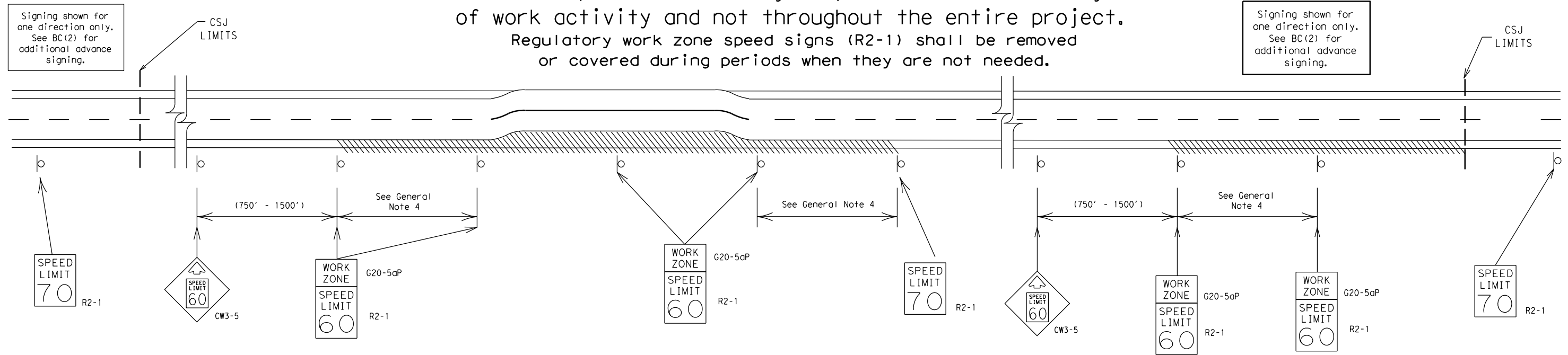
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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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# TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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



## GUIDANCE FOR USE:

### LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

### SHORT TERM WORK ZONE SPEED LIMITS

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

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

## GENERAL NOTES

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- Frequency of work zone speed limit signs should be:
 

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

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SHEET 3 OF 12



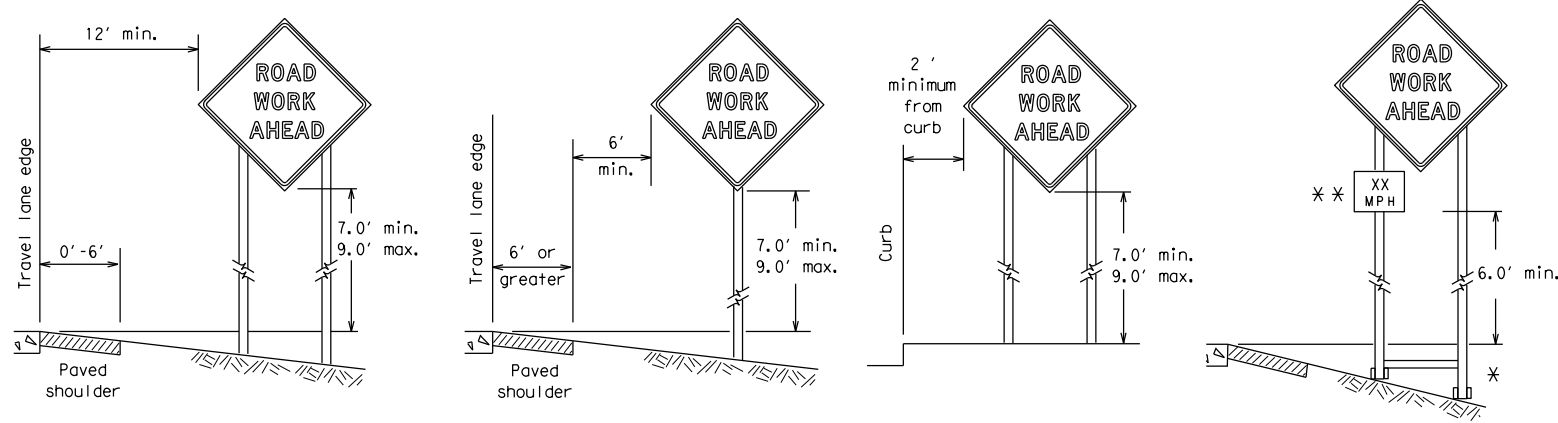
## BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC (3) - 21

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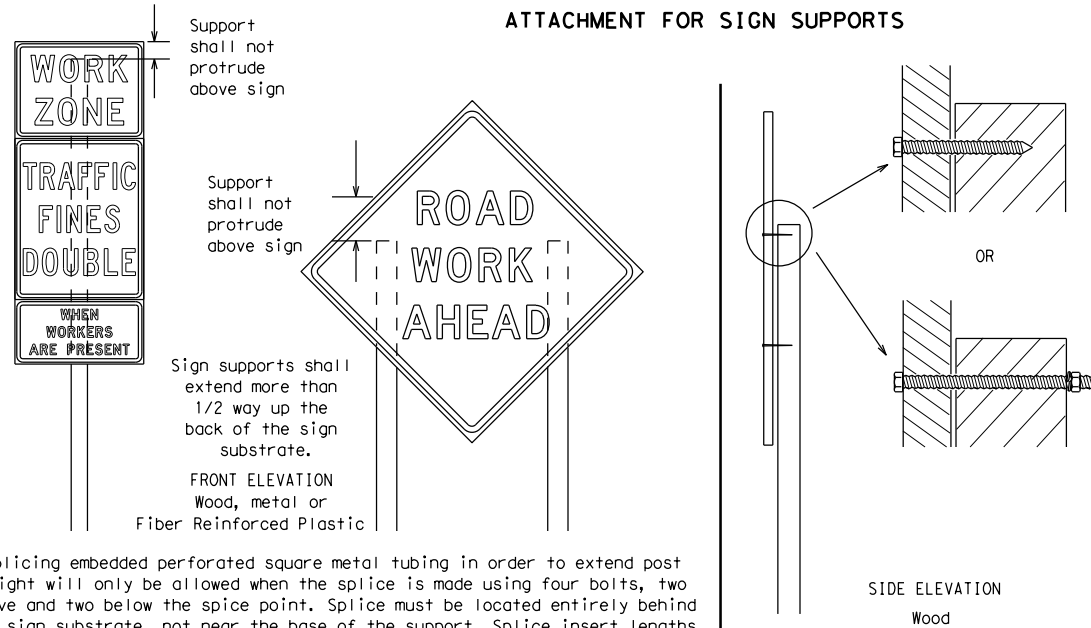
**TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS**



\* 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 splice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

**GENERAL NOTES FOR WORK ZONE SIGNS**

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

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

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

**SIGN MOUNTING HEIGHT**

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

**SIZE OF SIGNS**

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

**SIGN SUBSTRATES**

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

**REFLECTIVE SHEETING**

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

**SIGN LETTERS**

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

**REMOVING OR COVERING**

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

**SIGN SUPPORT WEIGHTS**

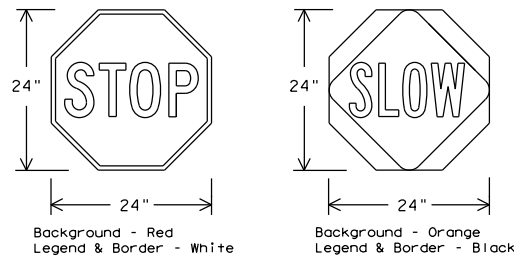
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not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

**FLAGS ON SIGNS**

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

**STOP/SLOW PADDLES**

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



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

**CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS**

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

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Texas Department of Transportation Traffic Safety Division Standard

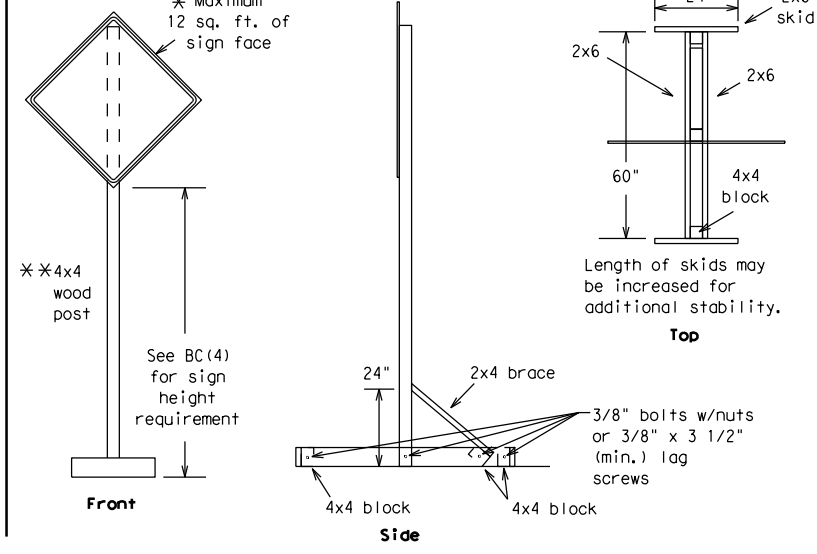
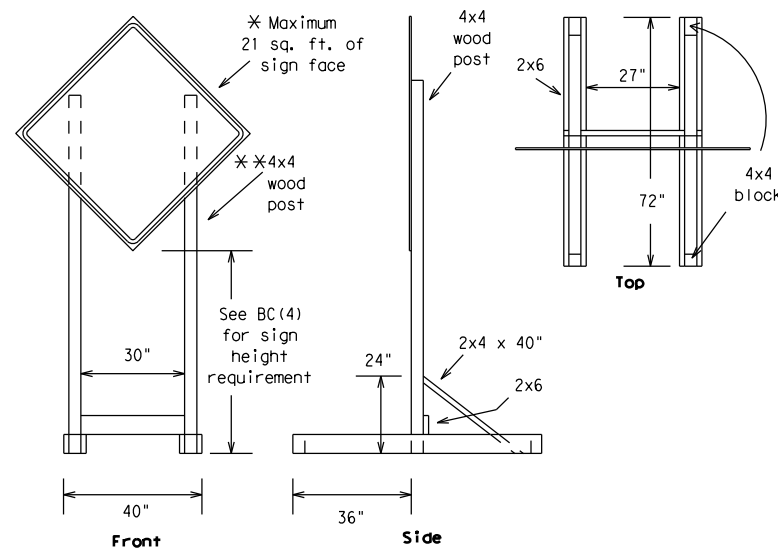
**BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES**

**BC (4) - 21**

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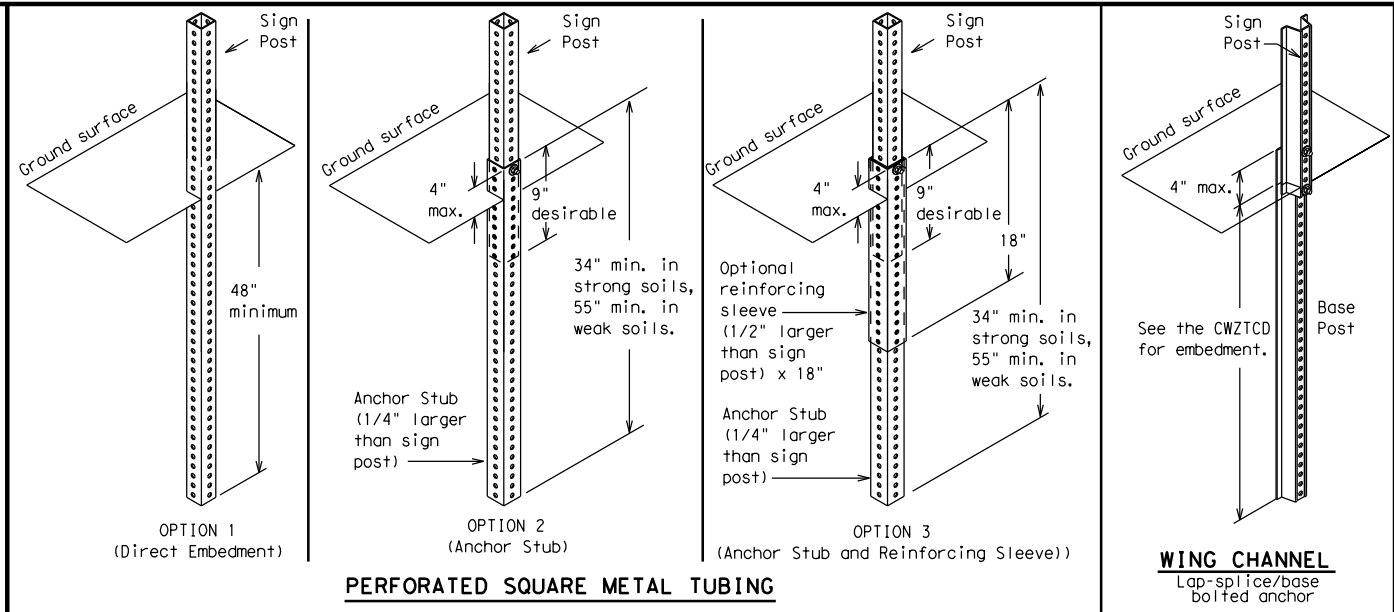
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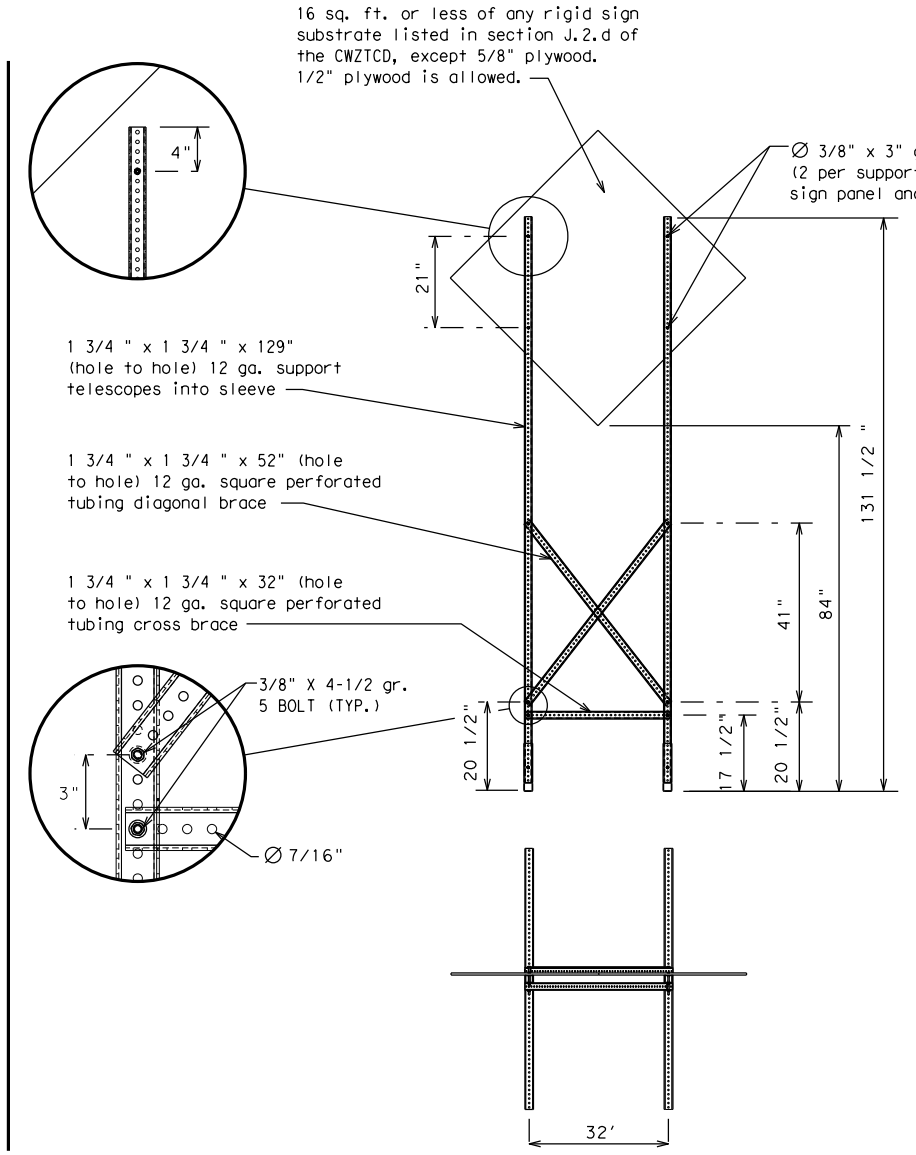
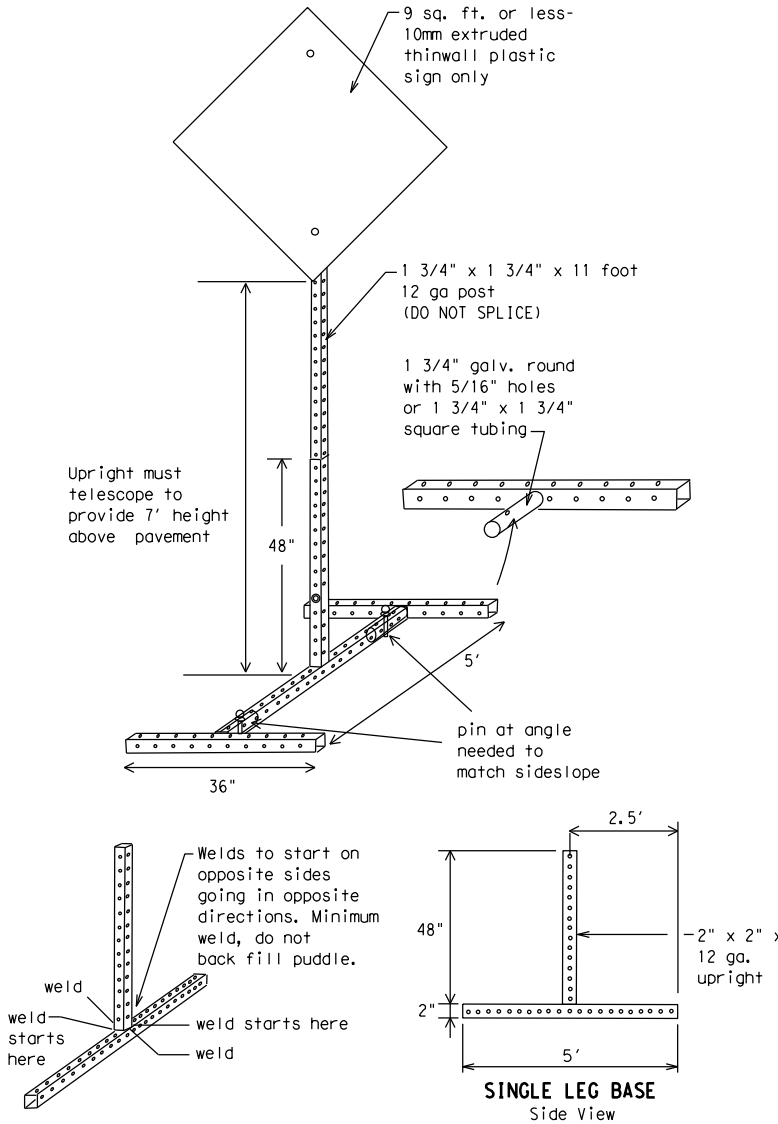
### SKID MOUNTED WOOD SIGN SUPPORTS

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



### 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**
- 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.
  - No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
  - When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.
- \* See BC(4) for definition of "Work Duration."
  - \*\* Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
  - See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

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## BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 21

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

# RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

## PORTABLE CHANGEABLE MESSAGE SIGNS

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

## Phase 1: Condition Lists

### Road/Lane/Ramp Closure List

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

### Other Condition List

FRONTAGE ROAD CLOSED
SHOULDER CLOSED XXX FT
RIGHT LN CLOSED XXX FT
RIGHT X LANES OPEN
DAYTIME LANE CLOSURES
I-XX SOUTH EXIT CLOSED
EXIT XXX CLOSED X MILE
RIGHT LN TO BE CLOSED
X LANES CLOSED TUE - FRI
ROADWORK XXX FT
FLAGGER XXXX FT
RIGHT LN NARROWS XXXX FT
MERGING TRAFFIC XXXX FT
LOOSE GRAVEL XXXX FT
DETOUR X MILE
ROADWORK PAST SH XXXX
BUMP XXXX FT
TRAFFIC SIGNAL XXXX FT
ROAD REPAIRS XXXX FT
LANE NARROWS XXXX FT
TWO-WAY TRAFFIC XX MILE
CONST TRAFFIC XXX FT
UNEVEN LANES XXXX FT
ROUGH ROAD XXXX FT
ROADWORK NEXT FRI-SUN
US XXX EXIT X MILES
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
DETOUR NEXT X EXITS
USE EXIT XXX
STAY ON US XXX SOUTH
TRUCKS USE US XXX N
WATCH FOR TRUCKS
EXPECT DELAYS
REDUCE SPEED XXX FT
USE OTHER ROUTES
STAY IN LANE *

### Location List

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

### Warning List

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

### \*\* Advance Notice List

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

\*\* See Application Guidelines Note 6.

## APPLICATION GUIDELINES

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

## WORDING ALTERNATIVES

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

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

## FULL MATRIX PCMS SIGNS

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

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

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

DATE: 12/13/2023 \$TIME\$ FILE: \$FILES\$



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

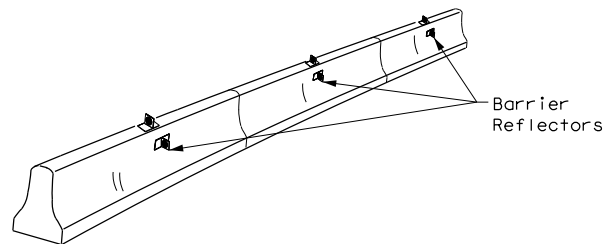
BC (6) - 21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6447	95	001, ETC.	US 77, ETC.
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	YKM	VICTORIA, ETC.	40	



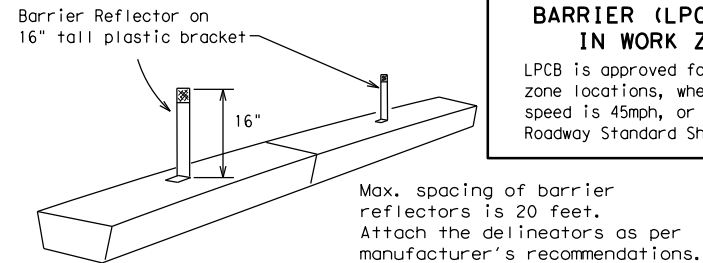
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



**CONCRETE TRAFFIC BARRIER (CTB)**

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

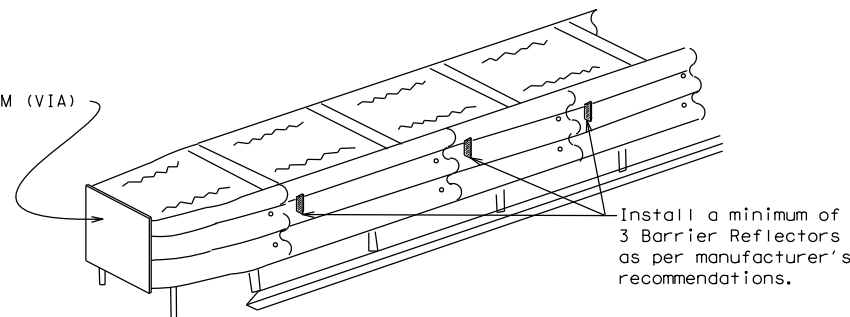


**LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES**

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

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

**LOW PROFILE CONCRETE BARRIER (LPCB)**



**DELINEATION OF END TREATMENTS**

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

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

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

**WARNING LIGHTS**

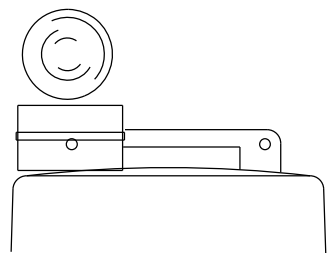
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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

**WARNING LIGHTS MOUNTED ON PLASTIC DRUMS**

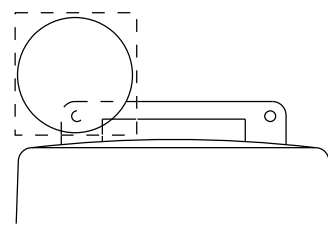
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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

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

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



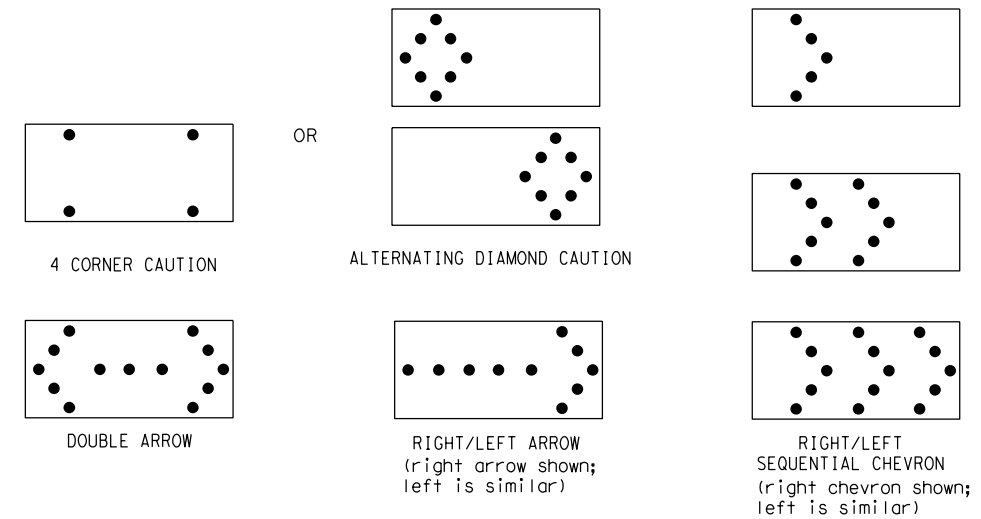
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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

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



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

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

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

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

**FLASHING ARROW BOARDS**

SHEET 7 OF 12

**TRUCK-MOUNTED ATTENUATORS**

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



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

**BC (7) - 21**

FILE:	bc-21.dgn	DN:	TxDOT	CK:	TxDOT	DN:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		6447	95	001, ETC.		US 77, ETC.			
9-07	8-14	DIST	COUNTY		SHEET NO.				
7-13	5-21	YKM	VICTORIA, ETC.		41				

DATE: 12/13/2023 \$TIME\$ FILE: \$FILES\$

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 FILE: \$FILES\$

**GENERAL NOTES**

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

**GENERAL DESIGN REQUIREMENTS**

Pre-qualified plastic drums shall meet the following requirements:

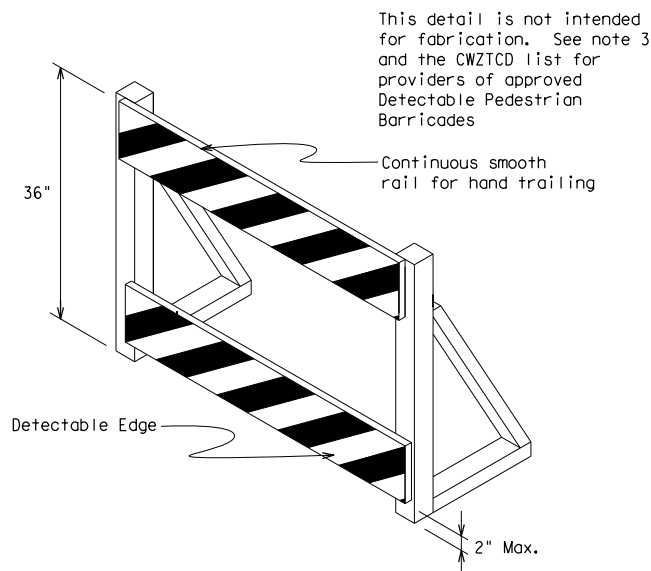
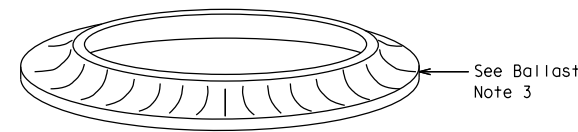
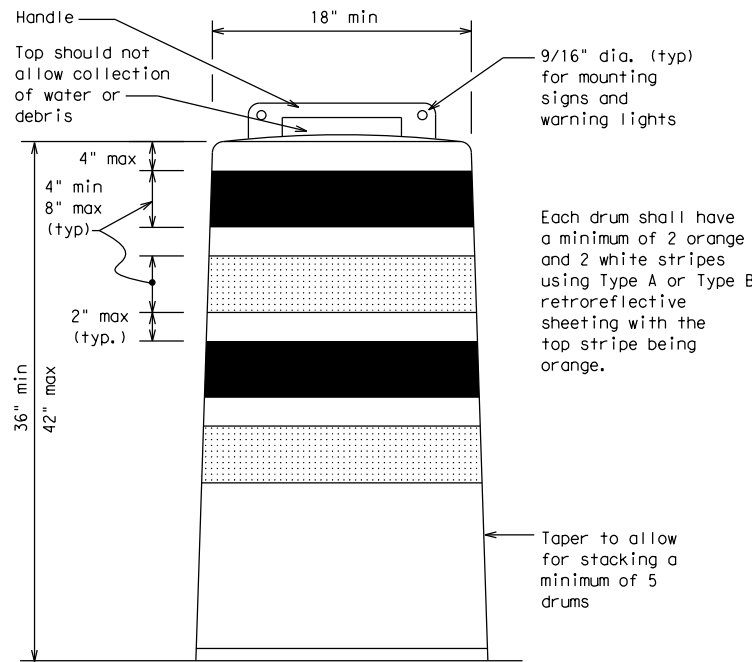
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

**RETROREFLECTIVE SHEETING**

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

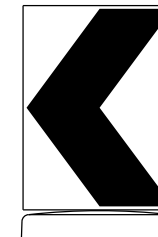
**BALLAST**

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

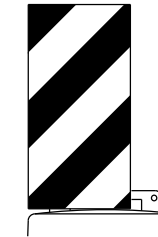


**DETECTABLE PEDESTRIAN BARRICADES**

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



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



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

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

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

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

SHEET 8 OF 12

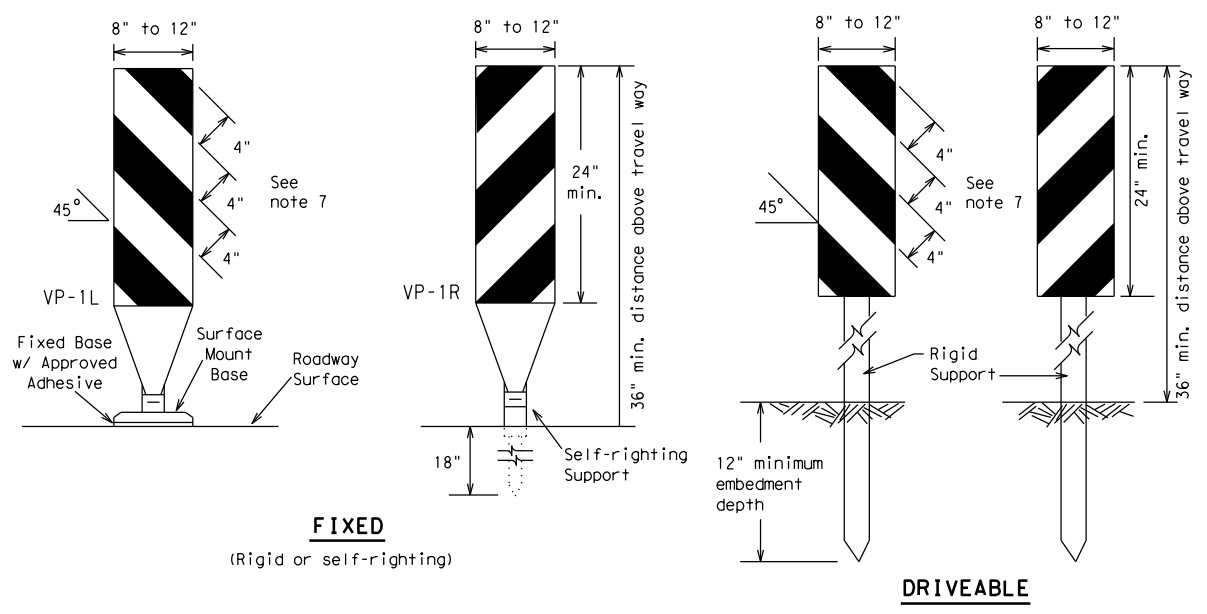


**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (8) - 21**

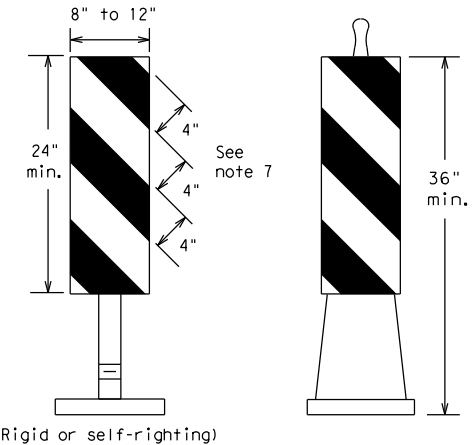
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REVISIONS		6447	95	001, ETC.		US 77, ETC.			
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9-07	5-21			YKM	VICTORIA, ETC.	42			
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**FIXED**  
(Rigid or self-righting)

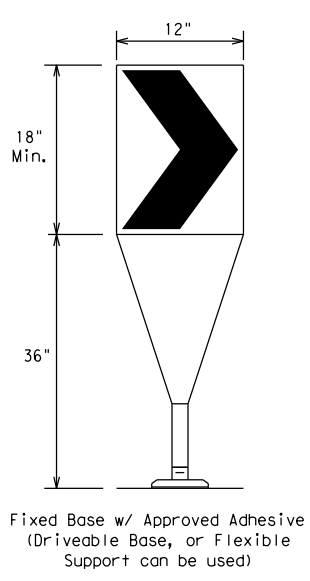
**DRIVEABLE**



**PORTABLE**

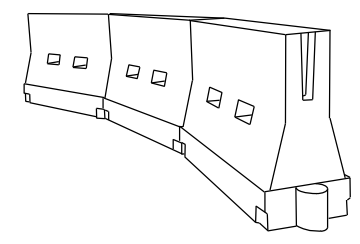
**VERTICAL PANELS (VPs)**

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



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

**CHEVRONS**



**LONGITUDINAL CHANNELIZING DEVICES (LCD)**

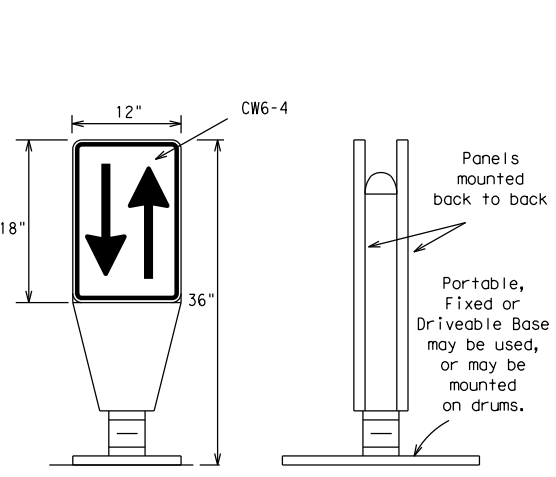
- LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
- LCDs may be used instead of a line of cones or drums.
- LCDs shall be placed in accordance to application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

**WATER BALLASTED SYSTEMS USED AS BARRIERS**

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

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

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



**OPPOSING TRAFFIC LANE DIVIDERS (OTLD)**

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

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

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

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

SHEET 9 OF 12



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (9) - 21**

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6447	95	001, ETC.	US 77, ETC.
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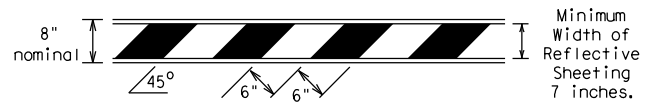
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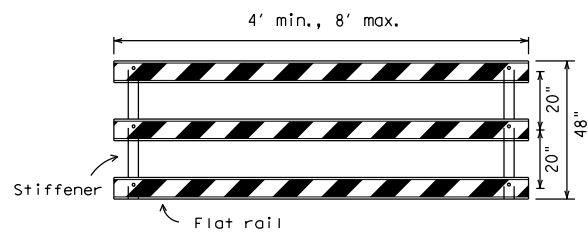
**TYPE 3 BARRICADES**

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

Barricades shall NOT be used as a sign support.

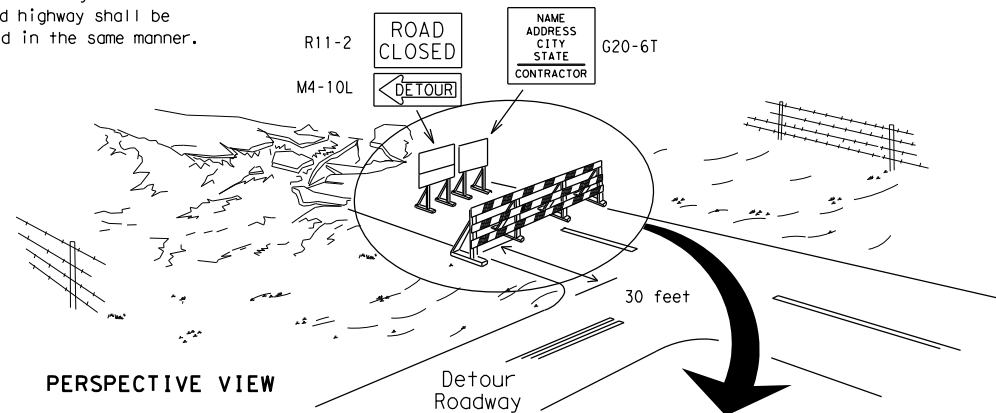


**TYPICAL STRIPING DETAIL FOR BARRICADE RAIL**



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

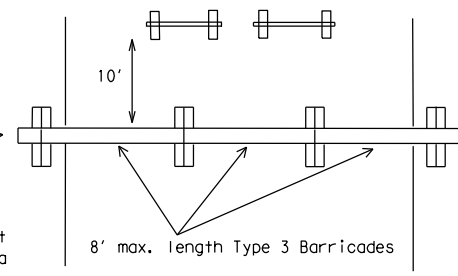
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

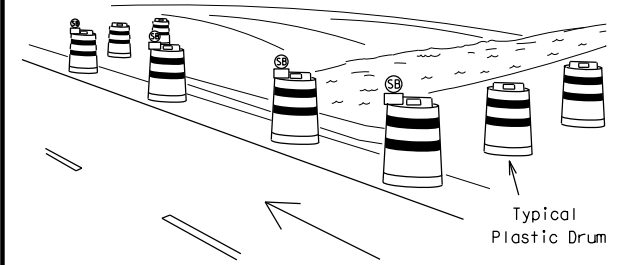
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.

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.

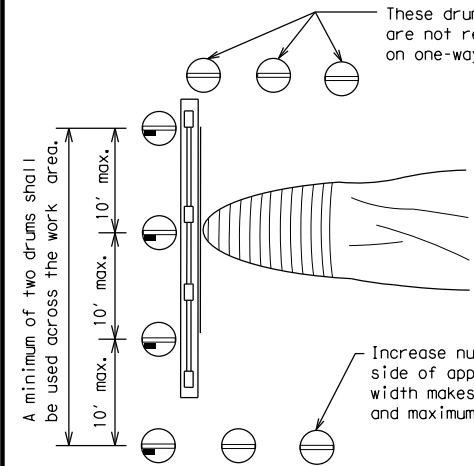


PLAN VIEW

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



PERSPECTIVE VIEW

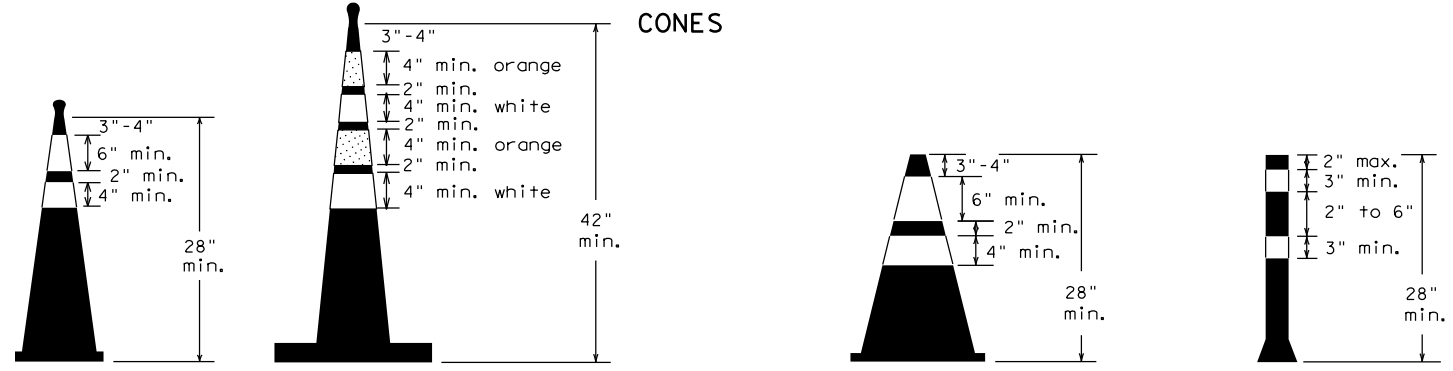


PLAN VIEW

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

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

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



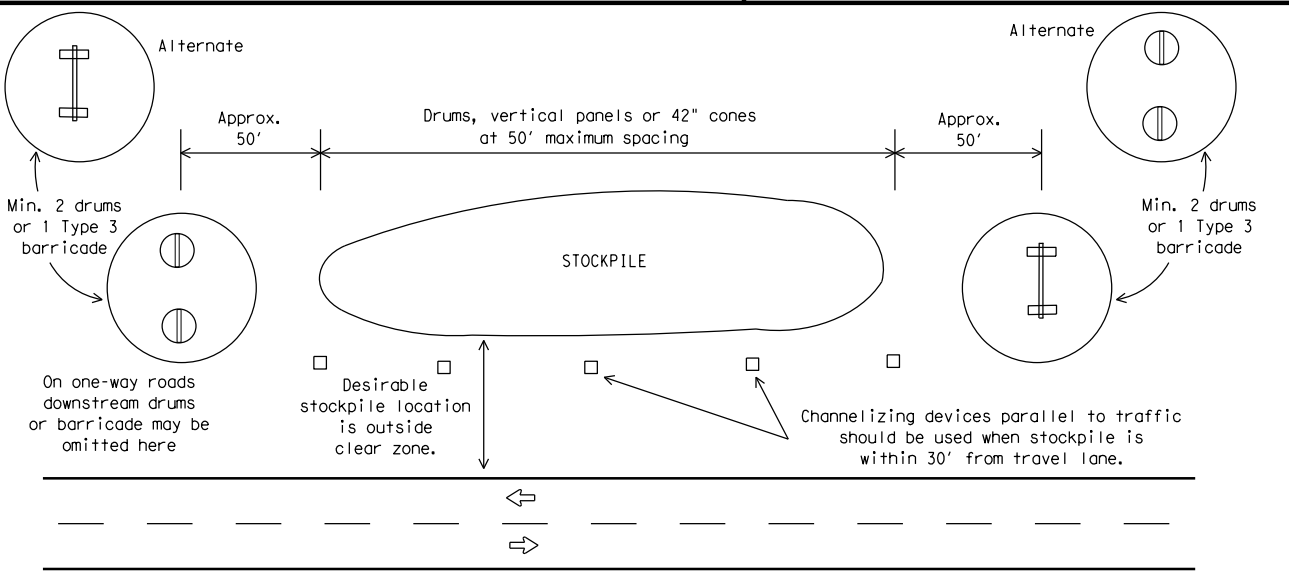
Two-Piece cones

One-Piece cones

Tubular Marker

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

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**



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (10) - 21**

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## WORK ZONE PAVEMENT MARKINGS

### GENERAL

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

### RAISED PAVEMENT MARKERS

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

### PREFABRICATED PAVEMENT MARKINGS

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

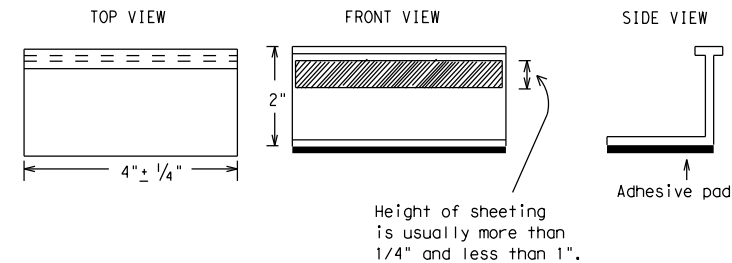
### MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

### REMOVAL OF PAVEMENT MARKINGS

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

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

### RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

SHEET 11 OF 12



## BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

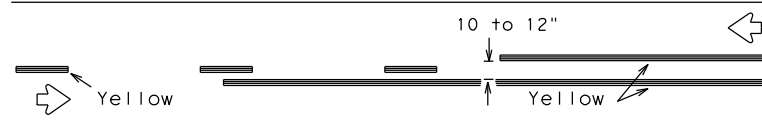
**BC(11)-21**

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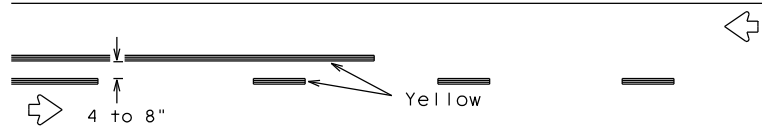
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## PAVEMENT MARKING PATTERNS

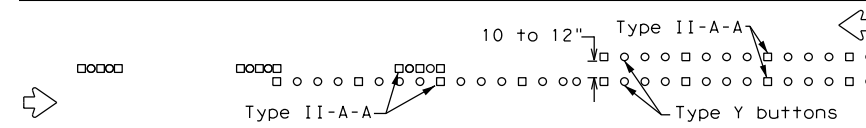


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

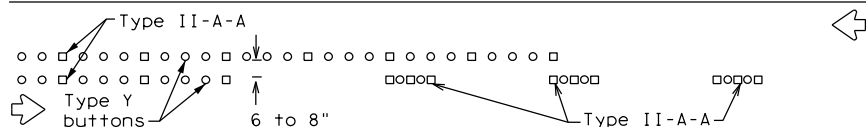


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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.

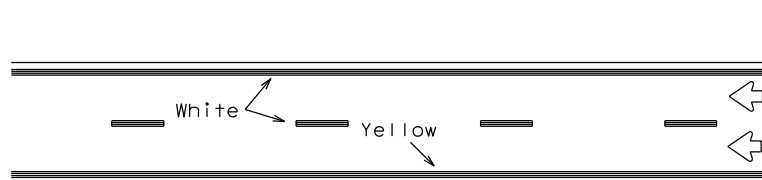


RAISED PAVEMENT MARKERS - PATTERN A



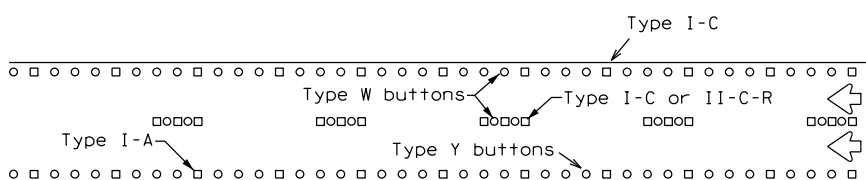
RAISED PAVEMENT MARKERS - PATTERN B

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



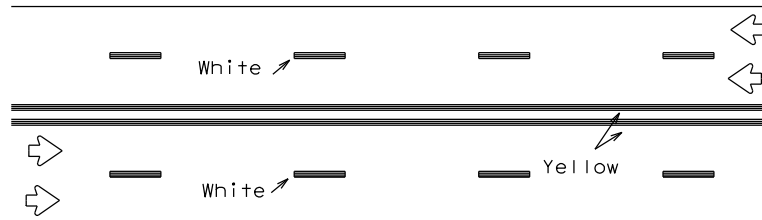
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectorized pavement markings.



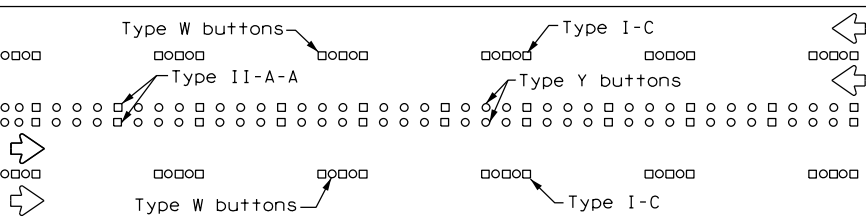
RAISED PAVEMENT MARKERS

## EDGE & LANE LINES FOR DIVIDED HIGHWAY



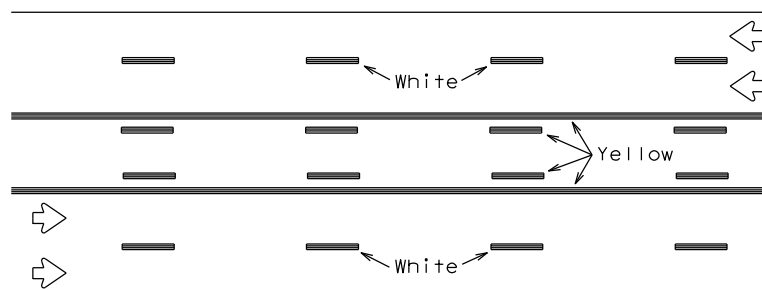
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectorized pavement markings.



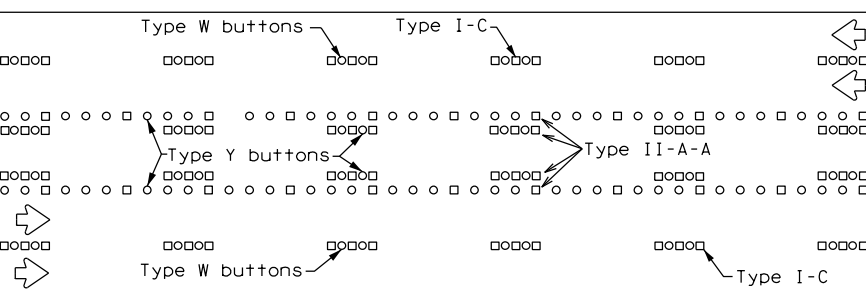
RAISED PAVEMENT MARKERS

## LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

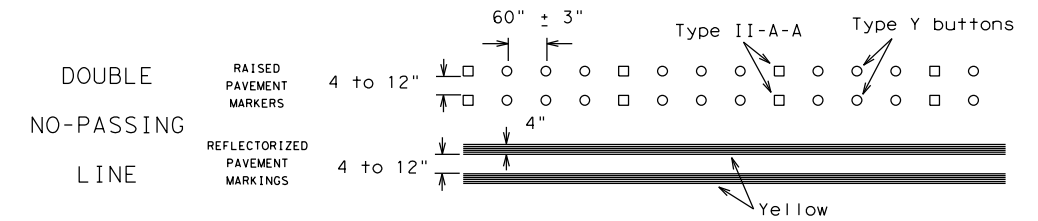
Prefabricated markings may be substituted for reflectorized pavement markings.



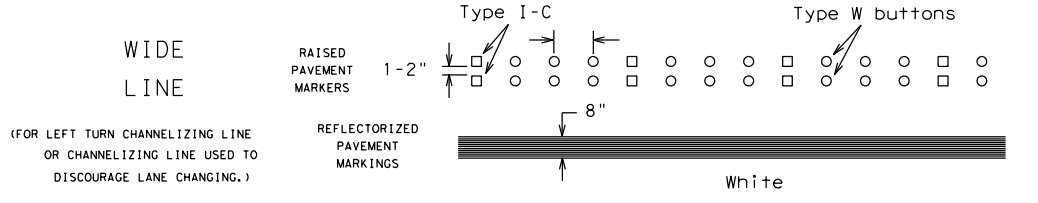
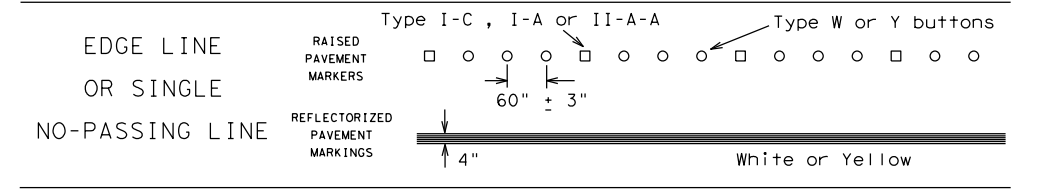
RAISED PAVEMENT MARKERS

## TWO-WAY LEFT TURN LANE

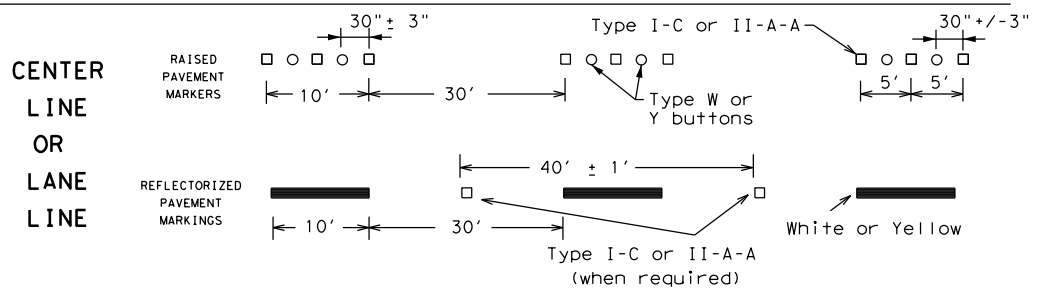
## STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



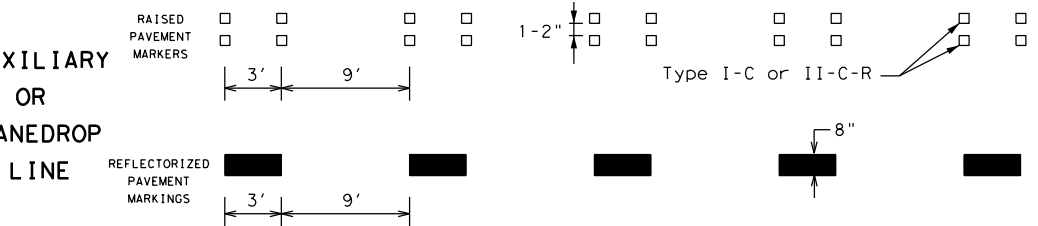
### SOLID LINES



### BROKEN LINES

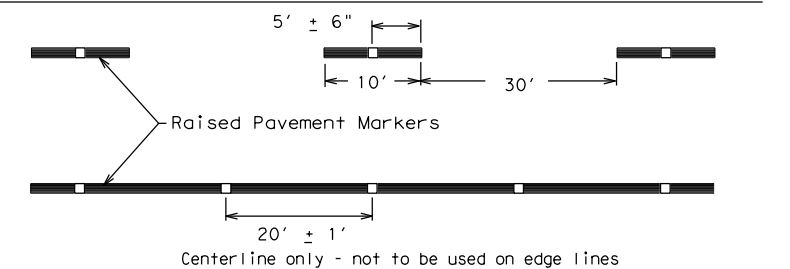


### AUXILIARY OR LANEDROP LINE



### 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.



SHEET 12 OF 12



## BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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2-98 7-13				
11-02 8-14	DIST	COUNTY	SHEET NO.	
	YKM	VICTORIA, ETC.	46	

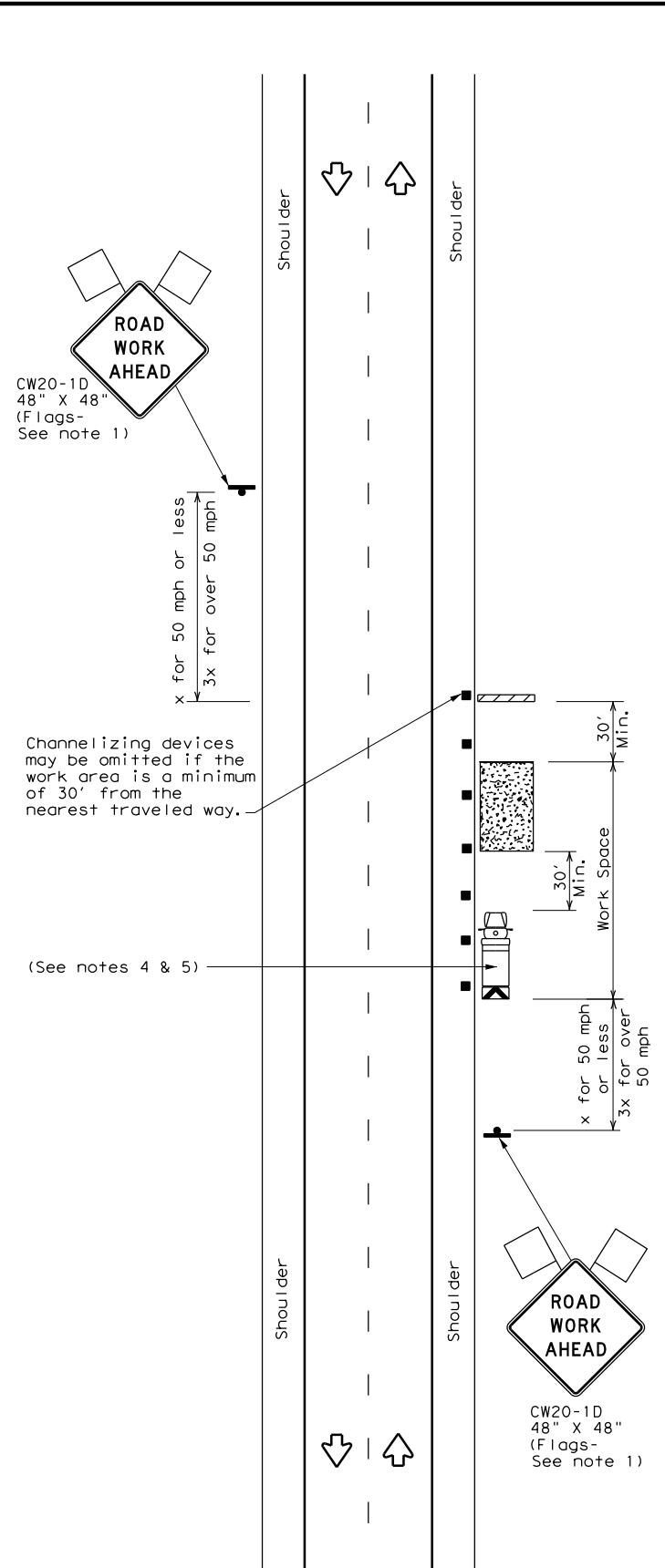
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DATE: 12/13/2023 \$TIME\$  
FILE: \$FILES\$

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

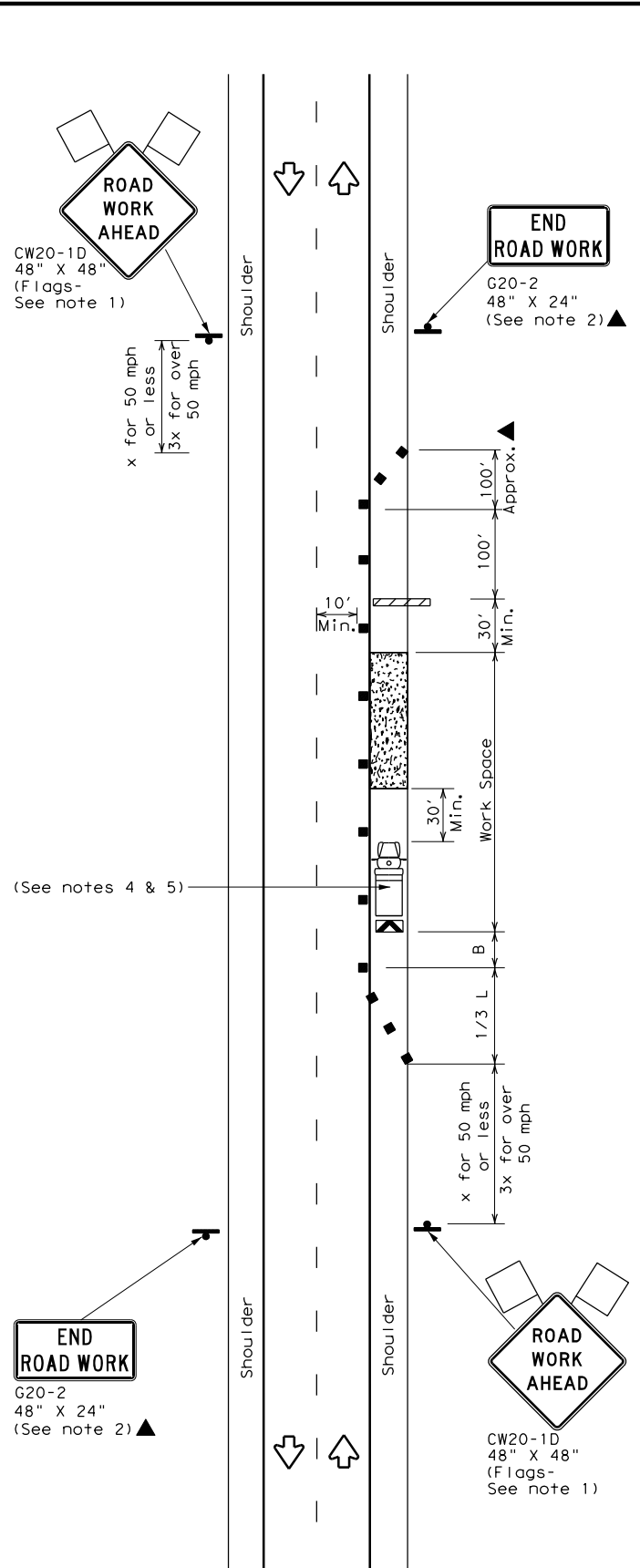
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DATE: 12/13/2023 \$TIME\$  
FILE: \$FILES\$



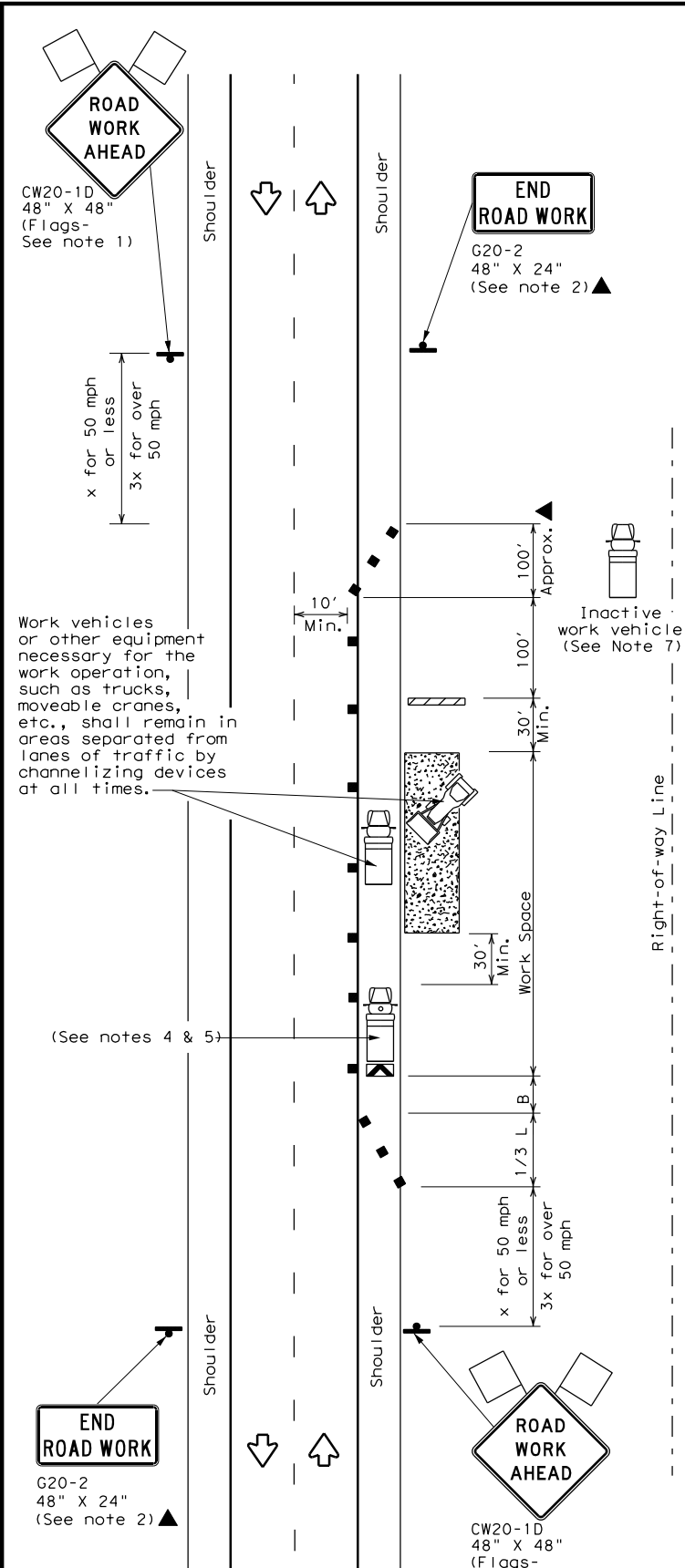
TCP (2-1a)

**WORK SPACE NEAR SHOULDER**  
Conventional Roads



TCP (2-1b)

**WORK SPACE ON SHOULDER**  
Conventional Roads



TCP (2-1c)

**WORK VEHICLES ON SHOULDER**  
Conventional Roads

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

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

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

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

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



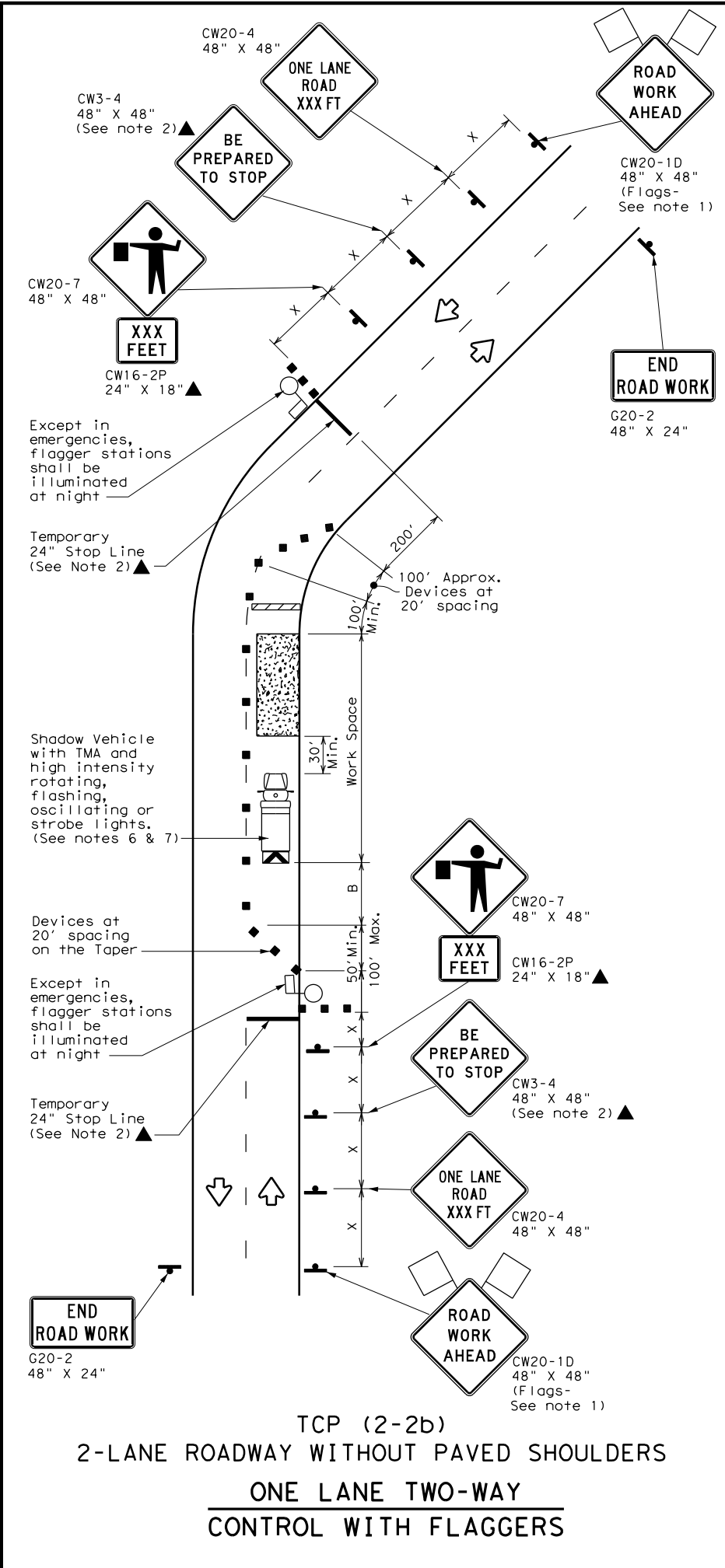
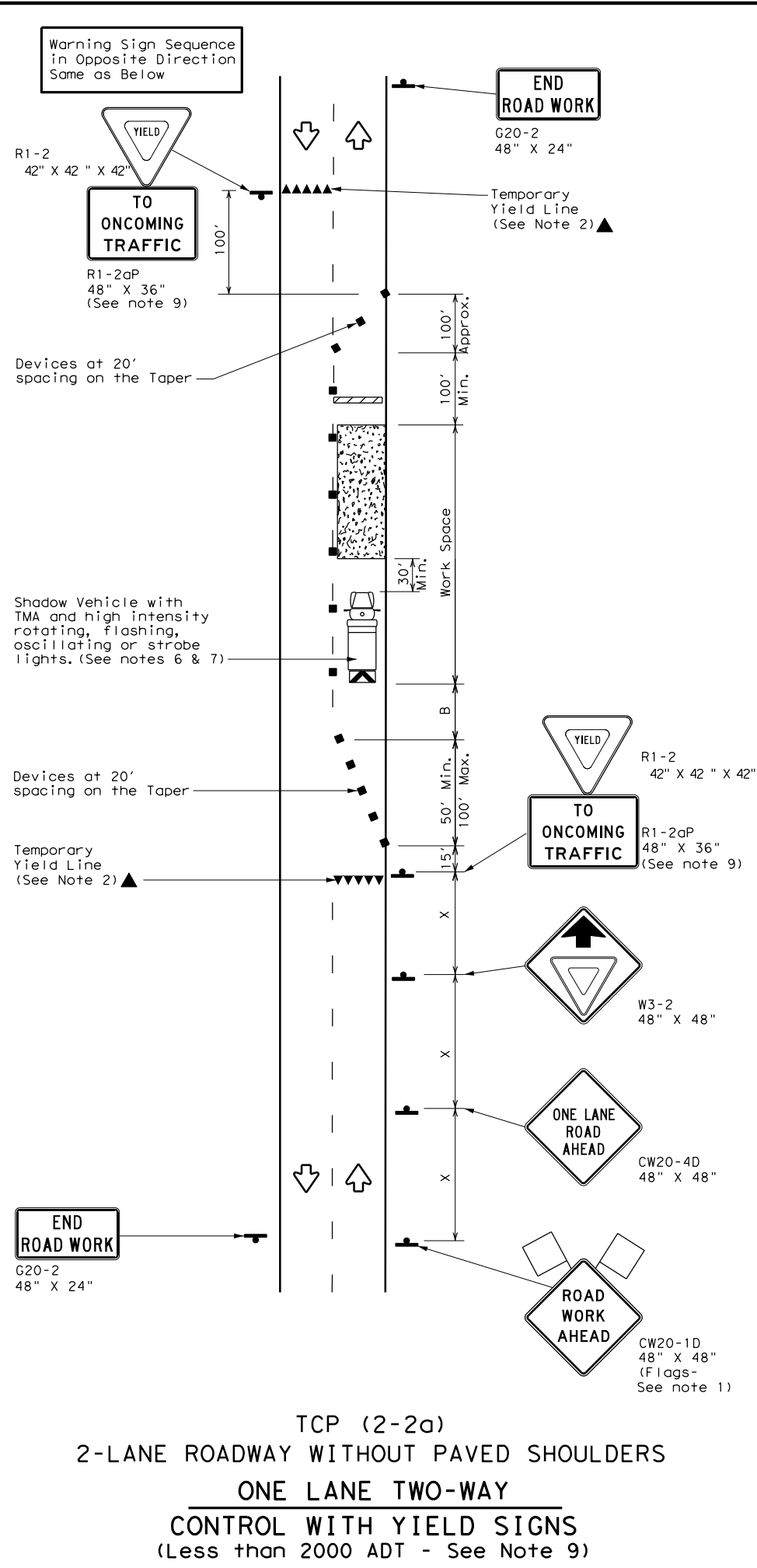
**TRAFFIC CONTROL PLAN**  
**CONVENTIONAL ROAD**  
**SHOULDER WORK**

**TCP (2-1) - 18**

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	6447	95	001, ETC.	US 77, ETC.
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 2-12	YKM	VICTORIA, ETC.	47	
1-97 2-18				

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FILE: \$FILES\$



**LEGEND**

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

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

- Flags attached to signs where shown, are REQUIRED.
  - 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.
  - The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
  - Flaggers should use two-way radios or other methods of communication to control traffic.
  - Length of work space should be based on the ability of flaggers to communicate.
  - 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.
  - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
- TCP (2-2a)**
- The R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work space should be no longer than one half city block. In rural areas, roadways with less than 2000 ADT, work space should be no longer than 400 feet.
  - The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.
- TCP (2-2b)**
- Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
  - If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
  - 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**

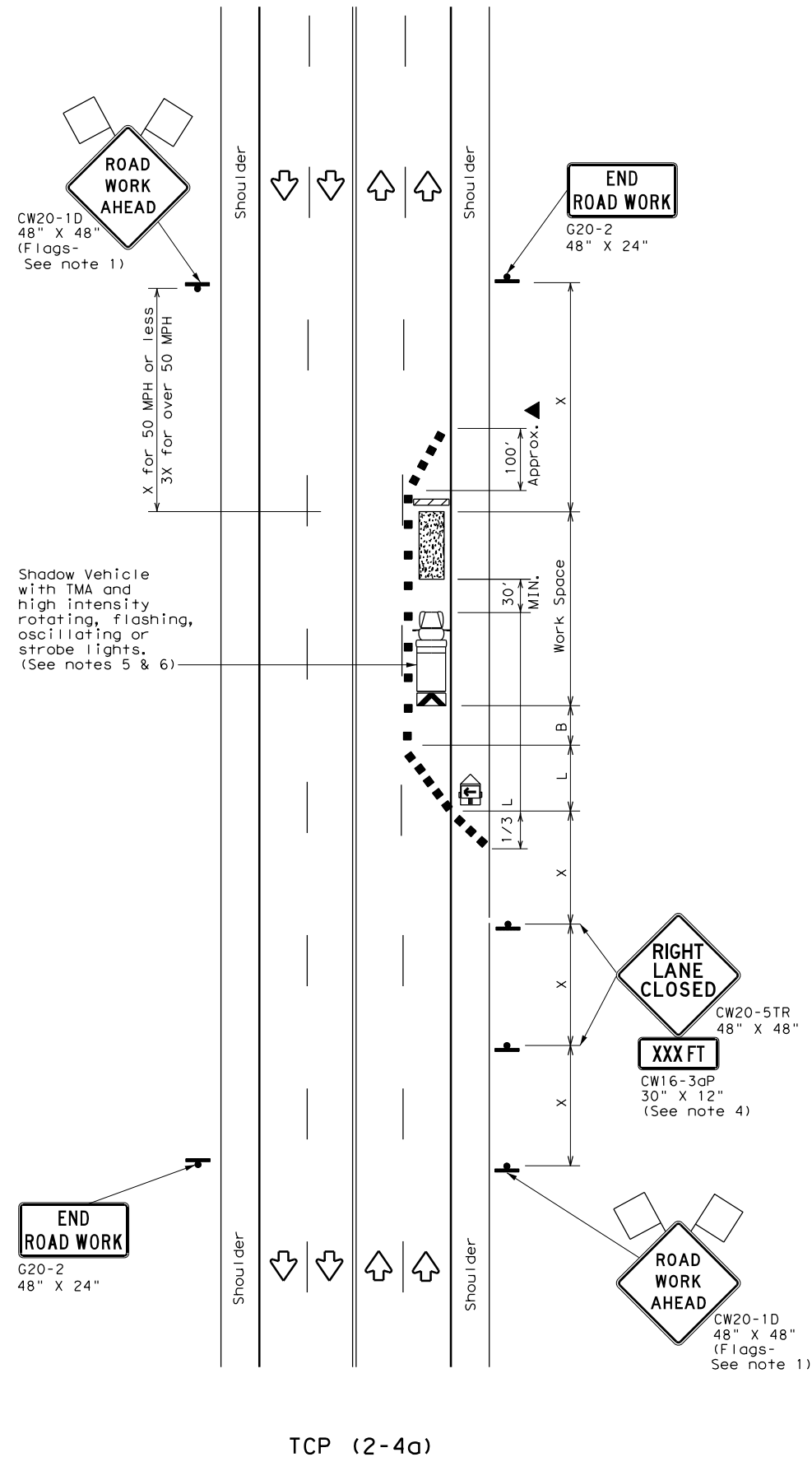
**TCP (2-2) - 18**

FILE:	tcp2-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT	December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS		6447	95	001, ETC. US 77, ETC.	
8-95	3-03				
1-97	2-12				
4-98	2-18				
		DIST	COUNTY	SHEET NO.	
		YKM	VICTORIA, ETC.	48	



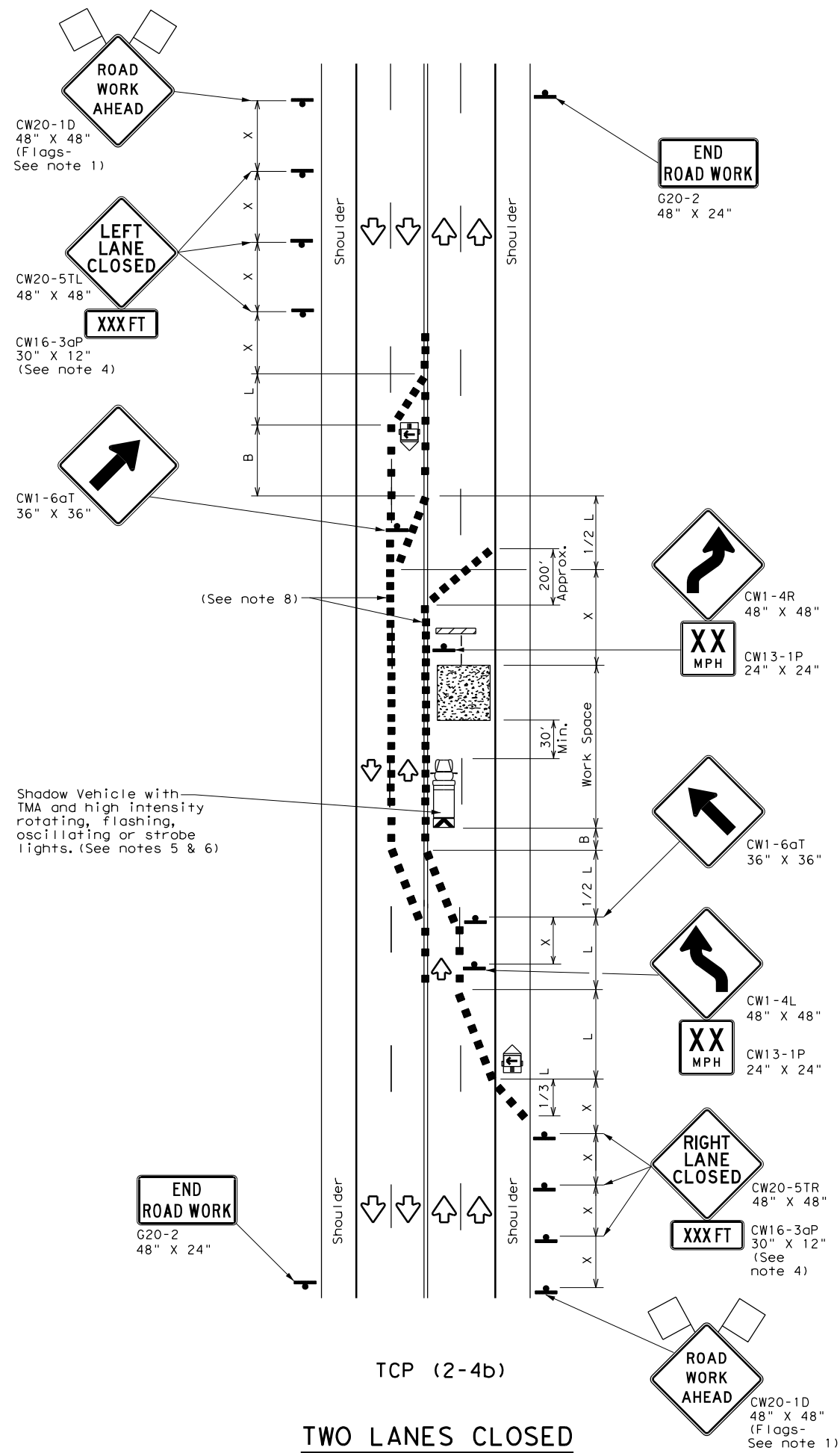
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FILE: \$FILES\$



TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

**LEGEND**

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

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

- Flags attached to signs where shown, are REQUIRED.
- 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.
- The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
- For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
- 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.
- Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

**TCP (2-4a)**

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

**TCP (2-4b)**

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

**Texas Department of Transportation**

**Traffic Operations Division Standard**

## TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

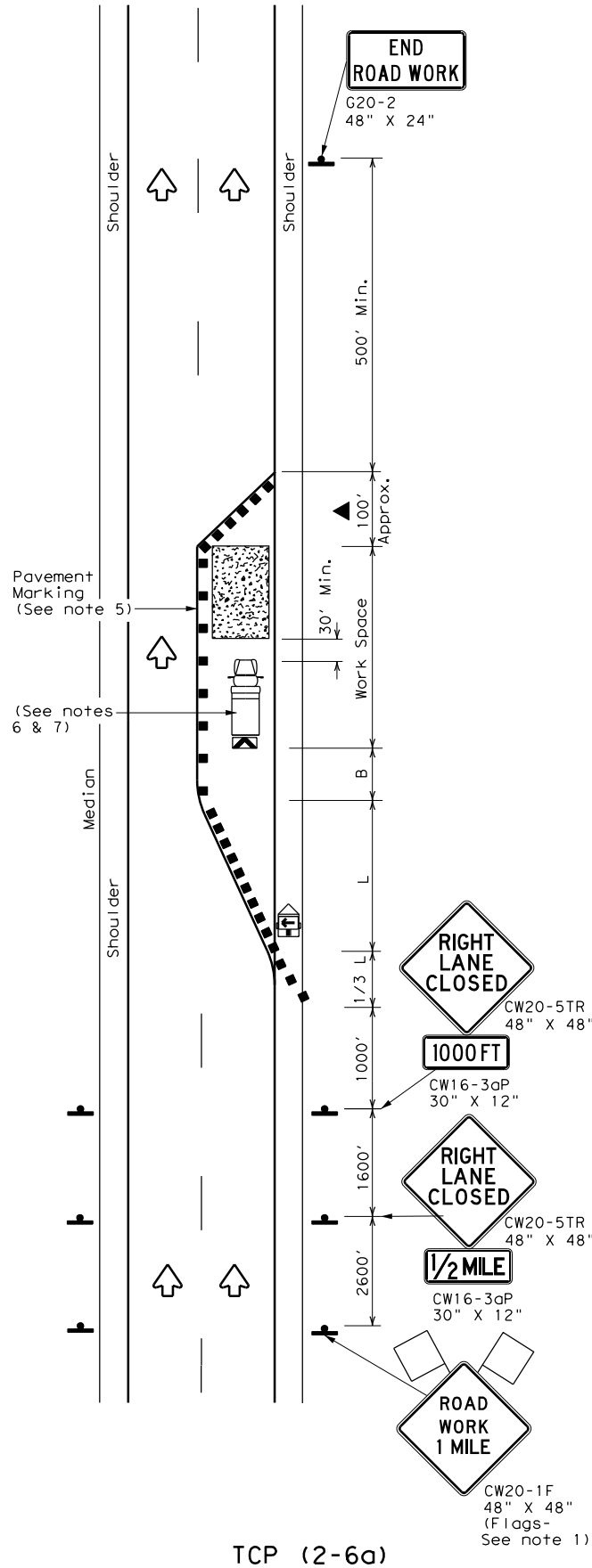
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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS		6447	95	001, ETC. US 77, ETC.
8-95	3-03	DIST		COUNTY
1-97	2-12	YKM		VICTORIA, ETC.
4-98	2-18			SHEET NO. 49

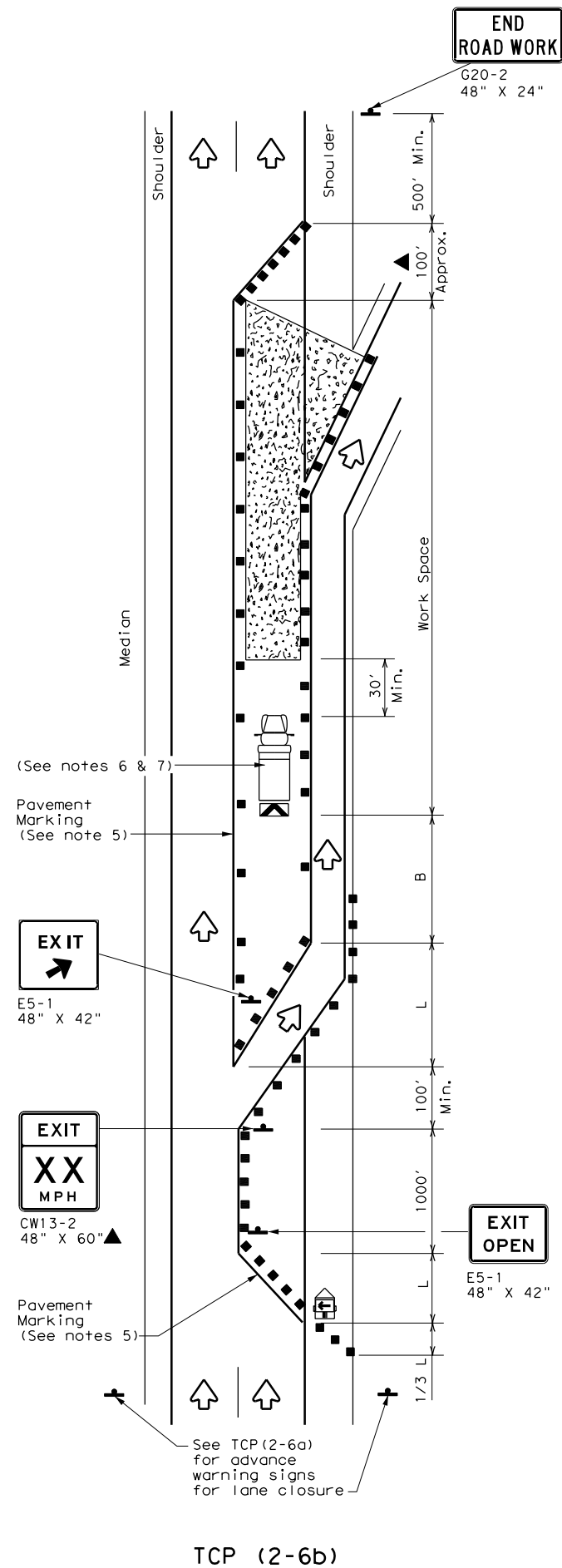
164

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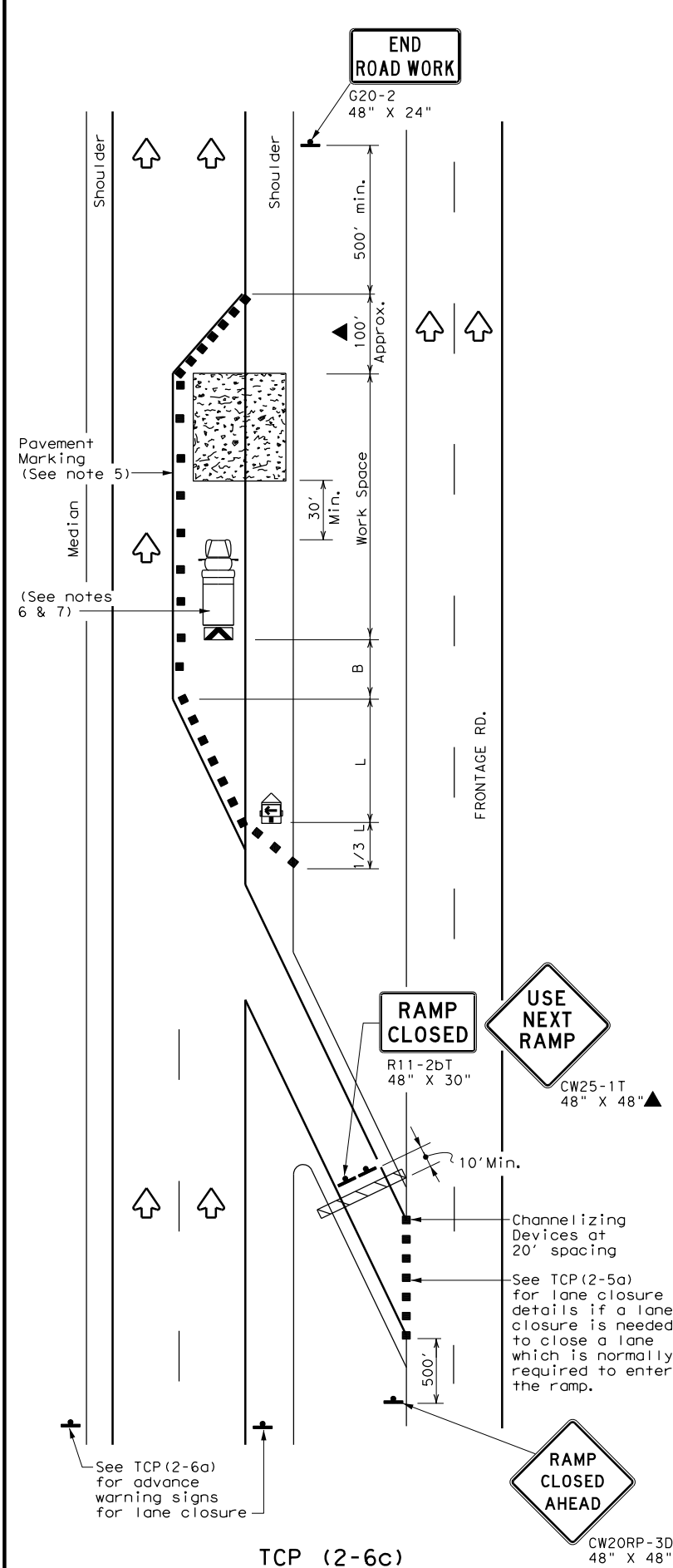
DATE: 12/13/2023 \$TIME\$  
FILE: \$FILES\$



TCP (2-6a)  
**ONE LANE CLOSURE**



TCP (2-6b)  
**LANE CLOSURE NEAR EXIT RAMP**



TCP (2-6c)  
**LANE CLOSURE NEAR ENTRANCE RAMP**

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

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

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

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

- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
  - 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.
  - Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
  - Channelizing devices used along the work space or along tangent sections may be supplemented with vertical panels (VP) placed on every other channelizing device. If night time conditions make it difficult to see at least two VPs, the VPs may be placed on each channelizing device.
  - The placement of pavement markings may be omitted on Intermediate-term stationary work zones with the approval of the Engineer.
  - Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
  - Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.



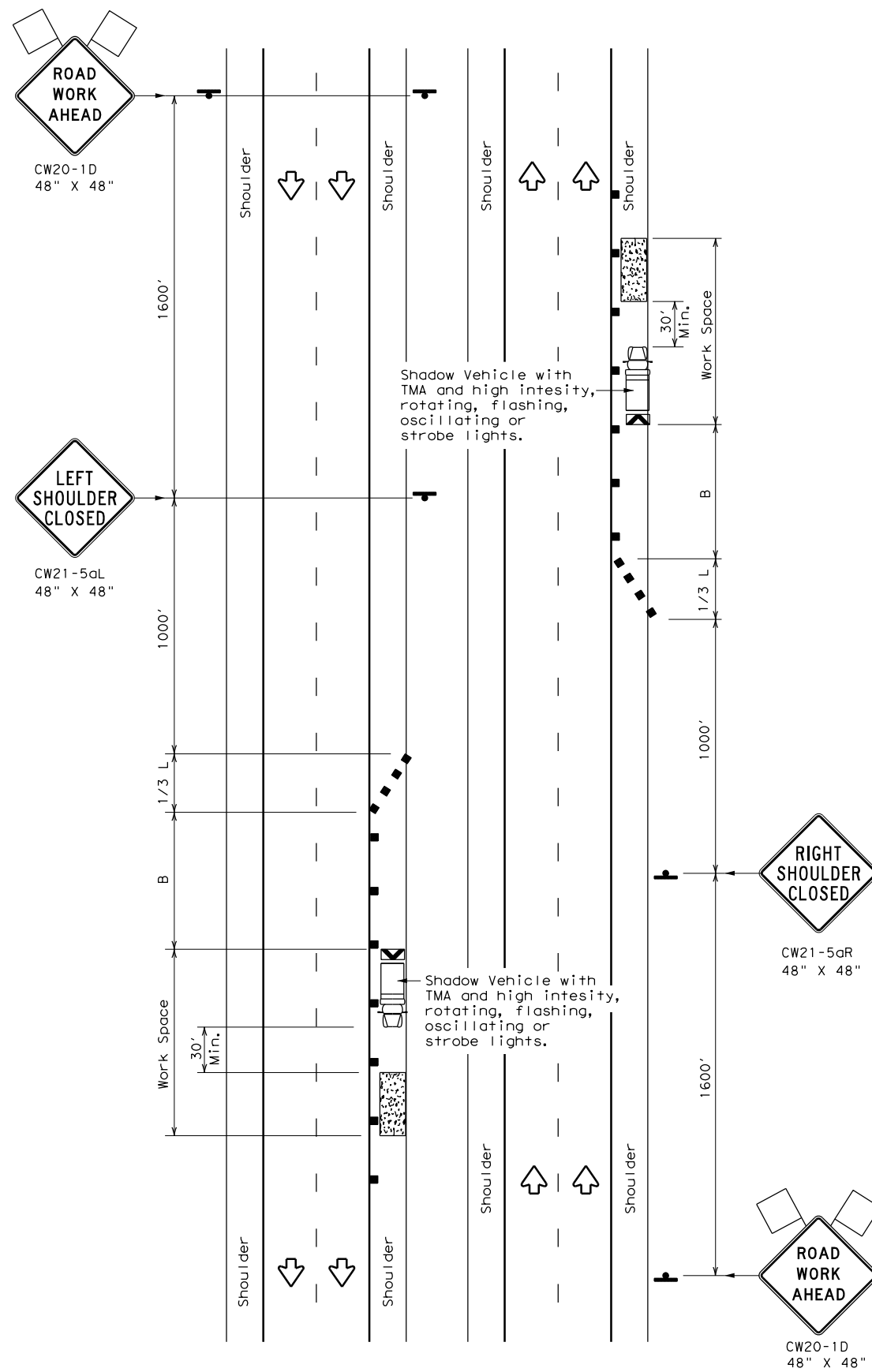
**TRAFFIC CONTROL PLAN  
LANE CLOSURES ON  
DIVIDED HIGHWAYS**

**TCP (2-6) - 18**

FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CON:	SECT:	JOB:	HIGHWAY:
REVISIONS	6447	95	001, ETC.	US 77, ETC.
2-94 4-98	DIST:	COUNTY:	SHEET NO.:	
8-95 2-12	YKM	VICTORIA, ETC.	50	
1-97 2-18				

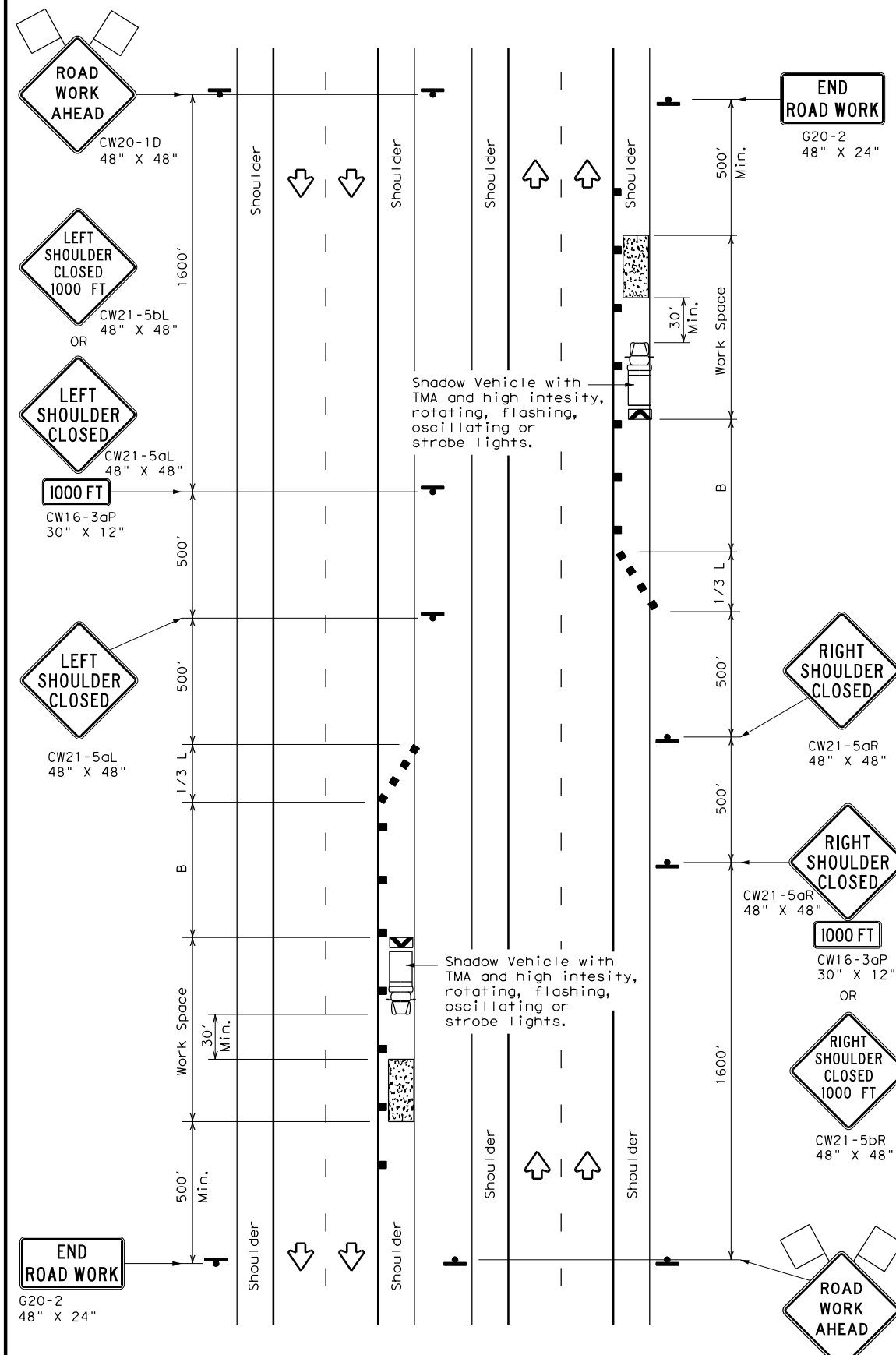
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DATE: 12/13/2023 \$TIME\$  
FILE: \$FILES\$



TCP (5-1a)

**WORK AREA ON SHOULDER**



TCP (5-1b)

**WORK AREA ON SHOULDER**

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

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

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

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

**GENERAL NOTES**

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



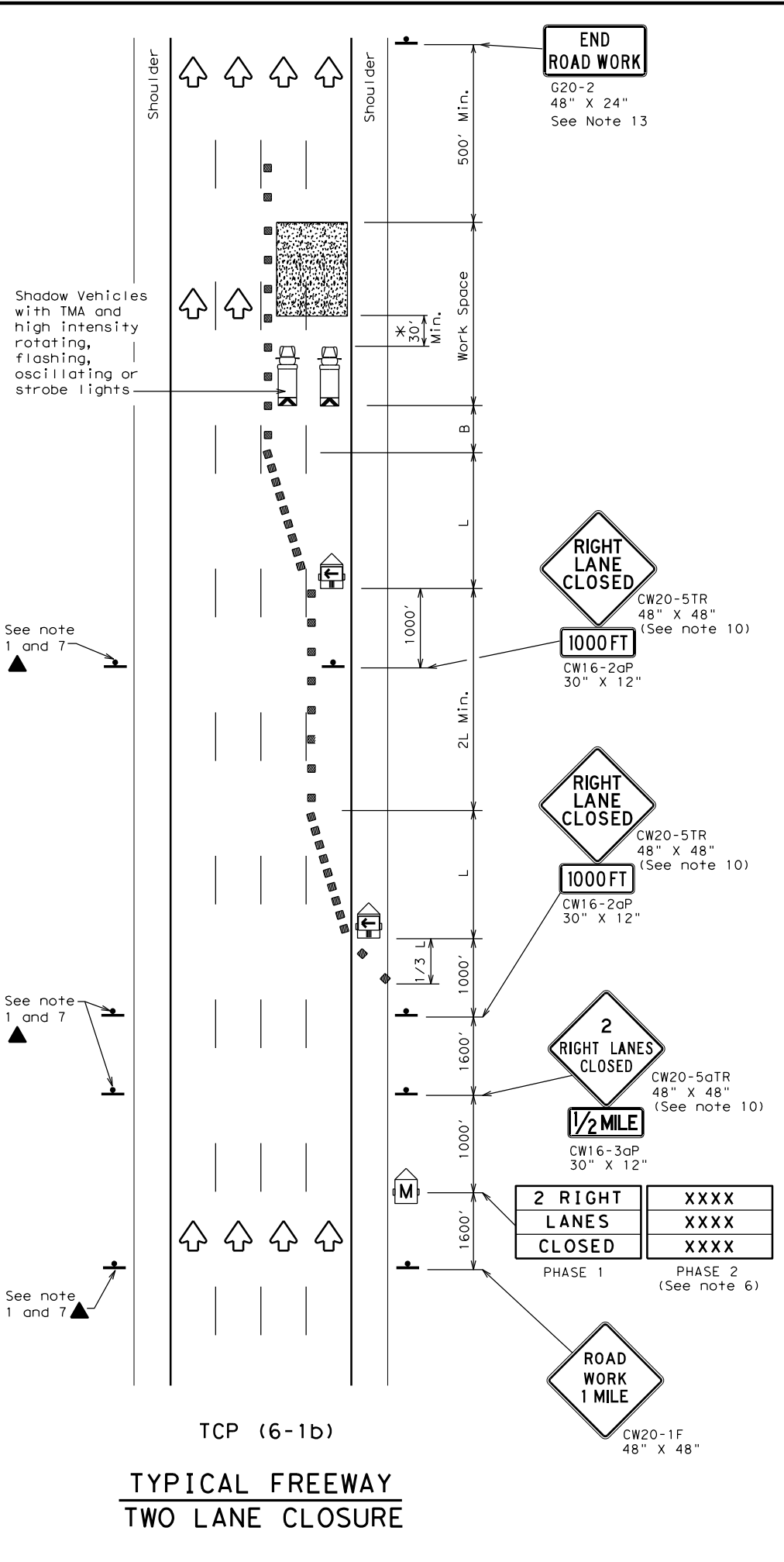
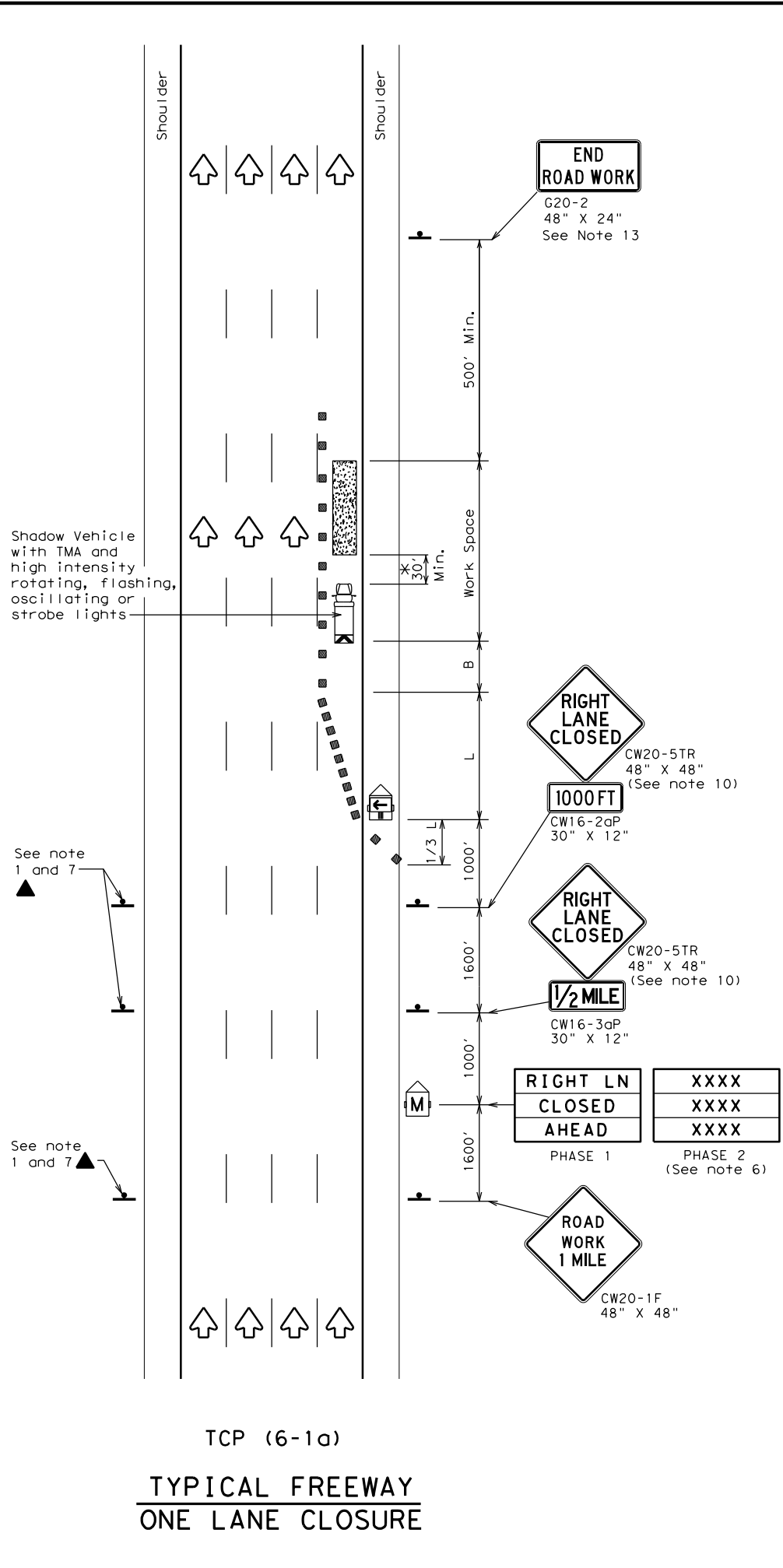
**TRAFFIC CONTROL PLAN  
SHOULDER WORK FOR  
FREEWAYS / EXPRESSWAYS**

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

FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
2-18	REVISIONS	6447 95	001, ETC.	US 77, ETC.
	DIST	COUNTY	SHEET NO.	
	YKM	VICTORIA, ETC.	51	

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DATE: 12/13/2023 \$TIME\$  
FILE: \$FILES\$



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

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

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

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

**GENERAL NOTES**

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

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



**TRAFFIC CONTROL PLAN  
FREEWAY LANE CLOSURES**

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

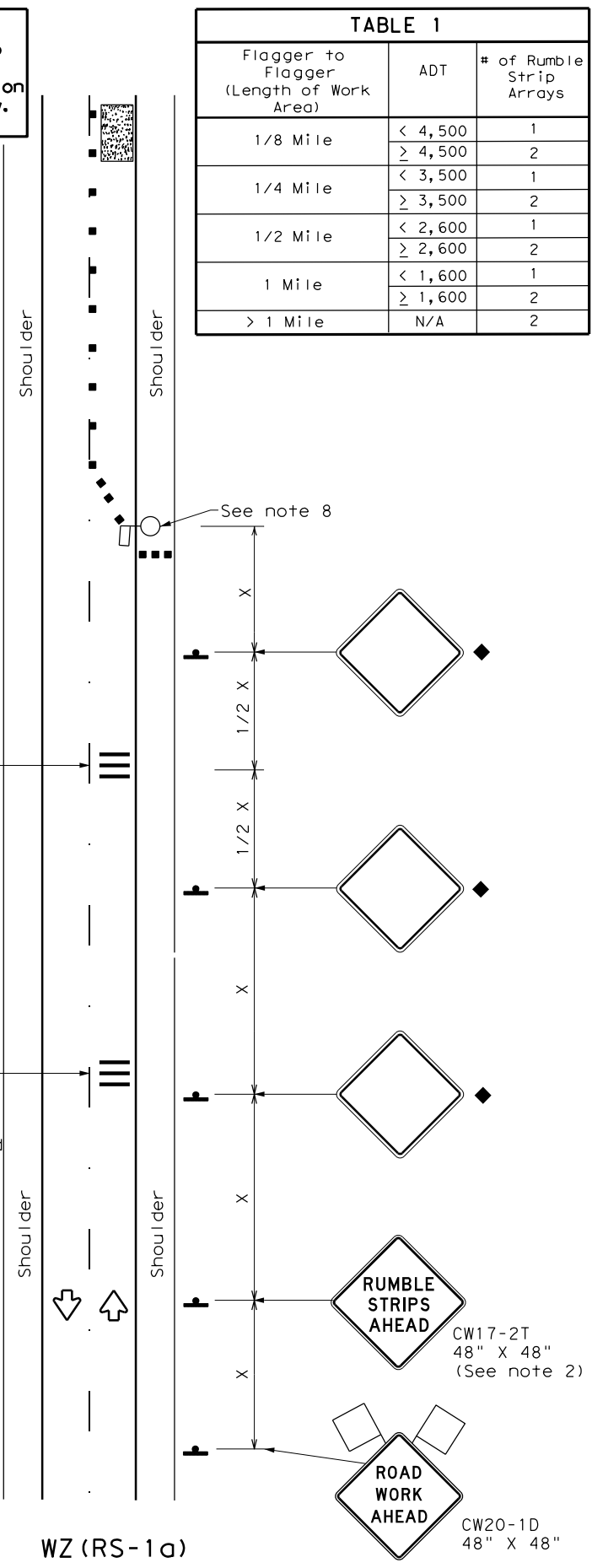
FILE:	tcp6-1.dgn	DN:	TxDOT	CK:	TxDOT	DN:	TxDOT	CK:	TxDOT
© TxDOT	February 1998	CONT	SECT	JOB	HIGHWAY				
8-12	REVISIONS	6447	95	001, ETC.	US 77, ETC.				
		DIST	COUNTY	SHEET NO.					
		YKM	VICTORIA, ETC.	52					

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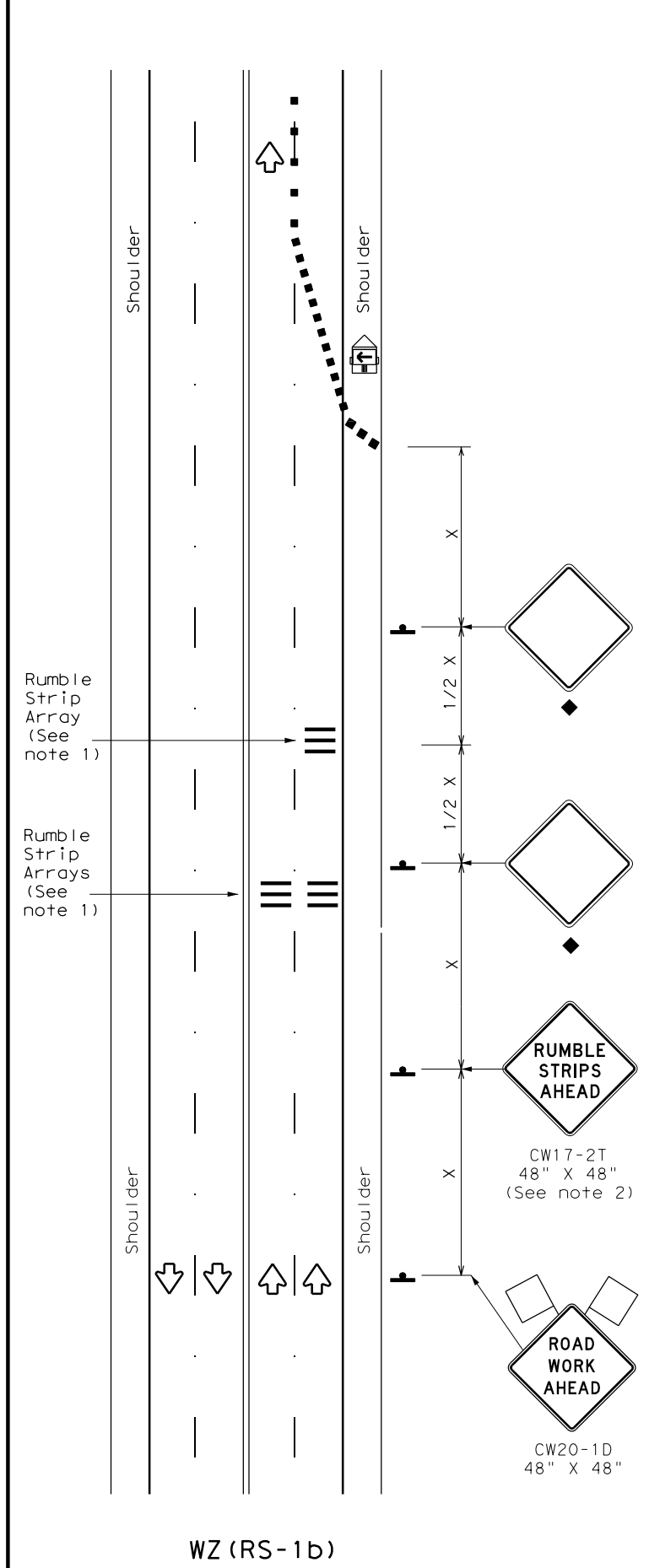
DATE: 12/13/2023 \$TIME\$  
FILE: \$FILES\$

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

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



RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	L = WS / 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)

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

◆ Signs are for illustrative purposes only. Signs required may vary depending on the TCP, TMUTCD Typical Application, or project specific details for the project.  
 \* For posted speeds in excess of 65 MPH, it is recommended that spacing is increased as speed limits increase. Increasing space between rumble strips will improve effectiveness.

Texas Department of Transportation  
 Traffic Safety Division Standard

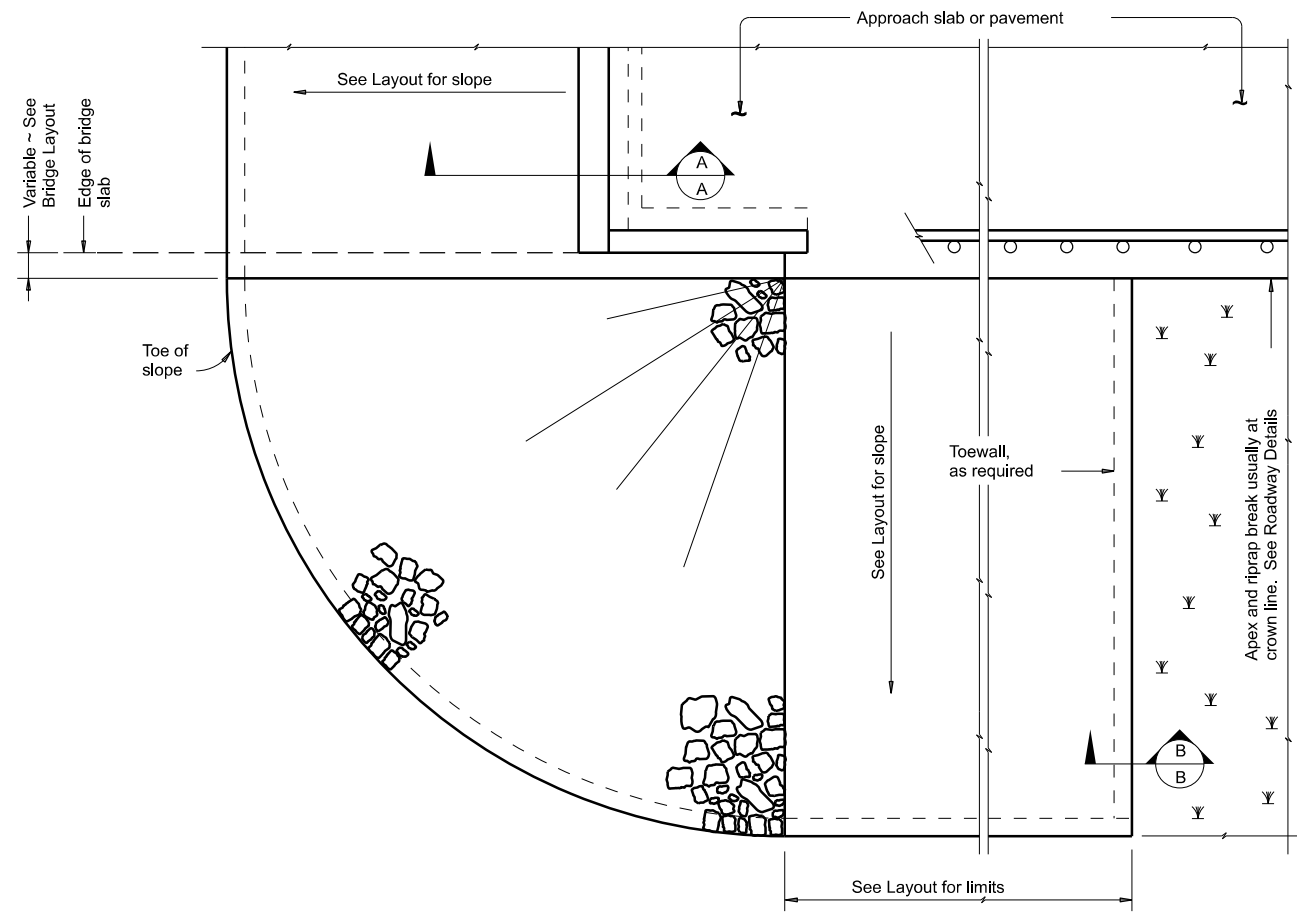
## TEMPORARY RUMBLE STRIPS

### WZ (RS) - 22

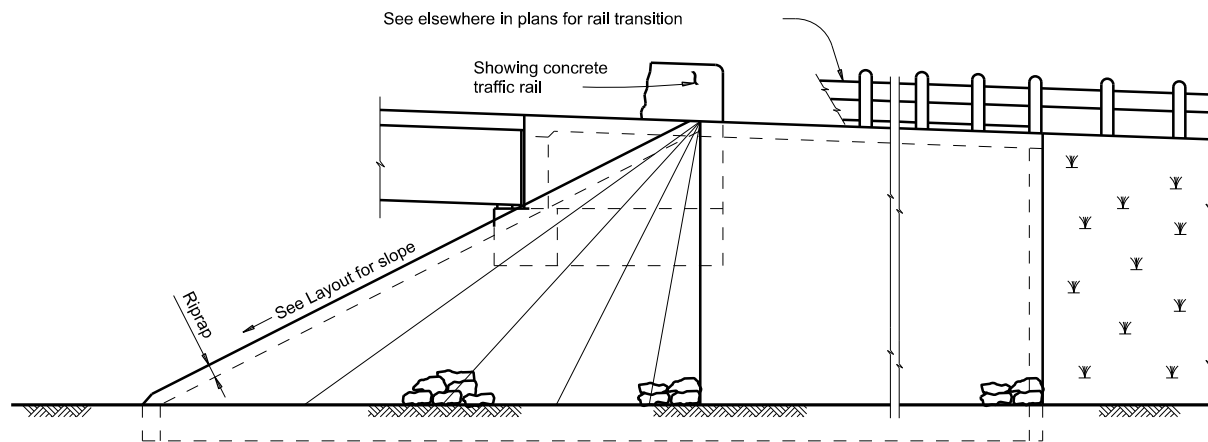
FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	6447	95	001, ETC.	US 77, ETC.
2-14 1-22	DIST	COUNTY	SHEET NO.	
4-16	YKM	VICTORIA, ETC.	53	

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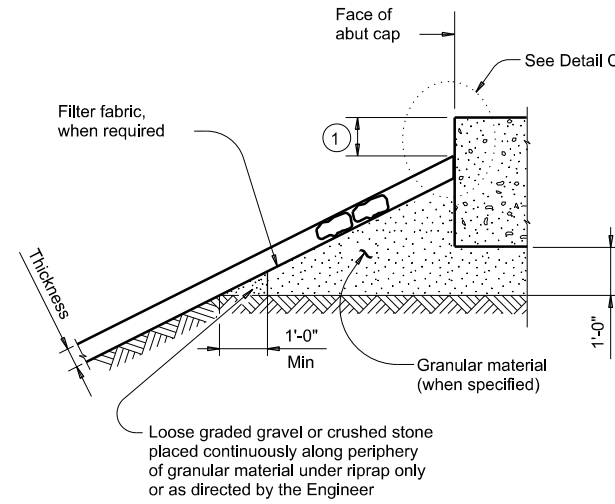
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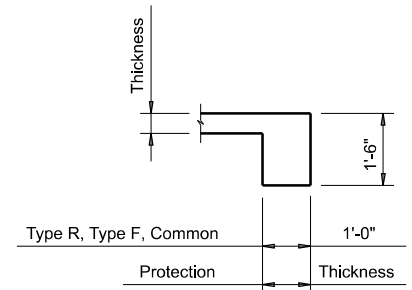
PLAN



ELEVATION



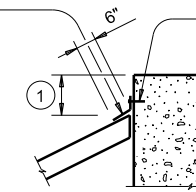
SECTION A-A AT CAP



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".

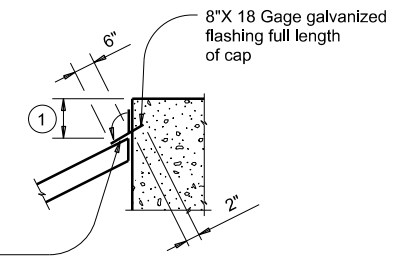
8"X 18 Gage galvanized flashing full length of cap



CAP OPTION A

Nail flashing to cap or wingwall and seal with joint sealer

Plug ends and seal joint along ends of cap and side of wingwalls with joint sealer



CAP OPTION B

DETAIL C

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.

SHEET 1 OF 2

		<b>Bridge Division Standard</b>	
<h2>STONE RIPRAP</h2>			
<h3>SRR</h3>			
FILE: MS-SRR-19.dgn	DN: AES	CK: JGD	DW: BWH
©TxDOT	Apr 2019	CONTRACT NO. 6447	SECTION 95
REVISIONS		JOB NO. 001, ETC.	HIGHWAY NO. 77, ETC.
DIST. YKM	COUNTY VICTORIA, ETC.	SHEET NO. 54	

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DATE: 12/13/2023 \$TIME\$  
FILE: \$FILE\$

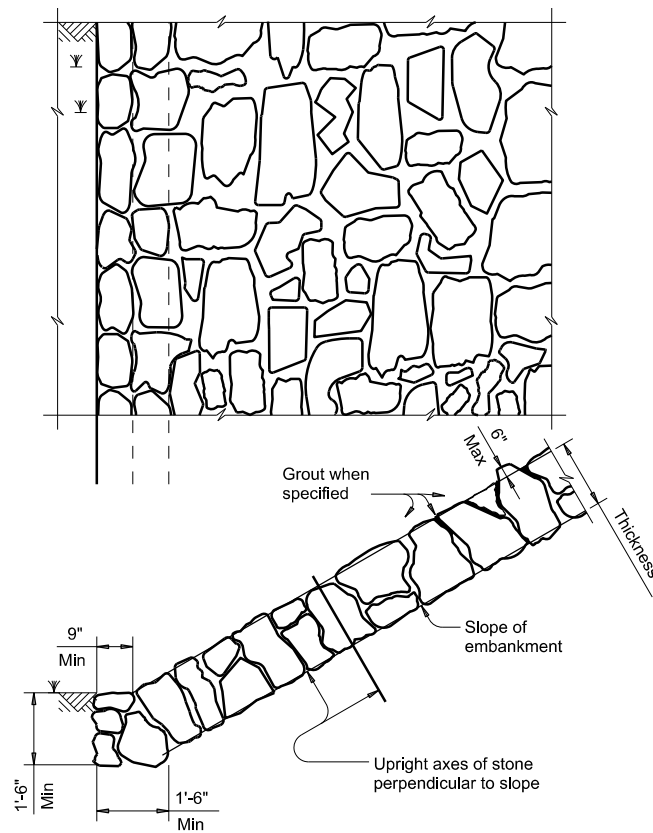


FIGURE 1 ~ TYPE R STONE RIPRAP

dry or grouted

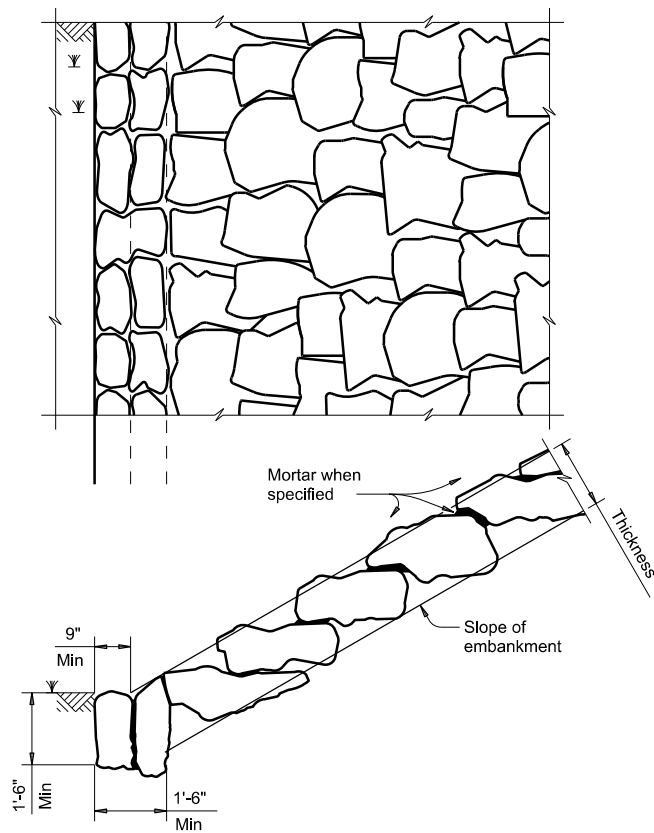


FIGURE 2 ~ TYPE F STONE RIPRAP

dry or mortared

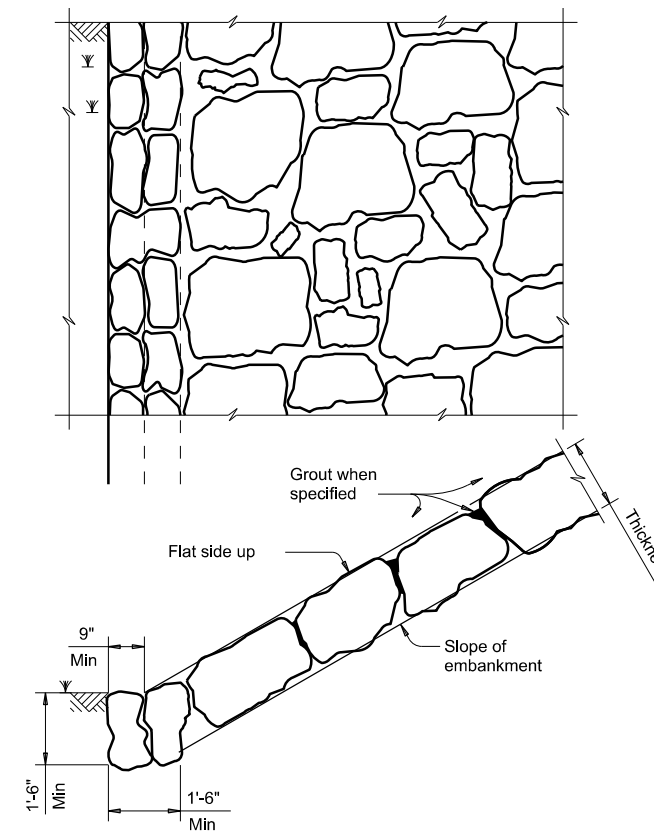
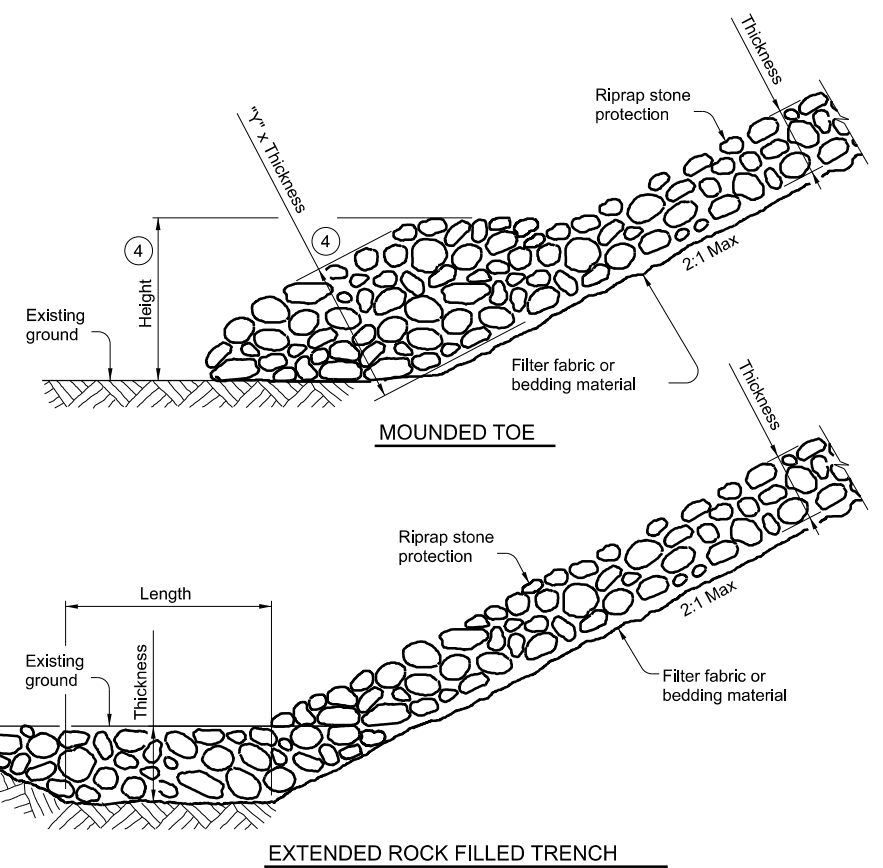


FIGURE 3 ~ TYPE F STONE RIPRAP

grouted

- 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.



PROTECTION STONE RIPRAP TOE OPTIONS

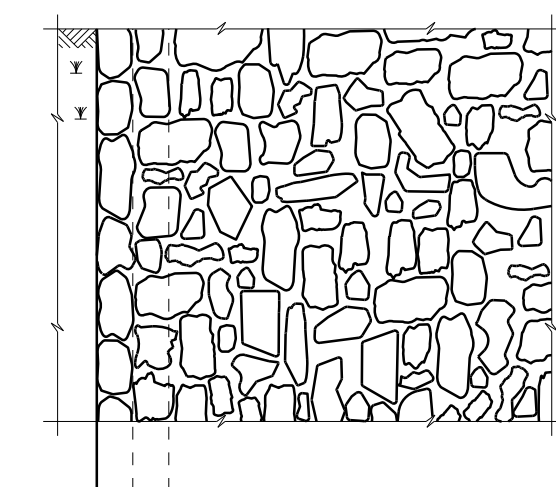


FIGURE 4 ~ COMMON STONE RIPRAP

dry or grouted

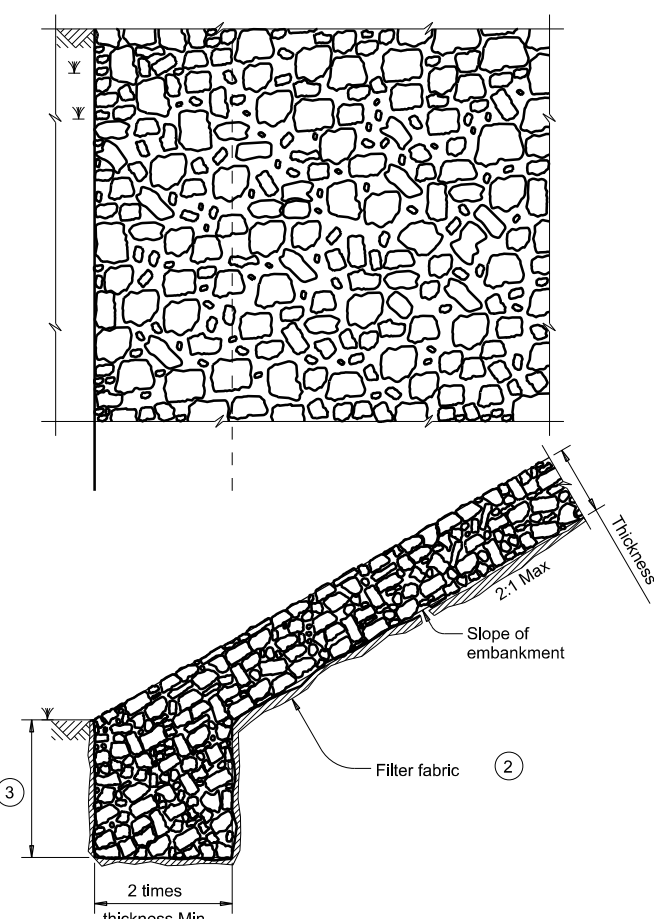


FIGURE 5 ~ PROTECTION STONE RIPRAP

SHEET 2 OF 2



STONE RIPRAP

SRR

FILE: MS-SRR-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	6447	95	001, ETC.	US 77, ETC.
	DIST	COUNTY	SHEET NO.	
	YKM	VICTORIA, ETC.	55	

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DATE: FILE:

**I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402**

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

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

- 
- No Action Required      Required Action

Action No.

- Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
- Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
- Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
- When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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

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

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

- No Permit Required
- Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
- Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
- Individual 404 Permit Required
- Other Nationwide Permit Required: NWP# 3a

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.

- VARIOUS LOCATIONS
- 
- 
- 

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
<input checked="" type="checkbox"/> Temporary Vegetation	<input checked="" type="checkbox"/> Silt Fence	<input checked="" type="checkbox"/> Vegetative Filter Strips
<input type="checkbox"/> Blankets/Matting	<input type="checkbox"/> Rock Berm	<input type="checkbox"/> Retention/Irrigation Systems
<input type="checkbox"/> Mulch	<input type="checkbox"/> Triangular Filter Dike	<input type="checkbox"/> Extended Detention Basin
<input type="checkbox"/> Sodding	<input type="checkbox"/> Sand Bag Berm	<input type="checkbox"/> Constructed Wetlands
<input type="checkbox"/> Interceptor Swale	<input type="checkbox"/> Straw Bale Dike	<input type="checkbox"/> Wet Basin
<input type="checkbox"/> Diversion Dike	<input type="checkbox"/> Brush Berms	<input type="checkbox"/> Erosion Control Compost
<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Mulch Filter Berm and Socks
<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks
<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Vegetation Lined Ditches
	<input type="checkbox"/> Stone Outlet Sediment Traps	<input type="checkbox"/> Sand Filter Systems
	<input type="checkbox"/> Sediment Basins	<input type="checkbox"/> 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

**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

- Minimize the amount of vegetation proposed for clearing. Removal of native vegetation, particularly mature native trees and shrubs will be avoided to the greatest extent possible.
- The use of any non-native plant species in revegetation will be discouraged.
- Avoid vegetation clearing activities during the general nesting season, March through August, to minimize adverse impacts to birds.

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

- No Action Required      Required Action

**BIRD IMPACTS**

- Prior to construction, perform daytime surveys for nests including under bridges and in culverts to determine if they are active before removal. Nests that are active should not be disturbed.
- Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season (February 15 - October 1 as established by the Migratory Bird Treaty Act).
- Avoid the removal of unoccupied, inactive nests, as practicable.
- Prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair.
- Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.

**VI. GENERAL NOTES**

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE FACT THAT DISCHARGE OF PERMANENT OR TEMPORARY FILL MATERIAL INTO THE WATERS OF THE UNITED STATES (U.S.), INCLUDING JURISDICTIONAL WETLANDS, AS NECESSARY FOR CONSTRUCTION, WILL REQUIRE SPECIFIC APPROVAL OF THE U.S. ARMY CORPS OF ENGINEERS (USACE) UNDER SECTION 404 OF THE CLEAN WATER ACT

THE DEPARTMENT WILL OBTAIN THE APPROPRIATE PERMIT(S), NATIONWIDE OR INDIVIDUAL, WHEN NECESSARY AS DICTATED BY THE PROPOSED ACTIONS FOR THE PROJECT AND IT'S POTENTIAL TO AFFECT USACE JURISDICTIONAL AREAS. THE CONTRACTOR MAY REVIEW THE PERMITTED PLANS AT THE OFFICE OF THE AREA ENGINEER IN CHARGE OF CONSTRUCTION. THE DEPARTMENT WILL HOLD THE CONTRACTOR RESPONSIBLE FOR FOLLOWING ALL CONDITIONS OF THE APPROVED PERMIT. IF THE CONTRACTOR CANNOT WORK WITHIN THE LIMITS OF THIS PERMIT(S), THEN IT BECOMES THE CONTRACTOR'S ENTIRE RESPONSIBILITY TO CONSULT WITH THE USACE PERTAINING TO THE NEED FOR CHANGES OR AMENDMENTS TO THE CONDITIONS OF THE EXISTING PERMITS(S) AS ORIGINALLY OBTAINED BY THE DEPARTMENT.

PARTICULAR IMPORTANCE IS STRESSED ON THE FACT THAT ANY IMPACTS TO USACE JURISDICTIONAL WATERS OF THE U.S., INCLUDING JURISDICTIONAL WETLANDS, BE THE MINIMUM NECESSARY TO COMPLETE THE PROPOSED WORK. CONTRACTOR SHALL MAINTAIN NEAR NORMAL FLOW OF ANY JURISDICTIONAL WATERS OF THE U.S. AT ALL TIMES DURING CONSTRUCTION. IF THE CONTRACTOR NEEDS FURTHER EXPLANATION OF THE CONDITIONS OF THE PERMIT, INCLUDING MEANS OF COMPLIANCE, THEY MAY CONTACT THE YOAKUM DISTRICT ENVIRONMENTAL COORDINATOR

**LIST OF ABBREVIATIONS**

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

**VII. 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.

- 
- 
- 


**VIII. OTHER ENVIRONMENTAL ISSUES**

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

- No Action Required      Required Action

Action No.

- 
- 
- 

 <b>Texas Department of Transportation</b>		<b>Design Division Standard</b>		
<h2 style="margin: 0;">ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS</h2> <h1 style="margin: 0;">EPIC</h1>				
FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
12-12-2011 (DS) REVISIONS	6447	95	001, ETC.	US 77, ETC.
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY	SHEET NO.	
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	YKM	VICTORIA , ETC.	<b>56</b>	



**STORMWATER POLLUTION PREVENTION PLAN (SWP3):**

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

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

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

**1.0 SITE/PROJECT DESCRIPTION**

**1.1 PROJECT CONTROL SECTION JOB (CSJ):**  
6447-95-001

**1.2 PROJECT LIMITS:**

From: SEE PROJECT LOCATION MAP

To: \_\_\_\_\_

**1.3 PROJECT COORDINATES:**

BEGIN: (Lat) SEE INDIVIDUAL PROJECT SHEETS

END: (Lat) \_\_\_\_\_, (Long) \_\_\_\_\_

**1.4 TOTAL PROJECT AREA (Acres):** 12 AC

**1.5 TOTAL AREA TO BE DISTURBED (Acres):** <1 AC

**1.6 NATURE OF CONSTRUCTION ACTIVITY:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**1.7 MAJOR SOIL TYPES:**

Soil Type	Description
SEE PROJECT LOCATION MAP	
Location 1: Natatche loam	0 to 1 percent slopes, frequently flooded
Location 2: Wockley fine sandy loam	0 to 1 percent slopes
Location 3: Kuy sand & Milby sand	0 to 5 percent slopes & 0 to 2 percent slopes
Location 4: Tidehaven fine sandy loam	0 to 1 percent slopes
Location 5: Tadina fine sand & Zalco fine sand	1 to 5 percent slopes & 0 to 1 percent slopes, frequently flooded
Location 6: Cheetham loamy sand	1 to 3 percent slopes
Location 7: Cheetham loamy sand	1 to 3 percent slopes

**1.8 PROJECT SPECIFIC LOCATIONS (PSLs):**

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

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

Type	Sheet #s

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

**1.9 CONSTRUCTION ACTIVITIES:**

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

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

**1.10 POTENTIAL POLLUTANTS AND SOURCES:**

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

**1.11 RECEIVING WATERS:**

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

Tributaries	Classified Waterbody
SEE PROJECT LOCATION MAP	
Location 1: Ivy's (Ives) Creek Piney Creek	Segment ID 1202 Brazos River
Location 2: No tributary near project location	No classified waterbody near project location
Location 3: Skull Creek	Segment ID 1402 Colorado River
Location 4: No tributary near project location	No classified waterbody near project location
Location 5: West Sandy Creek	No classified waterbody near project location

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

**1.12 ROLES AND RESPONSIBILITIES: TxDOT**

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

**1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR**

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

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

MS4 Entity

**STORMWATER POLLUTION PREVENTION PLAN (SWP3)**

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			57
STATE	STATE DIST.	COUNTY	
TEXAS	YKM	VICTORIA , ETC.	
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.

**STORMWATER POLLUTION PREVENTION PLAN (SWP3):**

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

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

**2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:**

**T / P**

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

**2.2 SEDIMENT CONTROL BMPs:**

**T / P**

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

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

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

**T / P**

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

**2.3 PERMANENT CONTROLS:**

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

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

**2.4 OFFSITE VEHICLE TRACKING CONTROLS:**

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

**2.5 POLLUTION PREVENTION MEASURES:**

- Chemical Management
- Concrete and Materials Waste Management
- Debris and Trash Management
- Dust Control
- Sanitary Facilities
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**2.6 VEGETATED BUFFER ZONES:**

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

Type	Stationing	
	From	To

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

**2.7 ALLOWABLE NON-STORMWATER DISCHARGES:**

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

**2.8 DEWATERING:**

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

**2.9 INSPECTIONS:**

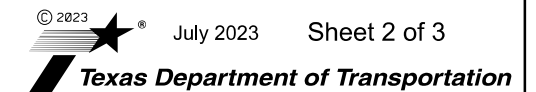
All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

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

**2.10 MAINTENANCE:**

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

**STORMWATER POLLUTION PREVENTION PLAN (SWP3)**



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			58
STATE	STATE DIST.	COUNTY	
TEXAS	YKM	VICTORIA , ETC.	
CONT.	SECT.	JOB	HIGHWAY NO.
6447	95	001, ETC.	US 77, ETC.

**1.7 MAJOR SOIL TYPES CONTINUED:**

Soil Type	Description
SEE PROJECT LOCATION MAP	
Location 8: Fordtran loamy fine sand & Kuy sand	0 to 5 percent slopes & 0 to 5 percent slopes
Location 9: Laewest clay	0 to 1 percent slopes
Location 10: Laewest clay	0 to 1 percent slopes
Location 11: Marcado sandy clay loam	3 to 8 percent slopes
Location 12: Marcado sandy clay loam	3 to 8 percent slopes
Location 13: Inez fine sandy loam	0 to 2 percent slopes
Location 14: Laewest clay	0 to 1 percent slopes
Location 15: Pledger clay	0 to 1 percent slopes, rarely flooded
Location 16: Clemville silty clay loam & Laewest silty clay, overwashed	0 to 1 percent slopes, occasionally flooded & 0 to 1 percent slopes
Location 17: Texana fine sandy loam	0 to 1 percent slopes
Location 18: Telferner-Urban land complex	0 to 3 percent slopes
Location 19: Zalco fine sand	0 to 1 percent slopes, frequently flooded
Location 20: Laewest clay	0 to 1 percent slopes
Location 21: Pits and Dumps	N/A
Location 22: Edna loam	0 to 1 percent slopes
Location 23: Dacosta sandy clay loam	0 to 1 percent slopes
Location 24: Edna loam	0 to 1 percent slopes
Location 25: Brazoria clay	0 to 1 percent slopes, rarely flooded
Location 26: Edna loam	0 to 1 percent slopes
Location 27: Lake Charles clay	0 to 1 percent slopes

**1.11 RECEIVING WATERS CONTINUED:**

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

Tributaries	Classified Waterbody
SEE PROJECT LOCATION MAP	
Location 6: Kotzebue Creek	No classified waterbody near project location
Location 7: Coushatta Creek	Segment ID 1302 *San Bernard River (Impaired for bacteria)
Location 8: Church Creek Coushatta Creek	Segment ID 1302 *San Bernard River (Impaired for bacteria)
Location 9: Dry Creek	Segment ID 2453C *Arenosa Creek (Impaired for bacteria)
Location 10: Devers Creek	Segment ID 1604 Lake Texana
Location 11: No tributary near project location	Segment ID 2456 *Caracahua Bay (Impaired for bacteria)
Location 12: No tributary near project location	Segment ID 2456 *Caracahua Bay (Impaired for bacteria)
Location 13: Brushy Creek	Segment ID 1604C Sandy Creek
Location 14: No tributary near project location	Segment ID 1604 Lake Texana
Location 15: Dead Slough	Segment ID 1304 *Caney Creek Tidal (Impaired for Bacteria)
Location 16: No tributary near project location	Segment ID 1401 Colorado River Tidal
Location 17: Live Oak Creek	No classified waterbody near project location
Location 18: No tributary near project location	No classified waterbody near project location
Location 19: Dry Creek	No classified waterbody near project location
Location 29: No tributary near project location	No classified waterbody near project location
Location 21: No tributary near project location	No classified waterbody near project location

**1.11 RECEIVING WATERS CONTINUED:**

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

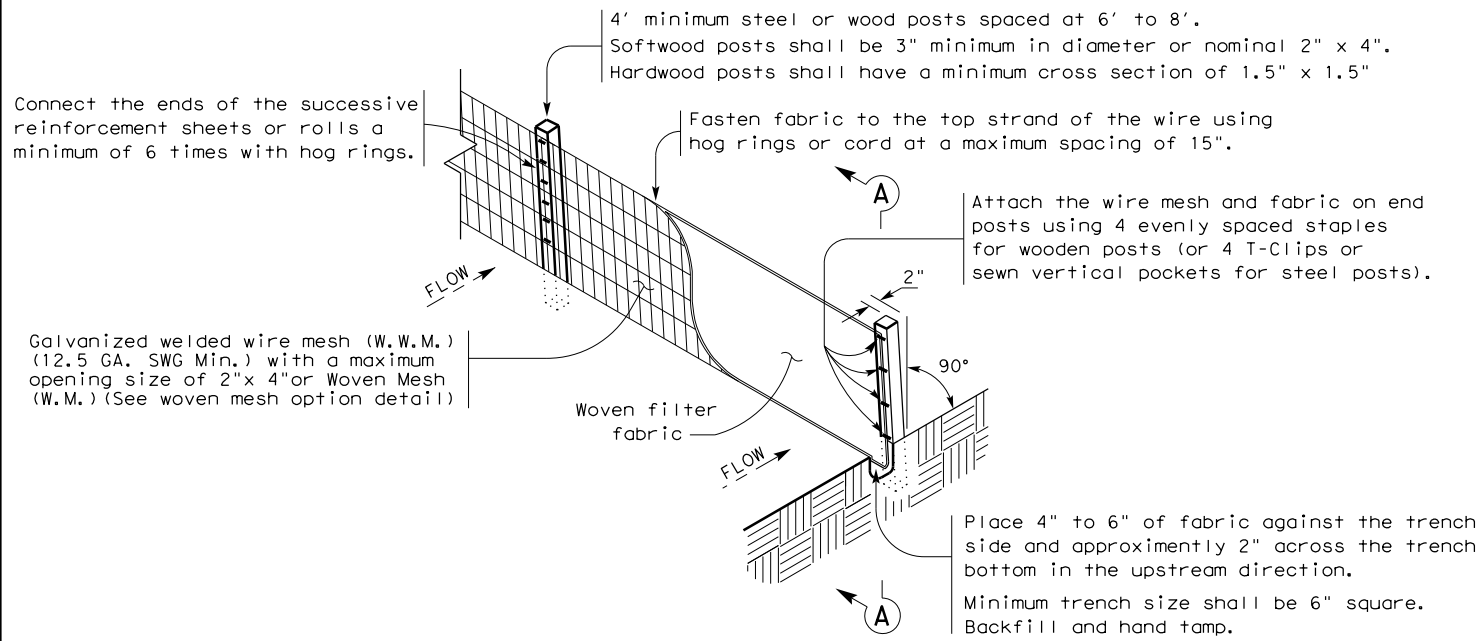
Tributaries	Classified Waterbody
SEE PROJECT LOCATION MAP	
Location 22: No tributary near project location	Segment ID 1604A East Mustang Creek
Location 23: No tributary near project location	No classified waterbody near project location
Location 24: Stage Stand Creek	Segment ID 1604A East Mustang Creek
Location 25: No tributary near project location	No classified waterbody near project location
Location 26: East Carancahua Creek	No classified waterbody near project location
Location 27: No tributary near project location	Segment ID 1402F Blue Creek

**STORMWATER POLLUTION PREVENTION PLAN (SWP3)**

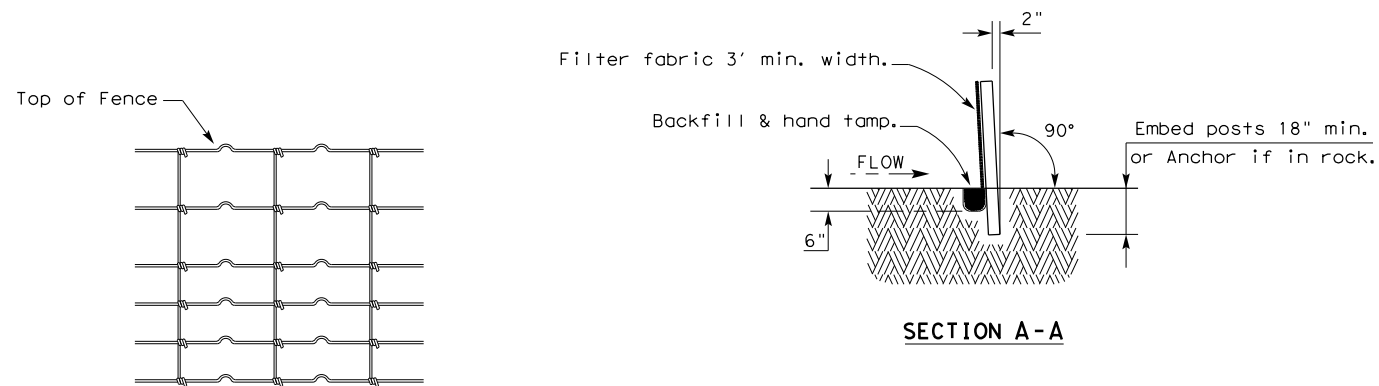
FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
				59
STATE	STATE DIST.	COUNTY		
TEXAS	YKM	VICTORIA , ETC.		
CONT.	SECT.	JOB	HIGHWAY NO.	
6447	95	001, ETC.	US 77, ETC.	

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10/18/2023  
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**TEMPORARY SEDIMENT CONTROL FENCE**



**HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL**

Galvanized hinge joint knot woven mesh (12.5 GA. SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

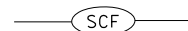
**SEDIMENT CONTROL FENCE USAGE GUIDELINES**

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT<sup>2</sup>. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

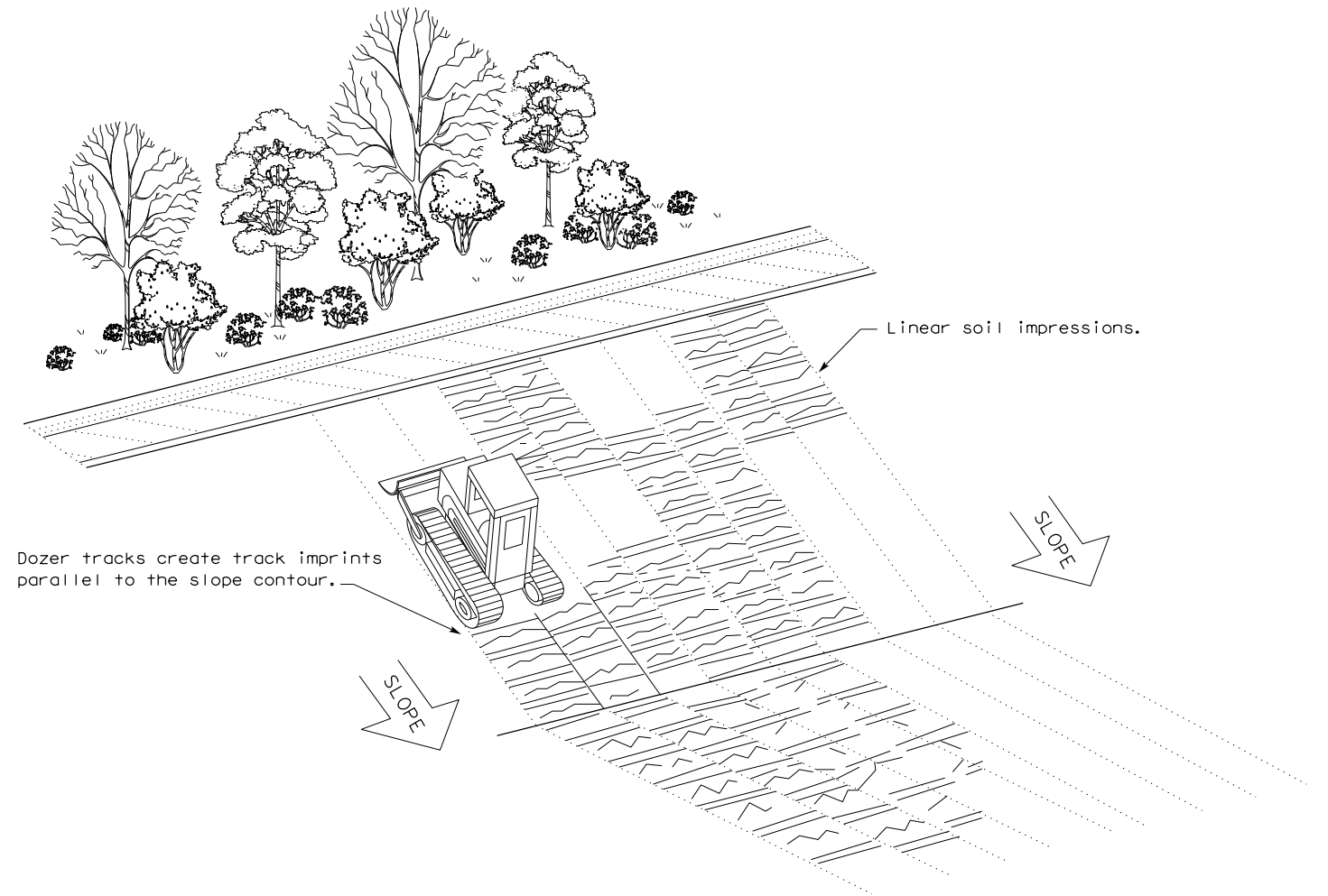
**LEGEND**

Sediment Control Fence



**GENERAL NOTES**

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continuous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



**VERTICAL TRACKING**

				<b>Design Division Standard</b>	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE &amp; VERTICAL TRACKING</b>					
<b>EC(1) - 16</b>					
FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS		6447	95	001, ETC.	US 77, ETC.
	DIST	COUNTY		SHEET NO.	
	YKM	VICTORIA, ETC.		60	