FED. RD. DIV. NO.	PROJECT NUMBER		HIGHWAY NUMBER
6	C 917-00-68		VARIOUS
STATE	DISTRICT	COUNTY	
TEXAS	BRY	BRAZOS	
CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	1

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

SEE SHEETS 2 AND 3
FOR INDEX OF SHEETS
& LOCATION MAP

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

PROJECT NUMBER: C 917-00-68

VARIOUS

BRAZOS COUNTY

FOR THE CONSTRUCTION OF BRIDGE REPAIRS CONSISTING OF CRACK, SPALL, JOINT, AND EROSION REPAIRS

LOCATION NO.	HIGHWAY	COUNTY	NBI	LIMITS	2022 AADT 2042 AADT	STATION		REFERENCE MARKERS		TOTAL LENGTH (FT)	BRIDGE LENGTH (FT)	RDWY LENGTH (FT)	REPAIR ID (FUA ID)
						FROM	TO	BEGIN	END				
BR-012	FM 2818	BRAZOS	17-021-0-2399-01-001	AT TURKEY CREEK	13,922 19,491	180+38.30	180+60.60	RM 412+2.354 MI	RM 412+2.358 MI	22.30	22.30	0.00	R-081 (597439) R-082 (596743)
BR-013	SH 47 SB	BRAZOS	17-021-0-3138-02-002	AT THOMPSON CREEK	10,849 19,311	99+70.00	102+90.00	RM 412+1.019 MI	RM 412+1.079 MI	320.00	320.00	0.00	R-084 (597447)
BR-033	SH 6 NB	GRIMES	17-094-0-0050-03-036	AT GRASSY CREEK	27,891 49,646	400+22.33	404+47.00	RM 616+0.911 MI	RM 616+0.991 MI	424.67	424.67	0.00	R-085 (597458) R-086 (597459) R-087 (597460)
BR-005	SH 6	BRAZOS	17-021-0-0050-02-183	AT MILLICAN CREEK NORTH	38,645 66,469	233+85.17	234+18.83	RM 602+1.148 MI	RM 602+1.154 MI	33.66	33.66	0.00	R-325 (N/A)

NO EXCEPTIONS
NO EQUATIONS
NO RAILROAD CROSSINGS

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014, AND SPECIFICATION ITEMS LISTED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT:

SPECIAL LABOR PROVISIONS FOR STATE PROJECTS (000—008).

TEXAS DEPARTMENT OF TRANSPORTATION®

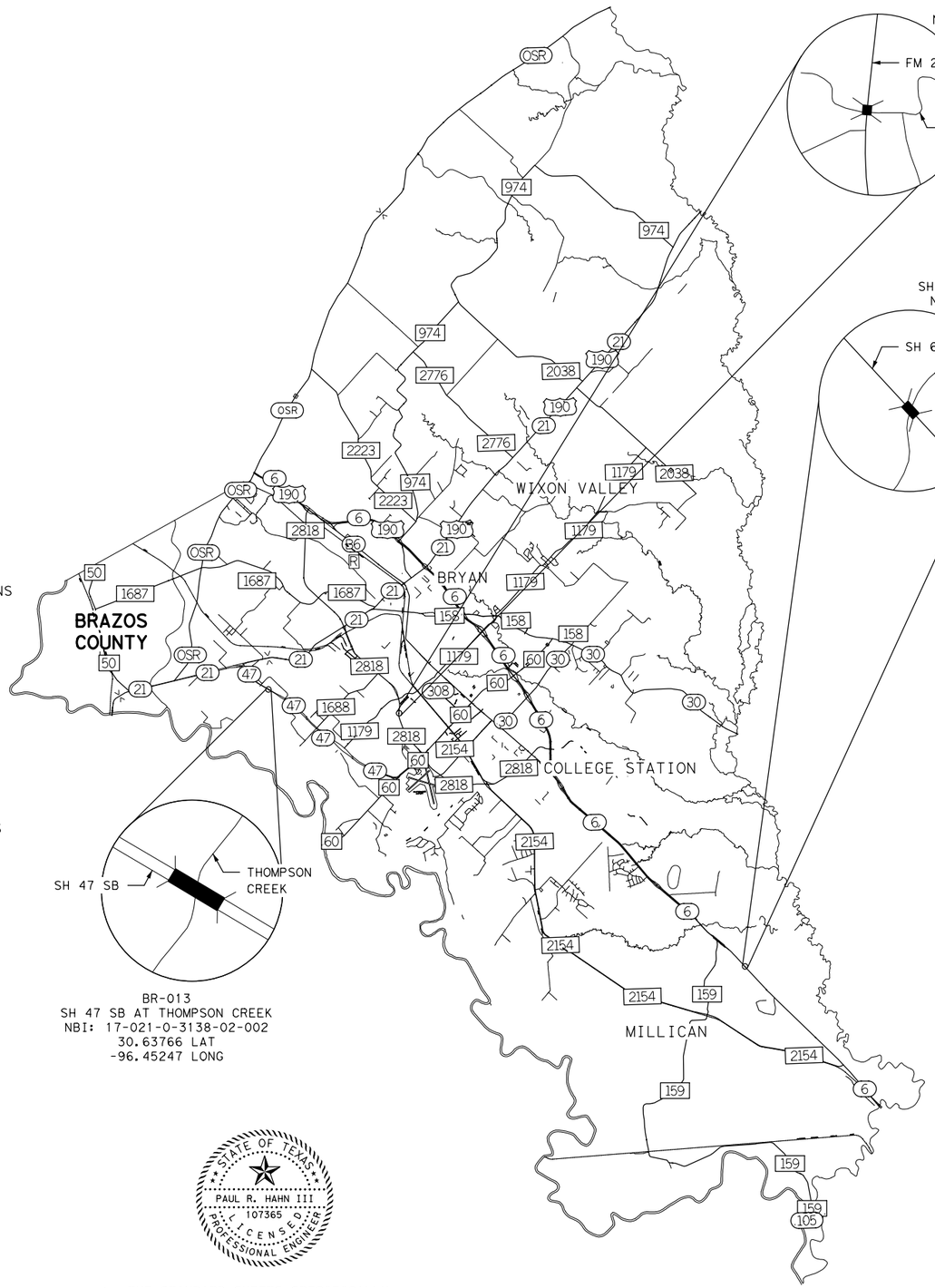
SUBMITTED FOR LETTING: 2/28/2024
DocuSigned by:
01EBC5C65E334CE...
DISTRICT BRIDGE ENGINEER

RECOMMENDED FOR LETTING: 2/28/2024
DocuSigned by:
DAA3B0E2...
DIRECTOR OF TRANSPORTATION
PLANNING AND DEVELOPMENT

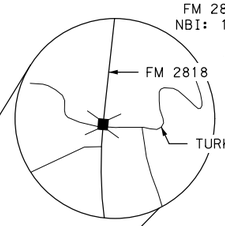
APPROVED FOR LETTING: 2/28/2024
DocuSigned by:
60E5537715D24EA...
DISTRICT ENGINEER

REV DATE: 2-12-2015
CSJ: C 917-00-68
FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms\196311BRY-C1-24_TITLE.dgn

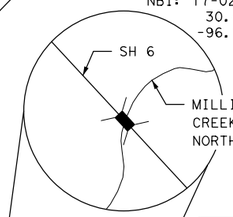
INDEX OF SHEETS

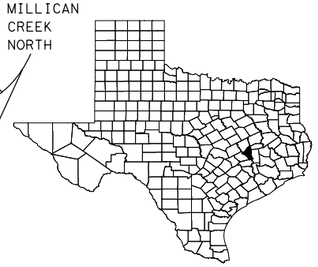


BR-012
FM 2818 AT TURKEY CREEK
NBI: 17-021-0-2399-01-001
30.62361 LAT
-96.37722 LONG



BR-005
SH 6 AT MILLICAN CREEK NORTH
NBI: 17-021-0-0050-02-183
30.49120 LAT
-96.18129 LONG





KEY TO COUNTIES

BR-013
SH 47 SB AT THOMPSON CREEK
NBI: 17-021-0-3138-02-002
30.63766 LAT
-96.45247 LONG

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED
PROFESSIONAL ENGINEER

X THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

NAME _____ DATE 2/16/2024

STATE OF TEXAS
PAUL R. HAHN III
107365
LICENSED
PROFESSIONAL ENGINEER

O THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

NAME _____ DATE 2/16/2024

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION # 739

HUITT-ZOLLARS
HUITT ZOLLARS, INC.
5430 LBJ FREEWAY,
SUITE 1500,
DALLAS, TEXAS 75240-2601
Firm No. F-761

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

100% SUBMITTAL

PRINT DATE	REVISION DATE
2/16/2024	

Texas Department of Transportation
Bryan District

INDEX OF SHEETS & LOCATION MAP

SHEET 1 OF 2 SHEETS

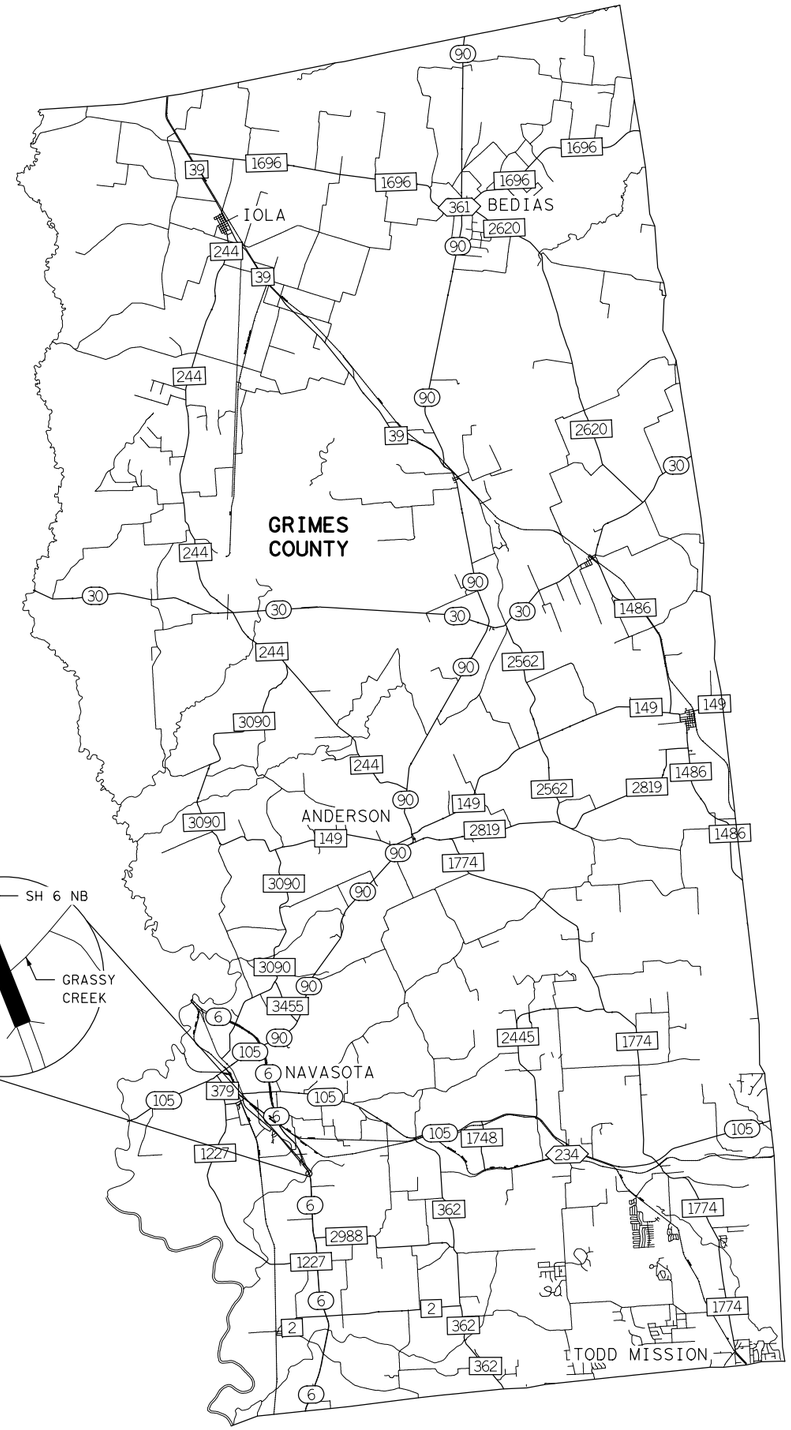
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	BRAZOS	
CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	2

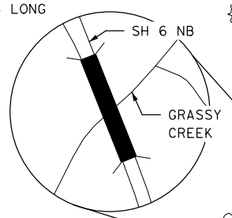
REV DATE: 2-12-2015
CSJ: C 917-00-68
FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms 196311\BRY-C1-24_INDEX_01.dgn

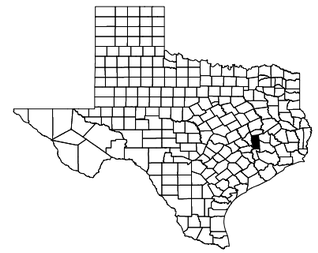
INDEX OF SHEETS

	SHEET NO.	DESCRIPTION
		ENVIRONMENTAL
	43	ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)
	44 - 45	TXDOT STORM WATER POLLUTION PREVENTION PLAN (SWP3)
	46	SH 6 AT MILLICAN CREEK NORTH NBI: 17-021-0-0050-02-183 SWP3 LAYOUT
	47	FM 2818 AT TURKEY CREEK NBI: 17-021-0-2399-01-001 SWP3 LAYOUT
	48	SH 47 SB AT THOMPSON CREEK NBI: 17-021-0-3138-02-002 SWP3 LAYOUT
	49	SH 6 NB AT GRASSY CREEK NBI: 17-094-0-0050-03-036 SWP3 LAYOUT
		STANDARDS (ENVIRONMENTAL)
O	50	EC(1)-16
O	51	EC(2)-16
O	52	EC(3)-16



BR-033
SH 6 NB AT GRASSY CREEK
NBI: 17-094-0-0050-03-036
30.33861 LAT
-96.04836 LONG





KEY TO COUNTIES

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION # 739

HUITT-ZOLLARS
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SUITE 1500,
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TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

100% SUBMITTAL	PRINT DATE	REVISION DATE
	2/14/2024	

STATE OF TEXAS
PAUL R. HAHN III
107365
LICENSED
PROFESSIONAL ENGINEER

O THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

NAME

2/14/2024
DATE

INDEX OF SHEETS & LOCATION MAP

SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	BRAZOS	
CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	3

REV DATE: 2-12-2015
CSJ: C 917-00-68
FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms19631\BRY-C1-24_INDEX_02.dgn

GENERAL:

Contractor questions on this project are to be addressed to the following individuals:
James Robbins, P.E., A.E., James.Robbins@txdot.gov
Joseph Greive, P.E., A.A.E., Joseph.Greive@txdot.gov

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

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

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

ITEM 7 "LEGAL RELATIONS AND RESPONSIBILITIES"

State contract mowers will mow the right of way during the growing season. The Contractor will be notified by the Engineer one week in advance of the anticipated time when mowers will be in the limits of the project. Clean the right of way to such a condition that allows the mowing contractors to safely mow.

In accordance with Item 7.2.5, Contractor equipment equipped with blue warning lights shall be wired so that operation of blue lights is independent of any other lights.

This project is on a hurricane evacuation route. Furnish at the pre-construction meeting a written plan outlining procedures to suspend work, secure the job site and safely handle traffic through and across the project in the event of a hurricane evacuation.

During the hurricane season (June 1 through November 30), do not close any travel lanes except when the Contractor can demonstrate that he can provide labor, equipment, material, work plan, and quality of work to satisfactorily return all lanes to an open, all-weather travel surface within three days of receiving written or verbal notice but no later than 3 days prior to hurricane landfall. Construction of temporary lanes to an all-weather surface will be paid in accordance with Article 9.7, "Payment for Extra Work and Force Account Method".

Sheet: 4
Highway: Various Control: 0917-00-068
County: Brazos

In addition to lane closures, cease work 3 days or as directed by the Engineer prior to hurricane landfall on or near the roadway that adversely impacts the flow of traffic and reduces the capacity of the highway during an evacuation. Prohibit the Contractor's, sub-contractors' or material suppliers' vehicles from entering or exiting the stream of traffic including material hauling and delivery, and mobilization or demobilization of equipment. When directed, this prohibition will include a reasonable time period for the evacuees to return to their point of origin.

In the event of the declaration of a hurricane watch, warning, other severe weather warning or national or state emergency that requires the roadways in the vicinity be used as evacuation routes, cease all work that requires the Contractor's, sub-contractors' or material suppliers' vehicles to enter the stream of traffic on these primary or secondary evacuation routes. This work includes material hauling and delivery, and mobilization or demobilization of equipment.

The following roadways are recognized hurricane evacuation routes in the Bryan District:

Primary Evacuation Routes: IH 45, US 77 (S of US 79), US 84 (E of IH 45), US 79, US 287, US 290, SH 6.

Secondary Evacuation Routes: US 190 (E of IH 45), SH 7, SH 21, SH 30 (SH 6 to IH 45), SH 36, SH 105 (E of SH 6).

Other routes may be designated.

Roadway closures during the following key dates and/or special events are prohibited:

- Day before and day of Texas A&M home football games
  - Day before and day of:
    - SH 6 in Brazos & Grimes County
    - SH 47
    - FM 2818
- Texas A&M graduation
- Texas A&M Family Weekend

The Engineer may decide to restrict construction operations or lane closures on these key dates and/or special events.

ITEM 8 "PROSECUTION AND PROGRESS"

By noon of each Wednesday, provide the Engineer a written outline of the daily work schedule for the following week. Include in the outline the times and places for proposed traffic control changes, lane and shoulder closures, and moving operations or other operations that affect traffic on the roadway. Unless otherwise authorized by the Engineer, prosecute the work on this project in accordance with the "TCP Narrative" sheet.

Some of the operations on the "TCP Narrative" sheet may be performed simultaneously.

Prepare Progress Schedule Bar Chart.

Equipment and material may be pre-staged at approved locations. When staging equipment and materials, they shall be marked/protected by type 3 barricades or appropriate TCP standards (includes overnight).

ITEM 100 "PREPARING RIGHT OF WAY"

This item is intended for the clearing of brush and materials adjacent to the bridge structures listed in the plan set. Trim trees and remove brush previously cut and abandoned below and adjacent to structures as directed by the Engineer.

Do not burn brush within the TxDOT Right of Way, all trees and brush will be disposed of by shredding, logging or other methods approved by the Engineer. Remove chippings and brush from the TxDOT Right of Way and dispose of according to local, state, and federal law(s). Do not allow chips to be carried into streams or waterways.

The contractor is responsible for all utility locates and coordination when performing preparing right of way activities.

ITEM 454 "BRIDGE EXPANSION JOINTS"

The list of approved Header Type Expansion Joints can be found at:
http://www.txdot.gov/inside-txdot/division/bridge/approved-systems/expansion-joints.html

Sheet: 4A

Highway: Various Control: 0917-00-068

County: Brazos

ITEM 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING"

Removal of ground mounted temporary signs and supports as specified on standard sheet BC(5), shall include the immediate backfilling of support holes with Type B embankment material and the compaction of the backfill material. The signs must also be removed within two weeks once construction ends.

For locations where the work duration is anticipated to be less than 15 working days, and work activities are limited to daylight hours, portable sign support as specified in section J.3 SHORT-TERM / SHORT-DURATION WORK ZONE SIGN SUPPORTS of the CWZTCD https://ftp.txdot.gov/pub/txdot-info/cmd/mpl/cwztcd.pdf may be used in place of other sign support as specified on standard sheet BC(5) with the approval of the Engineer.

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

Law enforcement assistance will be required for this project and is expected to be required for major traffic control changes and lane closures. Coordinate with local law enforcement and arrange for law enforcement as directed or agreed by the Engineer. Complete the daily tracking form provided by the department and submit invoices that agree with the tracking form for payment at the end of each month approved services were provided.

Patrol vehicles must be clearly marked to correspond with the officer's agency and equipped with appropriate lights to identify them as law enforcement. For patrol vehicles not owned by a law enforcement agency, markings will be retroreflective and legible from 100 ft. from both sides and the rear of the vehicle. Lights will be high intensity and visible from all angles.

Cancel law enforcement personnel when the event is canceled. Cancellation, minimums or "show up" fees will not be paid when cancellation is made 12 hours prior to beginning of the event. Failure to cancel within 12 hours will not be cause for payment for cancellation, minimums, or "show up" time. Payment of actual "show up" time to the event site due to cancellation will be on a case-by-case basis at a maximum of 2 hours per officer.

For work zone speed limits, the contractor shall submit Form 1204M for each work site indicated in the TCP Narrative for approval by the District. This form will determine the appropriate speed

reduction based on the work and shall be submitted a minimum of two weeks prior to performing the work at each site.

ITEM 506 "TEMPORARY EROSION, SEDIMENTATION AND ENVIRONMENTAL CONTROLS"

Prior to starting construction, review the SWP3 with the Engineer to confirm the type and placement of the devices. Device locations may be added, deleted, or modified by the Engineer.

No wheeled or tracked equipment shall be allowed to travel within the channel bottom except across stone riprap which has been set in final location. Use of timber mats to protect channel bottom from powered equipment will be considered subsidiary to other items.

ITEM 6001 "PORTABLE CHANGEABLE MESSAGE SIGN"

Furnish, install, and operate up to 3 Portable Changeable Message Signs (PCMS) for this project. The signs can be used both on the project and within a ten (10) mile radius of the project. Locations, messages, and durations of use will be specified by the Engineer. The primary uses will be to inform the public of special events, lane and road closures, and changes in traffic control. Signs will be paid for only when used as directed by the Engineer.

ITEM 6185 "TRUCK MOUNTED ATTENUATOR (TMA) AND TRAILER ATTENUATOR (TA)"

In addition to the shadow vehicles with truck mounted attenuator (TMA) that are specified as being required on the traffic control plan (TCP) for this project,

provide one (1) shadow vehicle(s) with TMA for TCP(2-4)-18 as detailed on General Note 5 of this standard sheet.

provide one (1) shadow vehicle(s) with TMA for TCP(2-6)-18 as detailed on General Note 6 of this standard sheet.

provide one (1) shadow vehicle(s) with TMA for TCP(5-1)-18 as detailed on General Note 1 of this standard sheet.

Sheet: 4B
Highway: Various Control: 0917-00-068
County: Brazos

Therefore, three (3) total shadow vehicles with TMA will be required for this type of work. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

Thirty (30) TMA days are provided in the project estimate for stationary operations.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0917-00-068 **DISTRICT** Bryan **COUNTY** Brazos
HIGHWAY Various

ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL
	100-6002	PREPARING ROW	STA	5.000	
	104-6009	REMOVING CONC (RIPRAP)	SY	48.000	
	403-6006	TEMPORARY SPL SHORING (COFFERDAM)	SF	618.000	
	429-6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	109.000	
	432-6008	RIPRAP (CONC)(CL B)(RR8&RR9)	CY	13.000	
	432-6033	RIPRAP (STONE PROTECTION)(18 IN)	CY	91.000	
	438-6001	CLEANING AND SEALING EXISTING JOINTS	LF	66.000	
	454-6007	HEADER TYPE EXPANSION JOINT	LF	66.000	
	480-6001	CLEAN EXIST CULVERTS	EA	1.000	
	500-6001	MOBILIZATION	LS	1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	2.000	
	506-6004	ROCK FILTER DAMS (INSTALL) (TY 4)	LF	27.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	27.000	
	506-6021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	546.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	546.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	640.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	640.000	
	780-6004	CONC CRCK REPR(DISCRETE)(ROUT AND SEAL)	LF	40.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	3.000	
	6185-6002	TMA (STATIONARY)	DAY	30.000	
	08	CONTRACTOR FORCE ACCOUNT LAW ENFORCEMENT (NON-PARTICIPATING)	LS	1.000	
		CONTRACTOR FORCE ACCOUNT SAFETY CONTINGENCY (NON-PARTICIPATING)	LS	1.000	
		CONTRACTOR FORCE ACCOUNT EROSION CONTROL MAINTENANCE (NON-PARTICIPATING)	LS	1.000	

TRAFFIC CONTROL NARRATIVE

1. ACCESS SHALL ALWAYS BE MAINTAINED TO ALL PROPERTY OWNERS UNLESS OTHERWISE APPROVED BY THE ENGINEER.

2. ALL EXISTING SIGNS ON OPEN ROADWAYS THAT ARE NOT IN CONFLICT WITH CONSTRUCTION AND TRAFFIC SHALL REMAIN IN PLACE UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

3. WORK HOURS ARE RESTRICTED TO 0800 TO 1600 UNLESS OTHERWISE APPROVED BY THE ENGINEER.

4. PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE INSTALLED 7 DAYS IN ADVANCE OF WORK AT BR-012 & BR-033 TO PROVIDE AMPLE NOTIFICATION TO THE TRAVELING PUBLIC. THE CONTRACTOR SHALL SUBMIT PROPOSED PCMS TEXT MESSAGES FOR EACH LOCATION TO THE ENGINEER FOR APPROVAL 3 DAYS PRIOR TO PLACEMENT.

5. THE CONTRACTOR IS TO INSTALL ALL SIGNS, DELINEATORS, PAVEMENT MARKINGS, AND CHANNELIZING DEVICES PER THE CURRENT TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD) AND TXDOT STANDARDS.

6. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN DRAINAGE DURING ALL PHASES OF CONSTRUCTION.

7. MAINTAIN ROADWAY LANE WIDTHS TO MATCH EXISTING CONDITIONS THROUGHOUT CONSTRUCTION UNLESS SPECIFIED OTHERWISE IN TRAFFIC CONTROL LAYOUTS OR TYPICAL SECTIONS.

8. THE CONTRACTOR SHALL COMPLETE WORK AT EACH PROJECT SITE ACCORDING TO THE PRIORITY LIST NOTED BELOW UNLESS OTHERWISE DIRECTED BY THE ENGINEER. THE CONTRACTOR MAY PROPOSE MODIFICATIONS TO THIS SEQUENCE OF WORK SUBJECT TO APPROVAL BY THE ENGINEER.

1. BR-012, FM 2818 AT TURKEY CREEK
2. BR-013, SH 47 SB AT THOMPSON CREEK
3. BR-033, SH 6 NB AT GRASSY CREEK
4. BR-005, SH 6 AT MILLICAN CREEK NORTH

BR-012 (FM 2818 AT TURKEY CREEK)
TRAFFIC CONTROL NARRATIVE

PHASE 1 - REPAIR CONCRETE WINGWALL AND INSTALL RIPRAP

1. PLACE ADVANCE WARNING SIGNS PER STANDARD BC(2)-21. PLACE PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) A MINIMUM OF 1,000 FEET IN ADVANCE OF OTHER TRAFFIC WARNING SIGNS, OR AS DIRECTED BY THE ENGINEER. USE THE "RIGHT LN CLOSED XXX FT" CONDITION FOR PCMS PHASE 1 MESSAGE AND THE "MERGE LEFT" WARNING FOR PCMS PHASE 2 MESSAGE, OR AS OTHERWISE DIRECTED OR APPROVED BY THE ENGINEER.

2. INSTALL EROSION AND SEDIMENTATION CONTROL DEVICES IN COORDINATION WITH THE WORK IN PROGRESS, OR AS DIRECTED BY THE ENGINEER. TRIM TREES TO ROW LINE.

3. IMPLEMENT WORK ZONE SPEED LIMIT ON FM 2818 PER STANDARD BC(3)-21. SEE ITEM 502 IN THE GENERAL NOTES FOR MORE INFORMATION ON WORK ZONE SPEED LIMITS.

4. MAINTAIN EXISTING TRAFFIC. USE TCP(2-4)-18 FOR STAGING OR MATERIALS AND EQUIPMENT. TIME RESTRICTIONS FOR LANE CLOSURE TO BE DETERMINED BY AREA ENGINEER.

5. PERFORM REPAIRS R-081 AND R-082 PER REPAIR DETAIL SHEETS.

6. PERFORM FINAL CLEANUP AND REMOVE ADVANCE WARNING SIGNS.

BR-013 (SH 47 SB AT THOMPSON CREEK)
TRAFFIC CONTROL NARRATIVE

PHASE 1 - REPAIR CONCRETE BENT CAPS

1. PLACE ADVANCE WARNING SIGNS PER STANDARD BC(2)-21.

2. INSTALL EROSION AND SEDIMENTATION CONTROL DEVICES IN COORDINATION WITH THE WORK IN PROGRESS, OR AS DIRECTED BY THE ENGINEER.

3. MAINTAIN EXISTING TRAFFIC. USE TCP(5-1)-18 FOR STAGING OF MATERIALS AND EQUIPTMENT.

4. PERFORM REPAIRS R-084 PER REPAIR DETAIL SHEETS.

5. PERFORM FINAL CLEANUP AND REMOVE ADVANCE WARNING SIGNS.

TCP ESTIMATED QUANTITIES

ITEM CODE	*DESCRIPTION*	*UNITS*	*TOTAL*
502-6001	*BARRICADES, SIGNS AND TRAFFIC HANDLING*	*MO*	*2*
6001-6002	*PORTABLE CHANGEABLE MESSAGE SIGN*	*EA*	*3*
6185-6002	*TMA (STATIONARY)*	*DAY*	*30*

STATE OF TEXAS
PAUL R. HAHN III
107365
LICENSED PROFESSIONAL ENGINEER
2/14/2024

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION # 739

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AUSTIN, TEXAS 78759
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TX PE Firm Reg. No. F-2147
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Drawings Not To Scale

100% SUBMITTAL	PRINT DATE	REVISION DATE
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TCP NARRATIVE

SHEET 1 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	BRAZOS

CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	6

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REV DATE: 2-12-2015
CSJ: C 917-00-68

BR-033 (SH 6 NB AT GRASSY CREEK)
TRAFFIC CONTROL NARRATIVE

PHASE 1 - REPAIR BENT CAP AND ABUTMENT SPALLS

1. PLACE ADVANCE WARNING SIGNS PER STANDARD BC(2)-21. PLACE PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) A MINIMUM OF 1,000 FEET IN ADVANCE OF OTHER TRAFFIC WARNING SIGNS, OR AS DIRECTED BY THE ENGINEER. USE THE "SHOULDER CLOSED XXX FT" CONDITION FOR PCMS PHASE 1 MESSAGE AND THE "DRIVE WITH CARE" WARNING FOR PCMS PHASE 2 MESSAGE, OR AS OTHERWISE DIRECTED OR APPROVED BY THE ENGINEER.

2. INSTALL EROSION AND SEDIMENTATION CONTROL DEVICES IN COORDINATION WITH THE WORK IN PROGRESS, OR AS DIRECTED BY THE ENGINEER.

3. MAINTAIN EXISTING TRAFFIC. USE TCP(5-1)-18 FOR STAGING OF MATERIALS AND EQUIPMENT.

4. PERFORM REPAIRS R-086 AND R-087 PER REPAIR DETAIL SHEETS.

5. REMOVE PHASE 1 TRAFFIC CONTROL.

PHASE 2 - REPAIR DECK JOINTS

1. ADJUST ADVANCE WARNING SIGNS PER STANDARD BC(2)-21. PLACE PORTABLE CHANGEABLE MESSAGE SIGNS, OR AS DIRECTED BY THE ENGINEER. USE THE "RIGHT LN CLOSED FOR XXX FT" CONDITION FOR PCMS PHASE 1 MESSAGE AND THE "MERGE LEFT" WARNING FOR PCMS PHASE 2 MESSAGE, OR AS OTHERWISE DIRECTED OR APPROVED BY THE ENGINEER.

2. IMPLEMENT WORK ZONE SPEED LIMIT ON SH 6 NB PER STANDARD BC(3)-21. SEE ITEM 502 IN THE GENERAL NOTES FOR MORE INFORMATION ON WORK ZONE SPEED LIMITS.

3. REDUCE TRAFFIC TO ONE LANE PER STANDARD TCP(2-6)-18.

4. PERFORM REPAIR R-085 PER REPAIR DETAIL SHEETS. REPAIRS SHALL BE MADE HALF THE WIDTH OF THE BRIDGE AT A TIME.

5. ADJUST TRAFFIC CONFIGURATION PER STANDARD TCP(2-6)-18 BETWEEN REPAIRS OF EACH HALF OF THE BRIDGE.

6. PERFORM FINAL CLEANUP AND REMOVE ADVANCE WARNING SIGNS.

BR-005 (SH 6 AT MILLICAN CREEK NORTH)
TRAFFIC CONTROL NARRATIVE

PHASE 1 - CLEAN EXIST CULVERT

1. ADJUST ADVANCE WARNING SIGNS PER STANDARD BC(2)-21.

2. INSTALL EROSION AND SEDIMENTATION CONTROL DEVICES IN COORDINATION WITH THE WORK IN PROGRESS, OR AS DIRECTED BY THE ENGINEER.

3. MAINTAIN EXISTING TRAFFIC ALONG NB SH 6 FRONTAGE ROAD. USE TCP(5-1)-18 FOR STAGING OF MATERIALS AND EQUIPMENT.

4. PERFORM REPAIR R-325 PER REPAIR DETAIL SHEETS.

5. REMOVE PHASE 1 TRAFFIC CONTROL.

PHASE 2 - CLEAN EXIST CULVERT

1. ADJUST ADVANCE WARNING SIGNS PER STANDARD BC(2)-21.

2. ADJUST EROSION AND SEDIMENTATION CONTROL DEVICES IN COORDINATION WITH THE WORK IN PROCESS, OR AS DIRECTED BY THE ENGINEER.

3. MAINTAIN EXISTING TRAFFIC ALONG SB SH 6 FRONTAGE ROAD. USE TCP(5-1)-18 FOR STAGING OF MATERIALS AND EQUIPTMENT.

4. PERFORM REPAIR R-325 PER REPAIR DETAIL SHEETS.

5. PERFORM FINAL CLEANUP AND REMOVE ADVANCE WARNING SIGNS.

STATE OF TEXAS
PAUL R. HAHN III
107365
LICENSED
PROFESSIONAL ENGINEER
2/14/2024

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
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Drawings Not To Scale

100% SUBMITTAL	PRINT DATE	REVISION DATE
	2/14/2024	

Texas Department of Transportation
Bryan District

TCP NARRATIVE

SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	BRAZOS	
CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	7

REV DATE: 2-12-2015
CSJ: C 917-00-68

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DATE: 2/14/2024 2:07:54 PM
FILE: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms19316\bc-21.dgn

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

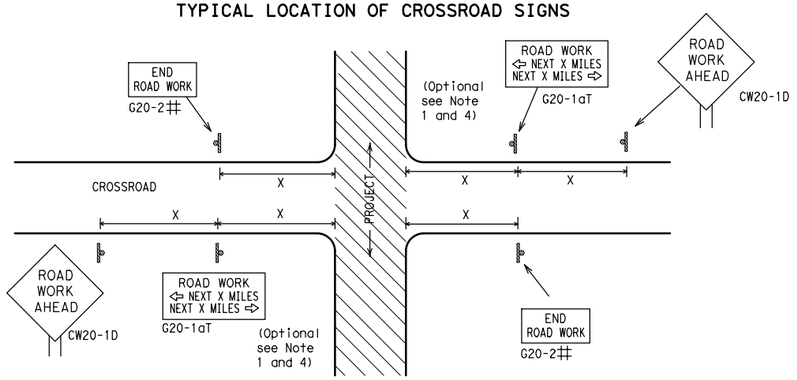
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13	0917	00	068	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
5-10 5-21	BRY	BRAZOS		8

DATE: 2/14/2024 2:07:54 PM
FILE: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms159916\bc-21.dgn

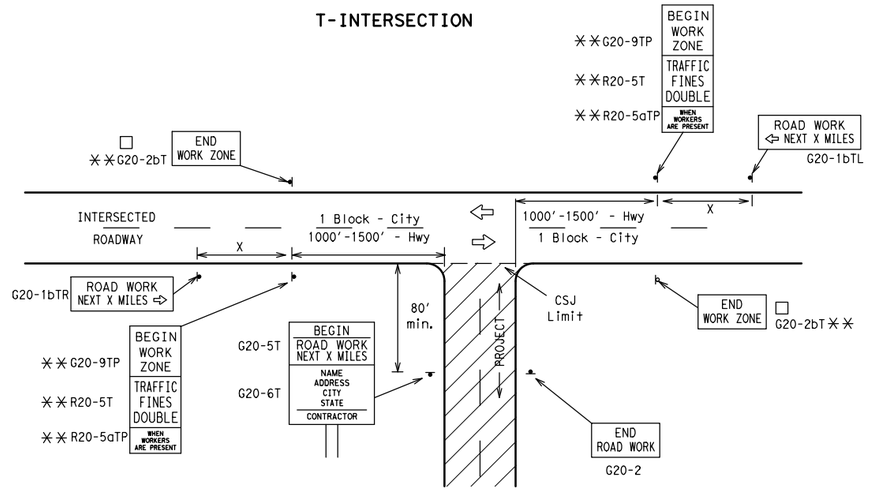
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

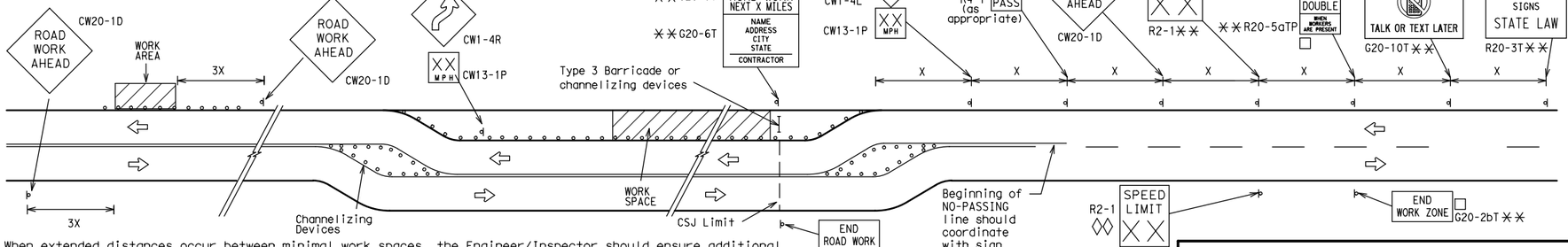
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

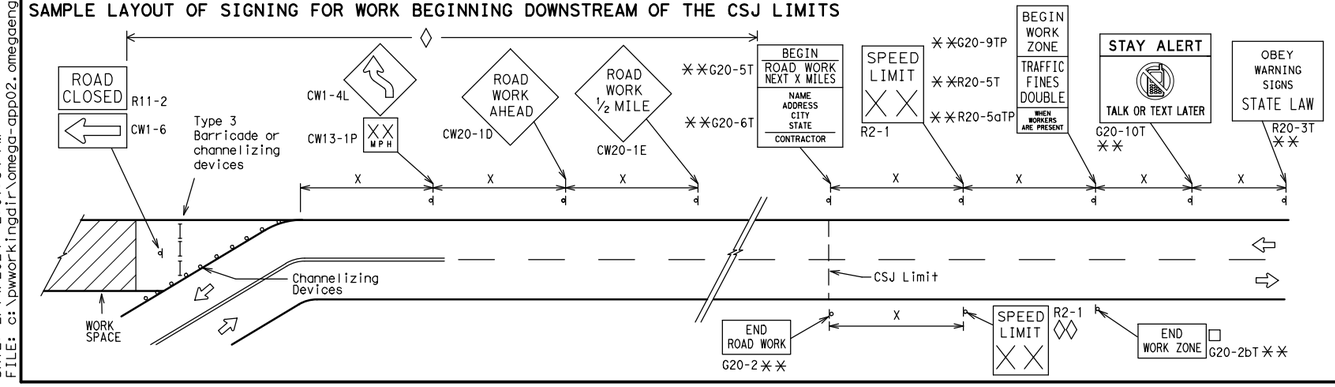
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING 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.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	00	068	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BRY	BRAZOS		9

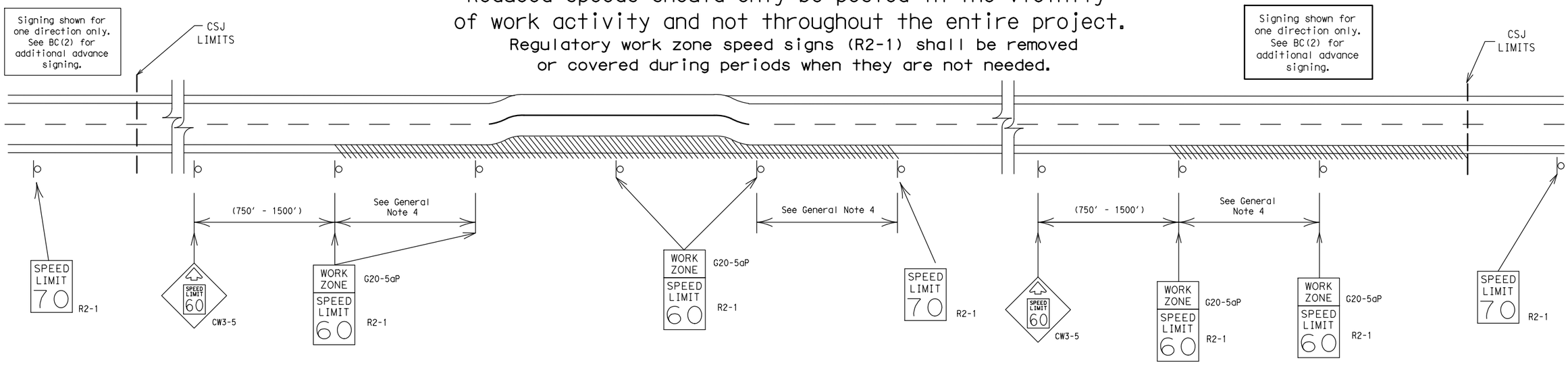
DATE: 2/14/2024 2:07:54 PM
FILE: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twfsoh\am159f16\bc-21.dgn

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

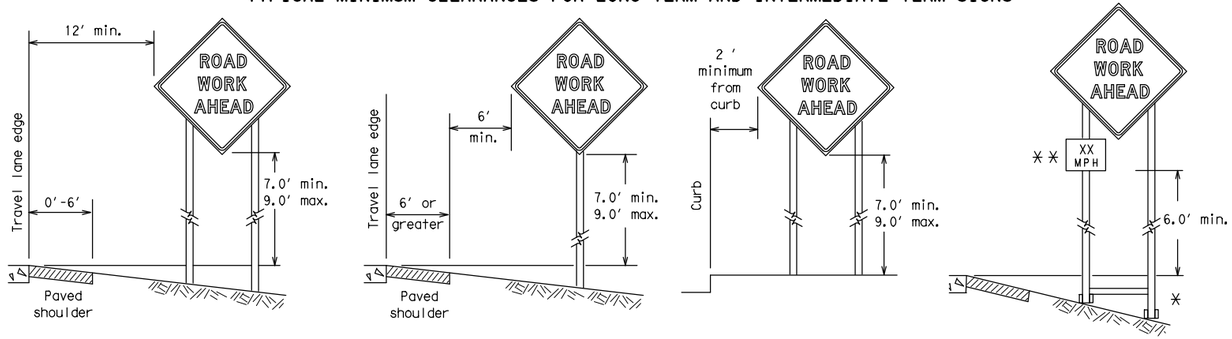
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	0917	00	068	VARIOUS
	DIST	COUNTY		SHEET NO.
	BRY	BRAZOS		10

DATE: 2/14/2024 2:07:55 PM
FILE: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms15916\bc-21.dgn

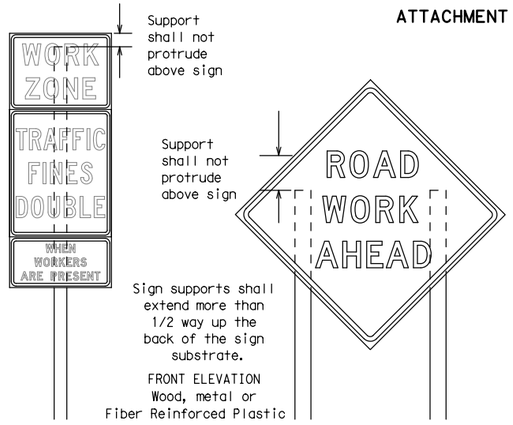
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

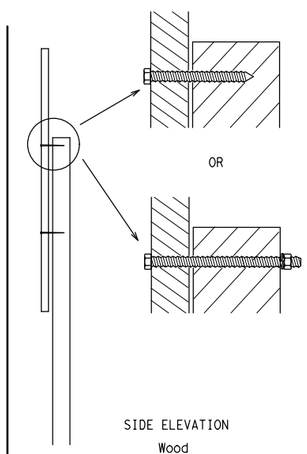


⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





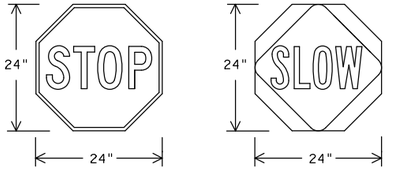
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



Background - Red
Legend & Border - White

Background - Orange
Legend & Border - Black

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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	00	068	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BRY	BRAZOS		11

DATE: 2/14/2024 2:07:55 PM
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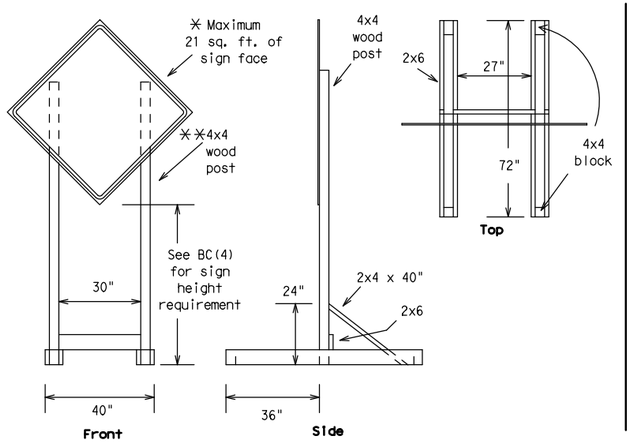
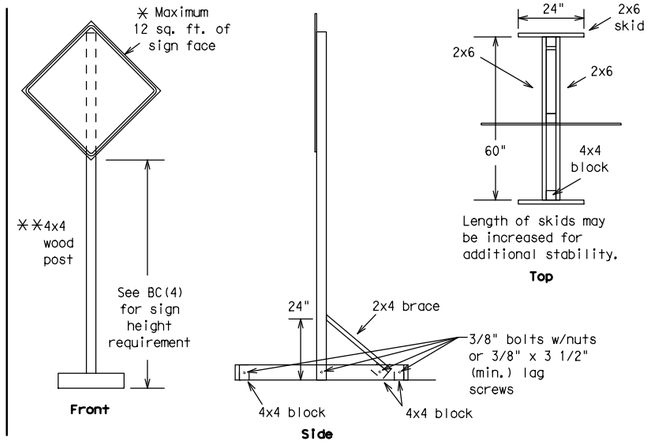
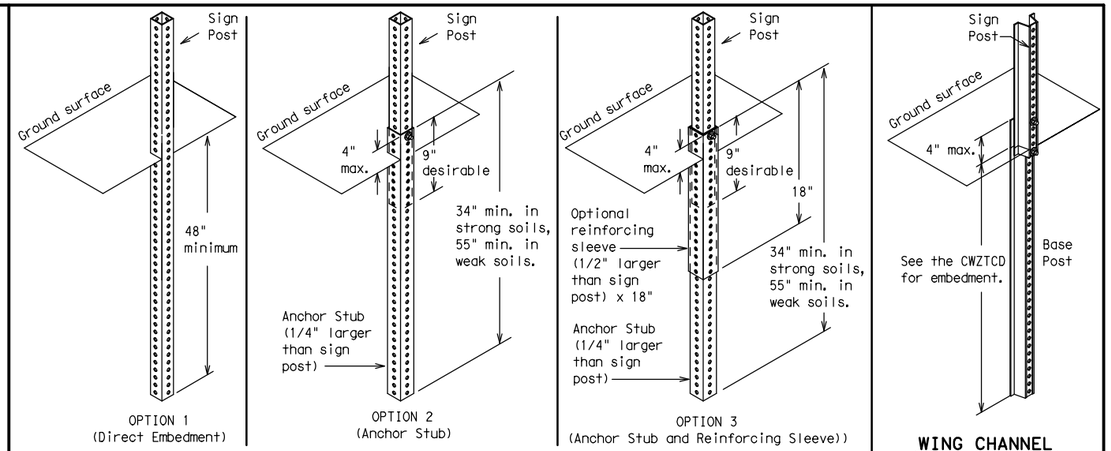




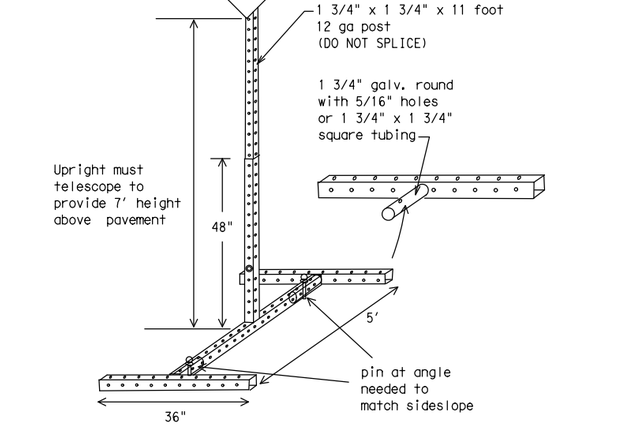
SKID MOUNTED WOOD SIGN SUPPORTS

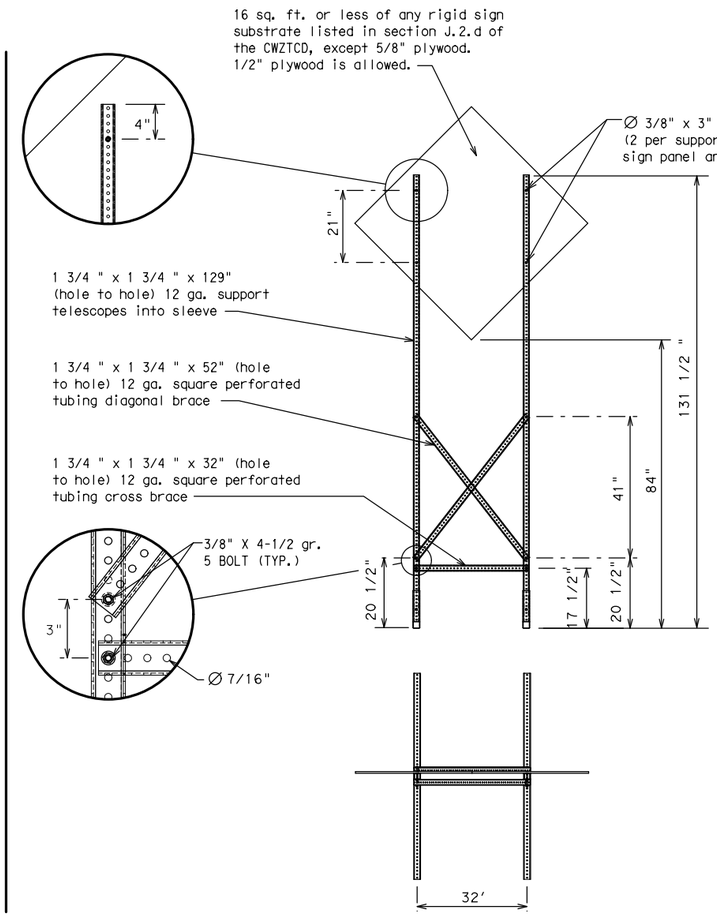
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

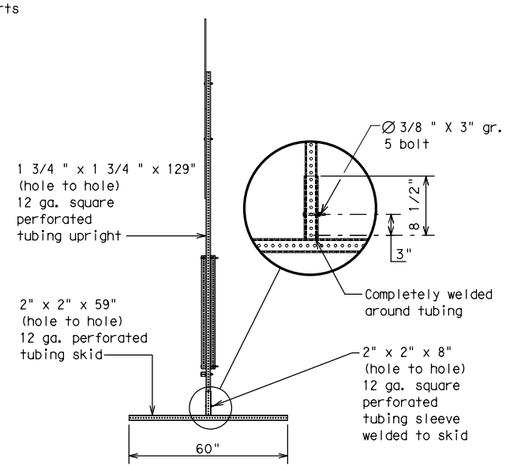


GROUND MOUNTED SIGN SUPPORTS

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

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	00	068	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BRY	BRAZOS		12

DATE: 2/14/2024 2:07:55 PM
FILE: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms15916\bc-21.dgn

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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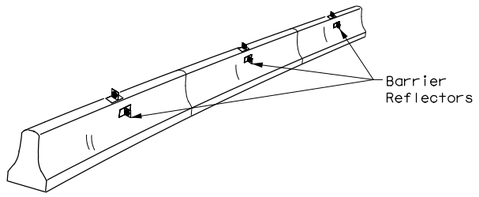
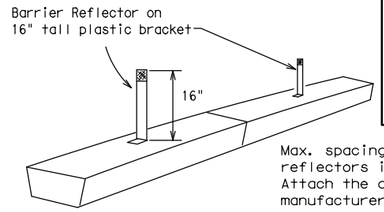
DATE: 2/14/2024 2:07:56 PM
FILE: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms15916\bc-21.dgn

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



CONCRETE TRAFFIC BARRIER (CTB)

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

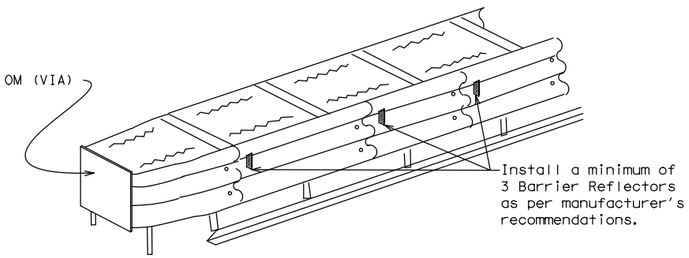


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

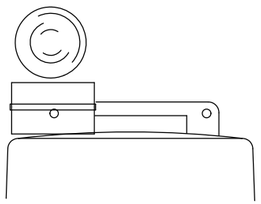


DELINEATION OF END TREATMENTS

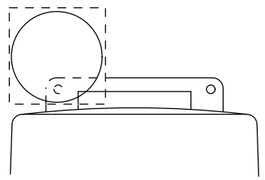
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

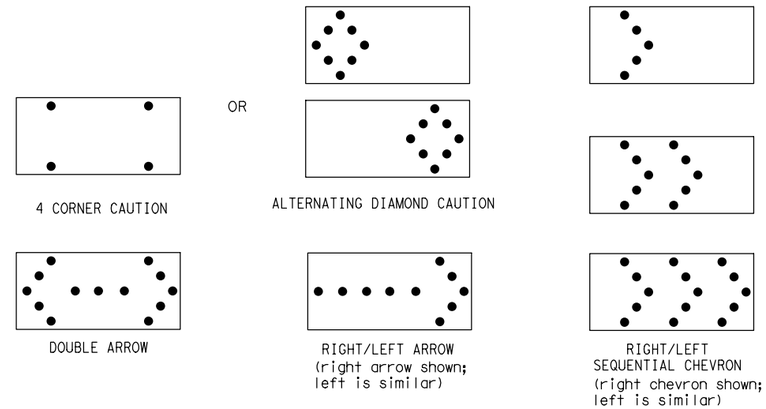
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



4 CORNER CAUTION

ALTERNATING DIAMOND CAUTION

DOUBLE ARROW

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

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

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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	00	068	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BRY	BRAZOS		14

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

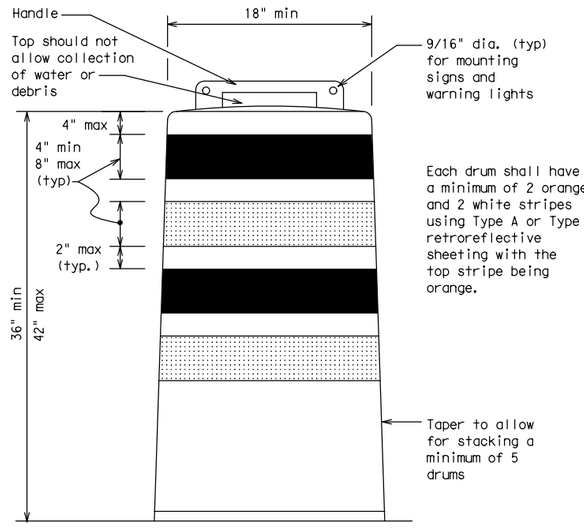
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

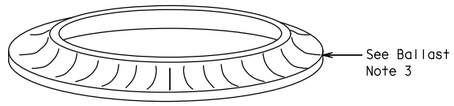
RETROREFLECTIVE SHEETING

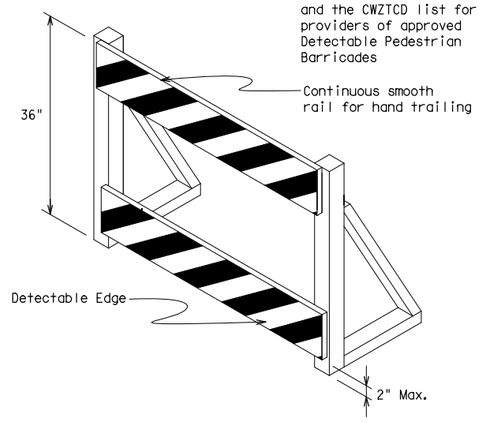
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

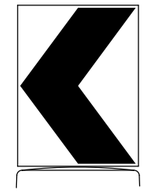




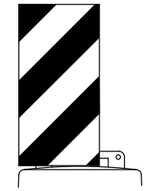


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	00	068	VARIOUS
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9-07 5-21	BRY	BRAZOS		15
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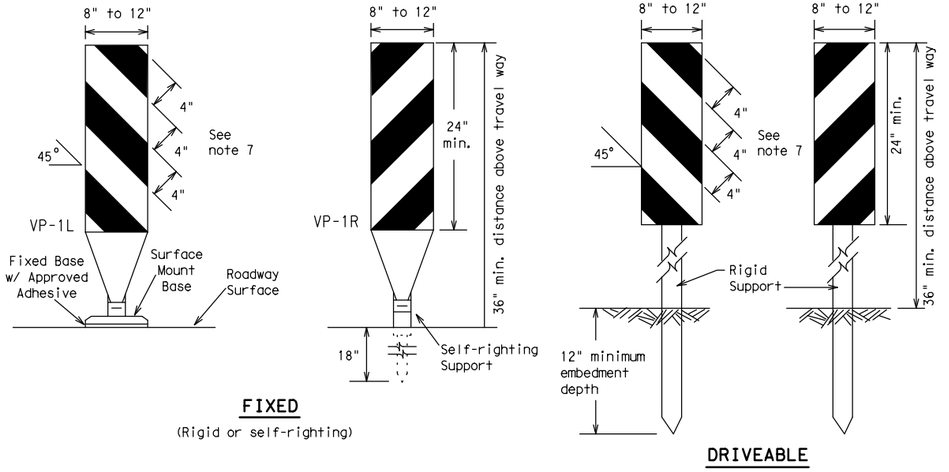
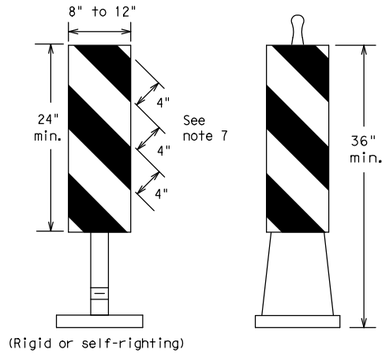


FIXED
(Rigid or self-righting)

DRIVEABLE

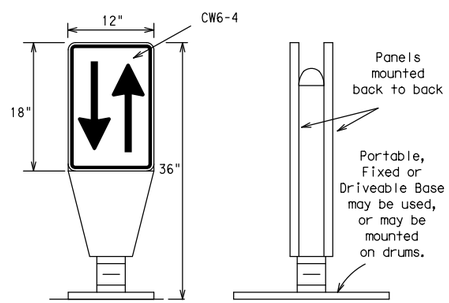


(Rigid or self-righting)

PORTABLE

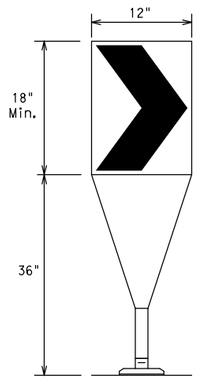
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



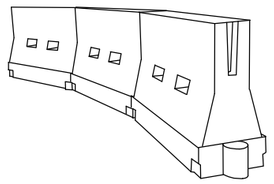
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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9-07 8-14	DIST	COUNTY		SHEET NO.
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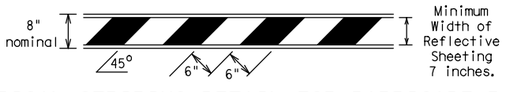
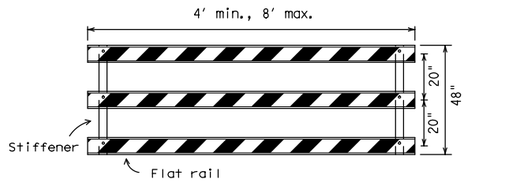
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



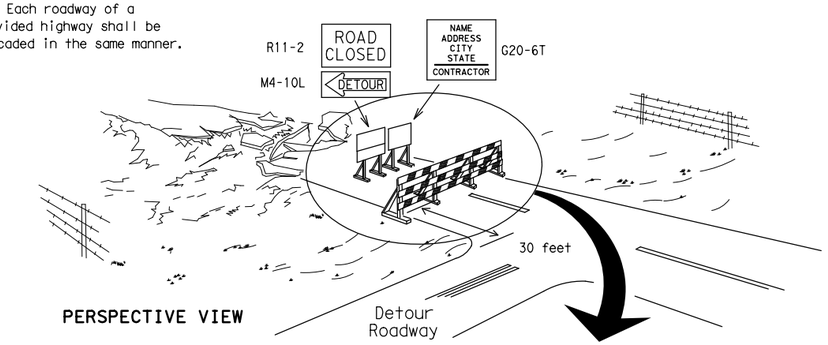
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

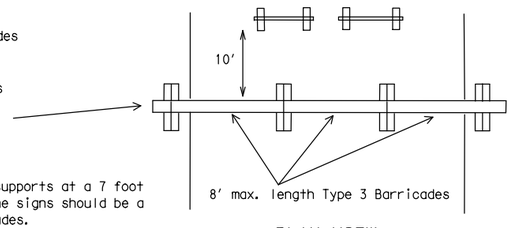
TYPICAL PANEL DETAIL
FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

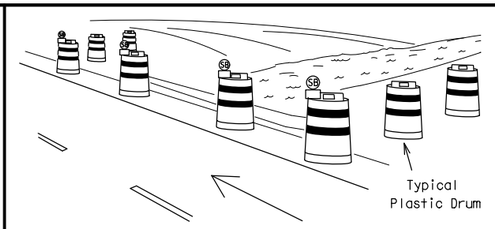
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

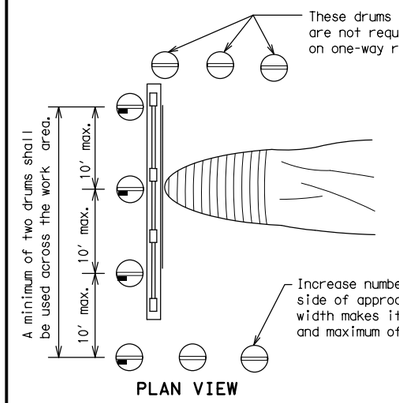
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

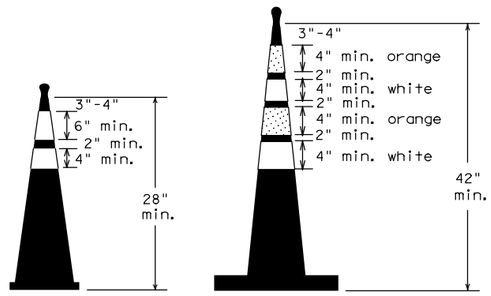
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



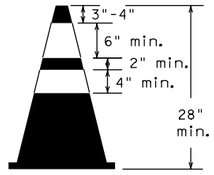
PLAN VIEW

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

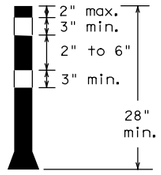
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

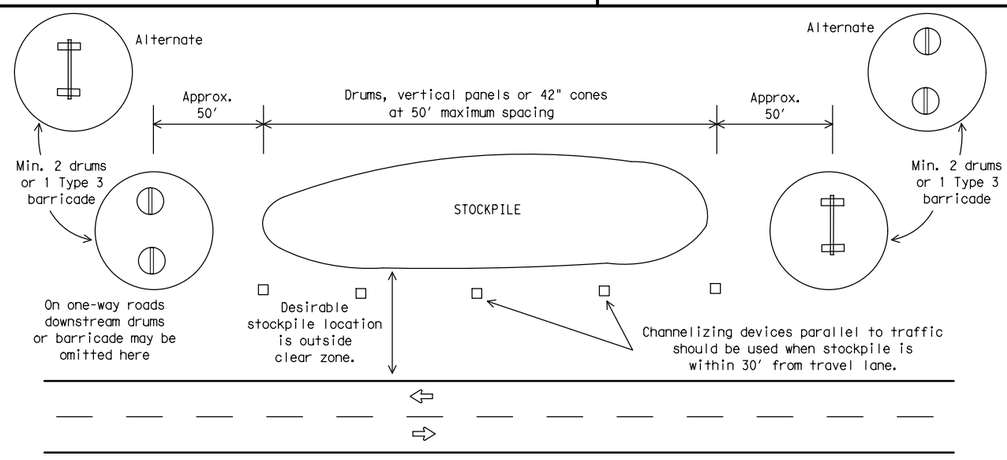


Tubular Marker

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	00	068	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BRY	BRAZOS		17

DATE: 2/14/2024 2:07:57 PM
FILE: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms15916\bc-21.dgn

WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

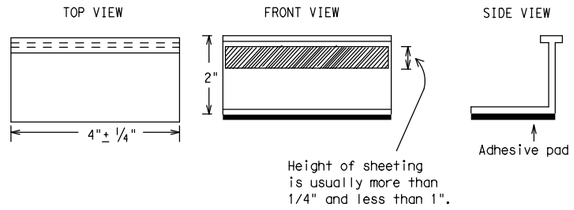
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	00	068	VARIOUS
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	BRY	BRAZOS		18
11-02 8-14				

DATE: 2/14/2024 2:07:57 PM
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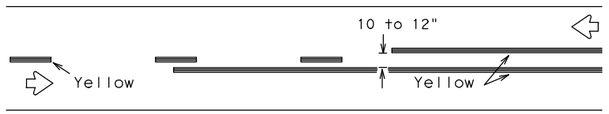
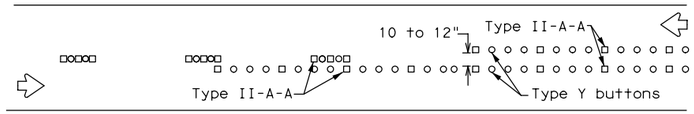
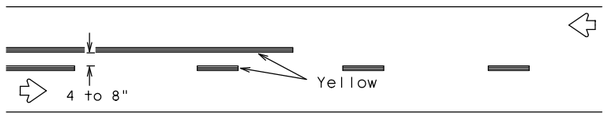
PAVEMENT MARKING PATTERNS



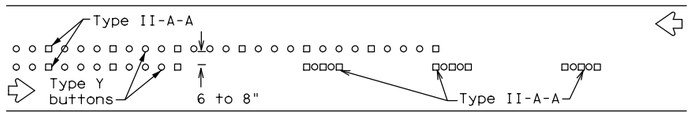
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



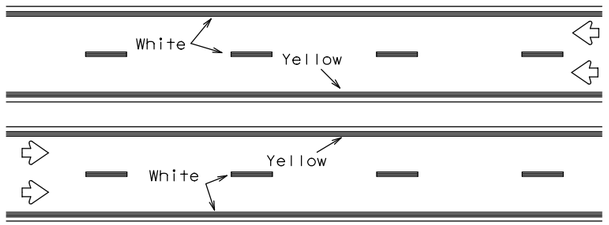
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



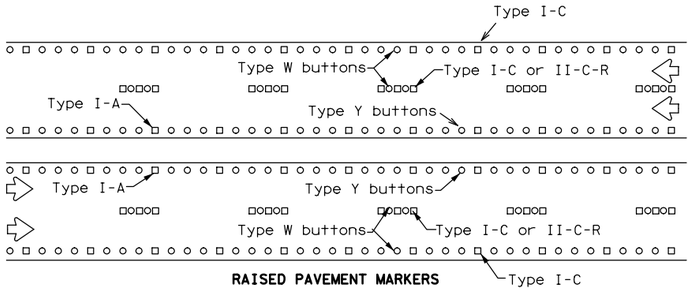
RAISED PAVEMENT MARKERS - PATTERN B

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

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



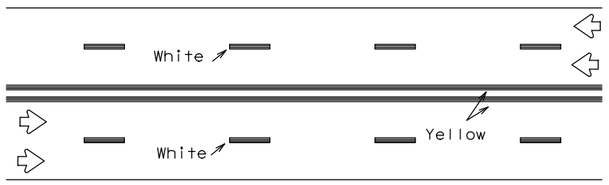
REFLECTORIZED PAVEMENT MARKINGS



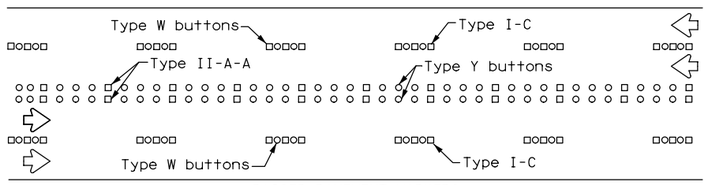
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



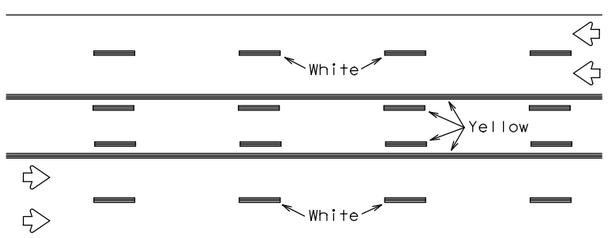
REFLECTORIZED PAVEMENT MARKINGS



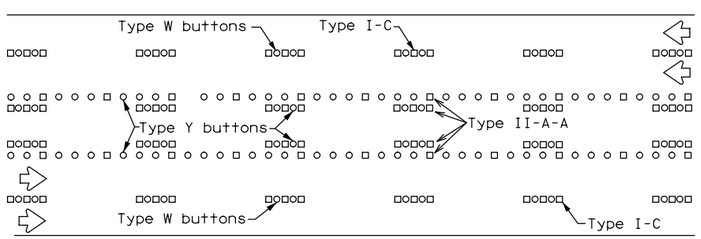
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

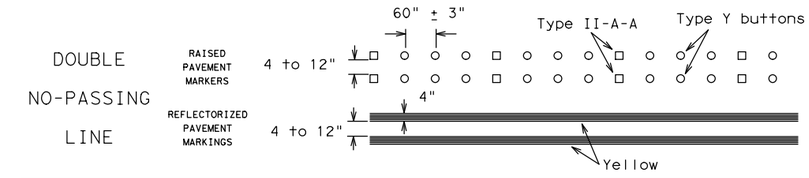
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

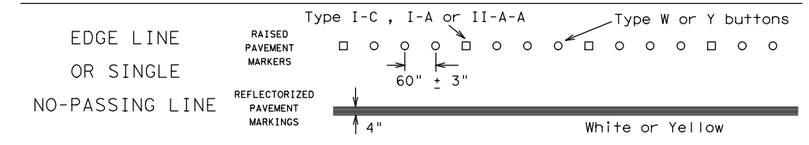
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

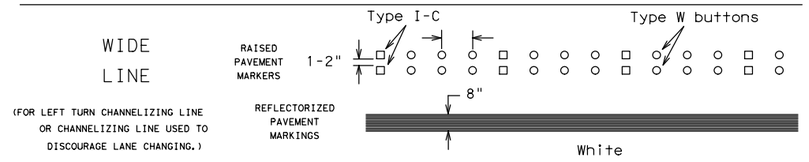


EDGE LINE OR SINGLE NO-PASSING LINE



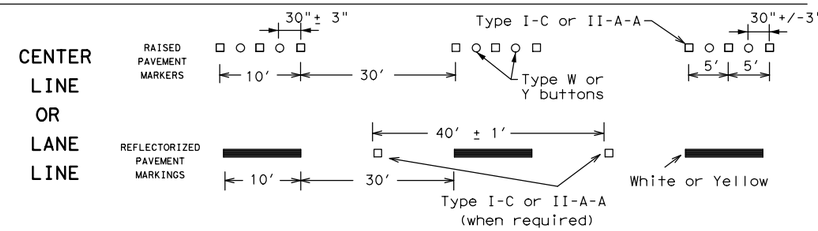
WIDE LINE

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

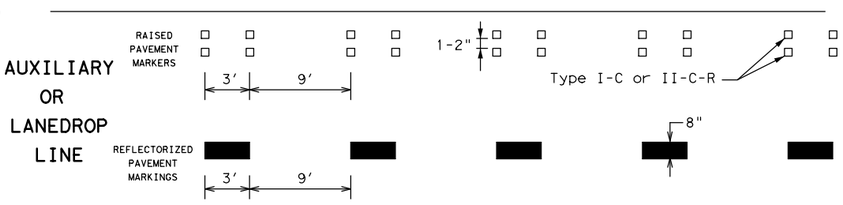


BROKEN LINES

CENTER LINE OR LANE LINE

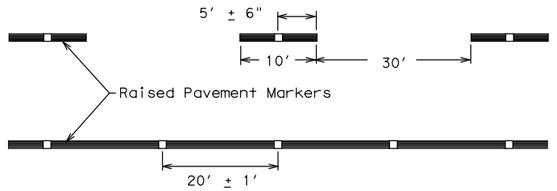


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
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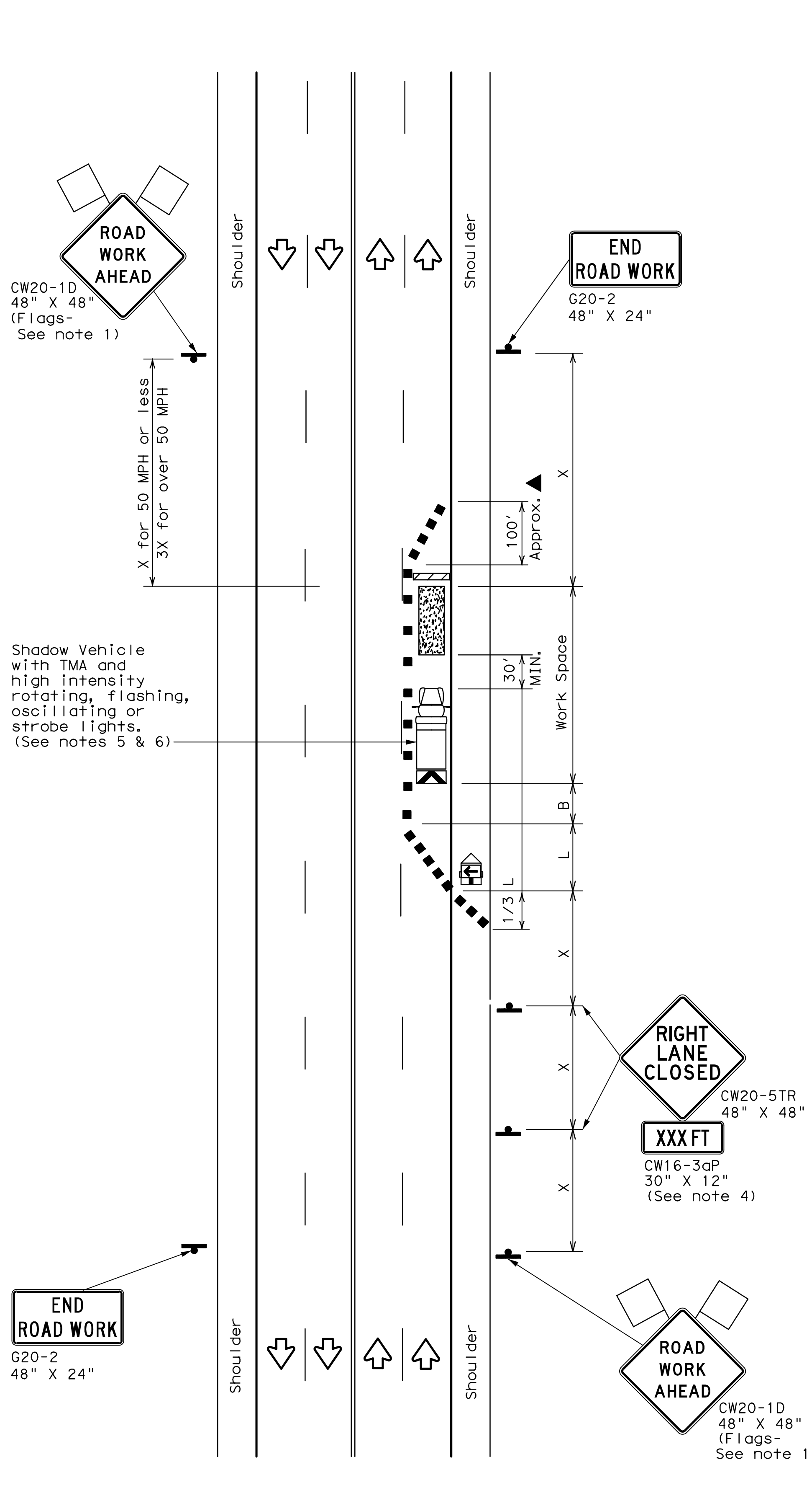
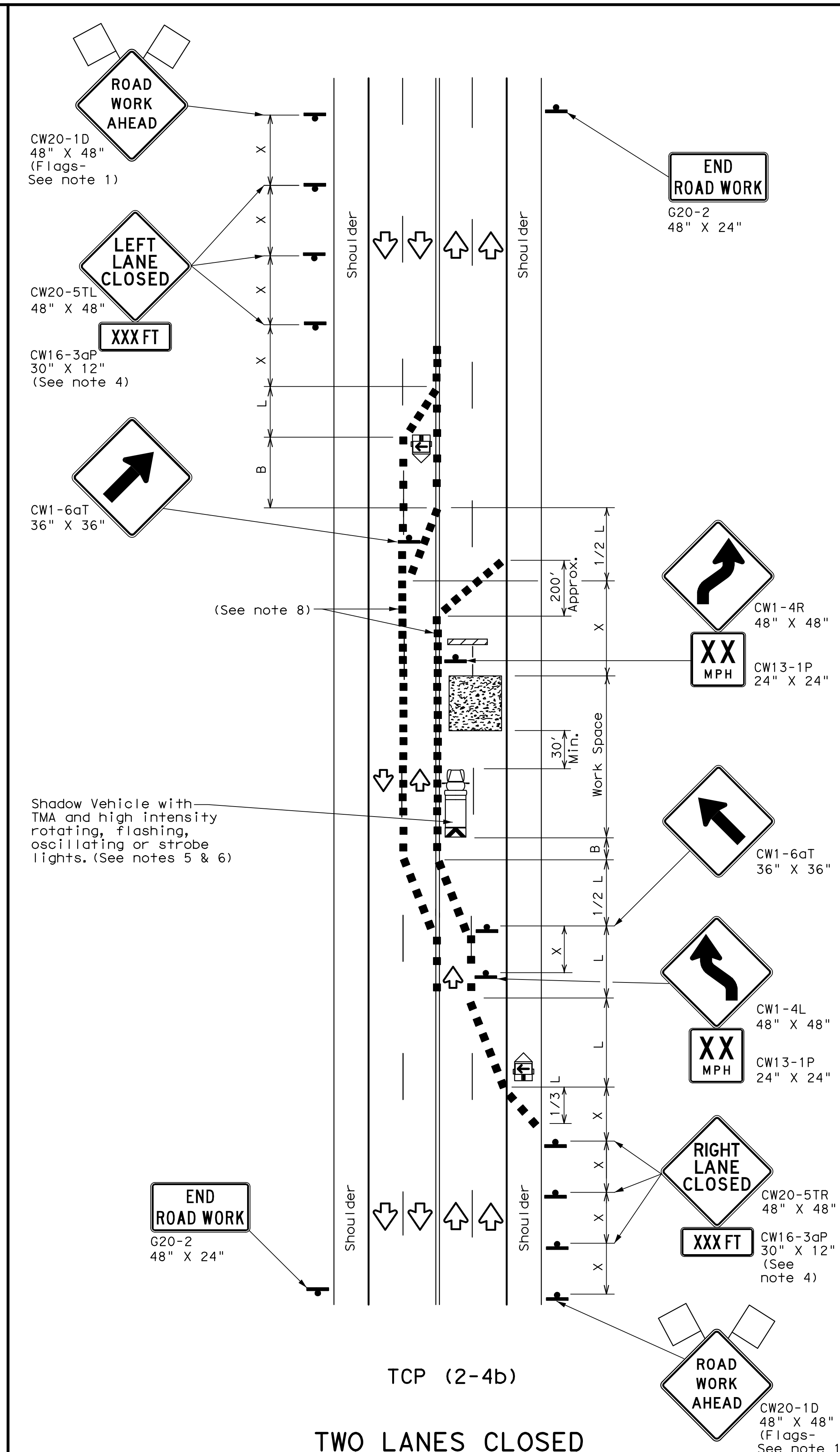


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

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

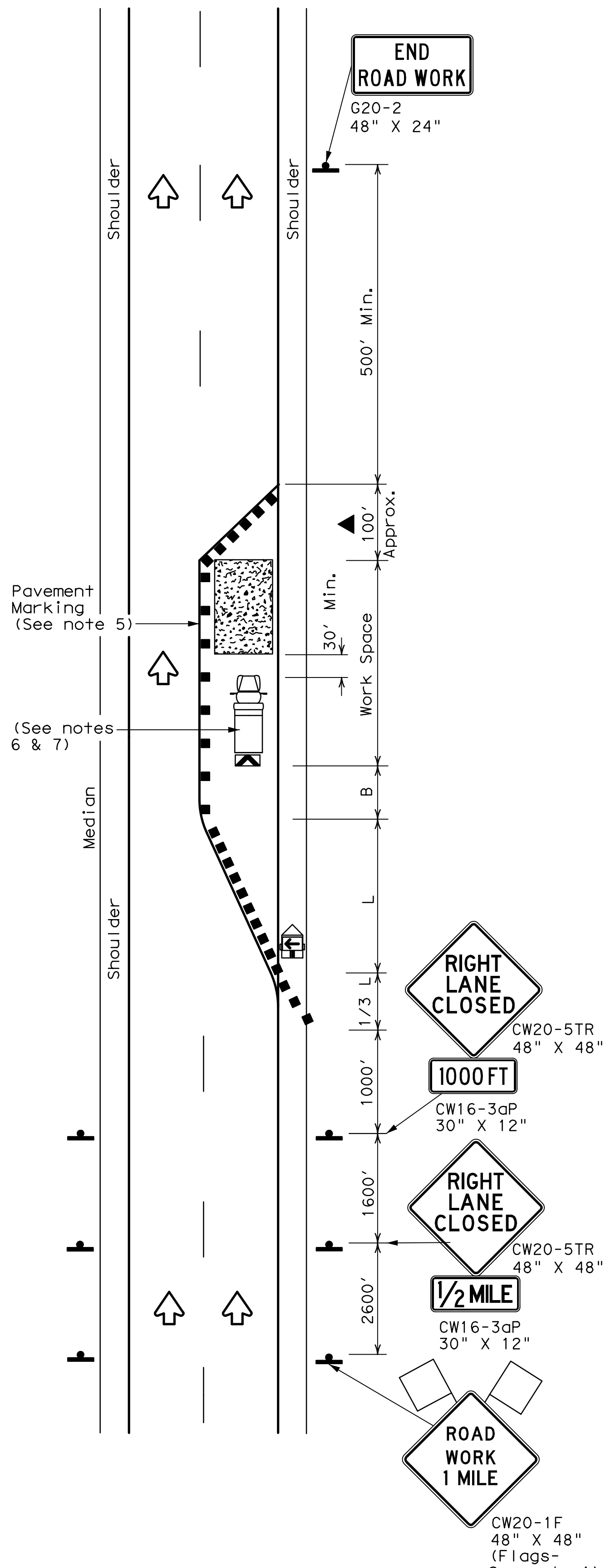
Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

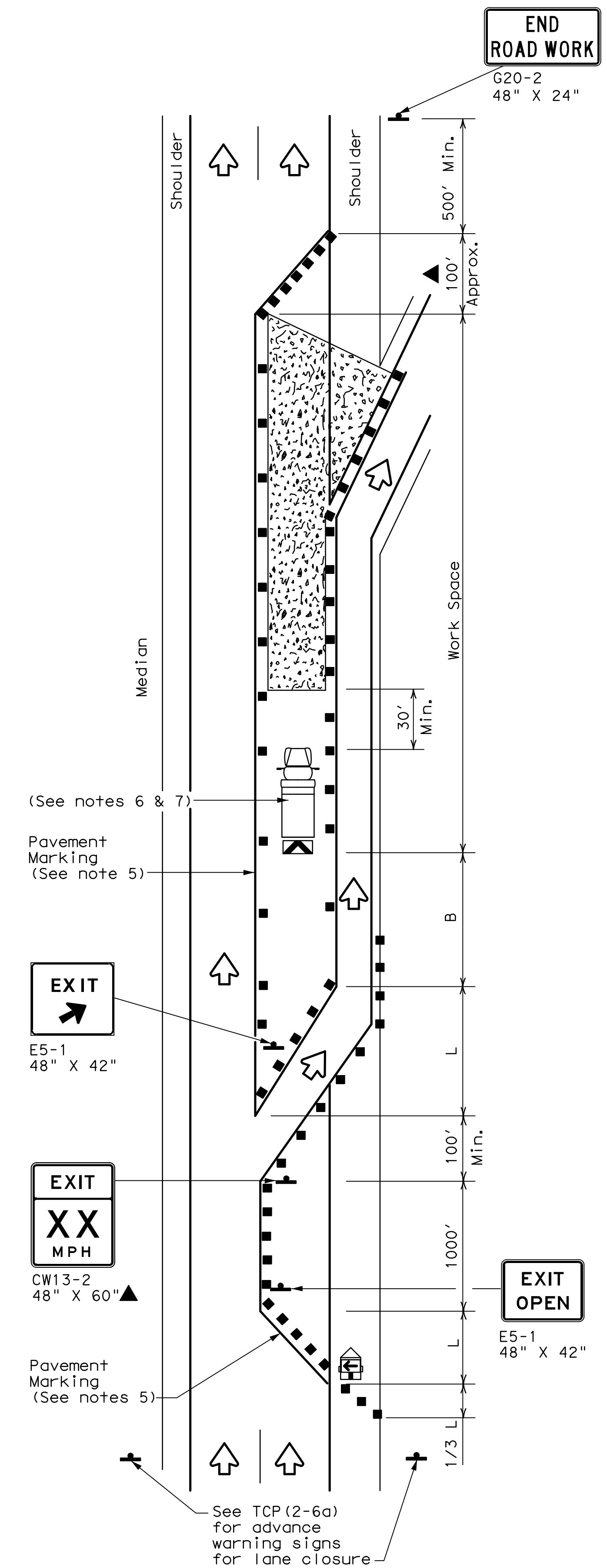
FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT 0917	SECT 00	JOB 068	HIGHWAY VARIOUS
REVISIONS 8-95 3-03, 1-97 2-12, 4-98 2-18	DIST BRY	COUNTY BRAZOS		SHEET NO. 20

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



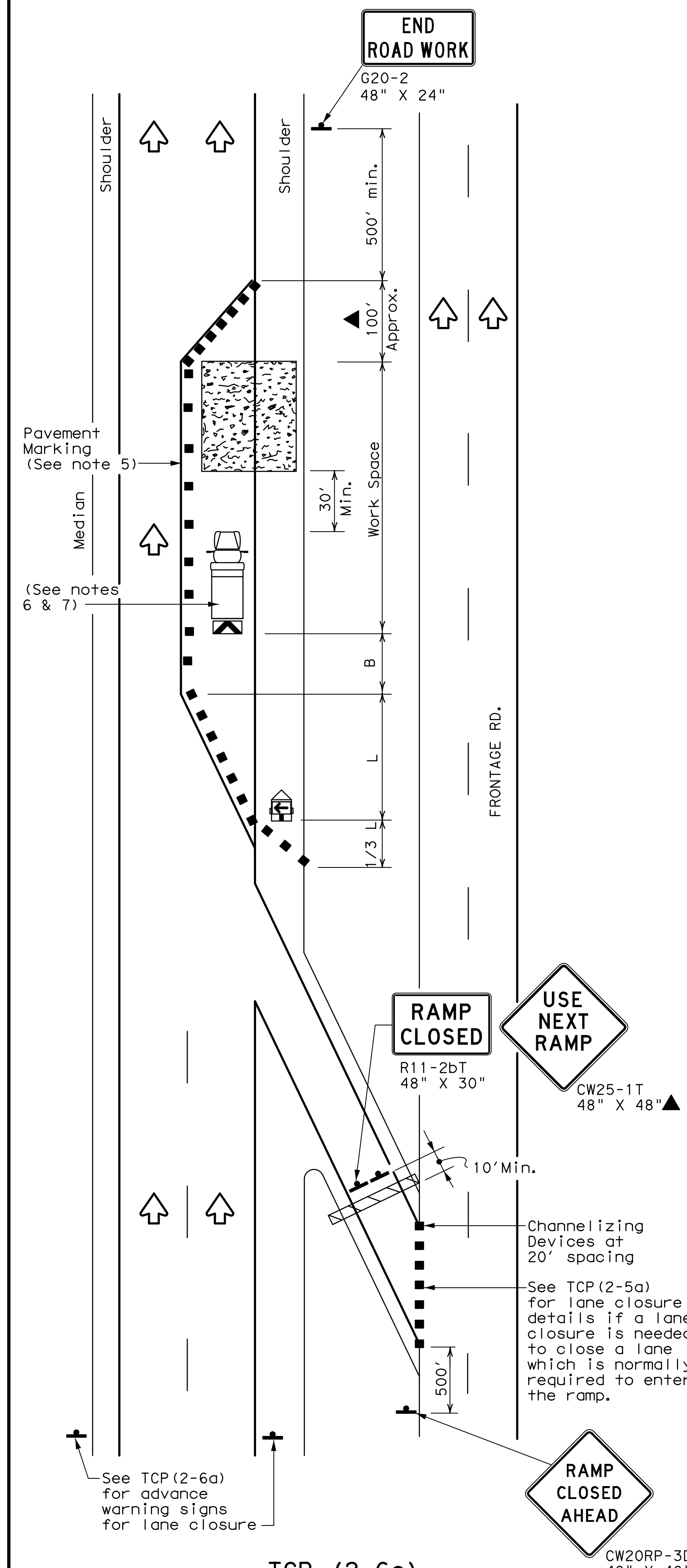
TCP (2-6a)

ONE LANE CLOSURE



TCP (2-6b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (2-6c)

LANE CLOSURE NEAR ENTRANCE RAMPS

LEGEND

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

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

* Conventional Roads Only

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

TYPICAL USAGE

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. 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.
4. Channelizing devices used along the work space or along tangent sections may be supplemented with vertical panels (VP) placed on everyother channelizing device. If night time conditions make it difficult to see at least two VPs, the VPs may be placed on each channelizing device.
5. The placement of pavement markings may be omitted on Intermediate-term stationary work zones with the approval of the Engineer.
6. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. 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.
7. 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.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

TCP(2-6)-18

FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT 0917	SECT 00	JOB 068	HIGHWAY VARIOUS
REVISIONS 2-94 4-98 / 8-95 2-12 / 1-97 2-18	DIST BRY	COUNTY BRAZOS		SHEET NO. 21

166

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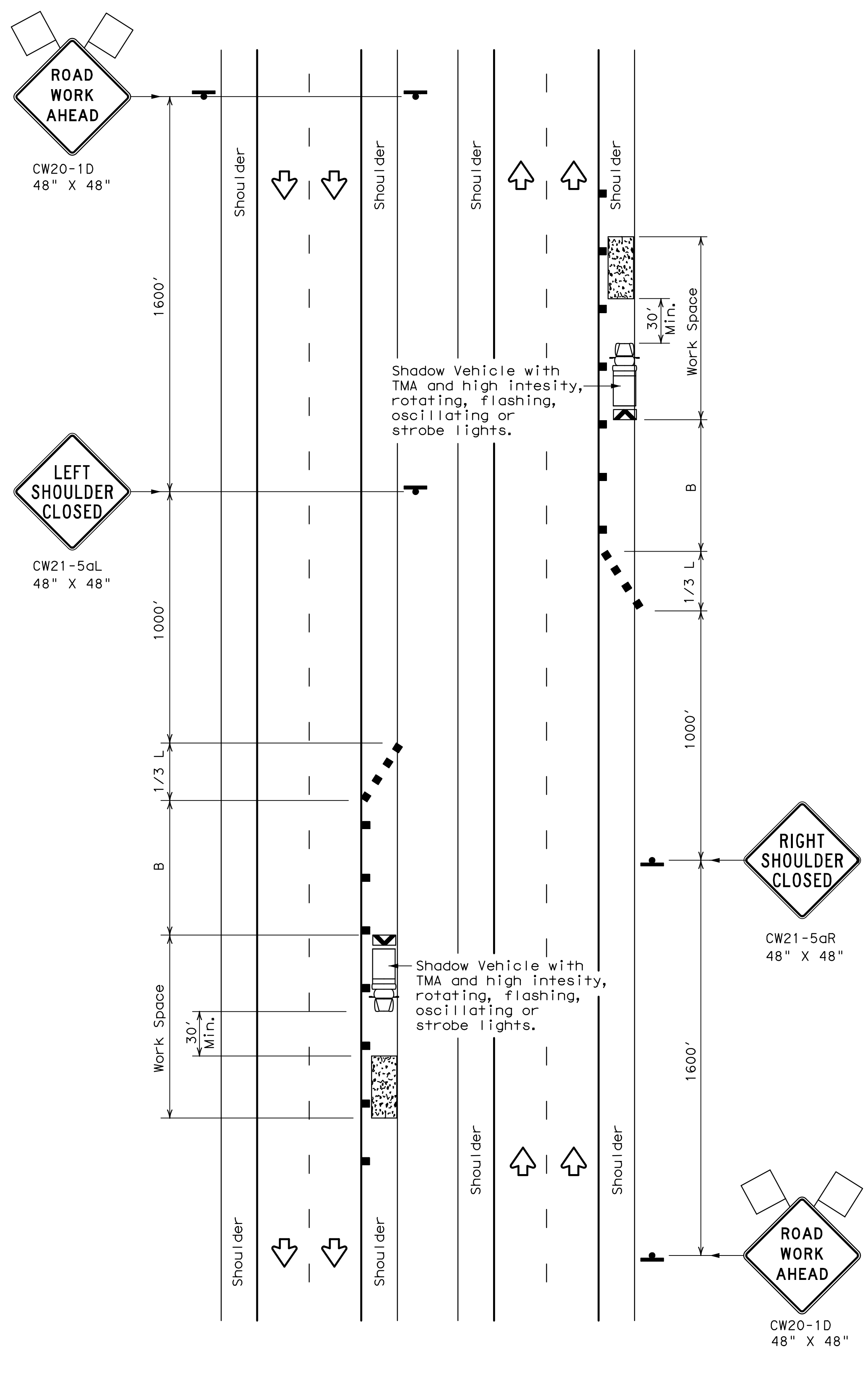
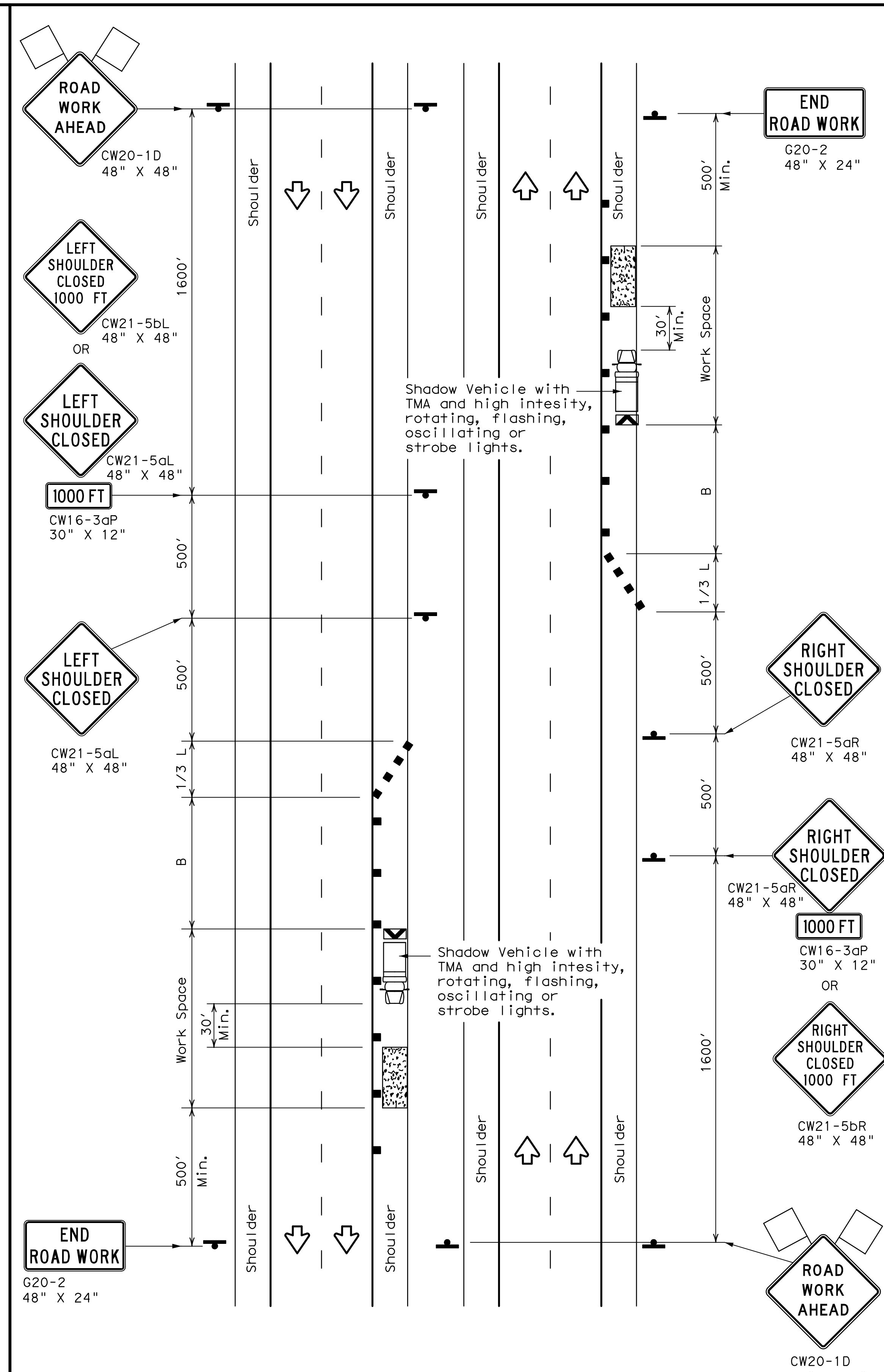


TCP (5-1a)

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	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

* Conventional Roads Only

** Taper lengths have been rounded off.

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

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

GENERAL NOTES

1. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30' to 100' in advance of the area of crew exposure without adversely effecting the performance or quality of the work. Type 3 barricades or drums may be substituted when workers on foot are no longer present when approved by the Engineer.

2. 28" tall or taller one-piece cones will be allowed only for Short Duration or Short Term stationary operations when workers are present to maintain the devices upright and in proper location. Intermediate Term stationary work areas should use Drums, Vertical Panels or 42" tall two-piece cones.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

TCP(5-1)-18

FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	0917	00	068	VARIOUS
	DIST		COUNTY	SHEET NO.
	BRY		BRAZOS	22

190

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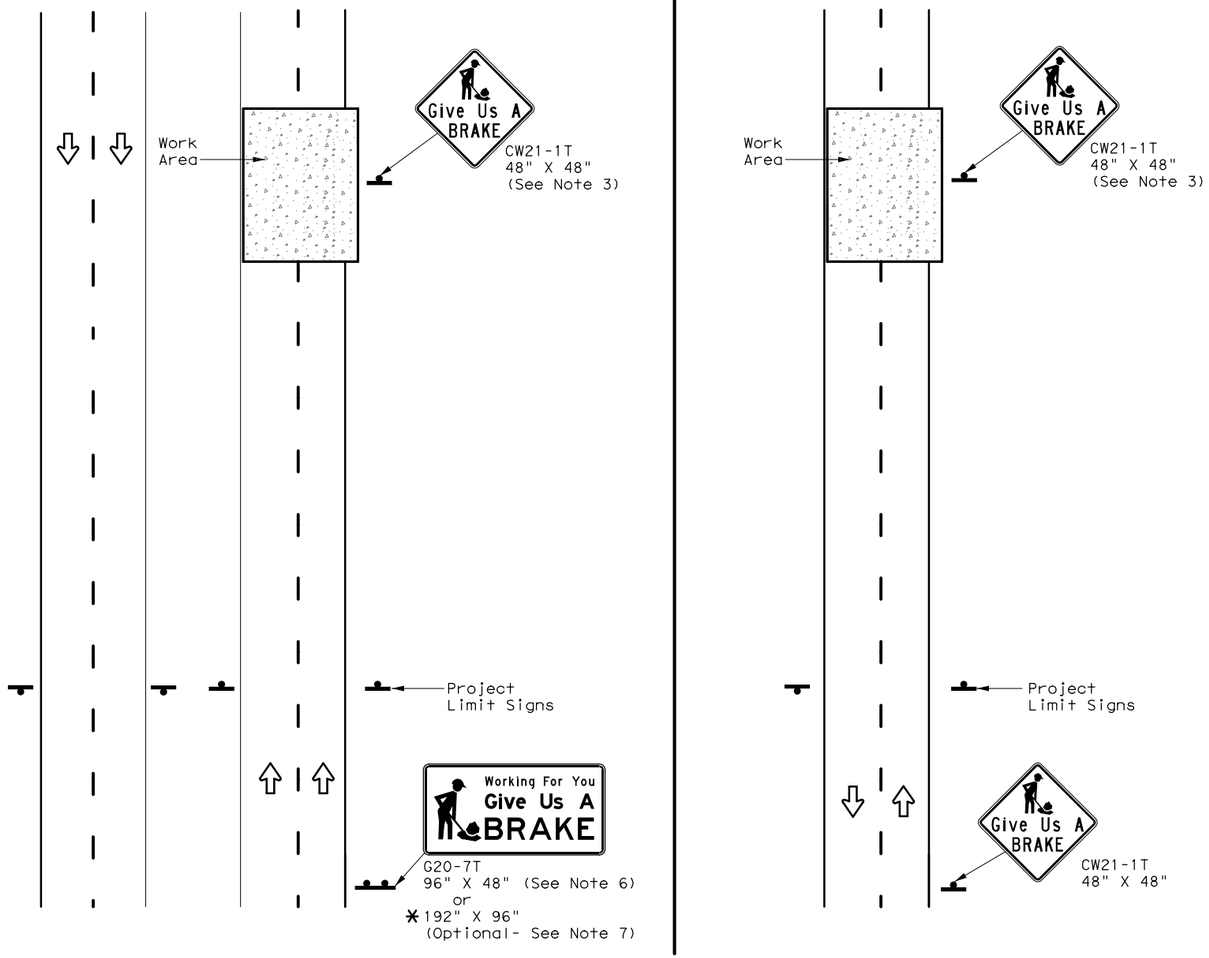

DIVIDED HIGHWAY

UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

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

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

GENERAL NOTES

1. See BC and SMD sheets for additional sign support details.
2. Sign locations shall be approved by the Engineer.
3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
5. Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
6. The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
   Item 636 - Aluminum Signs
   Item 647 - Large Roadside Sign Supports and Assemblies.
   Item 416 - Drilled Shaft Foundations
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	00	068	VARIOUS
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	BRY	BRAZOS		23

116

DATE: 2/14/2024 2:08:40 PM
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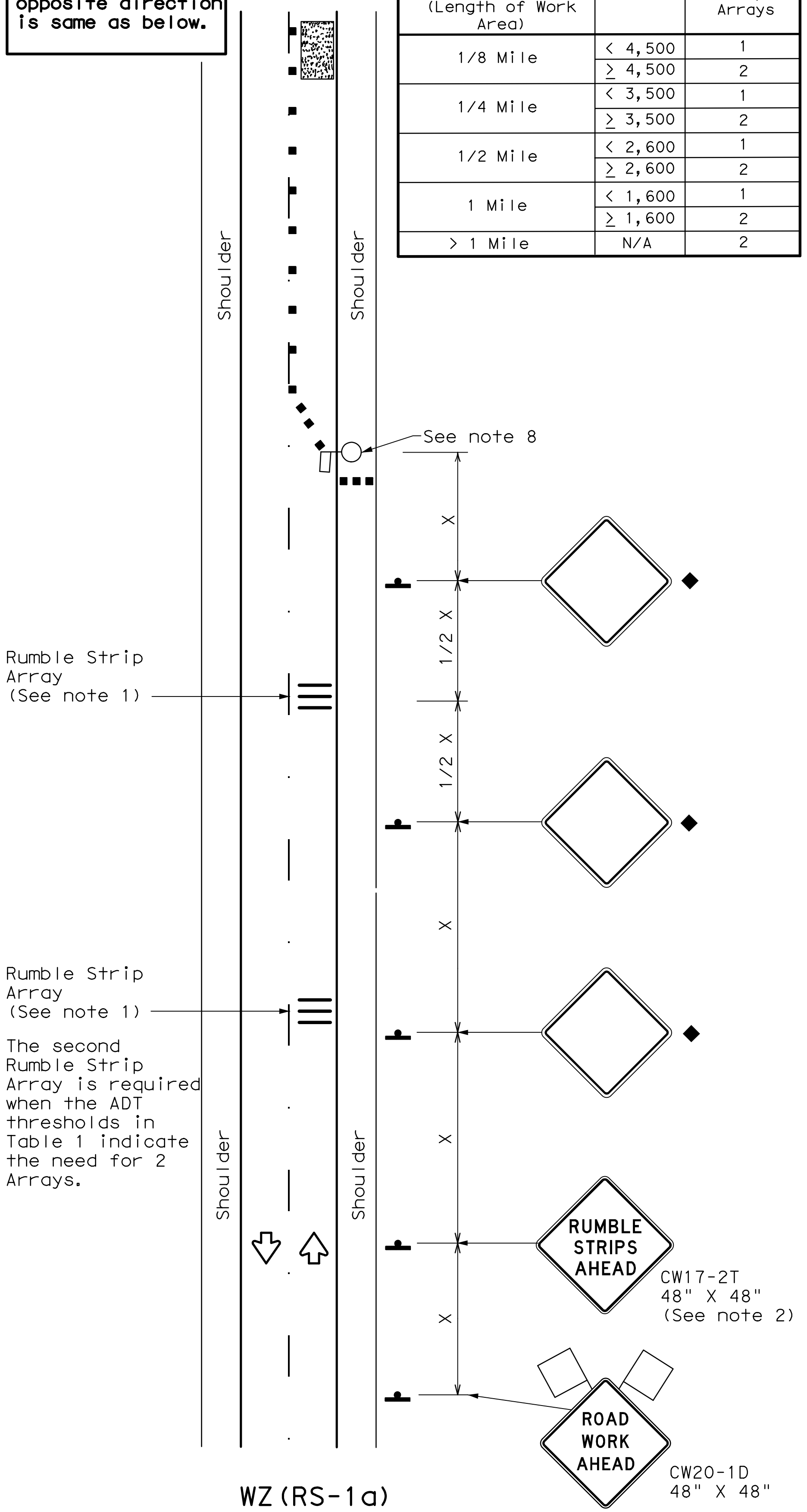
Warning sign and rumble strip sequence in opposite direction is same as below.

TABLE 1

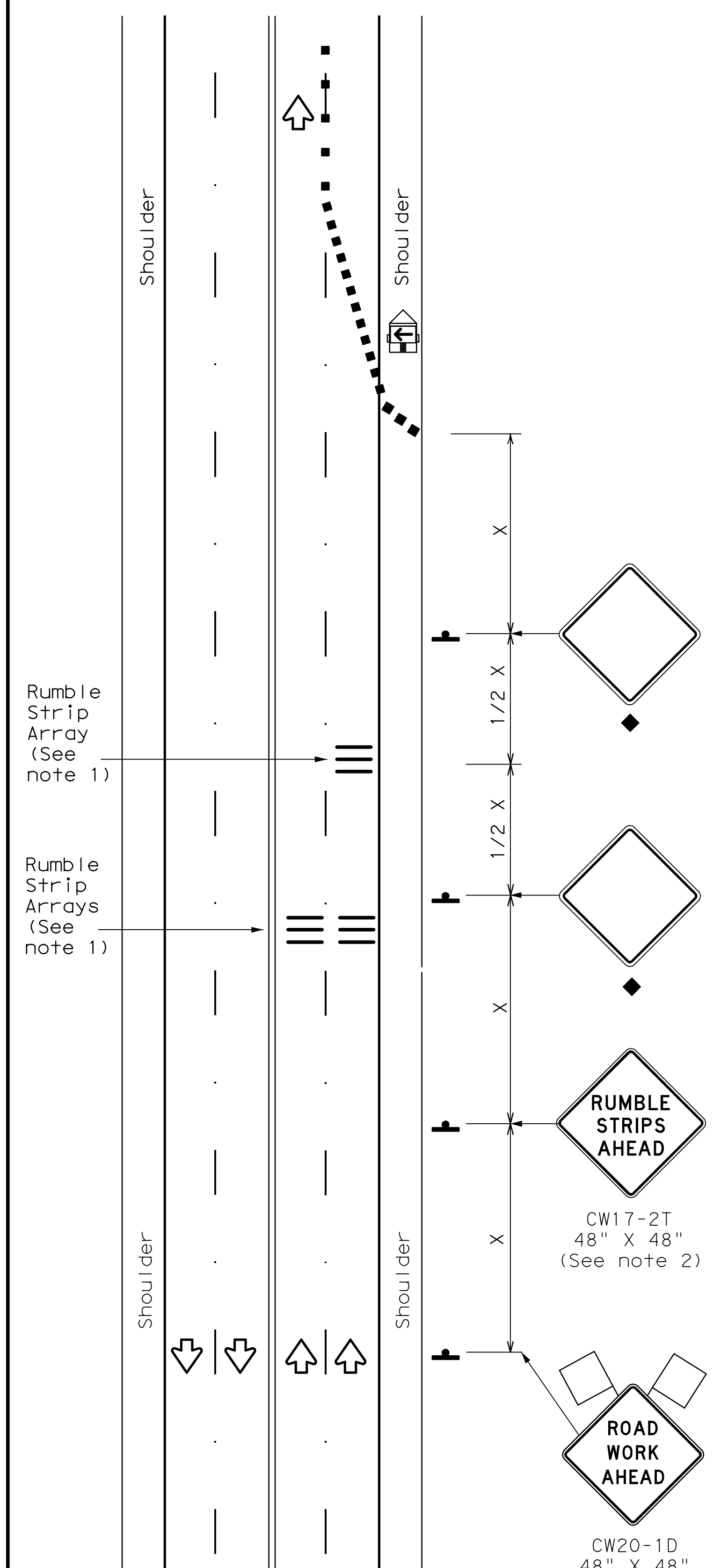
Flagger to Flagger (Length of Work Area)	ADT	# of Rumble Strip Arrays
1/8 Mile	< 4,500	1
	≥ 4,500	2
1/4 Mile	< 3,500	1
	≥ 3,500	2
1/2 Mile	< 2,600	1
	≥ 2,600	2
1 Mile	< 1,600	1
	≥ 1,600	2
> 1 Mile	N/A	2



The second Rumble Strip Array is required when the ADT thresholds in Table 1 indicate the need for 2 Arrays.

WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

TABLE 2

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

LEGEND

Symbol	Description	Symbol	Description
	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	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

✳ Conventional Roads Only

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

TYPICAL USAGE

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

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

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

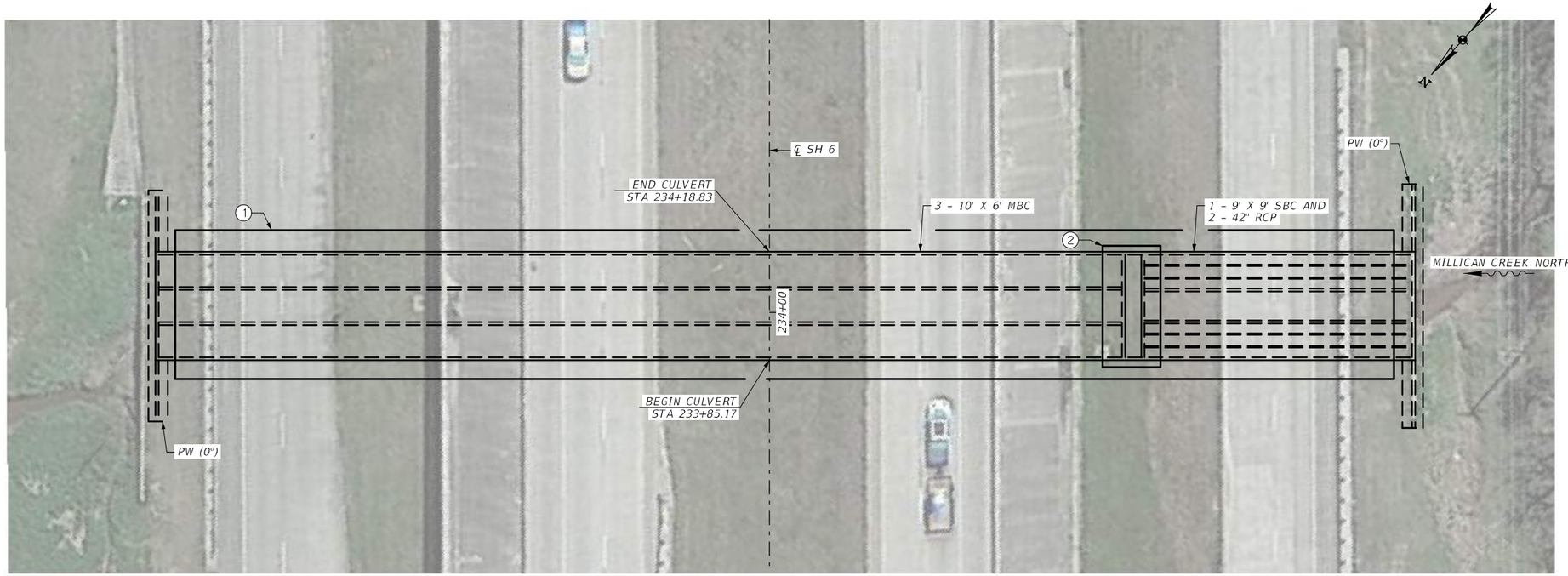
Texas Department of Transportation

Traffic Safety Division Standard

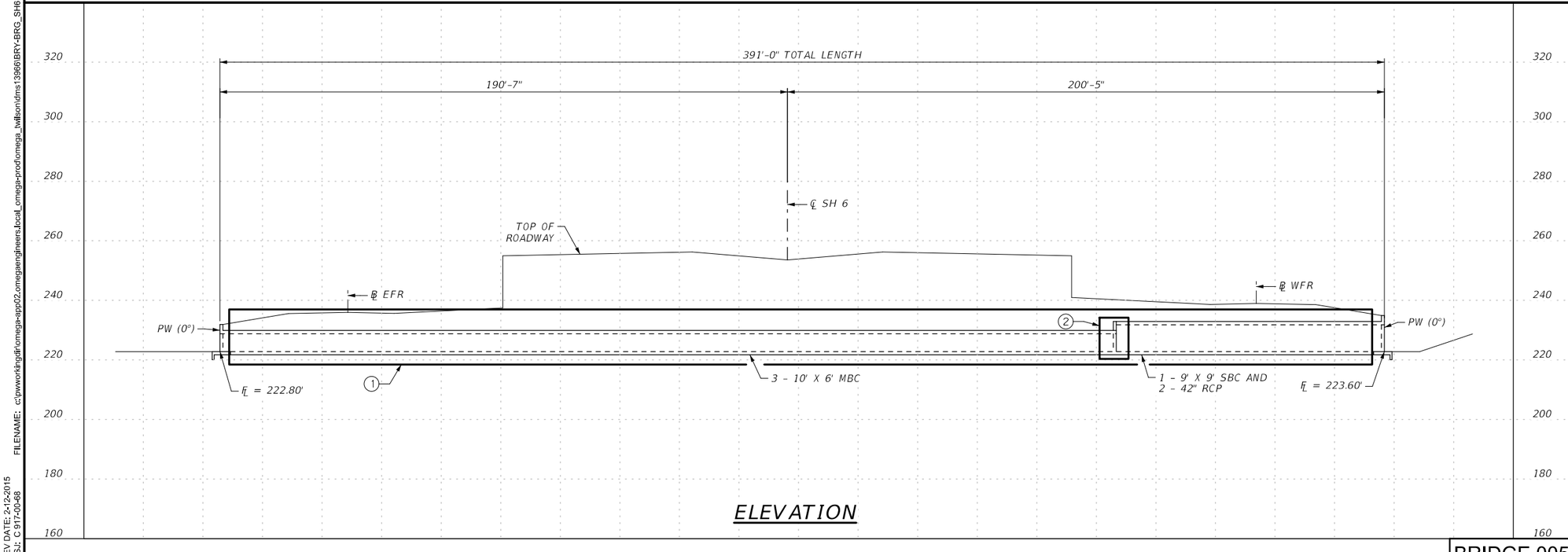
TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	0917	00	068	VARIOUS
	DIST	COUNTY		SHEET NO.
	BRY	BRAZOS		24



PLAN



ELEVATION

BRIDGE 005

GENERAL NOTES:

1. ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH TXDOT 2014 STANDARD SPECIFICATIONS OR SPECIAL SPECIFICATIONS AS NOTED.
2. REPAIR LOCATIONS AND DIMENSIONS ARE APPROXIMATE AND BASED UPON SITE VISITS AND AS-BUILT PLANS. ACTUAL DIMENSIONS AND QUANTITIES SHALL BE VERIFIED IN THE FIELD. INFORM THE ENGINEER IF ANY QUANTITY EXCEEDS ±15% OF QUANTITIES LISTED IN THIS PLAN SET.
3. CONTRACTOR WILL COORDINATE WITH PROPERTY OWNERS FOR RIGHT-OF-ENTRY IF NEEDED.
4. CONTRACTOR SHALL PROTECT AND PREVENT DEBRIS FROM FALLING INTO CREEK. IN THE EVENT IT DOES, CONTRACTOR SHALL RETRIEVE THE DEBRIS FROM THE CREEK.

(1) SEE EXISTING CONDITIONS FOR ADDITIONAL INFORMATION (REPAIR ID R-325).

(2) SEE EXISTING CONDITIONS PHOTOS 3 AND 4 FOR TRANSITION FROM 1 - 9' x 9' SBC AND 2 - 42" RCP TO 3 - 10' x 6' MBC.

EXIST NBI NUMBER: 17-021-0-0050-02-183

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
2/14/2024

HUITT-ZOLLARS
HUITT-ZOLLARS, INC.
5430 LBJ FREEWAY,
SUITE 1500,
DALLAS, TEXAS 75240-2601
Firm No. F-761

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

HORIZONTAL
0 20 40 80 FT
0 20 40 80 FT
VERTICAL

100% SUBMITTAL

PRINT DATE	REVISION DATE
2/14/2024	

Texas Department of Transportation
Bryan District

SH 6 AT MILLICAN CREEK NORTH
NBI: 17-021-0-0050-02-183
CULVERT LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	BRAZOS	
CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	25

REV DATE: 2-12-2015
CSJ: C 917-00-68

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PHOTO 1

(UP TO 3' OF SEDIMENT ACCUMULATION IN OUTSIDE BARRELS AND UP TO 1' IN MIDDLE BARREL)

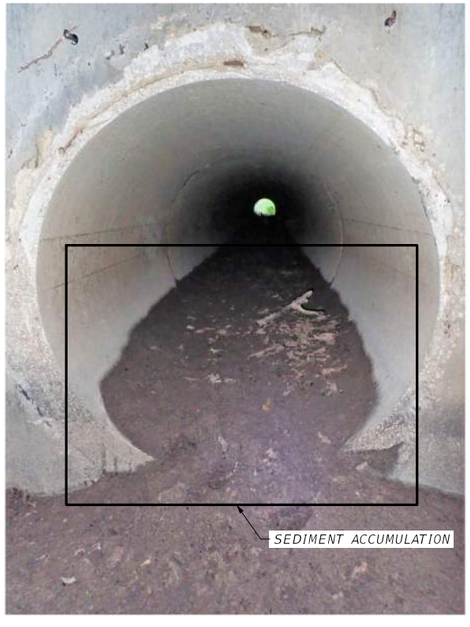

PHOTO 2

(SEDIMENT ACCUMULATION UP TO 6" IN BOTH PIPES)

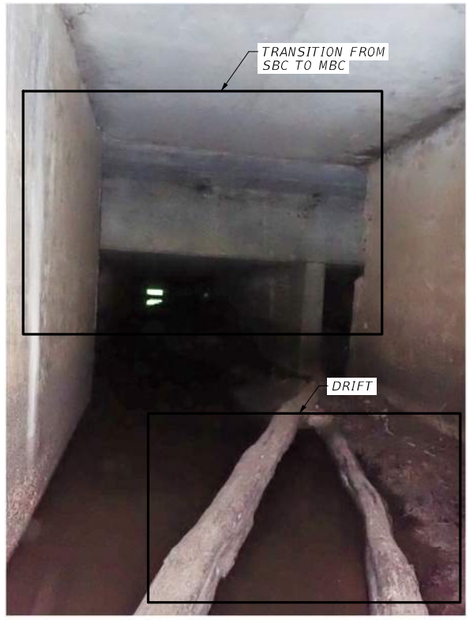

PHOTO 3

(SHOWING TRANSITION SECTION FROM 9' X 9' SBC TO 10' X 6' MBC)

PHOTO 4

(SHOWING TRANSITION SECTION FROM 42" RCP TO 10' X 6" MBC)

R-325 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0480 6001	CLEAN EXIST CULVERTS	EA	1

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
2/14/2024

HUITT-ZOLLARS, INC.
5430 LBJ FREEWAY,
SUITE 1500,
DALLAS, TEXAS 75240-2601
Firm No. F-761

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

Drawings Not To Scale

100% SUBMITTAL	PRINT DATE	REVISION DATE
	2/14/2024	

Texas Department of Transportation
Bryan District

SH 6 AT MILLICAN CREEK NORTH
NBI: 17-021-0-0050-02-183
EXISTING CONDITIONS

SHEET 1 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	BRAZOS

CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	26

BRIDGE 005

REV DATE: 2-12-2015
CSJ: C 917-00-68

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PHOTO 5

(MODERATE DOWNSTREAM DRIFT ACCUMULATION OUTSIDE OF MIDDLE BARREL)

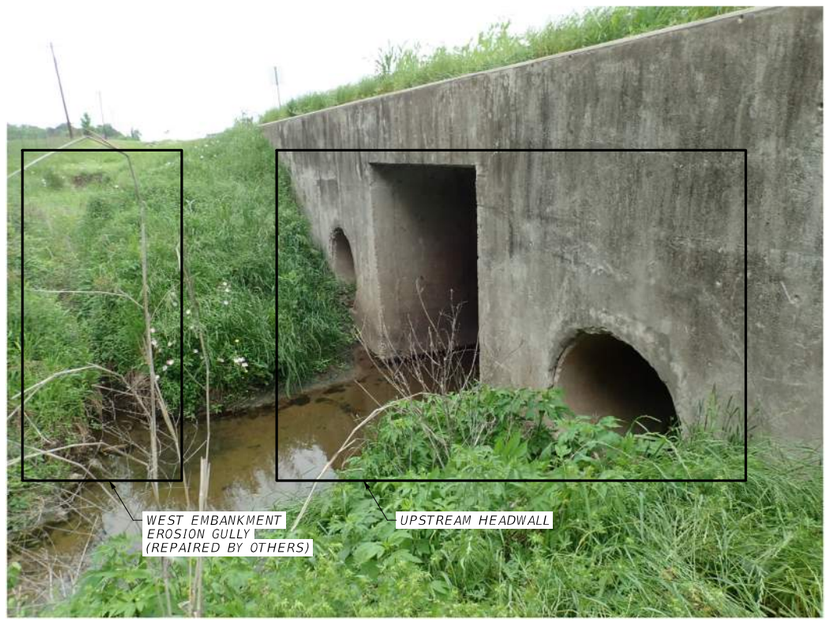


PHOTO 6

(UPSTREAM HEADWALL SHOWING 1 ~ 9' X 9' SBC AND 2 ~ 42" RCP)

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
2/14/2024

HUITT-ZOLLARS
HUITT-ZOLLARS, INC.
5430 LBJ FREEWAY,
SUITE 1500,
DALLAS, TEXAS 75240-2601
Firm No. F-761

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

Drawings Not To Scale

100% SUBMITTAL	PRINT DATE	REVISION DATE
	2/14/2024	

Texas Department of Transportation
Bryan District

SH 6 AT MILLICAN CREEK NORTH
NBI: 17-021-0-0050-02-183
EXISTING CONDITIONS

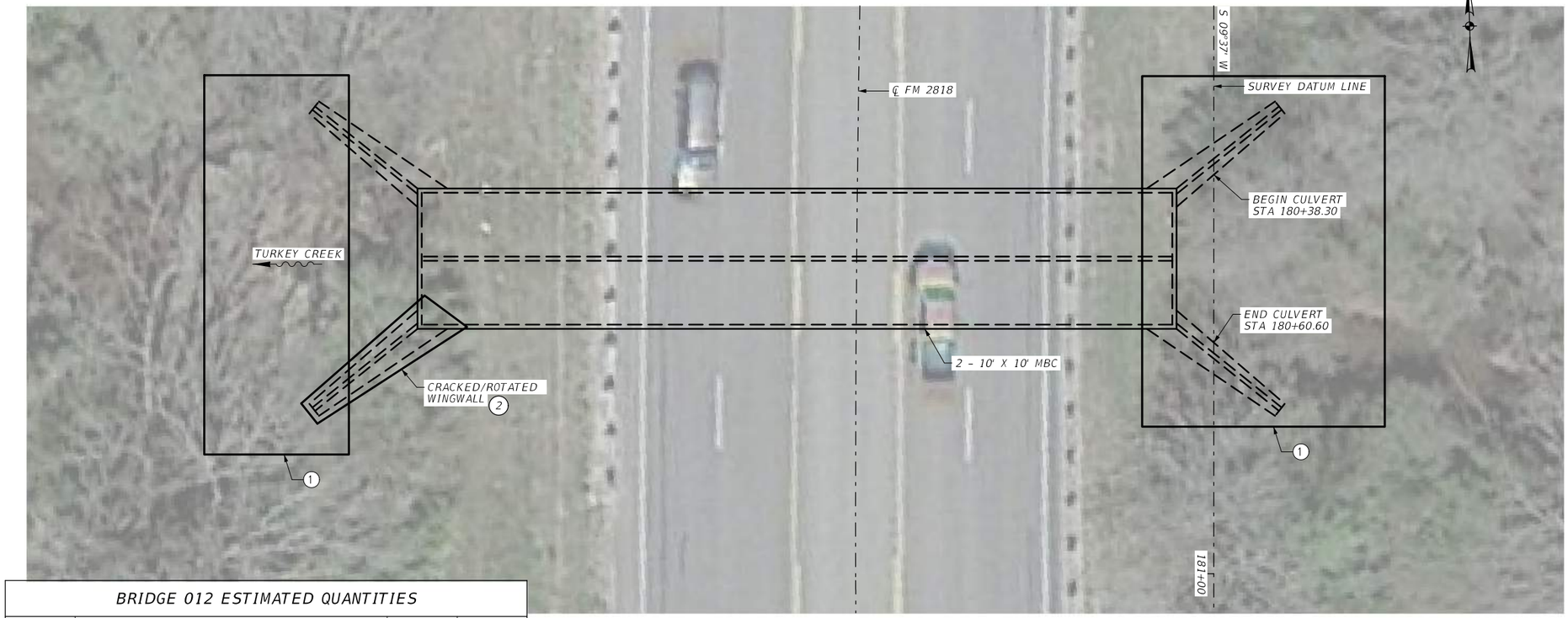
SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	BRAZOS

CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	27

BRIDGE 005



PLAN

BRIDGE 012 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
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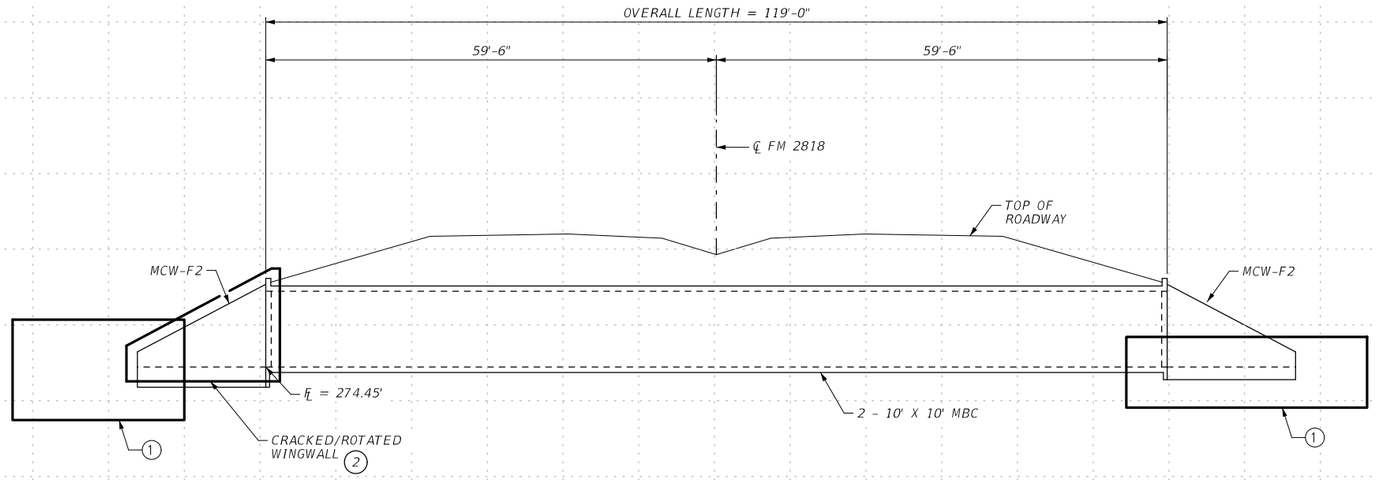


ELEVATION

GENERAL NOTES:

1. ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH TXDOT 2014 STANDARD SPECIFICATIONS OR SPECIAL SPECIFICATIONS AS NOTED.
2. REFERENCE THE TXDOT MARCH, 2021 CONCRETE REPAIR MANUAL FOR ADDITIONAL GUIDANCE ON SPALL AND CRACK REPAIR.
3. REPAIR LOCATIONS AND DIMENSIONS ARE APPROXIMATE AND BASED UPON SITE VISITS AND AS-BUILT PLANS. ACTUAL DIMENSIONS AND QUANTITIES SHALL BE VERIFIED IN THE FIELD. INFORM THE ENGINEER IF ANY QUANTITY EXCEEDS ±15% OF QUANTITIES LISTED IN THIS PLAN SET.
4. CONTRACTOR WILL COORDINATE WITH PROPERTY OWNERS FOR RIGHT-OF-ENTRY IF NEEDED.
5. CONTRACTOR SHALL PROTECT AND PREVENT DEBRIS FROM FALLING INTO CREEK. IN THE EVENT IT DOES, CONTRACTOR SHALL RETRIEVE THE DEBRIS FROM THE CREEK.

(1) SEE R-081 REPAIR DETAILS AND EXISTING CONDITIONS FOR ADDITIONAL INFORMATION.

(2) SEE R-082 REPAIR DETAIL FOR ADDITIONAL INFORMATION.

EXIST NBI NUMBER: 17-021-0-2399-01-001

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED PROFESSIONAL ENGINEER
2/14/2024

HUITT-ZOLLARS, INC.
5430 LBJ FREEWAY,
SUITE 1500,
DALLAS, TEXAS 75240-2601
Firm No. F-761

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

HORIZONTAL
0 10 20 40 FT
0 10 20 40 FT
VERTICAL

100% SUBMITTAL

PRINT DATE	REVISION DATE
2/14/2024	

FM 2818 AT TURKEY CREEK
NBI: 17-021-0-2399-01-001
CULVERT LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	BRAZOS

CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	28

BRIDGE 012

REV DATE: 2-12-2015
CSJ: C 917-00-68
FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms139731BRY-BRG_FM2818 OVER TURKEY CR_LAY_01.dgn

PHOTO 1

(UPSTREAM TOEWALL AND WINGWALL FOOTING EXPOSED UP TO 2' DUE TO CHANNEL BED SCOUR)

PHOTO 3

(DOWNSTREAM CONCRETE APRON AT SW CORNER IS UNDERMINED AND EXPOSED UP TO 2')

PHOTO 2

(DOWNSTREAM CONCRETE APRON AT NW CORNER IS UNDERMINED AND EXPOSED UP TO 2')

PHOTO 4

(DOWNSTREAM CONCRETE APRON IS ERODED WITH VOIDS UP TO 2')

REV DATE: 2-12-2015
CSJ: C 917-00-68

FILENAME: c:\pwworking\dfr\omega-app02.omegaengineers.local_omega-pro\omega_lwilson\dms139736RY-BRG_EC_012_01.dgn

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
2/14/2024

HUITT-ZOLLARS, INC.
5430 LBJ FREEWAY,
SUITE 1500,
DALLAS, TEXAS 75240-2601
Firm No. F-761

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

Drawings Not To Scale

100% SUBMITTAL	PRINT DATE	REVISION DATE
	2/14/2024	

Texas Department of Transportation
Bryan District

FM 2818 AT TURKEY CREEK
NBI: 17-021-0-2399-01-001
EXISTING CONDITIONS

SHEET 1 OF 1 SHEET

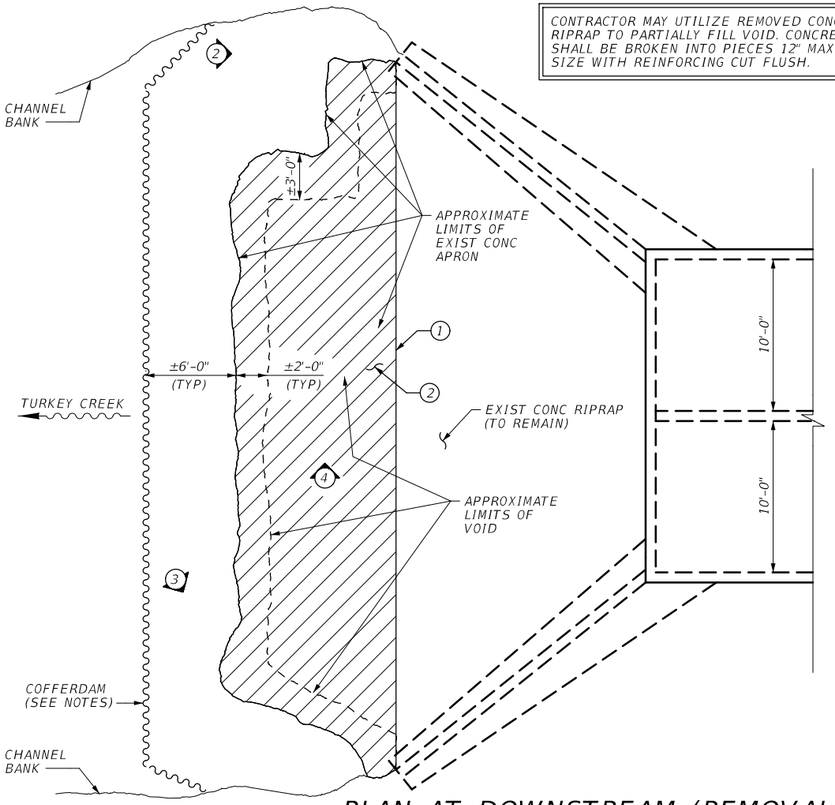
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	BRAZOS

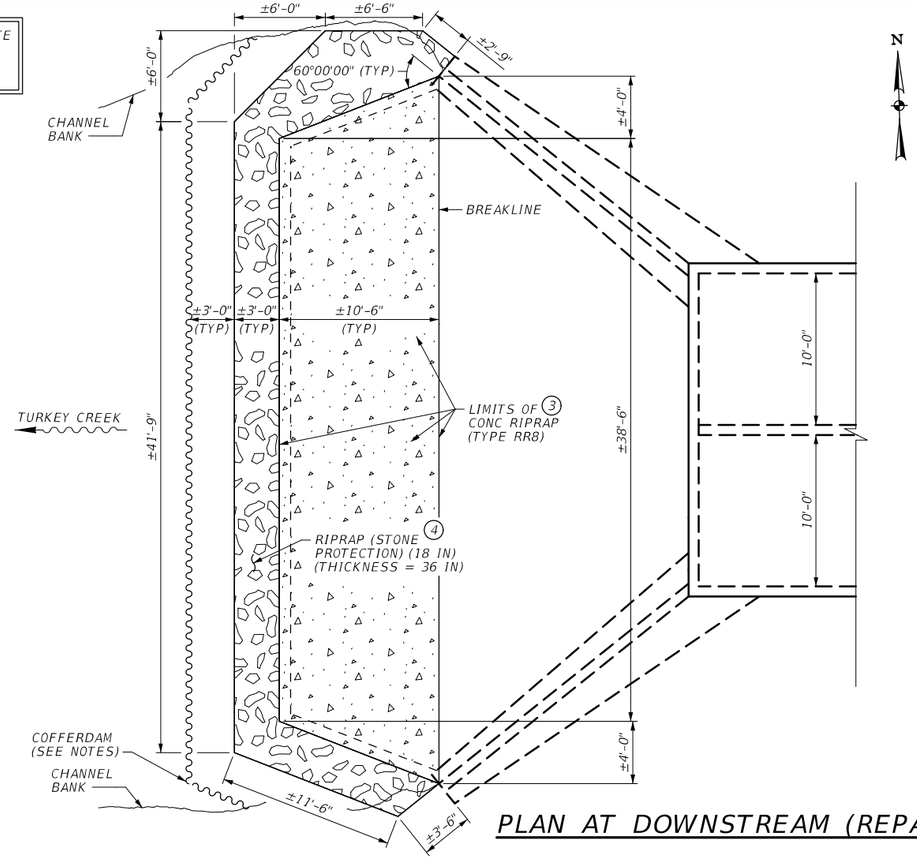
CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	29

BRIDGE 012

CONTRACTOR MAY UTILIZE REMOVED CONCRETE RIPRAP TO PARTIALLY FILL VOID. CONCRETE SHALL BE BROKEN INTO PIECES 12" MAX IN SIZE WITH REINFORCING CUT FLUSH.



PLAN AT DOWNSTREAM (REMOVAL)

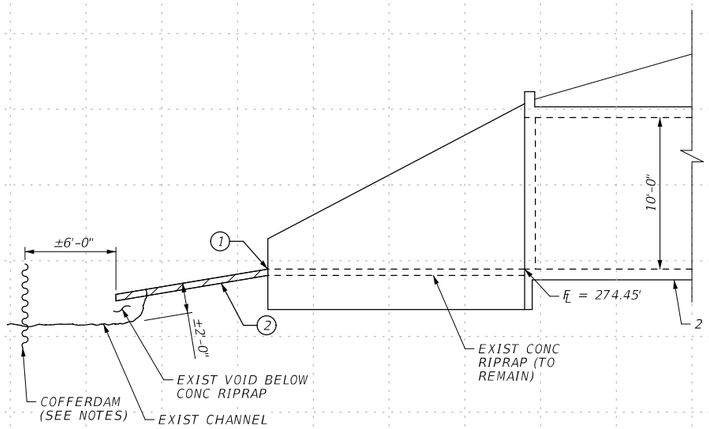


PLAN AT DOWNSTREAM (REPAIR)

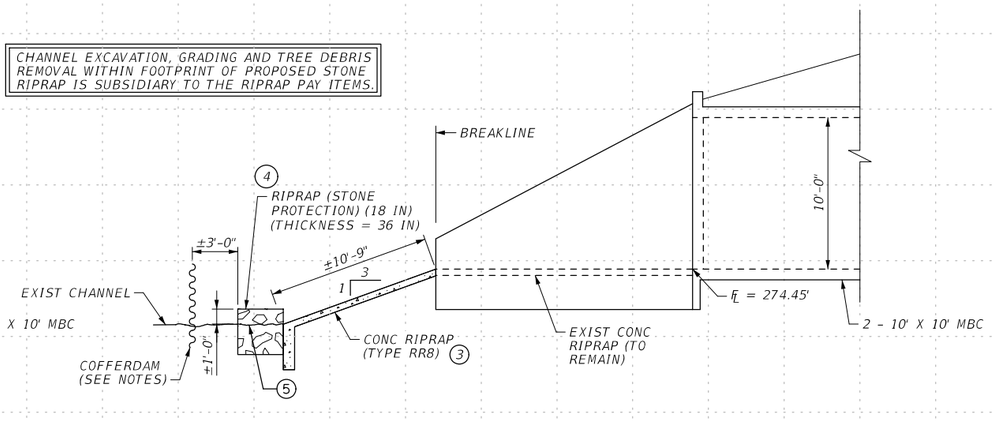
R-081 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0104 6009	REMOVING CONC (RIPRAP)	SY	48
0403 6006	TEMPORARY SPL SHORING (COFFERDAM)	SF	304
0432 6008	RIPRAP (CONC)(CL B)(RR8&RR9)	CY	13
0432 6033	RIPRAP (STONE PROTECTION)(18 IN)	CY	24

CHANNEL EXCAVATION, GRADING AND TREE DEBRIS REMOVAL WITHIN FOOTPRINT OF PROPOSED STONE RIPRAP IS SUBSIDIARY TO THE RIPRAP PAY ITEMS.



ELEVATION AT DOWNSTREAM (REMOVAL)



ELEVATION AT DOWNSTREAM (REPAIR)

BRIDGE 012

LEGEND:

(X) PHOTO DESIGNATION. SEE EXISTING CONDITIONS SHEET FOR ADDITIONAL INFORMATION.

1. SAWCUT RIRAP TO A ½" MIN DEPTH AS SHOWN. CLEAN AND EXTEND EXISTING REINFORCING 1'-0" MIN INTO NEW CONSTRUCTION.
2. REMOVE HATCHED AREA OF EXISTING RIPRAP AS SHOWN. ITEM 104-6009 REMOVING CONC (RIPRAP) ~ EST 48 SY.
3. INSTALL CONCRETE RIPRAP WITH 3'-0" TOE PER CRR STANDARD. ITEM 432-6008 RIPRAP (CONC) (CL B) (RR8 & RR9) ~ EST 13 CY.
4. INSTALL STONE PROTECTION PER SRR STANDARD. ITEM 432-6033 RIPRAP (STONE PROTECTION) (18 IN) ~ EST 24 CY.
5. ANY EXCAVATION REQUIRED TO INSTALL STONE RIPRAP TO A 2'-0" DEPTH IS SUBSIDIARY TO ITEM 432.

COFFERDAM NOTES:

THE COFFERDAM SHALL BE DESIGNED AND DETAILED IN ACCORDANCE WITH SECTION 400.3.1.3 COFFERDAM.

THE ACTUAL DIMENSIONS OF THE COFFERDAM SHALL BE DETERMINED BY THE CONTRACTOR.

THE CONTRACTOR SHALL DETERMINE THE EXTENSION OF THE COFFERDAM ABOVE EXISTING GRADE AND/OR WATER SURFACE TO ACCOUNT FOR POSSIBLE FLOOD WATER FLUCTUATIONS WITHIN THE CHANNEL.

THE PAY LIMITS FOR THE COFFERDAM IS BASED ON THE SQUARE FOOT SURFACE AREA PLAN QUANTITY OF:

304 SF

NO COST ADJUSTMENT WILL BE MADE FOR EITHER A LARGER OR SMALLER COFFERDAM FROM THAT SHOWN HERE.

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
2/14/2024

HUITT-ZOLLARS, INC.
5430 LBJ FREEWAY,
SUITE 1500,
DALLAS, TEXAS 75240-2601
Firm No. F-761

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

HORIZONTAL
0 5 10 20 FT
0 5 10 20 FT
VERTICAL

100% SUBMITTAL

PRINT DATE	REVISION DATE
2/14/2024	

Texas Department of Transportation
Bryan District

FM 2818 AT TURKEY CREEK
NBI: 17-021-0-2399-01-001
R-081 REPAIR DETAILS

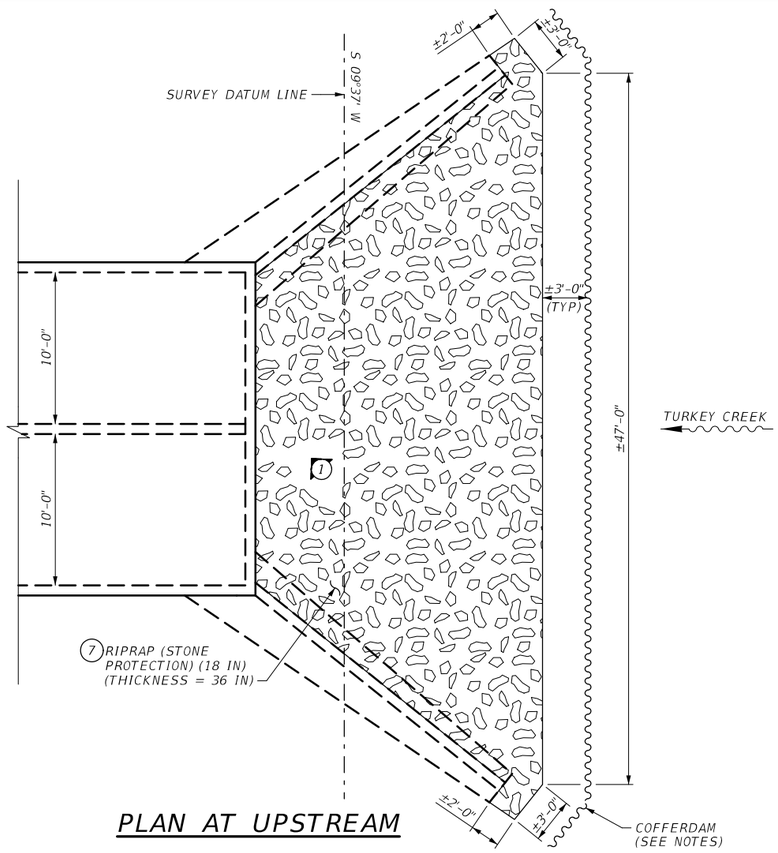
SHEET 1 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

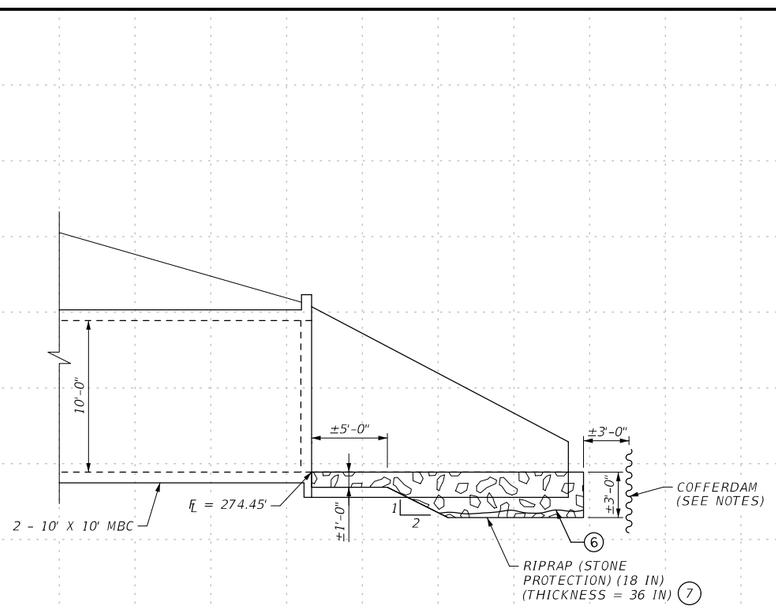
STATE	DISTRICT	COUNTY
TEXAS	BRY	BRAZOS

CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	30

FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms139736\BRY-BRG_R-081_01.dgn
REV DATE: 2-12-2015
CSJ: C 917-00-68



PLAN AT UPSTREAM



ELEVATION AT UPSTREAM

R-081 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0403 6006	TEMPORARY SPL SHORING (COFFERDAM)	SF	314
0432 6033	RIPRAP (STONE PROTECTION) (18 IN)	CY	67

N

LEGEND:

(X) PHOTO DESIGNATION. SEE EXISTING CONDITIONS SHEET FOR ADDITIONAL INFORMATION.

(6) ANY EXCAVATION REQUIRED TO INSTALL STONE RIPRAP TO A 3'-0" DEPTH IS SUBSIDIARY TO ITEM 432.

(7) INSTALL STONE PROTECTION PER SRR STANDARD. ITEM 432-6033 RIPRAP (STONE PROTECTION) (18 IN) ~ EST 67 CY.

CHANNEL EXCAVATION, GRADING AND TREE DEBRIS REMOVAL WITHIN FOOTPRINT OF PROPOSED STONE RIPRAP IS SUBSIDIARY TO THE RIPRAP PAY ITEMS.

COFFERDAM NOTES:

THE COFFERDAM SHALL BE DESIGNED AND DETAILED IN ACCORDANCE WITH SECTION 400.3.1.3 COFFERDAM.

THE ACTUAL DIMENSIONS OF THE COFFERDAM SHALL BE DETERMINED BY THE CONTRACTOR.

THE CONTRACTOR SHALL DETERMINE THE EXTENSION OF THE COFFERDAM ABOVE EXISTING GRADE AND/OR WATER SURFACE TO ACCOUNT FOR POSSIBLE FLOOD WATER FLUCTUATIONS WITHIN THE CHANNEL.

THE PAY LIMITS FOR THE COFFERDAM IS BASED ON THE SQUARE FOOT SURFACE AREA PLAN QUANTITY OF:

314 SF

NO COST ADJUSTMENT WILL BE MADE FOR EITHER A LARGER OR SMALLER COFFERDAM FROM THAT SHOWN HERE.

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
2/14/2024

HUITT-ZOLLARS, INC.
5430 LBJ FREEWAY,
SUITE 1500,
DALLAS, TEXAS 75240-2601
Firm No. F-761

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

HORIZONTAL
0 5 10 20 FT
0 5 10 20 FT
VERTICAL

100% SUBMITTAL

PRINT DATE	REVISION DATE
2/14/2024	

Texas Department of Transportation
Bryan District

FM 2818 AT TURKEY CREEK
NBI: 17-021-0-2399-01-001
R-081 REPAIR DETAILS

SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	BRAZOS

CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	31

BRIDGE 012

REV DATE: 2-12-2015
CSJ: C 917-00-68

FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms139736\BRY-BRG_R-081_02.dgn

R-082 ESTIMATED QUANTITIES			
ITEM CODE	DESCRIPTION	UNITS	TOTAL
0429 6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	5
0780 6004	CONC CRCK REPR(DISCRETE) (ROUT AND SEAL)	LF	40

PHOTO 1

SHOWING WINGWALL (WEST SIDE CULVERT) (FACING SOUTHEAST)

GENERAL NOTES:

1. PERFORM CRACK REPAIR IN ACCORDANCE WITH TXDOT ITEM 780, "CONCRETE CRACK REPAIR", AND THE TXDOT CONCRETE REPAIR MANUAL, MARCH 2021. IN ADDITION TO DETAILS SHOWN ON THIS SHEET, THE MANUAL INCLUDES CRITERIA FOR ROUTING, SURFACE PREPARATION, AND SEALANTS.
2. PERFORM SPALL REPAIR IN ACCORDANCE WITH TXDOT ITEM 429, "CONCRETE STRUCTURE REPAIR", AND THE TXDOT CONCRETE REPAIR MANUAL, MARCH 2021. IN ADDITION TO DETAILS SHOWN ON THIS SHEET, THE MANUAL INCLUDES CRITERIA FOR APPLICATION, SURFACE PREPARATION, FORMS AND CURING.
3. SEE GENERAL SPALLING REPAIR DETAIL FOR ADDITONAL INFORMATION.
4. CONTRACTOR TO SUBMIT ALL MATERIALS AND METHODS OF APPLICATION FOR APPROVAL.
5. REPAIR LOCATIONS AND DIMENSIONS ARE APPROXIMATE AND BASED UPON SITE VISITS AND AS-BUILT PLANS. ACTUAL DIMENSIONS AND QUANTITIES SHALL BE VERIFIED IN THE FIELD. INFORM THE ENGINEER IF ANY QUANTITY EXCEEDS ±15% OF QUANTITIES LISTED IN THIS PLAN SET.

STATE OF TEXAS
BRADLEY D. SHUEY
86490
LICENSED
PROFESSIONAL ENGINEER
2/14/2024

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION # 739

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

Drawings Not To Scale

100% SUBMITTAL	PRINT DATE	REVISION DATE
	2/14/2024	

Texas Department of Transportation
Bryan District

FM 2818 AT TURKEY CREEK
NBI: 17-021-0-2399-01-001
R-082 REPAIR DETAILS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	BRAZOS

CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	32

BRIDGE 012

REV DATE: 2-12-2015
CSJ: C 917-00-68

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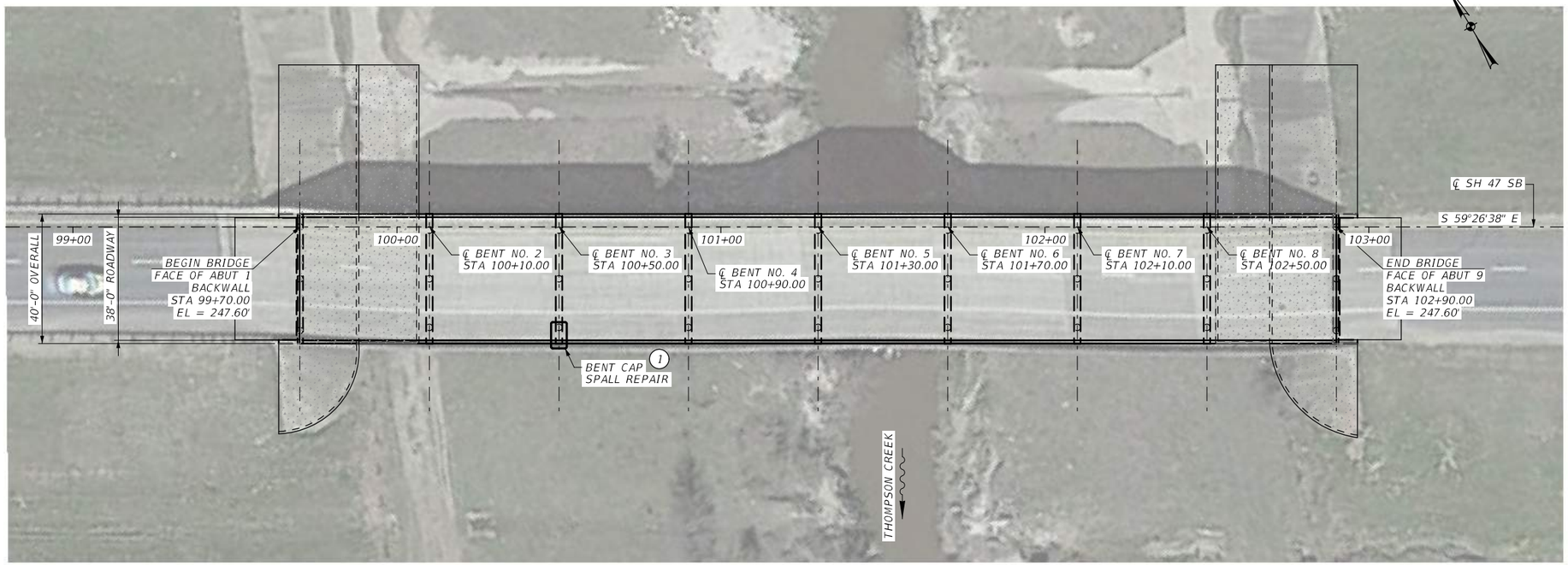
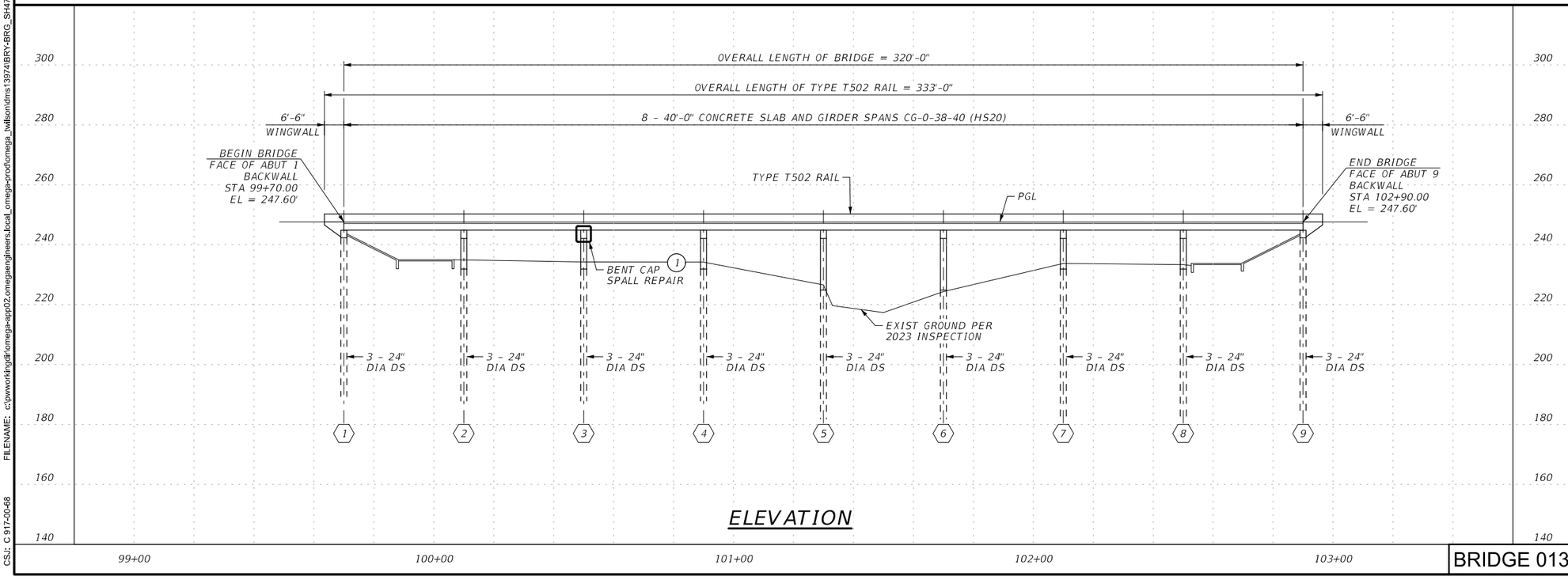


PLAN



ELEVATION

BRIDGE 013

GENERAL NOTES:

1. ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH TXDOT 2014 STANDARD SPECIFICATIONS OR SPECIAL SPECIFICATIONS AS NOTED.
2. REFERENCE THE TXDOT MARCH, 2021 CONCRETE REPAIR MANUAL FOR ADDITIONAL GUIDANCE ON SPALL AND CRACK REPAIR.
3. REPAIR LOCATIONS AND DIMENSIONS ARE APPROXIMATE AND BASED UPON SITE VISITS AND AS-BUILT PLANS. ACTUAL DIMENSIONS AND QUANTITIES SHALL BE VERIFIED IN THE FIELD. INFORM THE ENGINEER IF ANY QUANTITY EXCEEDS ±15% OF QUANTITIES LISTED IN THIS PLAN SET.
4. CONTRACTOR WILL COORDINATE WITH PROPERTY OWNERS FOR RIGHT-OF-ENTRY IF NEEDED.
5. CONTRACTOR SHALL PROTECT AND PREVENT DEBRIS FROM FALLING INTO CREEK. IN THE EVENT IT DOES, CONTRACTOR SHALL RETRIEVE THE DEBRIS FROM THE CREEK.

(1) SEE R-084 REPAIR DETAIL FOR ADDITIONAL INFORMATION.

EXIST NBI NUMBER: 17-021-0-3138-02-002

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED PROFESSIONAL ENGINEER
2/14/2024

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

HORIZONTAL
0 20 40 80 FT
0 20 40 80 FT
VERTICAL

100% SUBMITTAL	PRINT DATE	REVISION DATE
	2/14/2024	

Texas Department of Transportation
Bryan District

SH 47 SB AT THOMPSON CREEK
NBI: 17-021-0-3138-02-002
BRIDGE LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS
STATE	DISTRICT	COUNTY
TEXAS	BRY	BRAZOS
CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	33

REV DATE: 2-12-2015
CSJ: C 917-00-68
FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_lwilson\dms139741BRY-BRG_SH47 OVER THOMPSON CR_LAY_01.dgn

PHOTO 1

(MAJOR SPALL WITH EXPOSED REBAR AT BENT 3 ON THE SE FACE OF THE CAP)

GENERAL NOTES:

1. PERFORM SPALL REPAIR IN ACCORDANCE WITH TXDOT ITEM 429, "CONCRETE STRUCTURE REPAIR", AND THE TXDOT CONCRETE REPAIR MANUAL, MARCH 2021. IN ADDITION TO DETAILS SHOWN ON THIS SHEET, THE MANUAL INCLUDES CRITERIA FOR APPLICATION, SURFACE PREPARATION, FORMS AND CURING.
2. SEE BENT CAP SPALL REPAIR DETAIL AND GENERAL SPALLING REPAIR DETAIL FOR ADDITIONAL INFORMATION.
3. REPAIR LOCATIONS AND DIMENSIONS ARE APPROXIMATE AND BASED UPON SITE VISITS AND AS-BUILT PLANS. ACTUAL DIMENSIONS AND QUANTITIES SHALL BE VERIFIED IN THE FIELD. INFORM THE ENGINEER IF ANY QUANTITY EXCEEDS ±15% OF QUANTITIES LISTED IN THIS PLAN SET.

R-084 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0429 6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	14

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
2/14/2024

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

Drawings Not To Scale

100% SUBMITTAL	PRINT DATE	REVISION DATE
	2/14/2024	

Texas Department of Transportation
Bryan District

SH 47 SB AT THOMPSON CREEK
NBI: 17-021-0-3138-02-002
R-084 REPAIR DETAILS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	BRAZOS

CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	34

BRIDGE 013

REV DATE: 2-12-2015
CSJ: C 917-00-68

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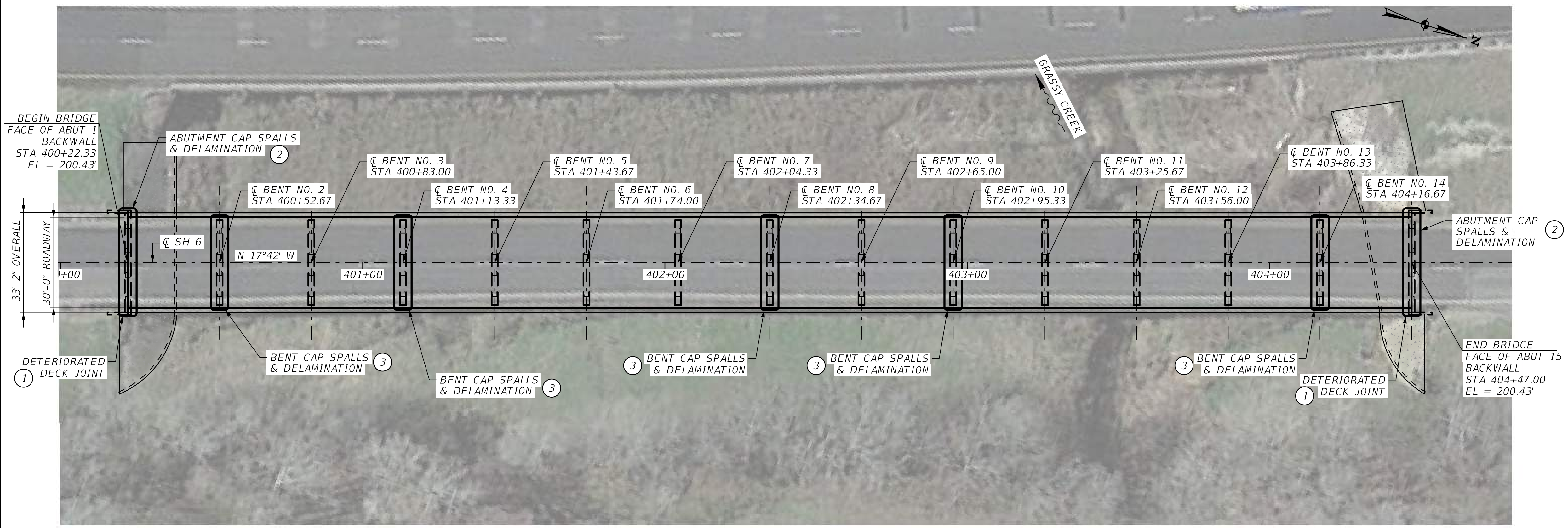


PLAN

GENERAL NOTES:

1. ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH TXDOT 2014 STANDARD SPECIFICATIONS OR SPECIAL SPECIFICATIONS AS NOTED.
2. REFERENCE THE TXDOT MARCH, 2021 CONCRETE REPAIR MANUAL FOR ADDITIONAL GUIDANCE ON SPALL AND CRACK REPAIR.
3. REPAIR LOCATIONS AND DIMENSIONS ARE APPROXIMATE AND BASED UPON SITE VISITS AND AS-BUILT PLANS. ACTUAL DIMENSIONS AND QUANTITIES SHALL BE VERIFIED IN THE FIELD. INFORM THE ENGINEER IF ANY QUANTITY EXCEEDS ±15% OF QUANTITIES LISTED IN THIS PLAN SET.
4. CONTRACTOR WILL COORDINATE WITH PROPERTY OWNERS FOR RIGHT-OF-ENTRY IF NEEDED.
5. CONTRACTOR SHALL PROTECT AND PREVENT DEBRIS FROM FALLING INTO CREEK. IN THE EVENT IT DOES, CONTRACTOR SHALL RETRIEVE THE DEBRIS FROM THE CREEK.

(1) SEE R-085 REPAIR DETAIL FOR ADDITIONAL INFORMATION.

(2) SEE R-086 REPAIR DETAIL FOR ADDITIONAL INFORMATION.

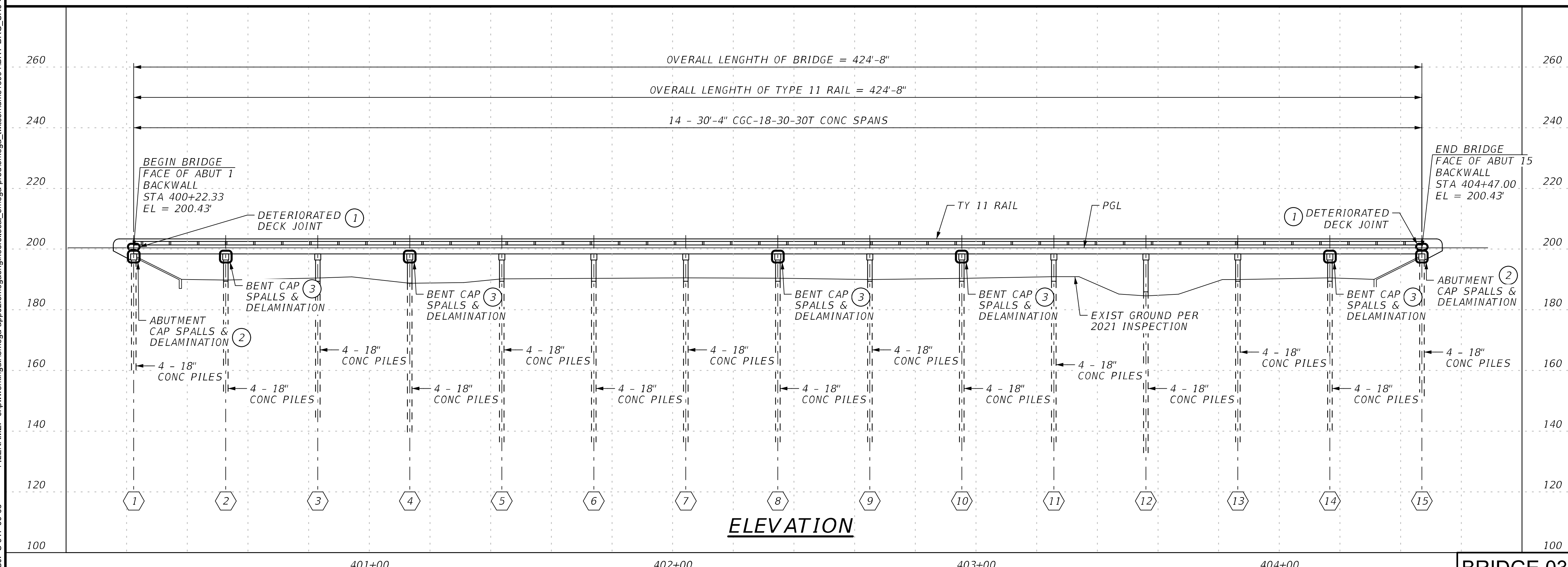
(3) SEE R-087 REPAIR DETAIL FOR ADDITIONAL INFORMATION.

EXIST NBI NUMBER: 17-094-0-0050-03-036

BRIDGE 033 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0100 6002	PREPARING ROW	STA	4

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
2/14/2024



ELEVATION

BRIDGE 033

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

HORIZONTAL 0 20 40 80 FT
0 20 40 80 FT VERTICAL

100% SUBMITTAL

PRINT DATE	REVISION DATE
2/14/2024	

Texas Department of Transportation
Bryan District

SH 6 NB AT GRASSY CREEK
NBI: 17-094-0-0050-03-036
BRIDGE LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS
STATE	DISTRICT	COUNTY
TEXAS	BRY	BRAZOS

CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	35

FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms13994\BRY-BRG_SH6 OVER GRASSY CR_LAY_01.dgn
REV DATE: 2-12-2015
CSJ: C 917-00-68

PHOTO 1

(DECK JOINT SEAL HAS MODERATE CRACKS OVER SOUTH ABUTMENT

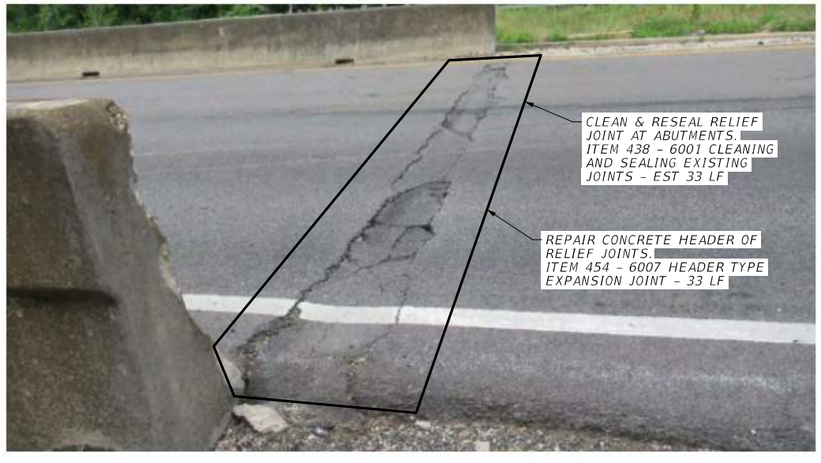
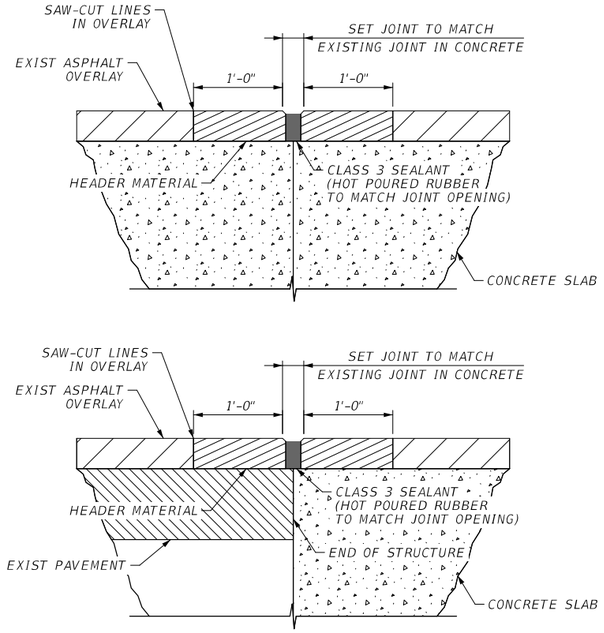


PHOTO 2

(DECK JOINT SEAL HAS MODERATE CRACKS AND SPALLS OVER NORTH ABUTMENT



HEADER TYPE DETAIL FOR RELIEF JOINT REPAIR

GENERAL NOTES:

1. PERFORM JOINT REPAIR IN ACCORDANCE WITH TXDOT ITEM 438, "CLEANING AND SEALING JOINTS" AND TXDOT ITEM 454, "HEADER TYPE EXPANSION JOINTS" IN ADDITION TO DETAILS SHOWN ON THIS SHEET.
2. CONTRACTOR TO SUBMIT ALL MATERIALS AND METHODS OF APPLICATION FOR APPROVAL.
3. NOTIFY THE ENGINEER IF EXISTING CONDITIONS DO NOT MATCH THE PHOTOS DURING REPAIR.
4. FOR "HEADER MATERIAL" SEE MATERIAL SPECIFICATION DMS - 6140.
5. PROVIDE CLASS 3 JOINT SEALANT IN ACCORDANCE WITH DMS - 6310, "JOINT SEALANTS AND FILLERS" FOR JOINTS IN ASPHALT OVERLAY.
6. REPAIR LOCATIONS AND DIMENSIONS ARE APPROXIMATE AND BASED UPON SITE VISITS AND AS-BUILT PLANS. ACTUAL DIMENSIONS AND QUANTITIES SHALL BE VERIFIED IN THE FIELD. INFORM THE ENGINEER IF ANY QUANTITY EXCEEDS ±15% OF QUANTITIES LISTED IN THIS PLAN SET.

STEPS

1. SAWCUT THROUGH THE ASPHALT TO TOP OF SLAB OR PAVEMENT AND REMOVE MATERIAL TO EXPOSE EXISTING JOINT. CLEAN JOINT OPENING OF ALL OLD EXPANSION MATERIALS, BITUMINOUS MATERIALS, DIRT, GREASE AND ALL OTHER DELETERIOUS MATERIALS IN ACCORDANCE WITH ITEM 438, " CLEANING AND SEALING JOINTS. "
2. SURFACES WHERE NOSING / HEADER MATERIAL IS TO BE PLACED MUST BE CLEAN AND DRY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
3. MATCH THE THICKNESS OF THE HEADER WITH THE THICKNESS OF THE OVERLAY. THE THICKNESS OF THE OVERLAY IS APPROXIMATELY 2" BUT MAY VARY. IF THE THICKNESS OF THE OVERLAY EXCEEDS 3.25", SET THE WIDTH OF THE HEADER AT ONE AND A HALF TIMES THE THICKNESS OF THE OVERLAY BUT SHOULD NOT BE GREATER THAN 8" UNLESS APPROVED BY THE ENGINEER.
4. OBTAIN APPROVAL OF CLEANED JOINT PRIOR TO PROCEEDING WITH JOINT SEALING OPERATION.
5. SEAL THE JOINT OPENING WITH A CLASS 3, "HOT POURED RUBBER." SEAL FLUSH TO THE TOP OF THE ASPHALTIC CONCRETE PAVEMENT.

R-085 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0438 6001	CLEANING AND SEALING EXISTING JOINTS	LF	66
0454 6007	HEADER TYPE EXPANSION JOINT	LF	66

STATE OF TEXAS
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Drawings Not To Scale

100% SUBMITTAL	PRINT DATE	REVISION DATE
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Texas Department of Transportation
Bryan District

SH 6 NB AT GRASSY CREEK
NBI: 17-094-0-0050-03-036
R-085 REPAIR DETAILS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	BRAZOS

CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	36

BRIDGE 033

REV DATE: 2-12-2015
CSJ: C 917-00-68

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PHOTO 1

(MODERATE DELAMINATION ON SOUTH ABUTMENT CAP)

PHOTO 2

(MODERATE DELAMINATION ON NORTH ABUTMENT CAP)

GENERAL NOTES:

1. PERFORM SPALL REPAIR IN ACCORDANCE WITH TXDOT ITEM 429, "CONCRETE STRUCTURE REPAIR", AND THE TXDOT CONCRETE REPAIR MANUAL, MARCH 2021. IN ADDITION TO DETAILS SHOWN ON THIS SHEET, THE MANUAL INCLUDES CRITERIA FOR APPLICATION, SURFACE PREPARATION, FORMS AND CURING.
2. CONTRACTOR TO SUBMIT ALL MATERIALS AND METHODS OF APPLICATION FOR APPROVAL.
3. SEE BENT CAP SPALL REPAIR DETAIL AND GENERAL SPALLING REPAIR DETAIL FOR ADDITIONAL INFORMATION.
4. REPAIR LOCATIONS AND DIMENSIONS ARE APPROXIMATE AND BASED UPON SITE VISITS AND AS-BUILT PLANS. ACTUAL DIMENSIONS AND QUANTITIES SHALL BE VERIFIED IN THE FIELD. INFORM THE ENGINEER IF ANY QUANTITY EXCEEDS ±15% OF QUANTITIES LISTED IN THIS PLAN SET.

R-086 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0429 6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	40

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Texas Department of Transportation
Bryan District

SH 6 NB AT GRASSY CREEK
NBI: 17-094-0-0050-03-036
R-086 REPAIR DETAILS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	BRAZOS

CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	37

BRIDGE 033

REV DATE: 2-12-2015
CSJ: C 917-00-68
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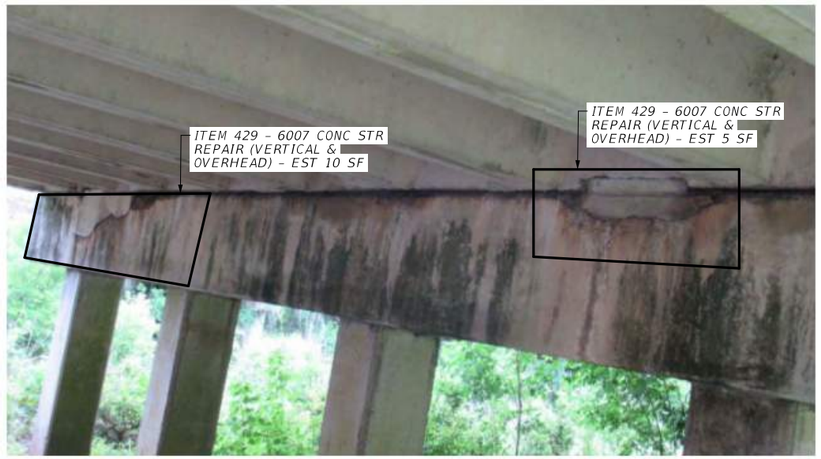

PHOTO 1

(MODERATE DELAMINATIONS AND SPALLS ON BENT CAP 2)

PHOTO 2

(MODERATE DELAMINATIONS AND SPALLS ON BENT CAP 4)

PHOTO 3

(MODERATE DELAMINATIONS AND SPALLS ON BENT CAP 8)

PHOTO 4

(MODERATE DELAMINATIONS AND SPALLS ON BENT CAP 14)

GENERAL NOTES:

1. PERFORM SPALL REPAIR IN ACCORDANCE WITH TXDOT ITEM 429, "CONCRETE STRUCTURE REPAIR", AND THE TXDOT CONCRETE REPAIR MANUAL, MARCH 2021. IN ADDITION TO DETAILS SHOWN ON THIS SHEET, THE MANUAL INCLUDES CRITERIA FOR APPLICATION, SURFACE PREPARATION, FORMS AND CURING.
2. CONTRACTOR TO SUBMIT ALL MATERIALS AND METHODS OF APPLICATION FOR APPROVAL.
3. SEE BENT CAP SPALL REPAIR DETAIL AND GENERAL SPALLING REPAIR DETAIL FOR ADDITIONAL INFORMATION.
4. REPAIR LOCATIONS AND DIMENSIONS ARE APPROXIMATE AND BASED UPON SITE VISITS AND AS-BUILT PLANS. ACTUAL DIMENSIONS AND QUANTITIES SHALL BE VERIFIED IN THE FIELD. INFORM THE ENGINEER IF ANY QUANTITY EXCEEDS ±15% OF QUANTITIES LISTED IN THIS PLAN SET.

R-087 ESTIMATED QUANTITIES			
ITEM CODE	DESCRIPTION	UNITS	TOTAL
0429 6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	50 (1)

(1) INCLUDES QUANTITY FOR BENT 10 SPALL REPAIR

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P:512 575 2288 F:281 647 9184

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	2/14/2024	

Texas Department of Transportation
Bryan District

SH 6 NB AT GRASSY CREEK
NBI: 17-094-0-0050-03-036
R-087 REPAIR DETAILS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	BRAZOS

CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	38

BRIDGE 033

REV DATE: 2-12-2015
CSJ: C 917-00-68

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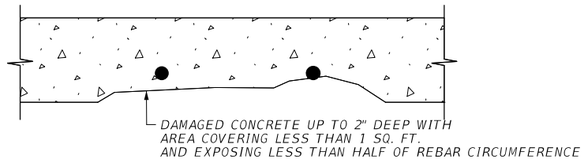
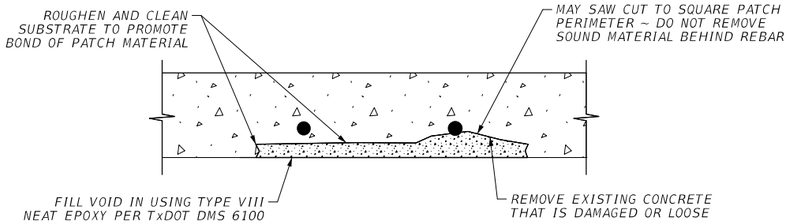
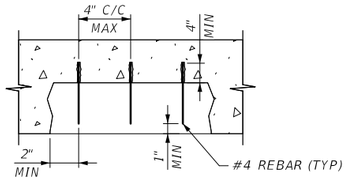


STEP 1 - MINOR SPALL REPAIR



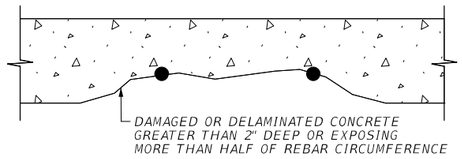
STEP 2 - MINOR SPALL REPAIR



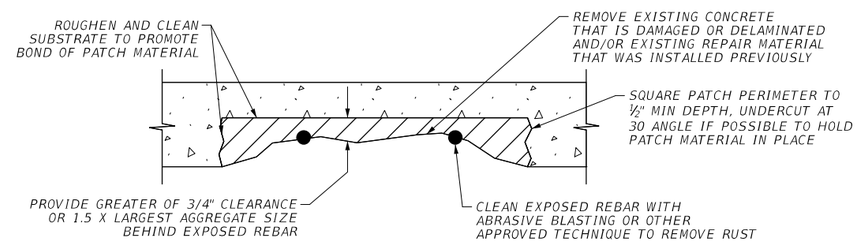
MECHANICAL TIE DETAIL

GENERAL NOTES:

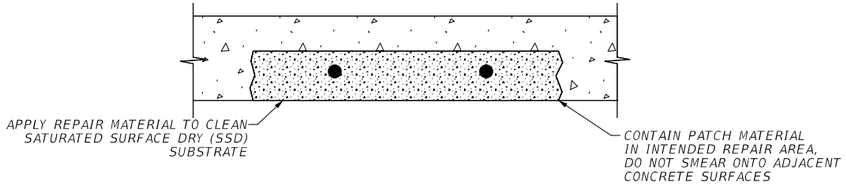
1. PERFORM REPAIR IN ACCORDANCE WITH TxDOT ITEM 429, "CONCRETE STRUCTURE REPAIR", AND THE TXDOT CONCRETE REPAIR MANUAL, MARCH 2021. IN ADDITION TO DETAILS SHOWN ON THIS SHEET, THE MANUAL INCLUDES CRITERIA FOR APPLICATION, SURFACE PREPARATION, FORMS, AND CURING.
2. CONTRACTOR TO SUBMIT ALL MATERIALS AND METHODS OF APPLICATION FOR APPROVAL.
3. DETAIL APPLIES TO GENERAL SPALLING.
4. APPLY MECHANICAL TIE DETAIL IN THE EVENT EXISTING REBAR IS CORRODED TO THE POINT OF NOT SUFFICIENTLY ANCHORING INTERMEDIATE AND MAJOR SPALL REPAIR MATERIAL TO THE SUBSTRATE.



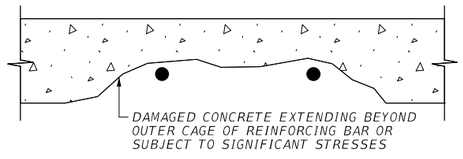
STEP 1 - INTERMEDIATE SPALL REPAIR



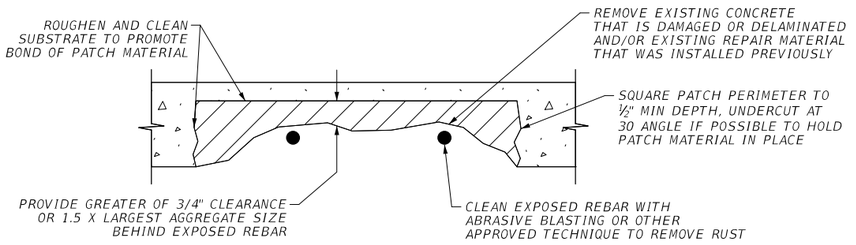
STEP 2 - INTERMEDIATE SPALL REPAIR



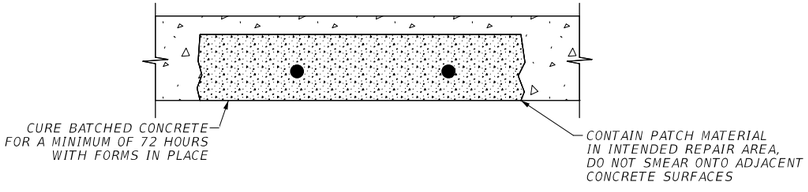
STEP 3 - INTERMEDIATE SPALL REPAIR



STEP 1 - MAJOR SPALL REPAIR



STEP 2 - MAJOR SPALL REPAIR



STEP 3 - MAJOR SPALL REPAIR

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	2/14/2024	

Texas Department of Transportation
Bryan District

GENERAL SPALLING REPAIR DETAIL

SHEET 1 OF 1 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	BRAZOS	
CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	39

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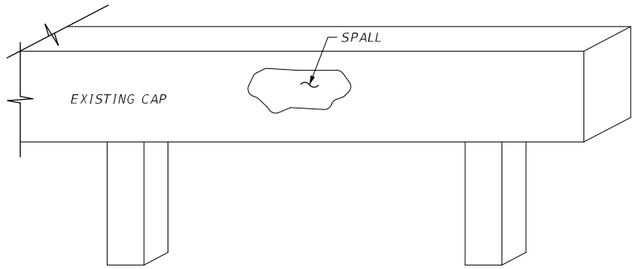
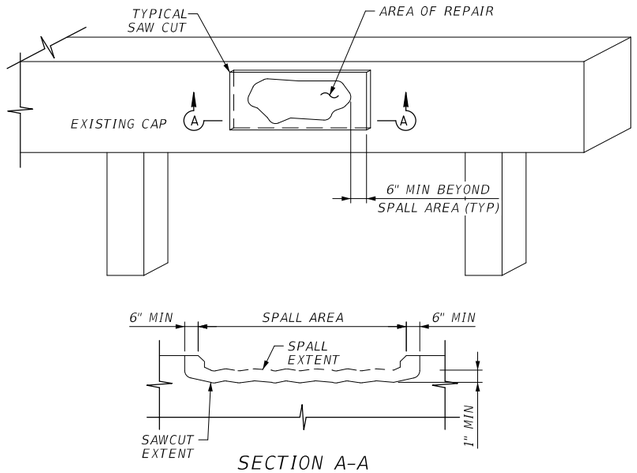
CSJ: C 917-00-68



1. DEFINE LIMITS OF AREA TO BE REPAIRED PLUS 6" ON ALL SIDES.

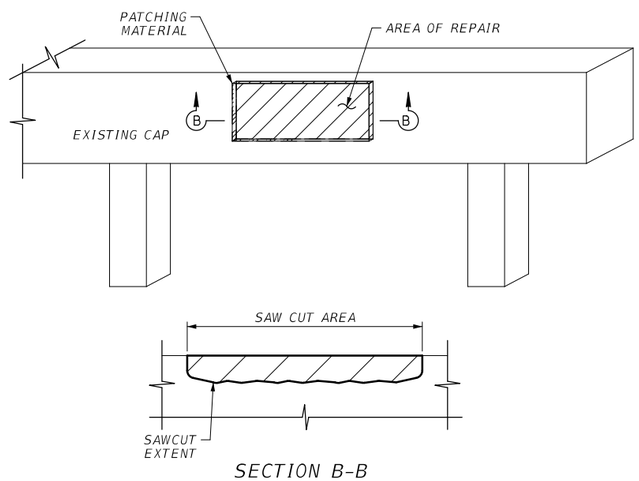
EXISTING CAP CONDITION



SECTION A-A

1. SAW-CUT THE AREA AROUND THE SPALL PERIMETER TO SOUND CONCRETE.
2. CLEAN AND REMOVE LOOSE CONCRETE DEBRIS. ROUGHEN AND CLEAN SUBSTRATE TO PROMOTE BOND OF PATCHING MATERIAL.
3. SEE GENERAL SPALLING REPAIR DETAIL FOR ADDITIONAL INFORMATION.

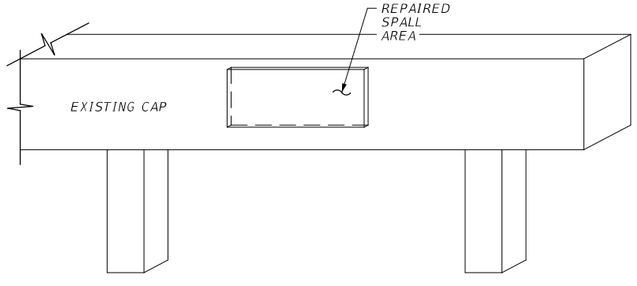
STEP 1



SECTION B-B

1. FINISH FLUSH WITH THE EXISTING CONCRETE.
2. SEE GENERAL SPALLING REPAIR DETAIL FOR ADDITIONAL INFORMATION.

STEP 2



1. ALLOW TO FULLY CURE PER MANUFACTURER'S RECOMMENDATIONS.

FINAL CAP CONDITION

STATE OF TEXAS
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127720
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2/14/2024

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100% SUBMITTAL	PRINT DATE	REVISION DATE
	2/14/2024	

Texas Department of Transportation
Bryan District

BENT CAP SPALL REPAIR DETAIL

SHEET 1 OF 1 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	BRAZOS	
CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	40

REV DATE: 2-12-2015
CSJ: C 917-20-68

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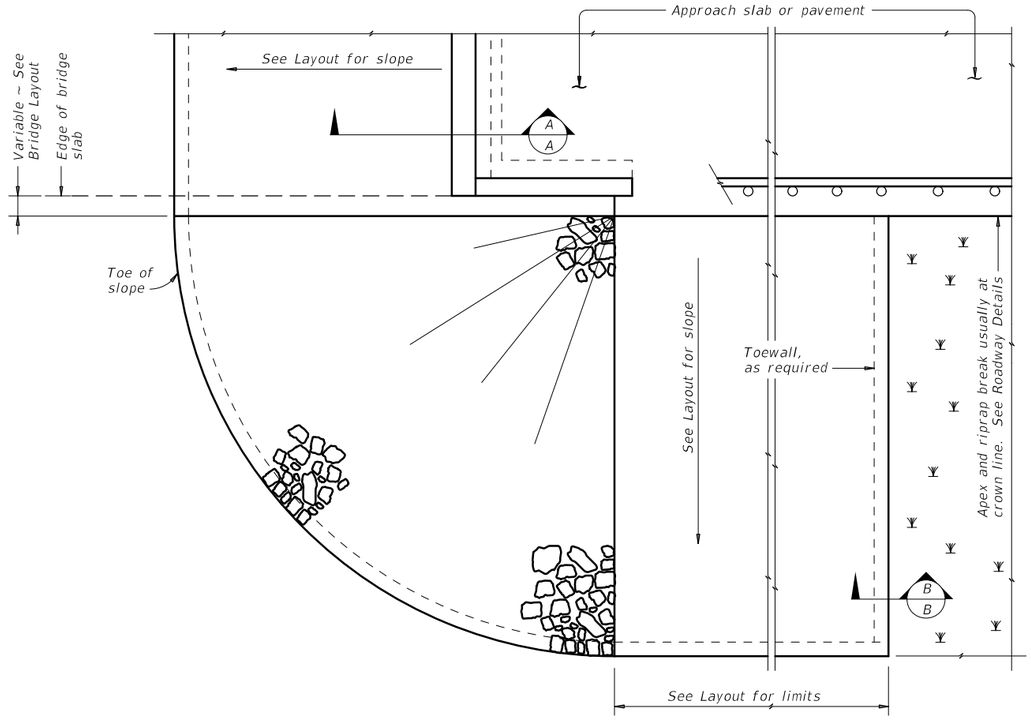
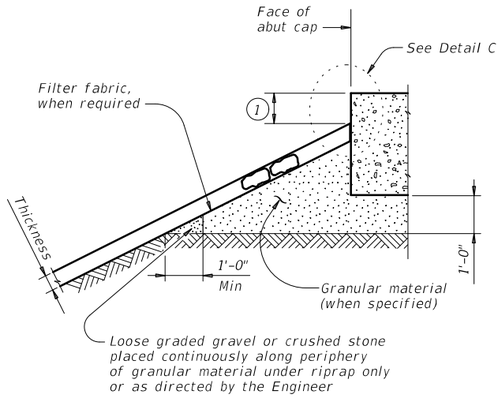
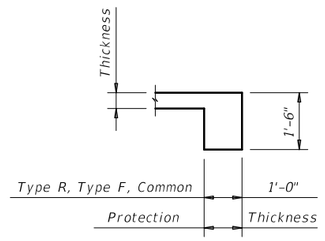


PLAN

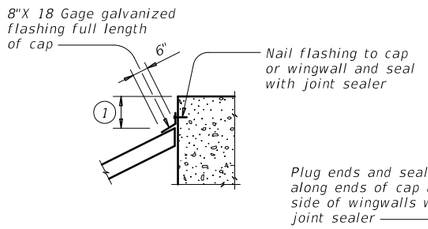


SECTION A-A AT CAP

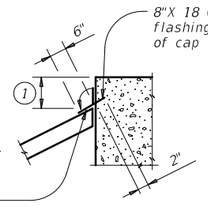


SECTION B-B

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

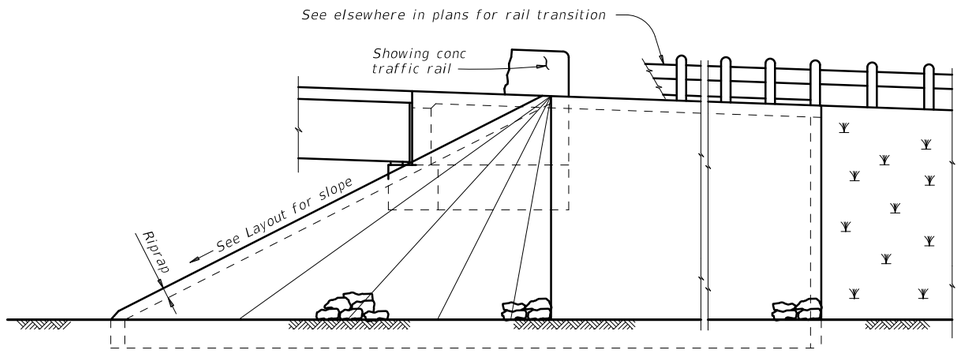


CAP OPTION A



CAP OPTION B

DETAIL C



ELEVATION

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

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

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1-19.dgn	DN: AES		CK: JGD	DW: BWH		CK: AES	
©TxDOT April 2019	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0917	00	068		VARIOUS		
	DIST	COUNTY				SHEET NO.	
	BRY	BRAZOS				41	

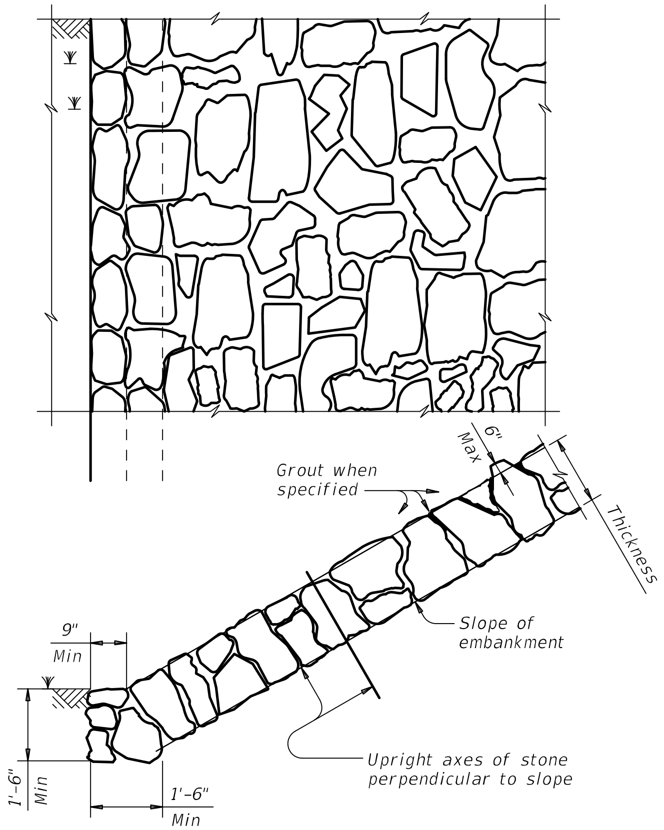


FIGURE 1 ~ TYPE R STONE RIPRAP

dry or grouted

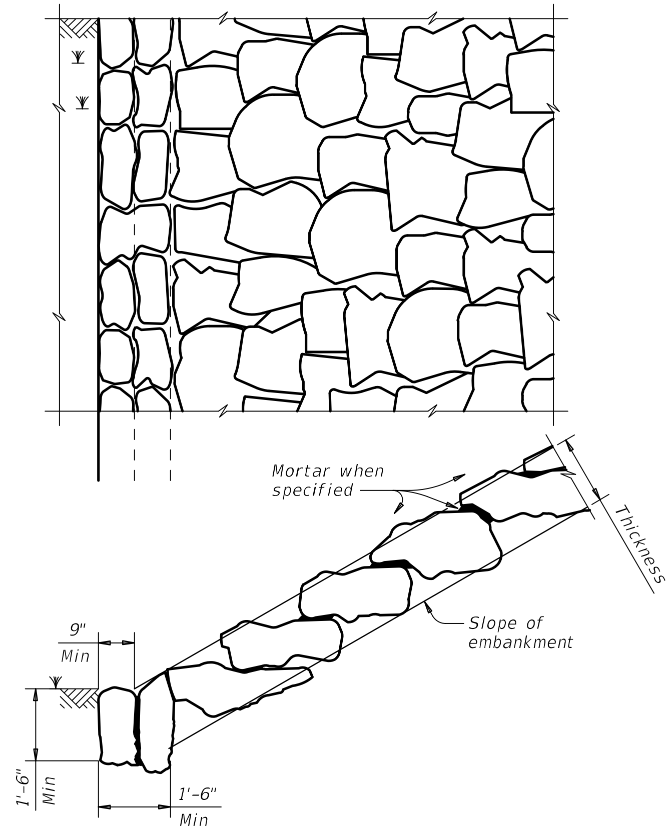


FIGURE 2 ~ TYPE F STONE RIPRAP

dry or mortared

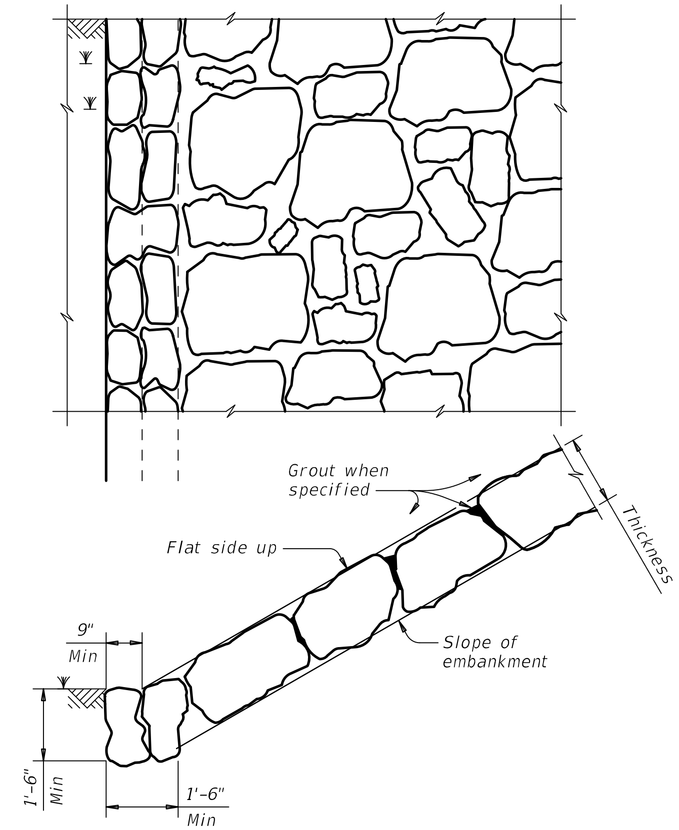


FIGURE 3 ~ TYPE F STONE RIPRAP

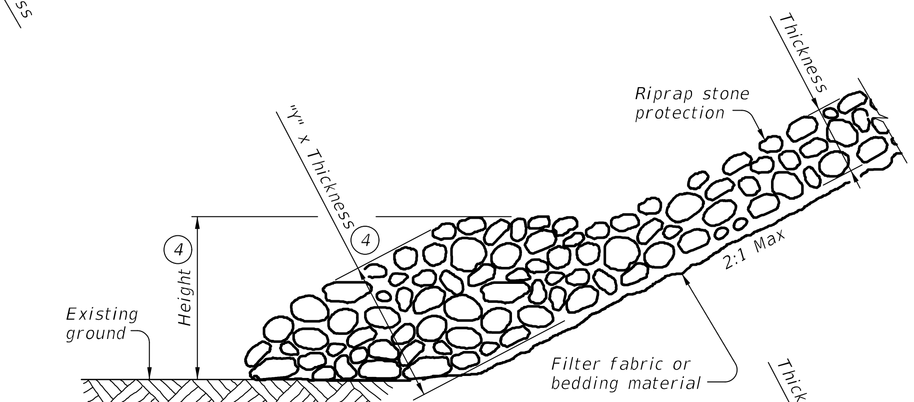
grouted

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

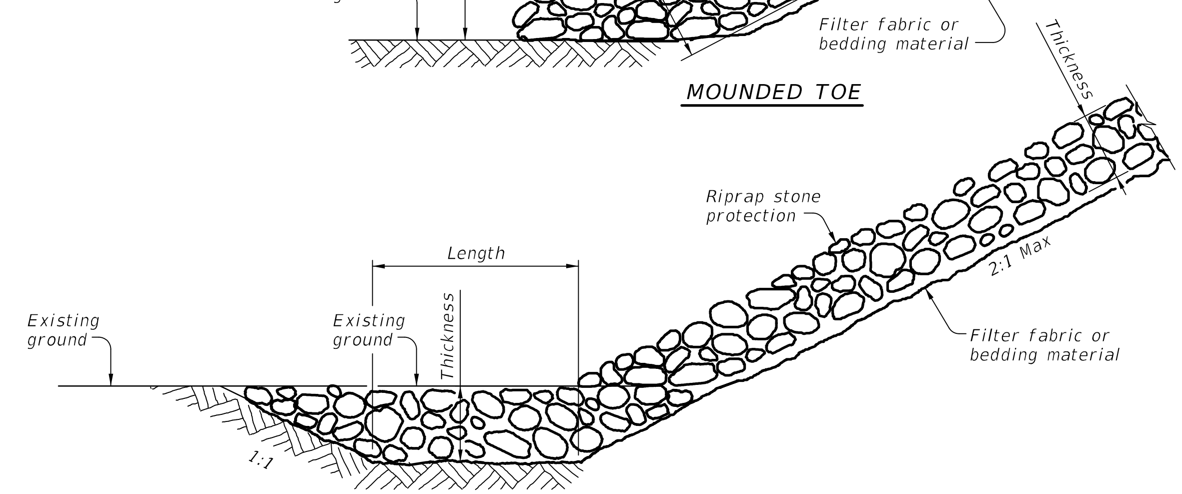
3. Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.

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.



MOUNDED TOE



EXTENDED ROCK FILLED TRENCH

PROTECTION STONE RIPRAP TOE OPTIONS (5)

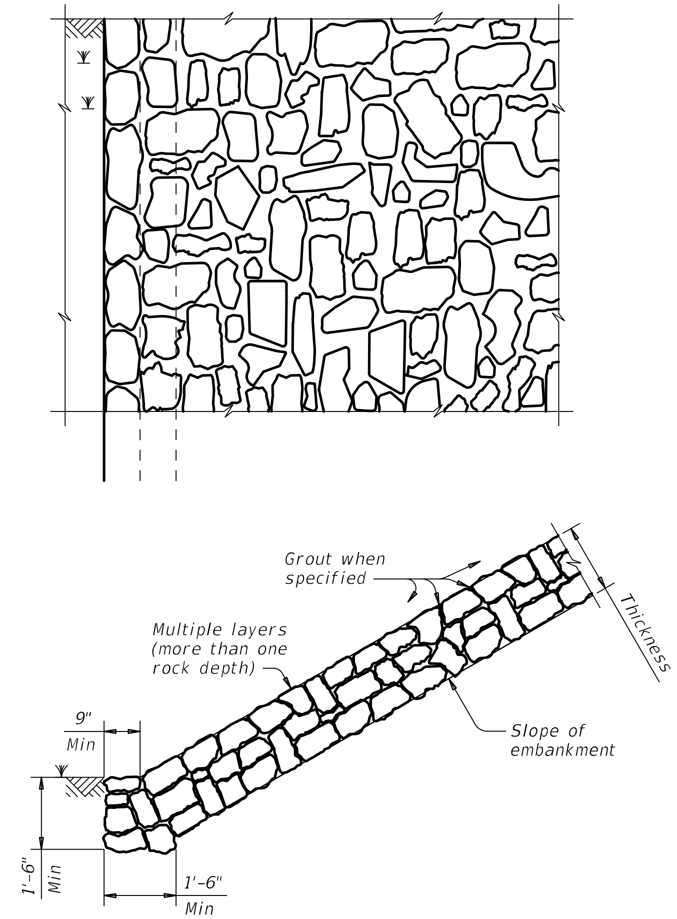


FIGURE 4 ~ COMMON STONE RIPRAP

dry or grouted

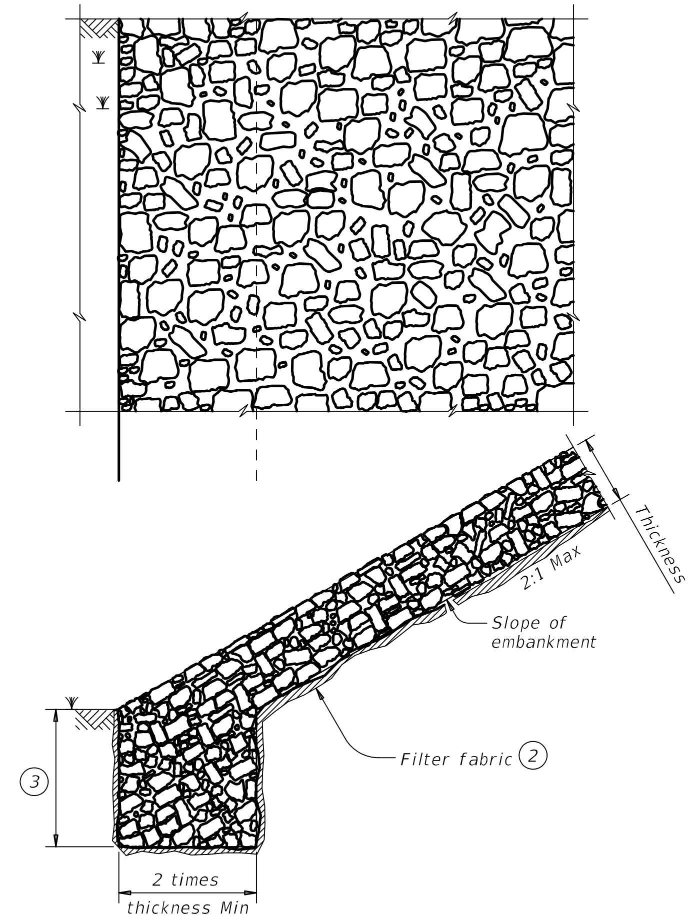


FIGURE 5 ~ PROTECTION STONE RIPRAP (5)

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

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©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	00	068	VARIOUS
	DIST		COUNTY	SHEET NO.
	BRY		BRAZOS	42

DATE: 2/14/2024 2:12:34 PM
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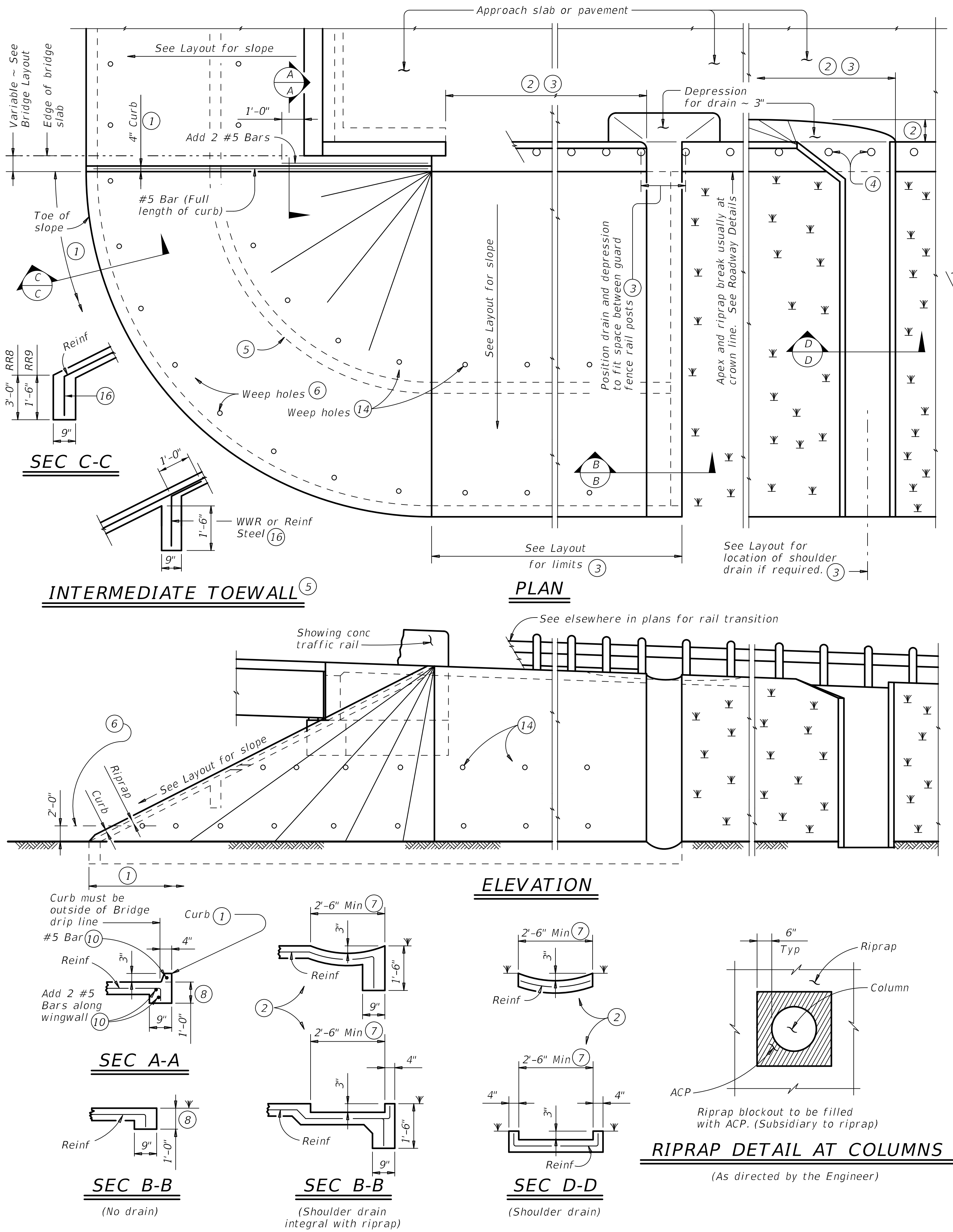
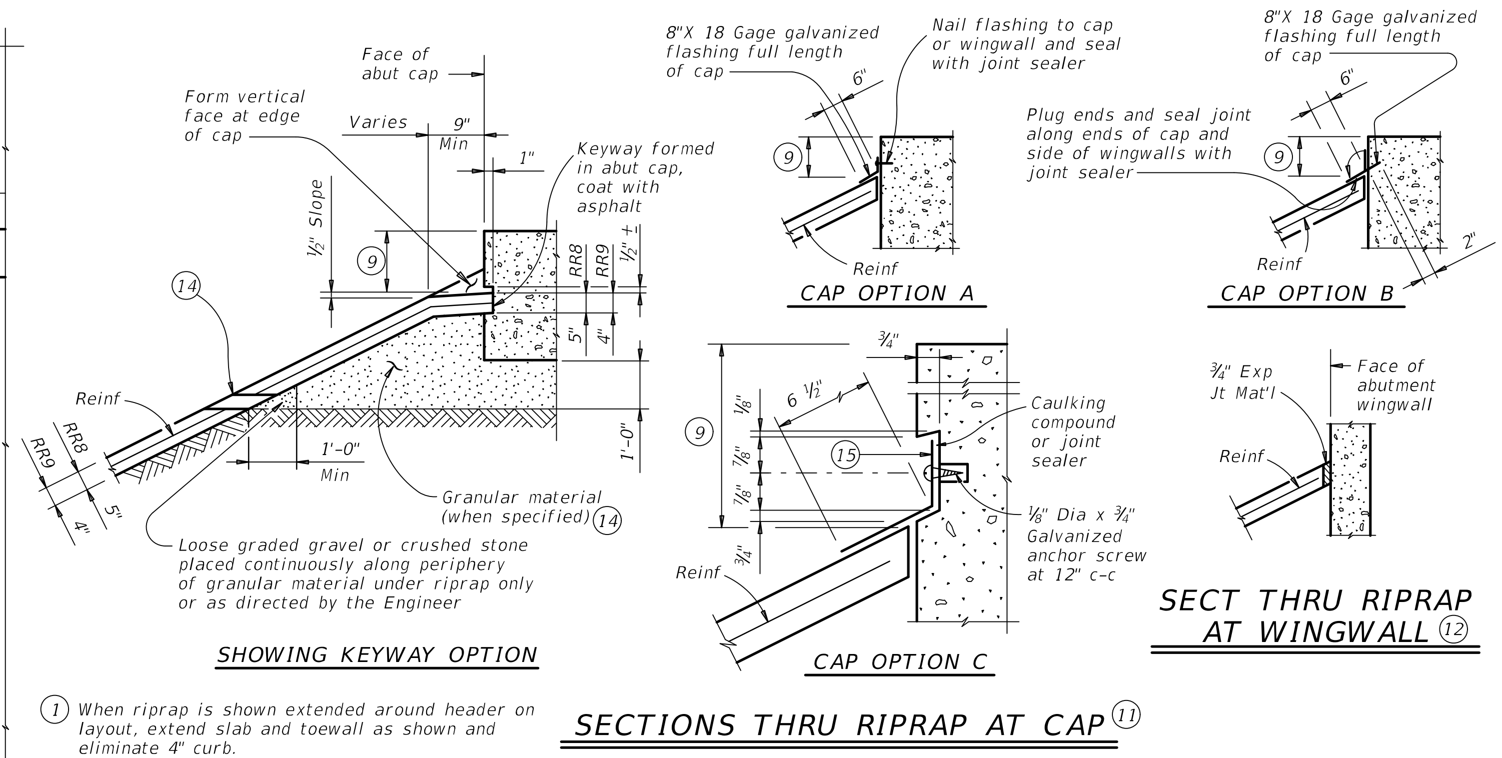
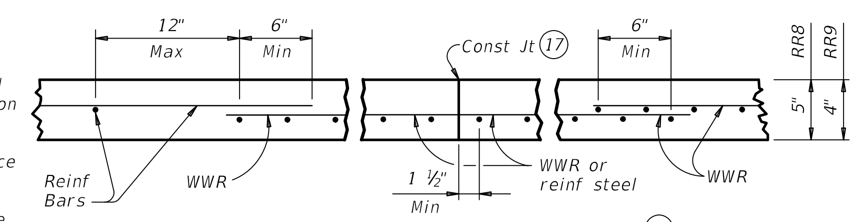






See General Notes for optional synthetic fiber reinforcement.

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

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

GENERAL NOTES:

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

Texas Department of Transportation — Bridge Division Standard

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

CRR

FILE: crrstde1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	00	068	VARIOUS
	DIST		COUNTY	SHEET NO.
	BRY		BRAZOS	42A

DATE: 2/16/2024 11:50:10 AM
FILE: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms15918\crrstde1-19.dgn

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

I. 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.

☒ Required Action ☐ No Action Required

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. FM 2818 at Turkey Creek is within or adjacent to TxDOT, City of Bryan, and Brazos County MS4s.

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

1. City of Bryan
2. Brazos County

Refer to 2014 TxDOT Standard Specification Items:
7.7.2 Texas Pollutant Discharge Elimination System (TPDES) Permits and Storm Water Pollution Prevention PLans (SWP3)
506 Temporary Erosion, Sedimentation and Environmental Controls
734 Litter Removal
735 Debris Removal
738 Cleaning and Sweeping Highways

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

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.
The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☐ No Permit Required

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

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

☐ Individual 404 Permit Required

☒ Other Nationwide Permit Required: NWP#3 Maintenance

Required Actions: List locations of waters of the US.

1. SH 6 over Millican Creek North - NBI - 170210005002183
2. FM 2818 over Turkey Creek - NBI - 170210239901001
3. SH 47 SB over Thompson Creek - NBI - 170210313802002
4. SH 6 NB over Grassy Creek - NBI - 170940005003036

Information regarding the USACE Nationwide Permit Program can be found at:
http://www.swf.usace.army.mil/Missions/Regulatory/Permitting/GeneralPermits.aspx

Refer to 2014 TxDOT Standard Specification Items:
7.7.3 Work in Waters of the United States
7.7.6 Project Specific Locations
496 Removing Structures
506 Temporary Erosion, Sedimentation and Environmental Controls
506.4.3.4 Restricted Activities and Required Precautions

III. CULTURAL RESOURCES

Refer to 2014 TxDOT Standard Specification Item 7.7.1 Cultural Resources, in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) immediately cease work in the vicinity and contact the Engineer.

☐ Required Action ☒ No Action Required

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.

☒ Required Action ☐ No Action Required

Action No.

1. Tree removal to be done in accordance with the Migratory Bird Treaty Act (see Section V).

Refer to 2014 TxDOT Standard Specification Items:
160 Topsoil
161 Compost
162 Sodding for Erosion Control
164 Seeding for Erosion Control
166 Fertilizer
168 Vegetative Watering
169 Soil Retention Blankets
170 Irrigation System
180 Wildflower Seeding
192 Landscape Planting
193 Landscape Establishment
506 Temporary Erosion, Sedimentation, and Environmental Controls
730 Roadside Mowing
751 Landscape Maintenance
752 Tree and Brush Removal

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

☒ Required Action ☐ No Action Required

Action No.

1. Do not kill snakes or other animals!
2. Do not destroy nests on structures within the project limits.

   Temporarily prevent the building of nests on any structures that require work within the project limits during the construction timeframe.

   This can be accomplished by application of bird repellant gel, netting, or removal by hand every 3-4 days.

   The nesting/breeding season for migratory birds is March 1 - September 1.

Under the Migratory Bird Treaty Act (MBTA), it is unlawful by any means or manner, to pursue, hunt, take, capture, [or] kill any migratory birds except as permitted by regulation (16 U.S.C. 703-704). Neither the statute nor its implementing regulations (Title 50, Code of Federal Regulations, Parts 10, 13, 21) exempt unintentional take of migratory birds. The unauthorized take (e.g. killing, capturing, or collecting) of migratory birds is a strict liability criminal offense that does not require knowledge or specific intent on the part of the offender. Even when engaged in an otherwise lawful activity for which the intent is not the killing of migratory birds, a violation may be committed.

3. If caves or sinkholes are discovered, cease work in the immediate area to verify the presence or absence of wildlife.
4. BMPs for T and E species will be discussed at the preconstruction meeting.

The Bryan District Environmental Section can be contacted at (979) 778-9766 to assist with the removal of wildlife that will not leave on their own with gentle persuasion.

Refer to 2014 TxDOT Standard Specification Item:
7.7.6 Project Specific Locations

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropiate 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 Engineerimmediately. The Contractor shall be responsiblefor the proper containment and cleanup of all product spills.

Contact the Engineer if any of the follwing 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 notifiy 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 discoverd on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ Required Action ☐ No Action Required

Action No.

1. The Clean Water Act, in part, requires that any spill of oil that could enter a waterway, as defined by the Act, and that violates applicable water quality standards or causes a film or sheen on water require reporting to the TCEQ and local authorities.
   Contact the Bryan District Environmental Section at 979-778-9766.

   If potentially hazardous material and/or contaminated media (i.e. soil, groudwater, surface water, sediment, building materials) are unexpectedly encountered during construction, immediately cease work in the vicinity and contact the Engineer.

   Refer to 2014 TxDOT Standard Specification Items:
   6.10 Hazardous Materials
   7.12 Responsibility for Hazardous Materials

VII. OTHER ENVIRONMENTAL ISSUES

☐ Required Action ☒ No Action Required

Refer to 2014 TxDOT Standard Specification Items:
7.7.6 Project Specific Locations
751 Landscape Maintenance

Contacts:

Mr. John D. Moravec
Environmental Coordinator
Texas Department of Transportation
Bryan District
2591 N. Earl Rudder Freeway
Bryan, TX 77803
Phone: (979) 778-9766
Fax: (979) 778-9702
e-mail: John.Moravec@txdot.gov

100% SUBMITTAL	PRINT DATE	REVISION DATE
	2/14/2024	02/12/2015

Texas Department of Transportation
Bryan District

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS
STATE	DISTRICT	COUNTY
TEXAS	BRY	BRAZOS
CONTROL	SECTION	JOB / SHEET NO.
0917	00	068 / 43

REV DATE: 2-12-2015
CSJ: C 917-00-68
FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms\196311BRY-C1-2d_EPIC.dgn.DGN

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TxDOT policy for projects disturbing less than 1 acre of soil, and not part of a larger common plan of development.

For projects with less than one acre of soil disturbing activity and 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 project's environmental permits, issues, and commitments (EPICs).

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0917-00-068

1.2 PROJECT LIMITS:
From: SH 6 over Millican Creek North

To: SH 6 NB over Grassy Creek

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 30.74464 ,(Long) -96.45251

END: (Lat) 30.33861 ,(Long) -96.04836

1.4 TOTAL PROJECT AREA (Acres): 3.06

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.29

1.6 NATURE OF CONSTRUCTION ACTIVITY:
Bridge maintenance and channel protection

1.7 MAJOR SOIL TYPES:

Soil Type	Description
SH 6 over Millican Creek North: Sandow loam, frequently flooded	SH 6 over Millican Creek North: 87% Sandow and similar, moderately well drained, low runoff rate
FM 2818 over Turkey Creek: Sandow loam, frequently flooded	FM 2818 over Turkey Creek: 87% Sandow and similar, moderately well drained, low runoff rate
SH 47 SB over Thompson Creek: Sandow loam, frequently flooded	SH 47 SB over Thompson Creek: 87% Sandow and similar, moderately well drained, low runoff rate
SH 6 NB over Grassy Creek: Tinn clay, 0 to 1% slopes, frequently flooded	SH 6 NB over Grassy Creek: 85% Tinn and similar, moderately well drained, high runoff rate

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 2.3.)

☒ 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
Millican Creek North	*Navasota River Below Lake Limestone (1209); impaired for bacteria
Turkey Creek	Brazos River Above Navasota River (1242)
*Thompsons Creek (1242D) (impaired for bacteria and depressed dissolved oxygen)	Brazos River Above Navasota River (1242)
Grassy Creek	Brazos River Above Navasota River (1242)
No TMDLs or I-Plans were identified	

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

1.12 ROLES AND RESPONSIBILITIES: TxDOT

☒ Development of plans and specifications
☒ Perform SWP3 inspections
☒ Maintain SWP3 records and update to reflect daily operations
☐ Other: _____
☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

☒ Day To Day Operational Control
☒ Maintain schedule of major construction activities
☒ Install, maintain and modify BMPs
☐ Other: _____
☐ Other: _____

100% SUBMITTAL

PRINT DATE	REVISION DATE
2/14/2024	

Texas Department of Transportation
Bryan District

TXDOT STORM WATER POLLUTION PREVENTION PLAN (SWP3)

SHEET 1 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS
STATE	DISTRICT	COUNTY
TEXAS	BRY	BRAZOS
CONTROL	SECTION	JOB / SHEET NO.
0917	00	068 / 44

FILENAME: c:\pwworking\dri\omega-app02.omegaengineers.local_omega-prod\omega_lwilson\dms196311\BRY-C1-24_SWP3_NARRATIVE_01.dgn
REV DATE: 2-12-2015
CSJ: C 917-00-68

STORMWATER POLLUTION PRVENTION 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

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:

- X Fire hydrant flushings
- X Irrigation drainage
- X Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- X Potable water sources
- X Springs
- X Uncontaminated groundwater
- X Water used to wash vehicles or control dust
- X 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 2.3 of this SWP3 .

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 2.3 of this SWP3.

100% SUBMITTAL

PRINT DATE	REVISION DATE
2/14/2024	

Texas Department of Transportation
Bryan District

TXDOT STORM WATER POLLUTION PREVENTION PLAN (SWP3)

SHEET 2 OF 2 SHEETS

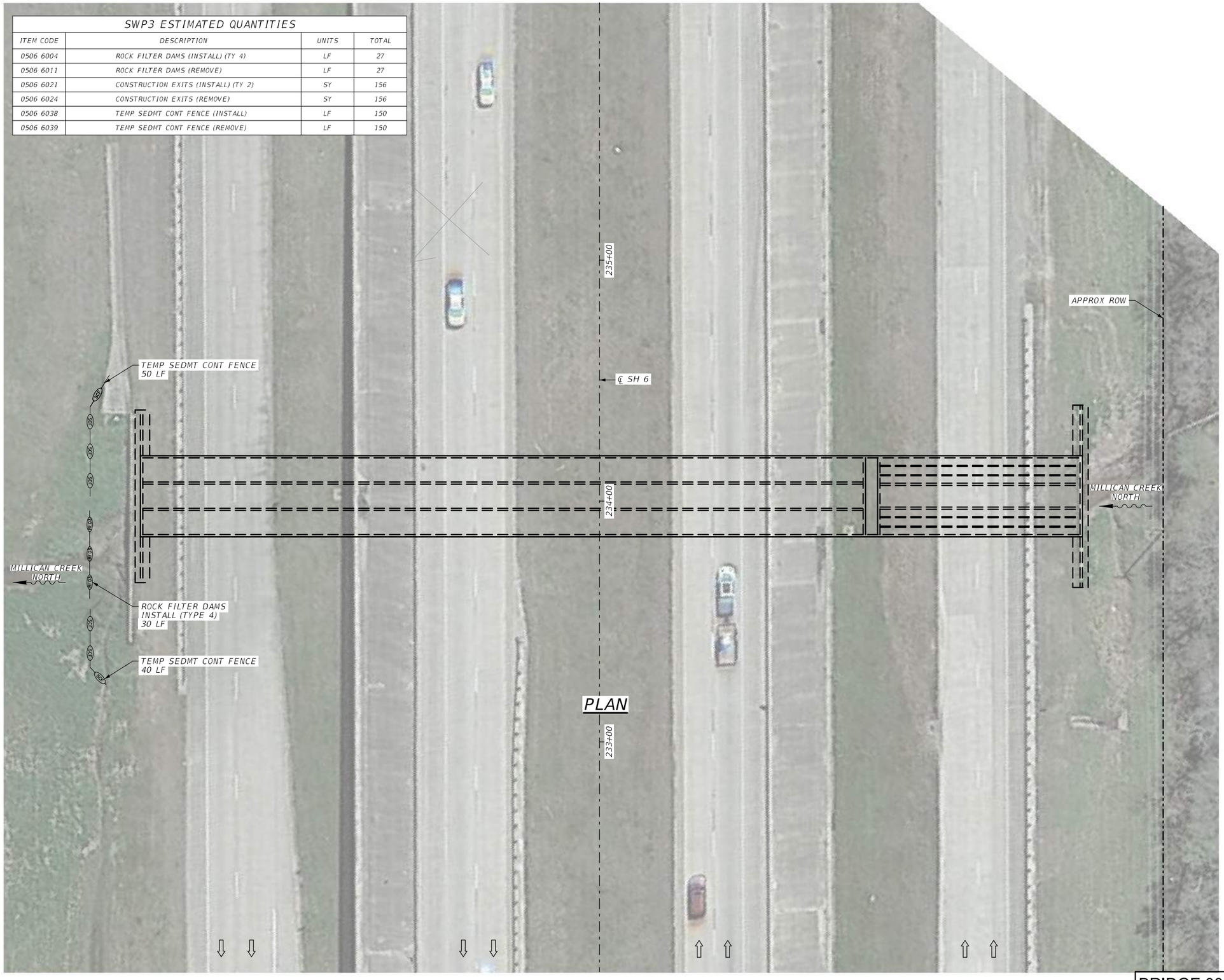
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	BRAZOS	
CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	45

FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_lwilson\dms196311BRY-C1-24_SWP3_NARRATIVE_02.dgn
REV DATE: 2-12-2015
CSJ: C 917-00-68

SWP3 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0506 6004	ROCK FILTER DAMS (INSTALL) (TY 4)	LF	27
0506 6011	ROCK FILTER DAMS (REMOVE)	LF	27
0506 6021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	156
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	156
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	150
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	150



PLAN

LEGEND

- SCF — SCF — SEDIMENT CONTROL FENCE
- DIRECTION OF FLOW
- CONSTRUCTION EXIT
- RFD — RFD — ROCK FILTER DAMN (TYPE 4)

NOTES:

1. INSTALL SEDIMENT CONTROL FENCE AROUND DOWNSTREAM OUTFALL.
2. INSTALL 2 CONSTRUCTION EXITS PER EC(3)-16 STD. 1 AT EACH SIDE OF US 190, SUBJECT TO APPROVAL OF THE ENGINEER. INSTALL SEDIMENT CONTROL FENCE DOWNSLOPE OF EACH CONSTRUCTION EXIT. APPROXIMATELY 30 LF EACH LOCATION, SUBJECT TO APPROVAL OF THE ENGINEER.
3. FIELD VERIFY LOCATIONS OF BMPs SHOWN AND ALTER LOCATIONS AS NEEDED TO ACHIEVE INTENDED PURPOSE AS APPROVED.
4. MAINTAIN SWP3 CONTROL MEASURES THROUGHOUT CONSTRUCTION.
5. SW3P MEASURES ARE NOT TO SCALE.

STATE OF TEXAS
PAUL R. HAHN III
107365
LICENSED
PROFESSIONAL ENGINEER
2/14/2024

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION # 739

HORIZONTAL
0 20 40 80 FT
0 20 40 80 FT
VERTICAL

100% SUBMITTAL

PRINT DATE	REVISION DATE
2/14/2024	

Texas Department of Transportation
Bryan District

SH 6 AT MILLICAN CREEK NORTH
NBI: 17-021-0-0050-02-183
SWP3 LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

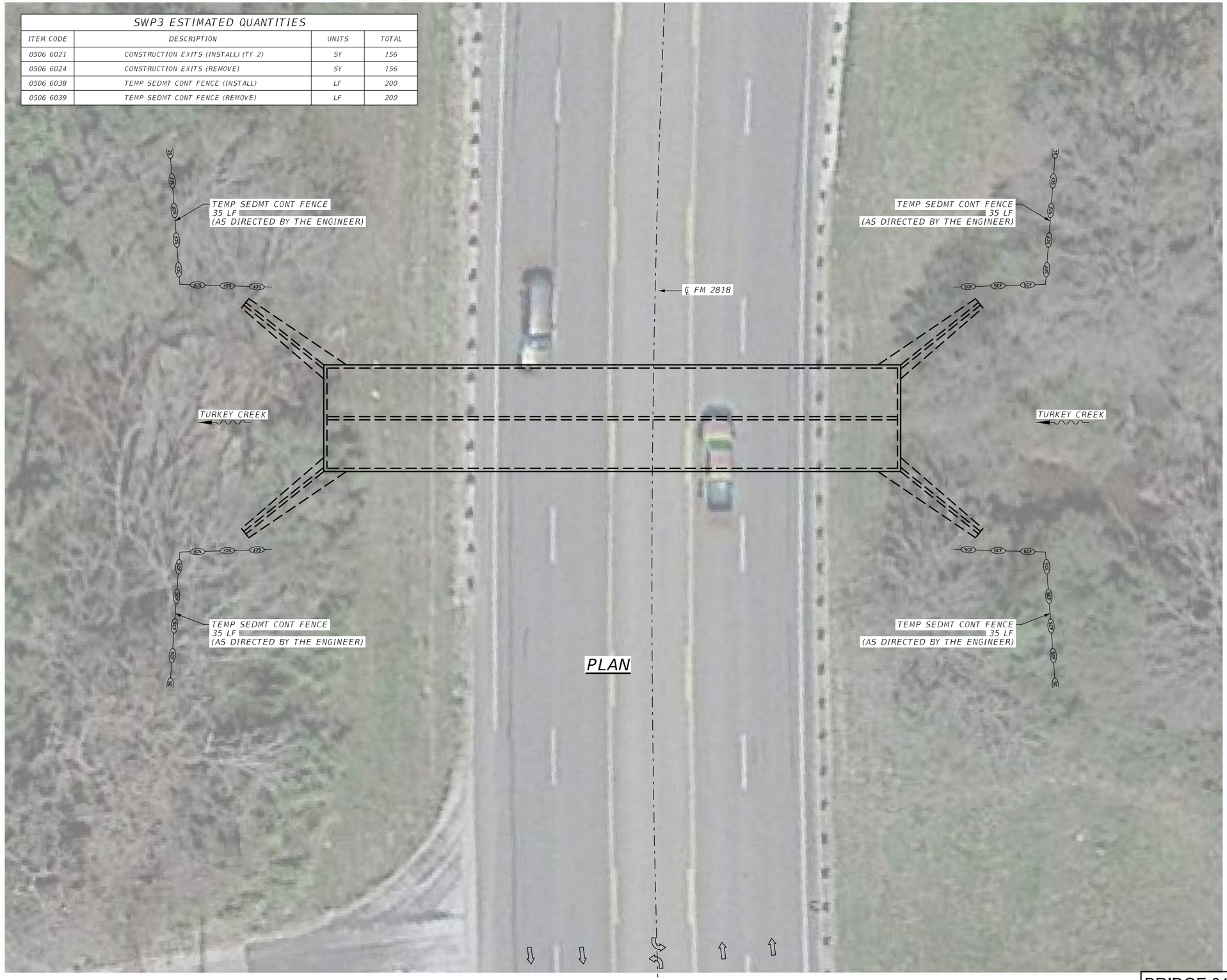
STATE	DISTRICT	COUNTY	
TEXAS	BRY	BRAZOS	
CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	46

BRIDGE 005

REV DATE: 2-12-2015
CSJ: C 917-00-68
FILENAME: c:\pwworking\dfi\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms139866\BRY-BRG_SH6 OVER MILLICAN CR NORTH_SW3P_LAY_01.dgn

SWP3 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0506 6021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	156
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	156
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	200
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	200



PLAN

N

LEGEND

- SCF — SEDIMENT CONTROL FENCE
- DIRECTION OF FLOW
- CONSTRUCTION EXIT

NOTES:

1. INSTALL SEDIMENT CONTROL FENCE AROUND DOWNSTREAM OUTFALL.
2. INSTALL 2 CONSTRUCTION EXITS PER EC(3)-16 STD. 1 AT EAST SIDE OF FM 2818, SUBJECT TO APPROVAL OF THE ENGINEER. INSTALL SEDIMENT CONTROL FENCE DOWNSLOPE OF EACH CONSTRUCTION EXIT. APPROXIMATELY 30 LF EACH LOCATION, SUBJECT TO APPROVAL OF THE ENGINEER.
3. FIELD VERIFY LOCATIONS OF BMPs SHOWN AND ALTER LOCATIONS AS NEEDED TO ACHIEVE INTENDED PURPOSE AS APPROVED.
4. MAINTAIN SWP3 CONTROL MEASURES THROUGHOUT CONSTRUCTION.
5. SW3P MEASURES ARE NOT TO SCALE.

STATE OF TEXAS
PAUL R. HAHN III
107365
LICENSED
PROFESSIONAL ENGINEER
2/14/2024

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION # 739

HORIZONTAL
0 10 20 40 FT
0 10 20 40 FT
VERTICAL

100% SUBMITTAL

PRINT DATE	REVISION DATE
2/14/2024	

Texas Department of Transportation
Bryan District

FM 2818 AT TURKEY CREEK
NBI: 17-021-0-2399-01-001
SWP3 LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	BRAZOS

CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	47

BRIDGE 012

REV DATE: 2-12-2015
CSJ: C 917-00-68

FILENAME: c:\pwworking\dl\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms139736RY-BRG_FM2818 OVER TURKEY CR_SW3P_LAY.dgn

SWP3 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0506 6021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	78
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	78
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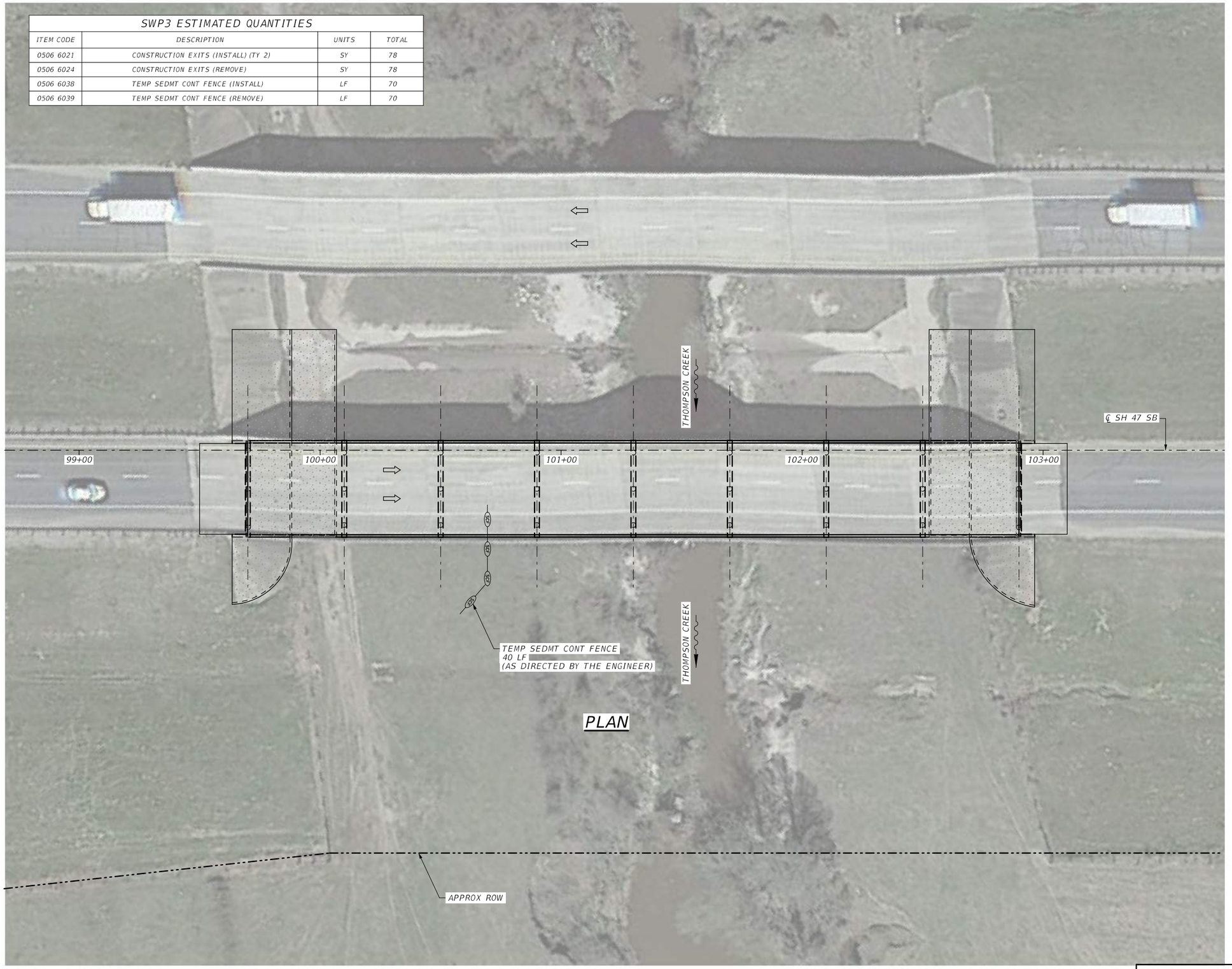
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	70



PLAN

N

LEGEND

- SCF — SCF — SEDIMENT CONTROL FENCE
- DIRECTION OF FLOW
- CONSTRUCTION EXIT

NOTES:

1. INSTALL SEDIMENT CONTROL FENCE DOWNSTREAM OF REPAIR LOCATIONS.
2. INSTALL 1 CONSTRUCTION EXIT PER EC(3)-16 STD. 1 AT THE WEST SIDE OF THOMPSON CREEK, SUBJECT TO APPROVAL OF THE ENGINEER. INSTALL SEDIMENT CONTROL FENCE DOWNSLOPE OF EACH CONSTRUCTION EXIT. APPROXIMATELY 30 LF EACH LOCATION, SUBJECT TO APPROVAL OF THE ENGINEER.
3. FIELD VERIFY LOCATIONS OF BMPs SHOWN AND ALTER LOCATIONS AS NEEDED TO ACHIEVE INTENDED PURPOSE AS APPROVED.
4. MAINTAIN SWP3 CONTROL MEASURES THROUGHOUT CONSTRUCTION.
5. SW3P MEASURES ARE NOT TO SCALE.

STATE OF TEXAS
PAUL R. HAHN III
107365
LICENSED
PROFESSIONAL ENGINEER
2/14/2024

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION # 739

HORIZONTAL
0 20 40 80 FT
0 20 40 80 FT
VERTICAL

100% SUBMITTAL	PRINT DATE	REVISION DATE
	2/14/2024	

Texas Department of Transportation
Bryan District

SH 47 SB AT THOMPSON CREEK
NBI: 17-021-0-3138-02-002
SWP3 LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	BRAZOS	
CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	48

BRIDGE 013

REV DATE: 2-12-2015
CSJ: C 917-00-68

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SWP3 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
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0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	156
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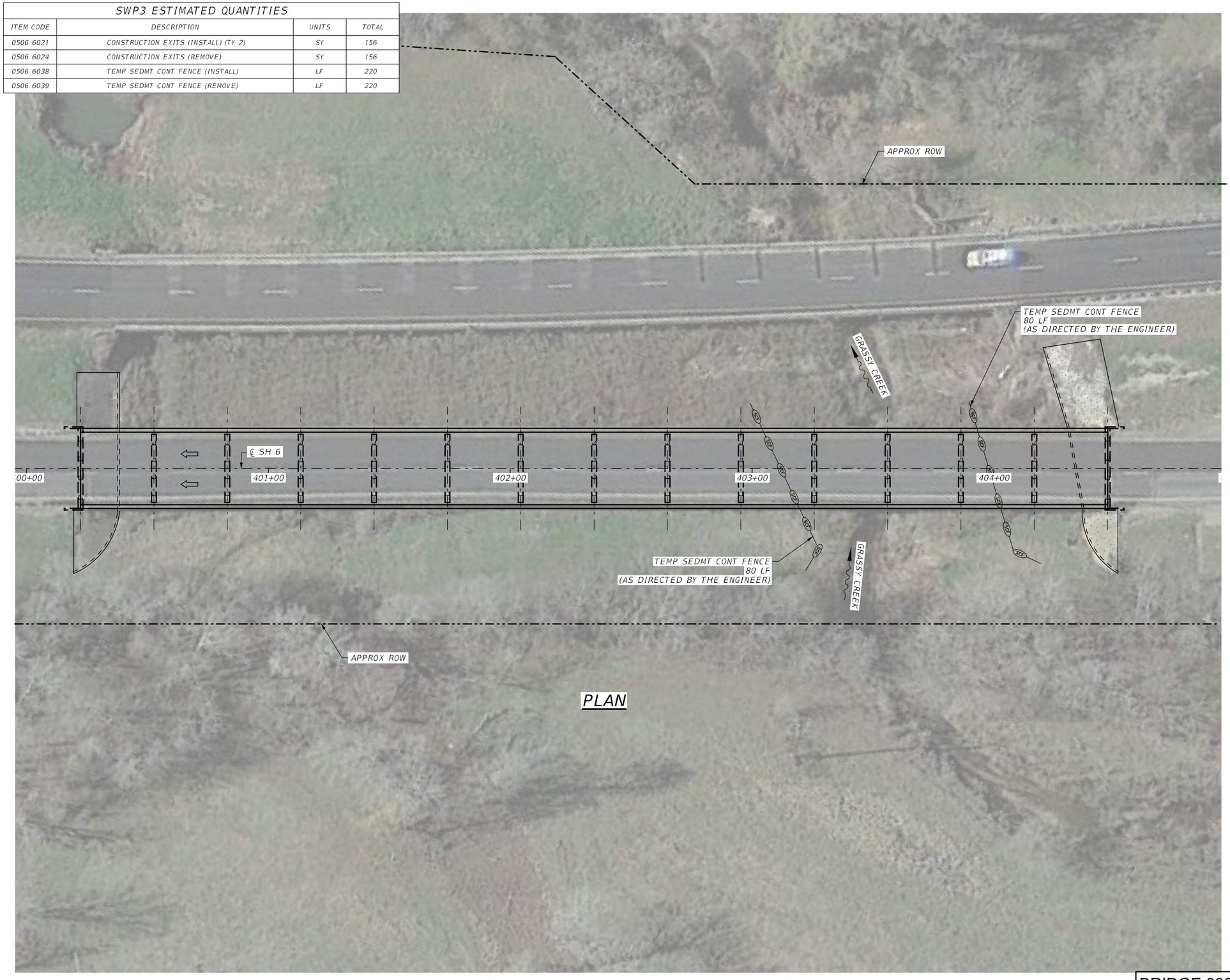

PLAN

N

LEGEND

- SCF — SCF — SEDIMENT CONTROL FENCE
- DIRECTION OF FLOW
- CONSTRUCTION EXIT

NOTES:

1. INSTALL SEDIMENT CONTROL FENCE ALONG EACH BANK OF GRASSY CREEK.
2. INSTALL 2 CONSTRUCTION EXITS PER EC(3)-16 STD. 1 AT EACH SIDE OF GRASSY CREEK, SUBJECT TO APPROVAL OF THE ENGINEER. INSTALL SEDIMENT CONTROL FENCE DOWNSLOPE OF EACH CONSTRUCTION EXIT. APPROXIMATELY 30 LF EACH LOCATION, SUBJECT TO APPROVAL OF THE ENGINEER.
3. FIELD VERIFY LOCATIONS OF BMPs SHOWN AND ALTER LOCATIONS AS NEEDED TO ACHIEVE INTENDED PURPOSE AS APPROVED.
4. MAINTAIN SWP3 CONTROL MEASURES THROUGHOUT CONSTRUCTION.
5. SW3P MEASURES ARE NOT TO SCALE.

STATE OF TEXAS
PAUL R. HAHN III
107365
LICENSED
PROFESSIONAL ENGINEER
2/14/2024

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION # 739

HORIZONTAL
0 20 40 80 FT
0 20 40 80 FT
VERTICAL

100% SUBMITTAL

PRINT DATE	REVISION DATE
2/14/2024	

Texas Department of Transportation
Bryan District

SH 6 NB AT GRASSY CREEK
NBI: 17-094-0-0050-03-036
SWP3 LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-00-68	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	BRAZOS	
CONTROL	SECTION	JOB	SHEET NO.
0917	00	068	49

BRIDGE 033

REV DATE: 2-12-2015
CSJ: C 917-00-68

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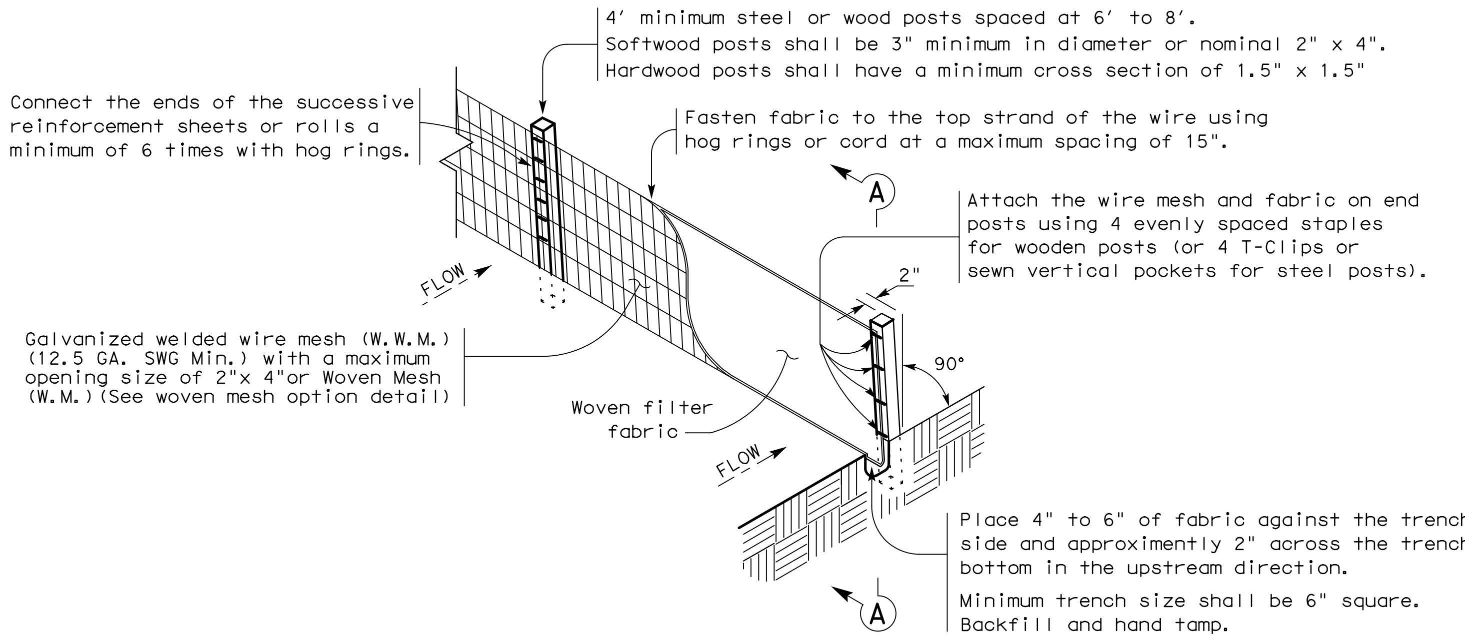
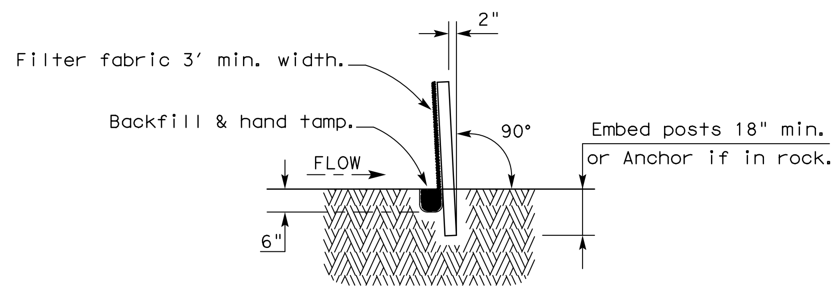
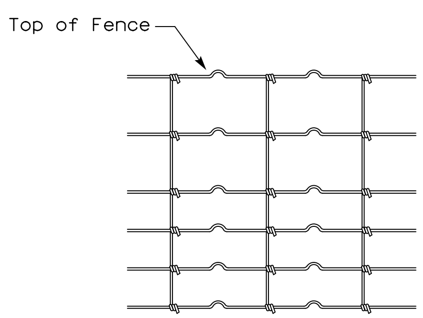


TEMPORARY SEDIMENT CONTROL FENCE

SCF



SECTION A-A



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^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

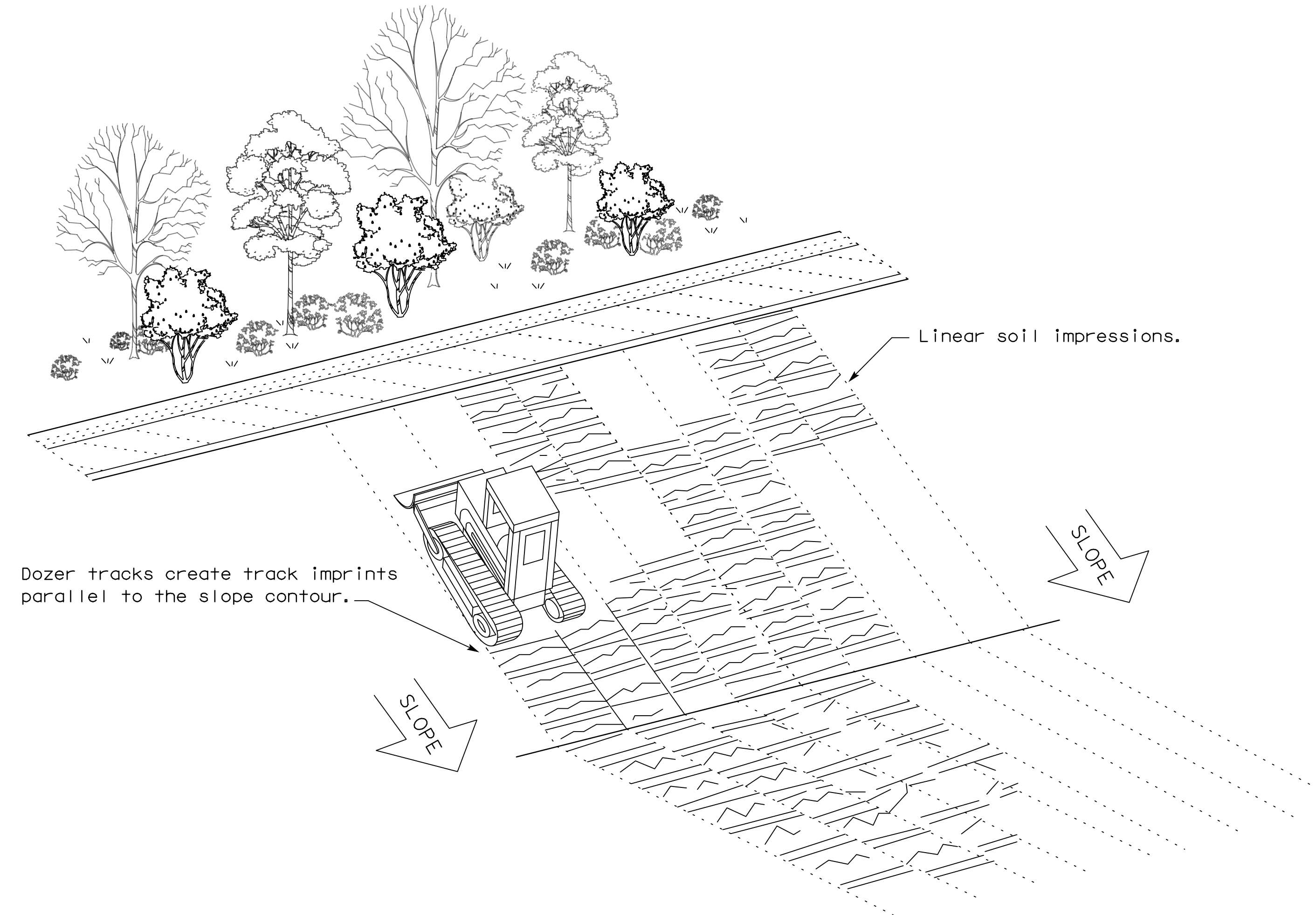
LEGEND

Sediment Control Fence

SCF

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 continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	00	068	VARIOUS
	DIST		COUNTY	SHEET NO.
	BRY		BRAZOS	50

DATE: 2/14/2024
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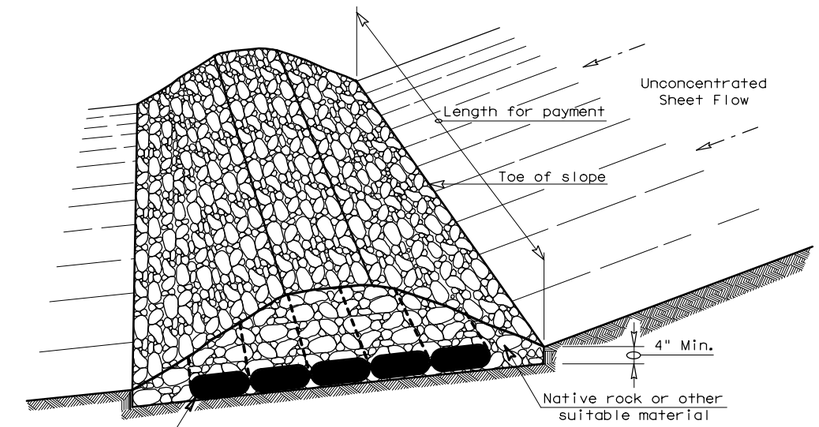
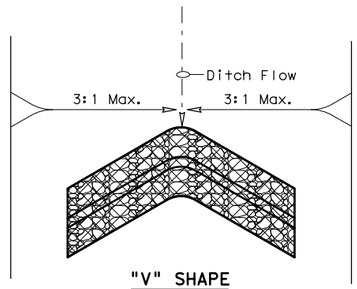
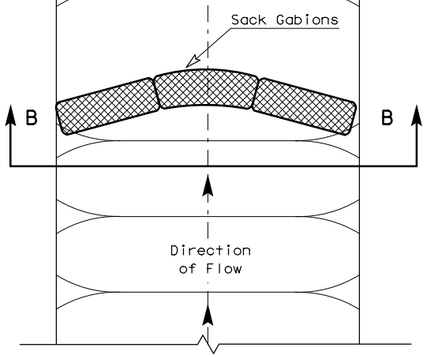


FILTER DAM AT TOE OF SLOPE

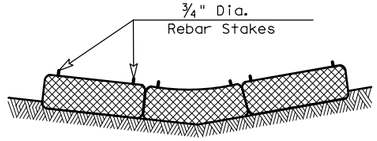
RFD1



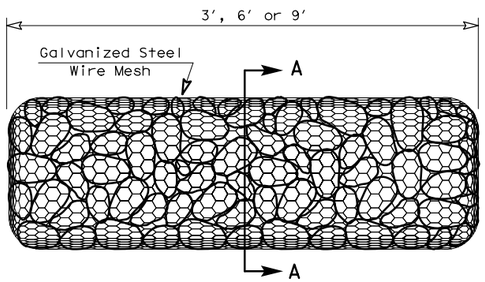
"V" SHAPE
PLAN VIEW



PLAN VIEW

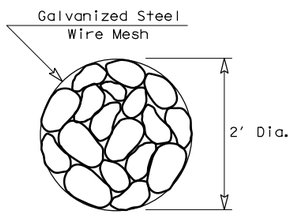


SECTION B-B

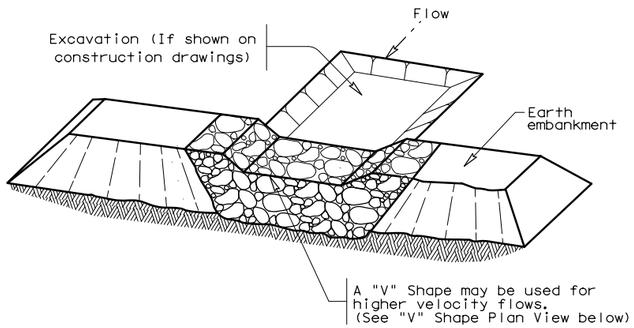


TYPE 4 (SACK GABIONS)

RFD4

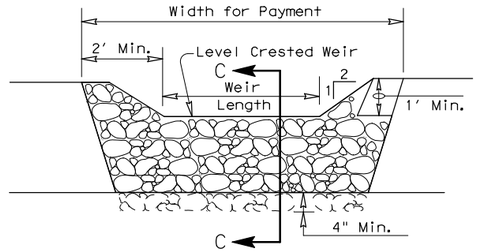


SECTION A-A

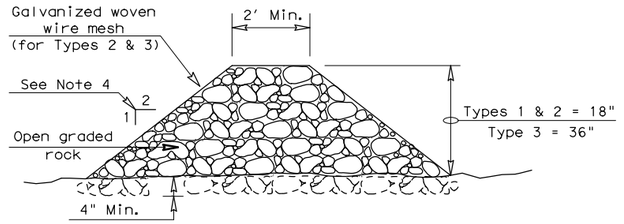


FILTER DAM AT SEDIMENT TRAP

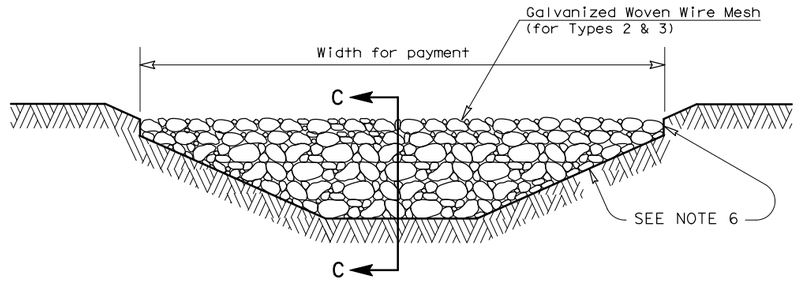
RFD1 — OR — RFD2



PROFILE



SECTION C-C



FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximently 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam	RFD1
Type 2 Rock Filter Dam	RFD2
Type 3 Rock Filter Dam	RFD3
Type 4 Rock Filter Dam	RFD4

Texas Department of Transportation — Design Division Standard

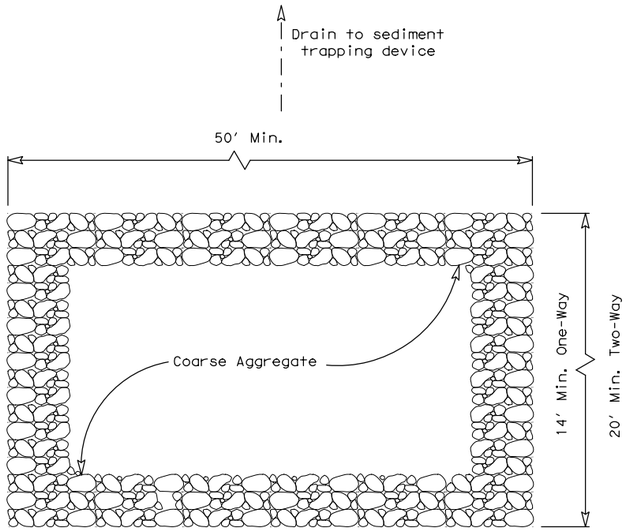
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

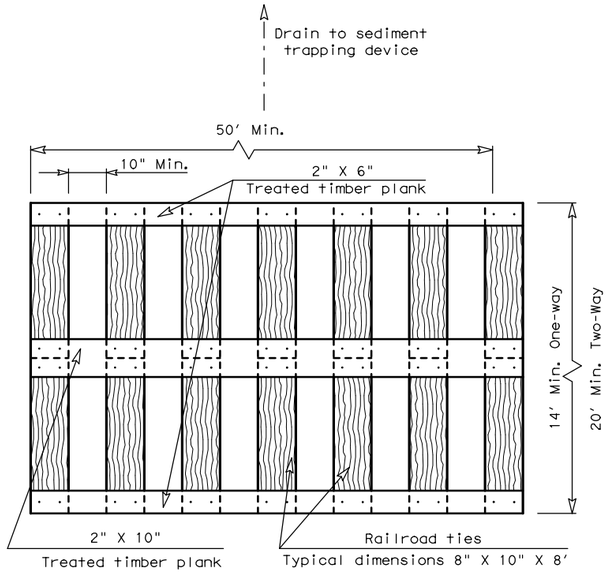
EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	00	068	VARIOUS
	DIST	COUNTY		SHEET NO.
	BRY	BRAZOS		51

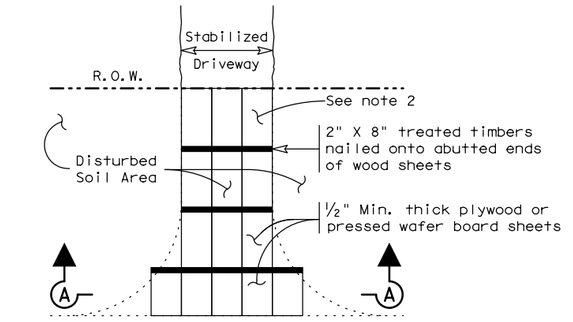
DATE: 2/14/2024
FILE: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms13957\ec316.dgn



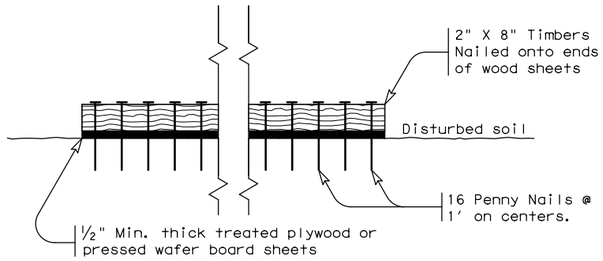
PLAN VIEW



PLAN VIEW



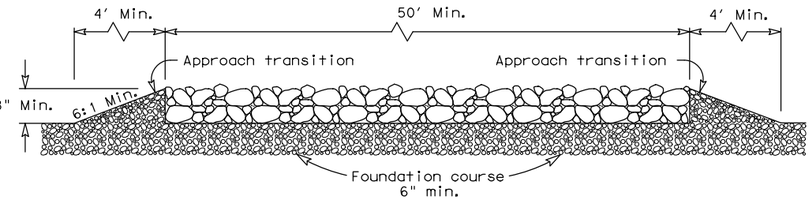
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

SHORT TERM



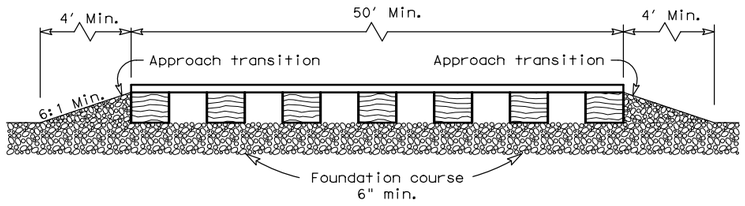
ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50′.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materialas approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50′.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	00	068	VARIOUS
	DIST	COUNTY		SHEET NO.
	BRY	BRAZOS		52