FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	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 917-18-89

VARIOUS

ROBERTSON COUNTY

BRIDGE REPAIRS CONSISTING OF RAIL REPLACEMENT, RIPRAP REPAIRS, SPALL REPAIRS AND BEARING PAD REPLACEMENT

LOCATION NO.	HIGHWAY	COUNTY	NBI	LIMITS	2022 AADT 2042 AADT	STATION FROM	STATION TO	REFERENCE MARKERS BEGIN	REFERENCE MARKERS END	TOTAL LENGTH (FT)	BRIDGE LENGTH (FT)	RDWY LENGTH (FT)	REPAIR ID (FUA ID)
BR-092	SH 6	ROBERTSON	17-198-0-0049-07-114	AT SANDY CREEK	19,999 24,399	122+46.90	123+37.90	RM 490+1.747 MI	RM 490+1.764 MI	91.00	91.00	0.00	R-121 (597621) R-122 (597622) R-123 (597623)
BR-094	US 190/SH 6 NB	ROBERTSON	17-198-0-0049-08-066	AT CAMPBELLS CREEK	19,967 35,541	726+42.00	729+45.33	RM 666+1.285 MI	RM 666+1.343 MI	303.33	303.33	0.00	R-124 (597627)
BR-095	US 190/SH 6	ROBERTSON	17-198-0-0049-08-116	AT U.P.R.R.	20,899 33,438	209+82.00	214+17.00	RM 658-0.182 MI	RM 658-0.099 MI	435.00	435.00	0.00	R-126 (597629) R-322 (633471)
BR-096	US 190/SH 6 SB	ROBERTSON	17-198-0-0049-08-157	AT CAMPBELLS CREEK	19,967 35,541	726+42.00	729+45.33	RM 666+1.285 MI	RM 666+1.343 MI	303.33	303.33	0.00	R-127 (597630)
BR-101	FM 391	ROBERTSON	17-198-0-0262-06-027	AT LOST CREEK	1,223 1,712	336+59.00	337+09.00	RM 394+0.872 MI	RM 394+0.881 MI	50.00	50.00	0.00	R-133 (597642) R-134 (597643)
BR-102	SH 7	ROBERTSON	17-198-0-0382-04-026	AT STEELE CREEK RELIEF NO. 2	3,110 4,354	856+14.30	857+35.63	RM 616+0.929 MI	RM 616+0.952 MI	121.33	121.33	0.00	R-135 (597648) R-136 (597649) R-326 (N/A) R-327 (N/A)
BR-104	FM 1373	ROBERTSON	17-198-0-0540-06-040	AT BUZZARD SLOUGH	136 190	357+60.00	358+20.66	RM 602+1.704 MI	RM 602+1.715 MI	60.67	60.67	0.00	R-139 (597652) R-328 (N/A)

NO EXCEPTIONS
NO EQUATIONS
1 RAILROAD CROSSING
1 RAILROAD PARALLEL

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®

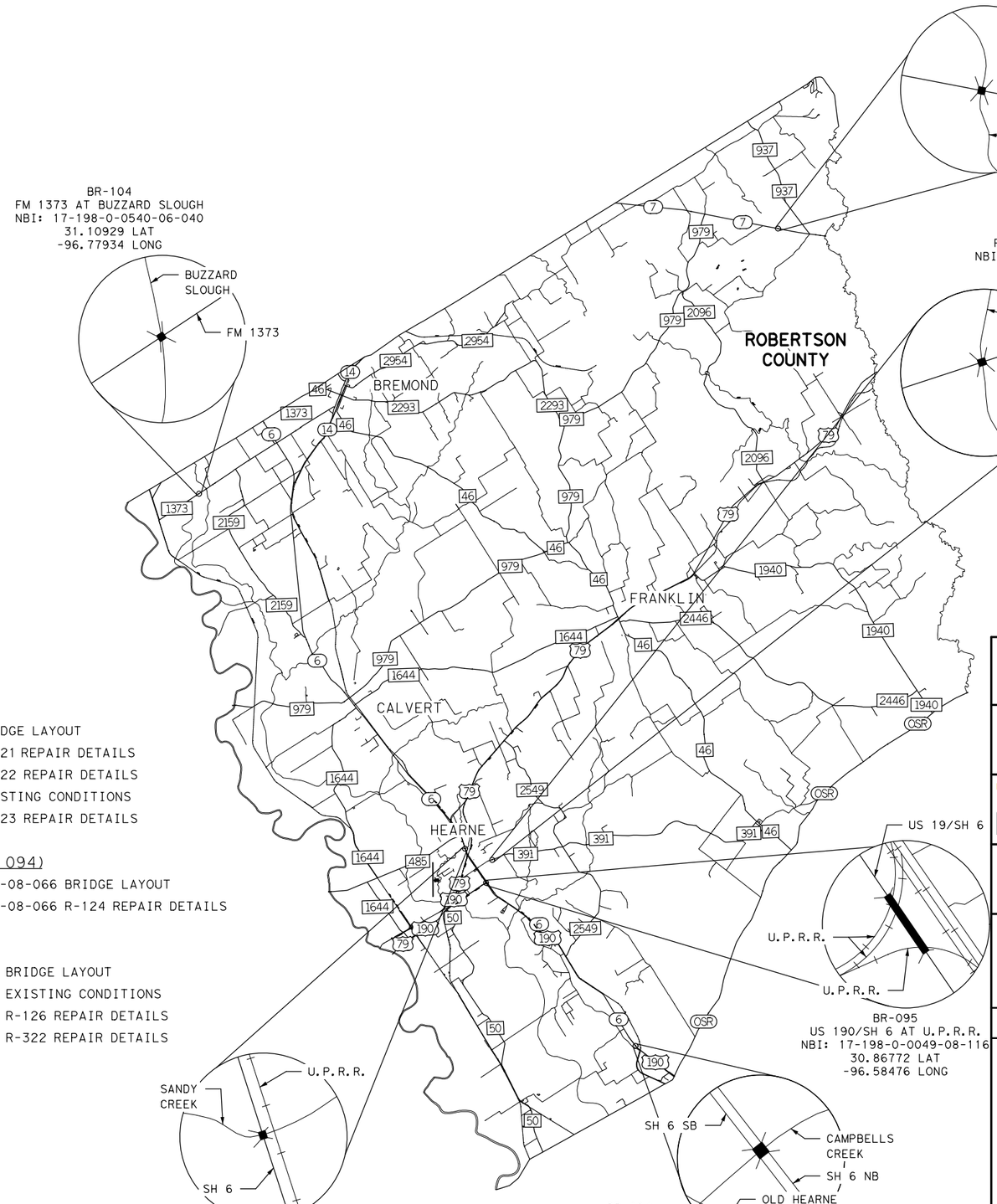
SUBMITTED FOR LETTING: 2/1/2024
DocuSigned by:
01EBC5C65E33...
DISTRICT BRIDGE ENGINEER

RECOMMENDED FOR LETTING: 2/1/2024
DocuSigned by:
DAA3B0...
DIRECTOR OF TRANSPORTATION
PLANNING AND DEVELOPMENT

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

REV DATE: 2-12-2015
CSJ: C 917-18-89
FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms\19632\BRY-C2-24_TITLE.dgn

INDEX OF SHEETS



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

2/27/2024
DATE

REV DATE: 2-12-2015
CSJ: C 917-18-89

FILENAME: c:\pw\working\dri\omega-app02.omegaengineers.local_omega-prod\omega_lwilson\dms196328\BRY-C2-24_INDEX_01.dgn

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
2/27/2024	

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 917-18-89	VARIOUS
STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON
CONTROL	SECTION	JOB / SHEET NO.
0917	18	089 / 2

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	SHEET NO.		DESCRIPTION
			US 190/SH 6 SB AT CAMPBELLS CR (BRIDGE 096)
	46		US 190/SH 6 SB AT CAMPBELLS CR NBI: 17-198-0-0049-08-157 BRIDGE LAYOUT
	47		US 190/SH 6 SB AT CAMPBELLS CR NBI: 17-198-0-0049-08-157 R-127 REPAIR DETAILS
			FM 391 AT LOST CREEK (BRIDGE 101)
	48		FM 391 AT LOST CREEK NBI: 17-198-0-0262-06-027 BRIDGE LAYOUT
	49	- 50	FM 391 AT LOST CREEK NBI: 17-198-0-0262-06-027 R-133 REPAIR DETAILS
	51	- 52	FM 391 AT LOST CREEK NBI: 17-198-0-0262-06-027 EXISTING CONDITIONS
	53	- 54	FM 391 AT LOST CREEK NBI: 17-198-0-0262-06-027 R-134 REPAIR DETAILS
			SH 7 AT STEELE CR RELIEF NO. 2 (BRIDGE 102)
	55		SH 7 AT STEELE CR RELIEF NO. 2 NBI: 17-198-0-0382-04-026 BRIDGE LAYOUT
	56		SH 7 AT STEELE CR RELIEF NO. 2 NBI: 17-198-0-0382-04-026 R-135 REPAIR DETAILS
	57		SH 7 AT STEELE CR RELIEF NO. 2 NBI: 17-198-0-0382-04-026 EXISTING CONDITIONS
	58		SH 7 AT STEELE CR RELIEF NO. 2 NBI: 17-198-0-0382-04-026 R-136 REPAIR DETAILS
	59		SH 7 AT STEELE CR RELIEF NO. 2 NBI: 17-198-0-0382-04-026 R-326 REPAIR DETAILS
	60		SH 7 AT STEELE CR RELIEF NO. 2 NBI: 17-198-0-0382-04-026 R-327 REPAIR DETAILS
			FM 1373 AT BUZZARD SLOUGH (BRIDGE 104)
	61		FM 1373 AT BUZZARD SLOUGH NBI: 17-198-0-0540-06-040 BRIDGE LAYOUT
	62	- 63	FM 1373 AT BUZZARD SLOUGH NBI: 17-198-0-0540-06-040 EXISTING CONDITIONS
	64		FM 1373 AT BUZZARD SLOUGH NBI: 17-198-0-0540-06-040 R-139 REPAIR DETAILS
	65	- 66	FM 1373 AT BUZZARD SLOUGH NBI: 17-198-0-0540-06-040 R-328 REPAIR DETAILS
			STANDARDS
	67		GENERAL SPALLING REPAIR DETAIL
	68		BENT CAP SPALL REPAIR DETAIL
X	69		CRR
X	70	- 71	SRR
	72	- 73	TYPE T551 (MOD)
			TRAFFIC ITEMS
			STANDARDS (TRAFFIC ITEMS)
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O	75		D & OM(2)-20
O	76		D & OM(3)-20
O	77		D & OM(6)-20
O	78		D & OM(VIA)-20

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	79		ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)
	80	- 81	TXDOT STORM WATER POLLUTION PREVENTION PLAN (SWP3)
	82		SH 6 AT SANDY CREEK NBI: 17-198-0-0049-07-114 SWP3 LAYOUT
	83		US 190/SH 6 NB AT CAMPBELLS CR NBI: 17-198-0-0049-08-066 SWP3 LAYOUT
	84	- 85	US 190/SH 6 AT U.P.R.R. NBI: 17-198-0-0049-08-116 SWP3 LAYOUT
	86		FM 391 AT LOST CREEK NBI: 17-198-0-0262-06-027 SWP3 LAYOUT
	87		SH 7 AT STEELE CR RELIEF NO. 2 NBI: 17-198-0-0382-04-026 SWP3 LAYOUT
	88		FM 1373 AT BUZZARD SLOUGH NBI: 17-198-0-0540-06-040 SWP3 LAYOUT
			STANDARDS (ENVIRONMENTAL)
O	89		EC(1)-16
O	90		EC(3)-16
			RAILROAD
	91	- 92	RAILROAD SCOPE OF WORK
	93	- 94	RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

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.

1/24/2024
NAME DATE

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.

1/24/2024
NAME DATE

FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\d1ms196321BRY-C2-24_INDEX_02.dgn
REV DATE: 2-12-2015
CSJ: C 917-18-89

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
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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
1/24/2024	

Texas Department of Transportation
Bryan District

INDEX OF SHEETS & LOCATION MAP

SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
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TEXAS	BRY	ROBERTSON
CONTROL	SECTION	JOB / SHEET NO.
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BASIS OF ESTIMATE					
ITEM	DESCRIPTION	COURSE	RATE	AMOUNT	QUANTITY
168-6001	VEGETATIVE WATERING		0.010 MG/SY	100 SY	1 MG

BASIS OF ESTIMATE * for contractor's information only					
ITEM	DESCRIPTION	COURSE	RATE	AMOUNT	QUANTITY
166-6002*	FERTILIZER **		60 LBS/AC	0.021 AC	0.0006 TON

Note: Rates are for estimating purposes only. Actual Rates will be determined in the field.
** Tonnage represents Nitrogen content only.

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.

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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".

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
  - SH 6 in Robertson County
  - US 190 in Robertson County
- 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.

FOR WORK IN PROXIMITY TO THE RAILROAD;

Fiber optic cable systems may be buried on the Railroad's property. Protection of the fiber optic cable systems is of extreme importance since any break could disrupt service to users resulting in business interruption and loss of revenue and profits. It is the Contractor's responsibility to utilize the contact information provided below to determine if fiber optic cable is buried anywhere on the Railroad's premises to be used by the State. If it is, the Contractor will telephone the telecommunications company(ies) involved, arrange for a cable locator, and make arrangements for relocation or other protection of the fiber optic cable prior to beginning any work on the Railroad's premises.

For 24/7 support of all requests for fiber optic locates along UPRR rights of way:
Web: http://www.up.com/cbud
Phone: 1-800-336-9193 (Emergencies)

If the project had a Maintenance Consent Letter (MCL) issued for clearance, the contractor at the time the contract is awarded must complete and submit the Contractor Endorsement included with the executed MCL. This form will serve as the contractors right of entry (ROE) onto RR property. The contractor is not responsible for the fee listed on the MCL, TXDOT handles this in coordination with the RR. Additional requirements as outlined on the MCL and in TxDOT Specifications include – insurance, RR flaggers, and RR safety certifications. Further, the contractor shall ensure that adequate insurance is obtained per the Rail Road Scope of Work (SOW) and that documentation of such is provided to the email included on the MCL, where the contractor endorsement is submitted. The contractor must also ensure that RR flaggers are set up with RailPros and that all employees working on the RR ROW have the required safety training per UPRR's requirements.

OTHER UNION PACIFIC RR REQUIREMENTS:

1. **Coordination:** Use the Union Pacific Railroad Public Projects Manual as a guide for assisting in administering, coordinating, planning, and implementing your project.
2. **Design Review:** Prior to construction, obtain Railroad review and approval of all relevant construction items, including but not limited to, shoring, track & ground monitoring,

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County: Robertson

erection, demolition, and falsework. All designs must adhere to the most restrictive provisions of the current UPRR and AREMA standards and guidelines in effect at the time the work is executed. Allow a minimum of 4 weeks for review and approval of each submittal. For submittals not in accordance with these notes, longer review times shall be expected.

3. **Operations:** Projects shall be designed such that all construction activities and phasing will not compromise safety nor impact Railroad operations.
4. **Passing Trains:** Railroad requirements do not allow work within 50 feet of track centerline when a train passes the work site and all personnel must clear the area within 25 feet of the track centerline and secure all equipment.
5. **Work Windows:** Construction activities must be performed within naturally occurring track windows. Coordinate all requests for construction work windows with the Railroad's Designated Representative to ensure that the work is scheduled to eliminate any potential disruption to the Railroad's operations.
6. **Temporary Construction Clearances:** Construction activities are not allowed within the temporary construction clearance envelope per the current UPRR Guidelines for Railroad Grade Separation Projects and Guidelines for Temporary Shoring.
7. **Drainage:** The proposed project shall not increase the quantity and/or characteristics of the flow in the Railroad's ditches and/or drainage structures.
8. **Before You Dig:** Appropriate measures for the location and protection of UPRR facilities shall be addressed in the plans and contract documents. For specific Railroad requirements and additional information refer to www.up.com/cbud. Abandonment of utilities must follow the UPRR Guidelines For Abandonment of Subsurface Utility Structures.

ITEM 8 "PROSECUTION AND PROGRESS"

The following standard detail sheet has been modified.
TYPE T551

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 166 "FERTILIZER"

Fertilize all areas of project that are being seeded or sodded.

ITEM 168 "VEGETATIVE WATERING"

Vegetative watering is required for all areas of the project that are being seeded or sodded.

ITEM 403 "TEMPORARY SPECIAL SHORING"

Quantity for cofferdam shown is for bidding purposes only, the Contractor shall determine the actual limits and quantity of cofferdam to be placed in the field. Height of cofferdam shall be estimated to within +1 FT of anticipated high water condition during work in the channel.

Construct Cofferdam using non-erodible materials and placement methods that do not damage the structure or utilities. Method and materials of construction, placement and quantity shall be approved by the Engineer prior to installation.

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ITEM 432 "RIPRAP"

The fifty foot (50') approach taper to the MBGF end treatment will be concrete Mow Strip unless otherwise shown in the plans or otherwise directed by the Engineer

ITEM 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING"

During one-way operations, station flaggers at all county roads and any other locations, such as private businesses, that may have traffic entering the work area.

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 with the Engineer the SW3P 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 four (4) 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(2-1)-18 as detailed on General Note 4 of this standard sheet.

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

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

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.

Fifty-Seven (57) TMA days are provided in the project estimate for stationary operations.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0917-18-089 **DISTRICT** Bryan **COUNTY** Robertson
HIGHWAY Various

ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL
	100-6002	PREPARING ROW	STA	1.000	
	104-6009	REMOVING CONC (RIPRAP)	SY	26.000	
	164-6001	BROADCAST SEED (PERM) (RURAL) (SANDY)	SY	100.000	
	168-6001	VEGETATIVE WATERING	MG	1.000	
	401-6001	FLOWABLE BACKFILL	CY	30.000	
	403-6006	TEMPORARY SPL SHORING (COFFERDAM)	SF	2,583.000	
	429-6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	155.000	
	432-6008	RIPRAP (CONC)(CL B)(RR8&RR9)	CY	11.000	
	432-6031	RIPRAP (STONE PROTECTION)(12 IN)	CY	4.000	
	432-6033	RIPRAP (STONE PROTECTION)(18 IN)	CY	292.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	2.000	
	446-6002	CLEAN & PAINT EXIST STR (SYSTEM II)	LS	1.000	
	451-6015	RETROFIT RAIL (TY T551)	LF	7.000	
	500-6001	MOBILIZATION	LS	1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	4.000	
	506-6021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	468.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	468.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1,305.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1,305.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	13.000	
	545-6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	1.000	
	658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	3.000	
	4002-6001	REPLACE ELASTOMERIC BEARING PADS	EA	1.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	4.000	
	6185-6002	TMA (STATIONARY)	DAY	57.000	
	08	CONTRACTOR FORCE ACCOUNT RAILROAD FLAGGING (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	
		CONTRACTOR FORCE ACCOUNT LAW ENFORCEMENT (NON-PARTICIPATING)	LS	1.000	

TRAFFIC CONTROL NOTES

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 EACH BRIDGE 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-092, SH 6 AT SANDY CREEK
2. BR-094, US 190/ SH 6 NB AT CAMPBELLS CREEK
3. BR-096, US 190/ SH 6 SB AT CAMPBELLS CREEK
4. BR-095, US 190/ SH 6 AT UPRR
5. BR-101, FM 391 AT LOST CREEK
6. BR-102, SH 7 AT STEELE CREEK RELIEF NO 2
7. BR-104, FM 1373 AT BUZZARD SLOUGH

BR-092 (SH 6 AT SANDY CREEK)
TRAFFIC CONTROL NARRATIVE

PHASE 1 - REPAIR BENT CAP SPALLS AND RIPRAP

1. PLACE ADVANCE WARNING SIGNS PER STANDARD BC(2)-12. 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 "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 (2-4)-18 FOR STAGING MATERIALS AND EQUIPMENT.

4. PERFORM REPAIRS R-122 AND R-123 PER REPAIR DETAIL SHEETS.

5. REMOVE PHASE 1 TRAFFIC CONTROL

PHASE 2 - REPLACE CONCRETE RAIL AND MBGF

1. ADJUST ADVANCE WARNING SIGN 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. ADJUST EROSION AND SEDIMENTATION CONTROL DEVICES IN COORDINATION WITH THE WORK IN PROGRESS, OR AS DIRECTED BY THE ENGINEER.

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

4. CLOSE OUTSIDE SB LANE AND REDUCE TRAFFIC TO ONE LANE PER STANDARD TCP(2-4)-18.

5. PERFORM REPAIR R-121 PER REPAIR DETAIL SHEETS.

6. PERFORM FINAL CLEANUP AND REMOVE ADVANCED WARNING SIGNS.

BR-094 (US 190/ SH 6 NB AT CAMPBELLS CREEK)
TRAFFIC CONTROL NARRATIVE

PHASE 1 - REPAIR BENT CAP 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(2-1)-18 FOR STAGING OF MATERIALS AND EQUIPMENT.

4. PERFORM REPAIR R-124 PER REPAIR DETAIL SHEETS.

5. ADVANCE WARNING SIGNS AND EROSION AND SEDIMENTATION CONTROL DEVICES TO REMAIN IN PLACE FOR WORK ON BR-096 (US 190/ SH 6 SB AT CAMPBELLS CREEK).

BR-095 (US 190 SH 6 AT U.P.R.R.)
TRAFFIC CONTROL NARRATIVE

PHASE 1 - REPAIR 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 "SHOULDER CLOSED FOR XXX FT" CONDITION FOR PCMS PHASE 1 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(2-1)-18 FOR STAGING OF MATERIALS AND EQUIPMENT.

4. PERFORM REPAIR R-126 PER REPAIR DETAIL SHEETS.

5. REMOVE PHASE 1 TRAFFIC CONTROL

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Texas Department of Transportation
Bryan District

TCP NARRATIVE

SHEET 1 OF 3 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	6

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FILENAME: c:\pwworkingdir\omega-ap02.omegaengineers.local_omega-prod\omega_twilson\dms1963218\BRY-C2-24_TCP_NARRATIVE_01.dgn

BR-095 (US 190 SH 6 AT U.P.R.R.)
TRAFFIC CONTROL NARRATIVE

PHASE 2 - REPLACE BEARING PAD

1. ADJUST ADVANCE WARNING SIGNS PER STANDARD BC(2)-21. PLACE PORTABLE CHANGEABLE MESSAGE SIGN (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. IMPLEMENT WORK ZONE SPEED LIMIT OF ON US 190/SH 6 PER STANDARD BC(3)-21. SEE ITEM 502 IN THE GENERAL NOTES FOR MORE INFORMATION ON WORK ZONE SPEED LIMITS.

3. CLOSE SB SIDE OF US 190/ SH 6 AND REDUCE TRAFFIC TO ONE LANE IN EACH DIRECTION PER STANDARD TCP(2-4)-18.

4. IN COORDINATION WITH UPRR, AND AS APPROVED BY THE ENGINEER, IMPLEMENT FLAGGER CONTROL ON UPRR RR WHILE OVERHEAD WORK IS IN PROGRESS.

5. CONTRACTOR TO PREPARE A LIFTING PLAN, SIGNED AND SEALED BY A LICENSED ENGINEER, SUBJECT TO APPROVAL BY THE STATE.

6. PERFORM REPAIR R-322 PER REPAIR DETAIL SHEETS. REPAIR WORK SHALL BE COMPLETED DURING THE NIGHTTIME HOURS, FROM 10PM TO 5AM, TUESDAY THROUGH THURSDAY ONLY.

7. PERFORM FINAL CLEANUP AND REMOVE ADVANCE WARNING SIGNS.

BR-096 (US 190/SH 6 SB AT CAMPBELLS CREEK)
TRAFFIC CONTROL NARRATIVE

PHASE 1 - REPAIR BENT CAP SPALLS

1. ADJUST ADVANCE WARNING SIGNS PER STANDARD BC(2)-21 WHICH HAVE REMAINED IN PLACE AFTER WORK ON BR-094 (US 190/ SH 6 NB OVER CAMPBELLS CREEK). 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 FOR 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. ADJUST EROSION AND SEDIMENTATION CONTROL DEVICES IN COORDINATION WITH THE WORK IN PROGRESS, OR AS DIRECTED BY THE ENGINEER WHICH HAVE REMAINED IN PLACE AFTER WORK ON BR-094 (US 190/ SH 6 NB OVER CAMPBELLS CREEK).

3. MAINTAIN EXISTING TRAFFIC. TEMPORARILY ADJUST TRAFFIC CONTROL PER TCP(2-1)-18 FOR STAGING OF MATERIALS AND EQUIPMENT. EXISTING FENCING MAY NEED TO BE ADJUSTED TO PROVIDE ACCESS TO THE SITE. THIS WORK SHALL BE SUBSIDIARY TO ITEM 100-6002.

4. PERFORM REPAIR R-127 PER REPAIR DETAIL SHEETS.

5. PERFORM FINAL CLEANUP AND REMOVE ADVANCE WARNING SIGNS.

BR-101 (FM 391 AT LOST CREEK)
TRAFFIC CONTROL NARRATIVE

PHASE 1 - REPAIR CONCRETE COLLARS AND 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 "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. TEMPORARILY ADJUST TRAFFIC CONTROL PER TCP(2-1)-18 FOR STAGING OF MATERIALS AND EQUIPMENT.

4. AS DIRECTED OR APPROVED BY THE ENGINEER, THE CONTRACTOR MAY REDUCE TRAFFIC TO ONE LANE, PER TCP(2-2)-18. USE THE "ROADWORK XXX FT" CONDITION FOR PHASE 1 PCMS MESSAGE AND THE "PREPARE TO STOP" WARNING FOR PCMS PHASE 2 MESSAGE, OR AS OTHERWISE DIRECTED OR APPROVED BY THE ENGINEER.

5. PERFORM REPAIR R-133 AND R-134 PER REPAIR DETAIL SHEETS.

6. PERFORM FINAL CLEANUP AND REMOVE ADVANCE WARNING SIGNS.

BR-102 (SH 7 AT STEELE CREEK RELIEF NO.2)
TRAFFIC CONTROL NARRATIVE

PHASE 1 - REPAIR CONCRETE BENT CAP AND 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 "SHOULDER CLOSED FOR 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. TRIM TREES TO ROW LINE.

3. MAINTAIN EXISTING TRAFFIC. TEMPORARILY ADJUST TRAFFIC CONTROL PER TCP(2-1)-18 FOR STAGING OF MATERIALS AND EQUIPMENT.

4. PERFORM REPAIR R-135, R-136, R-326 AND R-327 PER REPAIR DETAIL SHEETS.

5. PERFORM FINAL CLEANUP AND REMOVE ADVANCE WARNING SIGNS.

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Texas Department of Transportation
Bryan District

TCP NARRATIVE

SHEET 2 OF 3 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	7

REV DATE: 2-12-2015
CSJ: C 917-18-89
FILENAME: c:\pwworking\dfr\omega-app02.omegaengineers.local_omega-prod\omega_lwilson\dms\19632\BRY-C2-24_TCP_NARRATIVE_02.dgn

BR-104 (FM 1373 AT BUZZARD SLOUGH)
TRAFFIC CONTROL NARRATIVE

PHASE 1 - REPAIR 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 "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. TEMPORARILY ADJUST TRAFFIC CONTROL PER TCP(2-1)-18 FOR STAGING OF MATERIALS AND EQUIPMENT.

4. AS DIRECTED OR APPROVED BY THE ENGINEER, THE CONTRACTOR MAY REDUCE TRAFFIC TO ONE LANE, PER TCP(2-2)-18. USE THE "ROADWORK XXX FT" CONDITION FOR PHASE 1 PCMS MESSAGE AND THE "PREPARE TO STOP" WARNING FOR PCMS PHASE 2 MESSAGE, OR AS OTHERWISE DIRECTED OR APPROVED BY THE ENGINEER.

5. PERFORM REPAIR R-139 AND R-328 PER REPAIR DETAIL SHEETS.

6. PERFORM FINAL CLEANUP AND REMOVE ADVANCE WARNING SIGNS.

TCP ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	4
6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	4
6185-6002	TMA (STATIONARY)	DAY	57

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Bryan District

TCP NARRATIVE

SHEET 3 OF 3 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	8

REV DATE: 2-12-2015
CSJ: C 917-18-89
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DATE: 1/24/2024 1:36:47 PM
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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

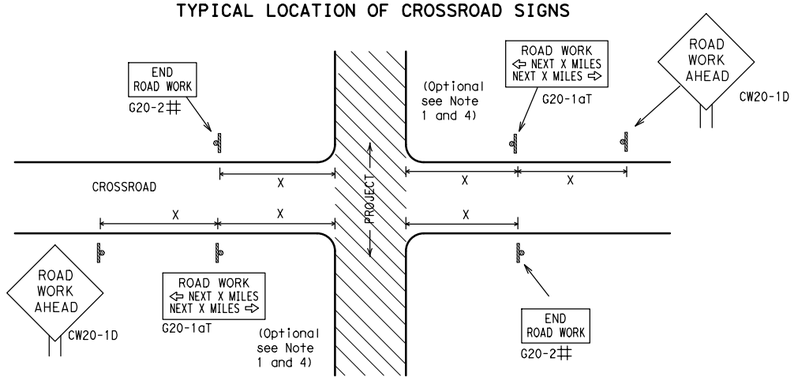
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

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	18	089	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
5-10 5-21	BRY	ROBERTSON		9

DATE: 1/24/2024 1:36:47 PM
FILE: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms159916\bc-21.dgn

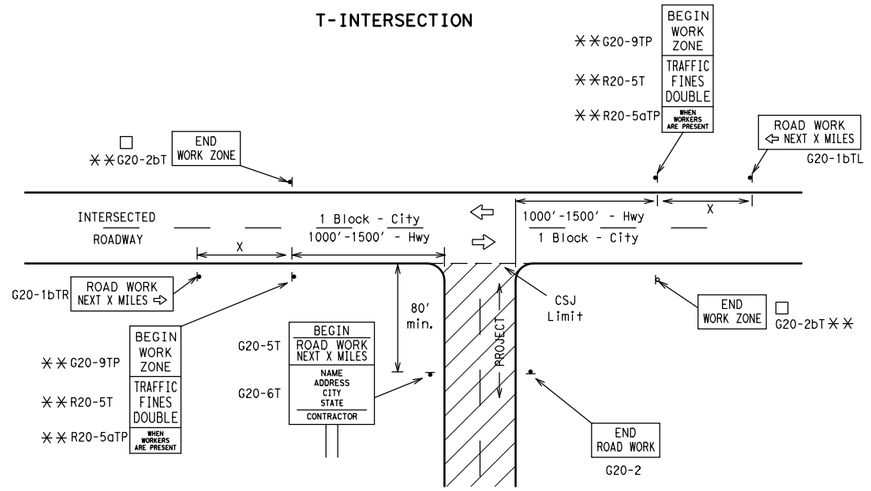
TYPICAL LOCATION OF CROSSROAD SIGNS



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.

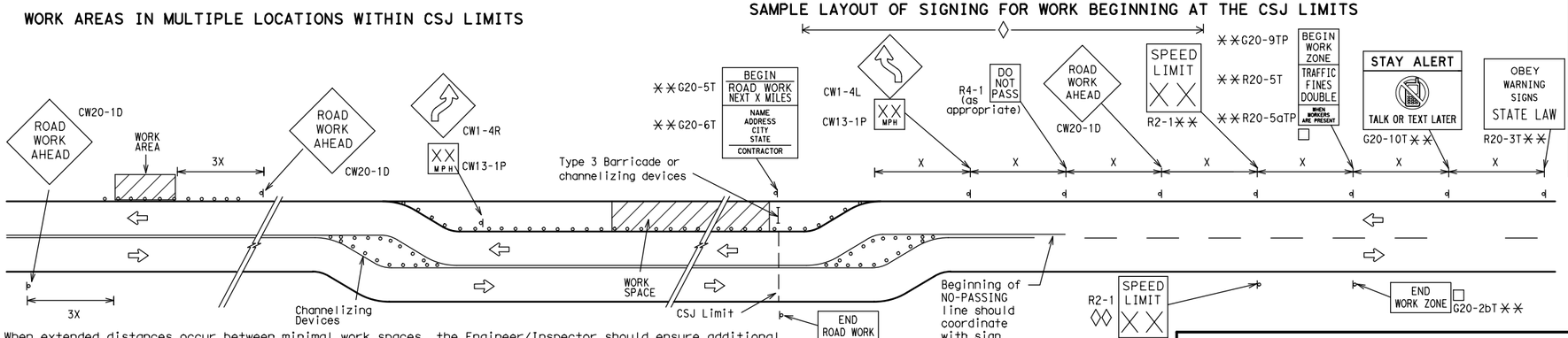
△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

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.

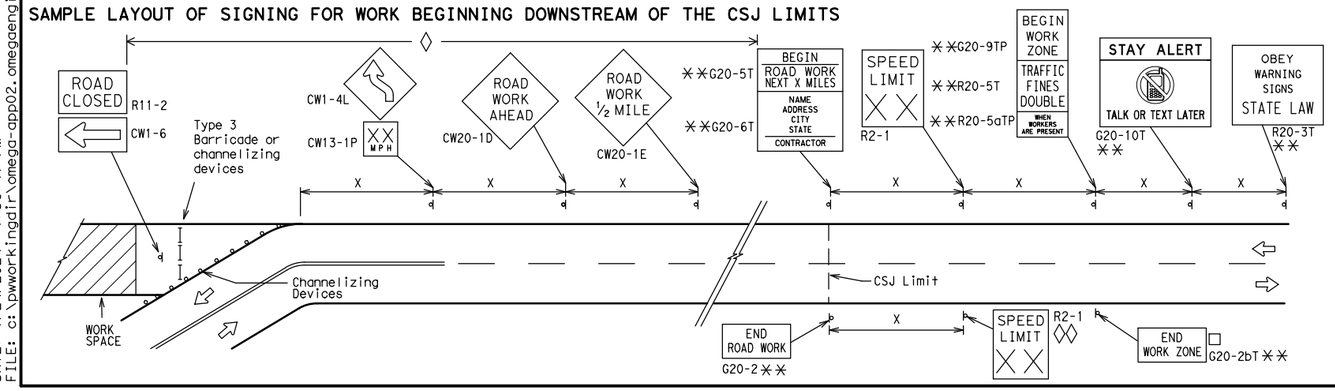
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE 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



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	18	089	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BRY	ROBERTSON		10

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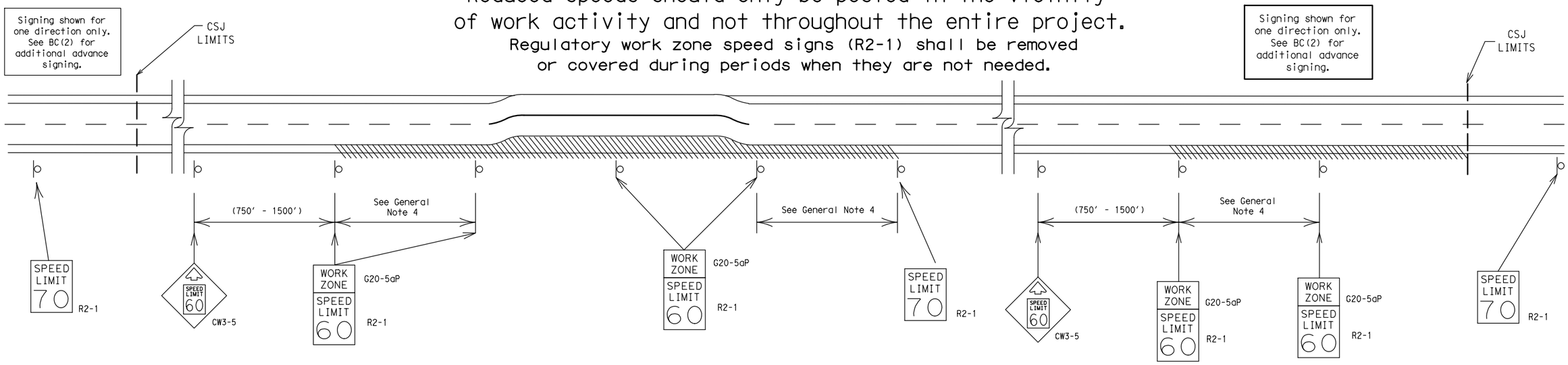
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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	BRY	ROBERTSON		11

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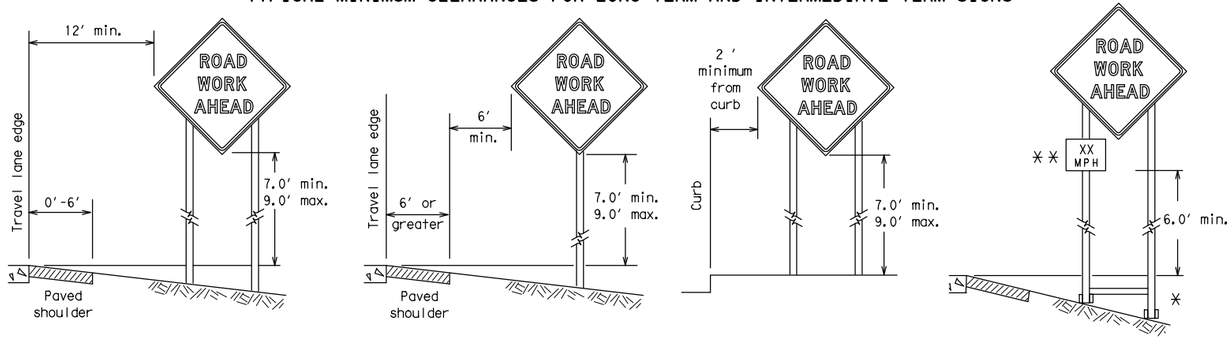
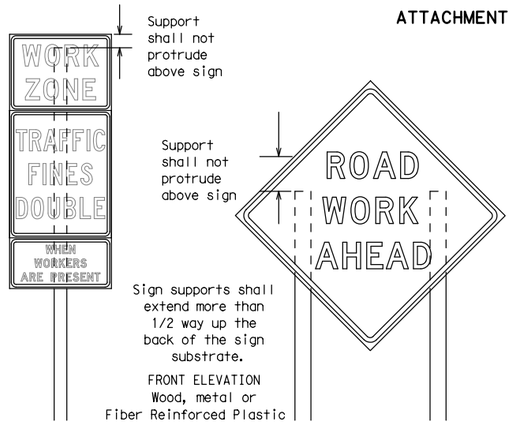
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

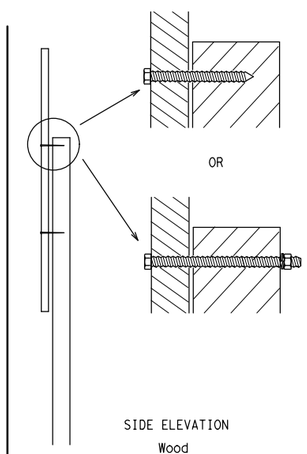


⚹ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





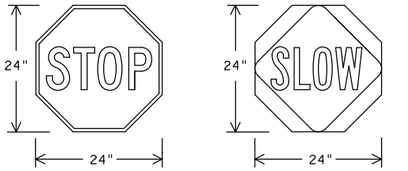
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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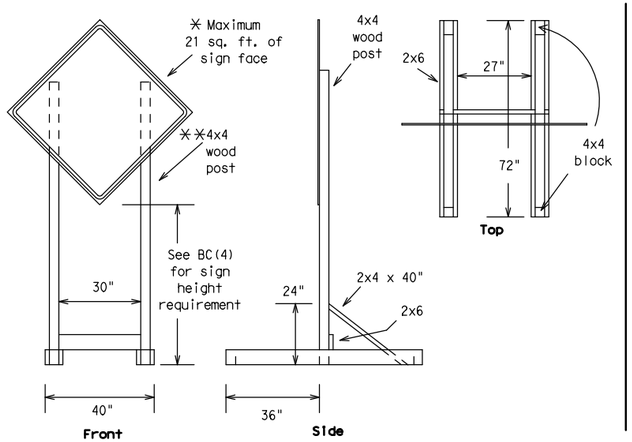
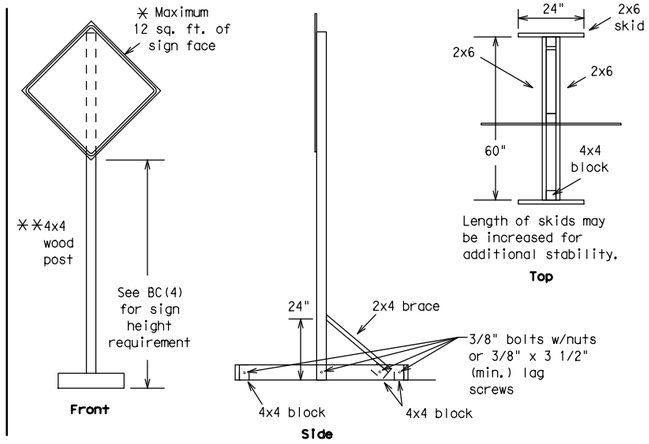
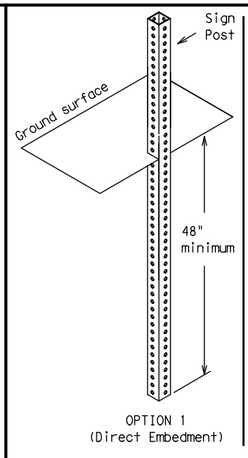
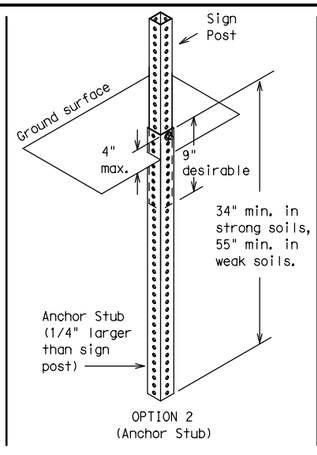


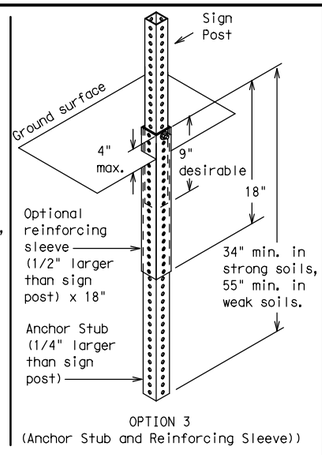


SKID MOUNTED WOOD SIGN SUPPORTS

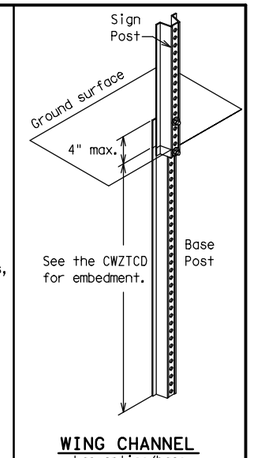
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS







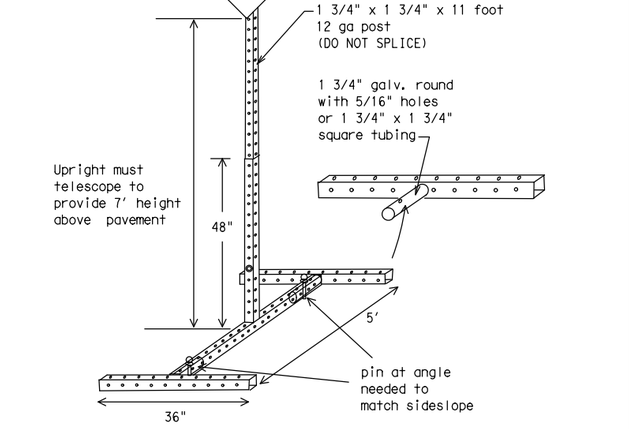
PERFORATED SQUARE METAL TUBING

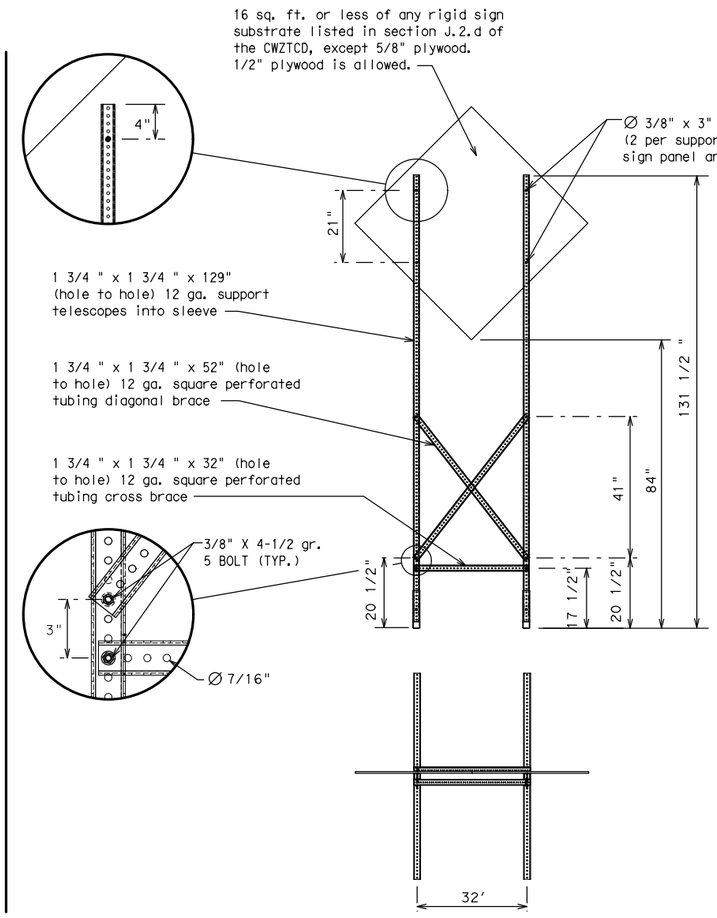


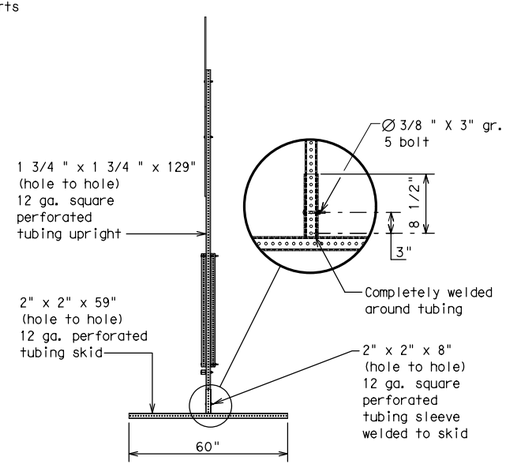
WING CHANNEL
Lap-splice/base bolted anchor

GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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
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

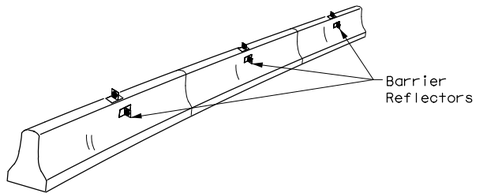
BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	18	089	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BRY	ROBERTSON		14

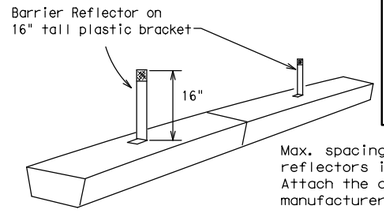
DATE: 1/24/2024 1:36:49 PM
FILE: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms15916\bc-21.dgn

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.



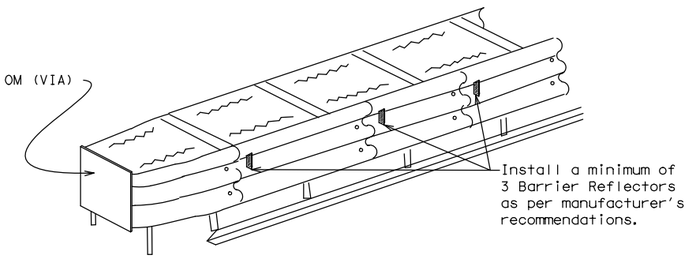
CONCRETE TRAFFIC BARRIER (CTB)

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)



DELINEATION OF END TREATMENTS

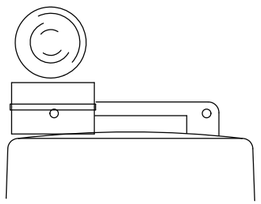
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

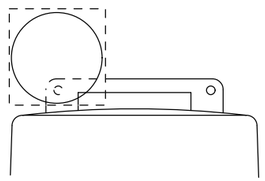
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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

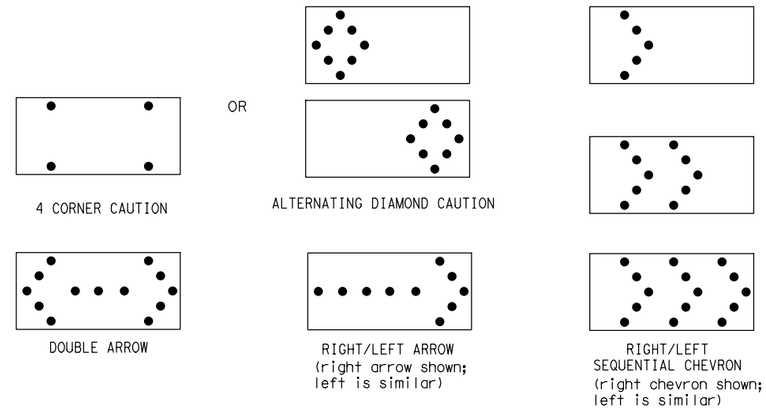
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing 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:



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	18	089	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BRY	ROBERTSON		15

101

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

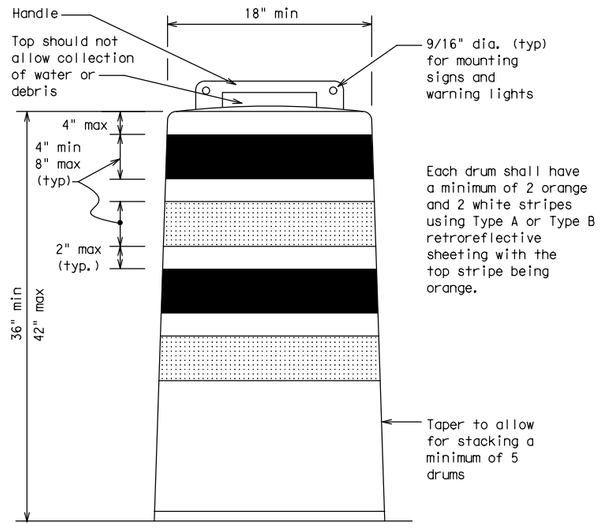
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

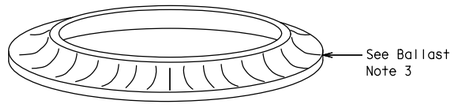
RETROREFLECTIVE SHEETING

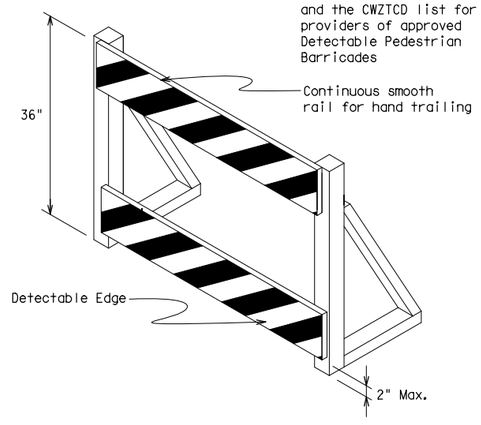
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

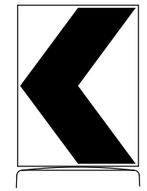




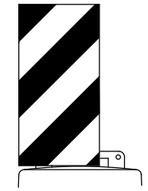


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

.

1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{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	18	089	VARIOUS
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	BRY	ROBERTSON		16
7-13				

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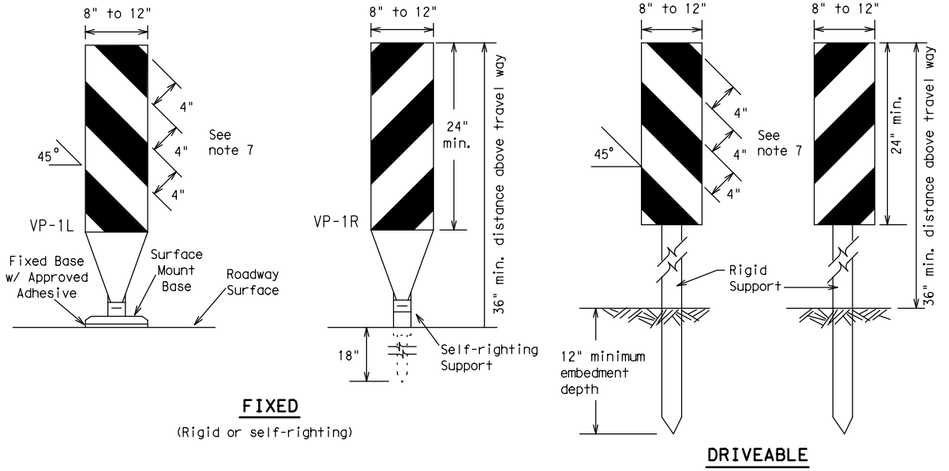
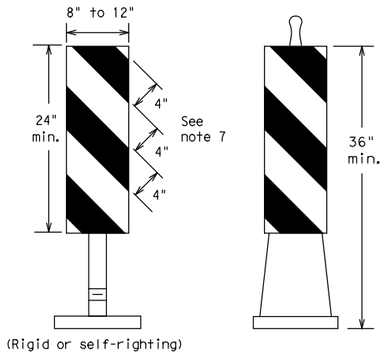


FIXED
(Rigid or self-righting)

DRIVEABLE

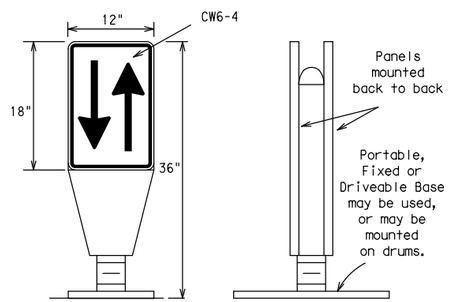


(Rigid or self-righting)

PORTABLE

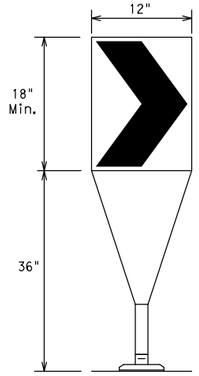
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is 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)



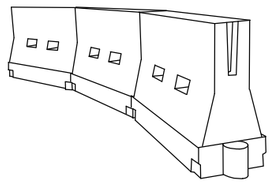
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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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REVISIONS	0917	18	089	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
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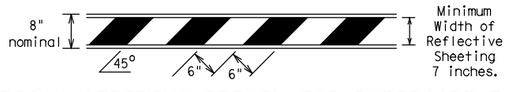
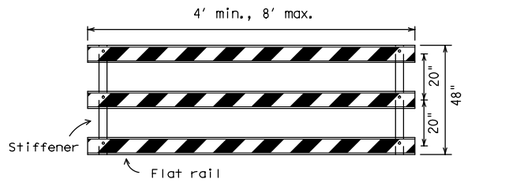
TYPE 3 BARRICADES

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.



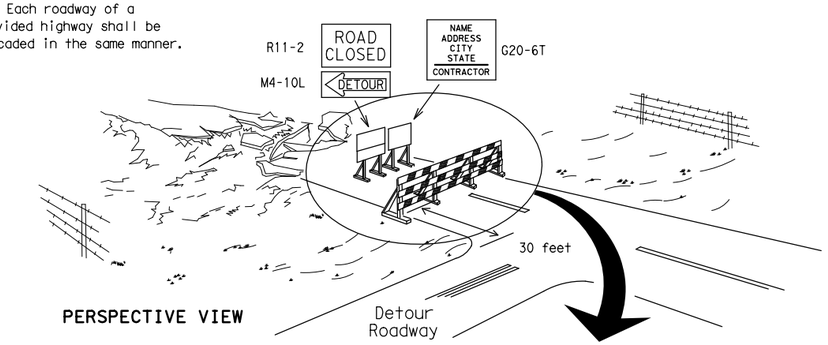
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

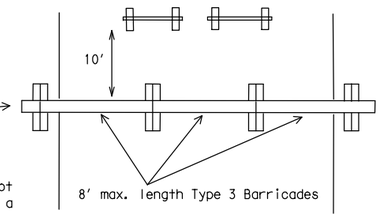
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

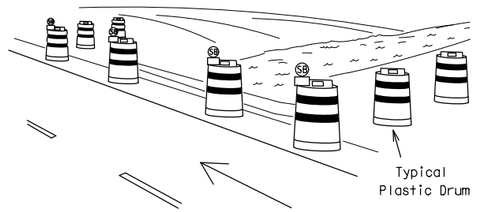
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

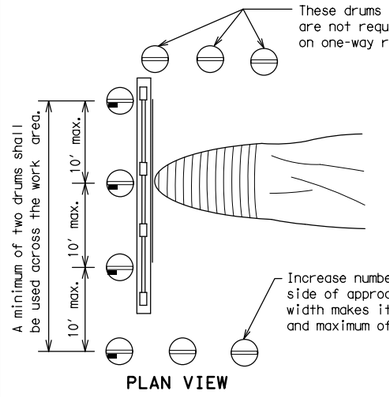
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

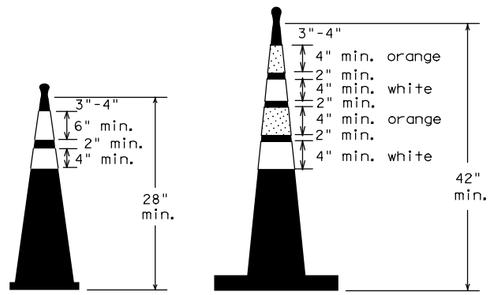
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder 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.



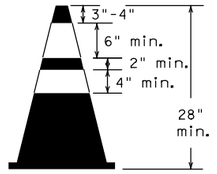
PLAN VIEW

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

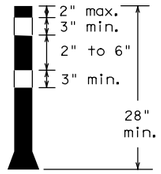
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

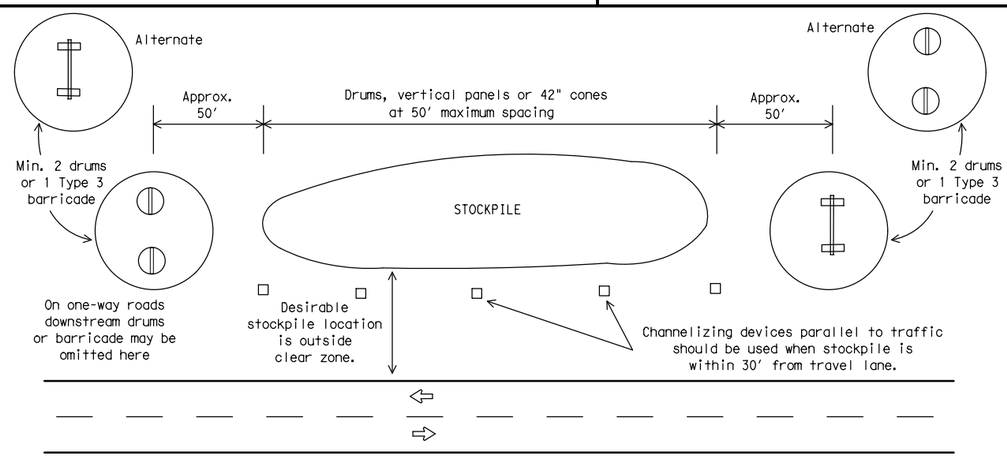


Tubular Marker

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	18	089	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BRY	ROBERTSON		18

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.

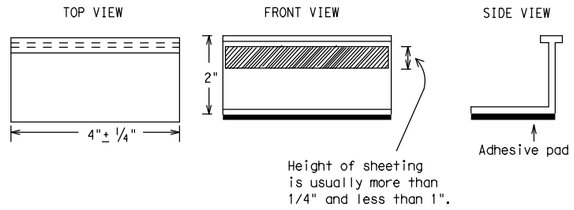
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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	18	089	VARIOUS
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	BRY	ROBERTSON		19
11-02 8-14				

DATE: 1/24/2024 1:36:51 PM
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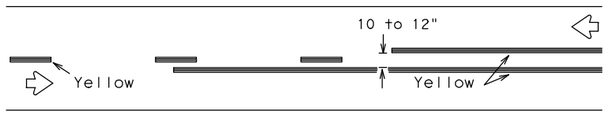
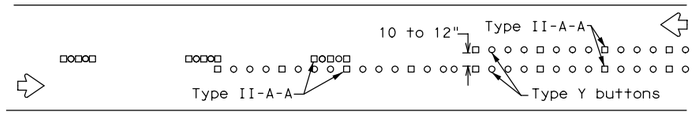
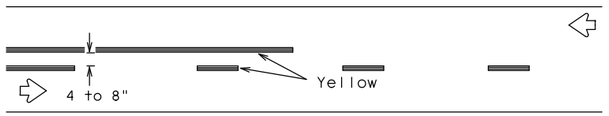
PAVEMENT MARKING PATTERNS



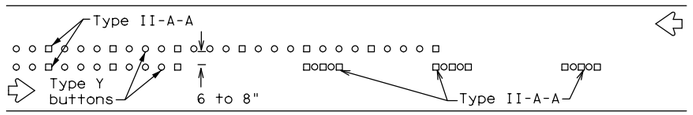
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



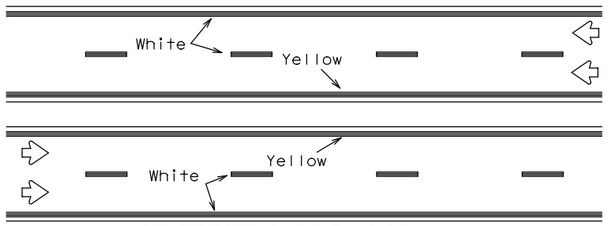
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



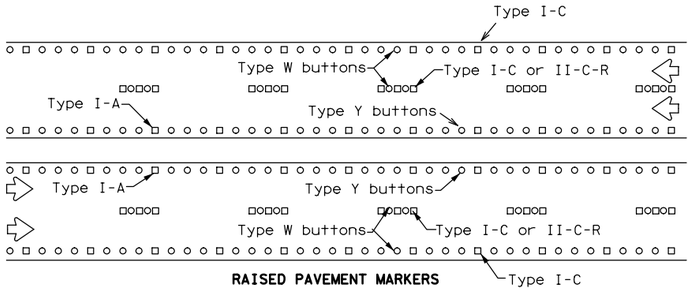
RAISED PAVEMENT MARKERS - PATTERN B

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



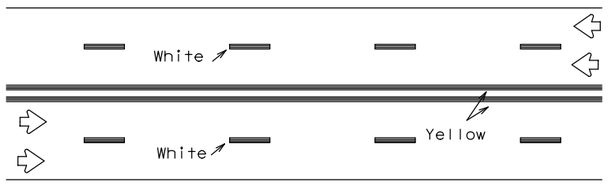
REFLECTORIZED PAVEMENT MARKINGS



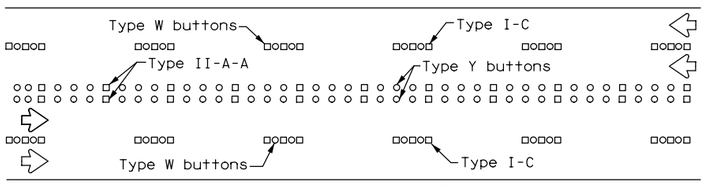
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



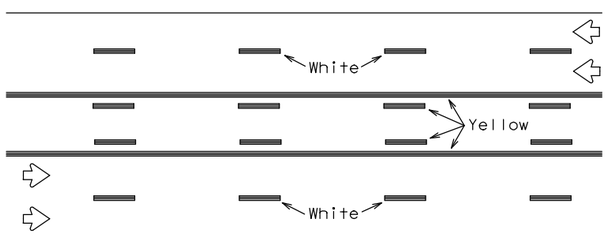
REFLECTORIZED PAVEMENT MARKINGS



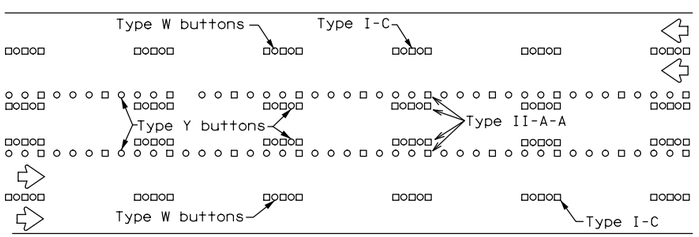
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

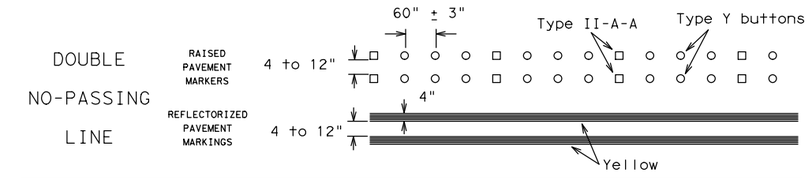
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

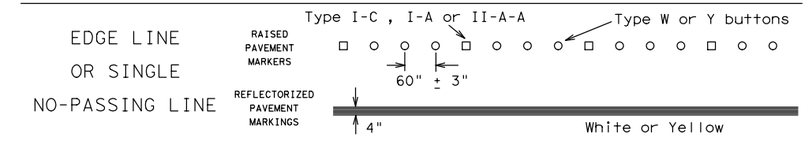
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

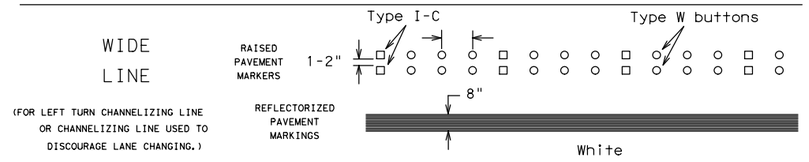


EDGE LINE OR SINGLE NO-PASSING LINE



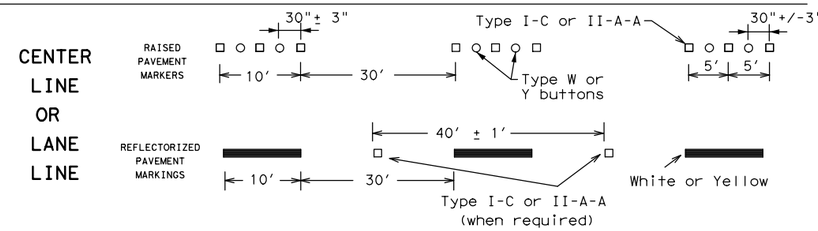
WIDE LINE

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

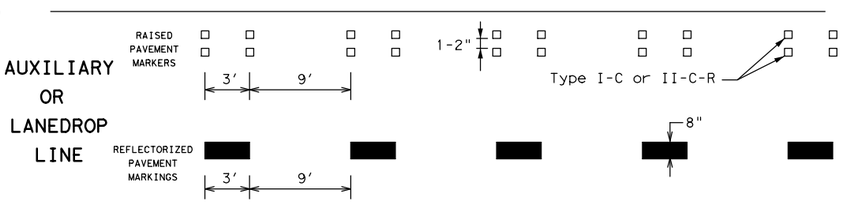


BROKEN LINES

CENTER LINE OR LANE LINE

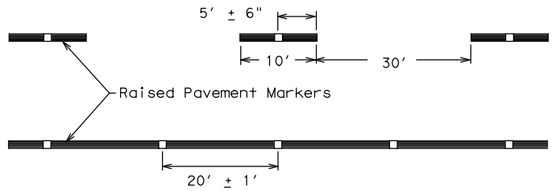


AUXILIARY OR LANEDROP LINE



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
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0917	18	089	VARIOUS
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON		20

DATE: 1/24/2024 1:37:03 PM
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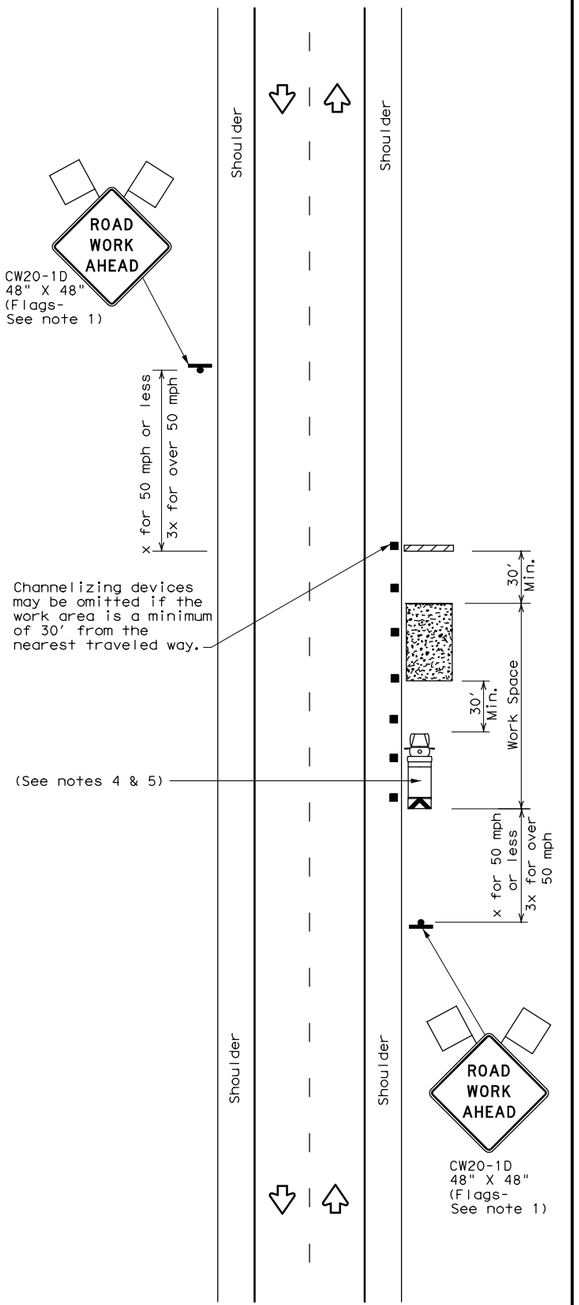
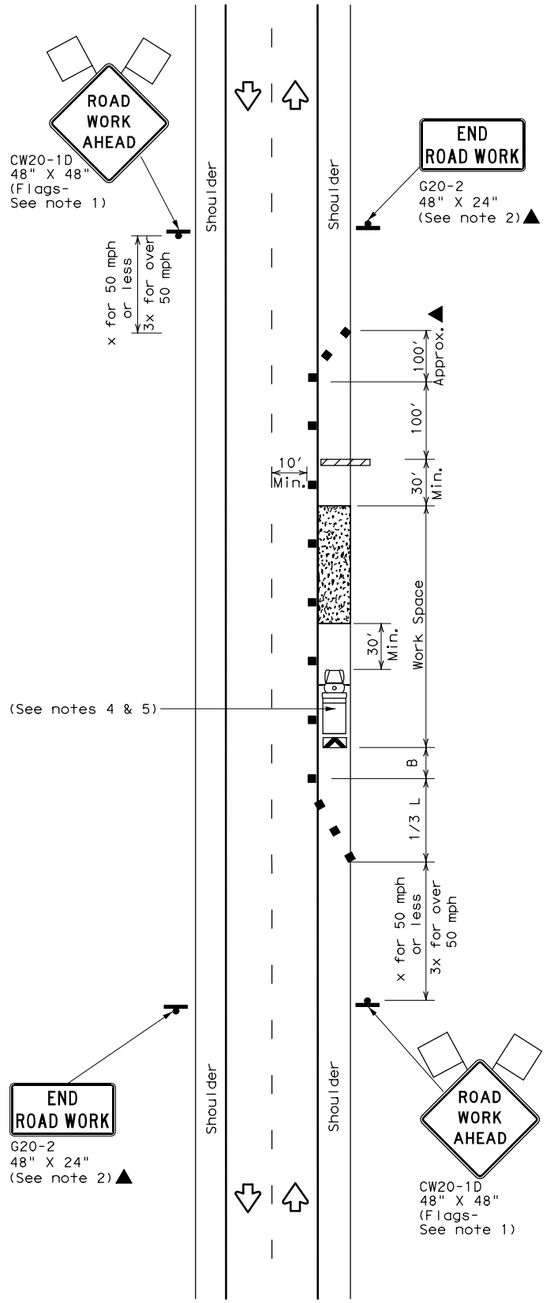


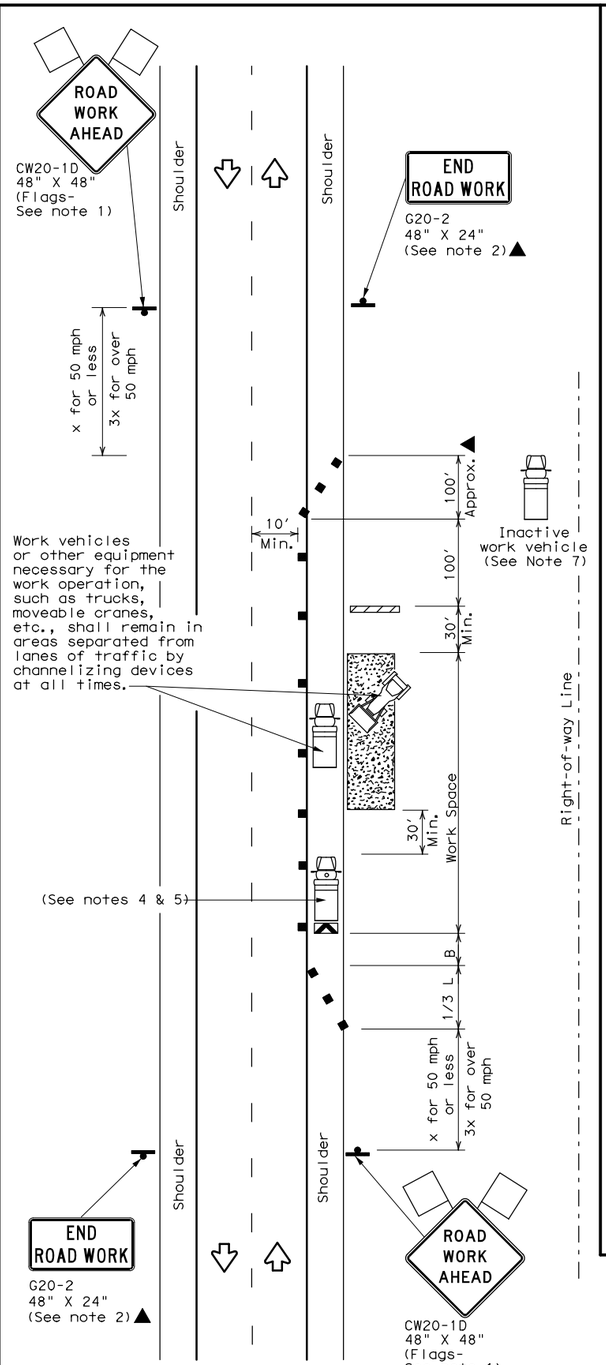
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
3. Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
4. 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.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
8. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

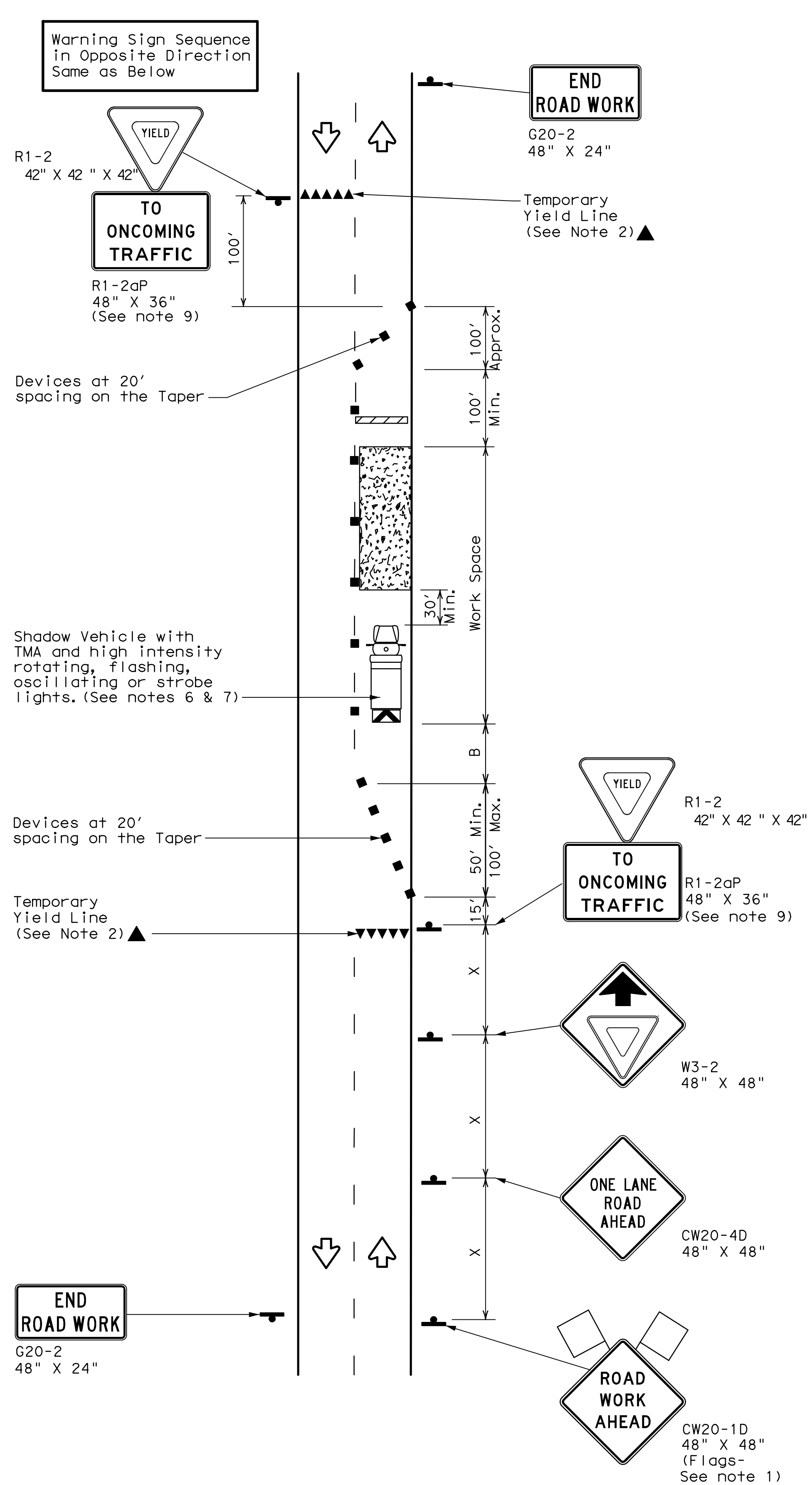
Texas Department of Transportation

Traffic Operations Division Standard

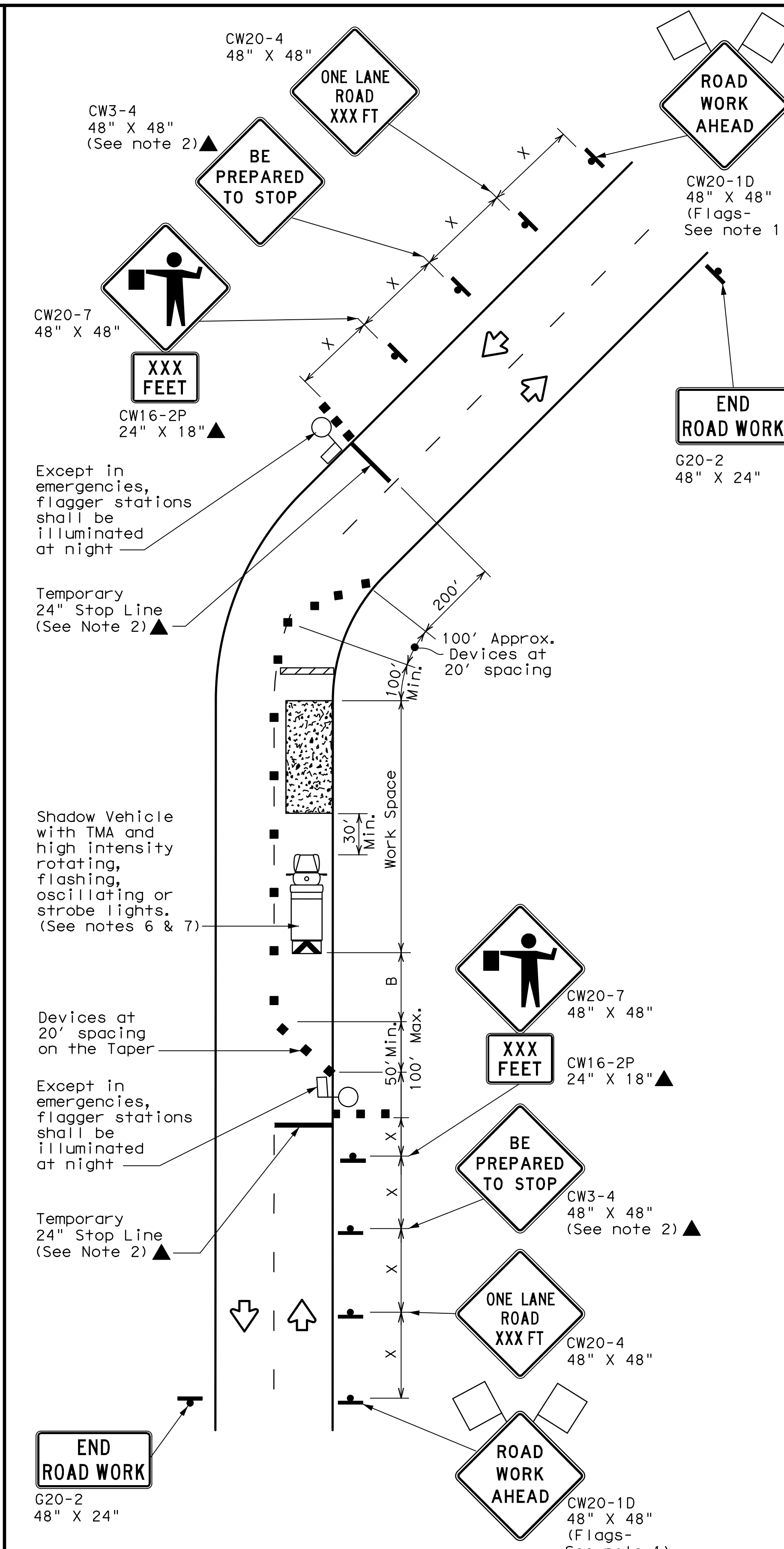
TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0917	18	089	VARIOUS
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON		21



TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-2a)

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

TCP (2-2b)

10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
12. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situtations.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0917	18	089	VARIOUS
	DIST		COUNTY	SHEET NO.
	BRY		ROBERTSON	22

162

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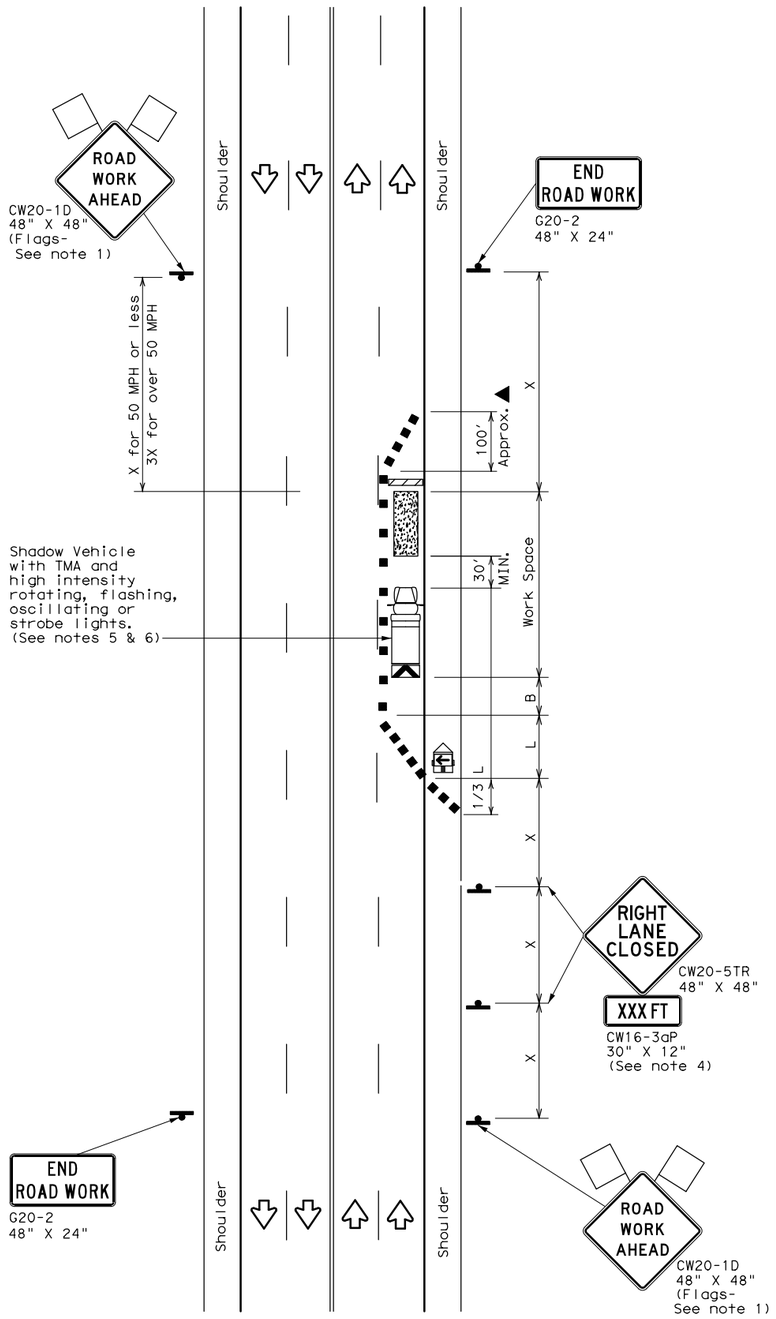
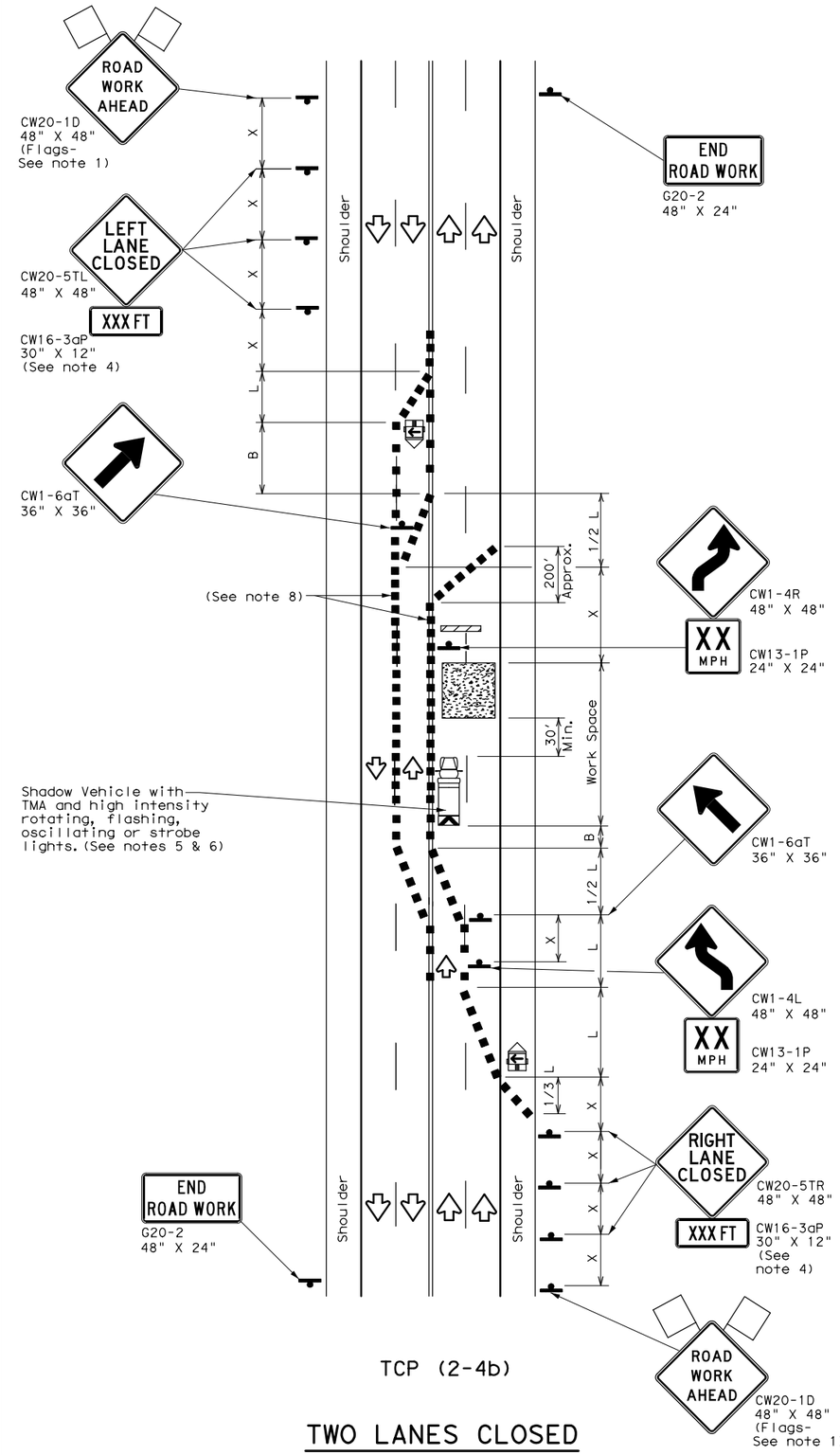


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. 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	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0917	18	089	VARIOUS
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	BRY	ROBERTSON		23

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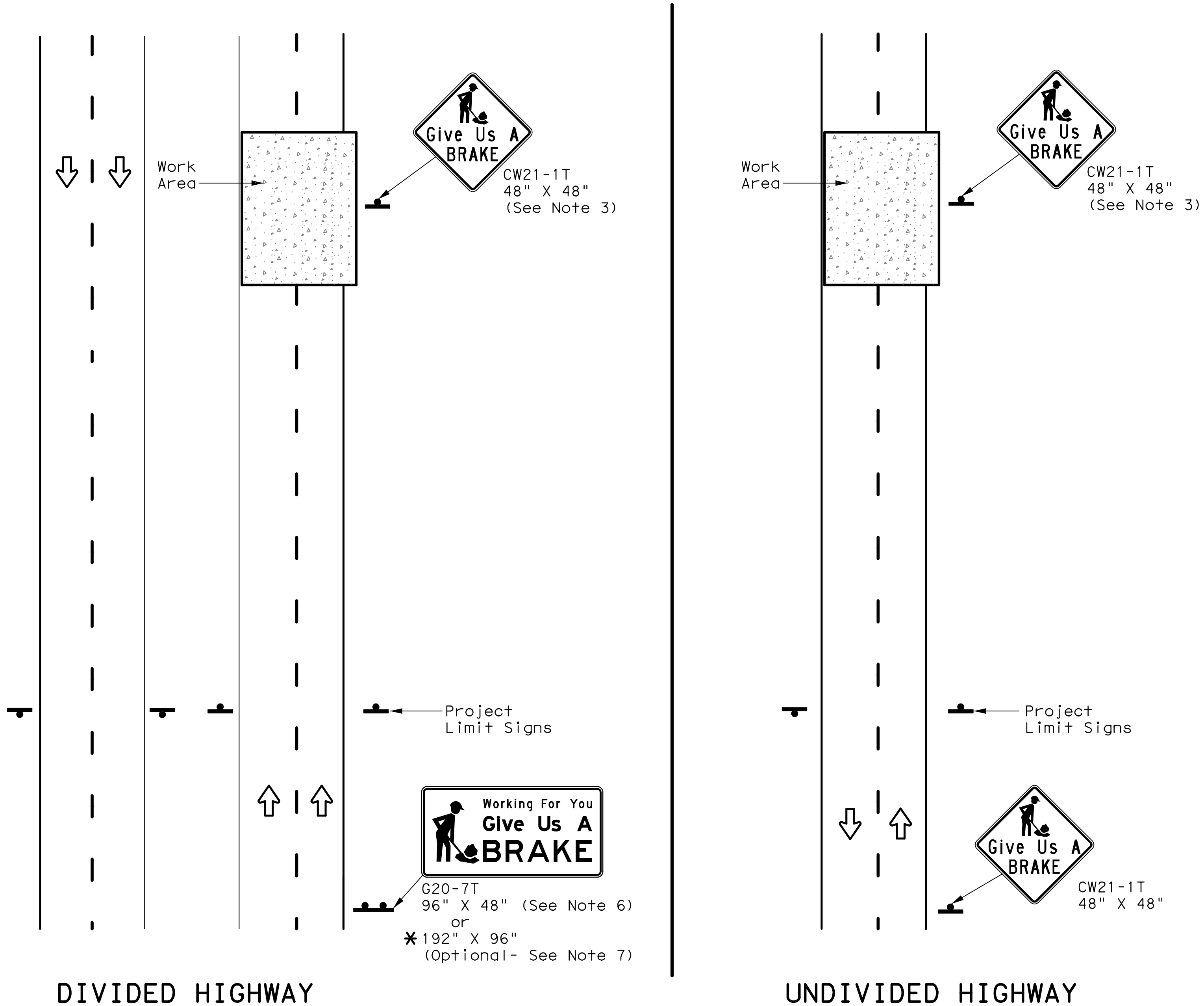

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

*** 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 Size	(LF) ①	(LF) ②	DRILLED SHAFT 24" DIA. (LF)
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	
(symbol)	Sign
(symbol)	Large Sign
(arrow)	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 0917	SECT 18	JOB 089	HIGHWAY VARIOUS
REVISIONS 6-96 5-98 7-13 8-96 3-03	DIST BRY	COUNTY ROBERTSON		SHEET NO. 24

116

DATE: 1/24/2024 1:37:32 PM
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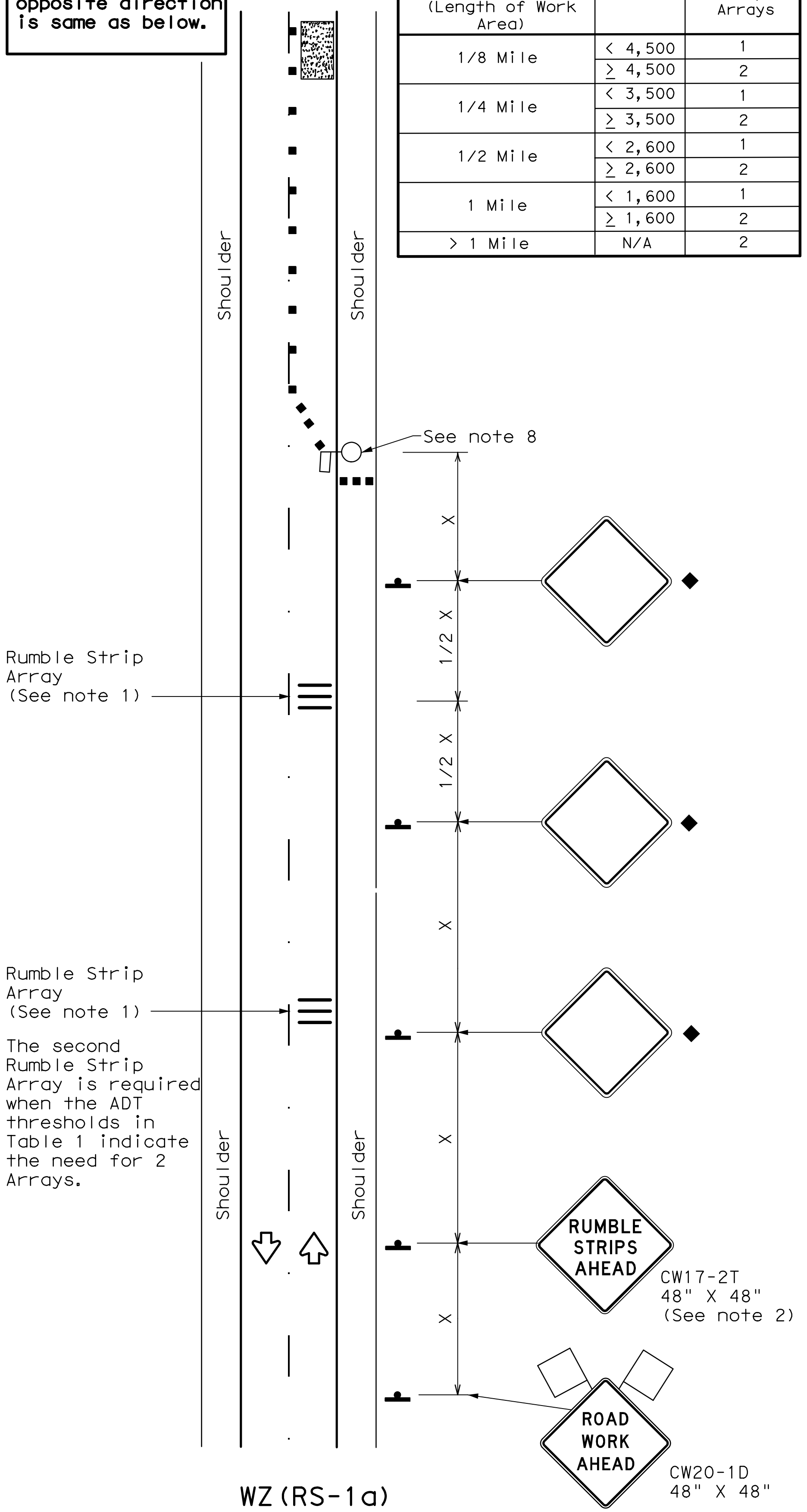
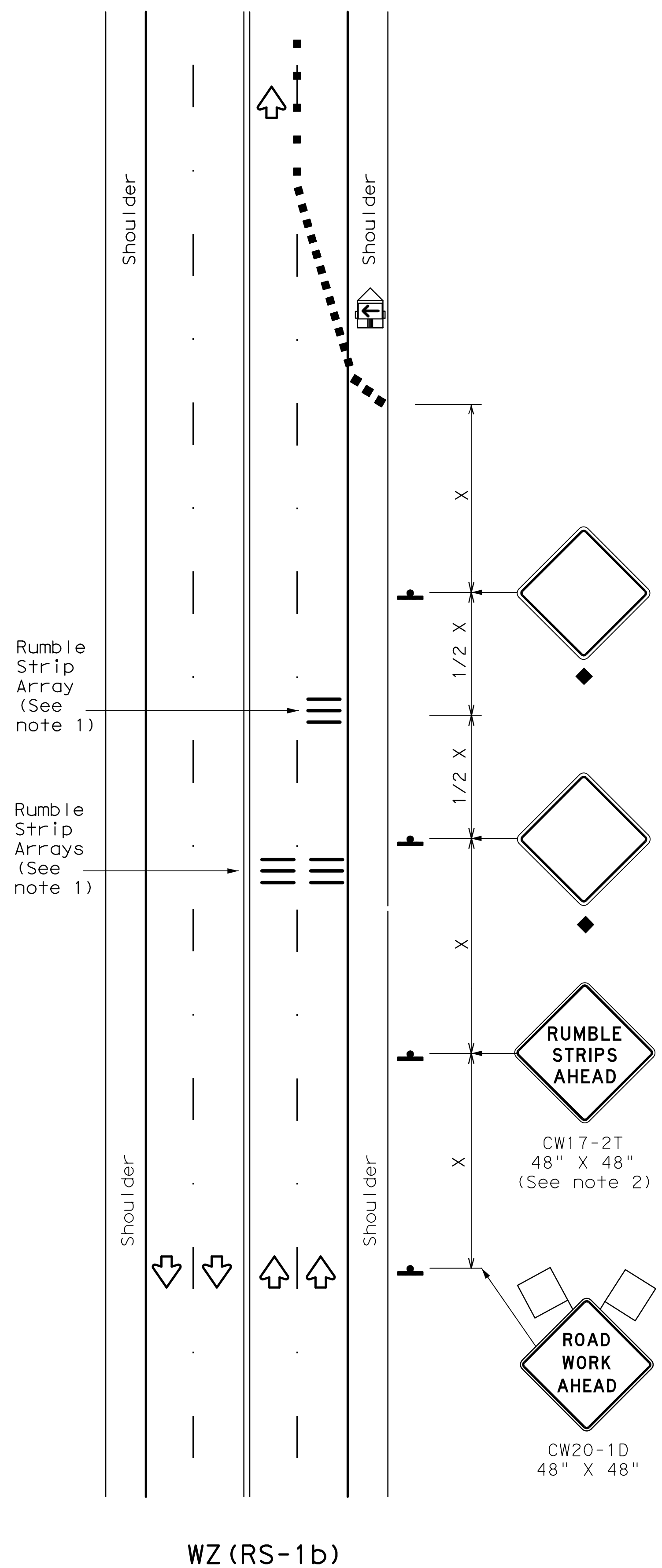
Warning sign and rumble strip sequence in opposite direction is same as below.

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



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	0917	18	089	VARIOUS
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON		25

117

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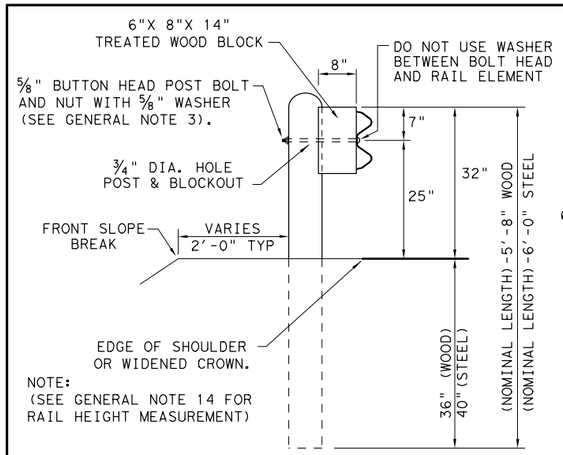
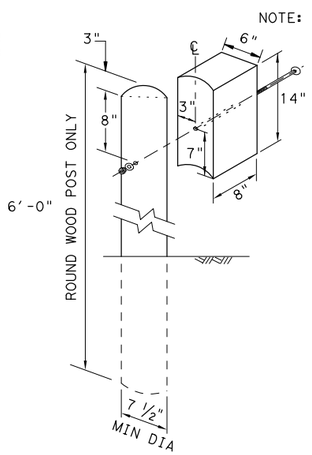
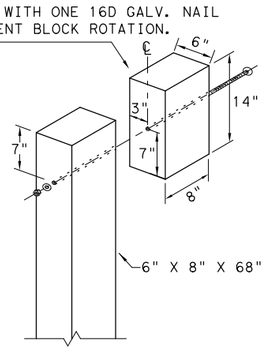


TYPICAL POST PLACEMENT

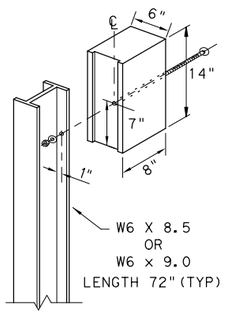


WOOD BLOCK TO ROUND WOOD POST

NOTE: TOENAIL WITH ONE 16D GALV. NAIL TO PREVENT BLOCK ROTATION.

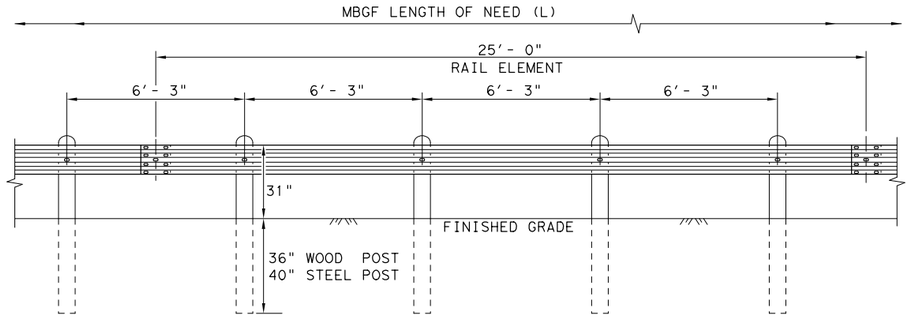


WOOD BLOCK TO RECTANGULAR WOOD POST



ROUTED WOOD BLOCK TO I-BEAM STEEL POST

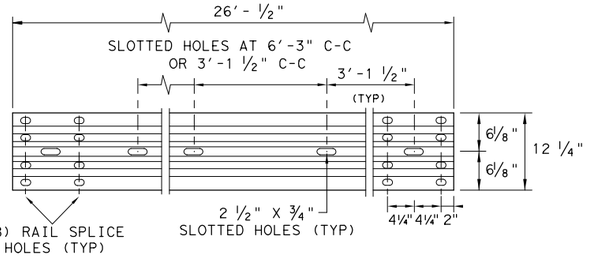
NOTE: ✻✻ "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



ELEVATION
MID-SPAN RAIL SPLICE

DIRECTION OF TRAFFIC

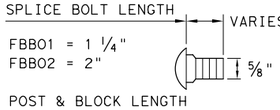
SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



ELEVATION 25'- 0"(NOM.) W-BEAM SECTION

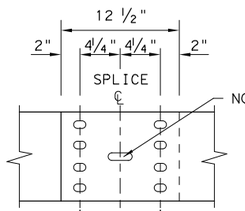
NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.

NOTE:
FOUR TYPES OF BUTTON-HEAD GUARD RAIL BOLTS COME WITH A RECCESSED NUT.



BUTTON HEAD BOLT

NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.

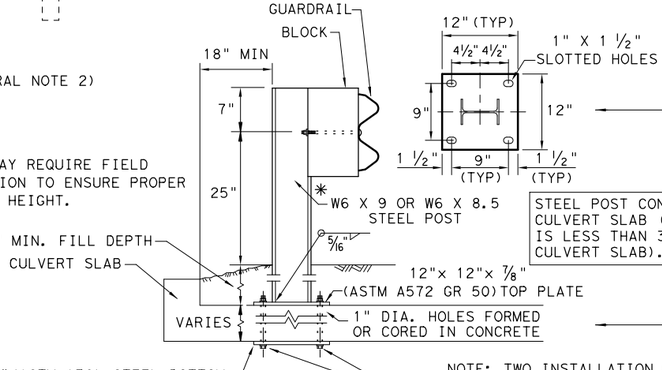


DIRECTION OF TRAFFIC

(8) ⅝" X 1 ¼" BUTTON HEAD SPLICE BOLTS WITH RECCESSED NUTS.

MID-SPAN RAIL SPLICE DETAIL

NOTE: GF(31), MID-SPAN RAIL SPLICES ARE REQUIRED WITH 6'-3" POST SPACINGS.



✻ POST(S) MAY REQUIRE FIELD MODIFICATION TO ENSURE PROPER GUARDRAIL HEIGHT.

STEEL POST CONNECTION TO CULVERT SLAB (USE WHEN THERE IS LESS THAN 36" COVER OVER CULVERT SLAB).

LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

1. BOLT-THROUGH OPTION: REQUIRES A 6" MIN. SLAB THICKNESS. ⅞" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
   NOTE: BOLT LENGTH = SLAB PLUS 2 ¼" MIN.

2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE ⅞" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS ¼" MIN. BEYOND NUT.

NOTE: CULVERTS OF 25 FT. OR LESS, SEE GF(31)LS STANDARD FOR "LONG SPAN" OPTION.

GENERAL NOTES

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540,"METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'- 0", OR 12'- 6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 ½" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
3. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445,"GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210,"COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
14. GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.

NOTE: TRANSISTIONS TO BRIDGE RAILS OR TRAFFIC BARRIERS.
SEE GF(31)TL3 TR STANDARD FOR HIGH-SPEED TL-3 TRANSITIONS.
SEE GF(31)TL2 TR STANDARD FOR LOW-SPEED TL-2 TRANSITIONS.

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE
TL-3 MASH COMPLIANT
GF(31)-19

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON		26

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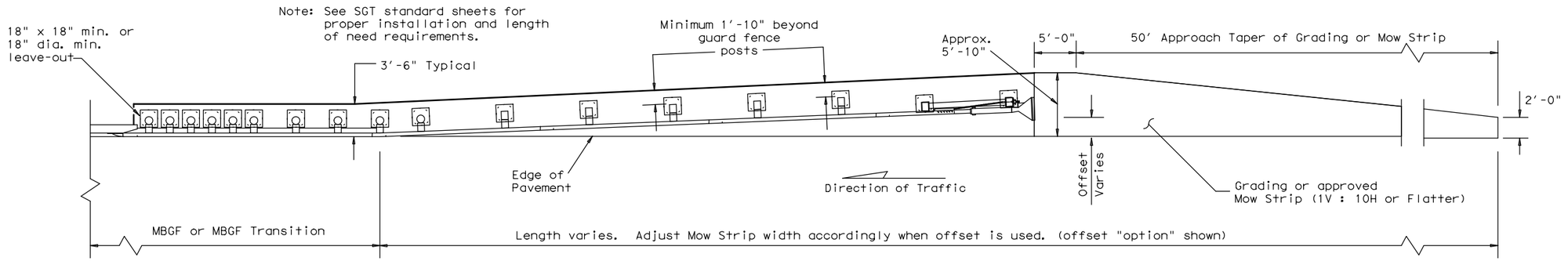
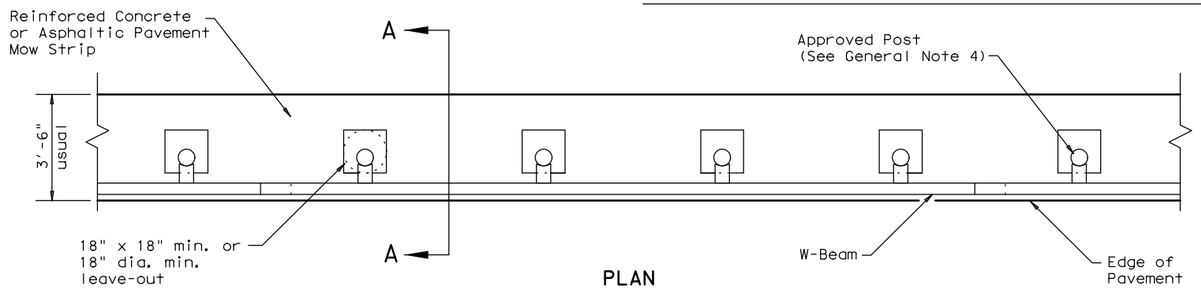
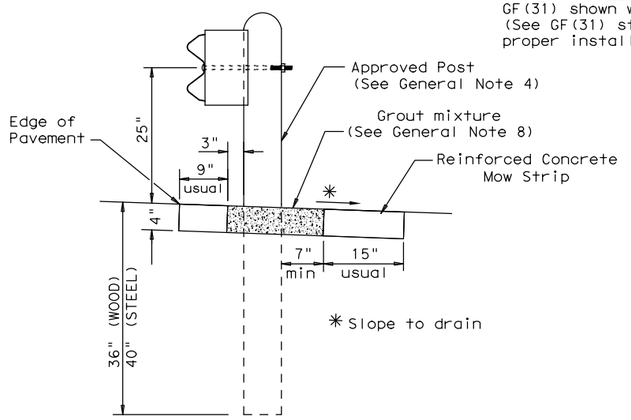


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



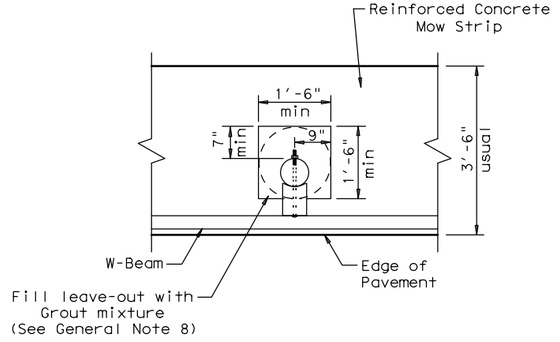
PLAN

GF(31) shown with Mow Strip
(See GF(31) standard sheet for proper installation)



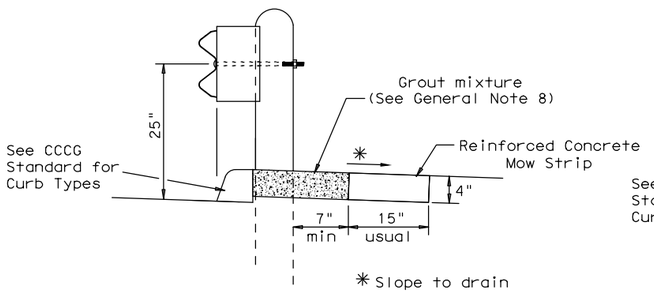
SECTION A-A

Typical



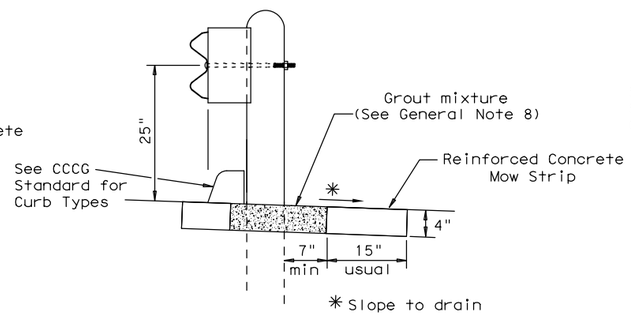
MOW STRIP DETAIL

Reinforced Concrete Mow Strip with 18" x 18" Square or 18" Dia. minimum leave-out.



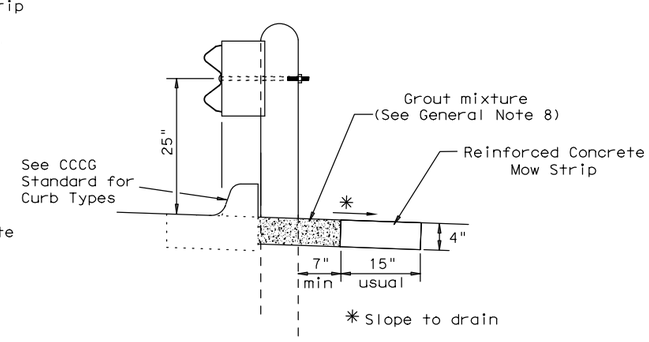
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.

Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.

GENERAL NOTES

1. This mow strip design is for use with metal beam guard fence, guard fence transitions, and guard fence end treatments. See applicable GF(31) MBGF or GF(31) Transition Standard sheet for additional information.
2. Mow strips shall be reinforced concrete with (wire mesh or synthetic fiber), as shown on the plans and will be paid for under the pertinent bid item. Reinforced concrete shall be placed in accordance with Item 432, "Riprap." The use of the synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Material Producer List (MPL), maintained by TxDOT, Construction Division.
3. The leave-out behind the post shall be a minimum of 7".
4. Only steel (W6 x 8.5 or W6 x 9.0), or 7 ½" Dia. round wood posts are acceptable for use in the mow strip. See GF(31) Standard for additional details.
5. Other curb placement options may be used. Curbs are not considered part of the mow strip and will be paid for under other pertinent bid item.
6. Thickness of the mow strip will be 4".
7. The limits of payment for reinforced concrete will include leave-outs for the posts.
8. The leave-outs shall be filled with a Grout mixture consisting of: 2719 pounds sand, 188 pounds Type 1 or II cement, and 550 pounds of water per cubic yard, with a 28-day compressive strength of approximately 230 psi or less. Provide grout with a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (Suggested Maximum leave-out of 20"). Payment for furnishing and placing the grout mixture will be subsidiary to the pay item of riprap mow strip.

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE (MOW STRIP) TL-3 MASH COMPLIANT

GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
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	BRY	ROBERTSON		27

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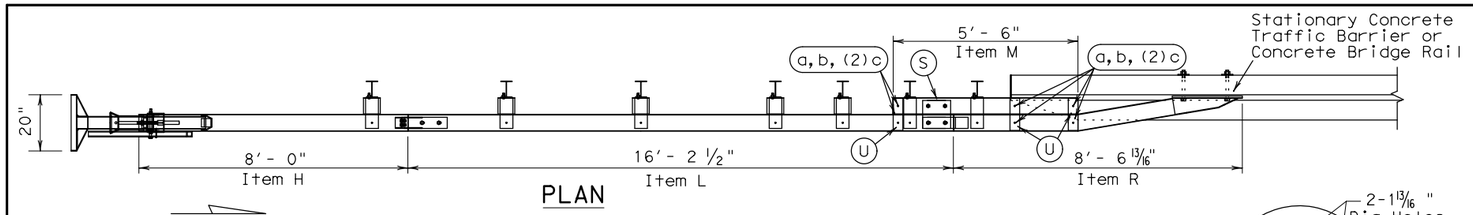
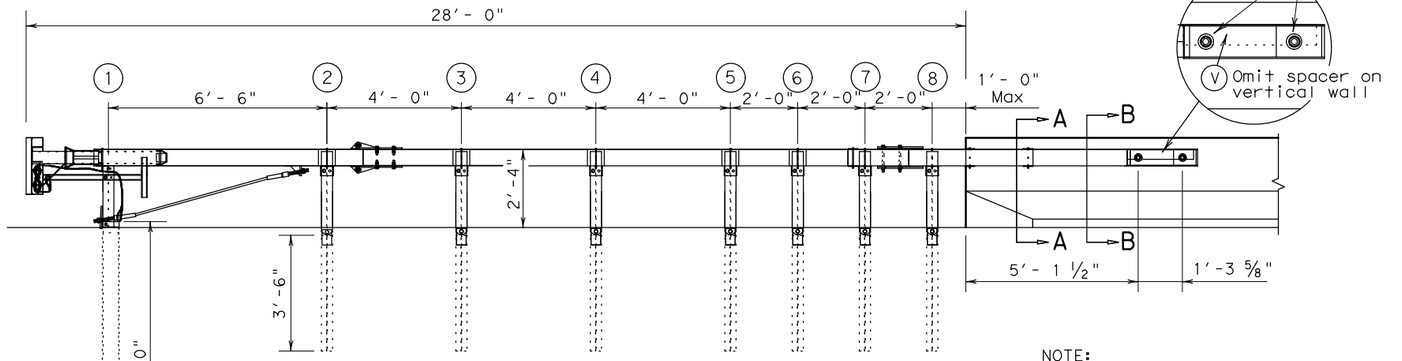


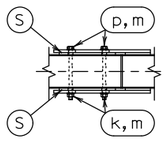
PLAN

Direction of Traffic

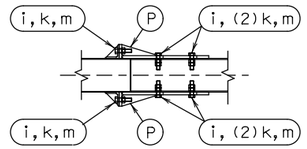


ELEVATION

NOTE:
Concrete bridge rails may require a modified end at the terminal connection. (Contact the Bridge Division for details.)



SPLICE PLATE DETAIL

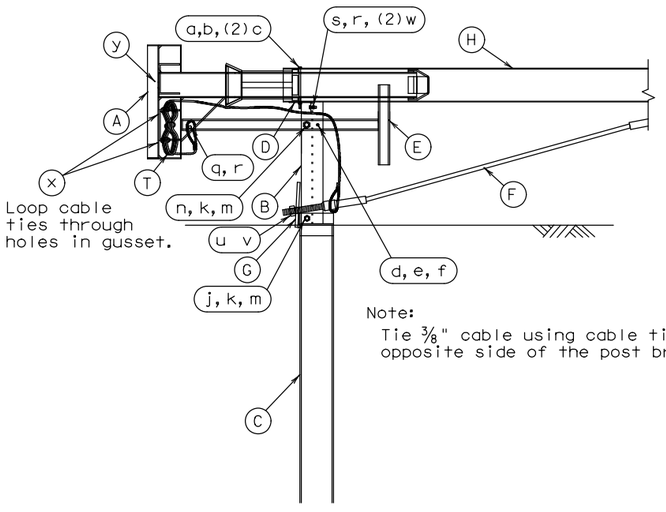


END SPLICE PLATE DETAIL

GENERAL NOTES

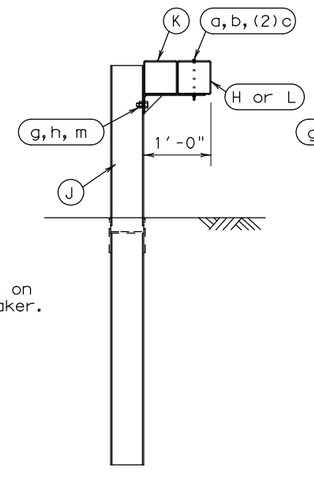
1. For specific information regarding installation and technical guidance of the system, contact: Road Systems, Inc., at (330)346-0721. 3616 Old Howard County Airport. Big Springs, TX 79720
2. Due to the Single-Sided design, the BEAT-SSCC is not appropriate for use at locations where backside hits towards the rigid concrete barrier are possible, e.g. In gore areas, or in narrow median locations where backside opposite direction hits are likely.
3. All bolts, nuts, cable assemblies, cable anchors, bearing plate, tubing, post, impact heads, and other steel components shall be galvanized, unless otherwise noted.
4. The breakaway cable assembly must be taut. A locking device, (vice grips or channel lock pliers) should be used to prevent the cable from twisting when tightening the nuts.
5. When site conditions permit, posts may be driven. The lower section of post #1 should not be driven with the upper post section attached. If posts are placed in a drilled hole, the backfill material must be satisfactorily compacted to prevent settlement.
6. If rock excavation is encountered, see manufacturer's installation booklet for installation recommendations.
7. Post shall not be set full depth in concrete.
8. The appropriate connection of the SSCC to the stationary rigid structure is a critical component to insure proper performance of the system. The length of the 1" bolts used to attach the system to the rigid structure will vary with the wall thickness and will need to be determined in the field.
9. The approach area in front of the SSCC and the area within the system itself shall be free of fixed obstacles greater than 4 inches in height and have a fill slope or a cut slope of 1V:10H or flatter.
10. Unless otherwise shown in the plans, SSCC rail placed in the vicinity of curbs shall be blocked out so that the face of curb is located directly below the face of rail. The steel posts shall be installed at the proper ground elevation above the gutter pan or roadway surface. Curbs located along or in front of the SSCC system shall not be greater than 4 inches in height.
11. An object marker shall be installed on the front of the impact head as detailed on D & OM(VIA).

ITEM	QTY	DESCRIPTION
A	1	Box-Beam Impact Head
B	1	Upper End Post (A1) W6 x 9 x 1′-9 ½" LG.
C	1	Lower End Post (A4) W6 x 15 x 8′-0" LG.
D	1	Support Bracket (B1) L4 x 2 x 4" LG.
E	1	Post Breaker (A2) Welded TS2 x 2 x ¼"
F	1	Cable Anchor Assembly
G	1	Cable Anchor Bearing Plate
H	1	End Tube Rail (A5) x 8′-0" LG.
J	7	Steel Breakaway Post W6 x 9 x 6′-0" LG.
K	5	Support Bracket w/ Blockout (A9) TS6 x 6 w/ Bent PL.
L	1	Second Rail (A11) x 16′-2 ½" LG.
M	1	Transition Blockout (A6) x 5′-6" LG.
N	2	Trans. Support Bracket (A10) 3/16" Bent PL. w/ Gusset
P	2	End Section Splice Plate (A3) - Detail Below
Q	2	1" Square Washer (B10) PL 4 x 4 x ¼"
R	1	Anchor Rail (A13) x 8′-6 13/16 "LG.
S	2	Splice Plate (A12) PL 10 x 10 x ⅜" Detail Below
T	1	⅜" GALV. Cable x 20′-0" (A14)
U	6	Tie Plate (C10) PL 11 ½" x 3 ½"x 3/16 "
V	1	Spacer (D10) (OMIT ON VERTICAL WALL)
		HARDWARE
a	14	5/16 " x 7 ½" Hex Bolt (A449)
b	14	5/16 " Hex Nut
c	28	5/16 " Washer
d	1	¼" x 3" Hex Bolt (A449)
e	1	¼" Hex Nut
f	1	¼" Washer
g	7	⅝" x 1 ½" Bolt (A307)
h	7	⅝" Recess Nut
j	8	⅝" x 2" Hex Bolt (A325 or A449)
j	1	⅝" x 8" Hex Bolt (A325 or A449)
k	18	⅝" Hex Nut
m	25	⅝" Washer
n	1	⅝" x 3" Hex Bolt (A325 or A449)
p	4	⅝" x 9" Hex Bolt (A325 or A449)
q	1	½" x 5" Hex Bolt (A325 or A449)
r	2	½" Hex Nut
s	1	½" x 2" Hex Bolt (A307, A325 or A449)
t	2	1" x 10"Hex Bolt(A325 or A449)(Length Varies w/Wall Sect)
u	4	1" Hex Nut (2H Heavy Hex Nut)
v	4	1" Washer Structural Washer
w	2	½" Washer
x	2	Cable Tie
y	1	Object Marker

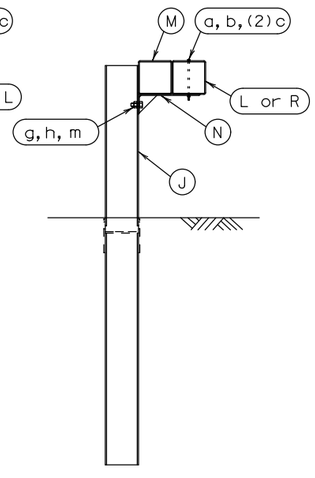


Note:
Tie ⅜" cable using cable ties on opposite side of the post breaker.

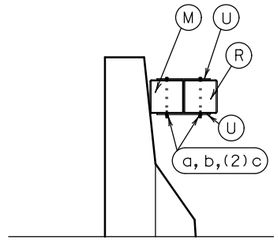
POSTS 1
IMPACT HEAD DETAIL



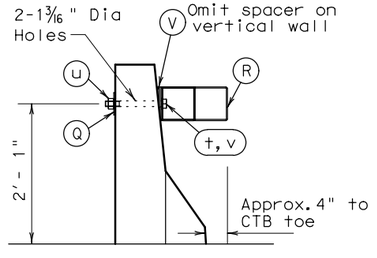
POSTS 2 THRU 6



POSTS 7 & 8



SECTION A-A



SECTION B-B

Texas Department of Transportation

Design Division Standard

ROAD SYSTEMS INC CRASH CUSHION (BEAT)

SSCC-16

FILE: sscc16.dgn	DN: TxDOT	CK: KM	DW: BD	CK: VP
©TxDOT April 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	18	089	VARIOUS
REVISED 03,2016 (VP)	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON		28

DATE: 2/26/2024 2:44:24 PM
FILE: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms\5917\catcb17.dgn

Note: Transition requirement, When a single sided transition section is required, see the MBGF transition standards for the proper installation.

3360G 5/8"x1 1/4" H.G.R. Bolt and 3340G Nuts
9852A 6"x3" Strut
984G side Pl 10 Ga both sides
9915A Spacer Channel w/hole for Cable ass'y. facing Post (2)
31G 12 Ga
Begin M.B.G.F. Length of need
19261G 1/2" Plate both sides
130A 10 Ga Slotted w/steel plate at Post (4)
19259G Washers (typ)
Rail is lapped such that over-sections face away from the nose (typ)
End payment for CAT(EA), begin payment for Metal Thrie-Beam Guard Fence(LF)
Thrie-Beam (Nested-2 each side) rail (12 gauge)
End payment for Metal Thrie-Beam Guard Fence (LF)
*Change splice lap direction for uni-directional application
*Traffic
Bracket A ℄ 9606A
Median Barrier
983G Nose Plate 10 Ga
3275G 3/8" Rod & 4252G 4-Nuts w/2 4258G Wash
3395G Splice Bolts (typ)
9921G Tube
701A
9G
21G
"W" beam to Thrie-Beam transition rail (12 gauge) 974G
Traffic

PLAN VIEW

Spacer Bracket Attachment Options:
(1) 2-5/8"x 15" post bolts 3550G through the barrier with rectangular washers 3320G
(2) 8 Expansion bolts 4406G to attach 2 brackets to the barrier (No bracket attachment to thrie-beam is required).

31'-3" Front Section | 12' 6" End Section | 18'- 9" Transition Section
6'-3" | 3'- 1½"
5/8"x 2" H.G.R. Splice Bolts 3400G & Nuts 3340G

782G 5/8" Plate
19271G Pipe Sleeve
3177B 18"x18" (2) Object markers
3380G 5/8"x1 1/2" Large Hex Hd Bolt & 3340G Nuts
3360G 5/8"x1 1/4" H.G.R. splice Bolts and 3340G Nuts
3320G (typ)
Pipe 705G Sleeve
2'-3"
5" Ground Line
3000G
3910G 2-1" Hex Nuts & 3900G 1-1" Washer each end of 3000G
705G Pipe Sleve (inserted into Post)
740G 6'x8" Tube (typ) at all Wood Posts
766G 1/4" Plate (typ) at all Wood Posts
3910G Double Nut at each end for locking
3012G 3/4" Cable Assembly
9852A 6"x3" Strut
3320G Washer PL 1 3/4" x 3/16" x 3" Lg
Rail ℄
See Thrie-Beam Terminal Connection Detail 980G
10"
Option (1) above 2-15" thru Bolts 3550G with rectangular washers 3320G
5/8"x (B) H.G.R. Bolts & Nuts (Typ.) (See table below)

ELEVATION VIEW

Note: There are no Rail to Post attachments for Posts (3), (5), & (6)

3650G 5/8"x 25" H.G.R. Post Bolt & 3340G Nut w/2 3320G Washers
3100B Wood Block
9916A Sleeve
705G Pipe inserted in Post
782G 5/8" Plate
9852A Strut
3075B Wood Post (notched)
766G Soil Plate
3497G 5/8"x 9 1/2" Large Hex Hd Bolt & 3340G Nut w/2 3300G Washer
3478G 5/8"x 7 1/2" Hex Hd Bolt and 3340G Nut
740G 6"x8"x4'-6" Tube

SECTION A-A (1)

3101B Wood Block
Toe nail
3360G 5/8"x 1 1/4" H.G.R. Bolt and 3340G Nut (typ)
9852A Strut
705G Pipe inserted in Post
3074B Wood Post
766G Soil Plate

SECTION B-B (2)

3101B Wood Block
3' - 6" Minimum (typ)
4640G 5/8"x 24" Hex Hd Bolt & 3340G Nut w/2 3300G Wash
3497G 5/8"x 9 1/2" Hex Hd Bolt and 3340G Nut
3074B Wood Post
3478G 5/8"x 7 1/2" Hex Hd Bolt and 3340G Nut
740G 6"x8"x4'-6" Tube
7/8" x 2 1/2" slotted holes for 5/8" bolts (typical)

SECTION C-C (3) & (5)

4470G 5/8"x 8" Hex Hd Bolt & 3340G Nut for 19261G Plates, Post 4 only
9921G 6"x8" Tube located 4" down from top of Wood Post
3101B Wood Block
3395G Splice Bolt & 3340G Nut w/2 19259G Wash (typ)
For Post (4) only
3263G 3/8"x 2" Lag Screws & 4257G Wash
3074B Wood Post
766G Soil Plate

SECTION E-E (4) & (6)

3275G 3/8" Rod w/4 4252G Nuts and 2 4258G Lock Washers
Lockwashers
3/8" Hex Nut

SECTION D-D

Note: 3395G Splice Bolts are used to allow telescoping action

5/8" Dia.
5/8"-11 Threads
1" Unthreaded
1 3/4"

3395G SPLICE BOLT

Steel Plate on Slotted 10 Ga Rail at Post (4)

DETAIL 1

21G W-Beam Guardrail
9G W-Beam GR
3101B
4062B
3650G
3340G
3320G
14"
1'-9"
3'-8"

POSTS (7) (8)

Nested Thrie-Beam both sides at Posts (10) (11) & (12) only
22"
2'-7"
3'-4"

SECTION F-F
Post (9) (10) (11) & (12)

9 1/2"
3" 3 1/2" 3"
1 1/4"
7/8" x 2 1/2" slotted holes for 5/8" bolts (typical)
2 3/4"
4"
7 3/16"
7 5/8"
3 3/16"
5"
3/4"
1 1/4"
9606A

BRACKET "A" DETAILS
AT C.T.B. (1" ACP Key-in)
1/4" steel plate or section of rectangular tubing with flanges welded on to the satisfaction of the Engineer

Post	(A) Block Width	Product Code	(B) Post Bolt Length	Product Code
9	6 1/2"	3409B	24"	3640G
10	5 1/2"	3408B	22"	3620G
11	4 1/2"	3407B	20"	3600G
12	3 1/2"	3406B	18"	3580G

** Modifications (as approved by the Engineer) in bracket design will be required for other barrier configurations.

Post to be refitted in field as approved by the Engineer
Varies with curb type (approx 6 1/2" for Type II Curb & Gutter)
4"max
28"
21"
6 1/4"
3'- 6"
Post Length
4'- 6" Tube
Width of plate reduced in the field at curb locations as approved by the Engineer

TYPICAL CURB PLACEMENT

SHEET 1 OF 2

Texas Department of Transportation
Design Division Standard

TRINITY HIGHWAY ENERGY ABSORPTION CRASH CUSHION (CONCRETE BARRIER)

CATCB(1)-17

FILE: catcb17.dgn	DN: TxDOT	CK: KM	DW: BD	CK: VP
©TxDOT: 1997	CONT	SECT	JOB	HIGHWAY
REVISIONS 03,2016 VP 03,2017 KM	0917	18	089	VARIOUS
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON		28A

SACRIFICIAL

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CATCB FRONT SECTION (POSTS 1 THRU 6)

BILL OF MATERIAL

Mfr Code #	QTY	DESCRIPTION
983G	1	Nose Plate (10 Ga)
984G	2	Side Plate (10 Ga)
31G	2	"W" Beam 12 Ga x 13'-6 1/2"
130A	2	"W" Beam 10 Ga x 13'-6 1/2"
9852A	1	Channel Strut x 6'-6"
740G	6	Steel Foundation Tube
766G	6	Soil Plate 18"x 24"
3075B	1	Wood Post 5 1/2" x 7 1/2" (Notched) (Post 1)
3074B	5	Wood Post 5 1/2" x 7 1/2"(Post 2-6)
3100B	2	Wood Block 5 1/2" x 7 1/2"(Post 1)
3101B	10	Wood Block 5 1/2" x 7 1/2"(Post 2-6)
9916A	1	Sleeve (Post 1)
9915A	1	Spacer Channel (Post 2)
9921G	2	Steel Tube (Posts 4 & 6)
19271G	1	Pipe Sleeve (Post 1)
705G	1	Pipe Sleeve (Post 2)
19261G	2	Post Plate (Post 4)
782G	1	Bearing Plate (Post 1)
3012G	1	Cable Assembly(Posts 1 to 2)
3275G	2	3/8" Restraint Rod(Post 3 & 5)
19259G	32	Plate Washer (Posts 4 & 6)

HARDWARE

3263G	4	3/8" x 2" Lg Lag Screw
4252G	8	3/8" Hex Nut
4258G	4	3/8" Lock Washer
4257G	4	3/8" Flat Washer
3320G	4	Rectangular Washer
3395G	32	5/8" x 1 3/4" H.H. Splice Bolt
3650G	2	5/8" x 25" Lg H.G.R. Bolt
4640G	8	5/8" x 24" Lg H.H. Bolt
3478G	13	5/8" x 7 1/2" Lg H.H. Bolt
3380G	8	5/8" x 1 1/2" Lg H.H. Bolt
3360G	16	5/8" x 1 1/4" Lg H.G.R. Bolt
3340G	85	5/8" H.G.R. Nut
3300G	8	5/8" Flat Washer
3497G	6	5/8" x 9 1/2" Lg H.H. Bolt
3910G	4	1" Hex Nut
3900G	2	1" Flat Washer

CATCB GUARDRAIL TERMINAL END SECTION (POSTS 7 & 8)

BILL OF MATERIAL

Mfr Code #	QTY	DESCRIPTION
4064B	2	Wood Post 5 1/2" x 7 1/2" x 6'
3101B	4	Wood Block 5 1/2" x 7 1/2"
21G	1	"W" Beam Guard Rail (12 Ga)
9G	1	"W" Beam Guard Rail (12 Ga)
701A	1	Bracket
782G	1	Bearing Plate
705G	1	Pipe Sleve
3000G	1	Cable Assembly
3320G	2	Rectangular Washer

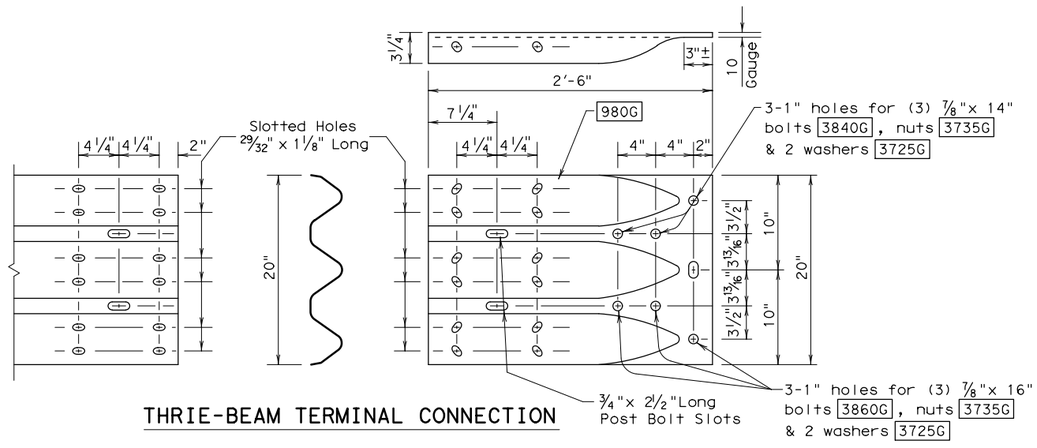
HARDWARE		
3360G	24	5/8" x 1 1/4" H.G.R. Splice Bolt
3400G	4	5/8" x 25" H.G.R. Post Bolt
3380G	8	5/8" x 1 1/2" Hex Hd Bolt
3340G	28	5/8" H.G.R. Nut
3300G	8	5/8" Washer
3910G	4	1" Hex Nut
3900G	2	1" Washer

CATCB TRANSITION SECTION (POST 9 THRU END SHOE)

BILL OF MATERIAL

	Mfr Code #	QTY	DESCRIPTION
	211G	4	Thrie beam 12'-6"(12 Ga)
	974G	2	Trans panel 6'-3"(12 Ga)
	980G	2	Special Thrie beam end shoe
	3078B	3	Wood Post 6"x 8"x 6', (Posts11&12)
	3320G	20	Rectangular Washer
	3340G	62	5/8" H.G.R. Nut
	3400G	52	5/8" x 2" Splice Bolt
	3406B	2	22 1/2" Block 6"x 3 1/2" (Post 12)
	3407B	2	22 1/2" Block 6"x 4 1/2" (Post 11)
	3408B	2	22 1/2" Block 6"x 5 1/2" (Post 10)
	3409B	2	22 1/2" Block 6"x 6 1/2" (Post 9)
*	3412B	1	Wood Post 6"x 8"x 6', (Posts 9)
*	3560G	2	5/8" x 16" Bolt
*	4406G	8	5/8" x 3 3/4" Expansion Bolts w/Nuts
	3580G	2	5/8" x 18"Post Bolt (Post 12)
	3600G	2	5/8" x 20"Post Bolt (Post 11)
	3620G	2	5/8" x 22"Post Bolt (Post 10)
	3640G	2	5/8" x 24"Post Bolt (Post 9)
	3725G	12	7/8" Washer (End Shoe Bolts)
	3735G	6	7/8" Hex Nuts (End Shoe Bolts)
	3840G	3	7/8" x 14" Hex Bolt (End Shoe)
	3860G	3	7/8" x 16" Hex Bolt (End Shoe)
	9606A	2	Spacer Bracket
	Delineation		
	3177B	2	Object Marker 18"x 18" (Cut to fit)
	Optional Hardware for Single Slope Barrier-42"		
	3640G	2	5/8" x 24" Bolt
	4896G	6	7/8" x 24" Hex Bolt (End Shoe)

* Expansion or through bolts may be used with optional bracket installation.



THRIE-BEAM TERMINAL CONNECTION

GENERAL NOTES

1. For specific information regarding installation and technical guidance of the system, contact: Trinity Highway at 1(888)323-6374. 70 W. Madison St. Suite 2350. Chicago, IL 60602
2. Crown will be widened to accommodate the CAT system. The crown should extend at least 3 feet beyond the inside face of rail. The ground line at posts should be an extension of the roadway surface crown.
3. All bolts, nuts, washers, cable assemblies, cable anchors, post tubes, backup plates, and soil plates shall be galvanized.
4. The exposed end segment of an "End Section" should be evaluated as a potential obstacle in the determination of the need of MBGF for the opposing direction of traffic.
5. For placement at curb sections, the height from gutter pan to post bolt will be 21", and the front section shall be flared (See Detail 2).
6. The wood blockouts shall be "toe nailed" to the rectangular wood posts to prevent them from turning when the wood shrinks.
7. Either 6"- 8" or 5 1/2"x 7 1/2" wood blocks may be used at posts 1 thru 8 as supplied by the manufacturer.
8. If a "single sided" transition section is required for the attachment to a rigid concrete rail, see the MBGF transition standards for the proper installation.
9. Object markers shall be installed on the front of the terminal as detailed on the D&OM(VIA).

SACRIFICIAL

Texas Department of Transportation

Design Division Standard

TRINITY HIGHWAY ENERGY ABSORPTION CRASH CUSHION (CONCRETE BARRIER)

CATCB(1)-17

FILE: catcb17.dgn	DN: TxDOT	CK: KM	DW: BD	CK: VP
©TxDOT:1997	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED 03,2016 VP REVISED 03,2017 KM	0917	18	089	VARIOUS
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON		28B

DATE: 2/26/2024
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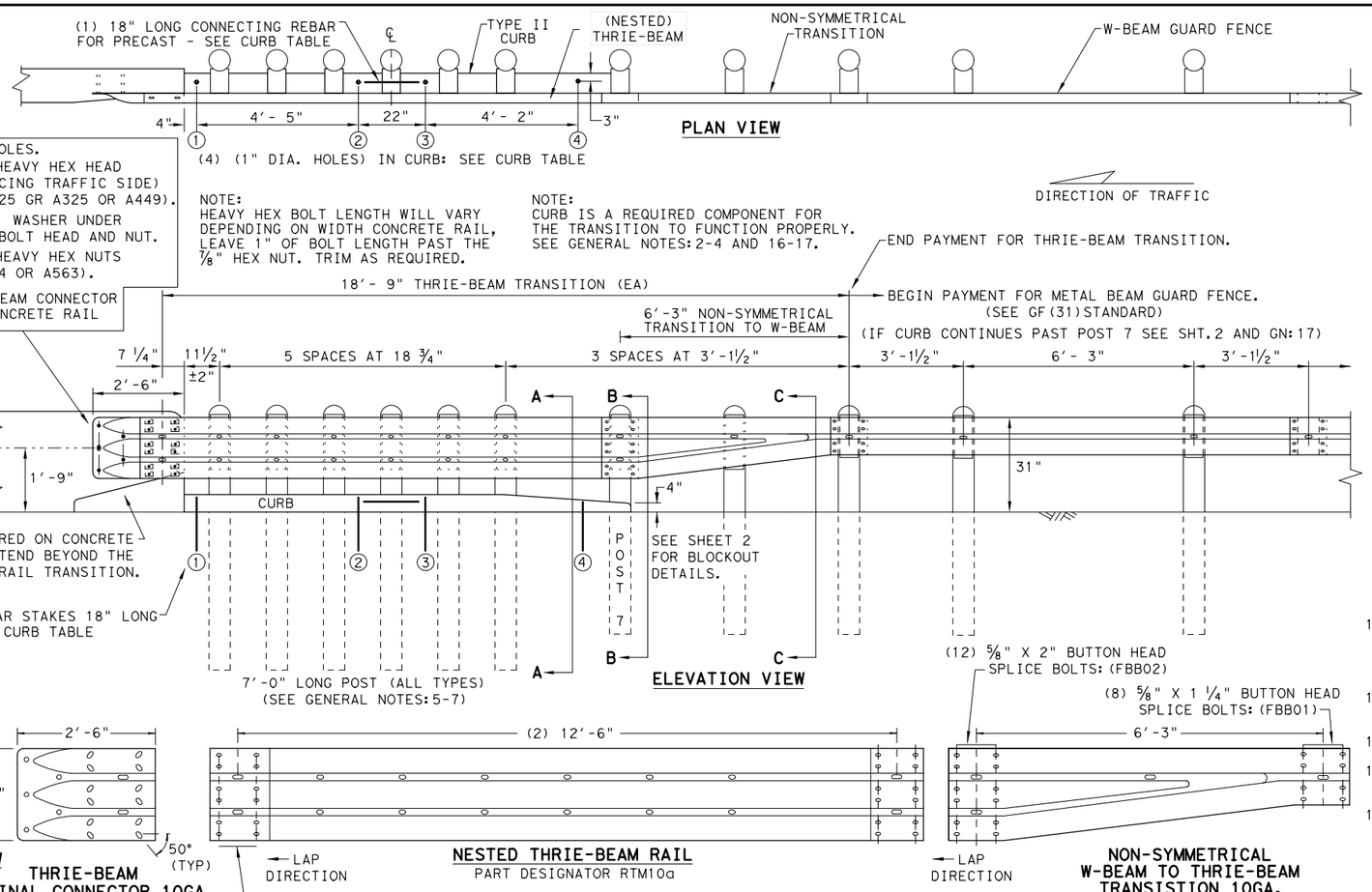
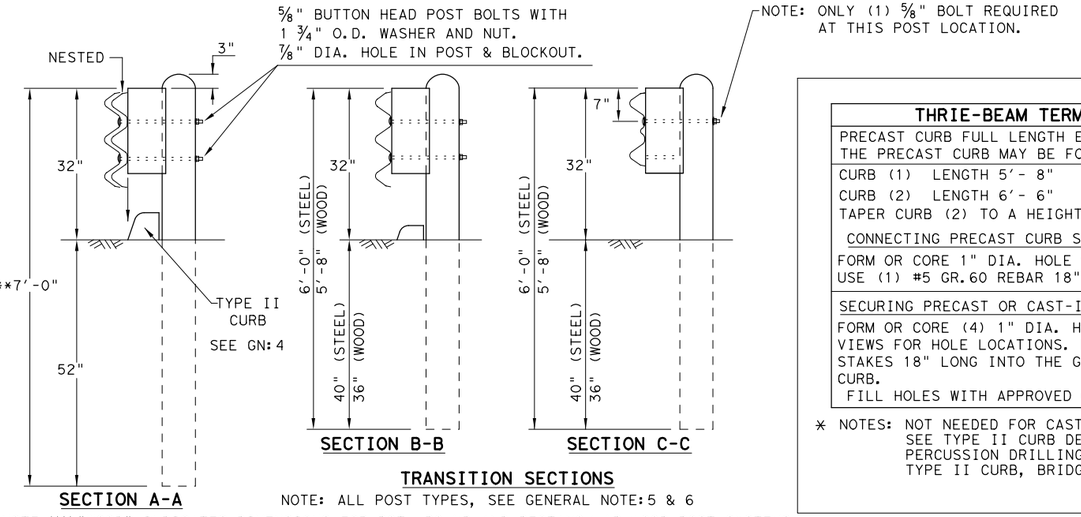




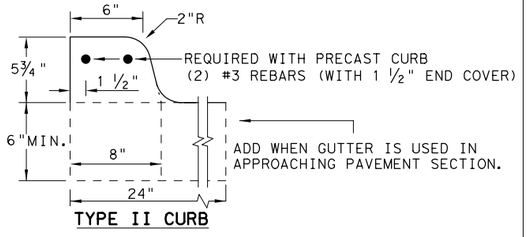
THRIE-BEAM TERMINAL - CURB TABLE

PRECAST CURB FULL LENGTH EQUALS 12'- 2"
THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.

CURB (1) LENGTH 5'- 8"
CURB (2) LENGTH 6'- 6"
TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7

CONNECTING PRECAST CURB SECTIONS (1) & (2):
FORM OR CORE 1" DIA. HOLE 9" LONG INTO EACH CURB END.
USE (1) #5 GR.60 REBAR 18" LONG TO CONNECT BOTH CURBS.

SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE *:
FORM OR CORE (4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR.60 REBAR STAKES 18" LONG INTO THE GROUND AND ½" BELOW TOP OF CURB.
FILL HOLES WITH APPROVED GROUT MIXTURE.



NOTE: OPTIONS FOR TYPE II CURB:
1. PRECAST
2. CAST-IN-PLACE

* NOTES: NOT NEEDED FOR CAST-IN-PLACE.
SEE TYPE II CURB DETAIL FOR REBAR AND COVER REQUIREMENTS.
PERCUSSION DRILLING IS NOT PERMITTED WITH:
TYPE II CURB, BRIDGE RAIL OR CONCRETE TRAFFIC RAIL.

TYPE II CURB DETAILS

GENERAL NOTES

1. CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
2. CONCRETE CURB MAY BE CAST-IN-PLACE OR PRECAST AS SHOWN ON THIS SHEET. WHEN USED IN CONJUNCTION WITH THE THRIE-BEAM TRANSITIONS, CURB SHALL BE TYPE II (5- ¾" HEIGHT); SEE CURRENT CCCG STANDARD SHEET FOR FURTHER DETAILS. IF OTHER CURB HEIGHTS ARE SHOWN IN THE PLANS IN CONJUNCTION WITH THE TRANSITION, THE CURB HEIGHT MAY BE FROM 4" TO 8" WITH A RELATIVELY VERTICAL FACE. CONCRETE CURB SHALL BE CONTINUOUS TO THE SEVENTH POST UNLESS OTHERWISE SHOWN IN THE PLANS. SEE GENERAL NOTE: 17 FOR CIRCUMSTANCES WHERE CURB CONTINUES PAST POST 7.
3. CONCRETE CURB TYPE II SUBSIDIARY TO "METAL BEAM GUARD FENCE TRANSITION". IF NO ADDITIONAL CURB IS INDICATED BEYOND THE TRANSITION, THEN ANY CURB HEIGHT GREATER THAN 4" WILL BE TAPERED DOWN BEGINNING AT THE LAST 7 FT. POST TO A MAXIMUM HEIGHT OF 4" AT POST 7. IF SHOWN ELSEWHERE IN THE PLANS, ADDITIONAL CURB UNDERNEATH GUARDRAIL WILL BE PAID FOR BY THE LINEAR FOOT.
4. UNLESS OTHERWISE SHOWN IN THE PLANS, TRANSITIONS SHALL BE PLACED WITH THE BLOCKOUT FACE IN FRONT OF OR DIRECTLY ABOVE THE CURB FACE. SEE SECTION A-A.
5. FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ½" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
6. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. REFER TO GF(31) STANDARD SHEET.
7. THE POST LENGTH SHALL BE MARKED ON ALL 7'- 0" LONG POSTS BY THE MANUFACTURER. THE MARK SHALL BE LOCATED WITHIN THE TOP 1 FT. REGION OF THE POST, AT LEAST ⅝" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
8. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
9. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE THRIE-BEAM TERMINAL CONNECTOR AND THE THRIE-BEAM TRANSITION TO W-BEAM SHALL BE OF THE SAME MATERIAL, BUT SHALL NOT BE LESS THAN 10 GAUGE. CONTRACTOR SHALL VERIFY THAT THE LOCATIONS OF BOLT HOLES MATCH THOSE IN THE THRIE-BEAM TERMINAL CONNECTOR PRIOR TO ORDERING MATERIALS.
10. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
11. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
12. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
13. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
14. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. TXDOT'S MATERIALS AND TESTS DIVISION MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
15. REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
16. THE INSTALLATION OF THE TYPE II CURB IS CRITICAL FOR THE PERFORMANCE OF THE THRIE-BEAM TRANSITION SYSTEM. THE CURB PREVENTS (VEHICLE WHEEL SNAGGING) AT THE CONCRETE RAIL AND IS REQUIRED TO MEET MASH CRASH TEST CRITERIA.
17. IF CURB EXTENDS BEYOND POST 7, 25' OF NESTED W-BEAM GUARDRAIL SHALL BE INSTALLED BEYOND THE PAY LIMITS OF THRIE-BEAM TRANSITION SECTION, (SEE SHT.2). PAYMENT FOR THIS 25' SECTION WILL BE BY LINEAR FOOT, PAY ITEM "0540 6XXX MTL W-BEAM GD FEN (NESTED)(TIM POST)" OR "540 6XXX MTL W-BEAM GD FEN (NESTED)(STEEL POST)" AS APPLICABLE FOR POST TYPE. SEE SHT.2 FOR ADDITIONAL INFORMATION.

HIGH-SPEED TRANSITION

SHEET 1 OF 2

Texas Department of Transportation | Design Division Standard

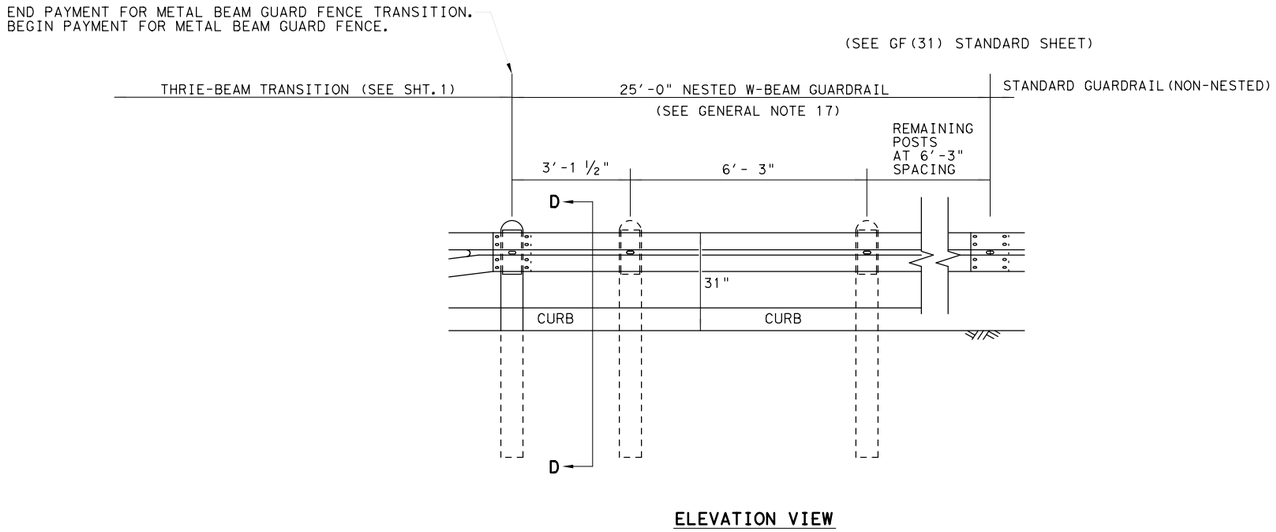
METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

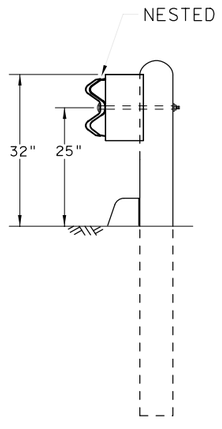
FILE: gf31trt1320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	18	089	VARIOUS
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON		28C

DATE: 2/26/2024
FILE: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms15917\gf31tr1320.dgn

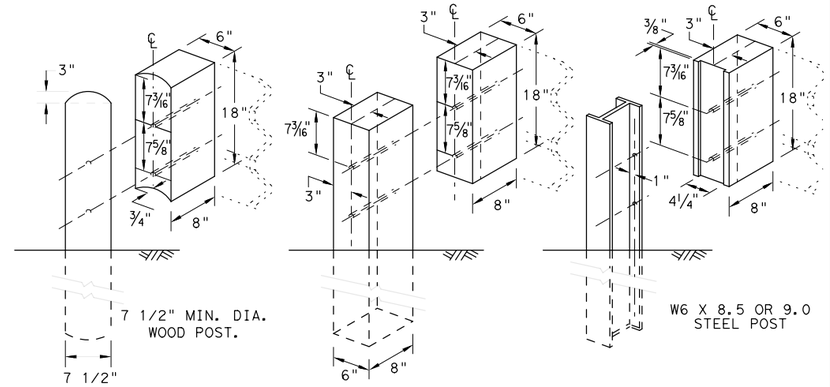
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THRIE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

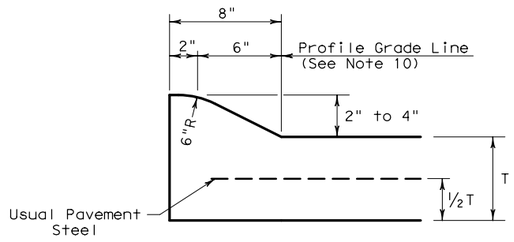
Texas Department of Transportation | Design Division Standard

METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

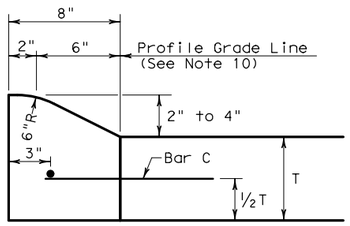
GF(31)TR TL3-20

FILE: gf31tr1320.dgn		DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG		
©TxDOT: NOVEMBER 2020		CONT	SECT	JOB	HIGHWAY		
REVISIONS		0917	18	089	VARIOUS		
		DIST	COUNTY		SHEET NO.		
		BRY	ROBERTSON		28D		

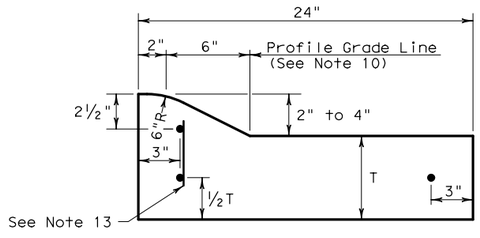
DATE: 2/27/2024
FILE: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms1591\cccg22.dgn



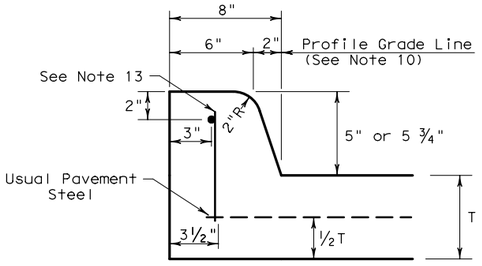
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



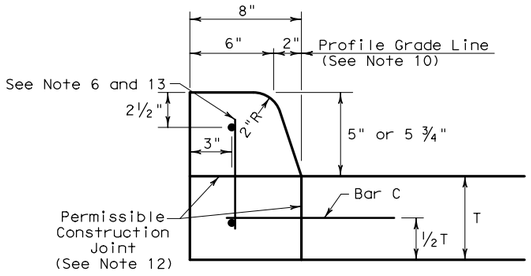
TYPE I CURB
2" - 4" HEIGHT



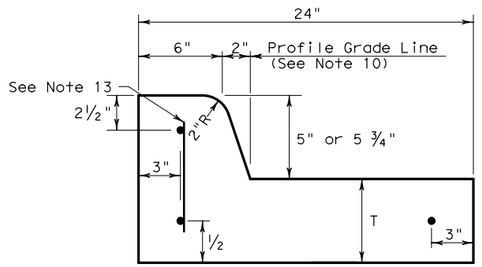
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



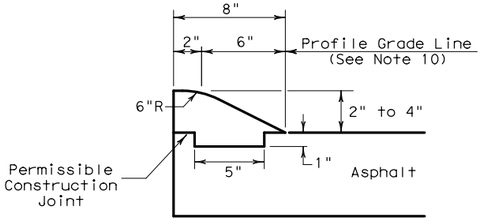
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



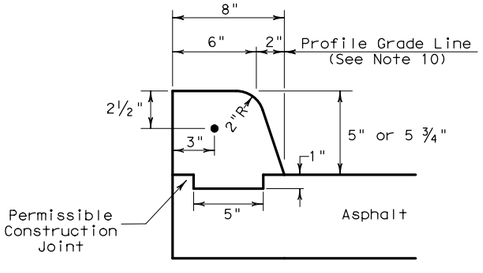
TYPE II CURB
5" - 5 ¾" HEIGHT



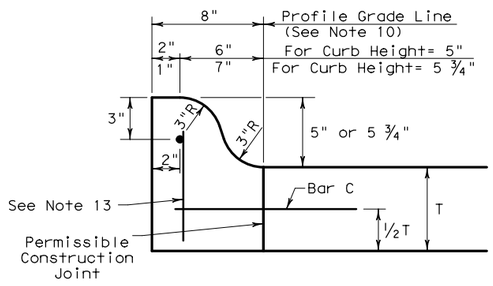
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



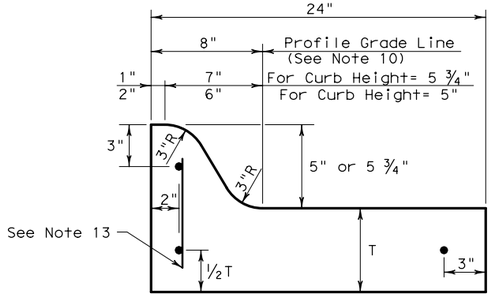
TYPE III CURB (KEYED)
2" - 4" HEIGHT



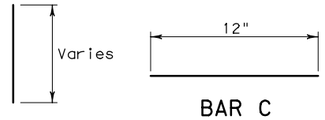
TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



TYPE IIa CURB
5" - 5 ¾" HEIGHT

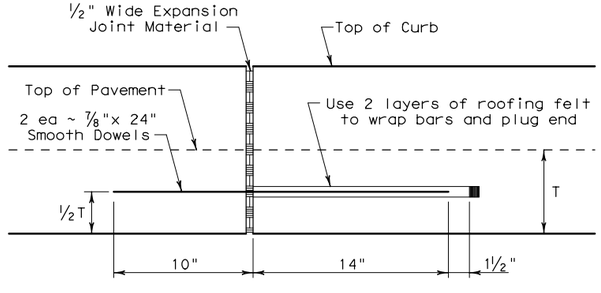


TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT



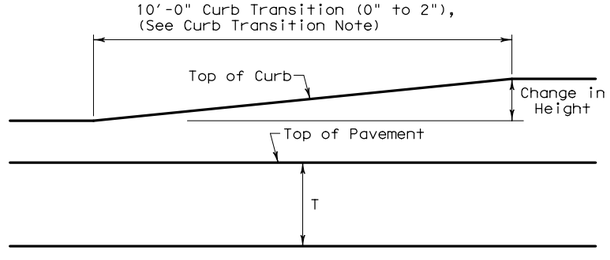
BAR B

BAR C



EXPANSION JOINT DETAIL

CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



CURB TRANSITION
Note: To be paid for as Highest Curb

GENERAL NOTES

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is acceptable. Use fibers meeting the requirements of DMS 4550, "Fibers for Concrete," and dose fibers in accordance with Material Producers List (MPL) "Fibers for Class A and B Concrete Applications."
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and grouted in place, or may be inserted into fresh concrete.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C~C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When horizontal permissible construction joints are used, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans. Reinforcing steel for curb section shall then conform to that required for concrete curb.
13. Bar B placement as needed (typically at four ft. C-C) to support curb reinforcing steel during concrete placement.

Texas Department of Transportation

Design Division Standard

CONCRETE CURB AND CURB AND GUTTER

CCCG-22

FILE: cccg21.dgn	DN: TXDOT	CK: AN	DW: CS	CK: KM
© TxDOT: JUNE 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	18	089	VARIOUS
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON		28E

LOC NO.	TCP PHASE	PLAN SHEET NUMBER	LOCATION	STA	TEST LEVEL	DIRECTION OF TRAFFIC (UNI/BI)	FOUNDATION PAD		BACKUP SUPPORT			AVAILABLE SITE LENGTH	CRASH CUSHION									
															MOVE / RESET		L	L	R	R	S	S
							PROPOSED MATERIAL	PROPOSED THICKNESS	DESCRIPTION	WIDTH	HEIGHT		INSTALL	REMOVE	MOVE/ RESET	FROM LOC.#	N	W	N	W	N	W
092	N/A	35	SW CORNER OF SH 6 AT SANDY CREEK	123+50	TL-3	UNI	CONC	4"	T551 (MOD) RETROFIT	1′-0" (NOM)	2′-8"	50′	1								1	
												TOTALS	1									

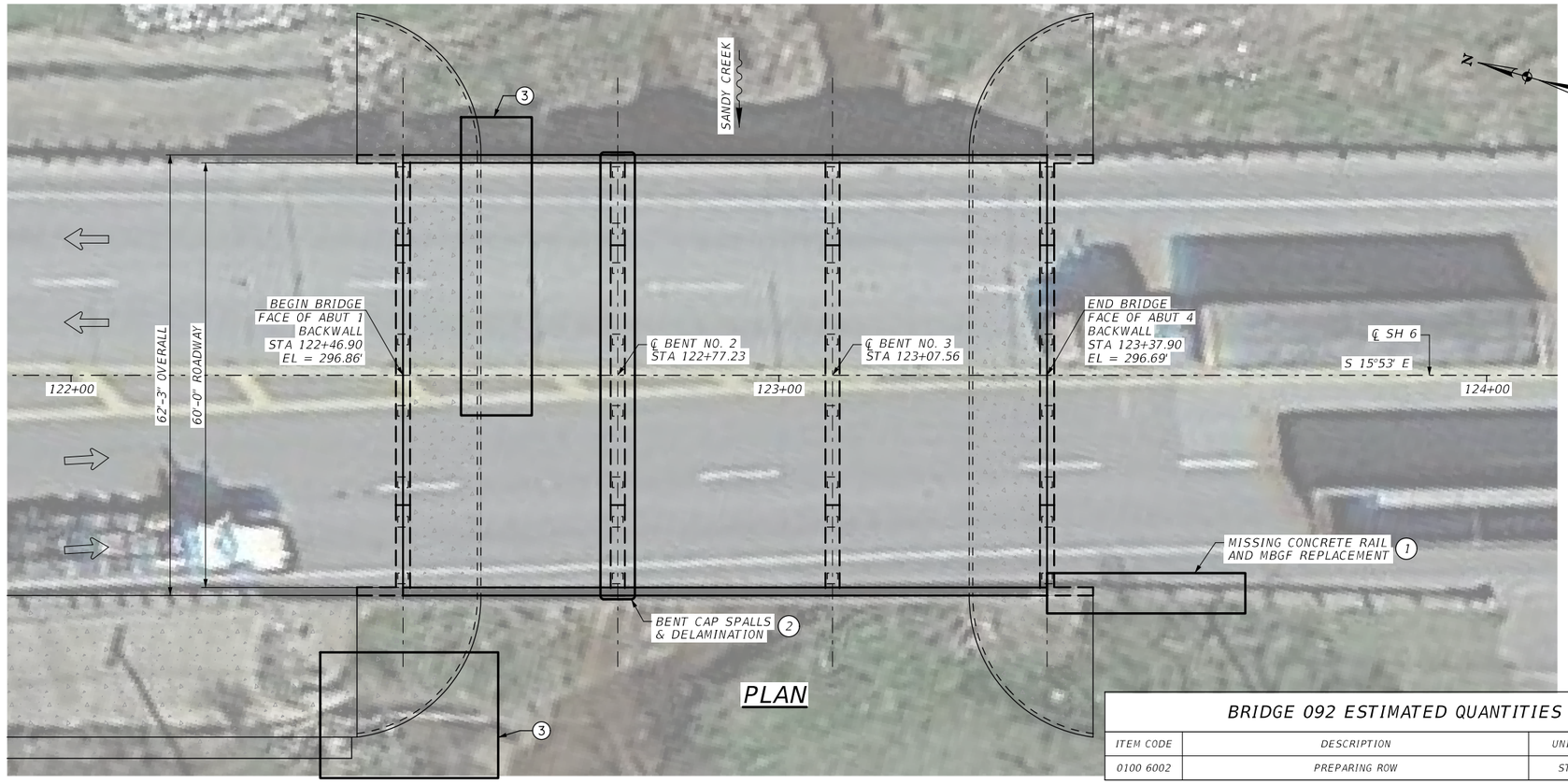
LEGEND:

L=LOW MAINTENANCE
R=REUSABLE
S=SACRIFICIAL
N=NARROW
W=WIDE

FOR DEFINITIONS SEE THE "CRASH CUSHION CATEGORIZATION CHART.PDF" AT THE DESIGN DIVISION (ROADWAY STANDARDS) WEBSITE. USE QUICK LINKS TO ACCESS ATTENUATORS / CRASH CUSHIONS SECTION.
http://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/rdwylse.htm

CRASH CUSHION SUMMARY SHEET

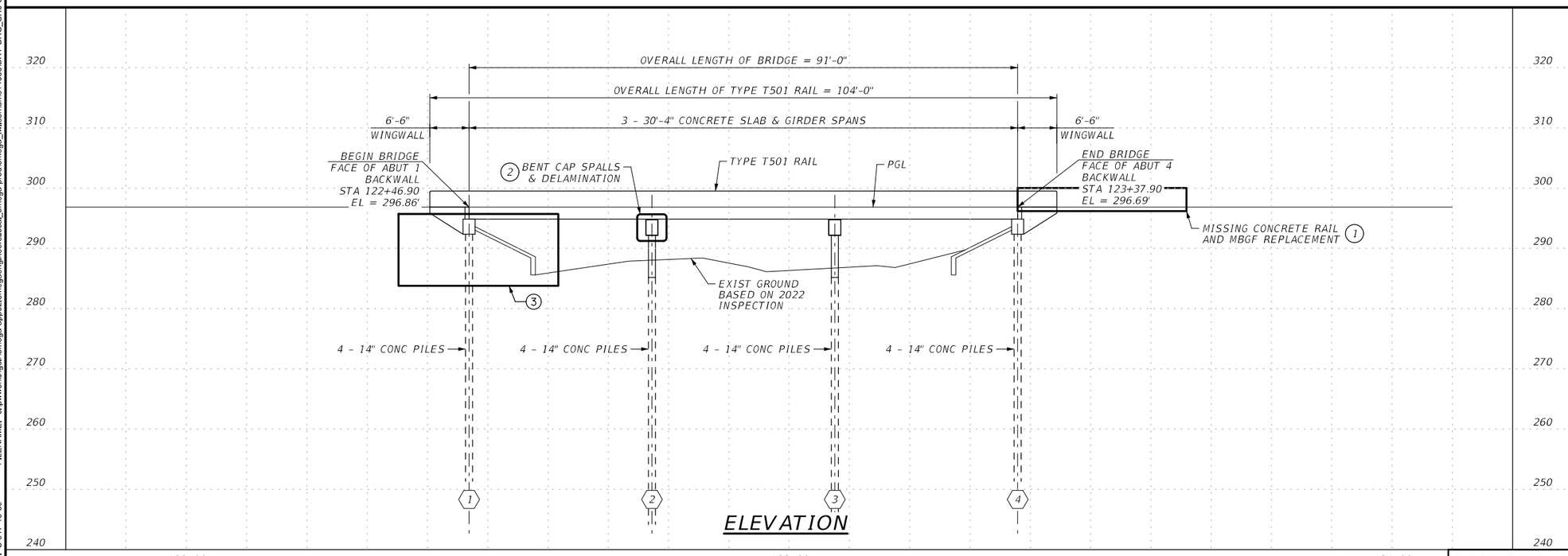
FILE: ccss.dgn	DN: TxDOT	CK:	CK:
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	18	089	VARIOUS
	DIST	COUNTY	
	BRY	ROBERTSON	
	FEDERAL AID PROJECT		SHEET NO.
	C 917-18-89		29



PLAN

BRIDGE 092 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0100 6002	PREPARING ROW	STA	1



ELEVATION

BRIDGE 092

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-121 REPAIR DETAIL FOR ADDITIONAL INFORMATION.

(2) SEE R-122 REPAIR DETAIL FOR ADDITIONAL INFORMATION.

(3) SEE R-123 REPAIR DETAILS AND EXISTING CONDITIONS FOR ADDITIONAL INFORMATION.

EXIST NBI NUMBER: 17-198-0-0049-07-114

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

SH 6 AT SANDY CREEK
NBI: 17-198-0-0049-07-114
BRIDGE LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	30

REV DATE: 2-12-2015
CSJ: C 917-18-89
FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms140561BRY-BRG_SH6 OVER SANDY CR_LAY_01.dgn

R-121 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0451 6015	RETROFIT RAIL (TY T551)	LF	7

PHOTO 1

(MISSING SECTION OF CONCRETE BRIDGE RAIL OVER SW WINGWALL)

GENERAL NOTES:

1. PERFORM CONCRETE 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. NOTIFY EOR IF EXISTING CONDITIONS DO NOT MATCH THE PHOTOS DURING REPAIR.
4. ELEMENT LOCATIONS AND DIMENSIONS ARE APPROXIMATE AND BASED ON AS-BUILT PLANS, AERIAL PHOTOS, AND SITE VISITS. ACTUAL LOCATIONS AND DIMENSIONS SHOULD BE FIELD VERIFIED.
5. REFER TO SHEET 2 FOR RAIL RETROFIT DETAILS.
6. REFER TO SHEET 3 FOR METAL BEAM GUARDFENCE LAYOUT AND QUANTITIES.

STATE OF TEXAS
BRADLEY D. SHUEY
86490
LICENSED PROFESSIONAL ENGINEER
1/24/2024

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
	1/24/2024	

Texas Department of Transportation
Bryan District

SH 6 AT SANDY CREEK
NBI: 17-198-0-0049-07-114
R-121 REPAIR DETAILS

SHEET 1 OF 3 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	31

BRIDGE 092

REV DATE: 2-12-2015
CSJ: C 917-18-89

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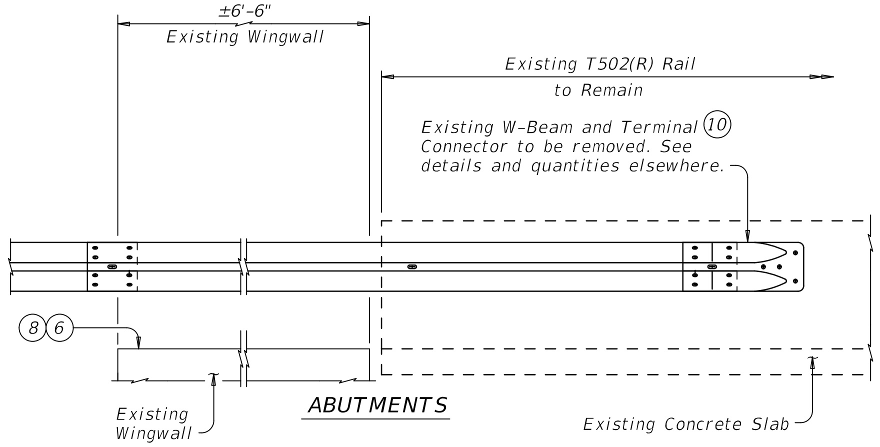
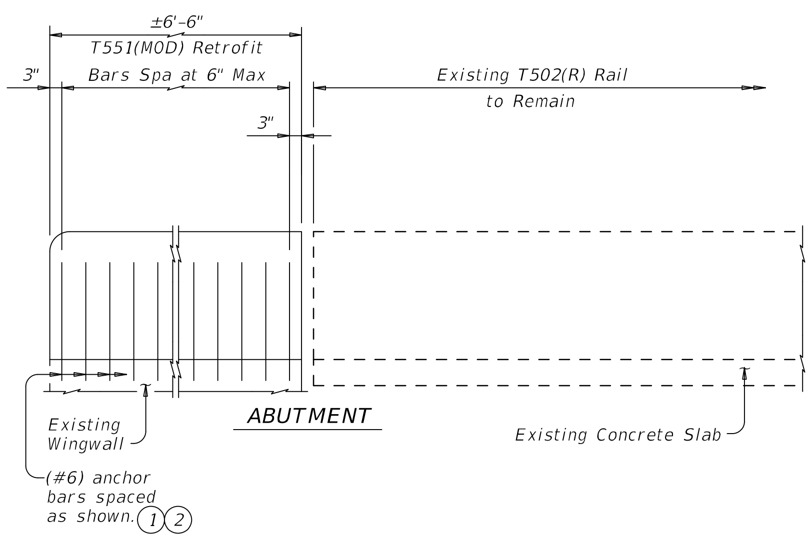
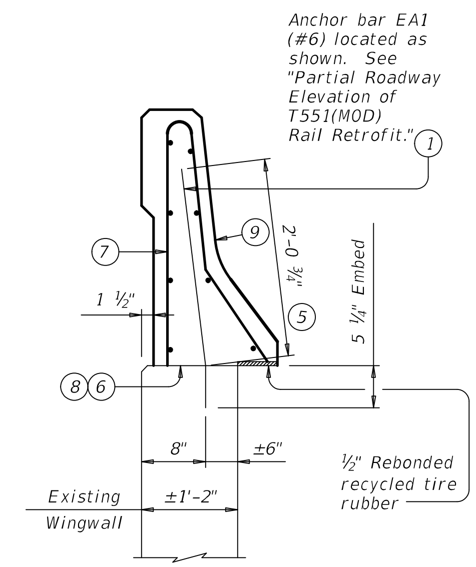


PARTIAL ROADWAY ELEVATION OF EXISTING T502(R) RAIL AND MBGF



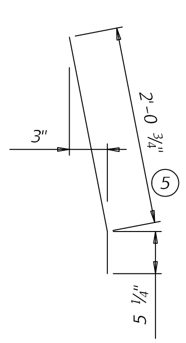
PARTIAL ROADWAY ELEVATION OF T551(MOD) RAIL RETROFIT (3)



T551(MOD) RAIL

RAIL RETROFIT SECTION ON WINGWALL (4)

Using Adhesive Anchors



ANCHOR
BAR EA1 (#6)

(1) Embed (#6) anchor bars with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 5 ¼". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 20 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

(2) See T551(MOD) Rail Section in "Rail Retrofit Section on Wingwalls (using Adhesive Anchors)"

(3) Showing spacing of (#6) adhesive anchor in a rail retrofit condition. Reinforcing steel and terminal connections not shown for clarity. See T551(MOD) rail standard for details and notes not shown.

(4) Showing location or locations of anchor bars in a rail retrofit condition. See appropriate rail standard for details and notes not shown.

(5) Increase by amount of existing overlay/seal coat thickness, not to exceed 2". If thickness of existing overlay/seal coat is greater than 2" at toe of rail, taper overlay at a 1:10 or flatter slope over shoulder width to a thickness of 2" or less at toe of rail.

(6) Do not cast rails or parapet walls on top of overlays/seal coats.

(7) See T551(MOD) rail standard for reinforcing steel. Modify length of vertical reinforcing bars as required to fit existing structure only as directed by the Engineer.

(8) Clean top of existing wingwall of all laitance and debris. Remove remaining fragments of damaged/existing concrete rail to top of existing wingwall. Existing reinforcing shall be trimed flush with top of existing wingwall.

(9) Face of rail and/or toe of rail. Location or placement of rail retrofit must match face of rail and/or toe of rail on bridge.

(10) Remove MBGF (W-Beam) portions, terminal connector, and attachment hardware, from the face of the existing concrete rail. Dispose of these materials as directed by the Engineer. Plug existing bolt holes with epoxy grout or as directed by the Engineer. This work is considered subsidiary to the pertinent bid items.

CONSTRUCTION NOTES:

Field verify dimensions before commencing work and ordering materials.

Slip forming is not allowed for this location.

Welding of reinforcment is not permitted unless approved by the Engineer.

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test a minimum of 3 anchors unless otherwise directed by the Engineer. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testingas directed.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if required elsewhere.

(#6) and (#4) anchor bars used for the adhesive anchorage system must not be epoxy coated within the required embedment.

GENERAL NOTES:

The details provided on this sheet have been developed based on the TxDOT Standard RETROFIT GUIDE FOR CONCRETE RAILS (C-RAIL-R). The Use of these retrofit details will result in a railing acceptable for the MASH Test Level indicated on the applicable rail standard.

Removal and replacement of backfill, subgrade, and asphalt or concrete pavement necessary for this installation is considered subsidiary to the retrofit railing.

Payment for the Type T551(MOD) retrofit shall be paid for as Item 451-6015 "RETROFIT RAIL (TY 551). All details shown herein are subsidiary to rail retrofit.

Reinforcing bar dimensions shown are out-to-out of bar.

STATE OF TEXAS
BRADLEY D. SHUEY
86490
LICENSED
PROFESSIONAL ENGINEER
1/24/2024

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
	1/24/2024	

Texas Department of Transportation
Bryan District

SH 6 AT SANDY CREEK
NBI: 17-198-0-0049-07-114
R-121 REPAIR DETAILS

SHEET 2 OF 3 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6	C 917-18-89	VARIOUS	
STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	32

BRIDGE 092

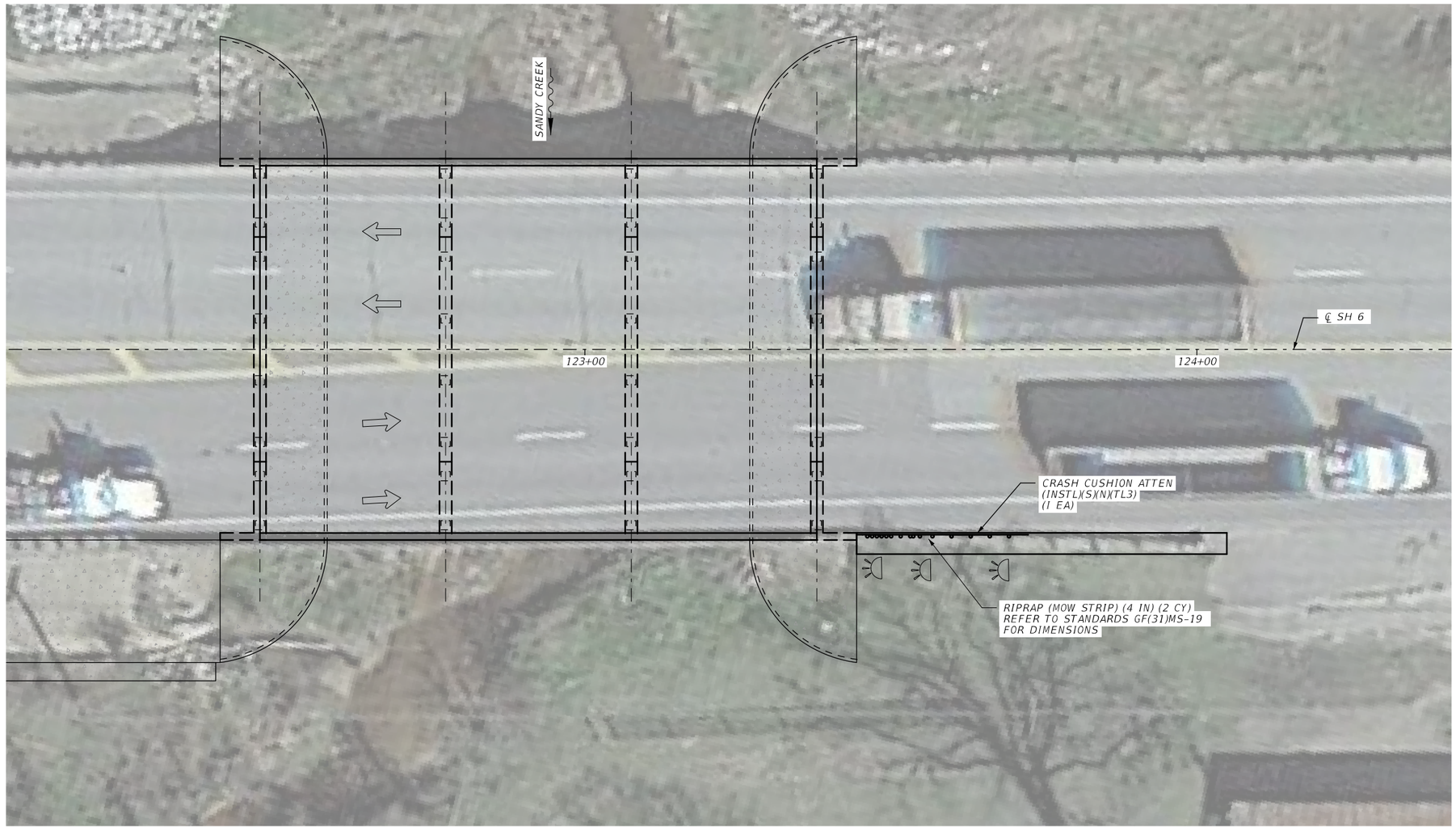
FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms14056\BRY-BRG_R-121_02.dgn
REV DATE: 2-12-2015
CSJ: C 917-18-89

ROADWAY ESTIMATED QUANTITIES

432 6045	RIPRAP (MOW STRIP)(4 IN)	CY	2
542 6001	*REMOVE METAL BEAM GUARD FENCE	LF	13
545 6019	**CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	1
658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	3

*REMOVE TERMINAL CONNECTOR AND MBGF TRANSITION BETWEEN CONCRETE RAIL AND GAURDRAIL END TREATMENT.

** SSCC-16 OR CATCB(1)-17 MAY BE USED. IF CATCB(1)-17 IS USED, THE THRIE-BEAM TRANSITION IS SUBSIDIARY TO ITEM 545.



N

LEGEND

INST DEL ASSM (D-SW) SZ-1(BRF) GF2

STATE OF TEXAS
PAUL R. HAHN III
107365
LICENSED PROFESSIONAL ENGINEER
2/26/2024

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
2/26/2024	

Texas Department of Transportation
Bryan District

SH 6 AT SANDY CREEK
NBI: 17-198-0-0049-07-114
R-121 REPAIR DETAILS

SHEET 3 OF 3 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	33

BRIDGE 092

REV DATE: 2-12-2015
CSJ: C 917-18-89

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PHOTO 1

(NORTH FACE OF NORTH INTERIOR BENT CAP HAS LARGE SPALLING AND FAILING REPAIRS)

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-122 ESTIMATED QUANTITIES

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

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
1/24/2024

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
	1/24/2024	

Texas Department of Transportation
Bryan District

SH 6 AT SANDY CREEK
NBI: 17-198-0-0049-07-114
R-122 REPAIR DETAILS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	34

BRIDGE 092

REV DATE: 2-12-2015
CSJ: C 917-18-89

FILENAME: c:\pw\working\dir\omega-app02.omegaengineers.local_omega-pro\omega_twilson\dms14056\BRY-BRG_R-122_01.dgn

PHOTO 1

(NW CONCRETE RIPRAP CRACKED RESULTING IN A VOID UP TO 3.5' DEEP. RIPRAP TOEWALL SCOURED AND EXPOSED UP TO 3')

PHOTO 3

(NW DRAINAGE FLUME IS SCOURED AND UNDERMINED WITH VOID UP TO 3.5' DEEP)

PHOTO 2

(VOID UNDER CONCRETE RIPRAP NW CORNER UP TO 3.5' DEEP DUE TO CONCRETE CRACK)

PHOTO 4

(ABUTMENT 1 HEADER RIPRAP TOEWALL IS EXPOSED UP TO 3')

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

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
	1/24/2024	

Texas Department of Transportation
Bryan District

SH 6 AT SANDY CREEK
NBI: 17-198-0-0049-07-114
EXISTING CONDITIONS

SHEET 1 OF 1 SHEET

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	35

BRIDGE 092

REV DATE: 2-12-2015
CSJ: C 917-18-89

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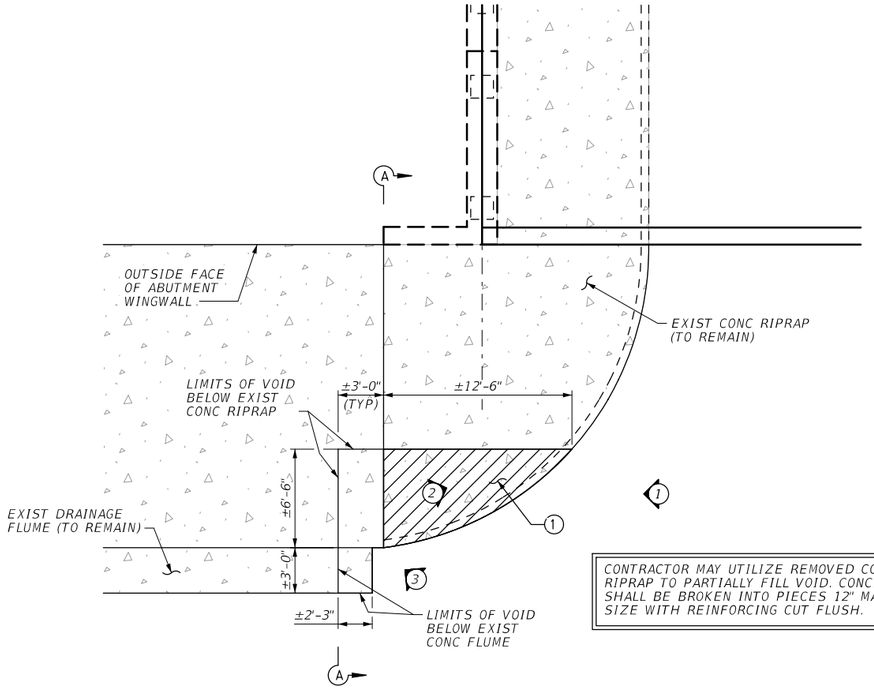
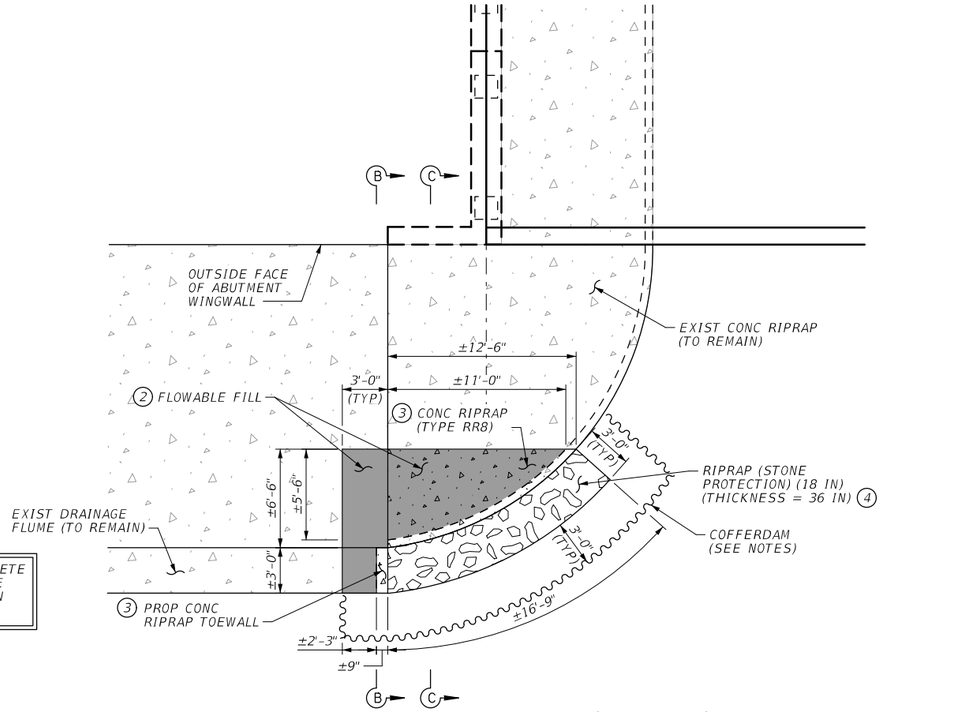


PLAN AT ABUTMENT 1 (REMOVAL)

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 ABUTMENT 1 (REPAIR)

LEGEND:

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

(1) REMOVE HATCHED AREA OF CRACKED EXISTING RIPRAP AS SHOWN. ITEM 104-6009 REMOVING CONC (RIPRAP) ~ EST 6 SY.

(2) PLACE FLOWABLE FILL TO FILL VOID BELOW EXISTING ABUTMENT RIPRAP AND CONCRETE FLUME. ITEM 401-6001 FLOWABLE BACKFILL ~ EST 10 CY.

(3) INSTALL CONCRETE RIPRAP AND TOEWALL PER CRR STANDARD AND AS SHOWN. ITEM 432-6008 RIPRAP (CONC) (CL B) (RR8 & RR9) ~ EST 4 CY.

(4) INSTALL STONE PROTECTION PER SRR STANDARD. ITEM 432-6033 RIPRAP (STONE PROTECTION) (18 IN) ~ EST 6 CY.

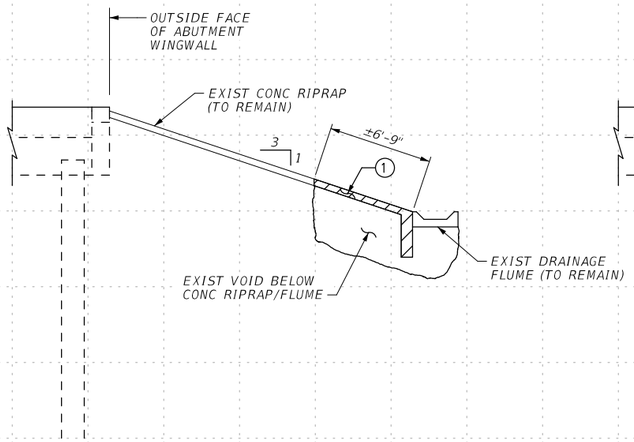
COFFERDAM NOTES:

SANDY CREEK IS AN EPHEMERAL STREAM WITH LITTLE TO NO BASE FLOW EXCEPT DURING AND AFTER RAINFALL RUNOFF EVENTS. CONTRACTOR SHALL DETERMINE IF COFFERDAM IS NECESSARY WITHIN THE TIME REQUIRED TO PERFORM WORK WITHIN THE CHANNEL.

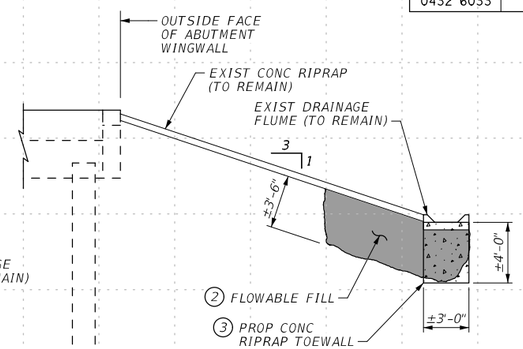
QUANTITY FOR COFFERDAM SHOWN IS FOR BIDDING PURPOSES ONLY. SEE GENERAL NOTES FOR ADDITIONAL INFORMATION.

R-123 ESTIMATED QUANTITIES

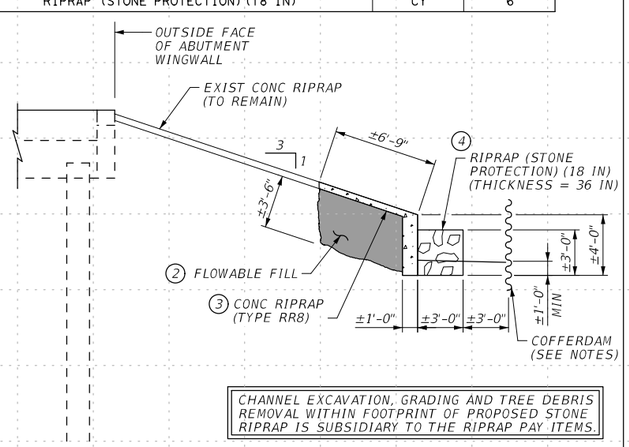
ITEM CODE	DESCRIPTION	UNITS	TOTAL
0104 6009	REMOVING CONC (RIPRAP)	SY	6
0401 6001	FLOWABLE BACKFILL	CY	10
0403 6006	TEMPORARY SPL SHORING (COFFERDAM)	SF	274
0432 6008	RIPRAP (CONC) (CL B) (RR8&RR9)	CY	4
0432 6033	RIPRAP (STONE PROTECTION) (18 IN)	CY	6



SECTION A-A (REMOVAL)



SECTION B-B (REPAIR)



SECTION C-C (REPAIR)

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

BRIDGE 092

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

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
VERTICAL 0 5 10 20 FT

100% SUBMITTAL	PRINT DATE	REVISION DATE
	1/24/2024	

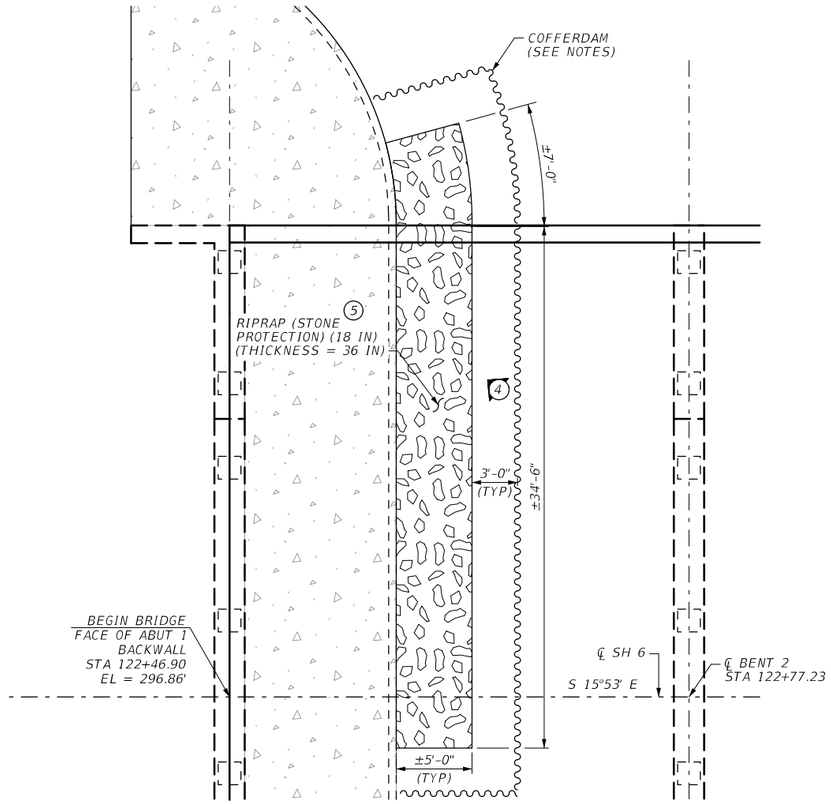
SH 6 AT SANDY CREEK
NBI: 17-198-0-0049-07-114
R-123 REPAIR DETAILS

SHEET 1 OF 2 SHEETS

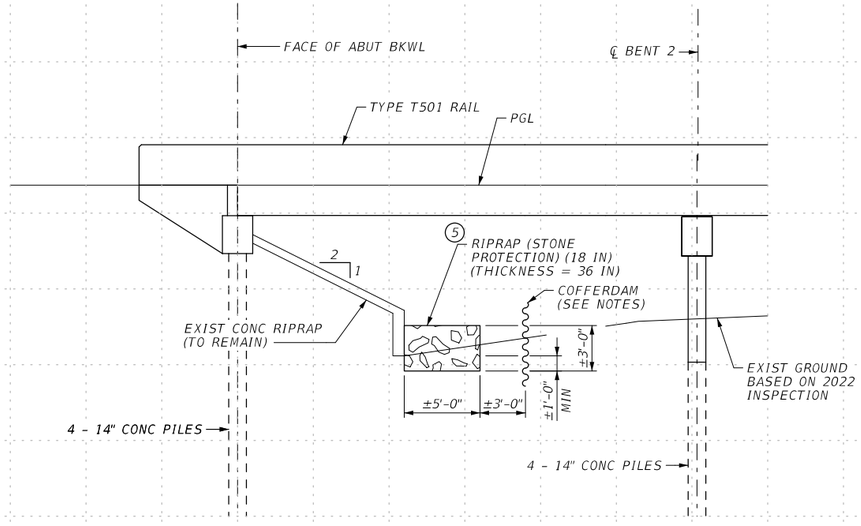
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	36

FILENAME: c:\pwworking\dfromega-app02.omegaengineers.local_omega-prod\omega_twilson\dms\14056\BRY-BRG_R-123_01.dgn
REV DATE: 2-12-2015
CSJ: C 917-18-89



PLAN AT ABUTMENT 1



ELEVATION AT ABUTMENT 1

R-123 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0403 6006	TEMPORARY SPL SHORING (COFFERDAM)	SF	315
0432 6033	RIPRAP (STONE PROTECTION) (18 IN)	CY	23

LEGEND:

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

(5) INSTALL STONE PROTECTION PER SRR STANDARD. ITEM 432-6033 RIPRAP (STONE PROTECTION) (18 IN) ~ EST 23 CY.

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

COFFERDAM NOTES:

SANDY CREEK IS AN EPHEMERAL STREAM WITH LITTLE TO NO BASE FLOW EXCEPT DURING AND AFTER RAINFALL RUNOFF EVENTS. CONTRACTOR SHALL DETERMINE IF COFFERDAM IS NECESSARY WITHIN THE TIME FRAME REQUIRED TO PERFORM WORK WITHIN THE CHANNEL.

QUANTITY FOR COFFERDAM SHOWN IS FOR BIDDING PURPOSES ONLY. SEE GENERAL NOTES FOR ADDITIONAL INFORMATION.

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

Texas Department of Transportation
Bryan District

SH 6 AT SANDY CREEK
NBI: 17-198-0-0049-07-114
R-123 REPAIR DETAILS

SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	37

BRIDGE 092

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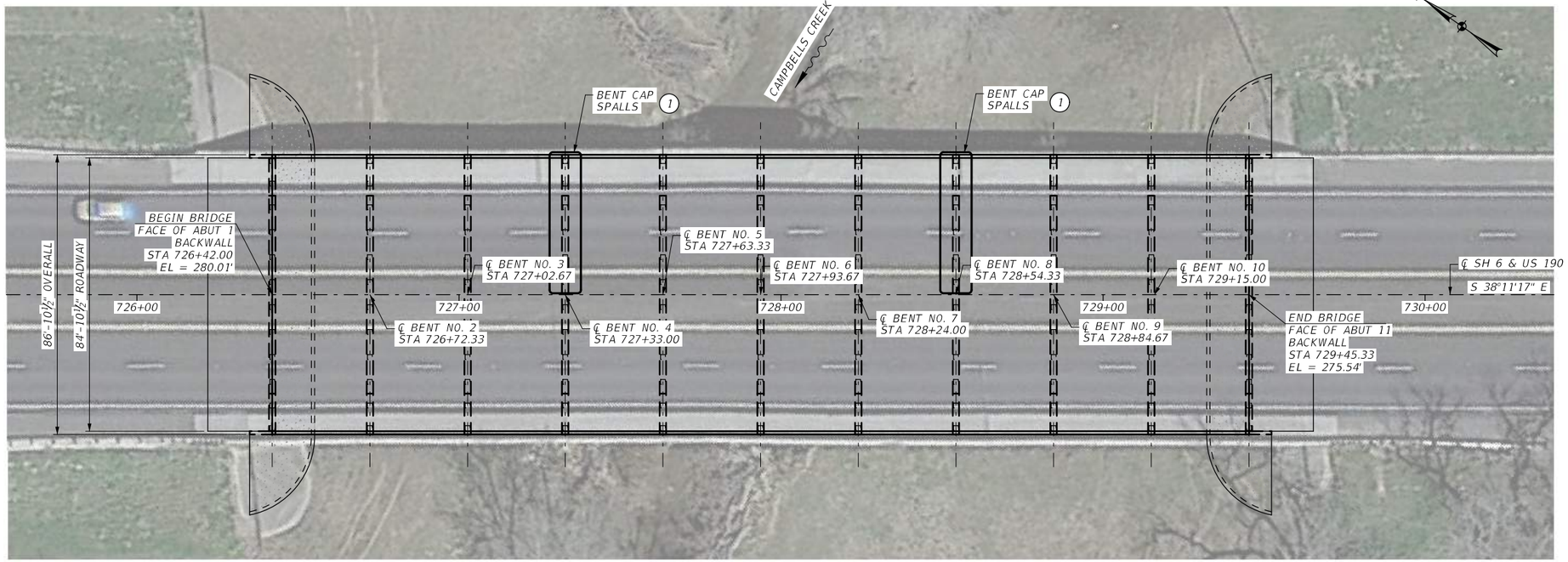
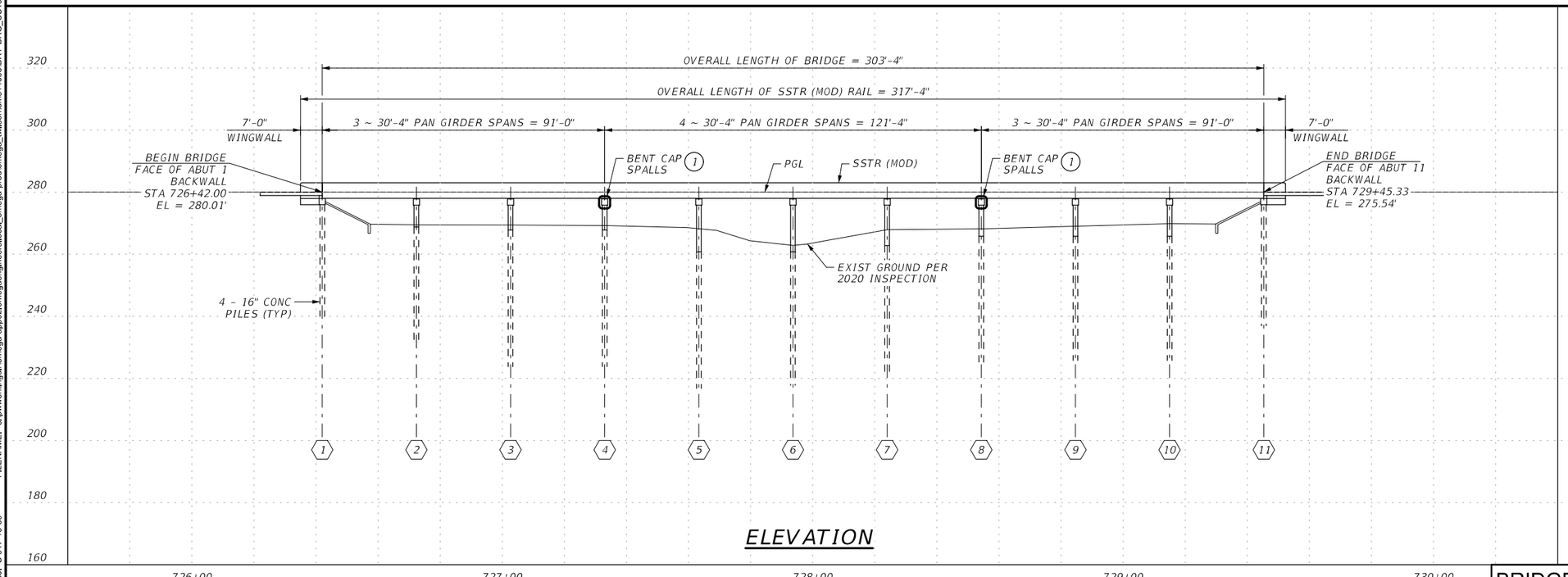
REV DATE: 2-12-2015
CSJ: C 917-18-89



PLAN



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-124 REPAIR DETAILS FOR ADDITIONAL INFORMATION.

EXIST NB NBI NUMBER: 17-198-0-0049-08-066

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

US 190/SH 6 NB AT CAMPBELLS CR
NBI: 17-198-0-0049-08-066
BRIDGE LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	38

BRIDGE 094

FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms140581BRY-BRG_US190 SH6 NB OVER CAMPBELLS CR_LAY_01.dgn
REV DATE: 2-12-2015
CSJ: C 917-18-89

PHOTO 1

(MODERATE SPALLING WITH EXPOSED STEEL ON SE FACE OF BENT CAP 4)

PHOTO 2

(MODERATE SPALLING ON NW FACE OF BENT CAP 8)

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.

PHOTO 3

(MODERATE SPALLS AND DELAMINATION ON SE FACE OF BENT CAP 4)

R-124 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0429 6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	28

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

Texas Department of Transportation
Bryan District

US 190/SH 6 NB AT CAMPBELLS CR
NBI: 17-198-0-0049-08-066
R-124 REPAIR DETAILS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	39

BRIDGE 094

REV DATE: 2-12-2015
CSJ: C 917-18-89

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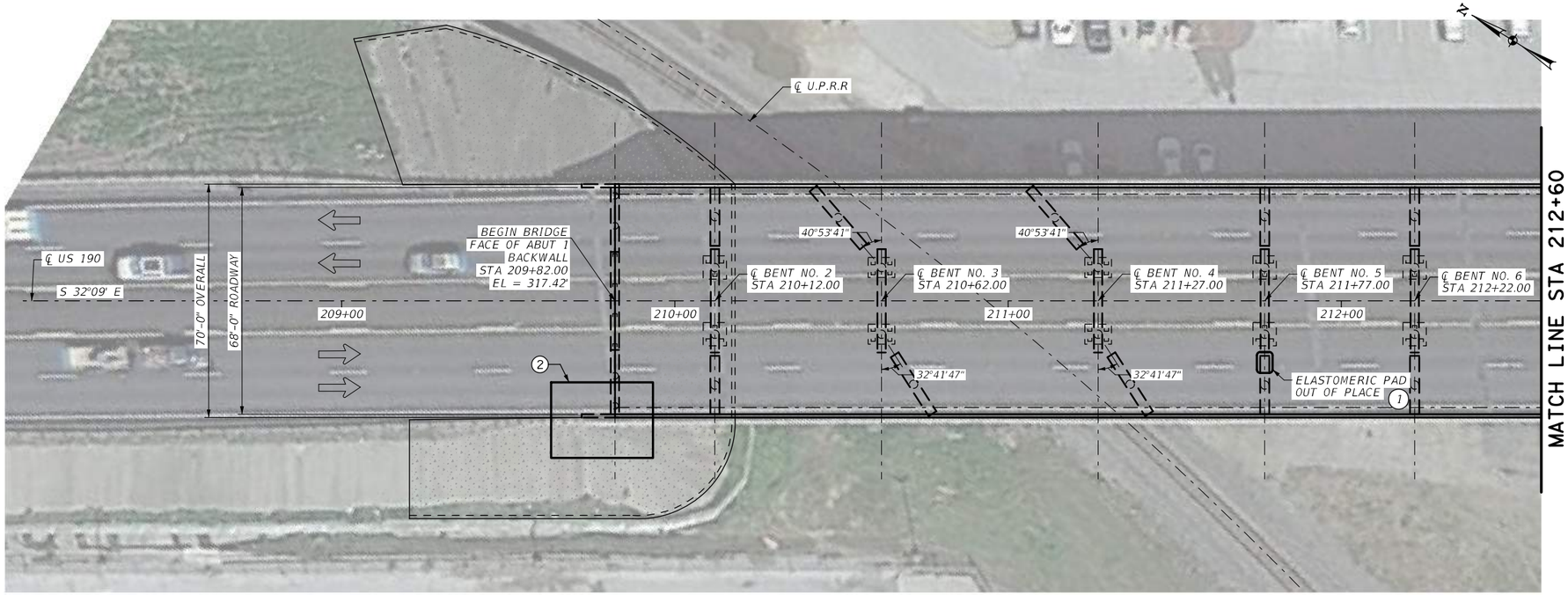
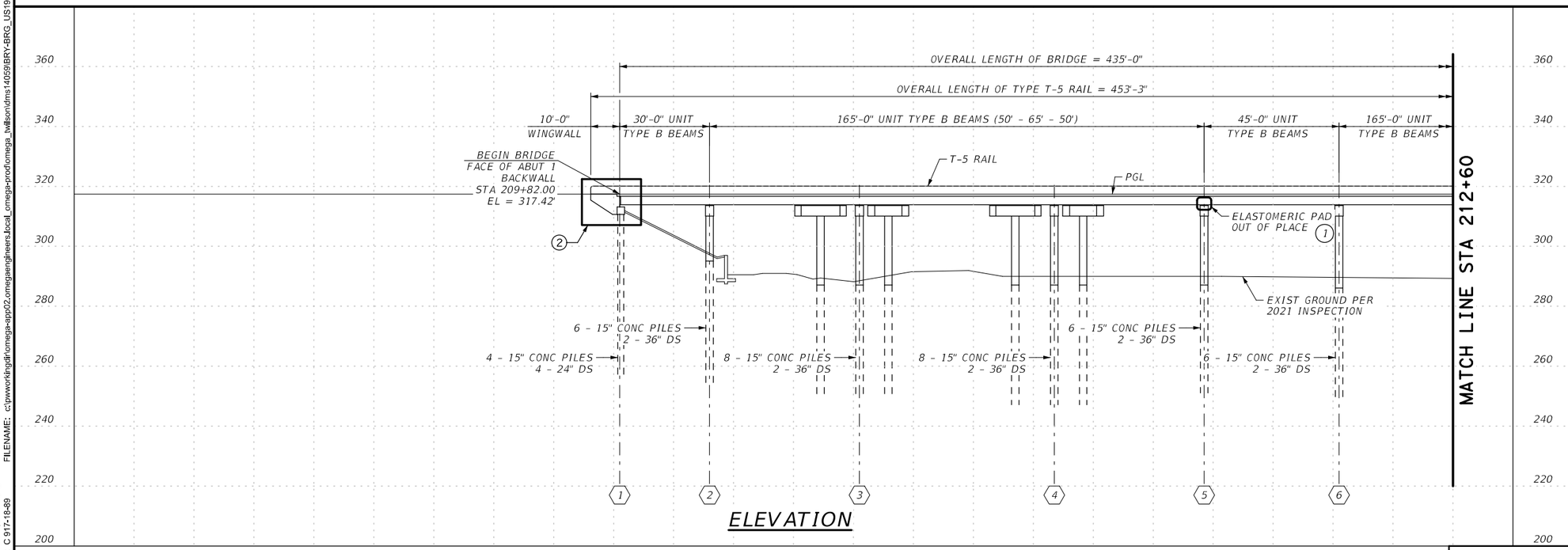


PLAN



ELEVATION

BRIDGE 095

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.

(1) SEE R-322 REPAIR DETAIL FOR ADDITIONAL INFORMATION.

(2) SEE R-126 REPAIR DETAILS AND EXISTING CONDITIONS FOR ADDITIONAL INFORMATION.

EXIST NBI NUMBER: 17-198-0-0049-08-116

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
1/24/2024

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 20 40 80 FT
0 20 40 80 FT
VERTICAL

100% SUBMITTAL

PRINT DATE	REVISION DATE
1/24/2024	

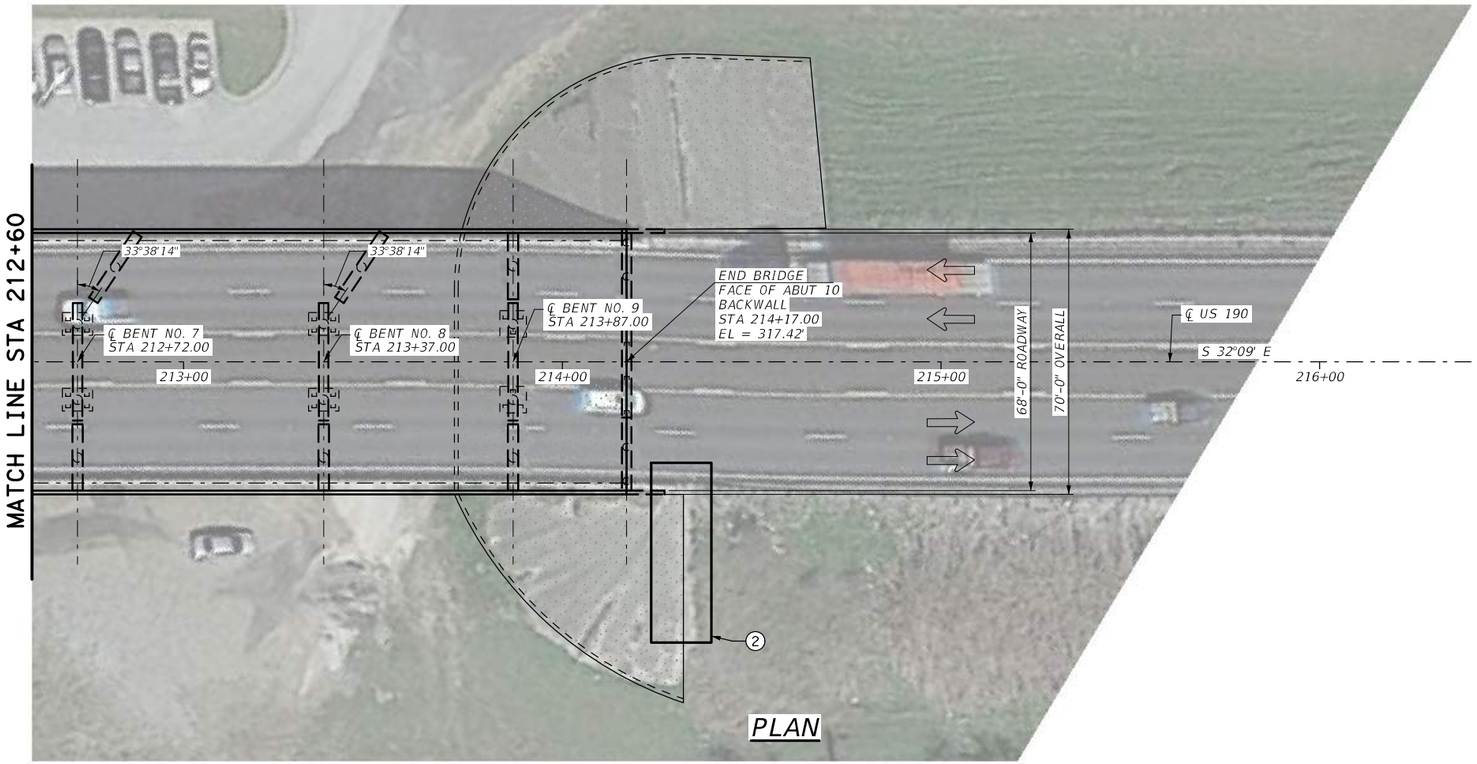
US 190/SH 6 AT U.P.R.R.
NBI: 17-198-0-0049-08-116
BRIDGE LAYOUT

SHEET 1 OF 2 SHEETS

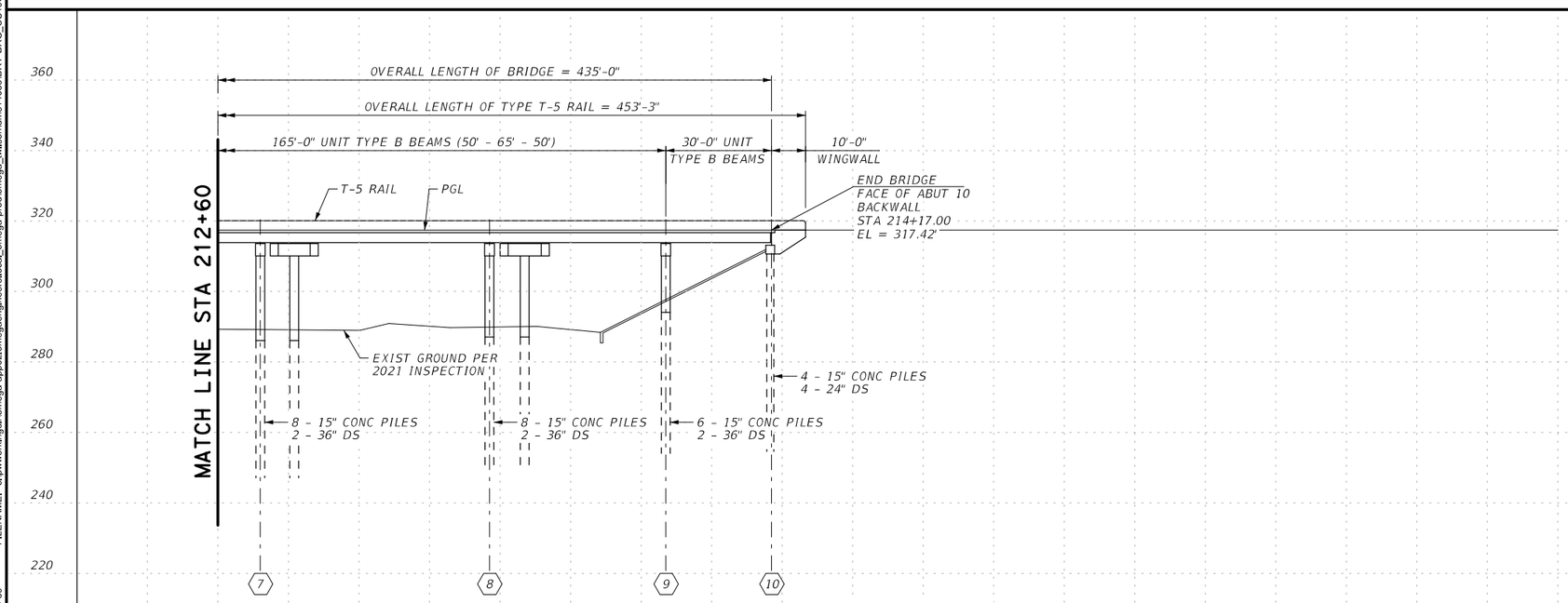
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	40

FILENAME: c:\pwworking\dfriomega-app02.omegaengineers.local_omega-prod\omega_twilson\dms1405918\BRY-BRG_US190 OVER UPRR_LAY_01.dgn
REV DATE: 2-12-2015
CSJ: C 917-18-89



PLAN



ELEVATION

2 SEE R-126 REPAIR DETAILS AND EXISTING CONDITIONS FOR ADDITIONAL INFORMATION.

EXIST NBI NUMBER: 17-198-0-0049-08-116

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED PROFESSIONAL ENGINEER
1/24/2024

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 20 40 80 FT
0 20 40 80 FT
VERTICAL

100% SUBMITTAL

PRINT DATE	REVISION DATE
1/24/2024	

US 190/SH 6 AT U.P.R.R.
NBI: 17-198-0-0049-08-116
BRIDGE LAYOUT

SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	41

BRIDGE 095

FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms140591BRY-BRG_US190 OVER UPRR_LAY_02.dgn
REV DATE: 2-12-2015
CSJ: C 917-18-89

PHOTO 1

(CONCRETE RIPRAP AT ABUTMENT 1 WEST WINGWALL HAS SETTLED AND CRACKED CREATING A VOID UP TO 3' DEEP)

PHOTO 2

(EROSION DUE TO ROADWAY RUNOFF AT SOUTH BRIDGE CORNER EXPOSED EDGE OF DRAINAGE FLUME AND CREATED AN EROSION DITCH IN EMBANKMENT UP TO 1.5' DEEP)

REV DATE: 2-12-2015
CSJ: C 917-18-89

FILENAME: c:\pw\working\dir\omega-app02.omegaengineers.local_omega-prod\omega_lwilson\dms14059\BRY-BRG_EC_095_01.dgn

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

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
	1/24/2024	

Texas Department of Transportation
Bryan District

US 190/SH 6 AT U.P.R.R.
NBI: 17-198-0-0049-08-116
EXISTING CONDITIONS

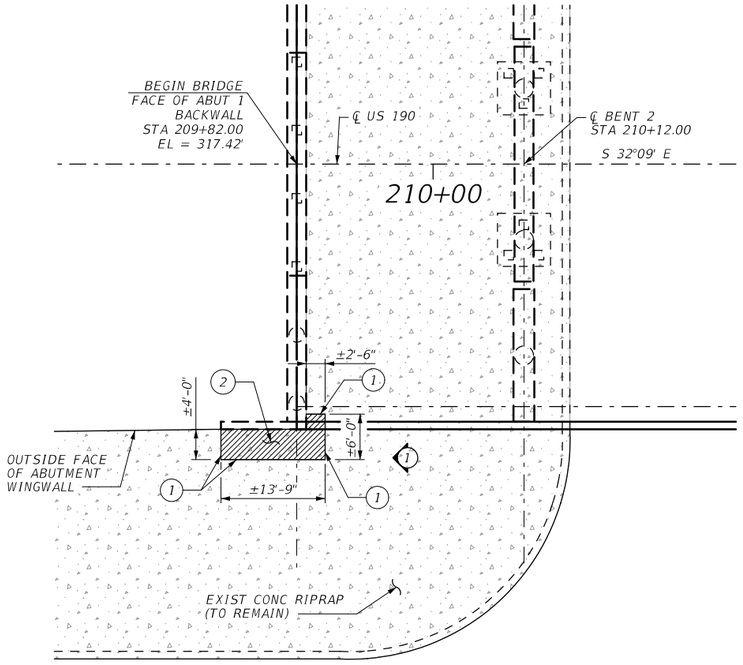
SHEET 1 OF 1 SHEET

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

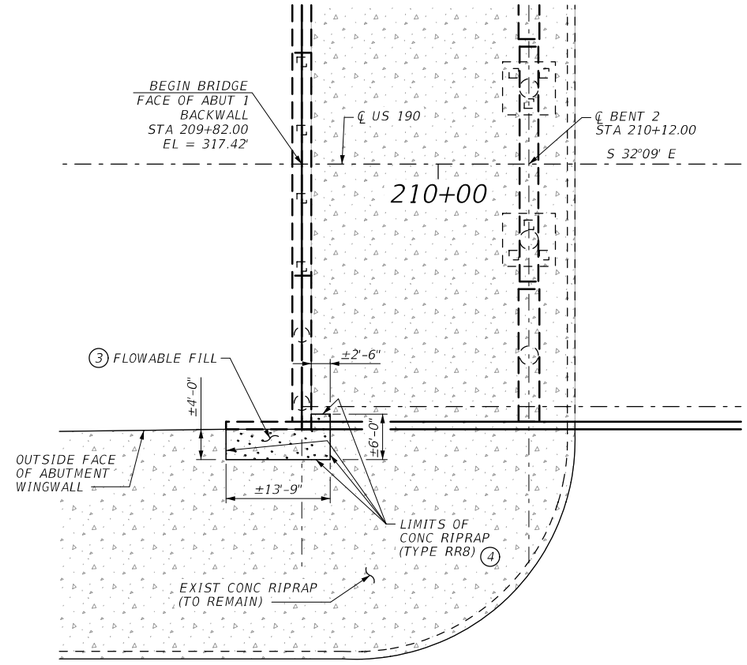
STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	42

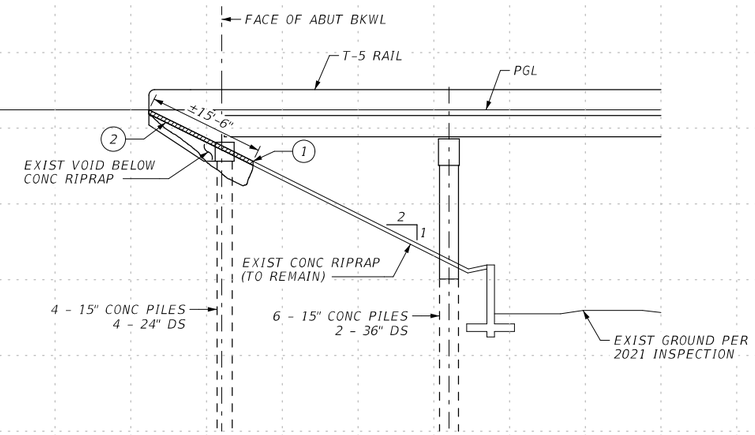
BRIDGE 095



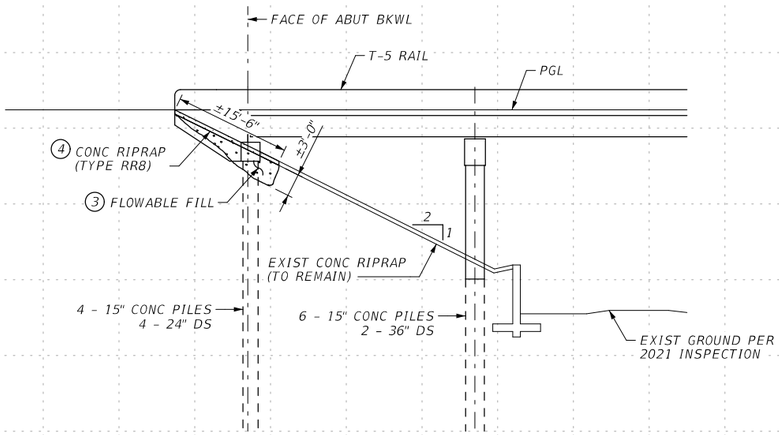
PLAN AT ABUTMENT 1 (REMOVAL)



PLAN AT ABUTMENT 1 (REPAIR)



ELEVATION AT ABUTMENT 1 (REMOVAL)



ELEVATION AT ABUTMENT 1 (REPAIR)

R-126 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0104 6009	REMOVING CONC (RIPRAP)	SY	7
0401 6001	FLOWABLE BACKFILL	CY	5
0432 6008	RIPRAP (CONC) (CL B) (RR8&RR9)	CY	1

LEGEND:

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

1. SAWCUT TO A ½" MIN DEPTH AS SHOWN. CLEAN AND EXTEND REINFORCING 1'-0" MIN INTO NEW CONSTRUCTION.
2. REMOVE HATCHED AREA OF EXISTING RIPRAP AS SHOWN. ITEM 104-6009 REMOVING CONC (RIPRAP) ~ EST 7 SY.
3. PLACE FLOWABLE FILL TO FILL VOID BELOW EXISTING ABUTMENT RIPRAP AND TO RE-ESTABLISH 2:1 SLOPE. ITEM 401-6001 FLOWABLE BACKFILL ~ EST 5 CY.
4. INSTALL CONCRETE RIPRAP PER CRR STANDARD. ITEM 432-6008 RIPRAP (CONC) (CL B) (RR8 & RR9) ~ EST 1 CY.

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

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED
PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

Texas Department of Transportation
Bryan District

US 190/SH 6 AT U.P.R.R.
NBI: 17-198-0-0049-08-116
R-126 REPAIR DETAILS

SHEET 1 OF 2 SHEETS

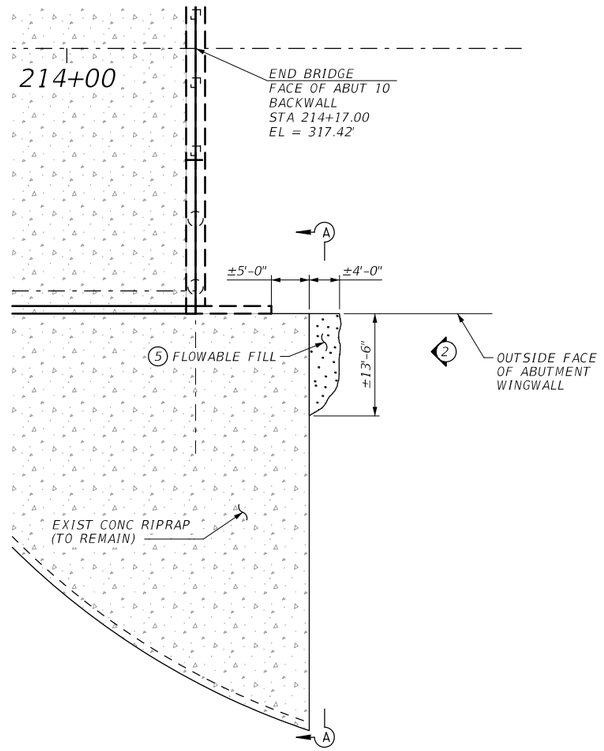
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

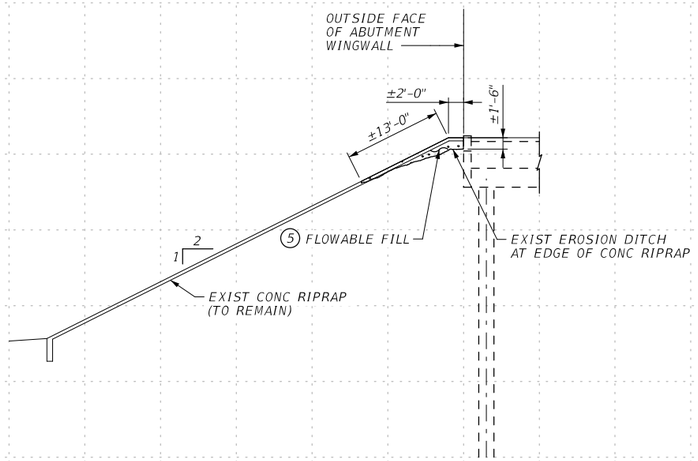
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	43

BRIDGE 095

REV DATE: 2-12-2015
CSJ: C 917-18-89
FILENAME: c:\pw\working\dri\omega-app02.omegaengineers.local_omega-prod\omega_lwilson\dms140598RY-BRG_R-126_01.dgn



PLAN AT ABUTMENT 10



SECTION A-A

R-126 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0401 6001	FLOWABLE BACKFILL	CY	2

LEGEND:

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

(5) PLACE FLOWABLE FILL TO FILL EROSION DITCH AT EDGE OF CONCRETE RIPRAP. SHAPE TOP OF FLOWABLE FILL SO WATER DRAINS AWAY FROM CONCRETE RIPRAP EDGE. ITEM 401-6001 FLOWABLE BACKFILL ~ EST 2 CY.

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

Texas Department of Transportation
Bryan District

US 190/SH 6 AT U.P.R.R.
NBI: 17-198-0-0049-08-116
R-126 REPAIR DETAILS

SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

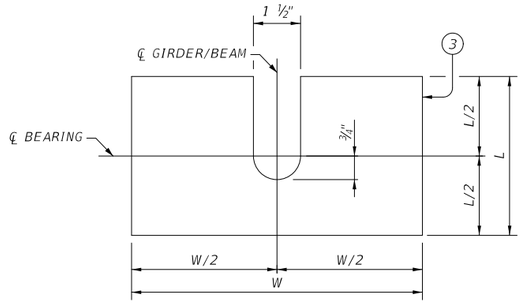
STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	44

BRIDGE 095

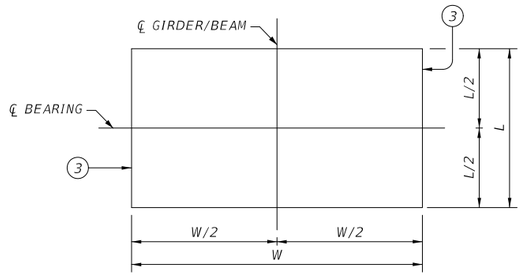
REV DATE: 2-12-2015
CSJ: C 917-18-89
FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms\14059\BRY-BRG_R-126_02.dgn

PHOTO 1

(ELASTOMERIC BEARING PAD AT BENT 5 BEAM 9 HAS WALKED OUT)



BEARING PAD PLAN WITH DOWEL



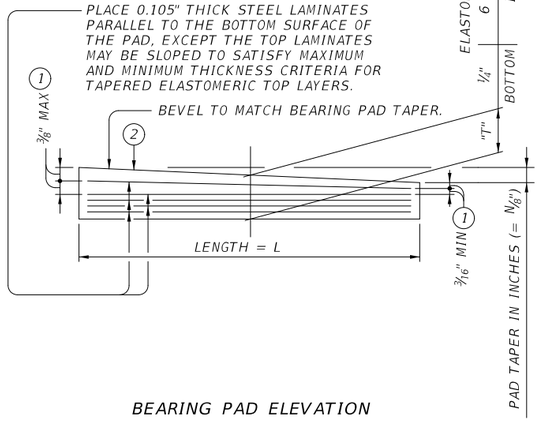
BEARING PAD PLAN WITHOUT DOWEL

BEARING PAD SUMMARY TABLE

BENT NO.	DOWELS (Y/N)	BEARING PAD DIMENSION			BEAM SLOPE (IN/1 FT RDWY)	BEARING PAD TYPE	QUANTITY
		L (IN)	W (IN)	T (IN)			
5	Y	8	15	0.75	0.125	N/A	1

R-322 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
4002 6001	REPLACE ELASTOMERIC BEARING PADS	EA	1



BEARING PAD ELEVATION

LAMINATED ELASTOMERIC BEARING REPLACEMENT DETAILS

(50 DUROMETER)

(1) MAXIMUM AND MINIMUM LAYER THICKNESSES SHOWN ARE FOR ELASTOMER ONLY, ON TAPERED LAYERS.

(2) INDICATE BEARING TYPE ON ALL PADS. FOR TAPERED PADS, LOCATE BEARING TYPE ON THE HIGH SIDE. INCLUDE THE VALUE OF "N" (AMOUNT OF TAPER IN ⅛" INCREMENTS) IN THIS MARK.
EXAMPLES: N=0, (FOR 0" TAPER)
N=1, (FOR ⅛" TAPER)
N=2, (FOR ¼" TAPER)
(ETC.)
FABRICATED PAD TOP SURFACE SLOPE MUST NOT VARY FROM PLAN BEAM SLOPE BY MORE THAN $\left(\frac{0.0625"}{Length}\right)$ IN/IN.

(3) LOCATE PERMANENT MARK HERE.

GENERAL NOTES:

1. REPLACE EXISTING BEARINGS PER SPECIAL SPECIFICATION 4002, "ELASTOMERIC BEARING PADS". PAYMENT FOR LIFTING THE STRUCTURE IS INCLUDED IN THE PRICE BID FOR REPLACING ELASTOMERIC BEARING PADS.
2. RAISE THE EXISTING SPAN IN ACCORDANCE WITH ITEM 495, "RAISING EXISTING STRUCTURES." IT IS ACCEPTABLE TO CUT EXISTING PAD TO FACILITATE REMOVAL.
3. FOLLOWING INSTALLATION OF NEW BEARING PAD APPLY STRIPE COAT OF TYPE V EPOXY AT INTERFACE OF PAD AND CONCRETE PEDESTAL TO SECURE PAD.

LIFTING NOTES:

1. ALL WORK AND MATERIALS FOR BEARING PAD REPLACEMENT MUST BE PERFORMED AND PAID FOR IN ACCORDANCE WITH SPECIAL SPECIFICATION 4002, "ELASTOMERIC BEARING PADS." VERIFY ALL LOCATIONS AND BEAM SLOPES PRIOR TO ORDERING MATERIALS.
2. SUBMIT LIFTING PLANS AND CALCULATIONS TO THE ENGINEER FOR APPROVAL. DESIGN LIFTING DEVICE AND SUPPORTS FOR LIVE LOAD AND DEAD LOAD WITH APPROPRIATE LOAD FACTORS IN ACCORDANCE WITH ITEM 495, "RAISING EXISTING STRUCTURES." UNFACTORED LOADS ARE AS FOLLOWS:
   DL = 36.5 KIPS PER BEAM END
   LL = 108 KIPS PER BEAM END
   (INCLUDING IMPACT)
3. LIMIT LIFTING TO ½" MAXIMUM TO ALLOW FOR PAD REPLACEMENT. NOTE THAT DOWELS MAY RESTRAIN EXISTING PADS. DO NOT DAMAGE DECK, BEAMS, OR CAP DURING ANY STAGE OF BEARING PAD REPLACEMENT.
4. SUPPORTING FALSEWORK ON EXISTING BENT CAPS IS PERMITTED FOLLOWING REQUIREMENTS OF LIFTING NOTE 2 ABOVE.
5. JACKING AGAINST THE SLAB IS NOT ALLOWED. JACKING FROM EXISTING BENT CAP IS PERMITTED FOLLOWING REQUIREMENTS OF LIFTING NOTE 2 ABOVE.
6. PLACE NEW BEARING PADS AND LOWER BEAMS BACK ONTO PADS. ENSURE THAT ALL NEW BEARING PADS COMPRESS WHEN JACKING FORCE IS REMOVED. IF LOAD IS NOT TRANSFERRED AS INTENDED, PLACE STEEL SHIMS UNDER PAD OR USE EPOXY INJECTION OR GROUT MIXTURE AS SPECIFIED IN ARTICLE 784.4.3 TO PROPERLY ENGAGE BEARING PAD AND TRANSFER LOAD.

LIVE LOAD IS PERMITTED ON THE BRIDGE ONLY AFTER THE STRUCTURE HAS BEEN RAISED AND IS SUPPORTED BY CRIBBING OR TEMPORARY SUPPORTS.

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
1/24/2024

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
	1/24/2024	

Texas Department of Transportation
Bryan District

US 190/SH 6 AT U.P.R.R.
NBI: 17-198-0-0049-08-116
R-322 REPAIR DETAILS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	45

BRIDGE 095

REV DATE: 2-12-2015
CSJ: C 917-18-89
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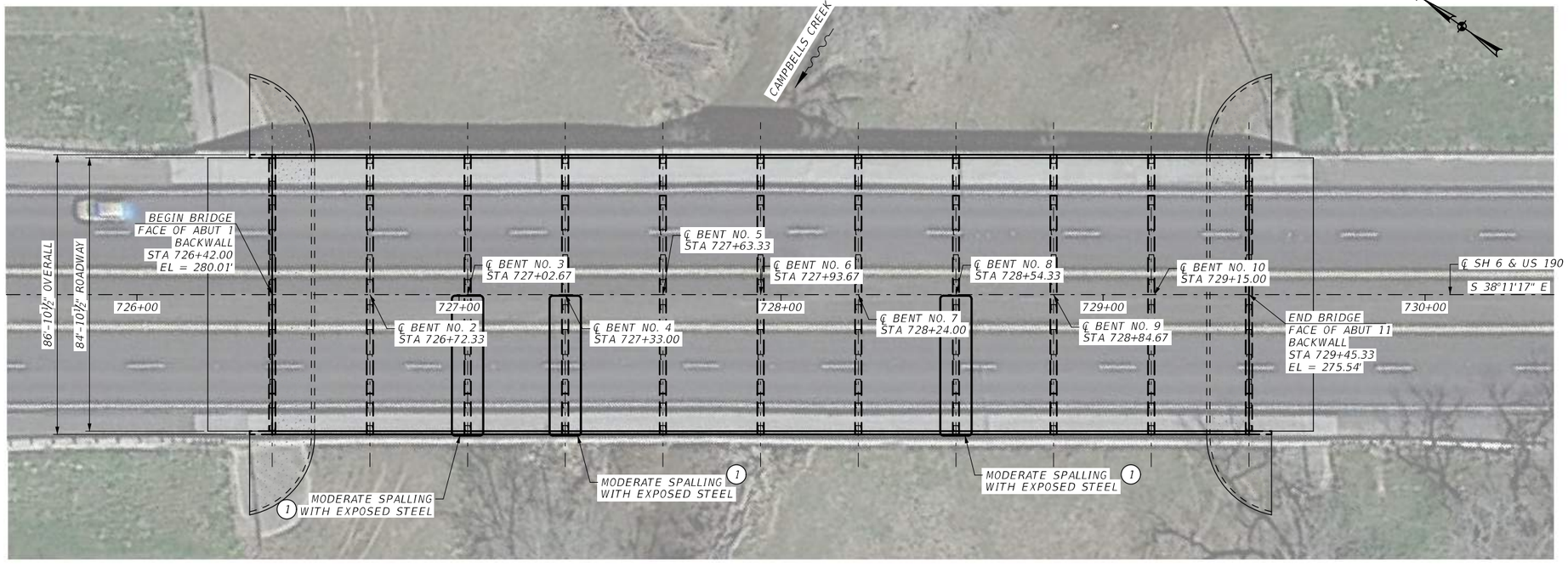
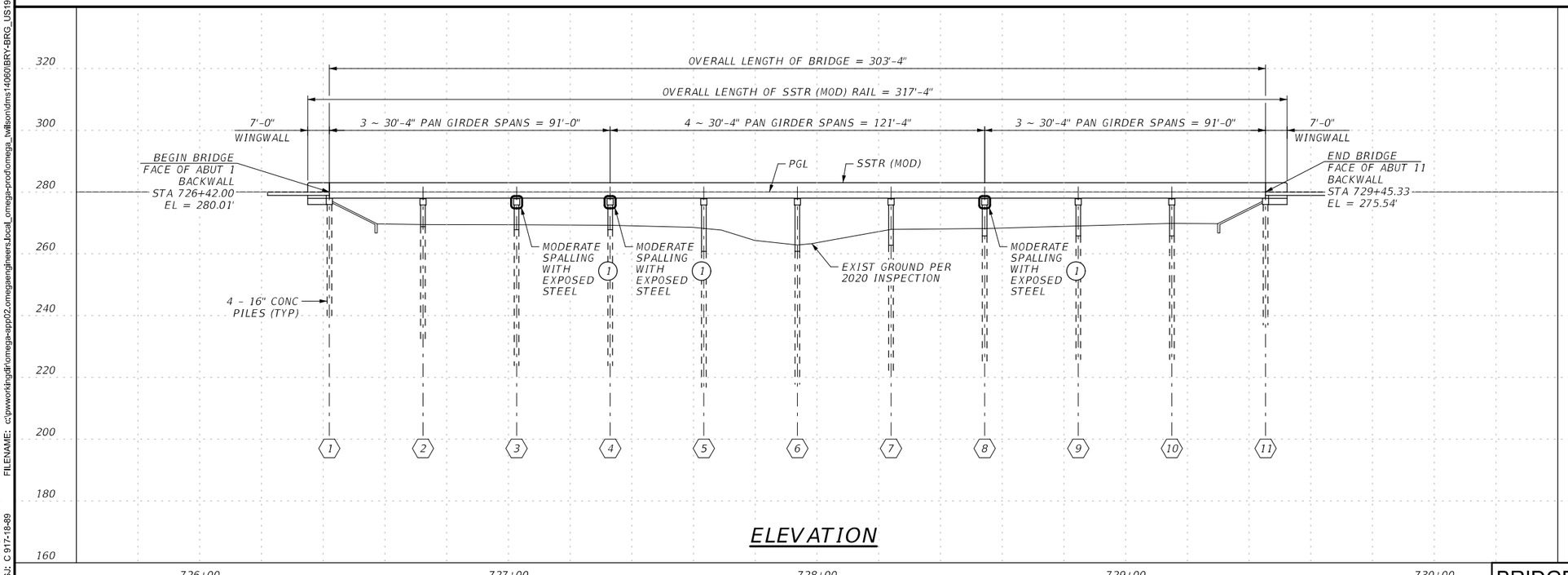


PLAN



ELEVATION

BRIDGE 096

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 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-127 REPAIR DETAIL FOR ADDITIONAL INFORMATION.

EXIST SB NBI NUMBER: 17-198-0-0049-08-157

STATE OF TEXAS
GODWIN A. ARTHUR
LICENSED
127720
PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

Texas Department of Transportation
Bryan District

US 190/SH 6 SB AT CAMPBELLS CR
NBI: 17-198-0-0049-08-157
BRIDGE LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	46

REV DATE: 2-12-2015
CSJ: C 917-18-89
FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega+prod\omega_lwilson\dms140601BRY-BRG_US190 SH6 SB OVER CAMPBELLS CR_LAY_01.dgn

PHOTO 1

(MODERATE DELAMINATION ON BENT CAP 3)

PHOTO 2

(MODERATE SPALLS AND DELAMINATION ON SE FACE OF BENT CAP 4)

PHOTO 3

(MODERATE SPALLS WITH EXPOSED REBAR ON NW FACE OF BENT CAP 8)

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-127 ESTIMATED QUANTITIES			
ITEM CODE	DESCRIPTION	UNITS	TOTAL
0429 6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	52

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
1/24/2024

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
	1/24/2024	

Texas Department of Transportation
Bryan District

US 190/SH 6 SB AT CAMPBELLS CR
NBI: 17-198-0-0049-08-157
R-127 REPAIR DETAILS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS
STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON
CONTROL	SECTION	JOB / SHEET NO.
0917	18	089 / 47

BRIDGE 096

REV DATE: 2-12-2015
CSJ: C 917-18-89

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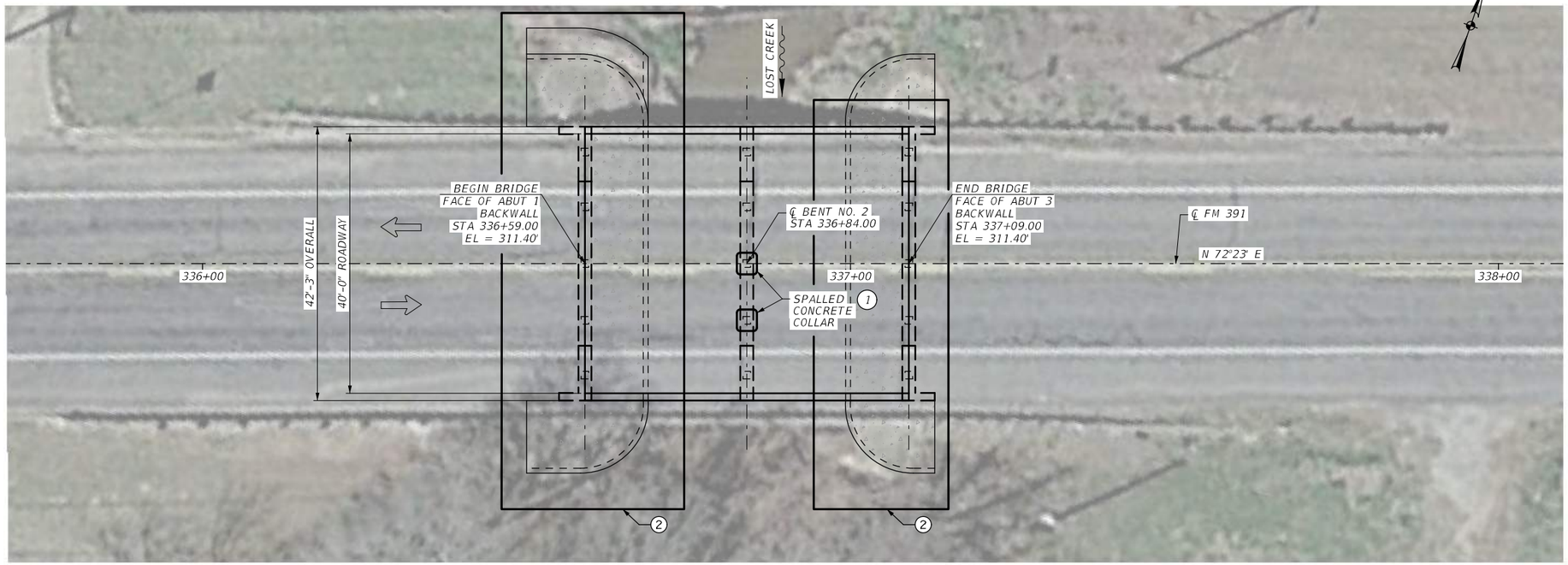
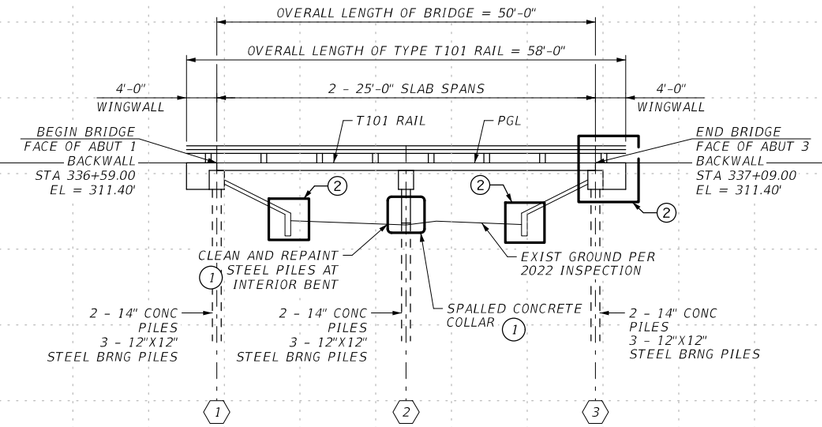


PLAN



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-133 REPAIR DETAIL FOR ADDITIONAL INFORMATION.

(2) SEE R-134 REPAIR DETAILS AND EXISTING CONDITIONS FOR ADDITIONAL INFORMATION.

EXIST NBI NUMBER: 17-198-0-0262-06-027

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

FM 391 AT LOST CREEK
NBI: 17-198-0-0262-06-027
BRIDGE LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	48

BRIDGE 101

REV DATE: 2-12-2015
CSJ: C 917-18-89

FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms140865\BRY-BRG_FM391 OVER LOST CR_LAY_01.dgn

PHOTO 1

(CONCRETE ENCASEMENT HAS SPALLED OFF ON COLUMN 3 WEST SIDE)

PHOTO 2

(CONCRETE ENCASEMENT HAS SPALLED OFF ON COLUMN 3 EAST SIDE)

PHOTO 3

(RUST ON ALL INTERIOR BENT COLUMNS - COLUMN 3 SHOWN)

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. SEE SW3P LAYOUT FOR LIMITS AND QUANTITIES FOR TEMPORARY SHORING (COFFERDAM)
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.

R-133 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0429 6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	20
0446 6002	CLEAN & PAINT EXIST STR (SYSTEM II)	LS	1

PHOTO 4

(CONCRETE ENCASEMENT HAS SPALLED OFF ON COLUMN 4 WEST SIDE)

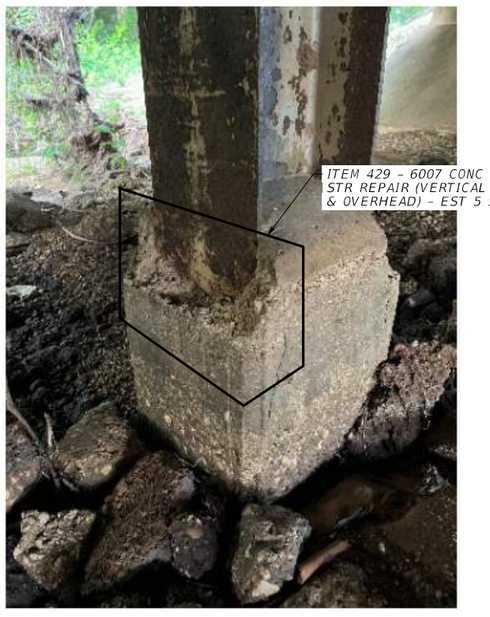


PHOTO 5

(CONCRETE ENCASEMENT HAS SPALLED OFF ON COLUMN 4 EAST SIDE)

PHOTO 6

(RUST ON ALL INTERIOR BENT COLUMNS - COLUMN 4 SHOWN)

BRIDGE 101

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
1/24/2024

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
	1/24/2024	

FM 391 AT LOST CREEK
NBI: 17-198-0-0262-06-027
R-133 REPAIR DETAILS

SHEET 1 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	49

REV DATE: 2-12-2015
CSJ: C 917-18-89

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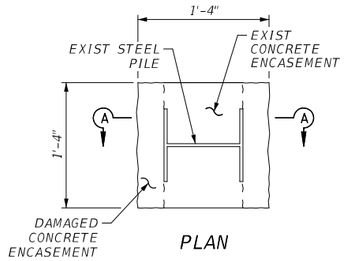
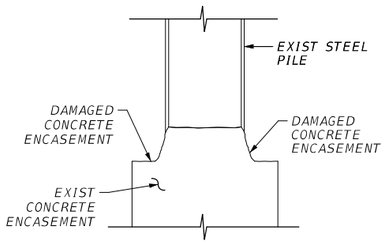
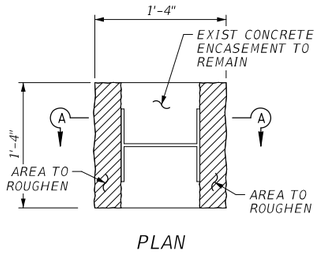


PLAN

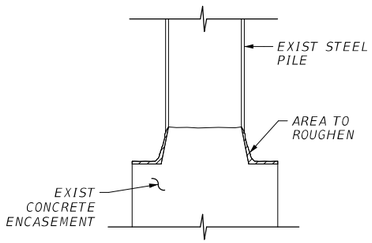


SECTION A-A

EXISTING CONDITION



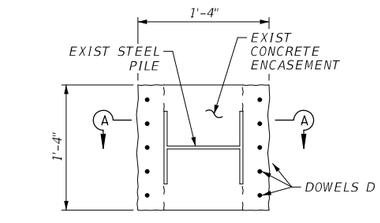
PLAN



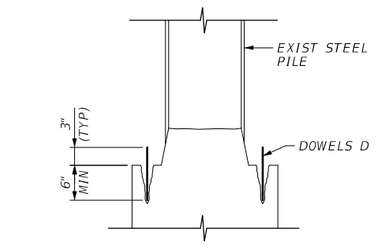
SECTION A-A

1. DEFINE LIMITS OF CONCRETE ENCASEMENT DAMAGE AND ROUGHEN SUBSTRATE TO ENSURE BOND BETWEEN PATCH MATERIAL AND ORIGINAL CONCRETE ENCASEMENT.

STEP 1



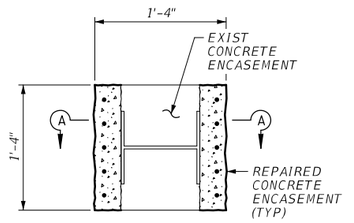
PLAN



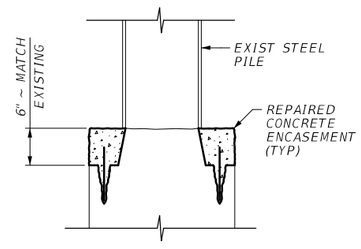
SECTION A-A

1. PLACE BARS D (#4) AND EPOXY EMBED INTO EXIST CONCRETE ENCASEMENT.
2. PLACE FORMWORK FOR NEW CONCRETE ENCASEMENT.

STEP 2



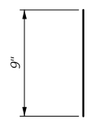
PLAN



SECTION A-A

1. PLACE NEW SECTIONS OF CONCRETE ENCASEMENT.

STEP 3



DOWEL D

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. CONTRACTOR TO TAKE CARE NOT TO DAMAGE EXISTING STEEL PILE OR THE SURROUNDING EXISTING CONCRETE ENCASEMENT. IF THE EXISTING STEEL PILE OR THE SURROUNDING CONCRETE ENCASEMENT IS DISTURBED OR DAMAGED, THE CONTRACTOR SHALL REPAIR THE DAMAGE.
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.

MATERIAL NOTES:

1. USE REPAIR MATERIAL IN ACCORDANCE WITH THE TXDOT CONCRETE REPAIR MANUAL CHAPTER 3 SECTION 3, MARCH 2021.

PAINTING NOTES:

1. CLEAN AND PAINT IN ACCORDANCE WITH ITEM 446, "FIELD CLEANING AND PAINT STEEL".
2. SUBMIT PLANS AND PROCEDURES DETAILING PROPOSED METHOD OF ACCESS AND CONTAINMENT FOR CLEANING AND PAINTING OPERATIONS AT LEAST 30 DAYS IN ADVANCE OF SCHEDULED WORK PER ITEM 446.4.7.
3. PROVIDE PAINT SYTEM IN ACCORDANCE WITH DMS-8100, "STRUCTURAL STEEL PAINTS-FORMULA" FOR PRIME COAT AND DMS-8101 "STRUCTURAL STEEL PAINTS-PERFORMANCE".
4. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING VEHICULAR TRAFFIC AND THE CREEK SURROUNDING THE PAINT OPERATION. PAYMENT FOR PROTECTION IS CONSIDERED SUBSIDIARY TO PAY ITEM 446.

TOTAL ESTIMATED SURFACE AREA = 180 SF

STATE OF TEXAS
GODWIN A. ARTHUR
127720
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PROFESSIONAL ENGINEER
1/24/2024

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
	1/24/2024	

Texas Department of Transportation
Bryan District

FM 391 AT LOST CREEK
NBI: 17-198-0-0262-06-027
R-133 REPAIR DETAILS

SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	50

BRIDGE 101

REV DATE: 2-12-2015
CSJ: C 917-18-89

FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_lwilson\dms\14065\BRY-BRG_R-133_02.dgn

PHOTO 1

(EROSION DUE TO ROADWAY RUNOFF EXPOSED TOP OF SE RIPRAP AND UP TO 1.5' DEEP VOID)

PHOTO 3

(ABUTMENT 3 CONCRETE RIPRAP TOEWALL IS EXPOSED APPROXIMATELY 1.5')

PHOTO 2

(EROSION DUE TO RUNOFF EXPOSED SE RIPRAP TOEWALL APPROXIMATELY 1')

PHOTO 4

(DRAINAGE FLUME AT NW CORNER HAS BEEN UNDERMINED AND EXPOSED UP TO 2.5')

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

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
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P:512 575 2288 F:281 647 9184

Drawings Not To Scale

100% SUBMITTAL	PRINT DATE	REVISION DATE
	1/24/2024	

Texas Department of Transportation
Bryan District

FM 391 AT LOST CREEK
NBI: 17-198-0-0262-06-027
EXISTING CONDITIONS

SHEET 1 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	51

BRIDGE 101

REV DATE: 2-12-2015
CSJ: C 917-18-89

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PHOTO 5

(RUNOFF EROSION EXPOSED NW RIPRAP TOEWALL UP TO 2.5')

PHOTO 6

(RUNOFF EROSION EXPOSED SW RIPRAP TOEWALL UP TO 1')

REV DATE: 2-12-2015
CSJ: C 917-18-89

FILENAME: c:\pw\working\dir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms140651BRY-BRG_EC_101_02.dgn

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

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
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Drawings Not To Scale

100% SUBMITTAL	PRINT DATE	REVISION DATE
	1/24/2024	

Texas Department of Transportation
Bryan District

FM 391 AT LOST CREEK
NBI: 17-198-0-0262-06-027
EXISTING CONDITIONS

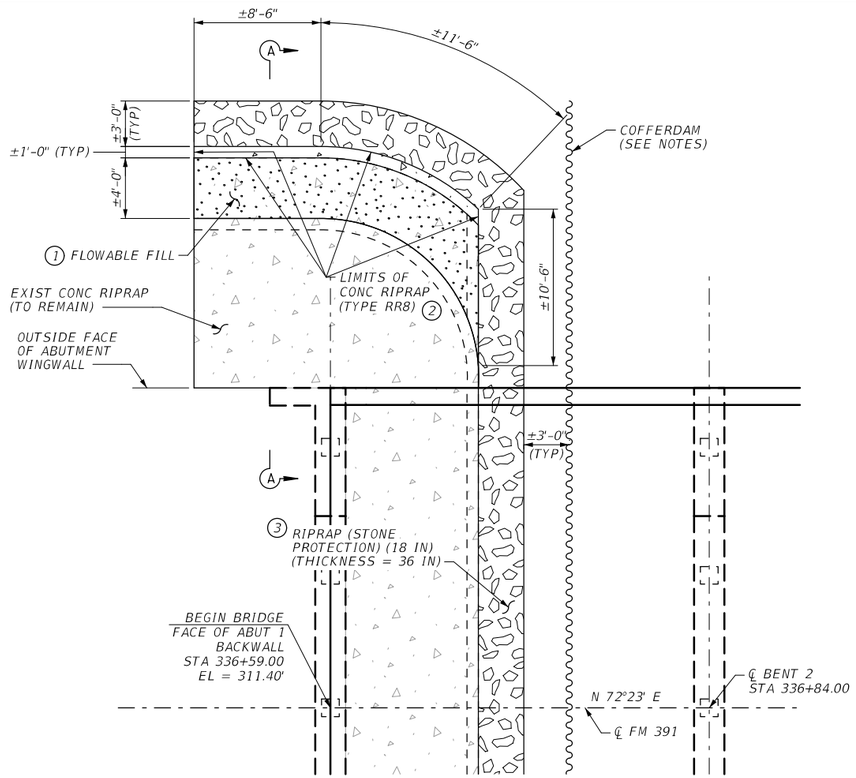
SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

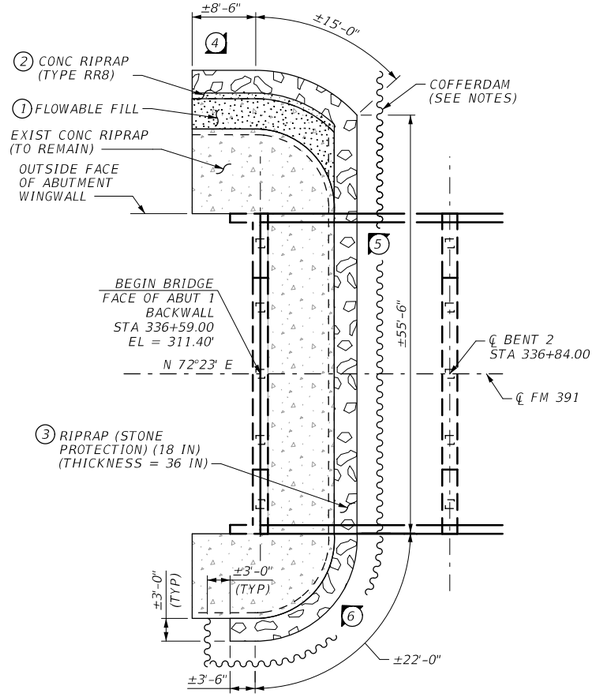
STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	52

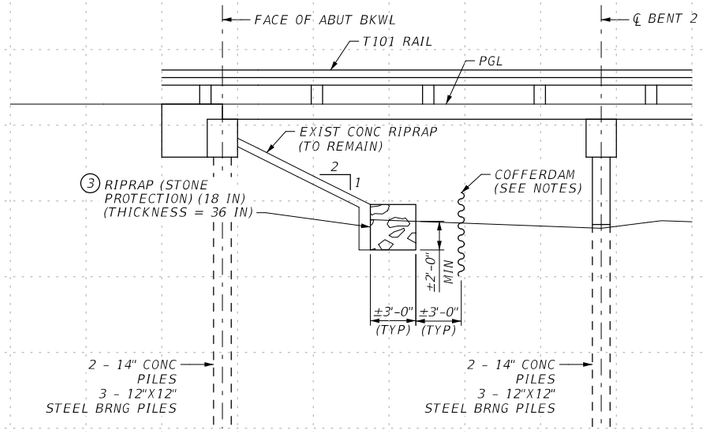
BRIDGE 101



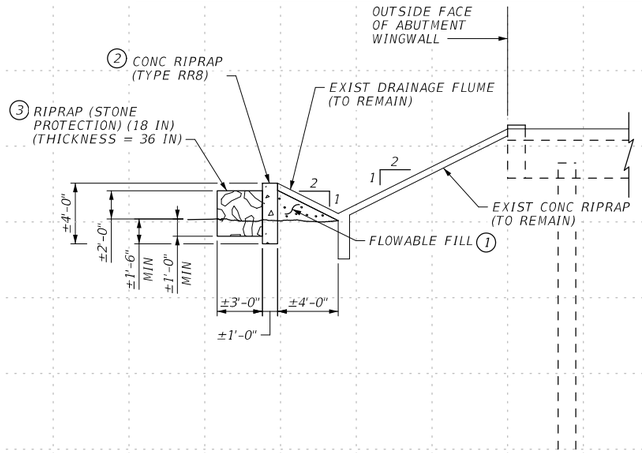
PLAN AT ABUTMENT 1



PLAN AT ABUTMENT 1 (20 SCALE)



ELEVATION AT ABUTMENT 1



SECTION A-A

R-134 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0401 6001	FLOWABLE BACKFILL	CY	5
0403 6006	TEMPORARY SPL SHORING (COFFERDAM)	SF	551
0432 6008	RIPRAP (CONC) (CL B) (RR8&RR9)	CY	3
0432 6033	RIPRAP (STONE PROTECTION) (18 IN)	CY	35

LEGEND:

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

1. PLACE FLOWABLE FILL TO FILL VOID BELOW DRAINAGE FLUME. ITEM 401-6001 FLOWABLE BACKFILL ~ EST 5 CY.
2. INSTALL CONCRETE RIPRAP TOE PER CRR STANDARD. ITEM 432-6008 RIPRAP (CONC) (CL B) (RR8 & RR9) ~ EST 3 CY.
3. INSTALL STONE PROTECTION PER SRR STANDARD. ITEM 432-6033 RIPRAP (STONE PROTECTION) (18 IN) ~ EST 35 CY.

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

COFFERDAM NOTES:

LOST CREEK IS AN EPHEMERAL STREAM WITH LITTLE TO NO BASE FLOW EXCEPT DURING AND AFTER RAINFALL RUNOFF EVENTS. CONTRACTOR SHALL DETERMINE IF COFFERDAM IS NECESSARY WITHIN THE TIME FRAME REQUIRED TO PERFORM WORK WITHIN THE CHANNEL.

QUANTITY FOR COFFERDAM SHOWN IS FOR BIDDING PURPOSES ONLY. SEE GENERAL NOTES FOR ADDITIONAL INFORMATION.

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

Texas Department of Transportation
Bryan District

FM 391 AT LOST CREEK
NBI: 17-198-0-0262-06-027
R-134 REPAIR DETAILS

SHEET 1 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	53

BRIDGE 101

REV DATE: 2-12-2015
CSJ: C 917-18-89
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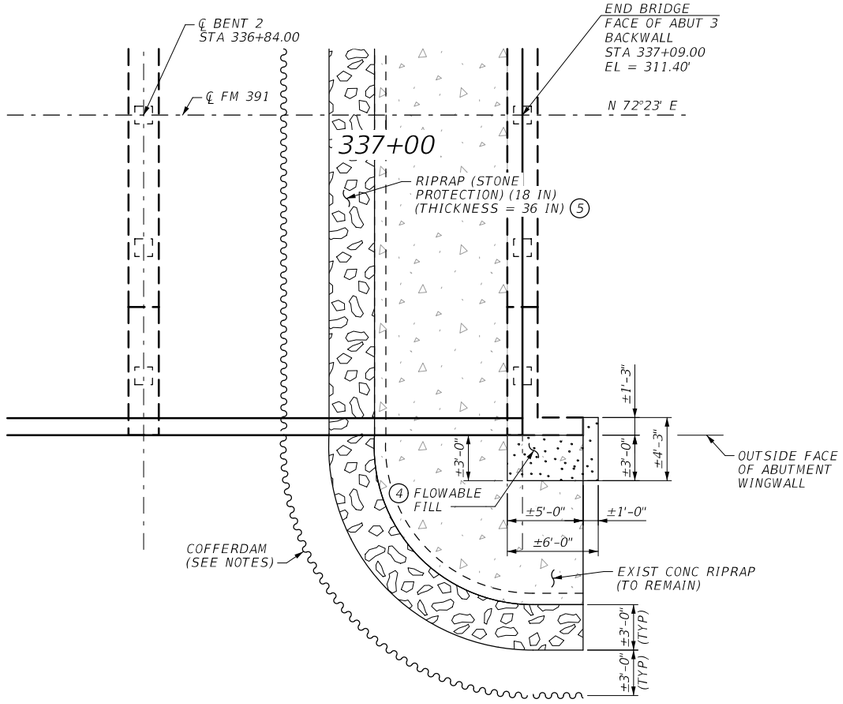
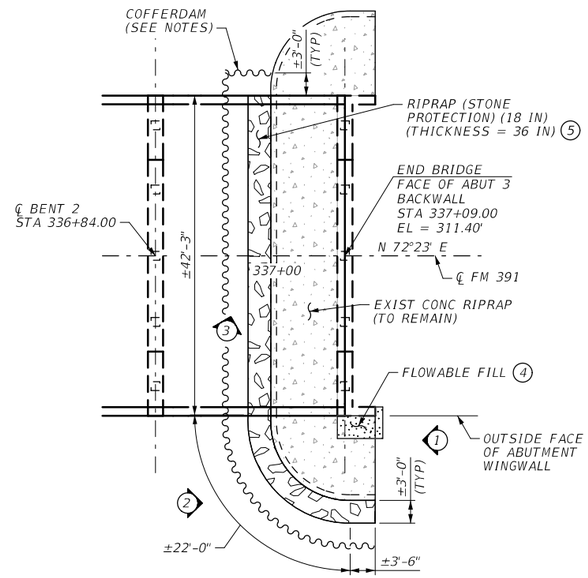
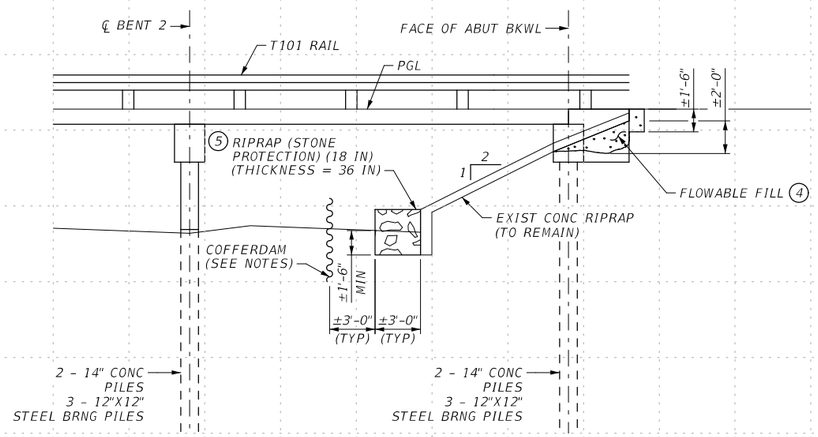


PLAN AT ABUTMENT 3



PLAN AT ABUTMENT 3 (20 SCALE)



ELEVATION AT ABUTMENT 3

R-134 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0401 6001	FLOWABLE BACKFILL	CY	1
0403 6006	TEMPORARY SPL SHORING (COFFERDAM)	SF	448
0432 6033	RIPRAP (STONE PROTECTION) (18 IN)	CY	22

LEGEND:

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

(4) PLACE FLOWABLE FILL TO FILL VOID BELOW EXISTING ABUTMENT RIPRAP AND TO CAP EXPOSED EDGE OF RIPRAP. SHAPE TOP OF FLOWABLE FILL SO WATER DRAINS AWAY FROM CONCRETE RIPRAP EDGE. ITEM 401-6001 FLOWABLE BACKFILL ~ EST 1 CY.

(5) INSTALL STONE PROTECTION PER SSR STANDARD. ITEM 432-6033 RIPRAP (STONE PROTECTION) (18 IN) ~ EST 22 CY.

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

COFFERDAM NOTES:

LOST CREEK IS AN EPHEMERAL STREAM WITH LITTLE TO NO BASE FLOW EXCEPT DURING AND AFTER RAINFALL RUNOFF EVENTS. CONTRACTOR SHALL DETERMINE IF COFFERDAM IS NECESSARY WITHIN THE TIME FRAME REQUIRED TO PERFORM WORK WITHIN THE CHANNEL.

QUANTITY FOR COFFERDAM SHOWN IS FOR BIDDING PURPOSES ONLY. SEE GENERAL NOTES FOR ADDITIONAL INFORMATION.

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

FM 391 AT LOST CREEK
NBI: 17-198-0-0262-06-027
R-134 REPAIR DETAILS

SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	54

BRIDGE 101

REV DATE: 2-12-2015
CSJ: C 917-18-89
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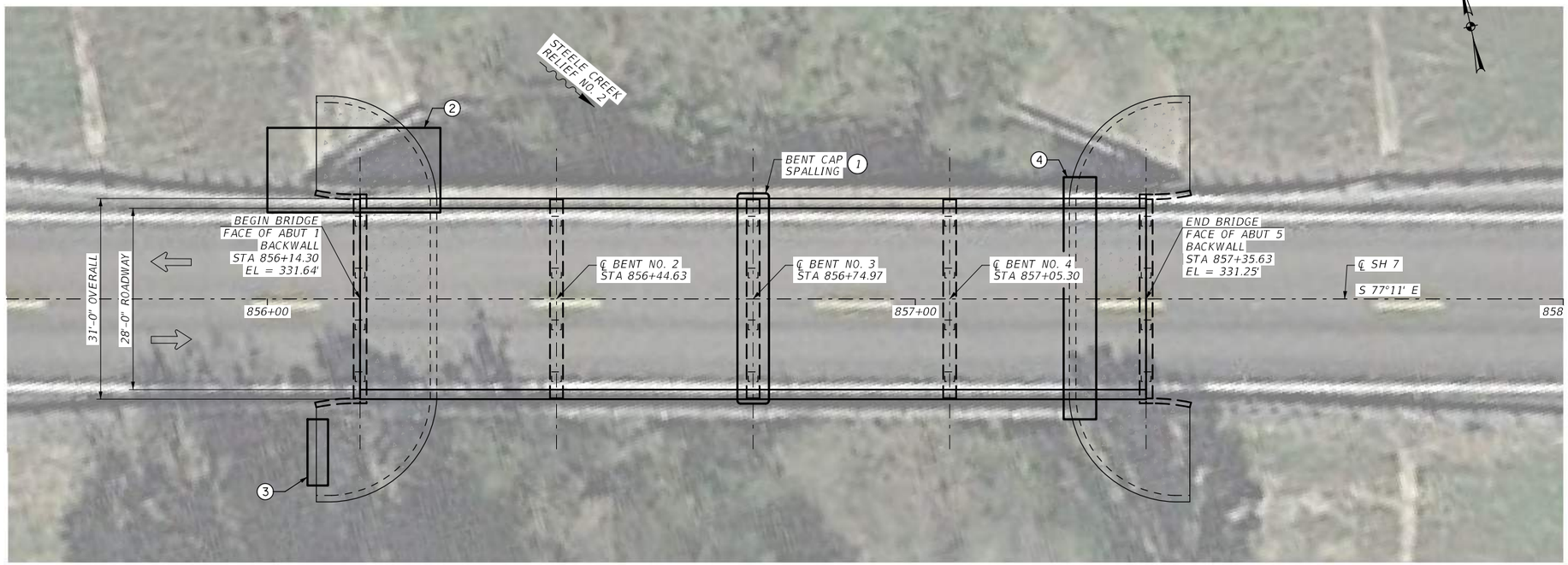
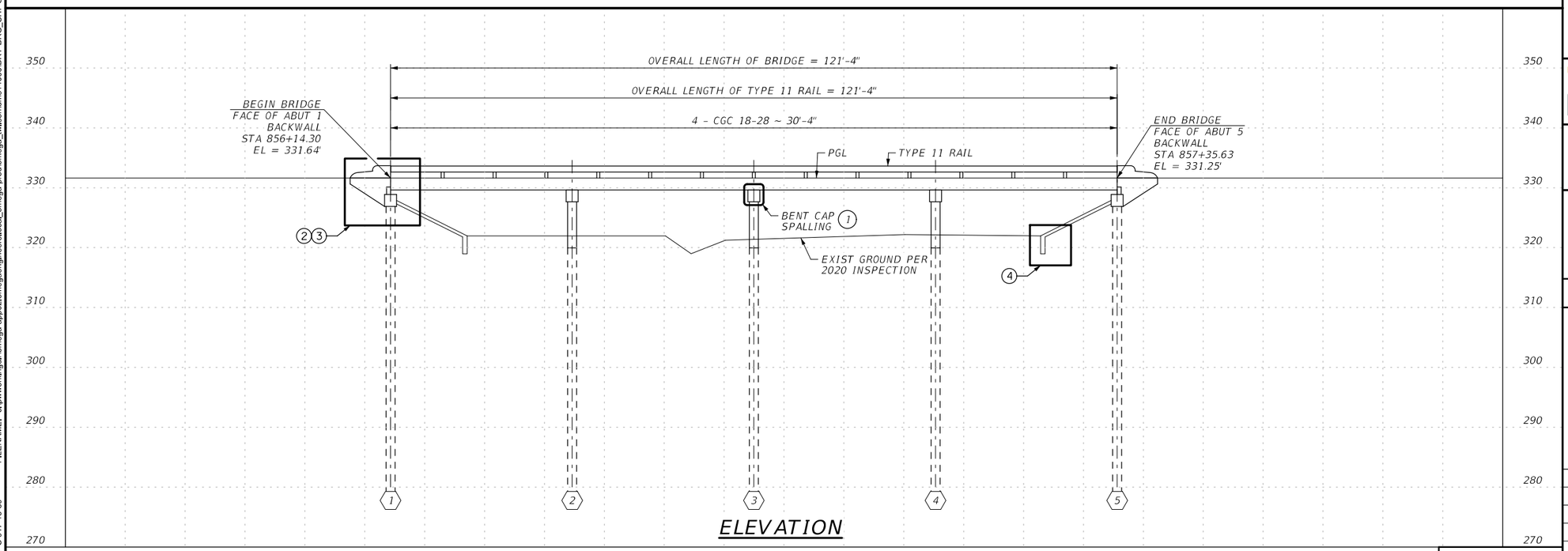


PLAN



ELEVATION

BRIDGE 102

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-135 REPAIR DETAIL FOR ADDITIONAL INFORMATION.

(2) SEE R-136 REPAIR DETAILS AND EXISTING CONDITIONS FOR ADDITIONAL INFORMATION.

(3) SEE R-326 REPAIR DETAILS AND EXISTING CONDITIONS FOR ADDITONAL INFORMATION.

(4) SEE R-327 REPAIR DETAILS AND EXISTING CONDITIONS FOR ADDITONAL INFORMATION.

EXIST NBI NUMBER: 17-198-0-0382-04-026

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
1/24/2024

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
	1/24/2024	

Texas Department of Transportation
Bryan District

SH 7 AT STEELE CR RELIEF NO. 2
NBI: 17-198-0-0382-04-026
BRIDGE LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS
STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON
CONTROL	SECTION	JOB / SHEET NO.
0917	18	089 / 55

REV DATE: 2-12-2015
CSJ: C 917-18-89
FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms140661BRY-BRG_SH7 OVER STEELE CR REL NO 2_LAY_01.dgn

PHOTO 1

(PREVIOUS REPAIR WORK AT BENT CAP 3 HAS BEGUN TO CHIP AND SPALL ALONG EDGES)

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-135 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0429 6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	15

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
1/24/2024

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
	1/24/2024	

Texas Department of Transportation
Bryan District

SH 7 AT STEELE CR RELIEF NO. 2
NBI: 17-198-0-0382-04-026
R-135 REPAIR DETAILS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	56

BRIDGE 102

REV DATE: 2-12-2015
CSJ: C 917-18-89

FILENAME: c:\pw\working\dir\omega-app02.omegaengineers.local_omega-prod\omega_lwilson\dms14066\BRY-BRG_R-135_01.dgn

PHOTO 1

(EROSION DUE TO ROADWAY RUNOFF HAS UNDERMINED AND EXPOSED TOP OF NW CONCRETE RIPRAP, CREATING A VOID UP TO 1' DEEP)

PHOTO 3

(EROSION DUE TO ROADWAY RUNOFF HAS UNDERMINED AND EXPOSED TOP OF SW CONCRETE RIPRAP, CREATING A VOID UP TO 1' DEEP)

PHOTO 2

(CONCRETE RIPRAP HAS SHIFTED AWAY FROM NW WINGWALL CREATING A 2" GAP)

PHOTO 4

(ABUTMENT 5 CONCRETE RIPRAP HEADER TOEWALL IS EXPOSED UP TO 2')

REV DATE: 2-12-2015
CSJ: C 917-18-89

FILENAME: c:\pw\working\dri\omega-app02.omegaengineers.local_omega-pro\omega_lwilson\dms140661BRY-BRG_EC_102_01.dgn

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

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
	1/24/2024	

Texas Department of Transportation
Bryan District

SH 7 AT STEELE CR RELIEF NO. 2
NBI: 17-198-0-0382-04-026
EXISTING CONDITIONS

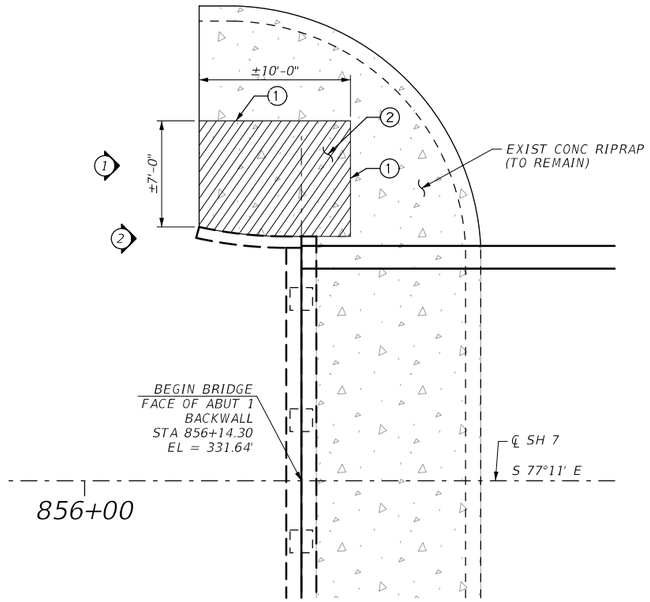
SHEET 1 OF 1 SHEET

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

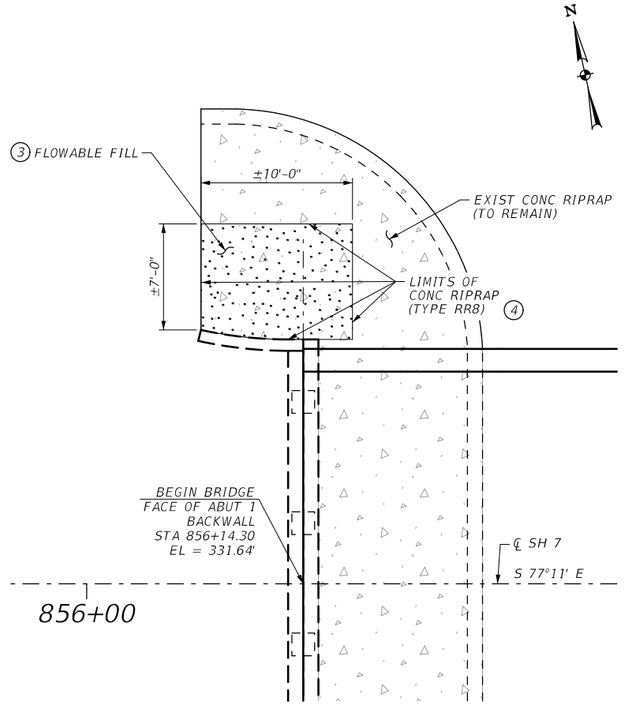
STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	57

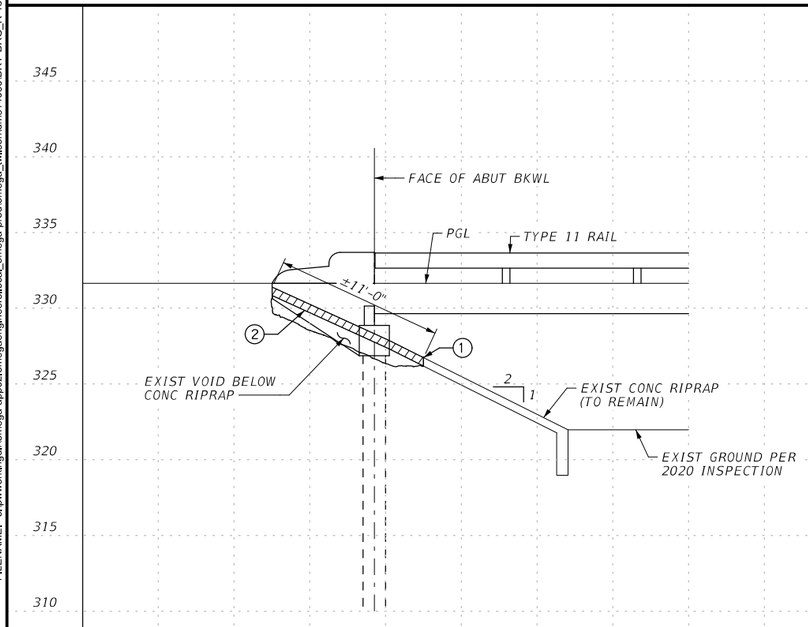
BRIDGE 102



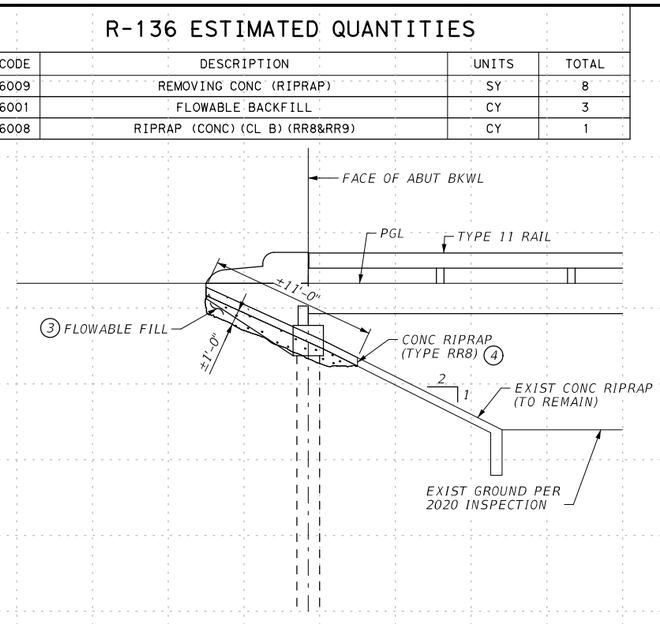
PLAN AT ABUTMENT 1 (REMOVAL)



PLAN AT ABUTMENT 1 (REPAIR)



ELEVATION AT ABUTMENT 1 (REMOVAL)



ELEVATION AT ABUTMENT 1 (REPAIR)

R-136 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0104 6009	REMOVING CONC (RIPRAP)	SY	8
0401 6001	FLOWABLE BACKFILL	CY	3
0432 6008	RIPRAP (CONC)(CL B)(RR8&RR9)	CY	1

LEGEND:

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

1. SAWCUT RIPRAP TO A ½" MIN DEPTH AS SHOWN. CLEAN AND EXTEND REINFORCING 1'-0" MIN INTO NEW CONSTRUCTION.
2. REMOVE HATCHED AREA OF EXISTING RIPRAP AS SHOWN. ITEM 104-6009 REMOVING CONC (RIPRAP) ~ EST 8 SY.
3. PLACE FLOWABLE FILL TO FILL VOID BELOW EXISTING ABUTMENT RIPRAP AND RE-ESTABLISH 2:1 SLOPE. ITEM 401-6001 FLOWABLE BACKFILL ~ EST 3 CY.
4. INSTALL CONCRETE RIPRAP PER CRR STANDARD. ITEM 432-6008 RIPRAP (CONC)(CL B)(RR8 & RR9) ~ EST 1 CY.

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

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

SH 7 AT STEELE CR RELIEF NO. 2
NBI: 17-198-0-0382-04-026
R-136 REPAIR DETAILS

SHEET 1 OF 1 SHEET

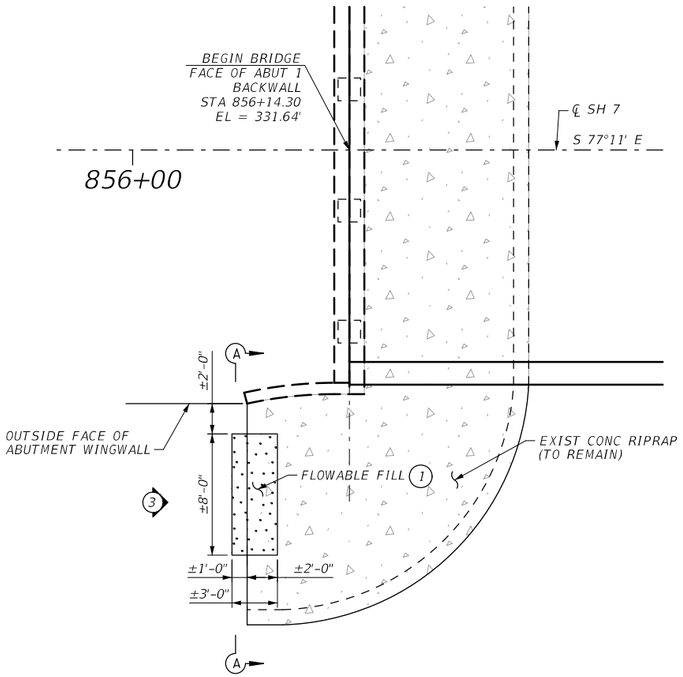
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

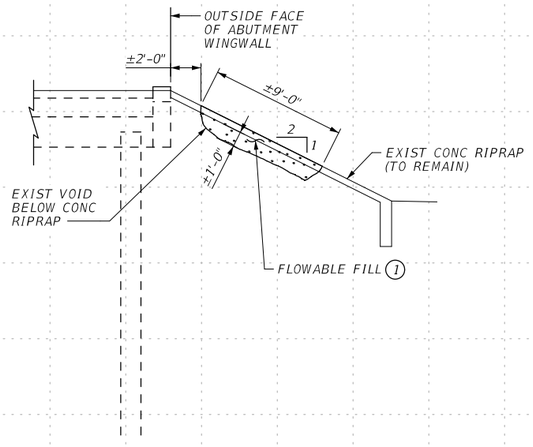
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	58

BRIDGE 102

REV DATE: 2-12-2015
CSJ: C 917-18-89
FILENAME: c:\pw\working\dir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms140661BRY-BRG_R-136_01.dgn



PLAN AT ABUTMENT 1



SECTION A-A

R-326 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0401 6001	FLOWABLE BACKFILL	CY	1

N

LEGEND:

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

1 PLACE FLOWABLE FILL TO FILL VOID BELOW EXISTING ABUTMENT RIPRAP. SHAPE TOP OF FLOWABLE FILL SO WATER DRAINS AWAY FROM CONCRETE EDGE. ITEM 401-6001 FLOWABLE BACKFILL ~ EST 1 CY.

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

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 5 10 20 FT
0 5 10 20 FT
VERTICAL

100% SUBMITTAL

PRINT DATE	REVISION DATE
1/24/2024	

Texas Department of Transportation
Bryan District

SH 7 AT STEELE CR RELIEF NO. 2
NBI: 17-198-0-0382-04-026
R-326 REPAIR DETAILS

SHEET 1 OF 1 SHEET

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	59

BRIDGE 102

REV DATE: 2-12-2015
CSJ: C 917-18-89
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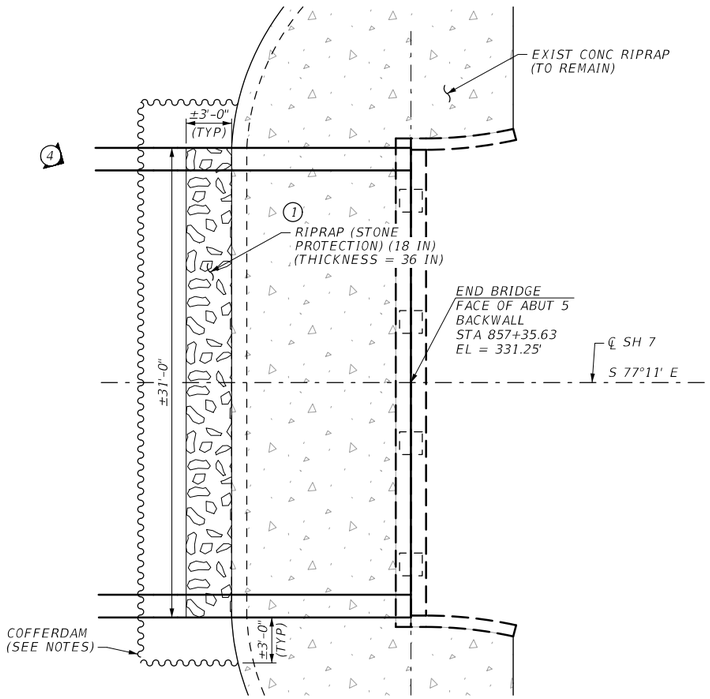
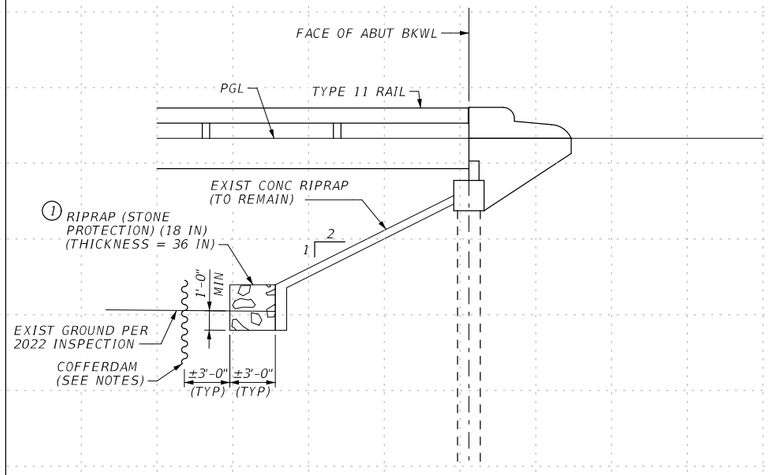


PLAN AT ABUTMENT 5



ELEVATION AT ABUTMENT 5

R-327 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0403 6006	TEMPORARY SPL SHORING (COFFERDAM)	SF	275
0432 6033	RIPRAP (STONE PROTECTION) (18 IN)	CY	11

N

LEGEND:

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

(1) INSTALL STONE PROTECTION PER SRR STANDARD. ITEM 432-6033 RIPRAP (STONE PROTECTION) (18 IN) ~ EST 11 CY.

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

COFFERDAM NOTES:

STEELE CREEK RELIEF NO. 2 IS AN EPHEMERAL STREAM WITH LITTLE TO NO BASE FLOW EXCEPT DURING AND AFTER RAINFALL RUNOFF EVENTS. CONTRACTOR SHALL DETERMINE IF COFFERDAM IS NECESSARY WITHIN THE TIME FRAME REQUIRED TO PERFORM WORK WITHIN THE CHANNEL.

QUANTITY FOR COFFERDAM SHOWN IS FOR BIDDING PURPOSES ONLY. SEE GENERAL NOTES FOR ADDITIONAL INFORMATION.

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

Texas Department of Transportation
Bryan District

SH 7 AT STEELE CR RELIEF NO. 2
NBI: 17-198-0-0382-04-026
R-327 REPAIR DETAILS

SHEET 1 OF 1 SHEET

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	60

BRIDGE 102

REV DATE: 2-12-2015
CSJ: C 917-18-89
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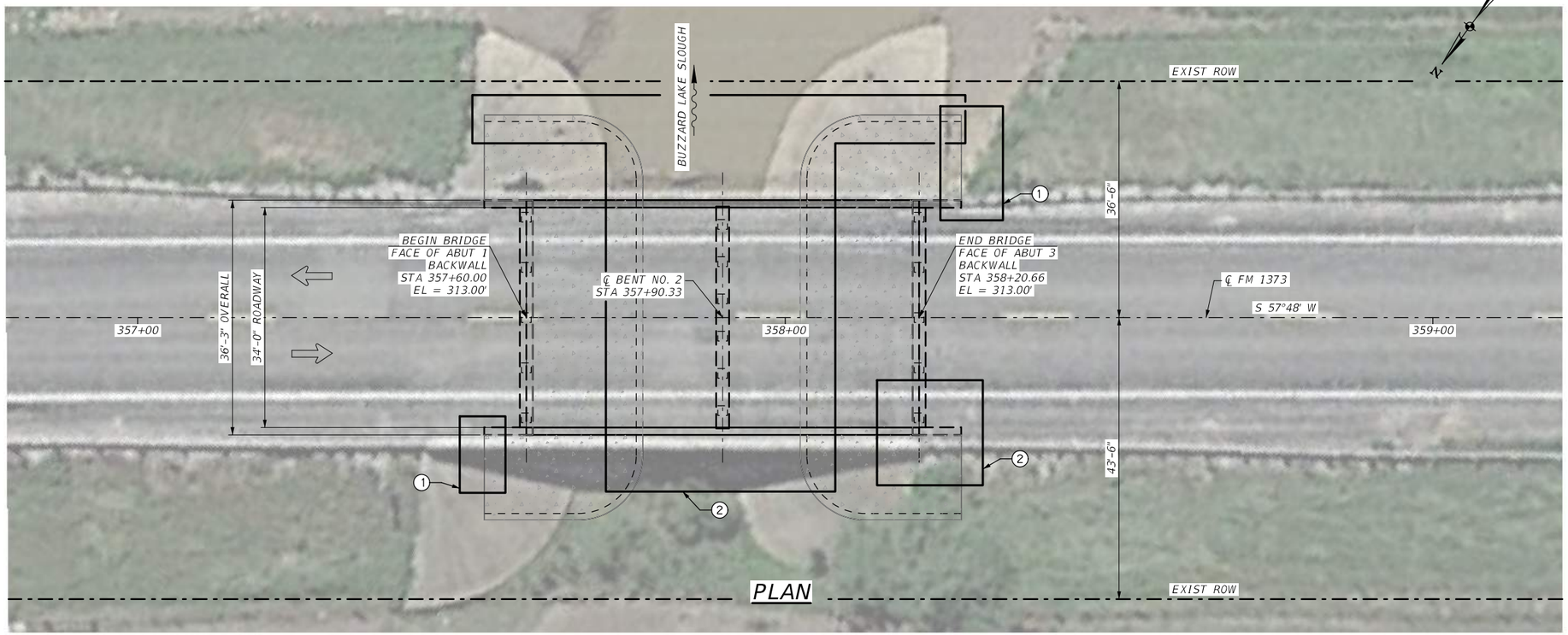
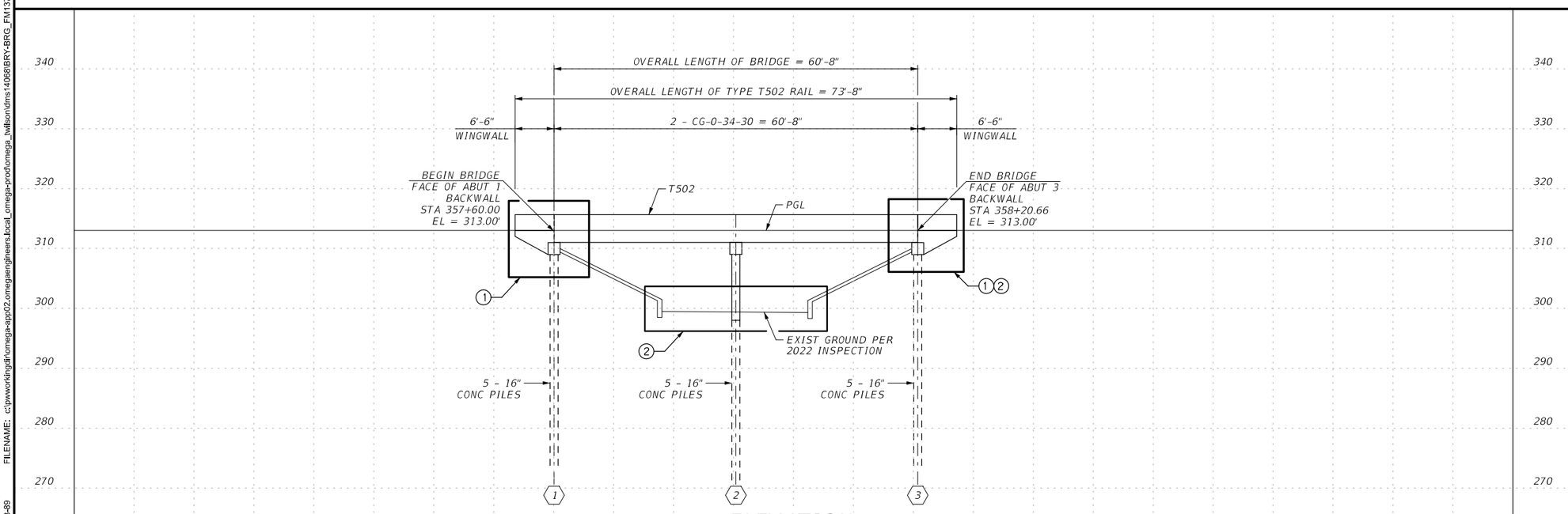


PLAN



ELEVATION

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 R-139 REPAIR DETAILS AND EXISTING CONDITIONS FOR ADDITIONAL INFORMATION.

(2) SEE R-328 REPAIR DETAILS AND EXISTING CONDITIONS FOR ADDITIONAL INFORMATION.

EXIST NBI NUMBER: 17-198-0-0540-06-040

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

Texas Department of Transportation
Bryan District

FM 1373 AT BUZZARD SLOUGH
NBI: 17-198-0-0540-06-040
BRIDGE LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS
STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	61

BRIDGE 104

REV DATE: 2-12-2015
CSJ: C 917-18-89
FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms140681BRY-BRG_FM1373 OVER BUZZARD SL_LAY_01.dgn

PHOTO 1

(EROSION DUE TO ROADWAY RUNOFF HAS EXPOSED FULL LENGTH ALONG EDGE OF CONCRETE RIPRAP AT SOUTH WINGWALL APPROXIMATELY 1.5')

PHOTO 3

(EROSION DUE TO ROADWAY RUNOFF HAS EXPOSED TOP OF CONCRETE RIPRAP AT WEST WINGWALL APPROXIMATELY 1')

PHOTO 2

(EROSION DUE TO ROADWAY RUNOFF HAS EXPOSED TOP OF CONCRETE RIPRAP AT NORTH WINGWALL APPROXIMATELY 1')

PHOTO 4

(ABUTMENT 3 CONCRETE RIPRAP AT WEST WINGWALL HAS CRACKED CREATING A VOID UP TO 6" DEEP EXTENDING UP TO END OF WINGWALL)

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

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
	1/24/2024	

Texas Department of Transportation
Bryan District

FM 1373 AT BUZZARD SLOUGH
NBI: 17-198-0-0540-06-040
EXISTING CONDITIONS

SHEET 1 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	62

BRIDGE 104

REV DATE: 2-12-2015
CSJ: C 917-18-89

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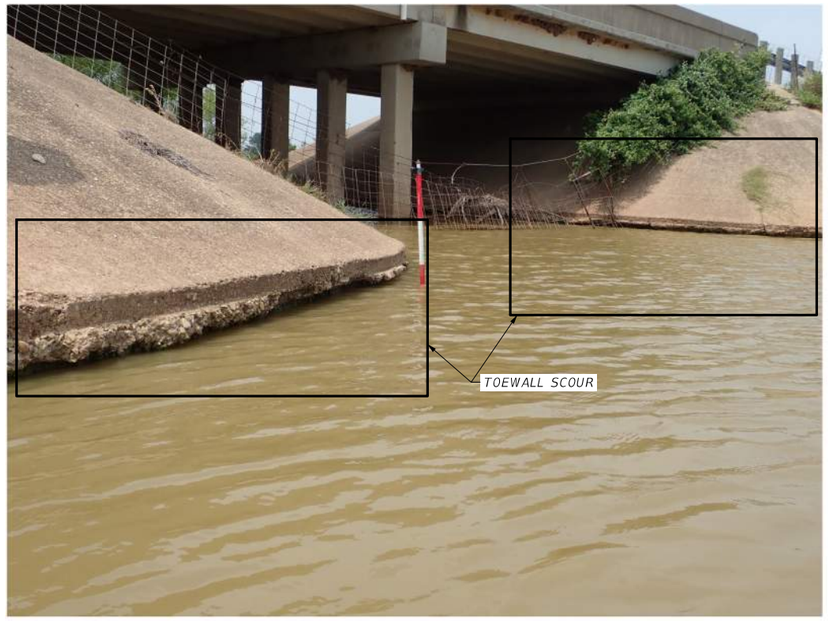


PHOTO 5

(ABUTMENT 3 TOEWALL IS EXPOSED UP TO 2.5' ALONG APPROXIMATELY FULL LENGTH OF TOEWALL)

PHOTO 7

(CHANNEL BED EROSION HAS EXPOSED CONCRETE RIPRAP TOEWALL AT ABUTMENTS 1 AND 3)

PHOTO 6

(ABUTMENT 1 TOEWALL IS EXPOSED UP TO 1.5' ALONG APPROXIMATELY FULL LENGTH OF TOEWALL)

PHOTO 8

(ABUTMENT 3 TOEWALL IS EXPOSED UP TO 2.5')

REV DATE: 2-12-2015
CSJ: C 917-18-89

FILENAME: c:\pw\working\dl\omega-app02.omegaengineers.local_omega-prod\omega_lwilson\dms140681\BRY-BRG_EC_104_02.dgn

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

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
	1/24/2024	

Texas Department of Transportation
Bryan District

FM 1373 AT BUZZARD SLOUGH
NBI: 17-198-0-0540-06-040
EXISTING CONDITIONS

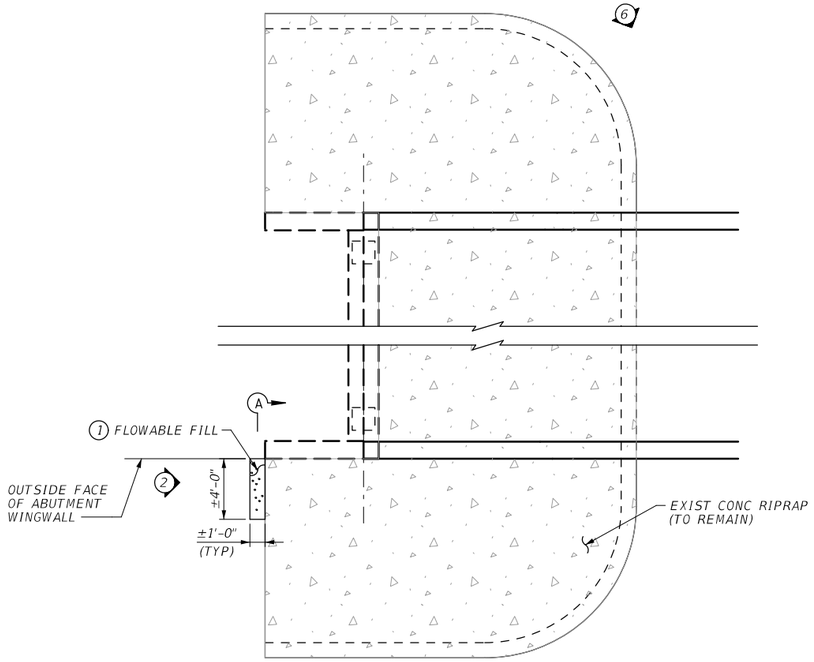
SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

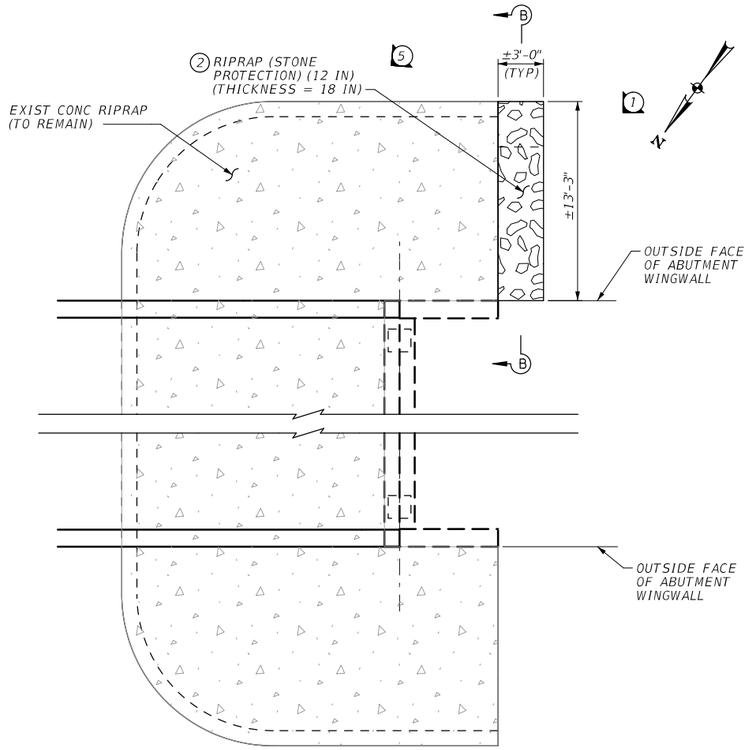
STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	63

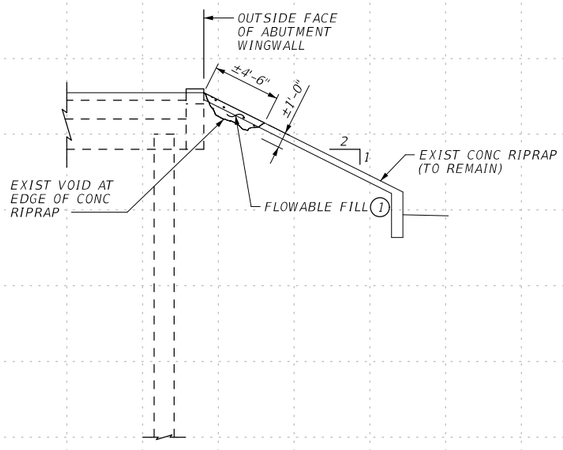
BRIDGE 104



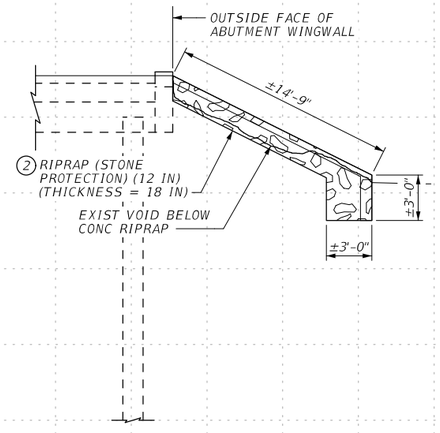
PLAN AT ABUTMENT 1



PLAN AT ABUTMENT 3



SECTION A-A



SECTION B-B

R-139 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0401 6001	FLOWABLE BACKFILL	CY	1
0432 6031	RIPRAP (STONE PROTECTION) (12 IN)	CY	4

LEGEND:

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

(1) PLACE FLOWABLE FILL TO FILL VOID AT EDGE OF EXIST CONC RIPRAP. SHAPE TOP OF FLOWABLE FILL SO WATER DRAINS AWAY FROM CONCRETE RIPRAP EDGE. ITEM 401-6001 FLOWABLE BACKFILL ~ EST 1 CY.

(2) INSTALL STONE PROTECTION PER SRR STANDARD. ALIGN TOP OF SRR WITH TOP OF EXISTING CONCRETE RIPRAP. ITEM 432-6031 RIPRAP (STONE PROTECTION) (12 IN) ~ EST 4 CY.

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

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

Texas Department of Transportation
Bryan District

FM 1373 AT BUZZARD SLOUGH
NBI: 17-198-0-0540-06-040
R-139 REPAIR DETAILS

SHEET 1 OF 1 SHEET

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	64

BRIDGE 104

REV DATE: 2-12-2015
CSJ: C 917-18-89
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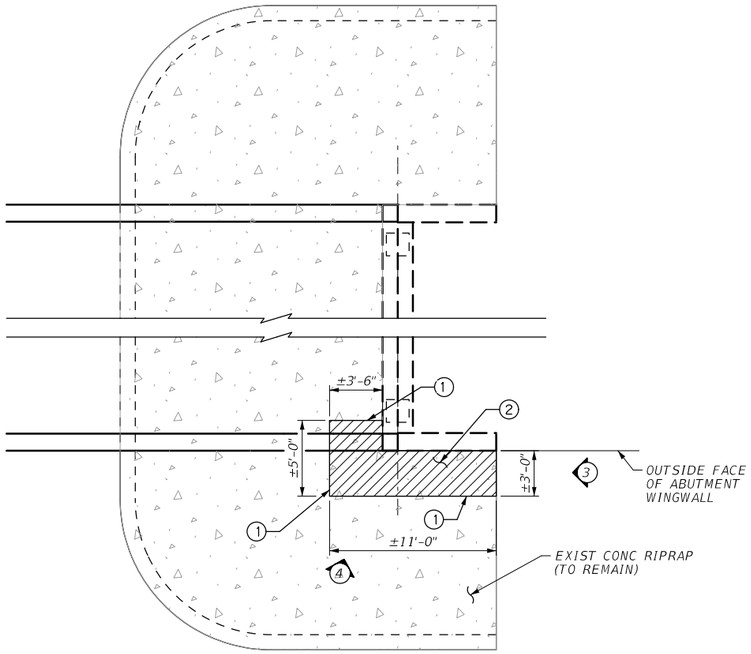
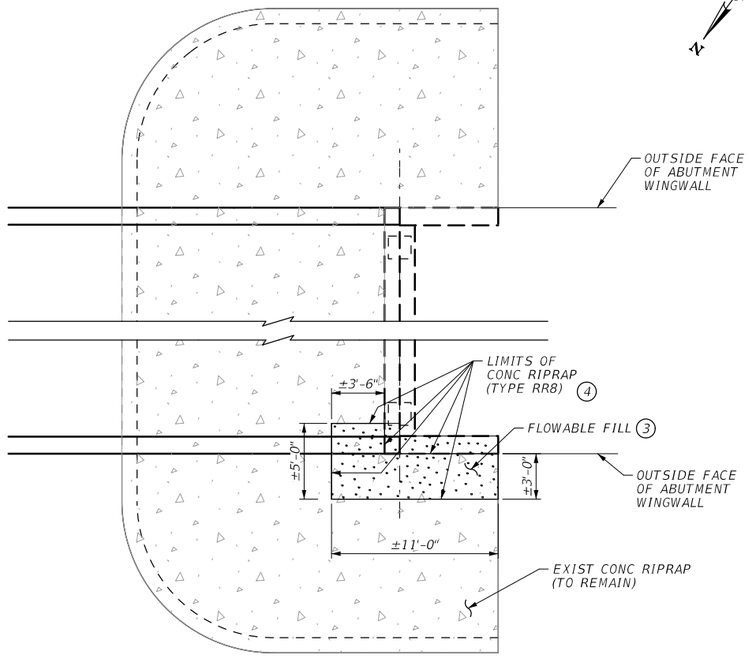
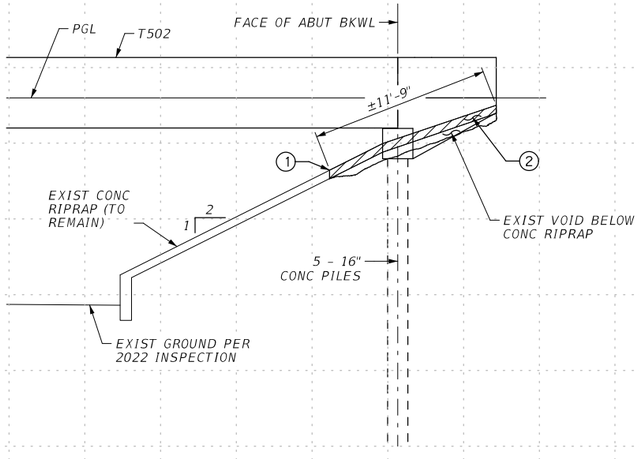


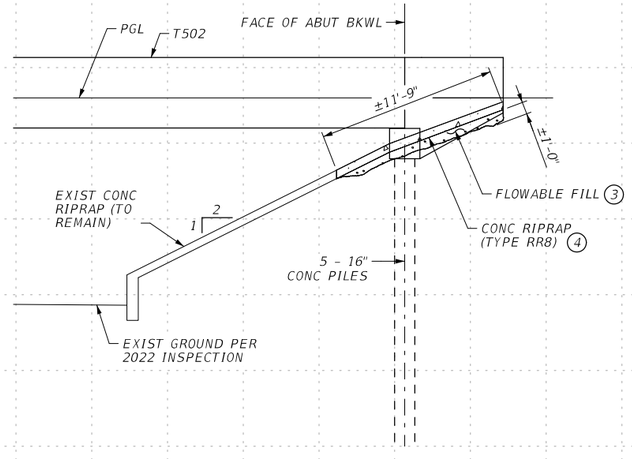
PLAN AT ABUTMENT 3 (REMOVAL)



PLAN AT ABUTMENT 3 (REPAIR)



ELEVATION AT ABUTMENT 3 (REMOVAL)



ELEVATION AT ABUTMENT 3 (REPAIR)

R-328 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0104 6009	REMOVING CONC (RIPRAP)	SY	5
0401 6001	FLOWABLE BACKFILL	CY	2
0432 6008	RIPRAP (CONC) (CL B) (RR8&RR9)	CY	2

LEGEND:

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

1. SAWCUT RIPRAP TO A ½" MIN DEPTH AS SHOWN. CLEAN AND EXTEND REINFORCING 1'-0" MIN INTO NEW CONSTRUCTION.
2. REMOVE HATCHED AREA OF EXISTING RIPRAP AS SHOWN. ITEM 104-6009 REMOVING CONC (RIPRAP) ~ EST 5 SY.
3. PLACE FLOWABLE FILL TO FILL VOID BELOW EXISTING ABUTMENT RIPRAP AND RE-ESTABLISH 2:1 SLOPE. ITEM 401-6001 FLOWABLE BACKFILL ~ EST 2 CY.
4. INSTALL CONCRETE RIPRAP PER CRR STANDARD. ITEM 432-6008 RIPRAP (CONC) (CL B) (RR8 & RR9) ~ EST 2 CY.

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

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

HUITT-ZOLLARS, INC.
5430 LBJ FREEWAY,
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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
1/24/2024	

Bryan District

FM 1373 AT BUZZARD SLOUGH
NBI: 17-198-0-0540-06-040
R-328 REPAIR DETAILS

SHEET 1 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	65

BRIDGE 104

REV DATE: 2-12-2015
CSJ: C 917-18-89
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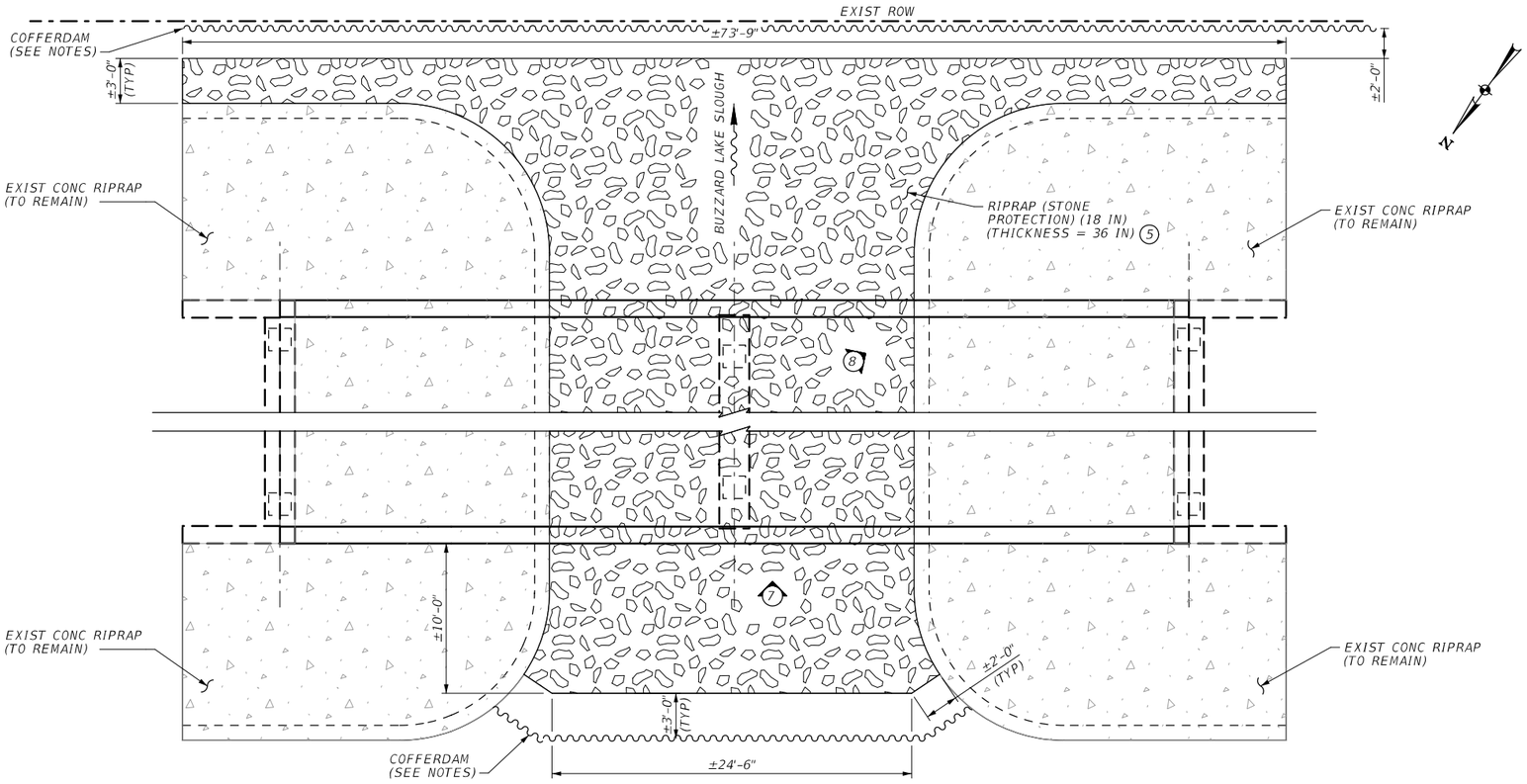
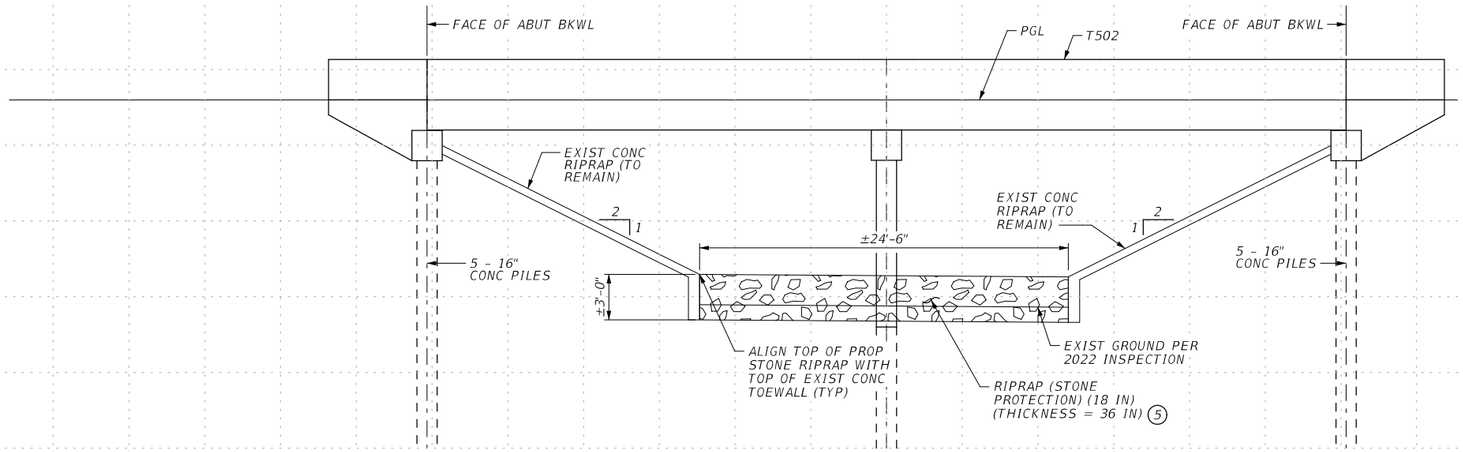


PLAN

R-328 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0403 6006	TEMPORARY SPL SHORING (COFFERDAM)	SF	620
0432 6033	RIPRAP (STONE PROTECTION) (18 IN)	CY	195



ELEVATION

BRIDGE 104

LEGEND:

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

(5) INSTALL STONE PROTECTION PER SRR STANDARD. ITEM 432-6033 RIPRAP (STONE PROTECTION) (18 IN) ~ EST 195 CY.

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

COFFERDAM NOTES:

BUZZARD SLOUGH IS AN EPHEMERAL WATERWAY ADJACENT TO THE LITTLE BRAZOS RIVER WITH LITTLE TO NO BASE FLOW EXCEPT DURING AND AFTER RAINFALL RUNOFF EVENTS. PONDING OCCURS BELOW THE STRUCTURE AND IS PERSISTENT SEVERAL MONTHS AFTER RAINFALL EVENTS. CONTRACTOR SHALL DETERMINE IF COFFERDAM IS NECESSARY WITHIN THE TIME FRAME REQUIRED TO PERFORM WORK WITHIN THE CHANNEL.

QUANTITY FOR COFFERDAM SHOWN IS FOR BIDDING PURPOSES ONLY. COFFERDAM AT THIS LOCATION WILL PRIMARILY BE UTILIZED FOR DEWATERING THE SITE TO PERFORM WORK AS REQUIRED. SEE GENERAL NOTES FOR ADDITIONAL INFORMATION.

STATE OF TEXAS
CHARLES E. QUADE
69396
REGISTERED PROFESSIONAL ENGINEER
1/24/2024

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 5 10 20 FT
0 5 10 20 FT
VERTICAL

100% SUBMITTAL

PRINT DATE	REVISION DATE
1/24/2024	

Texas Department of Transportation
Bryan District

FM 1373 AT BUZZARD SLOUGH
NBI: 17-198-0-0540-06-040
R-328 REPAIR DETAILS

SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	66

REV DATE: 2-12-2015
CSJ: C 917-18-89
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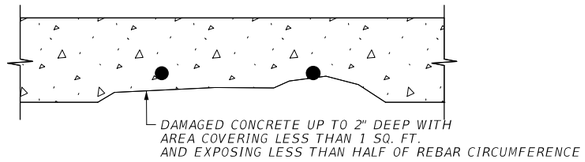
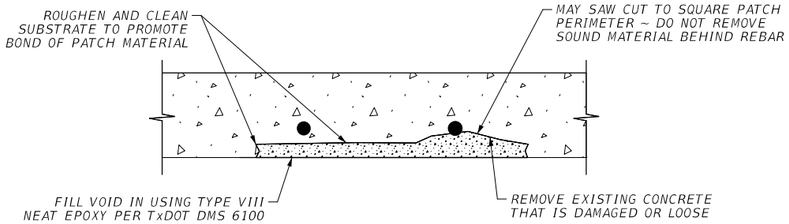
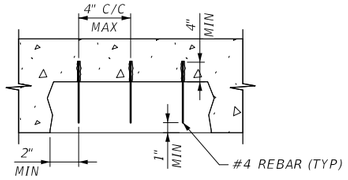


STEP 1 - MINOR SPALL REPAIR



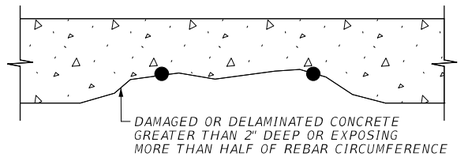
STEP 2 - MINOR SPALL REPAIR



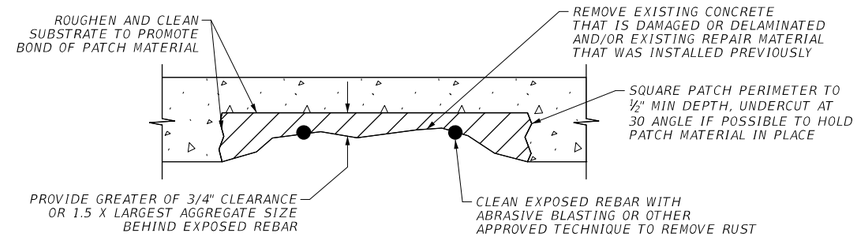
MECHANICAL TIE DETAIL

GENERAL NOTES:

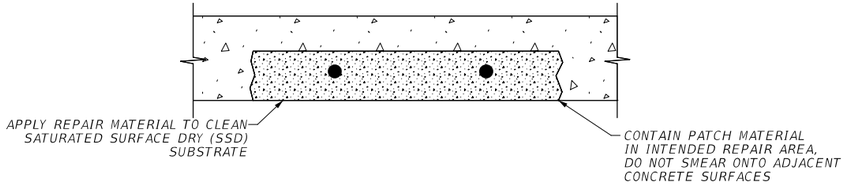
1. PERFORM REPAIR IN ACCORDANCE WITH TxDOT ITEM 429, "CONCRETE STRUCTURE REPAIR", AND THE TXDOT CONCRETE REPAIR MANUAL, MARCH 2021. IN ADDITION TO DETAILS SHOWN ON THIS SHEET, THE MANUAL INCLUDES CRITERIA FOR APPLICATION, SURFACE PREPARATION, FORMS, AND CURING.
2. CONTRACTOR TO SUBMIT ALL MATERIALS AND 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.



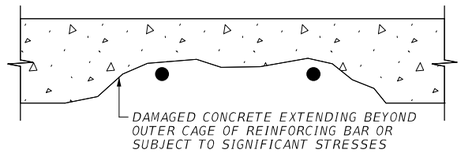
STEP 1 - INTERMEDIATE SPALL REPAIR



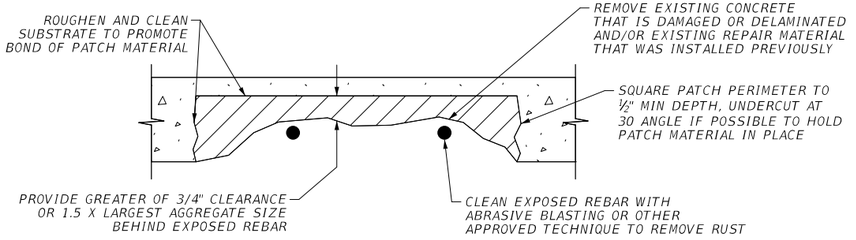
STEP 2 - INTERMEDIATE SPALL REPAIR



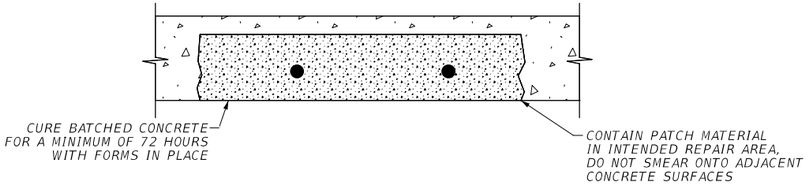
STEP 3 - INTERMEDIATE SPALL REPAIR



STEP 1 - MAJOR SPALL REPAIR



STEP 2 - MAJOR SPALL REPAIR



STEP 3 - MAJOR SPALL REPAIR

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
1/24/2024

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
	1/24/2024	

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 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	67

REV DATE: 2-12-2015
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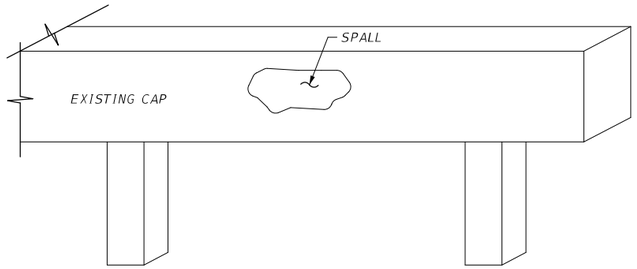
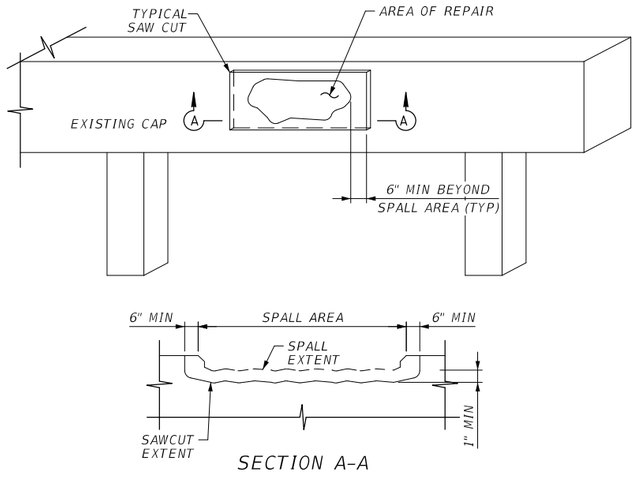


1. DEFINE LIMITS OF AREA TO BE REPAIRED PLUS 6" ON ALL SIDES.

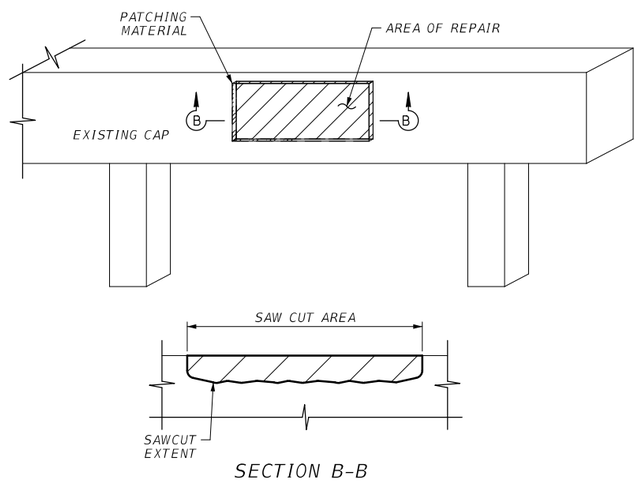
EXISTING CAP CONDITION



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.

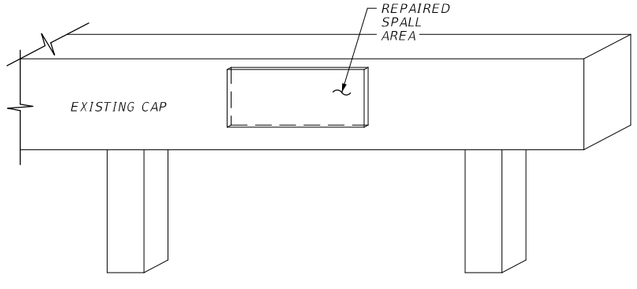
STEP 1



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
GODWIN A. ARTHUR
127720
LICENSED PROFESSIONAL ENGINEER
1/24/2024

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
	1/24/2024	

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 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	68

REV DATE: 2-12-2015
CSJ: C 917-18-89

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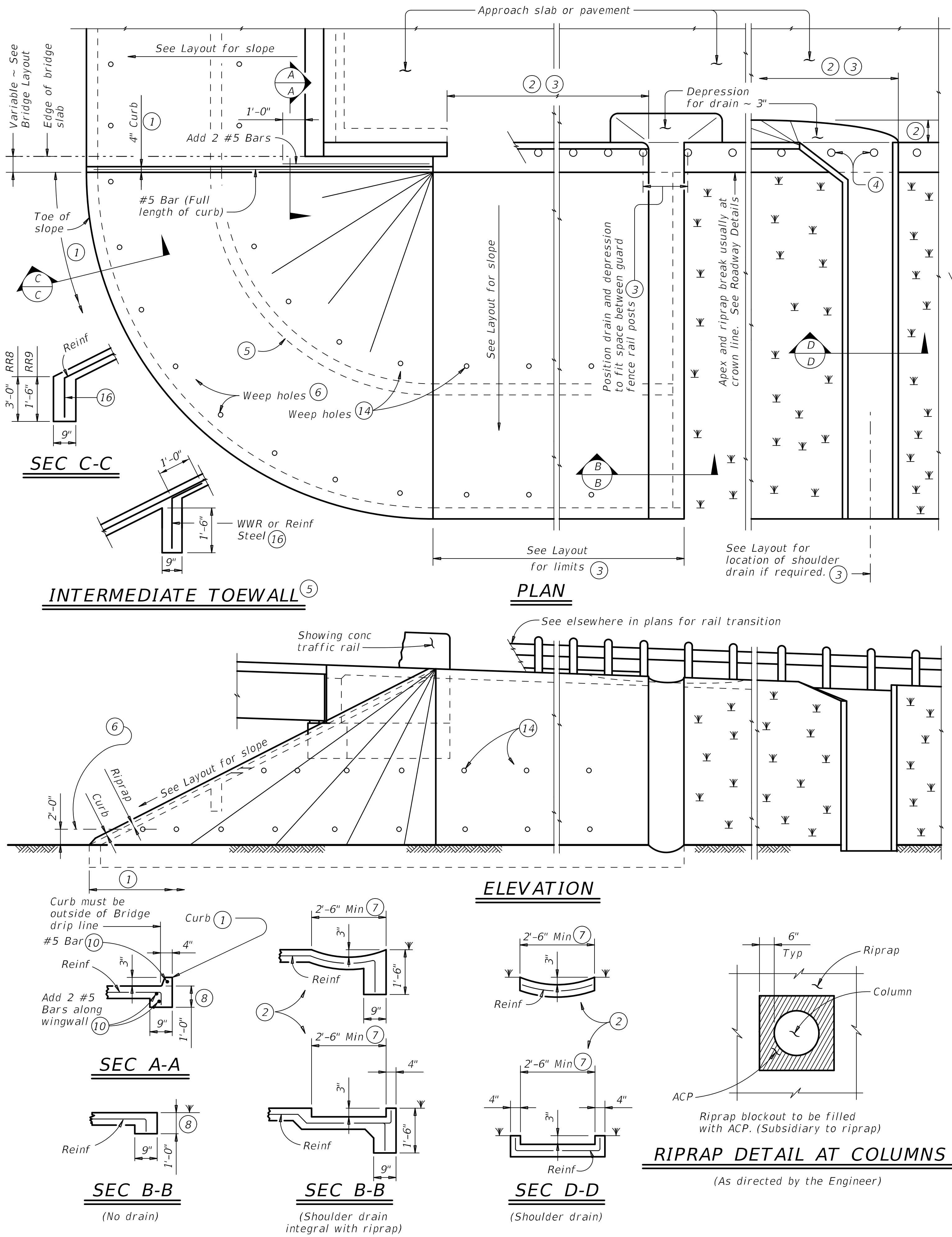

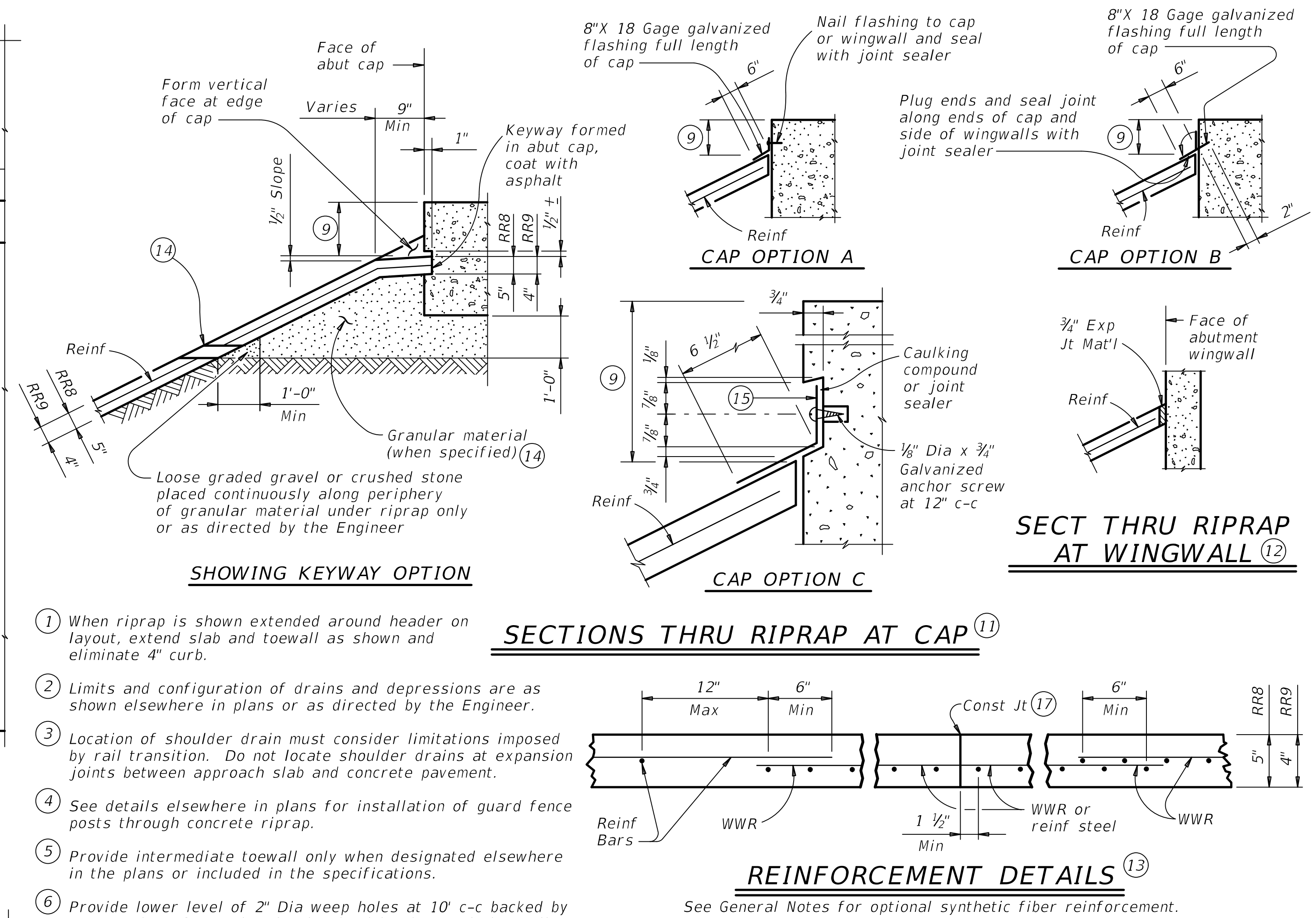

1. When riprap is shown extended around header on layout, extend slab and toewall as shown and eliminate 4" curb.
2. Limits and configuration of drains and depressions are as shown elsewhere in plans or as directed by the Engineer.
3. Location of shoulder drain must consider limitations imposed by rail 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	18	089	VARIOUS
	DIST		COUNTY	SHEET NO.
	BRY		ROBERTSON	69

DATE: 1/24/2024 1:48:09 PM
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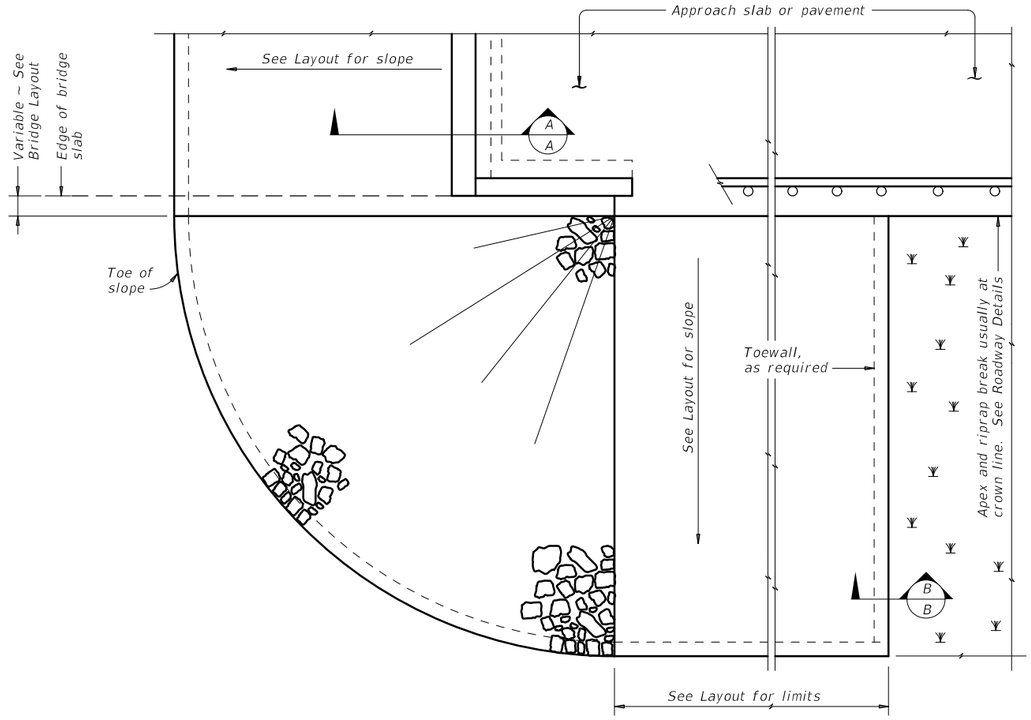
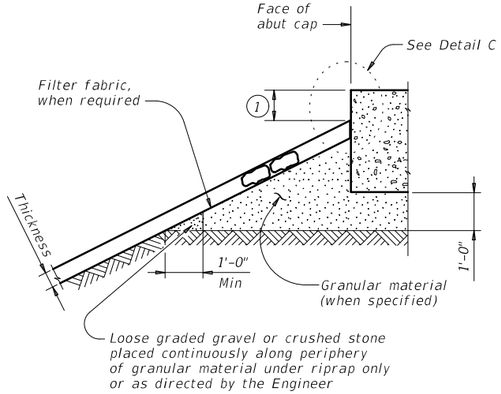
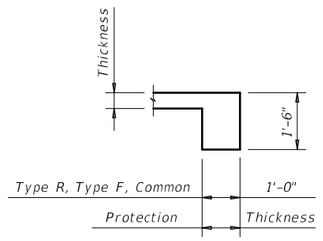


PLAN

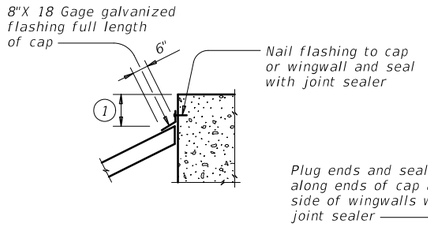


SECTION A-A AT CAP

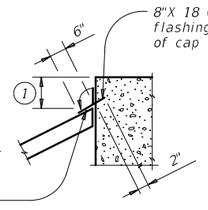


SECTION B-B

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

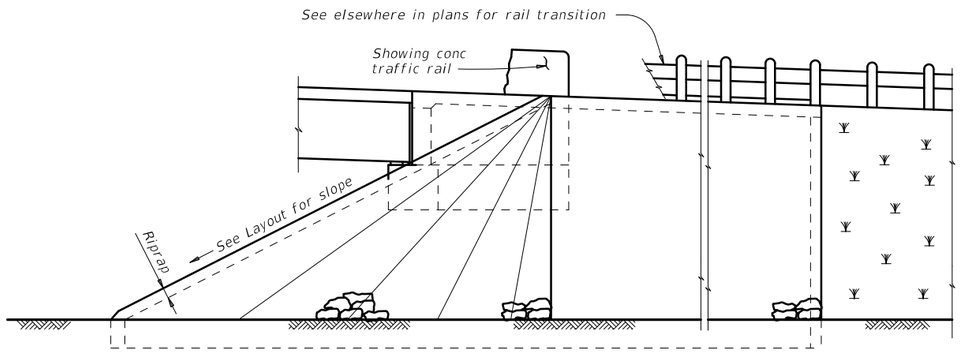


CAP OPTION A



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	18	089	VARIOUS
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON		70

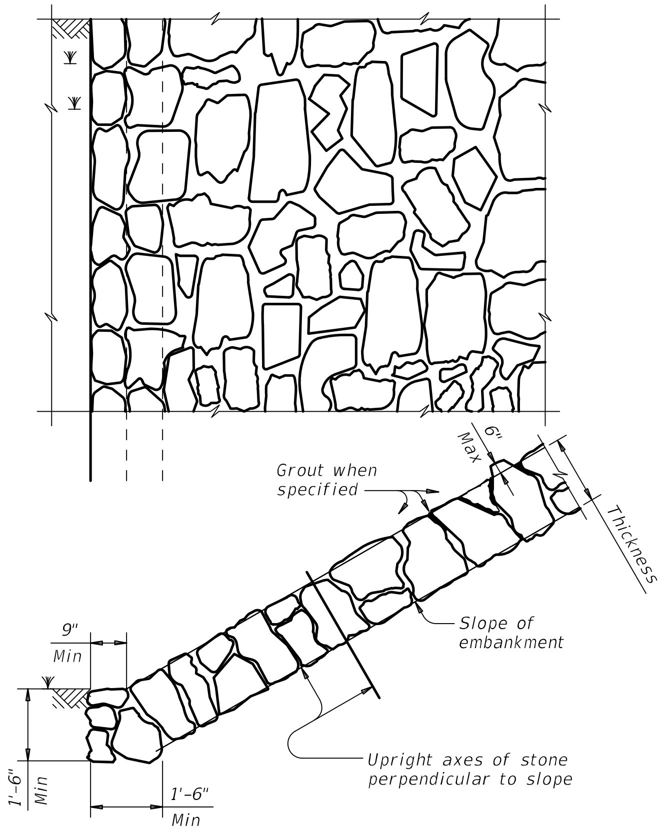


FIGURE 1 ~ TYPE R STONE RIPRAP

dry or grouted

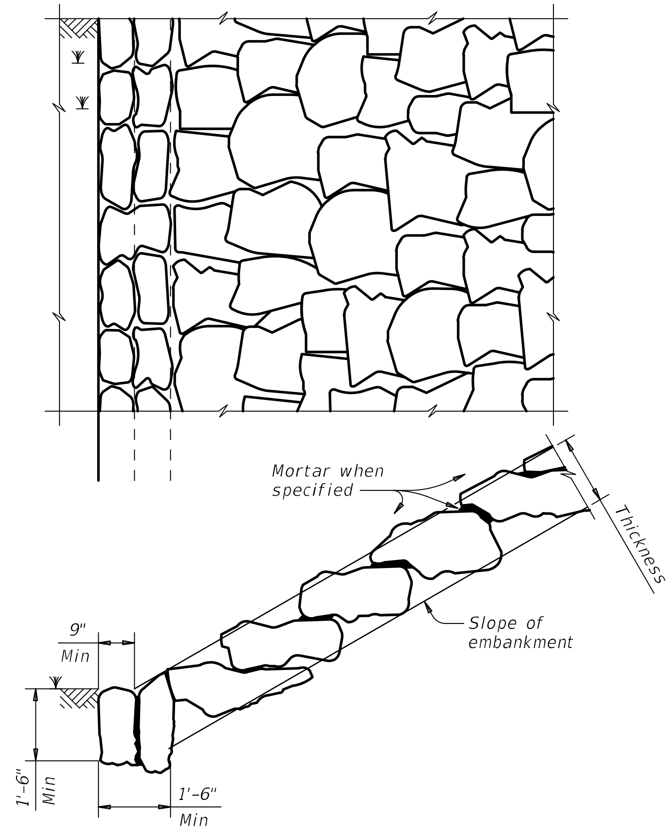


FIGURE 2 ~ TYPE F STONE RIPRAP

dry or mortared

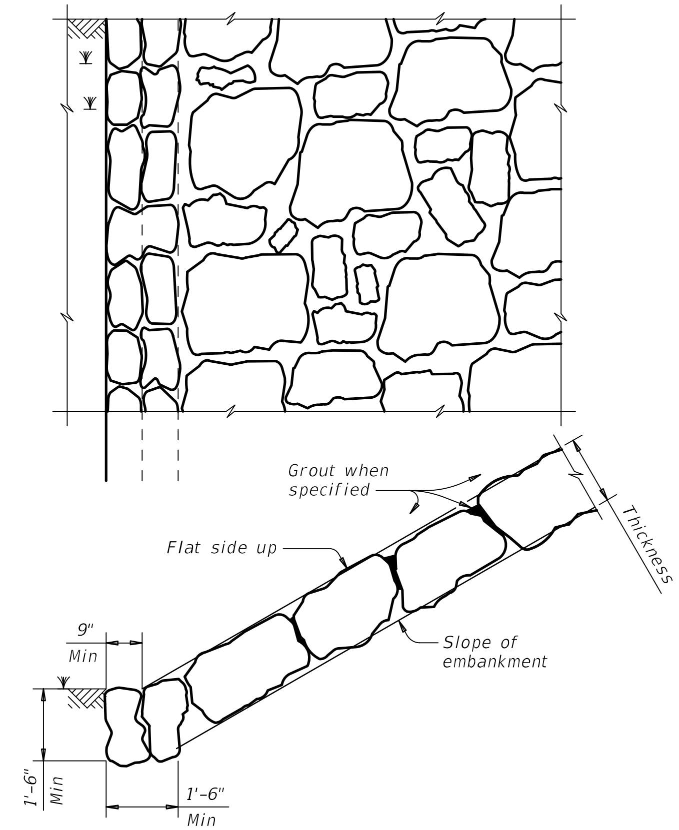
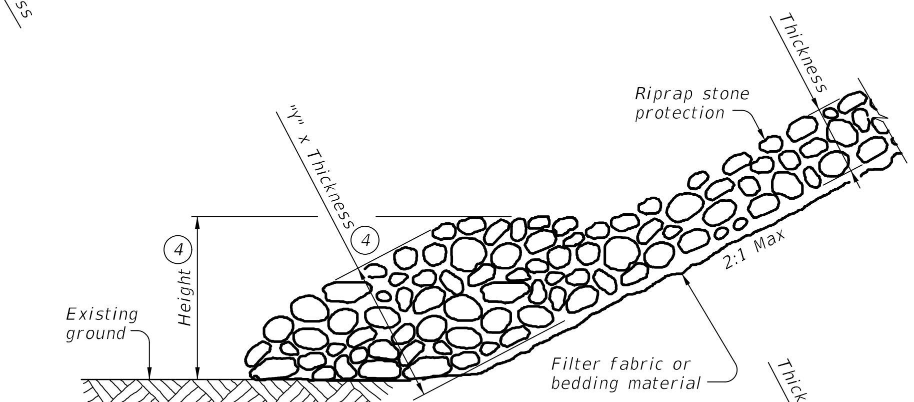


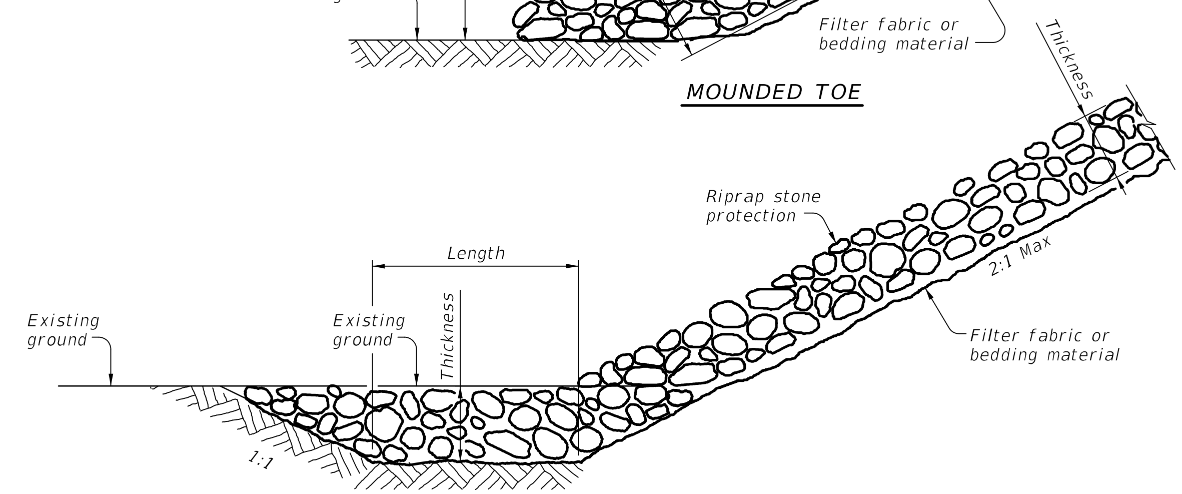
FIGURE 3 ~ TYPE F STONE RIPRAP

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)

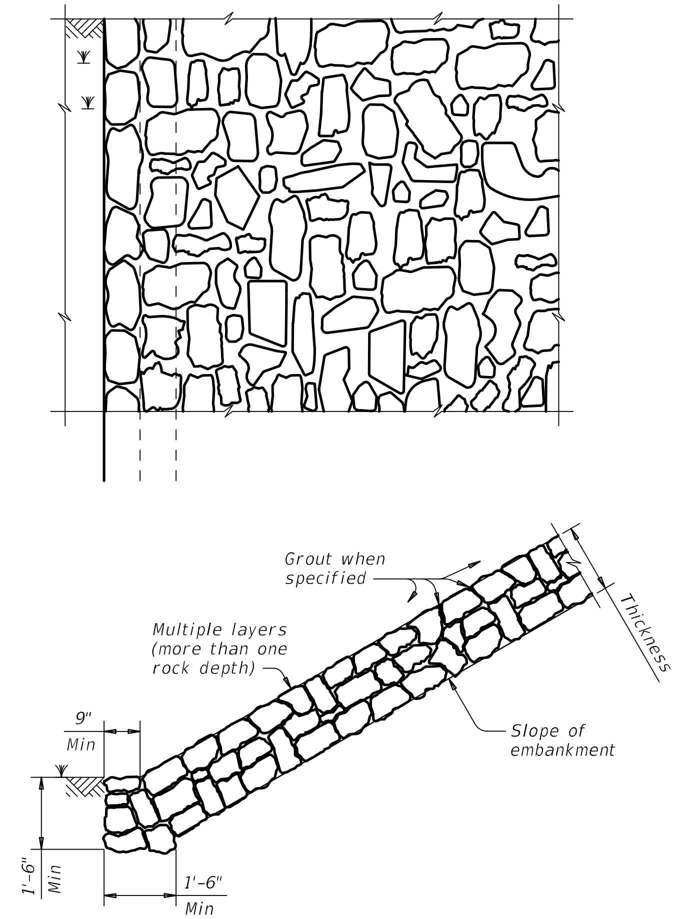


FIGURE 4 ~ COMMON STONE RIPRAP

dry or grouted

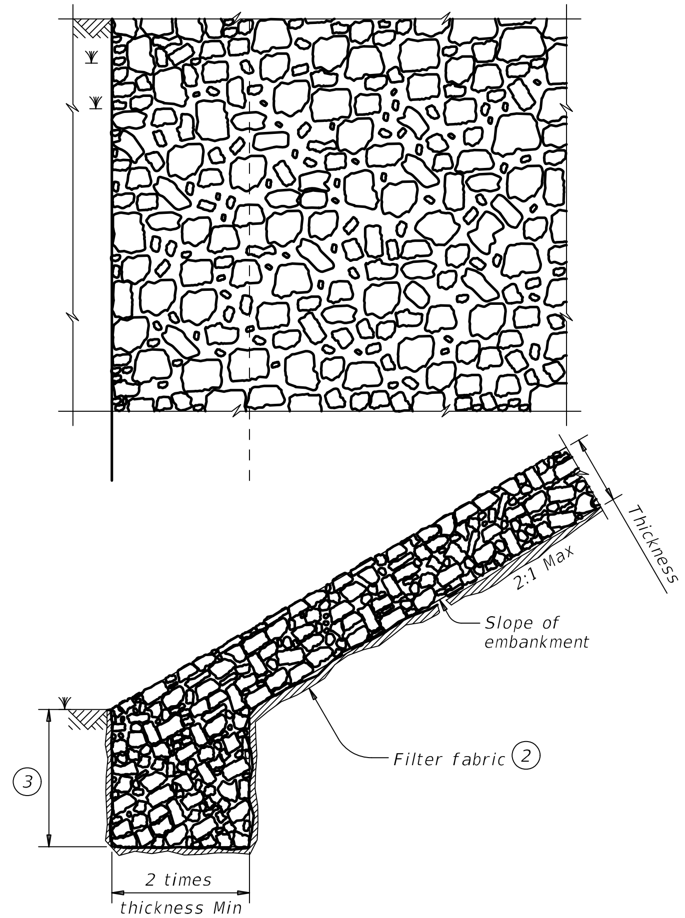


FIGURE 5 ~ PROTECTION STONE RIPRAP (5)

SHEET 2 OF 2

Texas Department of Transportation | Bridge Division Standard

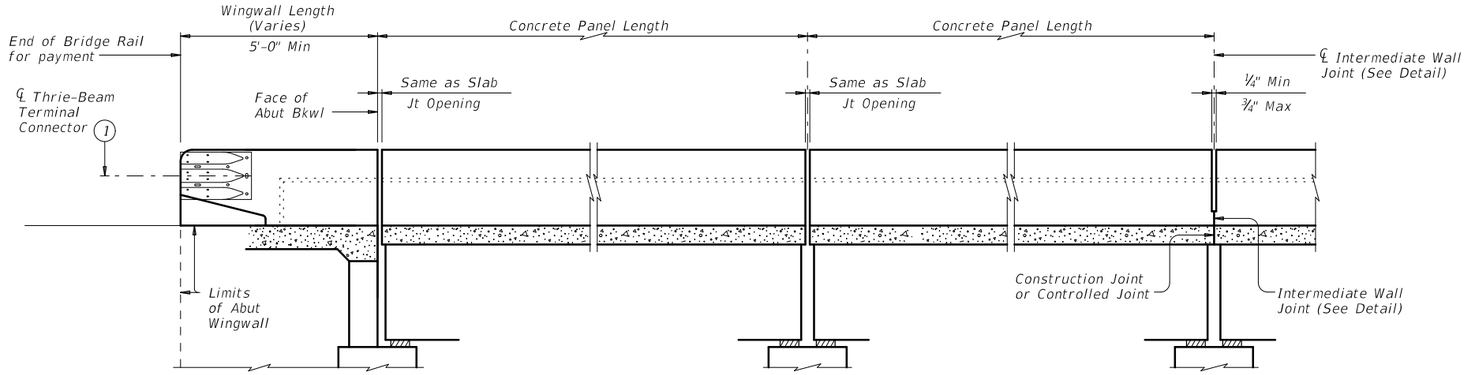
STONE RIPRAP

SRR

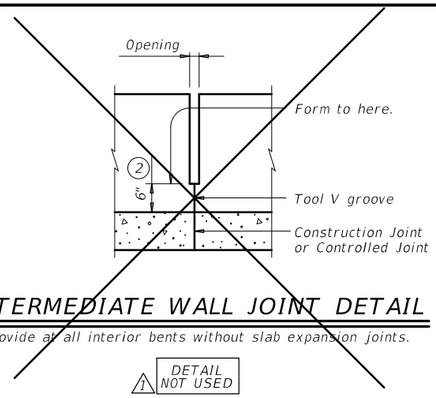
FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	18	089	VARIOUS
	DIST		COUNTY	SHEET NO.
	BRY		ROBERTSON	71

FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms19632\RL-T551-19(MOD).dgn

REV DATE: 2-12-2015
CSJ: C 917-18-89

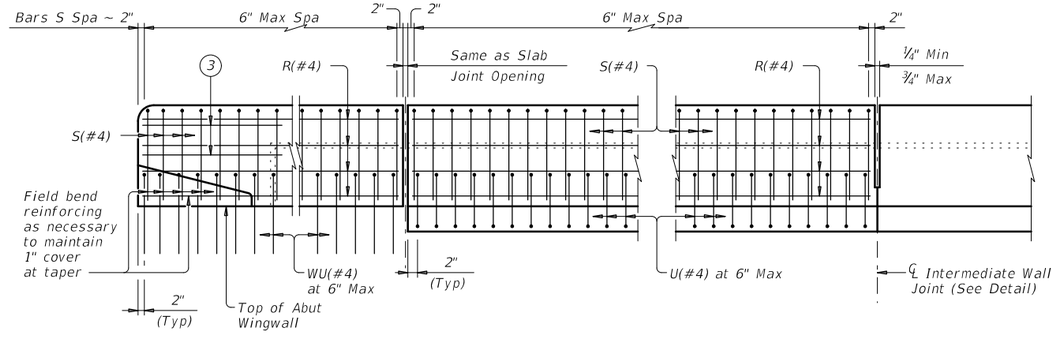


ROADWAY ELEVATION OF RAIL

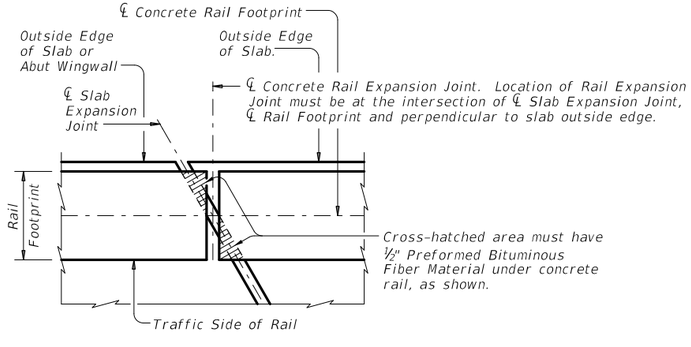


INTERMEDIATE WALL JOINT DETAIL

Provide at all interior bents without slab expansion joints.



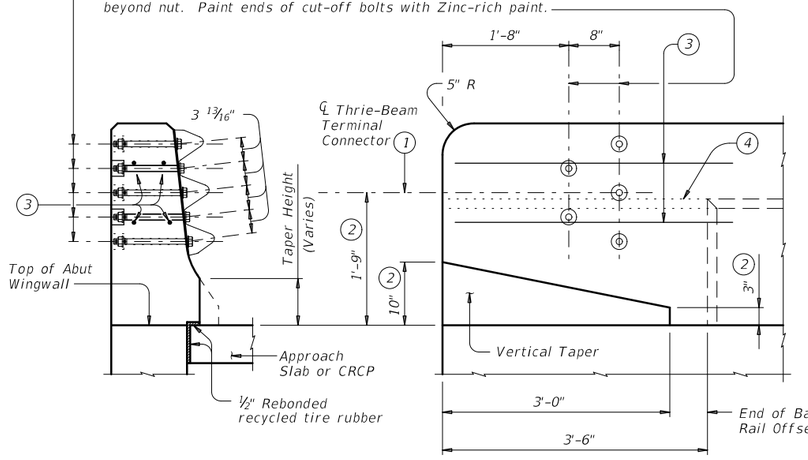
ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

℄ 5 ~ 1" Dia holes and 2 ½" Dia x 2" deep recesses. Form or core holes and recesses. Percussion drilling is not permitted. Adjust placement of reinforcing steel as necessary to avoid bolt holes and recesses. Bolt recesses are only required when pedestrian sidewalks are adjacent to back of rail. Tighten the 5 Terminal Connection Bolts in a well distributed pattern so to prevent damage or distortion of the Thrie-Beam Connection and the MBGF Transition. Cut bolts off after installation so as to extend no more than ¾" beyond nut. Paint ends of cut-off bolts with Zinc-rich paint.



TERMINAL CONNECTION DETAILS

1. Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
2. Increase 2" for structures with overlay.
3. Place 4 additional Bars R(#4) 3'-8" in length inside Bars S(#4) and centered 2'-0" from end of rail when Terminal Connections are required.
4. Back of rail offset may, with Engineer's approval, be continued to the end of the railing.

1 THIS STANDARD HAS BEEN MODIFIED FOR USE TO REPAIR AN EXISTING T501/T502 RAIL. ALL DETAILS NOT PERTAINING TO THIS REPAIR CONDITION HAVE BEEN CROSSED OUT. IN ADDITION, NOTES AND KEY NOTES, WHERE REQUIRED, HAVE BEEN ADDED TO CLARIFY THE RAIL REPAIR CONDITIONS.

THIS SHEET MUST BE USED WITH THE BRIDGE SPECIFIC DETAILS PROVIDED ELSEWHERE IN THIS PLAN SET.

VALID FOR USE WITH THE FOLLOWING BRIDGE ONLY:
BRIDGE 92: SH 6 OVER SANDY CREEK
NBI: 17-198-0-0049-07-114

STATE OF TEXAS
BRADLEY D. SHUEY
86490
LICENSED
PROFESSIONAL ENGINEER
1/24/2024

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION # 739

SHEET 1 OF 2

Texas Department of Transportation

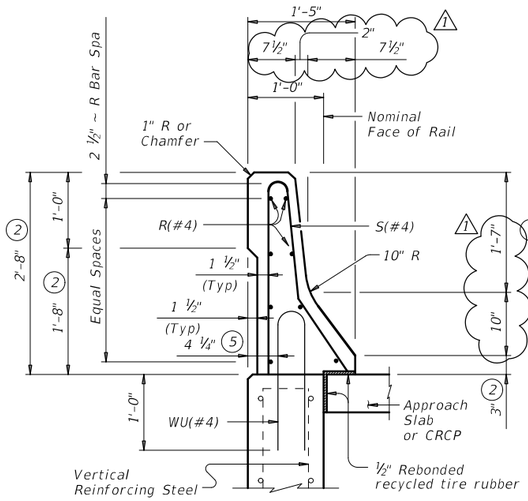
Bridge Division Standard

TRAFFIC RAIL

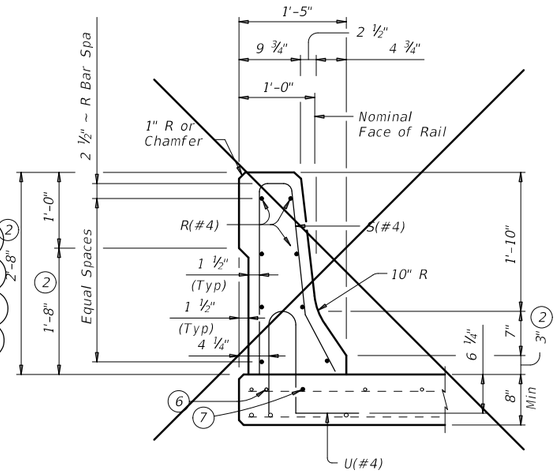
TYPE T551 (MOD)

FILE:	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	18	089	VARIOUS
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON		72

FILENAME: c:\pw\workingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms19632\RL-T551-19(MOD).dgn
REV DATE: 2-12-2015
CSJ: C 917-18-89



ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS



ON BRIDGE SLAB

SECTIONS THRU RAIL

(2) Increase 2" for structures with overlay.

(5) 5 ¼" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.

(6) As an aid in supporting reinforcement, additional longitudinal bars may be used in the slab with the approval of the Engineer. Such bars will be furnished at the Contractor's expense.

(7) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

(8) Bend or cut as required to clear drain slots.

(9) No longitudinal wires may be in top center of cage.

(10) Space U(#4) bars at 4" Max when end region of panel length is less than 6'-0" to side slot drain. Space U(#4) bars at 6" Max when end region of panel length is 6'-0" and greater to side slot drain.

(1) NOTES NOT USED

(1) THIS STANDARD HAS BEEN MODIFIED FOR USE TO REPAIR AN EXISTING T501/T502 RAIL. ALL DETAILS NOT PERTAINING TO THIS REPAIR CONDITION HAVE BEEN CROSSED OUT. IN ADDITION, NOTES AND KEY NOTES, WHERE REQUIRED, HAVE BEEN ADDED TO CLARIFY THE RAIL REPAIR CONDITIONS.

THIS SHEET MUST BE USED WITH THE BRIDGE SPECIFIC DETAILS PROVIDED ELSEWHERE IN THIS PLAN SET.

VALID FOR USE WITH THE FOLLOWING BRIDGE ONLY:
BRIDGE 92: SH 6 OVER SANDY CREEK
NBI: 17-198-0-0049-07-114

CONSTRUCTION NOTES:

This railing may be constructed by the slipform process when approved by the Engineer, with equipment approved by the Engineer. Provide sensor control for both line and grade. Tack welding to provide bracing for slipform operations is acceptable. Welding may be performed at a minimum spacing of 3 ft between the cage and the anchorage. It is permissible to weld to bars U, WU and S at any location on the cage. If increased bracing is needed, provide additional anchorage devices and weld in the upper two thirds of the cage. Paint welded areas on epoxy coated and/or galvanized reinforcing with an organic zinc rich paint in accordance with Item 445 "Galvanizing".

(1) SLIPFORMING NOT PERMITTED

If rail is slipformed, apply an heavy epoxy bead 1" behind toe of traffic side of rail to concrete deck just prior to slip forming. Provide a ¾" width x ¾" tall heavy epoxy bead with Type III, Class C or a Type V epoxy.

The back of railing must be vertical unless otherwise shown on the plans or approved by the Engineer.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.

(1) WELDED WIRE REINFORCEMENT NOT PERMITTED

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U and WU unless noted otherwise. Deformed WWR (ASTM A1064) may be substituted for Bars R and S as shown. Combinations of reinforcing steel and WWR or configurations of WWR other than shown are permitted if conditions in the table are satisfied. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:
Uncoated or galvanized ~ #4 = 1'-7"
Epoxy coated ~ #4 = 2'-5"

GENERAL NOTES:

This rail has been evaluated and accepted to be of equal strength to railings with like geometry, which have been crash tested to meet MASH TL-3 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.

Do not use this railing on bridges with expansion joints providing more than 5" movement.

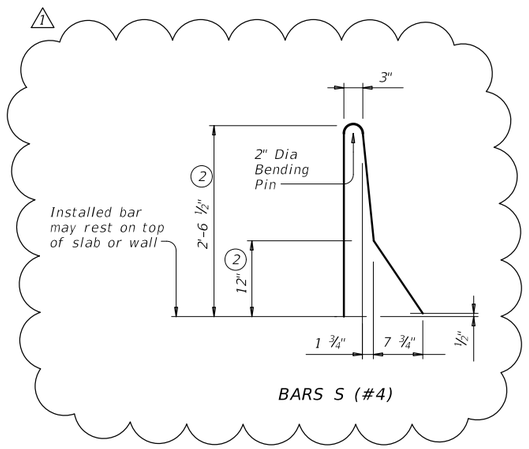
Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Shop drawings will not be required for this rail.

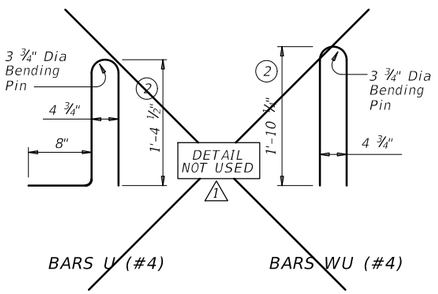
Average weight of railing with no overlay is 382 plf.

Cover dimensions are clear dimensions, unless noted otherwise.

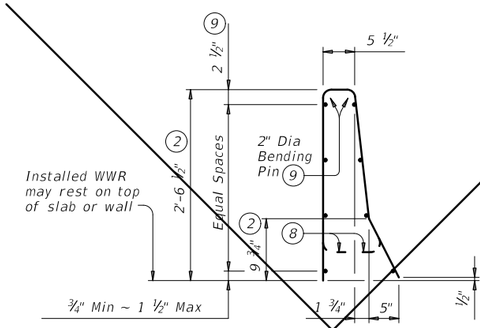
Reinforcing bar dimensions shown are out-to-out of bar.



BARS S (#4)



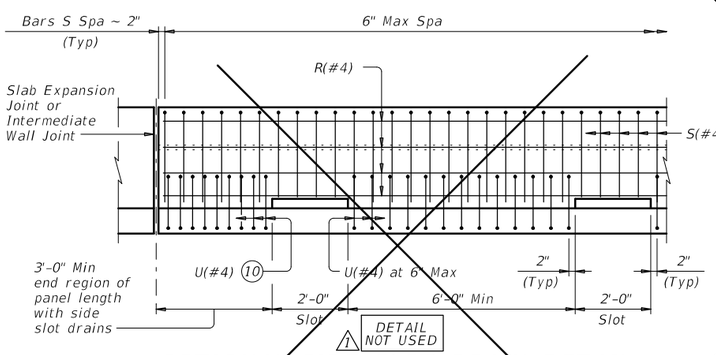
BARS U (#4) BARS WU (#4)



OPTIONAL WELDED WIRE REINFORCEMENT (WWR)

(1) DETAIL NOT USED

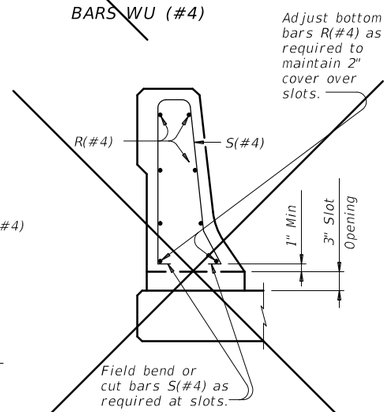
DESCRIPTION	LONGITUDINAL WIRES	VERTICAL WIRES
Minimum (Cumulative Total) Wire Area	1.067 Sq In.	0.267 Sq In. per Ft
	No. of Wires	Spacing
Minimum	8	4"
Maximum	10	8"
Maximum Wire Size Differential	The smaller wire must have an area of 40% or more of the larger wire.	



(1) DETAIL NOT USED

OPTIONAL SIDE SLOT DRAIN DETAIL

Note: Side Slot Drains may be used where shown elsewhere on the plans or as directed by the Engineer. If continuous slots at 8 ft c-c are required, then details as on standard Type T552 should apply. Do not place drains over railroad tracks, lower roadways, or sidewalks. When this rail is used as a separator between a roadway surface and a sidewalk surface, side drain slots will not be permitted.



SECTION THRU OPTIONAL SIDE SLOT DRAIN

(1) DETAIL NOT USED

Texas Department of Transportation — Bridge Division Standard

TRAFFIC RAIL

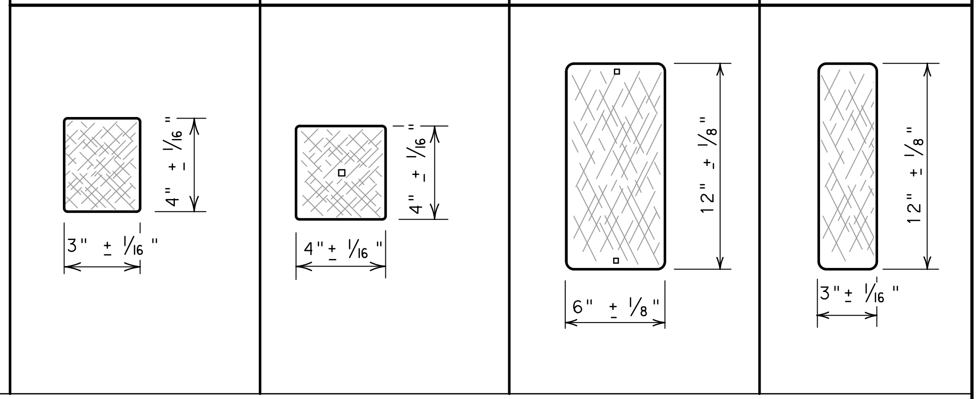
TYPE T551 (MOD)

STATE OF TEXAS · BRADLEY D. SHUEY · 86490 · LICENSED · PROFESSIONAL ENGINEER
1/24/2024

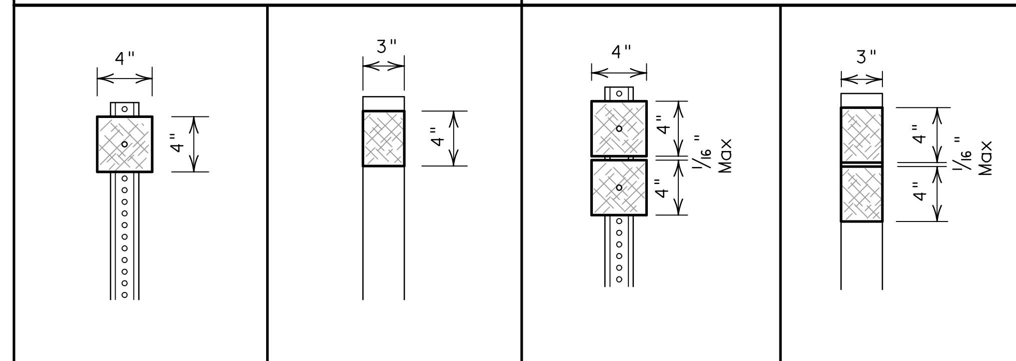
AGUIRRE & FIELDS ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION # 739

FILE:	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT September 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0917	18	089	VARIOUS
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON		73

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

DELINEATORS

	SINGLE		DOUBLE	
DEVICE	 1-Size 2 reflector unit	1-Size 1 reflector unit	2-Size 2 reflector units	2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

NUMBER OF REFLECTORS
S = Single
D = Double

COLOR OF REFLECTORS
W = White
Y = Yellow
R = Red

REFLECTOR UNIT SIZE
1 or 2

TYPE OF POST OR DELINEATOR
WC = Wing Channel Post
YFLX = Yellow Flexible Post
WFLX = White Flexible Post
BRF = Barrier Reflector

TYPE OF MOUNT
GND = Embedded (drivable or set in concrete)
CTB = Concrete Barrier Mount
GF1 or GF2 = Guard Fence Attachment
SRF = Surface Mount

DIRECTION
If Required
BI = Bi-Directional
BR = Bi-Directional with red on back

INSTL OM ASSM (OM-XX) (XXXX)XXX(XX)

TYPE OF OBJECT MARKER
1, 2, 3, or 4

NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

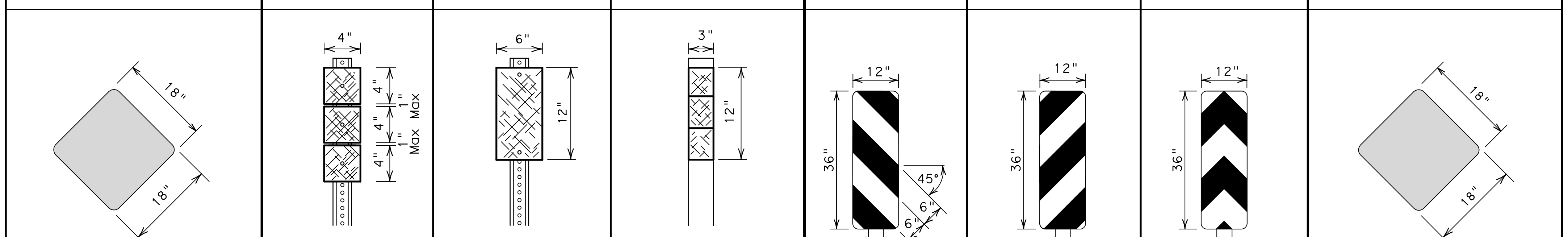
TYPE OF POST
WC = Wing Channel Post
WFLX = White Flexible Post
TWT = Thin Walled Tubing

TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

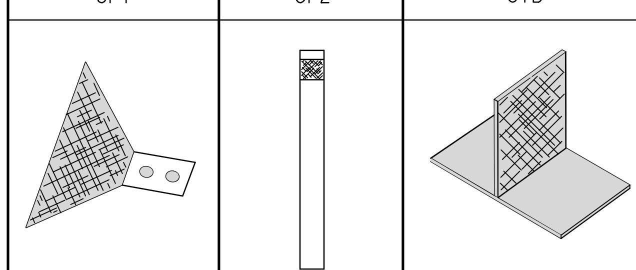
DIRECTION
If Required
BI = Bi-Directional

DEPARTMENTAL MATERIAL SPECIFICATIONS	
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

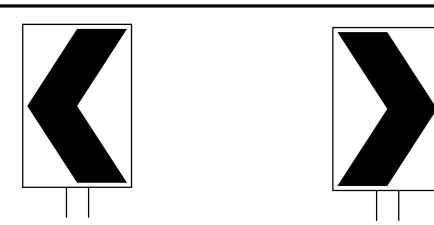
OBJECT MARKERS

	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

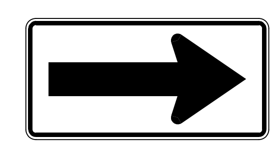
BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS

DEVICE	 W1-8			
SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

ONE DIRECTION LARGE ARROW

DEVICE	 W1-6	
SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

NOTE

1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies).
2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).

NOTE:

Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

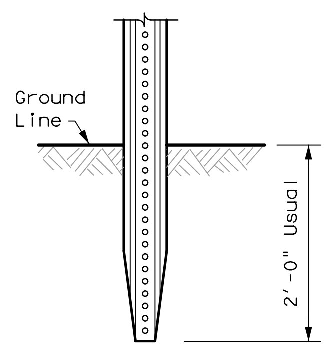
FILE: doml-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT 0917	SECT 18	JOB 089	HIGHWAY VARIOUS
REVISIONS 10-09 3-15 4-10 7-20	DIST BRY	COUNTY ROBERTSON		SHEET NO. 74

20A

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

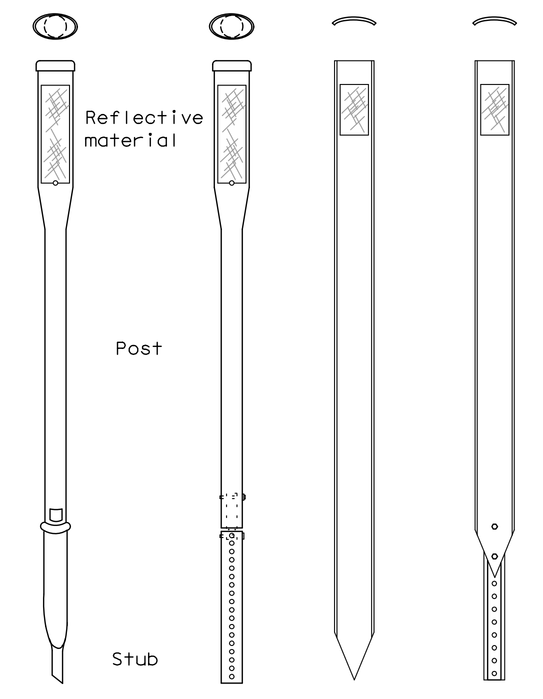


NOTES

1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

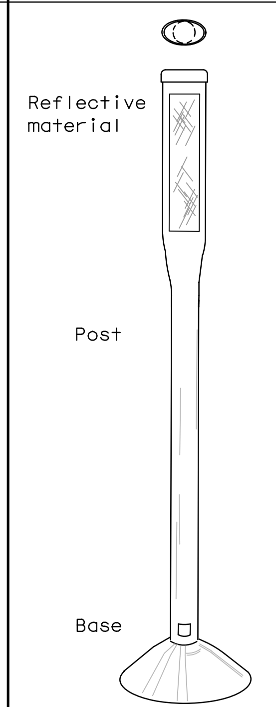
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



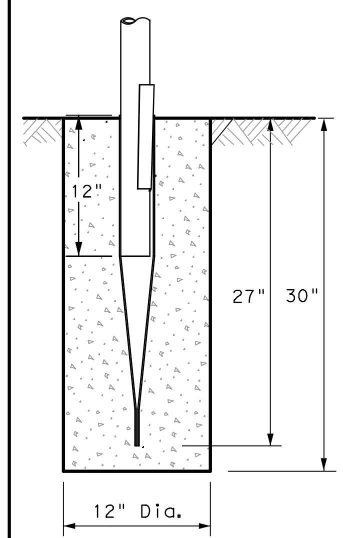
SURFACE MOUNT

NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

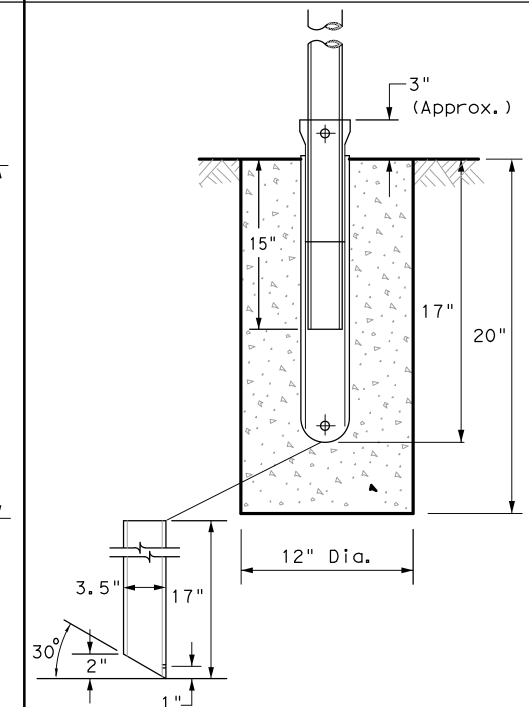
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

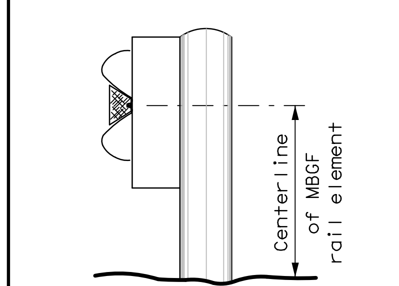
NOTE

1. Install per manufacturer's recommendations.

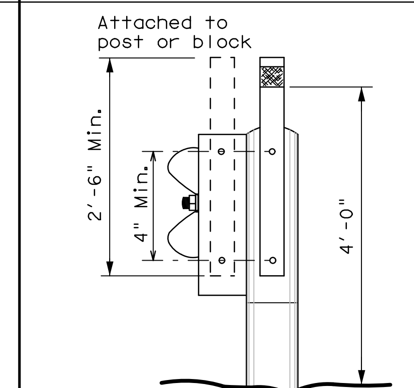
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

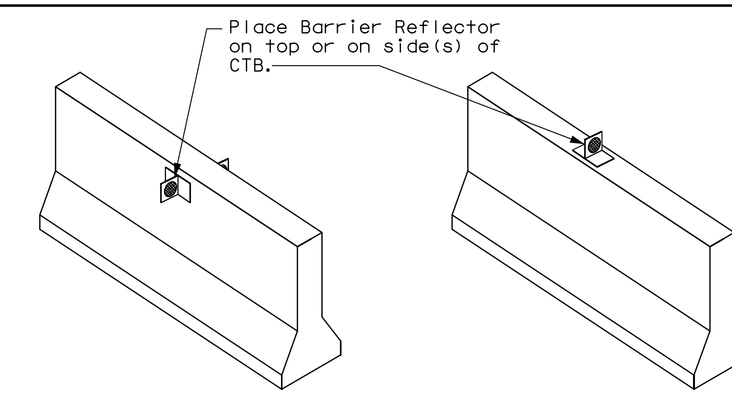
GF1



GF2



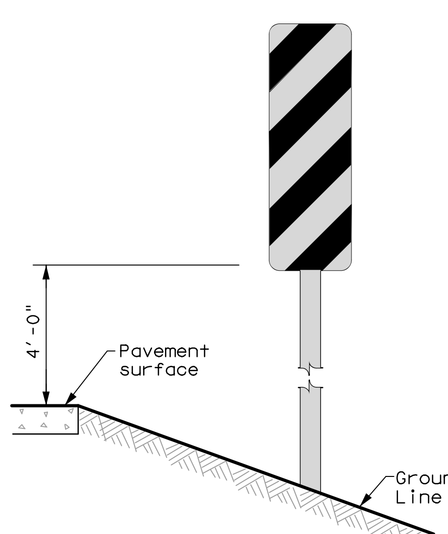
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

1. Place delineators on a section of roadway at a consistent distance from the edge of pavement.
2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible.
4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.
5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.

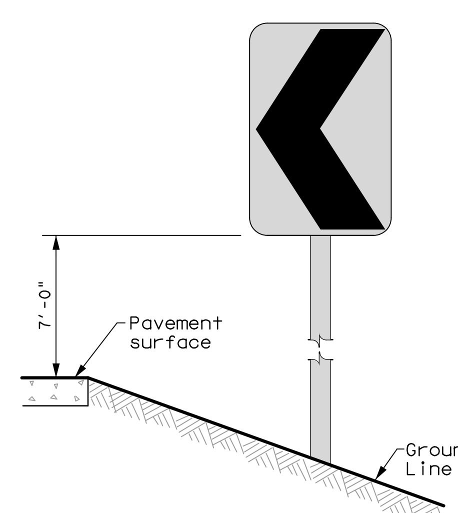
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)

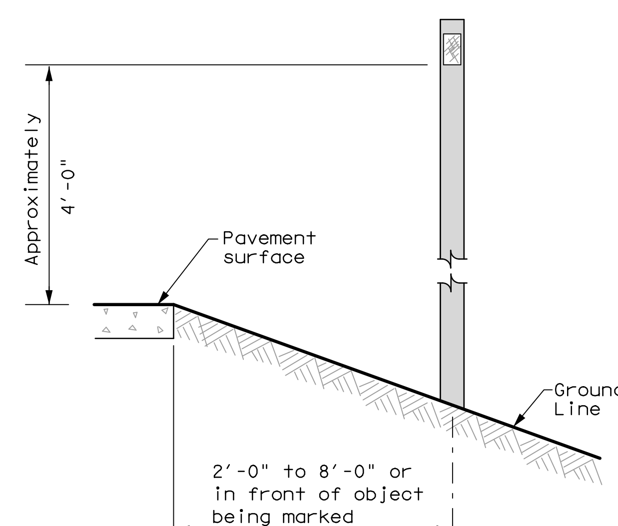
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

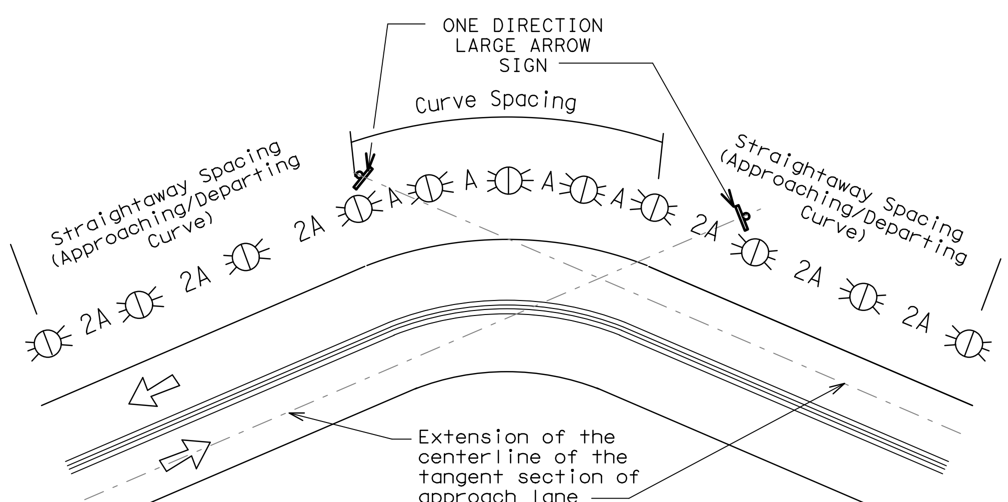
FILE: dom2-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	18	089	VARIOUS
10-09 3-15	DIST		COUNTY	SHEET NO.
4-10 7-20	BRY		ROBERTSON	75

20B

MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	• RPMs	• RPMs
15 MPH & 20 MPH	• RPMs and One Direction Large Arrow sign	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	• RPMs and Chevrons

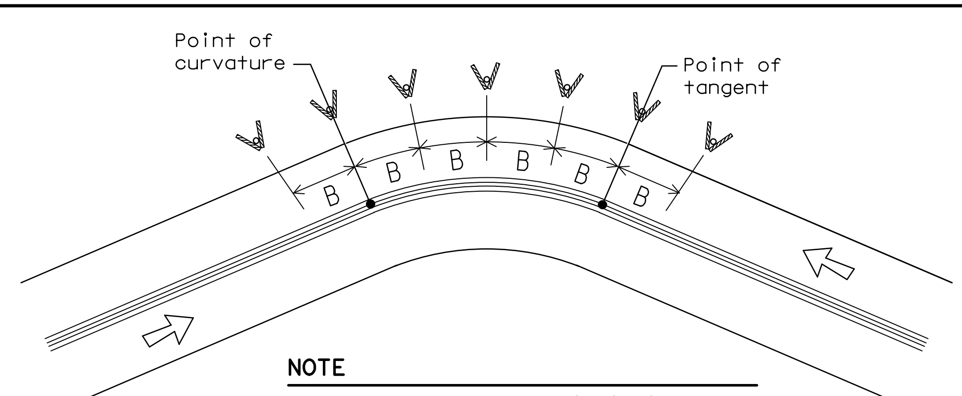
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

At least one chevron pair is installed beyond the point of tangent in tangent section.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

Degree of Curve	Radius of Curve (FEET)	Spacing in Curve (FEET)	Spacing in Straightaway (FEET)	Chevron Spacing in Curve (FEET)
		A	2A	B
1	5730	225	450	—
2	2865	160	320	—
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp.Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete)and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100'max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100'max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

NOTES

1. Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
2. Barrier reflectors may be used to replace required delineators.
3. Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND

Symbol	Description
(symbol)	Bi-directional Delineator
(symbol)	Delineator
(symbol)	Sign

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

FILE: dom3-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 3-15 8-15 8-15 7-20	0917	18	089	VARIOUS
	DIST		COUNTY	SHEET NO.
	BRY		ROBERTSON	76

20C

DATE: 1/24/2024 1:49:02 PM
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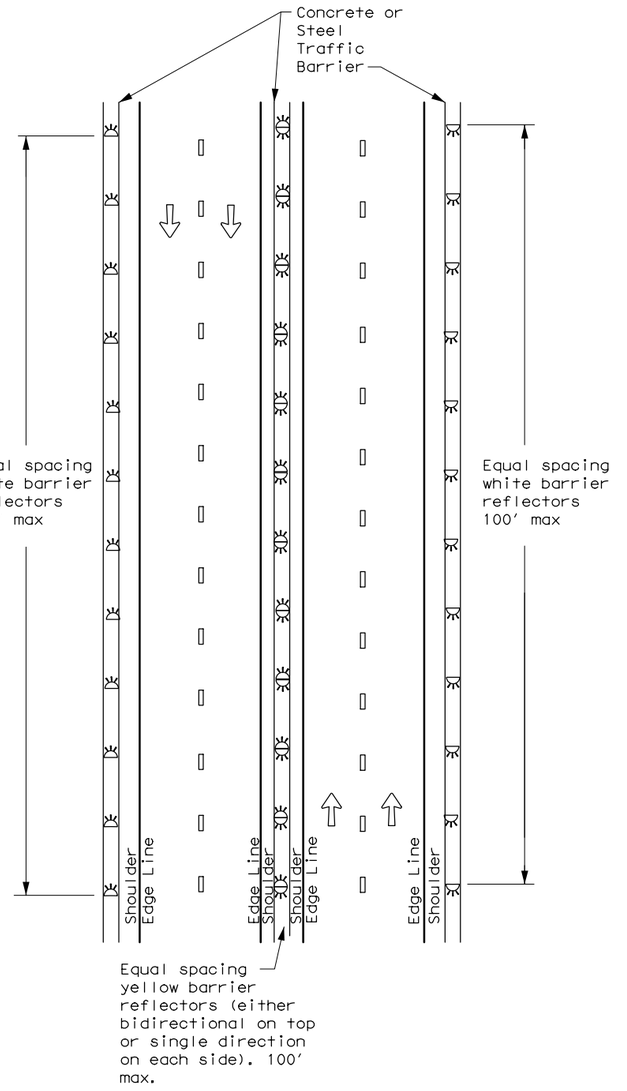
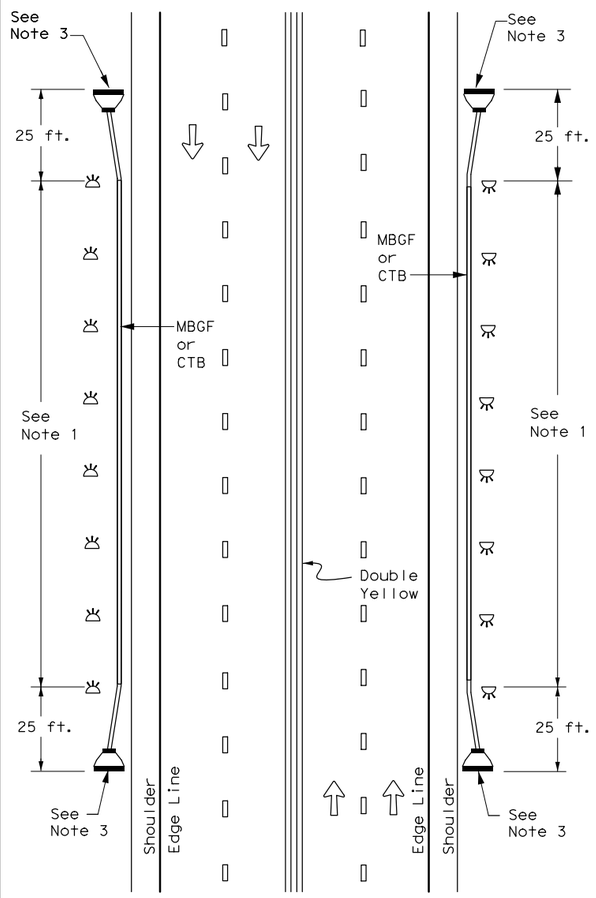
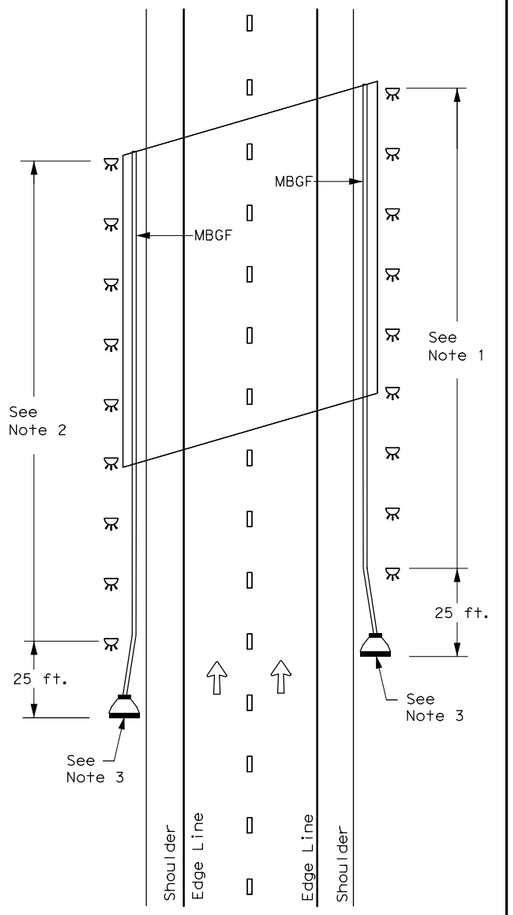
CONTINUOUS CONCRETE OR STEEL BARRIER



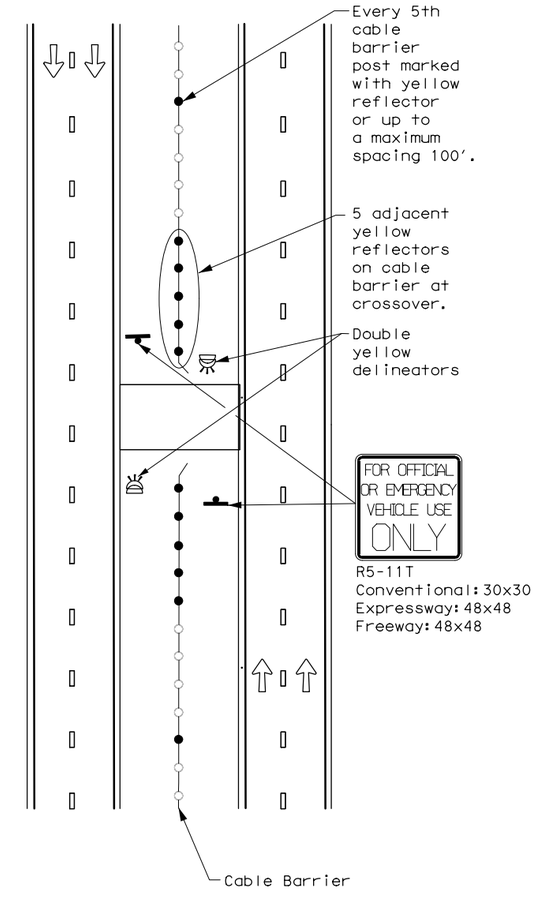
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



EMERGENCY CROSSOVER



NOTES

1. Equal spacing (100′ max), but not less than 3 single directional white barrier reflectors or delineators. On Continuos Barrier, equal spacing (100′ max.)
2. Equal spacing (100′ max), but not less than 3 single directional yellow barrier reflectors or delineators.
3. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3)in front of the terminal end.

LEGEND

	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(6)-20

FILE: dom6-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	18	089	VARIOUS
7-20	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON		77

DATE: 1/24/2024 1:49:07 PM
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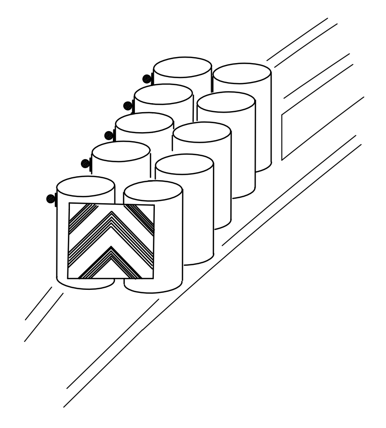
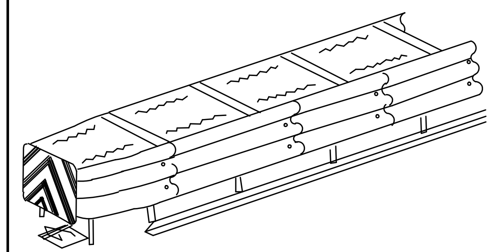
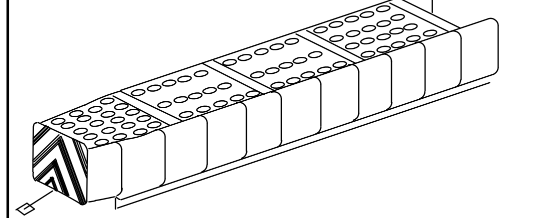
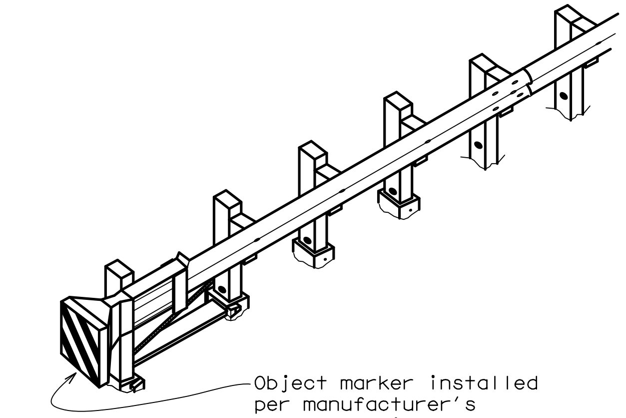
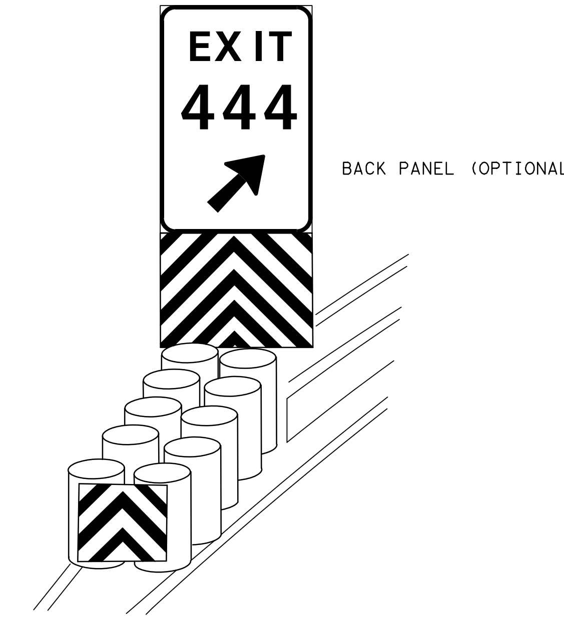
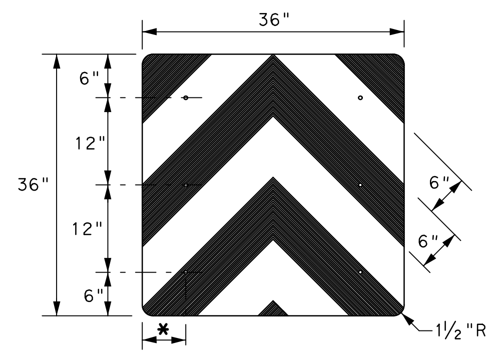


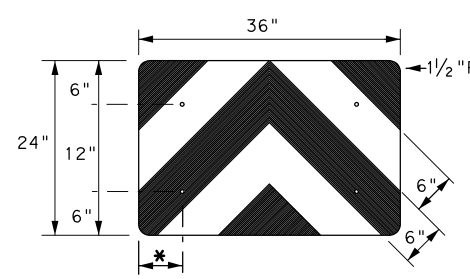




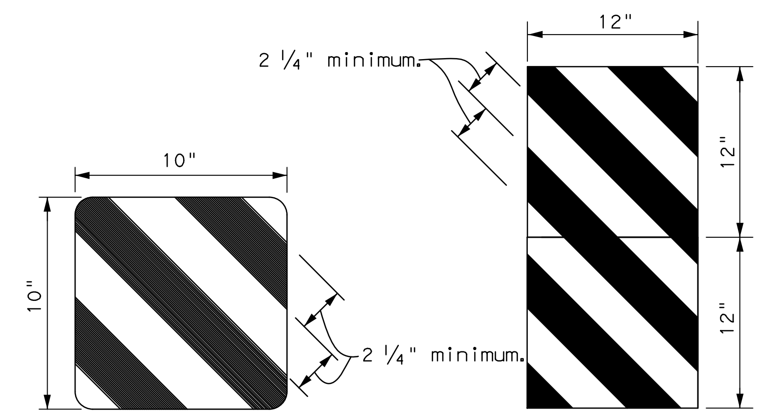




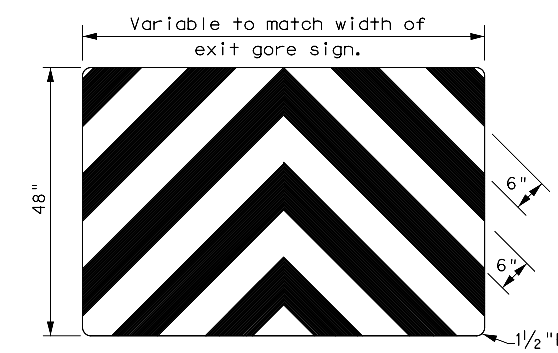


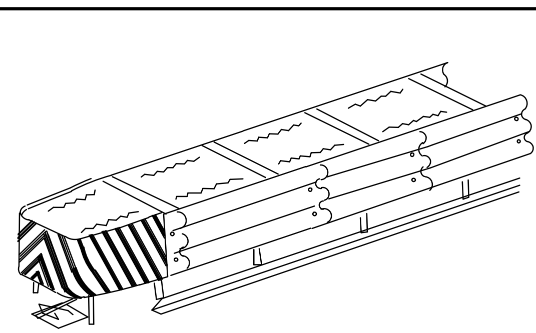


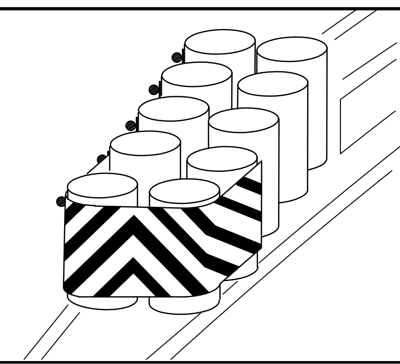
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

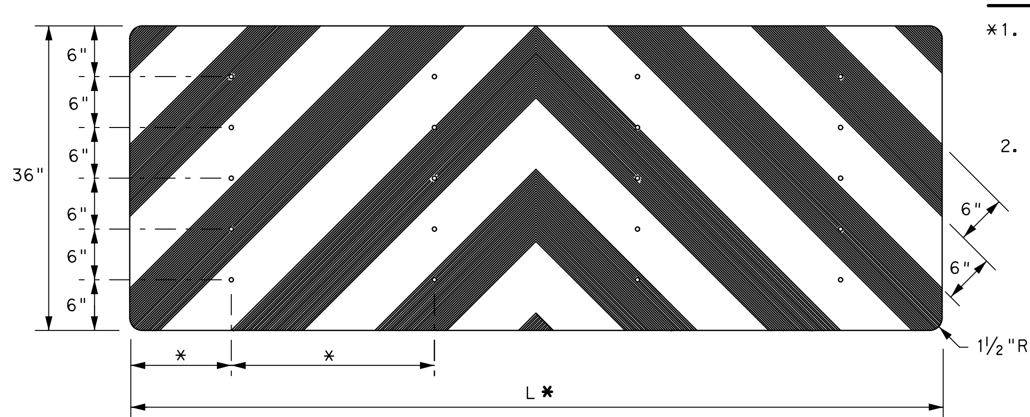


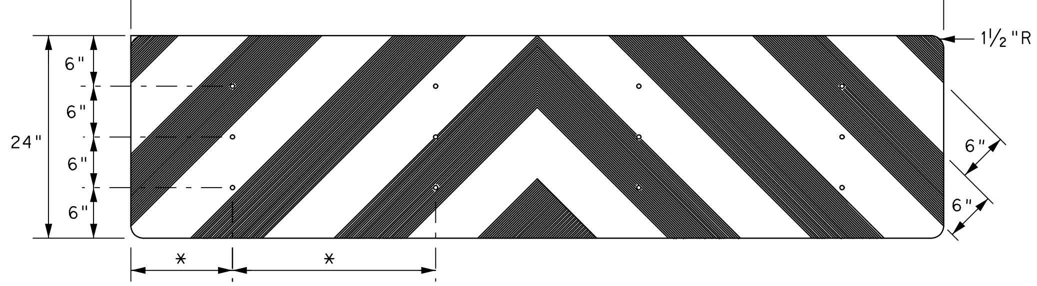
OBJECT MARKERS SMALLER THAN 3 FT^2











NOTES

*1. Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturers recommendation, or as directed by the Engineer.

2. Mounting should be flush with top of attenuator. Minimum size 96" x 24".

NOTES

1. Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.

2. Object Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts or tears. A radius at the corners is not required for direct applied sheeting.

3. Object Marker size may be reduced to fit smaller devices. Width of alternating black and yellow stripes are typically 6". Object Markers smaller than 3ft may have reduced width stripes of a minimum of 2 ¼".

4. Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.

5. Object Marker at nose of attenuator is subsidiary to the attenuator.

6. See D & OM (1-4) for required barrier reflectors.

Texas Department of Transportation | Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS

D & OM(VIA)-20

FILE: domvia20.dgn		DN: TXDOT		CK: TXDOT	DW: TXDOT		CK: TXDOT
©TxDOT December 1989		CONT	SECT	JOB		HIGHWAY	
REVISIONS		0917	18	089		VARIOUS	
4-92 8-04		DIST		COUNTY			SHEET NO.
8-95 3-15 4-98 7-20		BRY		ROBERTSON			78

20G

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.

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 Sandy Creek - NBI - 171980004907114
2. SH 6 NB over Campbells Creek - NBI 171980004908066
3. SH 6 SB over Campbells Creek - NBI - 171980004908157
4. FM 391 over Lost Creek - NBI - 171980026206027
5. SH 7 over Steele Creek Relief No. 2 - NBI - 171980038204026
6. FM 1373 over Buzzard Slough - NBI - 171980054006040

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:

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

100% SUBMITTAL	PRINT DATE	REVISION DATE
	1/24/2024	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 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	79

FILENAME: c:\pwworking\dfriomega-app02.omegaengineers.local_omega-prod\omega_twilson\d1ms196321BRY-C2-24_EPIC.dgn.DGN
REV DATE: 2-12-2015
CSJ: C 917-18-89

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.

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):
0917-18-089

1.2 PROJECT LIMITS:
From: SH 6 over Sandy Creek

To: FM 1373 over Buzzard Slough

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 30.88886 ,(Long) -96.59888

END: (Lat) 31.10929 ,(Long) -96.77934

1.4 TOTAL PROJECT AREA (Acres): 4.89

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.13

1.6 NATURE OF CONSTRUCTION ACTIVITY:
bridge maintenance and channel protection

1.7 MAJOR SOIL TYPES:

Soil Type	Description
SH 6 over Sandy Creek: Uhland loam, 0 to 1% slopes, frequently flooded	SH 6 over Sandy Creek: 90% Uhland and similar, moderately well drained, negligible runoff rate
SH 6 NB over Campbells Creek: Whitesboro clay loam, 0 to 1% slopes, frequently flooded	SH 6 NB over Campbells Creek: 90% Whitesboro and similar, moderately well drained, negligible runoff rate
SH 6 SB over Campbells Creek: Whitesboro clay loam, 0 to 1% slopes, frequently flooded	SH 6 SB over Campbells Creek: 90% Whitesboro and similar, moderately well drained, negligible runoff rate
FM 391 over Lost Creek: Robco-Tanglewood complex, 0 to 5% slopes	FM 391 over Lost Creek: 46% Robco and similar, moderately well drained, very low runoff rate
SH 7 over Steele Creek Relief No. 2: Sandow loam, 0 to 2% slopes, frequently flooded	SH 7 over Steele Creek Relief No. 2: 90% Sandow and similar, moderately well drained, medium runoff rate
FM 1373 over Buzzard Slough: Roetex clay, 0 to 1% slopes, frequently flooded	FM 1373 over Buzzard Slough: 90% Roetex and similar, somewhat poorly rained, negligible 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
X PSLs determined during construction
☐ No PSLs planned for construction

Type	Sheet #s
Construction Exits	

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.)

X Mobilization
X 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
X Achieve site stabilization and remove sediment and erosion control measures
X Other: repair bridge elements and riprap
☐ Other:
☐ Other:

1.10 POTENTIAL POLLUTANTS AND SOURCES:

X Sediment laden stormwater from stormwater conveyance over disturbed area
X Fuels, oils, and lubricants from construction vehicles, equipment, and storage
X Solvents, paints, adhesives, etc. from various construction activities
X Transported soils from offsite vehicle tracking
X Construction debris and waste from various construction activities
X Contaminated water from excavation or dewatering pump-out water
X Sanitary waste from onsite restroom facilities
X Trash from various construction activities/receptacles
☐ Long-term stockpiles of material and waste
☐
☐ 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
Sandy Creek; Little Brazos River (1242E)	Brazos River Above Navasota River (1242)
Campbells Creek (1242I); Little Brazos River (1242E)	Brazos River Above Navasota River (1242)
Campbells Creek (1242I); Little Brazos River (1242E)	Brazos River Above Navasota River (1242)
Lost Creek; Little Brazos River (1242E)	Brazos River Above Navasota River (1242)
Steele Creek Relief No. 2; *Steele Creek (1209K) (impaired for bacteria	*Navasota River Below Lake Limestone (1209); impaired for bacteria
Buzzard Slough; Hardin Slough	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

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

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

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

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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 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	80

FILENAME: c:\pwworking\dfriomega-app02.omegaengineers.local_omega-prod\omega_twilson\dms198328\BRY-C2-24_SWP3_NARRATIVE_01.dgn
REV DATE: 2-12-2015
CSJ: C 917-18-89

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
- ☐ X 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
- X ☐ Dewatering Controls
- ☐ ☐ Inlet Protection
- ☐ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Sandbag Berms
- X ☐ Sediment Control Fence
- X ☐ 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:

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

2.5 POLLUTION PREVENTION MEASURES:

- X Chemical Management
- X Concrete and Materials Waste Management
- X Debris and Trash Management
- X Dust Control
- X 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
1/24/2024	

Texas Department of Transportation
Bryan District

TXDOT STORM WATER POLLUTION PREVENTION PLAN (SWP3)

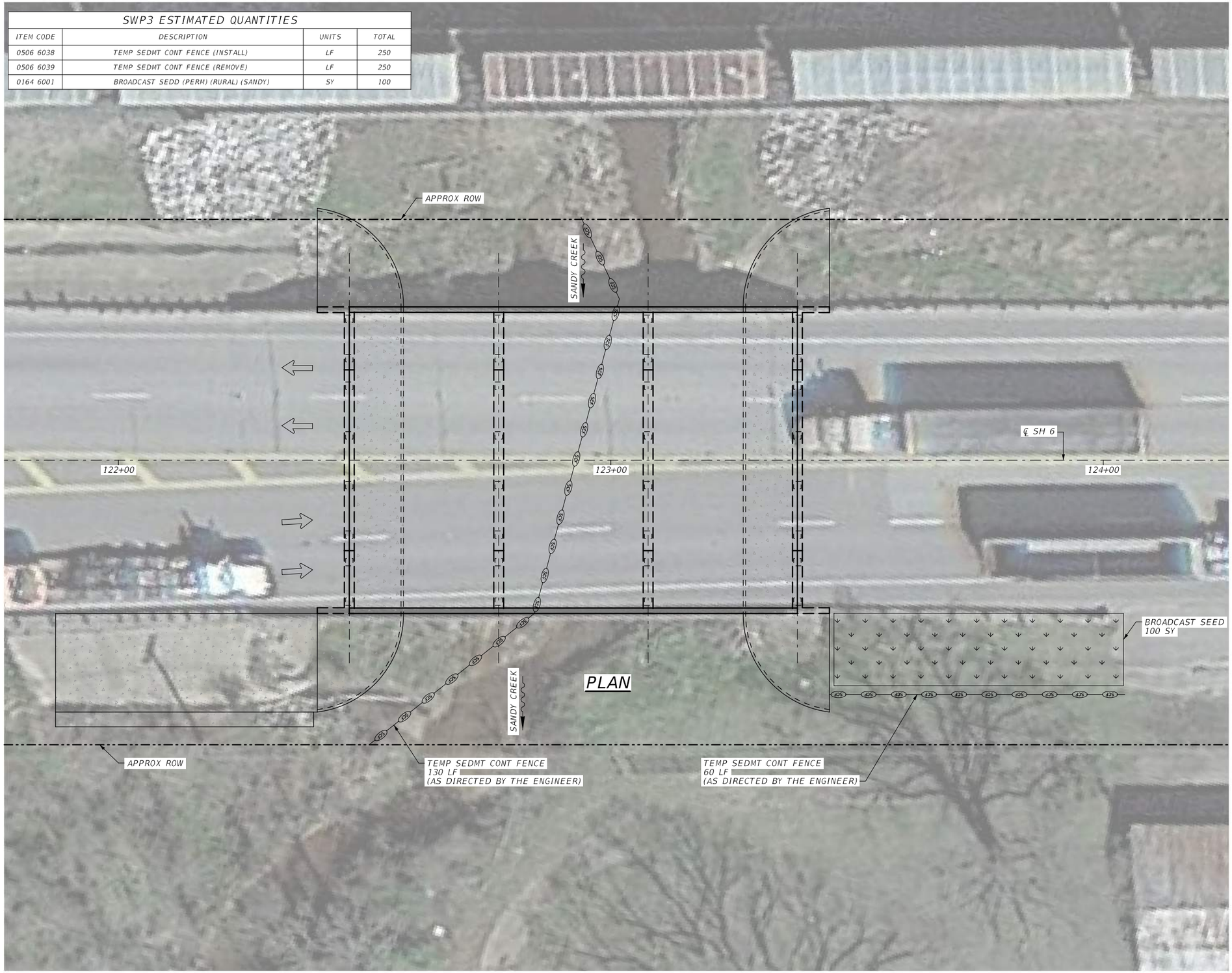
SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	81

FILENAME: c:\pwworking\dfriomega-app02.omegaengineers.local_omega-prod\omega_twilson\dms19632\BRY-C2-24_SWP3_NARRATIVE_02.dgn
REV DATE: 2-12-2015
CSJ: C 917-18-89

SWP3 ESTIMATED QUANTITIES			
ITEM CODE	DESCRIPTION	UNITS	TOTAL
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	250
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	250
0164 6001	BROADCAST SEDD (PERM) (RURAL) (SANDY)	SY	100



N

LEGEND

- SCF SCF — SEDIMENT CONTROL FENCE
- DIRECTION OF FLOW
- BROADCAST SEED

NOTES:

1. INSTALL SEDIMENT CONTROL FENCE AROUND WESTERN BANK OF SANDY CREEK AND ALONG SH 6 BELOW RAIL REPLACEMENT.
2. INSTALL 2 CONSTRUCTION EXITS PER EC(3)-16 STD. 1 AT EACH SIDE OF SANDY 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 LOCATION AS NEEDED TO ACHIEVE INTENDED PURPOSE AS APPROVED
3. MAINTAIN SW3P CONTROL MEASURES THROUGHOUT CONSTRUCTION.
4. SW3P MEASURES ARE NOT TO SCALE.

STATE OF TEXAS
PAUL R. HAHN III
107365
LICENSED
PROFESSIONAL ENGINEER
1/24/2024

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
	1/24/2024	

Texas Department of Transportation
Bryan District

SH 6 AT SANDY CREEK
NBI: 17-198-0-0049-07-114
SWP3 LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

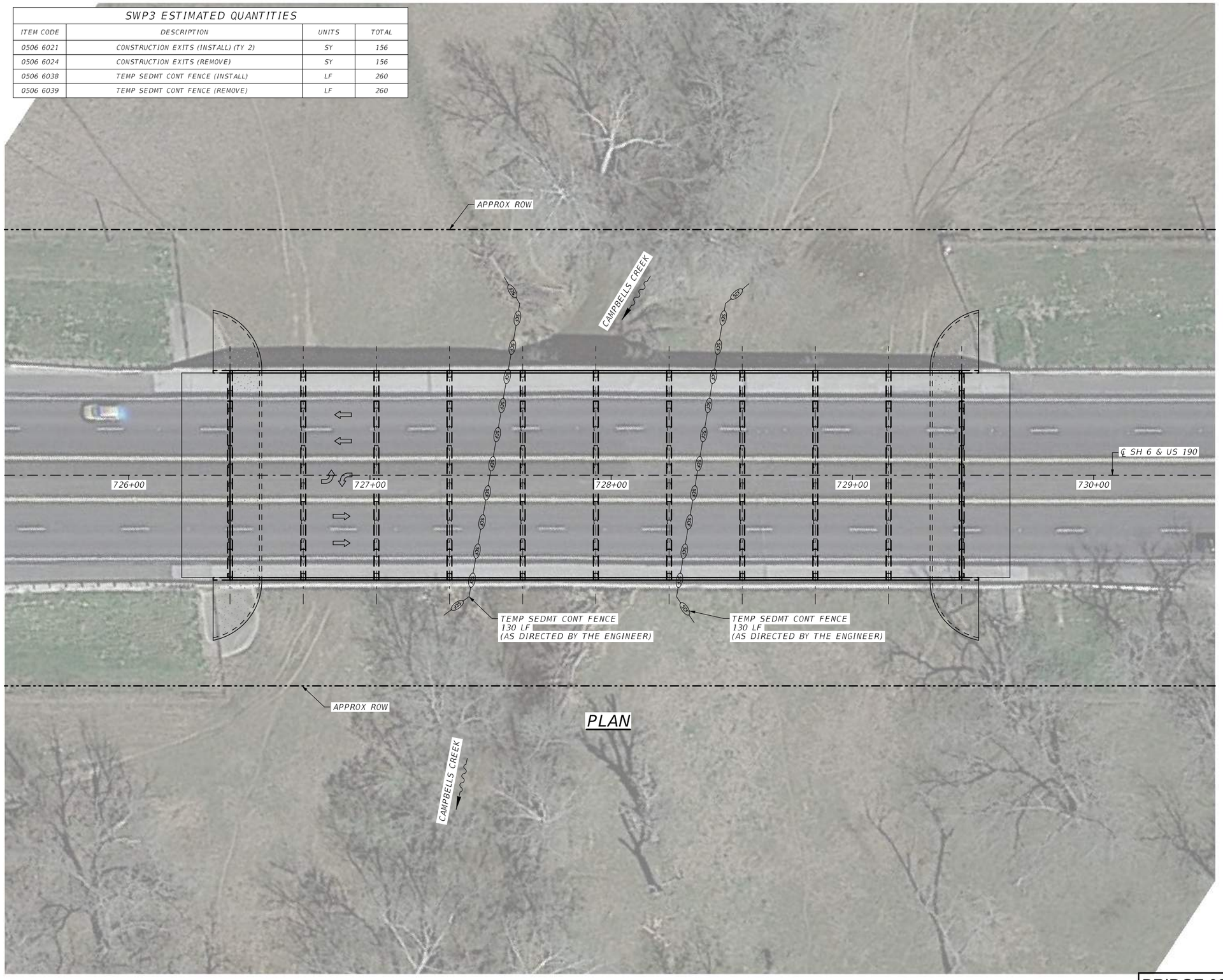
STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	82

BRIDGE 092

REV DATE: 2-12-2015
CSJ: C 917-18-89

FILENAME: c:\pwworking\dfw\omega-ap02.omegaengineers.local_omega-prod\omega_twilson\dms\14056\BRY-BRG_SH6 OVER SANDY CR_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	260
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	260



PLAN

BRIDGE 094

LEGEND

SCF — SEDIMENT CONTROL FENCE

DIRECTION OF FLOW

NOTES:

1. INSTALL SEDIMENT CONTROL FENCE AROUND EACH BANK OF CAMPBELLS CREEK.
2. INSTALL 2 CONSTRUCTION EXITS PER EC(3)-16 STD. 1 AT EACH SIDE OF SANDY 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 SW3P CONTROL MEASURES THROUGHOUT CONSTRUCTION.
5. SW3P MEASURES ARE NOT TO SCALE.
6. EROSION AND SEDIMENTATION CONRTOL DEVICES TO REMAIN IN PLACE FOR WORK ON BR-096 (US 190/ SH 6 SB OVER CAMPBELLS CREEK).

STATE OF TEXAS
PAUL R. HAHN III
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LICENSED
PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

Texas Department of Transportation
Bryan District

US 190/SH 6 NB AT CAMPBELLS CR
NBI: 17-198-0-0049-08-066
SWP3 LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

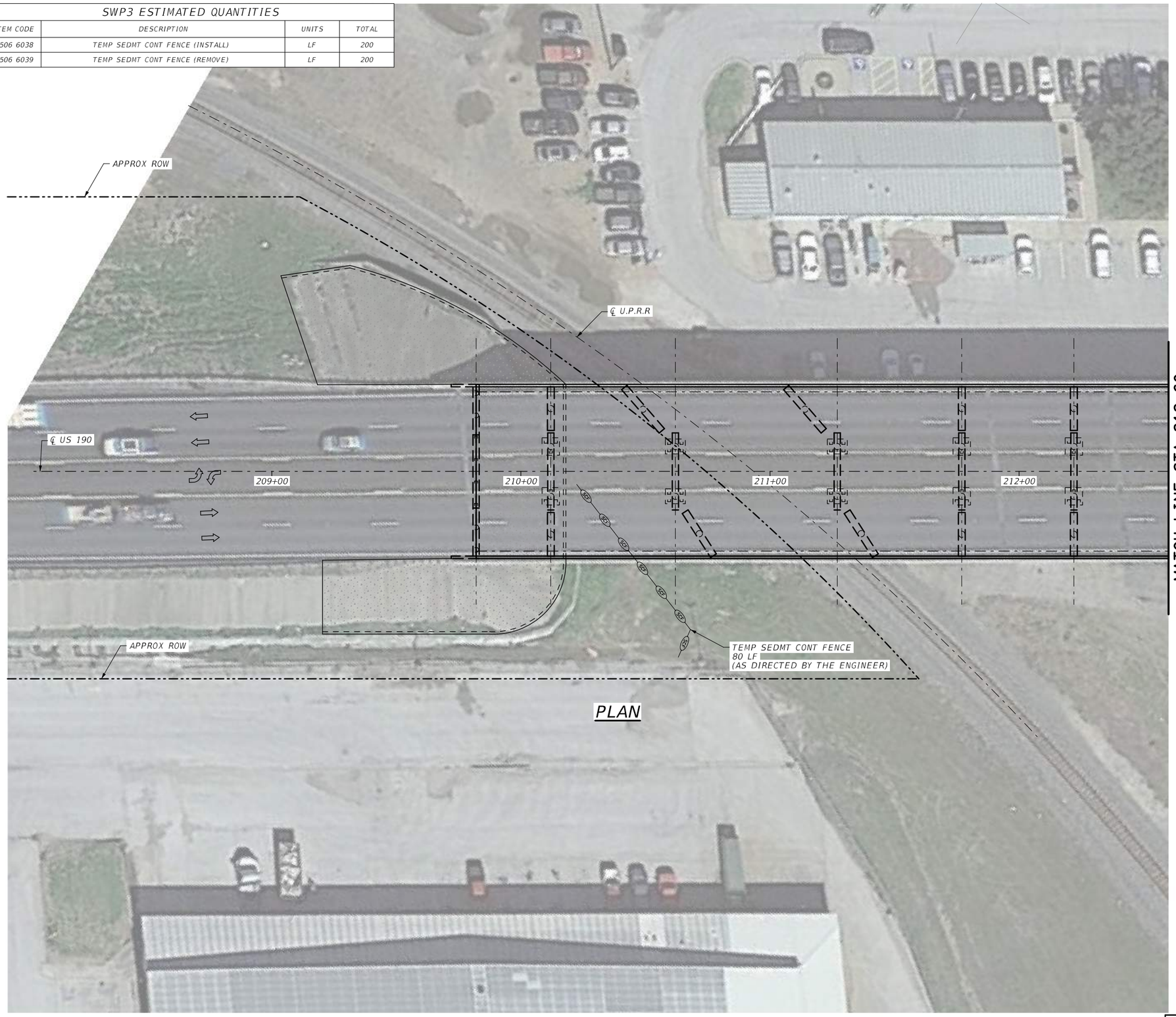
STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	83

REV DATE: 2-12-2015
CSJ: C 917-18-89

FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms\14059\BRY-BRG_US190 SH6 NB OVER CAMPBELLS CR_SW3P_LAY_01.dgn

SWP3 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	200
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	200



PLAN

N

LEGEND

SCF SCF — SEDIMENT CONTROL FENCE

DIRECTION OF FLOW

NOTES:

1. INSTALL SEDIMENT CONTROL FENCE AROUND EACH ABUTMENT.
2. FIELD VERIFY LOCATIONS OF BMPS SHOWN AND ALTER LOCATIONS AS NEEDED TO ACHIEVE INTENDED PURPOSE AS APPROVED.
3. MAINTAIN SW3P CONTROL MEASURES THROUGHOUT CONSTRUCTION.
4. SW3P MEASURES ARE NOT TO SCALE.

STATE OF TEXAS
PAUL R. HAHN III
107365
LICENSED
PROFESSIONAL ENGINEER
1/24/2024

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
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Texas Department of Transportation
Bryan District
©2024

US 190/SH 6 AT U.P.R.R.
NBI: 17-198-0-0049-08-116
SWP3 LAYOUT

SHEET 1 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	84

BRIDGE 095

REV DATE: 2-12-2015
CSJ: C 917-18-89

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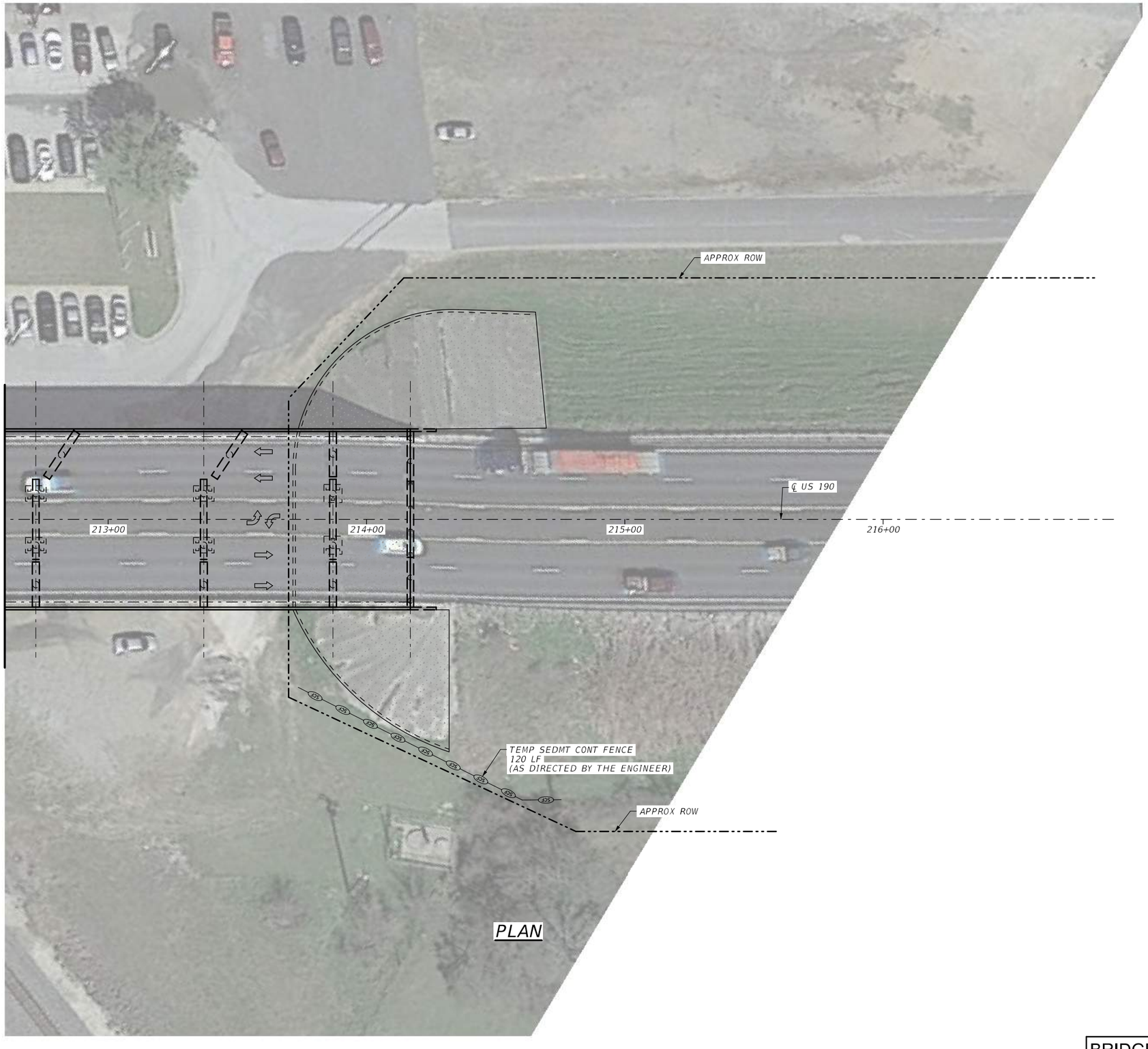

PLAN

N

LEGEND

SCF — SCF SEDIMENT CONTROL FENCE

DIRECTION OF FLOW

NOTES:

1. INSTALL SEDIMENT CONTROL FENCE AROUND EACH ABUTMENT.
2. FIELD VERIFY LOCATIONS OF BMPS SHOWN AND ALTER LOCATIONS AS NEEDED TO ACHIEVE INTENDED PURPOSE AS APPROVED.
3. MAINTAIN SW3P CONTROL MEASURES THROUGHOUT CONSTRUCTION.
4. SW3P MEASURES ARE NOT TO SCALE.

STATE OF TEXAS
PAUL R. HAHN III
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LICENSED
PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

Texas Department of Transportation
Bryan District

US 190/SH 6 AT U.P.R.R.
NBI: 17-198-0-0049-08-116
SWP3 LAYOUT

SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	85

BRIDGE 095

REV DATE: 2-12-2015
CSJ: C 917-18-89

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SWP3 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0403 6006	TEMP SPL SHORING (COFFERDAM)	SF	100
0506 6038	TEMP SEDT CONT FENCE (INSTALL)	LF	160
0506 6039	TEMP SEDT CONT FENCE (REMOVE)	LF	160

PLAN

LEGEND

- SCF SCF — SEDIMENT CONTROL FENCE
- DIRECTION OF FLOW
- TEMP SPL SHORING (COFFERDAM)

NOTES:

1. INSTALL SEDIMENT CONTROL FENCE AROUND EACH BANK OF LOST CREEK.
2. FIELD VERIFY LOCATIONS OF BMPS SHOWN AND ALTER LOCATIONS AS NEEDED TO ACHIEVE INTENDED PURPOSE AS APPROVED.
3. MAINTAIN SW3P CONTROL MEASURES THROUGHOUT CONSTRUCTION.
4. SW3P MEASURES ARE NOT TO SCALE.
5. TEMPORARY SPECIAL SHORING (COFFERDAM) QUANTITY IS APPROXIMATE AND WILL VARY DEPENDING ON FIELD CONDITIONS.

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
	1/24/2024	

Texas Department of Transportation
Bryan District

FM 391 AT LOST CREEK
NBI: 17-198-0-0262-06-027
SWP3 LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY	
TEXAS	BRY	ROBERTSON	
CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	86

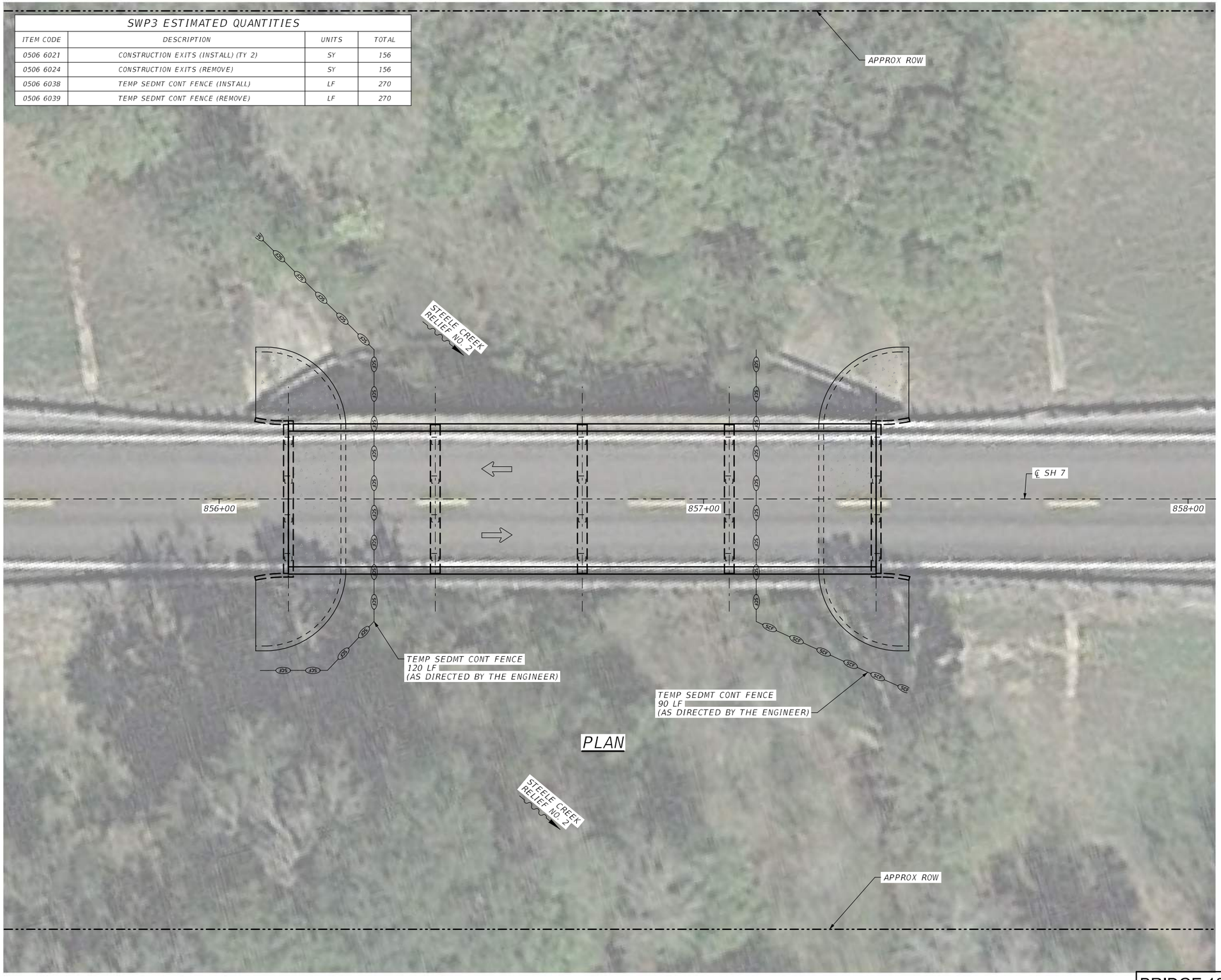
BRIDGE 101

REV DATE: 2-12-2015
CSJ: C 917-18-89

FILENAME: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms140651\BRY-BRG_FM391 OVER LOST CR_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	270
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	270



PLAN

N

LEGEND

SCF — SEDIMENT CONTROL FENCE

DIRECTION OF FLOW

NOTES:

1. INSTALL SEDIMENT CONTROL FENCE AROUND EACH BANK OF STEELE CREEK RELIEF NO. 2
2. INSTALL 2 CONSTRUCTION EXITs PER EC(3)-16 STD. 1 AT EACH SIDE OF THE 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 SW3P CONTROL MEASURES THROUGHOUT CONSTRUCTION.
5. SW3P MEASURES ARE NOT TO SCALE.

STATE OF TEXAS
PAUL R. HAHN III
107365
LICENSED PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

Texas Department of Transportation
Bryan District

SH 7 AT STEELE CR RELIEF NO. 2
NBI: 17-198-0-0382-04-026
SWP3 LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	87

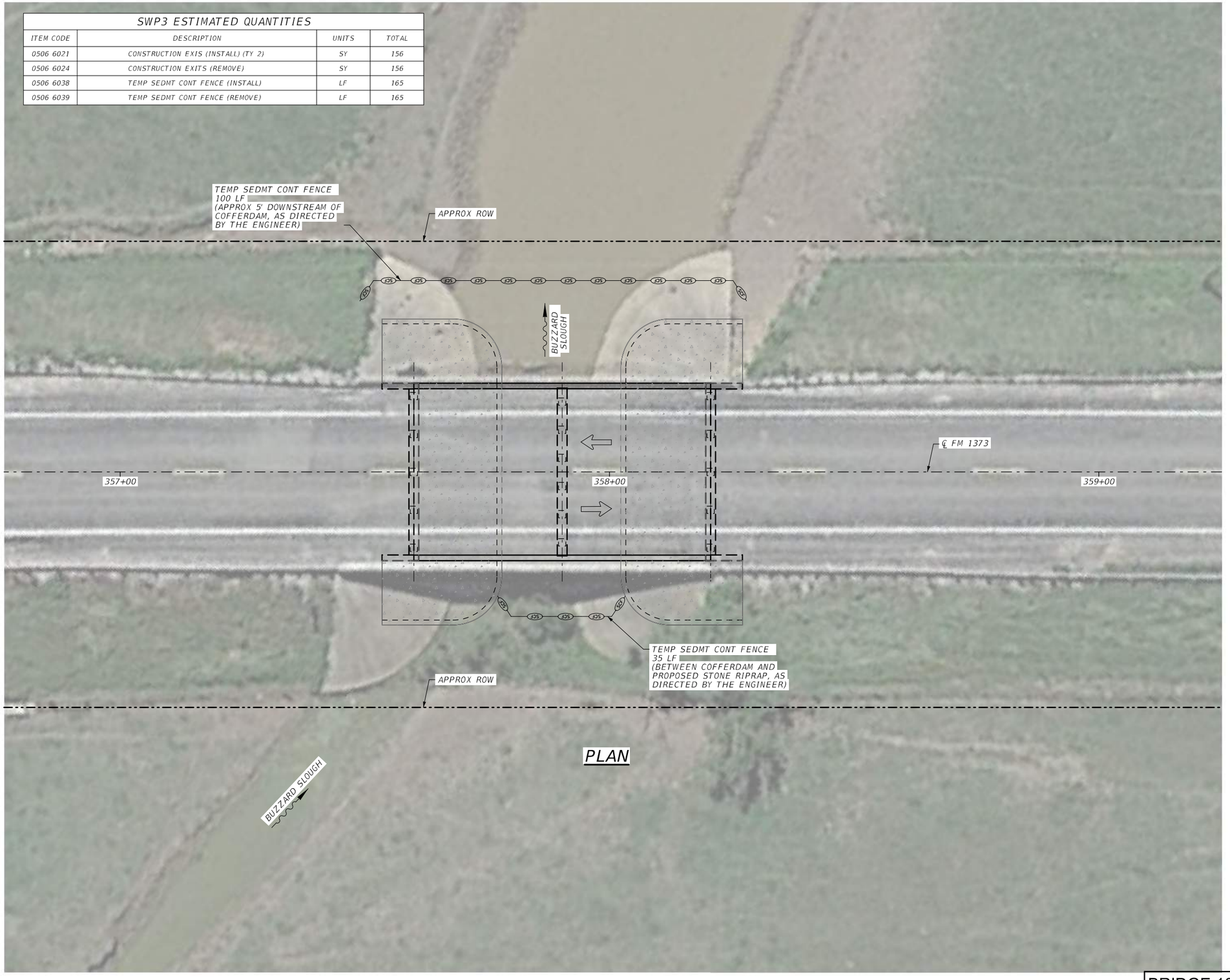
BRIDGE 102

REV DATE: 2-12-2015
CSJ: C 917-18-89

FILENAME: c:\pwworking\tdi\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms140066\BRY-BRG_SH7 OVER STEELE CR REL NO 2_SW3P_LAY_01.dgn

SWP3 ESTIMATED QUANTITIES

ITEM CODE	DESCRIPTION	UNITS	TOTAL
0506 6021	CONSTRUCTION EXIS (INSTALL) (TY 2)	SY	156
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	156
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	165
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	165



PLAN

LEGEND

SCF — SEDIMENT CONTROL FENCE

DIRECTION OF FLOW

NOTES:

1. INSTALL SEDIMENT CONTROL FENCE AROUND EACH BANK OF BUZZARD LAKE SLOUGH.
2. INSTALL 2 CONSTRUCTION EXITS PER EC(3)-16 STD. 1 AT EACH SIDE OF THE SLOUGH, 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 SW3P CONTROL MEASURES THROUGHOUT CONSTRUCTION.
5. SW3P MEASURES ARE NOT TO SCALE.

STATE OF TEXAS
PAUL R. HAHN III
107365
LICENSED
PROFESSIONAL ENGINEER
1/24/2024

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
1/24/2024	

Texas Department of Transportation
Bryan District

FM 1373 AT BUZZARD SLOUGH
NBI: 17-198-0-0540-06-040
SWP3 LAYOUT

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6	C 917-18-89	VARIOUS

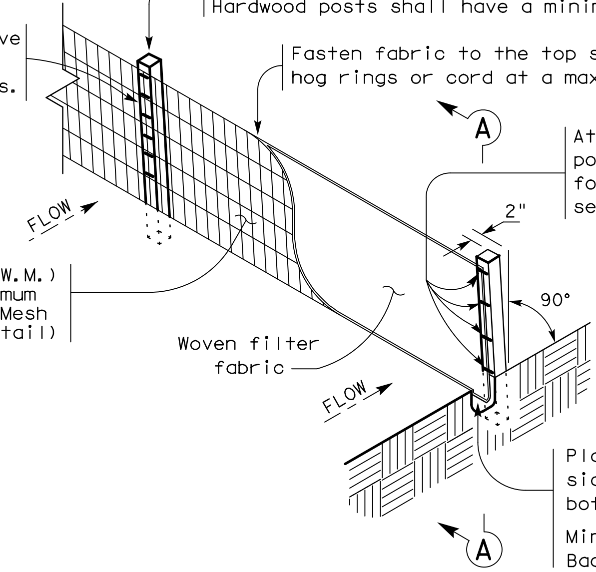
STATE	DISTRICT	COUNTY
TEXAS	BRY	ROBERTSON

CONTROL	SECTION	JOB	SHEET NO.
0917	18	089	88

BRIDGE 104

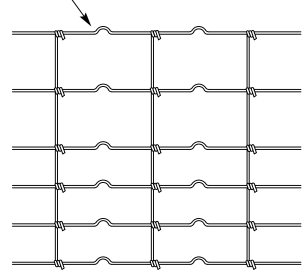
REV DATE: 2-12-2015
CSJ: C 917-18-89

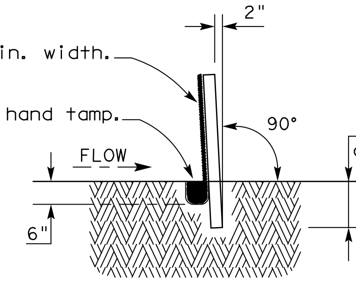
FILENAME: c:\pw\work\ngdi\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms\140688\BRY-BRG_FM1373 OVER BUZZARD SL_SW3P_LAY_01.dgn



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.

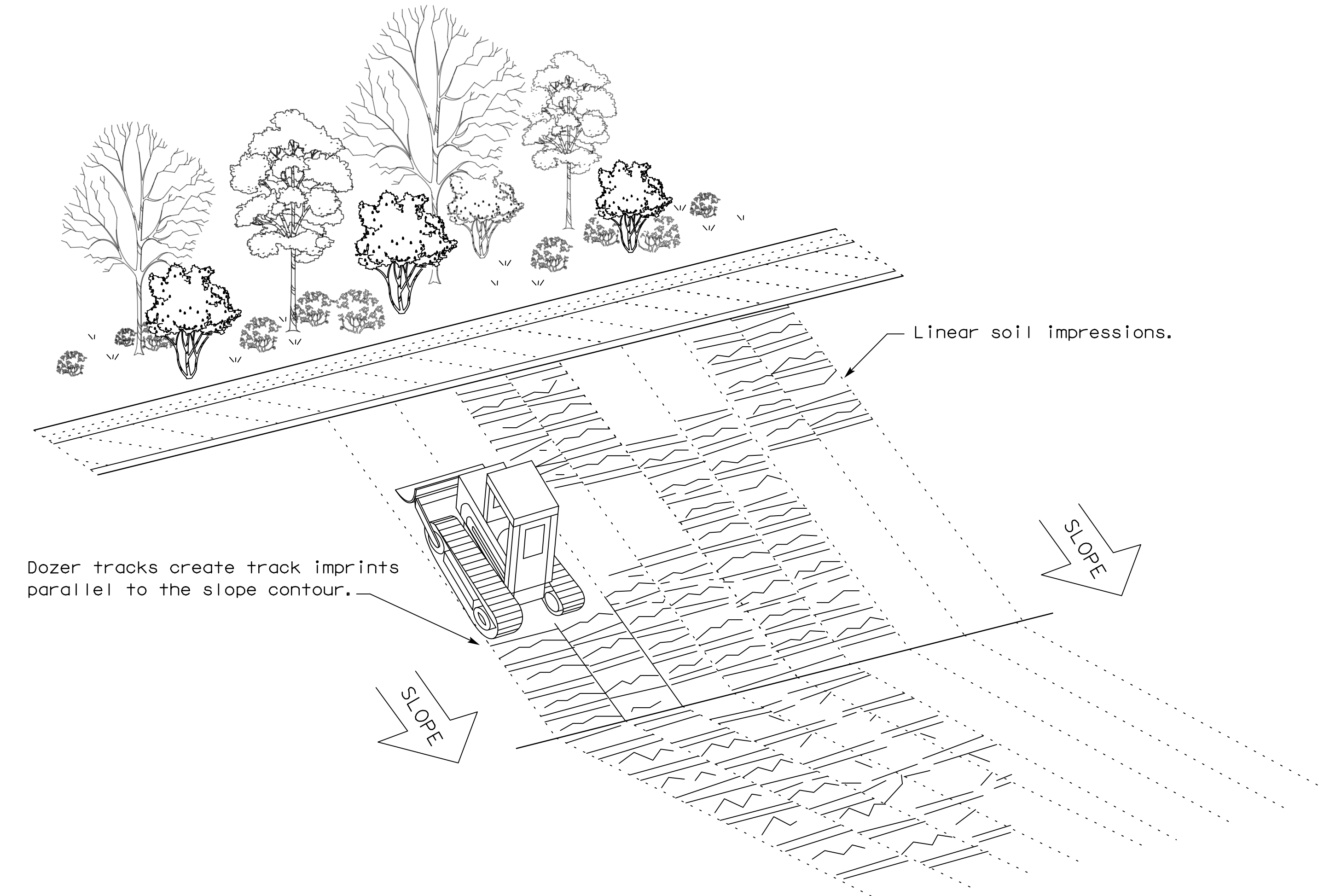
LEGEND

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

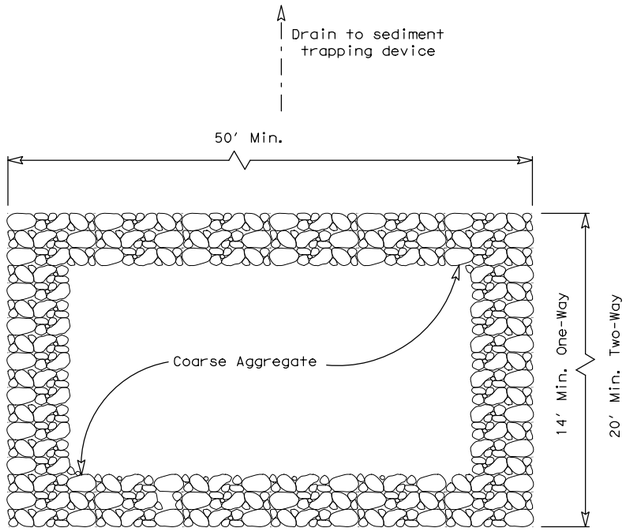
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

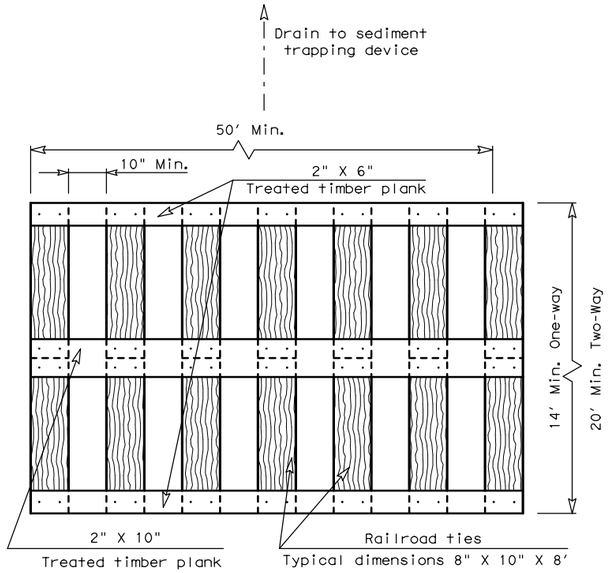
EC(1)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	18	089	VARIOUS
	DIST		COUNTY	SHEET NO.
	BRY		ROBERTSON	89

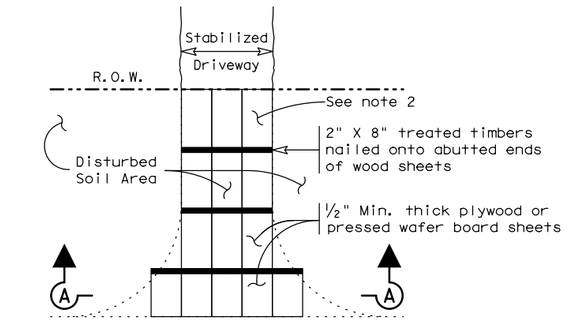
DATE: 1/24/2024
FILE: c:\pwworkingdir\omega-app02.omegaengineers.local_omega-prod\omega_twilson\dms13957\ec316.dgn



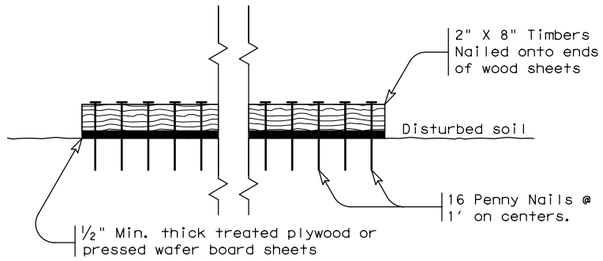
PLAN VIEW



PLAN VIEW



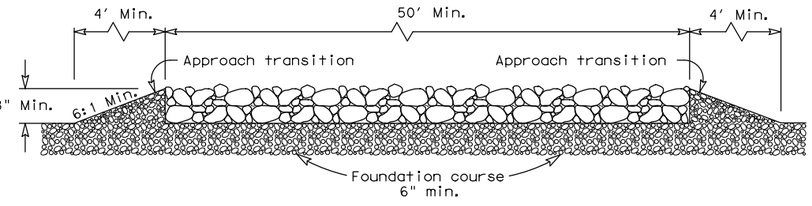
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

SHORT TERM



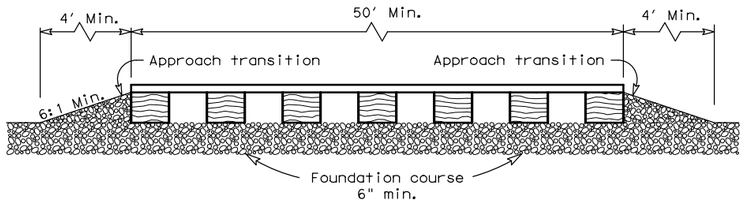
ELEVATION VIEW

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
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0917	18	089	VARIOUS
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON		90

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 745230K (Nearby closed crossing at Connection St, approx. 600' south of Bridge 092)

Crossing Type: Public (Closed)

RR Company Operating Track at Crossing: Union Pacific Railroad Company [UP]

RR Company Owning Track at Crossing: Union Pacific Railroad Company [UP]

RR MP: US 79/SH 6 Sandy Crk Bridge adjacent to railroad property In vicinity of MP 120.88 to 121.00

RR Subdivision: Ennis

City: Hearne

County: Robertson

CSJ at this Crossing: 0917-18-089

Latitude: 30.88884167

Longitude: -96.598975

Scope of Work, including any TCP, to be performed by State Contractor:

TCP Phase 1 & 3: Erosion devices will be installed. Traffic will temporarily adjusted per TCP (2-1)-18 for staging of materials and equipment.
TCP Phase 2: Erosion devices will be installed. The right-hand EB lane will be closed and traffic will be reduced to one lane per TCP(2-6)-18.
Bridge Work: Concrete rail retrofit over SW wingwall. Interior bent cap spall repair. Concrete riprap repair and replacement at Abutment 1.

Scope of Work to be performed by Railroad Company:

None.

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 2

On this project, night or weekend flagging is:

☐ Expected

☑ Not Expected

Flagging services will be provided by:

☑ Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.

☐ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☑ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required

☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.

☑ Not Required

Railroad Point of Contact: _____

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

IV. RAILROAD INSURANCE REQUIREMENTS

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Escalated Limits

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000

Railroad Protective Liability Limits

☐ Not Required	
☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☐ Other: _____	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☐ Not Required

☑ Required: UPRR Maintenance Consent Letter. TxDOT to assist

☐ Required: TxDOT to assist in obtaining the UPRR CROE

☐ Required: Contractor to obtain

- ☐ BNSF: _____
  https://bnsf.railpermitting.com
- ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

To view previously approved CROE templates agreed upon between the State and Railroad, see: https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html

Approved CROE templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed CROE between the Contractor and the Railroad if required on project.

VI. RAILROAD COORDINATION MEETING

A Railroad Coordination Meeting is required. See item 5, Article 8.1, of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges Manual for more details.

VII. RAILROAD SAFETY ORIENTATION

A. Complete the Railroad's course "Orientation for Contractor's Safety," and maintain registration prior to working on the Railroad's property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

UPRR, BNSF, CPKCR will not accept on-track safety training certificates from other Railroads. Refer to each Railroad's specific contractor right of entry for training information.

Know and follow the Contractor's Right of Entry Agreement EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency

Call: Union Pacific Railroad Company

Railroad Emergency Line at: 800-848-8715

Location: DOT 745230K(Nearby Closed Crossing at Connection St)

RR Milepost: In vicinity of 120.88 to 121.00

Subdivision: Ennis

RRD Review Only

Initials: KS

Date: 12-7-2023

Texas Department of Transportation | *Rail Division*

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf		DN: TxDOT	CK:	DW:		CK:	
© TxDOT June 2014		CONT	SECT	JOB		HIGHWAY	
REVISIONS		0917	18	089		VARIOUS	
6/2023		DIST	COUNTY			SHEET NO.	
		BRY	ROBERTSON			91	

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 745226V (US 190/SH 6 over U.P.R.R.)

Crossing Type: Public

RR Company Operating Track at Crossing: Union Pacific Railroad Company [UP]

RR Company Owning Track at Crossing: Union Pacific Railroad Company [UP]

RR MP: 1.220

RR Subdivision: Giddings Sub

City: Hearne

County: Robertson

CSJ at this Crossing: 0917-18-089

Latitude: 30.8679450

Longitude: -96.5851270

Scope of Work, including any TCP, to be performed by State Contractor:

TCP Phase 1 Repair Riprap: Erosion devices to be installed. Traffic will be adjusted per TCP (2-1)-18 for staging of materials and equipment.
TCP Phase 2 Replace Bearing Pad: EB side of US 190/SH 6 will be closed and traffic will be reduced to one lane each direction per standard TCP (2-4)-18. Flagger control will be required on UPRR while overhead work is in progress.
Bridge work: Contractor to repair concrete riprap erosion at both bridge abutments. Contractor to replace elastomeric bearing pad at Bent 5 Beam 9.

Scope of Work to be performed by Railroad Company:

None.

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 3

On this project, night or weekend flagging is:

☐ Expected

☑ Not Expected

Flagging services will be provided by:

☑ Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.

☐ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☑ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required

☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.

☑ Not Required

Railroad Point of Contact: _____

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

IV. RAILROAD INSURANCE REQUIREMENTS

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Escalated Limits

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000

Railroad Protective Liability Limits

☐ Not Required	
☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☐ Other: _____	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☐ Not Required

☑ Required: UPRR Maintenance Consent Letter. TxDOT to assist

☐ Required: TxDOT to assist in obtaining the UPRR CROE

☐ Required: Contractor to obtain

- ☐ BNSF: _____
  https://bnsf.railpermitting.com
- ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

To view previously approved CROE templates agreed upon between the State and Railroad, see: https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html

Approved CROE templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed CROE between the Contractor and the Railroad if required on project.

VI. RAILROAD COORDINATION MEETING

A Railroad Coordination Meeting is required. See item 5, Article 8.1. of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges Manual for more details.

VII. RAILROAD SAFETY ORIENTATION

A. Complete the Railroad's course "Orientation for Contractor's Safety," and maintain registration prior to working on the Railroad's property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

UPRR, BNSF, CPKCR will not accept on-track safety training certificates from other Railroads. Refer to each Railroad's specific contractor right of entry for training information.

Know and follow the Contractor's Right of Entry Agreement EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency

Call: UNION PACIFIC RAILROAD COMPANY

Railroad Emergency Line at: 800-848-8715

Location: DOT 745226V

RR Milepost: 1.220

Subdivision: Giddings

RRD Review Only

Initials: KS

Date: 09-22-2023

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf		DN: TxDOT	CK:	DW:		CK:	
© TxDOT June 2014		CONT	SECT	JOB		HIGHWAY	
REVISIONS		0917	18	089		VARIOUS	
6/2023		DIST	COUNTY			SHEET NO.	
		BRY	ROBERTSON			92	

PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

3.05 RAILROAD SAFETY ORIENTATION

A. Complete the railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR)and 14'-0" (KCS) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0917	18	089	VARIOUS
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON		93

3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
   1. Pre-construction meetings.
   2. Pile driving/drilling of caissons or drilled shafts.
   3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
   4. Erection of precast concrete or steel bridge superstructure.
   5. Placement of waterproofing (prior to placing ballast on bridge deck).
   6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

3.13 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

   UPRR 1-800-336-9193
   7:00 AM to 9:00 PM CST Monday-Friday except holidays,
   staffed 24 hrs/day for emergencies
   48 hrs notice required

   BNSF 1-800-533-2891
   24 hour number
   5 working days notice required

   KCS 1-800-344-8377
   Texas One Call, a 24 hour number
   48 hrs notice required, excluding weekends and holidays

   If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of 1/4 inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.15 RAILROAD FLAGGING

Per the Right of Entry Agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

3.16 CLEANING OF RIGHT-OF-WAY

When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the right of Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.

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RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

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©TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0917	18	089	VARIOUS
	DIST	COUNTY		SHEET NO.
	BRY	ROBERTSON		94