FED.RD. DIV.NO.	FEDERAL PROJECT NO.		SHEET NO.
6	BR 2B24(469),ETC.		1
STATE	STATE DIST.	COUNTY	
TEXAS	AMA	HUTCHINSON, ETC.	
CONT.	SECT.	JOB	HIGHWAY NO.
0356	01	112, ETC.	SH 136, ETC.

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT
FEDERAL PROJECT: BR 2B24(469),ETC.
HIGHWAY - SH 136, ETC.
COUNTY - HUTCHINSON, ETC.

CONTROL: 0356-01-112, ETC.

FOR THE CONSTRUCTION OF 2024 BMIP PROGRAM.
CONSISTING OF DECK OVERLAY, RAIL RETROFIT, BRIDGE REPAIR, MBGF, AND STRIPING AT VARIOUS LOCATIONS.

DESIGN SPEED = N/A
2022 ADT = N/A
2042 ADT = N/A
MINOR ARTERIAL

FINAL PLANS

LETTING DATE: _____

DATE CONTRACTOR BEGAN WORK: _____

DATE WORK WAS COMPLETED & ACCEPTED: _____

FINAL CONTRACT COST: $ _____

CONTRACTOR : _____

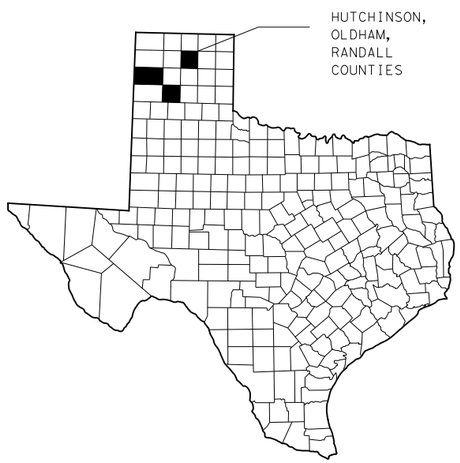
AREA ENGINEER: _____ Date: _____

INDEX OF SHEETS

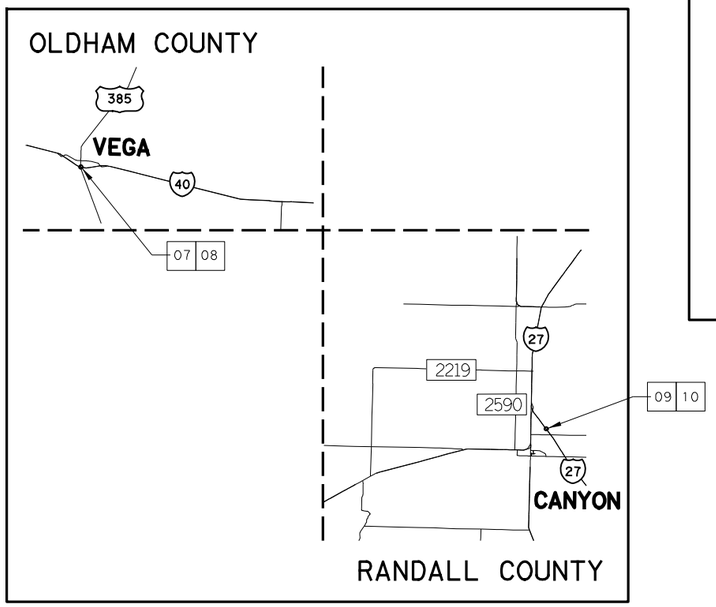
LOCATION SUMMARY

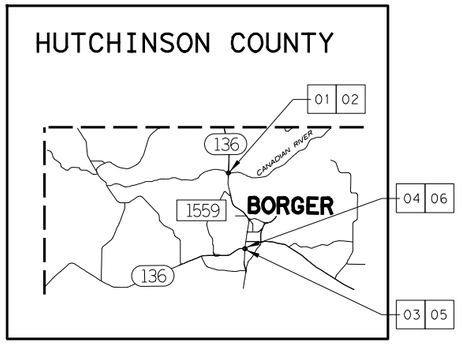
LOCATION	CSJ	NBI NUMBER	HIGHWAY	CROSSING
REF 01	0356-01-112	04-118-0-0356-01-008	SH 136 SB	CANADIAN RIVER
REF 02	0356-01-113	04-118-0-0356-01-014	SH 136 NB	CANADIAN RIVER
REF 03	0356-01-114	04-118-0-0379-01-020	SH 207 NB	SH 136 EB
REF 04	0356-01-115	04-118-0-0379-01-021	SH 207 NB	SH 136 WB
REF 05	0356-01-116	04-118-0-0379-01-031	SH 207 SB	SH 136 EB
REF 06	0356-01-117	04-118-0-0379-01-032	SH 207 SB	SH 136 WB
REF 07	0090-04-071	04-180-0-0090-04-057	IH 40 WB	US 385
REF 08	0090-04-072	04-180-0-0090-04-058	IH 40 EB	US 385
REF 09	0067-17-037	04-191-0-0067-17-142	IH 27 SB	P.D.T. FORK RED RIVER
REF 10	0067-17-038	04-191-0-0067-17-143	IH 27 NB	P.D.T. FORK RED RIVER

SEE LOCATION MAP FOR ADDITIONAL INFORMATION NOT SHOWN



KEY TO COUNTIES





N

EXCEPTIONS:
NONE

RAILROADS:
NONE

EQUATIONS:
NONE

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, SEPTEMBER 1, 2024 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, OCTOBER 23, 2023).

Texas Department of Transportation

RECOMMENDED FOR LETTING: DATE: 6/26/2024
DocuSigned by: 165D6A82BD4D488...
AREA ENGINEER

DATE: 7/1/2024
DocuSigned by: 9B5A6EA6AE8B46E...
DISTRICT DIRECTOR OF TRANSPORTATION PLANNING AND DEVELOPMENT

APPROVED FOR LETTING: DATE: 7/2/2024
DocuSigned by: 8B80E3AEB2BC43A...
DISTRICT ENGINEER

PENTABLE: 10382851.tbl
DATE: 6/21/2024
FILE: AMA2 BMIP Rural Titlesheet.dgn

FINAL SUBMITTAL (100%)

DW:	AJS	CK:	LJG
DW:	LJG	DW:	AJS
CK:	LJG		

INDEX OF SHEETS

STATE OF TEXAS
JAMES BROOKS
101002
LICENSED
PROFESSIONAL ENGINEER

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

SIGNATURE OF REGISTRANT, P.E. 6/11/2024 DATE

STATE OF TEXAS
BRIAN ENNS
93801
LICENSED
PROFESSIONAL ENGINEER

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

SIGNATURE OF REGISTRANT, P.E. 6/10/2024 DATE

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER

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

SIGNATURE OF REGISTRANT, P.E. 6/11/2024 DATE

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

INDEX OF SHEETS

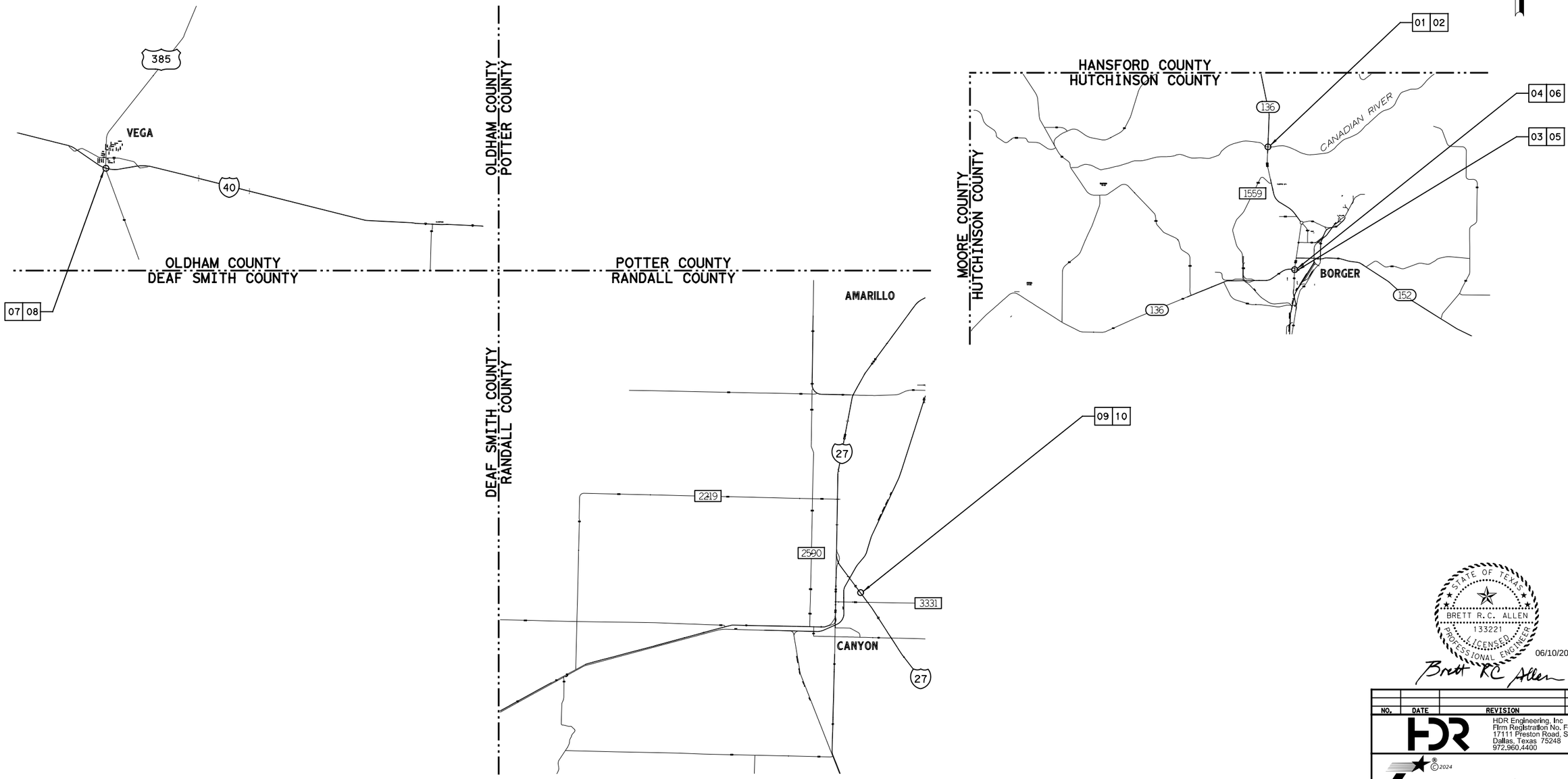
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		2

DATE: 6/8/2024 1:03:44 PM
FILE: AMA2 BMIP Rural Index.dgn

FINAL SUBMITTAL (100%)

DW:	CAM	CK:	LJG	DW:	CAM	CK:	LJG



LOCATION SUMMARY

LOCATION	CSJ	NBI NUMBER	HIGHWAY	CROSSING	LATITUDE	LONGITUDE
REF 01	0356-01-112	04-118-0-0356-01-008	SH 136 SB	CANADIAN RIVER	35.73136	-101.4183
REF 02	0356-01-113	04-118-0-0356-01-014	SH 136 NB	CANADIAN RIVER	35.7323	-101.418
REF 03	0356-01-114	04-118-0-0379-01-020	SH 207 NB	SH 136 EB	35.66056	-101.3987
REF 04	0356-01-115	04-118-0-0379-01-021	SH 207 NB	SH 136 WB	35.66186	-101.3985
REF 05	0356-01-116	04-118-0-0379-01-031	SH 207 SB	SH 136 EB	35.66071	-101.3988
REF 06	0356-01-117	04-118-0-0379-01-032	SH 207 SB	SH 136 WB	35.66188	-101.3987
REF 07	0090-04-071	04-180-0-0090-04-057	IH 40 WB	US 385	35.23705	-102.4279
REF 08	0090-04-072	04-180-0-0090-04-058	IH 40 EB	US 385	35.23685	-102.4284
REF 09	0067-17-037	04-191-0-0067-17-142	IH 27 SB	P.D.T. FORK RED RIVER	35.00515	-101.9024
REF 10	0067-17-038	04-191-0-0067-17-143	IH 27 NB	P.D.T. FORK RED RIVER	35.00526	-101.9022

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

LOCATION MAP

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		3

DATE: 6/8/2024 1:03:52 PM
FILE: AMA2 BMIP Rural Location Map.dgn

GENERAL NOTES

CSJ: 0356-01-112, ETC				
BASIS OF ESTIMATE FOR CONSTRUCTION				
Item	Description	Unit	Rate	
164	SEEDING		SEE PLAN SHEETS	
166	FERTILIZER		SEE PLAN SHEETS	
344(3)	TACK COAT	GAL	0.10 GAL / SY	
344(1)	SUPERPAVE MIXTURES	TON	2”	220 LB/SY/2000
NOTE:				
(1)	SP-D PG70-28 Weight Based On 110Lbs/SY/In			

General

Q&A on Proposal or Contractor questions on this project are to be addressed to the Dumas AE navigate to:

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

Use 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 of the project you want to view the Q&A for and click on the link in the window that pops up.

Early review documentation including watermark Plans, CTD and cross sections (if applicable) will be posted to TxDOT District’s FTP website.

https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/

All manufactured material used on the project must come from MPL located here:
https://www.txdot.gov/business/resources/materials/material-producer-list.html
Alternate materials are noted in this contract.

There are no "reference markers" within the project limits.

The following Standard Detail Sheets have been modified:

BAS-C (MOD)
C-RAIL-R (MOD)
SD-EBR (MOD)
T202TR (MOD)

Remove all excess material from bridge substructure resulting from all construction including planing, seal coat and ACP overlays. This work will not be paid for directly, but will be considered subsidiary to various bid items in the contract.

If Contractor damages any sprinkler heads, risers or water lines that are not to be relocated, he or she is required to replace or repair all damage at his or her own expense and to the Engineer’s satisfaction.

If portions of the right-of-way is used to store materials, equipment, and other uses with the approval of the Engineer, materials, equipment, etc., must either be located outside the 30 feet traffic safety clearance zone or be adequately protected.

Contractor facilities, such as asphalt plants, concrete plants, rock crushers, etc. are not allowed to be located within Department right of way.

Do not store any equipment or material under any bridge.

The slopes indicated on the typical sections may be varied when fixed features required slopes are re-established as directed by the Engineer.

Dust caused by construction operations is to be controlled by applying water in conformance with the requirements of Item 204, "Sprinkling". Sprinkling for dust control will not be paid for directly, but will be considered as subsidiary work to the various bid items.

Any work necessary to provide temporary ingress and egress during construction (such as building gravel ramps, etc.) Will not be paid for directly, but will be considered as subsidiary work to the various bid items.

Item 6 Control of Materials

The Buy America Material Classification Sheet is located at the below link.

https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html for clarification on material categorization.

Item 7 Legal Relations and Responsibilities

No significant traffic generator events identified.

The total area disturbed for this project is approximately 3 acres. The disturbed area in this project, all project locations in the Contract, and the Contractor Project Specific Locations (PSLs), within 1 mile of the project limits, for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the ROW. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the ROW to the Engineer and to the local government that operates a separate storm sewer system.

Item 8 Prosecution and Progress

Create, maintain, and submit for acceptance, a Critical Path Method (CPM) project schedule and a Project Schedule Summary Report (PSSR) using computer software that is fully compatible with the latest version of Primavera Systems, Inc. or Primavera P6.

Provide CPM scheduling, in accordance to Item 8. Submit a separate detailed schedule and plan for the Bridge Demolition and Construction Phase a minimum of four weeks prior to the anticipated start of this work. When the Contractor has made a final determination of the start date, the Contractor must notify the Engineer a minimum of seven days in advance.

Prosecute the work following the sequence shown in the traffic control plan narrative and corresponding traffic control plan. Prosecuting the work in concurrent phases is not allowed unless approved in writing by the engineer.

Item 100 Preparing Right Of Way

Prep ROW will consist only of tree & shrub removal as detailed on Reference 1 & 2.
All tree removal activities are to take place outside nesting season. See EPIC for nesting season.

Item 132 Embankment

The plasticity index for TY B will not exceed 25.

Materials excavated from the project will be allowed to be used on the project as directed by the Engineer.

Item 164 Seeding for Erosion Control

Perform planting operations in accordance with the recommendations contained in the latest version of the TxDOT manual "A Guide to Roadside Vegetation Establishment" developed by the Vegetation Management Section of the Maintenance Division.

Seeding may require more than one mobilization, depending upon the Contractor's sequence of work.

Item 166 Fertilizer

Fertilize all areas of project to be seeded or sodded in accordance with the Amarillo District Vegetation Specification Sheet.

Item 300 Asphalts, Oils, and Emulsions

Asphalt from different sources is not to be blended.

The "Open" seasons for applying asphaltic materials and mixtures for the listed items are to be as follows, unless authorized otherwise in writing by the Engineer:

ITEMS	OPEN SEASON
344	From April 15th through October 31st

Item 320 Equipment for Asphalt Concrete Pavement

A self-propelled, wheel mounted material transfer vehicle (MTV) capable of receiving hot mix from the haul trucks separate from the paver is required on all courses and all types of hot mix for this project. The MTV is to have a minimum storage capacity of approximately 25 tons, and equipped with a pivoting discharge conveyor and a means of completely remixing the hot mix prior to placement. The paver hopper is to be equipped with a separate surge storage insert with a minimum capacity of approximately 20 tons.

If used, the IR bar read out screen must be visible at all times to the Engineer.

When performing any scheduled work during night time hours (sunset to sunrise) all work areas will be fully illuminated using devices designed to not incumber or distract oncoming traffic. All illumination equipment must be approved by the Engineer in writing 48 hours before any scheduled night time work can begin. All associated equipment and labor is considered subsidiary to the item of work and will not be paid for directly.

Item 344 Superpave Mixtures

Use aggregate that meets the SAC requirement of class A.

Only fractionated RAP is allowed.

Use of RAS is not allowed.

All SP-D on this project is considered surface mix. A substitution PG binder is not allowed, as shown in Table 5.

When laying ACP on a roadway that has two or more lanes and the work is being done under traffic, then the adjacent lane or lanes are to be overlaid by the end of the following day.

Make a smooth, clean, minimum 1 inch deep butt joint where each end of the new pavement joins the existing pavement. Any method approved by the Engineer can be used to make the joint.

The District Lab will perform a maximum of 2(two) design verification tests. If additional verification tests are needed, the Contractor will be billed $3,500.00 per each additional verification test required to obtain an approved asphaltic concrete pavement mix design.

If lime is not used as an antistrip agent, then the production and placement testing frequency for the Boil test (TEX-530-C) shown in the table below.

Description	Test Method	Minimum Contractor Testing Frequency	Minimum Engineer Testing Frequency
Boil test	Tex-530-C	1 per lot	1 per 12 sublots

If used, the IR bar read out screen must be visible at all times to the Engineer.

Item 354 Planing and Texturing Pavement

The Contractor will retain ownership of planed materials.

Item 421 Hydraulic Cement Concrete

The sand equivalent value of fine aggregate is not to be less than 85 when subjected to test method tex-203-F.

The Engineer will perform all job control testing for acceptance.

The Engineer will provide strength-testing equipment when required in accordance with the Contract-controlling tests.

Furnish and maintain the following testing equipment:

- Test Molds

All cast-in-place concrete except for drilled shafts are to be air-entrained. Pre-cast and drilled shaft concrete may be air-entrained at the Contractor's option.

The Engineer will provide strength testing equipment for acceptance testing.

Item 427 Surface Finishes for Concrete

Provide a rub finish to Surface Area IV:

- All surfaces of proposed new rail

Allowable substitutes for TY X waterproofing materials include:

- Macropoxy® 646 Fast Cure | Protective & Marine Coatings (sherwin-williams.com). Two coats at maximum coverage rate of 200 SF/Gal per coat
- Si-Prime + Si-Rex03 - Klaas Coatings North America (klaascoatings-northamerica.com). One coat of Si-Prime at maximum coverage rate of 200 SF/Gal and two coats Si-Rex03 at maximum coverage rate of 300 SF/Gal per coat
- Sikagard®-550 W Elastic (G) | Concrete Protection. Two coats at maximum coverage rate of 100 SF/Gal per coat
- Loxon® XP LX11-50 Series | Waterproofing Masonry Coating-Flat | Sherwin Williams. Two coats at maximum coverage rate of 100 SF/Gal per coat

Item 429 Concrete Structure Repair

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

A hard copy of the Department's Concrete Repair Manual shall be on-hand whenever concrete repairs are being performed.

For Vertical and Overhead repairs use preapproved Type C Repair Material.

Provide containment for repair materials to prevent materials from falling into the water.

Remove any repair materials that do fall into the water.

Item 432 Riprap

All concrete riprap in contact with bridge abutments is to have joints made with a 6" fiber expansion joint material and be sealed with a joint sealer as approved by the Engineer. Afterward, use Cap Option A with 20 GA metal flashing for concrete riprap in contact with the abutment and wingwalls.

24" tie bars (#3 bars at 18" c-c) are to be used across all construction joints. Tie bars should be 12'' into each side of the construction joint. When tying new riprap into existing riprap drill and epoxy grout 8" minimum into existing concrete. This is to be considered subsidiary to the payment for riprap.

Provide an intermediate toe wall when rip rap exceeds 25' vertically.

Provide and install Type 2 filter fabric for all areas of stone riprap.

Item 502 Barricades, Signs, and Traffic Handling

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

The Contractor is to have the option of using either plastic drums, vertical panels, grabber cones or a combination where drums are shown as channelizing devices, as approved by the Engineer. Plastic drums are to be used in all transition areas in accordance with BC(8)-21 and WZ(TD)-17.

Provide a 3:1 backfill "safety slope" at the end of the day for any drop off exceeding 2" that is adjacent to a travel lane.

Lane closures are to be limited to a maximum of: 15 minute que time.

Notify the Engineer 24 hours prior to any lane closure.

Any work being done above travel lanes will require the lanes to be closed for traffic safety.

Item 505 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 for this project, provide 0 additional shadow vehicle(s) with TMA for TCP (1-4)-18, (1-5)-18, (2-1)-18, (2-5)-18, (2-16)-18, (3-1)-13, (3-2)-13, (3-3)-13 as detailed on the General Notes of this standard sheets.

Therefore, 2 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.

Item 506 Temporary Erosion, Sedimentation, and Environmental Controls

Erosion control devices are to be installed as needed in coordination with the work progress, or as directed by the Engineer.

Use wooden stakes to secure erosion control logs. Do not use rebar stakes.

Item 512 Portable Concrete Traffic Barrier

The state will furnish the portable concrete traffic barrier sections for Item 512, "Port. Concrete Traffic Barrier (Des Source)", the state will supply sufficient hardware to connect the sections together. The sections will be available at IH 40 & FM 2161.

When the Engineer determines that all phases of construction involving portable concrete traffic barriers are complete, the Contractor is to remove and deliver the PCTB sections, complete with all mounting hardware, to IH 40 & FM 2161. The Engineer will designate a location for unloading the PCTB sections. This work will be measured and paid for at the unit price bid for item 512, "Port Concrete Traffic Barrier (STKPL)".

Item 514 Permanent Concrete Traffic Barrier

The "Type 2" precast concrete traffic barrier is to be joined together using a "Type B" joint.

Item 540 Metal Beam Guard Fence

Drive steel posts for metal beam guard fence a minimum of 1/3 of the post length to final specified depth.

Item 542 Removing Metal Beam Guard Fence

All MBGF, GET & TAS will remain property of the Contractor.

Item 544 Guardrail End Treatments

Use Single Guardrail End Treatment (Ty III)(Steel Post).

Item 658 Delineator and Object Marker Assemblies

For all concrete barrier, bridge rail, and guard fence post mounted applications provide hollow or tubular posts with approved anchorage.

Item 666 Reflectorized Pavement Markings

Retroreflectivity Requirements:

All Type I markings must meet the minimum retroreflectivity values for edgeline markings, centerline or no passing barrier-line, and lane lines when measured any time after 3 days, but not later than 10 days after application:

- White markings: 250 millicandelas per square meter per lux (mcd/m^2/lx)
- Yellow markings: 175 mcd/m^2/lx

Retroreflectivity Measurements: Mobile or portable retroreflectometers may be used at the Contractor's discretion.

All Type I markings must meet the minimum retroreflectivity values for edgeline markings, centerline or no passing barrier-line, and lane lines when measured any time after 3 days, but not later than 10 days after application.

County: Hutchinson, ETC **Sheet: 4D**

Highway: SH 136, ETC **Control:** 0356-01-112, ETC

Item 677 Eliminating Existing Pavement Markings and Markers

Do not remove any existing pavement markings in any area in which the contractor is not able to place work zone pavement markings at the proper location within the same day.

Item 787 Replacing Elastomeric Bearing Pads

Prior to installation of the bearing pads, ensure the bearing seats are level. If work is needed to make the seats level, this will not be paid for directly but will be considered subsidiary to the bearing pad installation.

Install a Type V epoxy per DMS-6100, "Epoxies and Adhesives," once the bearing seats have been determined level. Place the bonding epoxy on a clean, dry surface, and place the bearing pad while the epoxy is still tacky, or in accordance with the manufacturer's recommendations.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0356-01-112 **DISTRICT** Amarillo **COUNTY** Hutchinson, Oldham, Randall
HIGHWAY IH 27, IH 40, SH 136, SH 207

			CONTROL SECTION JOB	**0067-17-037**		**0067-17-038**		**0090-04-071**		**0090-04-072**		**0356-01-112**		**0356-01-113**	
			PROJECT ID	**A00197802**		**A00197803**		**A00197787**		**A00197789**		**A00197724**		**A00197725**	
			COUNTY	**Randall**		**Randall**		**Oldham**		**Oldham**		**Hutchinson**		**Hutchinson**	
			HIGHWAY	**IH 27**		**IH 27**		**IH 40**		**IH 40**		**SH 136**		**SH 136**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	100-7001	PREPARING ROW	AC									5.950		4.720	
	104-7006	REMOV CONC (RIPRAP)	SY	22.000		357.000		5.000		2.000					
	104-7030	REMOV CONC (APPR SLAB)	SY												
	110-7002	EXCAV (CHANNEL)	CY	70.000		60.000				40.000					
	132-7001	EMBANK (FNL)(OC)(TY A)	CY	300.000		300.000				325.000					
	132-7003	EMBANK (FNL)(OC)(TY B)	CY							3.000					
	164-7010	DRILL SEED (PERM_RURAL_CLAY)	SY	825.000		810.000				645.000		1,245.000		1,925.000	
	344-7056	SP MIXES SP-D PG70-28	TON												
	344-7077	TACK COAT	GAL												
	354-7032	PLANE ASPH CONC PAV(0" TO 2")	SY			2,726.000									
	354-7039	PLANE ASPH CONC PAV(2" TO 4")	SY												
	354-7051	PLANE ASPH CONC PAV(2")	SY	2,726.000				1,052.000							
	354-7073	PLANE ASPH CONC PAV (0" TO 1.5")	SY									11,294.000		9,806.000	
	361-7004	FULL - DEPTH REPAIR CRCP (9")	CY	14.000		14.000									
	400-7010	CEM STABIL BKFL	CY	34.000										2.000	
	401-7001	FLOWABLE BACKFILL	CY	3.000		8.000		5.000		3.000					
	420-7052	CL C CONC (RAIL FOUNDATION)	CY									20.000		95.000	
	422-7013	APPROACH SLAB	CY	119.000		119.000									
	427-7005	EPOXY WATERPROOF FINISH (TY X)	SF	2,298.000		2,298.000		1,716.000		1,716.000		40,603.000		9,026.000	
	429-7003	CONC STR REPAIR(DECK REP(PART DEPTH))	SF	740.000		740.000		285.000		285.000		3,050.000		2,650.000	
	429-7005	CONC STR REPAIR(DECK REP (FULL DEPTH))	SF	250.000		250.000		95.000		95.000		1,020.000		885.000	
	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	272.000		155.000		159.000		135.000		1,771.000		918.000	
	432-7001	RIPRAP (CONC)(4 IN)	CY	136.000		130.000				83.000					
	432-7002	RIPRAP (CONC)(5 IN)	CY	20.000		18.000		1.000		1.000				2.000	
	432-7013	RIPRAP (MOW STRIP)(4 IN)	CY									4.000		17.000	
	432-7043	RIPRAP (STONE PROTECTION)(18 IN)	CY	53.000		129.000									
	438-7001	CLEANING AND SEALING EXISTING JOINTS	LF	162.000		162.000									
	438-7010	CLEANING AND SEALING JOINTS (FOAM)	LF	76.000		76.000		264.000		264.000				90.000	
	439-7017	POLYESTER POLYMER CONC OVERLAY (2")	SY	2,706.000		2,706.000		1,052.000		1,052.000					
	439-7021	POLYESTER POLYMER CONC OVERLAY (1")	SY									11,140.000		9,175.000	
	450-7024	RAIL (TY SSTR)	LF									137.000		675.000	
	451-7024	RETROFIT RAIL (TY SSTR)	LF											4,168.000	
	483-7024	MICROMILLING CONCRETE SLAB (2 IN)	SY							1,052.000					
	496-7022	REMOV STR (APPROACH SLAB)	EA	2.000		2.000									
	496-7036	REMOV STR (SMALL)	EA											2.000	
	500-7001	MOBILIZATION	LS	0.250		0.250						0.250		0.250	
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	1.000		1.000		1.000		1.000		3.000		4.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0356-01-112 **DISTRICT** Amarillo **COUNTY** Hutchinson, Oldham, Randall
HIGHWAY IH 27, IH 40, SH 136, SH 207

				0067-17-037		0067-17-038		0090-04-071		0090-04-072		0356-01-112		0356-01-113	
		CONTROL SECTION JOB													
		PROJECT ID		A00197802		A00197803		A00197787		A00197789		A00197724		A00197725	
		COUNTY		Randall		Randall		Oldham		Oldham		Hutchinson		Hutchinson	
		HIGHWAY		IH 27		IH 27		IH 40		IH 40		SH 136		SH 136	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	503-7002	PORTABLE CHANGEABLE MESSAGE SIGN	EA												
	505-7001	TMA (STATIONARY)	DAY	27.000		27.000		20.000		20.000		30.000		6.000	
	505-7002	TMA (MOBILE OPERATION)	HR	24.000		24.000		24.000		24.000		24.000		24.000	
	506-7043	BIODEG EROSN CONT LOGS (INSTL) (8")	LF	600.000		600.000		300.000		300.000		560.000		865.000	
	506-7046	BIODEG EROSN CONT LOGS (REMOVE)	LF	600.000		600.000		300.000		300.000		560.000		865.000	
	512-7009	PORT CTB (FUR & INST)(LOW PROF)(TY 1)	LF												
	512-7010	PORT CTB (FUR & INST)(LOW PROF)(TY 2)	LF												
	512-7017	PORT CTB (DES SOURCE)(F-SHAPE)(TY 1)	LF											2,250.000	
	512-7029	PORT CTB (MOVE)(F-SHAPE)(TY 1)	LF											2,250.000	
	512-7041	PORT CTB (STKPL)(F-SHAPE)(TY 1)	LF											2,250.000	
	512-7045	PORT CTB (STKPL)(LOW PROF)(TY 1)	LF												
	512-7046	PORT CTB (STKPL)(LOW PROF)(TY 2)	LF												
	514-7001	PERM CTB (SGL SLOPE) (TY 1) (42)	LF	420.000		420.000				420.000					
	514-7002	PERM CTB (SGL SLOPE) (TY 3) (42)	LF											20.000	
	540-7002	MTL W-BEAM GD FEN (STEEL POST)	LF									350.000		175.000	
	540-7005	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA									2.000		1.000	
	540-7015	DOWNSTREAM ANCHOR TERMINAL SECTION	EA									1.000		2.000	
	540-7016	MTL BM GD FEN TRANS (NON - SYM)	EA									1.000		2.000	
	540-7029	MTL BM GD FEN TRANS (ANCHOR PLATE)	EA									3.000			
	542-7001	REMOVE METAL BEAM GUARD FENCE	LF	300.000		300.000				1,025.000		375.000		775.000	
	542-7002	REMOVE TERMINAL ANCHOR SECTION	EA									2.000		2.000	
	543-7002	CABLE BARRIER SYSTEM (INSTALL)(TL-4)	LF							680.000					
	543-7018	CABLE BARRIER TERM SEC (INSTL)(TL-4)	EA							1.000					
	543-7038	CABLE BARRIER TERMINAL SECTION (REMOVE)	EA							1.000					
	544-7001	GUARDRAIL END TREATMENT (INSTALL)	EA									2.000		1.000	
	544-7003	GUARDRAIL END TREATMENT (REMOVE)	EA	1.000		1.000				1.000		2.000		2.000	
	545-7002	CRASH CUSH ATTEN (MOVE & RESET)	EA											1.000	
	545-7004	CRASH CUSH ATTEN (REMOVE)	EA											1.000	
	545-7006	CRASH CUSH ATTEN (INSTL)(L)(N)(TL3)	EA	1.000		1.000				1.000				1.000	
	545-7014	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA											1.000	
	636-7006	REPLACE EXISTING ALUMINUM SIGNS(TY O)	SF					14.000		14.000					
	658-7012	INSTL DEL ASSM (D-SW)SZ 1(BRF)CTB	EA											21.000	
	658-7018	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA									3.000		3.000	
	658-7031	INSTL DEL ASSM (D-SY)SZ 1(BRF)CTB	EA									1.000		27.000	
	658-7036	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA									2.000		1.000	
	662-7008	WK ZN PAV MRK NON-REMOV (W)6"(SLD)	LF											2,185.000	
	662-7038	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF											2,185.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0356-01-112 **DISTRICT** Amarillo **COUNTY** Hutchinson, Oldham, Randall
HIGHWAY IH 27, IH 40, SH 136, SH 207

			CONTROL SECTION JOB	**0067-17-037**		**0067-17-038**		**0090-04-071**		**0090-04-072**		**0356-01-112**		**0356-01-113**	
			PROJECT ID	**A00197802**		**A00197803**		**A00197787**		**A00197789**		**A00197724**		**A00197725**	
			COUNTY	**Randall**		**Randall**		**Oldham**		**Oldham**		**Hutchinson**		**Hutchinson**	
			HIGHWAY	**IH 27**		**IH 27**		**IH 40**		**IH 40**		**SH 136**		**SH 136**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	662-7068	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	2,280.000		2,280.000		1,960.000		1,960.000		4,300.000		4,760.000	
	662-7100	WK ZN PAV MRK REMOV (Y)6"(SLD)	LF	2,280.000		2,280.000		1,960.000		1,960.000		4,300.000		2,055.000	
	666-7289	TY I HIGH PERF PM (W)6"(BRK)(090MIL)	LF	190.000		190.000		70.000		70.000		840.000		1,070.000	
	666-7292	TY I HIGH PERF PM (W)6"(SLD)(090MIL)	LF	732.000		732.000		240.000		240.000		3,295.000		3,553.000	
	666-7304	TY I HIGH PERF PM (Y)6"(SLD)(090MIL)	LF	732.000		732.000		240.000		240.000		3,300.000		3,443.000	
	666-7347	PAVEMENT SLER 6"	LF									7,435.000		8,066.000	
	672-7002	REFL PAV MRKR TY I-C	EA												
	672-7006	REFL PAV MRKR TY II-C-R	EA	11.000		11.000		5.000		5.000		43.000		55.000	
	677-7001	ELIM EXT PM & MRKS (4")	LF											3,250.000	
	678-7002	PAV SURF PREP FOR MRK (6")	LF									7,435.000		8,066.000	
	713-7004	CRACK CLEANING AND SEALING (JCP)	LF	890.000		850.000		767.000		869.000		109.000		251.000	
	778-7004	CONCRETE RAIL REPLACEMENT (IN-KIND)	LF									72.000			
	785-7001	BRIDGE JOINT REPAIR (CONCRETE)	LF	106.000		106.000									
	785-7009	BRIDGE JOINT REPLACEMENT (CONCRETE)	LF											585.000	
	785-7011	BRIDGE JOINT REPLACEMENT (SEJ)	LF									360.000		630.000	
	786-7001	CARBON FIBER REINF POLYMER PROTECTION	SF							125.000					
	787-7001	REPLACING ELASTOMERIC BEARING PADS	EA	5.000											
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS									1.000			
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS									1.000			

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0356-01-112 **DISTRICT** Amarillo **COUNTY** Hutchinson, Oldham, Randall
HIGHWAY IH 27, IH 40, SH 136, SH 207

				0356-01-114		0356-01-115		0356-01-116		0356-01-117		TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB											
		PROJECT ID		**A00197783**		**A00197784**		**A00197785**		**A00197786**			
		COUNTY		**Hutchinson**		**Hutchinson**		**Hutchinson**		**Hutchinson**			
		HIGHWAY		**SH 207**		**SH 207**		**SH 207**		**SH 207**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	100-7001	PREPARING ROW	AC									10.670	
	104-7006	REMOV CONC (RIPRAP)	SY	37.000		31.000		23.000		25.000		502.000	
	104-7030	REMOV CONC (APPR SLAB)	SY	2.000		2.000		2.000		2.000		8.000	
	110-7002	EXCAV (CHANNEL)	CY									170.000	
	132-7001	EMBANK (FNL)(OC)(TY A)	CY									925.000	
	132-7003	EMBANK (FNL)(OC)(TY B)	CY			2.000		3.000		4.000		12.000	
	164-7010	DRILL SEED (PERM_RURAL_CLAY)	SY	270.000		490.000		380.000		360.000		6,950.000	
	344-7056	SP MIXES SP-D PG70-28	TON	82.000		132.000		131.000		82.000		427.000	
	344-7077	TACK COAT	GAL	74.000		120.000		119.000		75.000		388.000	
	354-7032	PLANE ASPH CONC PAV(0" TO 2")	SY									2,726.000	
	354-7039	PLANE ASPH CONC PAV(2" TO 4")	SY	1,156.000		1,788.000		1,784.000		1,163.000		5,891.000	
	354-7051	PLANE ASPH CONC PAV(2")	SY									3,778.000	
	354-7073	PLANE ASPH CONC PAV (0" TO 1.5")	SY									21,100.000	
	361-7004	FULL - DEPTH REPAIR CRCP (9")	CY									28.000	
	400-7010	CEM STABIL BKFL	CY									36.000	
	401-7001	FLOWABLE BACKFILL	CY	3.000		3.000		3.000		3.000		31.000	
	420-7052	CL C CONC (RAIL FOUNDATION)	CY									115.000	
	422-7013	APPROACH SLAB	CY									238.000	
	427-7005	EPOXY WATERPROOF FINISH (TY X)	SF	194.000		261.000		257.000		194.000		58,563.000	
	429-7003	CONC STR REPAIR(DECK REP(PART DEPTH))	SF	115.000		160.000		165.000		115.000		8,305.000	
	429-7005	CONC STR REPAIR(DECK REP (FULL DEPTH))	SF									2,595.000	
	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	107.000		132.000		131.000		114.000		3,894.000	
	432-7001	RIPRAP (CONC)(4 IN)	CY									349.000	
	432-7002	RIPRAP (CONC)(5 IN)	CY	10.000		8.000		7.000		7.000		74.000	
	432-7013	RIPRAP (MOW STRIP)(4 IN)	CY									21.000	
	432-7043	RIPRAP (STONE PROTECTION)(18 IN)	CY									182.000	
	438-7001	CLEANING AND SEALING EXISTING JOINTS	LF									324.000	
	438-7010	CLEANING AND SEALING JOINTS (FOAM)	LF	132.000		196.000		196.000		132.000		1,426.000	
	439-7017	POLYESTER POLYMER CONC OVERLAY (2")	SY	418.000		591.000		600.000		418.000		9,543.000	
	439-7021	POLYESTER POLYMER CONC OVERLAY (1")	SY									20,315.000	
	450-7024	RAIL (TY SSTR)	LF									812.000	
	451-7024	RETROFIT RAIL (TY SSTR)	LF	95.000		96.000		96.000		95.000		4,550.000	
	483-7024	MICROMILLING CONCRETE SLAB (2 IN)	SY									1,052.000	
	496-7022	REMOV STR (APPROACH SLAB)	EA									4.000	
	496-7036	REMOV STR (SMALL)	EA									2.000	
	500-7001	MOBILIZATION	LS									1.000	
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	1.000		2.000		2.000		1.000		17.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0356-01-112 **DISTRICT** Amarillo **COUNTY** Hutchinson, Oldham, Randall
HIGHWAY IH 27, IH 40, SH 136, SH 207

				0356-01-114		0356-01-115		0356-01-116		0356-01-117		TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB											
		PROJECT ID		**A00197783**		**A00197784**		**A00197785**		**A00197786**			
		COUNTY		**Hutchinson**		**Hutchinson**		**Hutchinson**		**Hutchinson**			
		HIGHWAY		**SH 207**		**SH 207**		**SH 207**		**SH 207**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	503-7002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000								2.000	
	505-7001	TMA (STATIONARY)	DAY	20.000		20.000		20.000		20.000		210.000	
	505-7002	TMA (MOBILE OPERATION)	HR	24.000		24.000		24.000		24.000		240.000	
	506-7043	BIODEG EROSN CONT LOGS (INSTL) (8")	LF	120.000		220.000		170.000		160.000		3,895.000	
	506-7046	BIODEG EROSN CONT LOGS (REMOVE)	LF	120.000		220.000		170.000		160.000		3,895.000	
	512-7009	PORT CTB (FUR & INST)(LOW PROF)(TY 1)	LF	460.000		340.000		460.000		340.000		1,600.000	
	512-7010	PORT CTB (FUR & INST)(LOW PROF)(TY 2)	LF	20.000				20.000				40.000	
	512-7017	PORT CTB (DES SOURCE)(F-SHAPE)(TY 1)	LF									2,250.000	
	512-7029	PORT CTB (MOVE)(F-SHAPE)(TY 1)	LF									2,250.000	
	512-7041	PORT CTB (STKPL)(F-SHAPE)(TY 1)	LF									2,250.000	
	512-7045	PORT CTB (STKPL)(LOW PROF)(TY 1)	LF	460.000		340.000		460.000		340.000		1,600.000	
	512-7046	PORT CTB (STKPL)(LOW PROF)(TY 2)	LF	20.000				20.000				40.000	
	514-7001	PERM CTB (SGL SLOPE) (TY 1) (42)	LF									1,260.000	
	514-7002	PERM CTB (SGL SLOPE) (TY 3) (42)	LF									20.000	
	540-7002	MTL W-BEAM GD FEN (STEEL POST)	LF	50.000		150.000		100.000		75.000		900.000	
	540-7005	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	1.000		1.000		1.000		1.000		7.000	
	540-7015	DOWNSTREAM ANCHOR TERMINAL SECTION	EA									3.000	
	540-7016	MTL BM GD FEN TRANS (NON - SYM)	EA									3.000	
	540-7029	MTL BM GD FEN TRANS (ANCHOR PLATE)	EA									3.000	
	542-7001	REMOVE METAL BEAM GUARD FENCE	LF	100.000		162.500		150.000		137.500		3,325.000	
	542-7002	REMOVE TERMINAL ANCHOR SECTION	EA	1.000				1.000		1.000		7.000	
	543-7002	CABLE BARRIER SYSTEM (INSTALL)(TL-4)	LF									680.000	
	543-7018	CABLE BARRIER TERM SEC (INSTL)(TL-4)	EA									1.000	
	543-7038	CABLE BARRIER TERMINAL SECTION (REMOVE)	EA									1.000	
	544-7001	GUARDRAIL END TREATMENT (INSTALL)	EA	1.000		1.000		1.000		1.000		7.000	
	544-7003	GUARDRAIL END TREATMENT (REMOVE)	EA			1.000						8.000	
	545-7002	CRASH CUSH ATTEN (MOVE & RESET)	EA									1.000	
	545-7004	CRASH CUSH ATTEN (REMOVE)	EA									1.000	
	545-7006	CRASH CUSH ATTEN (INSTL)(L)(N)(TL3)	EA									4.000	
	545-7014	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA									1.000	
	636-7006	REPLACE EXISTING ALUMINUM SIGNS(TY O)	SF									28.000	
	658-7012	INSTL DEL ASSM (D-SW)SZ 1(BRF)CTB	EA	1.000		1.000		1.000		1.000		25.000	
	658-7018	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	2.000		3.000		3.000		2.000		16.000	
	658-7031	INSTL DEL ASSM (D-SY)SZ 1(BRF)CTB	EA									28.000	
	658-7036	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA									3.000	
	662-7008	WK ZN PAV MRK NON-REMOV (W)6"(SLD)	LF	240.000		240.000		240.000		240.000		3,145.000	
	662-7038	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	240.000		240.000		240.000		240.000		3,145.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0356-01-112 **DISTRICT** Amarillo **COUNTY** Hutchinson, Oldham, Randall
HIGHWAY IH 27, IH 40, SH 136, SH 207

												TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0356-01-114**		**0356-01-115**		**0356-01-116**		**0356-01-117**			
		PROJECT ID		**A00197783**		**A00197784**		**A00197785**		**A00197786**			
		COUNTY		**Hutchinson**		**Hutchinson**		**Hutchinson**		**Hutchinson**			
		HIGHWAY		**SH 207**		**SH 207**		**SH 207**		**SH 207**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	662-7068	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	240.000		2,800.000		2,800.000		240.000		23,620.000	
	662-7100	WK ZN PAV MRK REMOV (Y)6"(SLD)	LF	620.000		650.000		650.000		620.000		17,375.000	
	666-7289	TY I HIGH PERF PM (W)6"(BRK)(090MIL)	LF	150.000		180.000		150.000		180.000		3,090.000	
	666-7292	TY I HIGH PERF PM (W)6"(SLD)(090MIL)	LF	610.000		925.000		789.000		775.000		11,891.000	
	666-7304	TY I HIGH PERF PM (Y)6"(SLD)(090MIL)	LF	588.000		686.000		586.000		668.000		11,215.000	
	666-7347	PAVEMENT SLER 6"	LF	1,348.000		1,791.000		1,525.000		1,623.000		21,788.000	
	672-7002	REFL PAV MRKR TY I-C	EA	9.000		10.000		9.000		10.000		38.000	
	672-7006	REFL PAV MRKR TY II-C-R	EA									130.000	
	677-7001	ELIM EXT PM & MRKS (4")	LF	380.000		410.000		380.000		485.000		4,905.000	
	678-7002	PAV SURF PREP FOR MRK (6")	LF	1,348.000		1,791.000		1,525.000		1,623.000		21,788.000	
	713-7004	CRACK CLEANING AND SEALING (JCP)	LF	304.000		374.000		440.000		344.000		5,198.000	
	778-7004	CONCRETE RAIL REPLACEMENT (IN-KIND)	LF									72.000	
	785-7001	BRIDGE JOINT REPAIR (CONCRETE)	LF									212.000	
	785-7009	BRIDGE JOINT REPLACEMENT (CONCRETE)	LF									585.000	
	785-7011	BRIDGE JOINT REPLACEMENT (SEJ)	LF									990.000	
	786-7001	CARBON FIBER REINF POLYMER PROTECTION	SF	22.000		8.000		20.000		27.000		202.000	
	787-7001	REPLACING ELASTOMERIC BEARING PADS	EA									5.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS									1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS									1.000	

SUMMARY OF TRAFFIC CONTROL ITEMS

ITEM DESCRIPTION	512 7017 PORT CTB (DES SOURCE)(F -SHAPE)(TY 1)	512 7009 PORT CTB (FUR & INST)(LOW PROF)(TY 1)	512 7010 PORT CTB (FUR & INST)(LOW PROF)(TY 2)	512 7029 PORT CTB (MOVE)(F -SHAPE)(TY 1)	512 7041 PORT CTB (STKPL)(F -SHAPE)(TY 1)	512 7045 PORT CTB (STKPL)(LOW PROF)(TY 1)	512 7046 PORT CTB (STKPL)(LOW PROF)(TY 2)	545 7002 CRASH CUSH ATTEN (MOVE & RESET)	545 7004 CRASH CUSH ATTEN (REMOVE)	545 7014 CRASH CUSH ATTEN (INSTL) (S)(N)(TL3)	662 7008 WK ZN PAV MRK NON -REMOV (W)6" (SLD)	662 7038 WK ZN PAV MRK NON -REMOV (Y)6" (SLD)	662 7068 WK ZN PAV MRK REMOV (W)6"(SLD)	662 7100 WK ZN PAV MRK REMOV (Y)6"(SLD)	677 7001 ELIM EXT PM & MRKS (4")
	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF	LF	LF	LF	LF
REF 01: SH 136 SB AT CANADIAN RIVER													4300	4300	
REF 02: SH 136 NB AT CANADIAN RIVER	2250			2250	2250			1	1	1	2185	2185	4760	2055	3250
REF 03: SH 207 NB AT SH 136 EB		460	20			460	20				240	240	240	620	380
REF 04: SH 207 NB AT SH 136 WB		340				340					240	240	2800	650	410
REF 05: SH 207 SB AT SH 136 EB		460	20			460	20				240	240	2800	650	380
REF 06: SH 207 SB AT SH 136 WB		340				340					240	240	240	620	485
REF 07: IH 40 WB AT US 385													1960	1960	
REF 08: IH 40 EB AT US 385													1960	1960	
REF 09: IH 27 SB AT PDT FORK RED RIVER													2280	2280	
REF 10: IH 27 NB AT PDT FORK RED RIVER													2280	2280	
PROJECT TOTAL	2250	1600	40	2250	2250	1600	40	1	1	1	3145	3145	23620	17375	4905

SUMMARY OF SWP3 ITEMS

ITEM DESCRIPTION	164 7010 DRILL SEED (PERM_RURAL_CLAY)	166 7002 FERTILIZER	506 7043 BIODEG EROSN CONT LOGS (INSTL) (8")	506 7046 BIODEG EROSN CONT LOGS (REMOVE)
	SY	TON	LF	LF
REF 01: SH 136 SB AT CANADIAN RIVER	1245	0.04	560	560
REF 02: SH 136 NB AT CANADIAN RIVER	1925	0.06	865	865
REF 03: SH 207 NB AT SH 136 EB	270	0.01	120	120
REF 04: SH 207 NB AT SH 136 WB	490	0.02	220	220
REF 05: SH 207 SB AT SH 136 EB	380	0.02	170	170
REF 06: SH 207 SB AT SH 136 WB	360	0.02	160	160
REF 07: IH 40 WB AT US 385			300	300
REF 08: IH 40 EB AT US 385	645	0.02	300	300
REF 09: IH 27 SB AT PDT FORK RED RIVER	825	0.03	600	600
REF 10: IH 27 NB AT PDT FORK RED RIVER	810	0.03	600	600
PROJECT TOTAL	6950 (1)	0.25 (2)	3895 (3)	3895

(1) SEE TYPICAL SWP3 LAYOUT FOR BASIS OF SEEDING QUANTITIES.

(2) FOR CONTRACTOR'S INFORMATION ONLY.

(3) PROVIDE EROSION CONTROL LOG ALONG ENTIRE LENGTH OF PROPOSED MOW STRIP AS DIRECTED BY THE ENGINEER.

DN: JB CK: JT DW: JR CK: JZ

6/25/2024 2:14

NO.	DATE	REVISION	APPR BY

TEXAS TRANSPORTATION SOLUTIONS, INC. Firm # F-19397

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 1 OF 4

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC	SH 136, ETC

DIST	COUNTY	SHEET #
AMA	HUTCHINSON, ETC	6

SUMMARY OF ROADWAY ITEMS

ITEM NO.	100-7001	344-7056	344-7077	354-7039	420-7052	432-7013	450-7024	514-7002	540-7002	540-7005	540-7015	540-7016	540-7029	542-7001	542-7002	544-7001	544-7003	545-7006
DESCRIPTION	PREPARING ROW ***	SP MIXES SP-D PG70-28 (220 LB/SY)	TACK COAT (0.10 GAL/SY)	PLANE ASPH CONC PAV (2" TO 4")	CL C CONC (RAIL FOUNDATION)	RIPRAP (MOW STRIP) (4 IN)	RAIL (TY SSTR)	PERM CTB (SGL SLOPE) (TY 3) (42)	MTL W-BEAM GD FEN (STEEL POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	DOWNSTREAM ANCHOR TERMINAL SECTION	MTL BM GD FEN TRANS (NON - SYM)	MTL BM GD FEN TRANS (ANCHOR PLATE)	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	CRASH CUSH ATTEN (INSTL) (L)(N) (TL3)
	AC	TON	GAL	SY	CY	CY	LF	LF	LF	EA	EA	EA	EA	LF	EA	EA	EA	EA
REF 01: SH 136 SB AT CANADIAN RIVER	5.95				20	4	137		350	2	1	1	3	375	2	2	2	
REF 02: SH 136 NB AT CANADIAN RIVER	4.72				95	17	675	20	175	1	2	2		775	2	1	2	1
REF 03: SH 207 NB AT SH 136 EB		82	74	738					50	1				100	1	1		
REF 04: SH 207 NB AT SH 136 WB		132	120	1,197					150	1				162.5		1	1	
REF 05: SH 207 SB AT SH 136 EB		131	119	1,184					100	1				150	1	1		
REF 06: SH 207 SB AT SH 136 WB		82	75	745					75	1				137.5	1	1		
REF 07: IH 40 WB AT US 385																		
REF 08: IH 40 EB AT US 385														1,025			1	
REF 09: IH 27 SB AT P.D.T FORK RED RIVER														300			1	
REF 10: IH 27 NB AT P.D.T FORK RED RIVER														300			1	
ROADWAY TOTALS	10.67	427	388	3,864	115	21	812	20	900	7	3	3	3	3,325.0	7	7	8	1

*** - ITEM 100 FOR TREE AND SHRUB REMOVAL ONLY AS DIRECTED BY ENGINEER.

SUMMARY OF MEDIAN PROTECTION ITEMS

ITEM NO.	104-7006	110-7002	132-7001	432-7001	514-7001	543-7002	543-7018	543-7038	545-7006
DESCRIPTION	REMOV CONC (RIPRAP)	EXCAV (CHANNEL)	EMBANK (FNL) (OC) (TY A)	RIPRAP (CONC) (4 IN)	PERM CTB (SGL SLOPE) (TY 1) (42)	CABLE BARRIER SYSTEM (INSTALL) (TL-4)	CABLE BARRIER TERM SEC (INSTL) (TL-4)	CABLE BARRIER TERMINAL SECTION (REMOVE)	CRASH CUSH ATTEN (INSTL) (L)(N) (TL3)
	SY	CY	CY	CY	LF	LF	EA	EA	EA
REF 01: SH 136 SB AT CANADIAN RIVER									
REF 02: SH 136 NB AT CANADIAN RIVER									
REF 03: SH 207 NB AT SH 136 EB									
REF 04: SH 207 NB AT SH 136 WB									
REF 05: SH 207 SB AT SH 136 EB									
REF 06: SH 207 SB AT SH 136 WB									
REF 07: IH 40 WB AT US 385									
REF 08: IH 40 EB AT US 385		40	325	83	420	680	1	1	1
REF 09: IH 27 SB AT P.D.T FORK RED RIVER		70	300	136	420				1
REF 10: IH 27 NB AT P.D.T FORK RED RIVER	317	60	300	130	420				1
MEDIAN PROTECTION TOTALS	317	170	925	349	1,260	680	1	1	3

NO.	DATE	REVISION	APPR BY

RTG RODRIGUEZ TRANSPORTATION GROUP
TBPE #5871

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 2 OF 4

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		7

DATE: 6/20/2024 12:39:05 PM
FILE: AMA2-RDWY-QTYSUM01.dgn

SUMMARY OF SIGNAGE, DELINEATION AND PAVEMENT MARKING ITEMS

ITEM NO.	636-7006	658-7012	658-7018	658-7031	658-7036	666-7289	666-7292	666-7304	666-7347	672-7002	672-7006	678-7002
DESCRIPTION	REPLACE EXISTING ALUMINUM SIGNS (TY O) **	INSTL DEL ASSM (D-SW)SZ 1 (BRF)CTB	INSTL DEL ASSM (D-SW)SZ 1 (BRF)GF2	INSTL DEL ASSM (D-SY)SZ 1 (BRF)CTB	INSTL DEL ASSM (D-SY)SZ 1 (BRF)GF2	TY I HIGH PERF PM (W)6" (BRK) (090MIL)	TY I HIGH PERF PM (W)6" (SLD) (090MIL)	TY I HIGH PERF PM (Y)6" (SLD) (090MIL)	PAVEMENT SLER 6"	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-C-R	PAV SURF PREP FOR MRK (6")
	SF	EA	EA	EA	EA	LF	LF	LF	LF	EA	EA	LF
REF 01: SH 136 SB AT CANADIAN RIVER			3	1	2	840	3,295	3,300	7,435		43	7,435
REF 02: SH 136 NB AT CANADIAN RIVER		21	3	27	1	1,070	3,553	3,443	8,066		55	8,066
REF 03: SH 207 NB AT SH 136 EB		1	2			150	610	588	1,348	9		1,348
REF 04: SH 207 NB AT SH 136 WB		1	3			180	925	686	1,791	10		1,791
REF 05: SH 207 SB AT SH 136 EB		1	3			150	789	586	1,525	9		1,525
REF 06: SH 207 SB AT SH 136 WB		1	2			180	775	668	1,623	10		1,623
REF 07: IH 40 WB AT US 385	14					70	240	240			5	
REF 08: IH 40 EB AT US 385	14					70	240	240			5	
REF 09: IH 27 SB AT P.D.T FORK RED RIVER						190	732	732			11	
REF 10: IH 27 NB AT P.D.T FORK RED RIVER						190	732	732			11	
SIGNAGE, DELINEATION AND PVMNT MARKING TOTALS	28	25	16	28	3	3,090	11,891	11,215	21,788	38	130	21,788

** - THIS QUANTITY CONSISTS OF REPLACEMENT OF EACH BRIDGE MOUNTED CLEARANCE SIGN.

NO.	DATE	REVISION	APPR BY

RTG RODRIGUEZ TRANSPORTATION GROUP
FIRM #5827

Texas Department of Transportation

QUANTITY SUMMARIES

SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		8

DATE: 5/16/2024 3:35:32 PM
FILE: AMA2-RDWY-QTYSUM02.dgn

FINAL SUBMITTAL (100%)

DW:	CK:	DW:	CK:
AJS	LJG	JCH	LJG

SUMMARY OF BRIDGE ITEMS

ITEM NO.	104-7006	104-7030	132-7003	354-7032	354-7039	354-7051	354-7073	361-7004	400-7010	401-7001	422-7013	427-7005	429-7003	429-7005	429-7007	432-7002
DESCRIPTION	REMOV CONC (RIPRAP)	REMOV CONC (APPR SLAB)	EMBANK (FNL)(OC)(TY B)	PLANE ASPH CONC PAV(0" TO 2")	PLANE ASPH CONC PAV(2" TO 4")	PLANE ASPH CONC PAV(2")	PLANE ASPH CONC PAV (0" TO 1.5")	FULL - DEPTH REPAIR CRCP (9")	CEM STABIL BKFL	FLOWABLE BACKFILL	APPROACH SLAB	EPOXY WATERPROOF FINISH (TY X)	CONC STR REPAIR(DECK REP(PART DEPTH))	CONC STR REPAIR(DECK REP (FULL DEPTH))	CONC STR REPAIR (VERTICAL & OVERHEAD)	RIPRAP (CONC)(5 IN)
	SY	SY	CY	SY	SY	SY	SY	CY	CY	CY	CY	SF	SF	SF	SF	CY
REF 01: SH 136 SB AT CANADIAN RIVER							11294					40603	3050	1020	1771	
REF 02: SH 136 NB AT CANADIAN RIVER							9806		2			9026	2650	885	918	2
REF 03: SH 207 NB AT SH 136 EB	37	2			418					3		194	115		107	10
REF 04: SH 207 NB AT SH 136 WB	31	2	2		591					3		261	160		132	8
REF 05: SH 207 SB AT SH 136 EB	23	2	3		600					3		257	165		131	7
REF 06: SH 207 SB AT SH 136 WB	25	2	4		418					3		194	115		114	7
REF 07: IH 40 WB AT US 385	5					1052				5		1716	285	95	159	1
REF 08: IH 40 EB AT US 385	2		3							3		1716	285	95	135	1
REF 09: IH 27 SB AT P.D.T. FORK RED RIVER	22					2726		14	34	3	119	2298	740	250	272	20
REF 10: IH 27 NB AT P.D.T. FORK RED RIVER	40			2726				14		8	119	2298	740	250	155	18
PROJECT TOTALS	185	8	12	2726	2027	3778	21100	28	36	31	238	58563	8305	2595	3894	74

SUMMARY OF BRIDGE ITEMS (CONTINUED)

ITEM NO.	432-7043	438-7001	438-7010	439-7017	439-7021	451-7024	(1) 483-7024	496-7036	496-7022	713-7004	778-7004	785-7001	785-7009	785-7011	786-7001	787-7001
DESCRIPTION	RIPRAP (STONE PROTECTION)(18 IN)	CLEANING AND SEALING EXISTING JOINTS	CLEANING AND SEALING JOINTS (FOAM)	POLYESTER POLYMER CONC OVERLAY (2")	POLYESTER POLYMER CONC OVERLAY (1")	RETROFIT RAIL (TY SSTR)	MICROMILLING CONCRETE SLAB (2 IN)	REMOV STR (SMALL)	REMOV STR (APPROACH SLAB)	CRACK CLEANING AND SEALING (JCP)	CONCRETE RAIL REPLACEMENT (IN-KIND)	BRIDGE JOINT REPAIR (CONCRETE)	BRIDGE JOINT REPLACEMENT (CONCRETE)	BRIDGE JOINT REPLACEMENT (SEJ)	CARBON FIBER REINF POLYMER PROTECTION	REPLACING ELASTOMERIC BEARING PADS
	CY	LF	LF	SY	SY	LF	SY	EA	EA	LF	LF	LF	LF	LF	SF	EA
REF 01: SH 136 SB AT CANADIAN RIVER					11140					109	72			360		
REF 02: SH 136 NB AT CANADIAN RIVER			90		9175	4168		2		251			585	630		
REF 03: SH 207 NB AT SH 136 EB			132	418		95				304					22	
REF 04: SH 207 NB AT SH 136 WB			196	591		96				374					8	
REF 05: SH 207 SB AT SH 136 EB			196	600		96				440					20	
REF 06: SH 207 SB AT SH 136 WB			132	418		95				344					27	
REF 07: IH 40 WB AT US 385			264	1052						767						
REF 08: IH 40 EB AT US 385			264	1052			1052			869					125	
REF 09: IH 27 SB AT P.D.T. FORK RED RIVER	53	162	76	2706					2	890		106				5
REF 10: IH 27 NB AT P.D.T. FORK RED RIVER	129	162	76	2706					2	850		106				
PROJECT TOTALS	182	324	1426	9543	20315	4550	1052	2	4	5198	72	212	585	990	202	5

(1) THIS BID ITEM WILL BE USED TO MILL THE EXISTING CONCRETE OVERLAY OFF THE BRIDGE DECK.

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

QUANTITY SUMMARIES

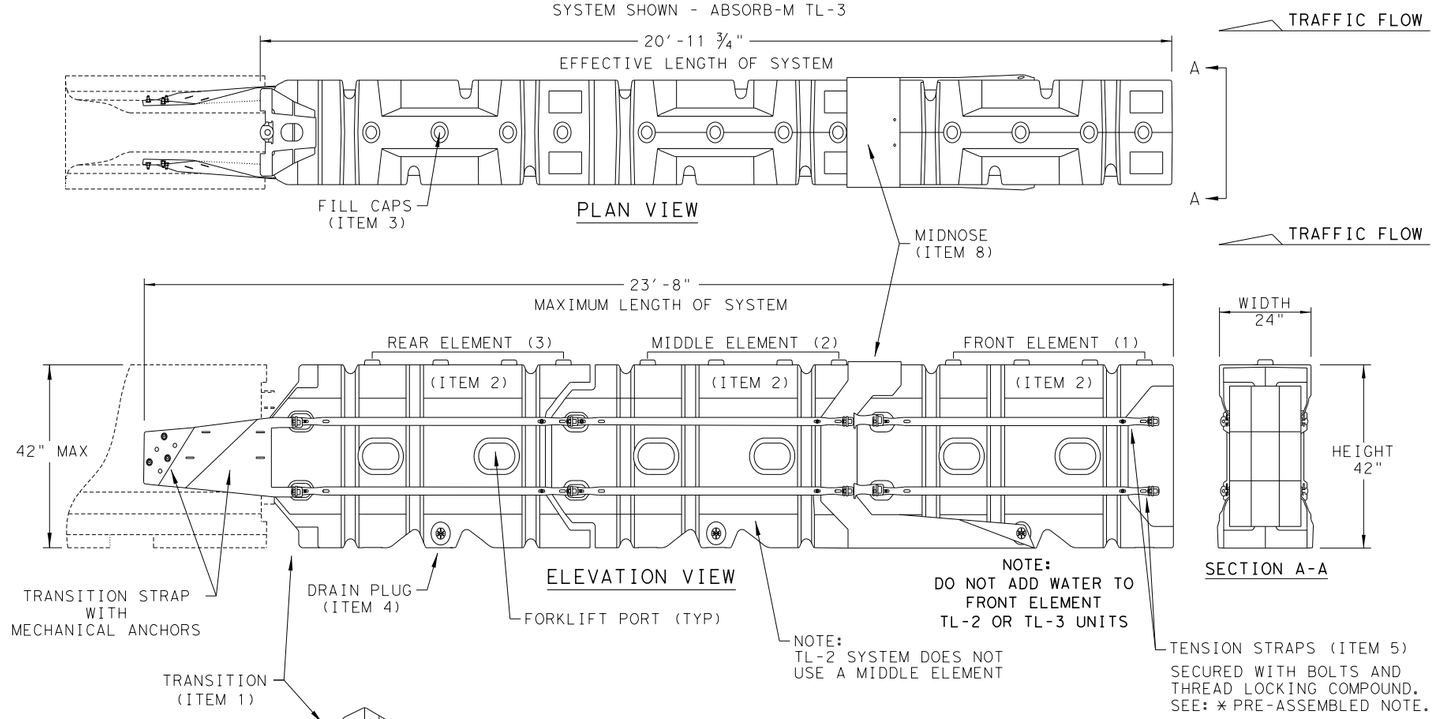
SHEET 4 OF 4

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		9

DATE: 6/8/2024 1:36:26 PM
FILE: AMA2 BMIP Rural Quantities.dgn

DATE: 1/2/2024
FILE: C:\Users\JamesBrooks\Documents\projects\0105.001 (AMA BMIP)\cadd\std\ABSORB(M)-19.dgn

SYSTEM SHOWN - ABSORB-M TL-3



THE ABSORB-M IS A NON-REDIRECTIVE, GATING, CRASH CUSHION DESIGNED TO MEET THE LATEST TL-3 & TL-2 MASH REQUIREMENTS.

THE SYSTEM IS DESIGNED TO ACCOMMODATE A VARIETY OF F-SHAPE AND SINGLE SLOPE CONCRETE BARRIERS. CONTACT THE MANUFACTURER FOR GUIDANCE REGARDING OTHER ALLOWABLE SHAPES.

TEST LEVEL	NUMBER OF ELEMENTS	EFFECTIVE LENGTH	MAXIMUM LENGTH
TL-2	2	14'- 7 3/4"	17'- 4"
TL-3	3	20'- 11 3/4"	23'- 8"

NOTE:
CROSS SLOPES OF UP TO 8% (OR 1:12 SLOPE) CAN BE ACCOMMODATED WITH STANDARD HARDWARE SHOWN WITHIN THE INSTRUCTIONS MANUAL. FOR SLOPES WITH EXCESS OF 8% (OR 1:12) CONTACT, LINDSAY TRANSPORTATION SOLUTIONS.

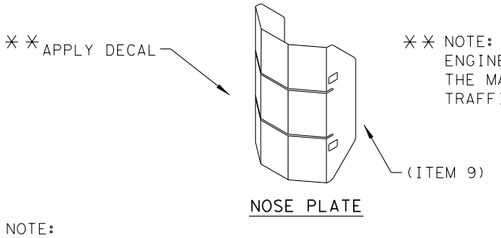
GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING THE INSTALLATION AND TECHNICAL GUIDANCE, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800. 180 RIVER ROAD, RIO VISTA, CA 94571
2. THE ABSORB-M SYSTEM IS ONLY APPROVED FOR USE IN (TEMPORARY WORK ZONE) LOCATIONS.
3. THE ABSORB-M IS A WATER FILLED NON-REDIRECTIVE, GATING CRASH CUSHION THAT DOES NOT NEED TO BE ATTACHED TO A FOUNDATION AND CAN BE INSTALLED ON TOP OF CONCRETE, ASPHALT, OR ANY SURFACE CAPABLE OF BEARING THE WEIGHT OF THE SYSTEM.
4. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
5. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
6. THE ABSORB-M SHOULD BE LOCATED APPROXIMATELY PARALLEL WITH THE BARRIER.
7. THE USE OF THE ABSORB-M IS RESTRICTED TO A BARRIER HEIGHT OF UP TO 42 INCHES.
8. DO NOT ADD WATER TO FRONT ELEMENT (TL-2 OR TL-3 UNIT).

BILL OF MATERIALS (BOM) ABSORB-M TL-3 & TL-2 SYSTEMS			QTY	QTY
ITEM #	PART NUMBER	PART DESCRIPTION	TL-2 SYSTEM	TL-3 SYSTEM
1	BSI-1809036-00	TRANSITION-(GALV)	1	1
* 2	BSI-1808002-00	PRE-ASSEMBLED ABSORBING (ELEMENTS)	2	3
* 3	BSI-4004598	FILL CAPS	8	12
* 4	BSI-4004599	DRAIN PLUGS	2	3
* 5	BSI-1809053-00	TENSION STRAP-(GALV)	8	12
* 6	BSI-2001998	C-SCR FH 3/8-16 X 1 1/2 GR5 PLT	8	12
* 7	BSI-2001999	C-SCR FH 3/8-16 X 1 GR5 PLT	8	12
8	BSI-1809035-00	MIDNOSE-(GALV)	1	1
9	BSI-1808014-00	NOSE PLATE	1	1
10	BSI-1809037-00	TRANSITION STRAP (LEFT-HAND)-(GALV)	1	1
11	BSI-1809038-00	TRANSITION STRAP (RIGHT-HAND)-(GALV)	1	1
12	BSI-1808005-00	PIN ASSEMBLY	8	10
13	BSI-2002001	ANC MECH 5/8-11X5 (GALV)	6	6
14	ABSORB-M	INSTALLATION AND INSTRUCTIONS MANUAL	1	1

*COMPONENTS PRE-ASSEMBLED WITH ELEMENT ASSEMBLY

DELINEATION DECAL PLACEMENT GUIDE



** NOTE: (PROVIDED BY OTHERS)
ENGINEER OR CONTRACTOR SHALL COORDINATE WITH THE MANUFACTURER FOR THE CORRECT DECAL PER TRAFFIC FLOW, LEFT, RIGHT OR BOTH-SIDES.

NOTE:
APPLY A HIGH REFLECTIVE DECAL TO THE NOSE PLATE. DELINEATION DECAL ORIENTATION IS SHOWN ON THE CONSTRUCTION PLAN SET AND SHALL BE IN ACCORDANCE WITH THE TEXAS MUTCD FOR (TRAFFIC CONTROL DEVICES). DECALs ARE AVAILABLE FOR TRAFFIC FLOW ON THE LEFT-SIDE, BOTH -SIDES AND RIGHT-SIDE.

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE ABSORB-M, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

SACRIFICIAL

Texas Department of Transportation — Design Division Standard

LINDSAY TRANSPORTATION SOLUTIONS
CRASH CUSHION
(MASH TL-3 & TL-2)
TEMPORARY - WORK ZONE
ABSORB(M)-19

FILE: absorbm19	DN: TxDOT	CK: KM	DW: VP	CK:
REVISIONS	CONT	SECT	JOB	HIGHWAY
	0356	01	112, ETC	SH 136, ETC
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC		10

DATE: 1/2/2024 11:58
FILE: C:\Users\JamesBrooks\Documents\projects\0105.001 (AMA BMIP)\cadd\std\BC-21.dgn

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

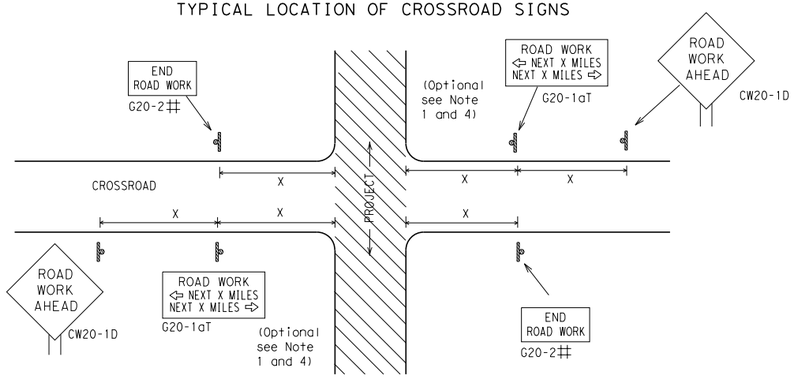
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13 9-07 8-14 5-10 5-21	0356	01	112, ETC	SH 136, ETC
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC		11

DATE: 1/2/2024 11:58
FILE: C:\Users\JamesBrooks\Documents\projects\0105.001 (AMA BMIP)\cadd\std\BC-21.dgn

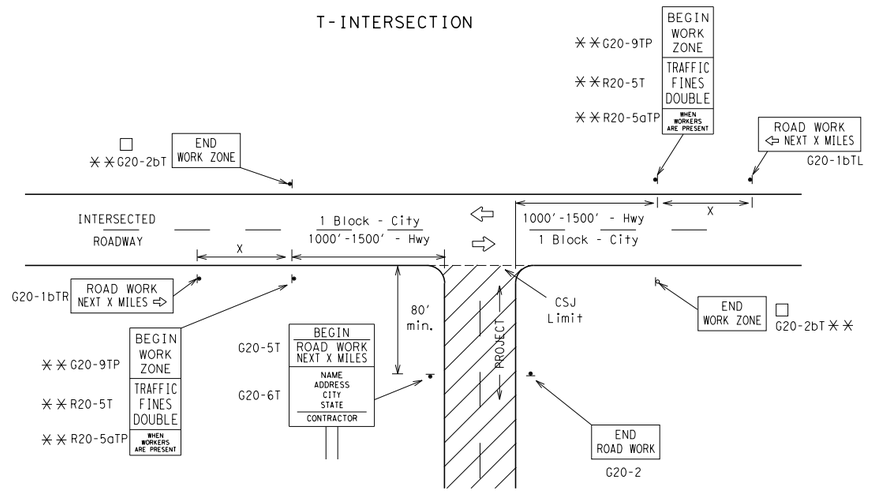
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

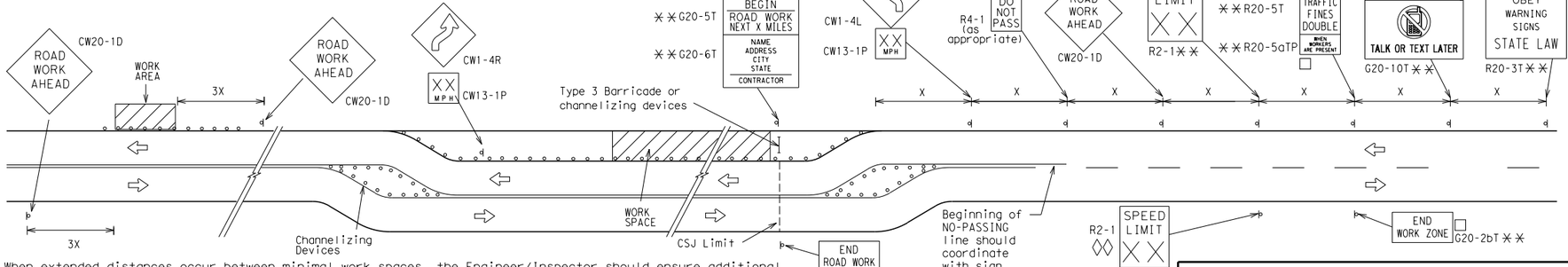
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

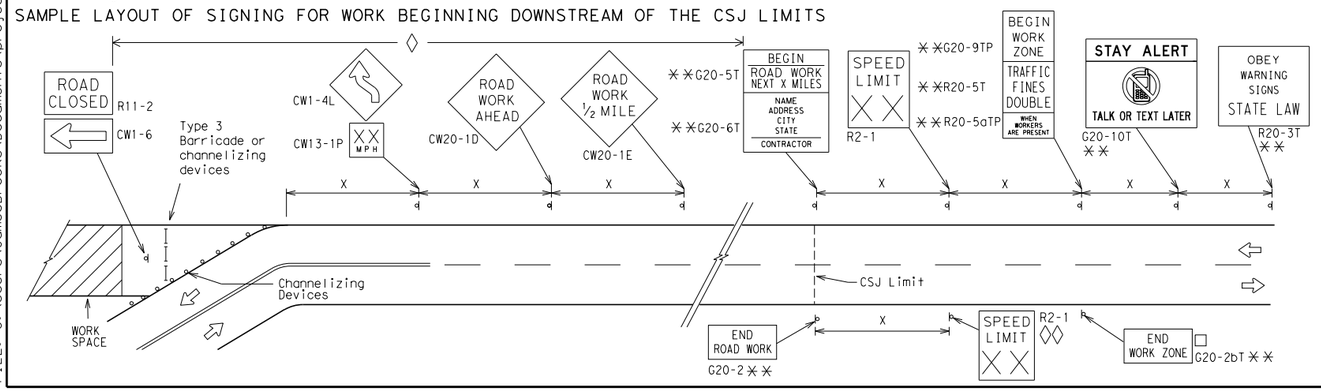
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC	SH 136, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	AMA	HUTCHINSON, ETC		12

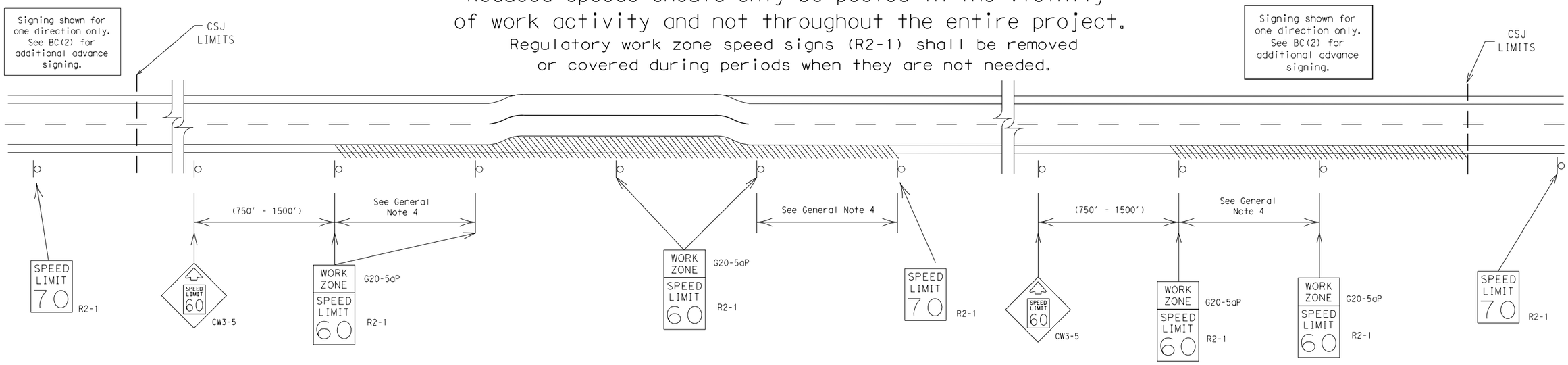
DATE: 1/2/2024 11:58
FILE: C:\Users\JamesBrooks\Documents\projects\0105.001 (AMA BMIP)\cadd\std\BC-21.dgn

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	0356	01	112, ETC	SH 136, ETC
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC		13

DATE: 1/2/2024 11:58
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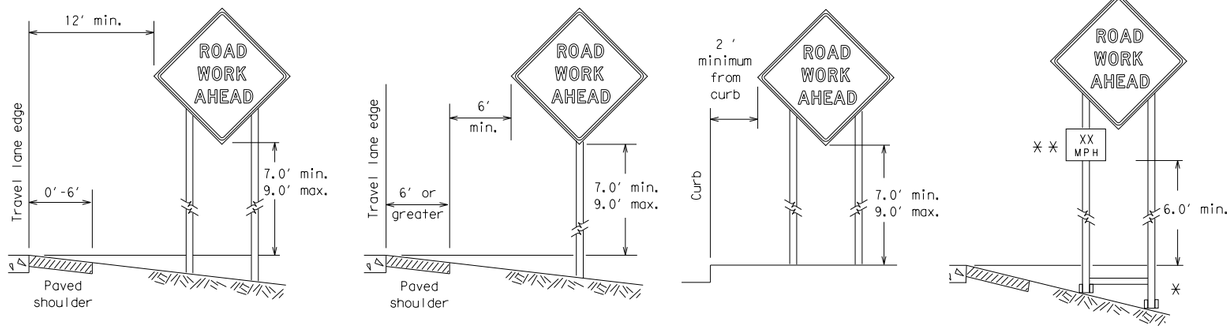
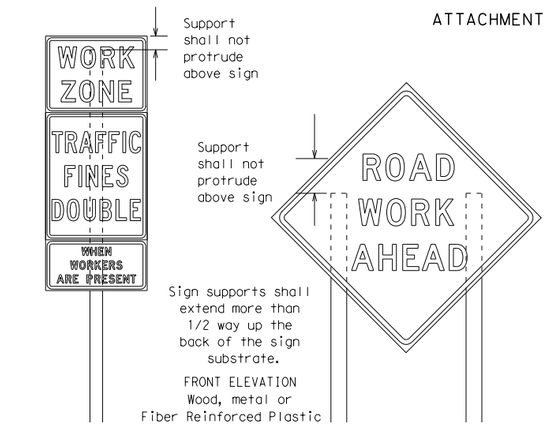
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

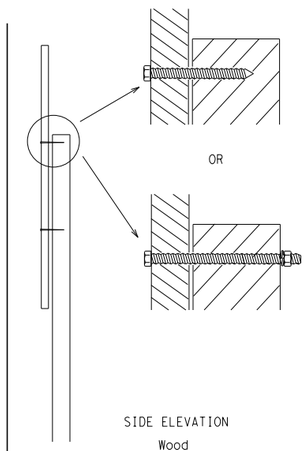


⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

⁎⁎ 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





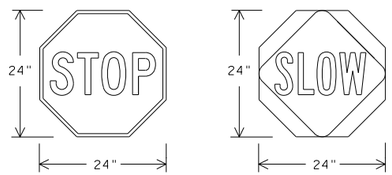
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	AMA	HUTCHINSON, ETC		14

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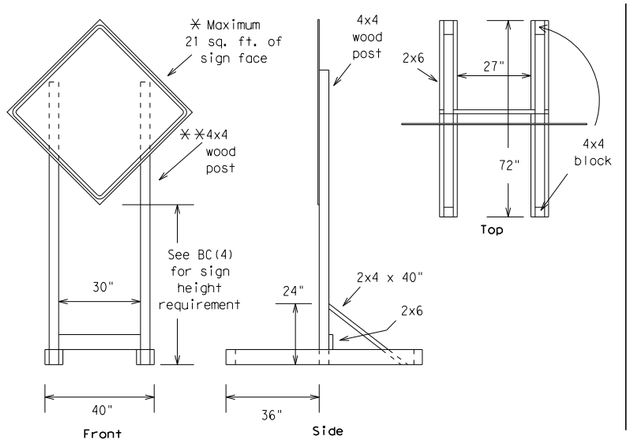
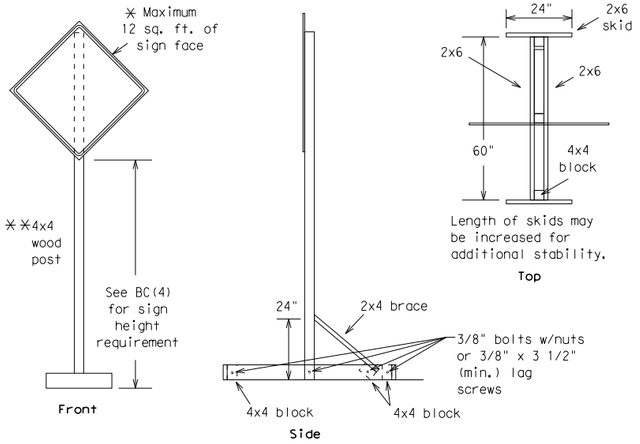
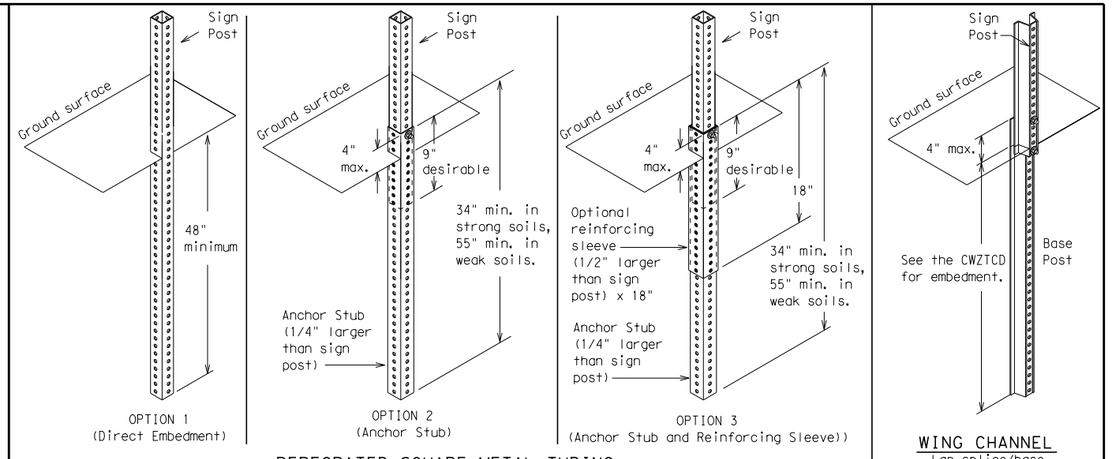




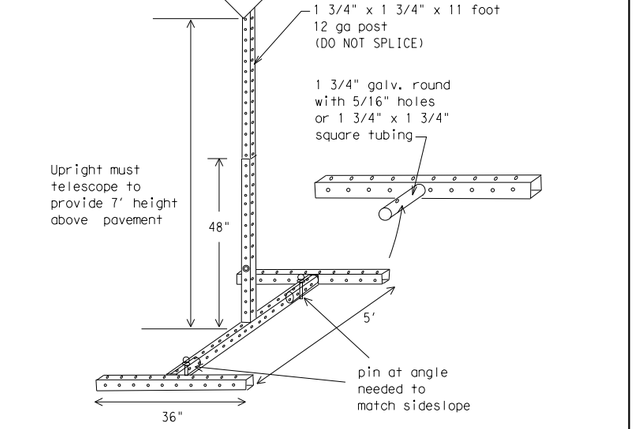
SKID MOUNTED WOOD SIGN SUPPORTS

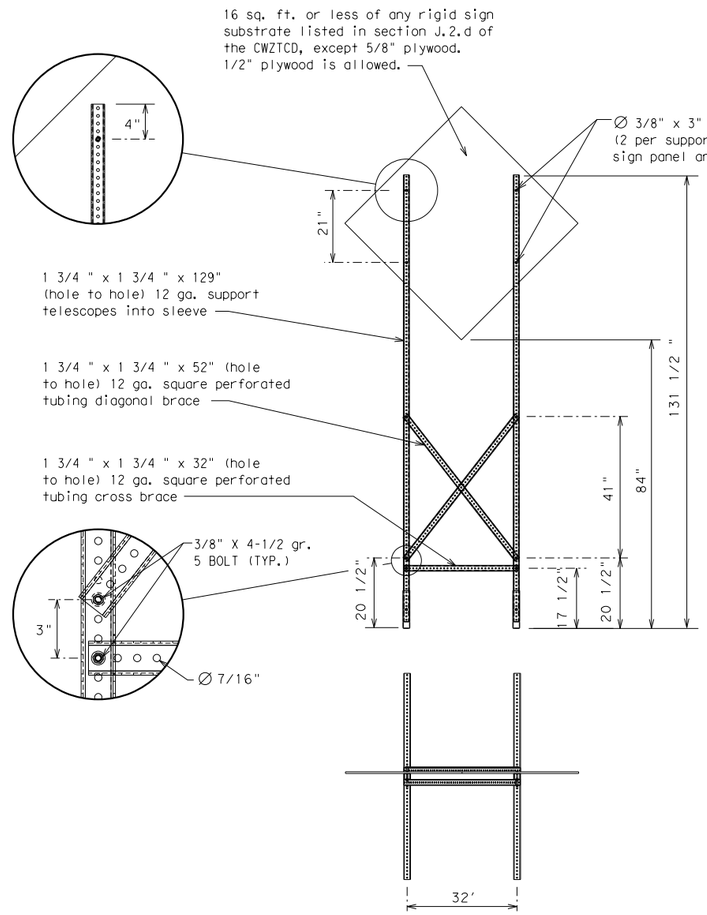
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

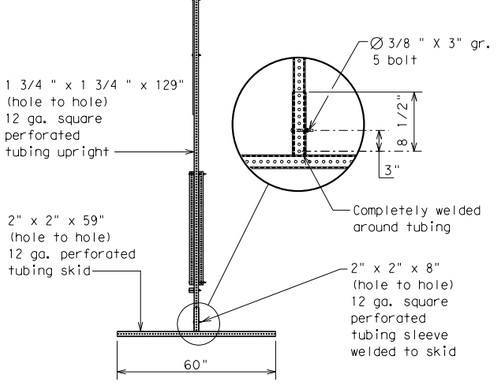


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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REVISIONS	0356	01	112, ETC	SH 136, ETC
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WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

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

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

Phase 2: Possible Component Lists

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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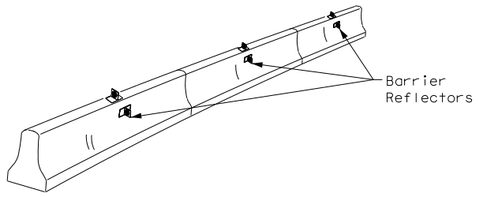
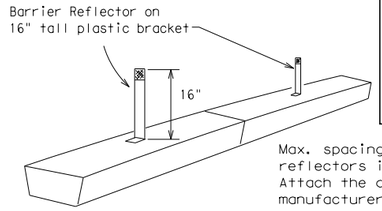
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



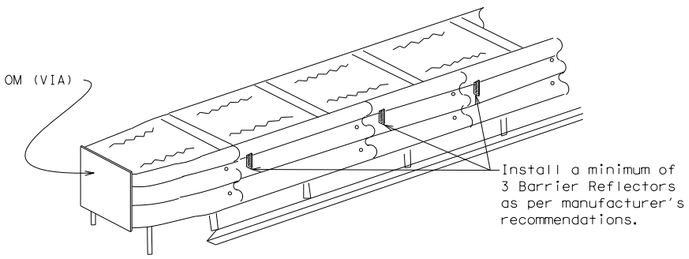
CONCRETE TRAFFIC BARRIER (CTB)

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

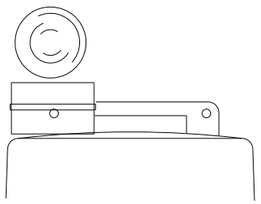
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

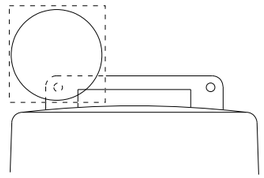
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

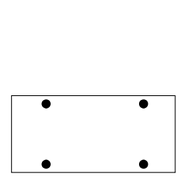
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

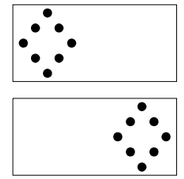
Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

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:

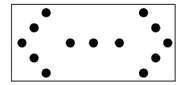


4 CORNER CAUTION

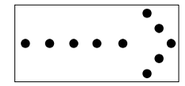
OR



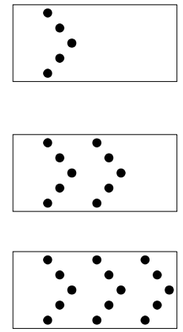
ALTERNATING DIAMOND CAUTION



DOUBLE ARROW



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



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

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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

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

BC(7)-21

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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:

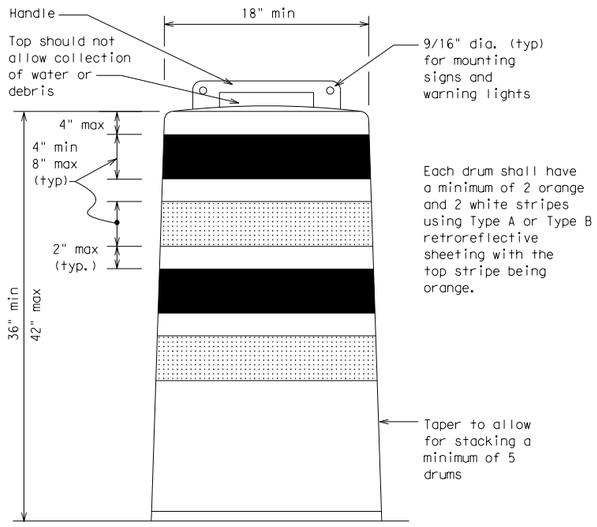
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

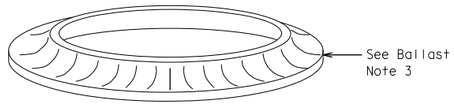
RETROREFLECTIVE SHEETING

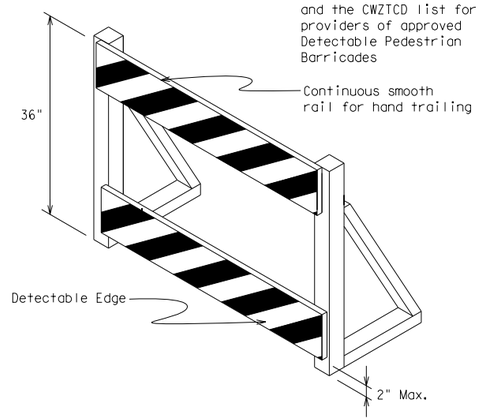
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

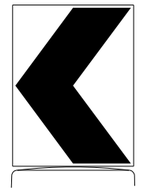




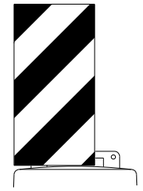


DETECTABLE PEDESTRIAN BARRICADES

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.

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Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

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9-07 5-21	AMA	HUTCHINSON, ETC		18
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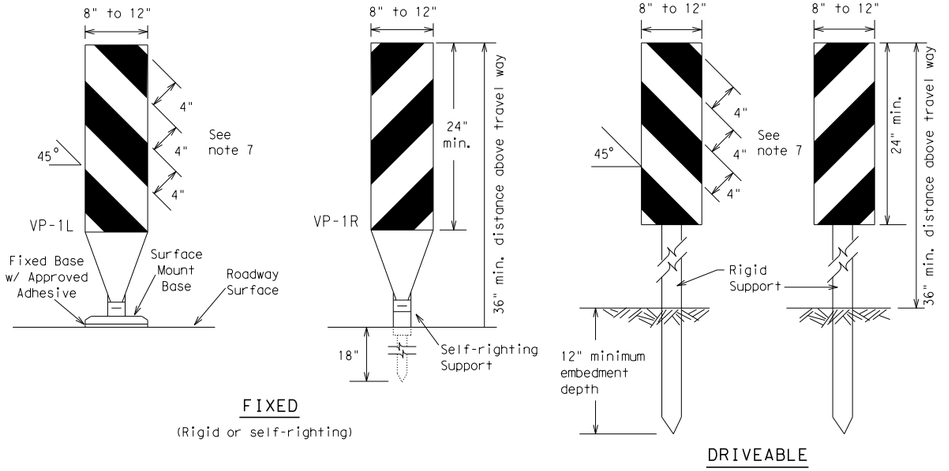
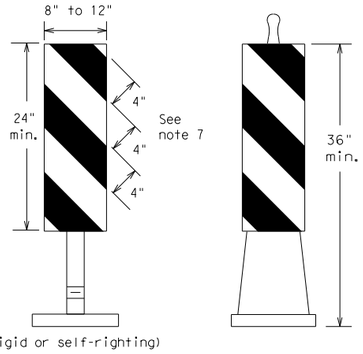


FIXED

(Rigid or self-righting)

DRIVEABLE

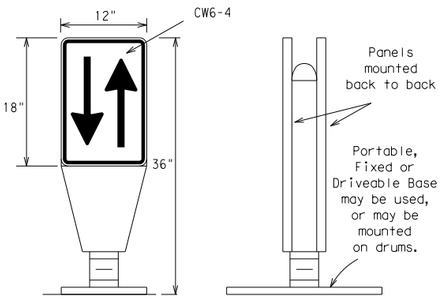


(Rigid or self-righting)

PORTABLE

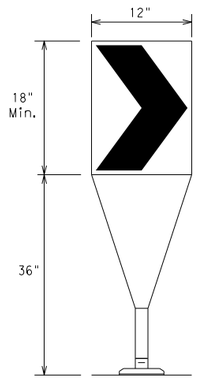
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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



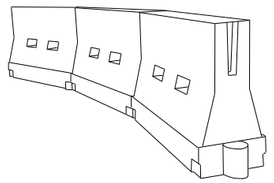
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

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Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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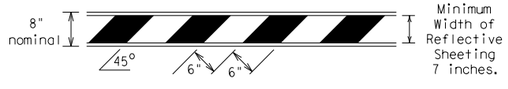
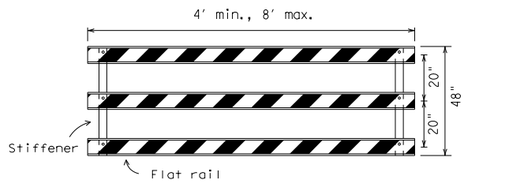
TYPE 3 BARRICADES

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.



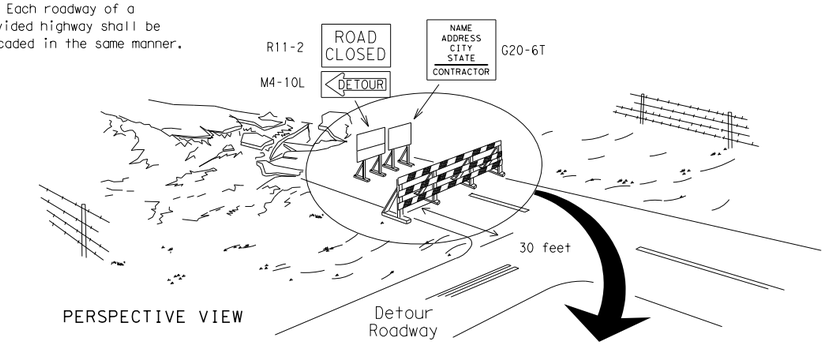
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

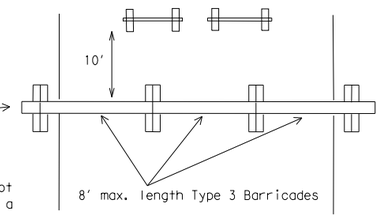
Each roadway of a divided highway shall be barricaded in the same manner.



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.

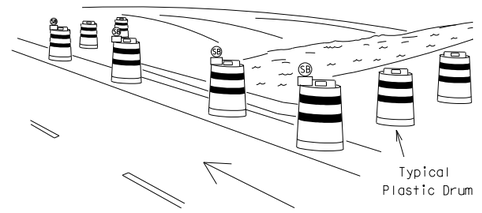
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

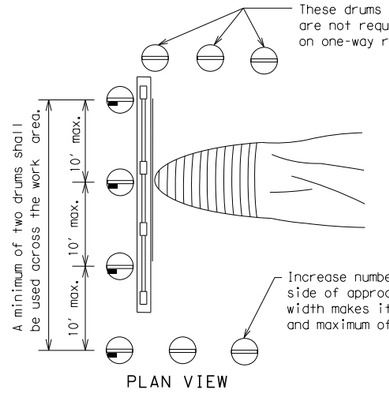
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

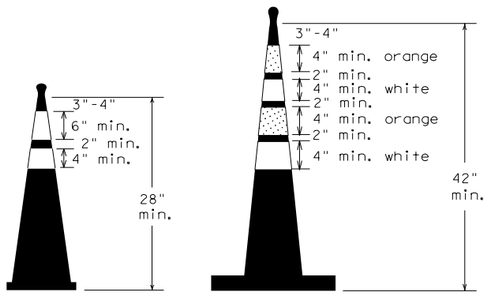
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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

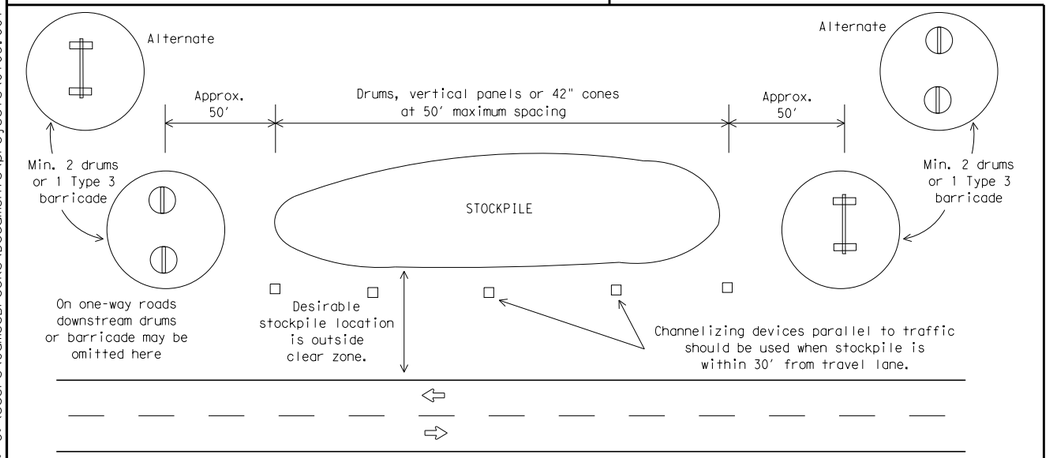
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

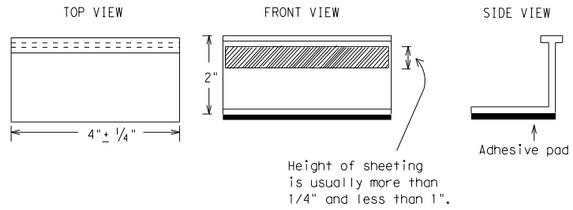
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

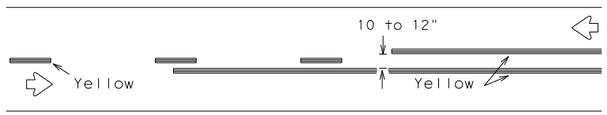
BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-98 9-07 5-21 1-02 7-13 11-02 8-14	0356	01	112, ETC	SH 136, ETC
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC		21

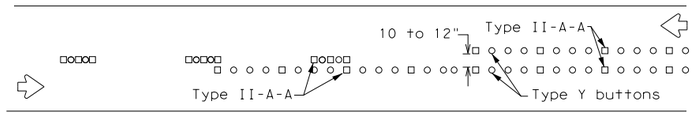
105

DATE: 1/2/2024 11:58
FILE: C:\Users\JamesBrooks\Documents\projects\0105.001 (AMA BMIP)\cadd\std\BC-21.dgn

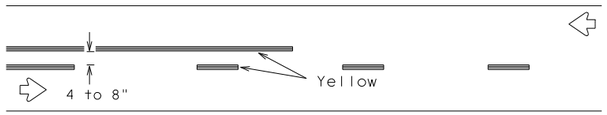
PAVEMENT MARKING PATTERNS



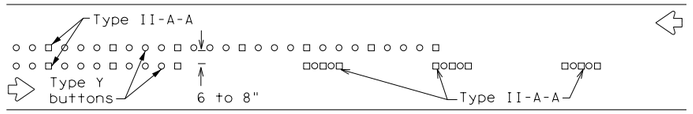
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



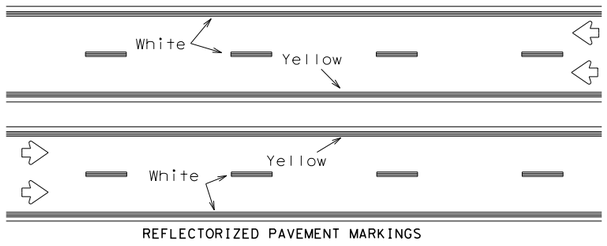
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



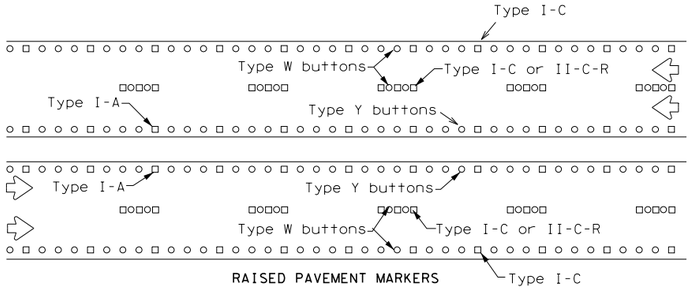
RAISED PAVEMENT MARKERS - PATTERN B

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



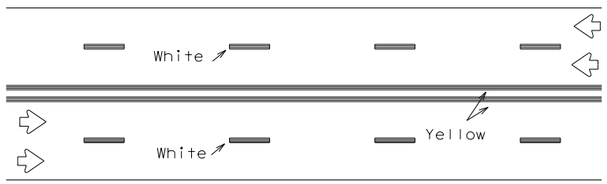
REFLECTORIZED PAVEMENT MARKINGS



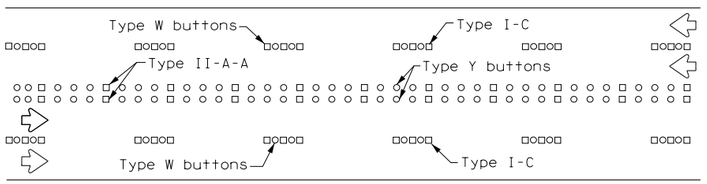
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



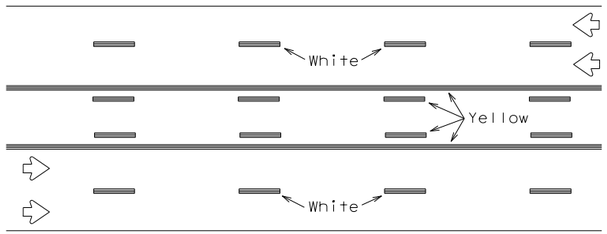
REFLECTORIZED PAVEMENT MARKINGS



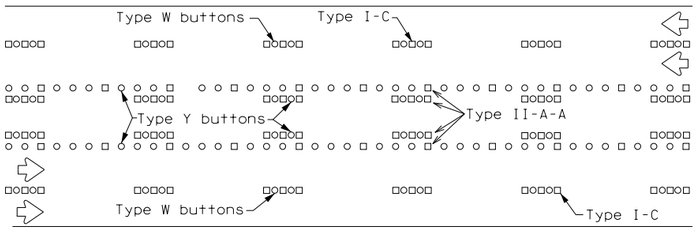
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

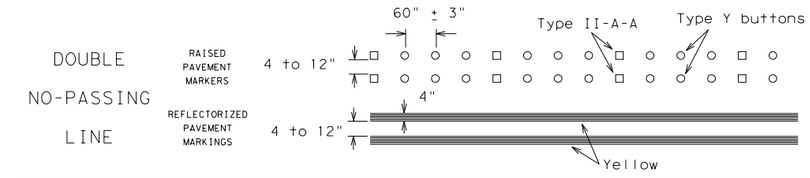
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

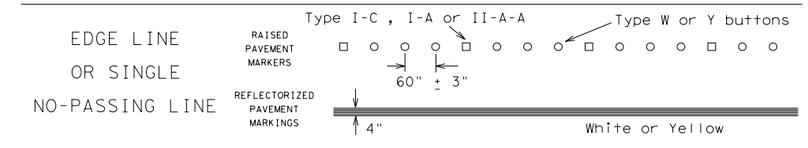
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

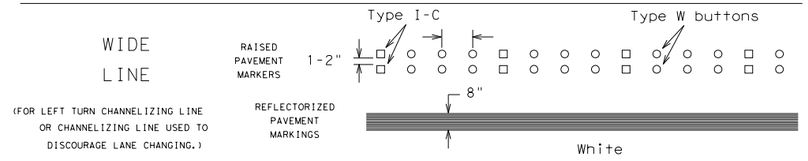


EDGE LINE OR SINGLE NO-PASSING LINE



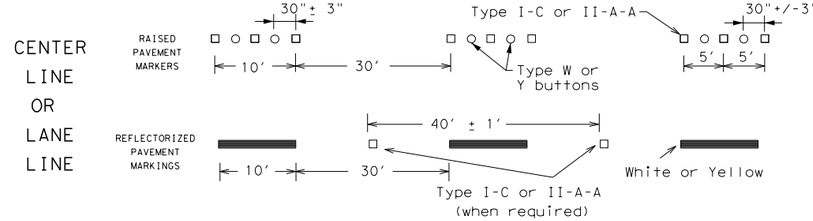
WIDE LINE

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

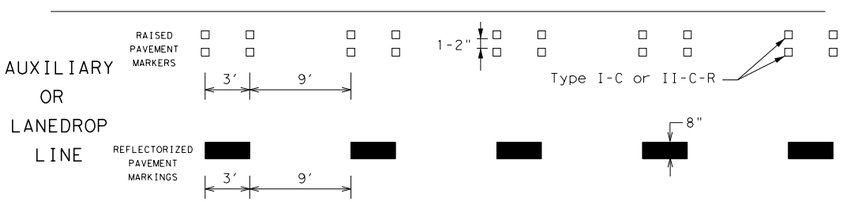


BROKEN LINES

CENTER LINE OR LANE LINE

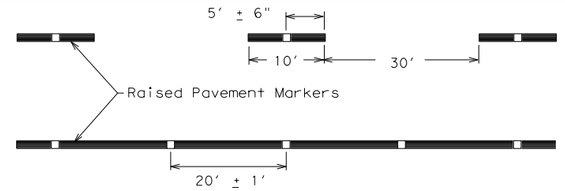


AUXILIARY OR LANEDROP LINE



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	0356	01	112, ETC	SH 136, ETC
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC		22

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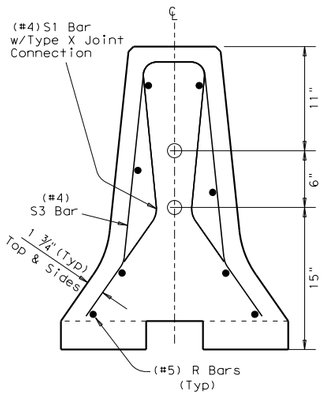
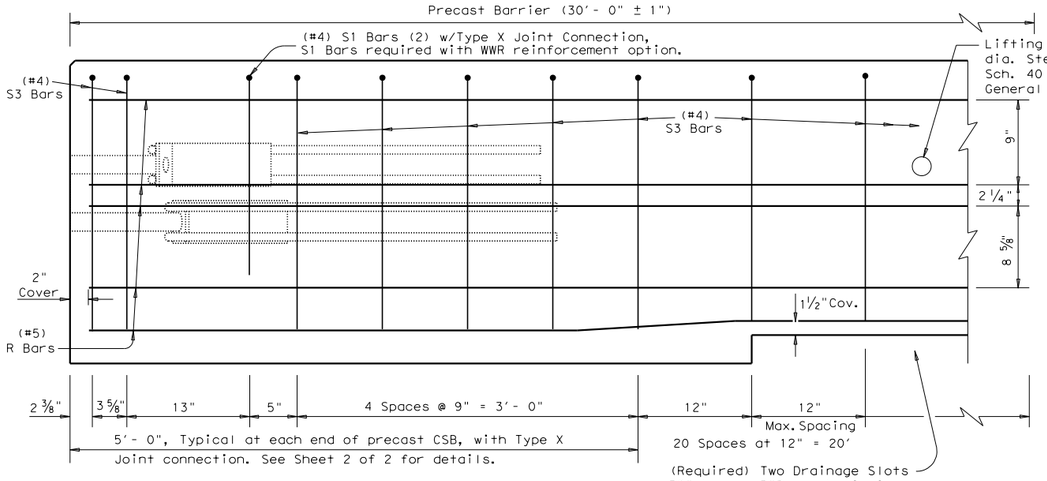


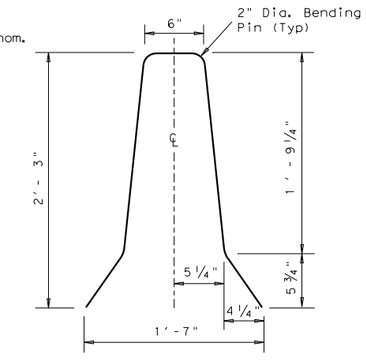
End View Precast Barrier

See sheet 2 of 3 for Joint connection Type X



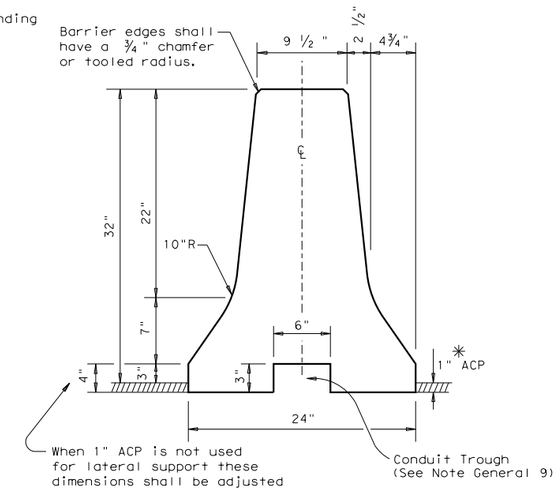
Reinforcement for Precast (CSB) Concrete Safety Barrier (Type 1)

Showing reinforcement for Joint Type X



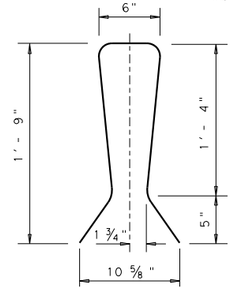
S3 Bar

#4 Bar



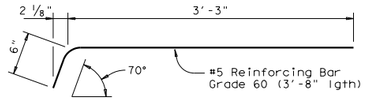
Concrete Safety Barrier

✳ When 1" ACP is "not" used as lateral support for permanent barrier placement. A permissible method of attaining the equivalent lateral support may be used, See CSB(6) sheet.



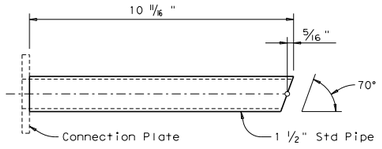
S1 Bar

#4 Bar (2) (Joint Type X)



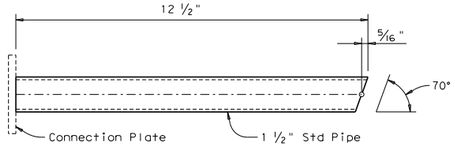
DEFORMED BAR ANCHOR DETAILS

Two (2) Bars required per assembly.
Eight (8) required per Joint.



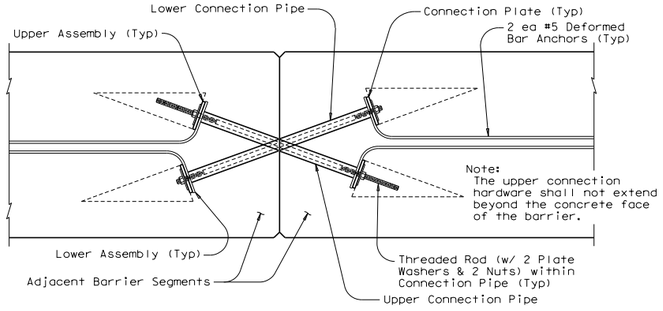
UPPER CONNECTION PIPE DETAILS

One (1) Steel Pipe required per Upper Assembly.
Two (2) required per Joint.



LOWER CONNECTION PIPE DETAILS

One (1) Steel Pipe required per Lower Assembly.
Two (2) required per Joint.



TYPE X JOINT INSTALLATION DETAIL

Barrier reinforcing and Type X Joint Leave-Out dimensions not shown for clarity.

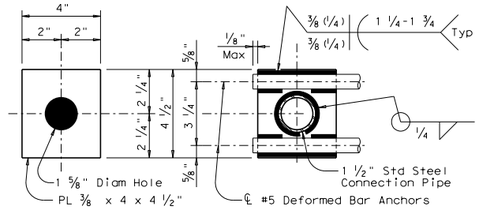
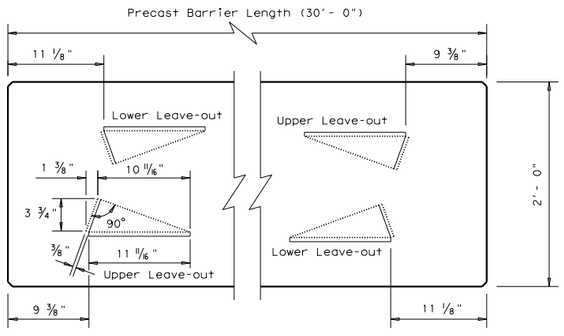


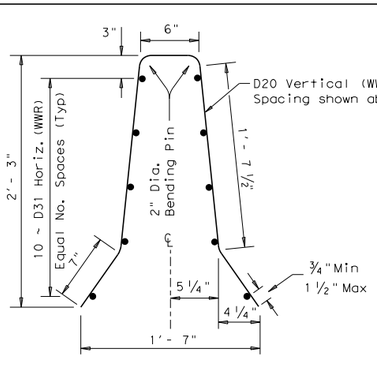
PLATE DIMENSIONS WELDING DETAILS

CONNECTION PLATE DETAILS

One (1) Plate required per assembly.
Four (4) required per Joint. All steel fittings for joint Type X shall be galvanized after fabrication in accordance with Item 445.



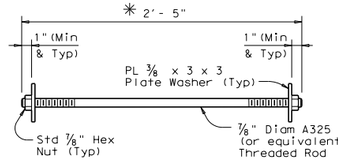
BARRIER PLAN AT END JOINTS



Welded Wire Reinforcement (WWR) Option for Bars R and S3

(WWR) General Notes

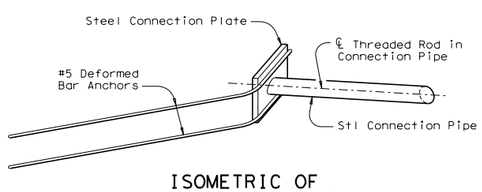
1. Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
2. Welded wire cage may be cut or bent to accommodate the Type X joint connection and drainage slots, as directed by the Engineer.
3. All reinforcement shall comply with Item 440, "Reinforcing Steel."
4. Combinations of reinforcing steel and WWR will be permitted, as directed by the Engineer. The dimension from the end of the barrier section to the first wire shall not exceed 3".



CONNECTION BOLT OR THREADED ROD DETAIL

Two (2) Threaded Rods (Or Equivalent Hex Hd. Bolts)
(w/ Two (2) PL ⅜ x 3 x 3 Plate Washers & Two (2) Std Hex Nuts)
required per Joint.

✳ The connection hardware shall not extend beyond the concrete face of the barrier. Hex head bolts may be provided. The proper length of all hardware should be verified.



ISOMETRIC OF TYPICAL WELDED ASSEMBLY

Four (4) [2 Upper & 2 Lower] Assemblies required per Joint.

Weight of one Precast 30 ft. (CSB) segment = Approx. 6.5 Tons or 440 lbs per ft.

GENERAL NOTES

1. Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
2. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
3. Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
4. All precast barrier edges shall have a ¾" chamfer or tooled radius.
5. All concrete, reinforcement, joint connection systems, grout etc. as shown, are considered as part of the barrier payment.
6. All steel assemblies for joint shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."
7. Regardless of the method of handling, barrier lifting points shall be approx. 7.5 feet from the ends of the barrier. Lifting devices and attachments to barrier sections shall be approved by the Engineer.
8. Surface finishing and grouting (where required) shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will assure a smooth surface. Surface finishing shall be considered subsidiary to the various bid items involved.
9. Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.

Texas Department of Transportation — Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE)

PRECAST BARRIER (TYPE 1)

CSB(1)-10

FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD	CK: VP
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC	SH 136, ETC
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC		23

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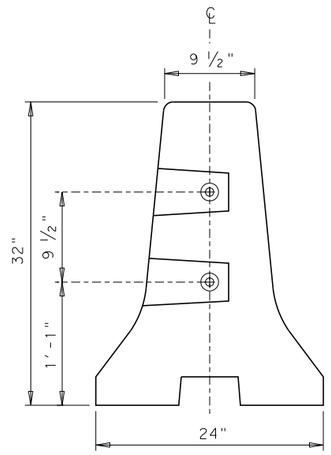
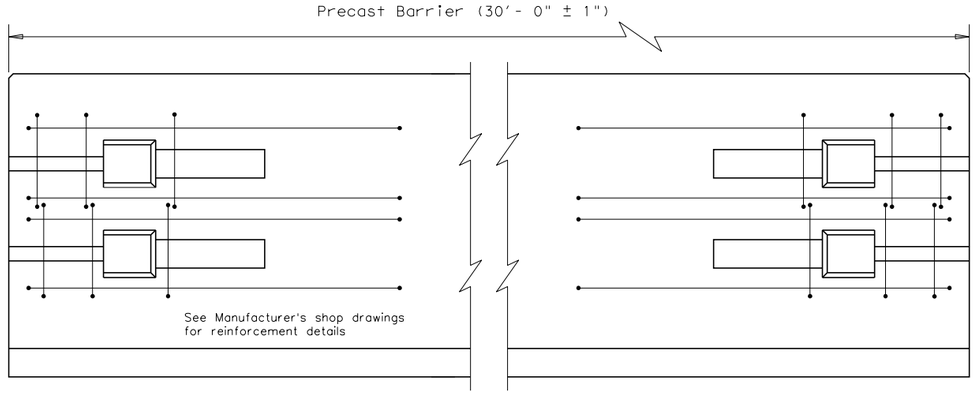


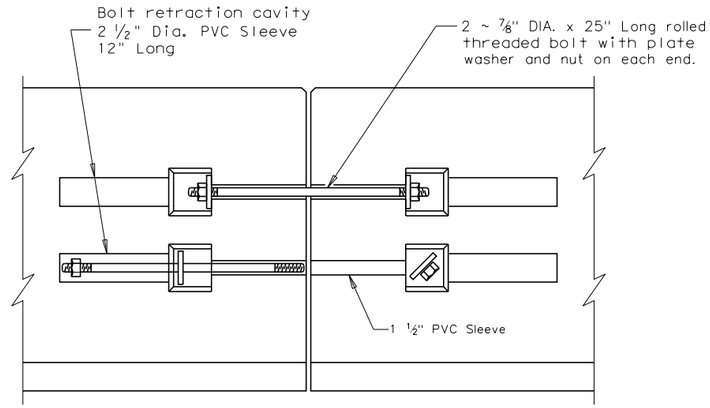
END VIEW (CSB) QUICK-BOLT

QUICK-BOLT POCKET LOCATIONS



ELEVATION (CSB) QUICK-BOLT

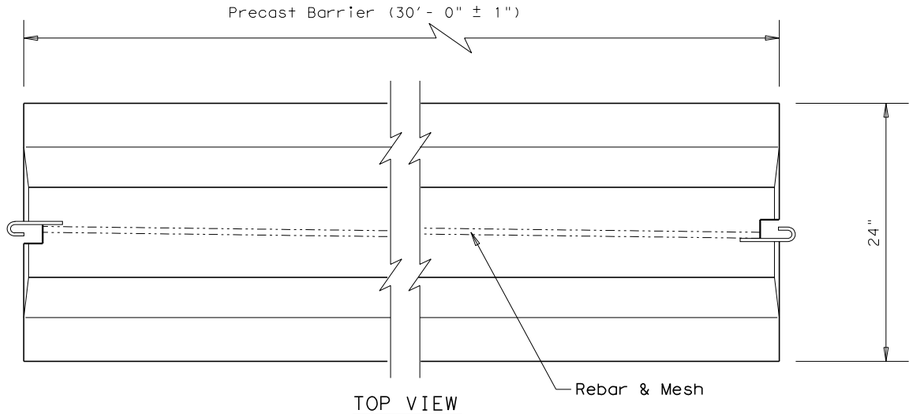
See Manufacturer's shop drawing for additional details



ELEVATION VIEW SHOWING JOINT CONNECTION

"QUICK-BOLT"

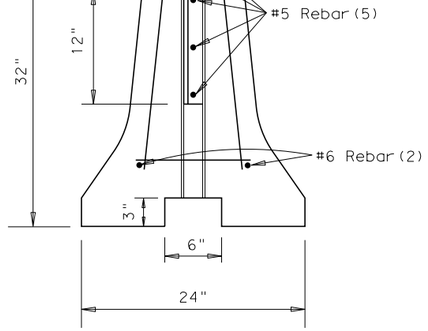
Joint Connection (Type Q)



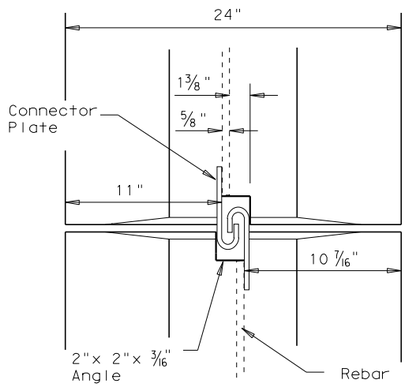
TOP VIEW

PRECAST (CSB) WITH J-J HOOKS

See Manufacturer's shop drawing for additional details



END VIEW
J-J HOOK CONNECTION



VIEW FROM ABOVE
J-J HOOK CONNECTION

Joint Connection (Type J)

Proprietary Joint Connections (CSB)

Two proprietary joint connections are acceptable as alternates to the (Type X) connection shown, here on. These joint connections types are:

J-J Hooks by Easi-Set Industries, (800)547-4045
Quick-Bolt by Bexar Concrete, (210)497-3773

If one of these connection systems are exclusively specified in the plans, prior approval for sole source use must be obtained. Details of the connection components and barrier reinforcement for these systems, will be shown on the manufacturer's shop drawing(s) furnished to the Engineer.

Texas Department of Transportation

Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE)

PRECAST BARRIER
(TYPE 1)

CSB(1)-10

FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD	CK: VP
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC	SH 136, ETC
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC		24

DATE: 1/2/2024
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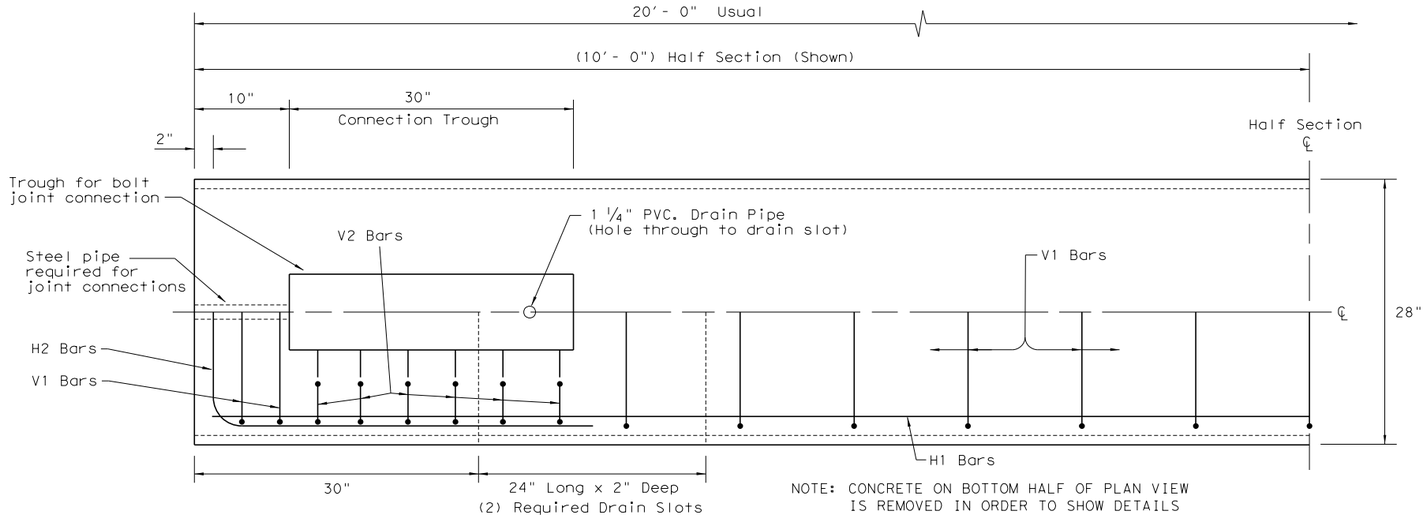
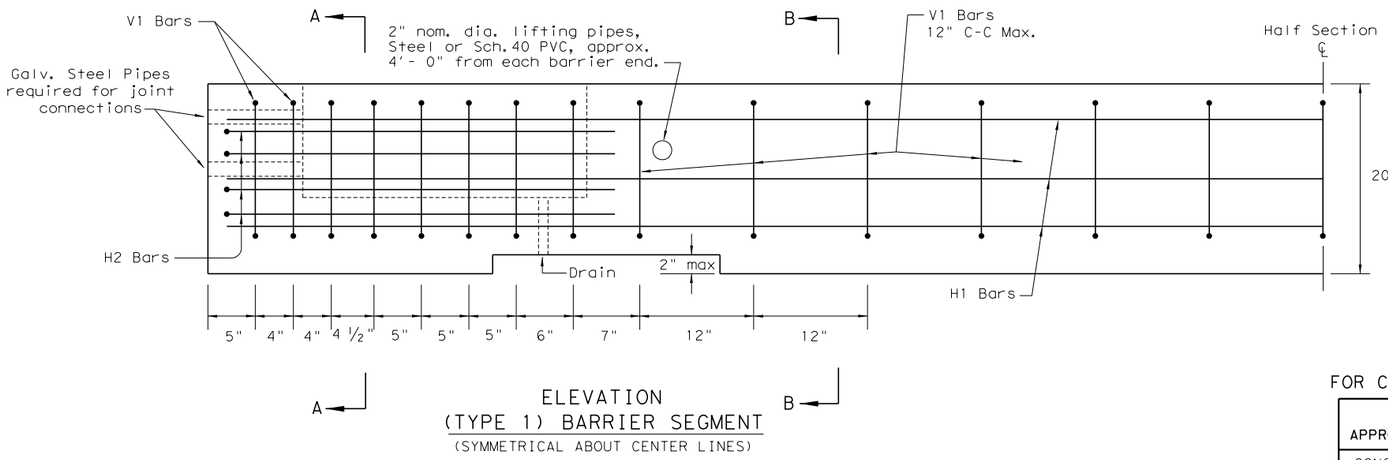
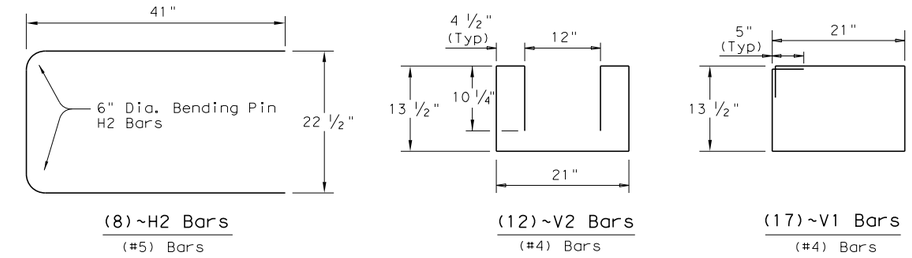


NOTE: CONCRETE ON BOTTOM HALF OF PLAN VIEW IS REMOVED IN ORDER TO SHOW DETAILS

PLAN
(TYPE 1) BARRIER SEGMENT
(SYMMETRICAL ABOUT CENTER LINES)

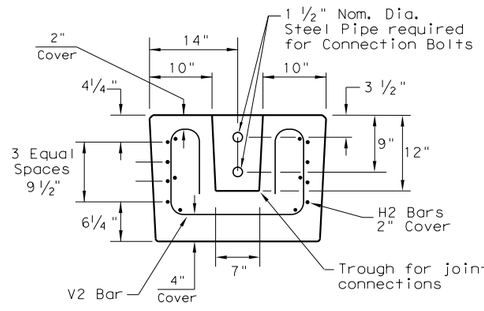


ELEVATION
(TYPE 1) BARRIER SEGMENT
(SYMMETRICAL ABOUT CENTER LINES)

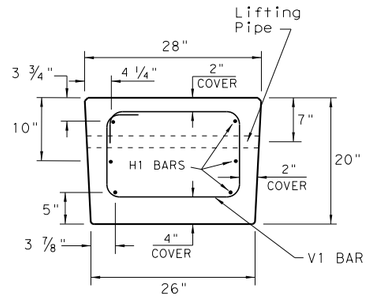


REINFORCING STEEL DETAILS
TYPE 1 - BARRIER SEGMENT

Note: Use 2" Dia. Bending Pin, unless otherwise shown



SECTION A-A



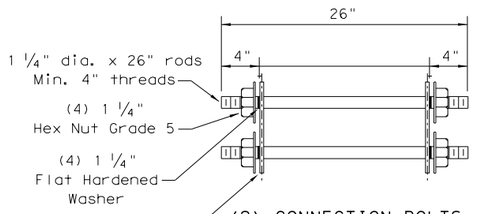
SECTION B-B

GENERAL NOTES

1. Low Profile Concrete Barrier (LPCB), is approved for use in temporary work zone locations, where the posted speed is 45 mph, or less.
2. Concrete shall be Class H for precast barrier with a minimum compressive strength of 3,600 psi.
3. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
4. Precast LPCB barrier length shall be 20 ft.
5. All barrier edges shall have ¾" chamfer or a tooled radius.
6. Joint connection hardware shall be in accordance with Item 449, "Anchor Bolts." and is considered subsidiary.
7. Steel pipe required for joint connection bolts shall be galvanized in accordance with Item 445,"Galvanizing."
8. Welded wire reinforcement (WWR) may be used in lieu of conventional reinforcement for Type 1 barrier, and shall meet the requirements shown.

FOR CONTRACTORS INFORMATION ONLY

(TYPE 1) APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	2.6
REINFORCING STEEL	LBS	330
TOTAL BARRIER WT.	LBS	11000



(2) CONNECTION BOLTS
ASTM A36

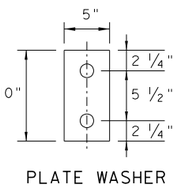
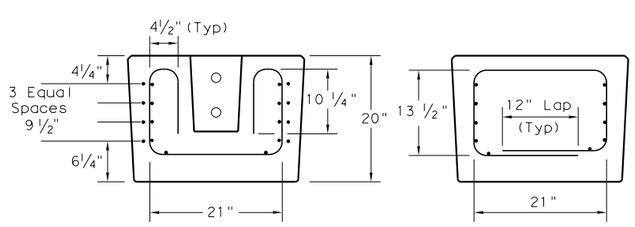


PLATE WASHER
5" x 10" x ⅜"

Note: Rods, Hex nuts and Washers shall be Galvanized.



SECTION A-A SECTION B-B

(WWR) GENERAL NOTES

1. Deformed Welded Wire Reinforcement shall conform to ASTM A497.
2. Welded wire cage may be cut or bent, if necessary, but must be approved by the Engineer.
3. Combinations of reinforcing steel and WWR are permitted, as directed by the Engineer. The dimensions from the end of the barrier section to the first wire shall not exceed 3".

REQUIRED (WWR) WIRE DESIGN

8 ~ (D31) Horizontal Wires (Equally spaced)
10 ~ (D20) Horizontal Wires (Equally spaced)
29 ~ (D20) Vertical Wires (Spaced as shown in Elevation View)

WELDED WIRE REINFORCEMENT (WWR)- OPTIONAL REINFORCING

SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

LOW PROFILE CONCRETE BARRIER
PRECAST BARRIER (TYPE 1)
LPCB-13

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC	SH 136, ETC
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC		25

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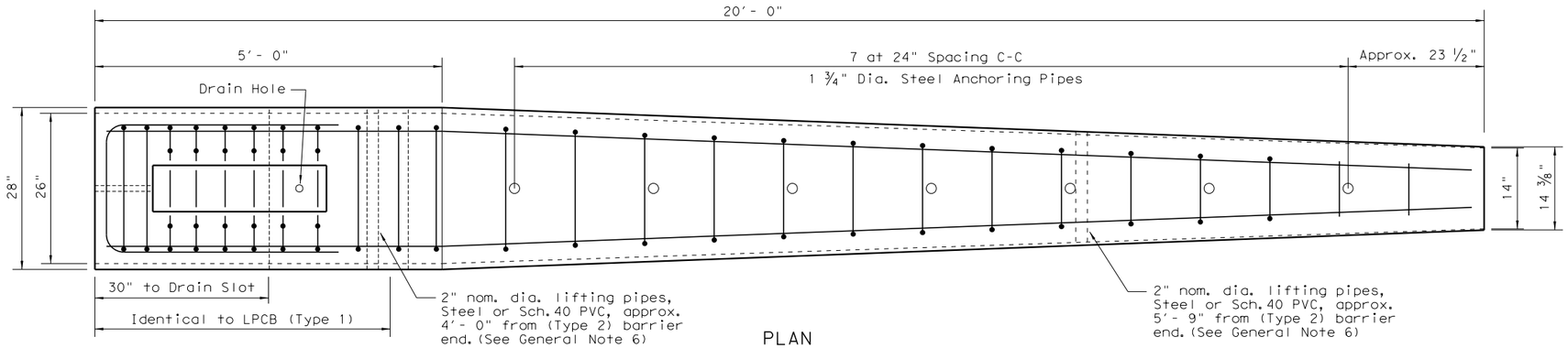
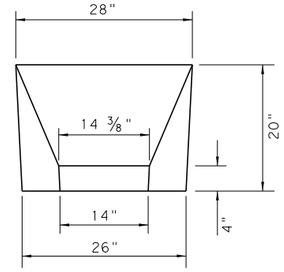
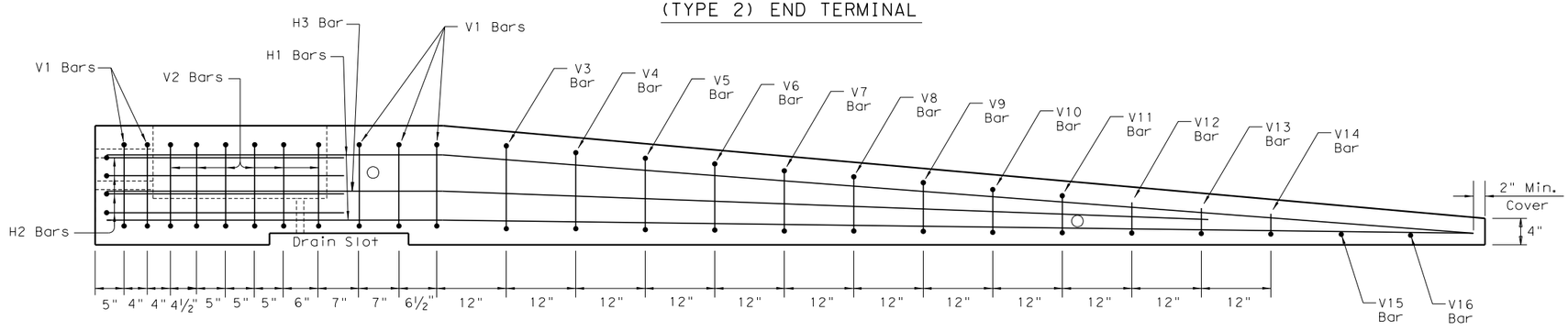


PLAN
(TYPE 2) END TERMINAL

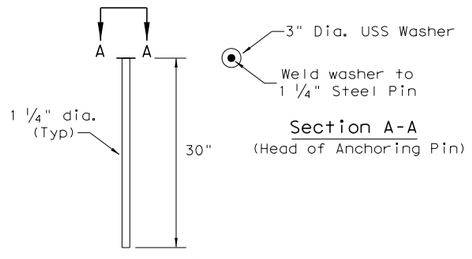


APPROACH VIEW



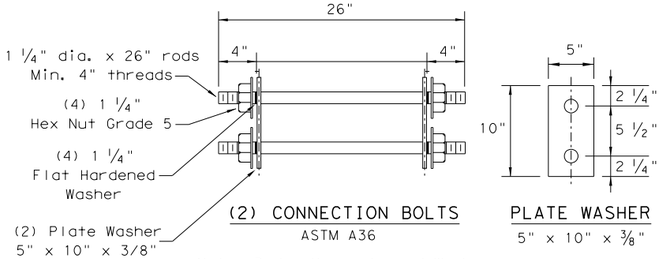
ELEVATION
(TYPE 2) END TERMINAL

Note:
Anchoring pipes not shown in Elevation View



(7) Anchor Pins
ASTM A36 Steel
(See Note 3)

Section A-A
(Head of Anchoring Pin)



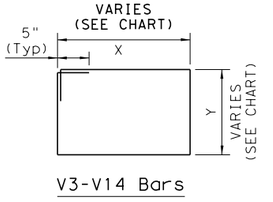
(2) CONNECTION BOLTS
ASTM A36

PLATE WASHER
5" x 10" x ⅜"

Note: Rods, Hex nuts and Washers shall be Galvanized.

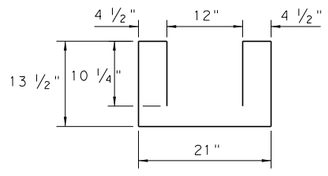
TYPE 2 - NOTES

1. Welded wire reinforcment (WWR) is "not" an option for Type 2 Barrier.
2. Type 2 Barrier shall be used as an end treatment for the Type 1 barrier segments, when applicable.
3. The end treatment can be used without the anchor pins in locations that can accommodate approximately 4 ft. of lateral displacement of the end treatment. The use of non-pinned end treatment does not affect the performance or the deflection of the Low-Profile barrier system.
4. The anchor pins are all the same length and are to be driven flush with the top of the (Type 2) barrier surface.
5. The bends in the H3 and H1 bars are slight, no formal bend is necessary.
6. The Type 2 barrier segment must be lifted from the rear first, to prevent cracking of sloped section.
7. See LPCB sheet 1 for additional information.

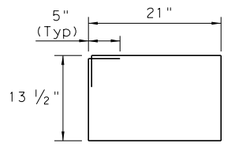


V3-V14 Bars

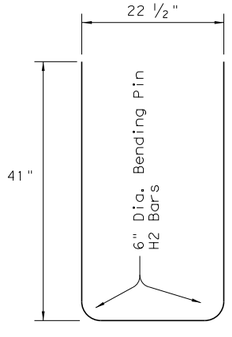
BAR (#4)	X (IN.)	Y (IN.)
V3 BAR	20 ¼	14 ½
V4 BAR	19 ½	13 ½
V5 BAR	18 ½	12 ¼
V6 BAR	17 ½	11 ¼
V7 BAR	17	10 ¼
V8 BAR	16 ¼	9
V9 BAR	15 ½	8
V10 BAR	14 ½	7
V11 BAR	13 ¾	6



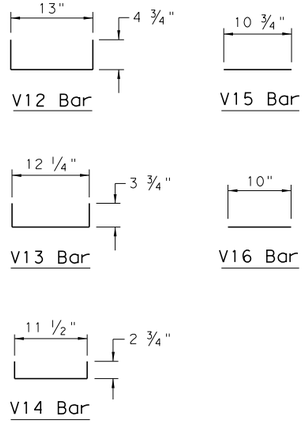
(6)~V2 Bars



(5)~V1 Bars



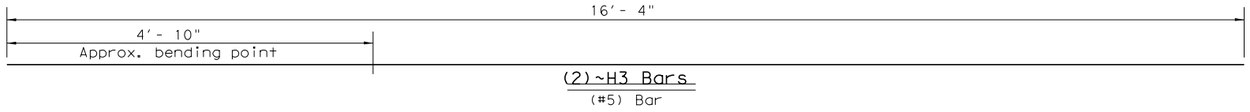
(4)~H2 Bars
(#5) Bars



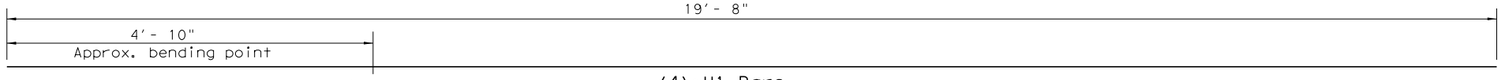
Note: All V Bars are (#4)

REINFORCING STEEL DETAILS
TYPE 2 - END TERMINAL

Note: Use 2" Dia. Bending Pin, unless otherwise shown



(2)~H3 Bars
(#5) Bar



(4)~H1 Bars
(#5) Bar

Note: Bends on H1 and H3 bars are slight and do not require formal bends.

FOR CONTRACTORS INFORMATION ONLY

(TYPE 2) APPROX. QUANTITIES	20 FT. SECTION	
CONCRETE	CY	1.65
REINFORCING STEEL	LBS	240
TOTAL BARRIER WT.	LBS	7000

Texas Department of Transportation
Design Division Standard

LOW PROFILE CONCRETE BARRIER
PRECAST BARRIER (TYPE 2)
LPCB-13

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC		26

DATE: 1/2/2024
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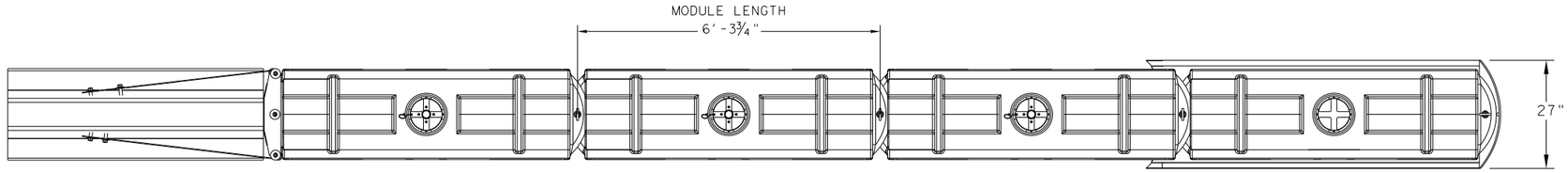
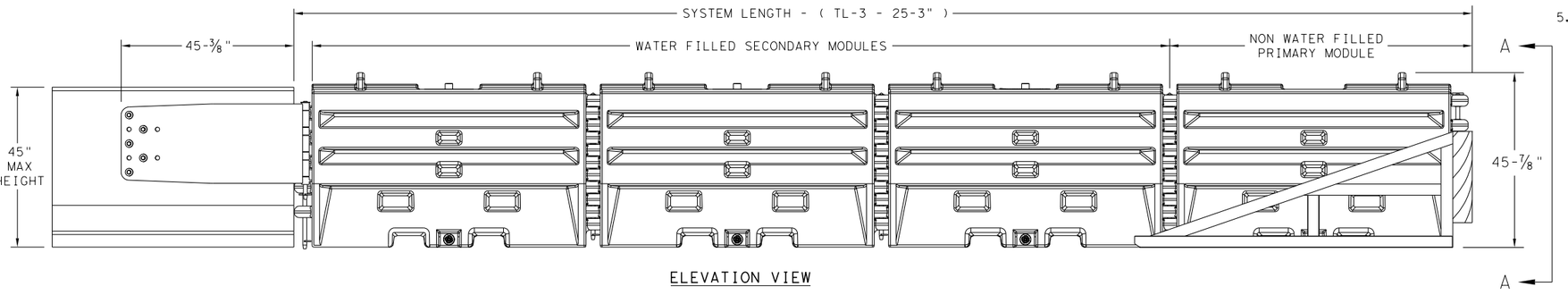


PLAN VIEW



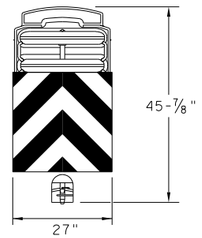
ELEVATION VIEW

GENERAL NOTES

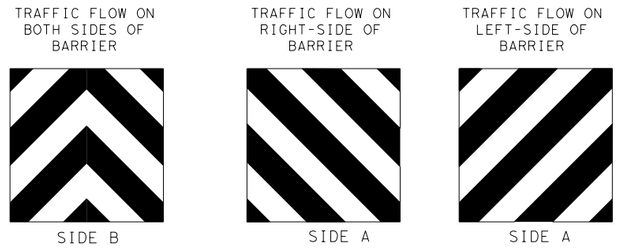
1. REFER TO THE INSTALLATION MANUAL FOR SPECIFIC SYSTEM ASSEMBLY AND MODULE ORIENTATION. FOR ADDITIONAL INFORMATION, CONTACT TRAFFIX, INC. AT (949) 361-5663.
2. THE SLED SYSTEM IS A MASH APPROVED TEST LEVEL 3 (TL-3) CRASH CUSHION APPROVED FOR USE IN TEMPORARY WORK ZONES. THE SLED SYSTEM IS A NON-REDIRECTIVE, GATING CRASH CUSHION THAT DOES NOT NEED TO BE ATTACHED TO THE GROUND AND CAN BE INSTALLED ON CONCRETE, ASPHALT, GRAVEL OR COMPACTED SOIL.
3. MAXIMUM PERMISSIBLE CROSS SLOPE IS 8° (DEGREES) (14%).
4. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
5. THE SLED SYSTEM CAN BE ATTACHED TO:

- CONCRETE BARRIER, TEMPORARY OR PERMANENT, 45" MAXIMUM HEIGHT
- STEEL BARRIER
- PLASTIC BARRIER
- CONCRETE BRIDGE ABUTMENTS
- W-BEAM GUARD RAIL
- THRIE BEAM GUARD RAIL

TEST LEVEL	NUMBER OF SECONDARY MODULES	SYSTEM LENGTH
TL-3	3	25' 3"

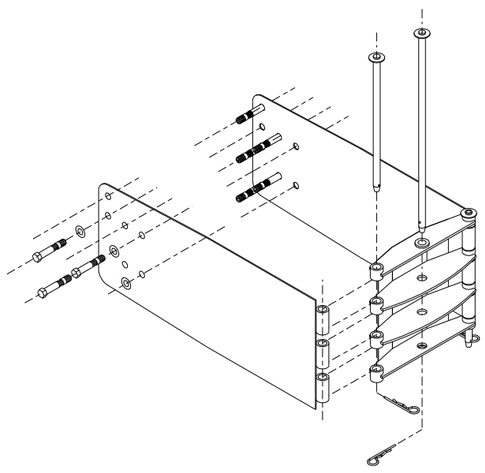


SECTION A-A



NOSE SHEETING PANEL DELINEATION

NOTE:
SEE INSTALLATION MANUAL FOR CUSTOMIZED DELINEATION NOSE SHEETING FOR DECAL PLACEMENT.



SLED TRANSITION COMPONENTS FOR ATTACHMENT TO CMB

NOTE:
SEE MANUFACTURER'S INSTALLATION MANUAL FOR FURTHER DETAILS.

TRANSITION OPTIONS
SLED TRANSITION TO CONCRETE TRAFFIC BARRIER (TEMPORARY OR PERMANENT)
SLED TRANSITION TO STEEL TRAFFIC BARRIER (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO PLASTIC TRAFFIC BARRIER (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO W-BEAM OR THRIE BEAM GUARD RAIL (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO CONCRETE BRIDGE ABUTMENT

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SLED, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

SACRIFICIAL

BILL OF MATERIAL

PART NUMBER	DESCRIPTION	QTY: TL-3
45131	TRANSITION FRAME, GALVANIZED	1
45150	TRANSITION PANEL, GALVANIZED	2
45147-CP	TRANSITION SHORT DROP PIN W/ KEEPER PIN, GALVANIZED	2
45148-CP	TRANSITION LONG DROP PIN W/ KEEPER PIN, GALVANIZED	1
45050	ANCHOR BOLTS	9
12060	WASHER, 3/4" ID X 2" OD	9
45044-Y	SLED YELLOW WATER FILLED MODULE	3
45044-YH	SLED YELLOW "NO FILL" MODULE	1
45044-S	CIS (CONTAINMENT IMPACT SLED), GALVANIZED	1
45043-CP	T-PIN W/ KEEPER PIN	4
18009-B-I	FILL CAP W/ "DRIVE BY" FLOAT INDICATOR	3
45033-RC-B	DRAIN PLUG	3
45032-DPT	DRAIN PLUG REMOVAL TOOL	1

Texas Department of Transportation

Design Division Standard

SLED
CRASH CUSHION
TL-3 MASH COMPLIANT
(TEMPORARY, WORK ZONE)
SLED-19

FILE: sled19.dgn	DN: TxDOT	CK: KM	DW: VP	CK:
© TxDOT: DECEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC	SH 136, ETC
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC		27

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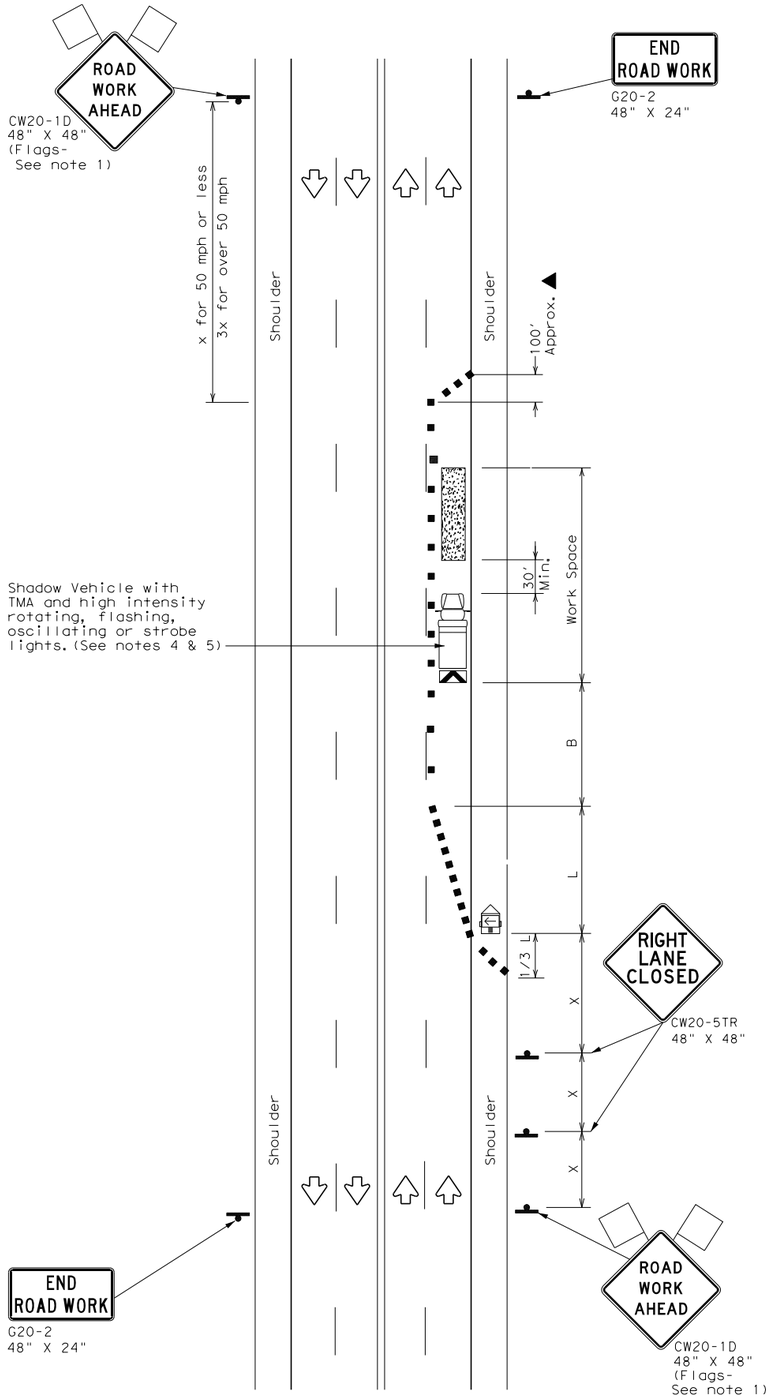
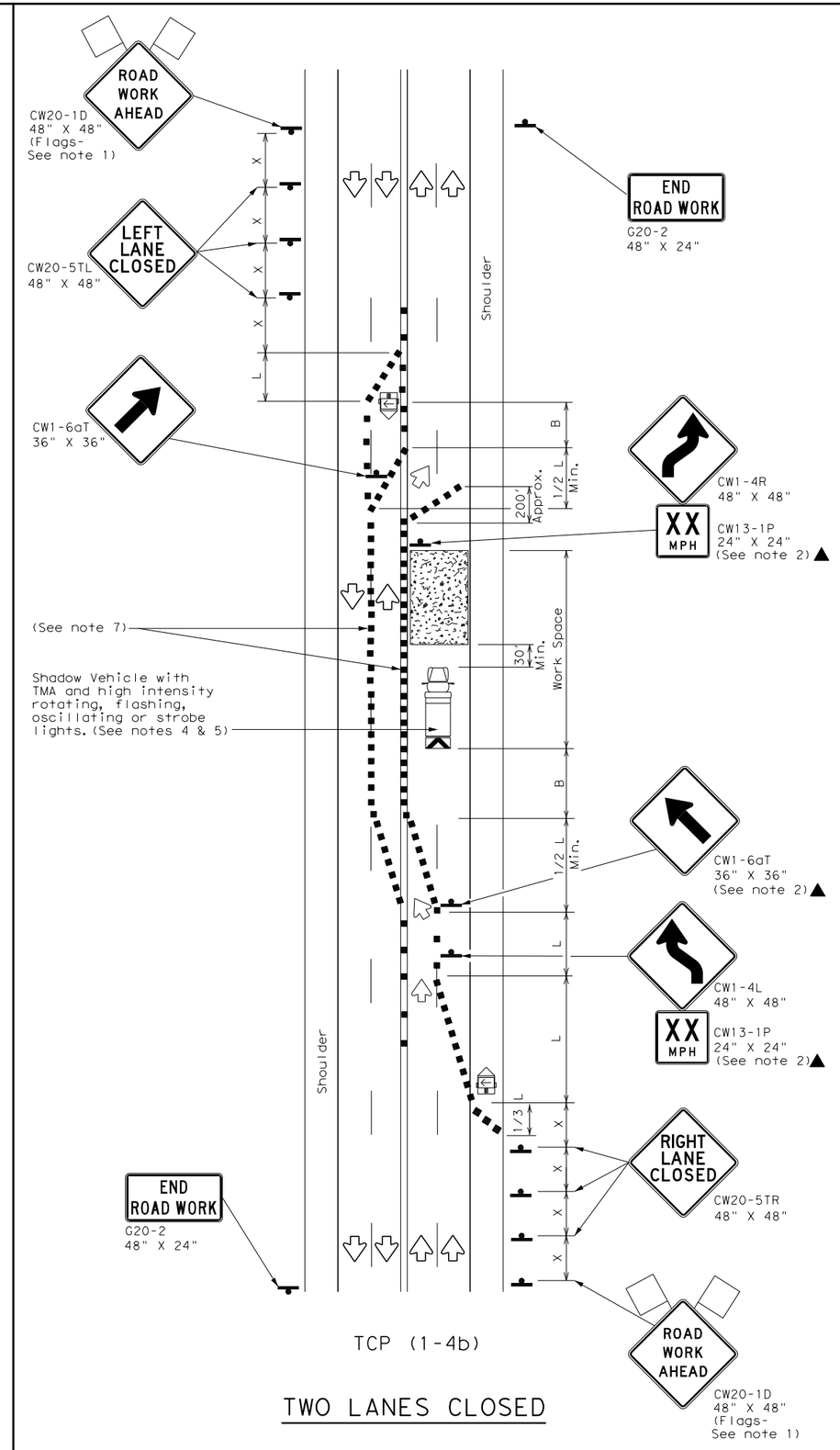


TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

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 CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-4a)

6. 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 where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

TCP (1-4b)

7. 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 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas 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(1-4)-18

FILE: tcp1-4-18.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	0356	01	112, ETC	SH 136, ETC
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC		28

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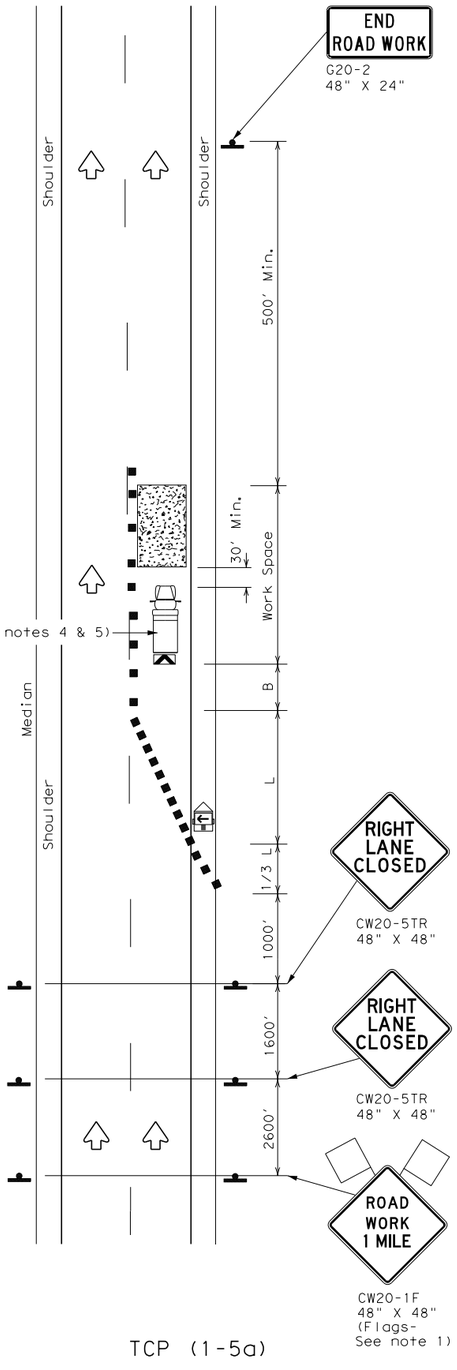
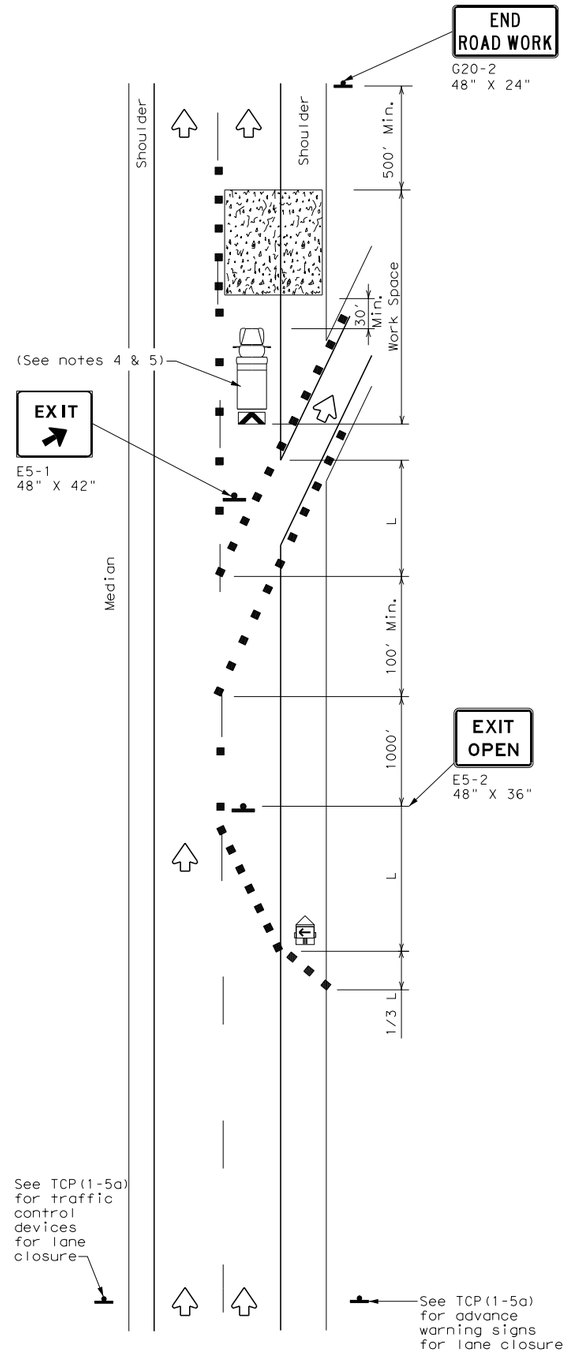


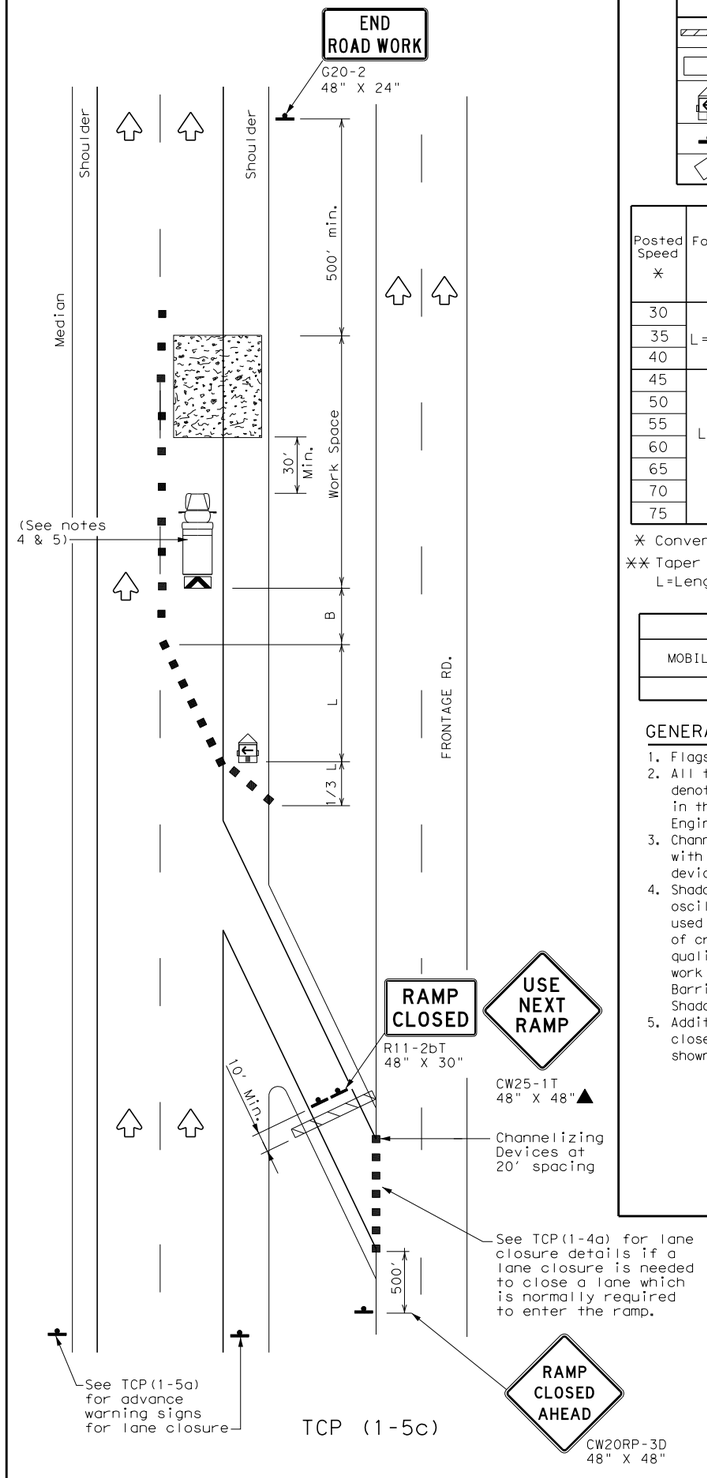
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
4. 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 in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

Texas Department of Transportation

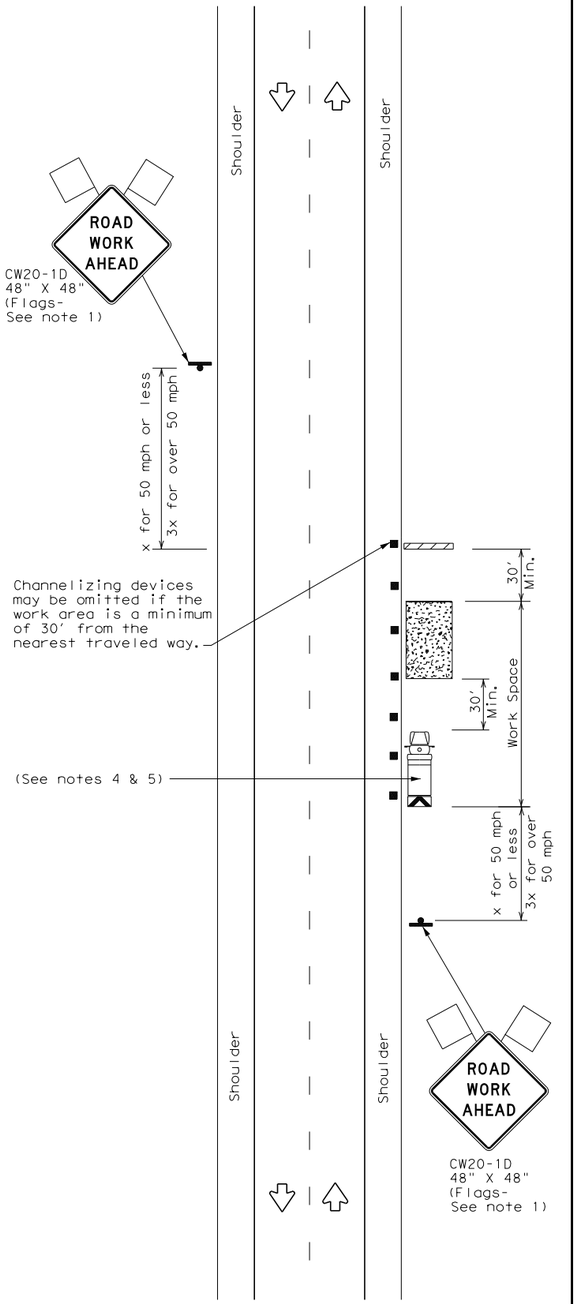
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-18

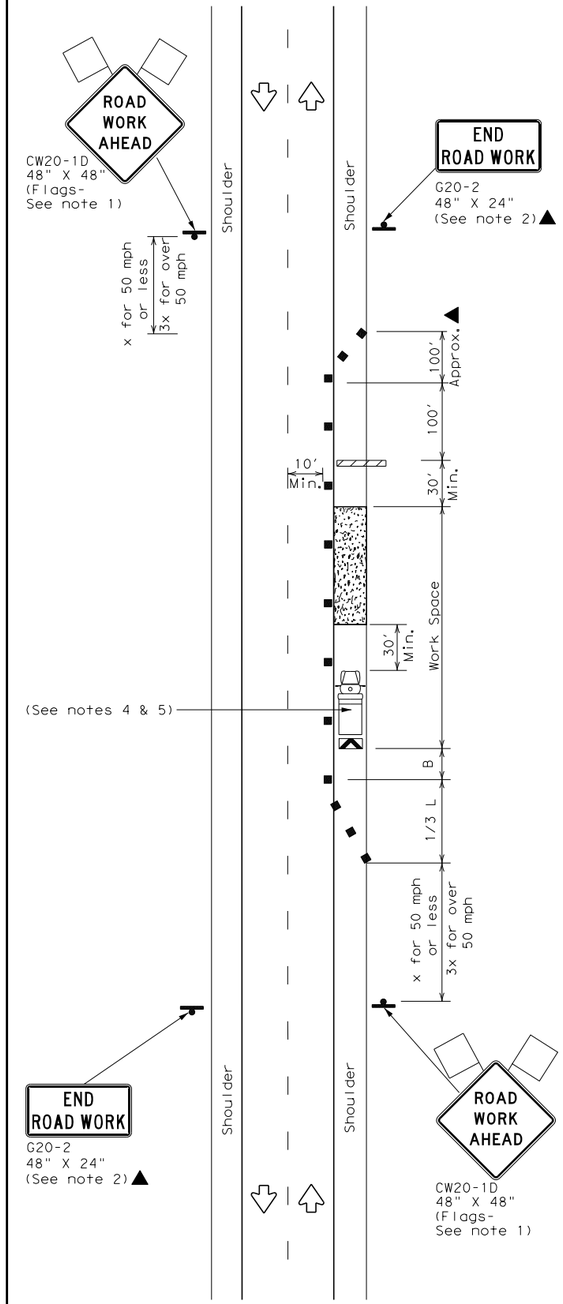
FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	0356	01	112, ETC	SH 136, ETC
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC		29

DATE: 1/2/2024 11:59
FILE: C:\Users\JamesBrooks\Documents\projects\0105.001 (AMA BMIP)\cadd\std\tcp2-1-18.dgn



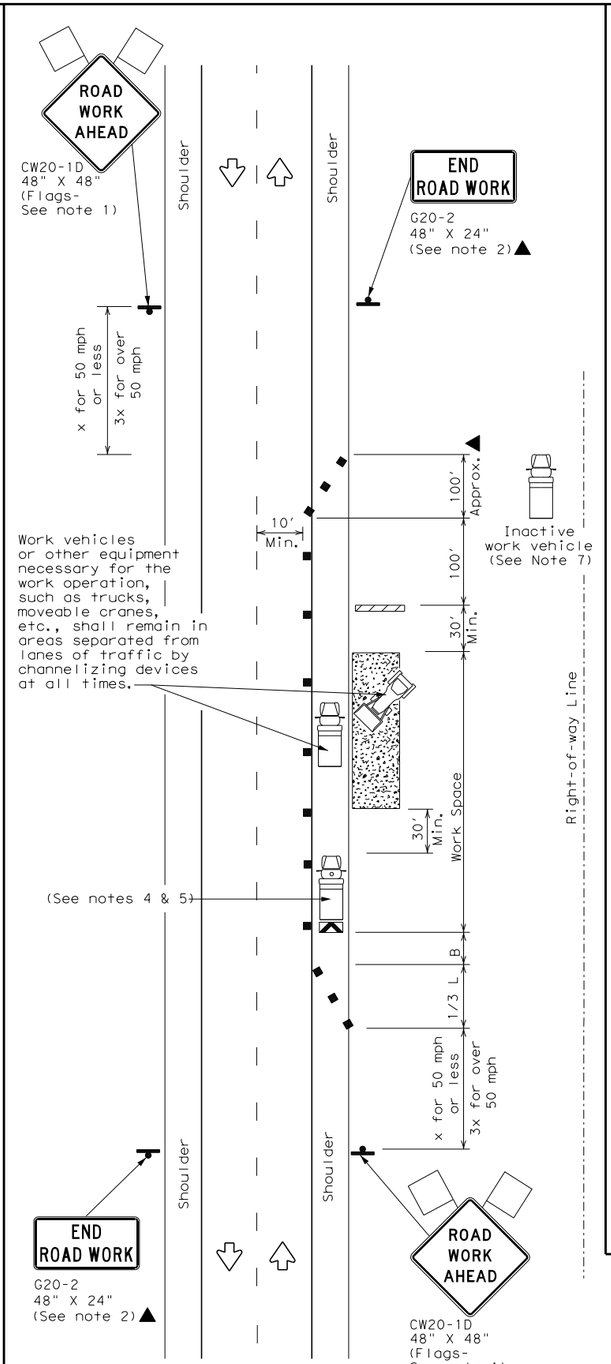
TCP (2-1a)

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	0356	01	112, ETC	SH 136, ETC
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	AMA	HUTCHINSON, ETC		30
1-97 2-18				

DATE: 1/2/2024 11:59
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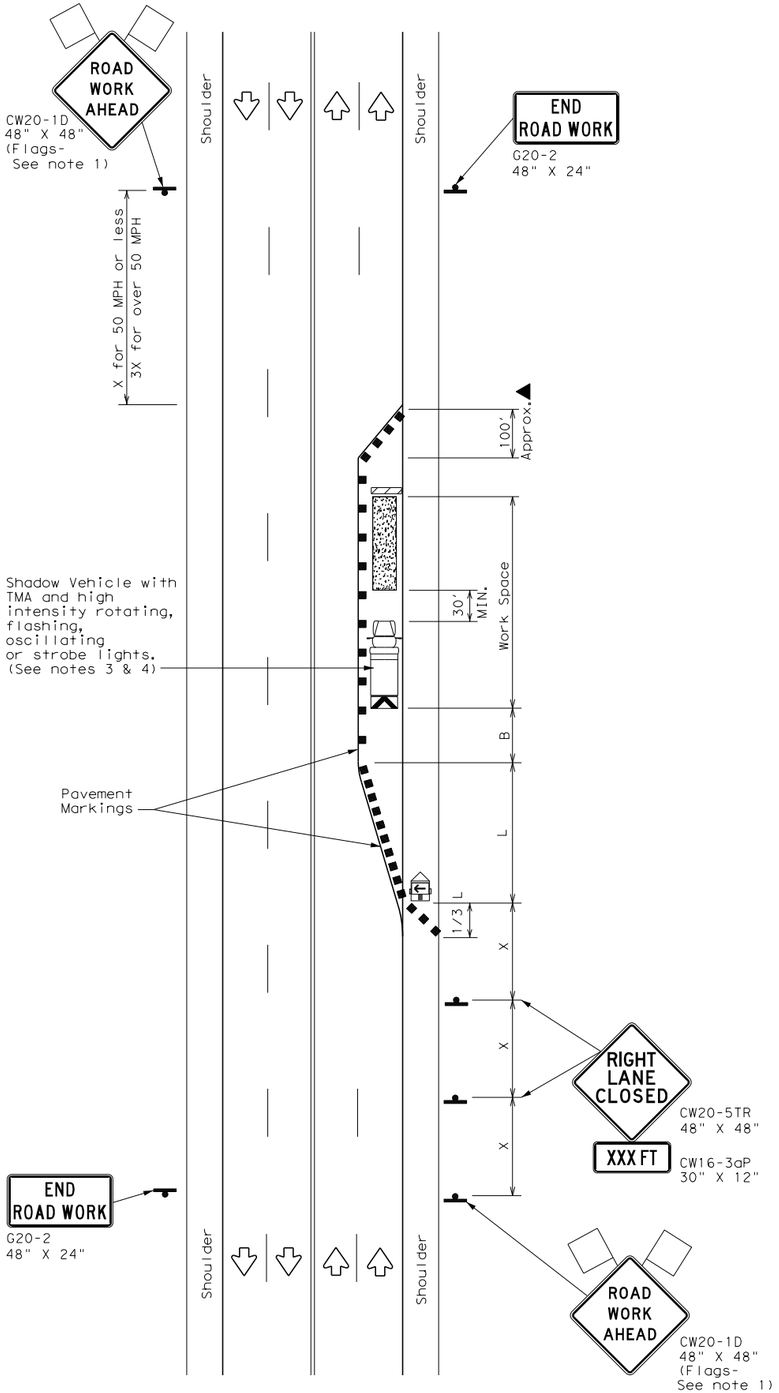
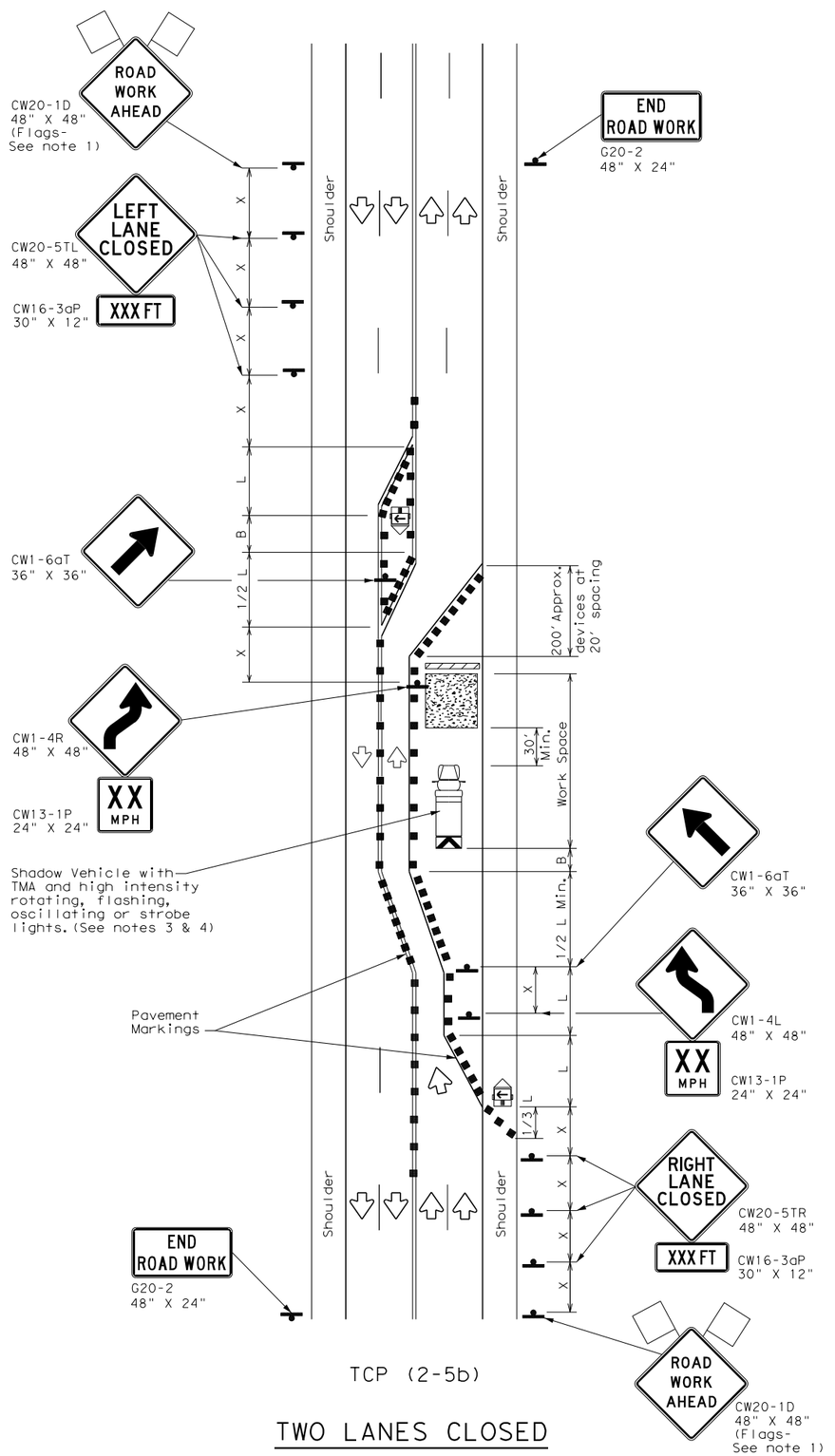


TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

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. 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 eposure 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 substitutued for the Shadow Vehicle and TMA.
4. 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.
5. The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

6. 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 (2-5b)

7. Conflicting pavement markings shall be removed for long-term projects.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

FILE: tcp2-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 2-12	0356	01	112, ETC	SH 136, ETC
1-97 3-03	DIST	COUNTY		SHEET NO.
4-98 2-18	AMA	HUTCHINSON, ETC		31

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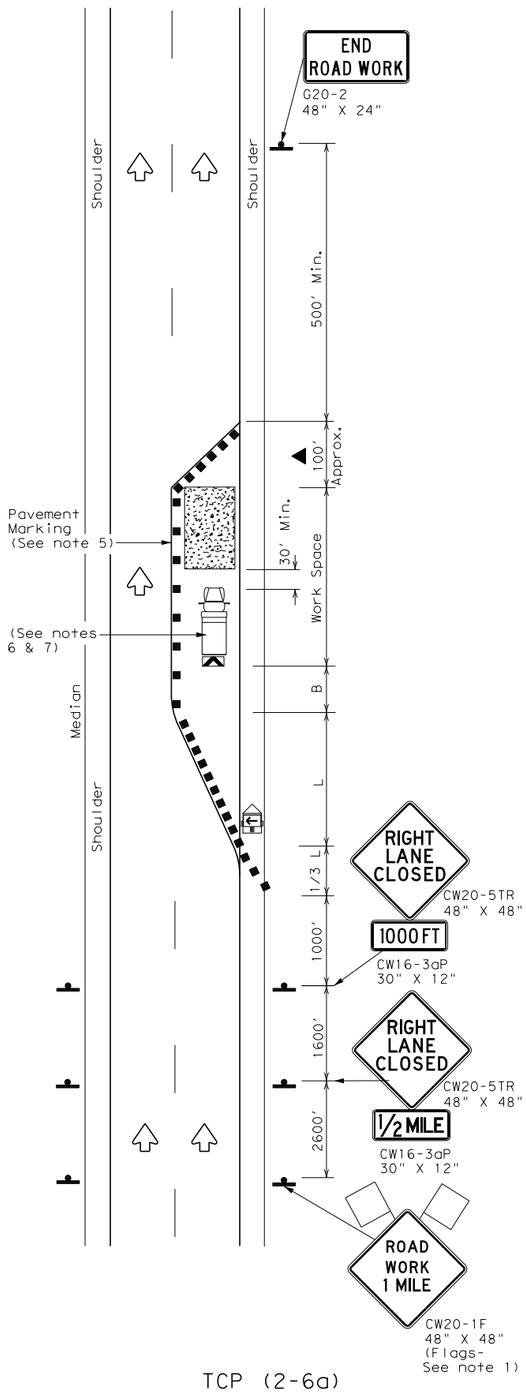
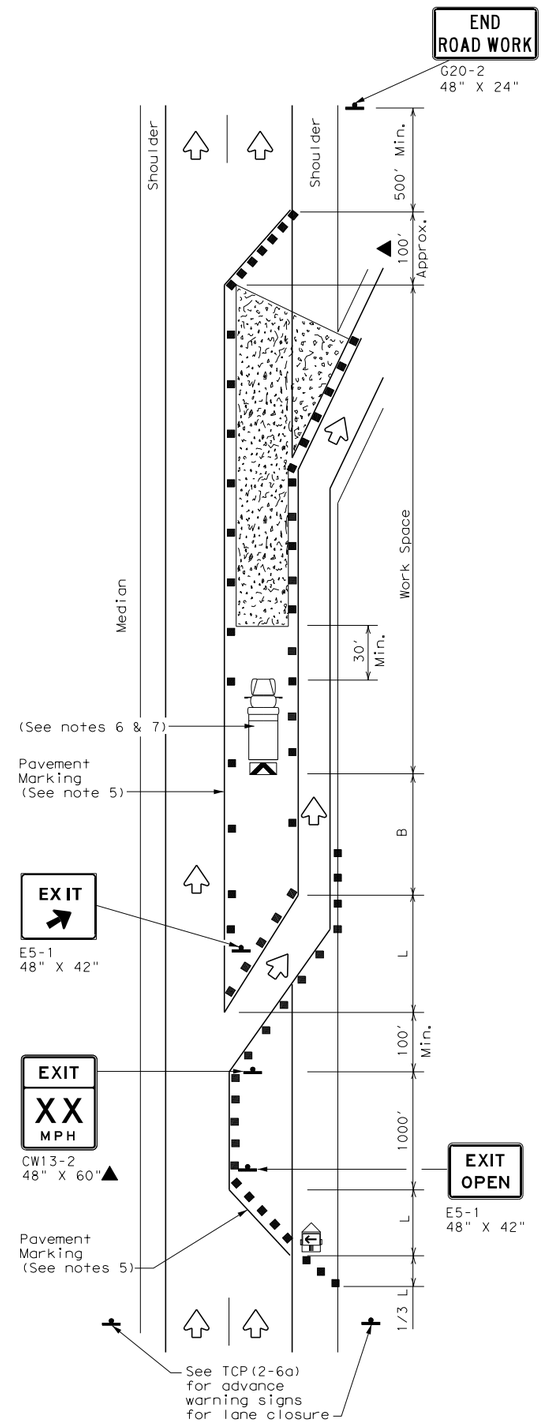


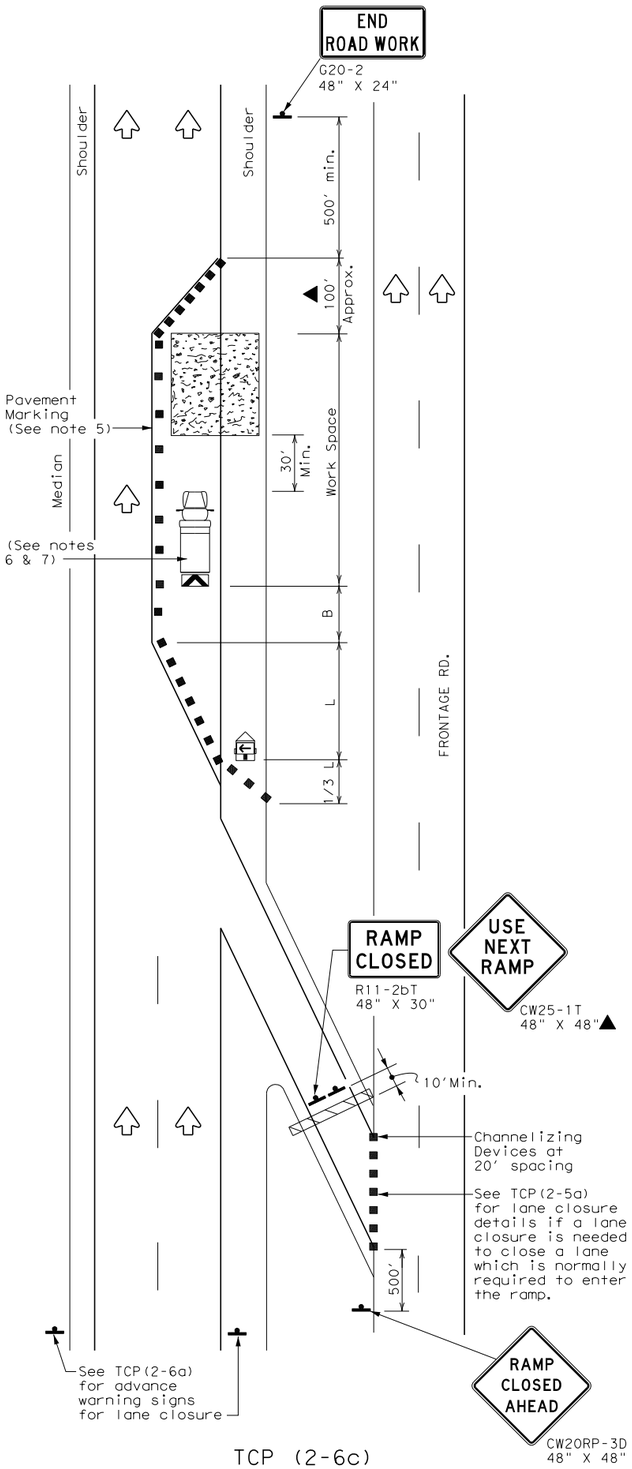
TCP (2-6a)

ONE LANE CLOSURE



TCP (2-6b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (2-6c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

TCP(2-6)-18

FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0356	01	112, ETC	SH 136, ETC
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC		32

166

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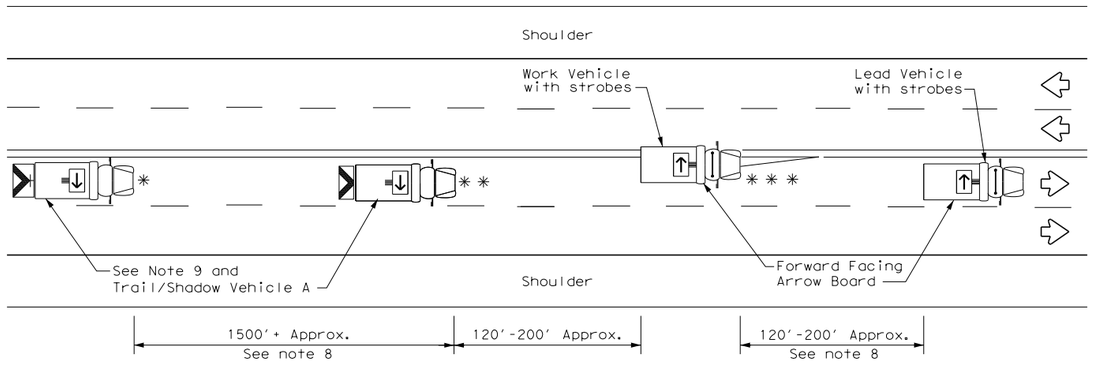
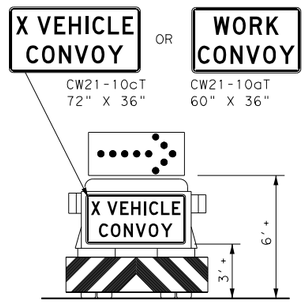


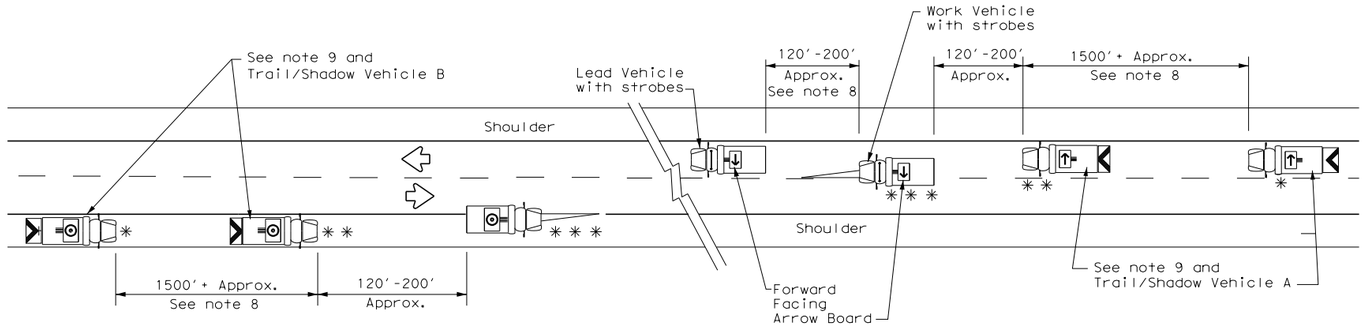
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

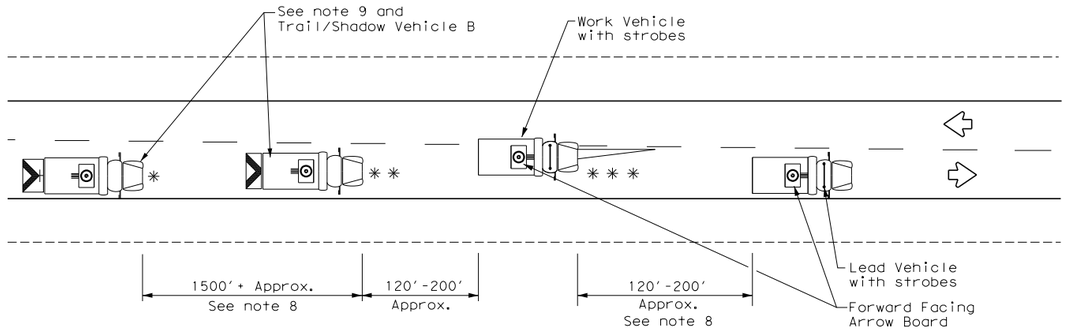


WORK ON SHOULDER

WORK ON TRAVEL LANE

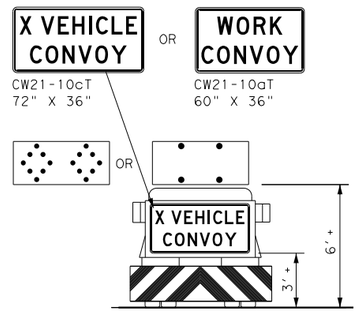
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

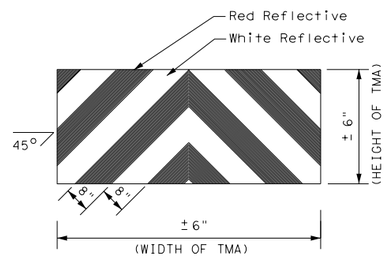
with Flashing Arrow Board in CAUTION display

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
* *	Shadow Vehicle		
* * *	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. "X VEHICLE CONVOY" (CW21-10cT) or "WORK CONVOY" (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped "WORK CONVOY"(CW21-10T) or "X VEHICLE CONVOY" (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0356	01	112, ETC	SH 136, ETC
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC		33

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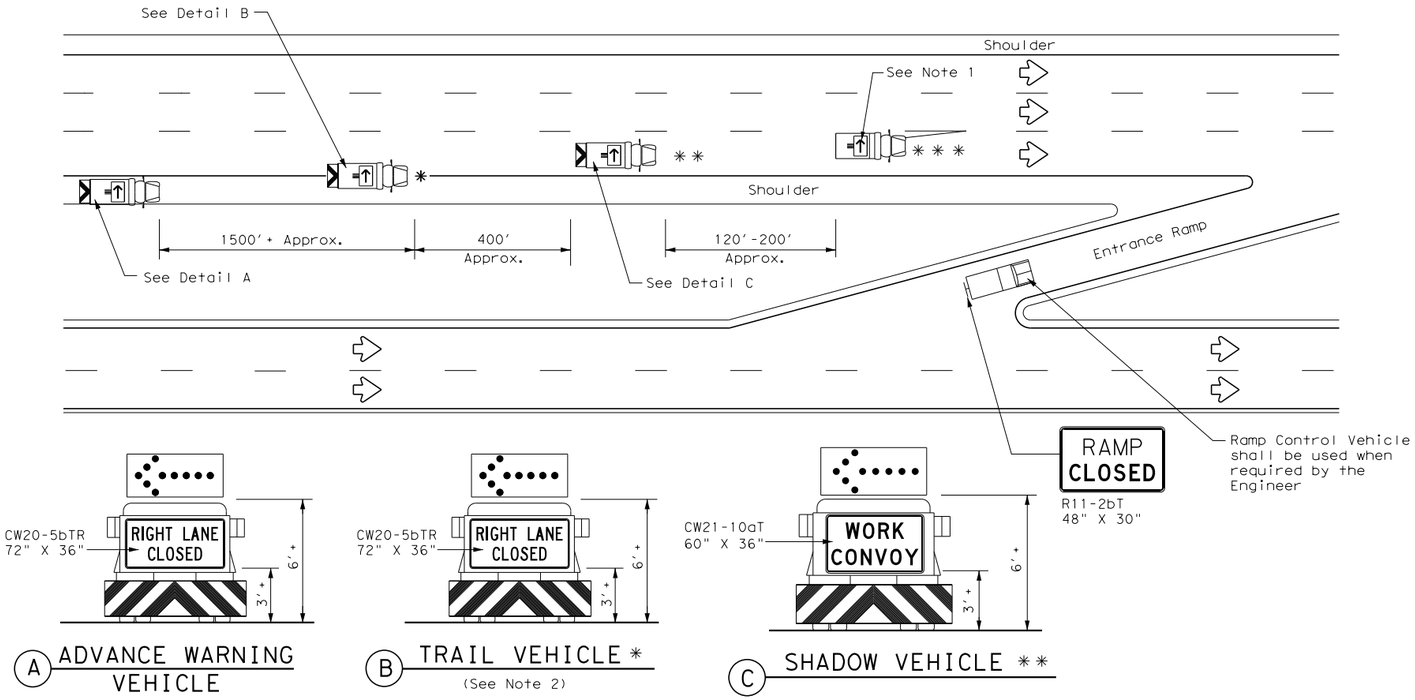
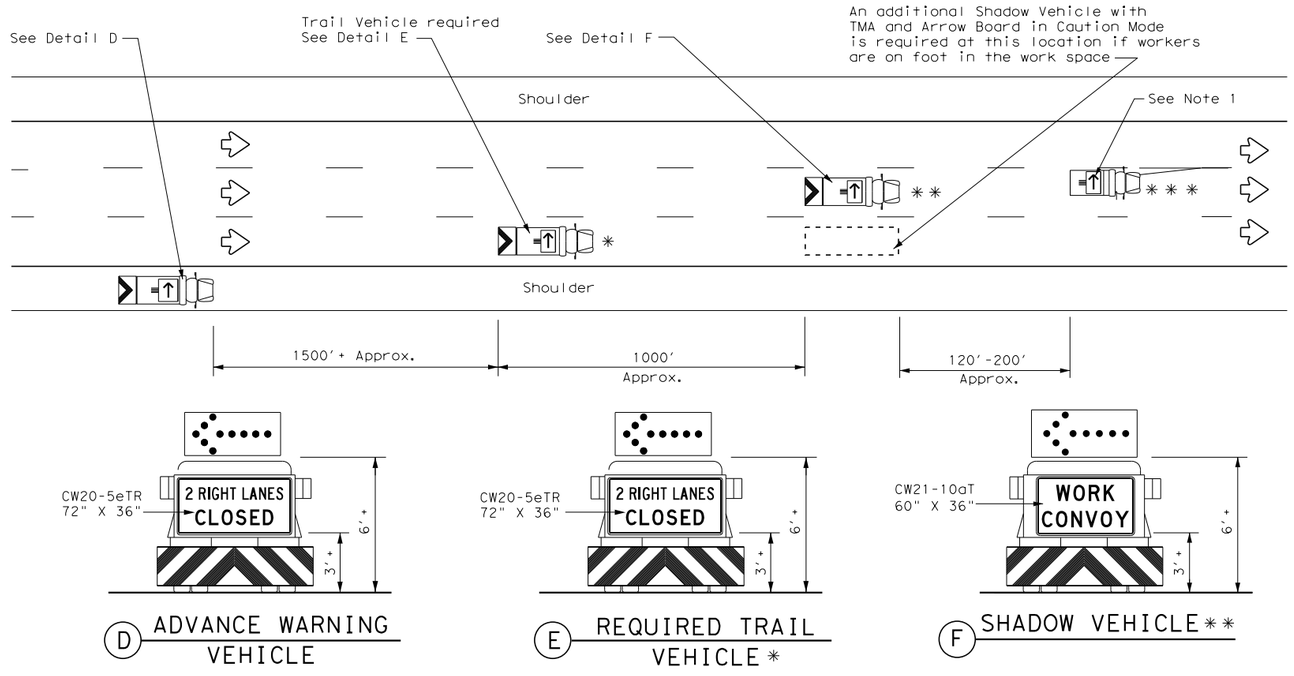


RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



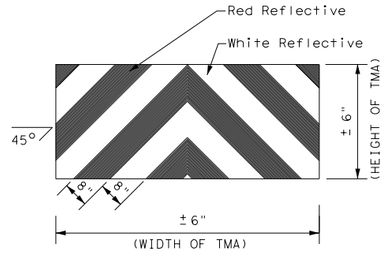
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

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

GENERAL NOTES

1. ADVANCE WARNING, TRAIL and SHADOW vehicles shall be equipped with Type B or Type C flashing arrow boards as per the Barricade and Construction (BC) standards. Arrow boards on WORK vehicles will be optional based on the type of work being performed. The arrow boards shall be operated from inside the vehicle.
2. For TCP(3-2a) the Engineer will determine if the TRAIL VEHICLE is required based on prevailing roadway conditions, traffic volume, and sight distance restrictions. All other vehicles shown for both TCP(3-2a) and TCP(3-2b) are required.
3. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
4. The use of truck mounted attenuators (TMA) on the ADVANCE WARNING, SHADOW, and TRAIL vehicles are required.
5. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DMS 8300, Type A.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE may vary according to terrain, work activity and other factors.
9. Standard 48" X 48" diamond shaped warning signs with the same message as those shown may be used where adequate mounting space exists.
10. The signs shown should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or a truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board, must be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
12. The principles on this sheet may be used to close lanes from the left side of the roadway considering the number of lanes, shoulder width, sight distance, and ramp frequency.
13. Signs and flashing arrow board modes shall be appropriately altered when implementing left lane closures or interior closures which close the left lanes.
14. The Advance Warning Vehicle may straddle the edgeline when shoulder width makes it necessary.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0356	01	112, ETC	SH 136, ETC
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC		34

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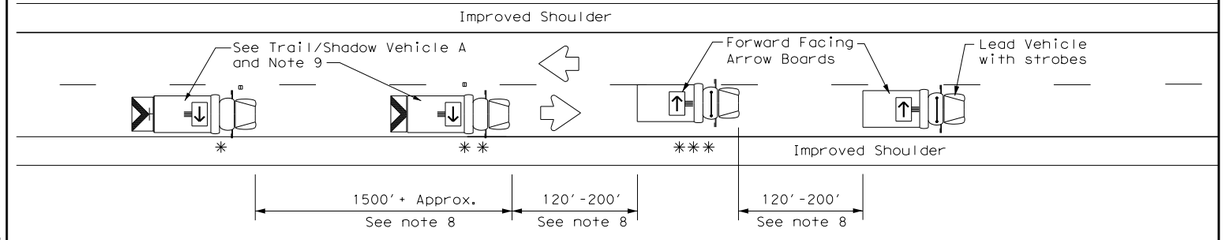
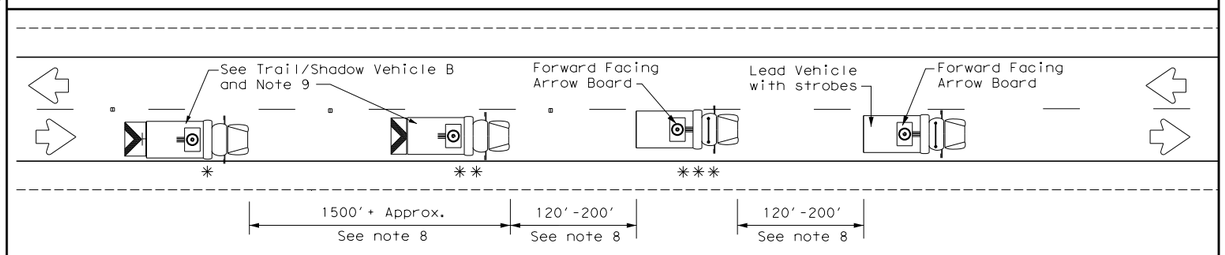


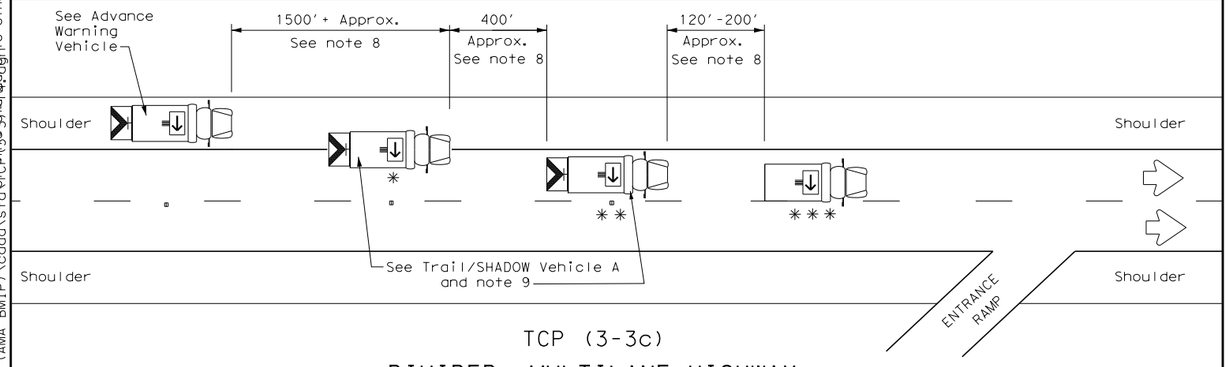
TCP (3-3a)

TWO LANE HIGHWAY WITH PAVED SHOULDERS (WORK ON TRAVEL LANE)



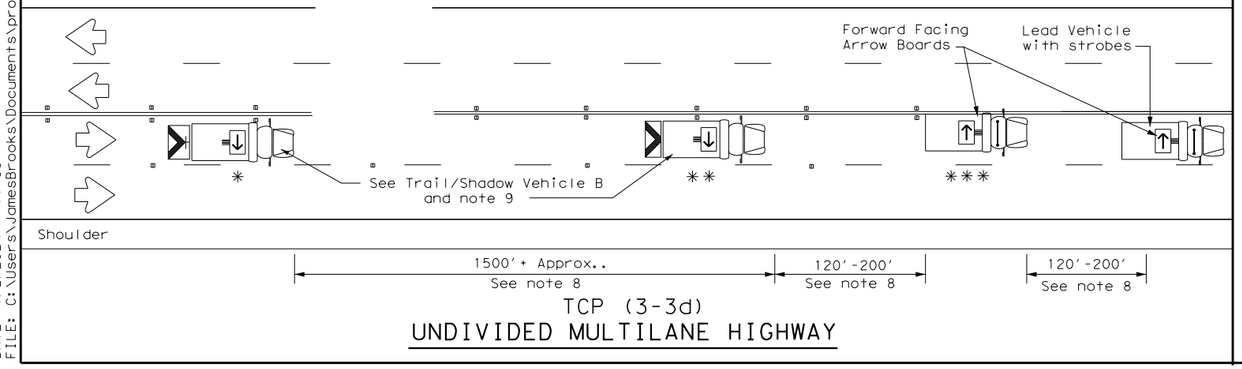
TCP (3-3b)

TWO LANE HIGHWAY WITHOUT PAVED SHOULDERS (WORK ON TRAVEL LANE)



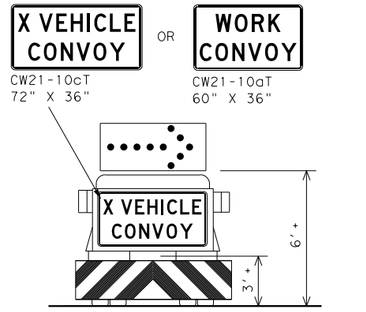
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



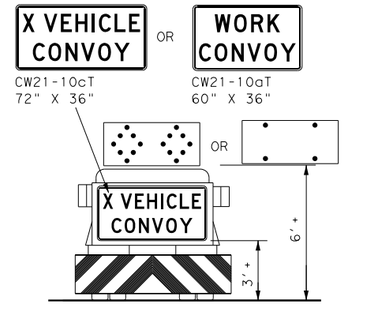
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



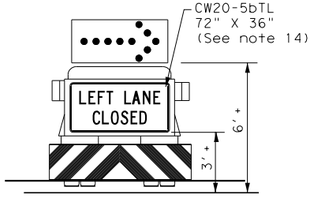
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

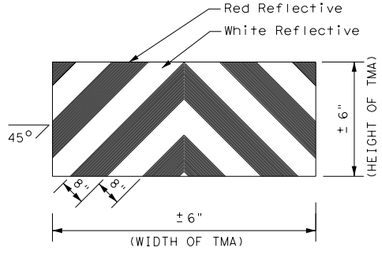


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer will determine if the LEAD vehicle and/or TRAIL vehicle are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating, or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE, ADVANCE WARNING and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. X VEHICLE CONVOY (CW21-10cT) or WORK CONVOY (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" x 48" diamond shaped WORK CONVOY (CW21-10T) or X VEHICLE CONVOY (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The X VEHICLE CONVOY sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. For divided highways with two or three lanes in one direction, the appropriate LEFT LANE CLOSED (CW20-5bTL), RIGHT LANE CLOSED (CW20-5bTR), or CENTER LANE CLOSED (CW20-5dT) sign should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board may be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. A double arrow shall not be displayed on the arrow board on the Advance Warning Vehicle.
12. For divided highways with three or four lanes in each direction, use TCP(3-2).
13. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
14. The Advance Warning Vehicle may straddle the edgeline when Shoulder width makes it necessary.
15. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a DO NOT PASS (R4-1) sign should be placed on the back of the rearmost protection vehicle.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL

TCP(3-3)-14

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	AMA	HUTCHINSON, ETC		35
1-97 7-14				

177

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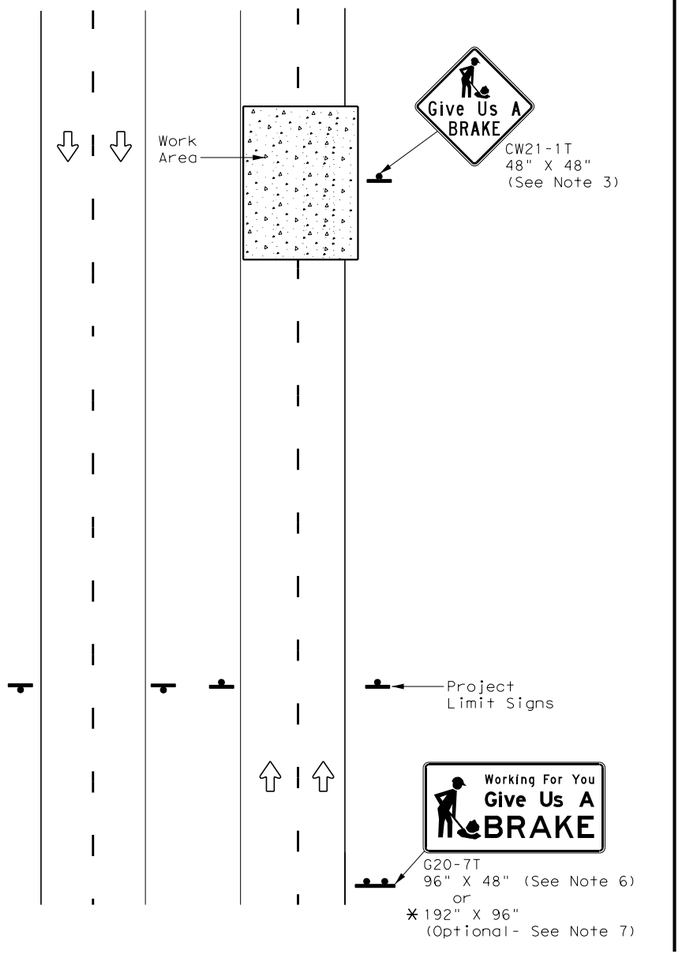
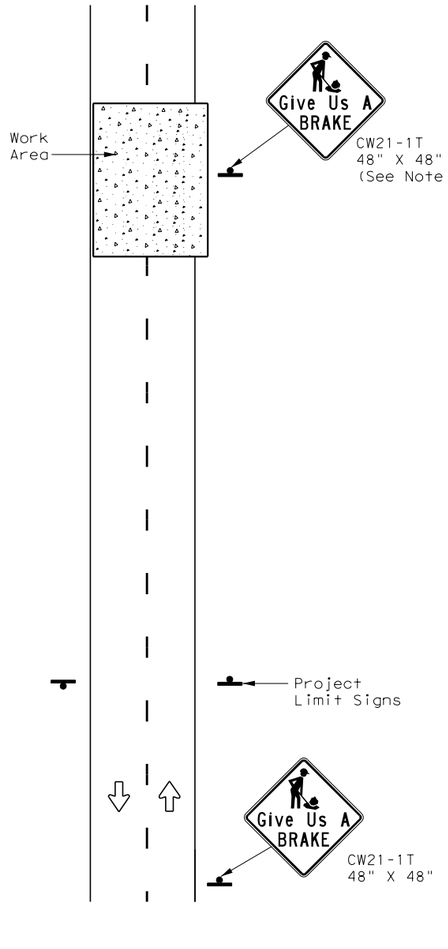


DIVIDED HIGHWAY



UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC	SH 136, ETC
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	AMA	HUTCHINSON, ETC		36

116

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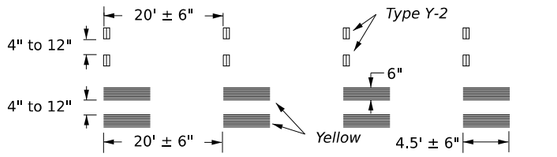
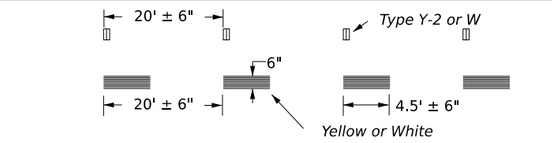
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

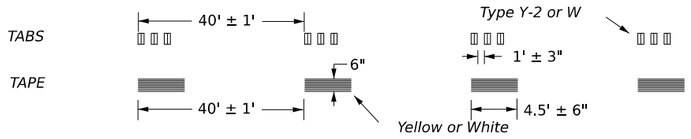


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



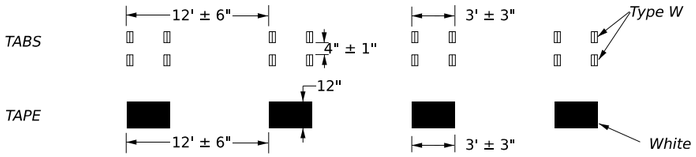
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

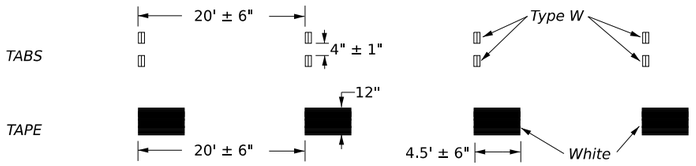


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



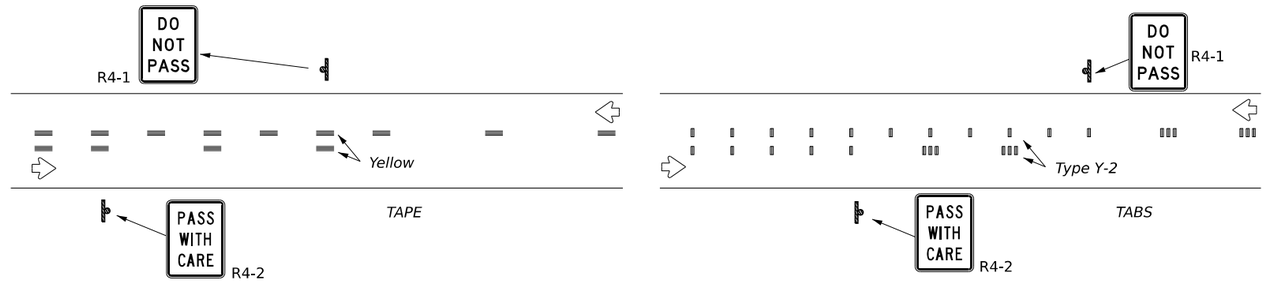
NOTES:

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

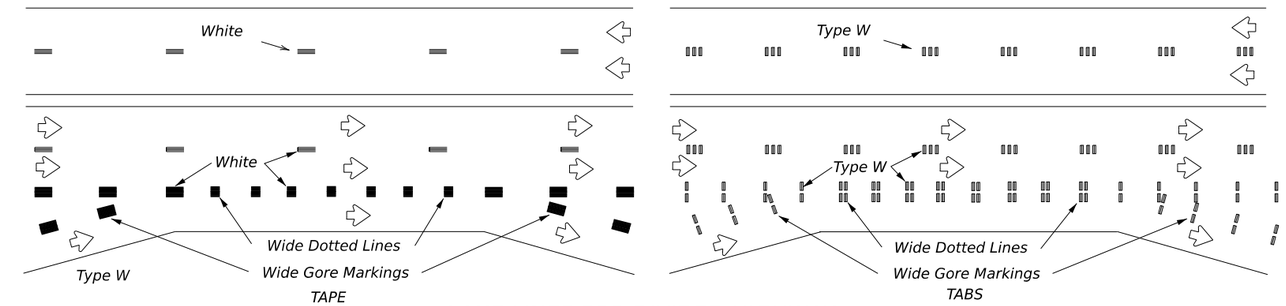
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

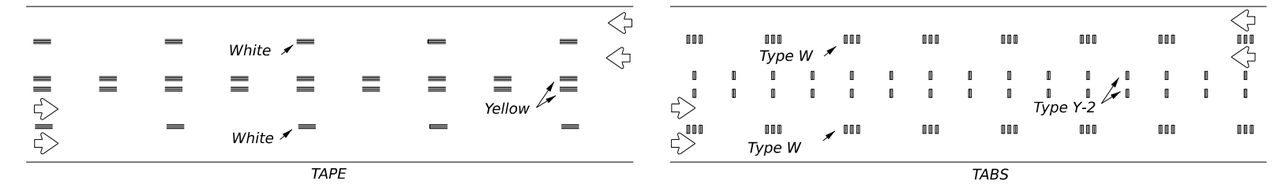
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



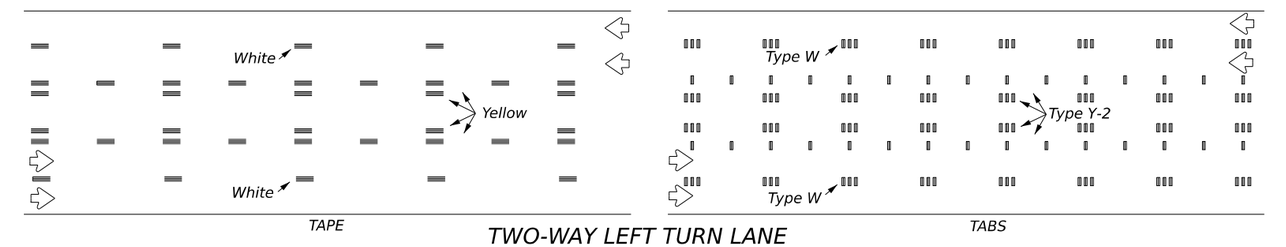
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



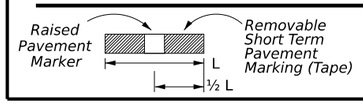
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:

http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

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©TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
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	AMA	HUTCHINSON, ETC		37

111

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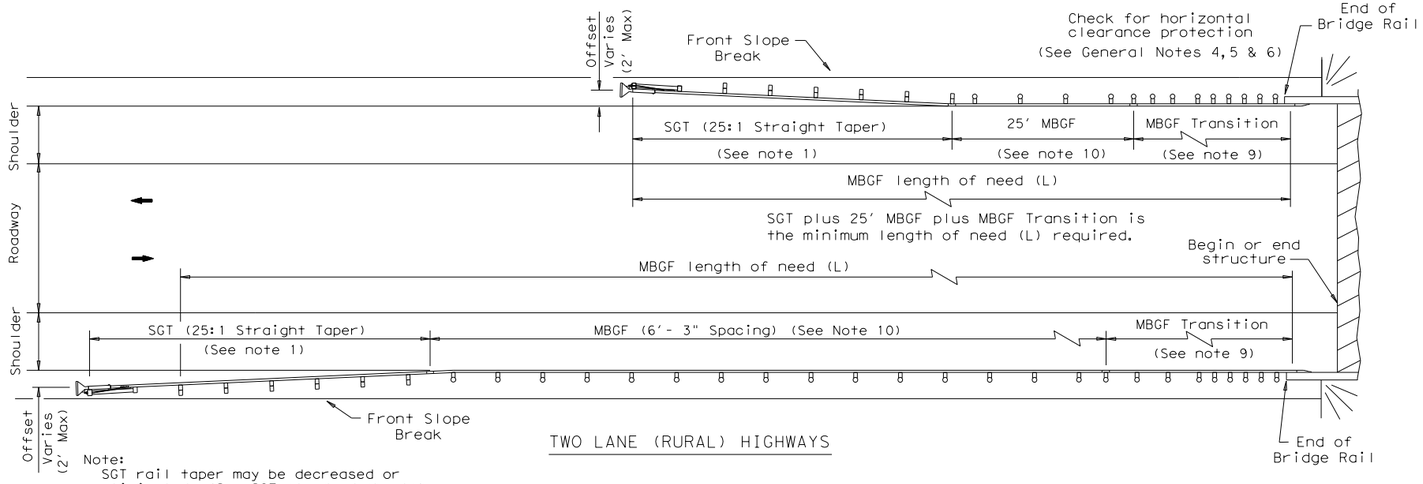
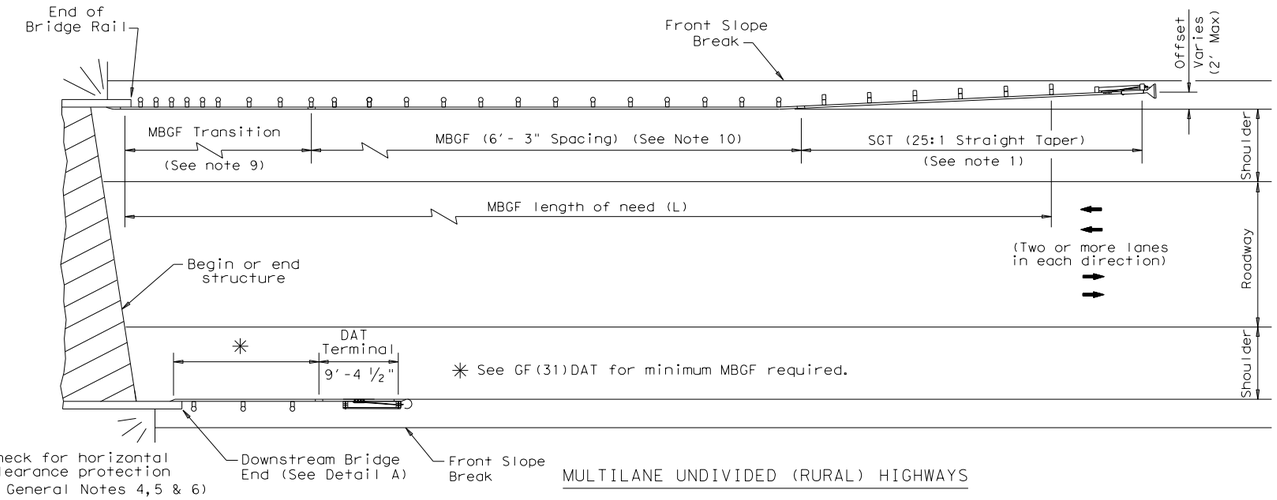
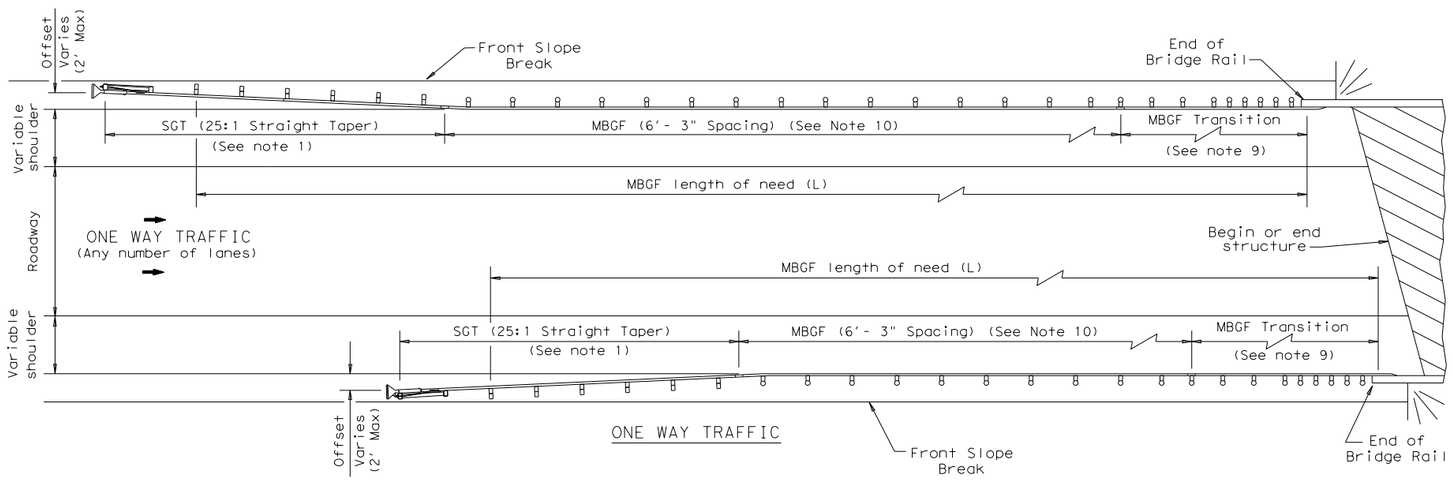


TWO LANE (RURAL) HIGHWAYS

Note:
SGT rail taper may be decreased or eliminated. (See SGT standard sheets)



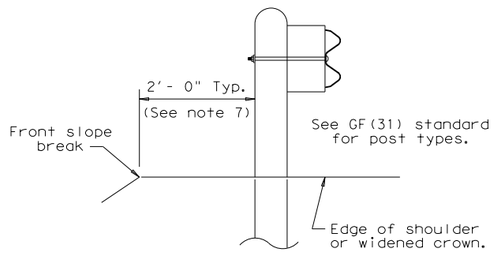
MULTILANE UNDIVIDED (RURAL) HIGHWAYS



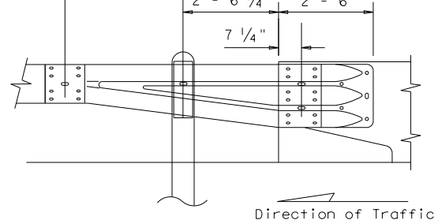
ONE WAY TRAFFIC

GENERAL NOTES

1. For more detail: See GF(31), SGT( )31, GF(31)TR, and GF(31)TL2 standard sheets.
2. Quantities of metal beam guard fence (MBGF) at individual bridge ends are as shown in the plans.
3. Use average daily traffic (ADT) for the current year to determine MBGF length of need in accordance with the Roadway Design Manual unless otherwise specified. Where significant traffic volume growth is anticipated on low volume (0-750 ADT) highways, use length determinations for the higher volume category.
4. MBGF may not be required to shield departure end of bridge unless other obstacles within the horizontal clearance limits or opposing traffic indicate a MBGF consideration.
5. Downstream anchor terminals (DAT) are only for downstream end anchorage use, outside the horizontal clearance area of opposing traffic.
6. Direct connection of MBGF to concrete rails are only for downstream rail connections outside the horizontal clearance area of opposing traffic. (This requires a minimum of three standard line posts plus the DAT terminal, See Detail A)
7. The crown shall be widened to accommodate MBGF. Typically the "front slope" break should be 2'- 0" from the back of the MBGF post. This applies to new construction on new alignment or where existing roadway cross section is to be widened to increase roadway width. This does not apply to rehabilitation work where existing roadway crown width is to be retained (See Typical Cross Section at MBGF).
8. For restrictive bridge widths: The MBGF should be properly transitioned from the existing bridge rail to the adjoining MBGF (See MBGF Transition Standards). Metal beam guard fence at these bridge location(s) shall be flared at the rate of 25:1 or flatter, and be of the length necessary to locate the terminal end at the 2 ft."maximum" offset from the shoulder edge in the approach direction.
9. Transition length and post spacing will vary depending on the transition type. Transition type will be shown elsewhere in the plans.
10. A minimum 25' length of MBGF will be required.



TYPICAL CROSS SECTION AT MBGF



Note:
All rail elements shall be lapped in the direction of adjacent traffic.

DETAIL A
Showing Downstream Rail Attachment

Texas Department of Transportation

Design Division Standard

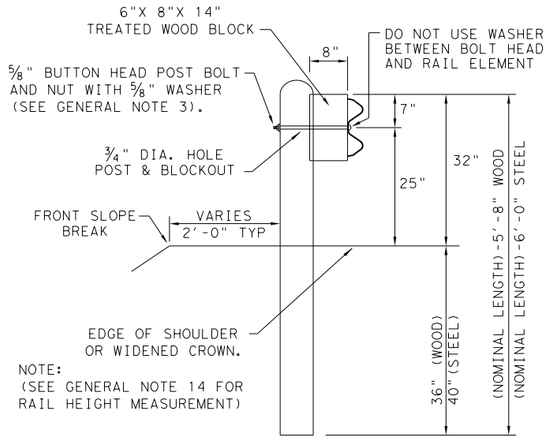
BRIDGE END DETAILS

(METAL BEAM GUARD FENCE APPLICATIONS TO RIGID RAILS)

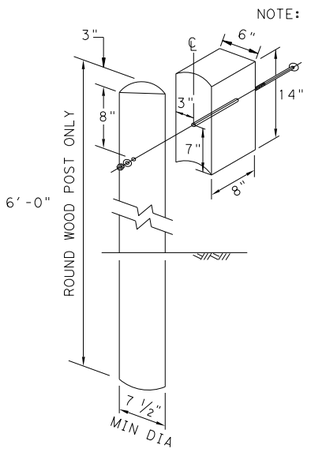
BED-14

FILE: bed14.dgn	DN: TxDOT	CK: AM	DW: BD/VP	CK: CGL
©TxDOT: December 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED APRIL 2014 SEE (MEMO 0414)	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		38

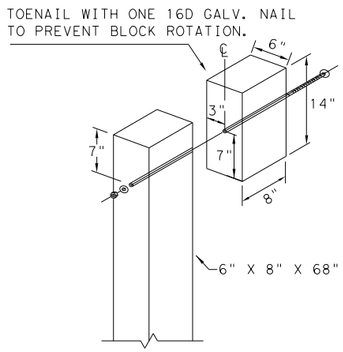
DATE: 3/4/2024
FILE: GF(31)-19.dgn



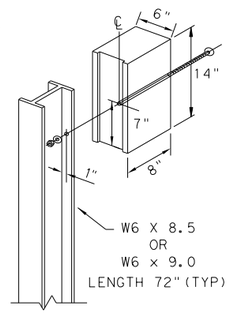
TYPICAL POST PLACEMENT



WOOD BLOCK TO
ROUND WOOD POST

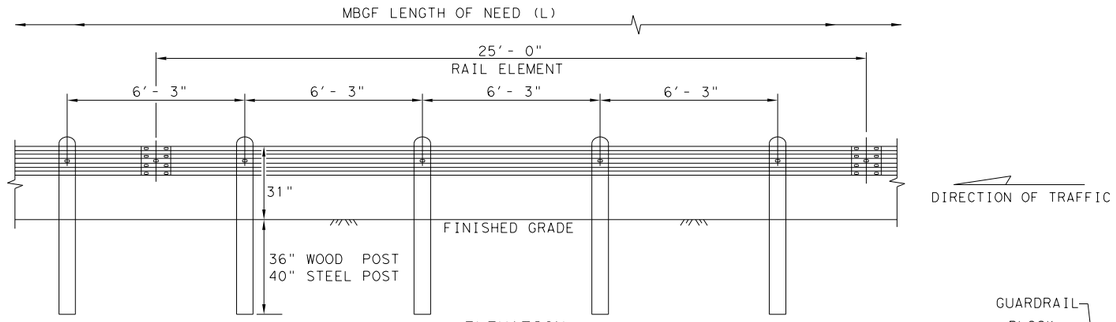


WOOD BLOCK TO
RECTANGULAR WOOD POST



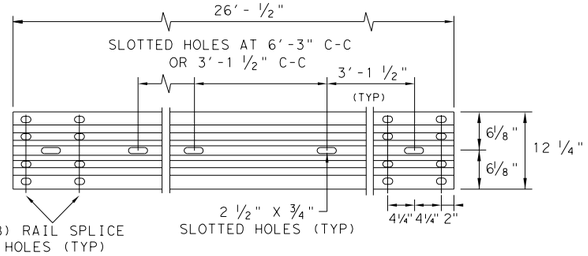
ROUTED WOOD BLOCK
TO I-BEAM STEEL POST

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



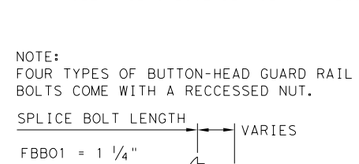
ELEVATION
MID-SPAN RAIL SPLICE

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



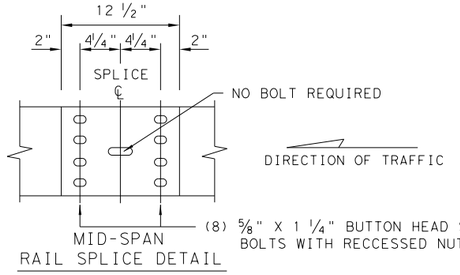
ELEVATION 25'- 0"(NOM.) W-BEAM SECTION

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



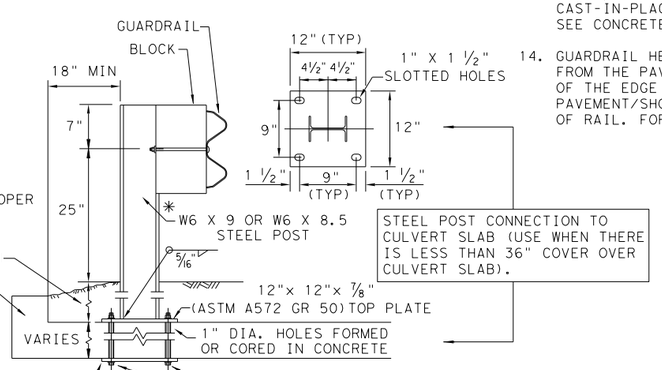
BUTTON HEAD BOLT

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



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. 7/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
   NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.

2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE 7/8" 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 1/4" MIN. BEYOND NUT.

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

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.

GENERAL NOTES

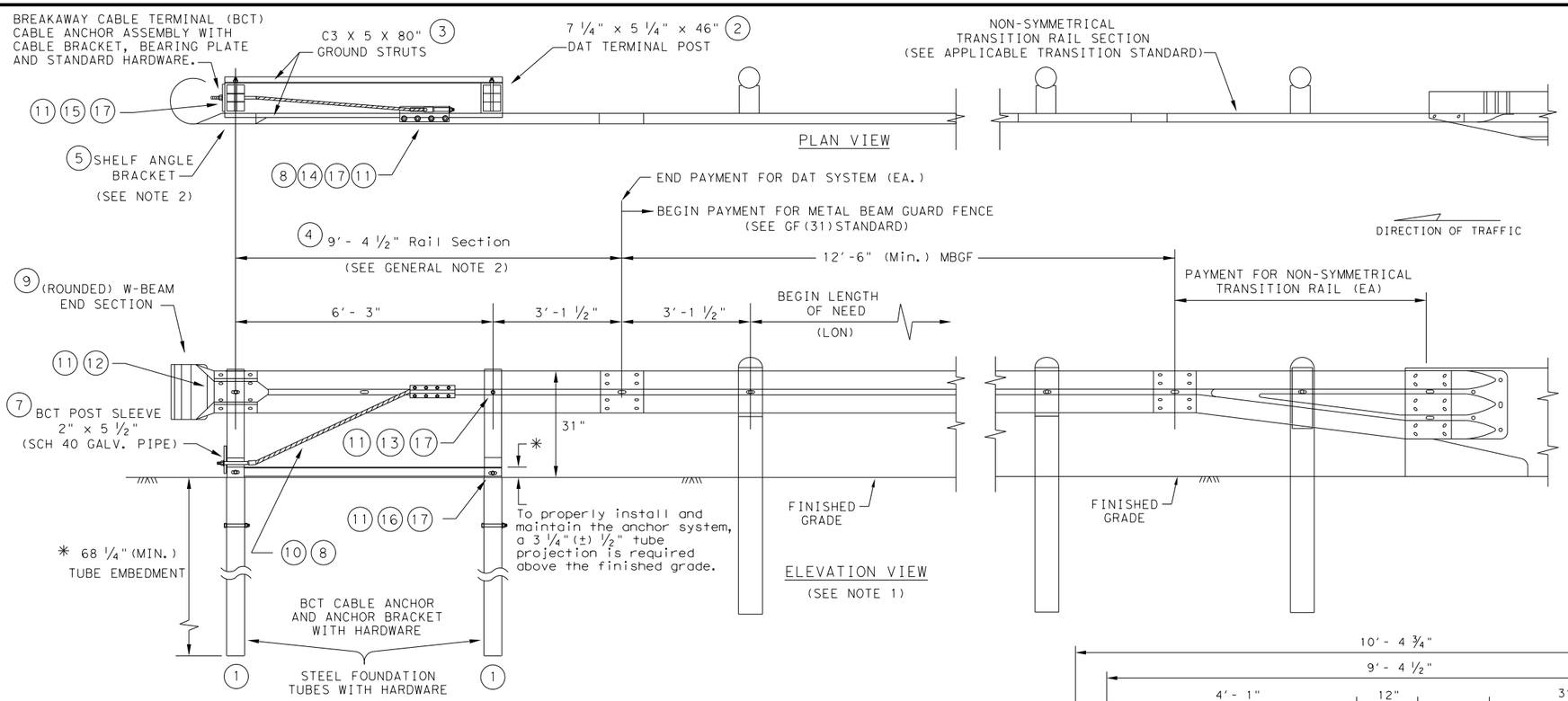
1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS 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 1/2" 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 5/8" 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.

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	
REVISIONS	0356	01	112,ETC.	SH 136,ETC.	
	DIST	COUNTY		SHEET NO.	
	AMA	HUTCHINSON,ETC.		39	



DOWNSTREAM ANCHOR TERMINAL (DAT)

NOTE: ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC.

GENERAL NOTES

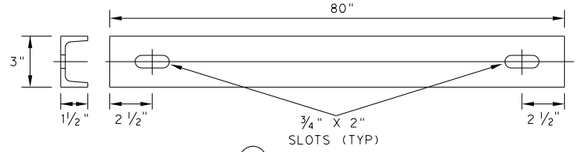
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN 3 3/4" ABOVE THE FINISHED GRADE.
4. ALL HARDWARE FOR DAT SHALL BE ASTM A307 UNLESS OTHERWISE SHOWN.
5. REFER TO GF(31) SHEET FOR TERMINAL CONNECTION DETAILS.

MOW STRIP INSTALLATION

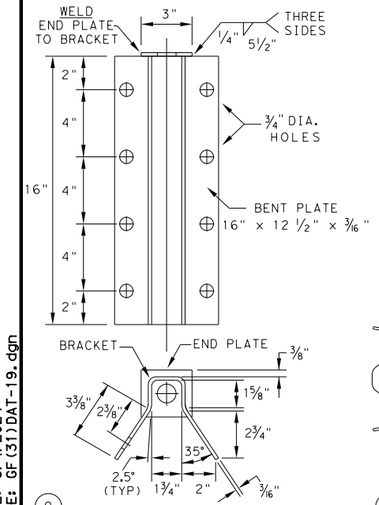
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

#	(DAT) PARTS LIST	QTY
(1)	STEEL FOUNDATION TUBE	2
(2)	DAT TERMINAL POST	2
(3)	CHANNEL STRUT	2
(4)	TERMINAL RAIL ELEMENT	1
(5)	SHELF ANGLE BRACKET	1
(6)	BCT BEARING PLATE	1
(7)	BCT POST SLEEVE	1
(8)	GUARDRAIL ANCHOR BRACKET	1
(9)	(ROUNDED) W-BEAM END SECTION	1
(10)	BCT CABLE ANCHOR	1
(11)	RECESSED NUT, GUARDRAIL	20
(12)	1 1/4" BUTTON HEAD BOLT	4
(13)	10" BUTTON HEAD BOLT	2
(14)	5/8" X 2" HEX HEAD BOLT	8
(15)	5/8" X 8" HEX HEAD BOLT	4
(16)	5/8" X 10" HEX HEAD BOLT	2
(17)	5/8" FLAT WASHER	18

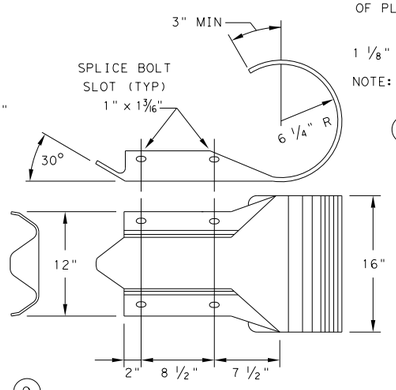
(4) TERMINAL RAIL ELEMENT FOR DAT



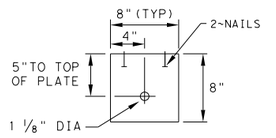
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



(8) GUARDRAIL ANCHOR BRACKET

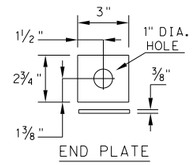


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

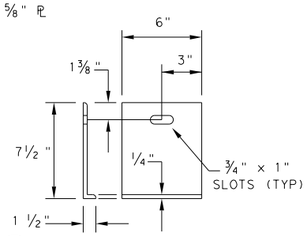


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

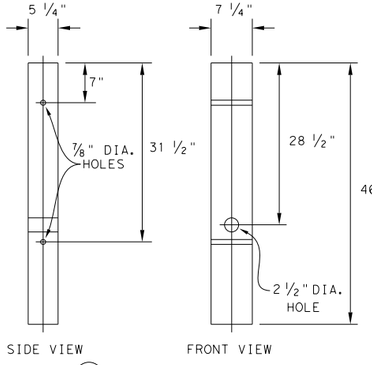
(6) BEARING PLATE
8"x 8"x 5/8" PL



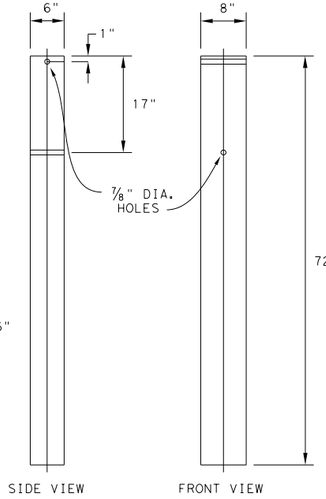
END PLATE



(5) SHELF ANGLE BRACKET



(2) TERMINAL POST
7 1/4"x 5 1/4"x 46" WOOD POST



(1) STEEL FOUNDATION TUBE
6"x 8"x 1/8" x 72" STEEL TUBE

Texas Department of Transportation

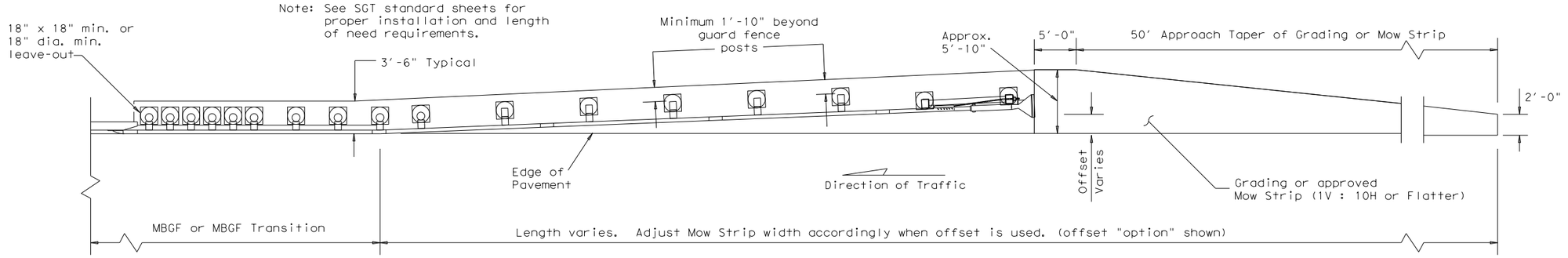
Design Division Standard

METAL BEAM GUARD FENCE
(DOWNSTREAM ANCHOR TERMINAL)
TL-3 MASH COMPLIANT

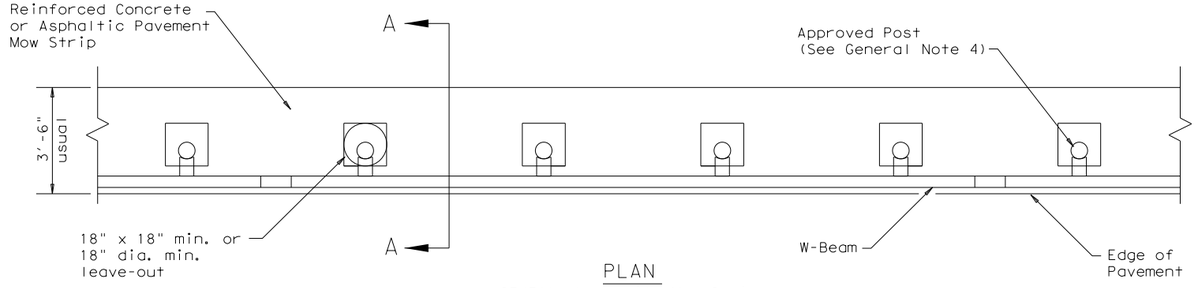
GF(31)DAT-19

FILE: gf31dat19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112,ETC.	SH 136,ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON,ETC.		40

DATE: 3/4/2024
FILE: GF(31)DAT-19.dgn

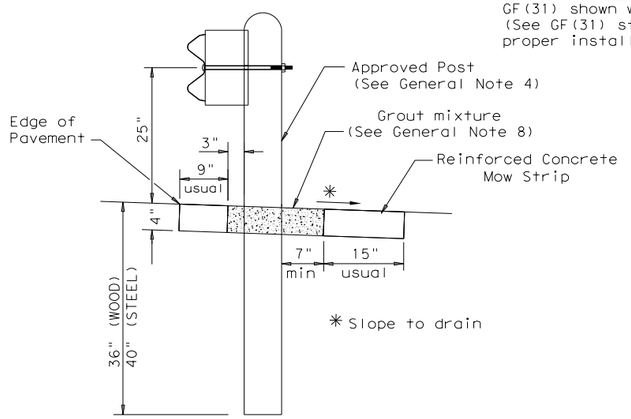


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



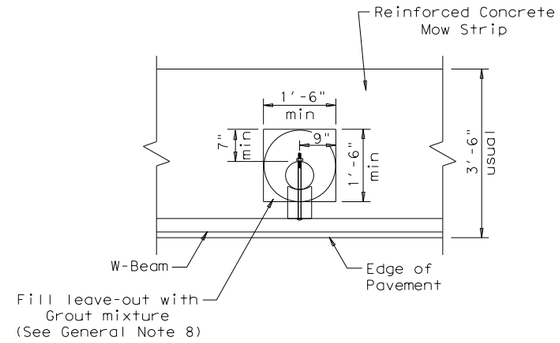
PLAN

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



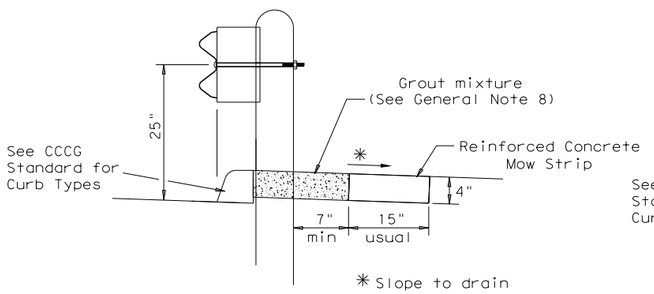
SECTION A-A

Typical



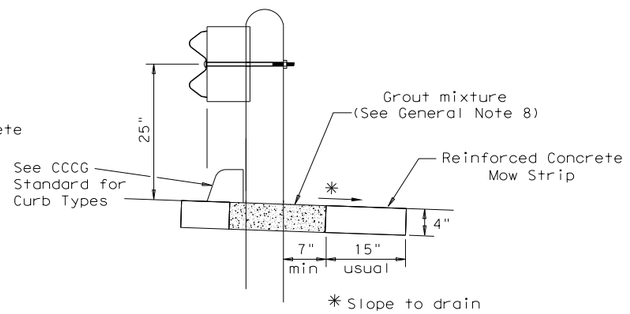
MOW STRIP DETAIL

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



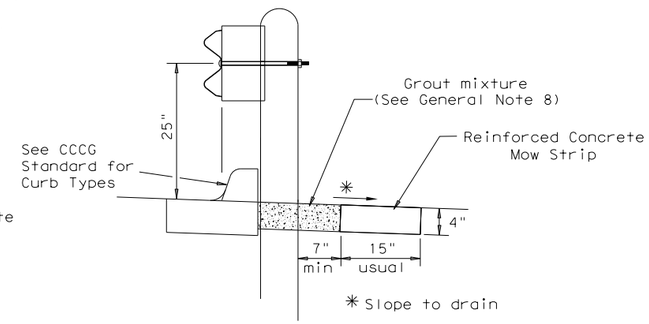
CURB OPTION (1)

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
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		41

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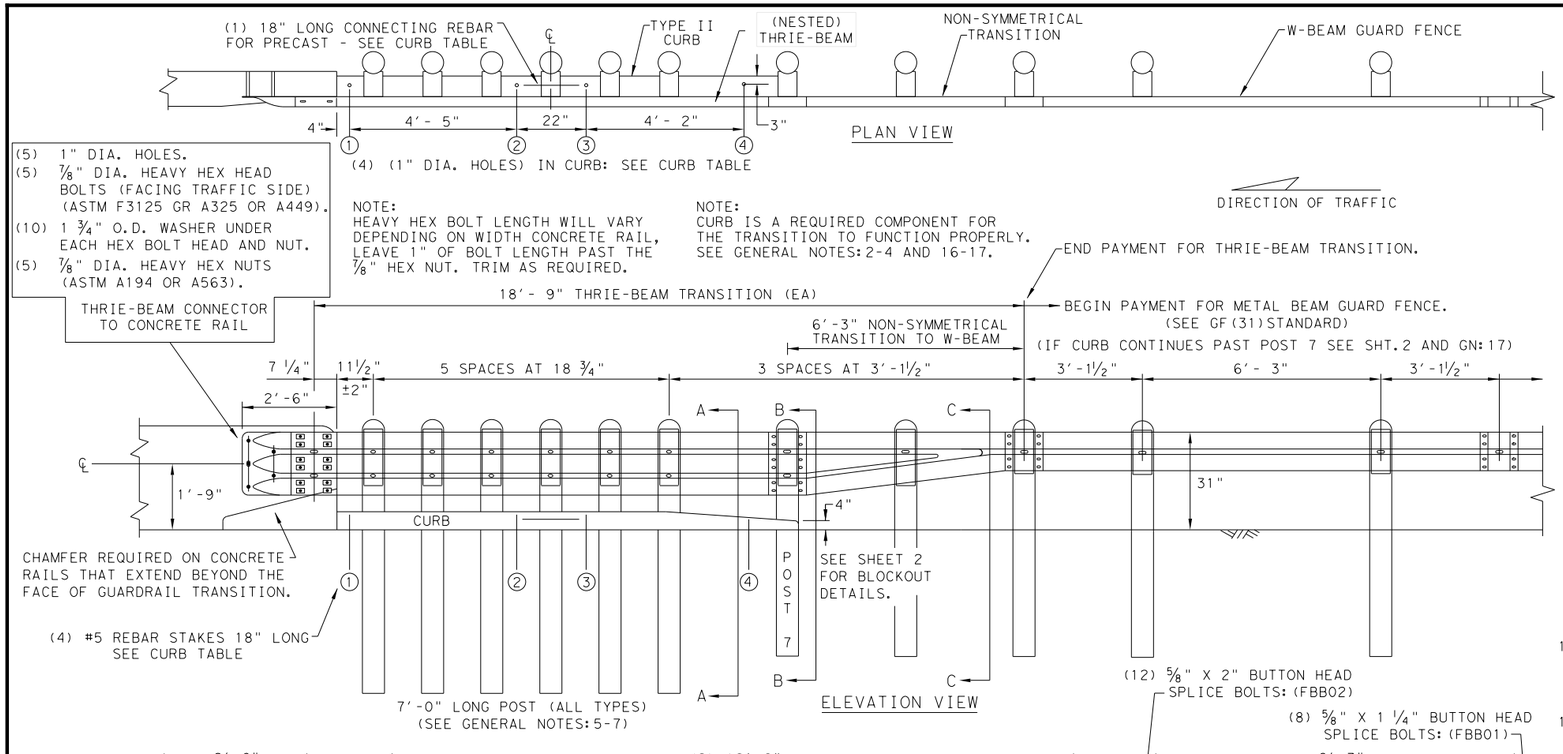


GENERAL NOTES

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- 3/4" 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 1/2" 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 5/8" 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 5/8" 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.

THRIE-BEAM TERMINAL - CURB TABLE

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

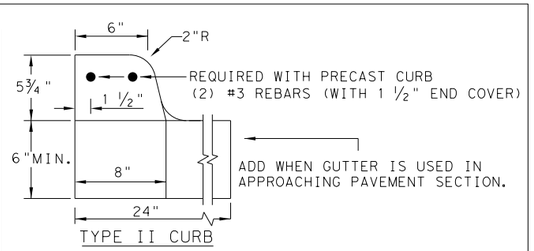
CURB (1) LENGTH 5'- 8"
CURB (2) LENGTH 6'- 6"
TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7

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 1/2" BELOW TOP OF CURB.
FILL HOLES WITH APPROVED GROUT MIXTURE.

* 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



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

HIGH-SPEED TRANSITION

SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

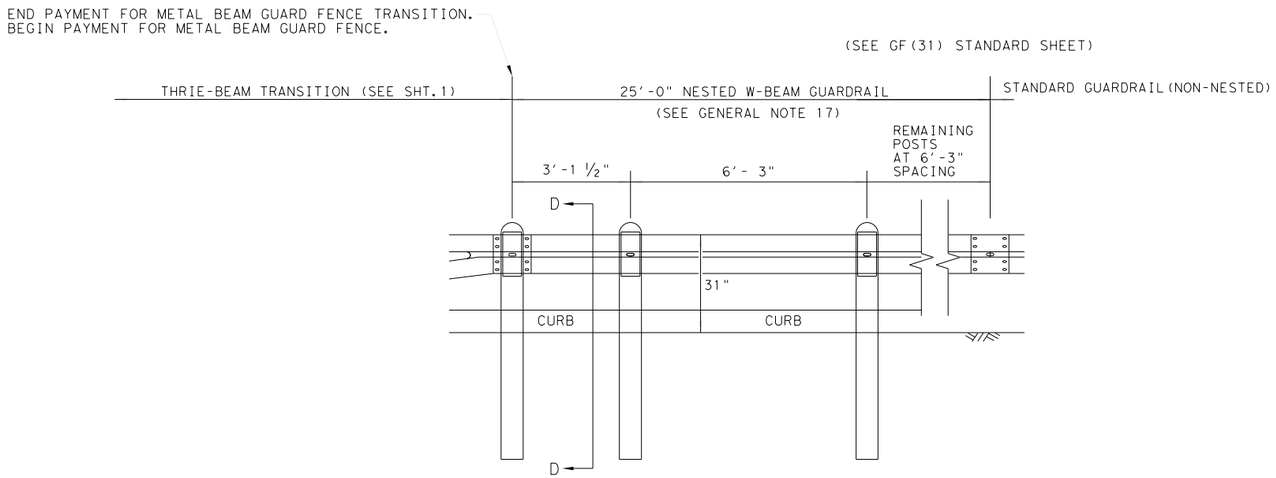
METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

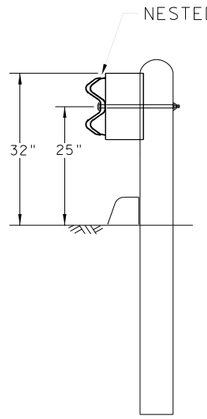
FILE: gf31tr-tl320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0356	01	112, ETC.	SH 136, ETC.	
	DIST	COUNTY		SHEET NO.	
	AMA	HUTCHINSON, ETC.		42	

DATE: 3/4/2024
FILE: GF(31)TR TL3-20.dgn

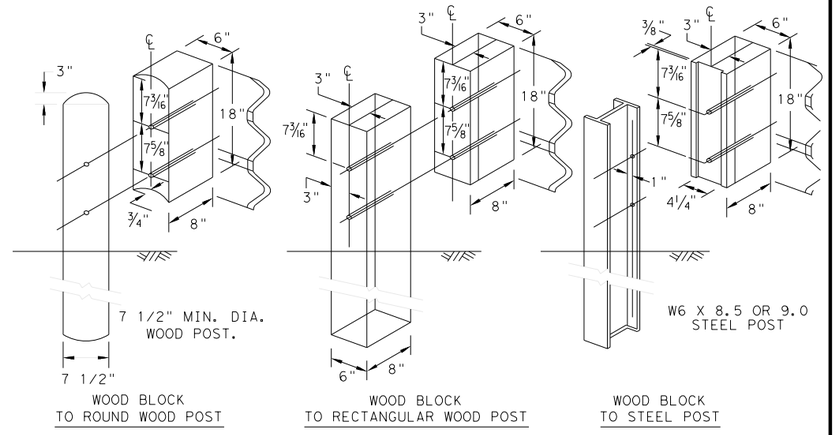
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



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	
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	AMA	HUTCHINSON, ETC.		43	

DATE: 3/4/2024
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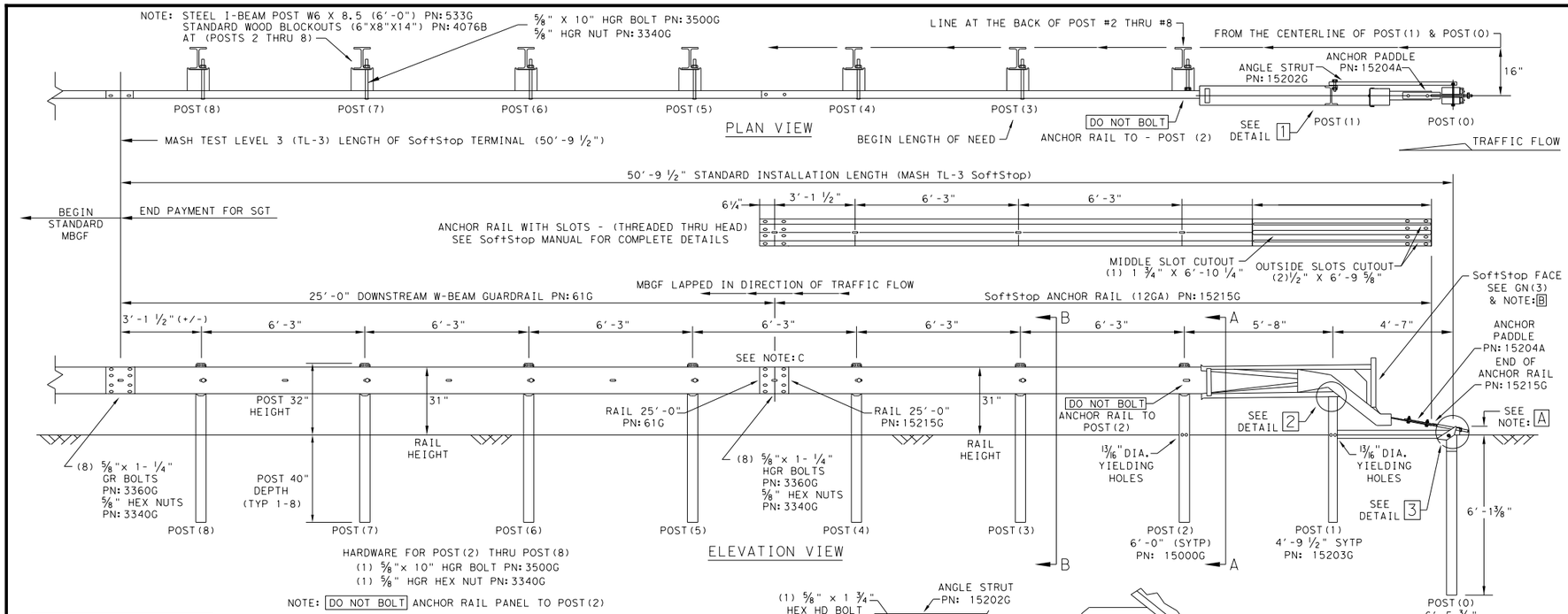


GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY AT 1(888)323-6374. 2525 N. STEMMONS FREEWAY, DALLAS, TX 75207
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; SoftStop END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL. PN: 620237B
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
7. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
8. POSTS SHALL NOT BE SET IN CONCRETE.
9. IT IS ACCEPTABLE TO INSTALL THE SoftStop IMPACT HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT.
10. DO NOT ATTACH THE SoftStop SYSTEM DIRECTLY TO A RIGID BARRIER.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE SoftStop SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.

NOTE: A	THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-3/4" MIN. TO 4" MAX. ABOVE FINISHED GRADE.
NOTE: B	PART PN: 5852B RIGHT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING) PART PN: 5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)
NOTE: C	W-BEAM SPLICE LOCATED BETWEEN LINE POST(4) AND LINE POST(5) GUARDRAIL PANEL 25'-0" PN: 61G ANCHOR RAIL 25'-0" PN: 15215G LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

PART	QTY	MAIN SYSTEM COMPONENTS
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25'- 0")
15205A	1	POST #0 - ANCHOR POST (6'- 5 7/8")
15203G	1	POST #1 - (SYTP) (4'- 9 1/2")
15000G	1	POST #2 - (SYTP) (6'- 0")
533G	6	POST #3 THRU #8 - I-BEAM (W6 x 8.5) (6'- 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" x 8" x 14")
6777B	7	BLOCKOUT - COMPOSITE (4" x 7 1/2" x 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (1/2" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT
		HARDWARE
4902G	1	1" ROUND WASHER F436
3908G	1	1" HEAVY HEX NUT A563 GR.DH
3717G	2	3/4" x 2 1/2" HEX BOLT A325
3701G	4	3/4" ROUND WASHER F436
3704G	2	3/4" HEAVY HEX NUT A563 GR.DH
3360G	16	5/8" x 1 1/4" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	5/8" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	5/8" x 10" HGR POST BOLT A307
3391G	1	5/8" x 1 3/4" HEX HD BOLT A325
4489G	1	5/8" x 9" HEX HD BOLT A325
4372G	4	5/8" WASHER F436
105285G	2	5/8" x 2 1/2" HEX HD BOLT GR-5
105286G	1	5/8" x 1 1/2" HEX HD BOLT GR-5
3240G	6	5/8" ROUND WASHER (WIDE)
3245G	3	5/8" HEX NUT A563 GR.DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE: B

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SoftStop END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

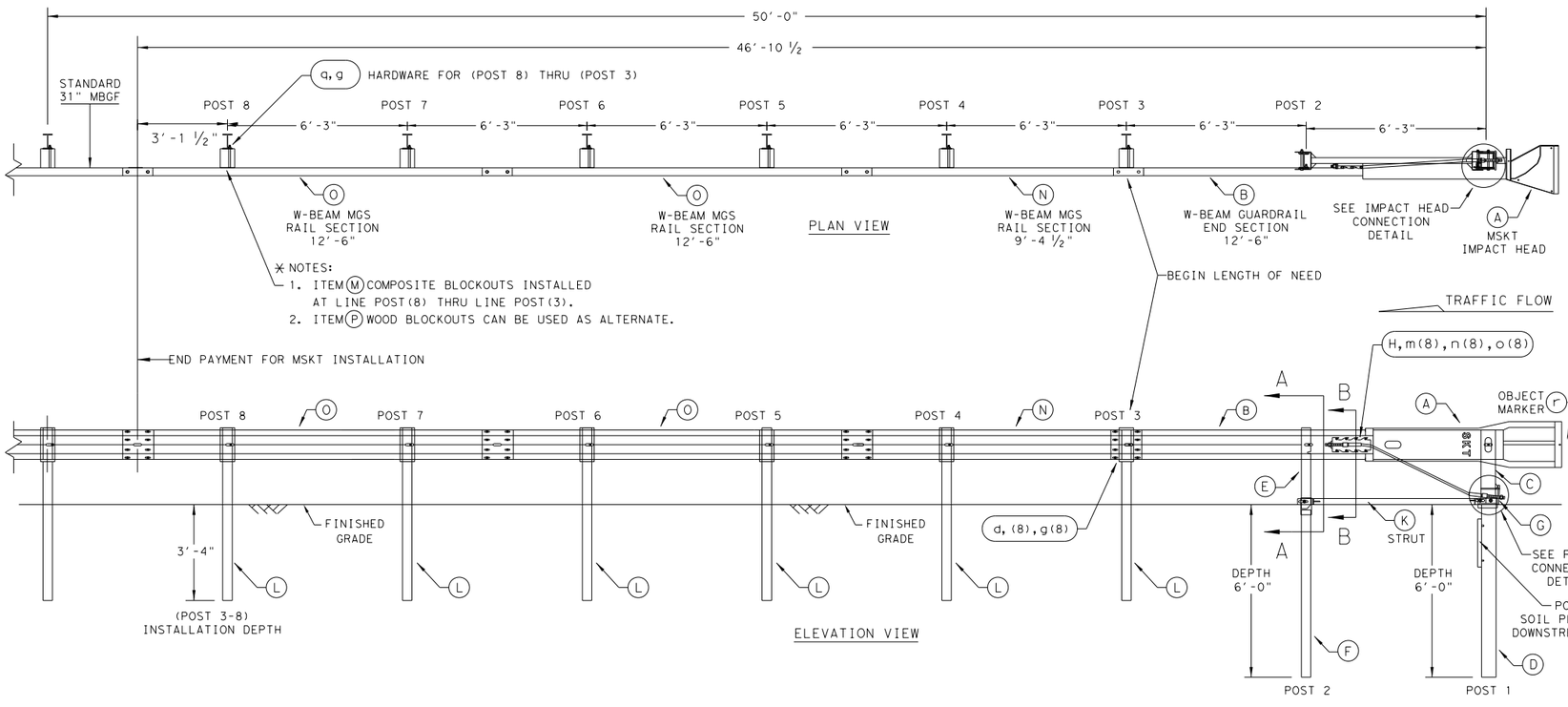
Texas Department of Transportation

Design Division Standard

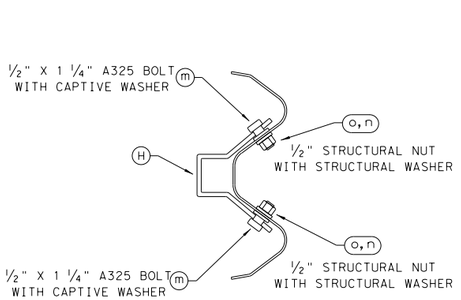
TRINITY HIGHWAY
SOFTSTOP END TERMINAL
MASH - TL-3
SGT(10S)31-16

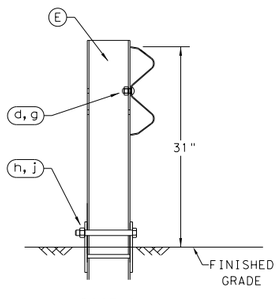
FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP		
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY		
REVISIONS	0356	01	112, ETC.	SH 136, ETC.		
	DIST	COUNTY		SHEET NO.		
	AMA	HUTCHINSON, ETC.		44		

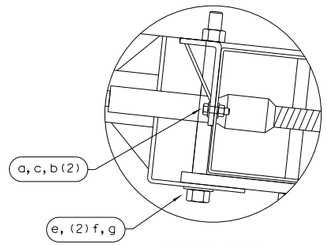
DATE: 3/4/2024
FILE: SGT(10S)31-16.dgn

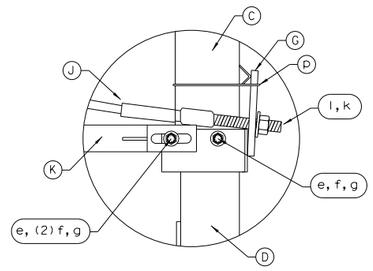


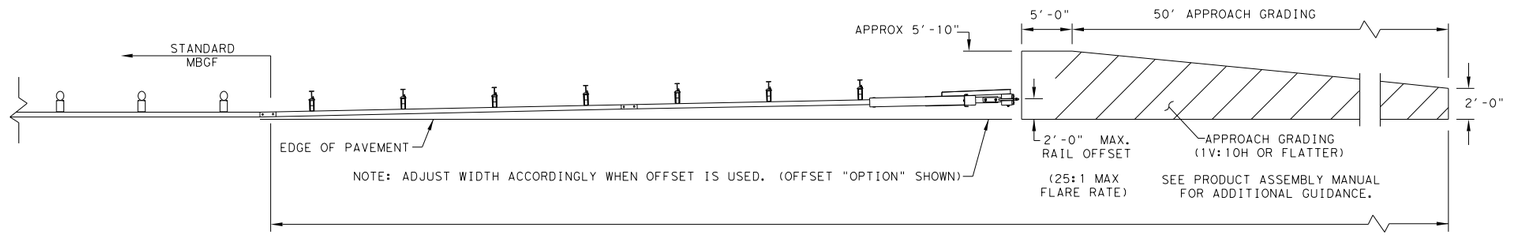
NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.











NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)

APPROACH GRADING AT GUARDRAIL END TREATMENTS

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE MSKT END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432)263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION~062717).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
7. A COMPOSITE MATERIAL BLOCKOUTS THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
8. IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
9. POSTS SHALL NOT BE SET IN CONCRETE.
10. SYSTEM MUST BE ATTACHED TO STANDARD 31" MBGF.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
13. THE SYSTEM IS SHOWN WITH TWO 12'-6" MBGF PANELS, ONE 25'-0" MBGF PANEL IS ALSO ALLOWED IN THEIR PLACE.
14. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POSTS 3-8 TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST. SPECIAL DRIVING CAP TO BE USED ON LOWER POSTS 1 & 2 TO PREVENT DAMAGE TO THE WELDED PLATES.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6x9 OR W6x8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 1/2")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
		SMALL HARDWARE	
a	2	5/16" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	5/16" WASHER	W0516
c	2	5/16" HEX NUT	N0516
d	25	5/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	5/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	5/8" WASHER	W050
g	33	5/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x 9/16" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	5/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151

SEE NOTES: * —

ALTERNATIVE ITEMS NOT SHOWN. * *
* ITEM(P) 8" WOOD-BLOCKOUT
* * ITEM(Q) 25'GUARD FENCE PANEL

Texas Department of Transportation — Design Division Standard

SINGLE GUARDRAIL TERMINAL

MSKT-MASH-TL-3

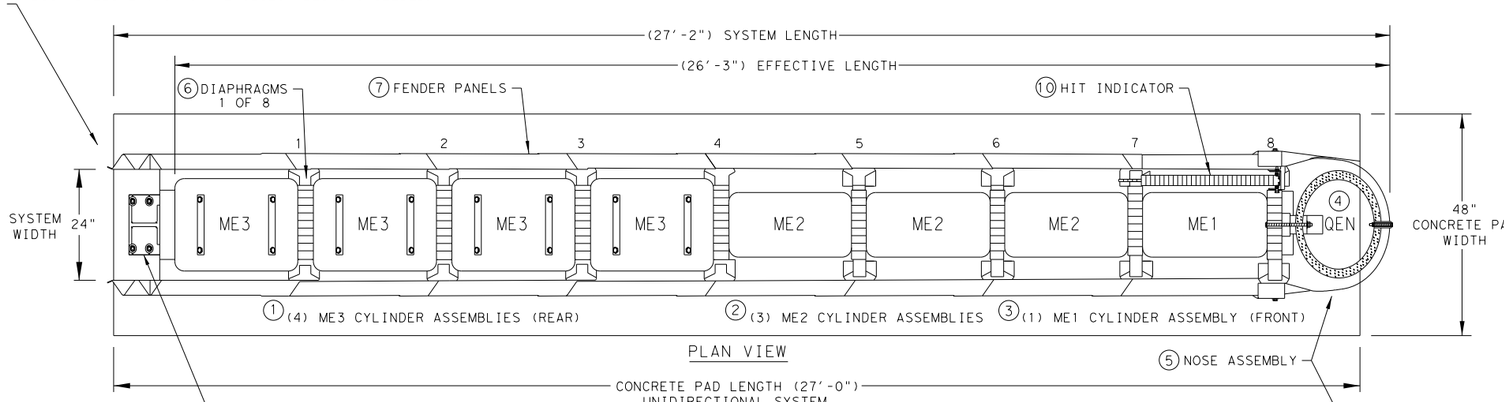
SGT(12S)31-18

FILE: sgt12s3118.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CL
© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		45

DATE: 3/4/2024
FILE: SGT(12S)31-18.dgn

NOTE:
A TRANSITION MAY BE REQUIRED TO INSTALL THE QUADGUARD ELITE M10 TO THE OBJECT BEING SHIELDED.

QUADGUARD EITE M10 24" WIDE (8 BAY) SYSTEM



PLAN VIEW

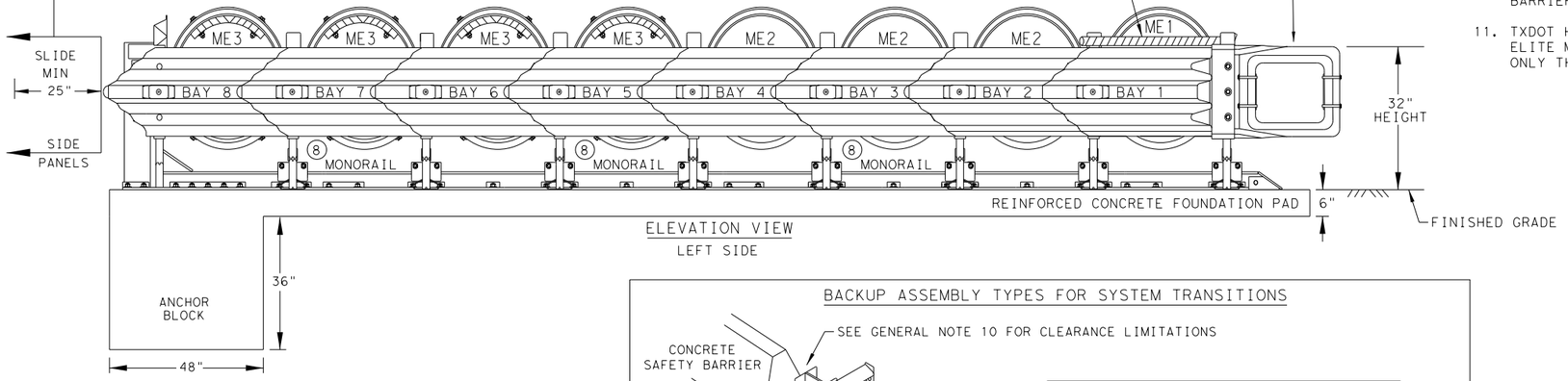
9 SHOWN WITH TENSION STRUT BACKUP ASSEMBLY

4 QEN CYLINDER INSTALLED INSIDE OF NOSE BELT ASSEMBLY 5

KEY		KEY	
1	ME3 CYLINDER ASSEMBLIES	6	DIAPHRAGMS
2	ME2 CYLINDER ASSEMBLIES	7	FENDER PANELS
3	ME1 CYLINDER ASSEMBLY	8	MONORAILS
4	QEN CYLINDER	9	TYPE OF BACKUP
5	NOSE BELT ASSEMBLY	10	HIT INDICATOR

NOTE:
PROVISION SHALL BE MADE FOR REAR FENDER SIDE PANELS TO SLIDE REARWARD UPON IMPACT, 25" MIN.

NOTE:
HIT INDICATOR WILL RAISE UPON IMPACT.



ELEVATION VIEW
LEFT SIDE

NOTES:
CONTACT THE MANUFACTURER WITH SITE SPECIFIC DATA (SSD) FOR CONCRETE PAD AND ANCHOR BLOCK INSTALLATION REQUIREMENTS.

A MANUFACTURER'S DRAWING PACKAGE UNIQUE AND SPECIFIC FOR THE QUADGUARD ELITE M10 FIELD INSTALATION AND INFORMATION REGARDING THE TYPE OF BACKUP ASSEMBLY REQUIRED FOR THE TRANSITION WILL BE PROVIDED BY THE MANUFACTURER TO THE ENGINEER AND INSTALLER.

6" REINFORCED CONCRETE PAD REQUIRES THE INSTALLATION OF AN ANCHOR BLOCK AS SHOWN ON THE MANUFACTURER'S DRAWING PACKAGE.

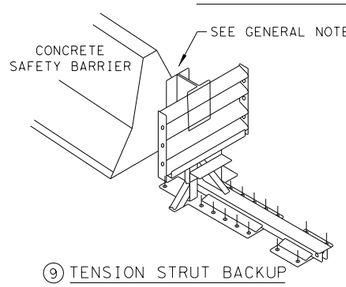
8" NON-REINFORCED CONCRETE PAD MAY NOT REQUIRE AN ANCHOR BLOCK, IF THE PAD IS INSTALLED AGAINST AN IMMOVABLE CONCRETE BACKUP.

CONCRETE PAD AND ANCHOR BLOCK COMBINATIONS SHALL BE CONFIRMED WITH THE MANUFACTURER BASED UPON SITE SPECIFIC DATA (SSD).

NOTE:
THE QUADGUARD ELITE M10 8-BAY, 24" WIDE - NARROW SYSTEM TESTED TO MASH TEST LEVEL 3.

TL-3 MODEL #	QM10024E	CYLINDER TYPES IN BAYS			
BAYS	8	TYPE-ME3	TYPE-ME2	TYPE-ME1	TYPE-QEN
DIAPHRAGMS	8	4	3	1	1
WIDTH	24"	REAR	FRONT		NOSE

BACKUP ASSEMBLY TYPES FOR SYSTEM TRANSITIONS

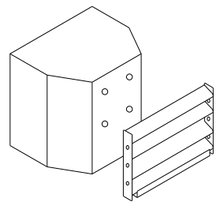


9 TENSION STRUT BACKUP

SYSTEM TRANSITIONS TYPES	
1	QUAD-BEAM TO CONCRETE SAFETY BARRIER
2	QUAD-BEAM TO CONCRETE BRIDGE RAIL
3	QUAD-BEAM TO CONCRETE END SHOE
4	QUAD-BEAM TO THRIE-BEAM RAIL
5	QUAD-BEAM TO W-BEAM RAIL

NOTE:
TRANSITION ASSEMBLIES FOR THE QUADGUARD ELITE M10 TO THRIE-BEAM OR W-BEAM FENCE REQUIRES I-BEAM POSTS:

ALL POSTS W6X8.5/9 I-BEAMS (78" LONG).



9 CONCRETE BACKUP

NOTES:
CONTACT THE MANUFACTURER WITH SITE SPECIFIC DATA (SSD) FOR THE CORRECT BACKUP ASSEMBLY AND TRANSITION PANELS OR SIDE PANELS USED FOR STANDARD AND BI-DIRECTIONAL INSTALLATIONS: AT DIVIDED-HIGHWAY MEDIANS OR UNDIVIDED ROADWAYS WHERE THE SYSTEM IS EXPOSED TO IMPACTS FROM ONE OR TWO DIFFERENT DIRECTIONS OF TRAFFIC FLOW.

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE QUADGUARD ELITE M10 SYSTEM AND IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY - ENERGY ABSORPTION INC. AT 1(888)323-6374.
2. SEE THE RECENT QUADGUARD ELITE M10 PRODUCT DESCRIPTION ASSEMBLY MANUAL FOR IMPACT PERFORMANCE CHARACTERISTICS AND DESIGN LIMITATIONS AND THE DRAWING PACKAGE FOR THE NARROW 24" SYSTEM BEFORE INSTALLING THE QUADGUARD ELITE M10 AT ANY GIVEN LOCATION.
3. FOR BI-DIRECTIONAL TRAFFIC: THE LOCATION AND OR WIDTH OF THE QUADGUARD ELITE M10 IS RESTRICTED. AS BI-DIRECTIONAL TRAFFIC APPROACHES THE REAR OF THE QUADGUARD ELITE M10, THE QUADGUARD ELITE M10 SHOULD NOT EXTEND FURTHER INTO THE TRAFFIC-SIDE OF THE BARRIER THAN THE OBSTACLE. ANY TRANSITION INSTALLED MUST EITHER BE TANGENT TO BOTH QUADGUARD ELITE M10 AND OBSTACLE OR MUST ANGLE TOWARD FIELD SIDE OF THE BARRIER.
4. SYSTEM TRANSITION: APPROPRIATE TRANSITION PANELS OR SIDE PANELS WILL BE REQUIRED FOR PROPER IMPACT PERFORMANCE. THE CORRECT PANEL(S) TO USE WILL DEPEND ON THE DIRECTION OF TRAFFIC FLOW AND WHAT TYPE OF BARRIER OR ROAD FEATURE THE QUADGUARD ELITE M10 SYSTEM IS SHIELDING. SEE THE QUADGUARD ELITE M10 PRODUCT DESCRIPTION & ASSEMBLY MANUAL FOR FURTHER DETAILS.
5. COMPONENTS FOR THE QUADGUARD ELITE (M10) BACKUP AND REINFORCING DETAILS ARE SHOWN ON THE QUADGUARD ELITE M10 PRODUCT DESCRIPTION & ASSEMBLY MANUAL.
6. CONCRETE PAD SHALL BE 6" MIN. REINFORCED 28MPa [4,000 PSI] (P.C.) OR 8" MIN. NON-REINFORCED 28MPa [4,000 PSI] CONCRETE ROADWAY MEASURING AT LEAST 12'-0" WIDE BY 50'-0" LONG. ANCHOR BLOCK IS NOT REQUIRED WHEN USING 8" CONCRETE PAD INSTALLED AGAINST AN IMMOVABLE STRUCTURE, E.G. CONCRETE WALL.
7. IF THE CROSS-SLOPE VARIES MORE THAN 2% OVER THE LENGTH OF THE SYSTEM, THE CONCRETE PAD WILL REQUIRE LEVELING. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
8. THE INSTALLATION AREA SHOULD BE FREE OF CURBS, ELEVATED OBJECTS,OR DEPRESSIONS.
9. THE QUADGUARD ELITE M10 SYSTEM SHOULD BE INSTALLED APPROXIMATELY PARALLEL WITH THE BARRIER.
10. FOR THE TENSION STRUT BACKUP THE DISTANCE BETWEEN THE BACK OF BACKUP AND THE BARRIER WALL SHOULD NOT EXCEED 7" IN ANY CASE.
11. TXDOT HAS ONLY APPROVED THE 24" WIDE QUADGUARD ELITE M10 SYSTEM. THE QUADGUARD ELITE M10 PRODUCT DESCRIPTION AND ASSEMBLY MANUAL INCLUDES SYSTEM WIDTH OF 24". ONLY THE 24" SYSTEM IS ALLOWED TO BE INSTALLED ON TEXAS ROADWAYS.

FOUNDATION & ANCHORING REQUIREMENTS FOUNDATION TYPES: A, B, C, & D	
FOUNDATION TYPE: A	REINFORCED CONCRETE PAD OR ROADWAY
FOUNDATION:	6" MINIMUM DEPTH (P.C.C.)
ANCHORAGE:	7" STUDS EMBEDDED 5 ½" - APPROVED ADHESIVE
FOUNDATION TYPE: B	ASPHALT OVER P.C.C.
FOUNDATION:	3" MIN. (A.C.) OVER 3" MIN. (P.C.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE
FOUNDATION TYPE: C	ASPHALT OVER SUBBASE
FOUNDATION:	6" MIN. (A.C.) OVER 6" MIN. (C.S.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE
FOUNDATION TYPE: D	ASPHALT ONLY
FOUNDATION:	8" MIN. (A.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 ½" - APPROVED ADHESIVE

KEY:
ASPHALT CONCRETE (A.C.)
COMPACTED SUBBASE (C.S.)
PORTLAND CEMENT CONCRETE (P.C.C.)

NOTE: SEE TRINITY'S PRODUCT DESCRIPTION ASSEMBLY MANUAL FOR THE APPROVED ADHESIVE.

IF THE UNIT IS ANCHORED TO ASPHALTIC CONCRETE, IT SHOULD BE RELOCATED TO FRESH, UNDISTURBED ASPHALT AND RE-ANCHORED AFTER EACH IMPACT TO ENSURE ADEQUATE FUTURE PERFORMANCE.

TENSION STRUT BACKUP MAY BE USED IN CONSTRUCTION ZONES ON ASPHALT CONCRETE (A.C.) FOR TEMPORARY USE ONLY.

LOW MAINTENANCE

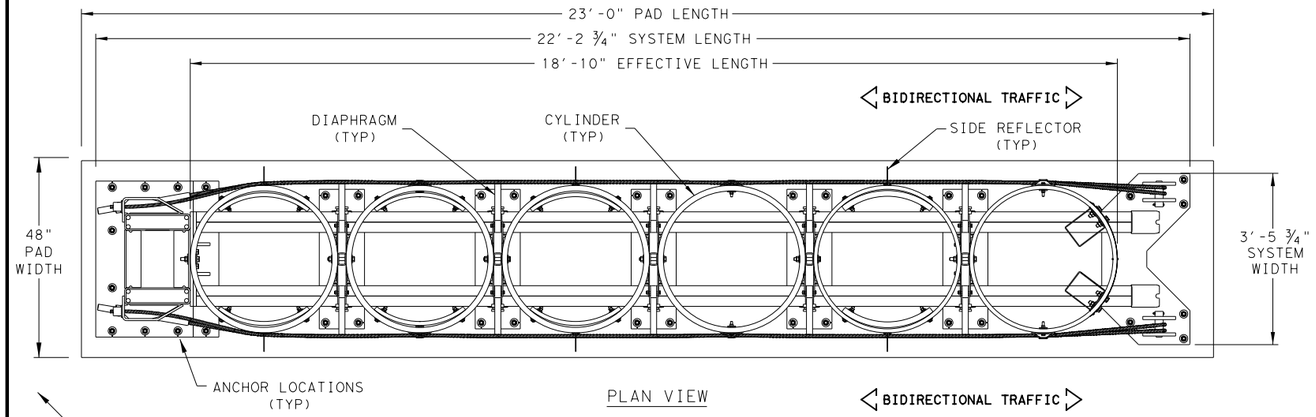
Texas Department of Transportation — Design Division Standard

TRINITY HIGHWAY ENERGY ABSORPTION QUADGUARD ELITE M10 (MASH TL-3)

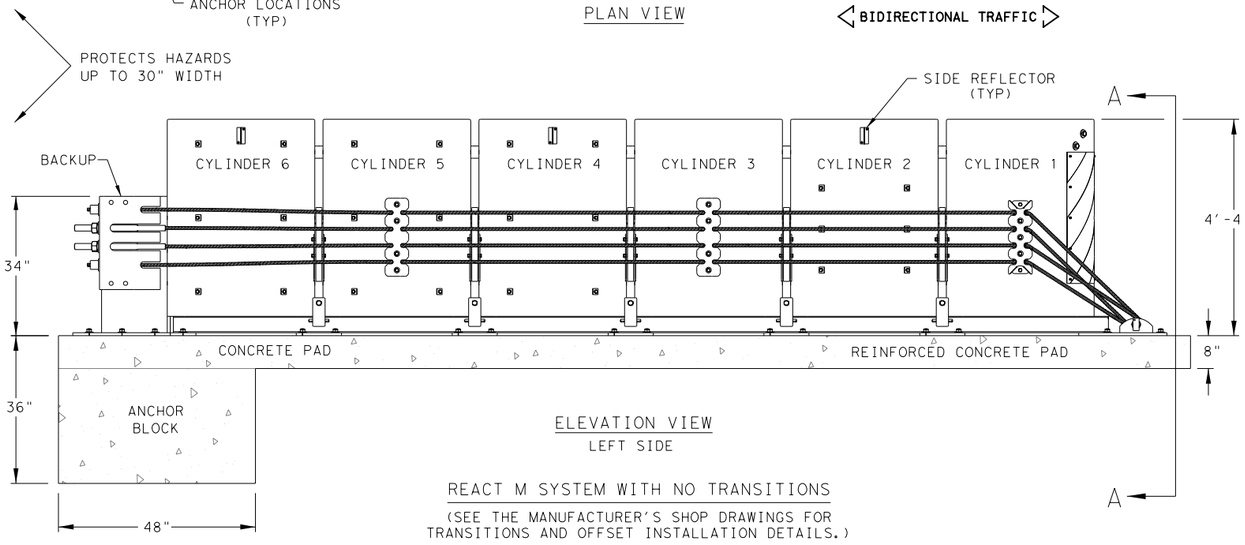
QGELITE(M10)(N)-20

FILE: qgelitem10n20.dgn	DN: TxDOT	CK: KM	DW: VP	CK: AG
© TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		46

DATE: 3/4/2024
FILE: QGELITE(M10)(N)-20.dgn



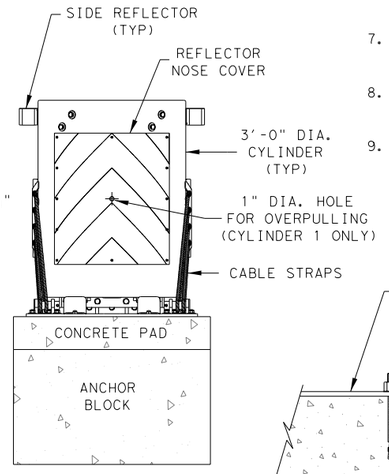
PLAN VIEW



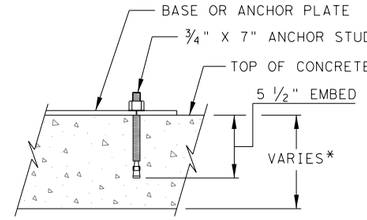
ELEVATION VIEW
LEFT SIDE

REACT M SYSTEM WITH NO TRANSITIONS

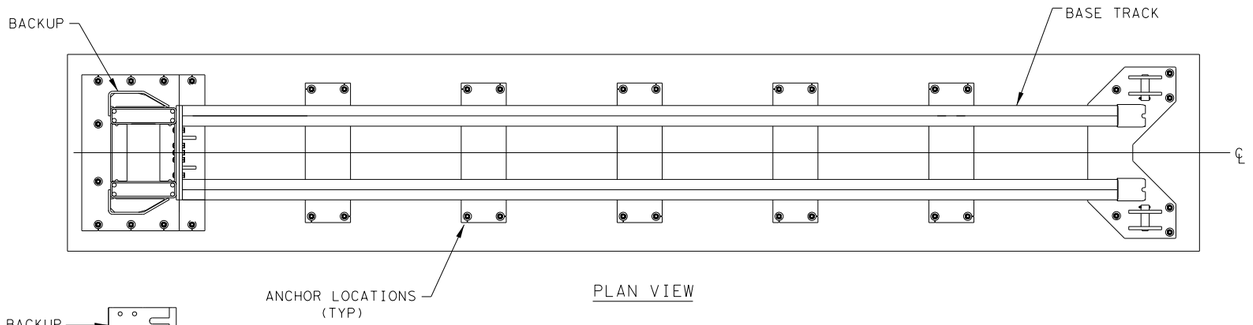
(SEE THE MANUFACTURER'S SHOP DRAWINGS FOR TRANSITIONS AND OFFSET INSTALLATION DETAILS.)



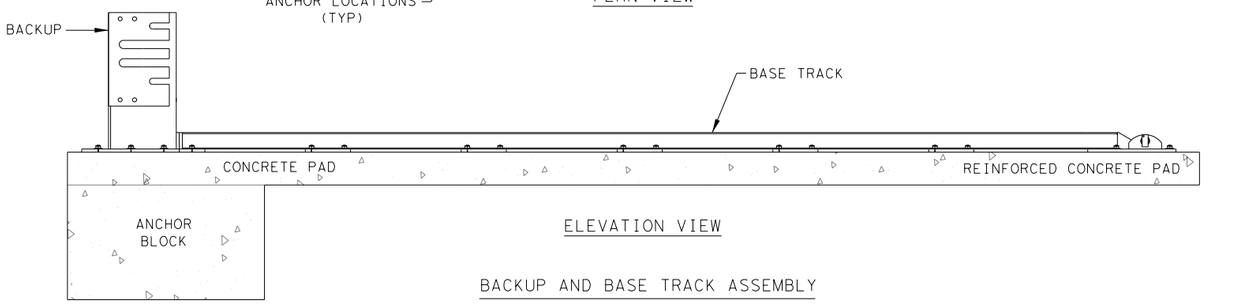
VIEW A-A



ANCHORING DETAIL
*SEE FOUNDATION TYPES TABLE



PLAN VIEW



ELEVATION VIEW

BACKUP AND BASE TRACK ASSEMBLY

(SEE THE MANUFACTURER'S SHOP DRAWINGS FOR TRANSITIONS, OFFSETS, BIDIRECTIONAL AND UNIDIRECTIONAL INSTALLATION DETAILS.)

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY - ENERGY ABSORPTION AT 1(888)323-6374 OR WEBSITE: www.trinityhighway.com.
2. THE NOSE OF THE REACT M SHALL BE CLAD WITH A PLASTIC WRAP WITH STANDARD DELINEATION ADHERED TO THE WRAP AND SHALL HAVE A SERIES OF SIDE MARKER REFLECTORS ON BOTH SIDES OF THE UNIT. SEE SITE PLAN VIEWS FOR MARKER AND PLASTIC WRAP COLOR ORIENTATION.
3. FOR BI-DIRECTIONAL TRAFFIC, APPROPRIATE TRANSITION DETAILS WILL BE AS SHOWN ON THE MANUFACTURER'S SHOP DRAWINGS.
4. DETAILS OF COMPONENTS FOR THE REACT M, BACKUPS AND REINFORCING DETAILS WILL BE SHOWN ON THE MANUFACTURER'S SHOP DRAWINGS FURNISHED TO THE ENGINEER.
5. IF THE CROSS-SLOPE VARIES MORE THAN 2% OVER THE LENGTH OF THE SYSTEM, THE CONCRETE PAD WILL REQUIRE LEVELING. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
6. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
7. THE REACT M SYSTEM SHOULD BE APPROXIMATELY PARALLEL WITH THE BARRIER OR CENTERLINE OF MERGING BARRIERS.
8. ALL STEEL COMPONENTS TO BE HOT DIPPED GALVANIZED EXCEPT STAKES, DRIVE SPIKES, THREADED BOLTS IN BACKUP UNIT, AND WEDGE FITTINGS ON CABLES.
9. THIS DRAWING REPRESENTS THE REACT M TL-3 SYSTEM, RE-DIRECTIVE, NON-GATING CRASH CUSHION THAT CAN PROTECT HAZARDS UP TO 30-INCHES IN WIDTH.

DESIGN DATA TABLE FOR REACT M

TEST NUMBER	TEST LEVEL	OVERALL LENGTH	TRANSITION LENGTH	SYSTEM WIDTH
3-30 TO 3-36	TL-3	22′-2 ¾"	-	3′-5 ¾"
3-37A	TL-3	22′-2 ¾"	9′-10 ¾"	3′-5 ¾"
3-38	TL-3	22′-2 ¾"	-	3′-5 ¾"

ANCHOR SYSTEM TYPE

APPROVED ADHESIVE, 7" STUDS, 5.5" EMBEDMENT

FOUNDATION TYPES

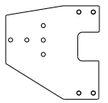
MINIMUM 8" REINFORCED PORTLAND CEMENT CONCRETE PAD (REQUIRED REINFORCING STEEL FOR CONCRETE PAD SHALL BE SHOWN ON THE MANUFACTURER'S SHOP DRAWINGS.

MINIMUM 8" NON-REINFORCED PORTLAND CEMENT CONCRETE ROADWAY MEASURING AT LEAST 12′ WIDE BY 50′ LONG)

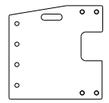
MINIMUM 7" CONCRETE DECK STRUCTURE, OR MINIMUM 6" REINFORCED CONCRETE ROADWAY

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE REACT M SYSTEM AND IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

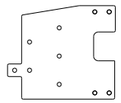
BACKUP ASSEMBLY TYPES FOR SYSTEM TRANSITIONS



SAFETY SHAPE BARRIER TRANSITION (ADAPTER)
TRANSITION PLATE(S) (OPTIONAL)
REQUIRED W/BI-DIRECTIONAL TRAFFIC FLOWS ONLY.



VERTICAL WALL BARRIER TRANSITION (ADAPTER)
TRANSITION PLATE(S) (OPTIONAL)
REQUIRED W/UNIDIRECTIONAL TRAFFIC FLOWS ONLY.



VERTICAL WALL BARRIER TRANSITION (ADAPTER)
TRANSITION PLATE(S) (OPTIONAL)
REQUIRED W/BI-DIRECTIONAL TRAFFIC FLOWS ONLY.

NOTES:
CONTACT THE MANUFACTURER WITH SITE SPECIFIC DATA (SSD) FOR THE CORRECT BACKUP ASSEMBLY AND TRANSITION PANELS OR SIDE PANELS USED FOR STANDARD AND BI-DIRECTIONAL INSTALLATIONS: AT DIVIDED-HIGHWAY MEDIANS OR UNDIVIDED ROADWAYS WHERE THE SYSTEM IS EXPOSED TO IMPACTS FROM ONE OR TWO DIFFERENT DIRECTIONS OF TRAFFIC FLOW.

LOW MAINTENANCE

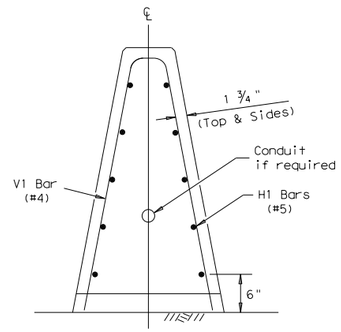
Texas Department of Transportation — Design Division Standard

TRINITY HIGHWAY ENERGY ABSORPTION CRASH CUSHION REACT M (NARROW) (MASH TL-3)

REACT(M)-21

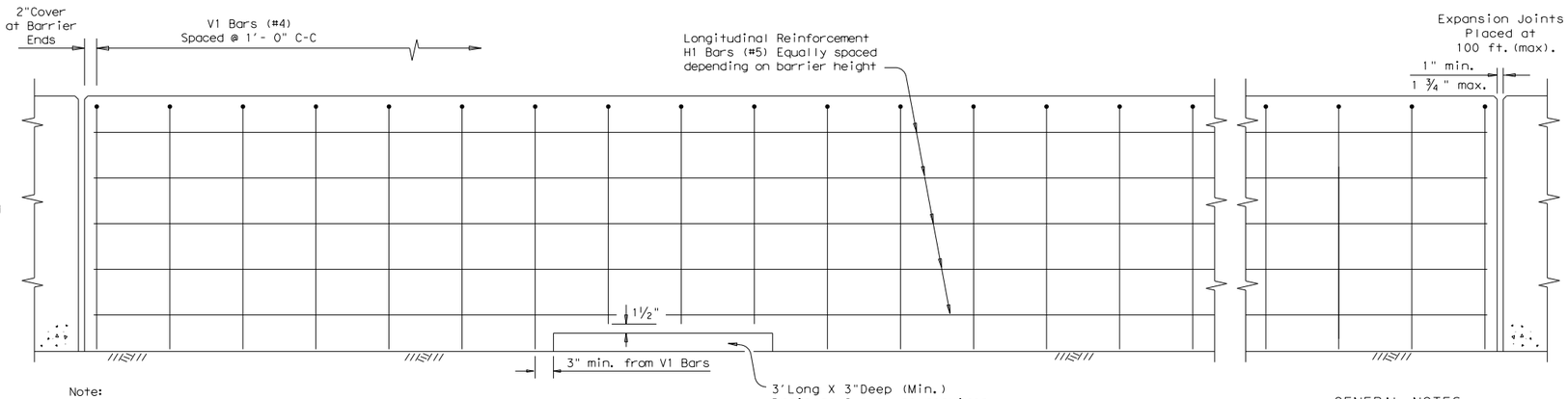
FILE: reactm21.dgn	DN: TXDOT	CK: KM	DW: SS	CK: CL
©TxDOT: JULY 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		47

DATE: 3/4/2024
FILE: $FILE$



END VIEW

CAST-IN-PLACE (CIP) BARRIER
Barrier is Symmetrical About the Center Line



Note:
Bottom of reinforcement cage may rest on top of the finished grade.

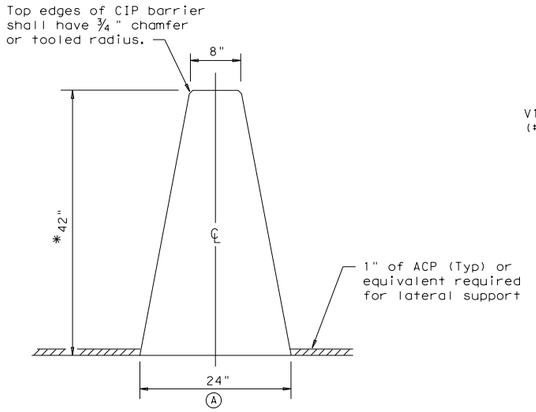
Reinforcement around the drainage slots may be cut or bent to accommodate the edge and top clearances.

ELEVATION VIEW

Cast-in-Place (SSCB)(Type 2)on Roadway

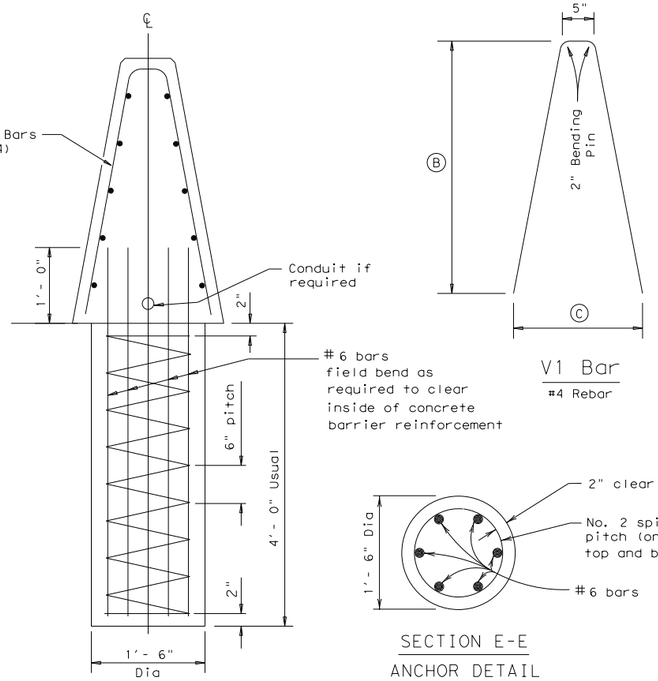
GENERAL NOTES

1. Concrete shall be Class C. Unless otherwise specified in the plans.
2. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
3. These details cover barrier per Item 514,"Permanent Concrete Traffic Barrier".
4. The Anchorage shown is considered subsidiary to the bid item.
5. Top edges of CIP barrier shall have a ¾ " chamfer or tooled radius.
6. Drainage slot locations (12'- 0", C-C Min. Spacing) are shown elsewhere, or as directed by the Engineer. Drainage slot heights on the SSCB may be increased to a maximum of 5 inches, without geometric changes to the barrier face.
7. Cast-in-place barrier may be slip formed. Bracing may be tied or tack welded to the reinforcement cage to provide cage stability. Do not weld to anchorage.
8. For locations where lighting is required, see the SSCB(4) sheet for the proper reinforcement and anchorage.



SINGLE SLOPE CONCRETE BARRIER

(SSCB)(42")



SECTION D-D

ANCHOR DETAIL

V1 Bar

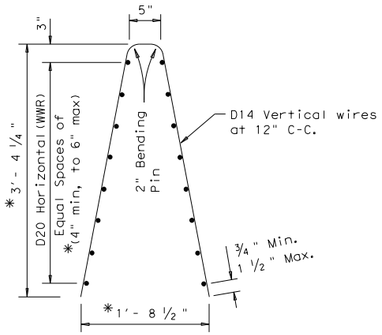
#4 Rebar

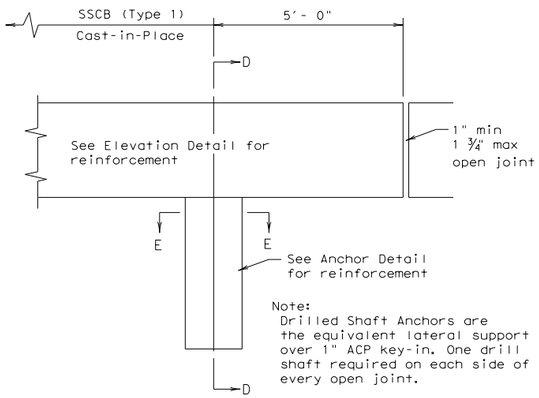
BARRIER HEIGHT (IN.)	* DIMENSIONS (IN.)		
	Ⓐ	Ⓑ	Ⓒ
42	24	40 ¼	20 ½
48	26 ¼	46 ¼	22 ¾
54	28 ½	52 ¼	25 ⅛

*(SSCB)(42") Barrier height may be increased to 48" or 54". This would increase the barrier and reinforcement dimensions accordingly.

SECTION E-E

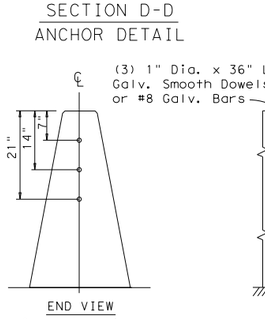
ANCHOR DETAIL





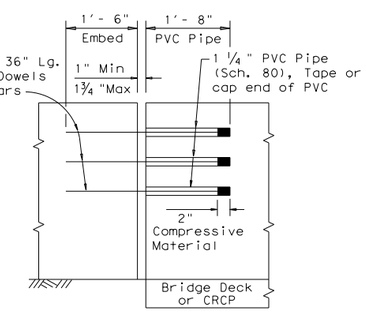
ELEVATION

ANCHOR LOCATION



END VIEW

Dowel locations



EXPANSION JOINT (Dowel Connection)

Dowels may be used, as directed by the Engineer, in locations where the barrier could be laterally displaced.

Welded Wire Reinforcement (WWR) Option for Bars V1 and H1

(WWR) General Notes

1. Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
2. Welded wire cage may be cut and bent to accommodate the drainage slots, as directed by the Engineer.
3. Welded wire splice locations shall have a "minimum" splice lap length of 12".
4. Combinations of reinforcing steel and WWR will be permitted, as directed by the Engineer. The dimension from the end of the barrier section to the first wire shall not exceed 3".

Cast-In-Place (CIP) or Slip-Formed (SSCB)

Cast-in-Place barrier may be connected to precast SSCB. Joint connection "Types" may be used in Cast-in-Place barrier, to match the precast barrier connection. (See required connection "Type" elsewhere in the plans)

The weight of Cast-in-Place (SSCB)42" is approx. 717 lbs per ft.

Texas Department of Transportation — Design Division Standard

SINGLE SLOPE CONCRETE BARRIER

CAST-IN-PLACE
(TYPE 1)
(FLEXIBLE PAVEMENT)

SSCB(1F)-10

FILE: sscb1f10.dgn	DN: TxDOT	CK: AM	DW: BD	CK:
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112,ETC.	SH 136,ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON,ETC.		48

DATE: 3/4/2024
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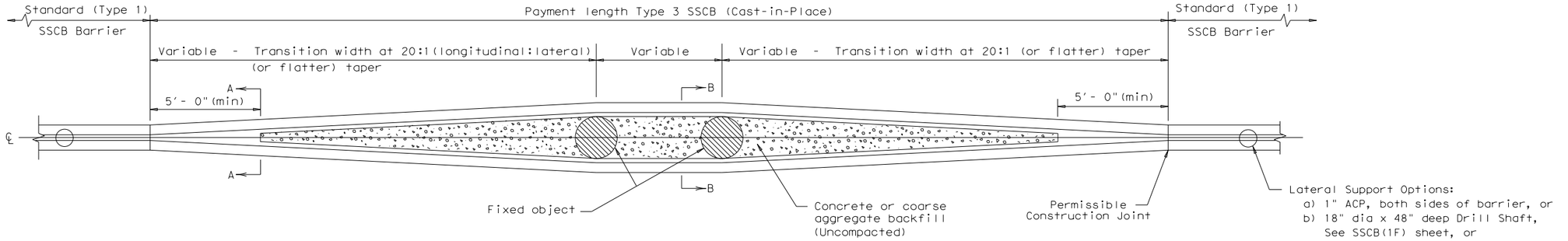
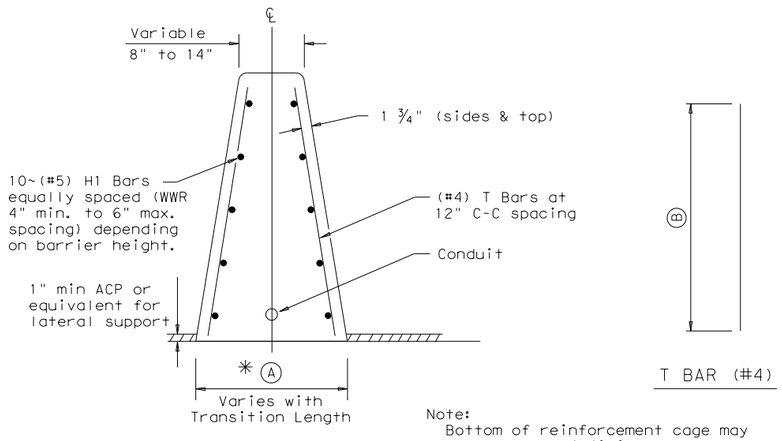


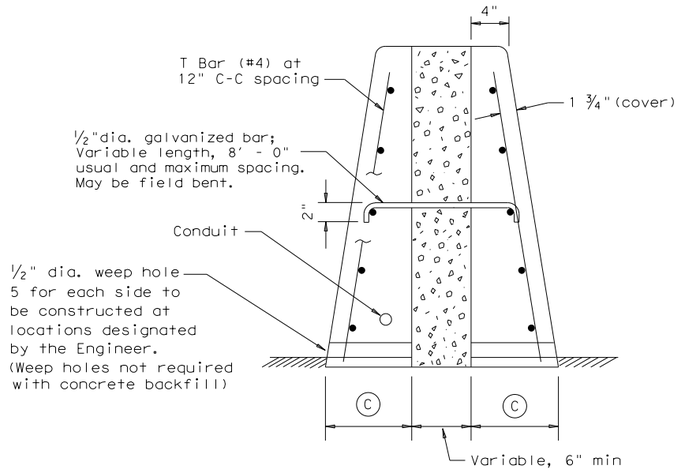
PLAN (TYPE 3) BARRIER



SECTION A-A

T BAR (#4)

Note:
Bottom of reinforcement cage may rest on top of finished grade.



SECTION B-B

GENERAL NOTES

1. Axis of concrete barrier shall be vertical, except where roadway is superelevated, then axis shall be normal to roadway surface.
2. All steel that requires galvanizing shall be in accordance with Item 445, "Galvanizing."
3. Bid price per liner foot of (Type 3) SSCB, including anchor sections, shall include all of the concrete, reinforcement, and aggregate backfill.
4. All concrete shall be Class C.
5. Longitudinal and vertical bars for roadway barrier shall conform to ASTM A615 (Grade 60), unless otherwise specified.
6. At construction joints the longitudinal bars shall extend beyond the joint so that bar splices will be a minimum of two feet from the construction joint.
7. Welded wire reinforcement (WWR) may be used as an option to conventional reinforcement and shall meet requirements shown.
8. Any method devised by the contractor and approved by the Engineer that will assure the longitudinal steel for and (Type 3) SSCB will be positioned ± ½inch as dimensioned will be satisfactory.
9. Conduit to be provided only when called for elsewhere in the plans. Position of conduit may be adjusted to facilitate construction subject to the approval of the Engineer.
10. See SSCB(4) standard for barrier with illumination.

Barrier height (IN.)	✳ Dimensions (IN.)		
	Ⓐ	Ⓑ	Ⓒ
42	24 Plus	40 ¼	12
48	26 ¼ Plus	46 ¼	13 ⅛
54	28 ½ Plus	52 ¼	14 ¼

✳(SSCB)(42") Barrier height may be increased to 48" or 54". This would increase the barrier and reinforcement dimensions accordingly.

Welded Wire Reinforcement (WWR) Option for Bars T and H1 (Type 3) Barrier

(WWR) General Notes

1. WWR design required for (Type 3) SSCB barrier: D14 vertical (12" C-C) x D20 horizontal wires spaced (4" min. to 6" max.) as height requires.
2. Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
3. Welded wire cage may be cut and bent to accommodate the drainage slots, as directed by the Engineer.
4. Welded wire splice locations shall have a "minimum" splice lap length of 12".
5. Combinations of reinforcing steel and WWR will be permitted, as directed by the Engineer. The dimension from the end of the barrier section to the first wire shall not exceed 3".

Texas Department of Transportation

Design Division Standard

SINGLE SLOPE CONCRETE BARRIER

CAST-IN-PLACE
(TYPE 3)
AT FIXED OBJECTS

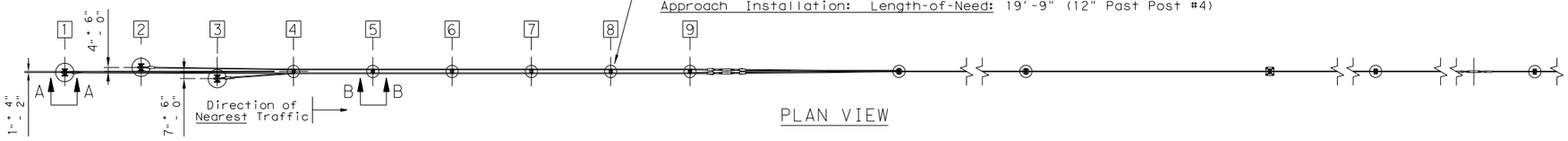
SSCB(3)-10

FILE: sscb310.dgn	DN: TxDOT	CK: AM	DW: BD	CK:
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		49

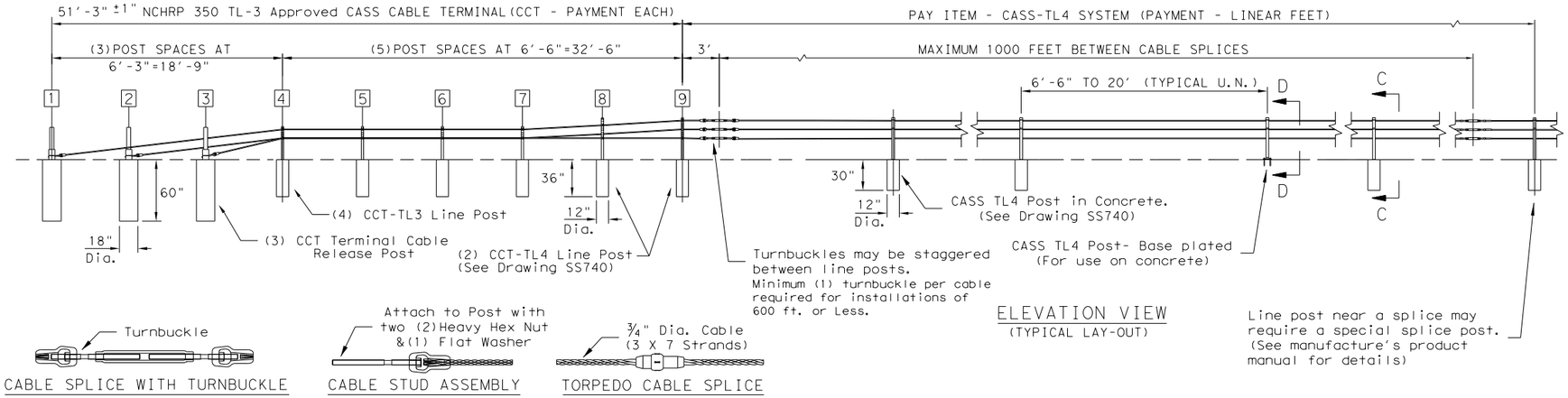
DATE: 3/4/2024
FILE: SSCB(3)-10.dgn

Preferred Installation: Locate post #2 away from nearest traffic.
System has been succesfully tested with opposite installation.

Length-of-Need Cass Cable Terminal (CCT):
Departure Installation: Length-of-Need: 44'-9" (At Post #8)
Approach Installation: Length-of-Need: 19'-9" (12" Past Post #4)



PLAN VIEW

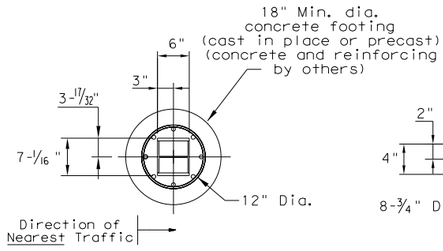


ELEVATION VIEW
(TYPICAL LAY-OUT)

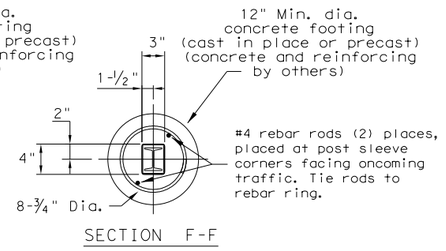
CABLE SPLICE WITH TURNBUCKLE
(OPEN BODY STYLE)

CABLE STUD ASSEMBLY

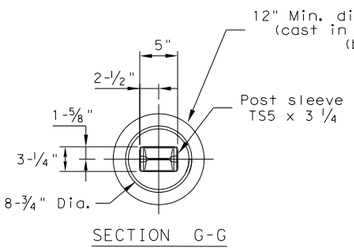
TORPEDO CABLE SPLICE



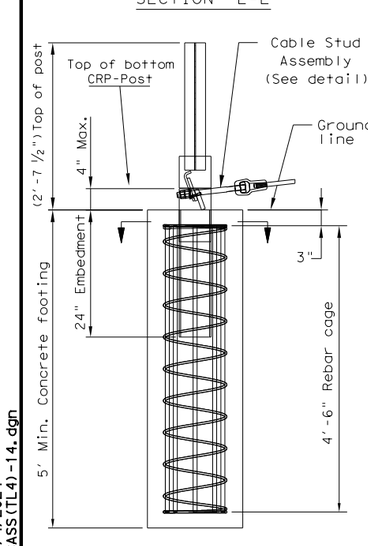
SECTION E-E



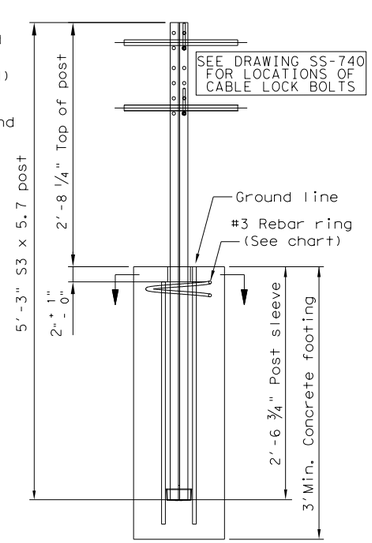
SECTION F-F



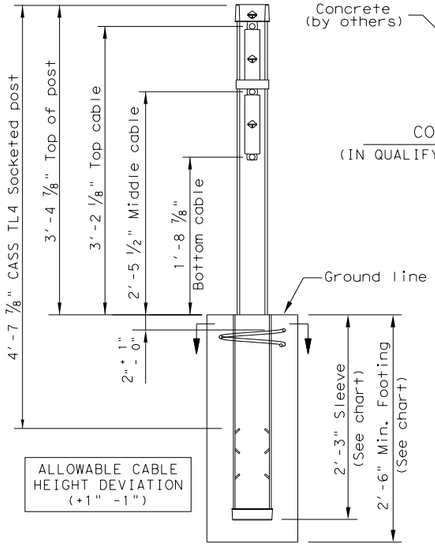
SECTION G-G



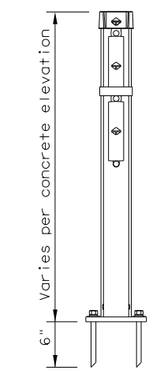
VIEW A-A
(CABLE RELEASE POST 1-3)



VIEW B-B
(TERMINAL LINE POST 4-7)

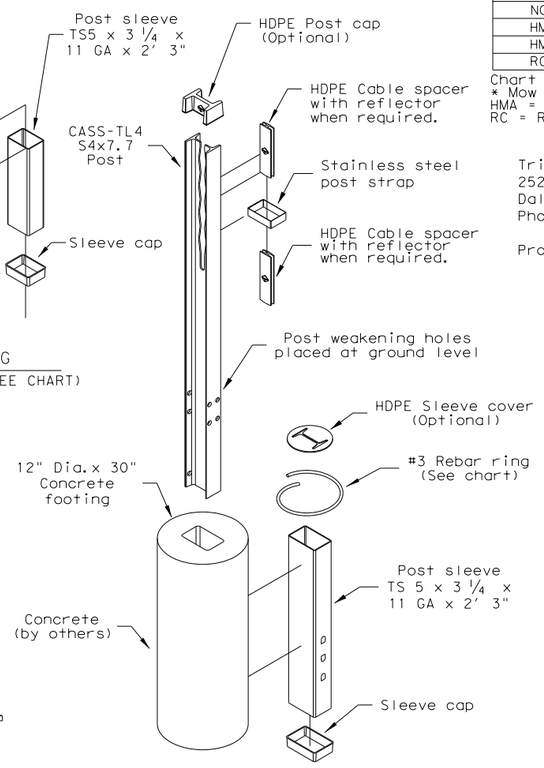


SECTION C-C
(SOCKETED POST)



SECTION D-D
(BASE PLATED POST)

CONCRETE FOOTING
(IN QUALIFYING MOW STRIP SEE CHART)



STANDARD POST & CONCRETE FOOTING
(SOCKETED POST)

GENERAL NOTES

1. This drawing is a general overview of CASS TL-4 Barrier System. See SS-740 (latest version) for specific details of CASS cable terminal (CCT) and cable safety system (CASS) requirements, proper installation, options and specification.
2. CASS is designed for bi-directional traffic flows and can be installed on either side of the median. Contact Trinity (800-527-6050) or consult the design, installation, or repair manual(s) for additional information.
3. All concrete for CASS footings shall be TxDOT class A. If class A or stronger concrete is utilized for the mowstrip, please see chart below for allowable footing depth and sleeve deviations.
4. All posts shall be socketed unless otherwise specified. All cables shall be pre-stretched unless otherwise specified.
5. For payment see Special Specification "Cable Barrier System".
6. CASS-TL4 shall be installed on shoulders or medians with slopes of 6:1 or flatter without obstructions, depressions, etc. That may significantly affect the stability of an errant vehicle. Grading of site and/or appropriate fill materials may be required. The designer/installer shall "Flatten" or "Round" various topographical inconsistencies that could interfere with the ability of the installer to consistently maintain the design height (in relation to the terrain) of the cables. Please consult manual(s) and / or TxDOT Memo(s) for installations in "Ditch Sections".
7. CASS TL-4 post spacing may be modified to avoid obstacles that conflict with the installation of cass-tl4 line posts or to reduce deflection on radiuses. No post space can exceed the maximum post TxDOT space limit of 20'. Reducing or increasing post spacing affects deflection. CASS TL-4 may be laterally transferred at a rate not to exceed 30:1.
8. Post foundations may be drilled through existing pavement. Please see line post foundation chart for minimum footing requirements in various applications.
9. For aesthetic purposes Trinity recommends all sleeves, driven posts, and lower cable release posts to be installed reasonably plumb (approximately 1/8" per foot).
10. CASS TL-4 shall be installed in well-drained, compacted, NCHRP Report 350 Standard soil. If soil does not meet this classification, if solid rock/concrete is encountered below grade or if soil is susceptable to severe freeze/thaw cycles, please contact Trinity about alternate footing design(s). Trinity suggests the use of "Mow strips" for erosion prevention and ease of maintenance / installation.
11. See the Texas MUTCD for proper "Barrier" Delineation.

MOW STRIP DETAIL*			CONCRETE FOOTING CHART		
MOW STRIP	DEPTH	WIDTH	FOOTING	TUBE SLEEVE	REBAR RING
NONE			30" Min.	27" Min.	YES
HMA	6" Min.	3' Min.	27" Min.	15" Min.	NO
HMA	8" Min.	3' Min.	24" Min.	15" Min.	NO
RC	3" Min.	3' Min.	24" Min.	15" Min.	NO

Chart does not apply to Terminal Posts 1 thru 9.
* Mow strip or pavement.
HMA = Hot Mix Asphalt (Not Recycled Asphalt Pavement).
RC = Reinforced Concrete (TxDOT Class A Minimum).

Trinity Highway Products, LLC.
2525 Stemmons Freeway
Dallas, TX 75207
Phone: (800) 644-7976

Product.INFO@TRIN.NET

CABLE TENSION CHART	
FAHRENHEIT	PRE-STRETCHED
DEGREES	LB / FORCE
-10	7300
0	7000
10	6600
20	6300
30	6000
40	5600
50	5300
60	5000
70	4600
80	4300
90	4000
100	3600
110	3300
120	3000
130	2700
140	2500
150	2300

Allowable deviation from chart in tangent sections: +800, -200 pounds/force. Cable tension readings are typically higher in curved cable sections.

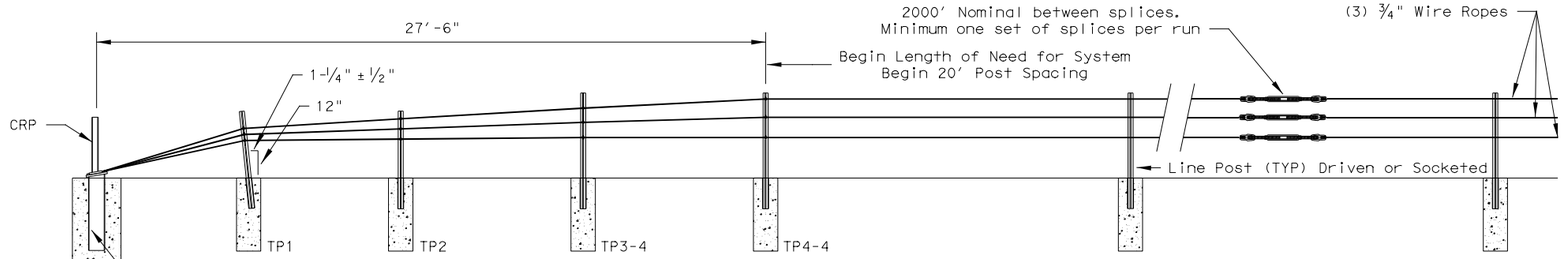
Texas Department of Transportation — Design Division Standard

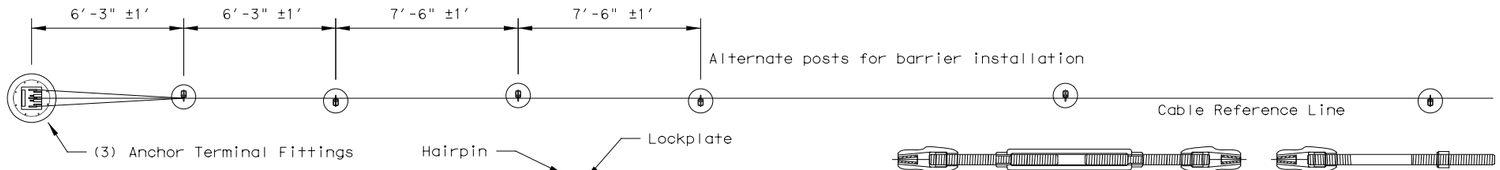
TRINITY CABLE SAFETY SYSTEM (TL-4)

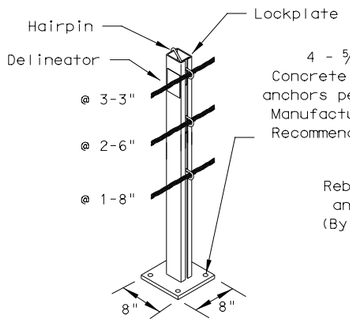
CASS(TL4)-14

FILE: casstl414.dgn	DN: TxDOT	CK: RM	DW: VP	CK:	
©TxDOT: March 2014	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0356	01	112, ETC.	SH 136, ETC.	
	DIST	COUNTY		SHEET NO.	
	AMA	HUTCHINSON, ETC.		50	

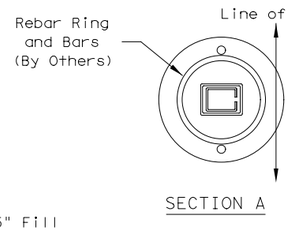
DATE: 3/4/2024
FILE: CASS(TL4)-14.dgn



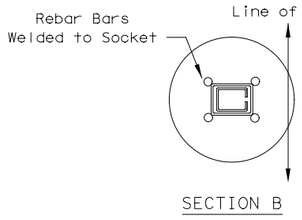




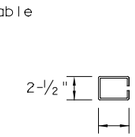
LINE POST
(BASE-PLATED OPTION)
Low-Fill Box Culvert Less than 15" Fill



SECTION A



SECTION B



C-SECTION POST

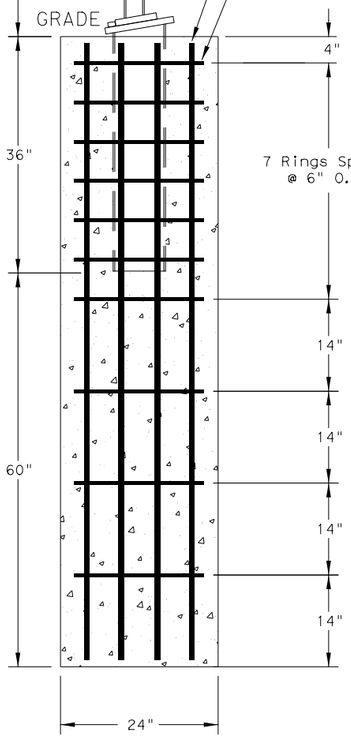
GENERAL NOTES

1. For additional information contact Gibraltar, Inc. at 1-800-495-8957, 830-798-5444, or see the manufacturer's product manual.
2. All concrete shall be CLASS A.
3. The Cable Barrier System shall be installed on shoulders or on medians with slopes of 6:1 or flatter. If installed on slopes steeper than 6:1 up to 4:1 the TL-4 system performs as a TL-3 and Gibraltar must be contacted for various guidelines related to placement.
4. The Cable Barrier System is accepted by the FHWA Test Level - 4.
5. See the Texas MUTCD for proper "Barrier" delineation.
6. Rock Clause: Where solid rock is encountered:
   A. For socketed post, continue digging 12" diameter, 15" deep into rock or the required plan depth, whichever comes first.
   B. For driven post, core drill a 4" diameter hole 18" deep into rock or the required plan depth, whichever comes first.
   C. For Anchor post, continue digging 24" diameter, 30" deep into rock or the required plan depth, whichever comes first.
7. Tolerances:
   * LP = 3" out of plumb, at top
   * Cable height = 1"
   * Anchor Post = 5" off of Cable Reference Line
8. The Gibraltar cable barrier system shall be installed in NCHRP Report 350 standard compacted soil. Soil must be well drained.
9. All non-welded rebar by others.
10. Minimum recommended line post foundation.
    A. Without mowstrip, 36" Deep x 12" diameter foundations with #3 rebar ring x 8" diameter with two #4 rebar vertical bars 30" long
    B. With 4" minimum depth hot mix asphalt, 30" deep x 12" diameter foundations with #3 rebar ring x 8" diameter with two #4 rebar vertical bars 30" long.
    C. With 3" minimum depth concrete mowstrip, 24" deep x 12" diameter foundations. (No rebar required)
    D. Direct drive post 42" deep.

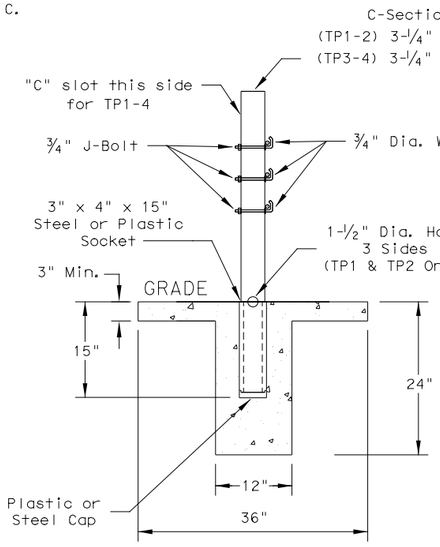
CABLE TENSION CHART*	
-10 °F	8000
0 °F	7600
10 °F	7200
20 °F	6800
30 °F	6400
40 °F	6000
50 °F	5600
60 °F	5200
70 °F	4800
80 °F	4400
90 °F	4000
100 °F	3600
110 °F	3200

DEFLECTION	
Deflection	Post Spacing
8'-0"	20 FT
7'-0"	12 FT
6'-8"	10 FT

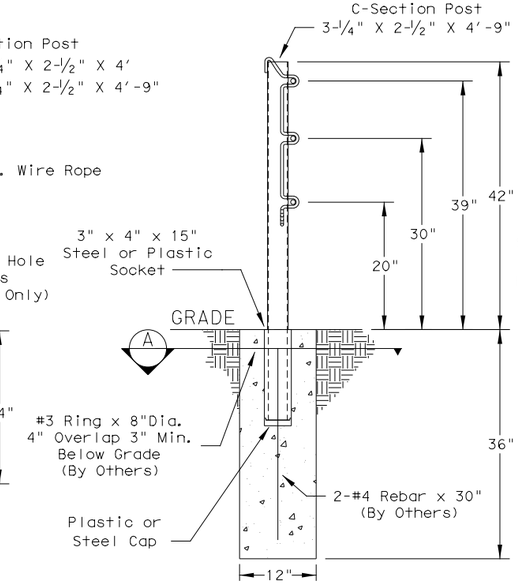
* Allowable Deviation from Chart +/- 10%



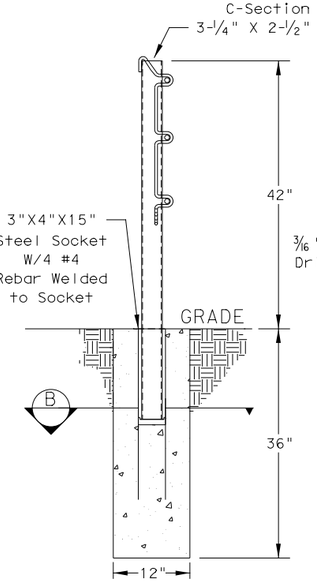
CABLE RELEASE AND ANCHOR POST



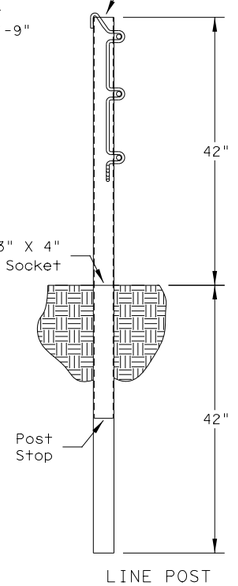
TERMINAL POST
(SHOWN WITH CONCRETE MOWSTRIP)
(Shown with Tube Plate Option)
(See Note 10)



LINE POST SOCKETED
(Shown with Rebar Ring/Bars Socket Option)
(See Note 9)



LINE POST SOCKETED
(Shown with Welded Rebar Socket Option)
(See Note 9)



LINE POST
(DRIVEN OPTION)
(Shown with Driven
Socket Option)
(See Note 9)

Texas Department of Transportation

Design Division Standard

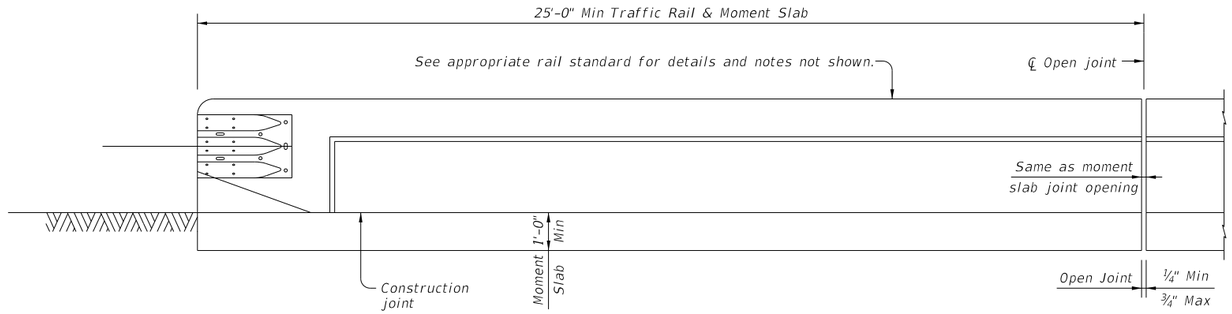
GIBRALTAR CABLE BARRIER SYSTEM (TL-4)

GBRLTR(TL4)-14

FILE: gbrltrtl414.dgn	DN: TxDOT	CK: RM	DW: VP	CK:
©TxDOT: March 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		51

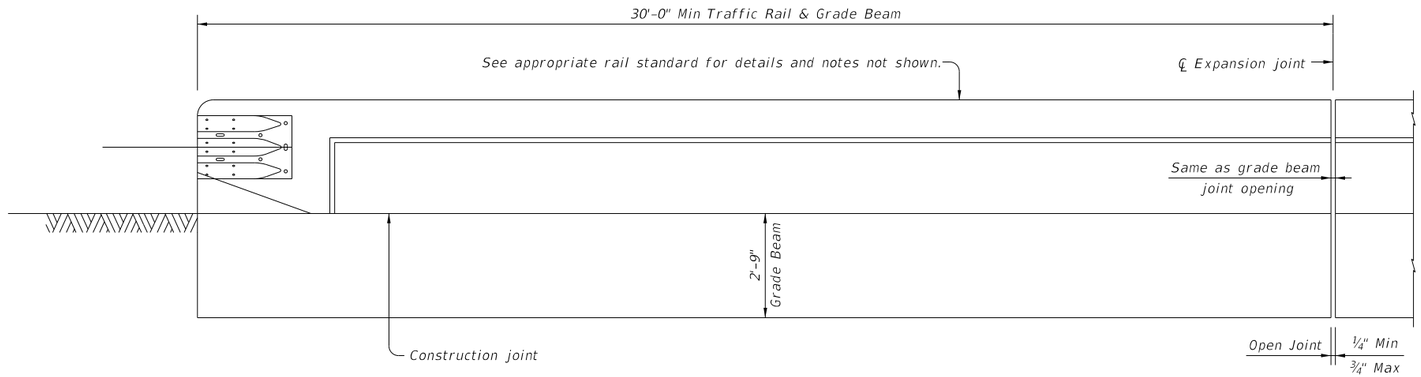
DATE: 3/4/2024
FILE: GBRLTR(TL4)-14.dgn

DATE: 3/4/2024 11:20:41 AM
FILE: TRF.dgn



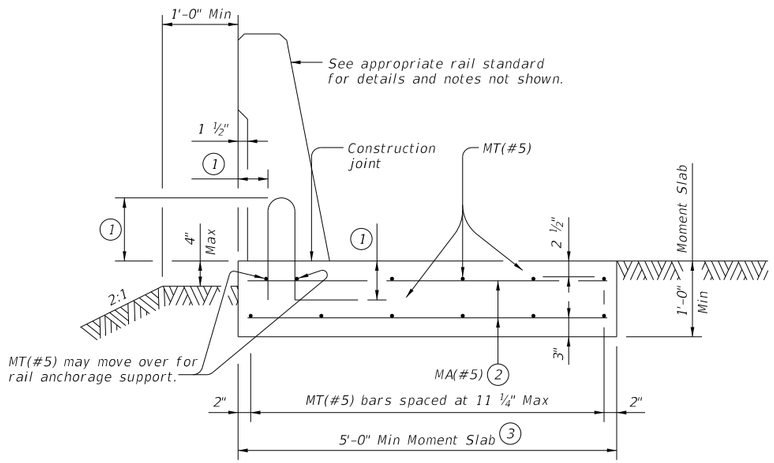
ROADWAY ELEVATION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



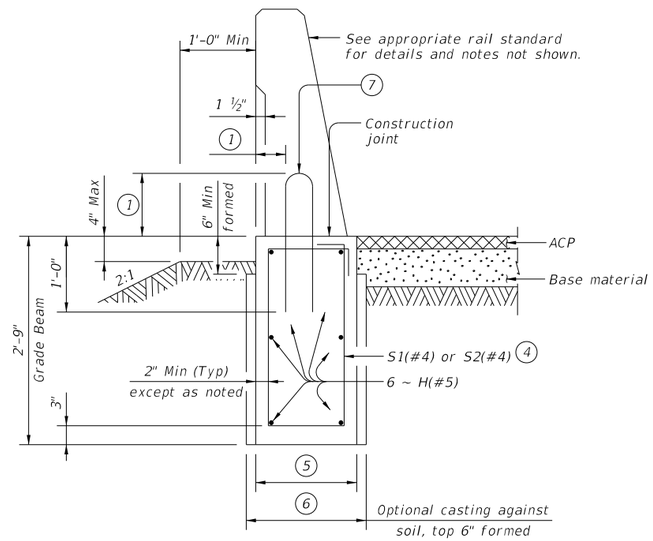
ROADWAY ELEVATION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



SECTION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar.)



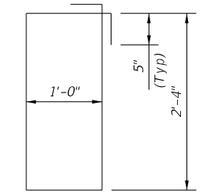
SECTION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar.)

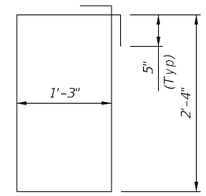
1. See applicable bridge rail standard.
2. MA(#5) space longitudinally along moment slab at 12" Max. (Spaced 2 ½" longitudinally from outside edge of moment slab).
3. Approximate moment slab concrete = 0.19 CY/LF and reinforcement = 22.4 LB/LF.
4. S1(#4) or S2(#4) spaced longitudinally along grade beam at 8" Max. (Spaced 2 ½" longitudinally from outside edge of grade beam).
5. Use bar S1(#4) with 1'-4" grade beam width and bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS.
   Approximate grade beam concrete = 0.14 CY/LF and reinforcement = 13.8 LB/LF.

   Use bar S2(#4) with 1'-7" grade beam width and bridge rail types: T66 and C66.
   Approximate grade beam concrete = 0.16 CY/LF and reinforcement = 14.2 LB/LF.
6. 1'-6" for bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS.

   1'-9" bridge rail types: T66 and C66.
7. Modify reinforcing on standard bridge rail anchorage if necessary by extending rail anchorage 12" Min, vertically into traffic rail



BARS S1(#4)



BARS S2(#4)

CONSTRUCTION NOTES:

Align moment slab (TRF-MS) or grade beam (TRF-GB) open joints with rail open joints maintaining no less than minimum rail length. Provide moment slab (TRF-MS) or grade beam (TRF-GB) with open joints at no greater than 100' spacing 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 required elsewhere.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for bars S1(#4), S2(#4) and H(#5) unless noted otherwise. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:

Uncoated or galvanized ~ #5 = 2'-4"
Epoxy coated ~ #5 = 3'-6"

GENERAL NOTES:

Use of these details will result in a moment slab (TRF-MS) or grade beam (TRF-GB) foundation that is acceptable for traffic rails which are MASH TL-2, TL-3, or TL-4 compliant.

See elsewhere in the plans for selected options between moment slab (TRF-MS) and/or grade beam (TRF-GB).

The foundation design resistance is based on the current AASHTO bridge railing requirements with the assumption of fair to good soil support conditions. Poor soil conditions will require suitably deeper and/or wider foundations.

See appropriate rail standard for details and notes not shown.

This detail is intended for use as a guide to unusual railing anchorage situations but may be included in the plans, modified as necessary to apply to specific installations required on the project.

Payment for moment slab (TRF-MS) and/or grade beam (TRF-GB) will be by Class "C" concrete or Class "C" (HPC) concrete for rail foundations.

The associated bridge railing will be paid for by the linear foot which includes the concrete and reinforcement.

Excavation will be subsidiary to other Items.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL FOUNDATIONS

FOR MASH TL-2, TL-3 & TL-4 BRIDGE RAILS

TRF

FILE:	rlstd027-20.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT	September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS		0356	01	112,ETC.	SH 136,ETC.
07-20: Added moment slab with rail foundation lengths.		DIST	COUNTY		SHEET NO.
		AMA	HUTCHINSON,ETC.		52

LOC NO.	TCP PHASE	ROADWAY PORTION	LOCATION	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
1	PERMANENT	SH 136 NB	REF Ø2, SH 136 NB OVER CANADIAN RIVER	TL-3	BI	CONC	6"	SSCB	24"	32"	50′	1				X					
2	PERMANENT	IH 40 EB	REF Ø8, IH 40 EB OVER US 385	TL-3	BI	CONC	6"	SSCB	24"	32"	50′	1				X					
3	PERMANENT	IH 27 SB	REF Ø9, IH 27 SB OVER P.D.T. FORK RED RIVER	TL-3	BI	CONC	6"	SSCB	24"	32"	50′	1				X					
4	PERMANENT	IH 27 NB	REF 10, IH 27 SB OVER P.D.T. FORK RED RIVER	TL-3	BI	CONC	6"	SSCB	24"	32"	50′	1				X					
5	TCP PH 1	SH 136 NB	REF Ø2, SH 136 NB OVER CANADIAN RIVER	TL-3	UNI	N/A	N/A	SSCB	24"	32"	50′	1								X	
6	TCP PH 2	SH 136 NB	REF Ø2, SH 136 NB OVER CANADIAN RIVER	TL-3	UNI	N/A	N/A	SSCB	24"	32"	50′		1	1	5					X	
											TOTALS	5	1	1							

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

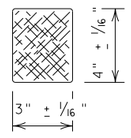
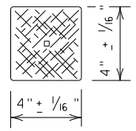
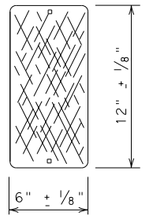
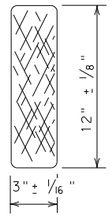
FOR DEFINITIONS SEE THE "CRASH CUSHION CATEGORIZATION CHART.PDF" AT THE DESIGN DIVISION (ROADWAY STANDARDS) WEBSITE. USE QUICK LINKS TO ACCESS ATTENUATORS / CRASH CUSHIONS SECTION.
http://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/rdwyIse.htm

STATE OF TEXAS
BRIAN ENNS
93801
LICENSED PROFESSIONAL ENGINEER
P.E. 3/13/2024

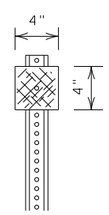
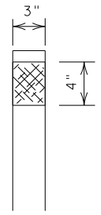
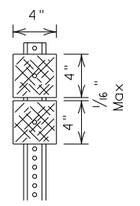
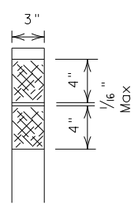
CRASH CUSHION SUMMARY SHEET

FILE: ccss.dgn	DN: TxDOT	CK:	CK:
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY	
	AMA	HUTCHINSON, ETC.	
	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		53

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

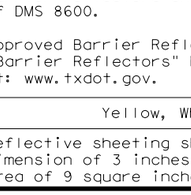
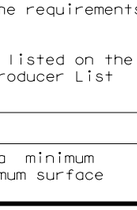
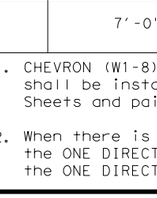
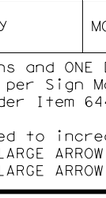
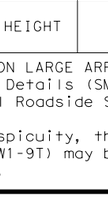
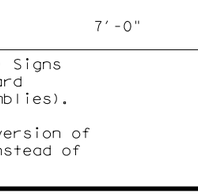
INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

- 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)

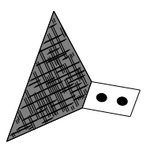
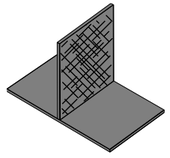
- TYPE OF OBJECT MARKER
  - 1, 2, 3, or 4
- NUMBER OF REFLECTORS OR DIRECTION
  - X = 3-Size 2 reflector units (Type 2 only)
  - Y = 1-Size 3 reflector unit (Type 2 only)
  - Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
  - L = Left Side (Type 3 Object Marker only)
  - R = Right Side (Type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

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

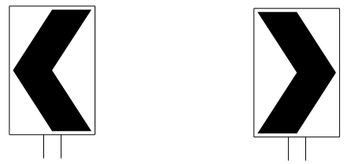
DEPARTMENTAL MATERIAL SPECIFICATIONS	
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

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

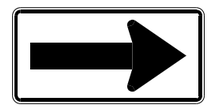
SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

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).

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:

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: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112,ETC.	SH 136,ETC.
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	AMA	HUTCHINSON,ETC.		54

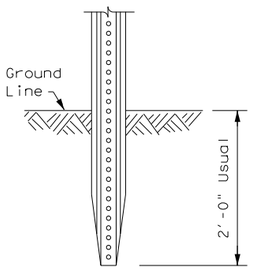
20A

DATE: 3/4/2024 11:21:02 AM
FILE: D&OM(1)-20.dgn

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

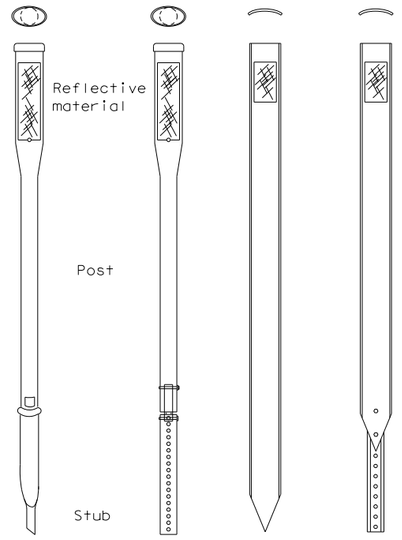


NOTES

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.

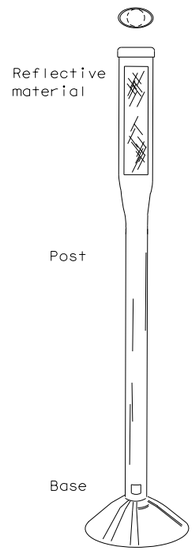
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



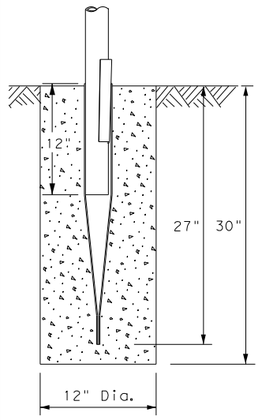
SURFACE MOUNT

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.

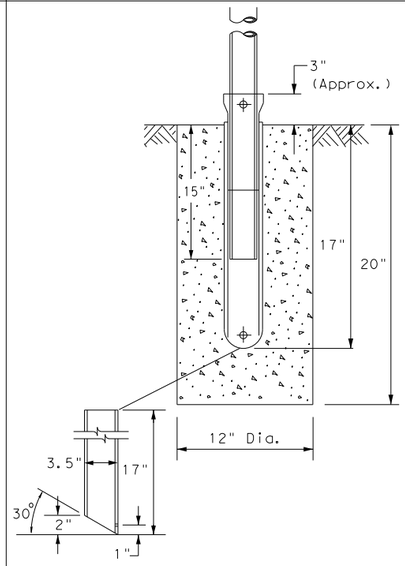
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

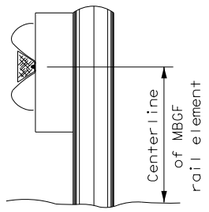
NOTE

1. Install per manufacturer's recommendations.

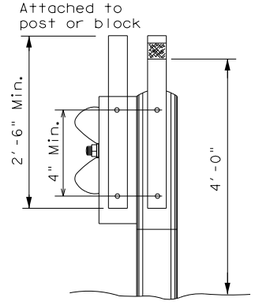
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

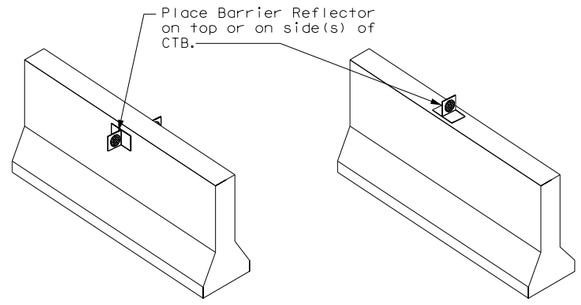
GF1



GF2



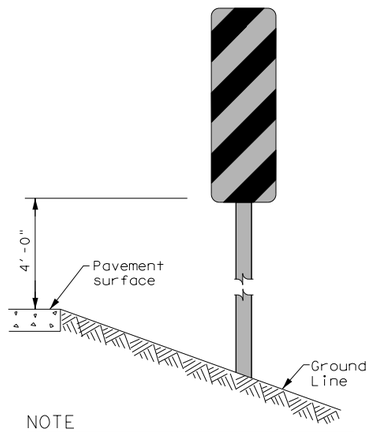
CONCRETE TRAFFIC BARRIER (CTB)



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.

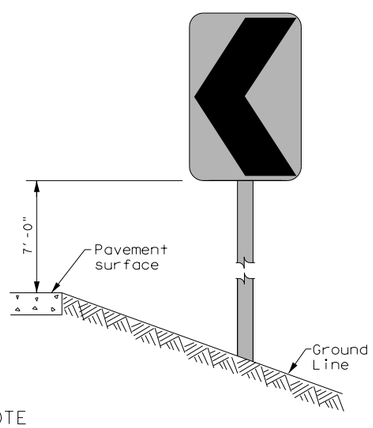
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



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)

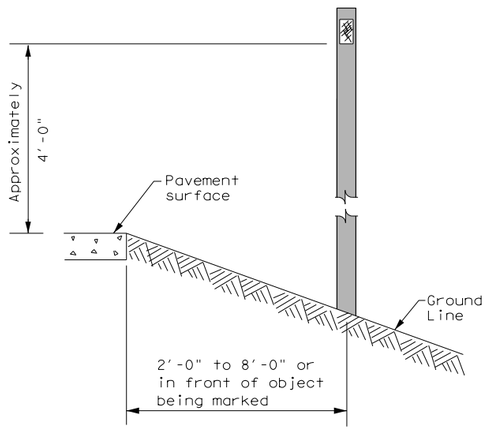
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



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	0356	01	112, ETC.	SH 136, ETC.
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	AMA	HUTCHINSON, ETC.		55

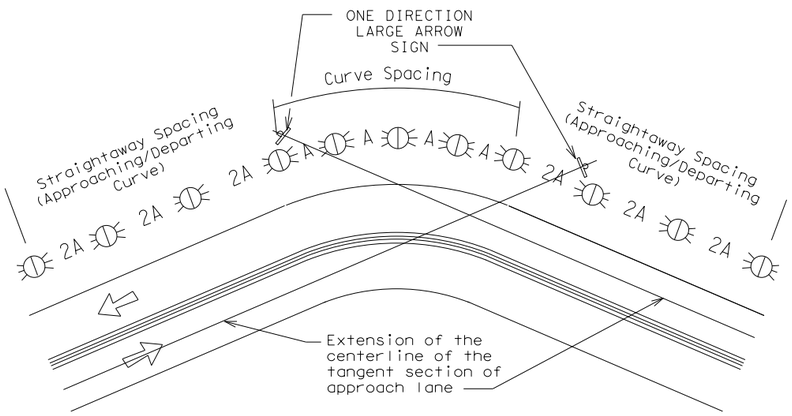
20B

DATE: 3/4/2024 11:21:16 AM
FILE: D&OM(2)-20.dgn

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

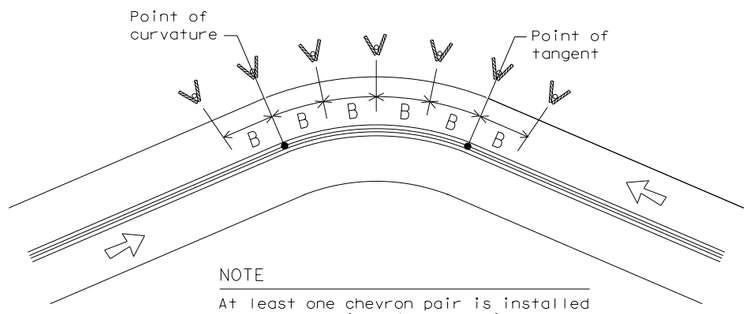
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



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	FEET			
	Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		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	
	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

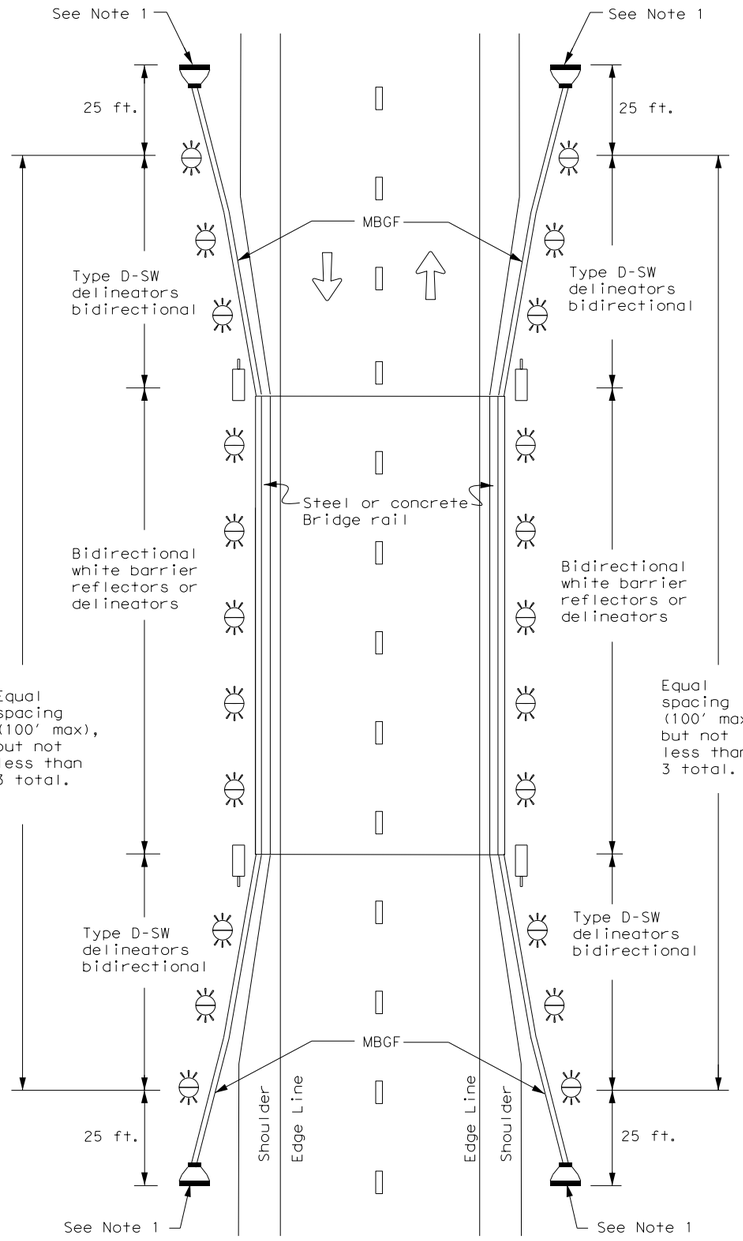
FILE: dom3-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
3-15 8-15 8-15 7-20	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		56

20C

DATE: 3/4/2024 11:21:32 AM
FILE: D&OM(3)-20.dgn

DATE: 3/4/2024 11:21:43 AM
FILE: D&OM(5)-20.dgn

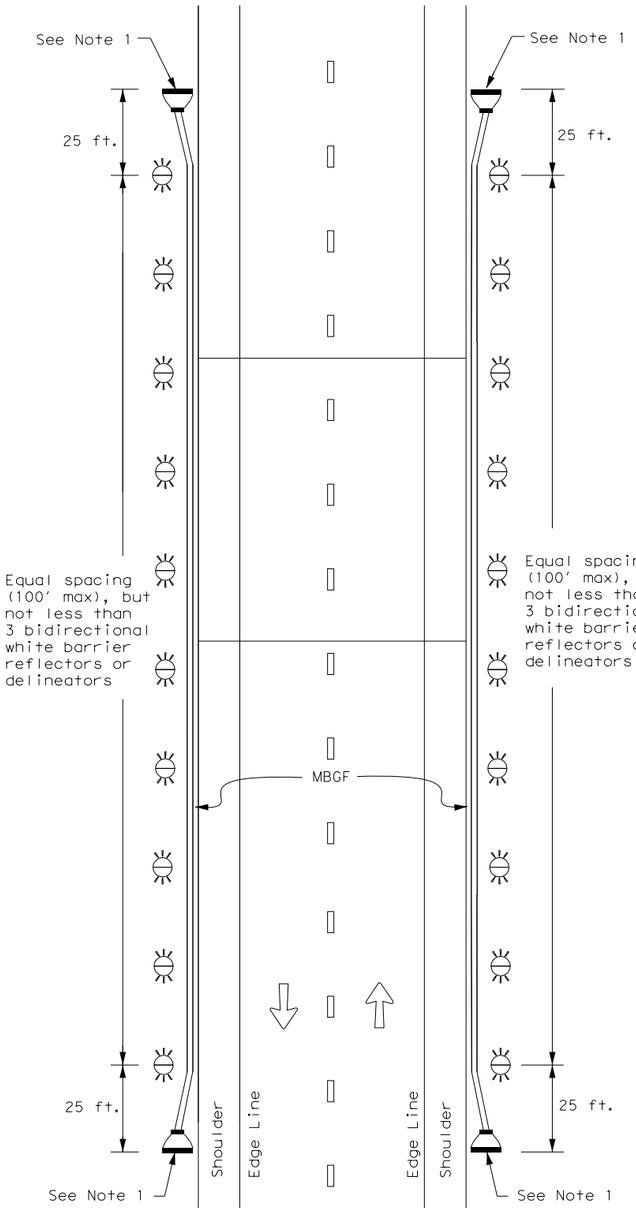
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



NOTE:

1. 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.

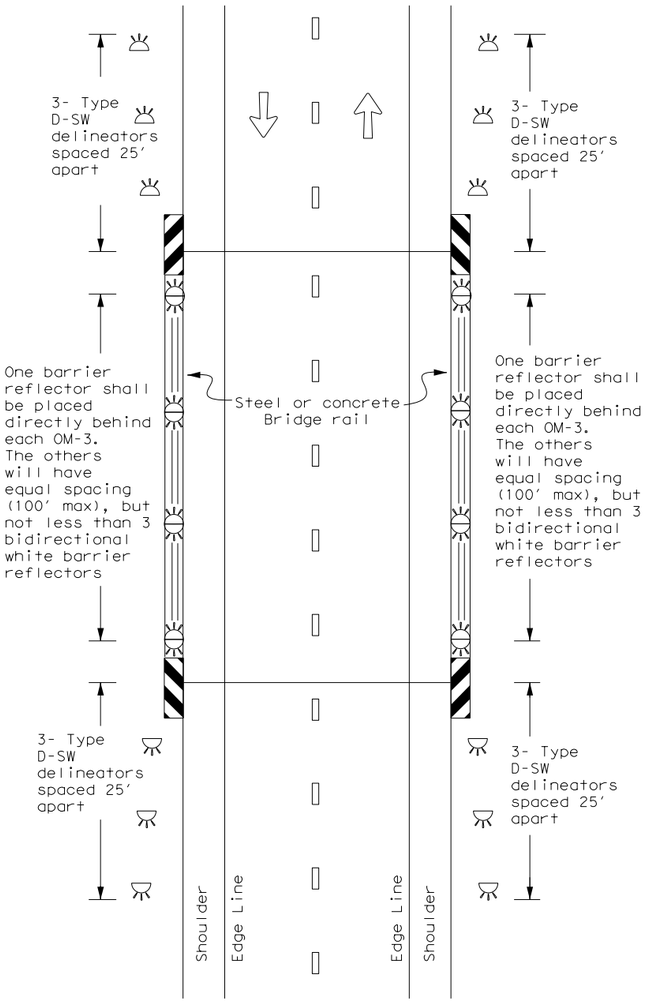
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



NOTE:

1. 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.

TWO-WAY, TWO LANE ROADWAY BRIDGE WITH NO APPROACH RAIL



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(5)-20

FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0356	01	112, ETC.	SH 136, ETC.
7-20	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		57

20E

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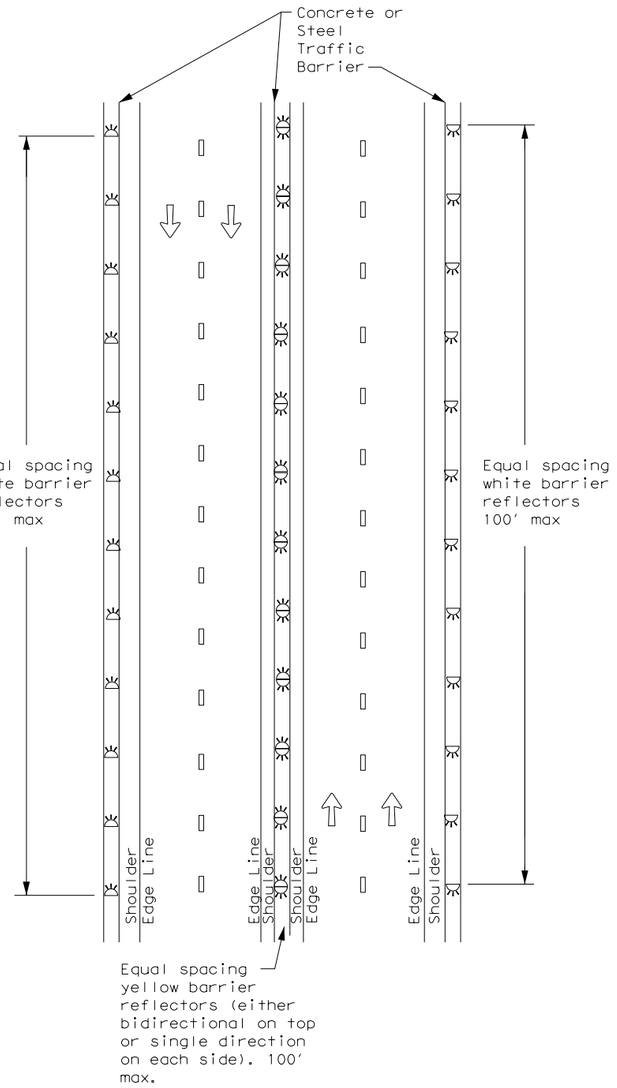
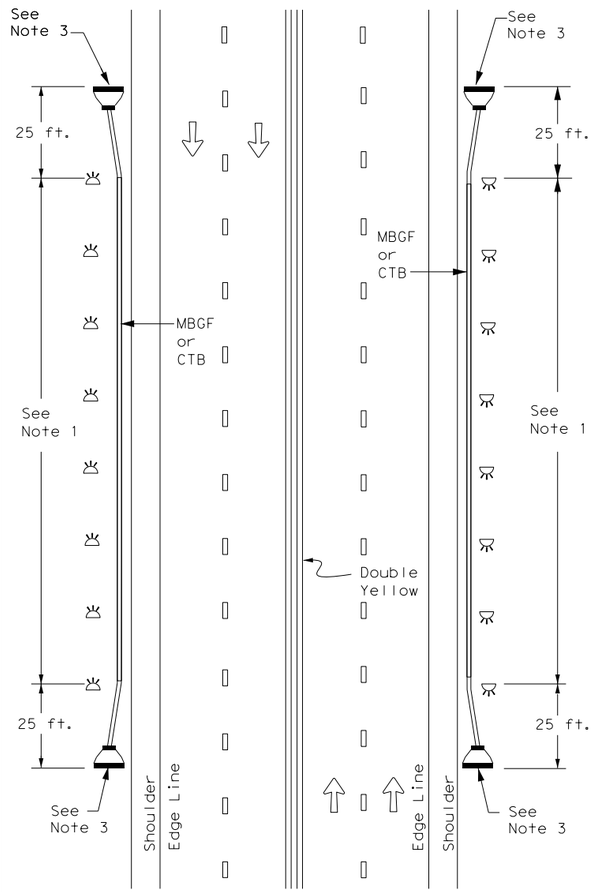
FILE: D&OM(6)-20.dgn

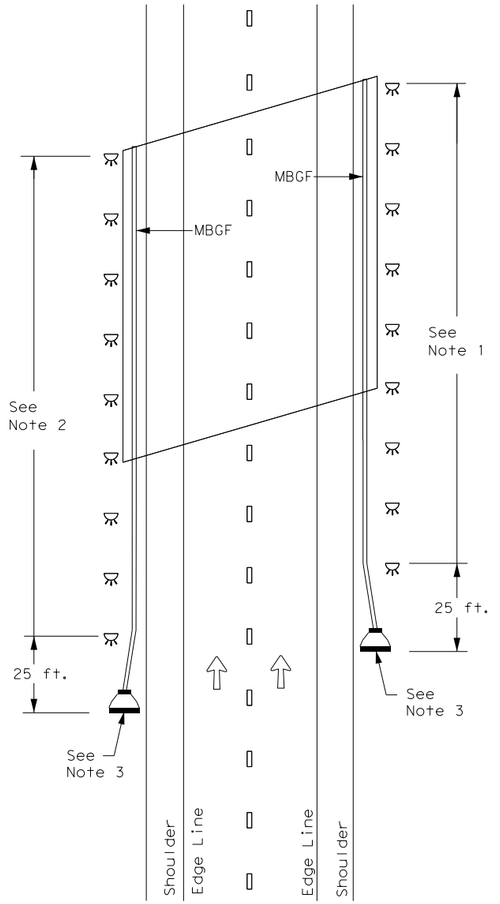
CONTINUOUS CONCRETE OR STEEL BARRIER



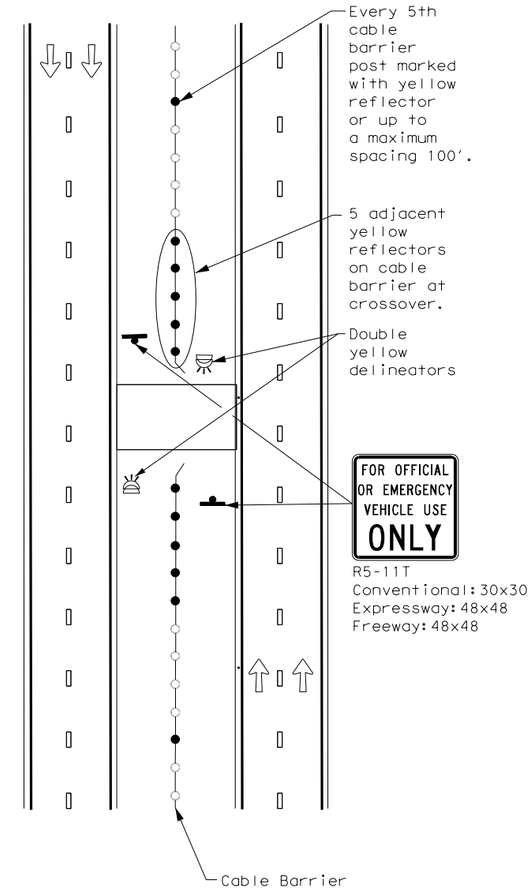
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



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
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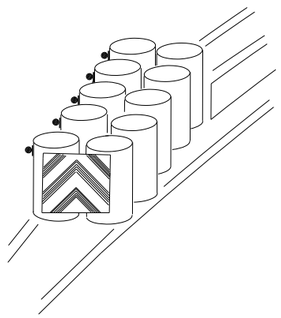
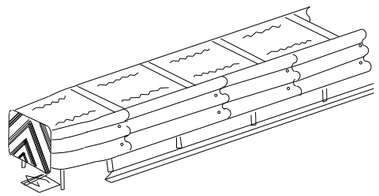
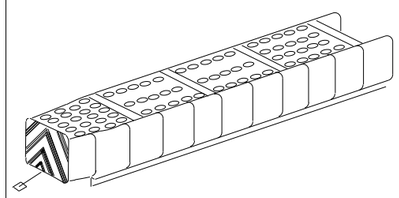
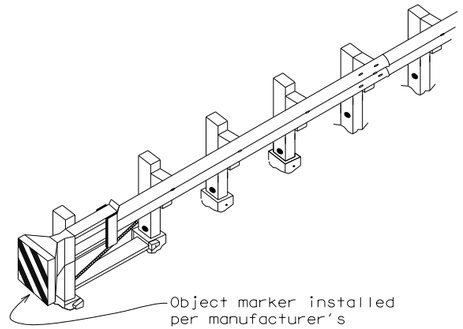
7-20	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON,ETC.		58

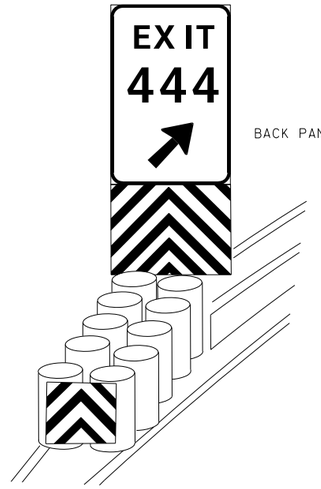
20F

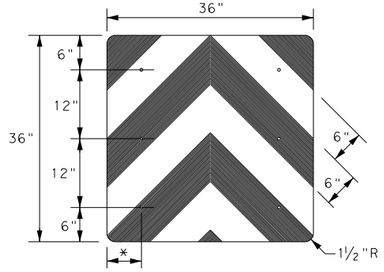


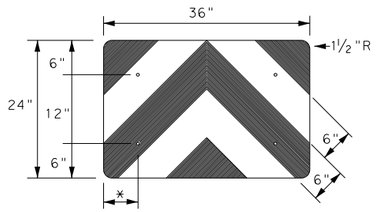




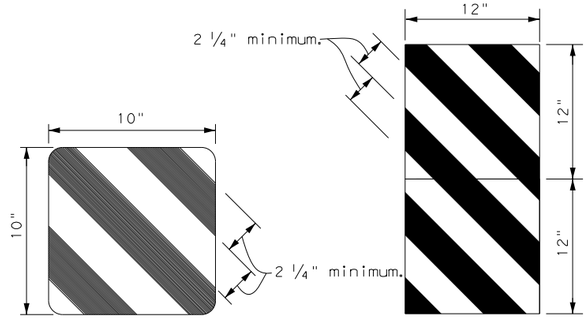




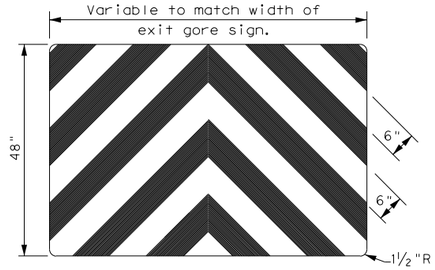


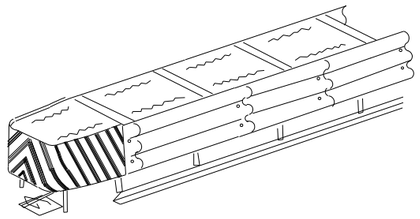


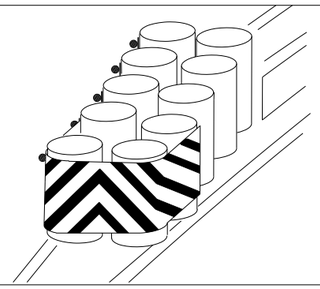
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

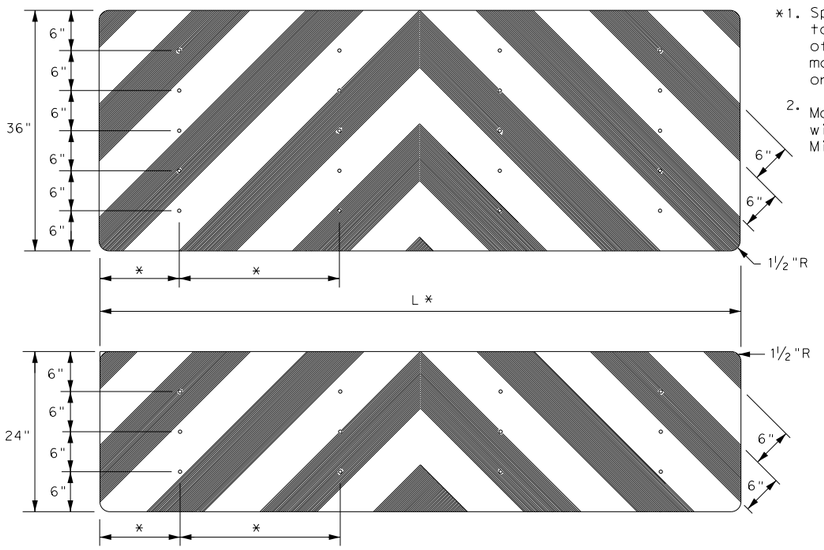


OBJECT MARKERS SMALLER THAN 3 FT^2









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
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4-92 8-04	DIST	COUNTY		SHEET NO.
8-95 3-15	AMA	HUTCHINSON, ETC.		59
4-98 7-20				
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DATE: 3/4/2024 11:22:13 AM
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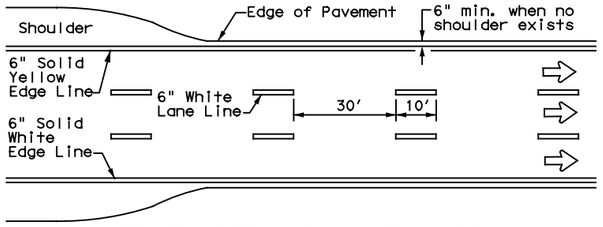
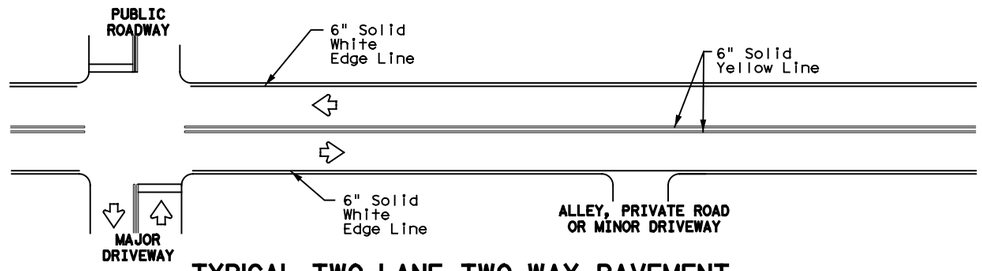
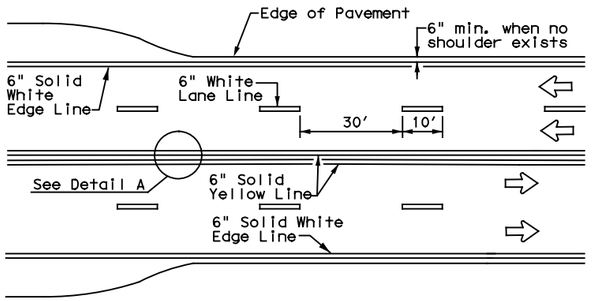
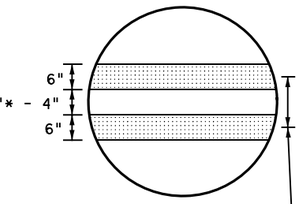


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS





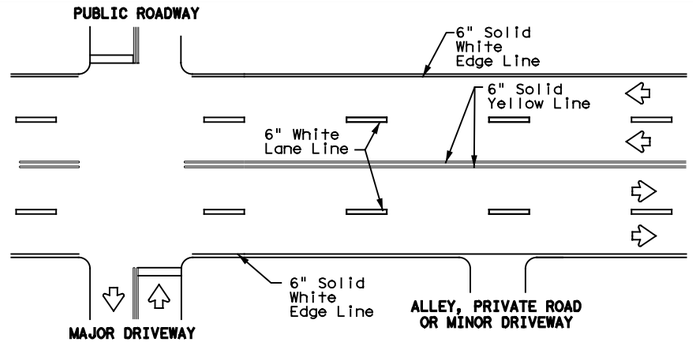
DETAIL "A"

9"** min. - 10" typ.
(18" max. for traveled way greater than 48' only)

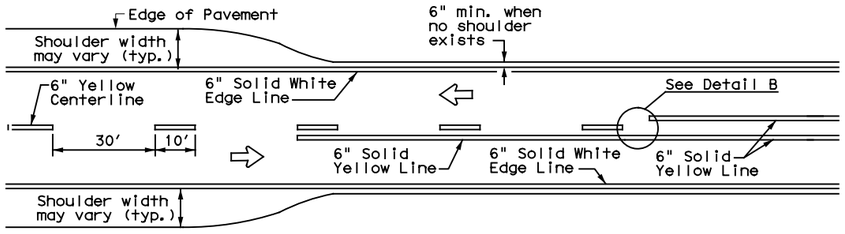
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

* 2" minimum for restripe projects when approved by the Engineer.

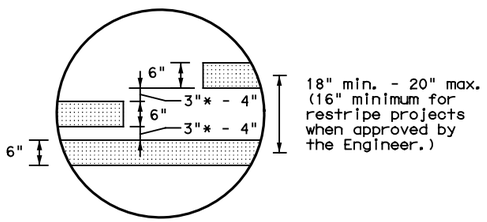
** 8" minimum for restripe projects when approved by the Engineer.



TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

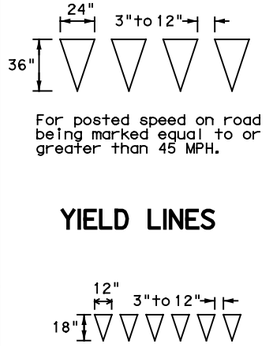


TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

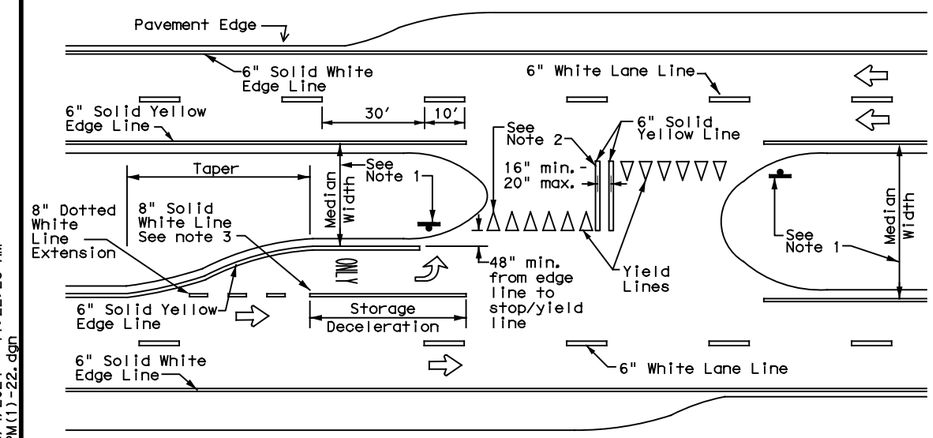


DETAIL "B"

* 2" minimum for restripe projects when approved by the Engineer.



YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

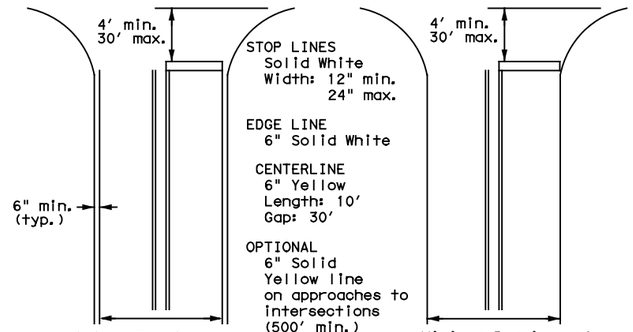
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections.
   Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

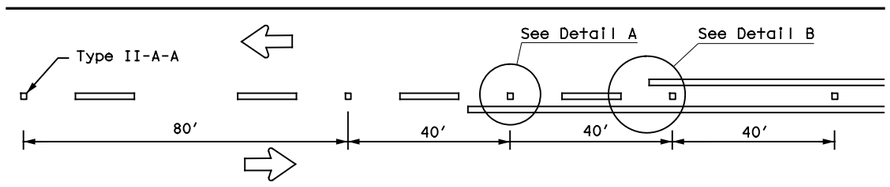
PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20	0356	01	112, ETC.	SH 136, ETC.
8-95 3-03 12-22	DIST	COUNTY		SHEET NO.
5-00 2-12	AMA	HUTCHINSON, ETC.		60

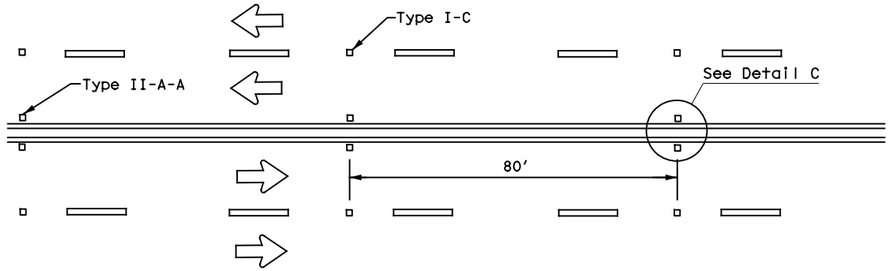
22A

DATE: 3/4/2024 11:22:26 AM
FILE: PM(1)-22.dgn

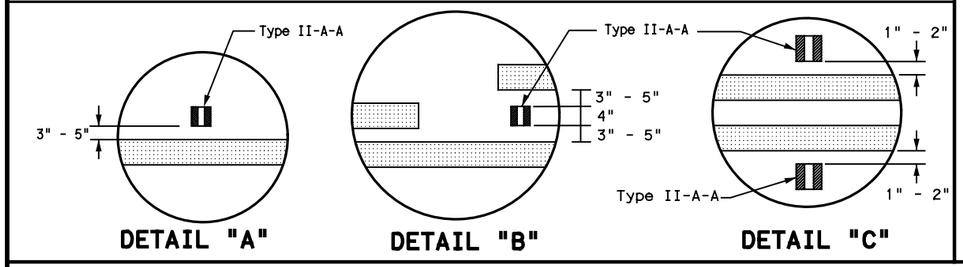
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

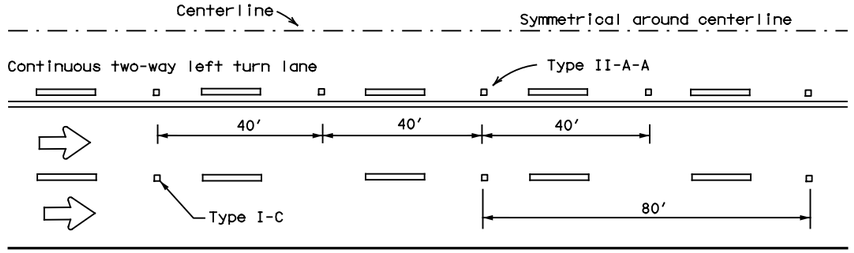


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

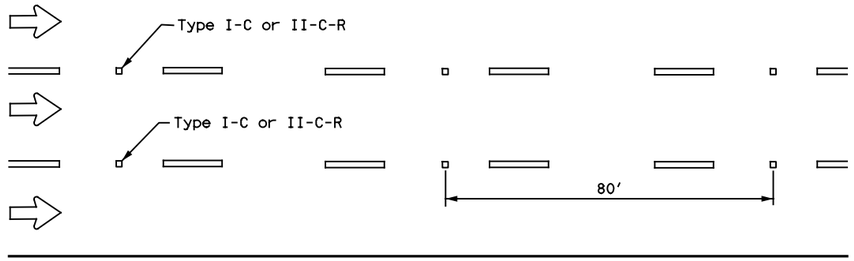


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



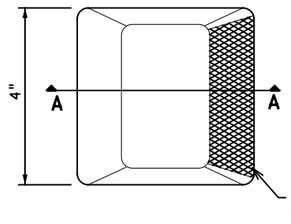
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

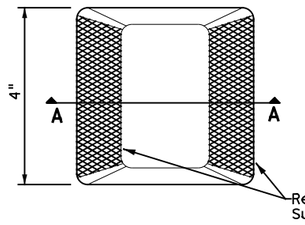
See Note 3.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

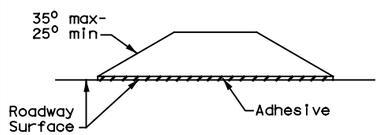
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

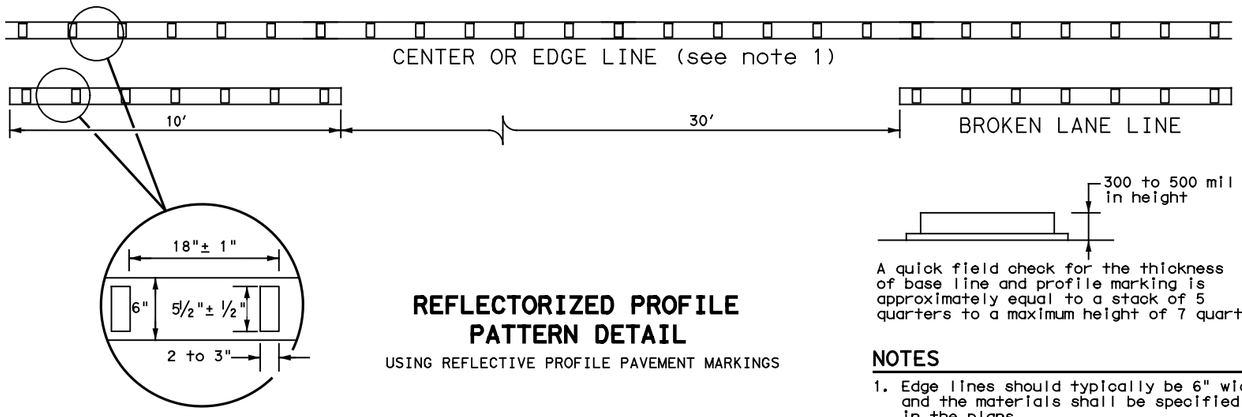


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



6" EDGE LINE, 6" CENTERLINE OR 6" LANE LINE

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTES

1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

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POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
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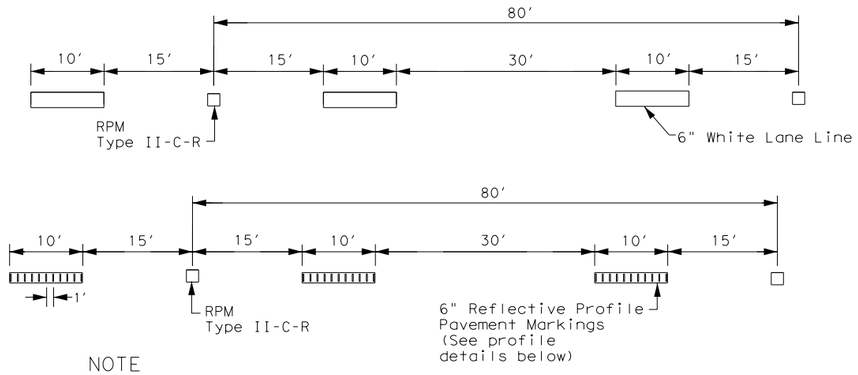
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON,ETC.		61

22B

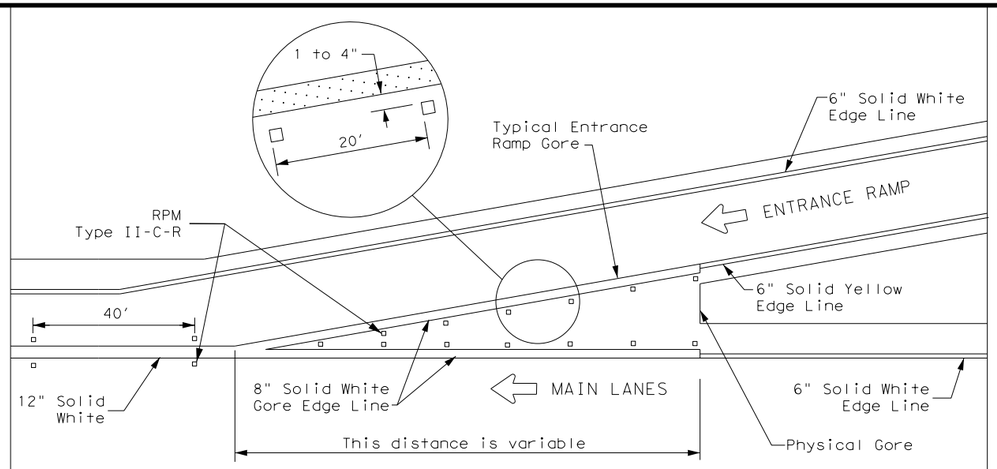
DATE: 3/4/2024 11:22:38 AM
FILE: PM(2)-22.dgn



NOTE

Reflectorized raised pavement markers Type II-C-R shall be spaced on 80'centers with the clear face toward normal traffic and the red face toward wrong way traffic. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.

TRAFFIC LANE LINES PAVEMENT MARKING

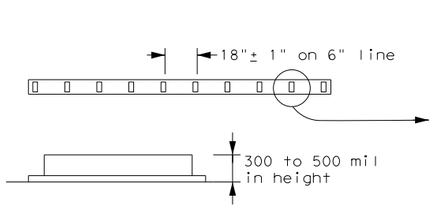


TYPICAL ENTRANCE RAMP GORE MARKING

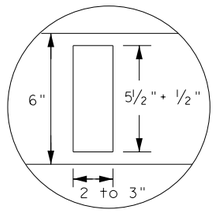
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R



Reflective Profile Pavement Markings

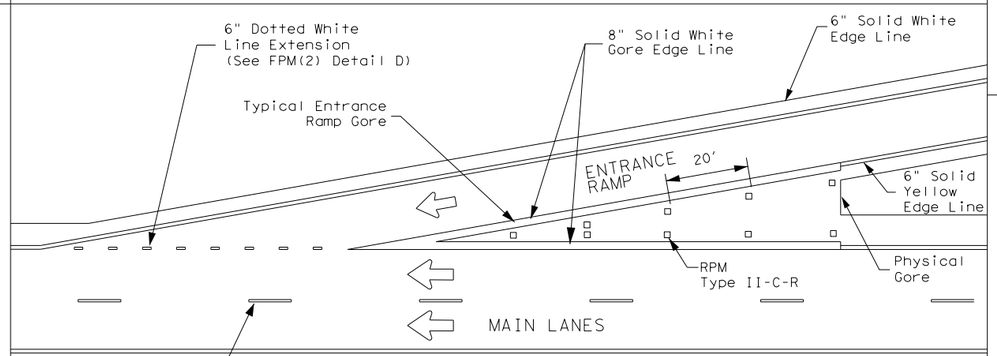


Standard 6" Profile Detail

NOTE

Edge lines should typically be 6" wide and the materials shall be as specified in the plans. See details above if reflective profile pavement markings are to be used.

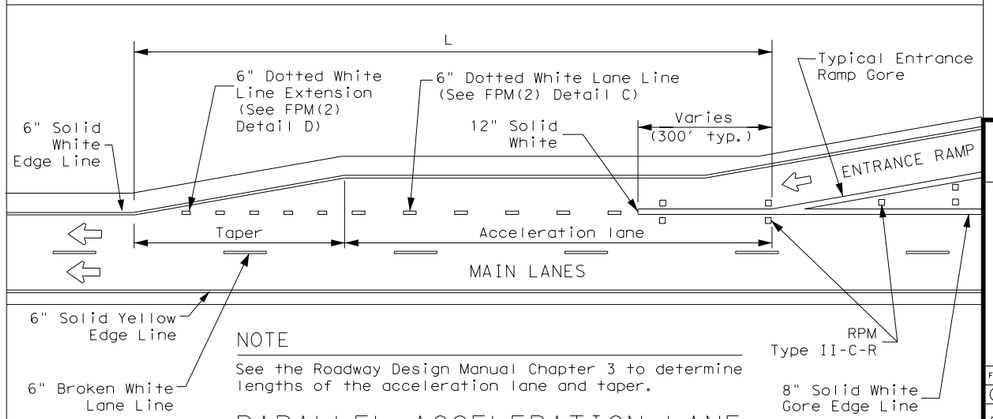
EDGE LINE PAVEMENT MARKINGS



NOTE

See the Roadway Design Manual Chapter 3 to determine if a tapered acceleration lane may be used.

TAPERED ACCELERATION LANE



NOTE

See the Roadway Design Manual Chapter 3 to determine lengths of the acceleration lane and taper.

PARALLEL ACCELERATION LANE

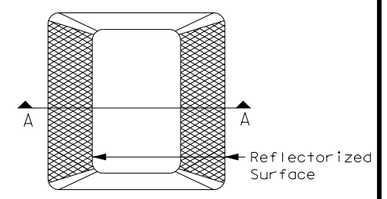
NOTES

1. Reflectorized raised pavement markers Type-II-C-R in the wrong way arrow shall have the clear face toward normal traffic and the red face toward the wrong way traffic.
2. Red reflectorized wrong way arrows, not to exceed two, may be placed on exit ramps. Locations of the arrows shall be as shown in the plans or as directed by the engineer.

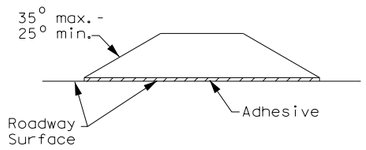
WRONG WAY ARROW

GENERAL NOTE

On concrete pavements the raised pavement markers shall be placed to one side of the longitudinal joints.



Type II (Top View)



SECTION A

REFLECTORIZED RAISED PAVEMENT MARKER (RPM)

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS WITH RAISED PAVEMENT MARKERS

FPM(1)-22

FILE: fpm(1)-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
5-74 8-00 2-12	DIST	COUNTY		SHEET NO.
4-92 2-08 10-22	AMA	HUTCHINSON, ETC.		62
5-00 2-10				

23A

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DATE: 3/4/2024 11:23:16 AM
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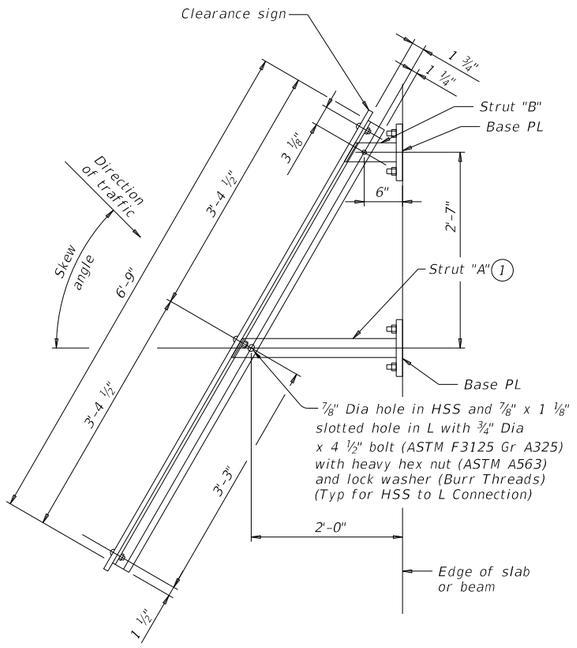
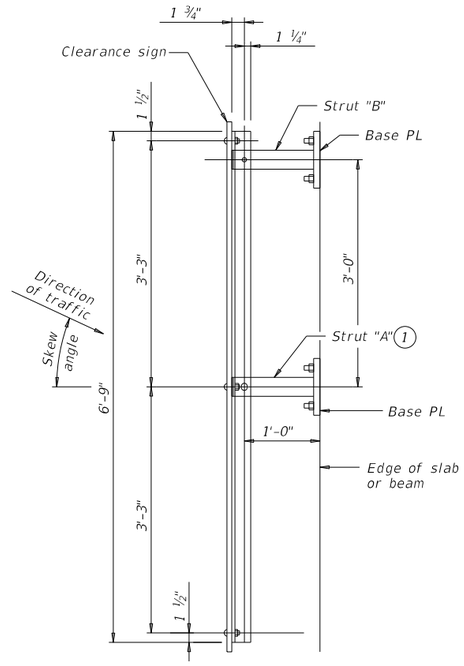


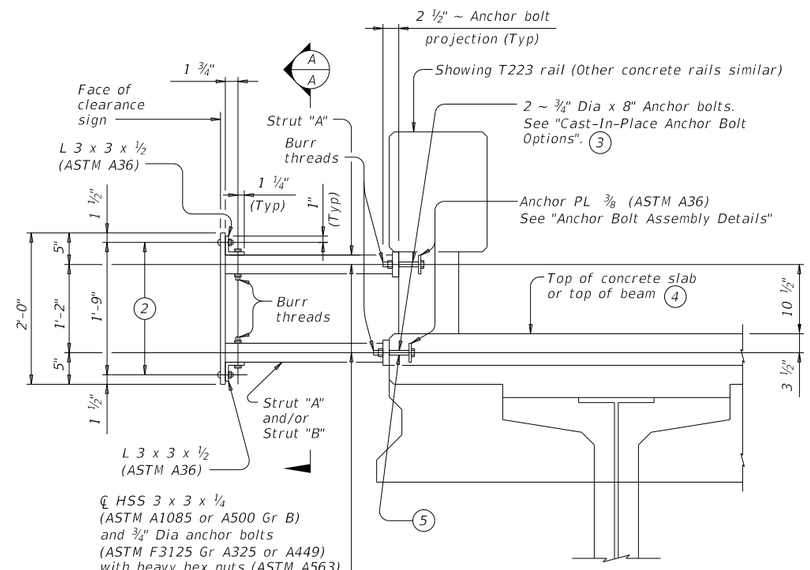
PLAN OF TYPE S MOUNT

(Used for skews over 30°)

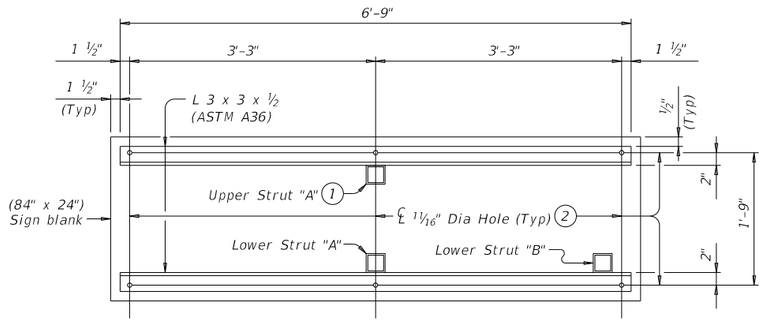


PLAN OF TYPE N MOUNT

(Used for 0° to 30° skews)



SECTION



SECTION A-A

1. Locate centerline of Strut A no closer than 12" from a vertical concrete edge.
2. ℄ ⅝" Dia x 2" Hexagon socket button head cap screws (ASTM A574) with hex nuts. Attach hex nuts to L 3 x 3 x ½ by tack welding in two places. Threads must have Class 3A fit tolerance in accordance ASME B1.1. Six screws required.
3. At the Contractor's option fully threaded adhesive anchors may be use instead of cast-in-place anchor bolts. Expansion anchors are not allowed. Provide adhesive anchors that are ¾" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). Embed fully threaded rods using a Type III, Class C, D, E, or F anchor adhesive. Adhesive anchor embedment depth is 8". Anchor adhesive chosen must be able to achieve a factored bond strength in tension of 2.2 kips per anchor (edge distance and spacing must be accounted for). 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".
4. For decked slab beams topped with a 2 course surface treatment and ACP overlay.
5. Anchor bolts to be cast into decked slab beams topped with a 2 course surface treatment or ACP overlay. Anchor bolts with heavy hex nuts, regular lock washers, hardened washers and anchor plate that is embedded in the beam will be provided by the beam Fabricator.

CONSTRUCTION NOTES:

Install the vertical face of clearance sign plumb unless otherwise approved by the Engineer.

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 1 anchor per bridge mounted clearance sign installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

MATERIAL NOTES:

Galvanize all steel components after fabrication unless otherwise noted.

GENERAL NOTES:

This standard provides details to mount a vertical clearance sign (84" x 24") to bridges. Rail Types T631, T631LS, PR11, PR22 and PR3 are not accommodated.

The Engineer will furnish the clearance to be shown on the sign.

See Bridge Layout for sign location and mounting type (Type N or S).

Cost of furnishing, installing, relocating or removing a clearance sign, including structural steel for sign mount, is included in unit price bid for Item 644, "Small Roadside Sign Assemblies".

One Sign Blank (84" x 24") is 14 SF.

Average steel weight for one complete Type N Mount is 219 Lb.

Average steel weight for one complete Type S Mount is 233 Lb.

SHEET 1 OF 3

Texas Department of Transportation

Bridge Division Standard

BRIDGE MOUNTED CLEARANCE SIGN ASSEMBLY

BMCS

FILE: bmcsste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		63

DATE: 3/4/2024 11:23:16 AM
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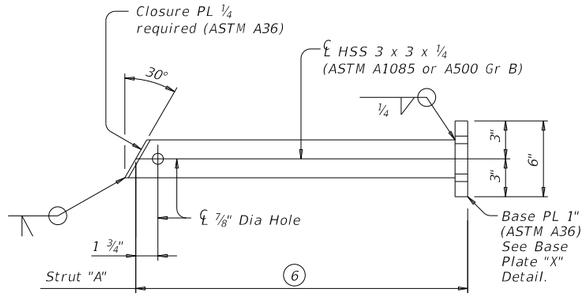
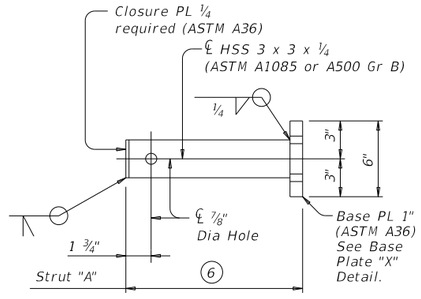
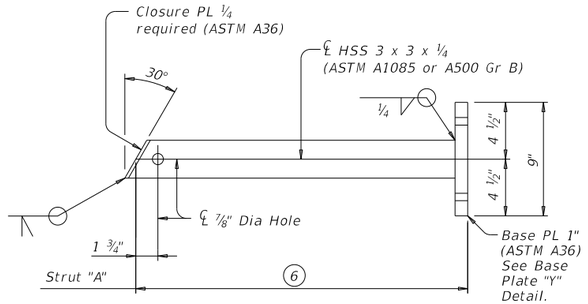


FOR T411 AND C411 RAIL TYPES



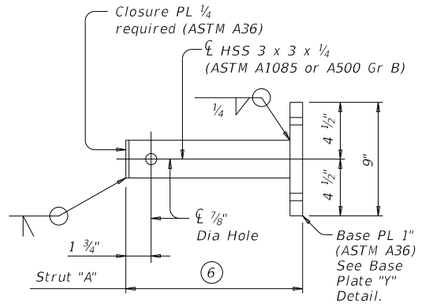
FOR T411 AND C411 RAIL TYPES



FOR T221, C221, T222, T223, C223, T401, T402, C402, T551, T552, T80HT, T80SS AND SSTR RAIL TYPES

UPPER STRUT DETAIL FOR (TYPE S MOUNT)

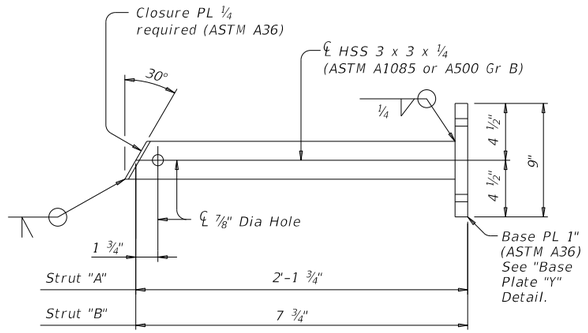
(Used for skews over 30°)



FOR T221, C221, T222, T223, C223, T401, T402, C402, T551, T552, T80HT, T80SS AND SSTR RAIL TYPES

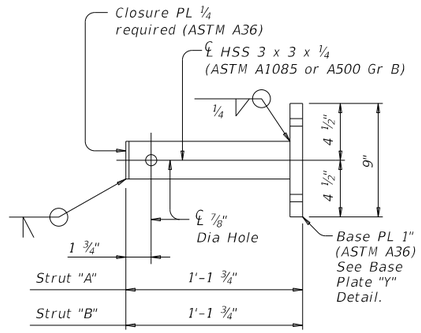
UPPER STRUT DETAIL FOR (TYPE N MOUNT)

(Used for 0° to 30° skews)



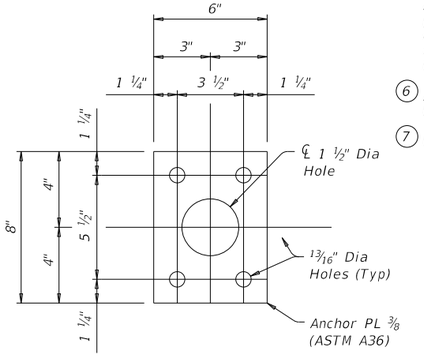
LOWER STRUT DETAILS FOR (TYPE S MOUNT)

(Used for skews over 30°)

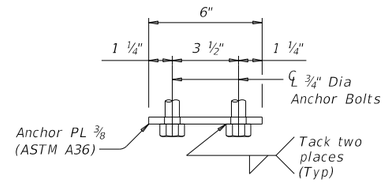


LOWER STRUT DETAILS FOR (TYPE N MOUNT)

(Used for 0° to 30° skews)



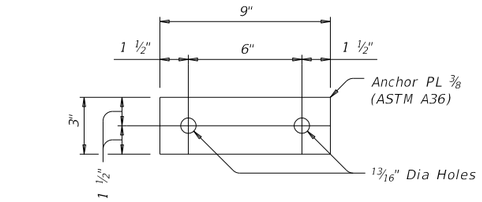
PLAN OF ANCHOR PLATE



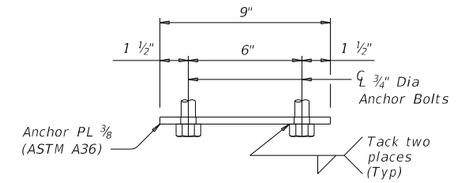
ELEVATION

ANCHOR BOLT ASSEMBLY DETAILS (3)

(Used on Base Plate "X" with T411 and C411 rail types.)



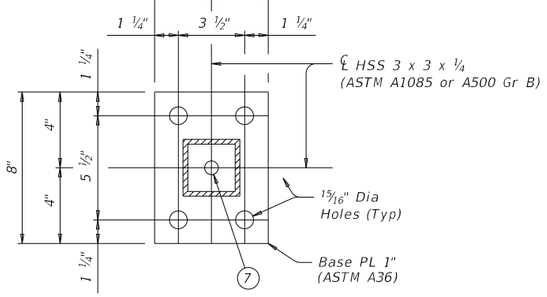
PLAN OF ANCHOR PLATE



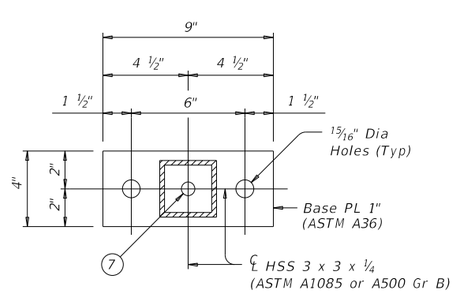
ELEVATION

ANCHOR BOLT ASSEMBLY DETAILS (3)

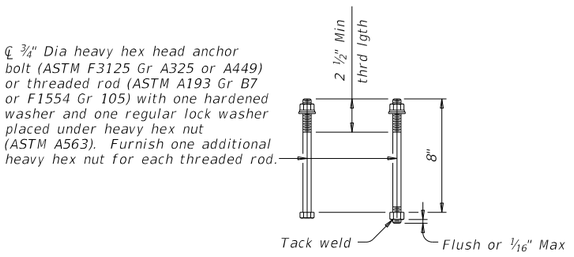
(Used on Base Plate "Y" and with T1F, T2P, C2P, T1W, C1W, T66 and C66 rail types.)



BASE PLATE "X" DETAIL



BASE PLATE "Y" DETAIL



CAST-IN-PLACE ANCHOR BOLT OPTIONS (3)

(3) At the Contractor's option fully threaded adhesive anchors may be use instead of cast-in-place anchor bolts. Expansion anchors are not allowed. Provide adhesive anchors that are ¾" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). Embed fully threaded rods using a Type III, Class C, D, E, or F anchor adhesive. Adhesive anchor embedment depth is 8". Anchor adhesive chosen must be able to achieve a factored bond strength in tension of 2.2 kips per anchor (edge distance and spacing must be accounted for). 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".

(6) Adjust length to accommodate edge of slab to back of rail for specific project conditions and to help plumb the vertical face of clearance sign.

(7) Hole required to drain zinc from base plate during galvanizing.

Texas Department of Transportation

Bridge Division Standard

BRIDGE MOUNTED CLEARANCE SIGN ASSEMBLY

BMCS

FILE: bmcsste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		64

DATE: 3/4/2024 11:23:17 AM
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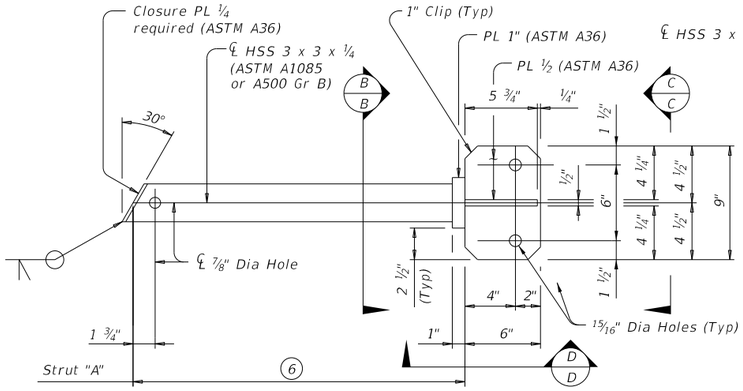
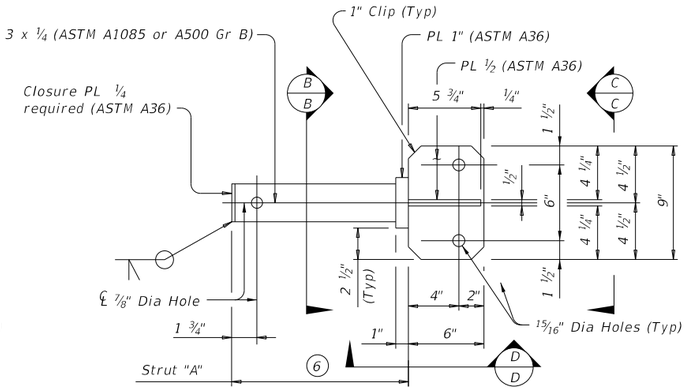


FOR T1F, T2P, C2P, T1W, C1W, T66 AND C66 RAIL TYPES

UPPER STRUT DETAIL FOR (TYPE S MOUNT)

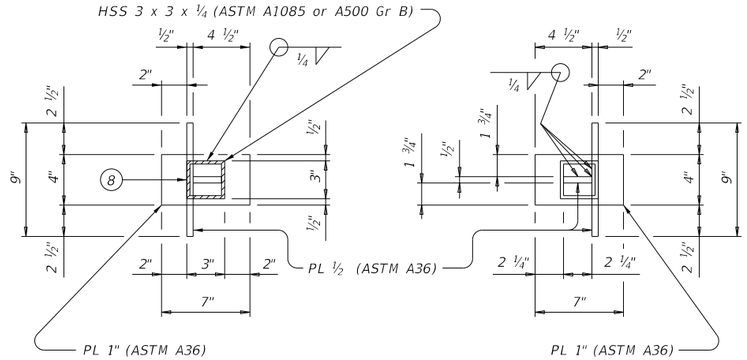
(Used for skews over 30°)



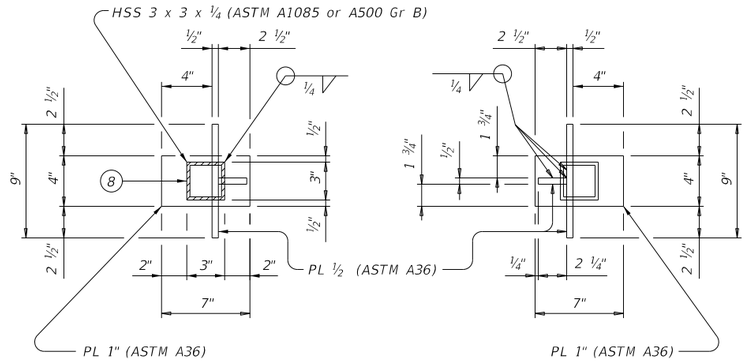
FOR T1F, T2P, C2P, T1W, C1W, T66 AND C66 RAIL TYPES

UPPER STRUT DETAIL FOR (TYPE N MOUNT)

(Used for 0° to 30° skews)



FOR 9" HIGH CURBS



FOR 11" HIGH CURBS

(2) ℄ ⅝" Dia x 2" Hexagon socket button head cap screws (ASTM A574) with hex nuts. Attach hex nuts to L 3 x 3 x ½ by tack welding in two places. Threads must have Class 3A fit tolerance in accordance ASME B1.1. Six screws required.

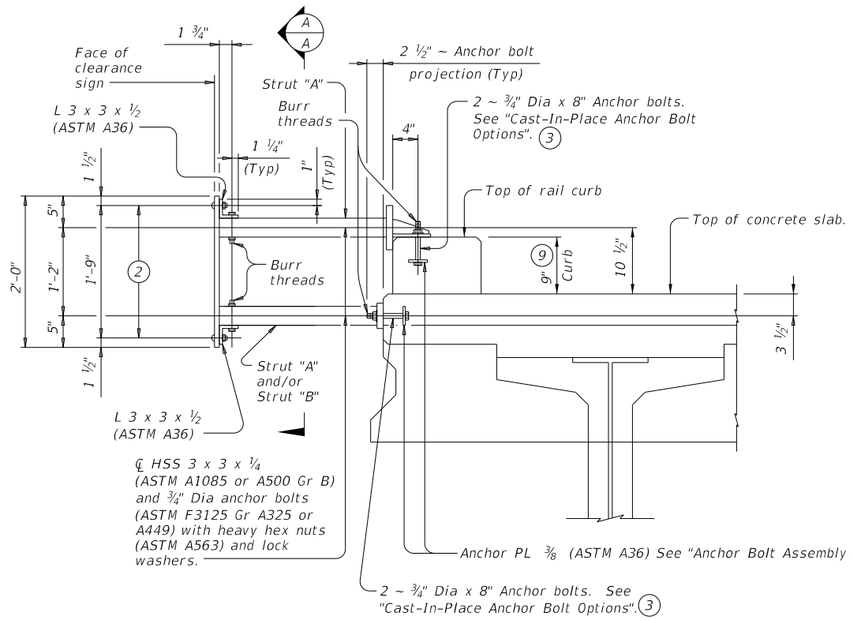
(3) At the Contractor's option fully threaded adhesive anchors may be use instead of cast-in-place anchor bolts. Expansion anchors are not allowed. Provide adhesive anchors that are ¾" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). Embed fully threaded rods using a Type III, Class C, D, E, or F anchor adhesive. Adhesive anchor embedment depth is 8". Anchor adhesive chosen must be able to achieve a factored bond strength in tension of 2.2 kips per anchor (edge distance and spacing must be accounted for). 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".

(4) For decked slab beams topped with a 2 course surface treatment and ACP overlay.

(6) Adjust length to accommodate edge of slab to back of rail for specific project conditions and to help plumb the vertical face of clearance sign.

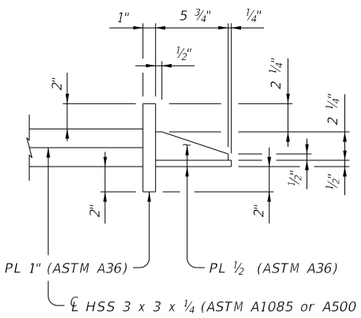
(8) Hole required in bottom of HSS to drain zinc during galvanizing.

(9) 11" curb is for structures with 2" ACP overlay.

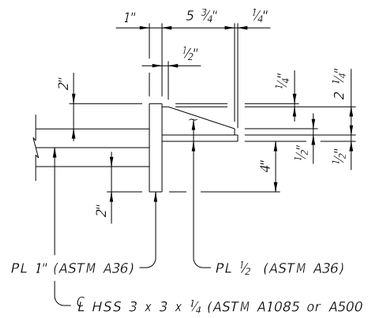


SECTION THRU T1F, T2P, C2P, T1W, C1W, T66 AND C66 RAIL CURB

Showing sign mount on a 9" high curb, 11" high curb similar.



FOR 9" HIGH CURBS



FOR 11" HIGH CURBS

VIEW D-D

SECTION B-B

VIEW C-C

SHEET 3 OF 3

Texas Department of Transportation

Bridge Division Standard

BRIDGE MOUNTED CLEARANCE SIGN ASSEMBLY

BMCS

FILE: bmcsste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		65

90% PLANS SUBMITTAL

DN: JB CK: JT DW: JR CK: JZ

NOT TO SCALE

TRAFFIC CONTROL GENERAL NOTES

1. PLACE PCMS AT LEAST 7 DAYS PRIOR TO ANY CONSTRUCTION ACTIVITIES. LOCATION AND EXACT WORDING AS DIRECTED BY THE ENGINEER.

2. INSTALL BARRICADES AND ADVANCE WARNING SIGNS AS SHOWN IN THE TCP AND BC STANDARDS. SIGNS MAY BE ADJUSTED IN THE FIELD WITH APPROVAL FROM THE ENGINEER.

3. INSTALL AND MAINTAIN EROSION CONTROL DEVICES AS SHOWN IN THE PLANS. LIMIT INSTALLATION TO INDIVIDUAL WORK AREAS. RE-SEED AREAS DISTURBED BY REMOVAL OF EROSION CONTROL DEVICES.

4. INSTALL TRAFFIC CONTROL DEVICES AS DIRECTED BY THE FOLLOWING CSJ SPECIFIC SEQUENCES AND BY THE ENGINEER. ANY SIGNS THAT CONFLICT WITH CURRENT TCP PHASE MUST BE COVERED.

5. ELIMINATE ANY PAVEMENT MARKINGS (EXISTING OR TEMPORARY) THAT CONFLICT WITH CURRENT TCP PHASE.

6. AT THE CONCLUSION OF EACH PHASE, REMOVE REMAINING WORK ZONE PAVEMENT MARKINGS AND INSTALL PERMANENT PAVEMENT MARKINGS USING TCP(3-1)-13, TCP(3-2)-13, AND TCP(3-3)-14 AS REQUIRED.

SH 207 AT SH 136 NOTES

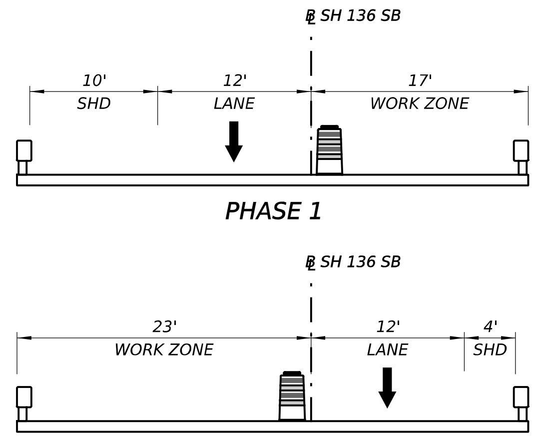
1. CLOSE SH 136 TRAFFIC LANES ONE AT A TIME TO ALLOW FOR UNDERSIDE BEAM REPAIRS USING TCP(1-4a)-18 AS DIRECTED BY THE ENGINEER.

IH 40 AT US 385 NOTES

1. CLOSE US 385 SB LANE TO ALLOW FOR UNDERSIDE BEAM REPAIRS USING TCP(1-2b) AS DIRECTED BY THE ENGINEER.

SEQUENCE OF CONSTRUCTION

REF 01: SH 136 SB AT CANADIAN RIVER

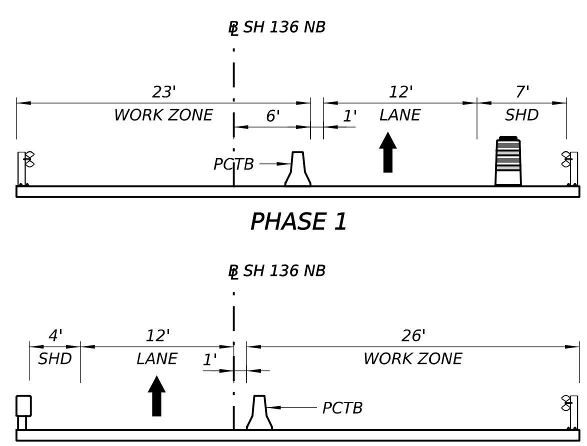


PHASE 1:
SHIFT TRAFFIC TO OUTSIDE LANE AND CLOSE THE INSIDE LANE USING TCP(2-5a)-18. CONDUCT BRIDGE REPAIRS IN THE WORK ZONE ACCORDING TO THE BRIDGE PLANS.

PHASE 2:
SHIFT TRAFFIC TO INSIDE LANE AND CLOSE THE OUTSIDE LANE USING TCP(2-5a)-18. CONDUCT BRIDGE REPAIRS IN THE WORK ZONE ACCORDING TO THE BRIDGE PLANS.

FINAL:
OPEN BOTH LANES TO TRAFFIC AND PERFORM FINAL CLEANUP.

REF 02: SH 136 NB AT CANADIAN RIVER

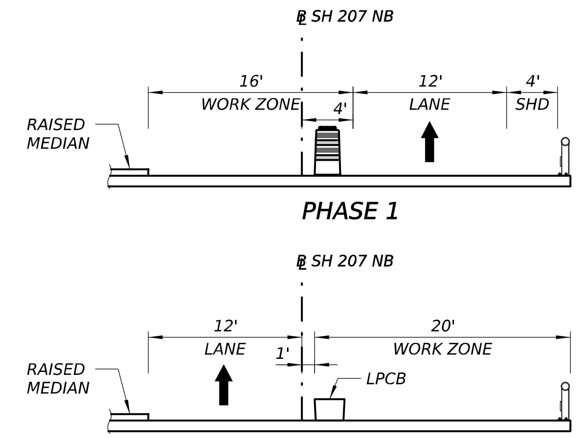


PHASE 1:
INSTALL PCTB AND AND WORK ZONE STRIPING. SHIFT TRAFFIC TO OUTSIDE LANE AND CLOSE THE INSIDE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

PHASE 2:
MOVE AND RESET PCTB. SHIFT TRAFFIC TO INSIDE LANE AND CLOSE THE OUTSIDE LANE PER THE TRAFFIC CONTROL PLANS. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

FINAL:
REMOVE PCTB. OPEN BOTH LANES TO TRAFFIC AND PERFORM FINAL CLEANUP.

REF 03: SH 207 NB AT SH 136 EB

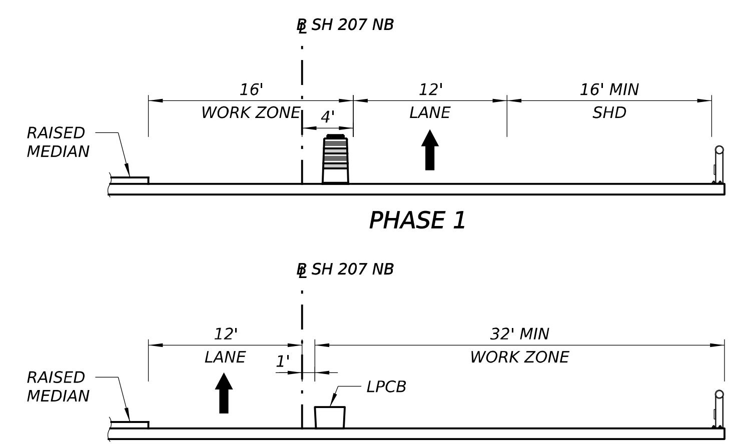


PHASE 1:
INSTALL WORK ZONE STRIPING. SHIFT TRAFFIC TO OUTSIDE LANE AND CLOSE THE INSIDE LANE USING TCP(2-6b)-18. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

PHASE 2:
INSTALL LPCB. SHIFT TRAFFIC TO INSIDE LANE AND CLOSE THE OUTSIDE LANE ACCORDING TO THE TCP PLANS. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

FINAL:
REMOVE LPCB. OPEN BOTH LANES TO TRAFFIC AND PERFORM FINAL CLEANUP.

REF 04: SH 207 NB AT SH 136 WB



PHASE 1:
CLOSE THE ENTRANCE RAMP AND INSTALL DETOUR AS SHOWN ON SH 207 AT SH 136 ENTRANCE RAMP CLOSURE DETOURS SHEET. INSTALL WORK ZONE STRIPING. SHIFT TRAFFIC TO OUTSIDE LANE AND CLOSE THE INSIDE LANE PER TCP(2-6b)-18. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

PHASE 2:
ENTRANCE RAMP TO REMAIN CLOSED. INSTALL LPCB. SHIFT TRAFFIC TO INSIDE LANE AND CLOSE THE OUTSIDE LANE PER THE TCP PLANS. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

FINAL:
REMOVE LPCB. OPEN BOTH LANES TO TRAFFIC AND REOPEN ENTRANCE RAMP. PERFORM FINAL CLEANUP.

NOTES:

1. ℄ LOCATION REFERS TO PAVEMENT MARKING BETWEEN TRAVEL LANES.

3/1/2024

NO.	DATE	REVISION	APPR BY

TEXAS TRANSPORTATION SOLUTIONS, INC. Firm # F-19397

Texas Department of Transportation

TRAFFIC CONTROL PLAN NARRATIVE

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC	SH 136, ETC
DIST	COUNTY		SHEET #
AMA	HUTCHINSON, ETC		66

1/2/2024 12:16

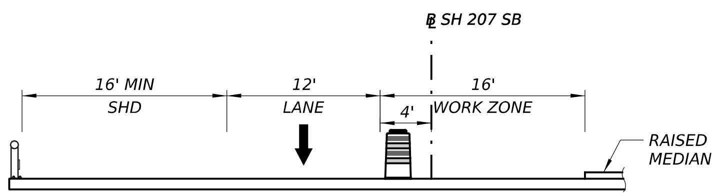
90% PLANS SUBMITTAL

DN: JB | CK: JT | DW: JR | CK: JZ

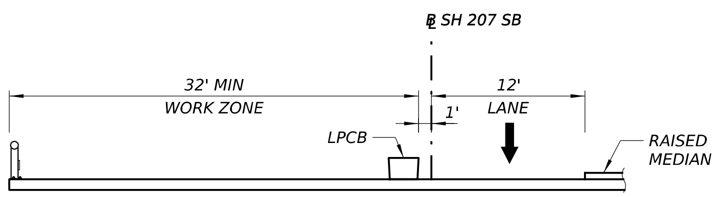
NOT TO SCALE

SEQUENCE OF CONSTRUCTION (CONTINUED)

REF 05: SH 207 SB AT SH 136 EB



PHASE 1



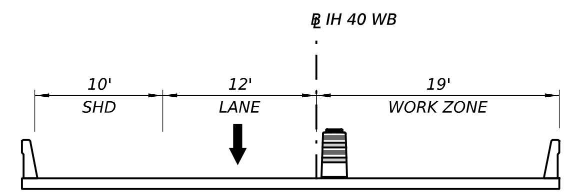
PHASE 2

PHASE 1:
CLOSE THE ENTRANCE RAMP AND INSTALL DETOUR SIGNAGE AS SHOWN ON **SH 207 AT SH 136 ENTRANCE RAMP CLOSURE DETOURS** SHEET. INSTALL WORK ZONE STRIPING. SHIFT TRAFFIC TO OUTSIDE LANE AND CLOSE THE INSIDE LANE W/ WORK ZONE SIGNAGE PER TCP(2-6b)-18. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

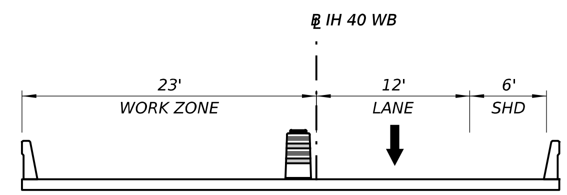
PHASE 2:
ENTRANCE RAMP TO REMAIN CLOSED. INSTALL LPCB. SHIFT TRAFFIC TO INSIDE LANE AND CLOSE THE OUTSIDE LANE PER THE TCP PLANS. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

FINAL:
REMOVE LPCB. OPEN BOTH LANES TO TRAFFIC AND REOPEN ENTRANCE RAMP. PERFORM FINAL CLEANUP.

REF 07: IH 40 WB AT US 385



PHASE 1



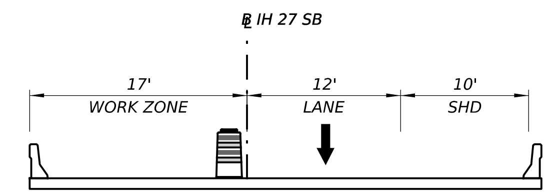
PHASE 2

PHASE 1:
SHIFT TRAFFIC TO OUTSIDE LANE AND CLOSE THE INSIDE LANE USING TCP(2-6a)-18. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

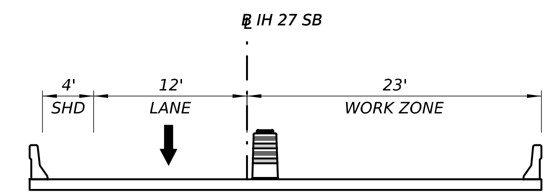
PHASE 2:
SHIFT TRAFFIC TO INSIDE LANE AND CLOSE THE OUTSIDE LANE USING TCP(2-6a)-18. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

FINAL:
OPEN BOTH LANES TO TRAFFIC AND PERFORM FINAL CLEANUP.

REF 09: IH 27 SB AT PDT FORK RED RIVER



PHASE 1



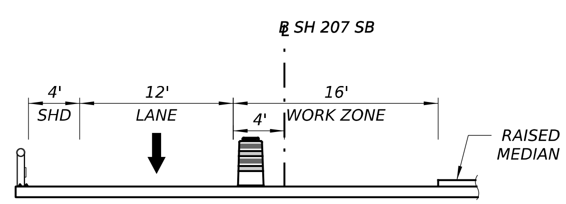
PHASE 2

PHASE 1:
SHIFT TRAFFIC TO OUTSIDE LANE AND CLOSE THE INSIDE LANE USING TCP(2-6a)-18. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

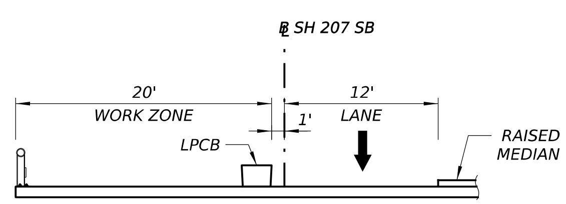
PHASE 2:
SHIFT TRAFFIC TO INSIDE LANE AND CLOSE THE OUTSIDE LANE USING TCP(2-6a)-18. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

FINAL:
OPEN BOTH LANES TO TRAFFIC AND PERFORM FINAL CLEANUP.

REF 06: SH 207 SB AT SH 136 WB



PHASE 1



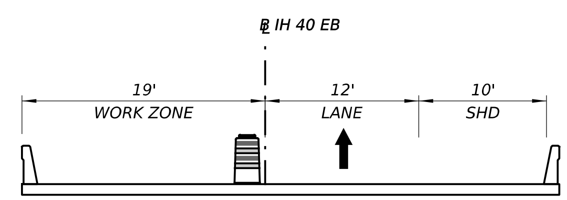
PHASE 2

PHASE 1:
INSTALL WORK ZONE STRIPING. SHIFT TRAFFIC TO OUTSIDE LANE AND CLOSE THE INSIDE LANE USING TCP(2-6b)-18. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

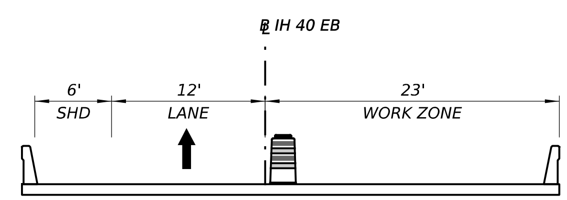
PHASE 2:
INSTALL LPCB. SHIFT TRAFFIC TO INSIDE LANE AND CLOSE THE OUTSIDE LANE ACCORDING TO THE TCP PLANS. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

FINAL:
REMOVE LPCB. OPEN BOTH LANES TO TRAFFIC AND PERFORM FINAL CLEANUP.

REF 08: IH 40 EB AT US 385



PHASE 1



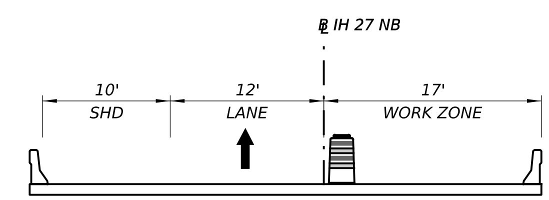
PHASE 2

PHASE 1:
SHIFT TRAFFIC TO OUTSIDE LANE AND CLOSE THE INSIDE LANE USING TCP(2-6a)-18. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

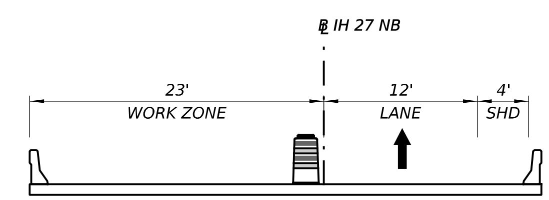
PHASE 2:
SHIFT TRAFFIC TO INSIDE LANE AND CLOSE THE OUTSIDE LANE USING TCP(2-6a)-18. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

FINAL:
OPEN BOTH LANES TO TRAFFIC AND PERFORM FINAL CLEANUP.

REF 10: IH 27 NB AT PDT FORK RED RIVER



PHASE 1



PHASE 2

PHASE 1:
SHIFT TRAFFIC TO OUTSIDE LANE AND CLOSE THE INSIDE LANE USING TCP(2-6a)-18. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

PHASE 2:
SHIFT TRAFFIC TO INSIDE LANE AND CLOSE THE OUTSIDE LANE USING TCP(2-6a)-18. MILL EXISTING PAVE. CONDUCT BRIDGE REPAIRS ACCORDING TO THE BRIDGE PLANS. PLACE OVERLAY AND REPLACE EXISTING MBGF. PLACE FINAL PAVEMENT MARKINGS.

FINAL:
OPEN BOTH LANES TO TRAFFIC AND PERFORM FINAL CLEANUP.

3/1/2024

NO.	DATE	REVISION	APPR BY

TEXAS TRANSPORTATION SOLUTIONS, INC. Firm # F-19397

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TRAFFIC CONTROL PLAN NARRATIVE

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC	SH 136, ETC
DIST	COUNTY		SHEET #
AMA	HUTCHINSON, ETC		67

1/2/2024 12:16

LEGEND

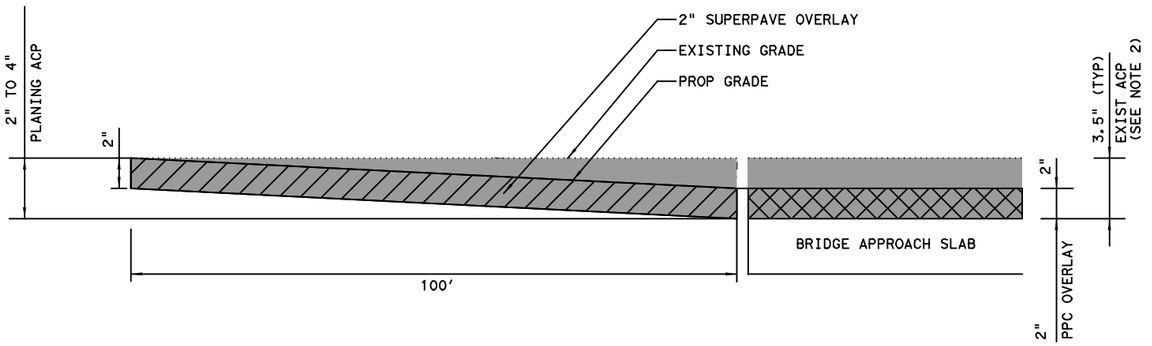
PPC OVERLAY (BRIDGE AND BAS)

PLANE ASPH CONC PVMT

2" SP-D PG70-28 OVERLAY

NOTES:

1. SEE PERTINENT BRIDGE PLANS FOR PLANING AND POLYESTER POLYMER CONCRETE OVERLAY OVER THE APPROACH SLAB AND BRIDGE DECK.
2. ESTIMATED ACP THICKNESS BASED ON AS-BUILT PLANS. ACTUAL THICKNESS MAY VARY. DO NOT PLANE CONCRETE SURFACE.



PAVEMENT TRANSITION DETAIL (ELEVATION VIEW)

REF 03: SH 207 NB OVER SH 136 EB
REF 04: SH 207 NB OVER SH 136 WB
REF 05: SH 207 SB OVER SH 136 EB
REF 06: SH 207 SB OVER SH 136 WB

NOT TO SCALE

STATE OF TEXAS
BRIAN ENNS
93801
LICENSED
PROFESSIONAL ENGINEER

P.E. 3/4/2024

NO.	DATE	REVISION	APPR BY

RTG RODRIGUEZ TRANSPORTATION GROUP FIRM #587

Texas Department of Transportation

ROADWAY PAVEMENT TRANSITION DETAILS

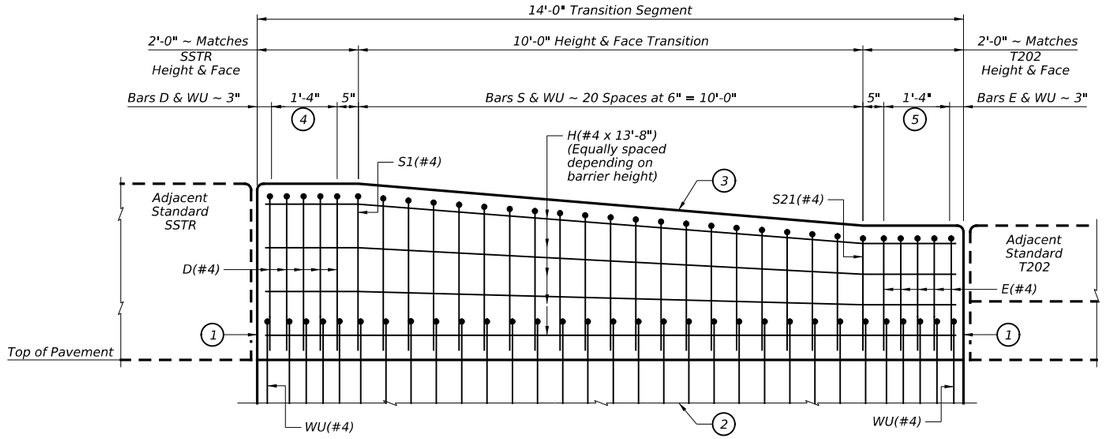
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		68

DATE: 3/4/2024 11:13:42 AM
FILE: AMA2-RDWY-PVMNT-DET01.dgn

FINAL SUBMITTAL (100%)

DW:	CK:	DW:	CK:
AJS	LJG	AJS	LJG

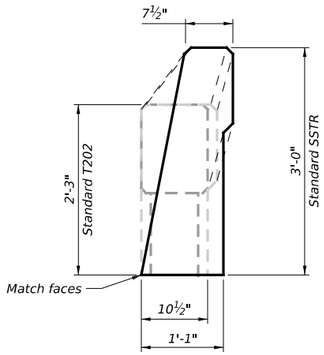


SIDE ELEVATION OF SEGMENT

GENERAL NOTES:

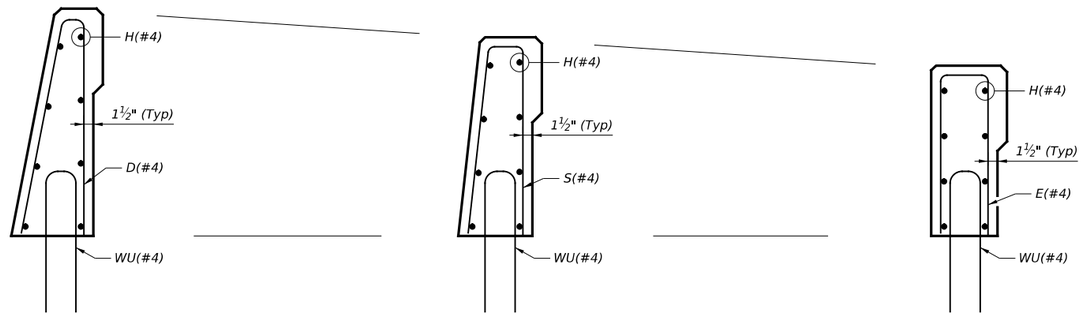
1. Reinforcing for the transition segment shall be Grade 60. All concrete shall be Class "C" unless otherwise specified in plans. Chamfer all exposed corners ¾" x ¾".
2. This transition segment is cast-in-place. The transition segment shall have end faces that are parallel to the adjacent barrier.
3. Height and face profile of the transition segment shall be gradually changed, within the limits detailed, so as to match the height and profile of the adjacent barriers. Adjust (bend and relocate) the reinforcing within the transition portion of the segment as necessary to conform to the altered barrier shape. Cover and minimum spacing requirement of the reinforcing shall not be violated.

(1) See SSTR Standards for joint details.
(2) See TRF Standards for rail foundation details.
(3) Increase barrier height by 2" for overlays. Adjust length of rebar as necessary.
(4) Bar D: 4 spaces at 4"
(5) Bar E: 4 spaces at 4"
(6) 2½" Dia Bending Pin



END ELEVATION OF SEGMENT

(Showing geometry only)

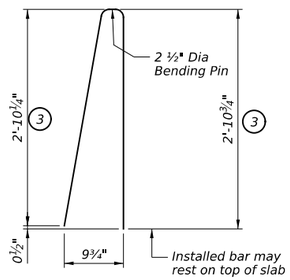


SSTR End

T202 End

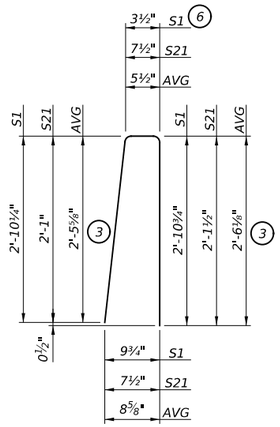
TYPICAL SECTIONS THROUGH TRANSITION SEGMENT

(Showing reinforcing and shape transitions only)



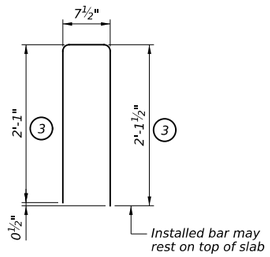
BARS D (#4)

(Length = 6'-0")



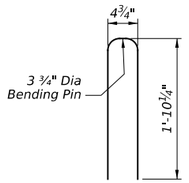
BARS S (#4)

(Average Length = 5'-5")



BARS E (#4)

(Length = 4'-10")



BARS WU (#4)

(Length = 4'-2")

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER

06/10/2024

Brett RC Allen

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

TRANSITION DETAILS SSTR TO T202

SCALE: N.T.S.

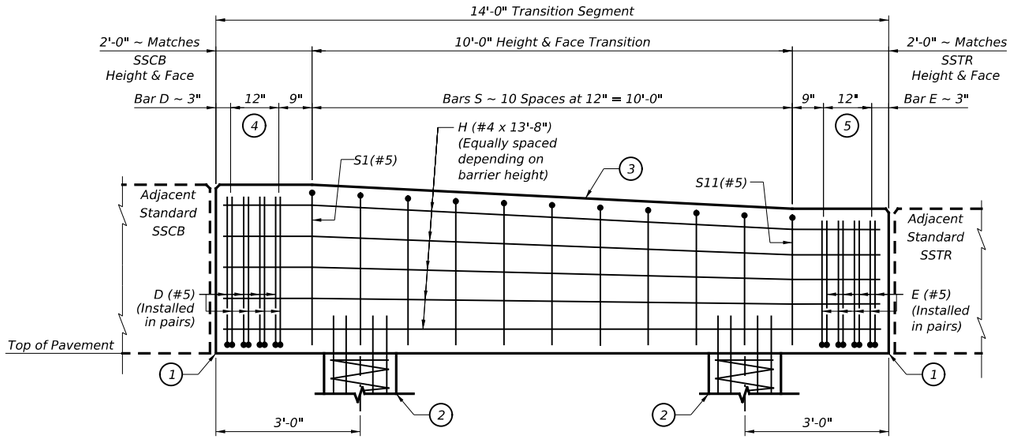
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		69

DATE: 6/8/2024 1:04:39 PM
FILE: AMA2_DET11.dgn

FINAL SUBMITTAL (100%)

DW:	CK	DW	CK
AJS	LJG	AJS	LJG

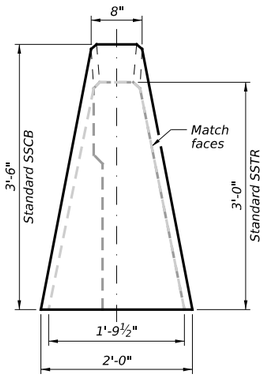


SIDE ELEVATION OF SEGMENT

GENERAL NOTES:

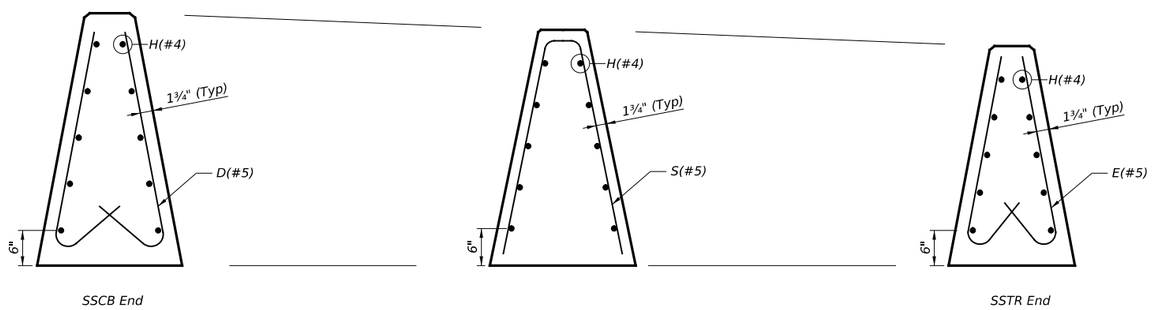
1. Reinforcing for the transition segment shall be Grade 60. All concrete shall be Class "C" unless otherwise specified in plans. Chamfer all exposed corners ¾" x ¾".
2. This transition segment is cast-in-place. The transition segment shall have end faces that are parallel to the adjacent barrier.
3. Height and face profile of the transition segment shall be gradually changed, within the limits detailed, so as to match the height and profile of the adjacent barriers. Adjust (bend and relocate) the reinforcing within the transition portion of the segment as necessary to conform to the altered barrier shape. Cover and minimum spacing requirement of the reinforcing shall not be violated.

(1) See SSCB Standards for joint details.
(2) See SSCB Standards for lateral support and anchor details.
(3) Increase barrier height by 2" for overlays. Adjust length of rebar as necessary.
(4) Bar D: 3 spaces at 4"
(5) Bar E: 3 spaces at 4"
(6) 2½" Dia Bending Pin



END ELEVATION OF SEGMENT

(Showing geometry only)

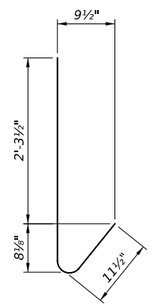


SSCB End

SSTR End

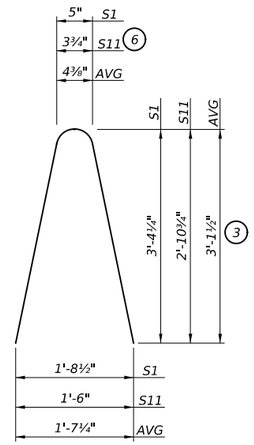
TYPICAL SECTIONS THROUGH TRANSITION SEGMENT

(Showing reinforcing and shape transitions only)



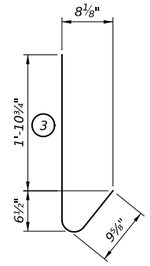
BARS D (#5)

Installed in pairs
(Length = 4'-0")



BARS S (#5)

(Average Length = 6'-5")



BARS E (#5)

Installed in pairs
(Length = 3'-4")

06/10/2024

Brett RC Allen

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc.
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

TRANSITION DETAILS SSCB TO SSTR

SCALE: N.T.S.

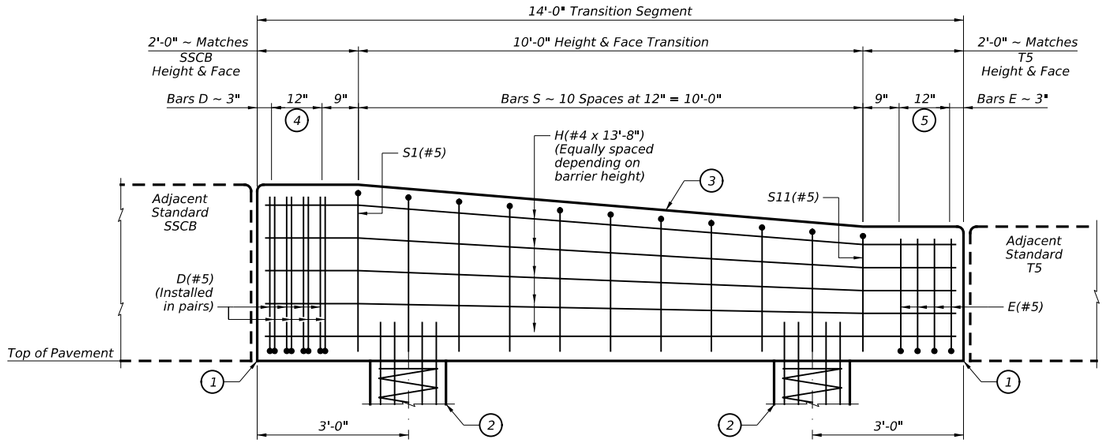
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		70

DATE: 6/8/2024 1:04:48 PM
FILE: AMA2_DET12.dgn

FINAL SUBMITTAL (100%)

DW:	CK:	DW	CK
AJS	LJG	AJS	LJG

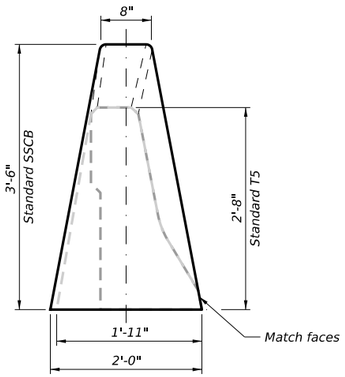


SIDE ELEVATION OF SEGMENT

GENERAL NOTES:

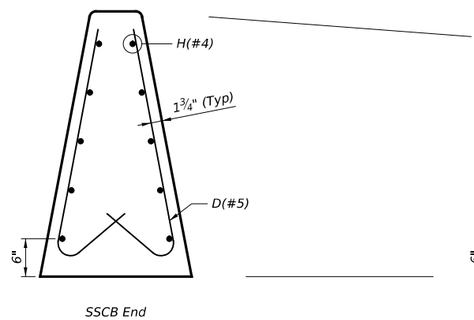
1. Reinforcing for the transition segment shall be Grade 60. All concrete shall be Class "C" unless otherwise specified in plans. Chamfer all exposed corners ¾" x ¾".
2. This transition segment is cast-in-place. The transition segment shall have end faces that are parallel to the adjacent barrier.
3. Height and face profile of the transition segment shall be gradually changed, within the limits detailed, so as to match the height and profile of the adjacent barriers. Adjust (bend and relocate) the reinforcing within the transition portion of the segment as necessary to conform to the altered barrier shape. Cover and minimum spacing requirement of the reinforcing shall not be violated.

(1) See SSCB Standards for joint details.
(2) See SSCB Standards for lateral support and anchor details.
(3) Increase barrier height by 2" for overlays. Adjust length of rebar as necessary.
(4) Bar D: 3 spaces at 4"
(5) Bar E: 3 spaces at 4"
(6) 2½" Dia Bending Pin

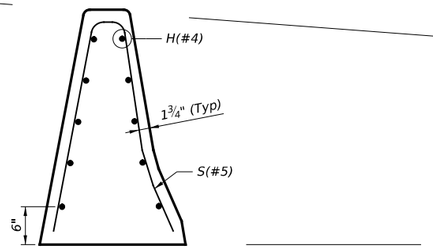


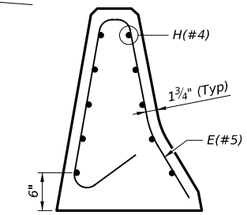
END ELEVATION OF SEGMENT

(Showing geometry only)



SSCB End

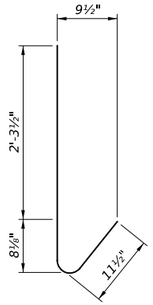




T5 End

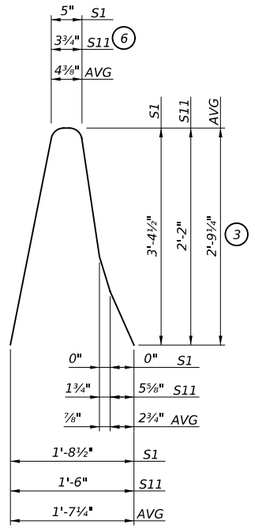
TYPICAL SECTIONS THROUGH TRANSITION SEGMENT

(Showing reinforcing and shape transitions only)



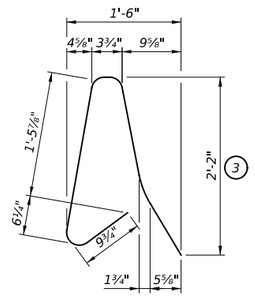
BARS D (#5)

Installed in pairs
(Length = 4'-0")



BARS S (#5)

(Average Length = 6'-1")



BARS E (#5)

(Length = 5'-11")

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06/10/2024

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TRANSITION DETAILS SSCB TO T5

SCALE: N.T.S.

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		71

DATE: 6/8/2024 1:04:56 PM
FILE: AMA2_DET10.dgn

FINAL SUBMITTAL (100%)

DW:	AJS	CK:	BRA	DW:	AJS	CK:	BRA

POLYESTER POLYMER CONCRETE (PPC) OVERLAY NOTES:

Perform work in accordance with Item 439 and below instructions. A technical representative of the overlay manufacturer should be present at the pre-construction meeting and execution of all work associated with the overlay installation.

1. Plane asphalt from bridge deck per Item 354, "Planing and Texturing Pavement." See bridge plans for the thickness of the existing ACP. Take care to not remove any concrete during the asphalt planing process.

2. Inspect the bridge deck for any potential deck repairs or delaminated concrete. Perform partial and/or full depth bridge deck repairs in accordance with Item 429, "Concrete Structure Repair" and Chapter 3, Section 4 of TxDOT Concrete Repair Manual. Cure repairs in accordance with Manufacturer's recommendations unless approved otherwise. This work will be paid for in accordance with Item 429, "Concrete Structure Repair."

3. Prepare the deck surface by shot blasting and cleaning with high pressure air. Remove all oil and other contaminants. Provide a surface profile with no less than ¼" deviation. This work is subsidiary to Item 439.

4. Mask existing joints and deck drains. Saw cutting of joints after overlay installation is prohibited.

5. Install Polyester Polymer Concrete Overlay per Item 439. See each bridge's Table of Repairs on the Bridge Location Repair Plan sheets for overlay thickness.

6. The Contractor is responsible for the ride quality of the finished surface. See Article 422.4.10, "Defective Work" for acceptance criteria to be enforced for this work.

7. Provide longitudinal sawcut grooving in accordance with Item 422. This work is subsidiary to Item 439.

8. Install pavement markings as shown on pavement marking plans.

9. Seal the expansion joints where designated on the bridge repair plans. See bridge plans for joint details.

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BRIDGE DECK OVERLAY NOTES

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		72

DATE: 6/8/2024 1:05:05 PM
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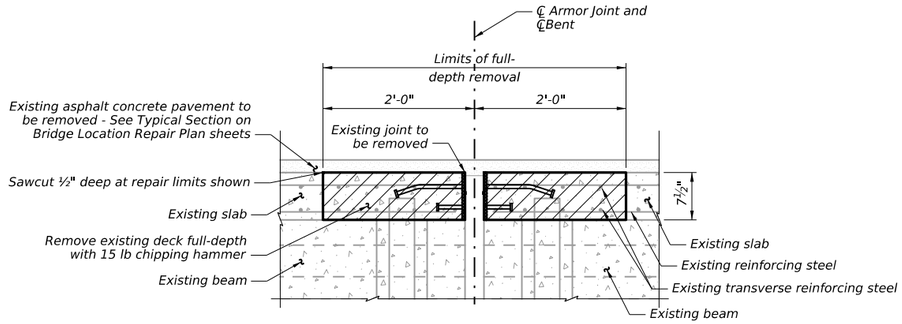
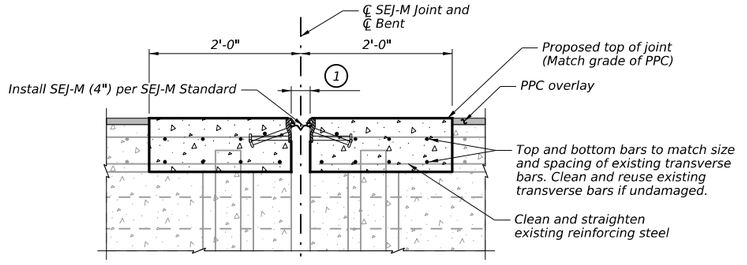
FINAL SUBMITTAL (100%)

DW:	CK:	DW:	CK:
AJS	LJG	AJS	LJG



EXISTING - ARMOR JOINT

(Bent location shown, Abutment location similar)
(Similar over Steel Girders)



PROPOSED - SEJ-M JOINT

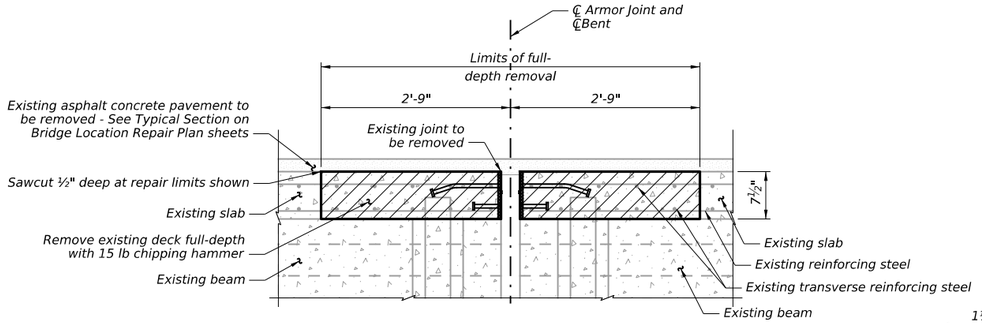
(Bent location shown, Abutment location similar)
(Similar over Steel Girders)

ARMOR JOINT REPLACEMENT DETAILS

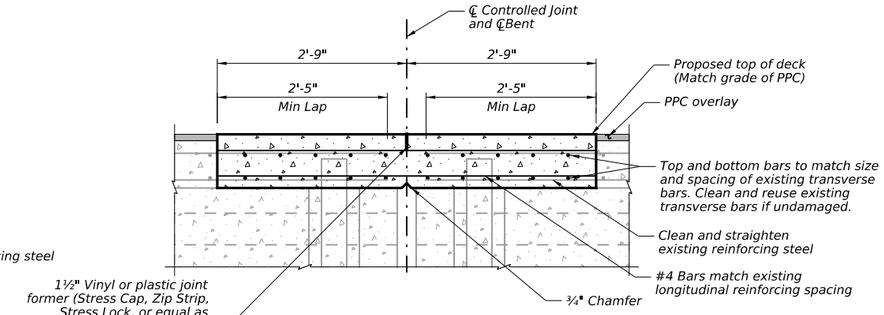
GENERAL NOTES:

1. Identify and mark all repair areas prior to beginning work. Verify areas and quantities with the Engineer.
2. Prepare detailed repair procedure in accordance with Item 785, "Bridge Joint Repair or Replacement" and Chapter 3, Section 4 of the TxDOT Concrete Repair Manual and detail herein.
3. Deck concrete shall be Class S concrete ($f'c$ = 4000 psi).
4. Reinforcing steel shall be Grade 60, and all new reinforcing steel in the deck shall be epoxy coated, except where noted on the plans. Replace existing reinforcing as directed by the Engineer. Lap length is 2'-5" for #4 bars. Refer to Item 440 of the General Notes about reinforcement.
5. Avoid damage to existing beams, backwalls, diaphragms, and bents. Repair concrete damage per Item 785, "Bridge Joint Repair or Replacement".
6. Armor Joint Replacement will be paid for in accordance with Item 785-7011, "Bridge Joint Replacement (SEJ)." Controlled Joint work will be paid for in accordance with Item 785-7009 "Bridge Joint Replacement (Concrete)." Construction Joint Repair will be paid for in accordance with Item 785-7001 "Bridge Joint Repair (Concrete)."

(1) See SEJ-M standard for joint opening width and additional details.
(2) See the BAS-C(MOD) standard sheet for additional details for the proposed approach slab.
(3) Before installation of roof felt and proposed approach slab, if vertical steel bars are protruding from the top of backwall, cut steel to be flush with the proposed top of backwall/bottom of approach interface.
(4) #6 Dowel Bars are to be either GFRP bars or Hot Dipped Galvanized Grade 60 bars.
(5) Measured parallel to centerline of bridge, not perpendicular to skewed joint

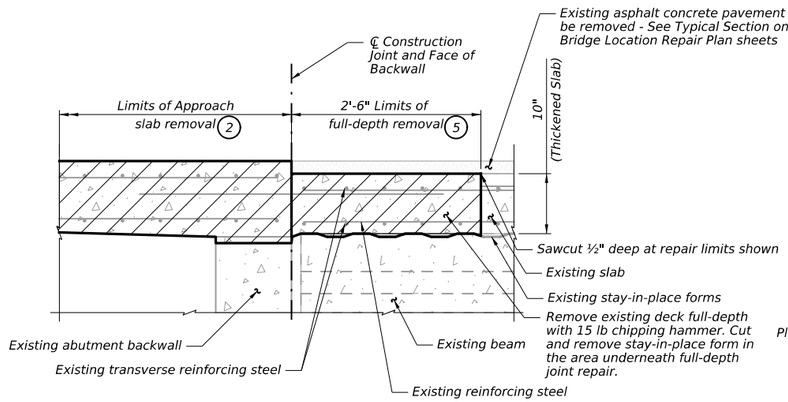


EXISTING - ARMOR JOINT

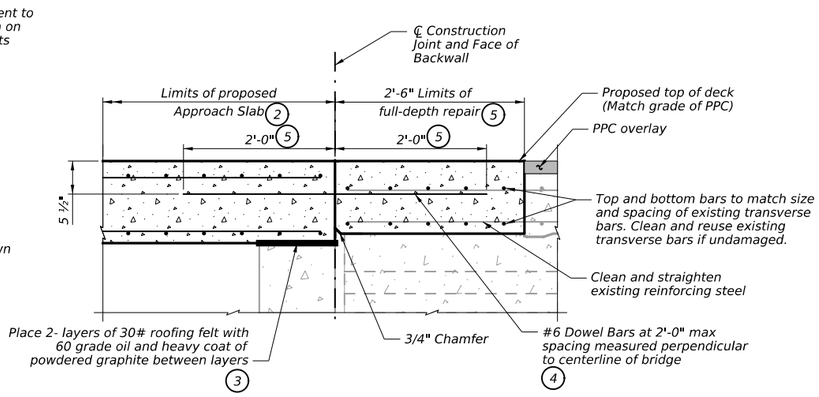


PROPOSED - CONTROLLED JOINT

CONTROLLED JOINT REPLACEMENT DETAILS



EXISTING - CONSTRUCTION JOINT



PROPOSED - CONSTRUCTION JOINT

CONSTRUCTION JOINT REPAIR DETAILS

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JOINT REPLACEMENT DETAILS

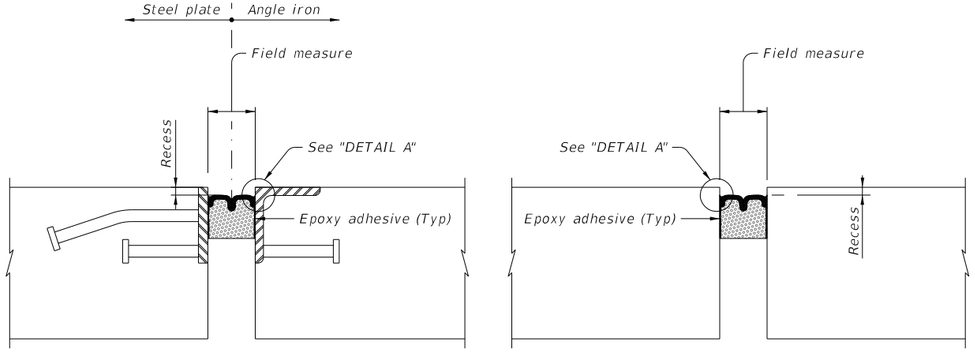
SCALE: N.T.S.
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		73

DATE: 6/8/2024 1:42:58 PM
FILE: AMA2_DET06.dgn

FINAL SUBMITTAL (100%)

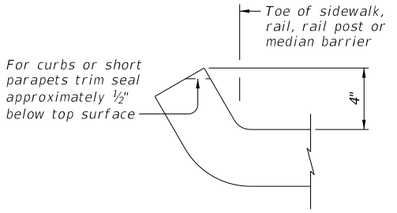
DW:	AJS	Ck:	BRA	DW:	AJS	Ck:	BRA



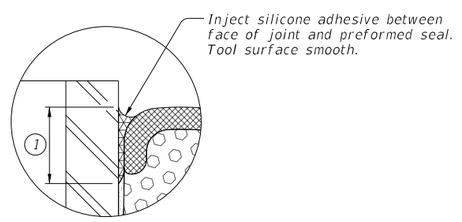
SHOWING STEEL NOSING

SHOWING CONCRETE NOSING

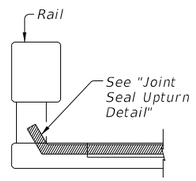
JOINT SECTIONS



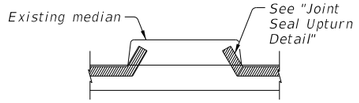
JOINT SEAL UPTURN DETAIL



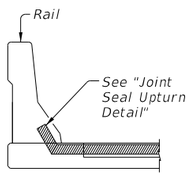
DETAIL A



AT CONCRETE BRIDGE RAIL



AT RAISED MEDIAN



AT CONCRETE BRIDGE RAIL

JOINT SEALANT TERMINATION DETAILS

CONSTRUCTION NOTES:

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

Splice and install seal in accordance with the Manufacturer's directions and with the adhesive provided by the Manufacturer.

Extend sealant up into rail or curb 4 inches on low side or sides of deck.

When cleaning and sealing relief joints at approach slabs, if the field measured joint width is less than ¼", Contractor is to resize the joint by sawing to the width of ¼" to accommodate the foam compression seal. Sawcut depth shall be the full depth of the concrete approach pavement. Contractor shall take care not to cut into the support slab in the approach slab. Confirm these depths with the Engineer before proceeding. Payment for resizing the joint shall be incidental to Item 438.

APPROVED PRECOMPRESSED FOAM SEAL MANUFACTURERS

MANUFACTURER (2)	STEEL OR CONCRETE SECTION	SEAL TYPE
Watson Bowman Acme	As shown	Wabo FS
SSI	As shown	Silspec SES
Sealtite	As shown	Sealtite 50N
EMSEAL	As shown	BEJS

(1) Injection depth as recommended by Manufacturer.

(2) Other manufacturers of bridge expansion joint foam seal may be listed on the plans.

PROCEDURES:

1) Correctly size joint seal based on field measurement and in accordance with Manufacturer's specifications. Multiple seal widths may be required. Ensure proper seal is selected for each joint.

2) Abrasive blast clean existing joint surfaces where seal is to be applied.

3) Wipe down joint surfaces to remove contaminants.

4) Mask areas adjacent to joint opening sufficiently to keep epoxy off deck surface.

5) Apply epoxy to joint opening side surfaces.

6) While epoxy is still tacky, remove shrink wrap from seal and install in joint opening.

7) Recess top of joint seal ½" in travel lanes and ¼" in shoulders.

8) Inject silicone adhesive along top interface of seal with joint side surface. Tool to spread adhesive as necessary.

GENERAL NOTES:

Provide pre-compressed silicone and foam hybrid joint seal in the size and at locations shown on the plans.

Payment is based on the length of seal placed and in accordance with Item 438, "Cleaning and Sealing Joints."

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CLEANING AND SEALING EXISTING BRIDGE JOINTS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		74

DATE: 6/8/2024 1:05:22 PM
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FINAL SUBMITTAL (100%)

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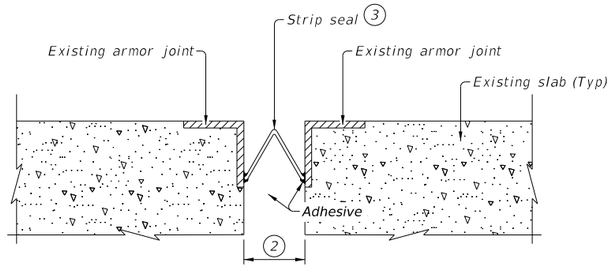
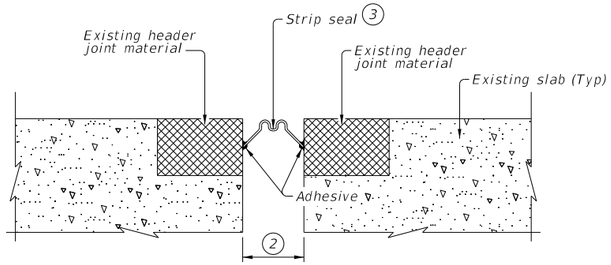
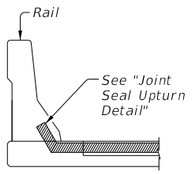


BONDED STRIP SEAL ON ARMOR JOINT

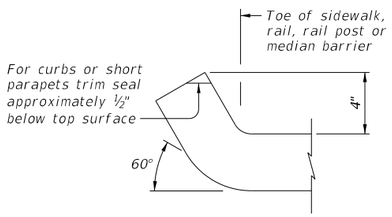


BONDED STRIP SEAL ON HEADER JOINT



AT CONCRETE BRIDGE RAIL

JOINT SEALANT TERMINATION DETAILS



JOINT SEAL UPTURN DETAIL

APPROVED STRIP SEAL SYSTEM MANUFACTURERS

Manufacturer	Strip Seal Seal Type
R.J. Watson	SF-225
R.J. Watson	SF-325
SSI	SSS-225
Watson Bowman ACME	SPS-225

(1) The PRE-INSTALLATION CONDITIONS and INSTALLATION PROCEDURE FOR NEW AND EXISTING JOINTS are meant to be general guides. See manufacturer specific procedures and instructions for detailed guidance.

(2) Recommended minimum installation width is 1.25".

(3) Regardless of seal type shown, any strip seal system from the table above may be used in this application.

PRE-INSTALLATION CONDITIONS (1)

- Ambient and surface temperatures must be at least 40°F.
- Joint surfaces must be completely dry. Do not install strip seal system immediately after a rain event or if precipitation is forecast for the day.
- Prepare joints and install strip seal system on the same day.
- No traffic is allowed to cross over primed and sandblasted joints.
- If necessary, repair existing joint appropriately per TxDOT Item 785, "Bridge Joint Repair or Replacement."
- Ensure that all materials associated with preparation and installation of strip seal are compatible.

INSTALLATION PROCEDURE FOR NEW AND EXISTING JOINTS: (1)

- Abrasive blast the vertical faces of the joint (steel or concrete) then clean with a cloth saturated in denatured alcohol.
- Apply the surface primer to the vertical joint faces. Follow all manufacturer's instructions for preparation and application of surface primer.
- Ready the strip seal next to the joint opening and clean thoroughly with a cloth saturated in denatured alcohol.
- Using a caulking tool, apply an initial bead of adhesive at least ⅜" in diameter to both vertical faces of the joint below the top surface of the joint.
- Place the strip seal into the joint above the initial bead of adhesive. Gradually press the seal downward while maintaining contact between the seal's sides and joint header. Position the strip seal so that seal top is at least ½" below the riding surface.
- Place a second bead of adhesive along each side of the strip seal no higher than the top of the strip seal's serrations. Ensure that this layer of adhesive is in contact with the strip seal and joint faces.
- Tool the second layer of adhesive with a tongue depressor (or other suitable tool) to create a concave face that is completely in contact with the joint faces.
- Cure the strip seal system per manufacturer's recommendations prior to permitting traffic on the bridge.

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CLEANING AND SEALING EXISTING BRIDGE JOINTS (STRIP SEAL)

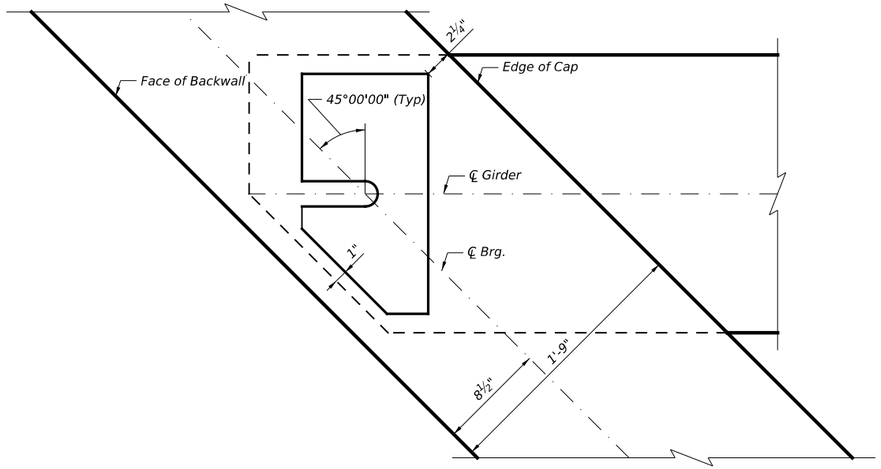
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		74A

DATE:
FILE:

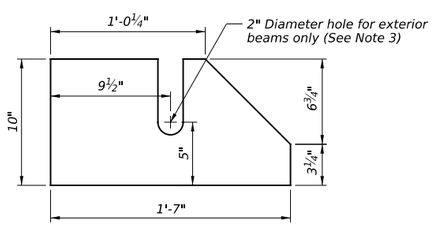
FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	AJS	LJG

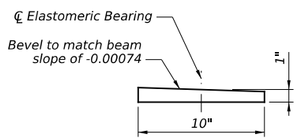


BEARING PAD LAYOUT DIMENSIONS AT ABUTMENTS

Replace pad (10" x 19" x 1")



PLAN BEARING (70 DUROMETER)



ELEVATION

GENERAL NOTES:

1. *Bearing pad replacement will be paid for in accordance with Item 787, "Replacing Elastomeric Bearing Pads".*
2. *Raise spans or individual girders as necessary to replace the indicated bearing in conformance with Item 495, "Raising Existing Structures". The work performed to raise the spans or girders will not be paid for directly but is considered subsidiary to Item 787.*
3. *A slot is to be cut into the bearing pads being installed on exterior beams only. The slot will allow the bearing pads to slide past the existing dowel rod that is embedded into the bent cap/abutment cap.*
4. *Following installation of new bearing pad, apply stripe coat of Type V Epoxy at interface of pad and concrete pedestal to secure pad. This work is subsidiary to bearing pad replacement.*

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BEARING PAD REPLACEMENT DETAILS

SCALE: N.T.S.

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		75

DATE: 6/8/2024 1:05:38 PM
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FINAL SUBMITTAL (100%)

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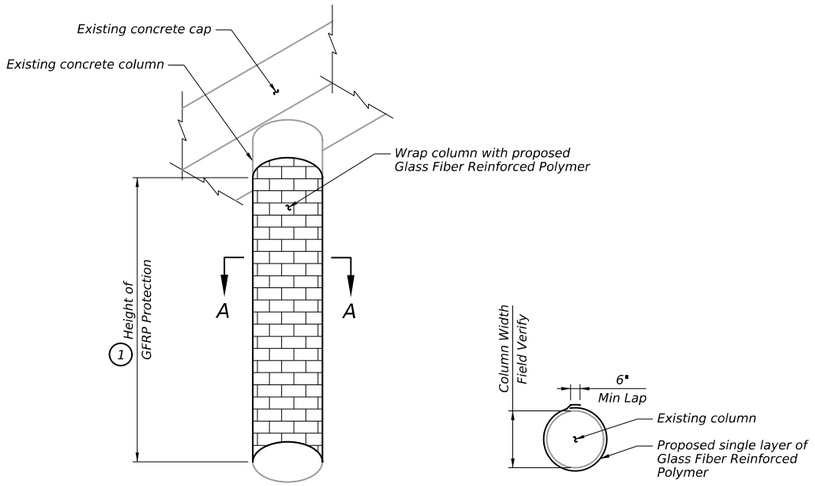


ISOMETRIC

SECTION A-A

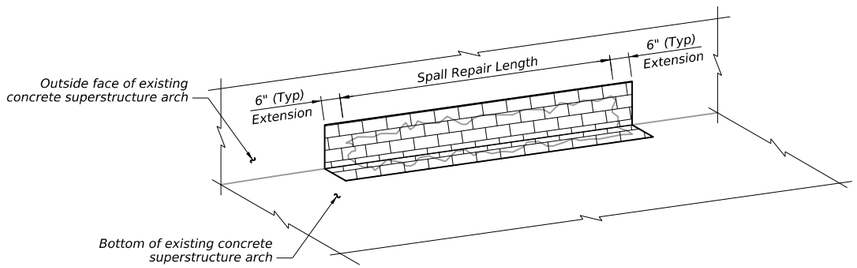
COLUMN WRAPPING DETAIL

TYPICAL COLUMN SPLIT CRACKING
(Showing Bent 3 Column 1 from IH 40 EB Overpass at US 385)

GENERAL NOTES:

1. Identify and mark all repair locations prior to beginning work. Verify areas and quantities with the Engineer.
2. Perform all concrete repair work prior to surface preparation for Glass Fiber Reinforced Polymer (GFRP) in accordance with Item 429.
3. Prepare concrete surface and install Externally Bonded FRP Structural Member Protection consisting of glass fibers in accordance with DMS-4700 and Item 786, "Carbon Fiber Reinforced Polymer". Substitution of carbon fiber is permissible. Payment is per Item 786, "Carbon Fiber Reinforced Polymer (CFRP)".
4. Wrap columns beginning from the bottom and proceed upward.
5. Orient unidirectional fibers horizontally, around the perimeter/circumference of the column. Utilize largest widths practical and overlap successive wraps by 6" minimum.
6. GFRP is for protection and confinement only. Working drawings are not required.
7. Clean and paint completed GFRP with UV protective paint as recommended by manufacturer. Match color to surrounding concrete as approved by the Engineer.

(1) See Substructure Isometrics for height of GFRP Protection.



SUPERSTRUCTURE ARCH DETAIL
(Same viewing angle as Typical Superstructure Arch Damage)

TYPICAL SUPERSTRUCTURE ARCH DAMAGE
(Showing Span 2 from SH 207 NB Overpass at SH 136 EB)

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06/10/2024
Brett RC Allen

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Texas Department of Transportation

GFRP WRAPPING DETAILS

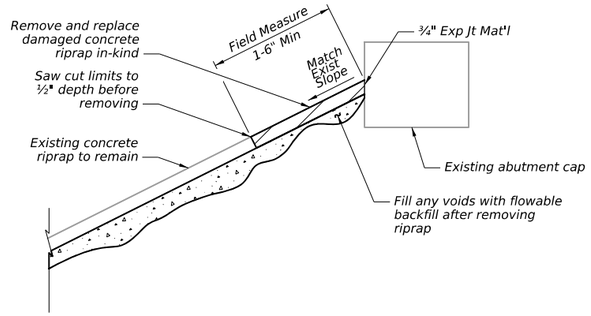
SCALE: N.T.S. SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		76

DATE: 6/8/2024 1:05:46 PM
FILE: AMA2_DET05.dgn

FINAL SUBMITTAL (100%)

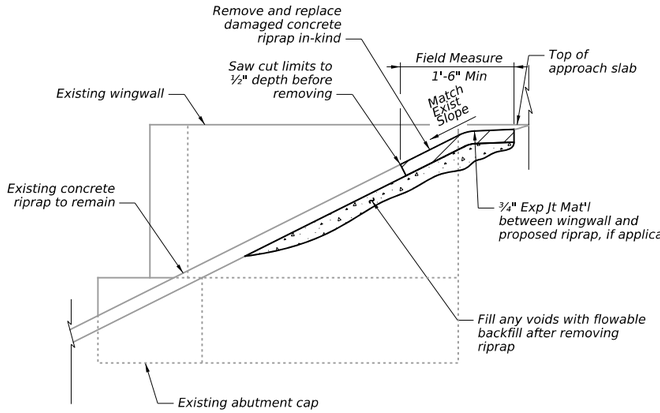
DW:	CK	DW:	CK
AJS	LJG	AJS	LJG



CONCRETE RIPRAP AT ABUTMENT DETAIL

TYPICAL RIPRAP DAMAGE AT ABUTMENT

(Showing Abutment 1 from SH 207 NB Overpass at SH 136 WB)

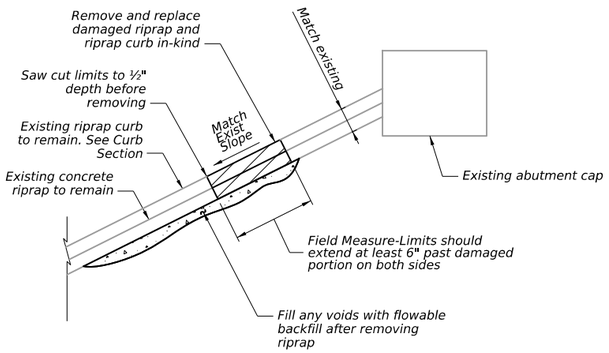


CONCRETE RIPRAP AT WINGWALL DETAIL

Beams and railings not shown for clarity

TYPICAL RIPRAP DAMAGE AT WINGWALL

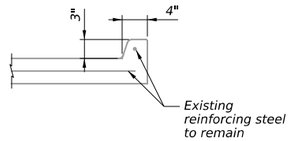
(Showing Abutment 4 from SH 207 SB Overpass at SH 136 WB)



CONCRETE RIPRAP CURB DETAIL

TYPICAL RIPRAP CURB DAMAGE

(Showing riprap curb at Abutment 4 from IH 40 EB Overpass at US 385)



CURB SECTION

GENERAL NOTES:

1. Quantity estimates of repairs are based on as-builts and the most recent inspection. Field verify limits of repairs and report deviations to the Engineer.
2. Sawcut and remove concrete in accordance with Item 104, "Removing Concrete".
3. Existing reinforcing steel shall be cleaned, straightened and left in place. Replace any damaged reinforcing in accordance with Item 432, "Riprap".
4. If any voids are discovered after removing the riprap, they are to be backfilled with flowable fill as specified in Item 401, "Flowable Backfill". If only flowable fill is specified in the Table of Repairs, then the flowable fill will be delivered through holes that are cored prior to the introduction of flowable fill to allow for the displacement of air, water, and other debris. Due care should be taken while pumping to avoid damage to the existing structure.
5. Install proposed riprap in accordance with Item 432, "Riprap," to match the slope of the existing riprap.
6. Refer to CRR standard for further information on riprap. Refer to Item 432 of the General Notes for additional notes about riprap joints.

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CONCRETE RIPRAP REPAIR DETAILS

SCALE: N.T.S.

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		77

DATE: 6/8/2024 1:05:54 PM
FILE: AMA2_DET02.dgn

FINAL SUBMITTAL (100%)

DW:	CK:	DW:	CK:
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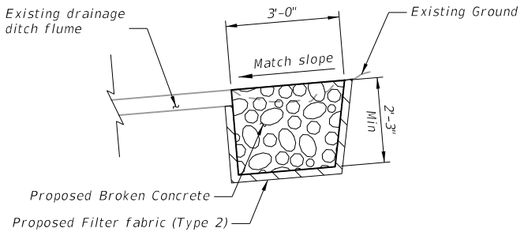
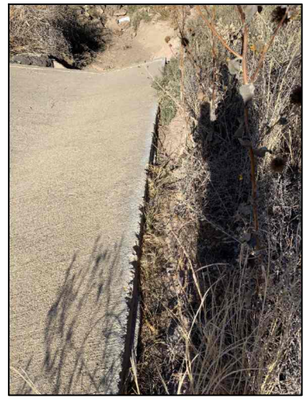


STONE RIPRAP AT DRAINAGE DITCH FLUME DETAIL

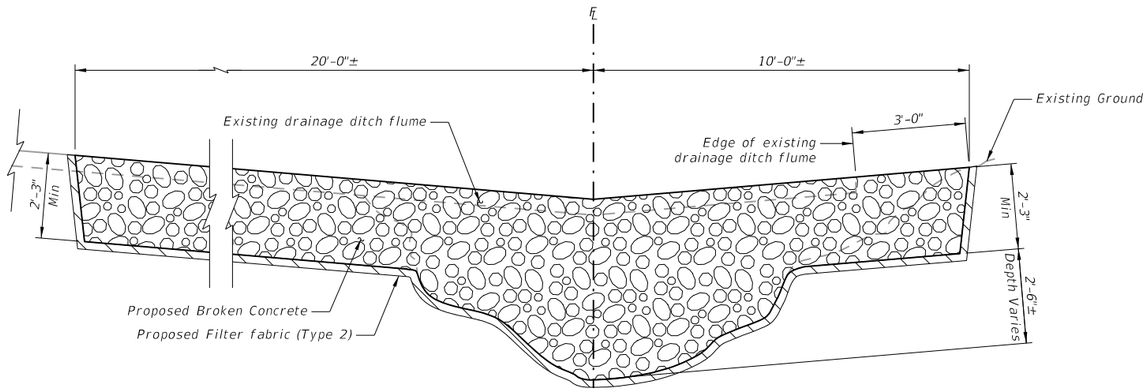


EROSION AT DRAINAGE DITCH FLUME

(Showing SE of Abutment 1 from IH 27 NB Over P.D.T. Fork Red River)

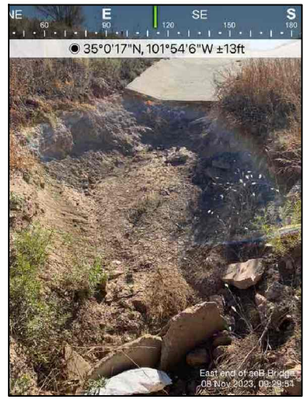
GENERAL NOTES:

1. *Broken concrete will be used as riprap and shall consist of material taken from approach slab removal unless directed otherwise by the Engineer.*
2. *Dimensions shown are approximate and broken concrete will be placed as directed by the Engineer. Riprap work will be paid for in accordance with Item 432-7043, "Riprap (Stone Protection)(18 in)."*



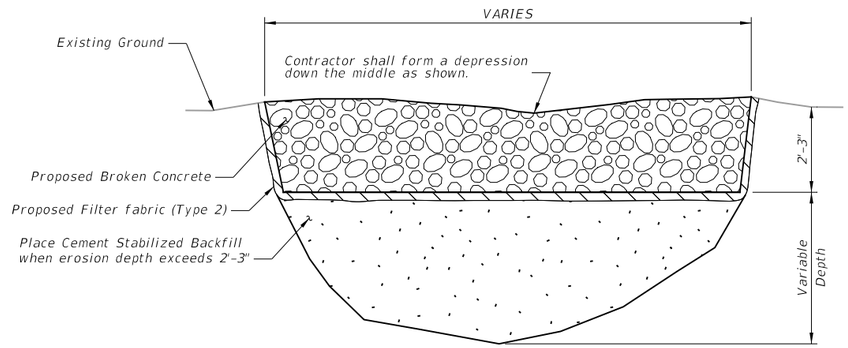
STONE RIPRAP AT DRAINAGE DITCH FLUME OUTFALL DETAIL

(Looking Northwest)



EROSION AT DRAINAGE DITCH FLUME OUTFALL

(Showing SE of Abutment 1 from IH 27 NB Over P.D.T. Fork Red River)



EROSION GULLY DETAIL

TYPICAL EROSION GULLY

(Showing South of Bent 2 from IH 27 SB Over P.D.T. Fork Red River)

LEGEND

- Cement Stabilized Backfill
- Riprap Stone Protection
- Filter Fabric

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EROSION REPAIR DETAILS

SCALE: N.T.S.

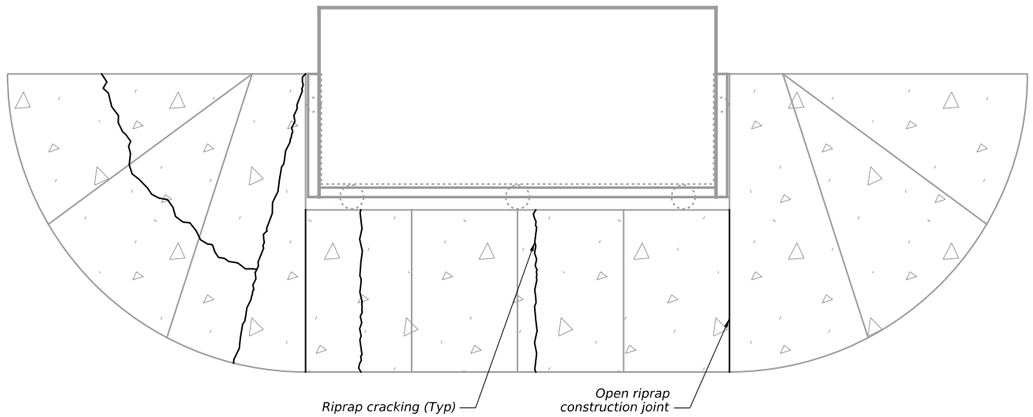
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		78

DATE: 6/8/2024 1:06:03 PM
FILE: AMA2_DET04.dgn

FINAL SUBMITTAL (100%)

DW:	AJS	CK:	LJG	DW:	AJS	CK:	LJG



EXISTING TYPICAL RIPRAP PLAN VIEW

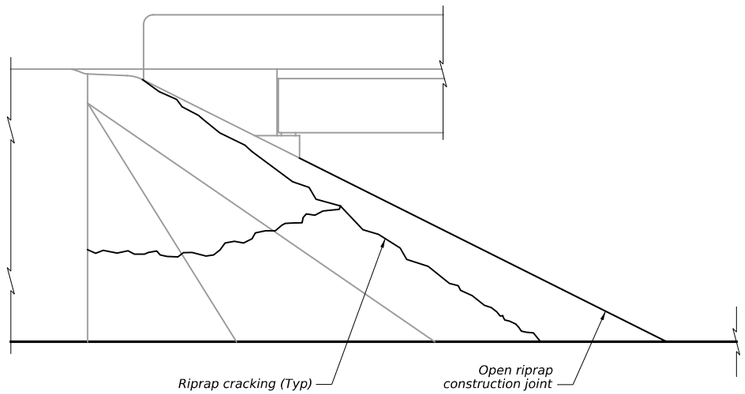
(Deck not shown for clarity)

TYPICAL OPEN RIPRAP CONSTRUCTION JOINT

(Showing Abutment 1 from SH 207 SB Overpass at SH 136 EB)

GENERAL NOTES:

1. *Quantity estimates of repairs are based on as-builts and the most recent inspection. Field verify limits of repairs and report deviations to the Engineer.*
2. *Cracks or construction joints with openings greater than ¼" or those designated by the Engineer are to be sealed.*
3. *Seal joint and cracks with Silicone sealant or approved equivalent.*
4. *Submit detailed repair procedures, including proposed proprietary materials, for approval prior to comencing work.*
5. *Concrete crack repairs are considered "Crack Repair - Rout-and-Seal Cracks" and shall be repaired following Chapter 3 Section 7 of the TxDOT concrete repair manual.*
6. *Crack repairs will be paid for in accordance with Item 713-7004, "Crack Cleaning and Sealing (JCP)."*



EXISTING TYPICAL RIPRAP ELEVATION VIEW

TYPICAL RIPRAP CRACKING

(Showing Abutment 1 from IH 27 SB at P.D.T. Ford Red River)

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CONCRETE RIPRAP CRACK SEALING DETAILS

SCALE: N.T.S.

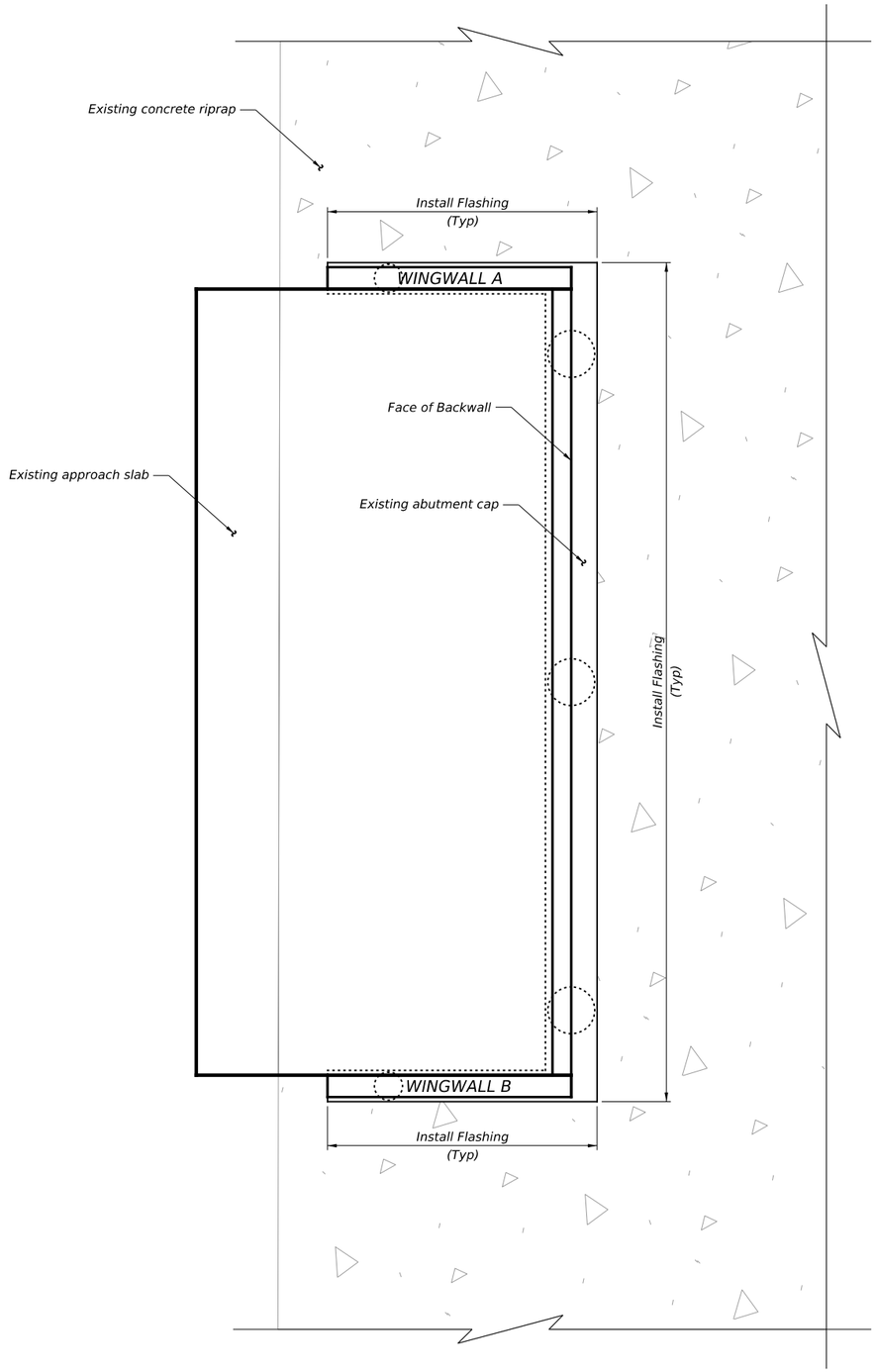
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		79

DATE: 6/8/2024 1:06:12 PM
FILE: AMA2_DET09.dgn

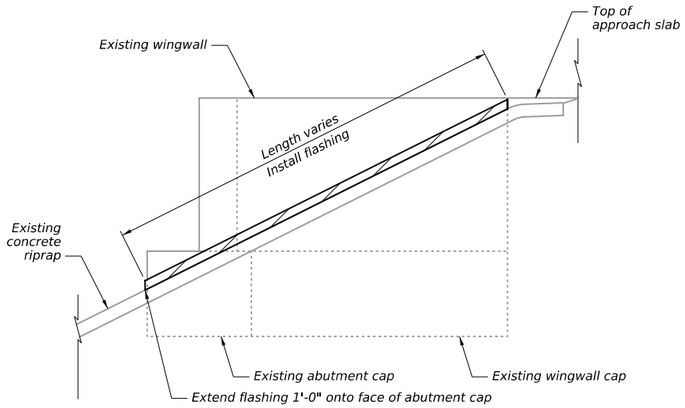
FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	AJS	LJG



ABUTMENT PLAN VIEW: SHOWING RIPRAP (TYP)

Deck not shown for clarity



WINGWALL ELEVATION VIEW (TYP): SHOWING RIPRAP

Beams and railings not shown for clarity

GENERAL NOTES:

1. *Flashing will be paid for in accordance with Item 713-7004, "Crack Cleaning and Sealing (JCP)".*
2. *Remove any existing joint material and clean debris and vegetation between the riprap and abutment joint. This work is subsidiary to Item 713 and will not be paid for separately.*
3. *Refer to Cap Option A on CRR Standard for additional details.*

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JOINT SEAL FLASHING DETAILS

SCALE: N.T.S.

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		80

DATE: 6/8/2024 1:06:20 PM
FILE: AMA2_DET03.dgn

FINAL SUBMITTAL (100%)

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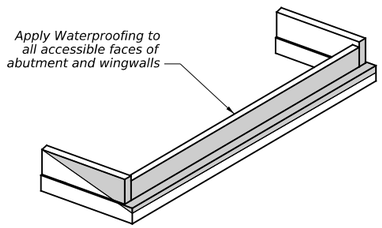
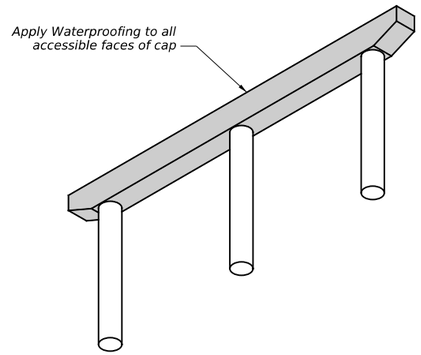
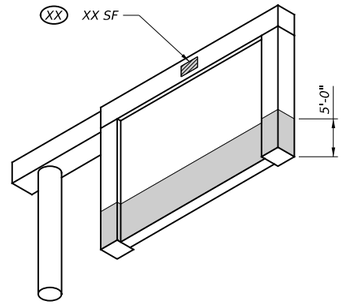


TYPICAL ABUTMENT (1)



TYPICAL BENT (1)

(All bridges excluding SH 136 at SB Canadian)



TYPICAL BENT (2)

(SH 136 at SB Canadian Only)

GENERAL NOTES:

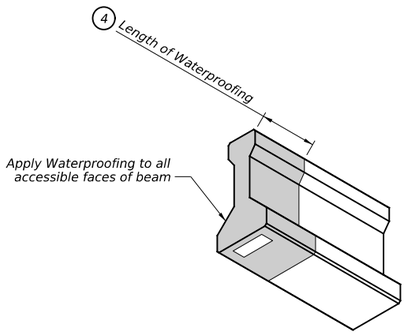
1. All work for waterproofing will be paid for in accordance to Item 427-7005, "Epoxy Waterproof Finish (TY X)."

(1) The abutment and bent shown are generic. Similar abutments and bents will be found in the field. See Substructure Concrete Waterproofing Table on the Substructure Repair Isometric sheets for square foot area of waterproofing required.

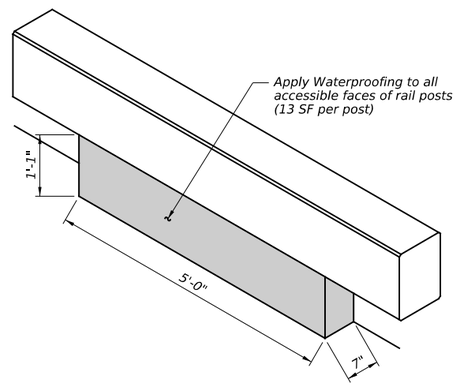
(2) Waterproof the bottom 5' of each bent for SH 136 SB at Canadian River. Additionally, waterproof over spall repair locations that are not located in the bottom 5' of each bent.

(3) This prestressed beam section is generic and other sections may be found in field.

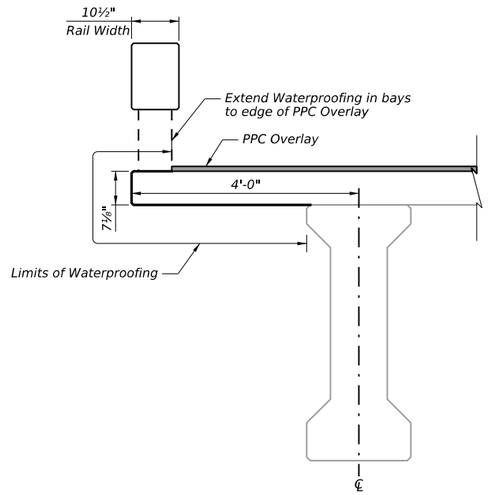
(4) See Table of Beam Repairs on the Bridge Location Repair Plan sheets for length and area of waterproofing required.



TYPICAL PRESTRESSED BEAM (3)



TYPICAL TRAFFIC RAIL TYPE T202



TYPICAL OVERHANG AND EDGE OF DECK

(LT Overhang shown, RT Overhang similar)

SUBSTRUCTURE CONCRETE WATERPROOFING TABLE

BRIDGE	SUBSTRUCTURES	AREA PER UNIT	TOTAL
REF 01: SH 136 SB AT CANADIAN RIVER	Abutments 1 & 33	337 SF	10439 SF
	Bents 2 - 32	315 SF	
REF 02: SH 136 NB AT CANADIAN RIVER	Abutments 1 & 27	331 SF	6218 SF
	Bents 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, & 25	463 SF	
REF 03: SH 207 NB AT SH 136 EB	Abutments 1 & 4	97 SF	194 SF
REF 04: SH 207 NB AT SH 136 WB	Abutment 1	137 SF	261 SF
	Abutment 4	124 SF	
REF 05: SH 207 SB AT SH 136 EB	Abutment 1	124 SF	257 SF
	Abutment 4	133 SF	

SUBSTRUCTURE CONCRETE WATERPROOFING TABLE (CONTINUED)

BRIDGE	SUBSTRUCTURES	AREA PER UNIT	TOTAL
REF 06: SH 207 SB AT SH 136 WB	Abutments 1 & 4	97 SF	194 SF
REF 07: IH 40 WB AT US 385	Abutments 1 & 4	363 SF	1716 SF
	Bents 2 & 3	495 SF	
REF 08: IH 40 EB AT US 385	Abutments 1 & 4	363 SF	1716 SF
	Bents 2 & 3	495 SF	
REF 09: IH 27 SB AT P.D.T. FORK RED RIVER	Bents 2, 6, & 9	586 SF	1758 SF
REF 10: IH 27 NB AT P.D.T. FORK RED RIVER	Bents 2, 6, & 9	586 SF	1758 SF

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WATERPROOFING DETAILS

SCALE: N.T.S.

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		81

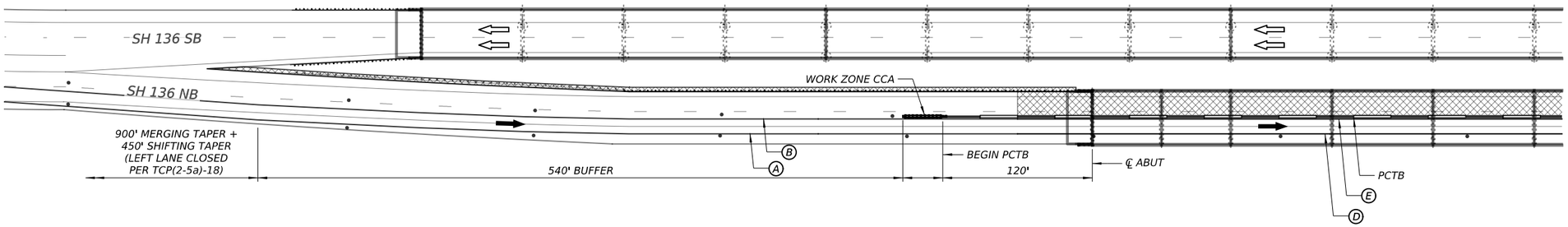
DATE: 6/8/2024 1:06:29 PM
FILE: AMA2_DET01.dgn

90% PLANS SUBMITTAL

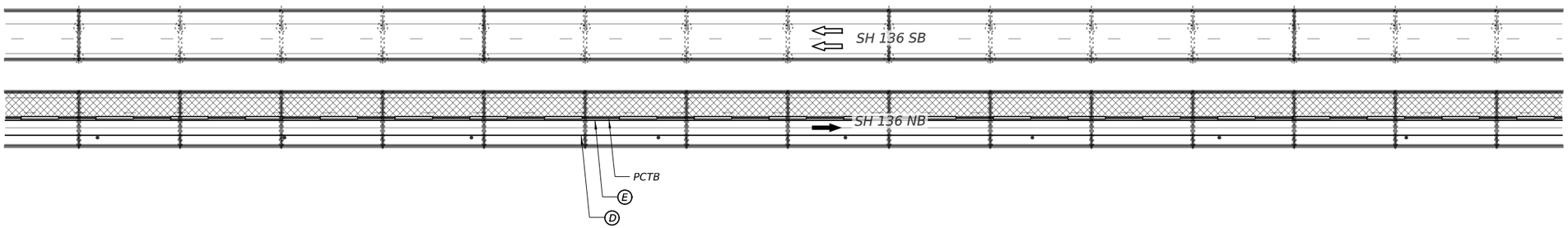
DW	JB	CK	JT	DW	JR	CK	JZ

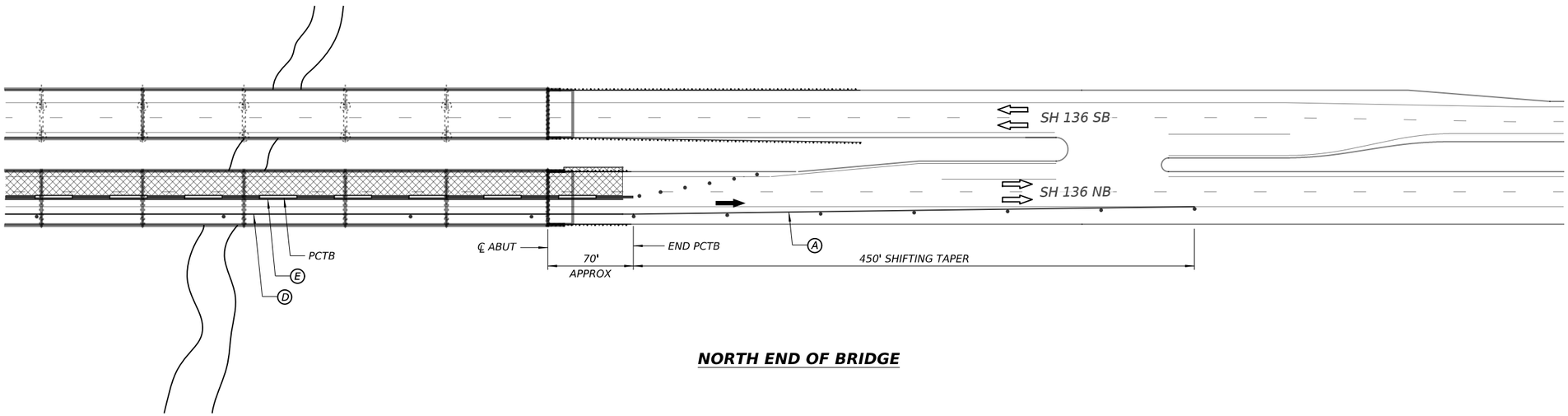
0 50 100
SCALE IN FEET

N



SOUTH END OF BRIDGE





NORTH END OF BRIDGE

LEGEND

- (A) WK ZN PAV MRK REMOV (W)6"(SLD)
- (B) WK ZN PAV MRK REMOV (Y)6"(SLD)
- (C) WK ZN PAV MRK REMOV (REFL) TY II-C-R
- (D) WK ZN PAV MRK NONREMOV (W)6"(SLD)
- (E) WK ZN PAV MRK NONREMOV (Y)6"(SLD)
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- DRUM (CHANNELIZER)
- TYPE III BARRICADE
- WORK ZONE

3/1/2024

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JAMES BROOKS
101002
LICENSED
PROFESSIONAL ENGINEER

NO.	DATE	REVISION	APPR BY

TEXAS TRANSPORTATION SOLUTIONS, INC. Firm # F-19397

Texas Department of Transportation

SH 136 NB AT CANADIAN RIVER TRAFFIC CONTROL PLAN PHASE 1

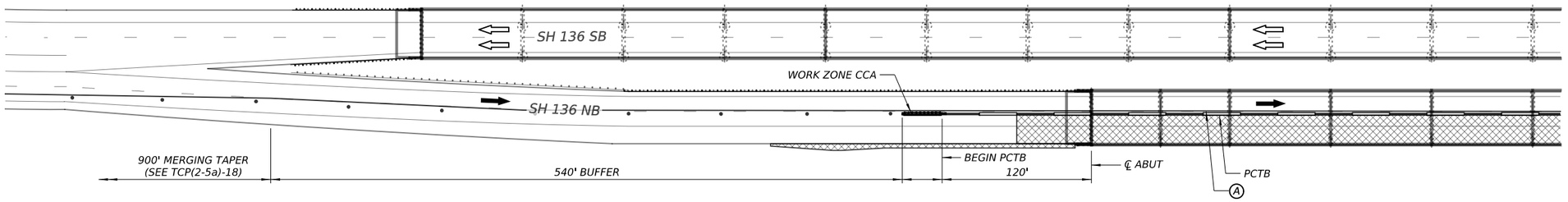
CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC	SH 136, ETC
DIST	COUNTY		SHEET #
AMA	HUTCHINSON, ETC		82

90% PLANS SUBMITTAL

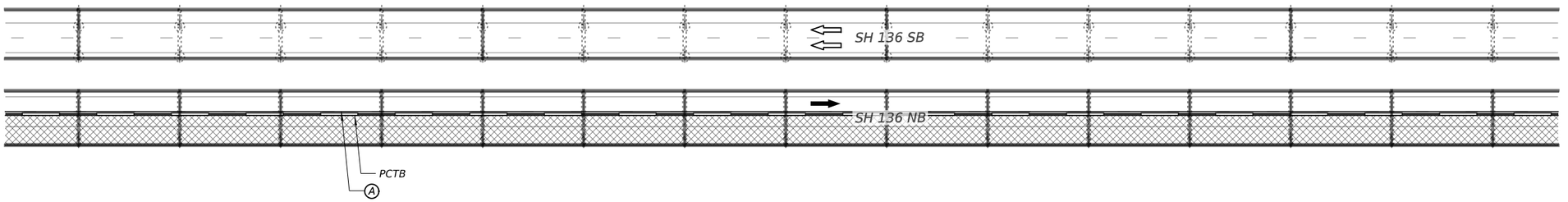
DW	JB	CK	JT	DW	JR	CK	JZ

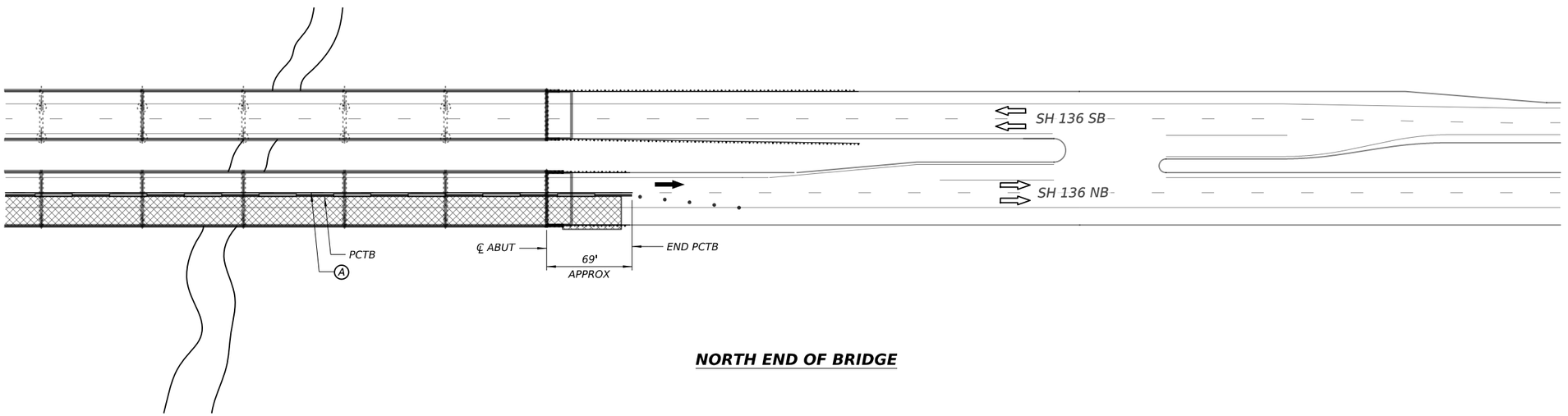
0 50 100
SCALE IN FEET

N



SOUTH END OF BRIDGE





NORTH END OF BRIDGE

LEGEND

- (A) WK ZN PAV MRK REMOV (W)6"(SLD)
- (B) WK ZN PAV MRK REMOV (Y)6"(SLD)
- (C) WK ZN PAV MRK REMOV (REFL) TY II-C-R
- (D) WK ZN PAV MRK NONREMOV (W)6"(SLD)
- (E) WK ZN PAV MRK NONREMOV (Y)6"(SLD)
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- DRUM (CHANNELIZER)
- TYPE III BARRICADE
- WORK ZONE

3/1/2024

STATE OF TEXAS
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101002
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NO.	DATE	REVISION	APPR BY

TEXAS TRANSPORTATION SOLUTIONS, INC. Firm # F-19397

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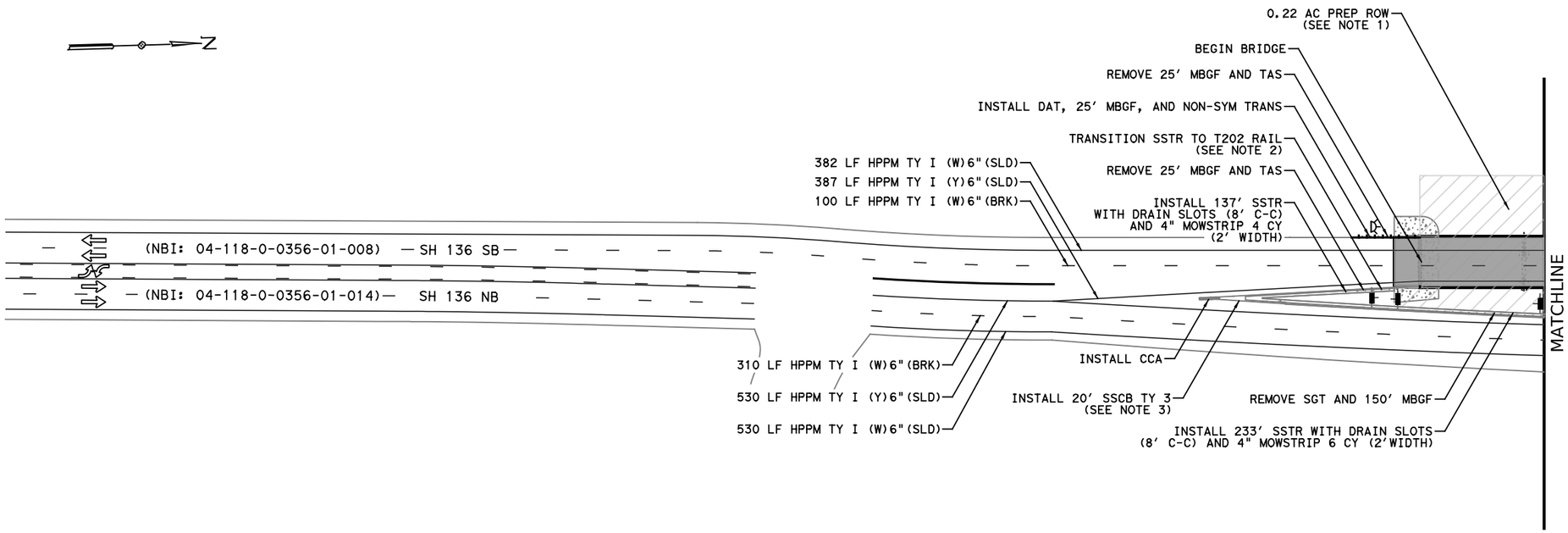
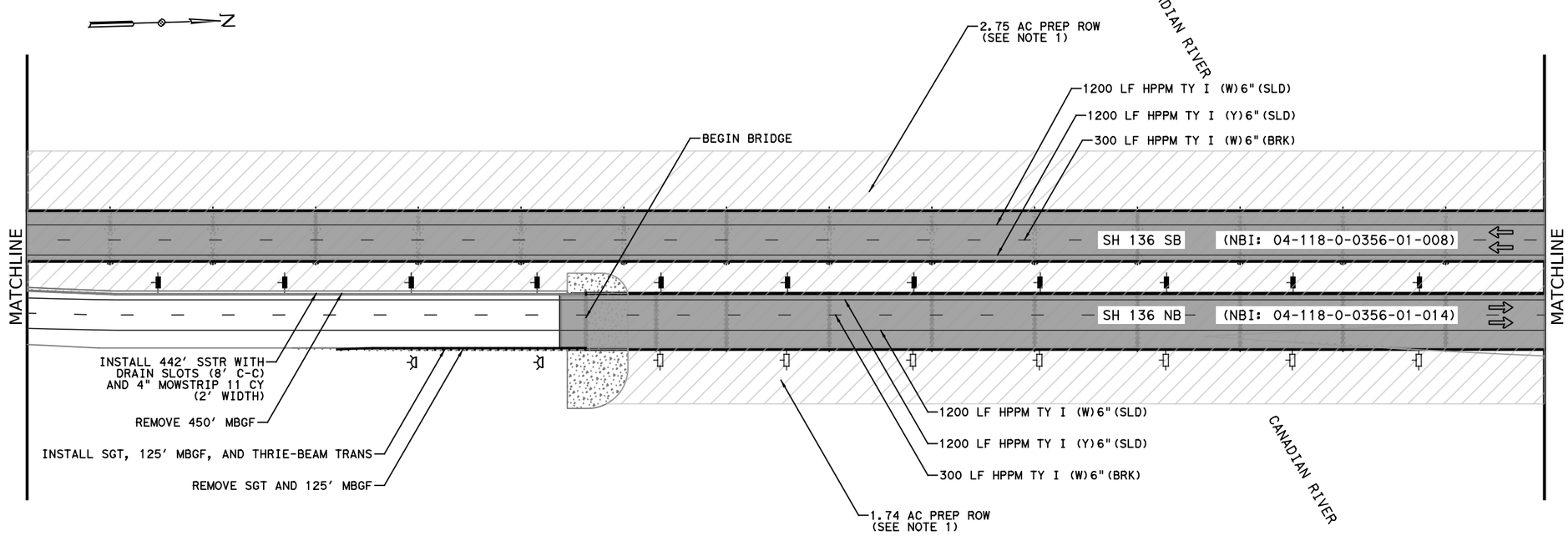
SH 136 NB AT CANADIAN RIVER TRAFFIC CONTROL PLAN PHASE 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC	SH 136, ETC
DIST	COUNTY		SHEET #
AMA	HUTCHINSON, ETC		83





LEGEND

- EXIST TRAFFIC LANE
- PLANE ASPH CONC PVMT & PPC OVERLAY (BRIDGE AND BAS)
- PREPARING ROW (SEE NOTE 1)
- DEL ASSM (D-SW)SZ 1(BRF)GF2
- DEL ASSM (D-SY)SZ 1(BRF)GF2
- DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)
- DEL ASSM (D-SW)SZ (BRF)CTB
- DEL ASSM (D-SY)SZ (BRF)CTB
- DEL ASSM (D-SW)SZ (BRF)CTB (BI)

NOTES:

1. ITEM 100, PREP ROW, FOR TREE AND SHRUB REMOVAL ONLY. ALL REMOVALS REQUIRE ENGINEER'S APPROVAL.
2. SSTR TO T202 RAIL TRANSITION IS SUBSIDIARY TO SSTR. SEE TRANSITION DETAILS SSTR TO T202 SHEET.
3. TRANSITION FROM SINGLE SSCB TO DUAL SSTR PAID FOR WITH SSCB TY 3. SSCB TY 3 INSTALLED WITH DRILLED SHAFT ANCHORS SUBSIDIARY TO SSCB TY 3.

STATE OF TEXAS
BRIAN ENNS
93801
LICENSED PROFESSIONAL ENGINEER
P.E. 6/21/2024

NO.	DATE	REVISION	APPR BY

RTG RODRIGUEZ TRANSPORTATION GROUP FIRM #587

Texas Department of Transportation

SH 136 NB & SB AT CANADIAN RIVER ROADWAY PLAN

REF 01-02: NBI#: 04-118-0-0356-01-008 & 014

SCALE:1"=100' SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		84

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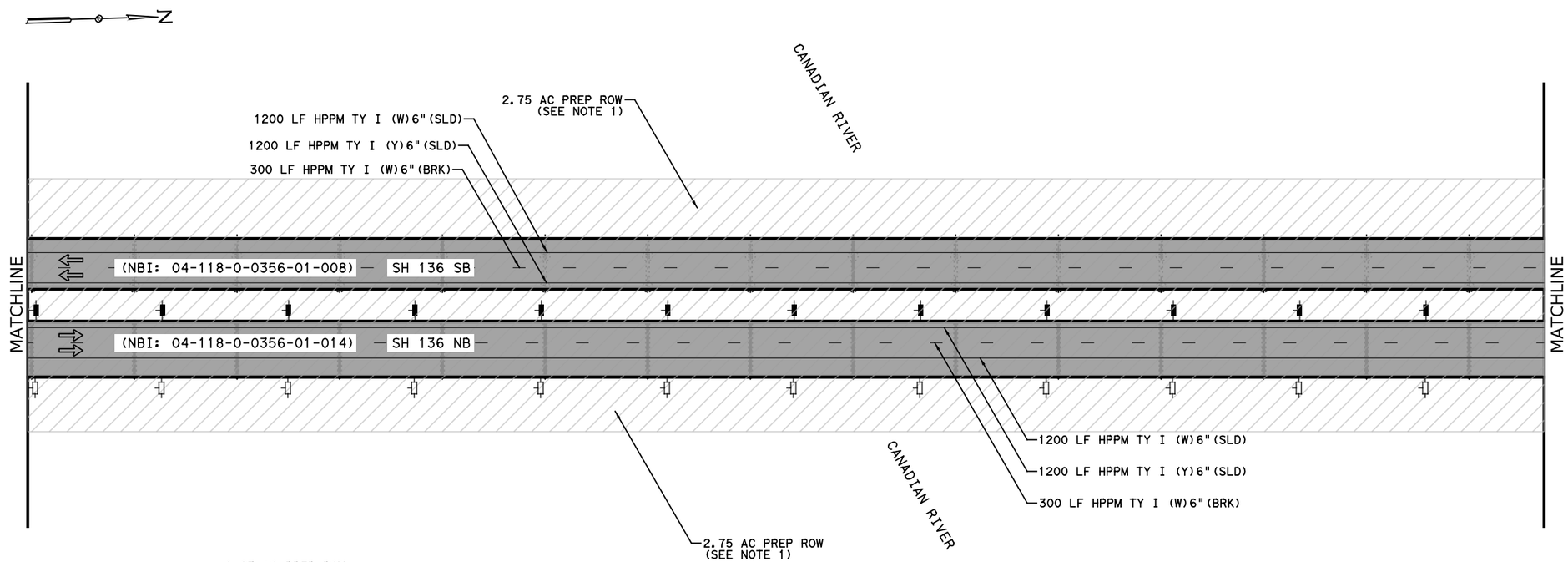
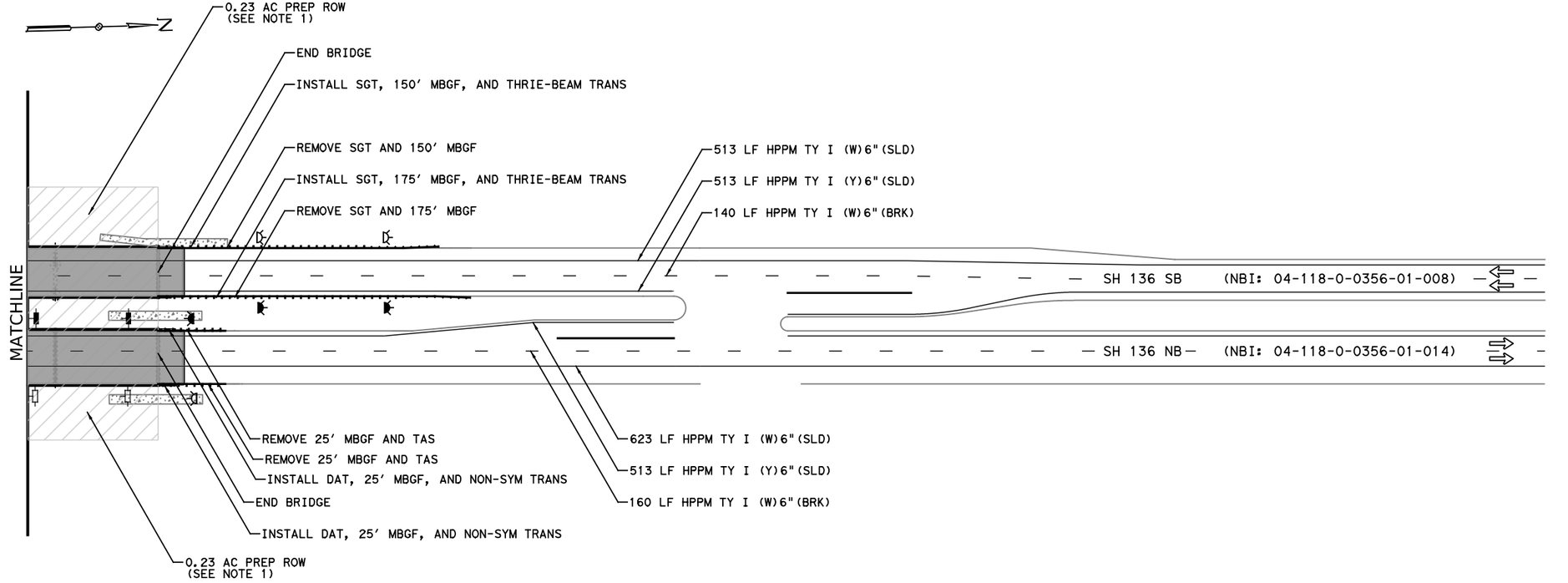
BE | CK | AD | DW | BE | CK | AD | DW





LEGEND

- EXIST TRAFFIC LANE
- PLANE ASPH CONC PVMT & PPC OVERLAY (BRIDGE AND BAS)
- PREPARING ROW (SEE NOTE 1)
- DEL ASSM (D-SW)SZ 1(BRF)GF2
- DEL ASSM (D-SY)SZ 1(BRF)GF2
- DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)
- DEL ASSM (D-SW)SZ (BRF)CTB
- DEL ASSM (D-SY)SZ (BRF)CTB
- DEL ASSM (D-SW)SZ (BRF)CTB (BI)

NOTES:

1. ITEM 100, PREP ROW, FOR TREE AND SHRUB REMOVAL ONLY. ALL REMOVALS REQUIRE ENGINEER'S APPROVAL.

STATE OF TEXAS
BRIAN ENNS
93801
LICENSED PROFESSIONAL ENGINEER

P.E. 6/21/2024

NO.	DATE	REVISION	APPR BY

RTG RODRIGUEZ TRANSPORTATION GROUP FIRM #587

Texas Department of Transportation

SH 136 NB & SB AT CANADIAN RIVER ROADWAY PLAN

REF 01-02: NBI#: 04-118-0-0356-01-008 & 014

SCALE:1"=100' SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		85

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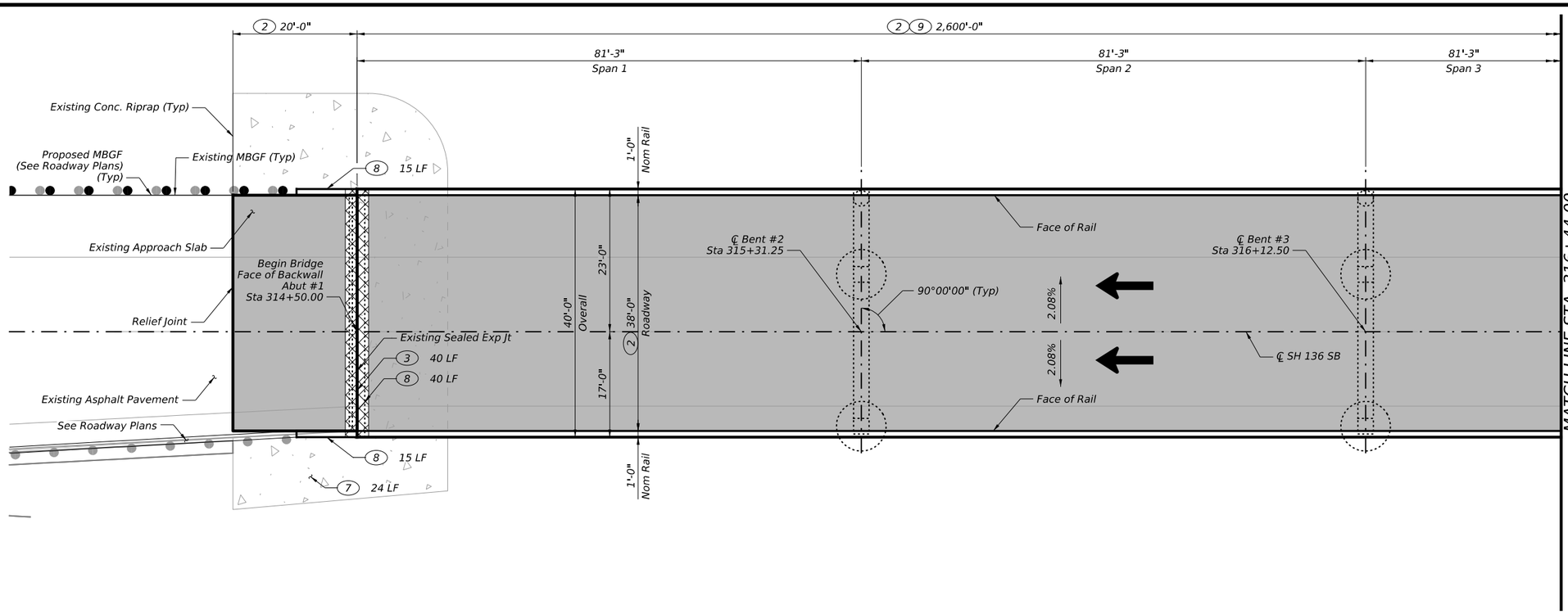
DW AD | DW BE | CK AD | CK BE

FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	JCH	LJG



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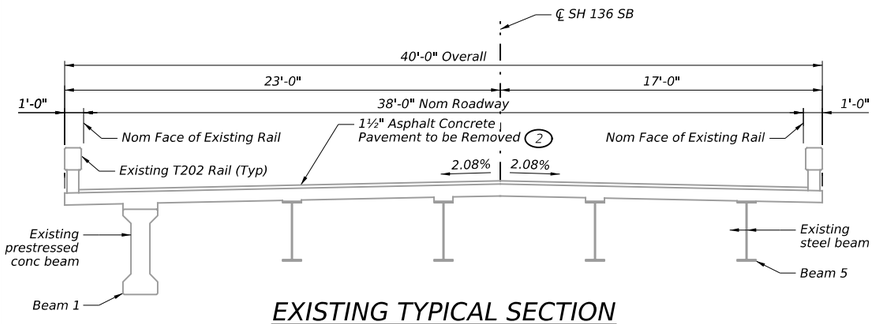

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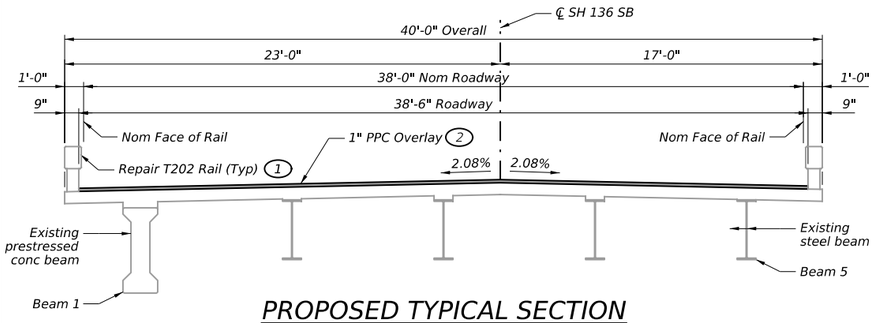

PROPOSED TYPICAL SECTION

GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request.
3. Stationing is based on as-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids, and all locations shall be approved by the Engineer prior to beginning repair work. Field verify limits and quantities with the Engineer. Payment will be for the field measured repair at the unit price bid.
5. Refer to Traffic Control Plans and Roadway Plans for information not shown.

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay and install PPC Overlay
- Full Depth Joint Replacement
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 136 SB
AT CANADIAN RIVER
BRIDGE LOCATION REPAIR PLAN

Ref 01: NBI# 04-118-0-0356-01-008

SCALE:1"=20' SHEET 1 OF 8

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		86

DATE: 6/8/2024 1:07:21 PM
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FINAL SUBMITTAL (100%)

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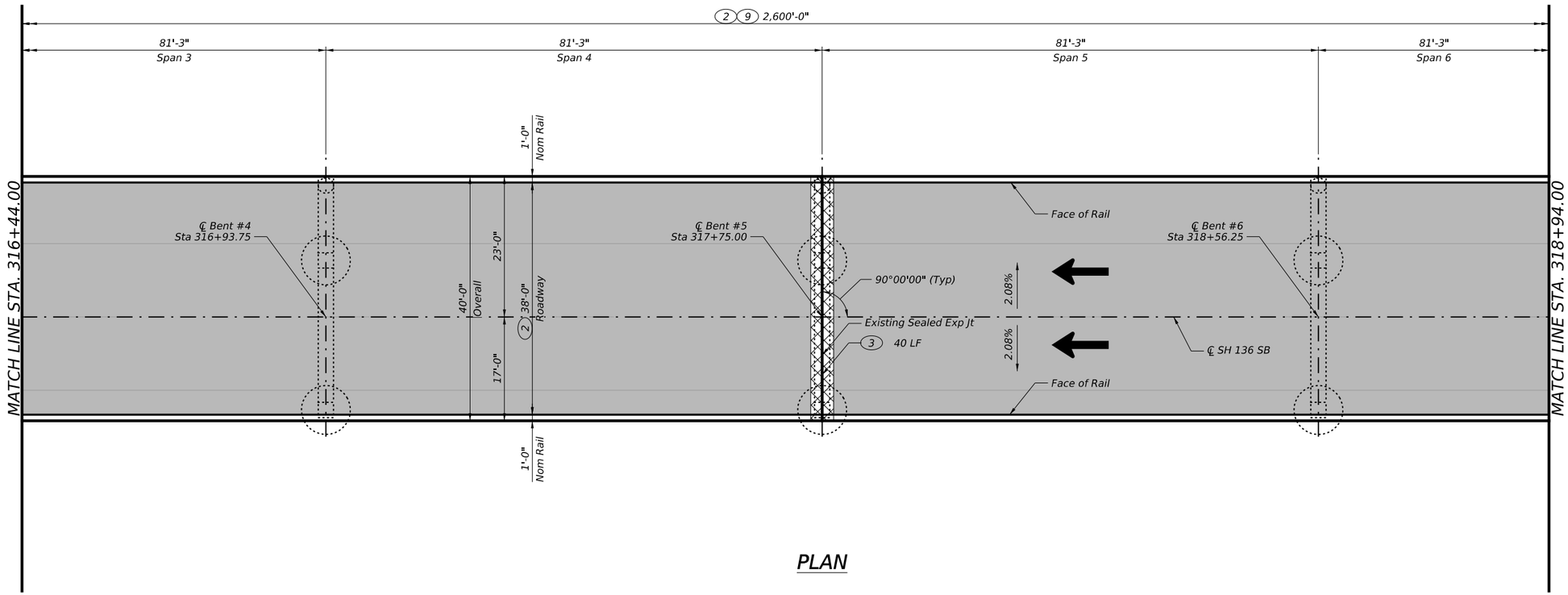
AJS	LJG	JCH	LJG



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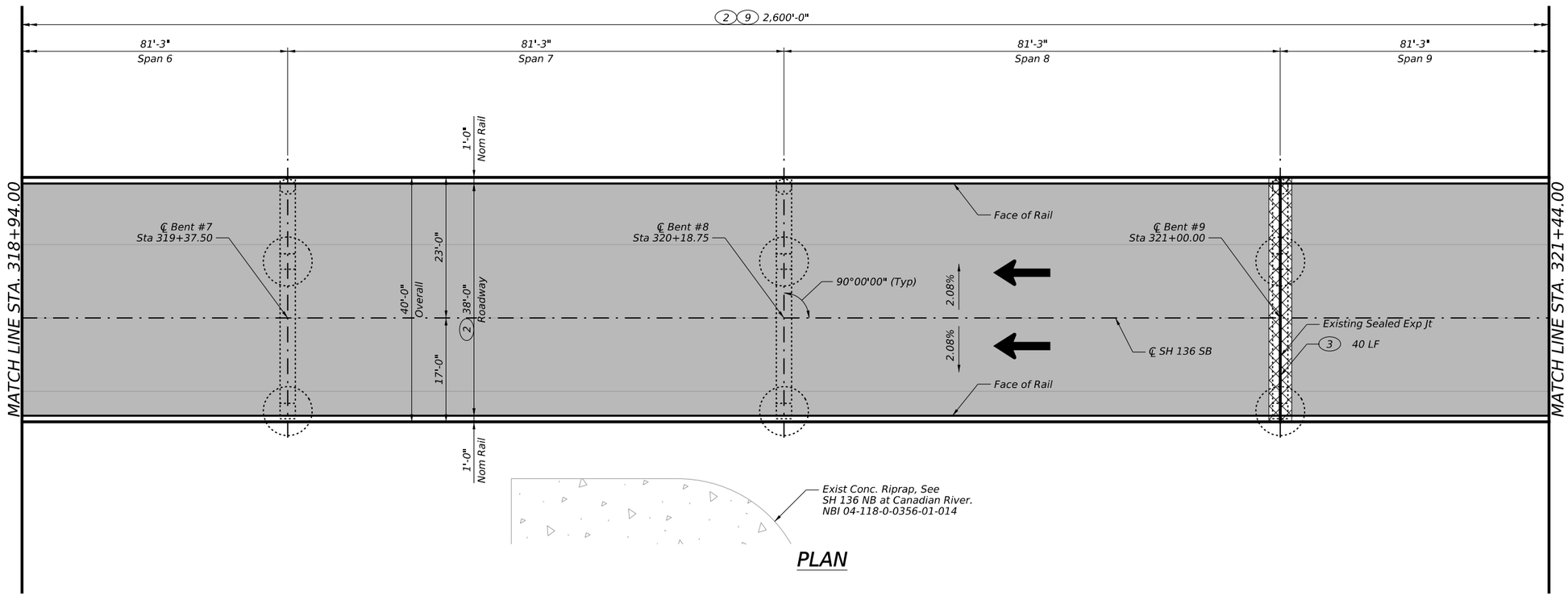

PLAN

0 10 20
SCALE IN FEET

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay and install PPC Overlay
- Full Depth Joint Replacement
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED PROFESSIONAL ENGINEER
06/10/2024

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Texas Department of Transportation

SH 136 SB
AT CANADIAN RIVER
BRIDGE LOCATION REPAIR PLAN

Ref 01: NBI# 04-118-0-0356-01-008

SCALE:1"=20' SHEET 2 OF 8

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		87

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FINAL SUBMITTAL (100%)

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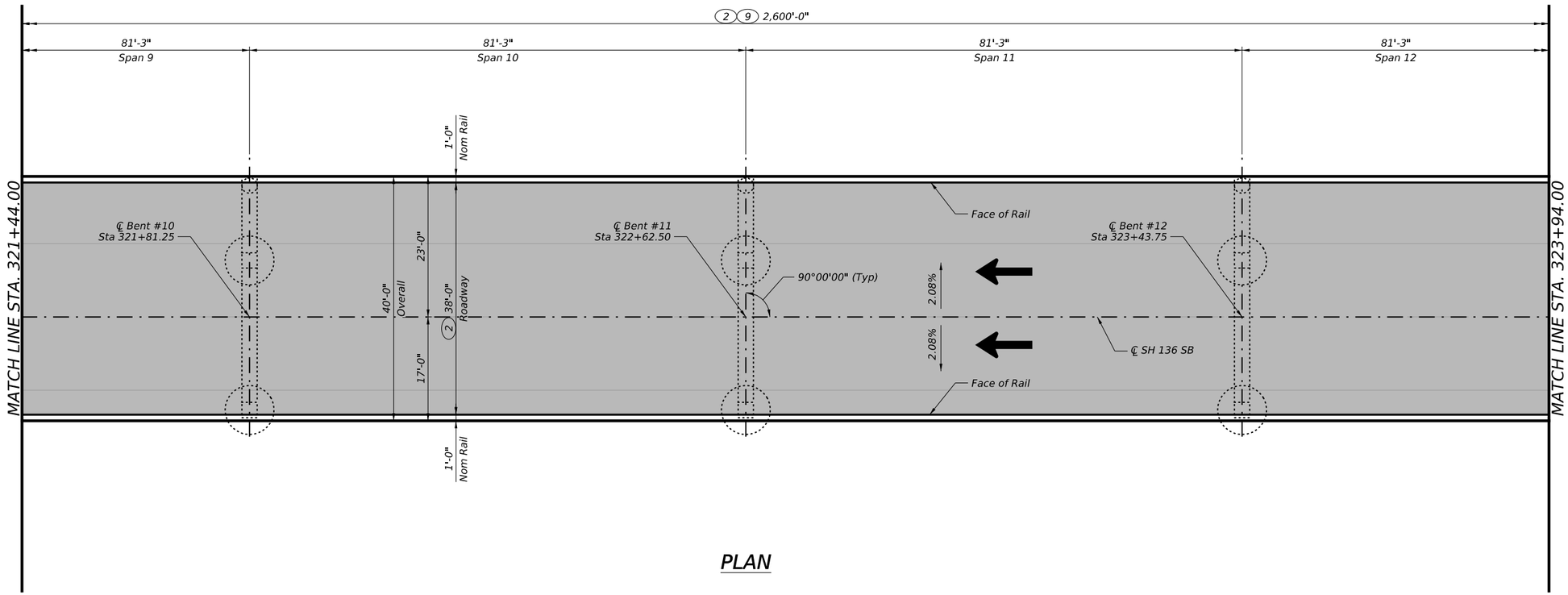
AJS	LJG	JCH	LJG



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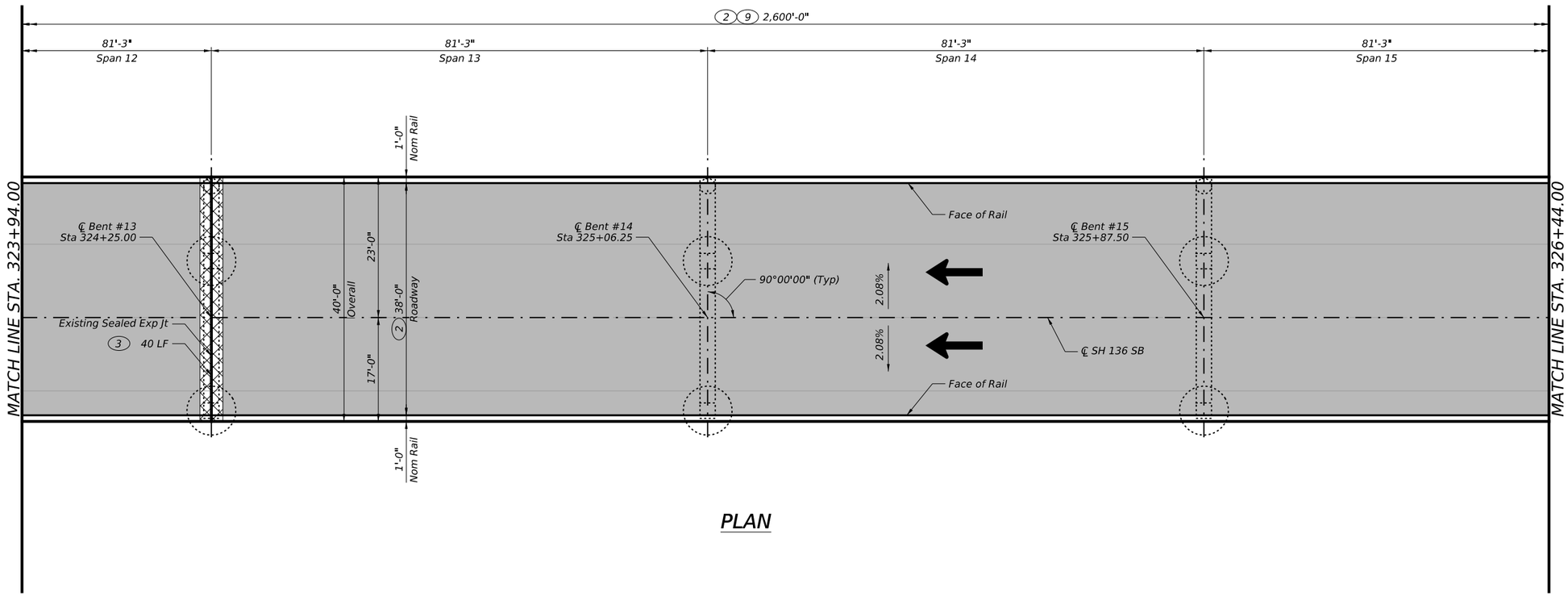

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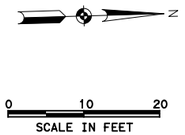

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay and install PPC Overlay
- Full Depth Joint Replacement
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
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06/10/2024

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SH 136 SB
AT CANADIAN RIVER
BRIDGE LOCATION REPAIR PLAN

Ref 01: NBI# 04-118-0-0356-01-008

SCALE:1"=20' SHEET 3 OF 8

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		88

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FINAL SUBMITTAL (100%)

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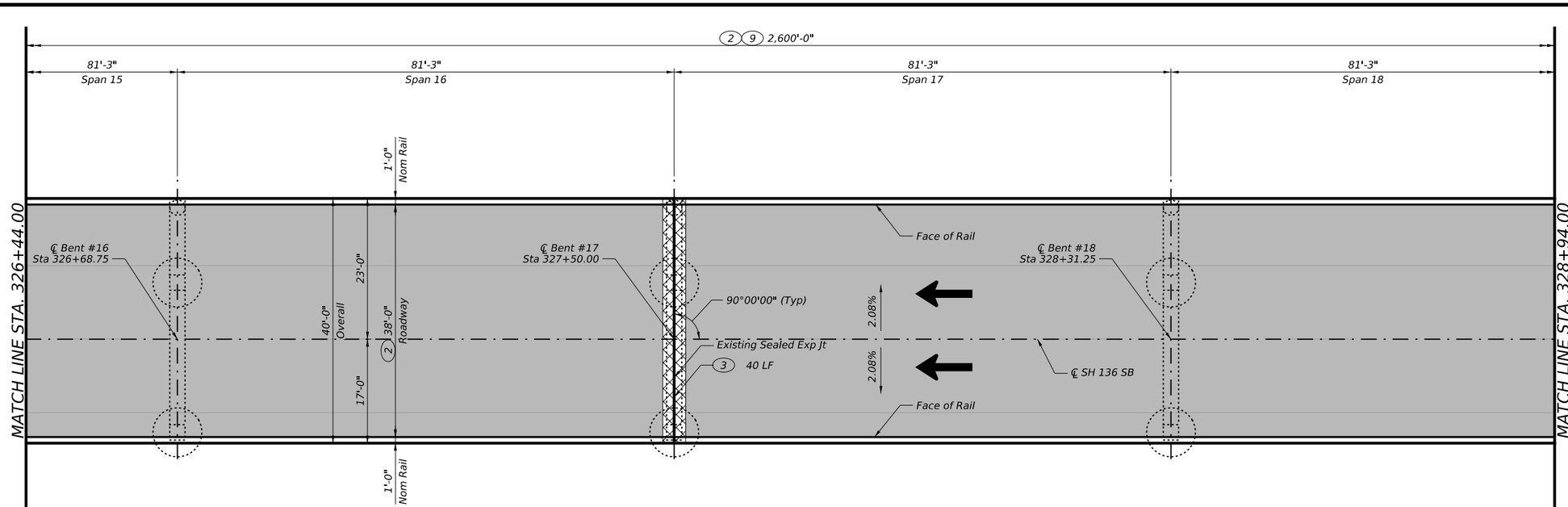

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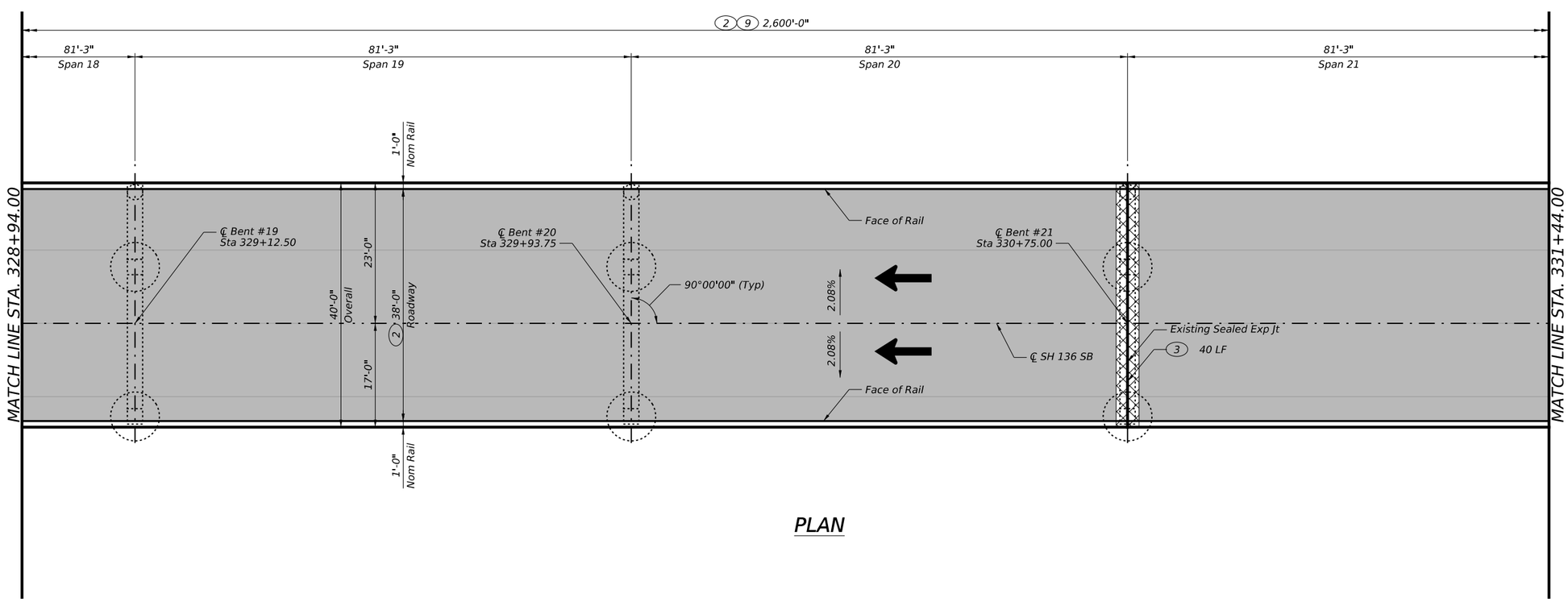

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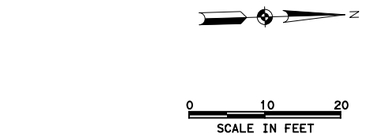

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay and install PPC Overlay
- Full Depth Joint Replacement
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
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06/10/2024

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SH 136 SB
AT CANADIAN RIVER
BRIDGE LOCATION REPAIR PLAN

Ref 01: NBI# 04-118-0-0356-01-008

SCALE:1"=20' SHEET 4 OF 8

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		89

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FINAL SUBMITTAL (100%)

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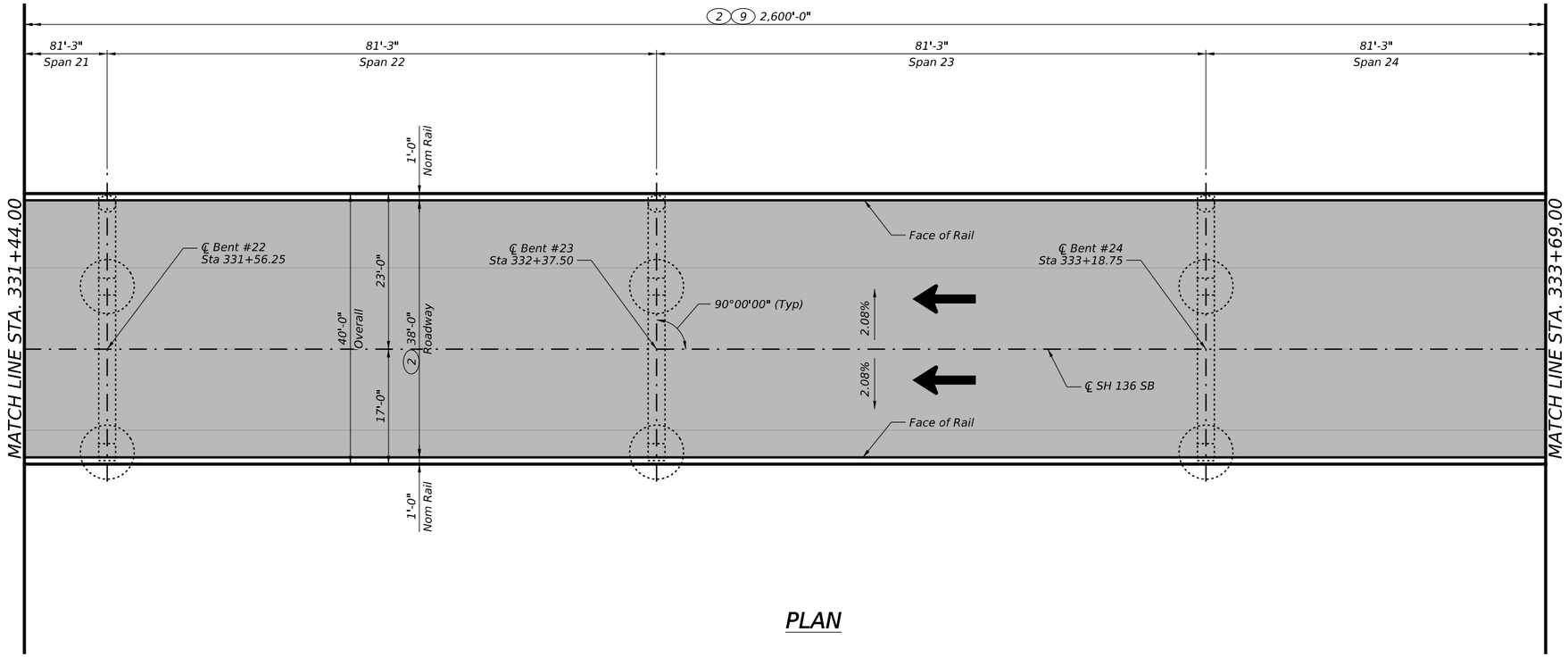

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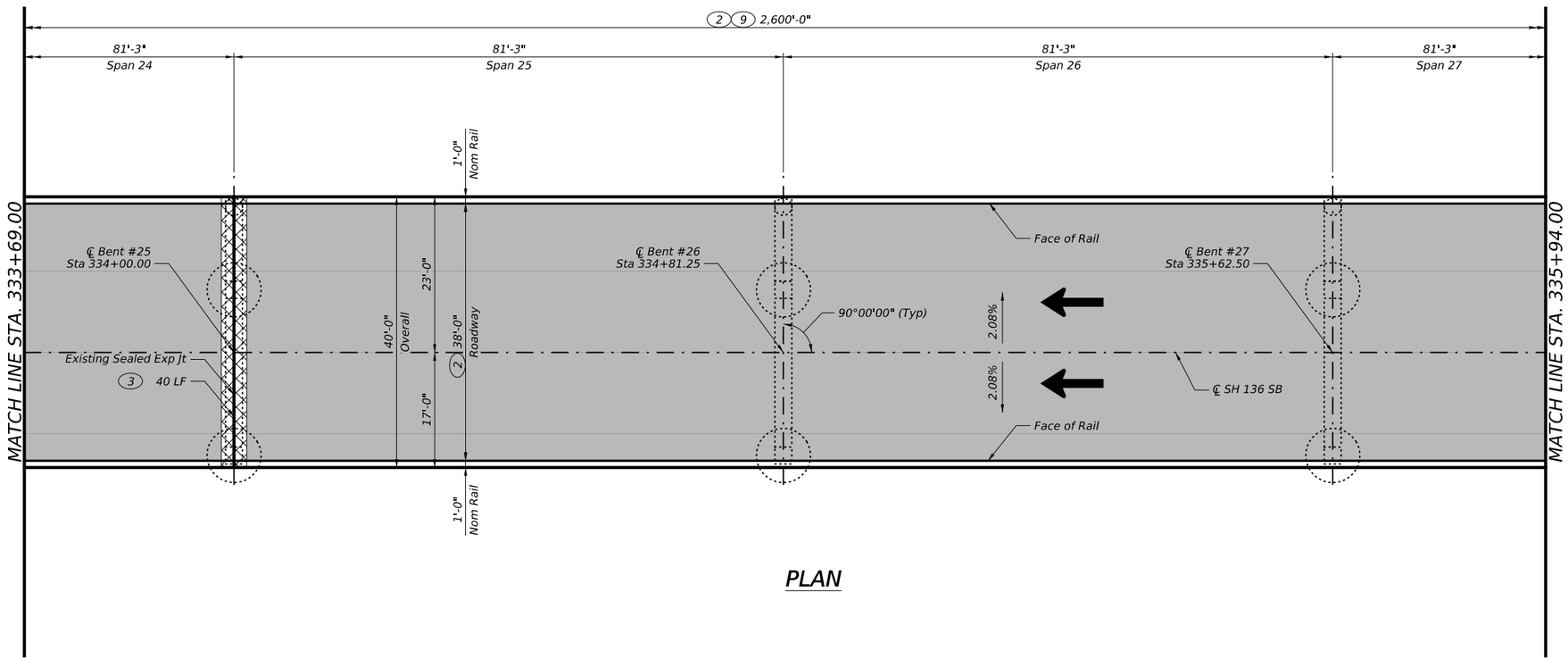

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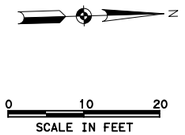

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay and install PPC Overlay
- Full Depth Joint Replacement
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

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17111 Preston Road, Suite 300
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972.960.4400

Texas Department of Transportation

SH 136 SB
AT CANADIAN RIVER
BRIDGE LOCATION REPAIR PLAN

Ref 01: NBI# 04-118-0-0356-01-008

SCALE:1"=20' SHEET 5 OF 8

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		90

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FINAL SUBMITTAL (100%)

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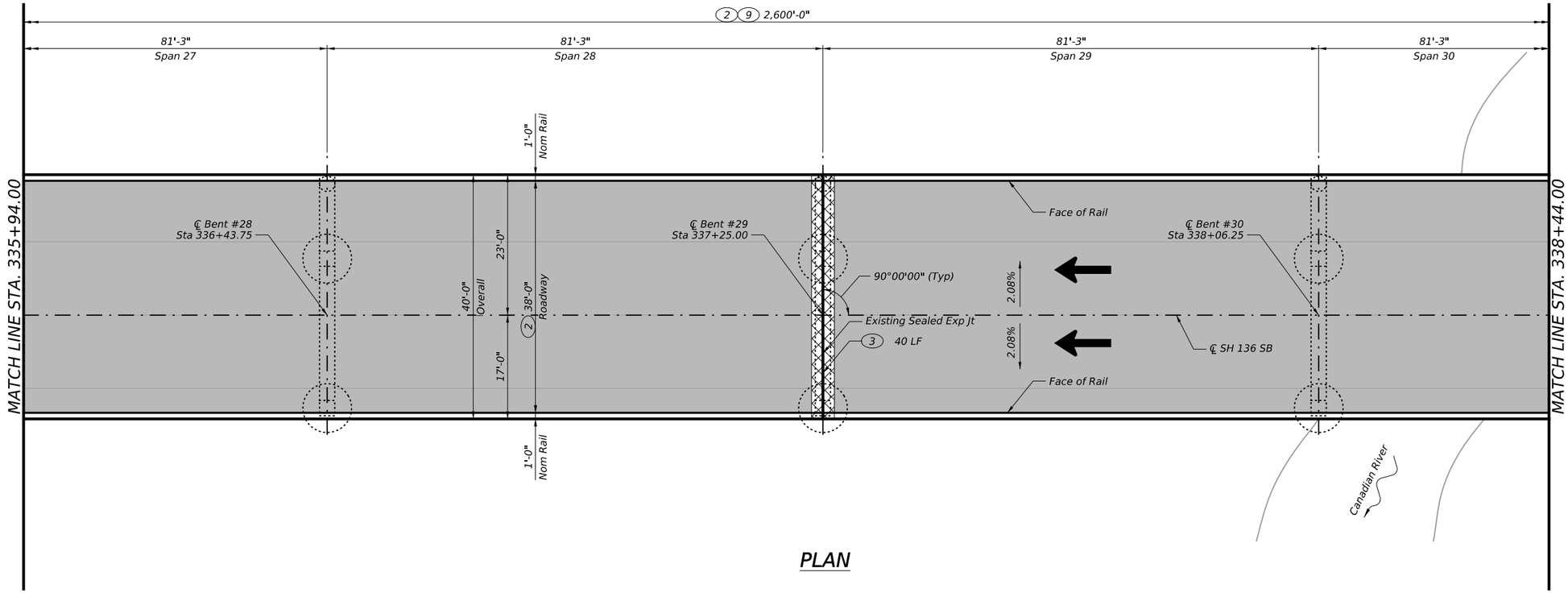

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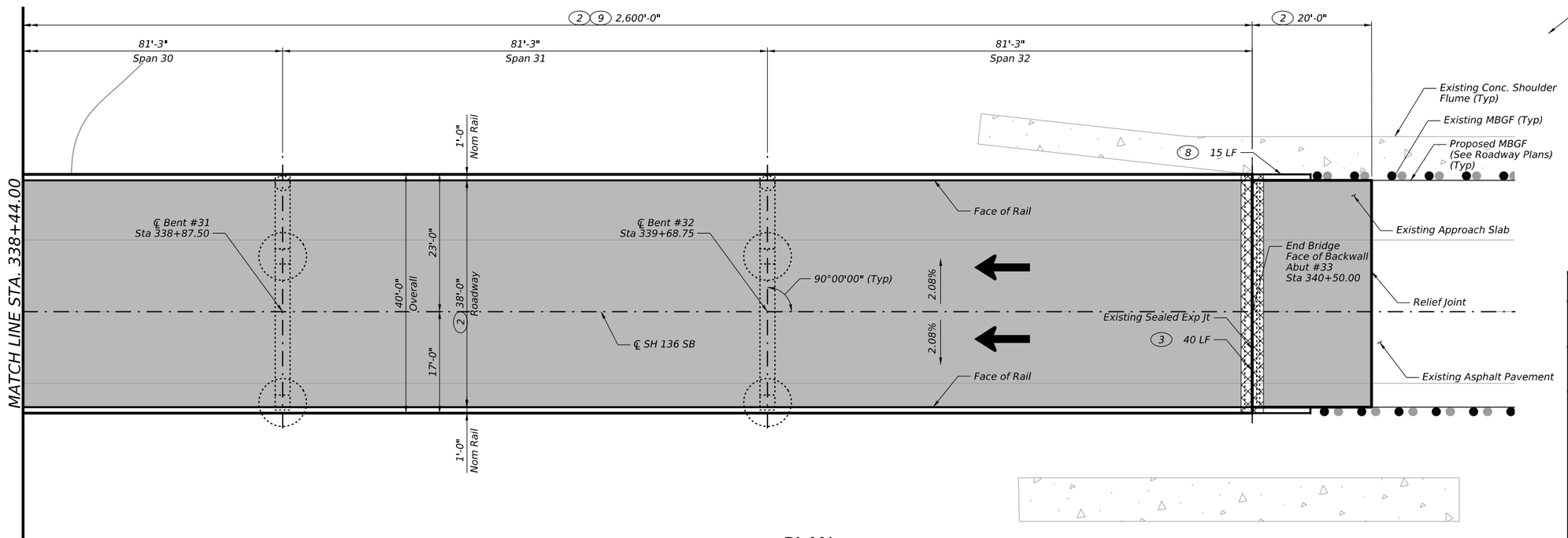

PLAN

N

0 10 20
SCALE IN FEET

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay and install PPC Overlay
- Full Depth Joint Replacement
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED PROFESSIONAL ENGINEER
06/10/2024

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Dallas, Texas 75248
972.960.4400

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SH 136 SB AT CANADIAN RIVER BRIDGE LOCATION REPAIR PLAN

Ref 01: NBI# 04-118-0-0356-01-008

SCALE:1"=20' SHEET 6 OF 8

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		91

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FINAL SUBMITTAL (100%)

DW:	JCH	CK:	LJG
DW:	AJS	CK:	LJG

④ TABLE OF DECK SOFFIT REPAIRS

Span	Transverse Location	Location	Spall Repair Quantity
1	West Edge	2/3 Span	2 SF
	West Edge	Bent 2	3 SF
	East Edge	Abut 1	1 SF
2	East Edge	Midspan	3 SF
3	West Edge	1/4 Span	4 SF
	East Edge	1/3 Span	2 SF
	East Edge	Midspan	3 SF
	East Edge	2/3 Span	1 SF
4	West Edge	1/4 Span	12 SF
	East Edge	Midspan	6 SF
5	East Edge	3/4 Span	10 SF
6	West Edge	1/4 Span	4 SF
	West Edge	Midspan	3 SF
	West Edge	3/4 Span	17 SF
6	East Edge	1/4 Span	10 SF
	East Edge	Midspan	16 SF
	East Edge	3/4 Span	6 SF
7	West Edge	Midspan	12 SF
	West Edge	3/4 Span	6 SF
	East Edge	1/4 Span	3 SF
	East Edge	3/4 Span	11 SF
	East Edge	Bent 8	7 SF
8	West Edge	1/4 Span	16 SF
	West Edge	Midspan	3 SF
	West Edge	3/4 Span	5 SF
	East Edge	Midspan	6 SF
	East Edge	Bent 9	5 SF
9	West Edge	Midspan	7 SF
	West Edge	3/4 Span	3 SF
	East Edge	Midspan	3 SF
	East Edge	3/4 Span	2 SF
10	West Edge	Midspan	4 SF
	West Edge	3/4 Span	8 SF
	West Edge	Bent 11	3 SF
	East Edge	3/4 Span	5 SF
11	West Edge	1/4 Span	2 SF
	West Edge	Midspan	6 SF
	West Edge	3/4 Span	2 SF
	West Edge	Bent 12	8 SF
	East Edge	1/4 Span	5 SF
	East Edge	Midspan	2 SF
	East Edge	3/4 Span	3 SF
	East Edge	Bent 12	3 SF
12	West Edge	Bent 12	8 SF
	West Edge	1/3 Span	16 SF
	West Edge	3/4 Span	2 SF
	East Edge	Bent 12	2 SF
	East Edge	Midspan	4 SF
	East Edge	3/4 Span	2 SF

④ TABLE OF DECK SOFFIT REPAIRS

Span	Transverse Location	Location	Spall Repair Quantity
13	West Edge	1/3 Span	1 SF
	West Edge	2/3 Span	5 SF
	West Edge	Bent 14	3 SF
	East Edge	Bent 13	8 SF
	East Edge	Midspan	6 SF
	East Edge	3/4 Span	15 SF
	East Edge	Bent 14	8 SF
14	West Edge	Bent 14	5 SF
	West Edge	1/4 Span	6 SF
	West Edge	3/4 Span	3 SF
	West Edge	Bent 15	4 SF
	East Edge	Bent 14	8 SF
	East Edge	1/4 Span	11 SF
	East Edge	Midspan	10 SF
	East Edge	3/4 Span	11 SF
15	West Edge	Bent 15	2 SF
	West Edge	1/4 Span	6 SF
	West Edge	3/4 Span	7 SF
	East Edge	Bent 16	2 SF
16	West Edge	Bent 16	5 SF
17	West Edge	1/4 Span	3 SF
	West Edge	Midspan	4 SF
	West Edge	Bent 18	4 SF
	East Edge	1/4 Span	1 SF
	East Edge	3/4 Span	2 SF
18	West Edge	3/4 Span	4 SF
	West Edge	Bent 19	4 SF
	East Edge	Bent 18	4 SF
	East Edge	1/4 Span	3 SF
19	West Edge	Bent 19	6 SF
	West Edge	Bent 20	3 SF
	East Edge	Midspan	5 SF
20	West Edge	1/3 Span	8 SF
	West Edge	3/4 Span	2 SF
	East Edge	Bent 20	4 SF
	East Edge	1/4 Span	5 SF
	East Edge	3/4 Span	5 SF
21	East Edge	Midspan	2 SF
22	West Edge	Bent 22	5 SF
	West Edge	1/4 Span	5 SF
	East Edge	Bent 22	3 SF
	East Edge	1/3 Span	5 SF
	East Edge	2/3 Span	14 SF
23	West Edge	1/4 Span	1 SF
	West Edge	Bent 24	3 SF
	East Edge	Midspan	4 SF
24	West Edge	Bent 25	2 SF
	East Edge	Bent 24	3 SF
	East Edge	1/4 Span	6 SF

④ TABLE OF DECK SOFFIT REPAIRS

Span	Transverse Location	Location	Spall Repair Quantity
24	West Edge	Bent 25	2 SF
	East Edge	Bent 24	3 SF
	East Edge	1/4 Span	6 SF
27	East Edge	3/4 Span	6 SF
28	East Edge	1/4 Span	6 SF
	East Edge	3/4 Span	2 SF
29	West Edge	Bent 29	3 SF
	West Edge	1/4 Span	3 SF
	East Edge	1/3 Span	3 SF
	East Edge	Bent 30	2 SF
30	West Edge	Bent 30	3 SF
	West Edge	1/4 Span	3 SF
	West Edge	3/4 Span	2 SF
	East Edge	1/4 Span	2 SF
31	West Edge	Midspan	2 SF
	West Edge	Bent 32	2 SF
	East Edge	Midspan	2 SF
	East Edge	2/3 Span	3 SF
32	West Edge	Bent 32	3 SF
	West Edge	2/3 Span	7 SF
	East Edge	Bent 32	2 SF
	East Edge	Midspan	13 SF
TOTAL			592 SF

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

NO.	DATE	REVISION	APPR BY

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Texas Department of Transportation

SH 136 SB
AT CANADIAN RIVER
BRIDGE LOCATION REPAIR PLAN

Ref 01: NBI# 04-118-0-0356-01-008

SHEET 7 OF 8

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		92

DATE: 6/8/2024 1:08:11 PM
FILE: AMA204118003560100B 01 BLY07.dgn

FINAL SUBMITTAL (100%)

DW:	CK:	DW:	CK:
AJS	LJG	JCH	LJG

TABLE OF REPAIRS

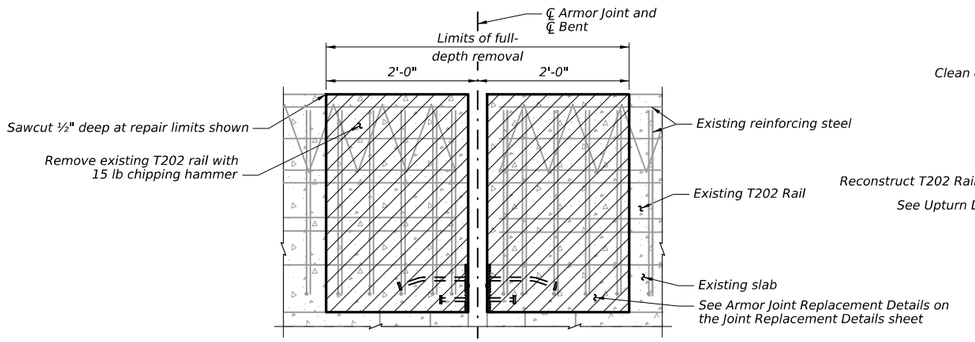
REPAIR NO.	REPAIR DESCRIPTION/LOCATION	ITEM CODE	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
1	Repair the spall/delaminations on the T202 rails. See Table of Rail Repairs for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	352	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual Chapter 3, Section 2.
2	Plane asphalt overlay a constant thickness of 1.5 in. and place Polyester Polymer Concrete (PPC) overlay. Assumed allowance of 3050 SF (3% of deck area) for partial-depth deck repairs and 1020 SF (1% of deck area) for full-depth deck repairs are provided to be used as directed by Engineer. See repair plan for locations.	354-7073	PLANE (0" TO 1.5")	11294	SY	See the Bridge Deck Overlay Notes sheet for details.
		429-7003	CONC STR REPAIR(DECK REP(PART DEPTH))	3050	SF	Repair as partial-depth deck repairs per the TxDOT Concrete Repair Manual, Chapter 3, Section 4.
		429-7005	CONC STR REPAIR(DECK REP (FULL DEPTH))	1020	SF	Repair as full-depth deck repairs per the TxDOT Concrete Repair Manual, Chapter 3, Section 4.
		439-7021	POLYESTER POLYMER CONC OVERLAY (1")	11140	SY	See the Bridge Deck Overlay Notes sheet for details.
3	After completion of asphalt planing, remove existing armor joints and replace with SEJ-M type expansion joints. Replace barrier in-kind to facilitate the installation the SEJ-M type expansion joints. Limits of barrier replacement are to match the limits of deck removal. Perform in conjunction with rail repairs and PPC overlay. See repair plan for locations.	785-7011	BRIDGE JOINT REPLACEMENT (SEJ)	360	LF	See Armor Joint Replacement Details on the Joint Replacement Details sheet.
		778-7004	CONCRETE RAIL REPLACEMENT (IN-KIND)	72	LF	See T202 Rail Reconstruction Detail.
4	Repair the spalls/delaminations in the deck soffit overhangs. See Table of Deck Soffit Repairs for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	592	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
5	Repair damaged beam end of Beam 1 at Bent 30, Span 29.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	1	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
6	Repair the spalls/delaminations in the substructure and then apply Waterproofing over each repair location not covered by Repair 10. See Substructure Repair Isometrics sheet for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	826	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
		427-7005	EPOXY WATERPROOF FINISH (TY X)	225	SF	See the Waterproofing Details sheet.
7	Clean and seal joints between riprap and cracks in riprap. See repair plan locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	24	LF	See the Concrete Riprap Crack Sealing Details sheet.
8	Clean and seal joints between riprap and abutment/wingwalls. Additionally, install flashing. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	85	LF	See the Joint Seal Flashing Details sheet.
9	Apply Waterproofing to the overhang soffit and edge of deck along the entire length of deck after Repairs 2 and 4 are complete. Waterproofing will extend to edge of PPC Overlay all open rail windows, and to the T202 rail posts. See repair plan for locations.	427-7005	EPOXY WATERPROOF FINISH (TY X)	29939	SF	See the Typical Traffic Rail Type T202 and Typical Overhang and Edge of Deck details on the Waterproofing Details sheet.
10	Apply Waterproofing to all faces of abutments and the bottom 5' of the wall piers. See Substructure Concrete Waterproofing Table on the Waterproofing Details sheet.	427-7005	EPOXY WATERPROOF FINISH (TY X)	10439	SF	See the Waterproofing Details sheet.

1 TABLE OF RAIL REPAIRS

Unit	West/East Rail	Spall Repair Quantity
1	East	17 SF
	West	17 SF
2	East	21 SF
	West	21 SF
3	East	12 SF
	West	12 SF
4	East	34 SF
	West	34 SF
5	East	30 SF
	West	30 SF
6	East	26 SF
	West	26 SF
7	East	14 SF
	West	14 SF
8	East	22 SF
	West	22 SF
TOTAL		352 SF

T202 RAIL RECONSTRUCTION NOTES:

1. Provide Class "C" concrete.
2. Provide Grade 60 reinforcing steel.
3. Epoxy coat or galvanize all reinforcing if slab bars are epoxy coated or galvanized.
4. Payment is in accordance with Item 778-7004 "Concrete Rail Replacement (In-Kind)".



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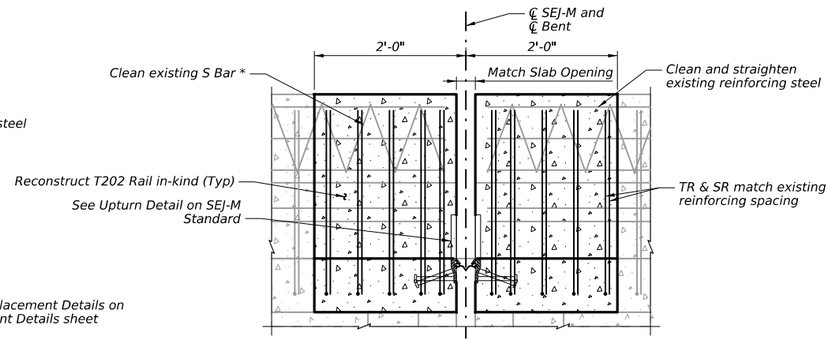
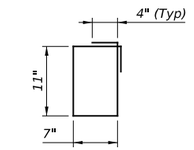


PROPOSED

* SP Bars may be present instead of S Bars. If so, replace in-kind and match existing reinforcing spacing

T202 RAIL RECONSTRUCTION DETAIL



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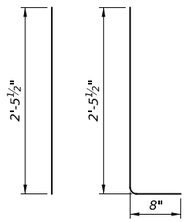

SR (#4) TR (#4)

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED PROFESSIONAL ENGINEER
06/10/2024

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 136 SB
AT CANADIAN RIVER
BRIDGE LOCATION REPAIR PLAN

Ref 01: NBI# 04-118-0-0356-01-008

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		93

DATE: 6/10/2024 9:30:23 AM
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FINAL SUBMITTAL (100%)

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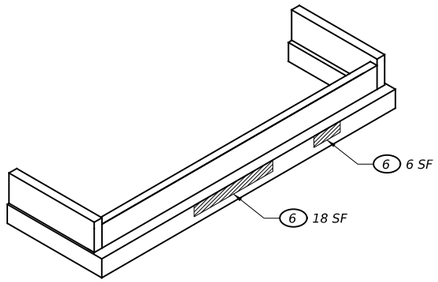

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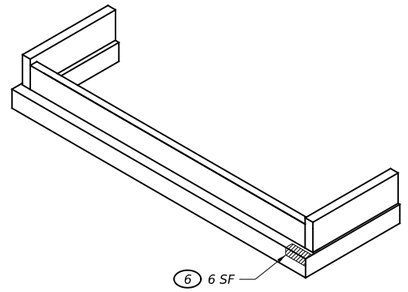
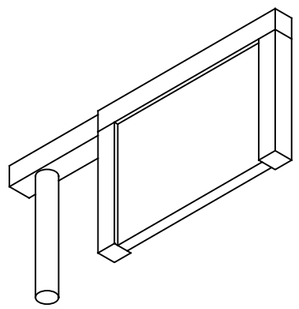
Looking Southwest



SOUTH FACE
Looking Northwest

ABUTMENT 1

ABUTMENT 33



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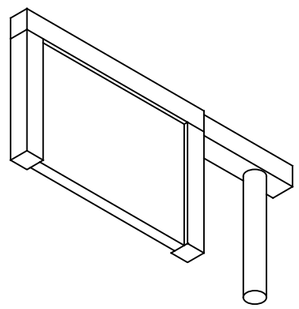
No Repairs



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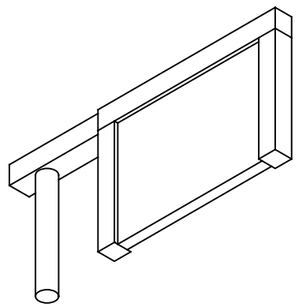
Looking Southwest

BENT 2



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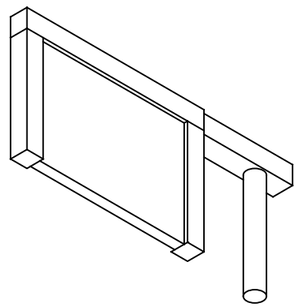
No Repairs



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Looking Southwest

BENT 3

SUBSTRUCTURE REPAIR ISOMETRICS

REPAIR CALL-OUT LEGEND

Spall/Delamination Repair

XX XX
- Repair Quantity Unit
- Estimated Repair Quantity At Each Location
- Repair No. - See Table of Repairs

STATE OF TEXAS
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133221
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Brett RC Allen

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Texas Department of Transportation

SH 136 SB
AT CANADIAN RIVER
SUBSTRUCTURE REPAIR ISOMETRICS

Ref 01: NBI# 04-118-0-0356-01-008

SCALE: N.T.S.

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		94

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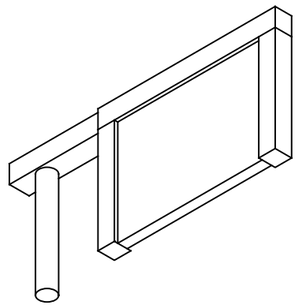
FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	JCH	LJG

REPAIR CALL-OUT LEGEND

- Spall/Delamination Repair
- Type X Epoxy Waterproof Finish not covered by Repair 10
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

BENT 4



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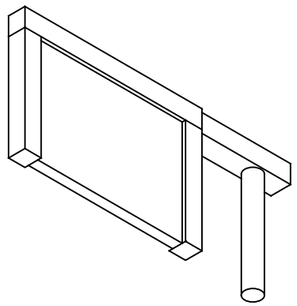
No Repairs



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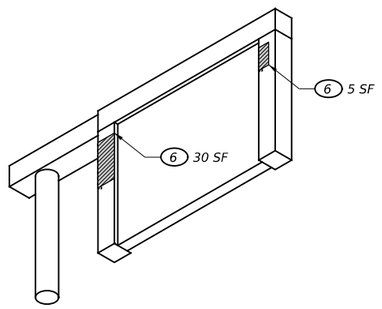

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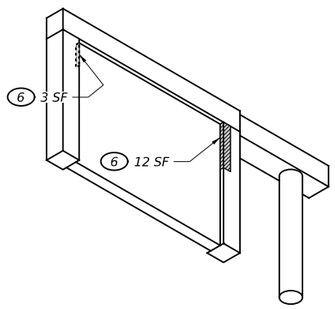

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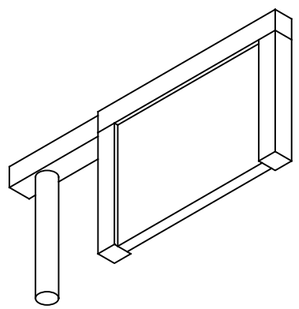

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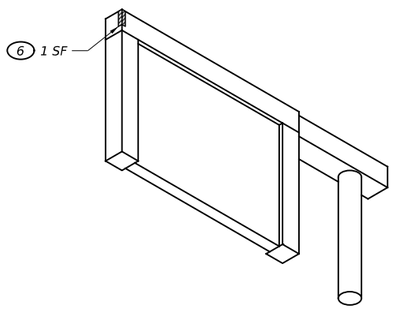

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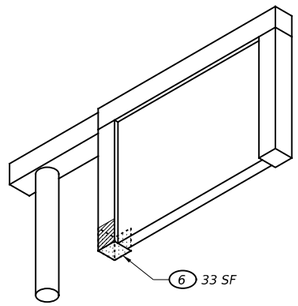

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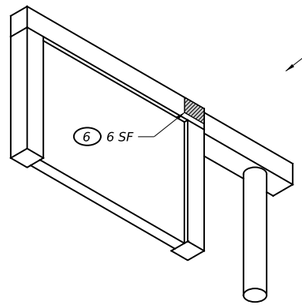

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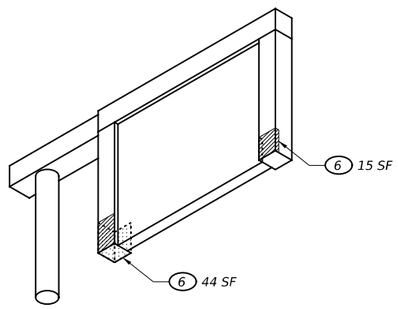

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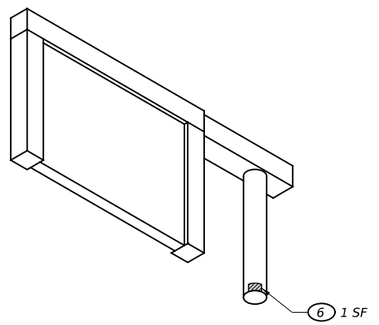
Looking Northwest



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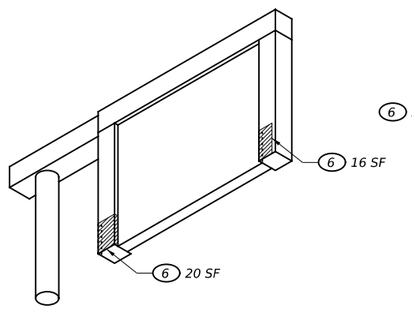

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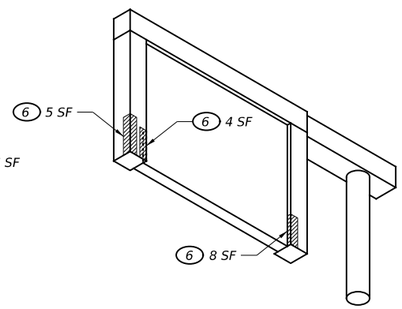

NORTH FACE
Looking Southwest

SUBSTRUCTURE REPAIR ISOMETRICS

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER
06/10/2024

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc.
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 136 SB
AT CANADIAN RIVER
SUBSTRUCTURE REPAIR ISOMETRICS

Ref 01: NBI# 04-118-0-0356-01-008

SCALE: N.T.S.

SHEET 2 OF 6

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		95

DATE: 6/8/2024 1:08:38 PM
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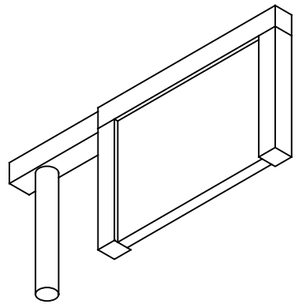
FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	JCH	LJG

REPAIR CALL-OUT LEGEND

- Spall/Delamination Repair
- Type X Epoxy Waterproof Finish not covered by Repair 10
- XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

BENT 10



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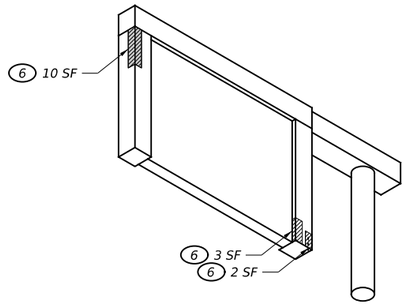

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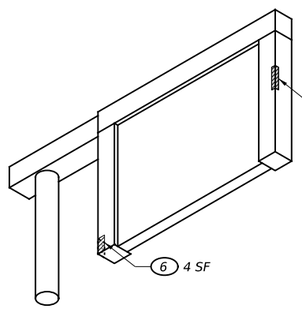

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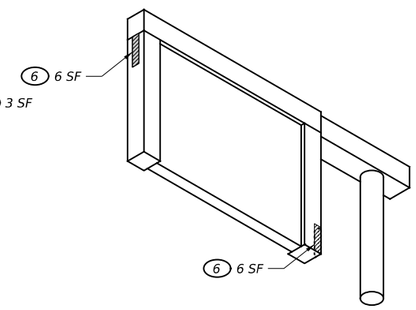

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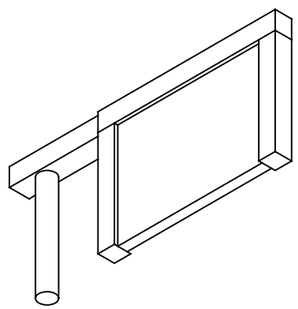

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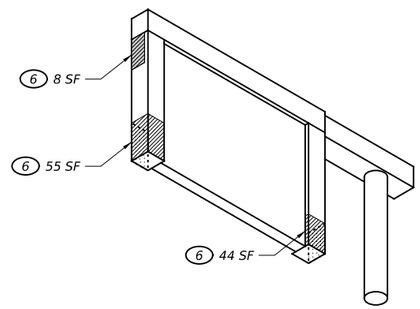

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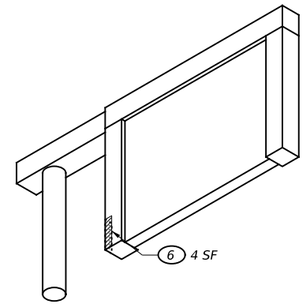

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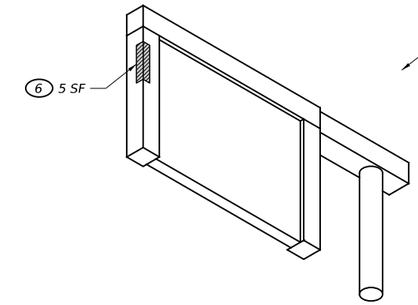

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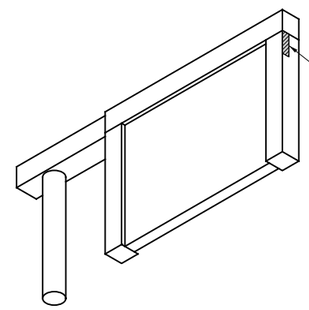

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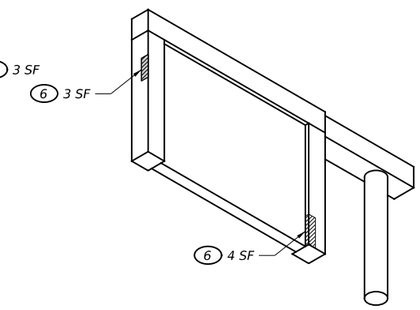

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Looking Southwest

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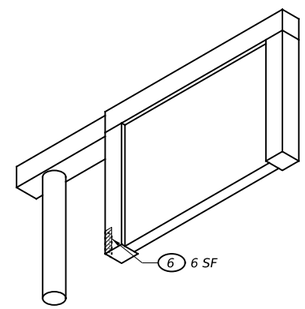

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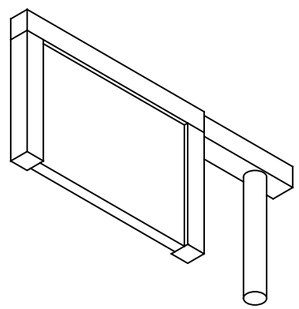

NORTH FACE
Looking Southwest

SUBSTRUCTURE REPAIR ISOMETRICS

STATE OF TEXAS
BRETT R.C. ALLEN
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SH 136 SB
AT CANADIAN RIVER
SUBSTRUCTURE REPAIR ISOMETRICS

Ref 01: NBI# 04-118-0-0356-01-008

SCALE: N.T.S.

SHEET 3 OF 6

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.

DIST	COUNTY	SHEET NO.
AMA	HUTCHINSON, ETC.	96

DATE: 6/8/2024 1:08:45 PM
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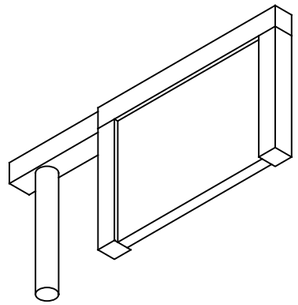
FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	JCH	LJG

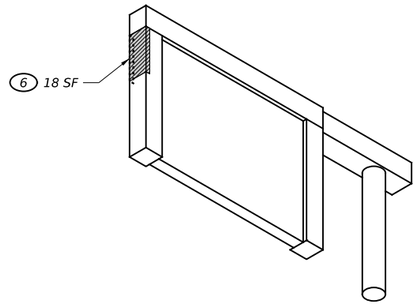
REPAIR CALL-OUT LEGEND

- Spall/Delamination Repair
- Type X Epoxy Waterproof Finish not covered by Repair 10
- XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

BENT 16



SOUTH FACE
Looking Northwest



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Looking Southwest

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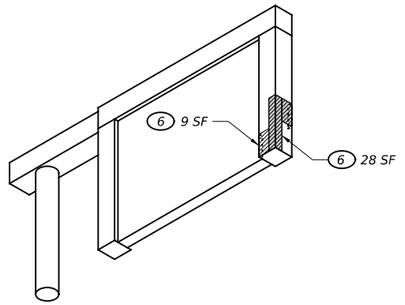

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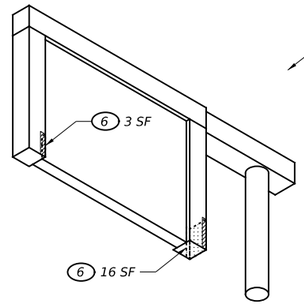
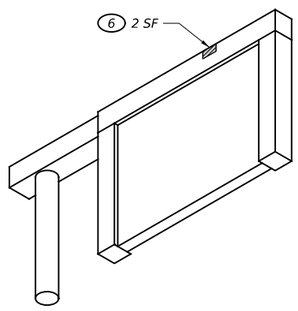
Looking Northwest

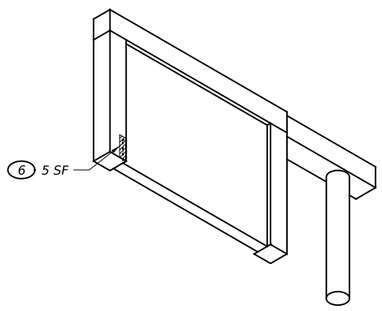


NORTH FACE
Looking Southwest

BENT 17

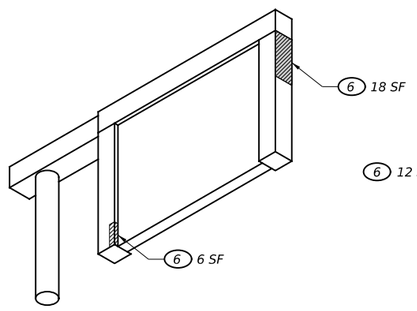


SOUTH FACE
Looking Northwest

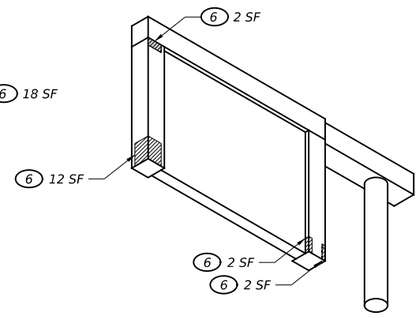


NORTH FACE
Looking Southwest

BENT 20

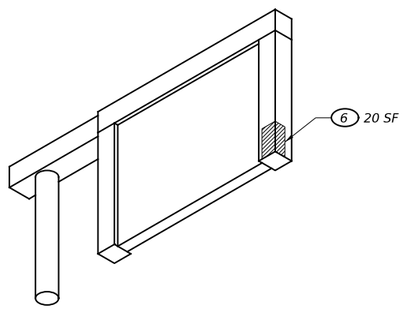


SOUTH FACE
Looking Northwest

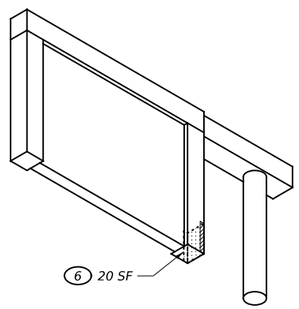


NORTH FACE
Looking Southwest

BENT 18

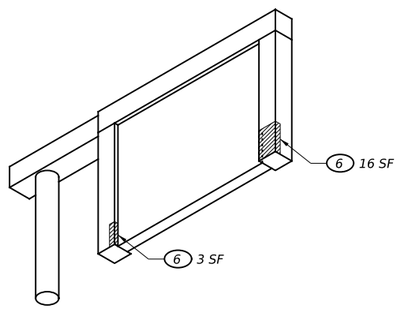


SOUTH FACE
Looking Northwest

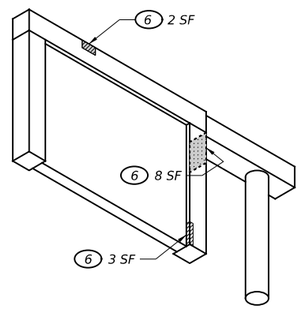


NORTH FACE
Looking Southwest

BENT 21



SOUTH FACE
Looking Northwest



NORTH FACE
Looking Southwest

SUBSTRUCTURE REPAIR ISOMETRICS

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 136 SB
AT CANADIAN RIVER
SUBSTRUCTURE REPAIR ISOMETRICS

Ref 01: NBI# 04-118-0-0356-01-008

SCALE: N.T.S.

SHEET 4 OF 6

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		97

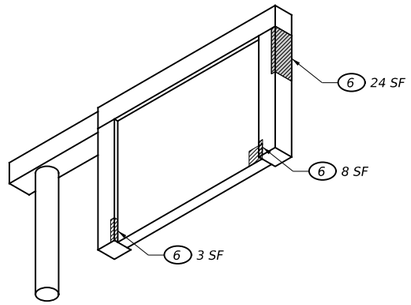
DATE: 6/8/2024 1:08:53 PM
FILE: AMA204118003560100B 801 SUB04.dgn

FINAL SUBMITTAL (100%)

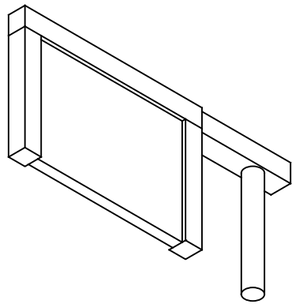
DW:	CK	DW:	CK
AJS	LJG	LJG	JCH

REPAIR CALL-OUT LEGEND

- Spall/Delamination Repair
- Type X Epoxy Waterproof Finish not covered by Repair 10
- XX XX
  - XX — Repair No. - See Table of Repairs
  - XX — Estimated Repair Quantity At Each Location
  - XX — Repair Quantity Unit

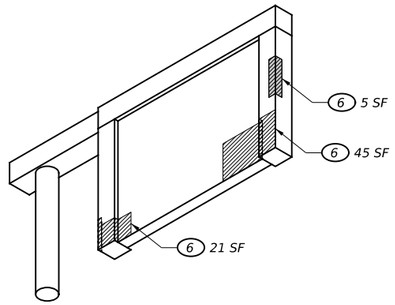


SOUTH FACE
Looking Northwest

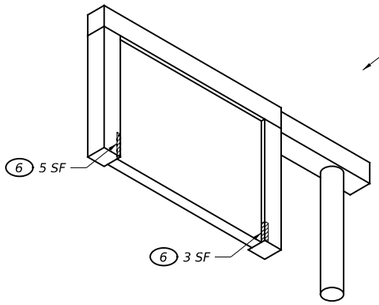


NORTH FACE
Looking Southwest

BENT 22

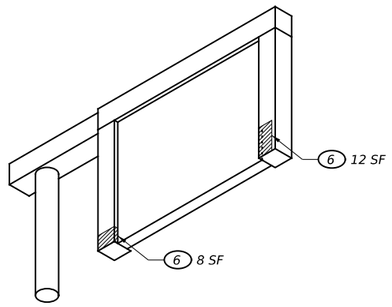


SOUTH FACE
Looking Northwest

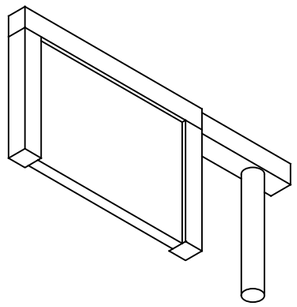


NORTH FACE
Looking Southwest

BENT 25

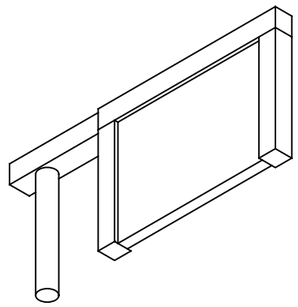


SOUTH FACE
Looking Northwest

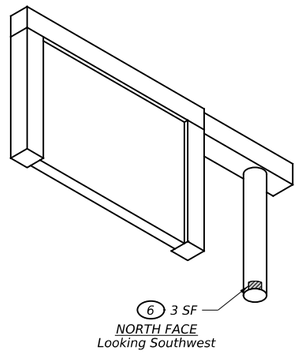


NORTH FACE
Looking Southwest

BENT 23

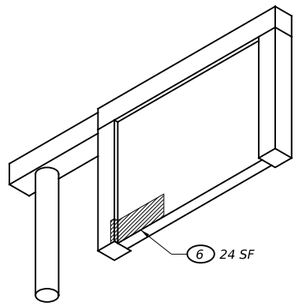


SOUTH FACE
Looking Northwest

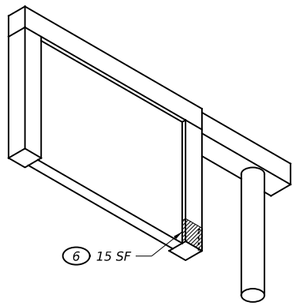


NORTH FACE
Looking Southwest

BENT 26

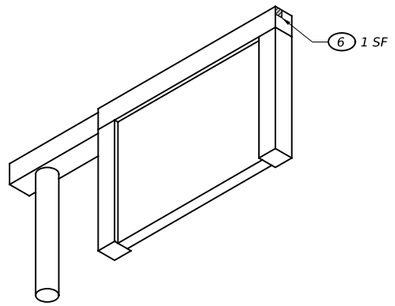


SOUTH FACE
Looking Northwest

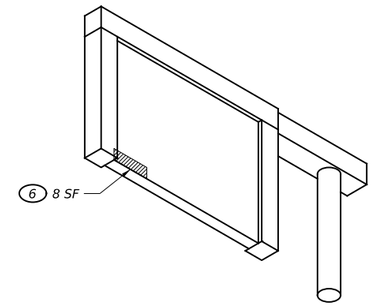


NORTH FACE
Looking Southwest

BENT 24



SOUTH FACE
Looking Northwest



NORTH FACE
Looking Southwest

BENT 27

SUBSTRUCTURE REPAIR ISOMETRICS

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER
06/10/2024

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 136 SB
AT CANADIAN RIVER
SUBSTRUCTURE REPAIR ISOMETRICS

Ref 01: NBI# 04-118-0-0356-01-008

SCALE: N.T.S.

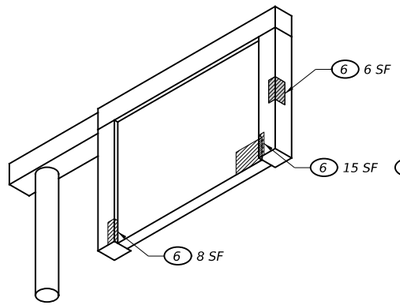
SHEET 5 OF 6

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		98

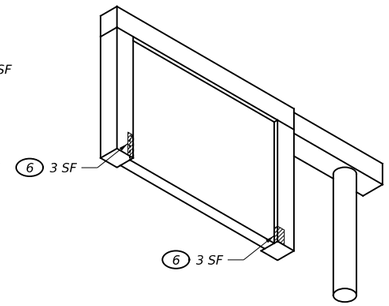
DATE: 6/8/2024 1:09:01 PM
FILE: AMA204118003601008_B01_SUB05.dgn

FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	LJG	JCH

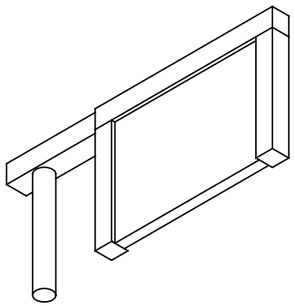


SOUTH FACE
Looking Northwest



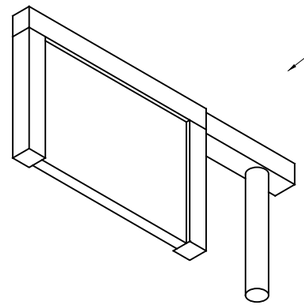
NORTH FACE
Looking Southwest

BENT 28



SOUTH FACE
Looking Northwest

No Repairs

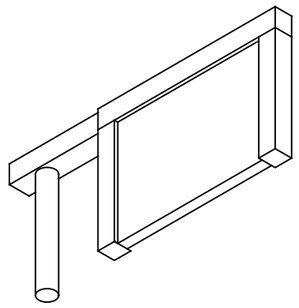


NORTH FACE
Looking Southwest

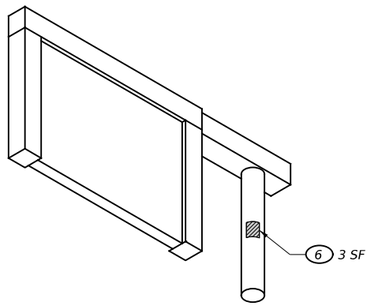
BENT 31

REPAIR CALL-OUT LEGEND

- Spall/Delamination Repair
- Type X Epoxy Waterproof Finish not covered by Repair 10
- XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

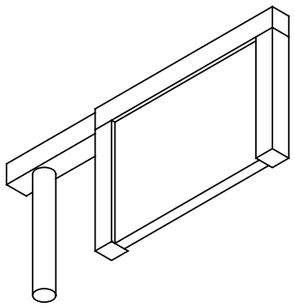


SOUTH FACE
Looking Northwest



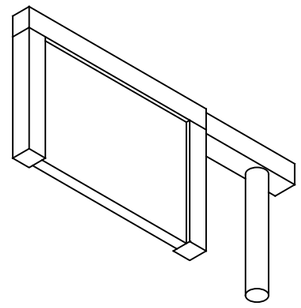
NORTH FACE
Looking Southwest

BENT 29



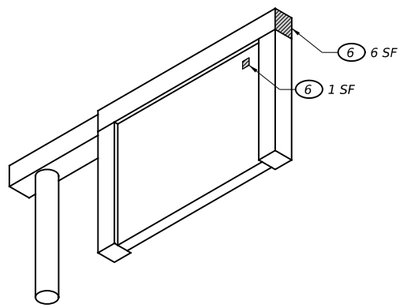
SOUTH FACE
Looking Northwest

No Repairs

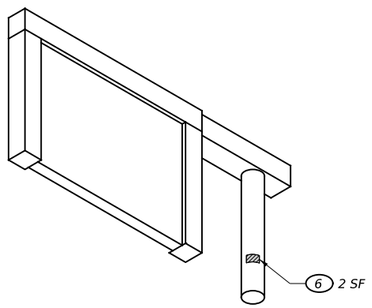


NORTH FACE
Looking Southwest

BENT 32



SOUTH FACE
Looking Northwest



NORTH FACE
Looking Southwest

BENT 30

SUBSTRUCTURE REPAIR ISOMETRICS

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER

06/10/2024

Brett RC Allen

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 136 SB
AT CANADIAN RIVER
SUBSTRUCTURE REPAIR ISOMETRICS

Ref 01: NBI# 04-118-0-0356-01-008

SCALE: N.T.S.

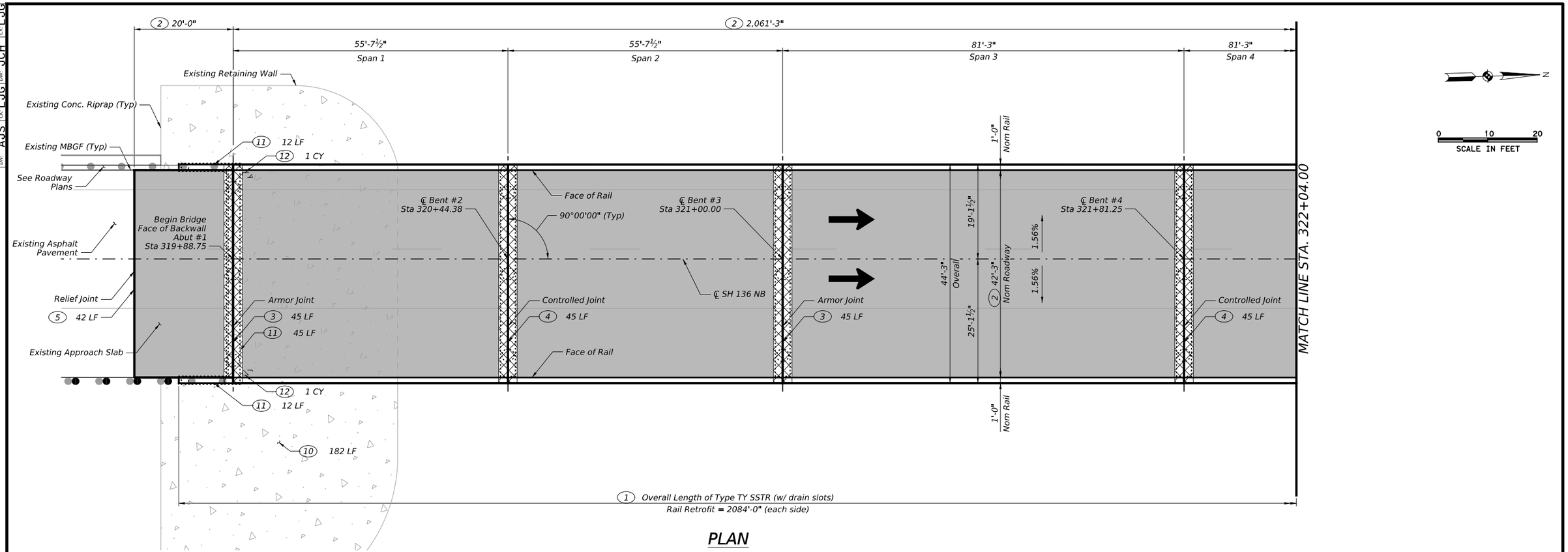
SHEET 6 OF 6

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		99

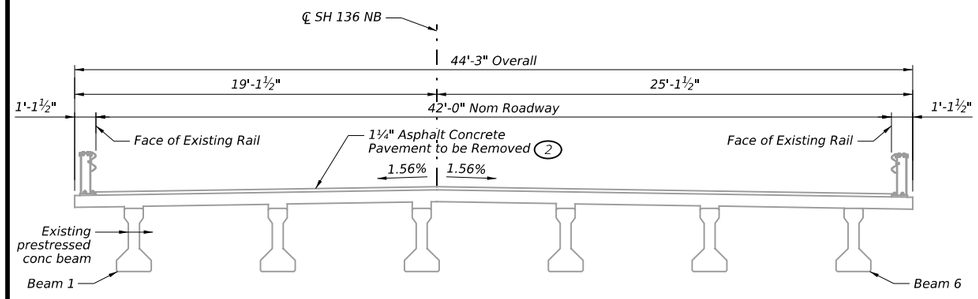
DATE: 6/8/2024 1:09:09 PM
FILE: AMA204118003601008 B01 SUB06.dgn

FINAL SUBMITTAL (100%)

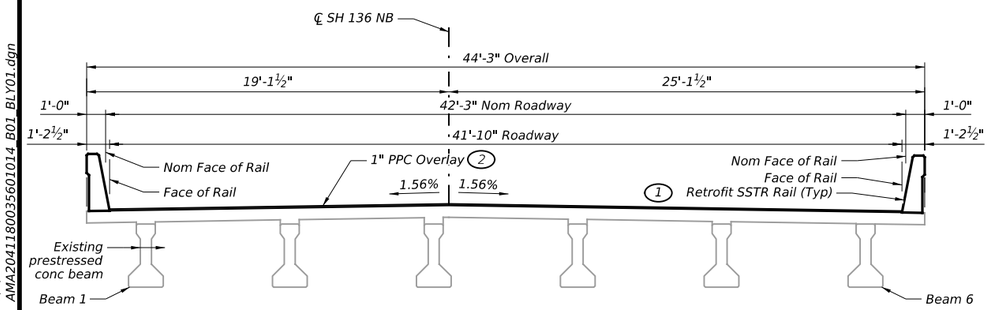
DW:	CK	DW:	CK
AJS	LJG	JCH	LJG



PLAN



EXISTING TYPICAL SECTION



PROPOSED TYPICAL SECTION

GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request.
3. Stationing is based on as-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids, and all locations shall be approved by the Engineer prior to beginning repair work. Field verify limits and quantities with the Engineer. Payment will be for the field measured repair at the unit price bid.
5. Refer to Traffic Control Plans and Roadway Plans for information not shown.

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay & Install PPC Overlay
- Conc Riprap Repair
- Full Depth Joint Replacement
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER
06/10/2024

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc.
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 136 NB
AT CANADIAN RIVER
BRIDGE LOCATION REPAIR PLAN

REF 02: NBI# 04-118-0-0356-01-014

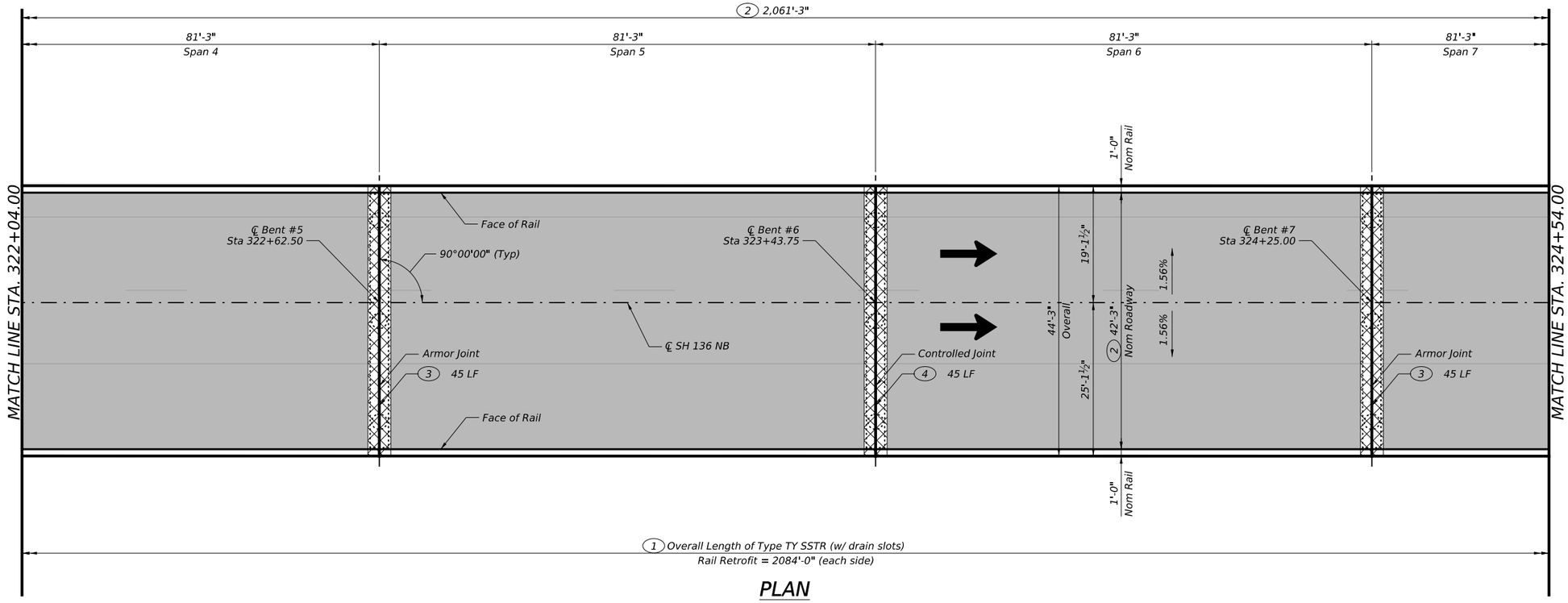
SCALE:1"=20' SHEET 1 OF 7

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		100

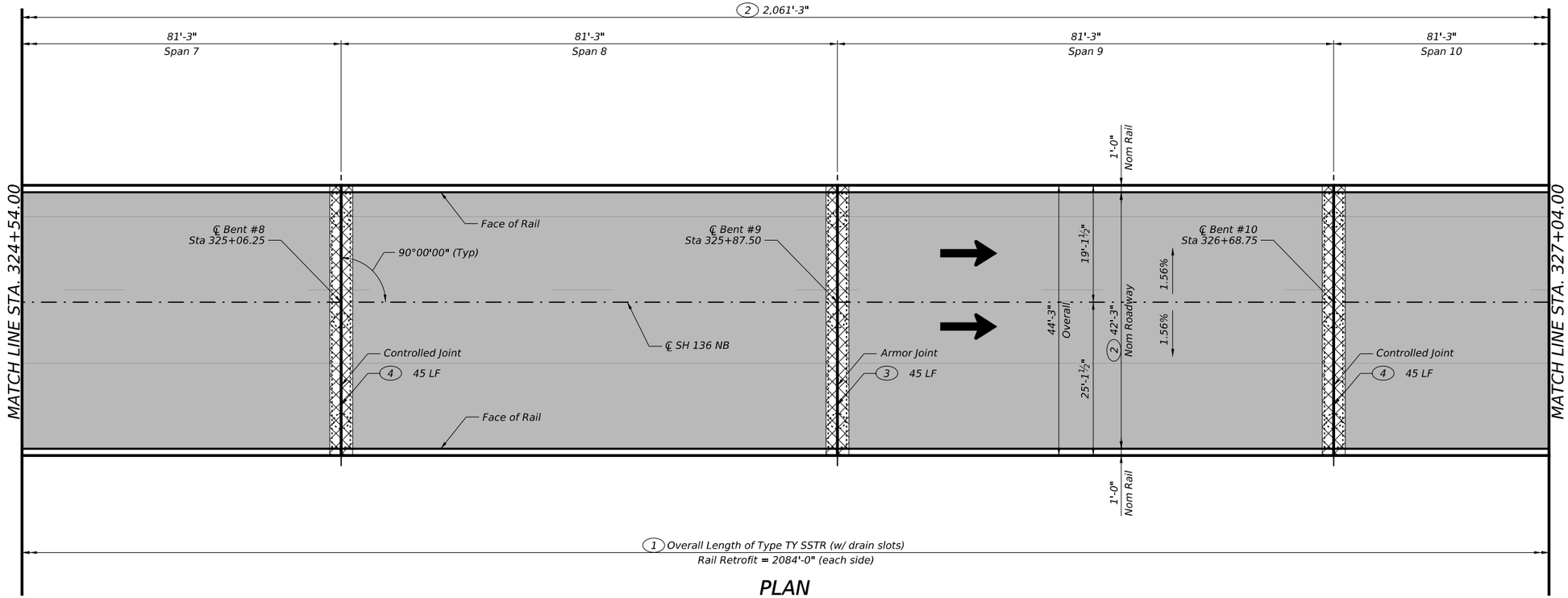
DATE: 6/8/2024 1:09:17 PM
FILE: AMA204118003601014 B01 BLY01.dgn

FINAL SUBMITTAL (100%)

DW:	AJS	CK:	LJG	DW:	JCH	CK:	LJG



PLAN



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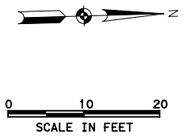


REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay & Install PPC Overlay
- Full Depth Joint Replacement
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED PROFESSIONAL ENGINEER
06/10/2024

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 136 NB AT CANADIAN RIVER BRIDGE LOCATION REPAIR PLAN

REF 02: NBI# 04-118-0-0356-01-014

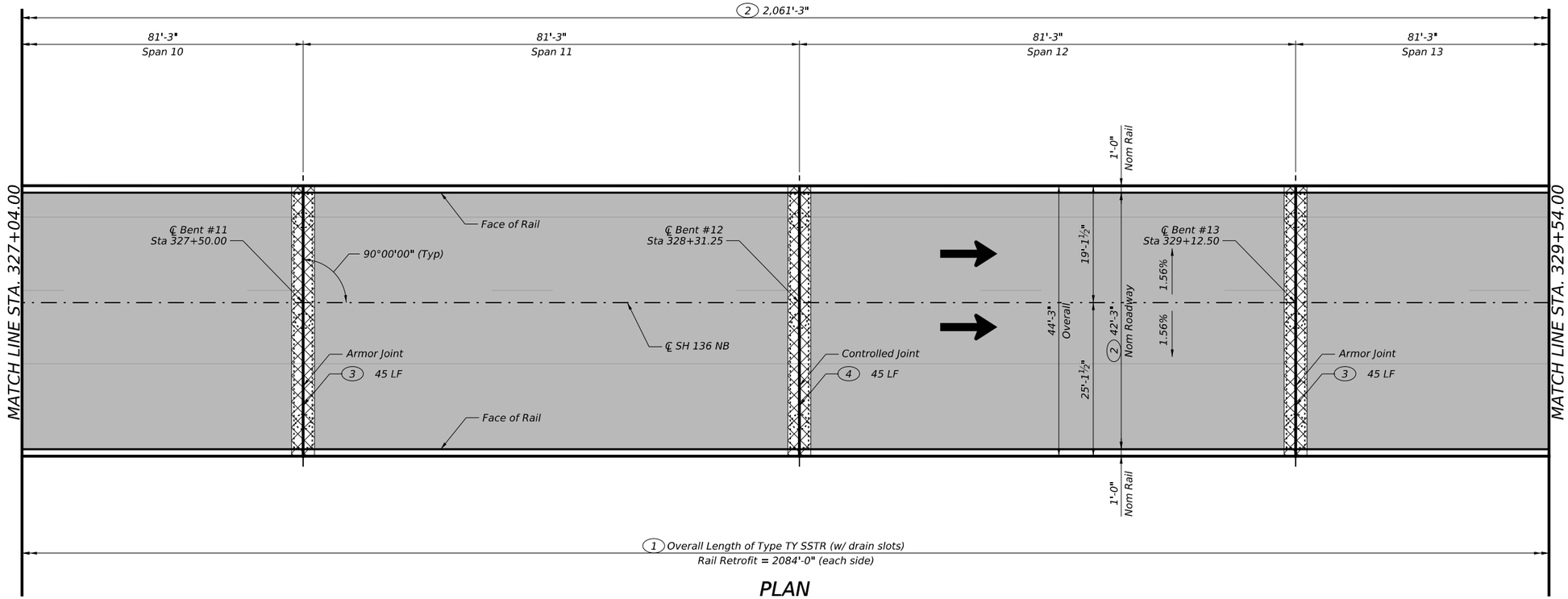
SCALE:1"=20' SHEET 2 OF 7

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		101

DATE: 6/8/2024 1:09:25 PM
FILE: AMA204118003560101 4 B01 BLY02.dgn

FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK	DW:	CK
AJS	LJG	LJG	JCH	JCH	LJG



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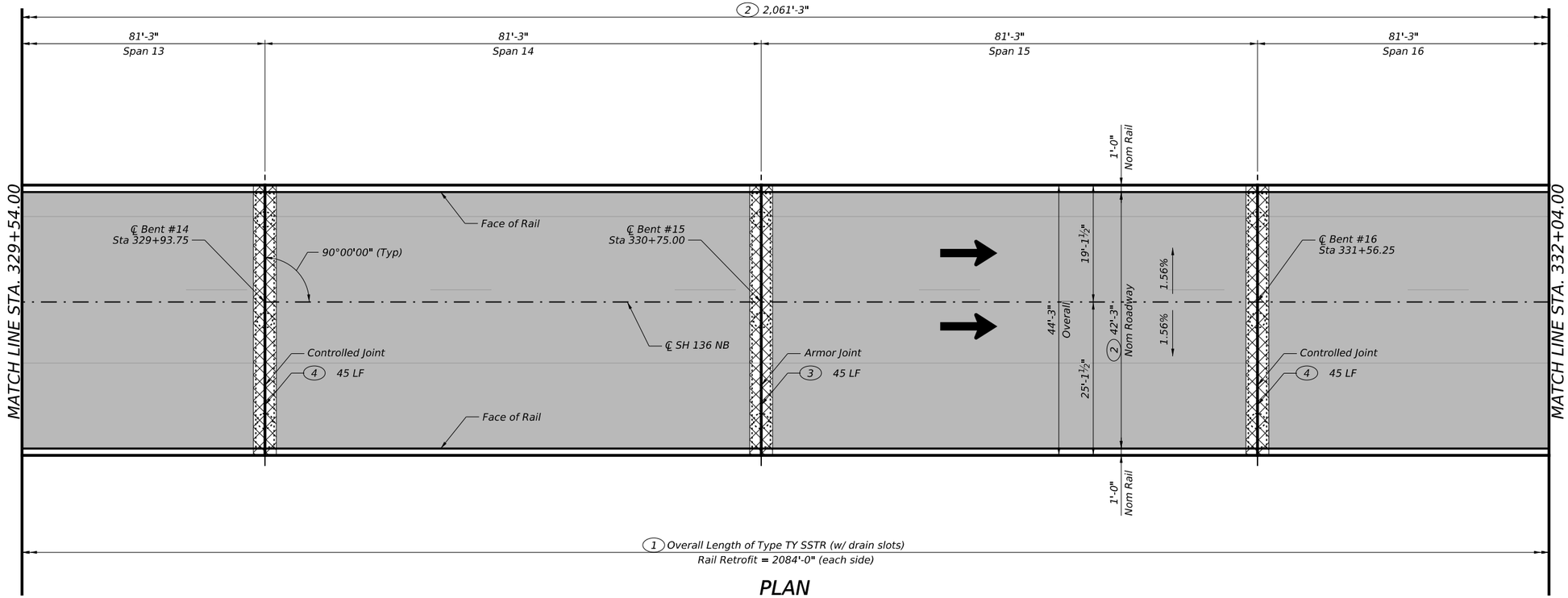

PLAN

N

0 10 20
SCALE IN FEET

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay & Install PPC Overlay
- Full Depth Joint Replacement
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED PROFESSIONAL ENGINEER
06/10/2024

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Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 136 NB AT CANADIAN RIVER BRIDGE LOCATION REPAIR PLAN

REF 02: NBI# 04-118-0-0356-01-014

SCALE:1"=20' SHEET 3 OF 7

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		102

DATE: 6/8/2024 1:09:33 PM
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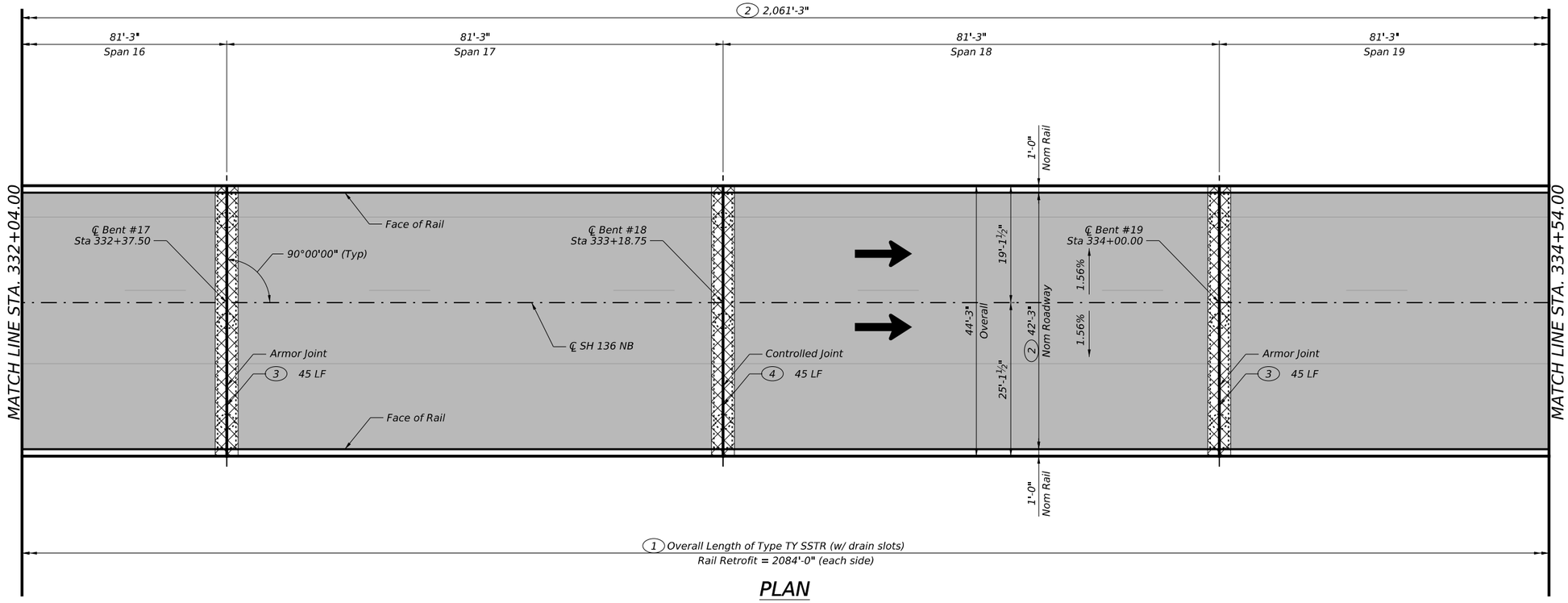
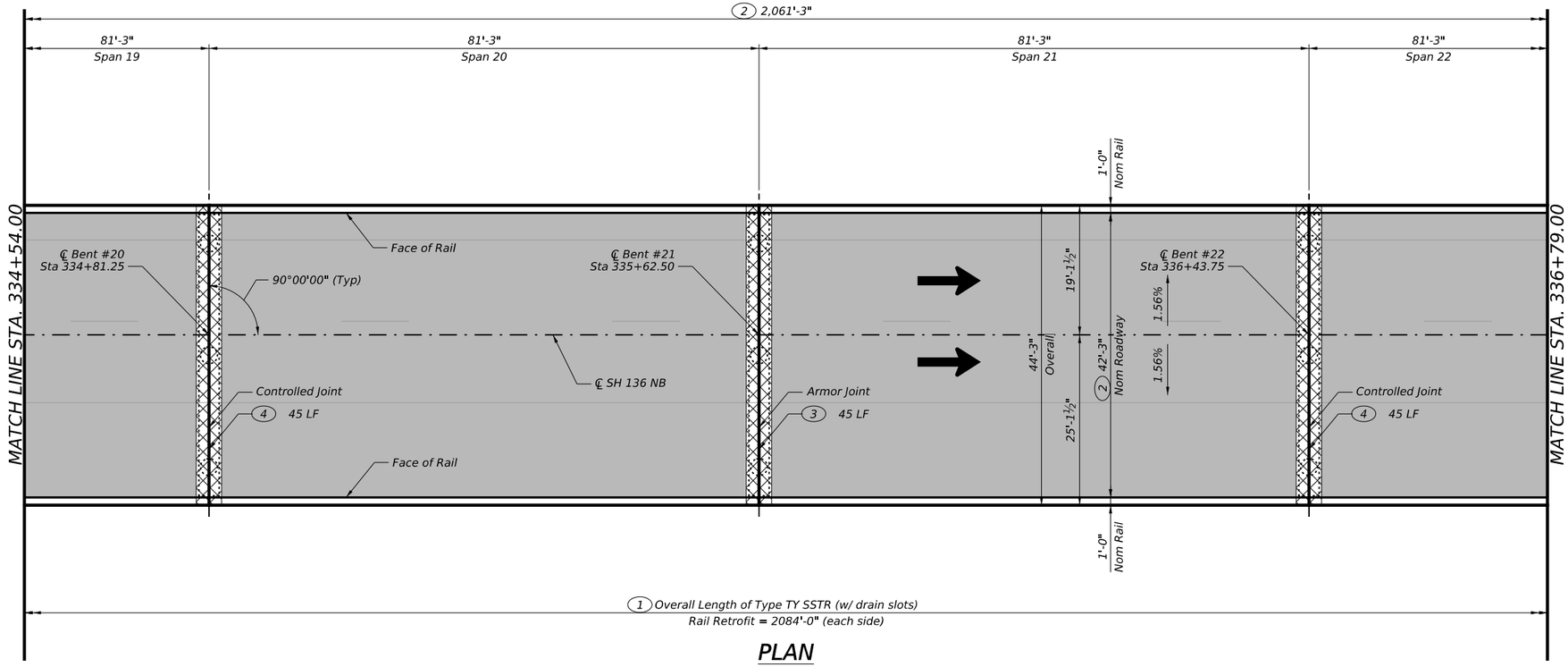
FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	JCH	LJG





REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay & Install PPC Overlay
- Full Depth Joint Replacement
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

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972.960.4400

Texas Department of Transportation

SH 136 NB
AT CANADIAN RIVER
BRIDGE LOCATION REPAIR PLAN

REF 02: NBI# 04-118-0-0356-01-014

SCALE:1"=20' SHEET 4 OF 7

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		103

DATE: 6/8/2024 1:09:42 PM
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FINAL SUBMITTAL (100%)

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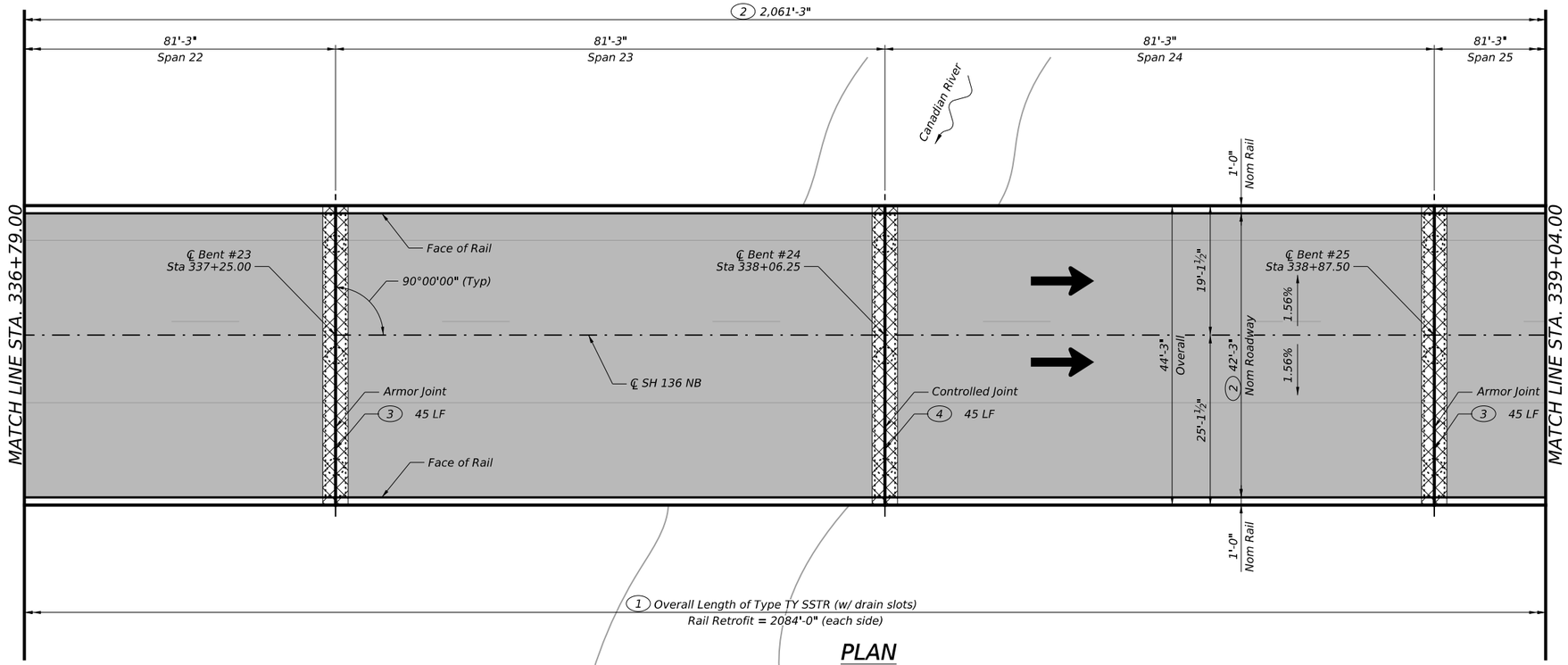

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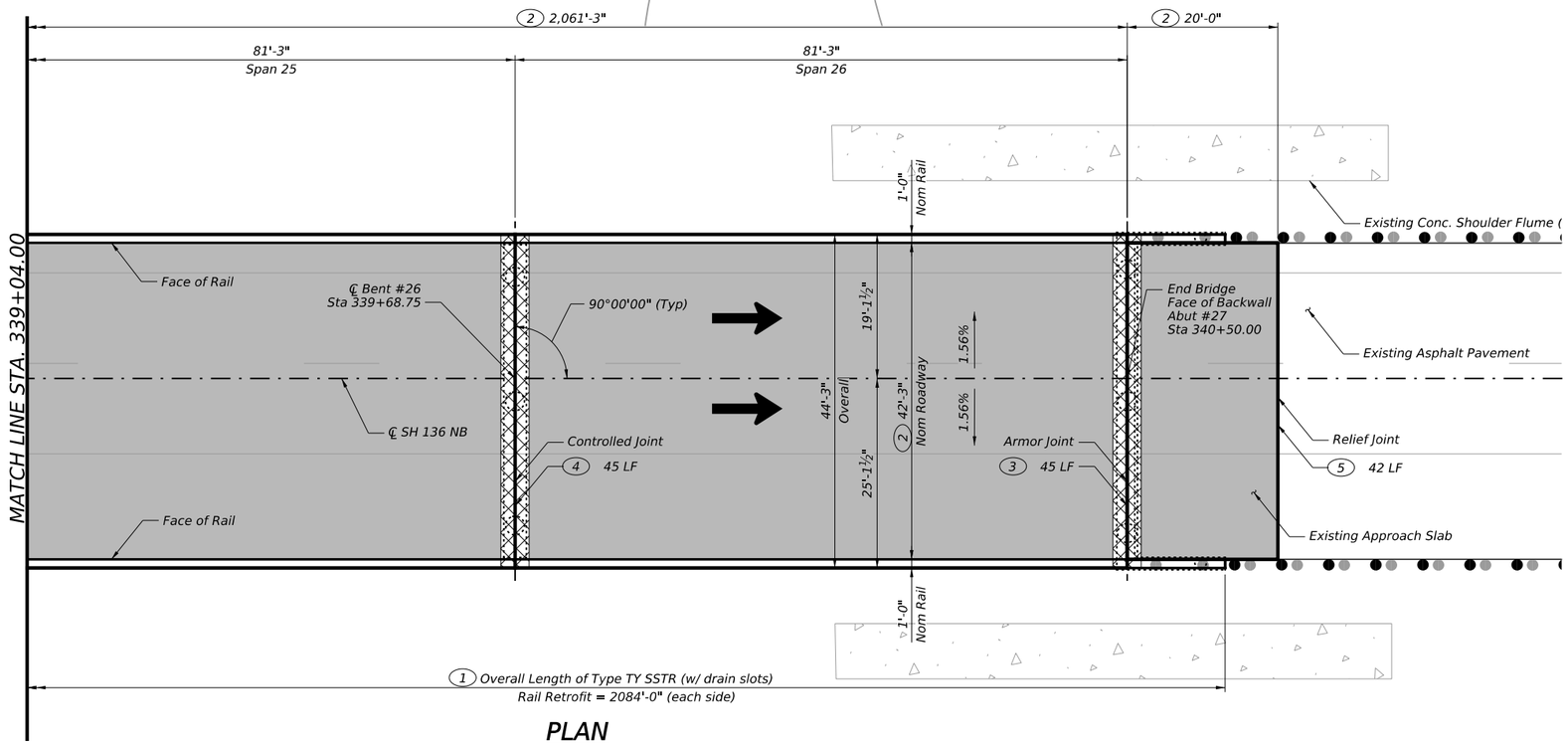

PLAN

N

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SCALE IN FEET

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay & Install PPC Overlay
- Full Depth Joint Replacement
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED PROFESSIONAL ENGINEER
06/10/2024

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 136 NB
AT CANADIAN RIVER
BRIDGE LOCATION REPAIR PLAN

REF 02: NBI# 04-118-0-0356-01-014

SCALE:1"=20' SHEET 5 OF 7

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		104

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FINAL SUBMITTAL (100%)

DW:	CK	QC	DW:	CK	QC
AJS	LJG		JCH	LJG	

⑥ TABLE OF DECK SOFFIT REPAIRS

Span	Transverse Location	Location	Spall Repair Quantity
1	West Edge	1/3 Width	1 SF
	West Edge	Midspan	7 SF
4	East Edge	1/3 Width	1 SF
5	West Edge	Bent 5	9 SF
	East Edge	Midspan	2 SF
12	West Edge	Bent 12	1 SF
15	East Edge	Bent 15	4 SF
	East Edge	Midspan	3 SF
	East Edge	3/4 Span	9 SF
18	East Edge	Bent 18	3 SF
	West Edge	Midspan	3 SF
20	West Edge	Bent 20	4 SF
22	East Edge	Bent 22	2 SF
25	East Edge	Bent 25	3 SF
26	East Edge	Bent 26	8 SF
	West Edge	Bent 26	2 SF
27	West Edge	1/3 Width	2 SF
TOTAL			64 SF

⑧ TABLE OF DIAPHRAGM REPAIRS

Span	Bay	Location	Spall Repair Quantity
6	1	Bent 6	5 SF
10	1	Bent 11	2 SF
11	1	Bent 11	1 SF
TOTAL			8 SF

⑦ TABLE OF BEAM REPAIRS

Span	Beam	Location	Spall Repair Quantity
1	1	Abut 1	3 SF
	4	Abut 1	2 SF
	6	Abut 1	2 SF
1	5	Bent 2	1 SF
	6	Bent 2	1 SF
2	1	Bent 3	4 SF
	2	Bent 3	2 SF
	5	Bent 3	3 SF
3	1	Bent 3	4 SF
	4	Bent 3	1 SF
	6	Bent 3	2 SF
3	1	Bent 4	4 SF
	2	Bent 4	2 SF
	5	Bent 4	1 SF
	6	Bent 4	3 SF
4	1	Bent 4	3 SF
	2	Bent 4	1 SF
	3	Bent 4	1 SF
	4	Bent 4	1 SF
	5	Bent 4	2 SF
	6	Bent 4	2 SF
4	1	Bent 5	4 SF
5	1	Bent 5	3 SF
	6	Bent 5	2 SF
5	1	Bent 6	4 SF
	2	Bent 6	5 SF
	3	Bent 6	6 SF
	4	Bent 6	4 SF
	5	Bent 6	4 SF
	6	Bent 6	3 SF
6	1	Bent 6	1 SF
	2	Bent 6	3 SF
	4	Bent 6	2 SF
	5	Bent 6	3 SF
	6	Bent 6	2 SF
6	1	Bent 7	2 SF
	2	Bent 7	1 SF
	4	Bent 7	2 SF
	5	Bent 7	1 SF
	6	Bent 7	1 SF
7	1	Bent 7	3 SF
	2	Bent 7	4 SF
	3	Bent 7	3 SF
	4	Bent 7	2 SF
	5	Bent 7	3 SF
	6	Bent 7	5 SF
7	1	Bent 8	3 SF
	4	Bent 8	2 SF
	5	Bent 8	5 SF
	6	Bent 8	2 SF
8	1	Bent 8	2 SF
	2	Bent 8	4 SF
	3	Bent 8	2 SF
	4	Bent 8	4 SF
	5	Bent 8	1 SF
	6	Bent 8	3 SF
8	3	Bent 9	1 SF
	4	Bent 9	4 SF
	5	Bent 9	2 SF
	6	Bent 9	3 SF

⑦ TABLE OF BEAM REPAIRS

Span	Beam	Location	Spall Repair Quantity
9	1	Bent 10	2 SF
	2	Bent 10	2 SF
	3	Bent 10	1 SF
	6	Bent 10	5 SF
10	1	Bent 10	1 SF
	2	Bent 10	1 SF
	4	Bent 10	1 SF
	6	Bent 10	3 SF
10	6	Bent 11	2 SF
11	1	Bent 11	2 SF
	3	Bent 11	1 SF
	4	Bent 11	1 SF
	6	Bent 11	3 SF
11	1	Bent 12	3 SF
	2	Bent 12	1 SF
	4	Bent 12	1 SF
	5	Bent 12	2 SF
	6	Bent 12	3 SF
12	1	Bent 12	2 SF
	5	Bent 12	2 SF
	6	Bent 12	2 SF
12	1	Bent 13	4 SF
	2	Bent 13	1 SF
	3	Bent 13	1 SF
	4	Bent 13	3 SF
	6	Bent 13	2 SF
13	1	Bent 13	3 SF
	3	Bent 13	2 SF
	5	Bent 13	1 SF
	6	Bent 13	1 SF
13	1	Bent 14	2 SF
	2	Bent 14	1 SF
	3	Bent 14	1 SF
	6	Bent 14	3 SF
14	2	Bent 14	2 SF
	3	Bent 14	2 SF
	4	Bent 14	1 SF
	5	Bent 14	2 SF
	6	Bent 14	2 SF
14	3	Bent 15	1 SF
	4	Bent 15	2 SF
	5	Bent 15	1 SF
15	4	Bent 15	1 SF
	5	Bent 15	3 SF
	6	Bent 15	1 SF
15	1	Bent 16	1 SF
	2	Bent 16	1 SF
	3	Bent 16	1 SF
	5	Bent 16	1 SF
16	1	Bent 16	2 SF
	2	Bent 16	4 SF
	3	Bent 16	2 SF
	6	Bent 16	2 SF
16	5	Bent 17	2 SF
	6	Bent 17	1 SF
17	5	Bent 17	1 SF
17	1	Bent 18	1 SF
	2	Bent 18	1 SF
	3	Bent 18	1 SF
	5	Bent 18	1 SF

⑦ TABLE OF BEAM REPAIRS

Span	Beam	Location	Spall Repair Quantity
18	1	Bent 18	4 SF
18	1	Bent 19	3 SF
	3	Bent 19	2 SF
	4	Bent 19	1 SF
	6	Bent 19	1 SF
19	1	Bent 19	2 SF
	2	Bent 19	1 SF
	3	Bent 19	1 SF
	4	Bent 19	1 SF
	6	Bent 19	2 SF
19	1	Bent 20	2 SF
	3	Bent 20	1 SF
	5	Bent 20	1 SF
	6	Bent 20	1 SF
20	1	Bent 20	3 SF
	2	Bent 20	1 SF
	3	Bent 20	1 SF
	6	Bent 20	2 SF
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	2	Bent 21	1 SF
	3	Bent 21	2 SF
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	6	Bent 23	1 SF
23	1	Bent 24	1 SF
	2	Bent 24	2 SF
	3	Bent 24	2 SF
	5	Bent 24	1 SF
	6	Bent 24	1 SF
24	1	Bent 24	2 SF
	2	Bent 24	2 SF
	3	Bent 24	4 SF
	4	Bent 24	2 SF
	5	Bent 24	2 SF
	6	Bent 24	2 SF

⑦ TABLE OF BEAM REPAIRS

Span	Beam	Location	Spall Repair Quantity
24	1	Bent 25	2 SF
	2	Bent 25	1 SF
	3	Bent 25	3 SF
	4	Bent 25	2 SF
	5	Bent 25	2 SF
	6	Bent 25	2 SF
25	1	Bent 25	3 SF
	2	Bent 25	2 SF
	3	Bent 25	2 SF
	4	Bent 25	3 SF
	5	Bent 25	2 SF
	6	Bent 25	1 SF
25	1	Bent 26	3 SF
	2	Bent 26	1 SF
	3	Bent 26	1 SF
	5	Bent 26	2 SF
	6	Bent 26	1 SF
26	1	Bent 26	3 SF
	2	Bent 26	1 SF
	3	Bent 26	1 SF
	4	Bent 26	1 SF
26	6	Abut 27	1 SF
TOTAL			417 SF

All beam ends are Type C Beams. Provide 1.5 LF of waterproofing at each end (including the end face of beam) under all proposed expansion joints. These include Abut/Bents 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, & 27. There is 18 SF of waterproofing per beam end and 156 beam ends, resulting in a total of 2808 SF.

STATE OF TEXAS
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133221
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PROFESSIONAL ENGINEER

06/10/2024

Brett RC Allen

NO.	DATE	REVISION	APPR BY

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Texas Department of Transportation

SH 136 NB
AT CANADIAN RIVER
BRIDGE LOCATION REPAIR PLAN

REF 02: NBI# 04-118-0-0356-01-014

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		105

DATE: 6/8/2024 1:09:57 PM
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FINAL SUBMITTAL (100%)

DW:	AJS	CK:	LJG	DW:	JCH	CK:	LJG

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	ITEM CODE	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
1	Remove existing T1 rail and replace with Type SSTR Rail. See repair plan for locations.	451-7024	RETROFIT RAIL (TY SSTR)	4168	LF	See SSTR Rail Retrofit Details on the C-RAIL-R (MOD). Proposed reinforcing steel for the railing shall be epoxy coated.
2	Plane asphalt overlay a constant thickness of 1.25 in. and place Polyester Polymer Concrete (PPC) overlay. Assumed allowance of 2650 SF (3% of deck area) for partial-depth deck repairs and 885 SF (1% of deck area) for full-depth deck repairs are provided to be used as directed by Engineer. See repair plan for locations.	354-7073	PLANE (0" TO 1.5")	9806	SY	See the Bridge Deck Overlay Notes sheet for details.
		429-7003	CONC STR REPAIR(DECK REP(PART DEPTH))	2650	SF	Repair as partial-depth deck repairs per the TxDOT Concrete Repair Manual, Chapter 3, Section 4.
		429-7005	CONC STR REPAIR(DECK REP (FULL DEPTH))	885	SF	Repair as full-depth deck repairs per the TxDOT Concrete Repair Manual, Chapter 3, Section 4.
		439-7021	POLYESTER POLYMER CONC OVERLAY (1")	9175	SY	See the Bridge Deck Overlay Notes sheet for details.
3	After completion of asphalt planing, remove existing armor joints and replace with SEJ-M type expansion joints. Perform in conjunction with rail retrofit and PPC overlay. See repair plan for locations.	785-7011	BRIDGE JOINT REPLACEMENT (SEJ)	630	LF	See Armor Joint Replacement Details on the Joint Replacement Details sheet.
4	After completion of asphalt planing, perform full-depth joint replacement, both sides of noted joint. Perform in conjunction with rail retrofit and concrete overlay. See repair plan for locations.	785-7009	BRIDGE JOINT REPLACEMENT (CONCRETE)	585	LF	See Controlled Joint Details on the Joint Replacement Details sheet.
5	Clean and seal relief joints. See repair plan for locations.	438-7010	CLEANING AND SEALING JOINTS (FOAM)	90	LF	See the Cleaning and Sealing Existing Bridge Joints sheet.
6	Repair the spalls/delaminations in the deck soffit. If the deck has been compromised by existing rail damage, the Engineer may utilize Full-Depth Deck Repairs instead of Vertical & Overhead Repairs. See Table of Deck Soffit Repairs for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	64	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
7	Repair damaged beam ends. After making repairs to beams, apply Waterproofing to beam ends under expansion joints. See Table of Beam Repairs for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	417	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
		427-7005	EPOXY WATERPROOF FINISH (TY X)	2808	SF	See the Typical Prestressed Beam detail on the Waterproofing Details sheet.
8	Repair the spalls/delaminations in the diaphragms. See Table of Diaphram Repairs for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	8	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
9	Repair the spalls/delaminations in the substructure. See Substructure Repair Isometrics sheet for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	429	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
10	Clean and seal construction joints and cracks in riprap. See repair plan for locations	713-7004	CRACK CLEANING AND SEALING (JCP)	182	LF	See the Concrete Riprap Crack Sealing Details sheet.
11	Clean and seal joints between riprap and abutment/wingwalls. Additionally, install flashing. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	69	LF	See the Joint Seal Flashing Details sheet.
12	Remove steel bracket and replace riprap that was removed from a prior repair. Before pouring new riprap, fill voids with cement stabilized backfill. See repair plan for locations.	496-7036	REMOV STR (SMALL)	2	EA	Cut off anchor bolts flush with abutment. See Steel Bracket Removal detail.
		400-7010	CEM STABIL BKFL	2	CY	
		432-7002	RIPRAP (CONC)(5 IN)	2	CY	
13	Apply Waterproofing to all faces of abutments and bent caps. See Substructure Concrete Waterproofing Table on the Waterproofing Details sheet.	427-7005	EPOXY WATERPROOF FINISH (TY X)	6218	SF	See the Waterproofing Details sheet.

12 STEEL BRACKET REMOVAL

REPAIR CALL-OUT LEGEND

Conc Riprap Repair

STATE OF TEXAS
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Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 136 NB
AT CANADIAN RIVER
BRIDGE LOCATION REPAIR PLAN

REF 02: NBI# 04-118-0-0356-01-014

SHEET 7 OF 7

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		106

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FINAL SUBMITTAL (100%)

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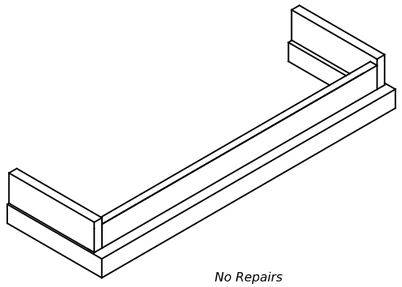
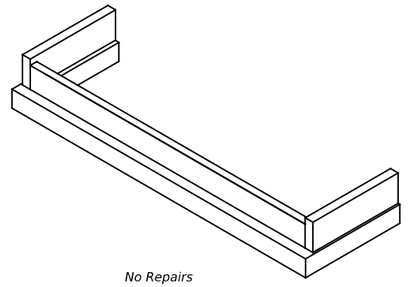


No Repairs

NORTH FACE
Looking Southwest

ABUTMENT 1



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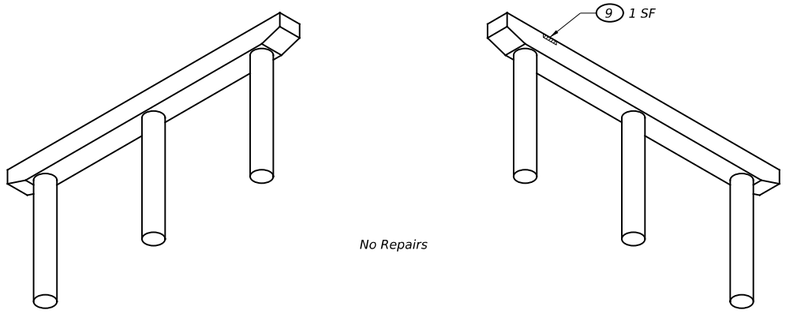
SOUTH FACE
Looking Northwest

ABUTMENT 27



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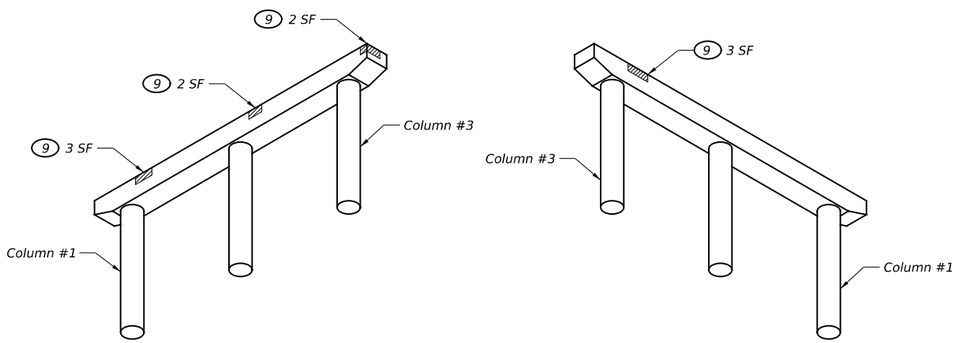
SOUTH FACE
Looking Northwest

NORTH FACE
Looking Southwest

BENT 2



SOUTH FACE
Looking Northwest

NORTH FACE
Looking Southwest

BENT 3

SUBSTRUCTURE REPAIR ISOMETRICS

REPAIR CALL-OUT LEGEND

- Spall/Delamination Repair
- XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
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06/10/2024
Brett RC Allen

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Texas Department of Transportation

SH 136 NB
AT CANADIAN RIVER
SUBSTRUCTURE REPAIR ISOMETRICS

REF 02: NBI# 04-118-0-0356-01-014

SCALE: N.T.S.

SHEET 1 OF 5

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		107

DATE: 6/8/2024 1:10:14 PM
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FINAL SUBMITTAL (100%)

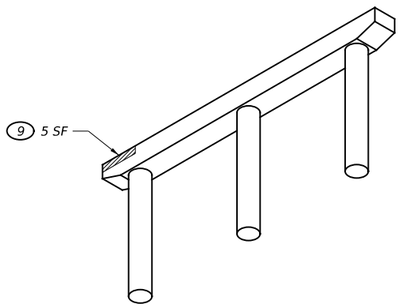
DW:	CK	DW:	CK
AJS	LJG	JCH	LJG

REPAIR CALL-OUT LEGEND

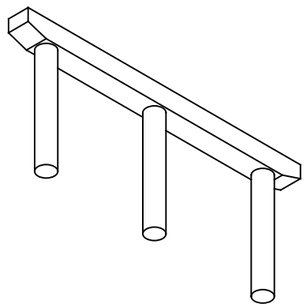
Spall/Delamination Repair

XX XX
- Repair Quantity Unit
- Estimated Repair Quantity At Each Location
- Repair No. - See Table of Repairs

BENT 4

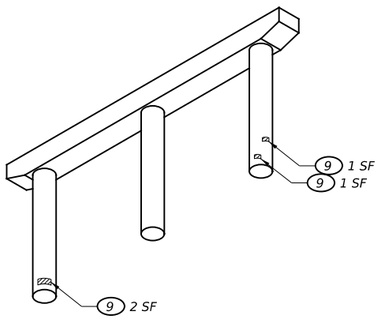


WEST FACE
Looking Northeast



EAST FACE
Looking Northwest

BENT 7



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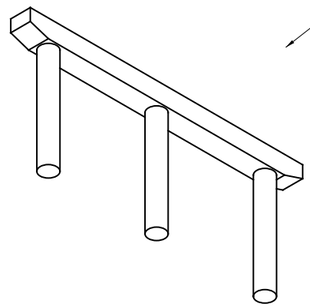
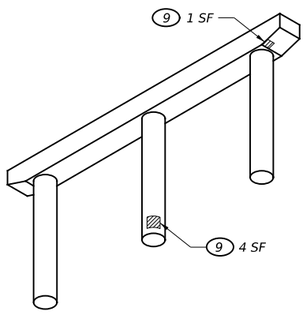
Looking Northeast

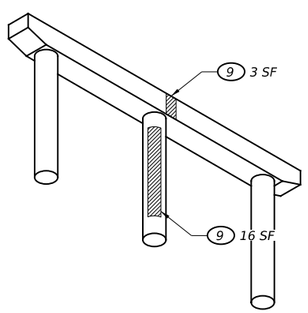


EAST FACE
Looking Northwest

BENT 5



WEST FACE
Looking Northeast



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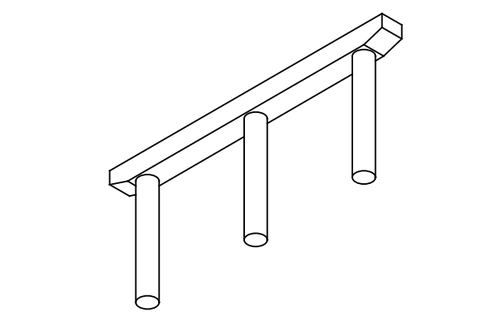
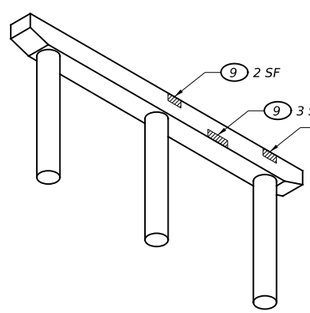
Looking Northwest



WEST FACE
Looking Northeast

BENT 8



EAST FACE
Looking Northwest

BENT 6

WEST FACE
Looking Northeast

EAST FACE
Looking Northwest

BENT 9

WEST FACE
Looking Northeast

EAST FACE
Looking Northwest

SUBSTRUCTURE REPAIR ISOMETRICS

STATE OF TEXAS
BRETT R.C. ALLEN
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06/10/2024

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SH 136 NB
AT CANADIAN RIVER
SUBSTRUCTURE REPAIR ISOMETRICS

REF 02: NBI# 04-118-0-0356-01-014

SCALE: N.T.S.

SHEET 2 OF 5

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		108

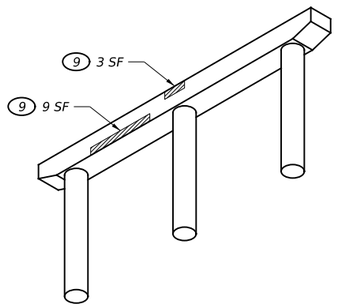
DATE: 6/8/2024 1:10:22 PM
FILE: AMA204118003560101 4_B01_SUB02.dgn

FINAL SUBMITTAL (100%)

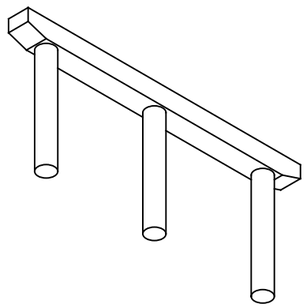
DW:	CK	DW:	CK
AJS	LJG	JCH	LJG

REPAIR CALL-OUT LEGEND

BENT 10

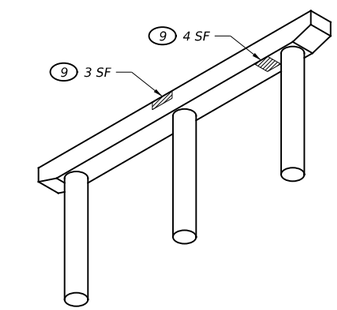


WEST FACE
Looking Northeast

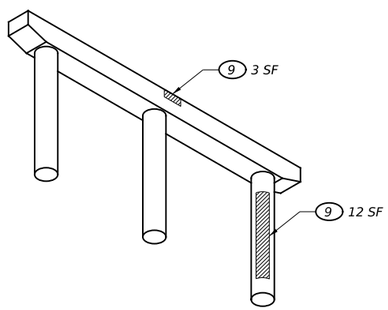


EAST FACE
Looking Northwest

BENT 11

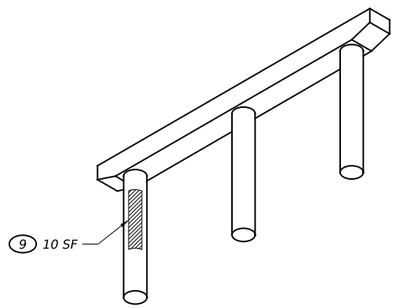


WEST FACE
Looking Northeast

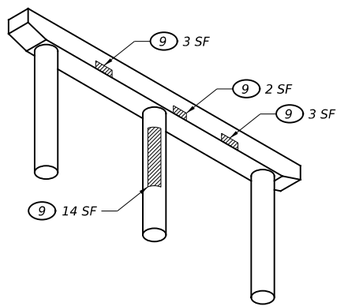


EAST FACE
Looking Northwest

BENT 12

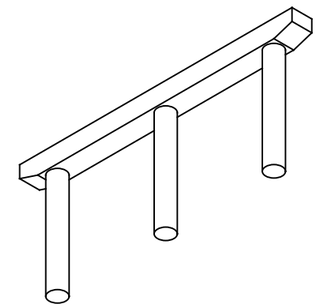


WEST FACE
Looking Northeast

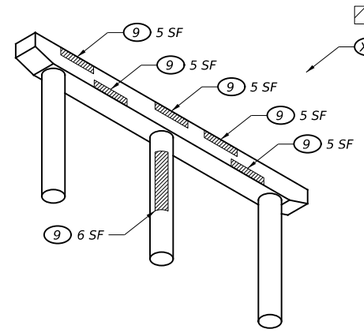


EAST FACE
Looking Northwest

BENT 13

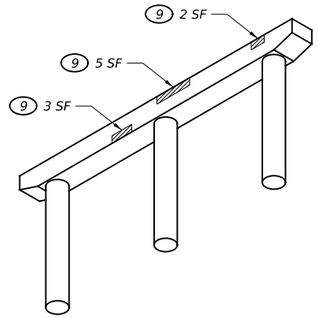


WEST FACE
Looking Northeast

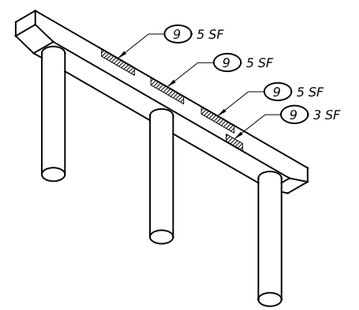


EAST FACE
Looking Northwest

BENT 14

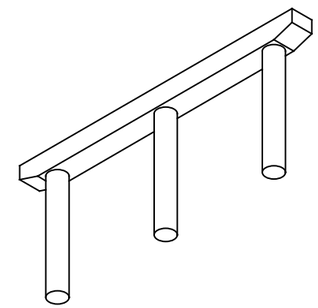


WEST FACE
Looking Northeast

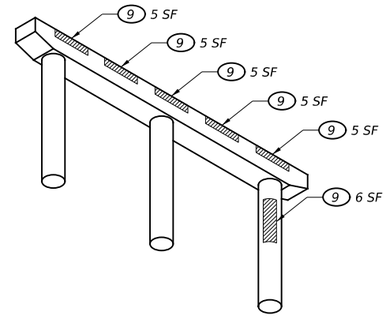


EAST FACE
Looking Northwest

BENT 15



WEST FACE
Looking Northeast



EAST FACE
Looking Northwest

SUBSTRUCTURE REPAIR ISOMETRICS

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc.
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 136 NB
AT CANADIAN RIVER
SUBSTRUCTURE REPAIR ISOMETRICS

REF 02: NBI# 04-118-0-0356-01-014

SCALE: N.T.S.

SHEET 3 OF 5

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		109

DATE: 6/8/2024 1:10:30 PM
FILE: AMA204118003601014 B01_SUB03.dgn

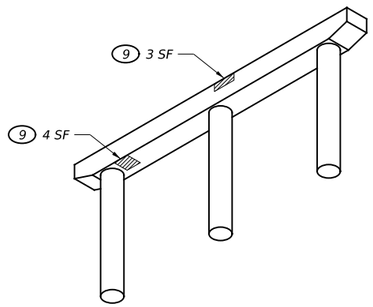
FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	JCH	LJG

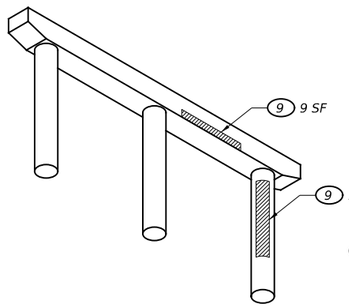
REPAIR CALL-OUT LEGEND

- Spall/Delamination Repair
- XX XX — Repair Quantity Unit / Estimated Repair Quantity At Each Location
- XX — Repair No. - See Table of Repairs

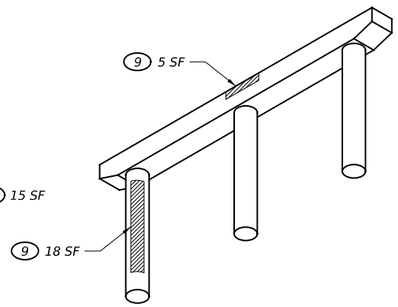
BENT 16



WEST FACE
Looking Northeast

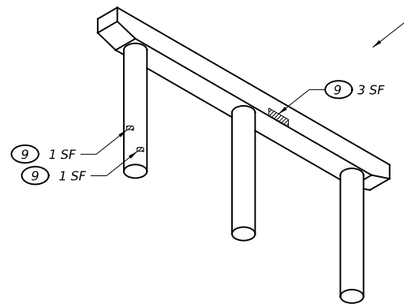


EAST FACE
Looking Northwest



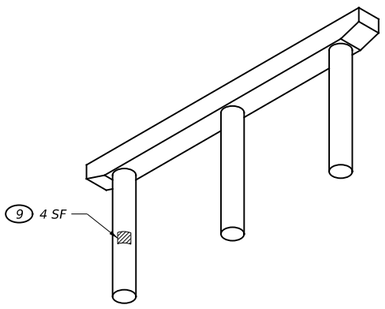
WEST FACE
Looking Northeast

BENT 19

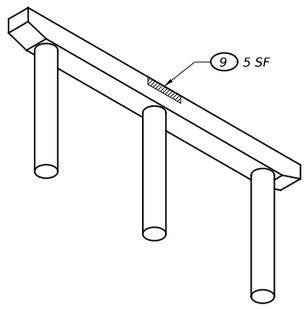


EAST FACE
Looking Northwest

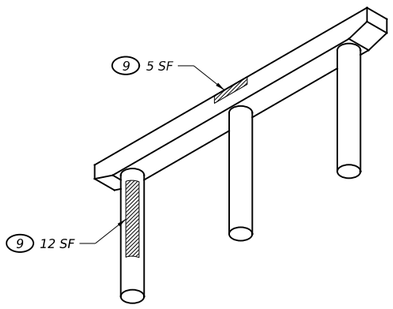
BENT 17



WEST FACE
Looking Northeast

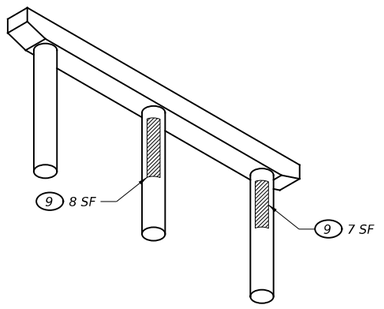


EAST FACE
Looking Northwest



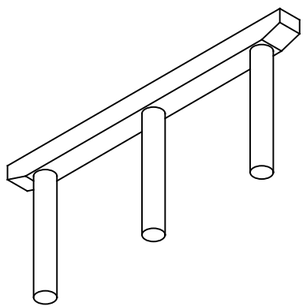
WEST FACE
Looking Northeast

BENT 20



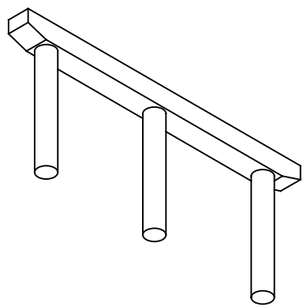
EAST FACE
Looking Northwest

BENT 18



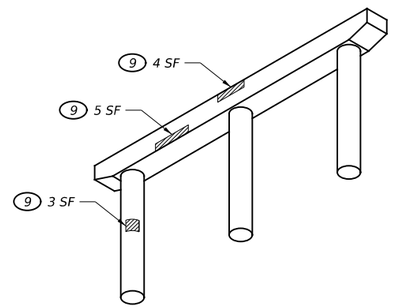
WEST FACE
Looking Northeast

No Repairs

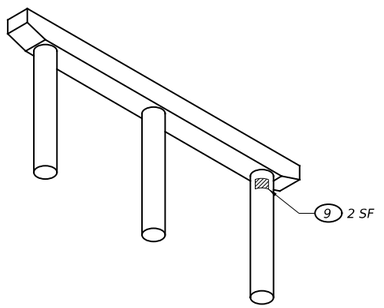


EAST FACE
Looking Northwest

BENT 21



WEST FACE
Looking Northeast



EAST FACE
Looking Northwest

SUBSTRUCTURE REPAIR ISOMETRICS

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 136 NB
AT CANADIAN RIVER
SUBSTRUCTURE REPAIR ISOMETRICS

REF 02: NBI# 04-118-0-0356-01-014

SCALE: N.T.S.

SHEET 4 OF 5

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		110

DATE: 6/8/2024 1:10:37 PM
FILE: AMA204118003560101 4_801 SUB04.dgn

FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	JCH	LJG

DATE: 6/8/2024 1:10:45 PM
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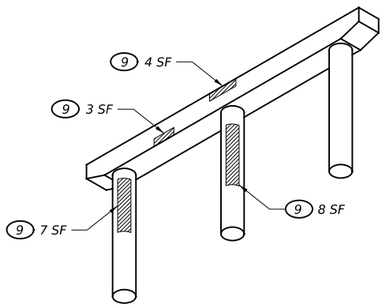
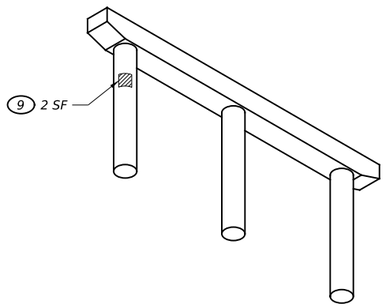
BENT 22

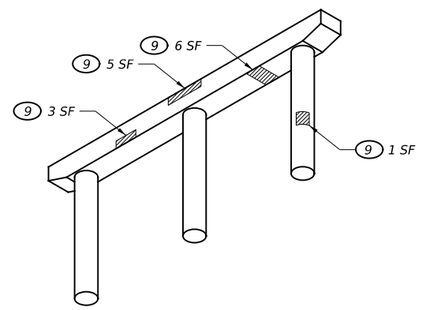


WEST FACE
Looking Northeast

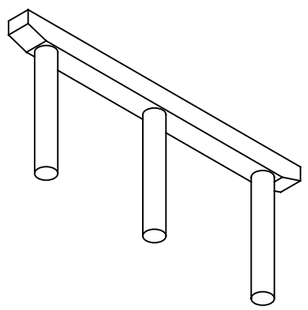


EAST FACE
Looking Northwest

BENT 23

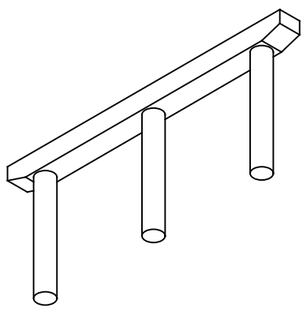


WEST FACE
Looking Northeast

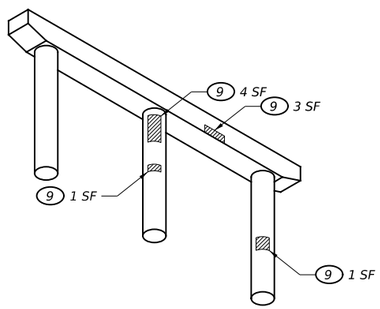


EAST FACE
Looking Northwest

BENT 24

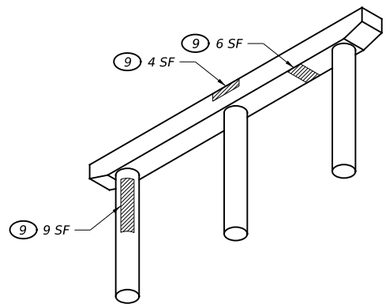


WEST FACE
Looking Northeast

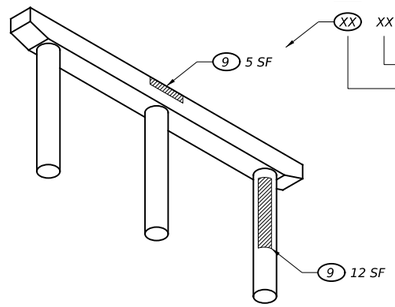


EAST FACE
Looking Northwest

BENT 25



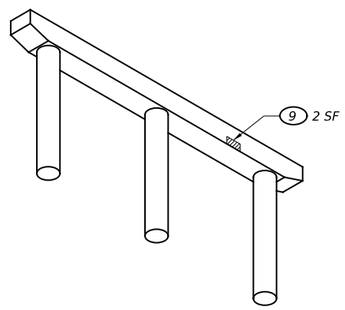
WEST FACE
Looking Northeast



EAST FACE
Looking Northwest

REPAIR CALL-OUT LEGEND

BENT 26



EAST FACE
Looking Northwest

SUBSTRUCTURE REPAIR ISOMETRICS

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER
06/10/2024

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 136 NB
AT CANADIAN RIVER
SUBSTRUCTURE REPAIR ISOMETRICS

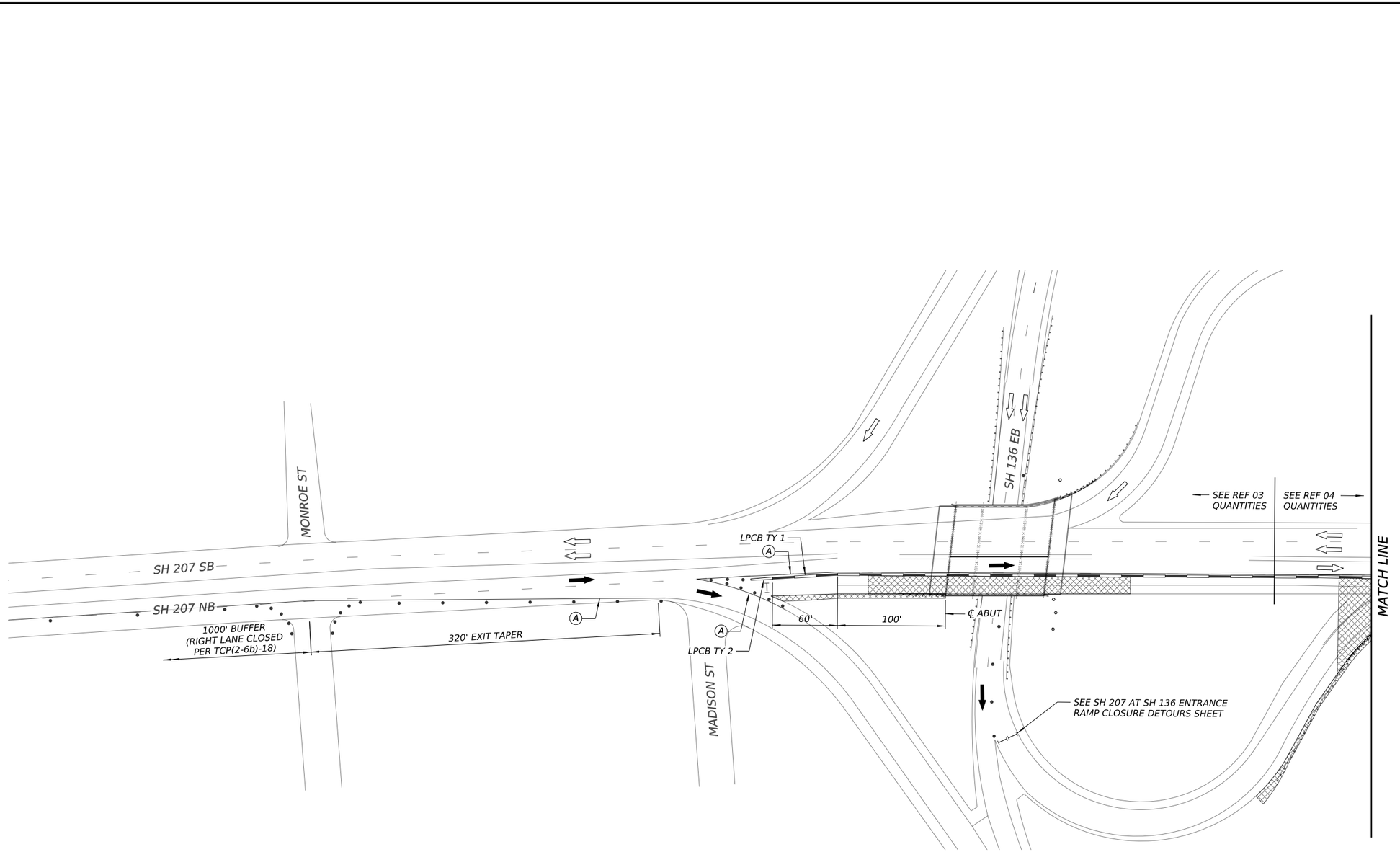
REF 02: NBI# 04-118-0-0356-01-014

SCALE: N.T.S.

SHEET 5 OF 5

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		111

DSN: JB CK: JT DW: JR CK: JZ



LEGEND

- (A) WK ZN PAV MRK REMOV (W)6"(SLD)
- (B) WK ZN PAV MRK REMOV (Y)6"(SLD)
- (C) WK ZN PAV MRK REMOV (REFL) TY II-C-R
- (D) WK ZN PAV MRK NONREMOV (W)6"(SLD)
- (E) WK ZN PAV MRK NONREMOV (Y)6"(SLD)
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- DRUM (CHANNELIZER)
- TYPE III BARRICADE
- WORK ZONE

3/1/2024

STATE OF TEXAS
JAMES BROOKS
101002
LICENSED
PROFESSIONAL ENGINEER

NO.	DATE	REVISION	APPR BY

TEXAS TRANSPORTATION SOLUTIONS, INC. Firm # F-19397

Texas Department of Transportation

SH 207 NB AT SH 136 TRAFFIC CONTROL PLAN PHASE 2

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC	SH 136, ETC
DIST	COUNTY		SHEET #
AMA	HUTCHINSON, ETC		112

2/26/2024 4:05
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LEGEND

- (A) WK ZN PAV MRK REMOV (W)6"(SLD)
- (B) WK ZN PAV MRK REMOV (Y)6"(SLD)
- (C) WK ZN PAV MRK REMOV (REFL) TY II-C-R
- (D) WK ZN PAV MRK NONREMOV (W)6"(SLD)
- (E) WK ZN PAV MRK NONREMOV (Y)6"(SLD)
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- DRUM (CHANNELIZER)
- TYPE III BARRICADE
- WORK ZONE

3/1/2024

STATE OF TEXAS
JAMES BROOKS
101002
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	APPR BY

TEXAS TRANSPORTATION SOLUTIONS, INC. Firm # F-19397

Texas Department of Transportation

SH 207 NB AT SH 136 TRAFFIC CONTROL PLAN PHASE 2

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC	SH 136, ETC
DIST	COUNTY		SHEET #
AMA	HUTCHINSON, ETC		113

DN: JB CK: JT DW: JR CK: JZ

2/26/2024 4:14
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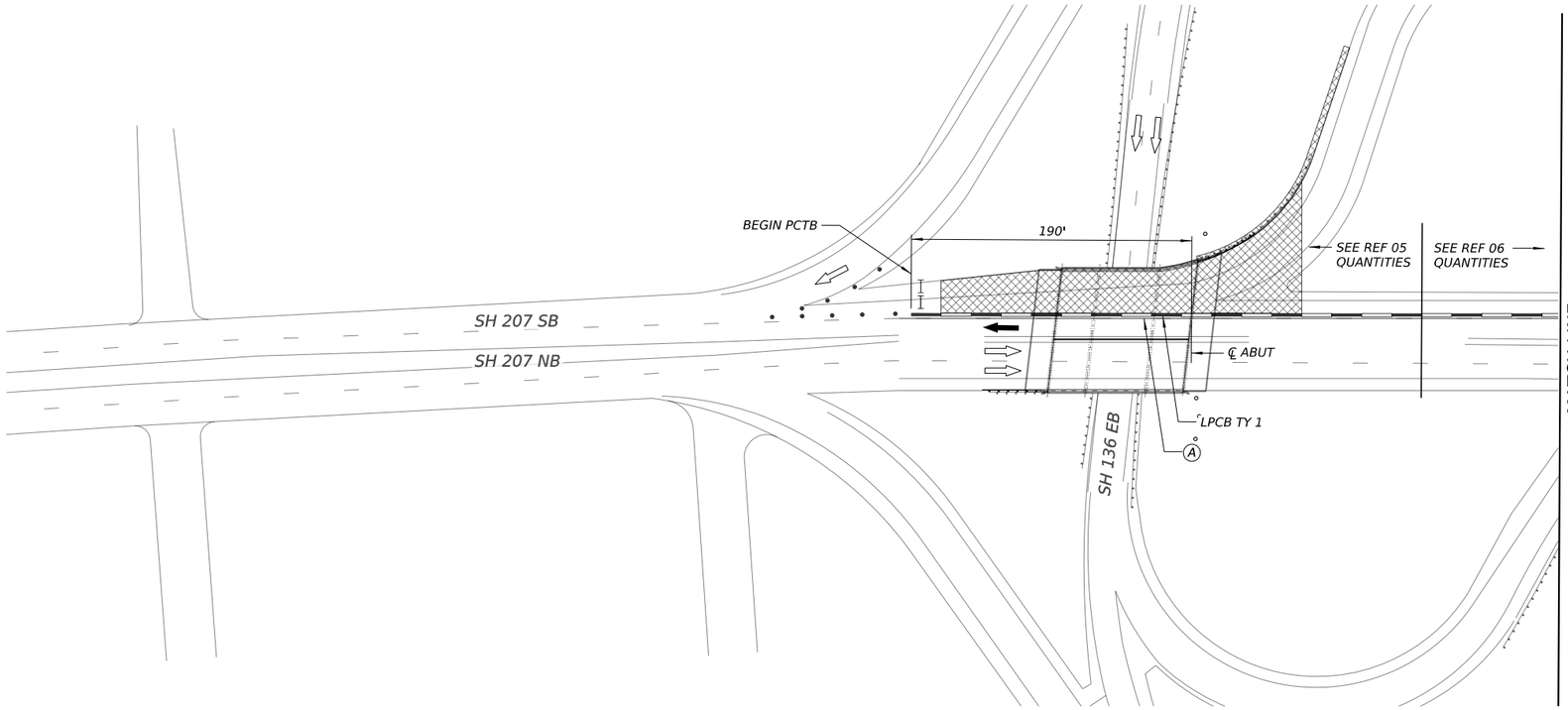
DW:	JB
CK:	JT
DW:	JR
CK:	JZ

0 50 100
SCALE IN FEET

N



LEGEND

- (A) WK ZN PAV MRK REMOV (W)6"(SLD)
- (B) WK ZN PAV MRK REMOV (Y)6"(SLD)
- (C) WK ZN PAV MRK REMOV (REFL) TY II-C-R
- (D) WK ZN PAV MRK NONREMOV (W)6"(SLD)
- (E) WK ZN PAV MRK NONREMOV (Y)6"(SLD)
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- DRUM (CHANNELIZER)
- TYPE III BARRICADE
- WORK ZONE

3/1/2024

STATE OF TEXAS
JAMES BROOKS
101002
LICENSED
PROFESSIONAL ENGINEER

NO.	DATE	REVISION	APPR BY

TEXAS TRANSPORTATION SOLUTIONS, INC. Firm # F-19397

Texas Department of Transportation

SH 207 SB AT SH 136 TRAFFIC CONTROL PLAN PHASE 2

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC	SH 136, ETC
DIST	COUNTY		SHEET #
AMA	HUTCHINSON, ETC		114

2/26/2024 4:57
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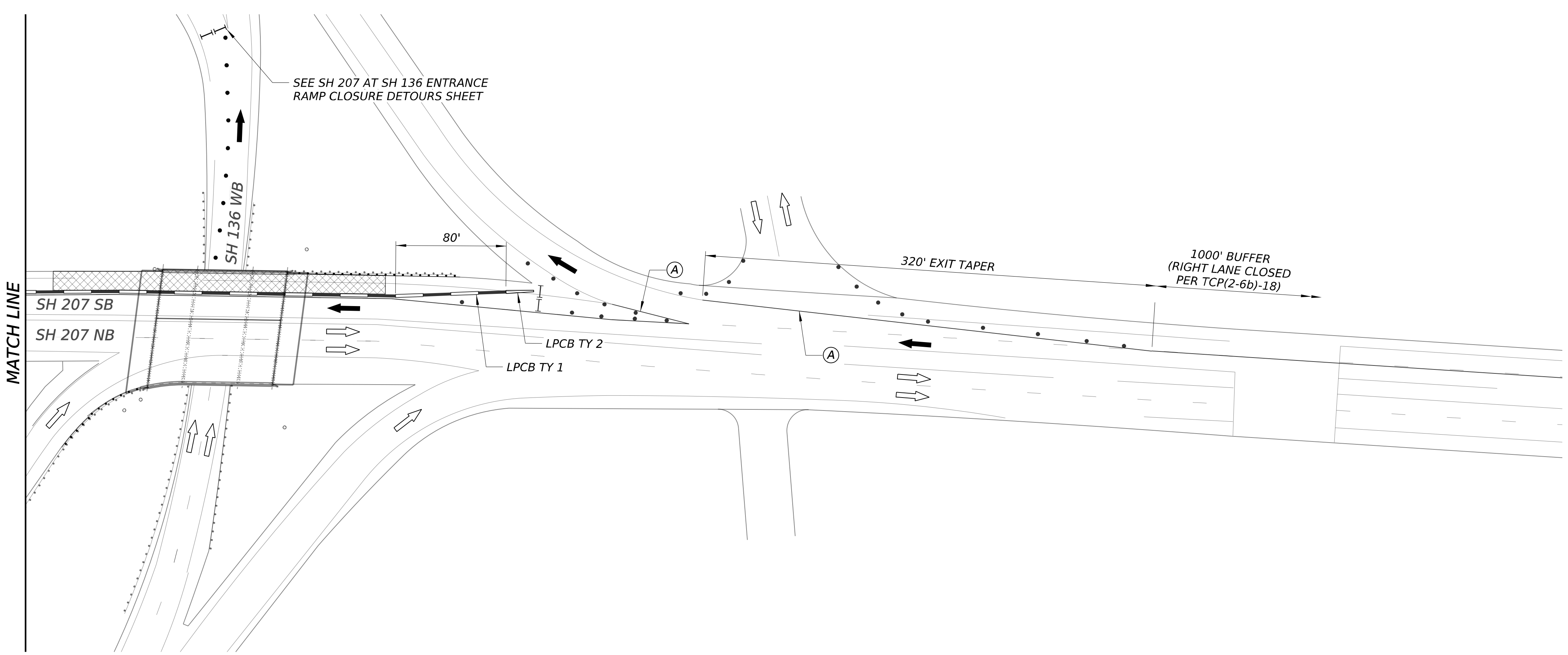


LEGEND

- (A) WK ZN PAV MRK REMOV (W)6"(SLD)
- (B) WK ZN PAV MRK REMOV (Y)6"(SLD)
- (C) WK ZN PAV MRK REMOV (REFL) TY II-C-R
- (D) WK ZN PAV MRK NONREMOV (W)6"(SLD)
- (E) WK ZN PAV MRK NONREMOV (Y)6"(SLD)
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- DRUM (CHANNELIZER)
- TYPE III BARRICADE
- WORK ZONE

3/1/2024

STATE OF TEXAS
JAMES BROOKS
101002
LICENSED PROFESSIONAL ENGINEER

DN: JB CK: JT DW: JR CK: JZ

NO.	DATE	REVISION	APPR BY

TEXAS TRANSPORTATION SOLUTIONS, INC. Firm # F-19397

Texas Department of Transportation

SH 207 SB AT SH 136 TRAFFIC CONTROL PLAN PHASE 2

SHEET 2 OF 2

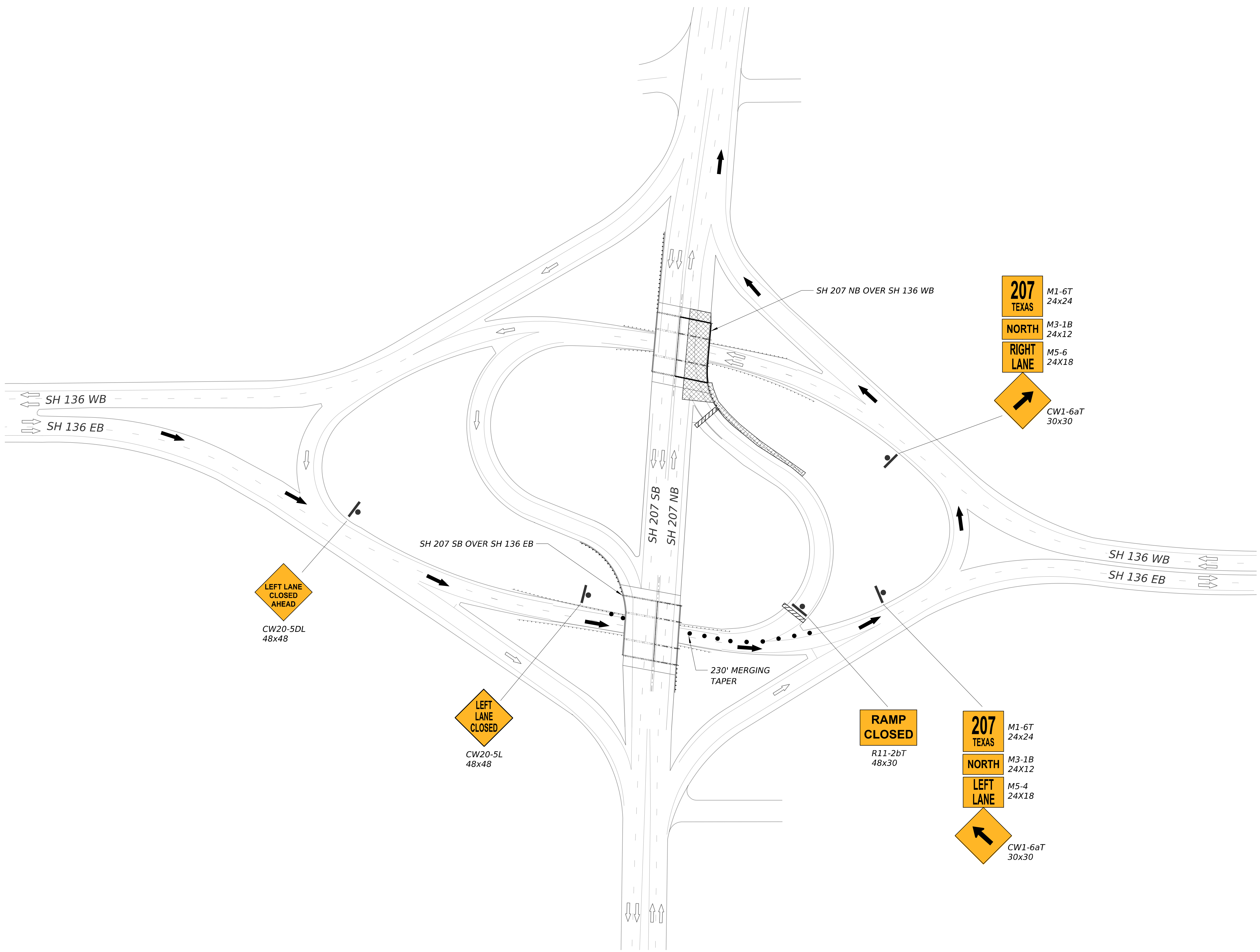
CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC	SH 136, ETC
DIST	COUNTY		SHEET #
AMA	HUTCHINSON, ETC		115

2/26/2024 5:03

90% PLANS SUBMITTAL

DN:	JB	CK:	JT	DW:	JR	CK:	JZ

NOT TO SCALE



LEGEND

- WORK ZONE
- EB TO NB TRAFFIC FLOW
- DRUMS OR VERTICAL PANELS
- TEMPORARY SIGN
- TYPE III BARRICADE(S)

NOTES:

1. ENTRANCE RAMP DETOUR FOR SH 207 NB AT SH 136 WB SHOWN. SH 207 SB AT SH 136 EB SIMILAR.
2. POSTED SH 136 / RAMP SPEED = 30 MPH.
3. NB AND SB SH 207 ENTRANCE RAMP DETOURS SHALL NOT BE IN PLACE AT THE SAME TIME.

3/1/2024

STATE OF TEXAS
JAMES BROOKS
101002
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	APPR BY

TEXAS TRANSPORTATION SOLUTIONS, INC. Firm # F-19397

Texas Department of Transportation

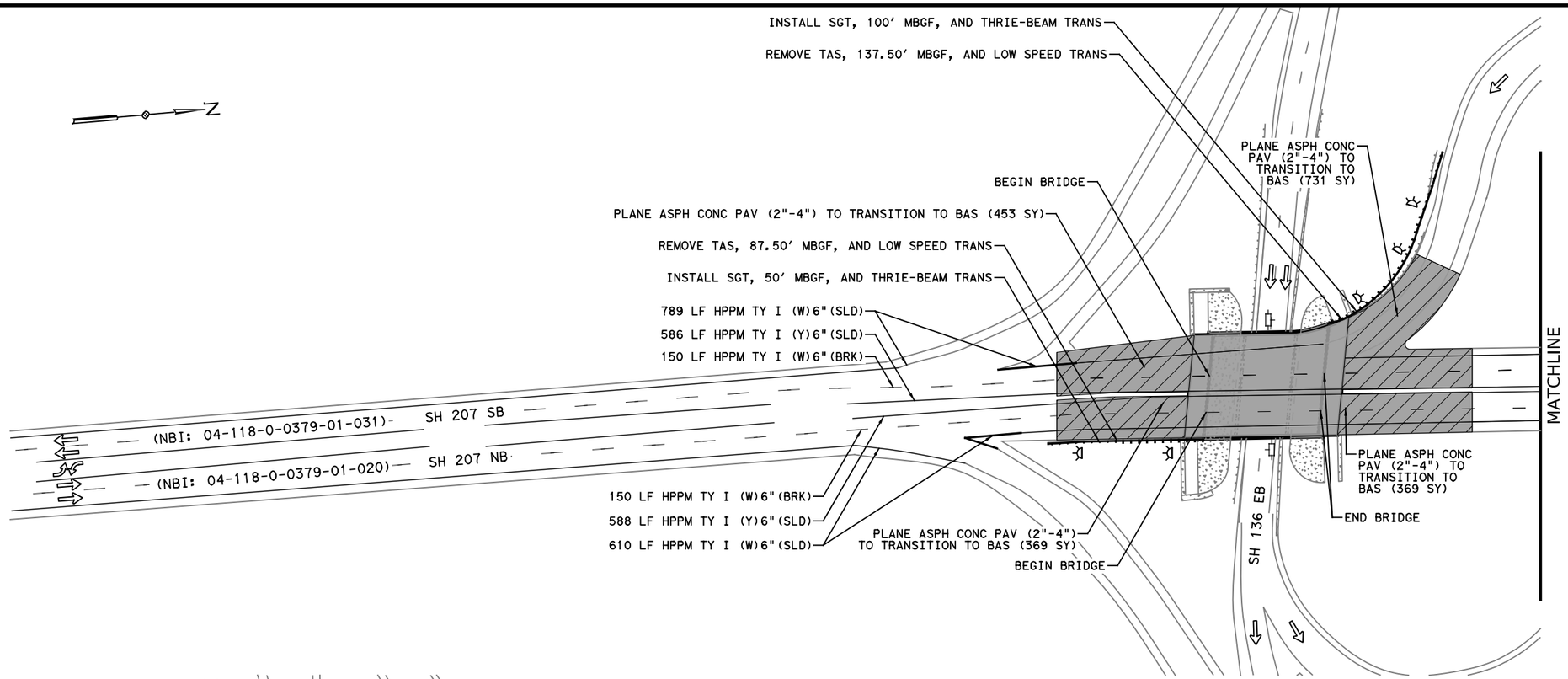
SH 207 AT SH 136 ENTRANCE RAMP CLOSURE DETOURS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC	SH 136, ETC
DIST	COUNTY		SHEET #
AMA	HUTCHINSON, ETC		116

12-48

1/2/2024



LEGEND

- EXIST TRAFFIC LANE
- PLANE ASPH CONC PVMT & PPC OVERLAY (BRIDGE AND BAS)
- PLANE ASPH CONC PVMT APPROACH) AND 2" SP-D PG70-28 OVERLAY
- DEL ASSM (D-SW)SZ 1(BRF)GF2
- DEL ASSM (D-SY)SZ 1(BRF)GF2
- DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)
- DEL ASSM (D-SW)SZ (BRF)CTB
- DEL ASSM (D-SY)SZ (BRF)CTB
- DEL ASSM (D-SW)SZ (BRF)CTB (BI)

NOTES:

1. FOR THE TRANSITION SECTION REFER TO THE ROADWAY PAVEMENT TRANSITION DETAILS.
2. ESTIMATED ACP THICKNESS BASED ON AS-BUILT PLANS. ACTUAL THICKNESS MAY VARY. DO NOT PLANE CONCRETE SURFACE.

STATE OF TEXAS
BRIAN ENNS
93801
LICENSED PROFESSIONAL ENGINEER
P.E. 3/4/2024

NO.	DATE	REVISION	APPR BY

RTG RODRIGUEZ TRANSPORTATION GROUP FIRM #587

Texas Department of Transportation

SH 207 NB & SB AT SH 136 EB & WB ROADWAY PLAN

REF 03-06: NBI#: 04-118-0-0379-01-020 & 021 & 031 & 032

SCALE:1"=100' SHEET 1 OF 1

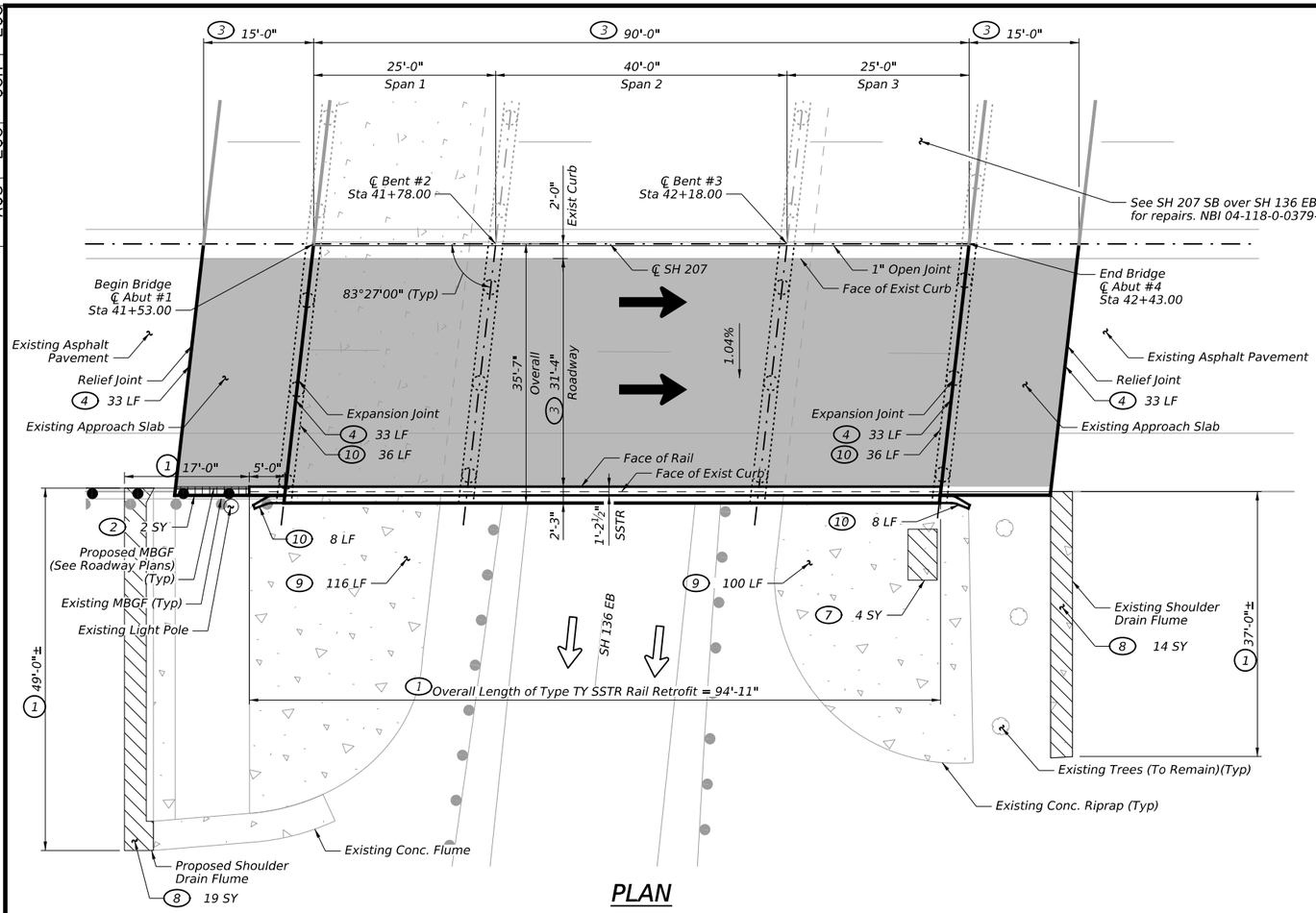
CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		117

DATE: 3/4/2024 11:14:30 AM
FILE: AMA2-RDWY-PLAN-020-021-031-032_01.dgn

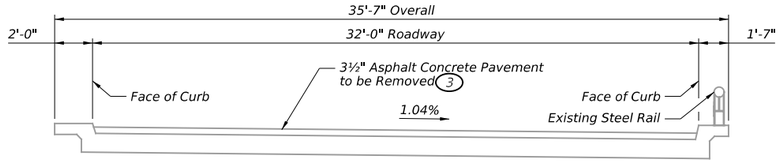
DW AD BE | DW AD BE

FINAL SUBMITTAL (100%)

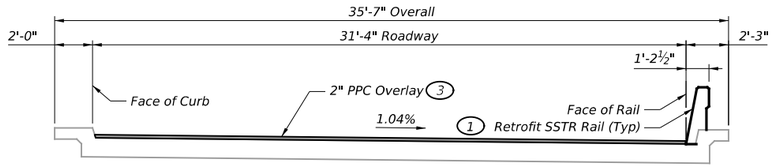
DW:	CK	DW:	CK	DW:	CK
AJS	LJG	LJG	JCH	JCH	LJG



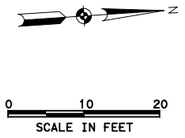
PLAN



EXISTING TYPICAL SECTION



PROPOSED TYPICAL SECTION



1 Shoulder drain flume location to be verified by the Engineer and may be field adjusted to match thrie-beam curb location. The Engineer may modify angle of shoulder drain to avoid existing trees. Do not damage or remove any existing trees.

GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request.
3. Stationing is based on as-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids, and all locations shall be approved by the Engineer prior to beginning repair work. Field verify limits and quantities with the Engineer. Payment will be for the field measured repair at the unit price bid.
5. Refer to Traffic Control Plans and Roadway Plans for information not shown.

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay and install PPC Overlay
- Approach Slab Removal
- Conc Riprap Repair
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 207 NB
AT SH 136 EB
BRIDGE LOCATION REPAIR PLAN

REF 03: NBI# 04-118-0-0379-01-020

SCALE:1"=20' SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		118

DATE: 6/8/2024 1:10:54 PM
FILE: AMA204118003790102O B01 BLY01.dgn

FINAL SUBMITTAL (100%)

DW:	AJS	CK:	LJG	DW:	JCH	CK:	LJG

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	ITEM CODE	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
1	Remove existing steel rail and replace with Type SSTR Rail. See repair plan for locations.	451-7024	RETROFIT RAIL (TY SSTR)	95	LF	See the SH 207 Rail Foundation Details sheet and the SSTR Rail Retrofit Details on the C-RAIL-R (MOD). Proposed reinforcing steel for the railing shall be epoxy coated.
2	Remove sections of approach slab to accommodate rail retrofit and MBGF (Roadway Item) installation at Abutment 1. See repair plan for locations.	104-7030	REMOV CONC (APPR SLAB)	2	SY	See the SH 207 Rail Foundation Details sheet.
3	Plane asphalt overlay a constant thickness of 3.5 in. and place Polyester Polymer Concrete (PPC) overlay. Assumed allowance of 115 SF (3% of deck area) for partial-depth deck repairs are provided to be used as directed by Engineer. See repair plan for locations.	354-7039	PLANE ASPH CONC PAV(2" TO 4")	418	SY	See the Bridge Deck Overlay Notes sheet for details.
		429-7003	CONC STR REPAIR(DECK REP(PART DEPTH))	115	SF	Repair as partial-depth deck repairs per the TxDOT Concrete Repair Manual, Chapter 3, Section 4.
		439-7017	POLYESTER POLYMER CONC OVERLAY (2")	418	SY	See the Bridge Deck Overlay Notes sheet for details.
4	Clean and seal expansion and relief joints. See repair plan for locations.	438-7010	CLEANING AND SEALING JOINTS (FOAM)	132	LF	See the Cleaning and Sealing Existing Bridge Joints sheet for details.
5	Repair the spalls/delaminations in the superstructure arch and apply Glass Fiber Reinforced Polymer (GFRP) Protection at locations over roadway and sidewalks. See Table of Superstructure Repairs for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	57	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
		786-7001	CARBON FIBER REINF POLYMER PROTECTION	22	SF	See the Superstructure Arch Detail on the GFRP Wrapping Details sheet.
6	Repair the spalls/delaminations in the substructure. See Substructure Repair Isometrics sheet for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	50	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
7	Remove and replace concrete riprap. Where voids are present, fill with flowable backfill before replacing concrete riprap. A quantity allowance of 3 CY of flowable backfill is provided to be used as directed by the Engineer. See repair plan for locations.	104-7006	REMOV CONC (RIPRAP)	4	SY	See the Concrete Riprap Repair Details sheet.
		401-7001	FLOWABLE BACKFILL	3	CY	
		432-7002	RIPRAP (CONC)(5 IN)	1	CY	
8	Remove and replace shoulder drain flume at abutments. See repair plan for locations.	104-7006	REMOV CONC (RIPRAP)	33	SY	See the SD-EBR standard sheets for details, with the following revision: Payment for shoulder drain will be as per Item 432, "Riprap (Conc)(5 IN)".
		432-7002	RIPRAP (CONC)(5 IN)	9	CY	
9	Clean and seal joints between riprap and cracks in riprap. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	216	LF	See the Concrete Riprap Crack Sealing Details sheet.
10	Clean and seal joints between riprap and abutment/wingwalls. Additionally, install flashing. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	88	LF	See the Joint Seal Flashing Details sheet.
11	Apply Waterproofing to all faces of abutments. See Substructure Concrete Waterproofing Table on the Waterproofing Details sheet.	427-7005	EPOXY WATERPROOF FINISH (TY X)	194	SF	See the Waterproofing Details sheet.

5 TABLE OF SUPERSTRUCTURE REPAIRS

Span	Transverse Location	Location	Spall Repair Quantity	GFRP Repair Quantity
1	1/3 Width	Abutment 1	2 SF	-
	1/2 Width	Abutment 1	1 SF	-
	3/4 Width	Abutment 1	3 SF	-
	Column 3	Bent 2	1 SF	-
	Column 1	Bent 2	1 SF	-
2	East Edge	Bent 2	5 SF	-
	East Edge	Midspan	10 SF	22 SF
	West Edge	Bent 3	4 SF	-
3	East Edge	Abutment 4	12 SF	-
	1/4 Width	Abutment 4	9 SF	-
	1/2 Width	Abutment 4	4 SF	-
	3/4 Width	Abutment 4	5 SF	-
TOTAL			57 SF	22 SF

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER
06/10/2024

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc.
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 207 NB
AT SH 136 EB
BRIDGE LOCATION REPAIR PLAN

REF 03: NBI# 04-118-0-0379-01-020

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		119

DATE: 6/8/2024 1:11:02 PM
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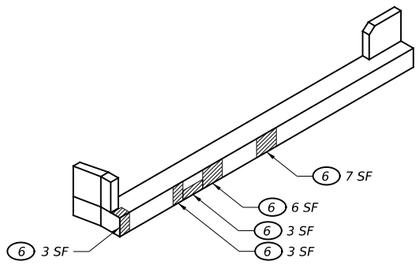
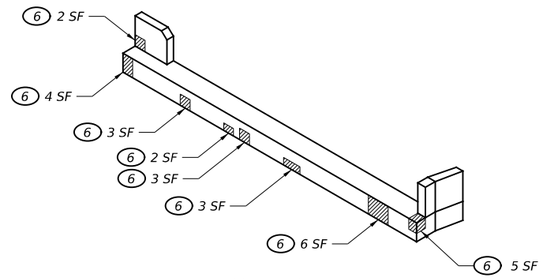
FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	LJG	JCH	LJG



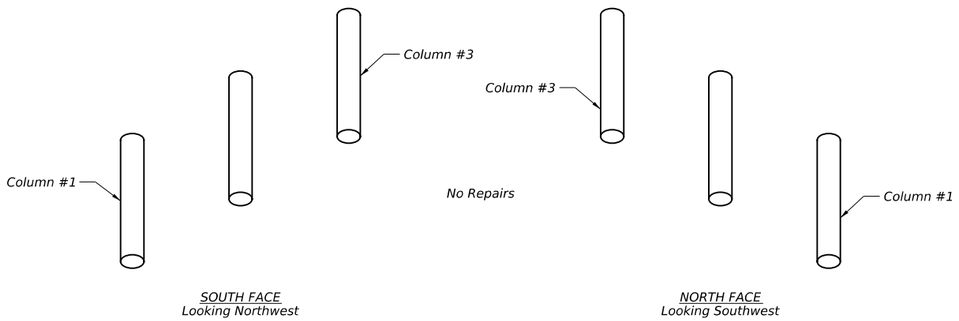
NORTH FACE
Looking Southwest

ABUTMENT 1



SOUTH FACE
Looking Northwest

ABUTMENT 4

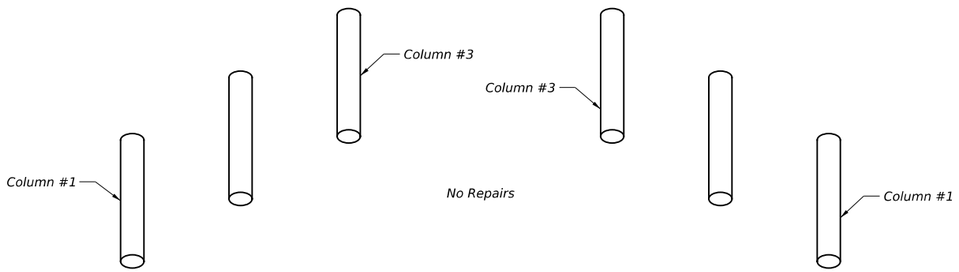


SOUTH FACE
Looking Northwest

NORTH FACE
Looking Southwest

BENT 2

(Superstructure slab not shown at top of columns)



SOUTH FACE
Looking Northwest

NORTH FACE
Looking Southwest

BENT 3

(Superstructure slab not shown at top of columns)

SUBSTRUCTURE REPAIR ISOMETRICS

REPAIR CALL-OUT LEGEND

Spall/Delamination Repair

(XX) XX XX
- Repair Quantity Unit
- Estimated Repair Quantity At Each Location
- Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 207 NB
AT SH 136 EB
SUBSTRUCTURE REPAIR ISOMETRICS

REF 03: NBI# 04-118-0-0379-01-020

SCALE: N.T.S. SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		120

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FINAL SUBMITTAL (100%)

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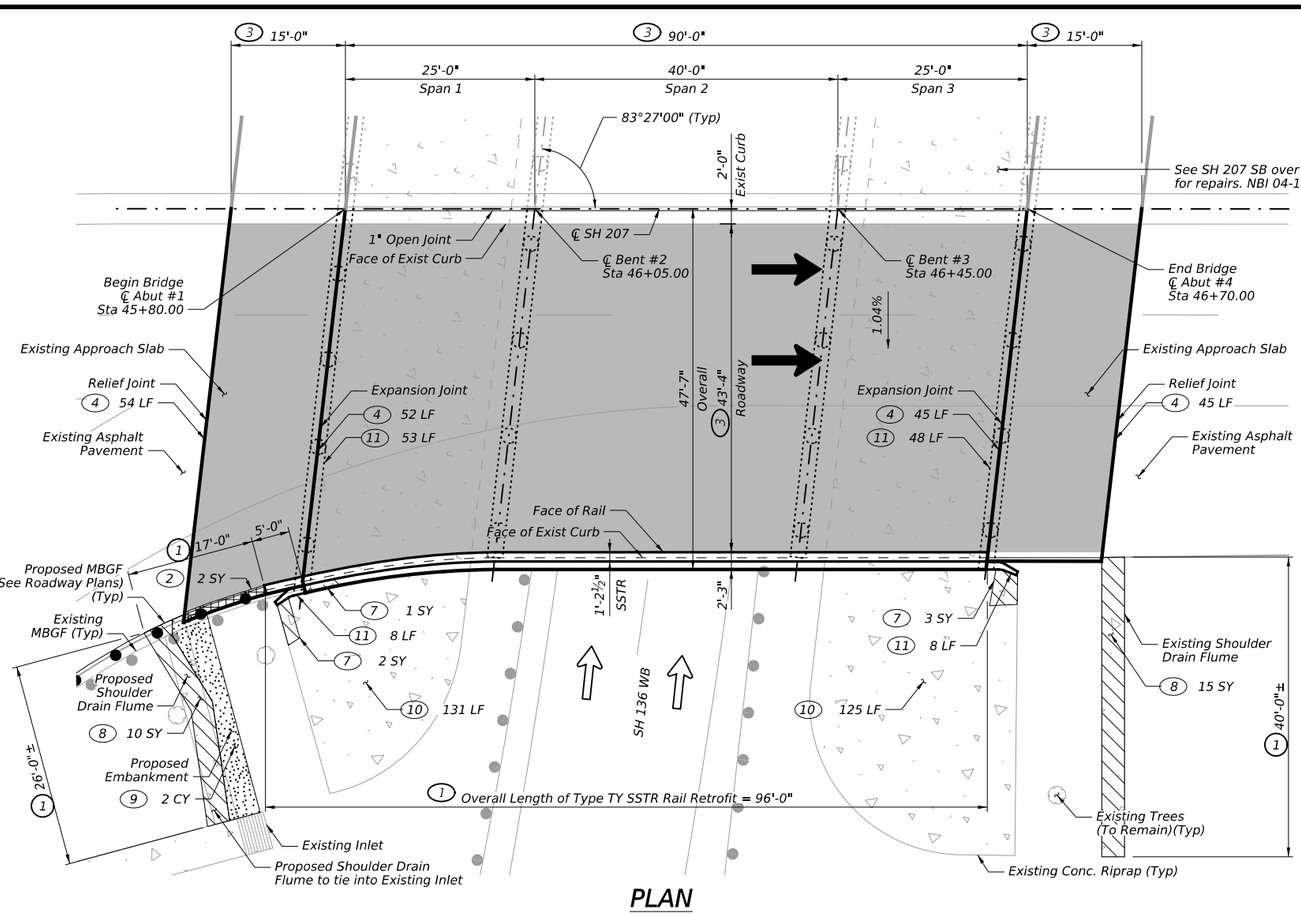

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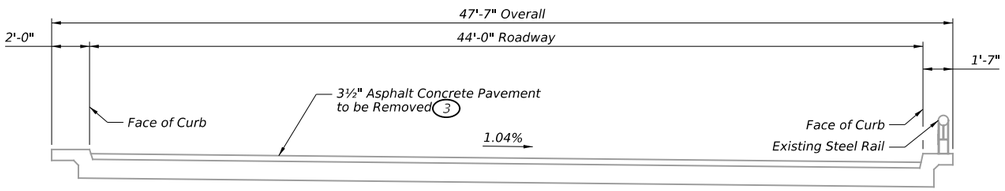
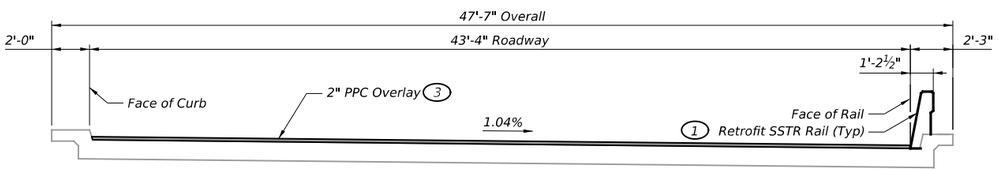


EXISTING TYPICAL SECTION

(Spans 2 & 3 shown, Span 1 similar)



PROPOSED TYPICAL SECTION

(Spans 2 & 3 shown, Span 1 similar)

N

0 10 20
SCALE IN FEET

1 Shoulder drain flume location to be verified by the Engineer and may be field adjusted to match thrie-beam curb location. The Engineer may modify angle of shoulder drain to avoid existing trees. Do not damage or remove any existing trees.

GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request.
3. Stationing is based on as-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids, and all locations shall be approved by the Engineer prior to beginning repair work. Field verify limits and quantities with the Engineer. Payment will be for the field measured repair at the unit price bid.
5. Refer to Traffic Control Plans and Roadway Plans for information not shown.

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay and install PPC Overlay
- Approach Slab Removal
- Conc Riprap Repair
- Embankment

(XX) XX XX
- Repair Quantity Unit
- Estimated Repair Quantity At Each Location
- Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 207 NB
AT SH 136 WB
BRIDGE LOCATION REPAIR PLAN

REF 04: NBI# 04-118-0-0379-01-021

SCALE:1"=20' SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		121

DATE: 6/8/2024 1:11:19 PM
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FINAL SUBMITTAL (100%)

DW:	CK:	DW:	CK:
AJS	LJG	JCH	LJG

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	ITEM CODE	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	Remove existing steel rail and replace with Type SSTR Rail. See repair plan for locations.	451-7024	RETROFIT RAIL (TY SSTR)	96	LF	See the SH 207 Rail Foundation Details sheet and the SSTR Rail Retrofit Details on the C-RAIL-R (MOD). Proposed reinforcing steel for the railing shall be epoxy coated.
(2)	Remove sections of approach slab to accommodate rail retrofit and MBGF (Roadway Item) installation at Abutment 1. See repair plan for locations.	104-7030	REMOV CONC (APPR SLAB)	2	SY	See the SH 207 Rail Foundation Details sheet.
(3)	Plane asphalt overlay a constant thickness of 3.5 in. and place Polyester Polymer Concrete (PPC) overlay. Assumed allowance of 160 SF (3% of deck area) for partial-depth deck repairs are provided to be used as directed by Engineer. See repair plan for locations.	354-7039	PLANE ASPH CONC PAV(2" TO 4")	591	SY	See the Bridge Deck Overlay Notes sheet for details.
		429-7003	CONC STR REPAIR(DECK REP(PART DEPTH))	160	SF	Repair as partial-depth deck repairs per the TxDOT Concrete Repair Manual, Chapter 3, Section 4.
		439-7017	POLYESTER POLYMER CONC OVERLAY (2")	591	SY	See the Bridge Deck Overlay Notes sheet for details.
(4)	Clean and seal expansion and relief joints. See repair plan for locations.	438-7010	CLEANING AND SEALING JOINTS (FOAM)	196	LF	See the Cleaning and Sealing Existing Bridge Joints sheet for details.
(5)	Repair the spalls/delaminations in the superstructure arch and apply Glass Fiber Reinforced Polymer (GFRP) Protection at locations over roadway and sidewalks. See Table of Superstructure Repairs for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	9	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
		786-7001	CARBON FIBER REINF POLYMER PROTECTION	8	SF	See the Superstructure Arch Detail on the GFRP Wrapping Details sheet.
(6)	Repair the spalls/delaminations in the substructure. See Substructure Repair Isometrics sheet for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	123	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
(7)	Remove and replace concrete riprap. Where voids are present, fill with flowable backfill before replacing concrete riprap. A quantity allowance of 3 CY of flowable backfill is provided to be used as directed by the Engineer. See repair plan for locations.	104-7006	REMOV CONC (RIPRAP)	6	SY	See the Concrete Riprap Repair Details sheet.
		401-7001	FLOWABLE BACKFILL	3	CY	
		432-7002	RIPRAP (CONC)(5 IN)	1	CY	
(8)	Remove and replace shoulder drain flume at abutments. See repair plan for locations.	104-7006	REMOV CONC (RIPRAP)	25	SY	See the SD-EBR standard sheets for details, with the following revision: Payment for shoulder drain will be as per Item 432, "Riprap (Conc)(5 IN)".
		432-7002	RIPRAP (CONC)(5 IN)	7	CY	
(9)	After removing concrete flume at Abutment 1, regrade slope and fill voids with embankment. See repair plan for location.	132-7003	EMBANK (FNL)(OC)(TY B)	2	CY	
(10)	Clean and seal joints between riprap and cracks in riprap. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	256	LF	See the Concrete Riprap Crack Sealing Details sheet.
(11)	Clean and seal joints between riprap and abutment/wingwalls. Additionally, install flashing. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	118	LF	See the Joint Seal Flashing Details sheet.
(12)	Apply Waterproofing to all faces of abutments. See Substructure Concrete Waterproofing Table on the Waterproofing Details sheet.	427-7005	EPOXY WATERPROOF FINISH (TY X)	261	SF	See the Waterproofing Details sheet.

(5) TABLE OF SUPERSTRUCTURE REPAIRS

Span	Transverse Location	Location	Spall Repair Quantity	GFRP Repair Quantity
1	2/3 Width	Abutment 1	1 SF	-
2	W Edge	Midspan	3 SF	8 SF
3	NE Corner	Abutment 4	1 SF	-
	2/3 Width	Abutment 4	4 SF	-
TOTAL			9 SF	8 SF

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED PROFESSIONAL ENGINEER
06/10/2024

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc.
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 207 NB
AT SH 136 WB
BRIDGE LOCATION REPAIR PLAN

REF 04: NBI# 04-118-0-0379-01-021

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		122

DATE: 6/8/2024 1:11:27 PM
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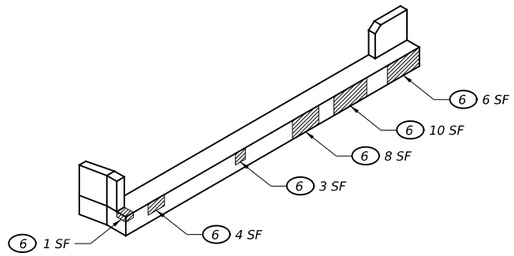
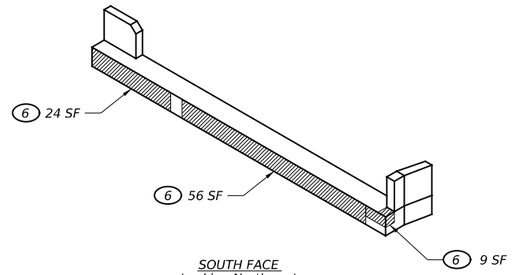
FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	JCH	LJG



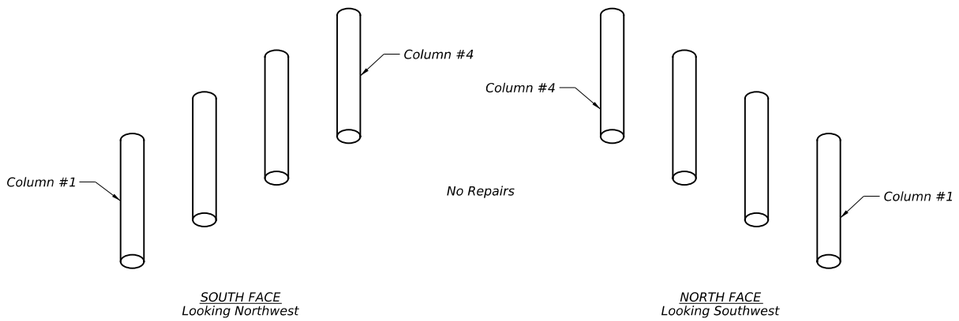
NORTH FACE
Looking Southwest

ABUTMENT 1



SOUTH FACE
Looking Northwest

ABUTMENT 4

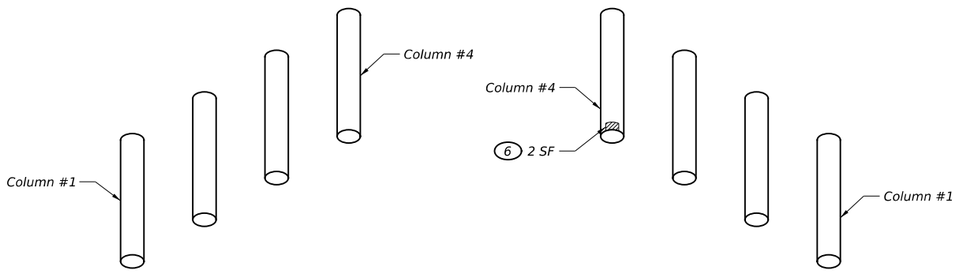


SOUTH FACE
Looking Northwest

NORTH FACE
Looking Southwest

BENT 2

(Superstructure slab not shown at top of columns)



SOUTH FACE
Looking Northwest

NORTH FACE
Looking Southwest

BENT 3

(Superstructure slab not shown at top of columns)

SUBSTRUCTURE REPAIR ISOMETRICS

REPAIR CALL-OUT LEGEND

Spall/Delamination Repair

XX XX
- Repair Quantity Unit
- Estimated Repair Quantity At Each Location
- Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER

06/10/2024

Brett RC Allen

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 207 NB
AT SH 136 WB
SUBSTRUCTURE REPAIR ISOMETRICS

REF 04: NBI# 04-118-0-0379-01-021

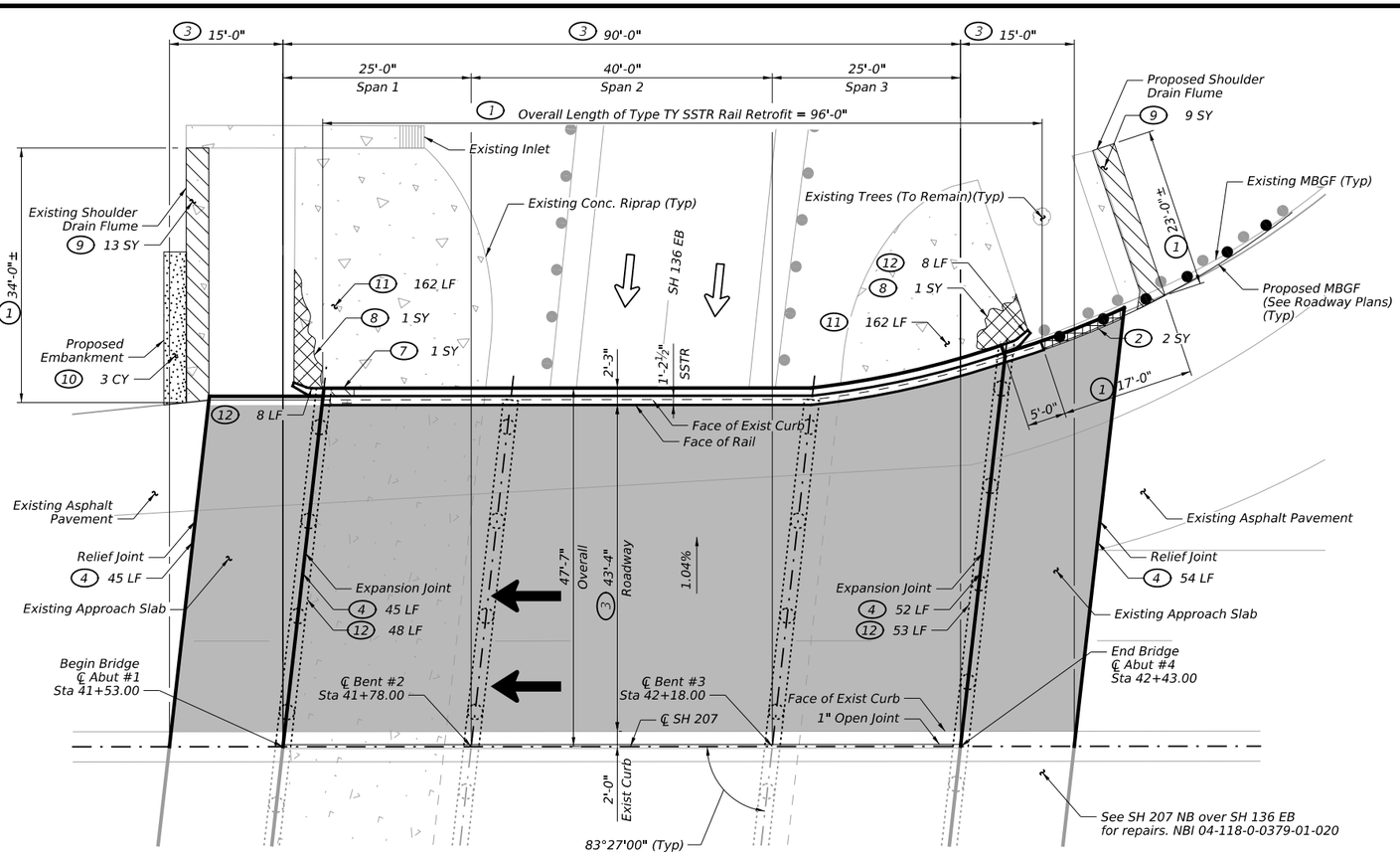
SCALE: N.T.S. SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		123

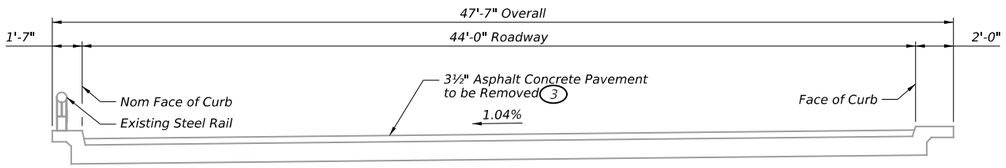
DATE: 6/8/2024 1:11:34 PM
FILE: AMA204118003790102 1 B01 SUB01.dgn

FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	JCH	LJG

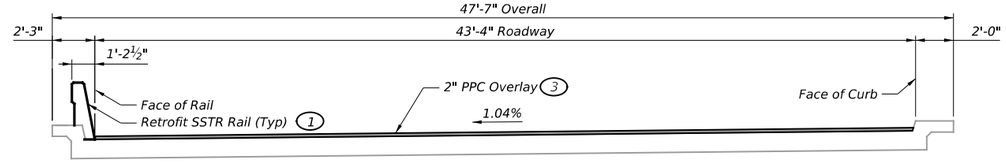


PLAN



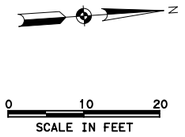
EXISTING TYPICAL SECTION

(Spans 2 & 3 shown, Span 1 similar)



PROPOSED TYPICAL SECTION

(Spans 2 & 3 shown, Span 1 similar)



1 Shoulder drain flume location to be verified by the Engineer and may be field adjusted to match thrie-beam curb location. The Engineer may modify angle of shoulder drain to avoid existing trees. Do not damage or remove any existing trees.

GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request.
3. Stationing is based on as-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids, and all locations shall be approved by the Engineer prior to beginning repair work. Field verify limits and quantities with the Engineer. Payment will be for the field measured repair at the unit price bid.
5. Refer to Traffic Control Plans and Roadway Plans for information not shown.

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay and install PPC Overlay
- Approach Slab Removal
- Conc Riprap Repair
- Embankment
- Flowable Backfill
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 207 SB
AT SH 136 EB
BRIDGE LOCATION REPAIR PLAN

REF 05: NBI# 04-118-0-0379-01-031

SCALE:1"=20' SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		124

DATE: 6/8/2024 1:11:43 PM
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FINAL SUBMITTAL (100%)

DW:	CK:	DW:	CK:
AJS	LJG	JCH	LJG

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	ITEM CODE	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
1	Remove existing steel rail and replace with Type SSTR Rail. See repair plan for locations.	451-7024	RETROFIT RAIL (TY SSTR)	96	LF	See the SH 207 Rail Foundation Details sheet and the SSTR Rail Retrofit Details on the C-RAIL-R (MOD). Proposed reinforcing steel for the railing shall be epoxy coated.
2	Remove sections of approach slab to accommodate rail retrofit and MBGF (Roadway Item) installation at Abutment 1. See repair plan for locations.	104-7030	REMOV CONC (APPR SLAB)	2	SY	See the SH 207 Rail Foundation Details sheet.
3	Plane asphalt overlay a constant thickness of 3.5 in. and place Polyester Polymer Concrete (PPC) overlay. Assumed allowance of 165 SF (3% of deck area) for partial-depth deck repairs are provided to be used as directed by Engineer. See repair plan for locations.	354-7039	PLANE ASPH CONC PAV(2" TO 4")	600	SY	See the Bridge Deck Overlay Notes sheet for details.
		429-7003	CONC STR REPAIR(DECK REP(PART DEPTH))	165	SF	Repair as partial-depth deck repairs per the TxDOT Concrete Repair Manual, Chapter 3, Section 4.
		439-7017	POLYESTER POLYMER CONC OVERLAY (2")	600	SY	See the Bridge Deck Overlay Notes sheet for details.
4	Clean and seal expansion and relief joints. See repair plan for locations.	438-7010	CLEANING AND SEALING JOINTS (FOAM)	196	LF	See the Cleaning and Sealing Existing Bridge Joints sheet for details.
5	Repair the spalls/delaminations in the superstructure arch and apply Glass Fiber Reinforced Polymer (GFRP) Protection at locations over roadway and sidewalks. See Table of Superstructure Repairs for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	25	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
		786-7001	CARBON FIBER REINF POLYMER PROTECTION	20	SF	See the Superstructure Arch Detail on the GFRP Wrapping Details sheet.
6	Repair the spalls/delaminations in the substructure. See Substructure Repair Isometrics sheet for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	106	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
7	Remove and replace concrete riprap. Where voids are present, fill with flowable backfill before replacing concrete riprap. A quantity allowance of 1 CY of flowable backfill is provided to be used as directed by the Engineer. See repair plan for locations.	104-7006	REMOV CONC (RIPRAP)	1	SY	See the Concrete Riprap Repair Details sheet.
		401-7001	FLOWABLE BACKFILL	1	CY	
		432-7002	RIPRAP (CONC)(5 IN)	1	CY	
8	Fill voids with flowable backfill. Access voids from eroded embankment or drill a hole in existing concrete riprap as directed by the Engineer. Avoid significant damage to concrete riprap. See repair plan for locations.	401-7001	FLOWABLE BACKFILL	2	CY	See the Concrete Riprap Repair Details sheet.
9	Remove and replace shoulder drain flume at abutments. See repair plan for locations.	104-7006	REMOV CONC (RIPRAP)	22	SY	See the SD-EBR standard sheets for details, with the following revision: Payment for shoulder drain will be as per Item 432, "Riprap (Conc)(5 IN)".
		432-7002	RIPRAP (CONC)(5 IN)	6	CY	
10	Cover exposed concrete riprap or concrete flume and regrade adjacent slope with embankment. See repair plan for locations.	132-7003	EMBANK (FNL)(OC)(TY B)	3	CY	
11	Clean and seal joints between riprap and cracks in riprap. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	324	LF	See the Concrete Riprap Crack Sealing Details sheet.
12	Clean and seal joints between riprap and abutment/wingwalls. Additionally, install flashing. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	116	LF	See the Joint Seal Flashing Details sheet.
13	Apply Waterproofing to all faces of abutments. See Substructure Concrete Waterproofing Table on the Waterproofing Details sheet.	427-7005	EPOXY WATERPROOF FINISH (TY X)	257	SF	See the Waterproofing Details sheet.

5 TABLE OF SUPERSTRUCTURE REPAIRS

Span	Transverse Location	Location	Spall Repair Quantity	GFRP Repair Quantity
1	SW Corner	Abutment 1	1 SF	-
	West Edge	Abutment 1	2 SF	-
	½ Width	Abutment 1	2 SF	-
	West Edge	Bent 2	2 SF	-
2	East Edge	Midspan	2 SF	6 SF
	West Edge	Bent 3	1 SF	3 SF
3	East Edge	Bent 3	1 SF	3 SF
	East Edge	Midspan	3 SF	8 SF
	West Edge	Abutment 4	6 SF	-
	¼ Width	Abutment 4	2 SF	-
	East Edge	Abutment 4	3 SF	-
TOTAL			25 SF	20 SF

STATE OF TEXAS
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Dallas, Texas 75248
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Texas Department of Transportation

SH 207 SB
AT SH 136 EB
BRIDGE LOCATION REPAIR PLAN

REF 05: NBI# 04-118-0-0379-01-031

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		125

DATE: 6/8/2024 1:11:52 PM
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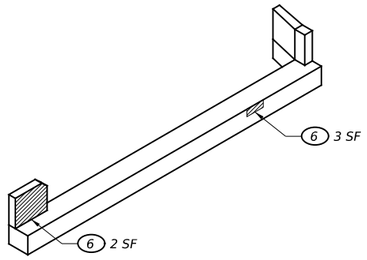
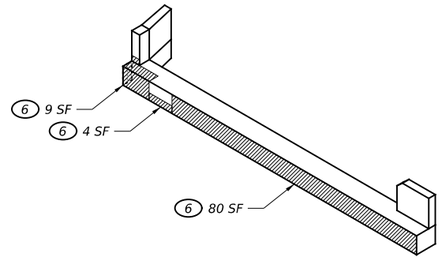
FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	LJG	JCH	LJG



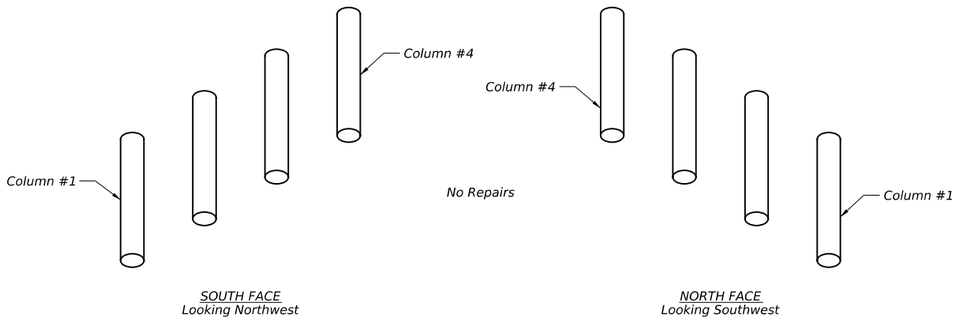
NORTH FACE
Looking Southwest

ABUTMENT 1



SOUTH FACE
Looking Northwest

ABUTMENT 4

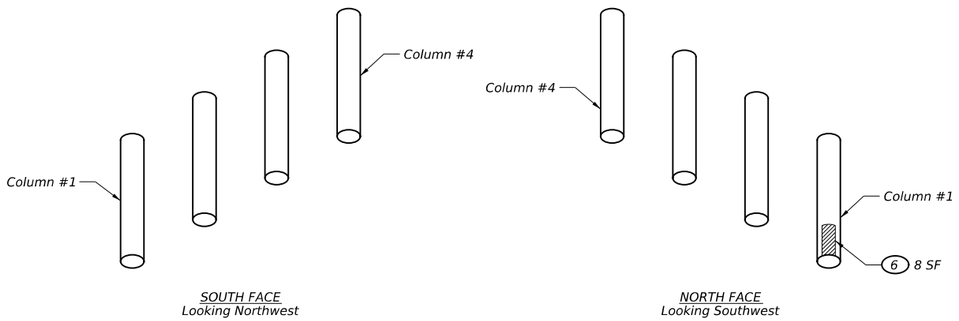


SOUTH FACE
Looking Northwest

NORTH FACE
Looking Southwest

BENT 2

(Superstructure slab not shown at top of columns)



SOUTH FACE
Looking Northwest

NORTH FACE
Looking Southwest

BENT 3

(Superstructure slab not shown at top of columns)

SUBSTRUCTURE REPAIR ISOMETRICS

REPAIR CALL-OUT LEGEND

Spall/Delamination Repair

XX XX
- Repair Quantity Unit
- Estimated Repair Quantity At Each Location
- Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER

06/10/2024

Brett RC Allen

NO.	DATE	REVISION	APPR BY

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Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 207 SB
AT SH 136 EB
SUBSTRUCTURE REPAIR ISOMETRICS

REF 05: NBI# 04-118-0-0379-01-031

SCALE: N.T.S. SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		126

DATE: 6/8/2024 1:12:00 PM
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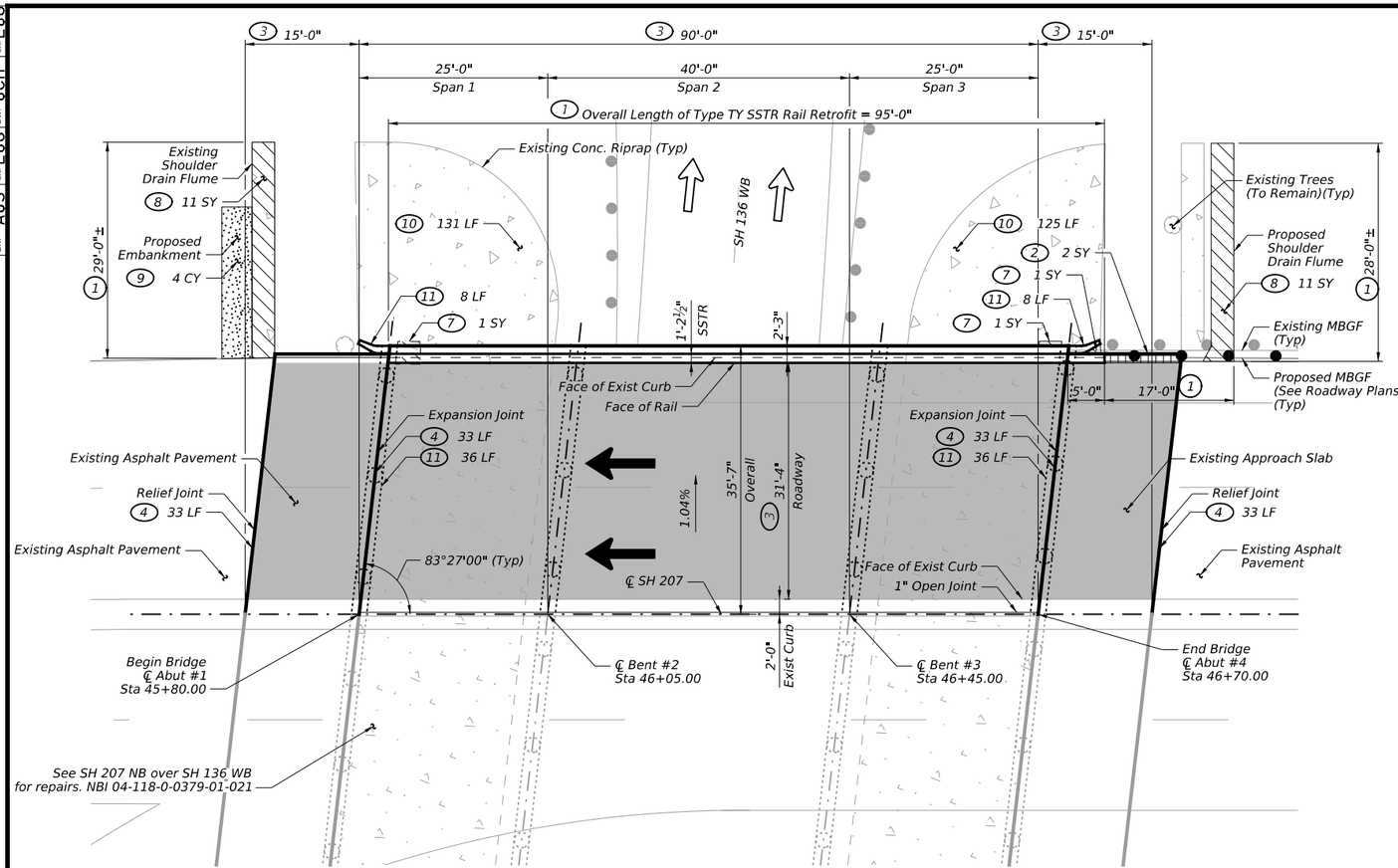
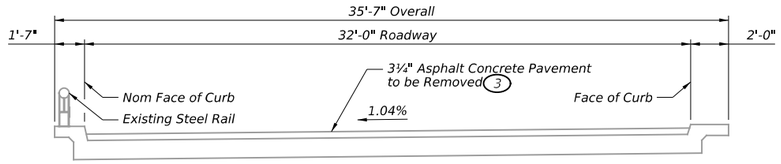
FINAL SUBMITTAL (100%)

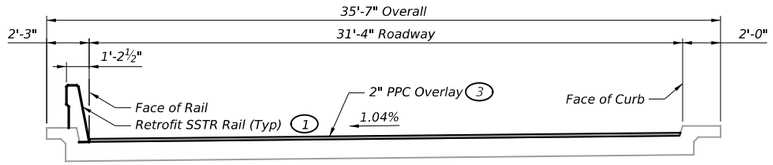
DW:	CK	DW:	CK
AJS	LJG	JCH	LJG



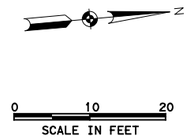
PLAN



EXISTING TYPICAL SECTION



PROPOSED TYPICAL SECTION



1 Shoulder drain flume location to be verified by the Engineer and may be field adjusted to match thrie-beam curb location. The Engineer may modify angle of shoulder drain to avoid existing trees. Do not damage or remove any existing trees.

GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request.
3. Stationing is based on as-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids, and all locations shall be approved by the Engineer prior to beginning repair work. Field verify limits and quantities with the Engineer. Payment will be for the field measured repair at the unit price bid.
5. Refer to Traffic Control Plans and Roadway Plans for information not shown.

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay and install PPC Overlay
- Approach Slab Removal
- Conc Riprap Repair
- Embankment
- XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 207 SB
AT SH 136 WB
BRIDGE LOCATION REPAIR PLAN

REF 06: NBI# 04-118-0-0379-01-032

SCALE:1"=20' SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		127

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FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	JCH	LJG

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	ITEM CODE	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	Remove existing steel rail and replace with Type SSTR Rail. See repair plan for locations.	451-7024	RETROFIT RAIL (TY SSTR)	95	LF	See the SH 207 Rail Foundation Details sheet and the SSTR Rail Retrofit Details on the C-RAIL-R (MOD). Proposed reinforcing steel for the railing shall be epoxy coated.
(2)	Remove sections of approach slab to accommodate rail retrofit and MBGF (Roadway Item) installation at Abutment 1. See repair plan for locations.	104-7030	REMOV CONC (APPR SLAB)	2	SY	See the SH 207 Rail Foundation Details sheet.
(3)	Plane asphalt overlay a constant thickness of 3.25 in. and place Polyester Polymer Concrete (PPC) overlay. Assumed allowance of 115 SF (3% of deck area) for partial-depth deck repairs are provided to be used as directed by Engineer. See repair plan for locations.	354-7039	PLANE ASPH CONC PAV(2" TO 4")	418	SY	See the Bridge Deck Overlay Notes sheet for details.
		429-7003	CONC STR REPAIR(DECK REP(PART DEPTH))	115	SF	Repair as partial-depth deck repairs per the TxDOT Concrete Repair Manual, Chapter 3, Section 4.
		439-7017	POLYESTER POLYMER CONC OVERLAY (2")	418	SY	See the Bridge Deck Overlay Notes sheet for details.
(4)	Clean and seal expansion and relief joints. See repair plan for locations.	438-7010	CLEANING AND SEALING JOINTS (FOAM)	132	LF	See the Cleaning and Sealing Existing Bridge Joints sheet for details.
(5)	Repair the spalls/delaminations in the superstructure arch and apply Glass Fiber Reinforced Polymer (GFRP) Protection at locations over roadway and sidewalks. See Table of Superstructure Repairs for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	53	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
		786-7001	CARBON FIBER REINF POLYMER PROTECTION	27	SF	See the Superstructure Arch Detail on the GFRP Wrapping Details sheet.
(6)	Repair the spalls/delaminations in the substructure. See Substructure Repair Isometrics sheet for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	61	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
(7)	Remove and replace concrete riprap. Where voids are present, fill with flowable backfill before replacing concrete riprap. A quantity allowance of 3 CY of flowable backfill is provided to be used as directed by the Engineer. See repair plan for locations.	104-7006	REMOV CONC (RIPRAP)	3	SY	See the Concrete Riprap Repair Details sheet.
		401-7001	FLOWABLE BACKFILL	3	CY	
		432-7002	RIPRAP (CONC)(5 IN)	1	CY	
(8)	Remove and replace shoulder drain flume at abutments. See repair plan for locations.	104-7006	REMOV CONC (RIPRAP)	22	SY	See the SD-EBR standard sheets for details, with the following revision: Payment for shoulder drain will be as per Item 432, "Riprap (Conc)(5 IN)".
		432-7002	RIPRAP (CONC)(5 IN)	6	CY	
(9)	After replacing shoulder drain flume at Abutment 1, regrade slope and fill voids with embankment. See repair plan for location.	132-7003	EMBANK (FNL)(OC)(TY B)	4	CY	
(10)	Clean and seal joints between riprap and cracks in riprap. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	256	LF	See the Concrete Riprap Crack Sealing Details sheet.
(11)	Clean and seal joints between riprap and abutment/wingwalls. Additionally, install flashing. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	88	LF	See the Joint Seal Flashing Details sheet.
(12)	Apply Waterproofing to all faces of abutments. See Substructure Concrete Waterproofing Table on the Waterproofing Details sheet.	427-7005	EPOXY WATERPROOF FINISH (TY X)	194	SF	See the Waterproofing Details sheet.

(5) TABLE OF SUPERSTRUCTURE REPAIRS

Span	Transverse Location	Location	Spall Repair Quantity	GFRP Repair Quantity
1	East Edge	Midspan	5 SF	-
2	West Edge	Bent 2	5 SF	-
	East Edge	Bent 2	8 SF	-
	West Edge	Midspan	7 SF	27 SF
	West Edge	Bent 3	6 SF	-
3	East Edge	3/4 Span	18 SF	-
	West Edge	Abutment 4	3 SF	-
	1/4 Width	Abutment 4	1 SF	-
TOTAL			53 SF	27 SF

STATE OF TEXAS
BRETT R.C. ALLEN
133221
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PROFESSIONAL ENGINEER
06/10/2024

NO.	DATE	REVISION	APPR BY

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972.960.4400

Texas Department of Transportation

SH 207 SB
AT SH 136 WB
BRIDGE LOCATION REPAIR PLAN

REF 06: NBI# 04-118-0-0379-01-032

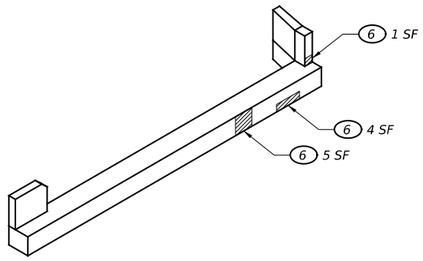
CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.

DIST	COUNTY	SHEET NO.
AMA	HUTCHINSON, ETC.	128

DATE: 6/8/2024 1:12:16 PM
FILE: AMA204118003790103 2_B01_BLY02.dgn

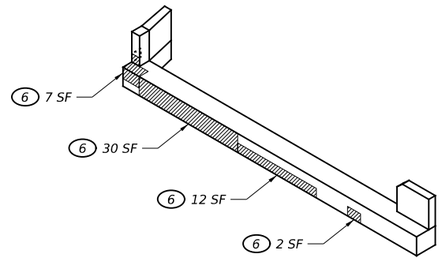
FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	LJG	JCH	LJG



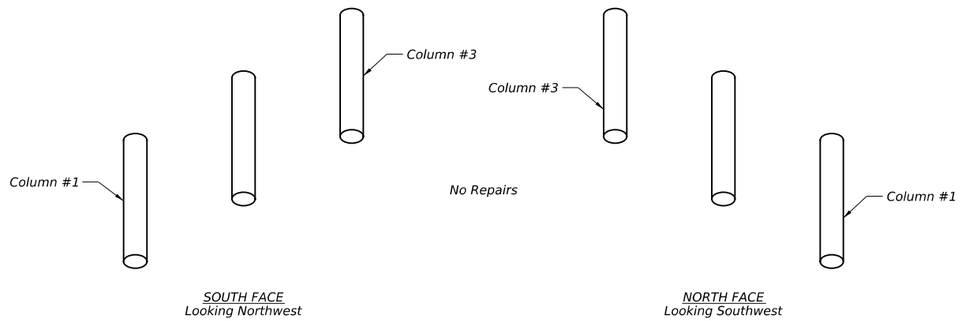
NORTH FACE
Looking Southwest

ABUTMENT 1



SOUTH FACE
Looking Northwest

ABUTMENT 4

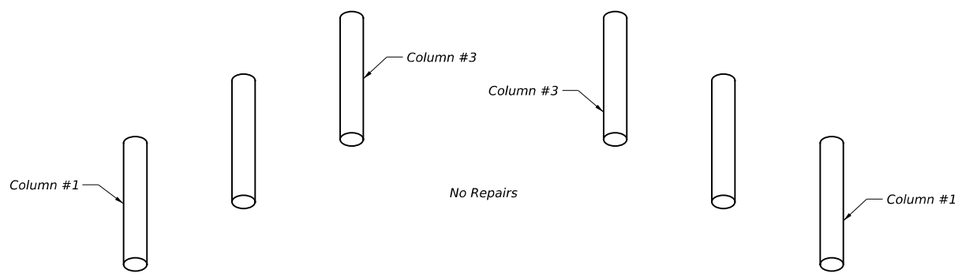


SOUTH FACE
Looking Northwest

NORTH FACE
Looking Southwest

BENT 2

(Superstructure slab not shown at top of columns)



SOUTH FACE
Looking Northwest

NORTH FACE
Looking Southwest

BENT 3

(Superstructure slab not shown at top of columns)

SUBSTRUCTURE REPAIR ISOMETRICS

REPAIR CALL-OUT LEGEND

Spall/Delamination Repair

(XX) XX XX
- Repair Quantity Unit
- Estimated Repair Quantity At Each Location
- Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

NO.	DATE	REVISION	APPR BY

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Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 207 SB
AT SH 136 WB
SUBSTRUCTURE REPAIR ISOMETRICS

REF 06: NBI# 04-118-0-0379-01-032

SCALE: N.T.S. SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		129

DATE: 6/8/2024 1:12:25 PM
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FINAL SUBMITTAL (100%)

DW:	CK:	DW:	CK:
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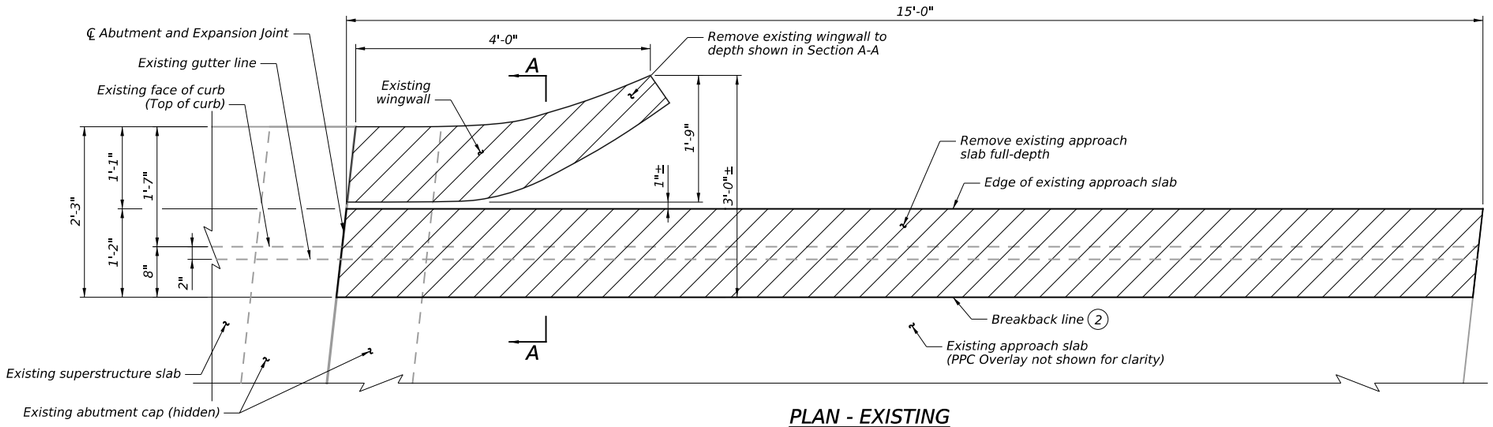
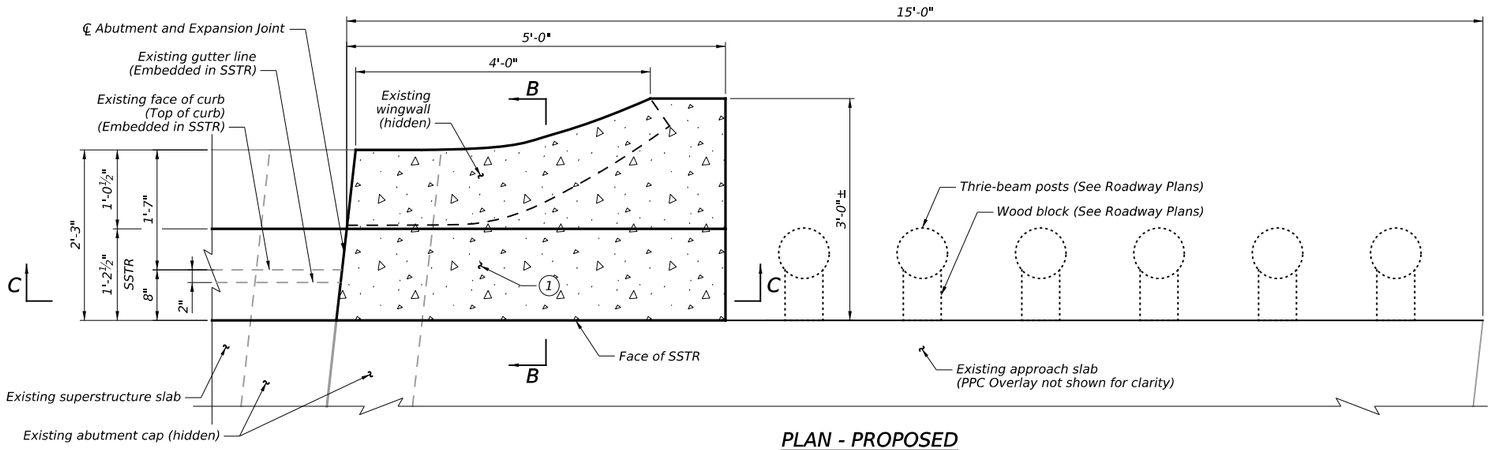
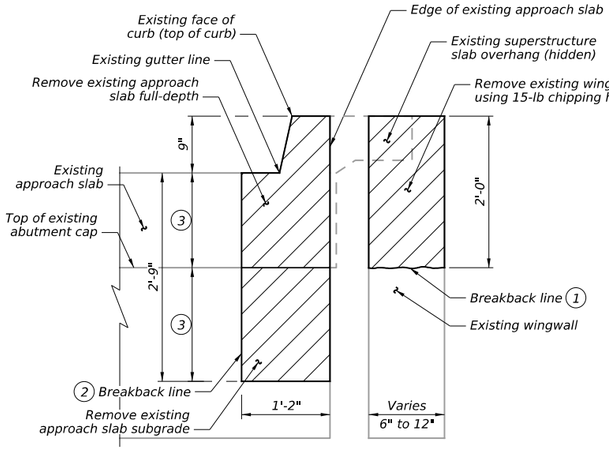


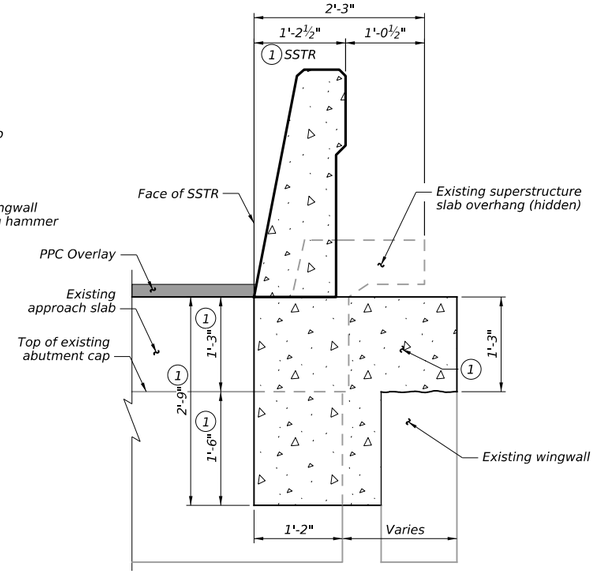
PLAN - EXISTING



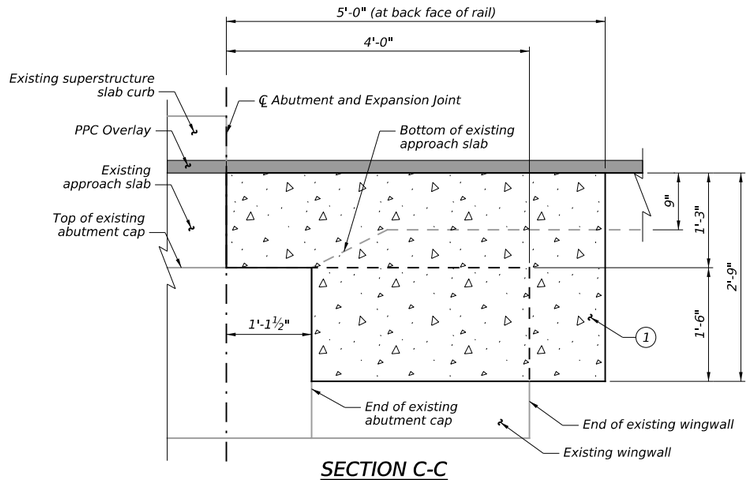
PLAN - PROPOSED



SECTION A-A



SECTION B-B



SECTION C-C

GENERAL NOTES:

1. Refer to Retrofit Guide for Concrete Rails sheet and SSTR standard sheet for additional details and notes. Reinforcement is shown on those sheets and not detailed on this sheet.
2. Sawcut and remove approach slab concrete in accordance with Item 104, "Removing Concrete". Work will be paid for in accordance with Item 104-6027, "Removing Conc (Appr Slab)". Cut and grind flush all existing reinforcing extending from the existing approach slab and paint ends with two coats of zinc-rich paint conforming to the Item 445, "Galvanizing".
3. Removal and replacement of backfill and subgrade is considered subsidiary to Item 451-6024, "Retrofit Rail (Ty SSTR)". Payment for rail retrofit will be as per Item 451-6024, "Retrofit Rail (Ty SSTR)".

(1) See Section of Existing Parallel Wingwalls Less Than 12" Thick detail on the C-RAIL-R (MOD) sheet for details.

(2) If the edge of existing approach slab is curved, breakback line shall be parallel to edge of existing approach slab.

(3) Existing approach slab full-depth removal varies from 1'-3" to 9". Remove existing approach slab subgrade. Subgrade removal depth varies as approach slab depth varies. The total removal depth is 2'-9", including approach slab and subgrade depths.

STATE OF TEXAS
BRETT R.C. ALLEN
133221
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PROFESSIONAL ENGINEER
06/10/2024

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc.
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

SH 207 RAIL
FOUNDATION DETAILS

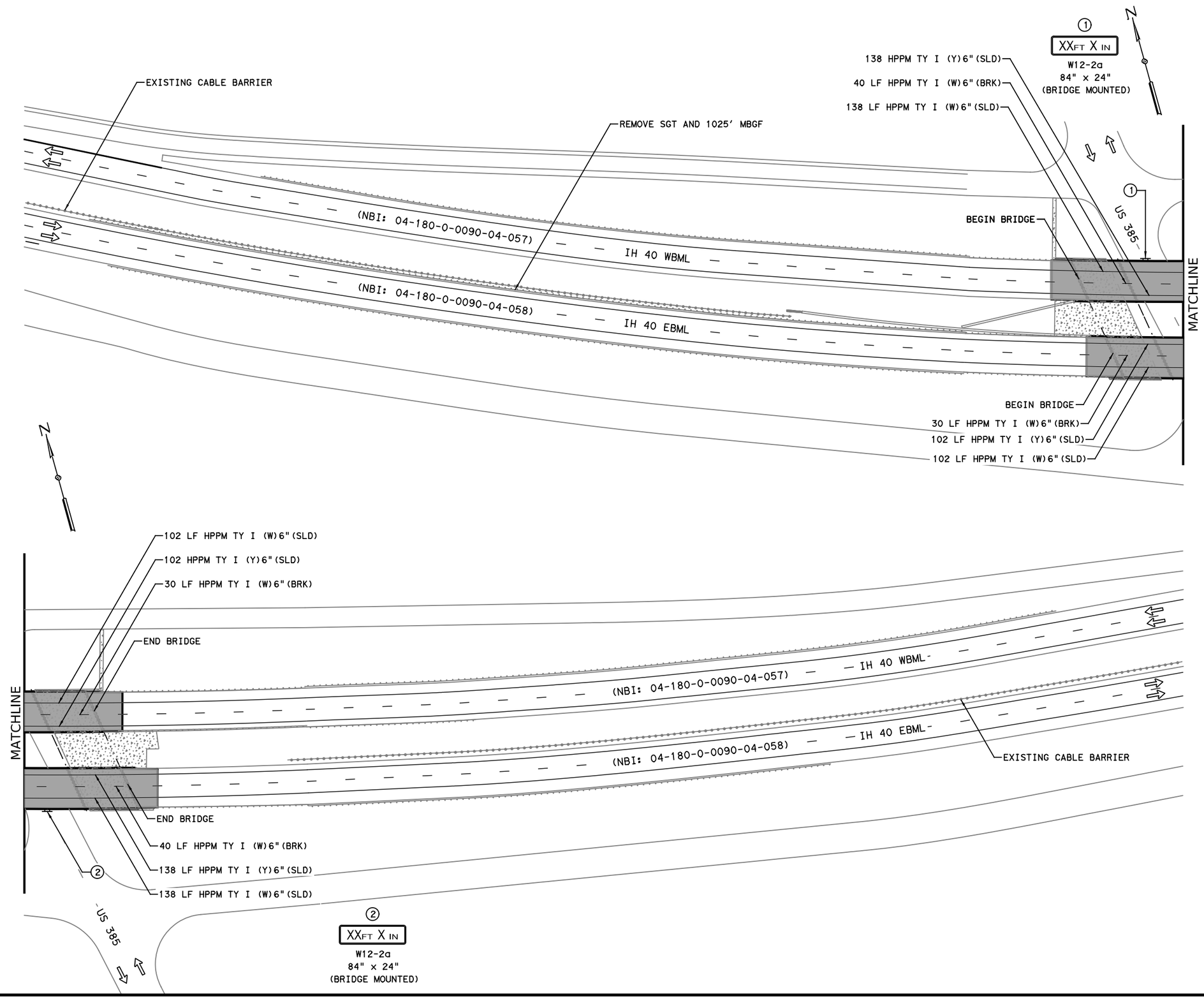
SCALE: N.T.S.

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		130

DATE: 6/8/2024 1:13:05 PM
FILE: AMA2_DET08.dgn

DW AD | BE CK | DW AD | BE CK



LEGEND

EXIST TRAFFIC LANE

PLANE ASPH CONC PVMT & PPC OVERLAY (BRIDGE AND BAS)

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

DEL ASSM (D-SY)SZ 1(BRF)GF2

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

DEL ASSM (D-SW)SZ (BRF)CTB

DEL ASSM (D-SY)SZ (BRF)CTB

DEL ASSM (D-SW)SZ (BRF)CTB (BI)

NOTES:

1. FOR THE MEDIAN SECTION REFER TO THE MEDIAN PROTECTION PLANS.

STATE OF TEXAS
BRIAN ENNS
93801
LICENSED PROFESSIONAL ENGINEER

P.E. 3/4/2024

NO.	DATE	REVISION	APPR BY

RTG RODRIGUEZ TRANSPORTATION GROUP TBPE# 8587

Texas Department of Transportation

IH 40 EB & WB AT US 385 ROADWAY PLAN

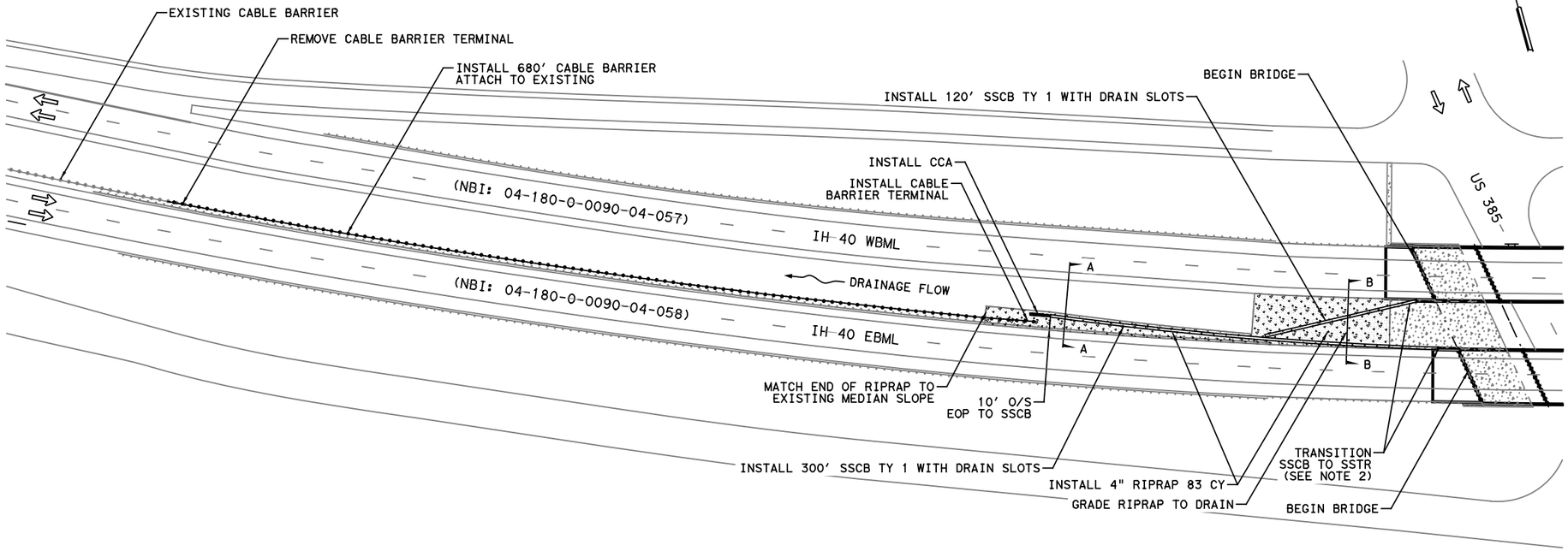
REF 07-08: NBI#: 04-180-0-0090-04-057 & 058

SCALE:1"=100' SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		131

DATE: 3/4/2024 11:14:43 AM
FILE: AMA2-RDWY-PLAN-057-058 01.dgn

DW AD | BE CK | DW AD | BE CK

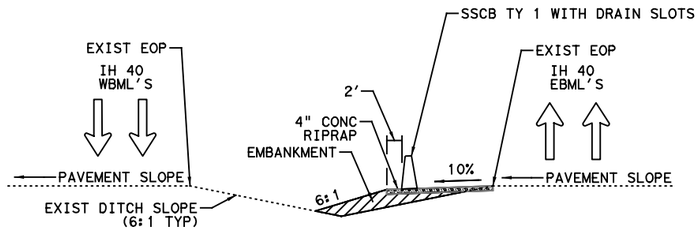


LEGEND

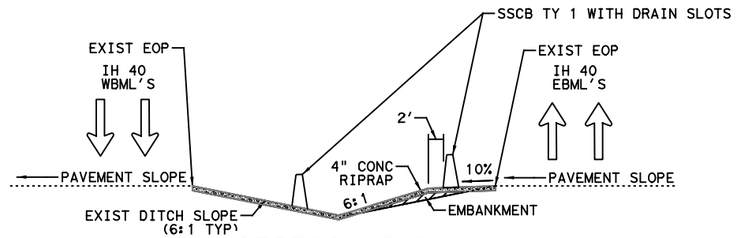
EXIST TRAFFIC LANE ⇨

NOTES:

1. SSCB TY I INSTALLED WITH DRILLED SHAFT ANCHORS AND DRAIN SLOTS. DRILLED SHAFT ANCHORS ARE SUBSIDIARY TO SSCB.
2. SSCB TY I HEIGHT AND SHAPE TRANSITIONS TO EXISTING BRIDGE RAIL ARE SUBSIDIARY TO SSCB. SEE TRANSITION DETAILS SSCB TO SSTR SHEET.



SECTION A-A



SECTION B-B

STATE OF TEXAS
BRIAN ENNS
93801
LICENSED PROFESSIONAL ENGINEER

P.E. 3/4/2024

NO.	DATE	REVISION	APPR BY

RTG RODRIGUEZ TRANSPORTATION GROUP FIRM #587

Texas Department of Transportation

IH 40 EB
AT US 385
MEDIAN PROTECTION PLAN

REF 08: NBI#: 04-180-0-0090-04-058

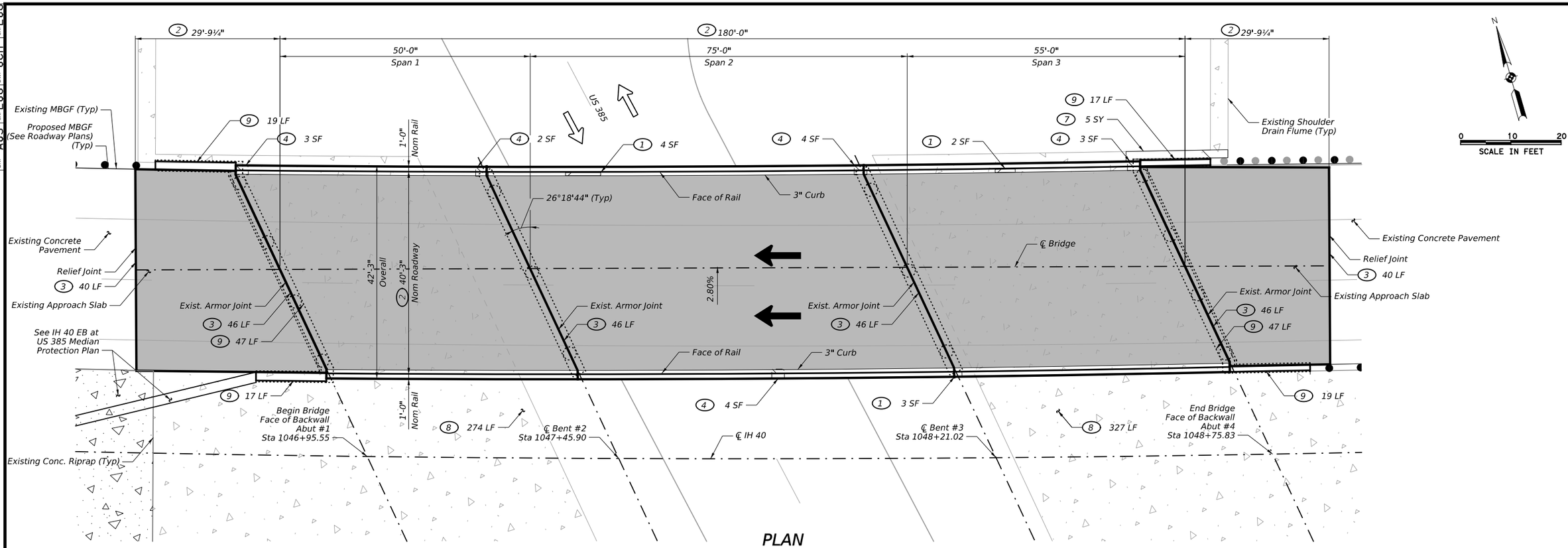
SCALE:1"=100' *SHEET 1 OF 1*

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		132

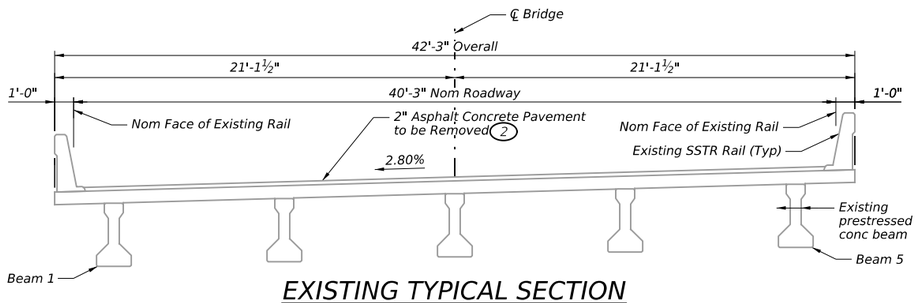
DATE: 3/4/2024 11:15:01 AM
FILE: AMA2-ROWY-MEDIAN-PLAN-057-058 01.dgn

FINAL SUBMITTAL (100%)

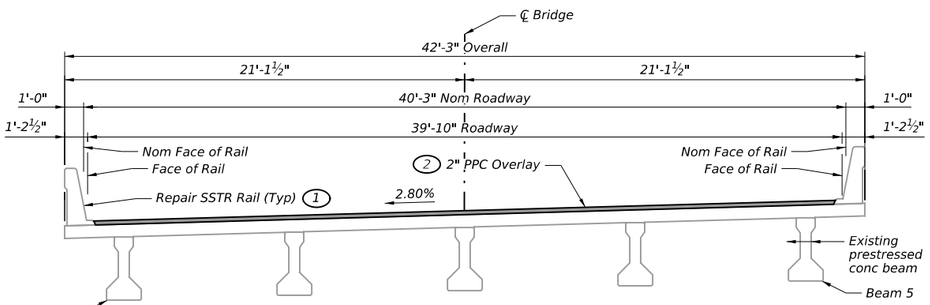
DW:	CK	DW:	CK
AJS	LJG	JCH	LJG



PLAN



EXISTING TYPICAL SECTION



PROPOSED TYPICAL SECTION

GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request.
3. Stationing is based on as-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids, and all locations shall be approved by the Engineer prior to beginning repair work. Field verify limits and quantities with the Engineer. Payment will be for the field measured repair at the unit price bid.
5. Refer to Traffic Control Plans and Roadway Plans for information not shown.

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay and install PPC Overlay
- Spall/Delamination Repair
- Conc Riprap Repair
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

NO.	DATE	REVISION	APPR BY

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17111 Preston Road, Suite 300
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972.960.4400

Texas Department of Transportation

IH 40 WB
AT US 385
BRIDGE LOCATION REPAIR PLAN

REF 07: NBI# 04-180-0-0090-04-057

SCALE:1"=20' SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		133

DATE: 6/8/2024 1:13:55 PM
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FINAL SUBMITTAL (100%)

DW:	CK:	DW:	CK:
AJS	LJG	JCH	LJG

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	ITEM CODE	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	Repair the spall/delaminations on the rails. See repair plan for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	9	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
(2)	Plane asphalt overlay and place Polyester Polymer Concrete (PPC) overlay. Assumed allowance of 285 SF (3% of deck area) for partial-depth deck repairs and 95 SF (1% of deck area) for full-depth deck repairs are provided to be used as directed by Engineer. See repair plan for locations.	354-7051	PLANE ASPH CONC PAV(2")	1052	SY	See the Bridge Deck Overlay Notes sheet for details.
		429-7003	CONC STR REPAIR(DECK REP(PART DEPTH))	285	SF	Repair as partial-depth deck repairs per the TxDOT Concrete Repair Manual, Chapter 3, Section 4.
		429-7005	CONC STR REPAIR(DECK REP (FULL DEPTH))	95	SF	Repair as full-depth deck repairs per the TxDOT Concrete Repair Manual, Chapter 3, Section 4.
		439-7017	POLYESTER POLYMER CONC OVERLAY (2")	1052	SY	See the Bridge Deck Overlay Notes sheet for details.
(3)	Clean and seal armor joints and relief joints. See repair plan for locations.	438-7010	CLEANING AND SEALING JOINTS (FOAM)	264	LF	See the Cleaning and Sealing Existing Bridge Joints sheet for details.
(4)	Repair the spalls/delaminations in the deck soffit. See repair plan for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	16	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
(5)	Repair damaged beam ends. See Table of Beam Repairs for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	18	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
(6)	Repair the spalls/delaminations in the substructure. See Substructure Repair Isometrics sheet for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	116	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
(7)	Remove and replace concrete riprap. Where voids are present, fill with flowable backfill before replacing concrete riprap. A quantity allowance of 5 CY of flowable backfill is provided to be used as directed by the Engineer. See repair plan for locations.	104-7006	REMOV CONC (RIPRAP)	5	SY	See the Concrete Riprap Repair Details sheet.
		401-7001	FLOWABLE BACKFILL	5	CY	
		432-7002	RIPRAP (CONC)(5 IN)	1	CY	
(8)	Clean and seal joints between riprap and cracks in riprap. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	601	LF	See the Concrete Riprap Crack Sealing Details sheet.
(9)	Clean and seal joints between riprap and abutment/wingwalls. Additionally, install flashing. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	166	LF	See the Joint Seal Flashing Details sheet.
(10)	Apply Waterproofing to all faces of abutments and bent caps. See Substructure Concrete Waterproofing Table on the Waterproofing Details sheet.	427-7005	EPOXY WATERPROOF FINISH (TY X)	1716	SF	See the Waterproofing Details sheet.

(5) TABLE OF BEAM REPAIRS

Span	Beam	Location	Spall Repair Quantity
1	1	Abutment 1	1 SF
2	1	Bent 2	1 SF
	2	Bent 2	1 SF
	3	Bent 2	2 SF
	4	Bent 2	1 SF
	5	Bent 2	1 SF
	1	Midspan	6 SF
	1	Bent 3	1 SF
	5	Bent 3	1 SF
3	1	Abutment 4	1 SF
	4	Abutment 4	2 SF
TOTAL			18 SF

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

NO.	DATE	REVISION	APPR BY

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Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

IH 40 WB
AT US 385
BRIDGE LOCATION REPAIR PLAN

REF 07: NBI# 04-180-0-0090-04-057

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		134

DATE: 6/8/2024 1:14:03 PM
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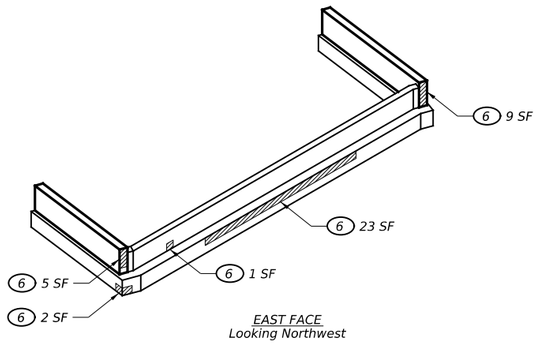
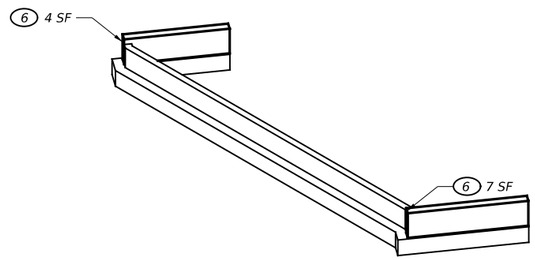
FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	JCH	LJG



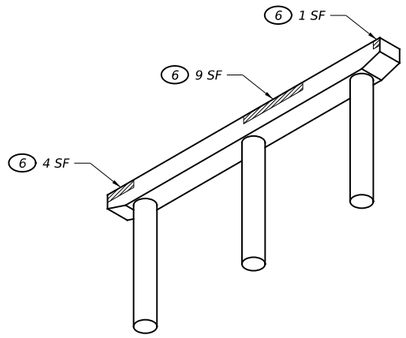
EAST FACE
Looking Northwest

ABUTMENT 1



WEST FACE
Looking Northeast

ABUTMENT 4



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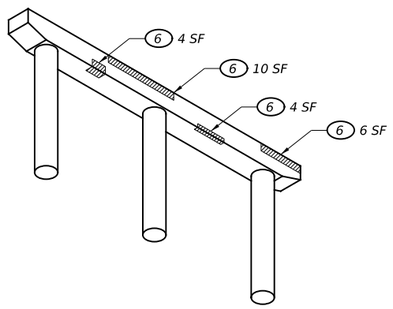
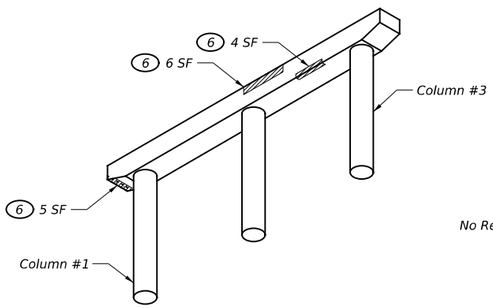
Looking Northeast



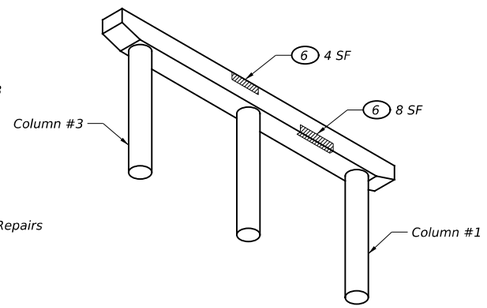
EAST FACE
Looking Northwest

BENT 2



WEST FACE
Looking Northeast

No Repairs



EAST FACE
Looking Northwest

BENT 3

SUBSTRUCTURE REPAIR ISOMETRICS

REPAIR CALL-OUT LEGEND

Spall/Delamination Repair

(XX) XX XX
- Repair Quantity Unit
- Estimated Repair Quantity At Each Location
- Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER

06/10/2024

Brett RC Allen

NO.	DATE	REVISION	APPR BY

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IH 40 WB
AT US 385
SUBSTRUCTURE REPAIR ISOMETRICS

REF 07: NBI# 04-180-0-0090-04-057

SCALE: N.T.S. SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		135

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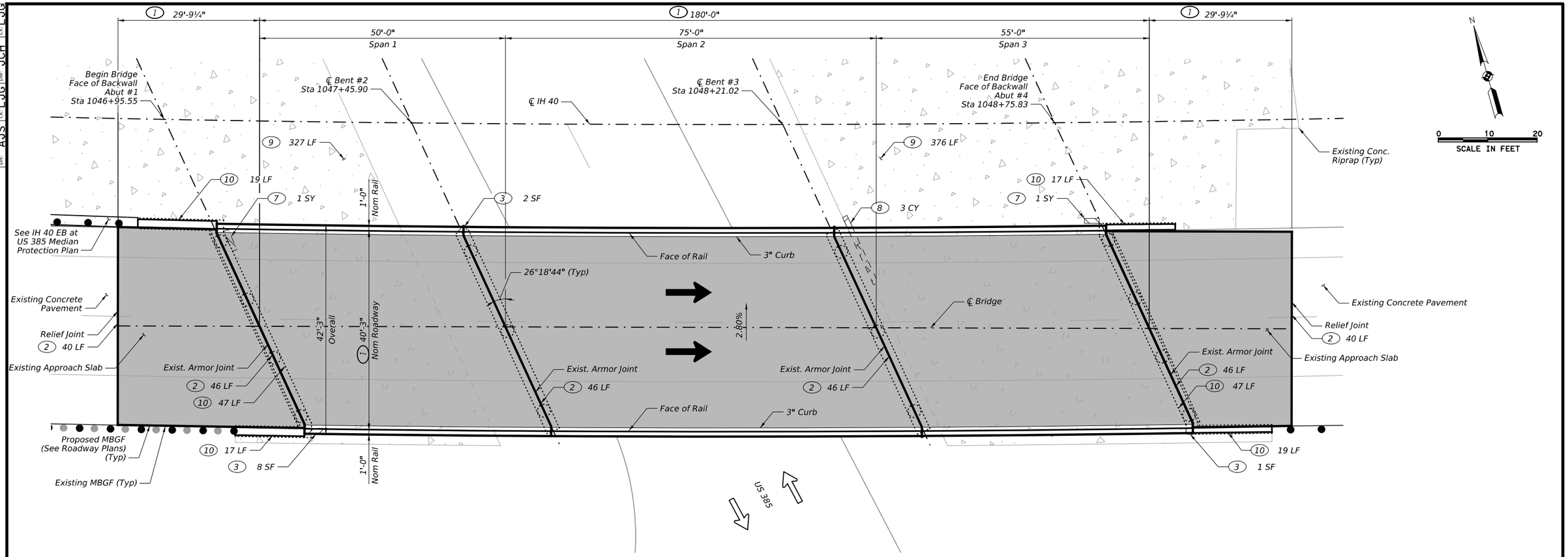
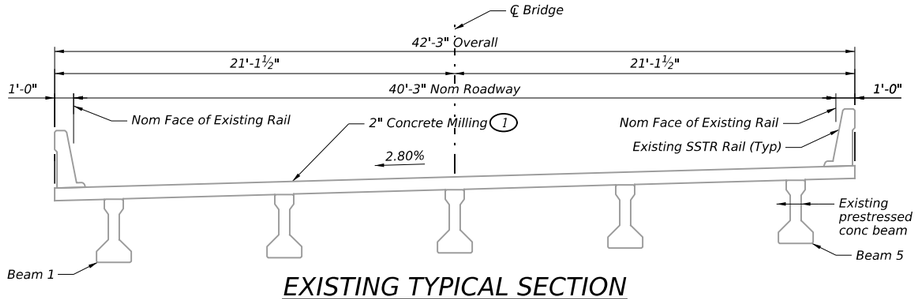
FINAL SUBMITTAL (100%)

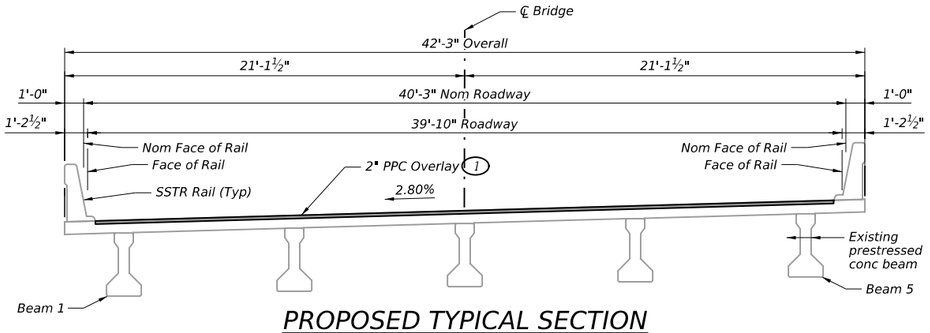
DW:	CK:	DW:	CK:
AJS	LJG	JCH	LJG



PLAN



EXISTING TYPICAL SECTION



PROPOSED TYPICAL SECTION

GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request.
3. Stationing is based on as-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids, and all locations shall be approved by the Engineer prior to beginning repair work. Field verify limits and quantities with the Engineer. Payment will be for the field measured repair at the unit price bid.
5. Refer to Traffic Control Plans and Roadway Plans for information not shown.

REPAIR CALL-OUT LEGEND

- Mill Concrete Overlay and install PPC Overlay
- Conc Riprap Repair
- Embankment
- Spall/Delamination Repair
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

NO.	DATE	REVISION	APPR BY

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Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

IH 40 EB
AT US 385
BRIDGE LOCATION REPAIR PLAN

REF 08: NBI# 04-180-0-0090-04-058

SCALE:1"=20' SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		136

DATE: 6/8/2024 1:14:21 PM
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FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK	DW:	CK
AJS	LJG	LJG	JCH	LJG	LJG

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	ITEM CODE	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	Mill concrete overlay and place Polyester Polymer Concrete (PPC) overlay. Assumed allowance of 285 SF (3% of deck area) for partial-depth deck repairs and 95 SF (1% of deck area) for full-depth deck repairs are provided to be used as directed by Engineer. See repair plan for locations.	483-7024	MICROMILLING CONCRETE SLAB (2 IN)	1052	SY	See the Bridge Deck Overlay Notes sheet for details.
		429-7003	CONC STR REPAIR(DECK REP(PART DEPTH))	285	SF	Repair as partial-depth deck repairs per the TxDOT Concrete Repair Manual, Chapter 3, Section 4.
		429-7005	CONC STR REPAIR(DECK REP (FULL DEPTH))	95	SF	Repair as full-depth deck repairs per the TxDOT Concrete Repair Manual, Chapter 3, Section 4.
		439-7017	POLYESTER POLYMER CONC OVERLAY (2")	1052	SY	See the Bridge Deck Overlay Notes sheet for details.
(2)	Clean and seal armor joints and relief joints. See repair plan for locations.	438-7010	CLEANING AND SEALING JOINTS (FOAM)	264	LF	See the Cleaning and Sealing Existing Bridge Joints sheet for details.
(3)	Repair the spalls/delaminations in the deck soffit. See repair plan for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	11	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
(4)	Repair the spalls/delaminations in the beams. After making repairs to the beams over traffic, apply Glass Fiber Reinforced Polymer (GFRP) Protection. See Table of Beam Repairs for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	16	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
		786-7001	CARBON FIBER REINF POLYMER PROTECTION	30	SF	See the Substructure Arch Detail on the GFRP Wrapping Details sheet.
(5)	Repair the spalls/delaminations in the diaphragm of Span 3, Bay 4 at Bent 3. See Concrete Diaphragm Repair detail for location.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	1	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
(6)	Repair the spalls/delaminations in the substructure. See Substructure Repair Isometrics sheet for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	107	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
(6A)	Wrap GFRP Protection around noted column repairs. See Substructure Repair Isometrics sheet for locations.	786-7001	CARBON FIBER REINF POLYMER PROTECTION	95	SF	See the Column Wrapping Detail on the GFRP Wrapping Details sheet.
(7)	Remove and replace concrete riprap. Where voids are present, fill with flowable backfill before replacing concrete riprap. A quantity allowance of 3 CY of flowable backfill is provided to be used as directed by the Engineer. See repair plan for locations.	104-7006	REMOV CONC (RIPRAP)	2	SY	See the Concrete Riprap Repair Details sheet.
		401-7001	FLOWABLE BACKFILL	3	CY	
		432-7002	RIPRAP (CONC)(5 IN)	1	CY	
(8)	Place embankment material to cover exposed toe of concrete riprap at Bent 3. See repair plan for location.	132-7003	EMBANK (FNL)(OC)(TY B)	3	CY	
(9)	Clean and seal joints between riprap and cracks in riprap. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	703	LF	See the Concrete Riprap Crack Sealing Details sheet.
(10)	Clean and seal joints between riprap and abutment/wingwalls. Additionally, install flashing. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	166	LF	See the Joint Seal Flashing Details sheet.
(11)	Apply Waterproofing to all faces of abutments and bent caps. See Substructure Concrete Waterproofing Table on the Waterproofing Details sheet.	427-7005	EPOXY WATERPROOF FINISH (TY X)	1716	SF	See the Waterproofing Details sheet.

(4) TABLE OF BEAM REPAIRS

Span	Beam	Location	Spall Repair Quantity	GFRP Repair Quantity
1	4	Abutment 1	1 SF	-
2	5	Bent 2	2 SF	-
	1	Midspan	11 SF	30 SF
	1	Bent 3	1 SF	-
	2	Bent 3	1 SF	-
TOTAL			16 SF	30 SF

(5) CONCRETE DIAPHRAGM REPAIR

REPAIR CALL-OUT LEGEND

Spall/Delamination Repair

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER

06/10/2024

Brett RC Allen

NO.	DATE	REVISION	APPR BY

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Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

IH 40 EB
AT US 385
BRIDGE LOCATION REPAIR PLAN

REF 08: NBI# 04-180-0-0090-04-058

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		137

DATE: 6/8/2024 1:14:30 PM
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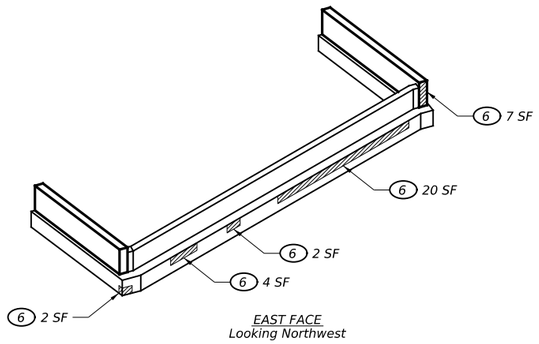
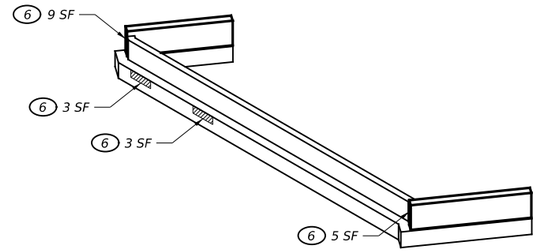
FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	JCH	LJG



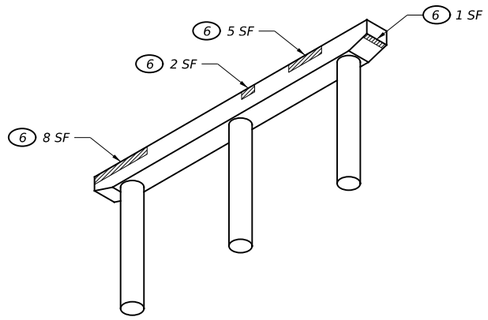
EAST FACE
Looking Northwest

ABUTMENT 1



WEST FACE
Looking Northeast

ABUTMENT 4



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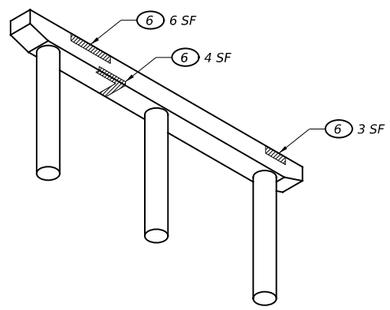
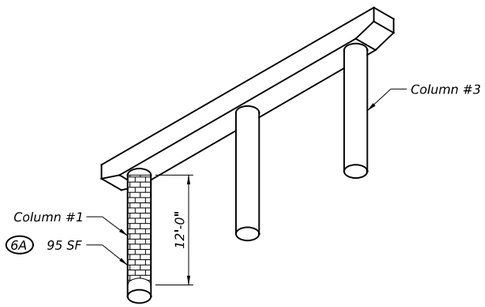
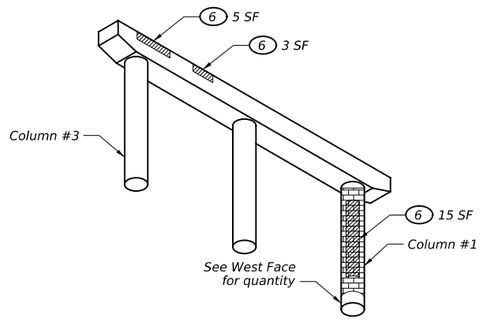


EAST FACE
Looking Northwest

BENT 2



WEST FACE
Looking Northeast



EAST FACE
Looking Northwest

BENT 3

SUBSTRUCTURE REPAIR ISOMETRICS

REPAIR CALL-OUT LEGEND

- Spall/Delamination Repair
- Glass Fiber Reinf. Polymer Protection
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER

06/10/2024

Brett RC Allen

NO.	DATE	REVISION	APPR BY

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Texas Department of Transportation

IH 40 EB
AT US 385
SUBSTRUCTURE REPAIR ISOMETRICS

REF 08: NBI# 04-180-0-0090-04-058

SCALE: N.T.S.

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		138

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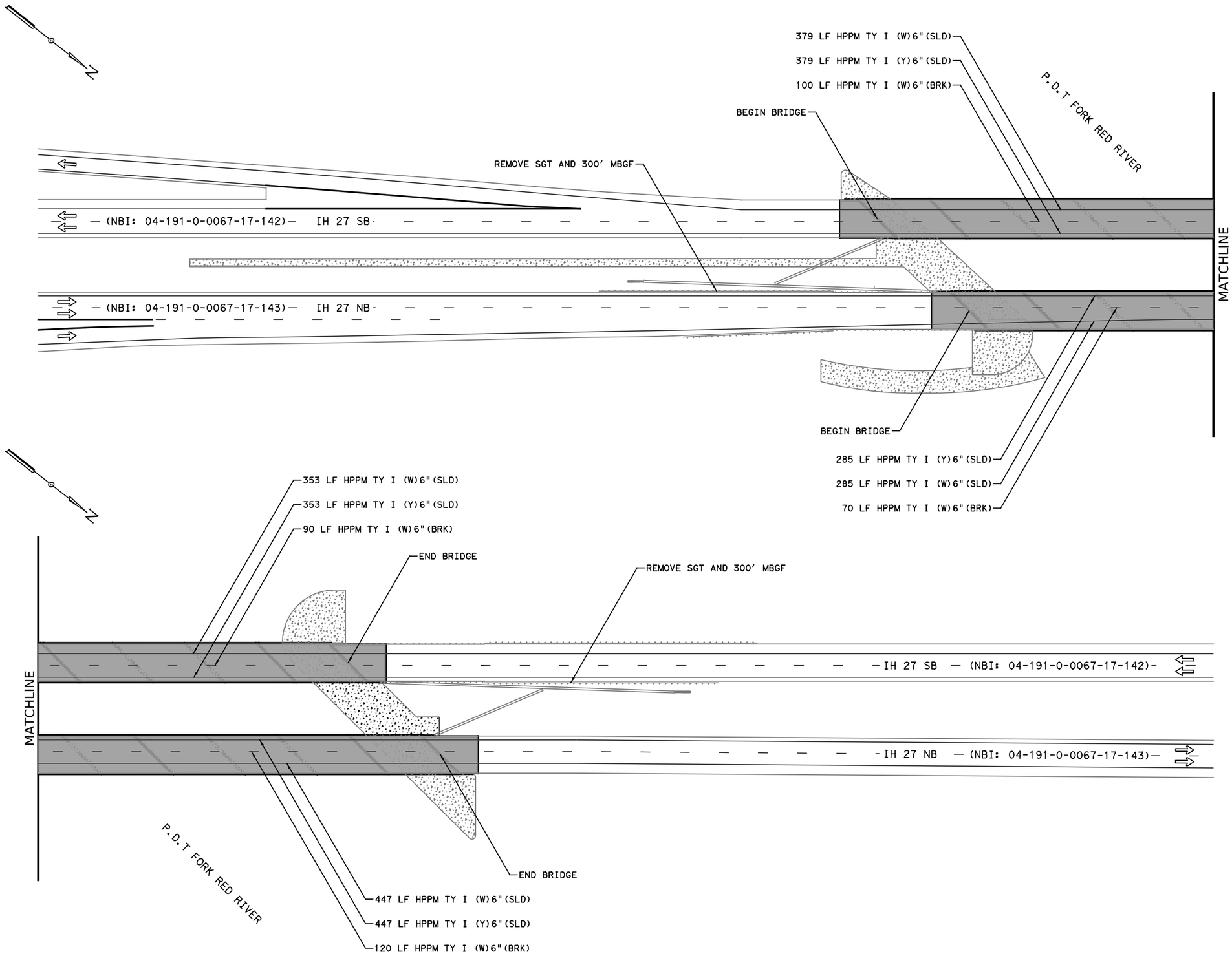

LEGEND

EXIST TRAFFIC LANE

PLANE ASPH CONC PVMT & PPC OVERLAY (BRIDGE AND BAS)

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

DEL ASSM (D-SY)SZ 1(BRF)GF2

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

DEL ASSM (D-SW)SZ (BRF)CTB

DEL ASSM (D-SY)SZ (BRF)CTB

DEL ASSM (D-SW)SZ (BRF)CTB (BI)

NOTES:

1. FOR THE MEDIAN SECTION REFER TO THE MEDIAN PROTECTION PLANS.

STATE OF TEXAS
BRIAN ENNS
93801
LICENSED PROFESSIONAL ENGINEER

P.E. 3/4/2024

NO.	DATE	REVISION	APPR BY

RTG RODRIGUEZ TRANSPORTATION GROUP FIRM #587

Texas Department of Transportation

IH 27 NB & SB AT P.D.T FORK RED RIVER ROADWAY PLAN

REF 09-10: NBI#: 04-191-0-0067-17-142

SCALE:1"=100' SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		139

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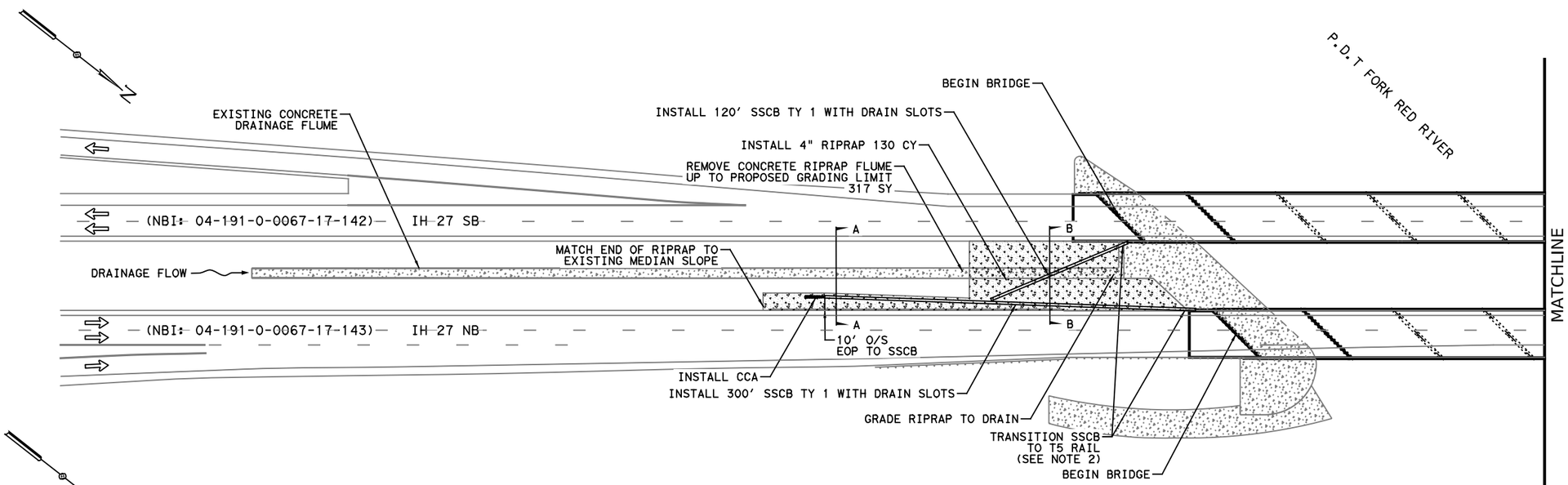
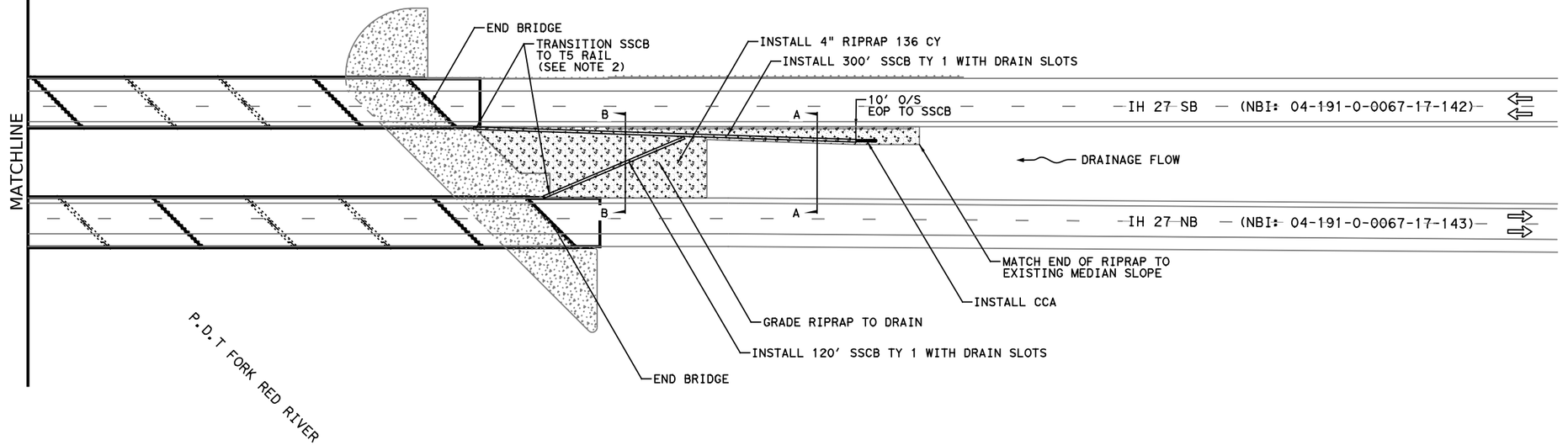
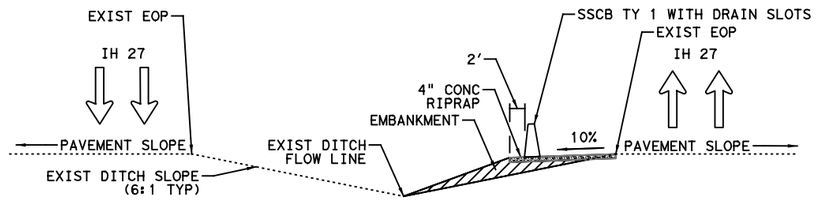
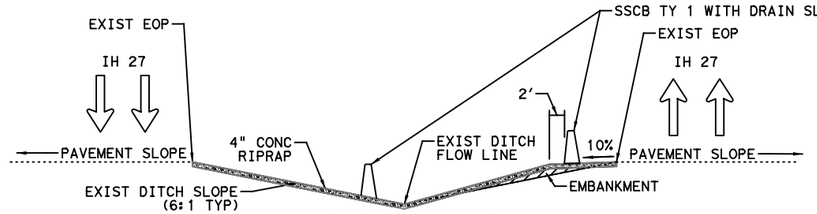
DW AD | BE CK | DW AD | BE CK







SECTION A-A



SECTION B-B

LEGEND

EXIST TRAFFIC LANE ⇨

NOTES:

1. SSCB TY I INSTALLED WITH DRILLED SHAFT ANCHORS AND DRAIN SLOTS. DRILLED SHAFT ANCHORS ARE SUBSIDIARY TO SSCB.
2. SSCB TY I HEIGHT AND SHAPE TRANSITIONS TO EXISTING BRIDGE RAIL ARE SUBSIDIARY TO SSCB. SEE TRANSITION DETAILS SSCB TO T5 SHEET.

STATE OF TEXAS
BRIAN ENNS
93801
LICENSED PROFESSIONAL ENGINEER

P.E. 3/4/2024

NO.	DATE	REVISION	APPR BY

RTG RODRIGUEZ TRANSPORTATION GROUP FIRM #587

IH 27 NB & SB AT P.D.T FORK RED RIVER MEDIAN PROTECTION PLAN

REF 09-10: NBI#: 04-191-0-0067-17-142 & 143

SCALE:1"=100' SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		140

DATE: 3/4/2024 11:15:29 AM
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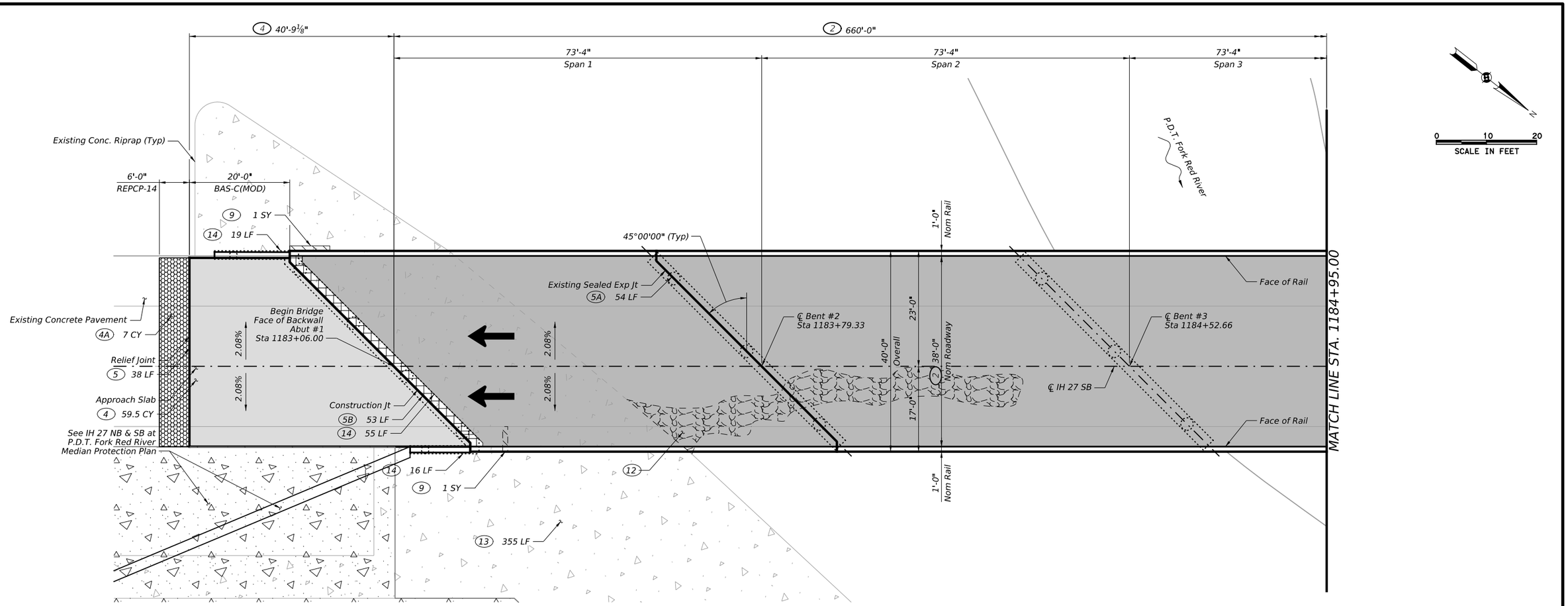
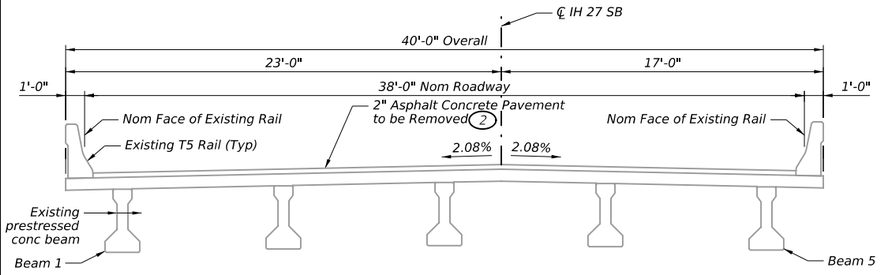
FINAL SUBMITTAL (100%)

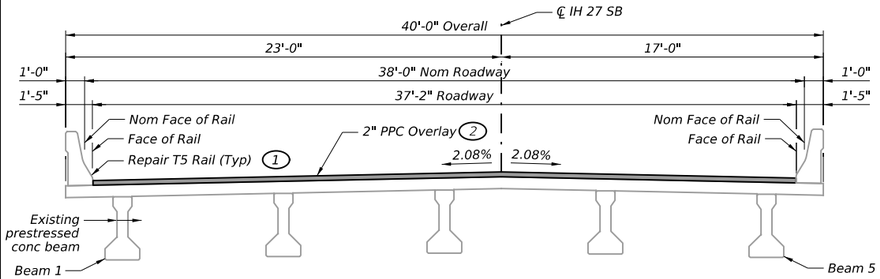
DW:	CK	DW:	CK
AJS	LJG	LJG	JCH



PLAN



EXISTING TYPICAL SECTION



PROPOSED TYPICAL SECTION

GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request.
3. Stationing is based on as-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids, and all locations shall be approved by the Engineer prior to beginning repair work. Field verify limits and quantities with the Engineer. Payment will be for the field measured repair at the unit price bid.
5. Refer to Traffic Control Plans and Roadway Plans for information not shown.

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay and install PPC Overlay
- Approach Slab Removal & Replacement
- Existing Pavement Removal & Replacement
- Conc Riprap Repair
- Erosion Gully Repair
- Full Depth Deck Joint Repair

(XX) XX XX
- Repair Quantity Unit
- Estimated Repair Quantity At Each Location
- Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

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Texas Department of Transportation

IH 27 SB
AT P.D.T. FORK RED RIVER
BRIDGE LOCATION REPAIR PLAN

REF 09: NBI# 04-191-0-0067-17-142

SCALE:1"=20' SHEET 1 OF 4

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		141

DATE: 6/8/2024 1:14:47 PM
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FINAL SUBMITTAL (100%)

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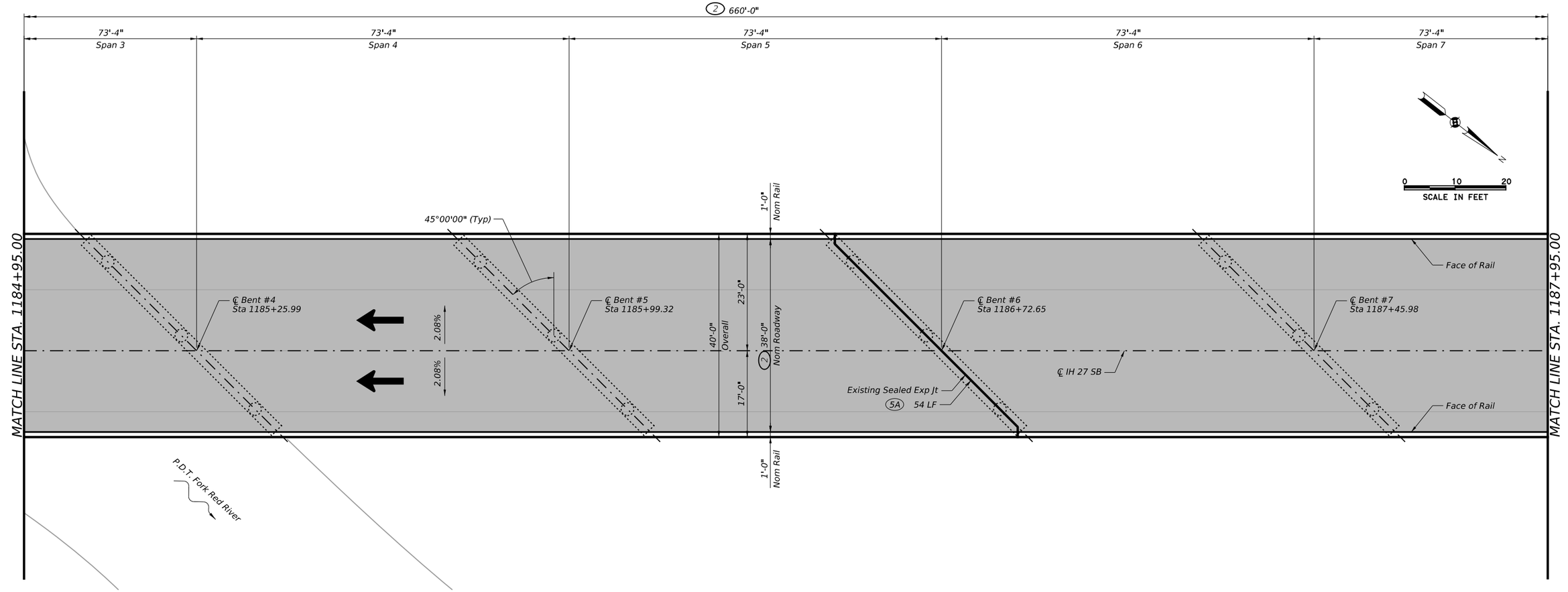
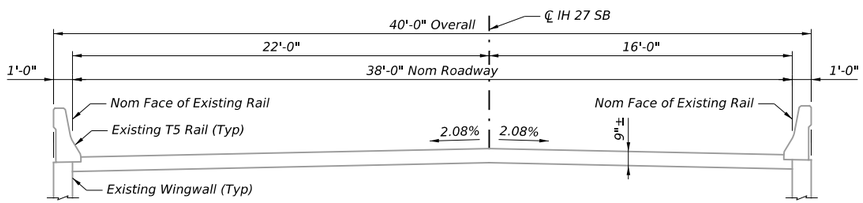
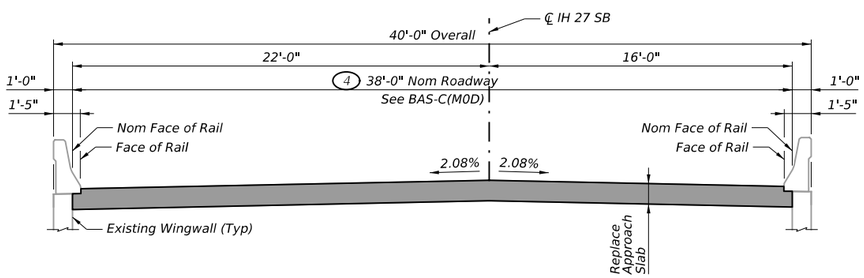


PLAN



EXISTING TYPICAL SECTION-APPROACH SLAB



PROPOSED TYPICAL SECTION-APPROACH SLAB

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay and install PPC Overlay
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
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PROFESSIONAL ENGINEER
06/10/2024

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Texas Department of Transportation

IH 27 SB
AT P.D.T. FORK RED RIVER
BRIDGE LOCATION REPAIR PLAN

REF 09: NBI# 04-191-0-0067-17-142

SCALE:1"=20' SHEET 2 OF 4

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		142

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FINAL SUBMITTAL (100%)

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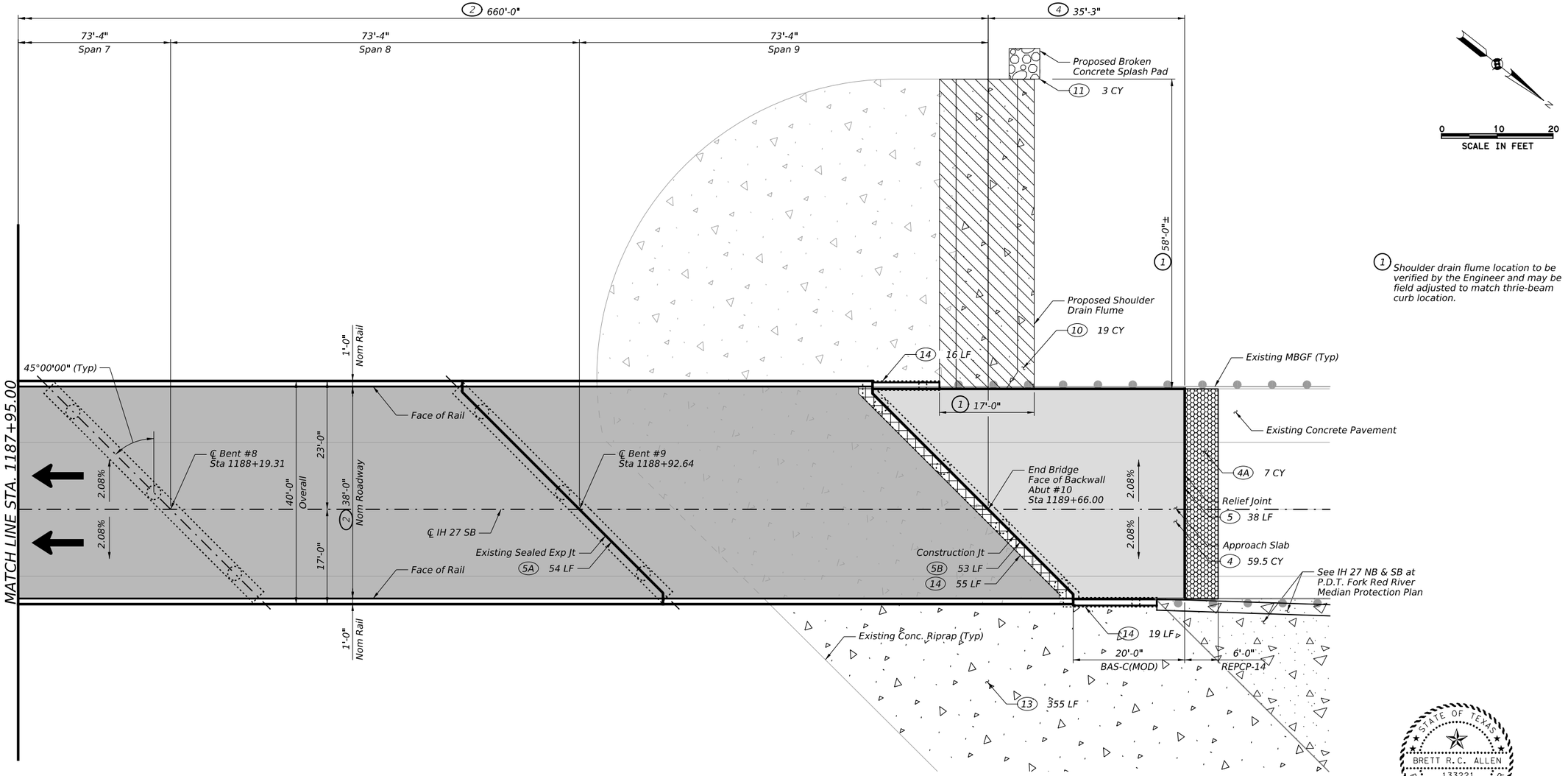

PLAN

1 TABLE OF RAIL REPAIRS

Location	SW/NE Rail	Spall Repair Quantity
Joint 1	SW	1 SF
Joint 1	NE	8 SF
Joint 2	NE	2 SF
Joint 3	NE	1 SF
Joint 4	NE	1 SF
Midspan 4	SW	1 SF
Joint 6	SW	1 SF
Joint 6	NE	3 SF
Joint 8	NE	1 SF
Joint 9	SW	1 SF
Joint 9	NE	1 SF
Joint 10	SW	3 SF
Approach Slab	SW	1 SF
TOTAL		25 SF

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay and install PPC Overlay
- Approach Slab Removal & Replacement
- Existing Pavement Removal & Replacement
- Conc Riprap Repair
- Riprap Stone Protection
- Full Depth Deck Joint Repair
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
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06/10/2024
Brett RC Allen

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Texas Department of Transportation

IH 27 SB
AT P.D.T. FORK RED RIVER
BRIDGE LOCATION REPAIR PLAN

REF 09: NBI# 04-191-0-0067-17-142

SCALE:1"=20' SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		143

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FINAL SUBMITTAL (100%)

DW:	CK:	DW:	CK:
AJS	LJG	JCH	LJG

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	ITEM CODE	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	Repair the spall/delaminations on the rails. See Table of Rail Repairs for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	25	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
(2)	Plane asphalt overlay and place Polyester Polymer Concrete (PPC) overlay. Assumed allowance of 740 SF (3% of deck area) for partial-depth deck repairs and 250 SF (1% of deck area) for full-depth deck repairs are provided to be used as directed by Engineer. See repair plan for locations.	354-7051	PLANE ASPH CONC PAV(2")	2726	SY	See the Bridge Deck Overlay Notes sheet for details.
		429-7003	CONC STR REPAIR(DECK REP(PART DEPTH))	740	SF	Repair as partial-depth deck repairs per the TxDOT Concrete Repair Manual, Chapter 3, Section 4.
		429-7005	CONC STR REPAIR(DECK REP (FULL DEPTH))	250	SF	Repair as full-depth deck repairs per the TxDOT Concrete Repair Manual, Chapter 3, Section 4.
		439-7017	POLYESTER POLYMER CONC OVERLAY (2")	2706	SY	See the Bridge Deck Overlay Notes sheet for details.
(3)	Replace elastomeric bearing pads at Abutment 1.	787-7001	REPLACING ELASTOMERIC BEARING PADS	5	EA	See the Bearing Pad Replacement Details sheet.
(4)	Remove and replace approach slabs. Concrete shall be salvaged and used as broken concrete for bid item 432-7043, "Riprap (Stone Protection)(18 in)" on this bridge and adjacent IH 27 NB bridge. See repair plan for locations.	496-7022	REMOV STR (APPROACH SLAB)	2	EA	See the BAS-C(MOD) standard sheet for details. Proposed reinforcing shall be epoxy coated.
		422-7013	APPROACH SLAB	119	CY	
(4A)	Remove and replace existing CRCP to accommodate construction of proposed support slab. Perform work in conjunction with Repair 4. See repair plan for locations.	361-7004	FULL - DEPTH REPAIR CRCP (9")	14	CY	See the REPCP-14 standard sheet for details.
(5)	Clean and seal relief joints. See repair plan for locations.	438-7010	CLEANING AND SEALING JOINTS (FOAM)	76	LF	See the Cleaning and Sealing Existing Bridge Joints sheet for details.
(5A)	Clean and seal expansion joints with bonded strip seal. See repair plan for locations.	438-7001	CLEANING AND SEALING EXISTING JOINTS	162	LF	See the Cleaning and Sealing Existing Bridge Joints (Strip Seal) sheet for details.
(5B)	Repair deck portion of the construction joints at the abutments. Deck joint replacement limits are from gutter line to gutter line. See repair plan for locations.	785-7001	BRIDGE JOINT REPAIR (CONCRETE)	106	LF	See Construction Joint Repair Details on the Joint Replacement Details sheet.
(6)	Repair the spalls/delaminations in the deck soffit. See Table of Deck Soffit Repairs for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	164	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
(7)	Repair the spalls/delaminations in the beams. After making repairs to the beams, waterproof beam ends under expansion joints. See Table of Beam Repairs for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	22	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
		427-7005	EPOXY WATERPROOF FINISH (TY X)	540	SF	See the Typical Prestressed Beam detail on the Waterproofing Details sheet.
(8)	Repair the spalls/delaminations in the substructure. See Substructure Repair Isometrics sheet for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	61	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
(9)	Remove and replace concrete riprap. Where voids are present, fill with flowable backfill before replacing concrete riprap. A quantity allowance of 3 CY of flowable backfill is provided to be used as directed by the Engineer. See repair plan for locations.	104-7006	REMOV CONC (RIPRAP)	2	SY	See the Concrete Riprap Repair Details sheet.
		401-7001	FLOWABLE BACKFILL	3	CY	
		432-7002	RIPRAP (CONC)(5 IN)	1	CY	
(10)	Install shoulder drain flume at Abutment 10. As part of installation, place concrete riprap in unpaved area between the flume and existing riprap. See repair plan for locations.	104-7006	REMOV CONC (RIPRAP)	20	SY	See the SD-EBR(MOD) standard sheet for details.
		432-7002	RIPRAP (CONC)(5 IN)	19	CY	
(11)	Install broken concrete splash pad using material from approach slab removal at end of shoulder drain flume. See repair plan for location.	432-7043	RIPRAP (STONE PROTECTION)(18 IN)	3	CY	Splash pad shall be a 7'-0" wide x 5'-0" long x 2'-3" deep at the end of shoulder drain flume. Splash pad shall be fully embedded in ground and top of material shall match existing ground elevation.
(12)	Fill erosion gully with cement stabilized backfill and top with broken concrete from approach slab removal. See repair plan for location.	400-7010	CEM STABIL BKFL	34	CY	See Erosion Gully Detail on the Erosion Repair Details sheets.
		432-7043	RIPRAP (STONE PROTECTION)(18 IN)	50	CY	
(13)	Clean and seal joints between riprap and cracks in riprap. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	710	LF	See the Concrete Riprap Crack Sealing Details sheet.
(14)	Clean and seal joints between riprap and abutment/wingwalls. Additionally, install flashing. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	180	LF	See the Joint Seal Flashing Details sheet.
(15)	Apply Waterproofing to all faces of abutments and bent caps. See Substructure Concrete Waterproofing Table on the Waterproofing Details sheet.	427-7005	EPOXY WATERPROOF FINISH (TY X)	1758	SF	See the Waterproofing Details sheet.

(6) TABLE OF DECK SOFFIT REPAIRS

Span	Transverse Location	Location	Spall Repair Quantity
1	SW Edge	Abutment 1	54 SF
	NW Edge	Abutment 1	2 SF
	NW Edge	Abutment 1	54 SF
2	SW Edge	Bent 2	3 SF
5	NE Edge	Bent 6	4 SF
	SW Edge	Bent 6	4 SF
6	SW Edge	Bent 6	3 SF
9	SW Edge	Bent 9	2 SF
9	SW Edge	Bent 10	38 SF
TOTAL			164 SF

(7) TABLE OF BEAM REPAIRS

Span	Beam	Location	Spall Repair Quantity
1	1	Abutment 1	3 SF
	3	Abutment 1	1 SF
	1	Bent 2	3 SF
	5	Bent 2	1 SF
2	1	Bent 2	2 SF
	5	Bent 2	2 SF
	5	Bent 3	1 SF
7	5	Bent 8	7 SF
8	1	Bent 9	1 SF
9	4	Bent 9	1 SF
TOTAL			22 SF

All beam ends are Type C Beams. Provide 1.5 LF of waterproofing at each end (including the end face of beam) under all proposed expansion joints. These include Bents 2, 6 & 9. There is 18 SF of waterproofing per beam end and 30 beam ends, resulting in a total of 540 SF.

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
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Texas Department of Transportation

IH 27 SB
AT P.D.T. FORK RED RIVER
BRIDGE LOCATION REPAIR PLAN

REF 09: NBI# 04-191-0-0067-17-142

SHEET 4 OF 4

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		144

DATE: 6/8/2024 1:15:12 PM
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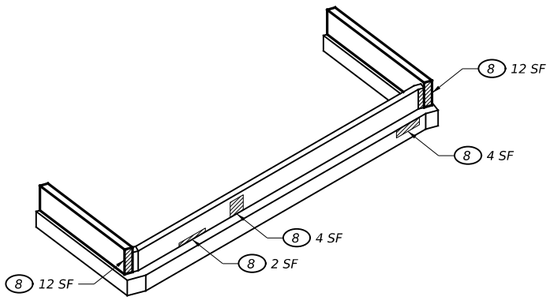
FINAL SUBMITTAL (100%)

DW:	CK	DW:	CK
AJS	LJG	JCH	LJG



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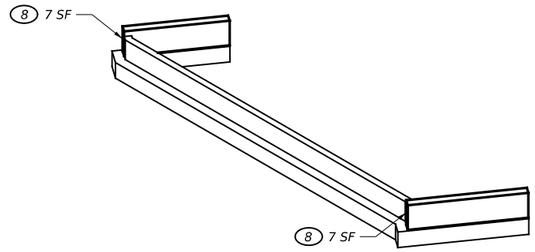
Looking Northeast

ABUTMENT 1



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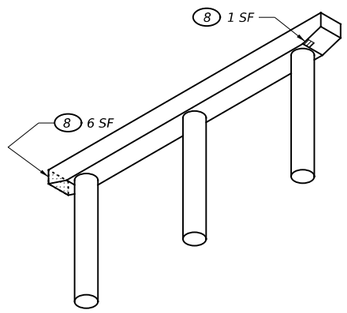

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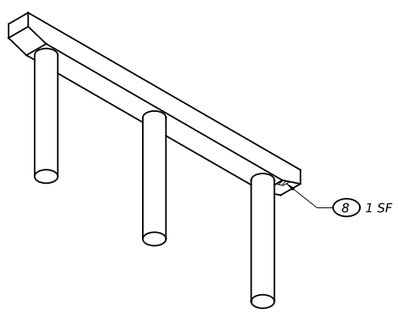

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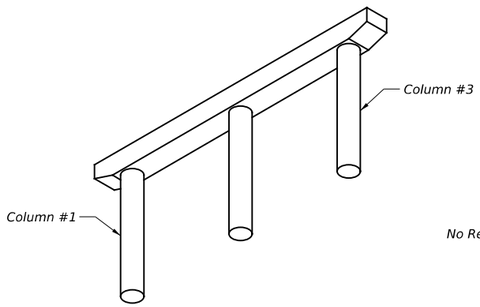
Looking Northeast

BENT 2



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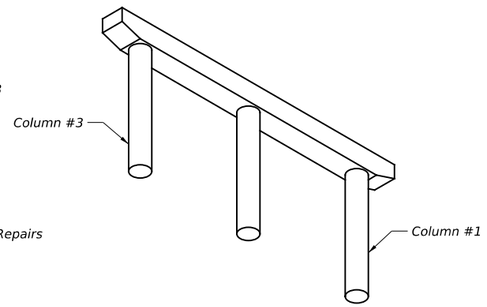
No Repairs



WEST FACE
Looking Northeast

BENT 3

SUBSTRUCTURE REPAIR ISOMETRICS

REPAIR CALL-OUT LEGEND

- Spall/Delamination Repair
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER

06/10/2024

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REF 09: NBI# 04-191-0-0067-17-142

SCALE: N.T.S.

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		145

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FINAL SUBMITTAL (100%)

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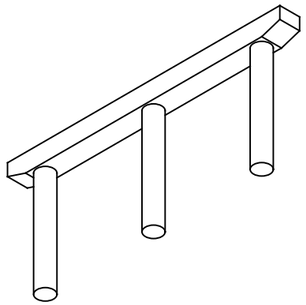
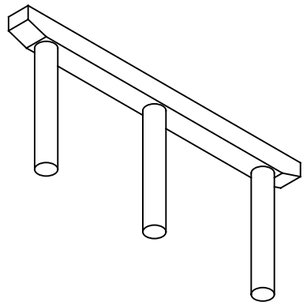


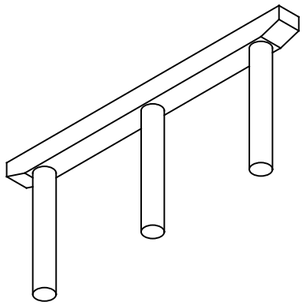
EAST FACE
Looking Northwest

No Repairs



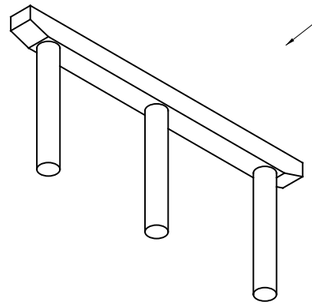
WEST FACE
Looking Northeast

BENT 4



EAST FACE
Looking Northwest

No Repairs

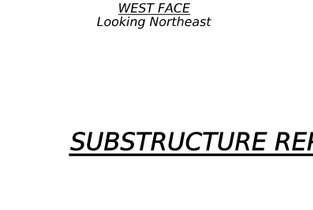


WEST FACE
Looking Northeast

BENT 7

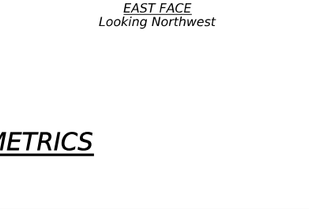
EAST FACE
Looking Northwest

No Repairs



WEST FACE
Looking Northeast

BENT 5

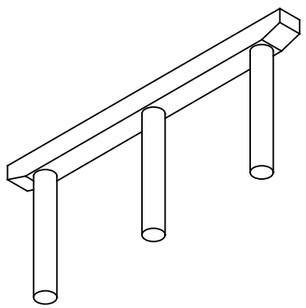


EAST FACE
Looking Northwest

No Repairs

WEST FACE
Looking Northeast

BENT 8



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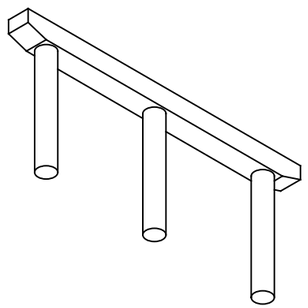
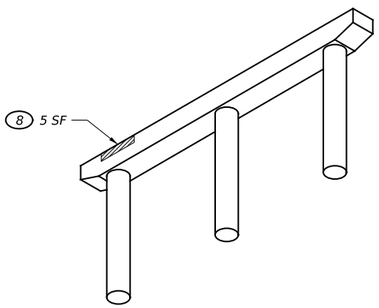
Looking Northwest

No Repairs



WEST FACE
Looking Northeast

BENT 6



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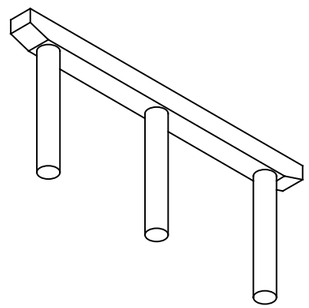

WEST FACE
Looking Northeast

BENT 9

REPAIR CALL-OUT LEGEND

Spall/Delamination Repair

XX XX
- Repair Quantity Unit
- Estimated Repair Quantity At Each Location
- Repair No. - See Table of Repairs

SUBSTRUCTURE REPAIR ISOMETRICS

STATE OF TEXAS
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REF 09: NBI# 04-191-0-0067-17-142

SCALE: N.T.S.

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		146

DATE: 6/8/2024 1:15:28 PM
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FINAL SUBMITTAL (100%)

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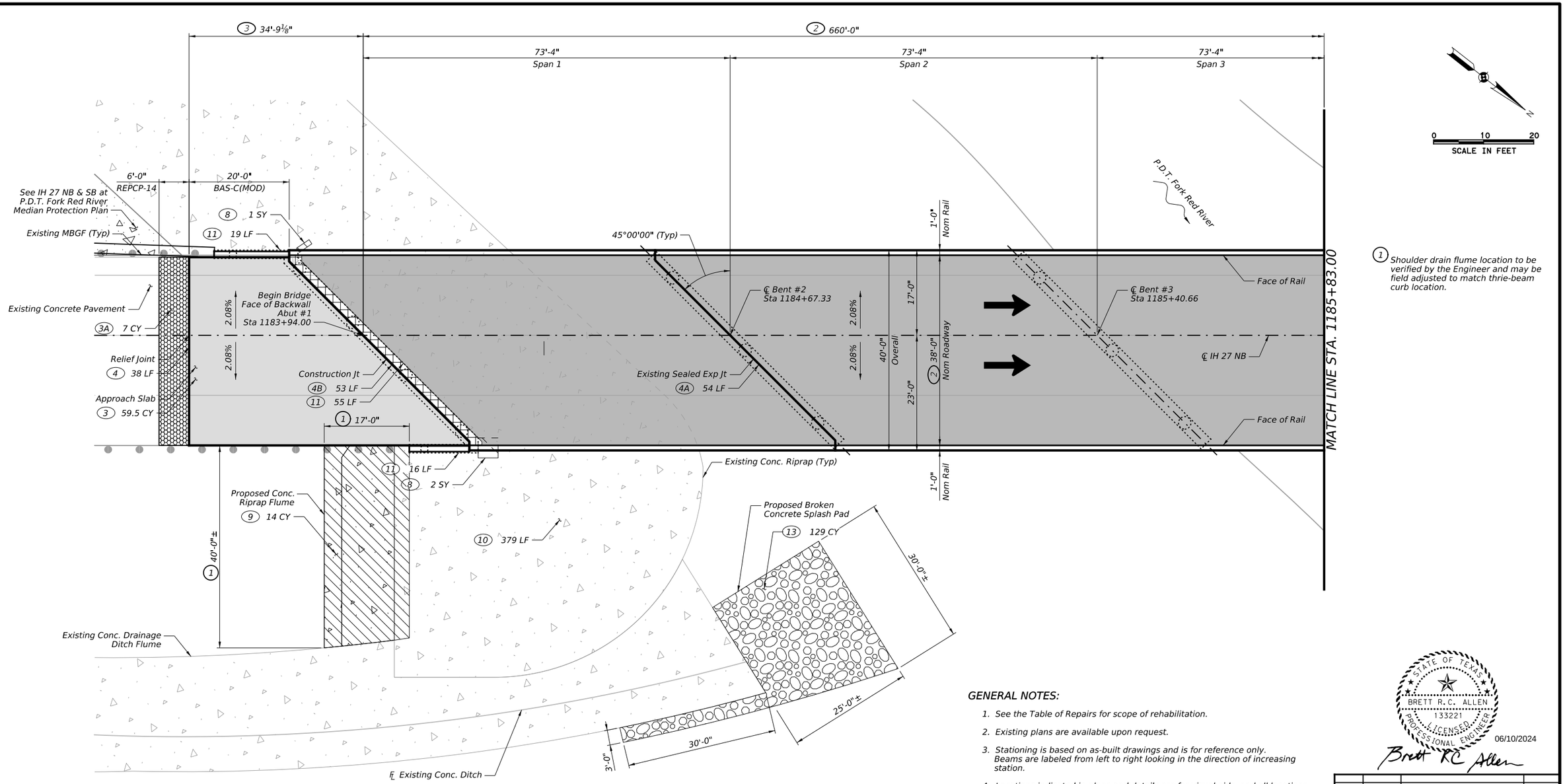
AJS	LJG	JCH	LJG



1 Shoulder drain flume location to be verified by the Engineer and may be field adjusted to match thrie-beam curb location.

PLAN

GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request.
3. Stationing is based on as-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids, and all locations shall be approved by the Engineer prior to beginning repair work. Field verify limits and quantities with the Engineer. Payment will be for the field measured repair at the unit price bid.
5. Refer to Traffic Control Plans and Roadway Plans for information not shown.

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay and install PPC Overlay
- Approach Slab Removal & Replacement
- Existing Pavement Removal & Replacement
- Conc Riprap Repair
- Riprap Stone Protection
- Full Depth Deck Joint Repair

(XX) XX XX
- XX XX — Repair Quantity Unit
- Estimated Repair Quantity At Each Location
- Repair No. - See Table of Repairs

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REF 10: NBI# 04-191-0-0067-17-143

SCALE:1"=20' SHEET 1 OF 4

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		147

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FINAL SUBMITTAL (100%)

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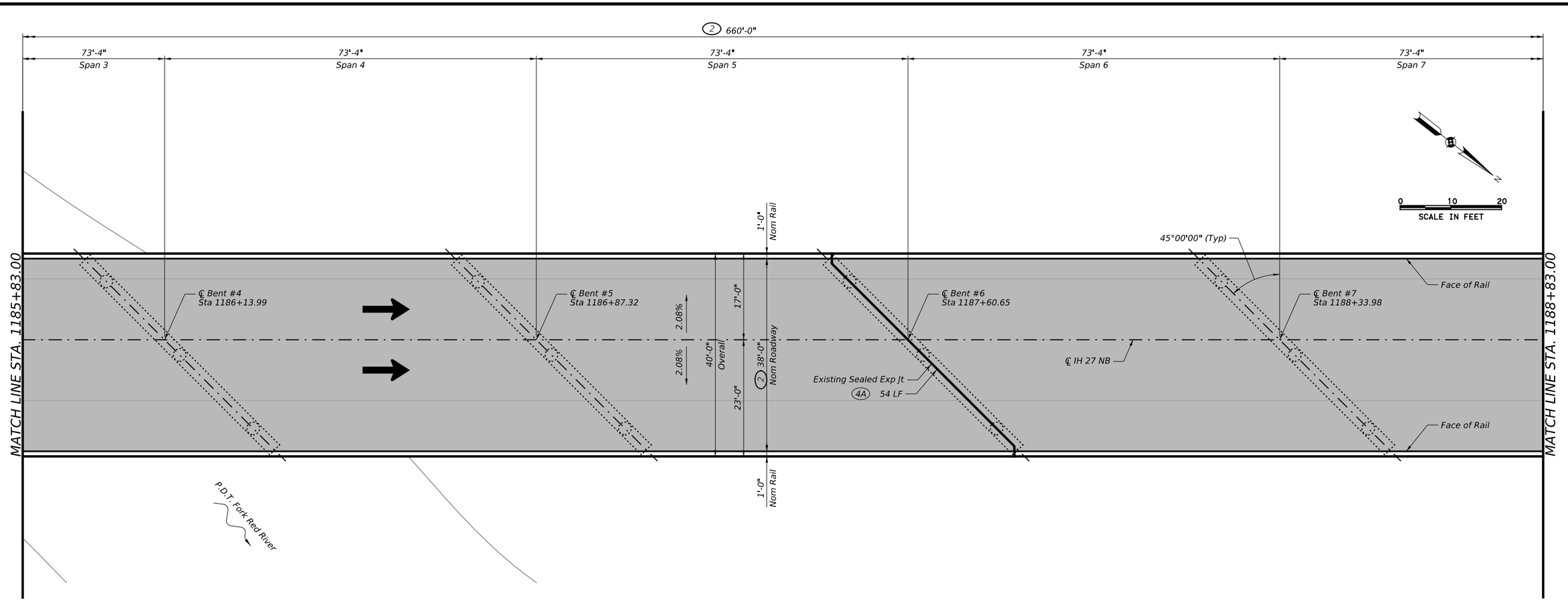
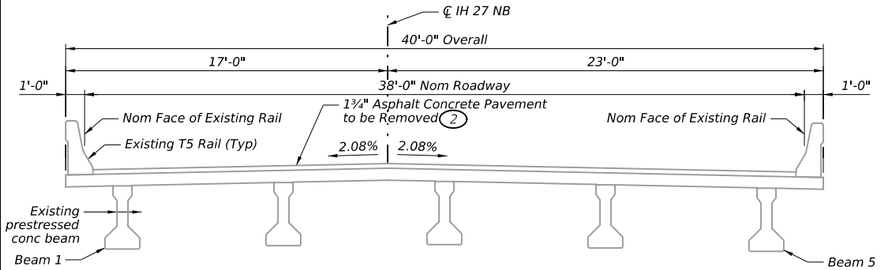
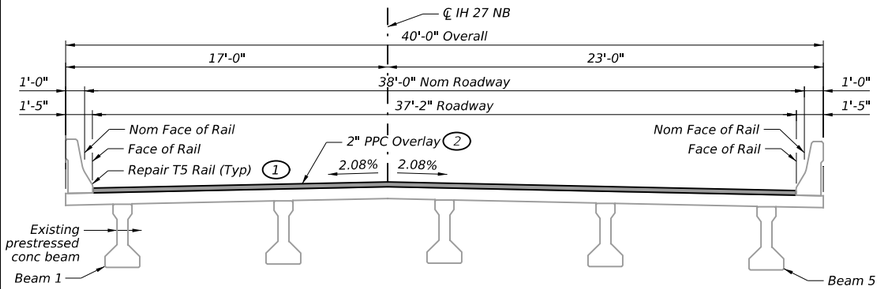


PLAN



EXISTING TYPICAL SECTION



PROPOSED TYPICAL SECTION

REPAIR CALL-OUT LEGEND

Plane Asphalt Overlay and install PPC Overlay

(XX) XX XX
- Repair Quantity Unit
- Estimated Repair Quantity At Each Location
- Repair No. - See Table of Repairs

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REF 10: NBI# 04-191-0-0067-17-143

SCALE:1"=20' SHEET 2 OF 4

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		148

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FINAL SUBMITTAL (100%)

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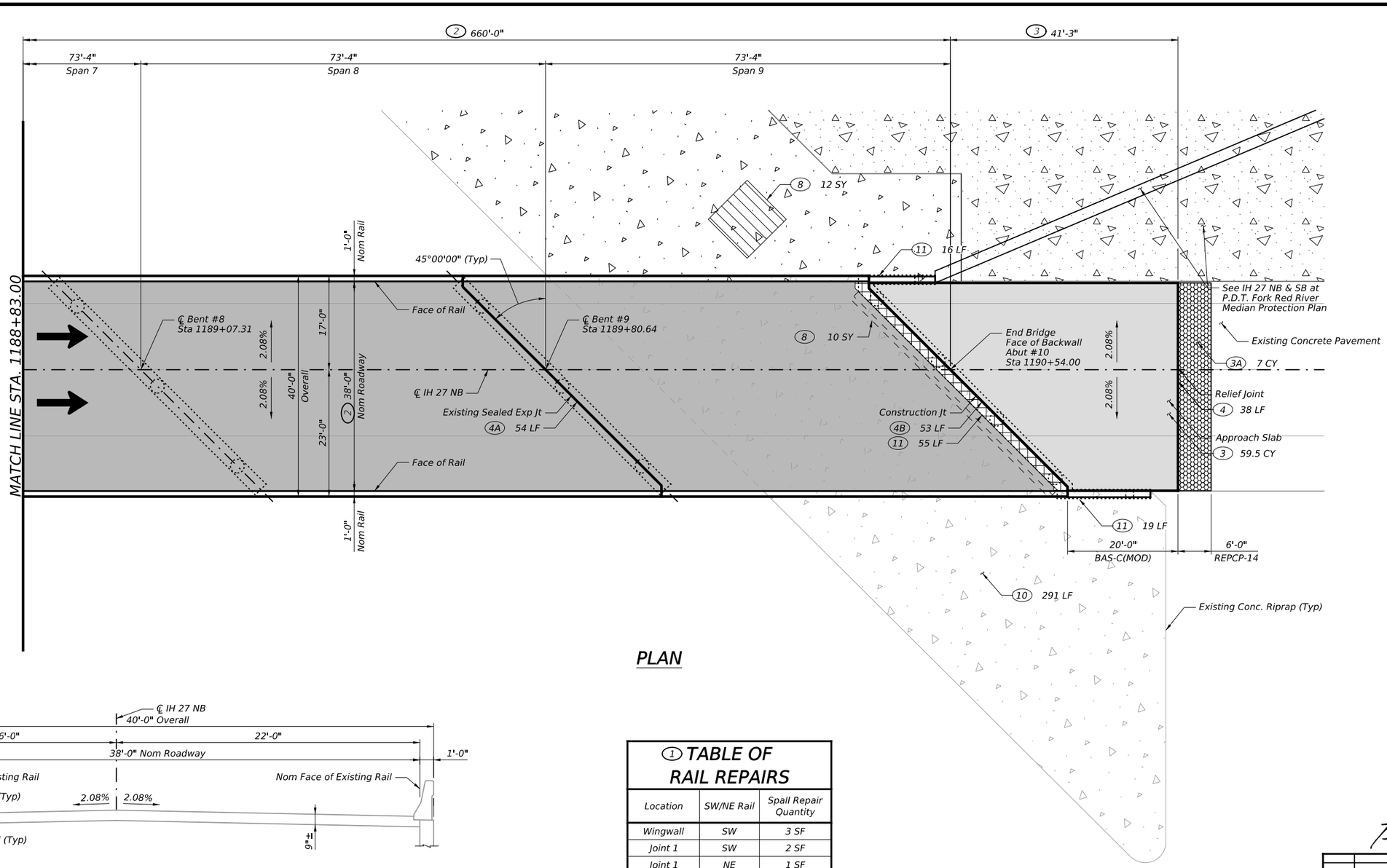
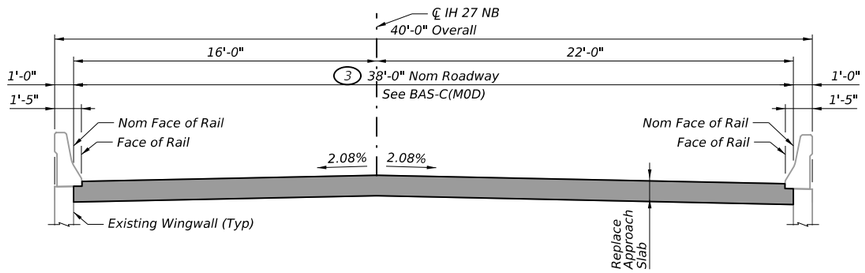


PLAN

EXISTING TYPICAL SECTION-APPROACH SLAB



PROPOSED TYPICAL SECTION-APPROACH SLAB

1 TABLE OF RAIL REPAIRS

Location	SW/NE Rail	Spall Repair Quantity
Wingwall	SW	3 SF
Joint 1	SW	2 SF
Joint 1	NE	1 SF
⅓ Span 1	NE	1 SF
Joint 2	NE	1 SF
Joint 4	SW	2 SF
Joint 4	NE	1 SF
¼ Span 4	SW	2 SF
Joint 5	SW	2 SF
Joint 6	SW	2 SF
Joint 7	SW	1 SF
Joint 7	NE	2 SF
⅓ Span 7	NE	4 SF
⅓ Span 8	NE	1 SF
Joint 10	SW	3 SF
Joint 10	NE	3 SF
TOTAL		31 SF

REPAIR CALL-OUT LEGEND

- Plane Asphalt Overlay and install PPC Overlay
- Approach Slab Removal & Replacement
- Existing Pavement Removal & Replacement
- Conc Riprap Repair
- Full Depth Deck Joint Repair

(XX) XX XX
- Repair Quantity Unit
- Estimated Repair Quantity At Each Location
- Repair No. - See Table of Repairs

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SCALE:1"=20' SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		149

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FINAL SUBMITTAL (100%)

DW:	CK:	DW:	CK:
AJS	LJG	JCH	LJG

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	ITEM CODE	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
1	Repair the spall/delaminations on the rails. See Table of Rail Repairs for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	31	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
2	Plane asphalt overlay a constant thickness of 1.75 in. and place Polyester Polymer Concrete (PPC) overlay. Assumed allowance of 740 SF (3% of deck area) for partial-depth deck repairs and 250 SF (1% of deck area) for full-depth deck repairs are provided to be used as directed by Engineer. See repair plan for locations.	354-7032	PLANE ASPH CONC PAV(0" TO 2")	2726	SY	See the Bridge Deck Overlay Notes sheet for details.
		429-7003	CONC STR REPAIR(DECK REP(PART DEPTH))	740	SF	Repair as partial-depth deck repairs per the TxDOT Concrete Repair Manual, Chapter 3, Section 4.
		429-7005	CONC STR REPAIR(DECK REP (FULL DEPTH))	250	SF	Repair as full-depth deck repairs per the TxDOT Concrete Repair Manual, Chapter 3, Section 4.
		439-7017	POLYESTER POLYMER CONC OVERLAY (2")	2706	SY	See the Bridge Deck Overlay Notes sheet for details.
3	Remove and replace approach slabs. Concrete shall be salvaged and used as broken concrete for bid item 432 7043, "Riprap (Stone Protection)(18 in)" on this bridge and adjacent IH 27 SB bridge. See repair plan for locations.	496-7022	REMOV STR (APPROACH SLAB)	2	EA	See the BAS-C(MOD) standard sheet for details. Proposed reinforcing shall be epoxy coated.
		422-7013	APPROACH SLAB	119	CY	
3A	Remove and replace existing CRCP to accommodate construction of proposed support slab. Perform work in conjunction with Repair 3. See repair plan for locations.	361-7004	FULL - DEPTH REPAIR CRCP (9")	14	CY	See the REPCP-14 standard sheet for details.
4	Clean and seal relief joints. See repair plan for locations.	438-7010	CLEANING AND SEALING JOINTS (FOAM)	76	LF	See the Cleaning and Sealing Existing Bridge Joints sheet for details.
4A	Clean and seal expansion joints with bonded strip seal. See repair plan for locations.	438-7001	CLEANING AND SEALING EXISTING JOINTS	162	LF	See the Cleaning and Sealing Existing Bridge Joints (Strip Seal) sheet for details.
4B	Repair deck portion of the construction joints at the abutments. Deck joint replacement limits are from gutter line to gutter line. See repair plan for locations.	785-7001	BRIDGE JOINT REPAIR (CONCRETE)	106	LF	See Construction Joint Repair Details on the Joint Replacement Details sheet.
5	Repair the spalls/delaminations in the deck soffit. See Table of Deck Soffit Repairs for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	76	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
6	Repair the spalls/delaminations in the beams. After making repairs to the beams, waterproof beam ends under expansion joints. See Table of Beam Repairs for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	11	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
		427-7005	EPOXY WATERPROOF FINISH (TY X)	540	SF	See the Typical Prestressed Beam detail on the Waterproofing Details sheet.
7	Repair the spalls/delaminations in the substructure. See Substructure Repair Isometrics sheet for locations.	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	37	SF	Repair as intermediate spalls per the TxDOT Concrete Repair Manual, Chapter 3, Section 2.
8	Remove and replace concrete riprap. Where voids are present, fill with flowable backfill before replacing concrete riprap. A quantity allowance of 8 CY of flowable backfill is provided to be used as directed by the Engineer. See repair plan for locations.	104-7006	REMOV CONC (RIPRAP)	25	SY	See the Concrete Riprap Repair Details sheet.
		401-7001	FLOWABLE BACKFILL	8	CY	
		432-7002	RIPRAP (CONC)(5 IN)	4	CY	
9	Install shoulder drain flume at Abutment 1. As part of installation, place concrete riprap in unpaved area between the flume and existing riprap. See repair plan for locations.	104-7006	REMOV CONC (RIPRAP)	15	SY	See the SD-EBR(MOD) standard sheet for details.
		432-7002	RIPRAP (CONC)(5 IN)	14	CY	
10	Clean and seal joints between riprap and cracks in riprap. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	670	LF	See the Concrete Riprap Crack Sealing Details sheet.
11	Clean and seal joints between riprap and abutment/wingwalls. Additionally, install flashing. See repair plan for locations.	713-7004	CRACK CLEANING AND SEALING (JCP)	180	LF	See the Joint Seal Flashing Details sheet.
12	Apply Waterproofing to all faces of abutments and bent caps. See Substructure Concrete Waterproofing Table on the Waterproofing Details sheet.	427-7005	EPOXY WATERPROOF FINISH (TY X)	1758	SF	See the Waterproofing Details sheet.
13	Install broken concrete splash pad at end of existing drainage ditch flume using material from approach slab removal. See repair plan for location.	432-7043	RIPRAP (STONE PROTECTION)(18 IN)	129	CY	Plan dimensions shown for pad are approximate. See Stone Riprap at Drainage Ditch Flume Details on the Erosion Repair Details sheet.

5 TABLE OF DECK SOFFIT REPAIRS

Span	Transverse Location	Location	Spall Repair Quantity
1	W Overhang	Abutment 1	9 SF
	E Edge	Abutment 1	2 SF
	W Edge	Drain Slot 5	3 SF
2	E Edge	Bent 2	1 SF
3	E Edge	Drain Slot 2	3 SF
4	W Overhang	Bent 4	10 SF
	E Edge	Drain Slot 1	3 SF
5	W Edge	Drain Slot 1	2 SF
	W Edge	Bent 6	4 SF
8	E Edge	Drain Slot 2	3 SF
	E Edge	Drain Slot 3	3 SF
	E Edge	Drain Slot 7	3 SF
9	W Overhang	Bent 9	2 SF
	E Overhang	Bent 9	1 SF
	E Overhang	Drain Slot 8	3 SF
	E Overhang	Drain Slot 9	3 SF
	W Edge	Drain Slot 3	4 SF
	W Edge	Drain Slot 4	4 SF
	W Edge	Drain Slot 7	4 SF
	W Edge	Drain Slot 8	4 SF
	W Edge	Drain Slot 9	4 SF
	W Overhang	Abutment 10	1 SF
TOTAL			76 SF

6 TABLE OF BEAM REPAIRS

Span	Beam	Location	Spall Repair Quantity
1	1	Abutment 1	1 SF
	5	Abutment 1	1 SF
2	3	Bent 3	1 SF
3	3	Bent 3	2 SF
	5	Bent 3	1 SF
5	1	Bent 5	1 SF
	5	Bent 5	1 SF
	1	Bent 6	1 SF
9	1	Bent 9	1 SF
	1	Abutment 10	1 SF
TOTAL			11 SF

All beam ends are Type C Beams. Provide 1.5 LF of waterproofing at each end (including the end face of beam) under all proposed expansion joints. These include Bents 2, 6, & 9. There is 18 SF of waterproofing per beam end and 30 beam ends, resulting in a total of 540 SF.

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SHEET 4 OF 4

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DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		150

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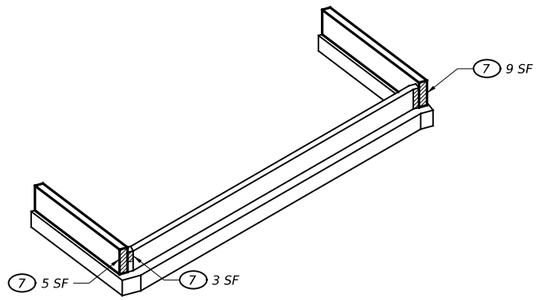
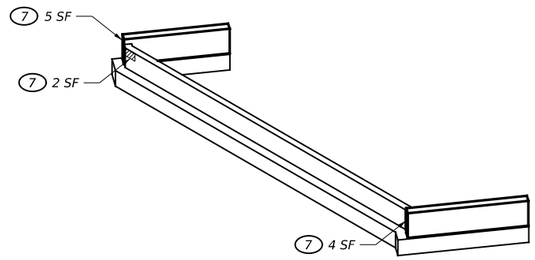
DW:	CK	DW:	CK
AJS	LJG	JCH	LJG



WEST FACE
Looking Northeast

ABUTMENT 1



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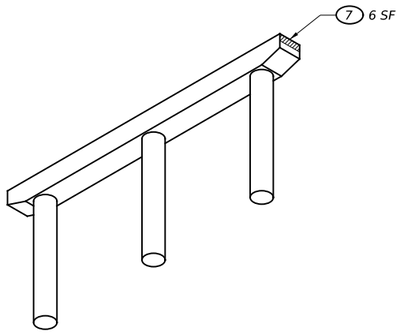
Looking Northwest

ABUTMENT 10



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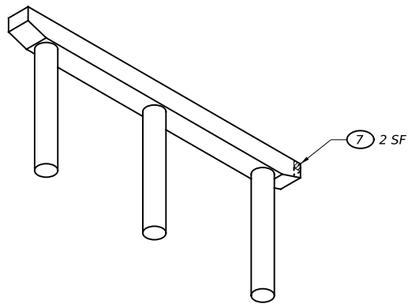

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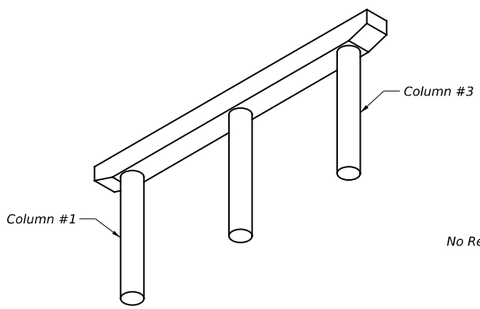
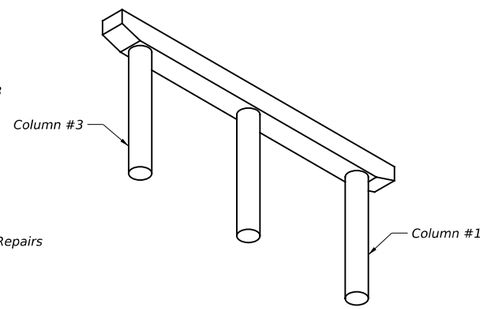
Looking Northeast

BENT 2



EAST FACE
Looking Northwest

No Repairs



WEST FACE
Looking Northeast

BENT 3

SUBSTRUCTURE REPAIR ISOMETRICS

REPAIR CALL-OUT LEGEND

- Spall/Delamination Repair
- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED
PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

IH 27 NB
AT P.D.T. FORK RED RIVER
SUBSTRUCTURE REPAIR ISOMETRICS

REF 10: NBI# 04-191-0-0067-17-143

SCALE: N.T.S.

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		151

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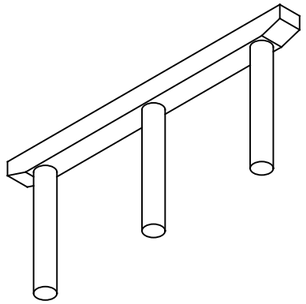
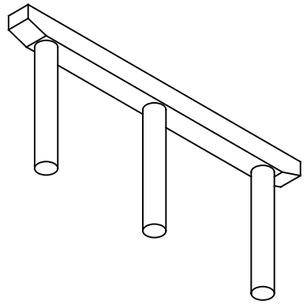


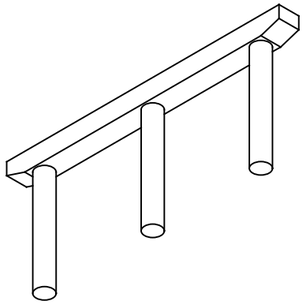
No Repairs

EAST FACE
Looking Northwest



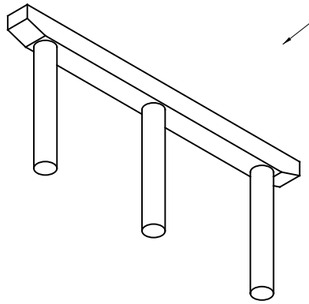
WEST FACE
Looking Northeast

BENT 4



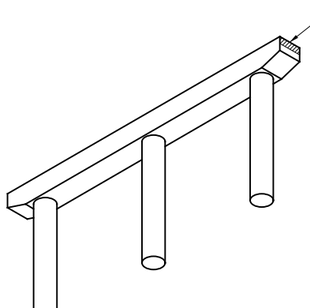
No Repairs

EAST FACE
Looking Northwest



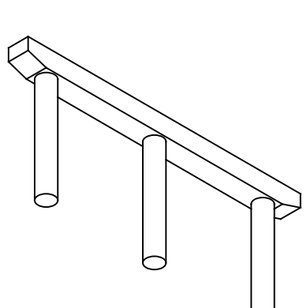
WEST FACE
Looking Northeast

BENT 7



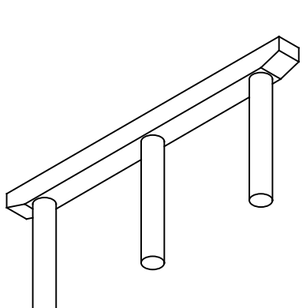
No Repairs

EAST FACE
Looking Northwest



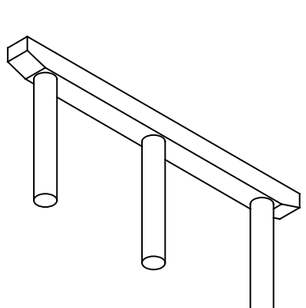
WEST FACE
Looking Northeast

BENT 5



No Repairs

EAST FACE
Looking Northwest



WEST FACE
Looking Northeast

BENT 8

EAST FACE
Looking Northwest

WEST FACE
Looking Northeast

BENT 6

No Repairs

EAST FACE
Looking Northwest

WEST FACE
Looking Northeast

BENT 9

REPAIR CALL-OUT LEGEND

SUBSTRUCTURE REPAIR ISOMETRICS

06/10/2024

Brett RC Allen

NO.	DATE	REVISION	APPR BY

HDR Engineering, Inc
Firm Registration No. F-754
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Dallas, Texas 75248
972.960.4400

Texas Department of Transportation

IH 27 NB
AT P.D.T. FORK RED RIVER
SUBSTRUCTURE REPAIR ISOMETRICS

REF 10: NBI# 04-191-0-0067-17-143

SCALE: N.T.S.

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC.	SH 136, ETC.
DIST	COUNTY		SHEET NO.
AMA	HUTCHINSON, ETC.		152

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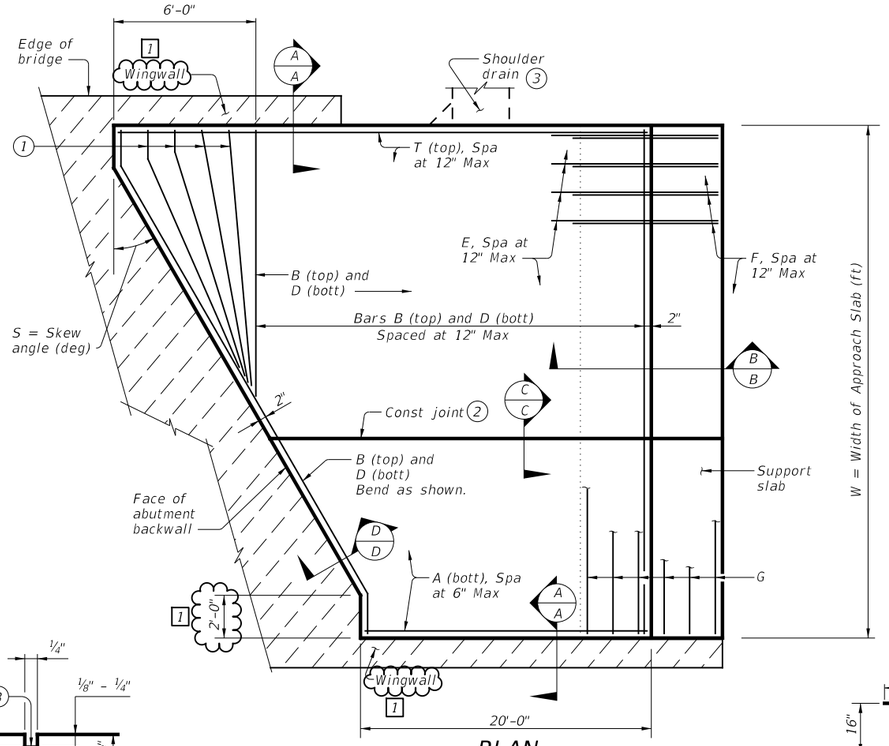
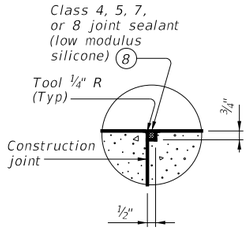
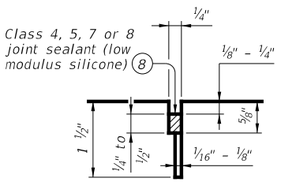


PLAN



SEALED CONSTRUCTION JOINT DETAIL



LONGITUDINAL SAW CUT JOINT DETAIL

BAR TABLE	
BAR	SIZE
A	#8
B	#5
D	#5
E	#5
F	#5
G	#5
T	#5

APPROXIMATE QUANTITIES 4

Reinf steel weight = 8.5 Lbs/SF of Approach Slab
= 18.4 Lbs/LF of Support Slab

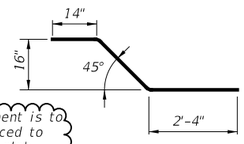
Vol of Appr Slab Conc (CY) = 1.057W – 0.008W x T + 0.02W² Tan S
(Includes Support Slab)

W = Width of Approach Slab (ft)

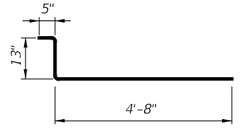
T = Conc Pavement Thickness (in)

S = Skew Angle (deg)

1. Flare Bars B and D in this region (1'-6" Max Spa, 3" Min Spa). Minimum flared bar length = 2'-6". Bend bars as necessary.
2. Provide longitudinal construction joints that align with longitudinal construction joints in the bridge slab with bridges built in stages. Other longitudinal construction joints must receive approval of the Engineer.
3. See details elsewhere in plans for shoulder drain location and details.
4. For Contractor's information only. Quantities shown are for one approach slab only.
5. On portion of support slab that supports the concrete pavement, adjust top surface elevation, if required, to accommodate concrete pavement thickness. Smooth trowel finish. Place two layers of 30# roofing felt.
6. Multiple piece tie bars are acceptable at longitudinal construction joints provided minimum laps shown are achieved.
7. See details elsewhere in plans for required cross-slope.
8. Place in accordance with Item 438.
9. Provide backer rod that is 25% larger than joint opening and compatible with the sealant.
10. If bridge rail is present at the wingwall or CIP retaining wall, place ½" rebonded recycled tire rubber between concrete railing and top of approach slab as shown when concrete railing projects over the approach slab.



BARS E (#5)



BARS F (#5)

GENERAL NOTES:

Construct approach slab in accordance with Item 422.

Provide Class "S" concrete with a minimum compressive strength of 4,000 psi.

Provide Grade 60 reinforcing steel.

Provide longitudinal joints as shown on the Longitudinal Saw Cut Joint Detail at lane lines and shoulders when width between longitudinal construction joints or edges of approach slab exceeds 16 feet. Saw cut joints within 24 hours of concrete placement to a depth of 1 ½" and seal in accordance with Item 438. Alternately, provide a controlled joint consisting of 1 ½" vinyl or plastic joint former (Stress Cap, Zip Strip, Stress Lock, or equal as approved by the Engineer.)

Provide rebonded recycled tire rubber joint filler that meets the requirements of DMS-6310. "Joint Sealants and Fillers."

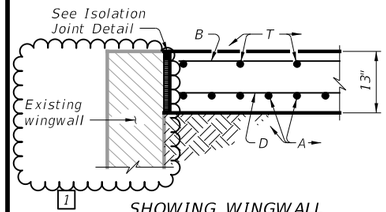
Construct the subgrade or subbase away from the bridge for a minimum distance of 100 feet prior to the approach slab, unless otherwise indicated on the plans.

Compact and finish the subgrade or foundation for the approach slab to the typical cross-section and to the lines and grades shown on the plans.

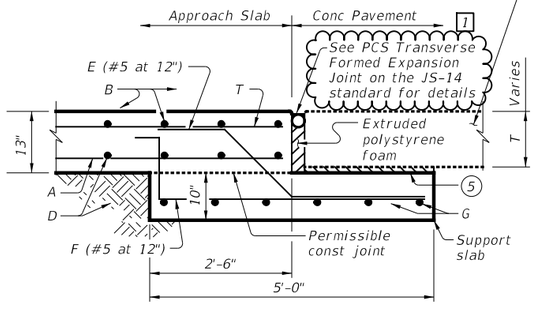
Cure for 4 days using water or membrane curing per Item 422.

All details shown herein are subsidiary to bridge approach slab.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

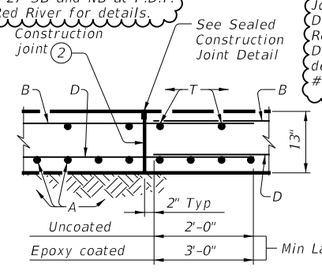


SHOWING WINGWALL

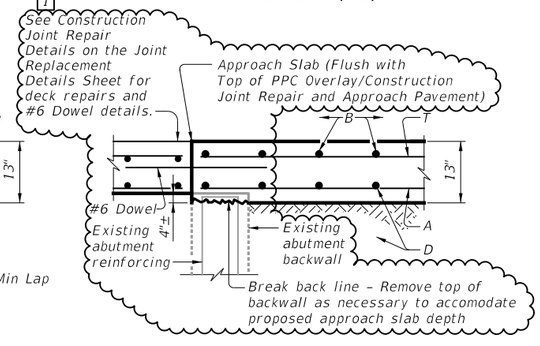


SECTION A-A

SECTION B-B



SECTION C-C 6



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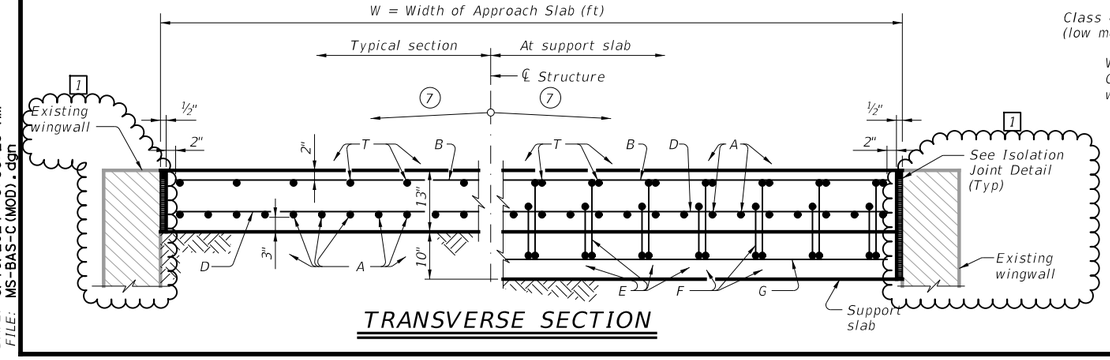
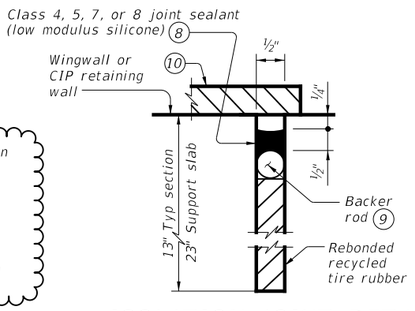


TRANSVERSE SECTION



ISOLATION JOINT DETAIL

HDR
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17111 Preston Road, Suite 300
Dallas, Texas 75248-1229
972.960.4400

STATE OF TEXAS
BRETT R.C. ALLEN
133221
LICENSED PROFESSIONAL ENGINEER
06/10/2024

Brett RC Allen

1 BRA 6/10/24
Updated to show skewed option only, existing backwall demolition, and const. jt. condition

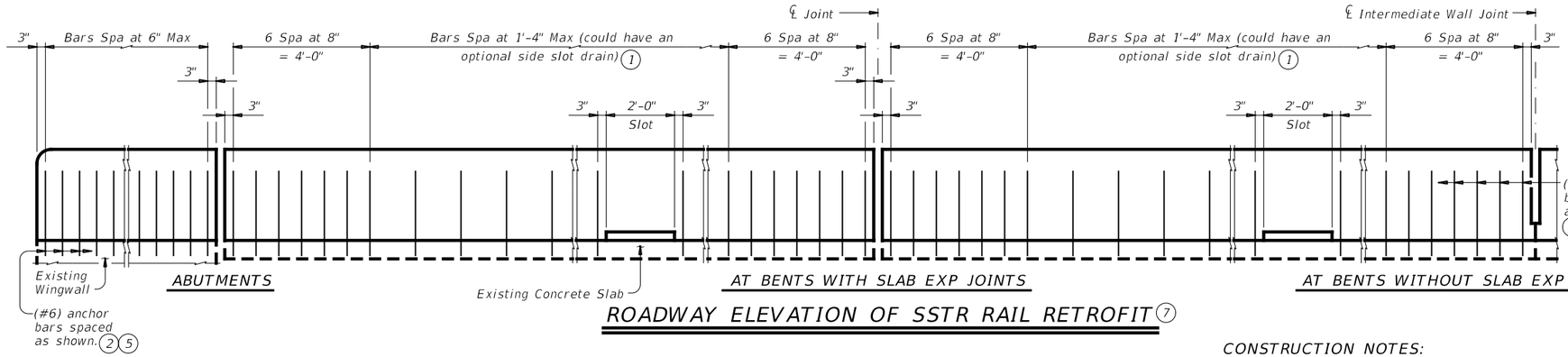
Texas Department of Transportation

Bridge Division Standard

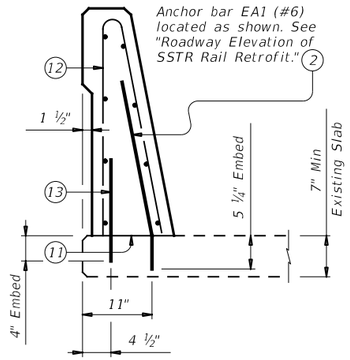
BRIDGE APPROACH SLAB
CONCRETE PAVEMENT

BAS-C(MOD)

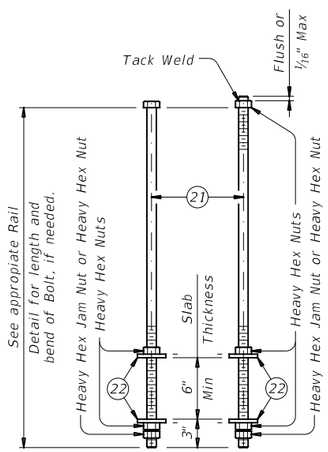
FILE: MS-BAS-C(MOD).dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		153



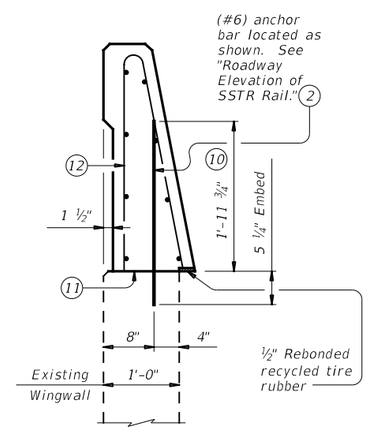
ROADWAY ELEVATION OF SSTR RAIL RETROFIT (7)



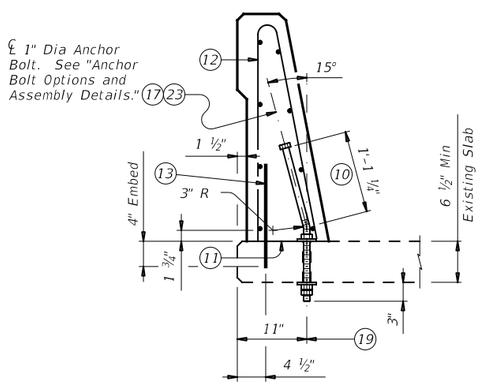
RAIL RETROFIT SECTIONS ON CONCRETE SLABS USING ADHESIVE ANCHORS (9)



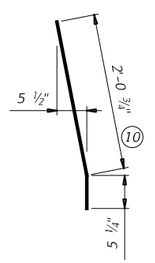
ANCHOR BOLT OPTIONS AND ASSEMBLY DETAILS (23)



RAIL RETROFIT SECTIONS ON WINGWALLS USING ADHESIVE ANCHORS (9)



RAIL RETROFIT SECTIONS ON SLABS USING ANCHOR BOLTS (20)



ANCHOR BAR EA1 (#6)

CONSTRUCTION NOTES:

Field verify dimensions before commencing work and ordering materials.

By adding additional anchorage, welding can be performed at a minimum spacing of 3 ft between the cage and additional anchorage. By satisfying additional anchorage requirements slip forming is allowed. Do not weld to the required anchorage.

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as 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:

Use of these retrofit details will result in a railing acceptable for the MASH Test Level indicated on the applicable rail standard.

Rail anchorage details shown on this guide may require modification for select structure types. See appropriate details elsewhere in plans for these modifications. Not all possible combinations of existing railing, curbs, parapets etc. have been shown on this sheet. Other combinations and reinforcement arrangements are permissible if they meet the same strength requirements as indicated on this guide.

Do not remove any part of a curb until it has been evaluated to not be a load-carrying structural component.

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

Payment for a rail retrofit will be as per Item 451, "Retrofit Railing", by the type of the rail retrofit. All details shown herein are subsidiary to rail retrofit.

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

(1) When side slot drains are used, provide 8'-0" Min clear spacing between drain slots.

(2) 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".

(5) See SSTR Rail Sections in "Rail Retrofit Section on Wingwalls using Adhesive Anchors" and/or "Rail Retrofit Section on Concrete Slabs using Adhesive Anchors."

(7) Showing spacing of (#6) adhesive anchor in a rail retrofit condition. Secondary (#4) adhesive anchor in a rail retrofit not shown for clarity. Reinforcing steel and terminal connections not shown for clarity. See rail standard for details and notes not shown.

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

(10) 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.

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

(12) See appropriate rail standard for reinforcing steel. Modify length of vertical reinforcing bars as required to fit existing structure. Longitudinal reinforcing bars may be removed only if their position puts them in conflict with un-removed portions of existing structure.

(13) Embed secondary (#4) anchor bars 1'-4" in length with a Type III Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 4". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 10 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". (#4) anchor bars spaced longitudinally along rail at 4 ft Max (Spaced 3" longitudinally from outside edge and edge of side slot drains).

(17) ℄ 1" Dia Anchor Bolt Spaced longitudinally along rail at 24" Max (Spaced 6" longitudinally from outside edge and edge of optional side slot drains, if required).

(19) ℄ 1 1/16" to 1 ¼" Dia holes. Core drill holes through existing deck (percussion drilling not permitted). Concrete spalls in the bottom of the deck exceeding ½" from edge of holes will be patched in accordance with Item 429, "Concrete Structure Repair" at the Contractor's expense.

(21) ℄ 1" Dia ASTM F1554 Gr 55 Anchor Bolt or Threaded Rod. Nuts must conform to ASTM A563 requirements.

(22) Plate Washer ⅜ x 3 x 3 ASTM A36 with 1 1/16" Dia Hole centered.

(23) Galvanize anchor bolts, nuts and plate washers.

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Dallas, Texas 75248-1229
972.960.4400

STATE OF TEXAS
BRETT R. C. ALLEN
133221
LICENSED PROFESSIONAL ENGINEER
06/10/2024

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

RETROFIT GUIDE FOR CONCRETE RAILS (SSTR)

C-RAIL-R(MOD)

FILE: RL-C-RAIL-R(MOD).dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
02-24: Updated to show only applicable SSTR options	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		154

DATE: 6/8/2024 1:17:24 PM
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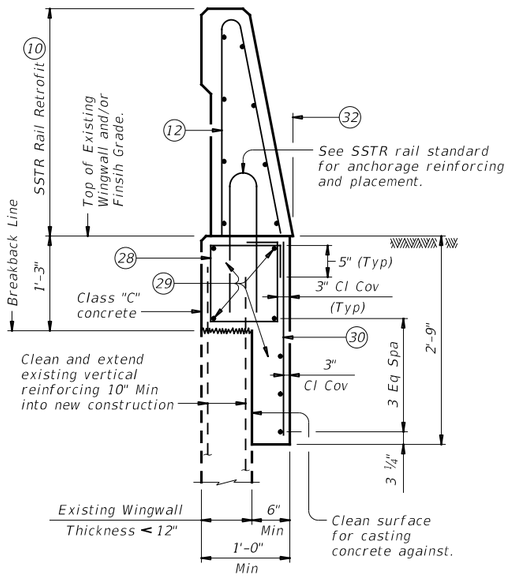
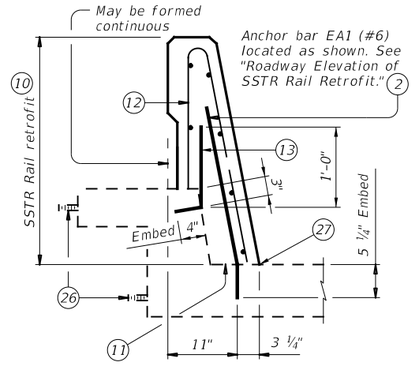


SECTION OF EXISTING PARALLEL WINGWALLS LESS THAN 12" THICK



RAIL RETROFIT SECTIONS ON CONCRETE ⑨ CURBS USING ADHESIVE ANCHORS

(2) 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".

(10) 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.

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

(12) See appropriate rail standard for reinforcing steel. Modify length of vertical reinforcing bars as required to fit existing structure. Longitudinal reinforcing bars may be removed only if their position puts them in conflict with un-removed portions of existing structure.

(13) Embed secondary (#4) anchor bars 1'-4" in length with a Type III Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 4". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 10 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". (#4) anchor bars spaced longitudinally along rail at 4 ft Max (Spaced 3" longitudinally from outside edge and edge of side slot drains).

(26) Remove existing rail, cut and grind anchor bolts flush, and paint ends with two coats of zinc-rich paint conforming to the Item "Galvanizing."

(27) Void out area in rail retrofit to accommodate existing drain holes in deck.

(28) Space (#4) stirrups at 8" Max. (Spaced 3 1#4" longitudinally from retrofitted ends of wingwall).

(29) 7 ~ (#5) bars with 3" end cover.

(30) Space (#4) bars at 8" Max with 3" end cover, spaced with (#4) stirrups.

(32) 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.

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LICENSED PROFESSIONAL ENGINEER
06/10/2024
Brett RC Allen

Texas Department of Transportation — Bridge Division Standard

RETROFIT GUIDE FOR CONCRETE RAILS (SSTR)

C-RAIL-R(MOD)

FILE: RL-C-RAIL-R(MOD).dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
02-24: Updated to show only applicable SSTR options	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		155

DATE: 6/8/2024 1:17:25 PM
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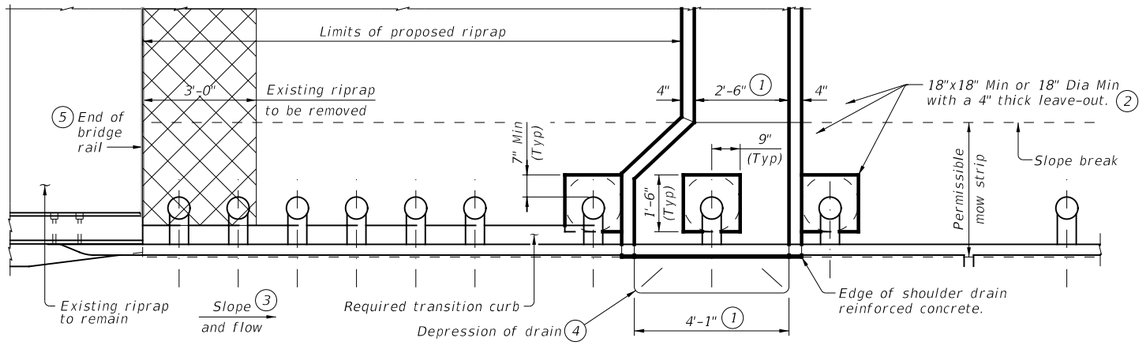
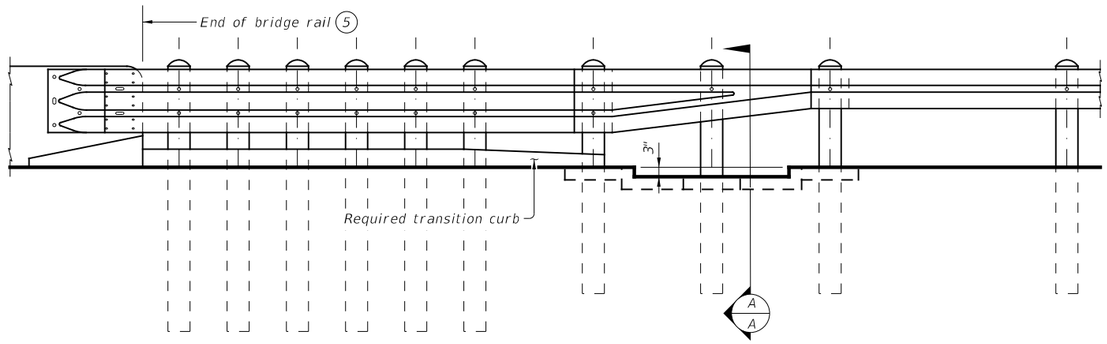
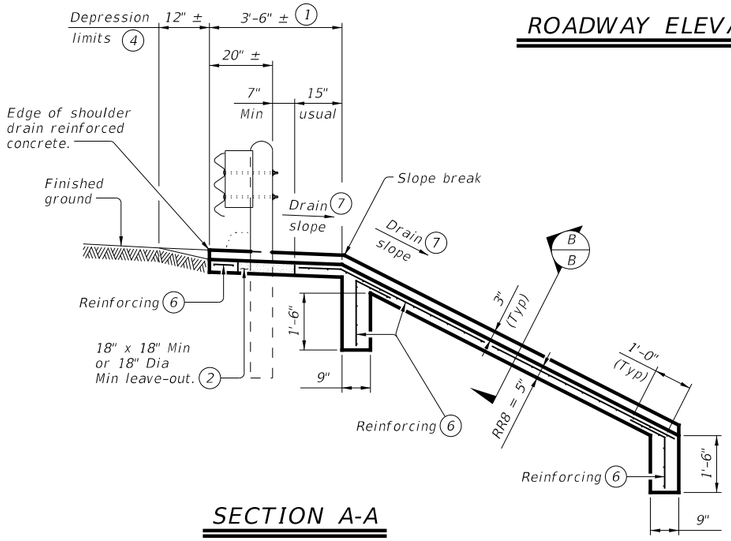


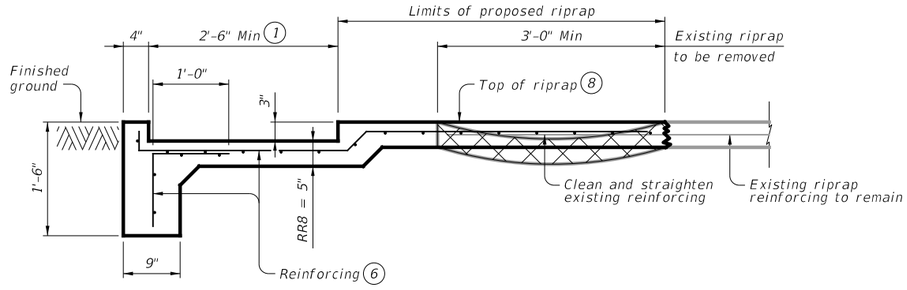
PLAN OF DRAIN WITH THRIE BEAM TRANSITION



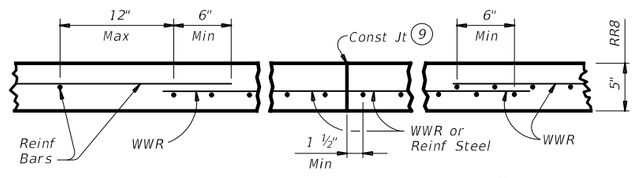
ROADWAY ELEVATION OF DRAIN WITH THRIE BEAM TRANSITION



SECTION A-A



SECTION B-B



REINFORCEMENT DETAILS 6

See General Notes for optional synthetic fiber reinforcement.

1. Use wider or other drain configurations if shown elsewhere in plans or if directed by the Engineer. Location of shoulder drain must consider limitation imposed by rail transition. Do not locate shoulder drains at expansion joints between approach slab and concrete pavement.
2. Fill leave-outs with no more than a 2-sack grout mixture (1 part cement, 5 parts water, and 14 parts sand by volume) with a 28-day compressive strength of approximately 120 psi or less. Provide grout of 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 (20" Max leave-out).
3. For other slope and flow directions drain configuration may be mirrored wider or tapered wider if shown elsewhere in the plans or directed by the Engineer.
4. Form depression into concrete, asphalt pavement, or approach slab.
5. See Bridge Layout for rail type.
6. Provide (#3) reinforcing bar at 18" spacing c-c or 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, unless shown otherwise.
7. See elsewhere in plans or as directed by the Engineer.
8. See CRR standard for details and notes not shown.
9. 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 fiber is utilized.

GENERAL NOTES:

Provide Class "B" concrete with a minimum compressive strength of 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.

See Metal Beam Guard Fence (Mow Strip) standard for details and notes not shown.

Payment for furnishing and placing 2-sack grout mixture will be subsidiary to shoulder drain.

Payment for shoulder drain will be as per Item 432, "Riprap (Conc)(5 IN)". All details shown herein are subsidiary to shoulder drain.

See Layout for limits of shoulder drain.

RR8 is to be used on stream crossings.

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06/10/2024

Brett RC Allen

SHEET 1 OF 1

Texas Department of Transportation

Bridge Division Standard

SHOULDER DRAIN AT END OF BRIDGE RAIL WITH ADDITIONAL RIPRAP

SD-EBR(MOD)

FILE: MS-SD-EBR(MOD).dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
02-24: Updated to show change in drain location and additional riprap requirements	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		156

DATE: 6/8/2024 1:17:33 PM
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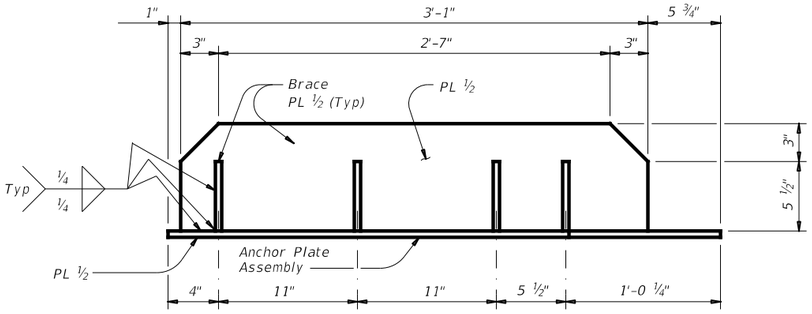
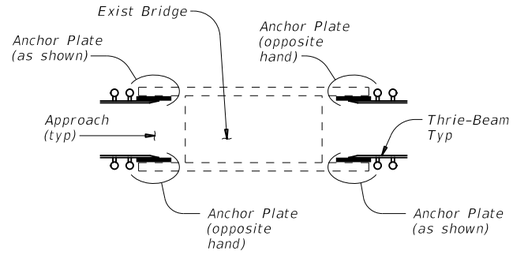
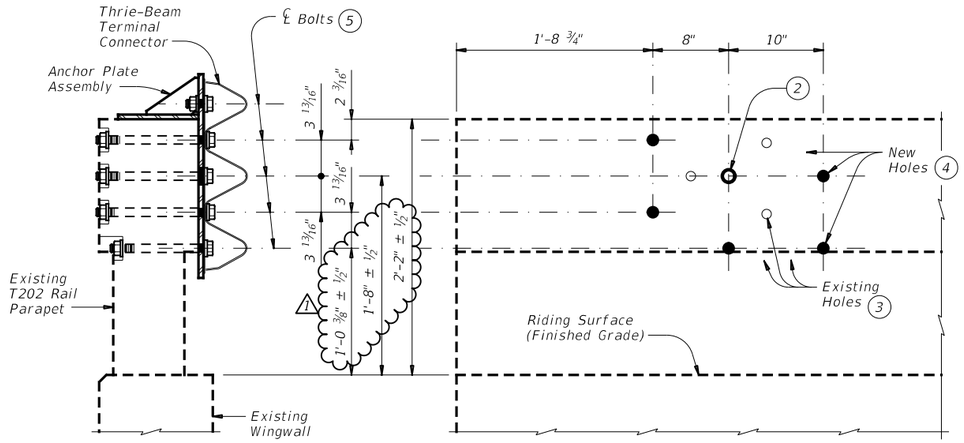


PLAN



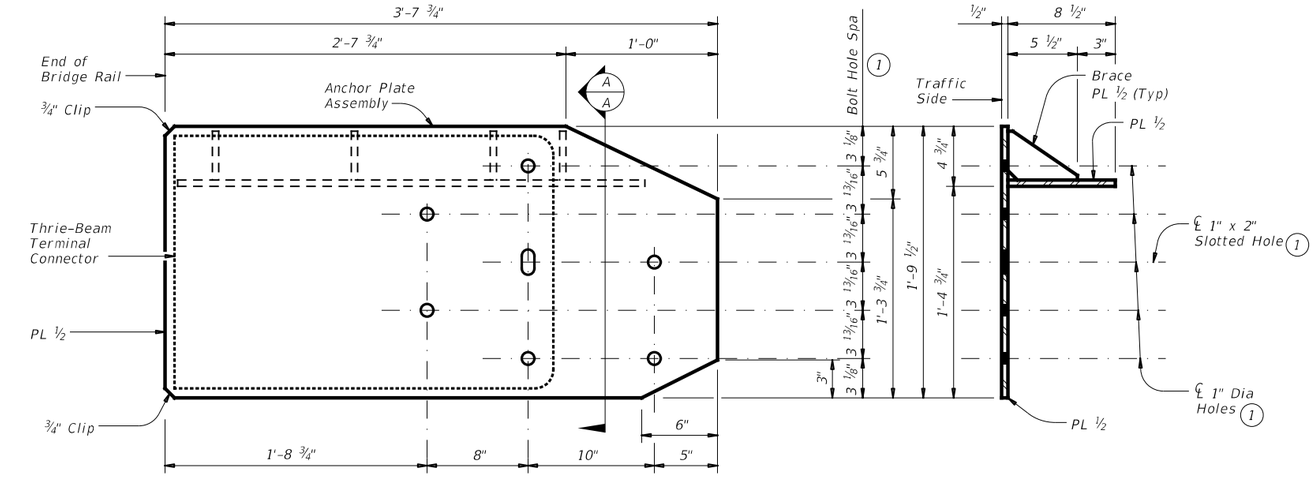
LOCATION DETAILS



SECTION
Showing completed installation

ROADSIDE ELEVATION
Anchor Plate assembly and Thrie-Beam Terminal Connector not shown for clarity

DETAILS OF BOLTS AND HOLES (1)

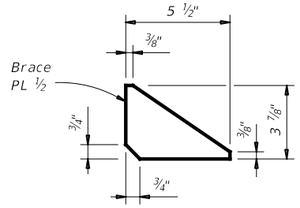


ROADSIDE ELEVATION

SECTION A-A

ANCHOR PLATE DETAILS

Anchor Plate shown is detailed for one end of one side of rail only. For other side, Anchor Plate must be built opposite hand.



BRACE PLATE DETAILS

CONSTRUCTION NOTES:

Field verify dimensions before commencing work and ordering materials.

Plugging of newly exposed existing bolt holes is not necessary except as stated here in or otherwise indicated on the plans. This work is considered subsidiary to the pertinent bid items.

Attach the MBGF Transition to the existing parapet using the Anchor Plate assembly and the Thrie-Beam Terminal Connection. Splice the Thrie-Beam Terminal Connection to the Thrie-Beam with the normal 12 connection bolts. Refer to Metal Beam Guard Fence Transition and Metal Beam Guard Fence detail sheets for additional details and information not shown herein.

MATERIAL NOTES:

Fabricate Anchor Plate assembly with steel conforming to either ASTM A36 or A572 Gr 50. Anchor Plate assembly must be free of burrs, sharp edges and weld splatter. Grind edges and corners to a 1/16" flat or radius. Hot-dip galvanize Anchor Plate assembly in accordance with Item 445, "Galvanizing." Anchor bolts, nuts, and washers must conform to Item 449, "Anchor Bolts."

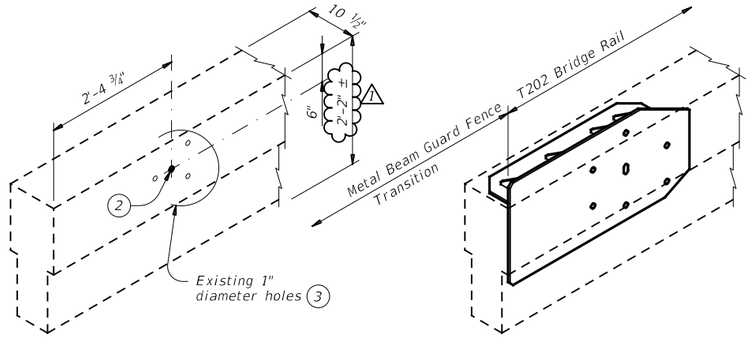
GENERAL NOTES:

These details are for retrofitting existing rails only, not new construction, with a Thrie-Beam Terminal Connection.

Shop drawings are not required for this installation.

Payment for materials, fabrication, and installation of this assembly are to be included in unit price bid in accordance with Item 540 "Mtl Bm Gd Fen Trans (Anchor Plate)."

Estimated weight of a single Anchor Plate assembly, including bolts, nuts, and washers, but not including the Thrie-Beam Terminal Connector = 190 Lbs.



EXISTING PARAPET
Shown after removal of existing MBGF Transition connector and prior to coring new bolt holes

ANCHOR PLATE PLACEMENT

(1) The Contractor must verify that locations of bolt holes match those in the Thrie-Beam Terminal Connector to be installed in that location prior to fabrication of the Anchor Plate assembly and prior to coring bolt holes in the existing T202 parapet.

(2) If the existing holes are aligned as expected, use the indicated existing 1" diameter hole in the installation of the Anchor Plate assembly and the Thrie-Beam Terminal Connector.

(3) If the existing holes are not aligned as expected, holes that cannot be utilized in the installation and are within 3" of a new bolt hole must be filled with epoxy grout prior to coring new holes.

(4) Drill new 1" diameter holes, each with a 2 ½" diameter x 1" deep recess, through existing railing parapet. Recesses are only required when pedestrian sidewalks are adjacent to back of rail unless directed otherwise by the Engineer. Holes should be perpendicular to the roadside face of the parapet. Drill holes and recesses with coring type equipment. Percussion drilling is not allowed. Patch spalls, when directed by the Engineer, in accordance with Item 429, "Concrete Structure Repair", at the contractor's expense.

(5) 7 ~ ⅞" diameter ASTM F3125 Gr A325 Hex Head Anchor Bolts each with 2 ~ 1 ¾" O.D. washers. Place washer under each head and nut. Provide bolts of sufficient length to extend a minimum of ½" beyond nut. Cut excess bolt length and paint cut surface with zinc-rich paint if directed by the Engineer.

INSTALLATION DETAILS

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06/10/2024

1. BRA 2/30/22 Updated for approximate rail heights.

Texas Department of Transportation

Bridge Division Standard

T202 TRANSITION RETROFIT GUIDE

T202TR(MOD)

FILE: RL-T202TR(MOD).dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112,ETC.	SH 136,ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON,ETC.		157

DATE: 6/8/2024 11:17:52 PM
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DATE: 6/8/2024 1:18:00 PM
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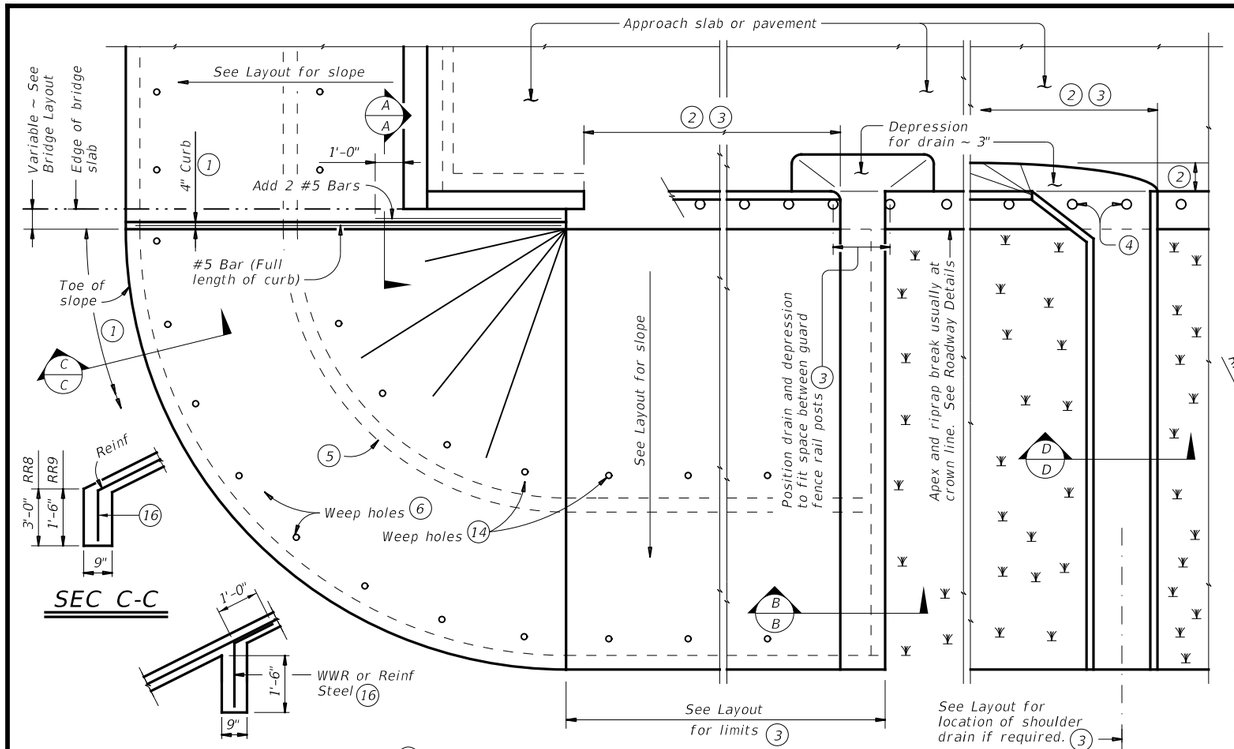
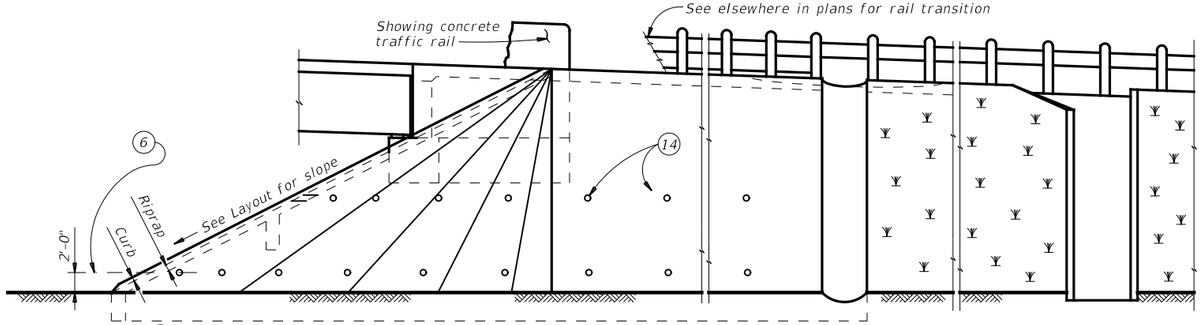


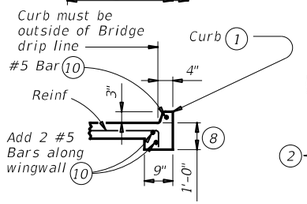
PLAN

SEC C-C

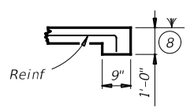
INTERMEDIATE TOEWALL



ELEVATION

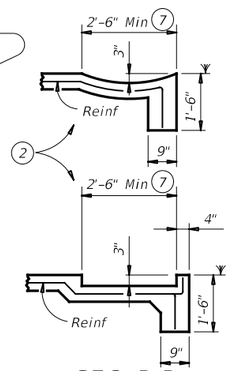


SEC A-A



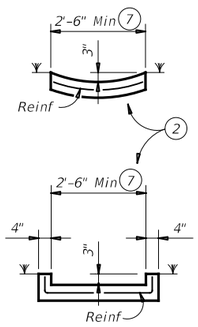
SEC B-B

(No drain)



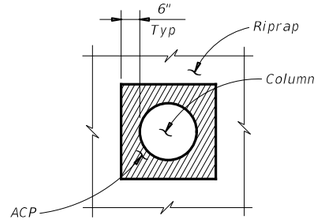
SEC B-B

(Shoulder drain integral with riprap)



SEC D-D

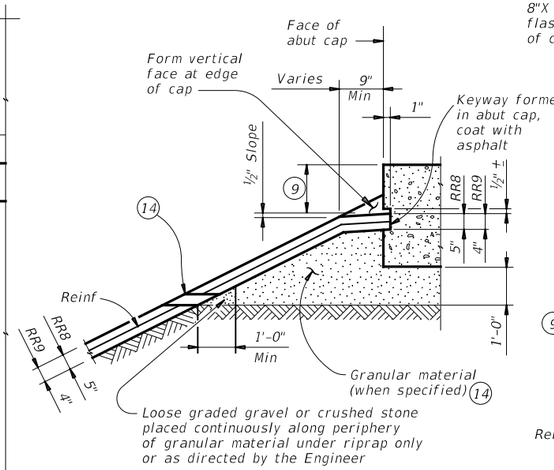
(Shoulder drain)



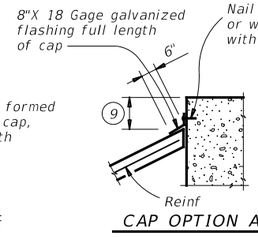
Riprap blockout to be filled with ACP. (Subsidiary to riprap)

RIPRAP DETAIL AT COLUMNS

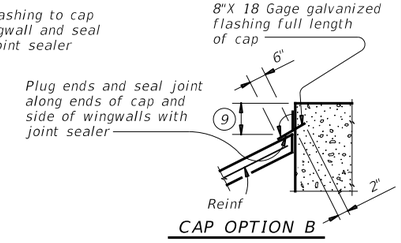
(As directed by the Engineer)



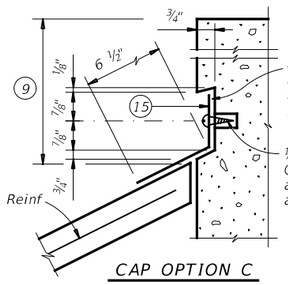
SHOWING KEYWAY OPTION



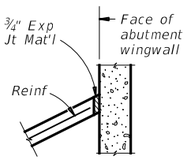
CAP OPTION A



CAP OPTION B

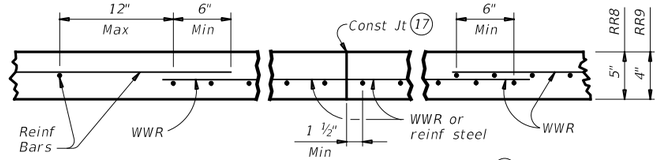


CAP OPTION C



SECT THRU RIPRAP AT WINGWALL (12)

SECTIONS THRU RIPRAP AT CAP (11)



REINFORCEMENT DETAILS (13)

See General Notes for optional synthetic fiber reinforcement.

(1) When riprap is shown extended around header on layout, extend slab and toewall as shown and eliminate 4" curb.

(2) Limits and configuration of drains and depressions are as shown elsewhere in plans or as directed by the Engineer.

(3) Location of shoulder drain must consider limitations imposed by rail transition. Do not locate shoulder drains at expansion joints between approach slab and concrete pavement.

(4) See details elsewhere in plans for installation of guard fence posts through concrete riprap.

(5) Provide intermediate toewall only when designated elsewhere in the plans or included in the specifications.

(6) Provide lower level of 2" Dia weep holes at 10' c-c backed by 1 CF packet of gravel and galvanized hardware cloth at all locations unless directed by the Engineer to eliminate.

(7) Use wider or other drain configurations if shown elsewhere in plans or if directed by the Engineer.

(8) Wall extension may be reduced or modified if approved by the Engineer. Increase wall extension to 1'-6" whenever the optional intermediate toewall is called for in the plans.

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

(10) #5 bars shown are required even when synthetic fiber reinforcing option is selected.

(11) Provide sealing option for joint between the face of cap and riprap as designated by the Engineer or as shown elsewhere on plans.

(12) Flashing (shown in Cap Option A) may be used at wingwall in addition to Exp Jt Mat'l if shown on plans or directed by the Engineer.

(13) Provide #3 reinforcing bars at 18" Spa c-c. Provide Welded Wire Reinforcement (WWR) as 6x6-D2.9xD2.9 or D3xD3. Combinations of WWR and reinforcing bars may be used if both are permitted. Use lap splices of a minimum 6 inches, measured from the transverse wire of WWR, and the ends of reinforcing bars.

(14) If granular material is specified, provide upper level of 2" Dia weep holes at 10' c-c backed by galvanized hardware cloth.

(15) 8" x 18 Gage Galv Sheet Metal

(16) Provide WWR or #3 bars, with 1'-0" extension into slope.

(17) WWR or reinforcing steel is continuous through riprap construction joints. Provide WWR or reinforcing steel that extends 1'-1" minimum into adjacent riprap on each side of construction joint even if synthetic reinforcing fiber is utilized.

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

GENERAL NOTES:

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

Provide Grade 60 reinforcing steel.

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

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

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

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

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

See Layout for limits of riprap.

RR8 is to be used on stream crossings.

RR9 is to be used on other embankments.

Texas Department of Transportation

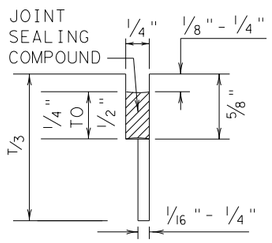
Bridge Division Standard

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

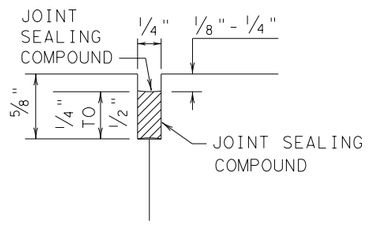
CRR

FILE: MS-CRR-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		158

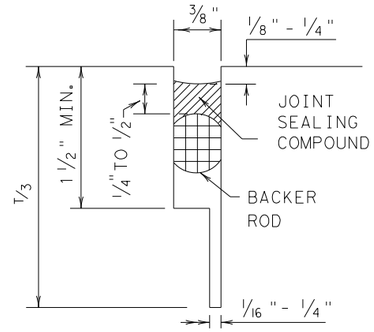
METHOD B: JOINT SEALING COMPOUND



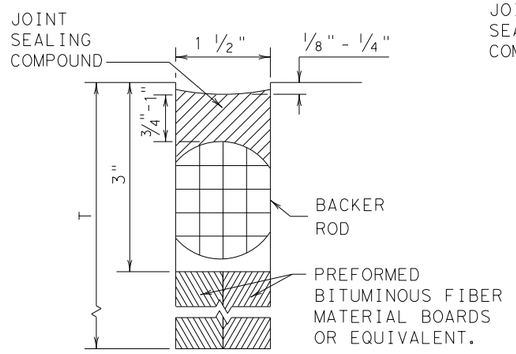
LONGITUDINAL SAWED
CONTRACTION JOINT



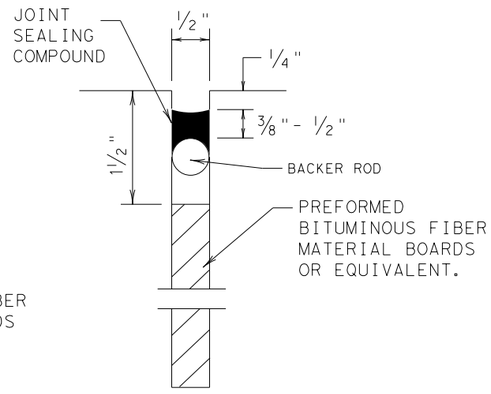
LONGITUDINAL OR TRANSVERSE
CONSTRUCTION JOINT



TRANSVERSE SAWED
CONTRACTION JOINT

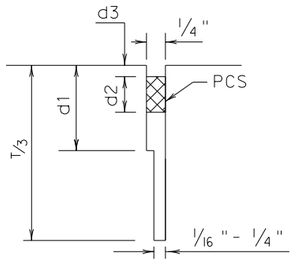


TRANSVERSE FORMED
EXPANSION JOINT

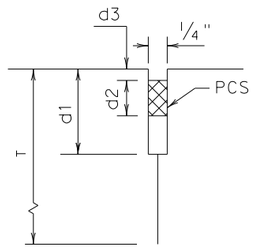


FORMED
ISOLATION JOINT

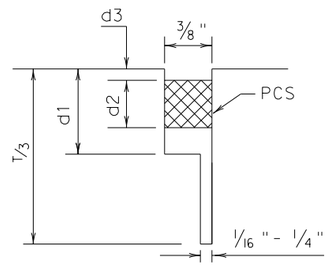
METHOD A: PREFORMED COMPRESSION SEALS (PCS)(DMS-6310 CLASS 6)



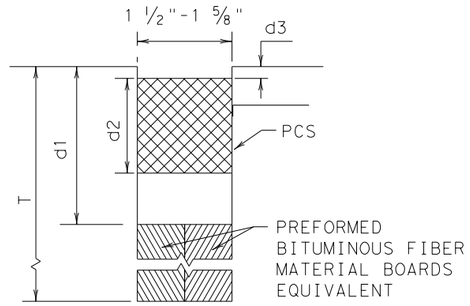
LONGITUDINAL SAWED
CONTRACTION JOINT



LONGITUDINAL
CONSTRUCTION JOINT



TRANSVERSE SAWED
CONTRACTION JOINT



TRANSVERSE FORMED
EXPANSION JOINT

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, EITHER METHOD "A" OR METHOD "B" MAY BE USED.
2. THE LOCATION OF JOINTS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.
3. THE JOINT RESERVOIR FOR SEALANT OR PCS SHALL BE SAWED UNLESS OTHERWISE SHOWN ON THE PLANS FOR THE LONGITUDINAL AND TRANSVERSE CONSTRUCTION JOINTS AND THE SAWED JOINTS.
4. DIMENSIONS d1, d2, AND d3 SHOWN IN METHOD A SHALL BE IN ACCORDANCE WITH THE PREFORMED COMPRESSION SEAL MANUFACTURER'S RECOMMENDATION.
5. REFER TO DMS-6310 "JOINT SEALANTS AND FILLERS" FOR THE CLASSIFICATIONS.
6. FOR SAWED LONGITUDINAL JOINT, LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINT, USE JOINT SEALANT CLASS 5 OR 8 UNLESS OTHERWISE SHOWN ON THE PLAN OR APPROVED.
7. FOR TRANSVERSE SAWED CONTRACTION, TRANSVERSE FORMED EXPANSION JOINT, AND ISOLATION JOINT USE JOINT SEALANT CLASS 5 OR 8 AT NEW JOINTS. USE JOINT SEALANT CLASS 4,5,7,OR 8 FOR MAINTAINING EXISTING JOINTS.
8. THE JOINTS SHALL BE CLEANED IN ACCORDANCE WITH THE ITEM 438 "CLEANING AND SEALING JOINTS" OR ITEM 713 "CLEANING AND SEALING JOINTS AND CRACKS (CONCRETE PAVEMENT)".
9. ISOLATION JOINTS ACCOMMODATE HORIZONTAL AND VERTICAL MOVEMENTS THAT OCCUR BETWEEN A PAVEMENT AND A STRUCTURE. ISOLATION JOINTS MAY BE USED FOR BRIDGE ABUTMENTS, INTERSECTIONS, CURB AND GUTTER, OLD AND NEW PAVEMENTS, OR AROUND DRAINAGE INLETS, MANHOLES, FOOTINGS AND LIGHTING STRUCTURES.

Texas Department of Transportation | Design Division Standard

CONCRETE PAVING DETAILS
JOINT SEALS
JS-14

FILE: js14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
©TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112,ETC.	SH 136,ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON,ETC.		159

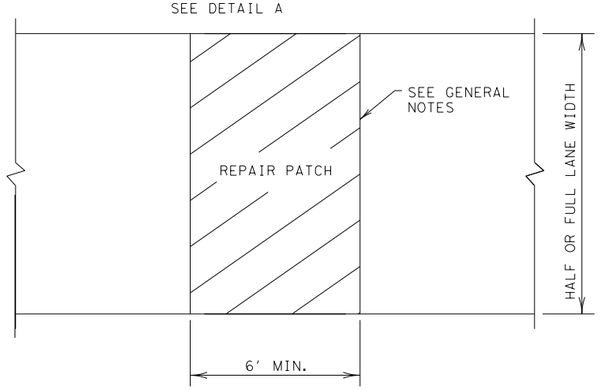
DATE: 6/8/2024
FILE: js14.dgn

TABLE NO.1 STEEL BAR SIZE AND SPACING						
TYPE PAVEMENT	SLAB THICKNESS AND BAR SIZE		LONGITUDINAL*		TRANSVERSE*	
			REGULAR BARS	TIEBARS	BARS	TIEBARS
	T (IN.)	BAR SIZE	SPACING (IN.)	SPACING (IN.)	SPACING (IN.)	SPACING (IN.)
CRCP	6.0	#5	7.5	7.5	24	24
	6.5		7.0	7.0		
	7.0		6.5	6.5		
	7.5		6.0	6.0		
	8.0	#6	9.0	9.0	24	24
	8.5		8.5	8.5		
	9.0		8.0	8.0		
	9.5		7.5	7.5		
	10.0		7.0	7.0		
	10.5		6.75	6.75		
	11.0		6.5	6.5		
	11.5		6.25	6.25		
	≥12.0		6.0	6.0		
JRCP	<8.0	#5	24.0	12.0	24	24
	≥8.0	#6	24.0	12.0	24	24
CPCD	<8.0	#5	NONE	12.0	NONE	24
	≥8.0	#6	NONE	12.0	NONE	24

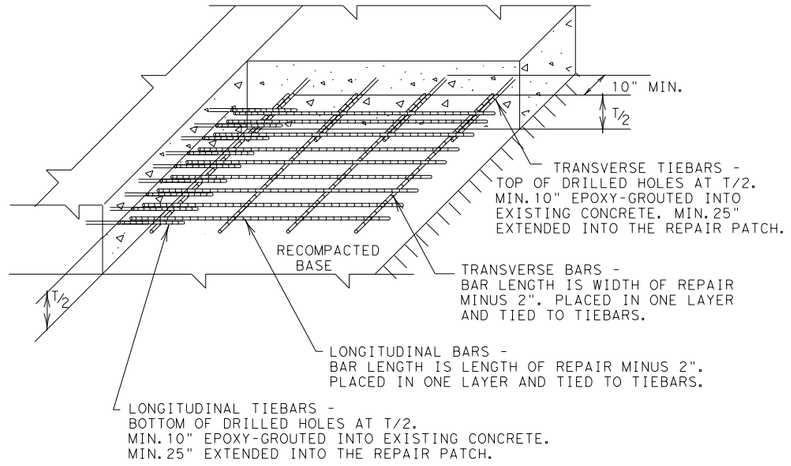
* USE 12" SPACING AS FIRST AND LAST SPACING AT END OR SIDE FOR ALL BARS.

GENERAL NOTES

1. ITEM 361, "REPAIR OF CONCRETE PAVEMENT" SHALL GOVERN FOR THIS WORK.
2. MULTIPLE PIECE TIEBARS SHALL BE USED WHEN THE REPAIR AREA MUST BE PLACED IN TWO STAGES DUE TO SEQUENCE OF CONSTRUCTION.
3. FULL DEPTH SAW CUTS SHALL BE MADE AROUND THE PERIMETER OF THE AREA TO BE REPAIRED. THE CUT SHALL BE MADE AT A RIGHT ANGLE TO THE PAVEMENT EDGE AND TO THE CENTER LINE OF THE PAVEMENT.
4. AT LEAST ONE LONGITUDINAL FULL DEPTH SAW CUT SHALL BE AT AN EXISTING LONGITUDINAL JOINT.
5. ADDITIONAL SAW CUTS MAY BE REQUIRED WITHIN THE AREA OF THE REPAIR TO FACILITATE REMOVAL OF THE CONCRETE OR TO ALLEVIATE BINDING OF THE FULL DEPTH SAW CUT AT THE REPAIR EDGE.
6. THE SAW CUTS WHICH EXTEND OUTSIDE THE AREA OF THE REPAIR WILL BE CLEANED AND FILLED WITH A CEMENTITIOUS GROUT APPROVED BY THE ENGINEER.
7. EXISTING LONGITUDINAL AND TRANSVERSE JOINTS REMOVED DUE TO REPAIR OPERATION SHOULD BE RESTORED IN ACCORDANCE WITH STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



PLAN VIEW

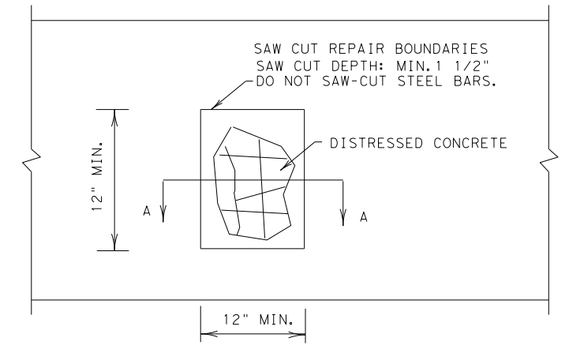


DETAIL A
GROUTED TIEBARS & REINFORCEMENT

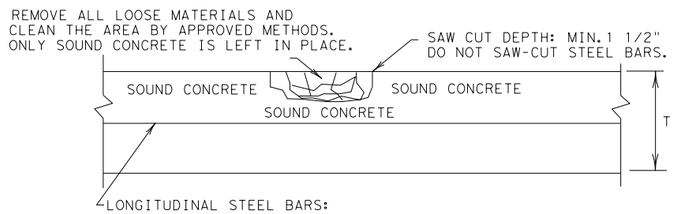
FULL-DEPTH REPAIR OF CRCP, JRCP, AND CPCD

GENERAL NOTES

1. ITEM 361, "REPAIR OF CONCRETE PAVEMENT" SHALL GOVERN FOR THIS WORK.
2. THE SAW CUTS WHICH EXTEND OUTSIDE THE AREA OF THE REPAIR WILL BE CLEANED AND FILLED WITH A CEMENTITIOUS GROUT APPROVED BY THE ENGINEER.
3. EXISTING LONGITUDINAL AND TRANSVERSE JOINTS REMOVED DUE TO REPAIR OPERATION SHOULD BE RESTORED IN ACCORDANCE WITH STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



PLAN VIEW



LONGITUDINAL STEEL BARS:

*REPAIR AREAS MAY BE ADJUSTED AFTER REMOVING DISTRESSED CONCRETE. SWITCH THE HALF-DEPTH REPAIR TO FULL-DEPTH REPAIR IF EXPOSED EXISTING LONGITUDINAL BARS ARE DEFICIENT, AS APPROVED. COMPENSATION WILL BE MADE FOR UNEXPECTED VOLUMES OF REPAIR AREAS OR CHANGES IN SCOPE OF WORK.

*INCREASE THE REPAIR AREA AND PERFORM A FULL-DEPTH REPAIR AS DIRECTED IF LONGITUDINAL STEEL BARS WERE DAMAGED BY THE REMOVAL OPERATIONS. NO ADDITIONAL COMPENSATION WILL BE MADE.

SECTION A-A

HALF-DEPTH REPAIR

Texas Department of Transportation | Design Division Standard

REPAIR OF CONCRETE PAVEMENT

REPCP-14

FILE: repcp14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
©TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		160

DATE: 6/8/2024
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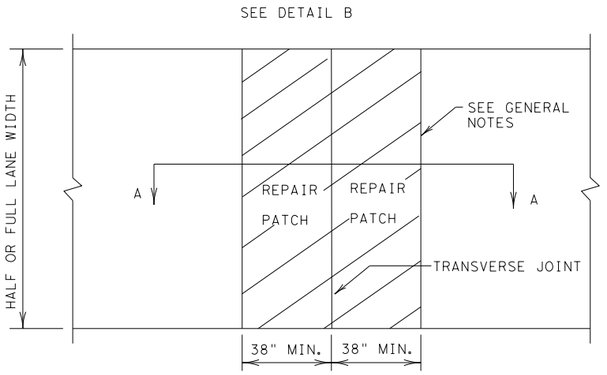
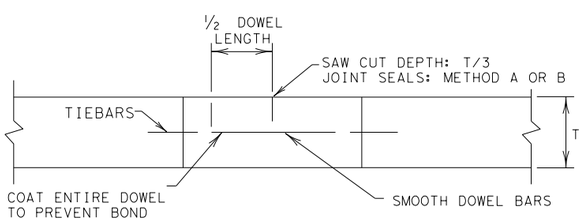
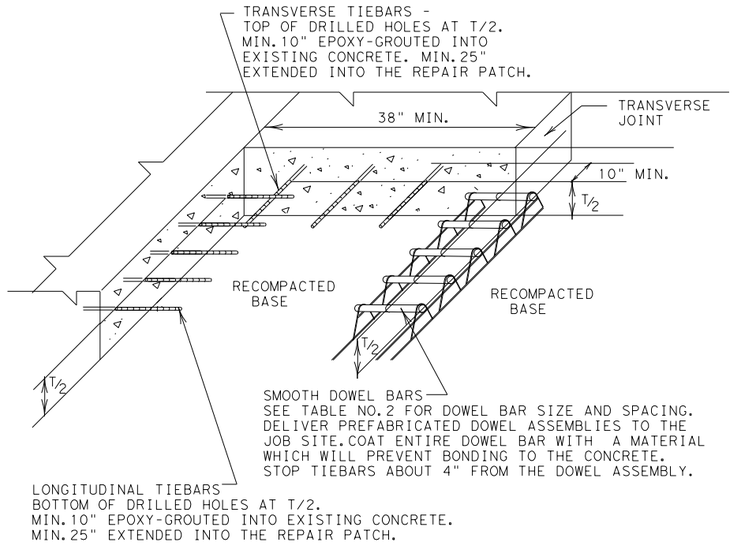


PLAN VIEW



SECTION A-A



DETAIL B
GROUTED TIEBARS & DOWELS

GENERAL NOTES

1. ITEM 361, "REPAIR OF CONCRETE PAVEMENT" SHALL GOVERN FOR THIS WORK.
2. MULTIPLE PIECE TIEBARS SHALL BE USED WHEN THE REPAIR AREA MUST BE PLACED IN TWO STAGES DUE TO SEQUENCE OF CONSTRUCTION.
3. FULL DEPTH SAW CUTS SHALL BE MADE AROUND THE PERIMETER OF THE AREA TO BE REPAIRED. THE CUT SHALL BE MADE AT A RIGHT ANGLE TO THE PAVEMENT EDGE AND TO THE CENTER LINE OF THE PAVEMENT.
4. AT LEAST ONE LONGITUDINAL FULL DEPTH SAW CUT SHALL BE AT AN EXISTING LONGITUDINAL JOINT.
5. ADDITIONAL SAW CUTS MAY BE REQUIRED WITHIN THE AREA OF THE REPAIR TO FACILITATE REMOVAL OF THE CONCRETE OR TO ALLEVIATE BINDING OF THE FULL DEPTH SAW CUT AT THE REPAIR EDGE.
6. THE SAW CUTS WHICH EXTEND OUTSIDE THE AREA OF THE REPAIR WILL BE CLEANED AND FILLED WITH A CEMENTITIOUS GROUT APPROVED BY THE ENGINEER.
7. EXISTING LONGITUDINAL AND TRANSVERSE JOINTS REMOVED DUE TO REPAIR OPERATION SHOULD BE RESTORED IN ACCORDANCE WITH STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."
8. DOWEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1/4 IN. HORIZONTALLY AND VERTICALLY UNLESS OTHERWISE SPECIFIED. WHERE DOWEL BAR BASKETS ARE USED, REMOVE THE SHIPPING WIRES.

TABLE NO. 2 DOWELS (SMOOTH BARS)			
PAVEMENT THICKNESS (INCHES)	SIZE AND DIA.	LENGTH (IN.)	SPACING (IN.)
<10	#8 (1 IN.)	18.0	12.0
≥10	#10 (1 1/4 IN.)		

REPAIR OF TRANSVERSE JOINT OF CPCD

Texas Department of Transportation | Design Division Standard

REPAIR OF CONCRETE PAVEMENT

REPCP-14

FILE: repcp14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
©TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		161

DATE: 6/8/2024
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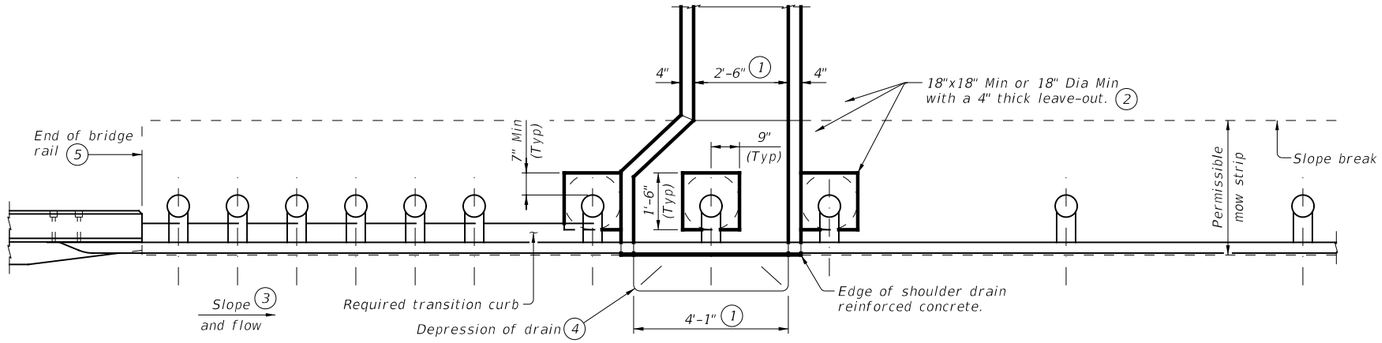
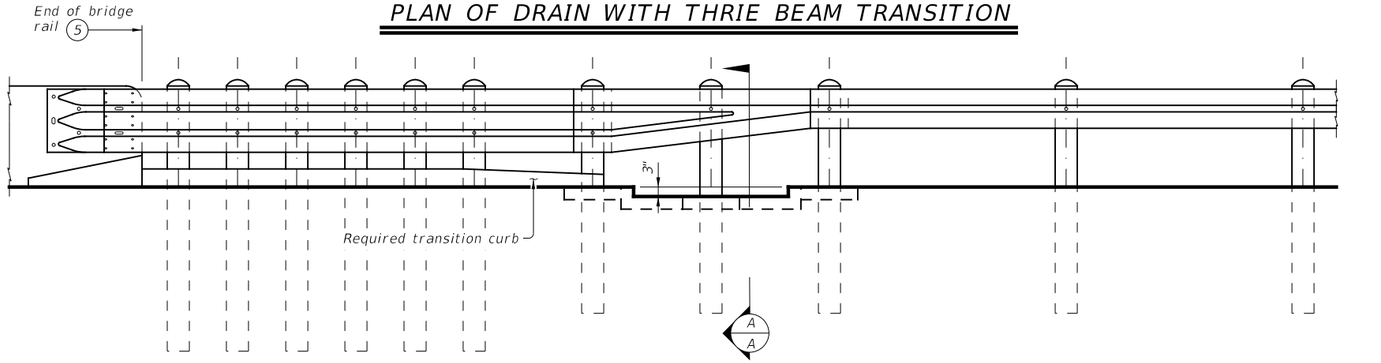
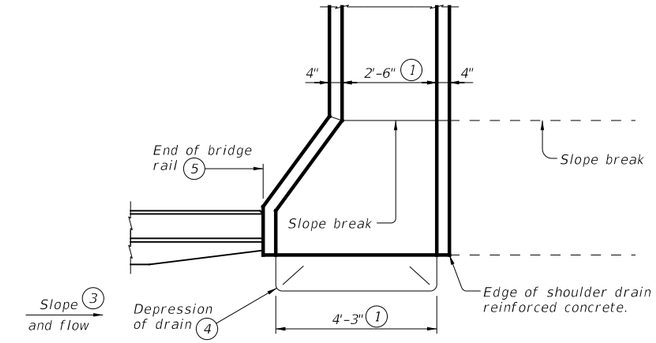


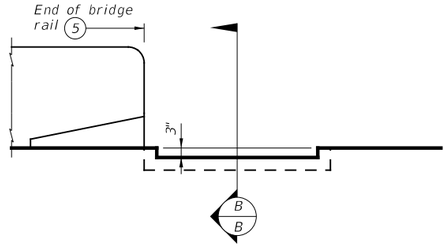
PLAN OF DRAIN WITH THRIE BEAM TRANSITION



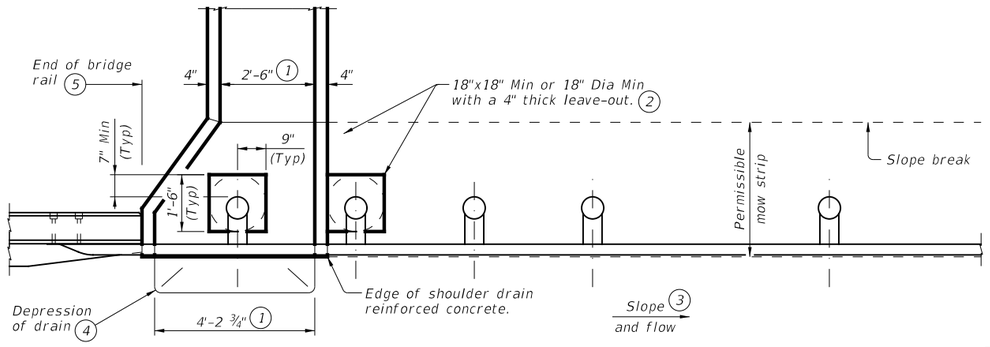
ROADWAY ELEVATION OF DRAIN WITH THRIE BEAM TRANSITION



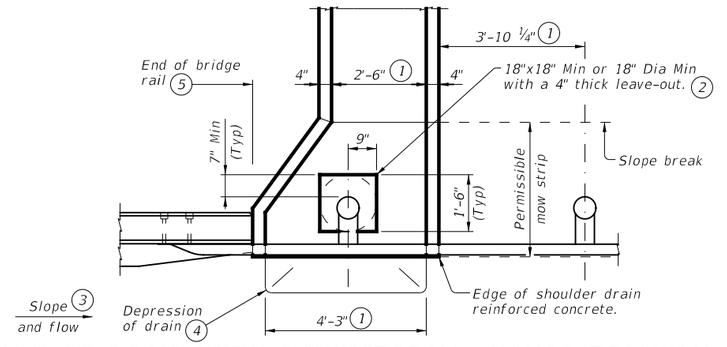
PLAN OF DRAIN WITHOUT MBGF TRANSITION



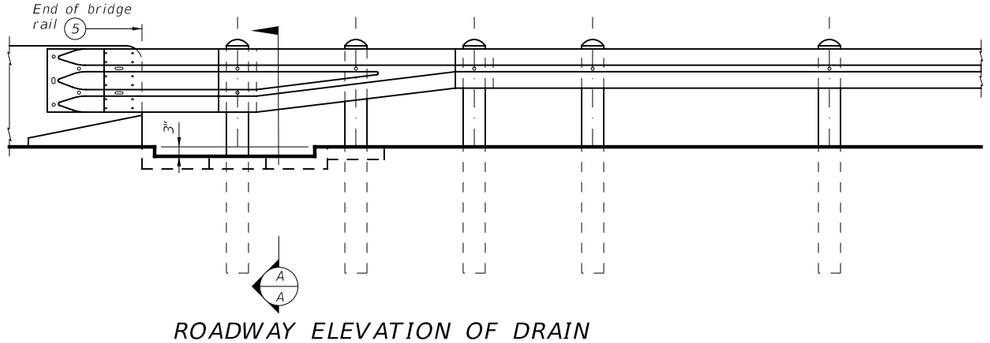
ROADWAY ELEVATION OF DRAIN WITHOUT MBGF TRANSITION



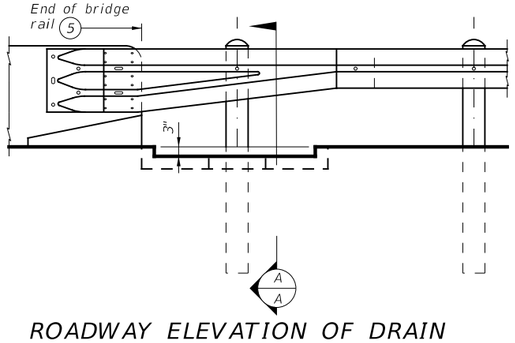
PLAN OF DRAIN WITH TL-2 (LOW SPEED) TRANSITION



PLAN OF DRAIN WITH DOWNSTREAM ANCHOR TERMINAL



ROADWAY ELEVATION OF DRAIN WITH TL-2 (LOW SPEED) TRANSITION



ROADWAY ELEVATION OF DRAIN WITH DOWNSTREAM ANCHOR TERMINAL

(1) Use wider or other drain configurations if shown elsewhere in plans or if directed by the Engineer. Location of shoulder drain must consider limitation imposed by rail transition. Do not locate shoulder drains at expansion joints between approach slab and concrete pavement.

(2) Fill leave-outs with no more than a 2-sack grout mixture (1 part cement, 5 parts water, and 14 parts sand by volume) with a 28-day compressive strength of approximately 120 psi or less. Provide grout of 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 (20" Max leave-out).

(3) For other slope and flow directions drain configuration may be mirrored wider or tapered wider if shown elsewhere in the plans or directed by the Engineer.

(4) Form depression into concrete, asphalt pavement, or approach slab.

(5) See Bridge Layout for rail type.

Texas Department of Transportation

Bridge Division Standard

SHOULDER DRAIN AT END OF BRIDGE RAIL

SD-EBR

FILE: MS-SD-EBR-19.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112,ETC.	SH 136,ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON,ETC.		162

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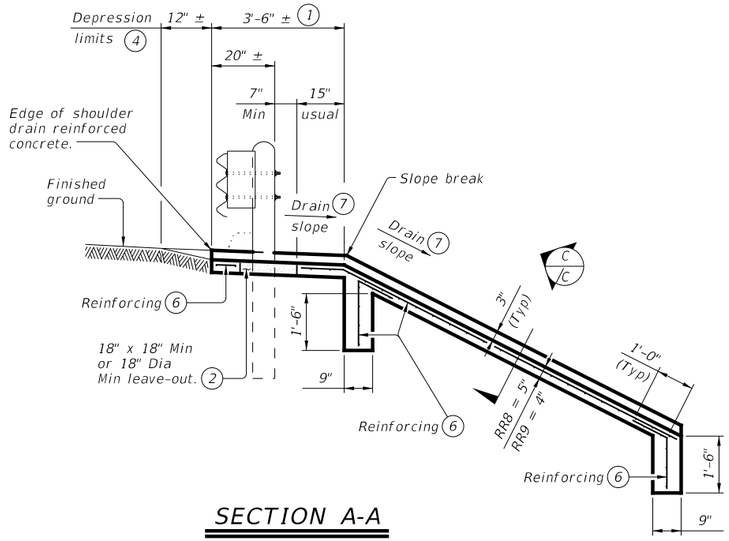
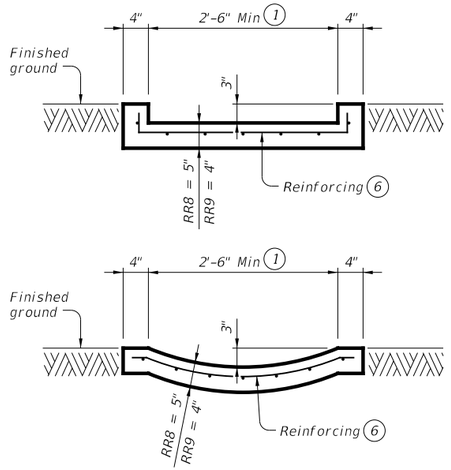
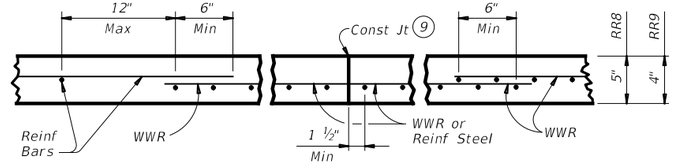


SECTION A-A



SECTION C-C

Sections shown without integrated riprap.



REINFORCEMENT DETAILS (6)

See General Notes for optional synthetic fiber reinforcement.

(1) Use wider or other drain configurations if shown elsewhere in plans or if directed by the Engineer. Location of shoulder drain must consider limitation imposed by rail transition. Do not locate shoulder drains at expansion joints between approach slab and concrete pavement.

(2) Fill leave-outs with no more than a 2-sack grout mixture (1 part cement, 5 parts water, and 14 parts sand by volume) with a 28-day compressive strength of approximately 120 psi or less. Provide grout of 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 (20" Max leave-out).

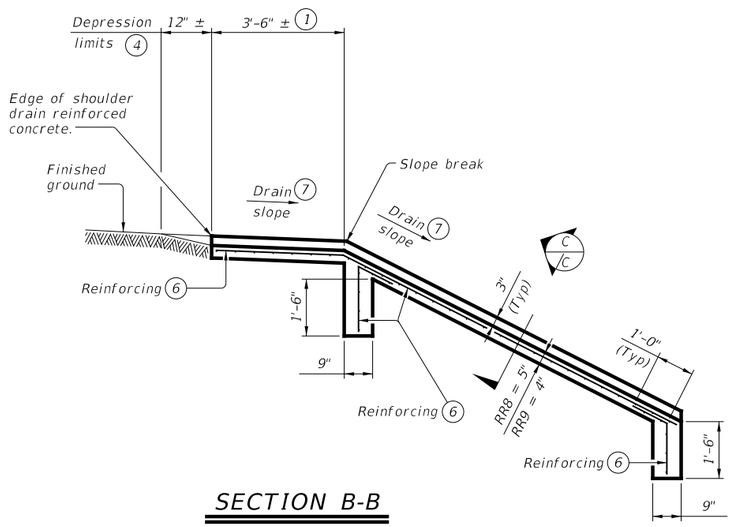
(4) Form depression into concrete, asphalt pavement, or approach slab.

(6) Provide (#3) reinforcing bar at 18" spacing c-c or 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, unless shown otherwise.

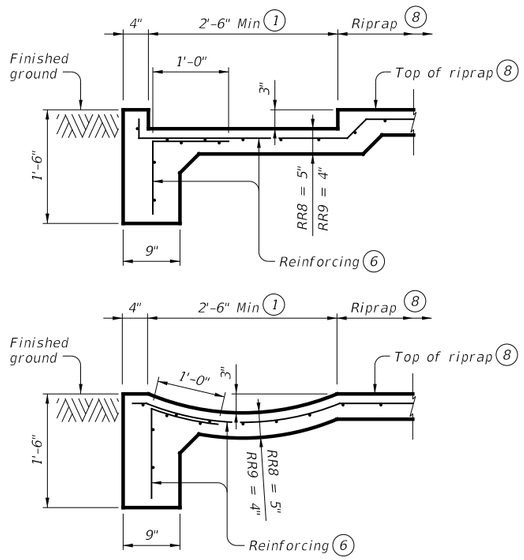
(7) See elsewhere in plans or as directed by the Engineer.

(8) See CRR standard for details and notes not shown.

(9) 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 fiber is utilized.



SECTION B-B



SECTION C-C

Sections shown with integrated riprap.

GENERAL NOTES:

Provide Class "B" concrete with a minimum compressive strength of 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.

See Metal Beam Guard Fence (Mow Strip) standard for details and notes not shown.

Payment for furnishing and placing 2-sack grout mixture will be subsidiary to shoulder drain.

Payment for shoulder drain will be as per Item 420, "Cl B Conc (Flume)". All details shown herein are subsidiary to shoulder drain.

See Layout for limits of shoulder drain.

RR8 is to be used on stream crossings.

RR9 is to be used on other embankments.

Texas Department of Transportation

Bridge Division Standard

SHOULDER DRAIN AT END OF BRIDGE RAIL

SD-EBR

FILE: MS-SD-EBR-19.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		163

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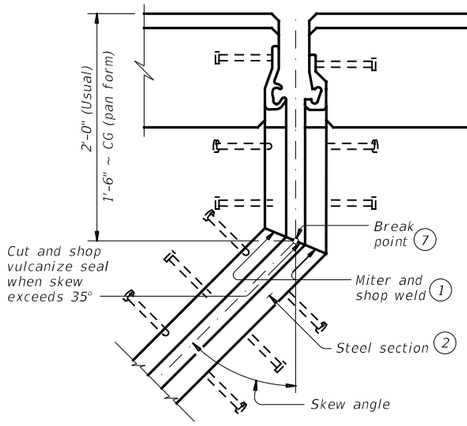
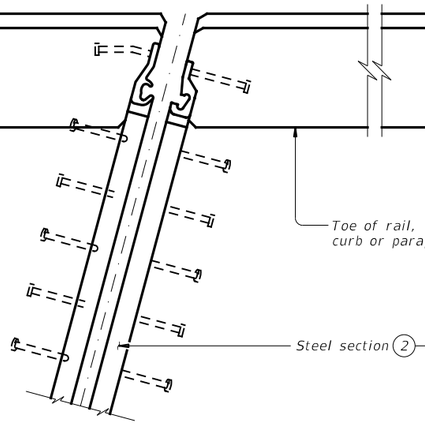
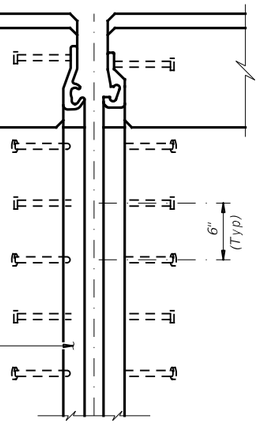


SHOWING SKEWS WITH SLAB BREAKBACKS

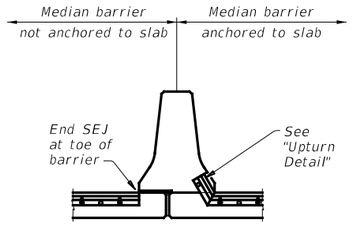


SHOWING SKEWS WITHOUT SLAB BREAKBACKS

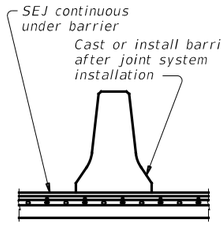


SHOWING WITHOUT SKEWS AND SLAB BREAKBACKS

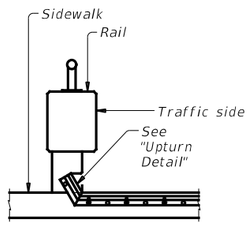
PLANS OF END CONDITIONS



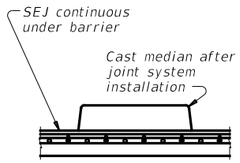
WITH OPEN DECK JOINT BELOW MEDIAN BARRIER



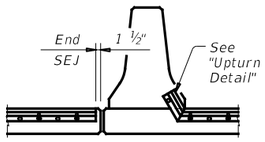
AT MEDIAN BARRIER



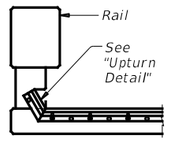
AT SIDEWALK BEHIND BRIDGE RAIL



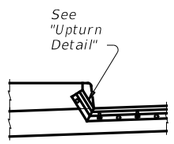
AT RAISED MEDIAN



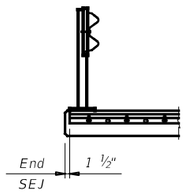
WITH OPEN DECK JOINT ADJACENT TO MEDIAN BARRIER



AT CONCRETE BRIDGE RAIL

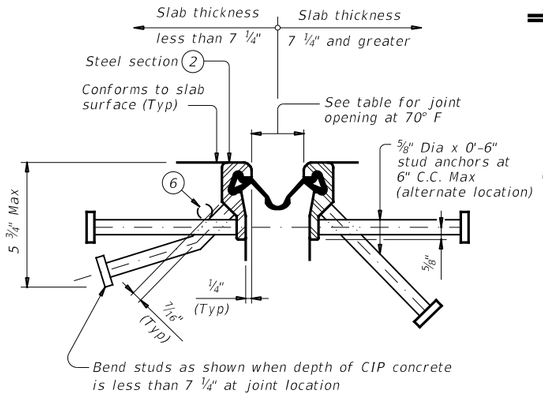


AT SIDEWALK

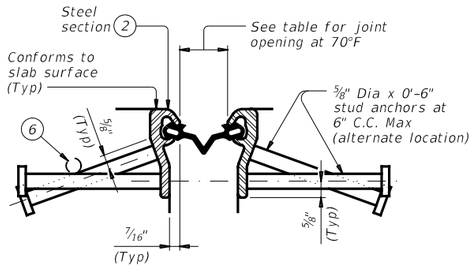


AT STEEL POST BRIDGE RAIL

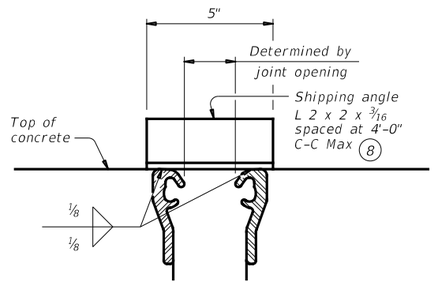
TYPICAL SECTIONS (5)



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



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



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

SHIPPING ANGLE

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

TABLE OF SEALED EXPANSION JOINT INFORMATION

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

REDUCED LONGITUDINAL MOVEMENT RANGE

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

DESIGN NOTES:

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

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

(1) Remove all burrs which will be in contact with seal prior to making splice.

(2) Shape of steel section shown is typical. Variations in sections must be approved by the Engineer.

(3) These openings are also the recommended minimum installation openings.

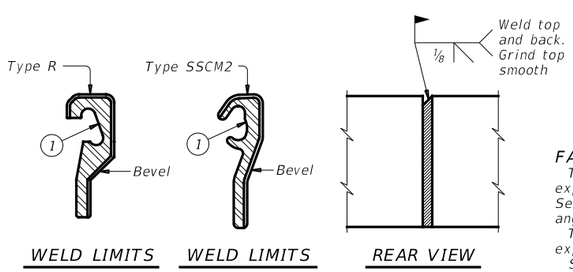
(4) Reduce for sidewalk or parapet heights less than 6".

(5) Other conditions affecting the joint profile should be noted elsewhere.

(6) Move transverse bars that are in conflict with SEJ studs, in either the bridge slab or approach slab, to rest at the junction of the studs.

(7) See Span details for location of break point.

(8) Align shipping angle perpendicular to joint.



WELD LIMITS WELD LIMITS REAR VIEW

FIELD SPLICE DETAIL

FABRICATION NOTES:

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

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

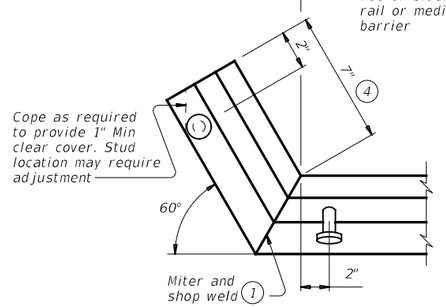
Ship steel sections in convenient lengths of 10'-0" Min and 24'-0" Max unless necessary for staged construction or widenings. One shop splice is permitted in each shipping length provided no piece is less than 2'-0" long and sufficient studs are added to limit the stud to shop splice distance to 2" Min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

Weld studs in accordance with AWS D1.1.

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

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

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



UPTURN DETAIL

CONSTRUCTION NOTES:

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

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

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

GENERAL NOTES:

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

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

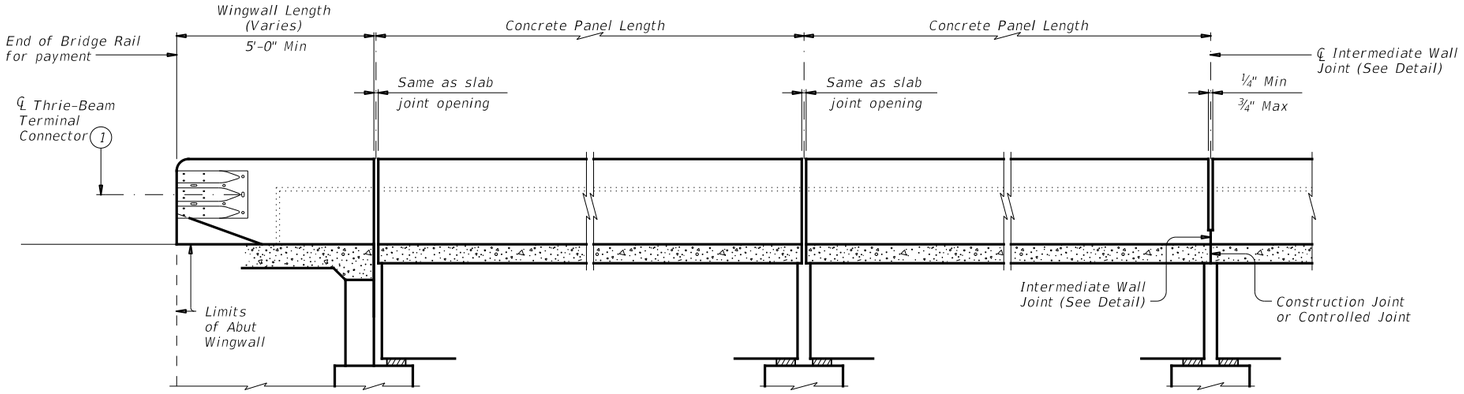
Texas Department of Transportation

Bridge Division Standard

SEALED EXPANSION JOINT TYPE M WITHOUT OVERLAY

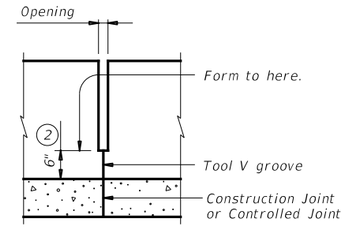
SEJ-M

FILE: MS-SEJ-M-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		164



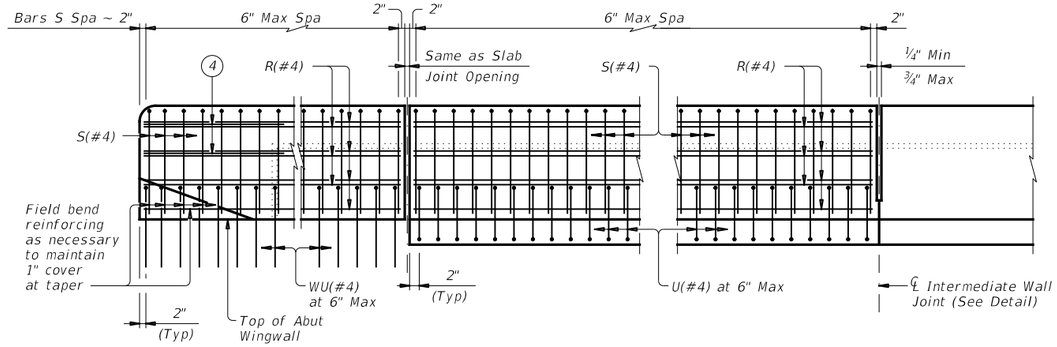
AT ABUTMENTS | AT BENTS WITH SLAB EXP JOINTS | AT BENTS WITHOUT SLAB EXP JOINTS

ROADWAY ELEVATION OF RAIL

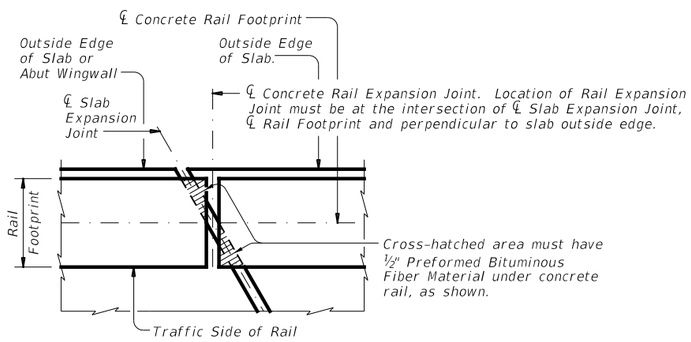


INTERMEDIATE WALL JOINT DETAIL

Provide at all interior bents without slab expansion joints.



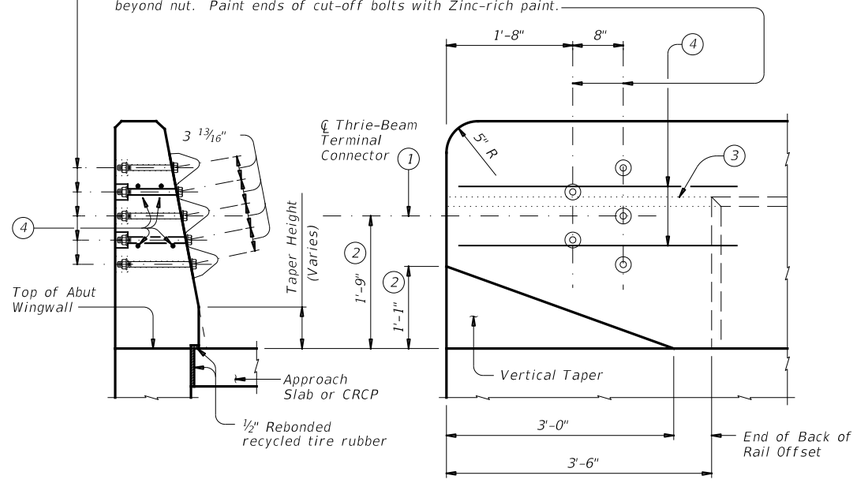
ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT



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.



SECTION | ELEVATION

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. Back of rail offset may, with Engineer's approval, be continued to the end of the railing.
4. 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.

Texas Department of Transportation | Bridge Division Standard

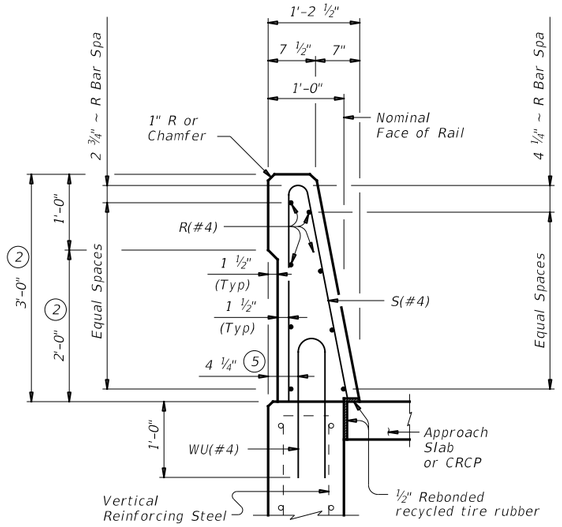
TRAFFIC RAIL SINGLE SLOPE

TYPE SSTR

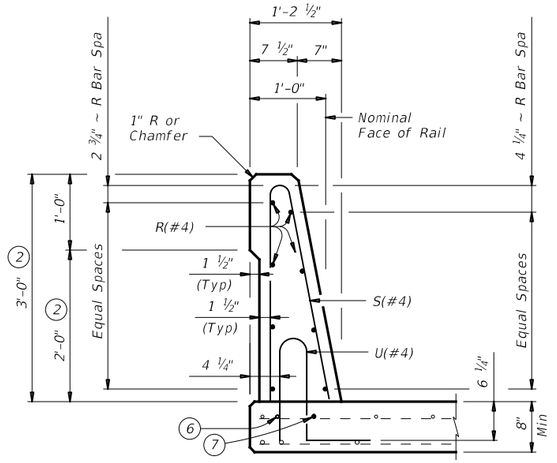
FILE: RL-SSTR-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		165

DATE: 6/8/2024 1:18:41 PM
FILE: RL-SSTR-19.dgn

DATE: 6/8/2024 1:18:41 PM
FILE: RL-SSTR-19.dgn

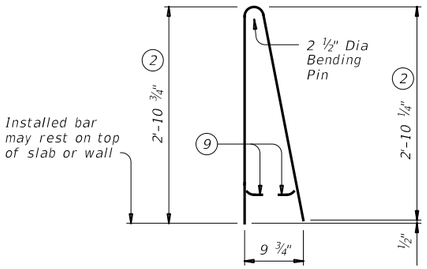


ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS

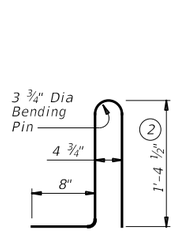


ON BRIDGE SLAB

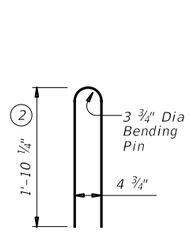
SECTIONS THRU RAIL



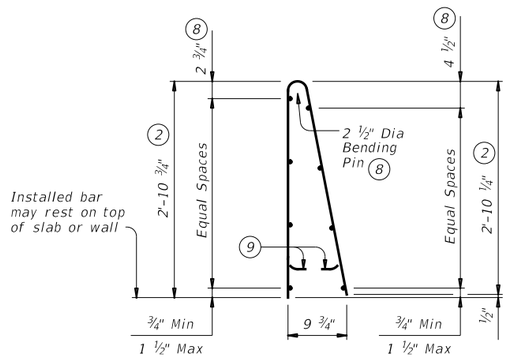
BARS S (#4)



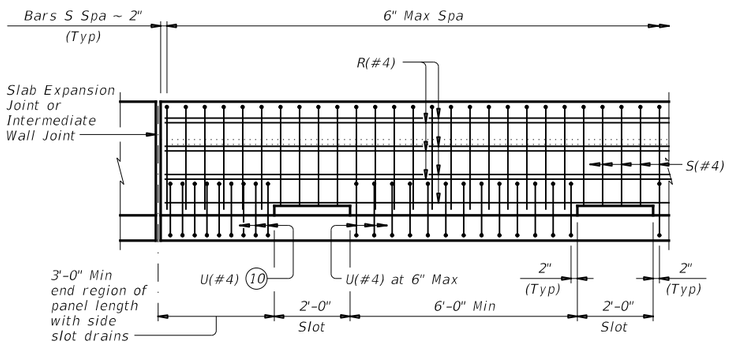
BARS U (#4)



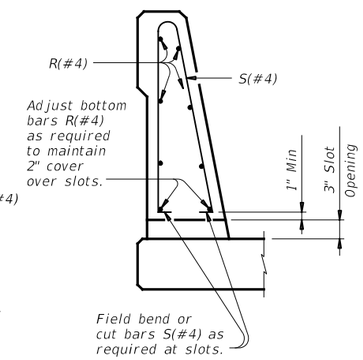
BARS WU (#4)



OPTIONAL WELDED WIRE REINFORCEMENT (WWR)



OPTIONAL SIDE SLOT DRAIN DETAIL



SECTION THRU OPTIONAL SIDE SLOT DRAIN

Note: Side Slot Drains may be used where shown elsewhere on the plans or as directed by the Engineer. Drains should not be placed 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.

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.	

(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 must be furnished at the Contractor's expense.

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

(8) No longitudinal wires may be within upper bend.

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

(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.

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".

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 ⅜" width x ¼" tall heavy epoxy bead with Type III, Class C or a Type V epoxy.

The back of railing must be vertical unless otherwise shown in 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.

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 successfully evaluated by full-scale crash test to meet MASH TL-4 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 376 plf.

Cover dimensions are clear dimensions, unless noted otherwise.

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

Texas Department of Transportation

Bridge Division Standard

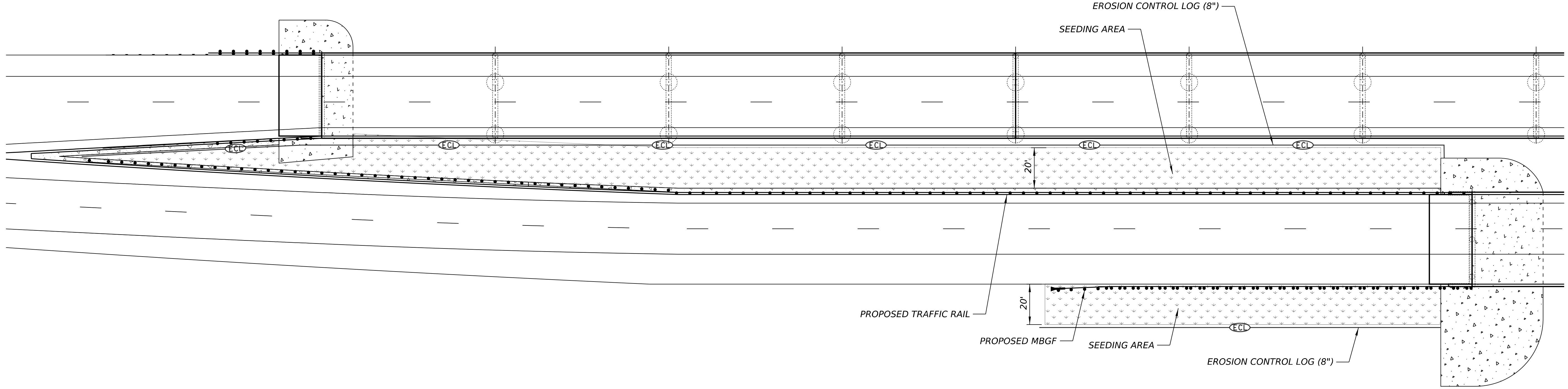
TRAFFIC RAIL SINGLE SLOPE

TYPE SSTR

FILE: RL-SSTR-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		166

90% PLANS SUBMITTAL

DN: JB CK: JT DW: JR CK: JZ



LOCATION	BIODEG EROSN CONT LOGS (8")	
	DATE INSTALLED	DATE REMOVED
REF 01: SH 136 SB AT CANADIAN RIVER		
REF 02: SH 136 NB AT CANADIAN RIVER		
REF 03: SH 207 NB AT SH 136 EB		
REF 04: SH 207 NB AT SH 136 WB		
REF 05: SH 207 SB AT SH 136 EB		
REF 06: SH 207 SB AT SH 136 WB		
REF 07: IH 40 WB AT US 385		
REF 08: IH 40 EB AT US 385		
REF 09: IH 27 SB AT PDT FORK RED RIVER		
REF 10: IH 27 NB AT PDT FORK RED RIVER		

NOTES:

1. SEE QUANTITY SUMMARIES FOR QUANTITIES TABULATED BY LOCATION.

2. PLACE EROSION CONTROL LOG AROUND TOE OF DISTURBED BRIDGE HEADER SLOPES AS DIRECTED BY THE ENGINEER.

3/1/2024

STATE OF TEXAS
JAMES BROOKS
101002
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	APPR BY

TEXAS TRANSPORTATION SOLUTIONS, INC. Firm # F-19397

Texas Department of Transportation

TYPICAL SWP3 LAYOUT

CONT	SECT	JOB	HIGHWAY
0356	01	112, ETC	SH 136, ETC
DIST	COUNTY		SHEET #
AMA	HUTCHINSON, ETC		167

DATE: 1/2/2024 12:57

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

① 0356-01-112, ② 0356-01-113, ③ 0356-01-114,
④ 0356-01-115, ⑤ 0356-01-116, ⑥ 0356-01-117

1.2 PROJECT LIMITS:

From: *SEE LOCATION MAP* To: *SEE LOCATION MAP*

1.3 PROJECT COORDINATES:

①	BEGIN:	(Lat) *35.729272°*	(Long)	*-101.418162°*
	END:	(Lat) *35.735328°*	(Long)	*-101.417952°*
②	BEGIN:	(Lat) *35.727699°*	(Long)	*-101.418417°*
	END:	(Lat) *35.735350°*	(Long)	*-101.418155°*
③	BEGIN:	(Lat) *35.660445°*	(Long)	*-101.398721°*
	END:	(Lat) *35.660942°*	(Long)	*-101.398682°*
④	BEGIN:	(Lat) *35.661633°*	(Long)	*-101.398610°*
	END:	(Lat) *35.662068°*	(Long)	*-101.398553°*
⑤	BEGIN:	(Lat) *35.660529°*	(Long)	*-101.398814°*
	END:	(Lat) *35.660982°*	(Long)	*-101.398776°*
⑥	BEGIN:	(Lat) *35.661645°*	(Long)	*-101.398710°*
	END:	(Lat) *35.662062°*	(Long)	*-101.398656°*

PROJECT AREA (Acres):

	1.4 TOTAL	1.5 DISTURBED
①	*3.80*	*0.76*
②	*3.43*	*0.72*
③	*0.23*	*0.15*
④	*0.39*	*0.20*
⑤	*0.37*	*0.19*
⑥	*0.25*	*0.18*

1.6 NATURE OF CONSTRUCTION ACTIVITY:

BRIDGE MAINTENANCE

1.7 MAJOR SOIL TYPES:

	Soil Type	Description
①	*LINCOLN SOILS*	*0 TO 2% SLOPES, FREQUENTLY FLOODED*
②	*LINCOLN SOILS*	*0 TO 2% SLOPES, FREQUENTLY FLOODED*
③	*OBARO-URBAN LAND COMPLEX*	*3 TO 12% SLOPES*
④	*OBARO-URBAN LAND COMPLEX*	*3 TO 12% SLOPES*
⑤	*OBARO-URBAN LAND COMPLEX*	*3 TO 12% SLOPES*
⑥	*OBARO-URBAN LAND COMPLEX*	*3 TO 12% SLOPES*

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

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

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

Type	Sheet #s

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

1.9 CONSTRUCTION ACTIVITIES:

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.3.)

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

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

1.11 RECEIVING WATERS:

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

	Tributaries	Classified Waterbody
①		*CANADIAN RIVER BELOW LAKE MEREDITH SEGMENT 0101*
②		*CANADIAN RIVER BELOW LAKE MEREDITH SEGMENT 0101*
③	*NO SURFACE WATERS PRESENT*	
④	*NO SURFACE WATERS PRESENT*	
⑤	*NO SURFACE WATERS PRESENT*	
⑥	*NO SURFACE WATERS PRESENT*	

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

1.12 ROLES AND RESPONSIBILITIES: TxDOT

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

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

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

3/1/2024

STATE OF TEXAS
JAMES BROOKS
101002
LICENSED PROFESSIONAL ENGINEER

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (LOCATIONS 1-6)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			*168*
STATE	STATE DIST.	COUNTY	
TEXAS	*AMA*	*HUTCHINSON, ETC*	
CONT.	SECT.	JOB	HIGHWAY NO.
0356	*01*	*112, ETC*	*SH 136, ETC*

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

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

2.2 SEDIMENT CONTROL BMPs:

T / P

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

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- X Excess dirt/mud on road removed daily
- X Haul roads dampened for dust control
- X Loaded haul trucks to be covered with tarpaulin
- ☐ 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
- ☐ Sanitary Facilities
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- ☐ Fire hydrant flushings
- X Irrigation drainage
- X Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- X Potable water sources
- ☐ 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.

3/1/2024

STATE OF TEXAS
JAMES BROOKS
101002
LICENSED
PROFESSIONAL ENGINEER

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (LOCATIONS 1-6)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			169
STATE	STATE DIST.	COUNTY	
TEXAS	AMA	HUTCHINSON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0356	01	112, ETC	SH 136, ETC

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

⑦ *0090-04-071,* ⑧ *0090-04-072,* ⑨ *0067-17-037,*
⑩ *0356-01-115*

1.2 PROJECT LIMITS:

From: *SEE LOCATION MAP* To: *SEE LOCATION MAP*

1.3 PROJECT COORDINATES:

⑦	BEGIN:	(Lat) *35.237195°*	(Long)	*-102.428743°*
	END:	(Lat) *35.236925°*	(Long)	*-102.427572°*
⑧	BEGIN:	(Lat) *35.236974°*	(Long)	*-102.428670°*
	END:	(Lat) *35.236712°*	(Long)	*-102.427657°*
⑨	BEGIN:	(Lat) *35.004015°*	(Long)	*-101.901570°*
	END:	(Lat) *35.005655°*	(Long)	*-101.903167°*
⑩	BEGIN:	(Lat) *35.004356°*	(Long)	*-101.901527°*
	END:	(Lat) *35.006001°*	(Long)	*-101.903109°*

PROJECT AREA (Acres):

	1.4 TOTAL	1.5 DISTURBED
⑦	*0.49*	*0.20*
⑧	*0.49*	*0.18*
⑨	*0.83*	*0.22*
⑩	*0.83*	*0.23*

1.6 NATURE OF CONSTRUCTION ACTIVITY:

BRIDGE MAINTENANCE

1.7 MAJOR SOIL TYPES:

	Soil Type	Description
⑦	*PANTEX SILTY CLAY LOAM*	*0 TO 1% SLOPES*
⑧	*PANTEX SILTY CLAY LOAM*	*0 TO 1% SLOPES*
⑨	*SPRONE & BIPPUS CLAY LOAMS*	*0 TO 2% SLOPES, FREQUENTLY FLOODED*
⑩	*SPRONE & BIPPUS CLAY LOAMS*	*0 TO 2% SLOPES, FREQUENTLY FLOODED*

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

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

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

Type	Sheet #s

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

1.9 CONSTRUCTION ACTIVITIES:

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.3.)

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

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

1.11 RECEIVING WATERS:

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

	Tributaries	Classified Waterbody
⑦	*NO SURFACE WATERS PRESENT*	
⑧	*NO SURFACE WATERS PRESENT*	
⑨	*PRAIRIE DOG TOWN FORK RED RIVER*	*UPPER PRAIRIE DOG TOWN FORK RED RIVER SEGMENT 0229*
⑩	*PRAIRIE DOG TOWN FORK RED RIVER*	*UPPER PRAIRIE DOG TOWN FORK RED RIVER SEGMENT 0229*

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

1.12 ROLES AND RESPONSIBILITIES: TxDOT

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

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

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

3/1/2024

STATE OF TEXAS
JAMES BROOKS
101002
LICENSED PROFESSIONAL ENGINEER

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (LOCATIONS 7-10)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			170
STATE	STATE DIST.	COUNTY	
TEXAS	AMA	HUTCHINSON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0356	01	112, ETC	SH 136, ETC

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

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

2.2 SEDIMENT CONTROL BMPs:

T / P

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

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- X Excess dirt/mud on road removed daily
- X Haul roads dampened for dust control
- X Loaded haul trucks to be covered with tarpaulin
- ☐ 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
- ☐ Sanitary Facilities
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- ☐ Fire hydrant flushings
- X Irrigation drainage
- X Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- X Potable water sources
- ☐ 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.

3/1/2024

STATE OF TEXAS
JAMES BROOKS
101002
LICENSED PROFESSIONAL ENGINEER

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (LOCATIONS 7-10)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			171
STATE	STATE DIST.	COUNTY	
TEXAS	AMA	HUTCHINSON, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0356	01	112, ETC	SH 136, ETC

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1. Comply with TPDES CGP. TxDOT must post a Small Site Notice and send a copy to any non TxDOT MS4 operator that receives discharge from the project. Refer to SW3P Plan Sheet, BMPs, and Detail.
2. The contractor must stabilize the project site as stated in SW3P.

☐ No Action Required ☒ Required Action

Action No.

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

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

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

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

☐ No Permit Required

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

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

☐ Individual 404 Permit Required

☒ Other Nationwide Permit Required: NWP3(a) - Comply with general conditions of the permit; no preconstruction notification is required.

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

1. Canadian River

2. P.D.T. Fork Red River

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

☐ No Action Required ☒ Required Action

Action No.

1. If unanticipated archeological deposits are encountered during construction, work in the immediate area will cease and TxDOT archeological staff will be contacted to initiate post-review discovery procedures. 1/64

IV. VEGETATION RESOURCES

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

☐ No Action Required ☒ Required Action

Action No.

1. Comply with Executive Order 13112 on Invasive Species and the intent of the Executive Order Memorandum on Beneficial Landscapes for re-vegetating the project area. The proposed seed mixture would be in accordance with Item 164, Seeding for Erosion Control in TxDOT's Standard Specifications for the construction of Highways, Streets, and Bridges.

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

☐ No Action Required ☒ Required Action

Action No.

1. If any species on the County Threatened & Endangered species List is sighted in the project area during construction, stop construction and notify the Area Engineer.
2. Swift Fox: Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered, and to avoid unnecessary impacts to dens.
3. Woodhouse's Toad, Texas Horned Lizard, Western Box Turtle, Western Hognose Snake, Western Massasauga, Prairie Rattlesnake:
   a) Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered. If reptiles are found on project site, contractors are to allow them to leave the project site safely.
   b) For the Texas Horned Lizard, avoidance should include avoiding harvester ant beds.
   c) If erosion control blankets or soil retention blankets are needed, the product should not contain netting, but should only contain loosely woven natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic netting should be avoided.
5. Bird BMP's:
   a) Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season;
   b) Avoid the removal of unoccupied, inactive nests, as practicable;
   c) Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.
6. The Migratory Bird Treaty Act of 1918 states that it is unlawful to kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, young, feather, egg in port or in whole, without a Federal permit issued in accordance within the Act's policies and regulations. In the event that migratory birds are encountered on-site during project construction, adverse impacts on protected birds, active nests, eggs, and/or young would be avoided.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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

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

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

Contact the Engineer if any of the following are detected:

* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

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

☒ Yes ☐ No

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

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

☒ Yes ☐ No

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

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

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

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

☐ No Action Required ☒ Required Action

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Texas Department of Transportation

Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0356	01	112, ETC.	SH 136, ETC.
12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC.		172

DATE: 6/8/2024
FILE: epic.dgn

ITEM 164 SEEDING FOR EROSION CONTROL

SEED (PERM) (RURAL or URBAN) (SAND or CLAY)

"WARM SEASON" PLANTING DATES	SEED MIXTURE	PURE LIVE SEED RATE & PLANT DEPTH
PERMANENT: EARLY SPRING SEED FROM FEBRUARY 15th THROUGH May 15th. AS AREAS OF THE ROW ARE PREPARED AND DETERMINED READY FOR DRILL SEEDING.	NEW CROP SEED: TYPE: BUFFALO GRASS (Texoka) "Fluffy" WESTERN WHEATGRASS (ARRIBA) "Hard" BERMUDA GRASS (BLACK JACK) "Hard Tiny Seed" 100% "Unhulled"	 3.0 LBS PLS / ACRE 6.0 LBS PLS / ACRE 5.0 LBS PLS / ACRE @ 1/4"-1/2" SOIL DEPTH
PERMANENT and TEMP. LATE SPRING SEED FROM MAY 15th THROUGH AUGUST 1st AS AREAS OF THE ROW THAT ARE LAID BY BUT DETERMINED TO BE OUT OF SEASON FOR PERMANENT DRILL SEEDING.	TYPE: MILLET (BROWN TOP) "Hard Shell, "Small Seed" - Nurse crop BERMUDA GRASS (BLACK JACK) "Hard Tiny Seed" 100% "Unhulled"	30. LBS PLS / ACRE @ 1/4" SOIL DEPTH 5.0 LBS PLS / ACRE
SOIL PREPARATION EQUIPMENT AND PRACTICES: RIPPER --- DISK --- HARROW --- CULTI-PACKER.		

NOTES:

1. ALL SEED MIXTURE TYPES SHALL BE PURCHASED IN PRE- MIXED BAGS, "BY TYPE" BLENDED BY THE GROWER SHIPPER.
2. SOILS THAT ARE COMPACTED, HAVE CLODS, SHALL BE REWORKED UNTIL READY FOR SEEDING. AS DIRECTED.
3. ALL SOIL SURFACES SHALL BE LEVEL WITH NATURAL FLOWING SMOOTH GRADES. NO TIRE RUTS OR FURTHER TRAFFIC ALLOWED.
4. SOIL SURFACE SHALL BE FIRM BUT NOT COMPACTED, ALLOWING 1/4" DEPRESSION UNDER NORMAL FOOT TRAFFIC.
5. SEED 100% OF THE BED AREA. NO SKIPS OR VOID AREAS ALLOWED. EXAMPLE: AREAS AROUND SIGN POSTS AND INLETS.
6. SEED UP TO THE FIRST 6" OF THE EDGE OF PAVEMENT. AS DIRECTED, HAND RAKE ISOLATED SEEDED AREAS.
7. WEIGH ALL CALIBRATED SEED SAMPLES FOR ACCURACY AND PRESENT DOCUMENTATION TO ENGINEER.

FOR DRILL SEEDING

1. USE ONLY PROFESSIONAL NATIVE GRASS OR TURF GRASS (MULTI- 3 BIN) DRILL SEEDERS.
2. CALIBRATE DRILL SEEDER FOR SPECIFIED (PLS) PER ACRE BEFORE DRILL SEEDING.
3. DRILL SEEDER MUST BE EQUIPPED WITH THE LARGE FRONT CUTTING COULTERS DURING THE INSPECTION OF DRILL SEEDER.

FOR BROADCAST SEEDING

1. USE ONLY COMMERCIAL TYPE CYCLONE TYPE SPREADERS.
2. CALIBRATE CYCLONE SPREADER FOR 1000 Sq. Ft. (PLS) PER ACRE BEFORE SEEDING.
3. TO PREVENT SEED SEPARATION IN SPREADERS, SPREAD ALL SEED TYPES INDEPENDENTLY IN A SEPARATE APPLICATION.
4. IMMEDIATELY AFTER SEEDING, IN ONE OR TWO OPERATIONS, CULTI-PACK THE SEEDED SOILS AND FIRM SEED INTO SURFACE.
5. DISCONTINUE SEEDING IF WIND EXCEEDS 10 MPH.

ITEM 164 SEEDING FOR EROSION CONTROL

SEED (TEMPORARY) COOL SEASON SEEDING

"COOL SEASON" PLANTING DATES	SEED MIXTURE	PURE LIVE SEED RATE & PLANT DEPTH
TEMPORARY: EARLY FALL SEED FROM AUGUST 1st THROUGH DECEMBER 1st. AS AREAS OF THE ROW ARE PREPARED AND DETERMINED READY FOR DRILL SEEDING.	NEW CROP SEED: TYPE: WESTERN WHEATGRASS "Hard Shell" RED WINTER WHEAT, VAR: TAM III "Hard Shell"	6.0 LBS PLS / ACRE 34. LBS PLS / ACRE @ 1" SOIL DEPTH
TEMPORARY: LATE FALL SEED FROM DECEMBER 1st THROUGH DECEMBER 31ST. AS AREAS OF THE ROW ARE PREPARED AND DETERMINED READY FOR DRILL SEEDING.	NEW CROP SEED: TYPE: RED WINTER WHEAT, VAR: TAM III "Hard Shell"	34. LBS ACRE / PLS @ 1" SOIL DEPTH
SOIL PREPARATION EQUIPMENT AND PRACTICES: RIPPER --- DISK --- HARROW --- CULTI-PACKER.		

ITEM 314 EMULSIFIED ASPHALT TREATMENT

TIME SCHEDULE:

IMMEDIATELY AFTER SOIL PREPARATION OR WITHIN 24 HOURS AFTER SEEDING, APPLY THE TACK COAT TO DESIGNATED SOIL SURFACES.

FUNCTIONAL USE:
SOIL EROSION CONTROL, OR MOISTURE RETENTION BARRIER.

NOTES:

1. ALL TRUCK APPLICATIONS SHALL BE COMPLETED IN ONE PASS OF THE DISTRIBUTOR. ALL TOUCH UP WORK WILL BE FINISHED BY HAND AND HOSE PROCEDURES. APPLY FROM EDGE OF PAVEMENT THROUGH THE FULL SPECIFIED AREAS.
2. ENGINEER WILL INSPECT FOR ACCURACY THE OVERALL DEPTH OF THE APPLIED TACK COAT MATERIALS.
3. FURTHER VEHICULAR TRAFFIC IS NOT ALLOWED ON LAID BY TACK COAT SURFACES. AT THE CONTRACTORS EXPENSE ALL DAMAGES TO TACK COAT SURFACES WILL BE RE -SHOT AS DIRECTED BY THE ENGINEER.

ITEM 166 FERTILIZER

TIME SCHEDULE:

AFTER TOPSOIL PLOWING PEPARATIONS ARE COMPLETED, FERTILIZE R.O.W. SOIL SURFACES AND HARROW 2" TO 4" DEEP INTO PLACE.

FUNCTIONAL USE:
PLANT NUTRIENTS FOR PLANT AND ROOT DEVELOPMENT.

FERTILIZER SHALL BE EVENLY DISTRIBUTED AT A RATE OF 28 LBS OF NITROGEN PER ACRE.
THE BREAK DOWN OF THE NITROGEN ELEMENT SHALL BE IN A 50% SLOW RELEASE FORM.
ANALYSIS OF THE (NPK) IS: 1-5-0 A HIGH PHOSPHATE BLEND.
AS DIRECTED BY THE VEGETATION MANAGER.

ITEM 166 NOTES:

1. BROADCAST SPECIFIED FERTILIZER FROM THE EDGE OF PAVEMENT, THROUGH THE ENTIRE ROW SEED BED AREA. APPLICATIONS FOR EDGE OF PAVEMENT, CULVERTS, SIGN POST AREAS, GUARD RAILS AND ISOLATED AREAS SHALL BE APPLIED BY WALK BEHIND SPREADERS AND BY HAND. NO FERTILIZER ALLOWED ON PAVEMENT SURFACES.
2. ALL SPREADERS SHALL BE CALIBRATED BY THE CONTRACTOR AND THE ENGINEER FOR ACCURACY AND PERFORMANCE. SHALL USE UNOPENED 50# BAGS OF SPECIFIED FERTILIZER FOR DAILY CALIBRATIONS. APPLICATION SHALL BE AN EVEN DISTRIBUTION OF PRODUCT ON DESIGNATED SOIL SURFACES.
3. FERTILIZER SHALL BE DELIVERED IN 50# BAGS UNLESS OTHERWISE SPECIFIED OR APPROVED PRIOR TO DELIVERY. BAGS SHALL BE CLEARLY LABELED SHOWING CONTENTS. IF BULK FERTILIZER IS APPROVED, DOCUMENTATION WILL BE REQUIRED FOR EACH LOAD OF MATERIAL DELIVERED VERIFYING AUTHENTICITY OF THE MATERIAL. CULTURAL PROCEDURES ARE UNDER THE DIRECTION OF THE TXDOT VEGETATION MANAGER.

3/14/2024

STATE OF TEXAS
JAMES BROOKS
101002
LICENSED
PROFESSIONAL ENGINEER

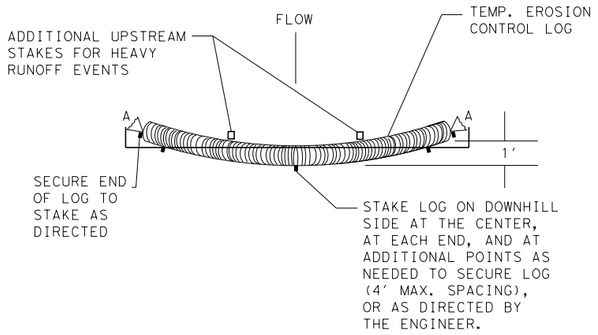
Texas Department of Transportation

AMARILLO DISTRICT STANDARD

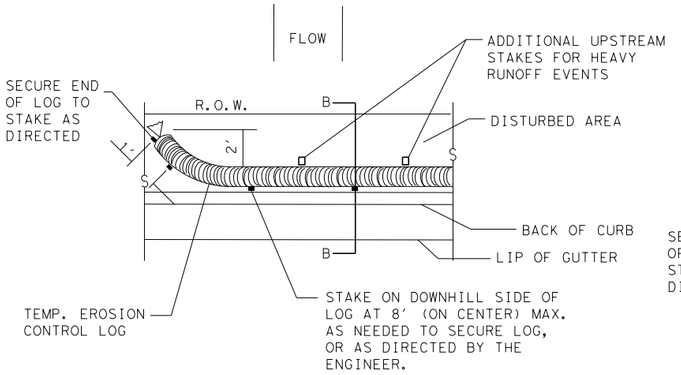
VEGETATION SPECIFICATION SHEET

FEDERAL AID PROJECT	DN: ADD	CK: ADD	DW: ADD	CK: ADD
See Title Sheet	CONT	SECT	JOB	HIGHWAY
REVISIONS 03/27/20	0356	01	112, ETC	SH 136, ETC
	DIST	COUNTY		SHEET NO.
	AMA	HUTCHINSON, ETC		173

DATE: 1/2/2024
FILE: C:\Users\JamesBrooks\Documents\projects\0105.001 (AMA BMIP)\cadd\stdVEC(9)-16.dgn



PLAN VIEW



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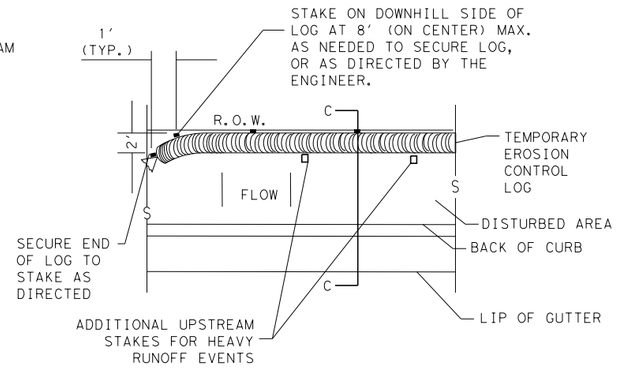
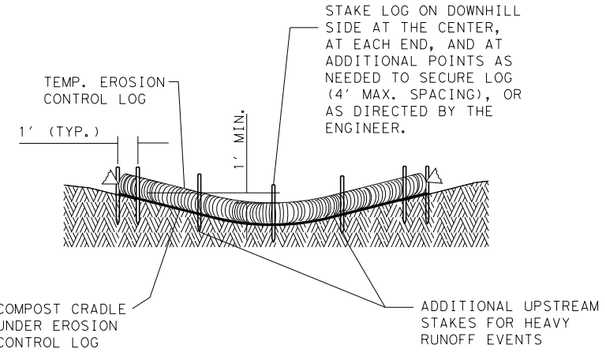


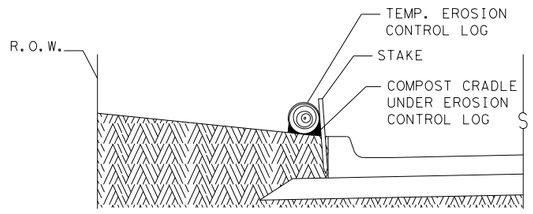
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

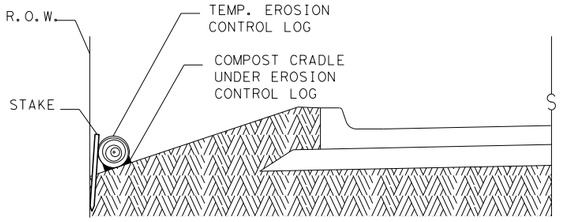
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



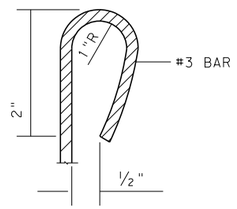
SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW

LEGEND

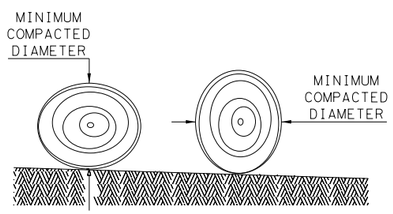
- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL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



REBAR STAKE DETAIL

GENERAL NOTES:

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



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SEDIMENT BASIN & TRAP USAGE GUIDELINES

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

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

Control logs should be placed in the following locations:

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

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

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

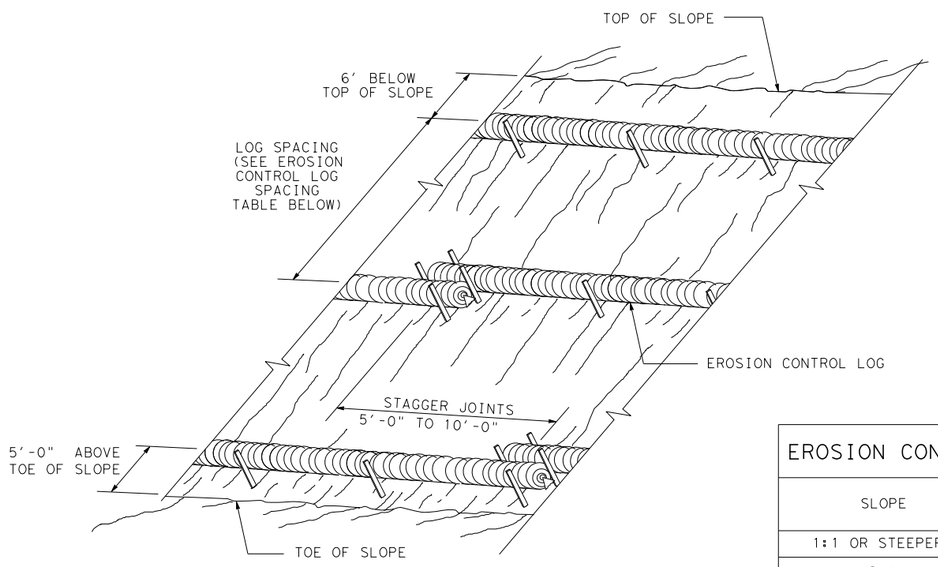
Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

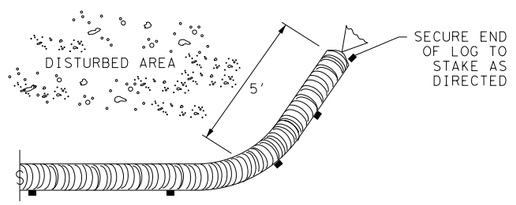
EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0356	01	112, ETC		SH 136, ETC		
	DIST		COUNTY				SHEET NO.
	AMA		HUTCHINSON, ETC				174



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

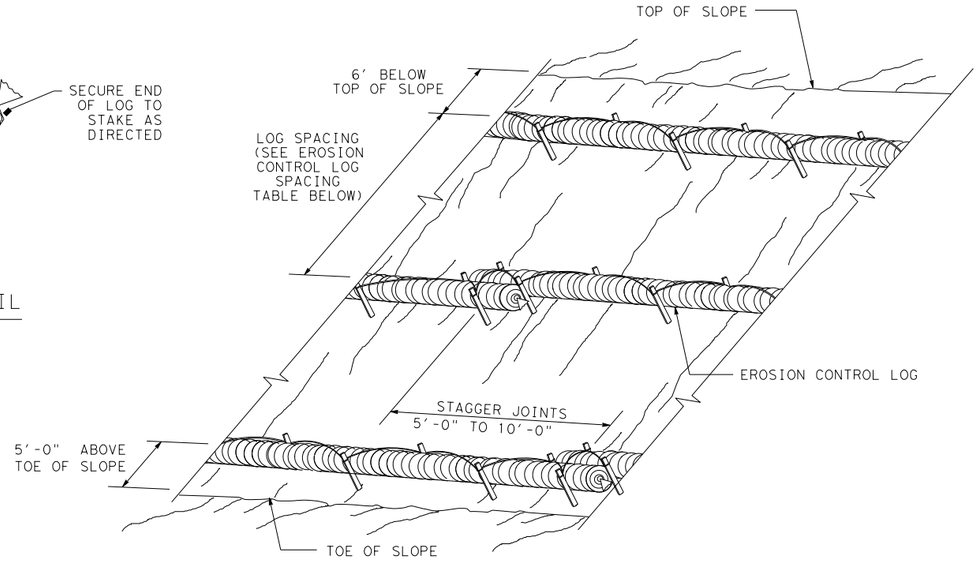
CL-SST



END SECTION RAP DETAIL

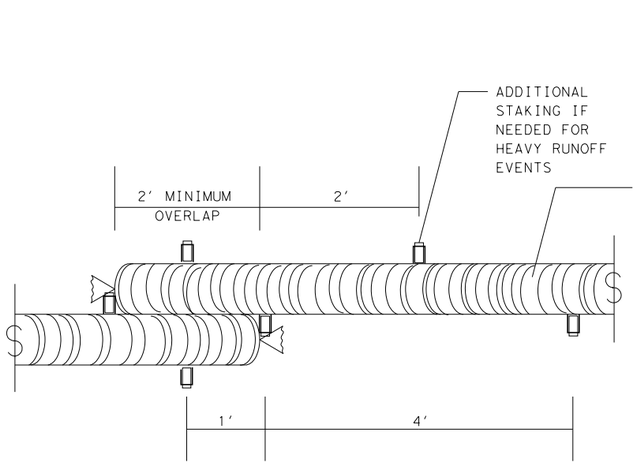
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

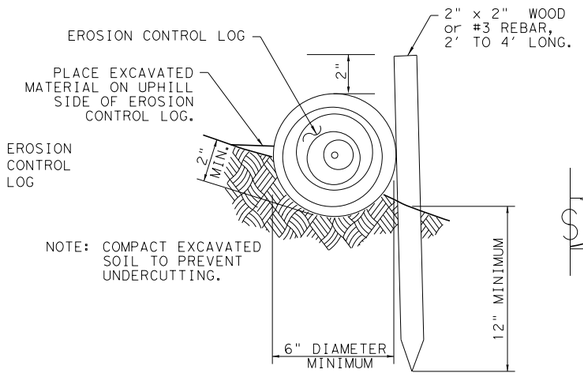
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

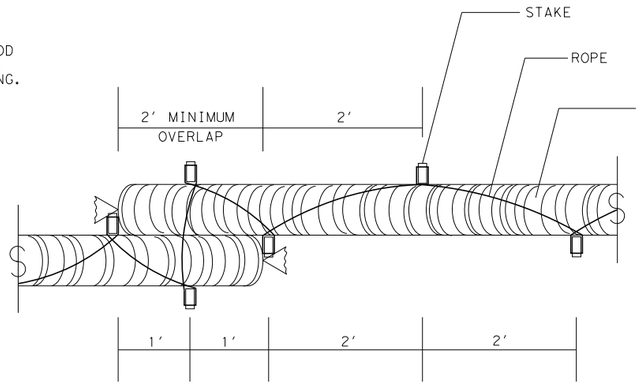


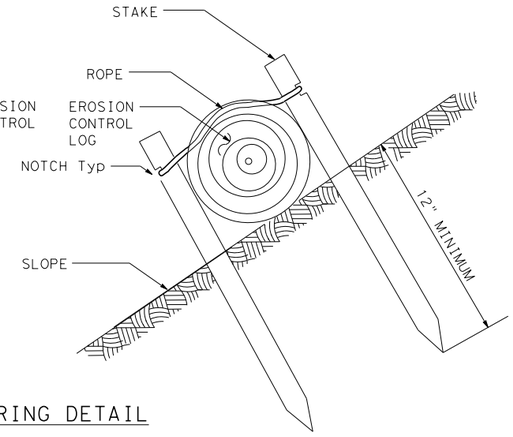


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

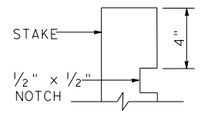
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

SHEET 2 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0356	01	112, ETC		SH 136, ETC	
	DIST		COUNTY			SHEET NO.
	AMA		HUTCHINSON, ETC			175

DATE: 1/2/2024
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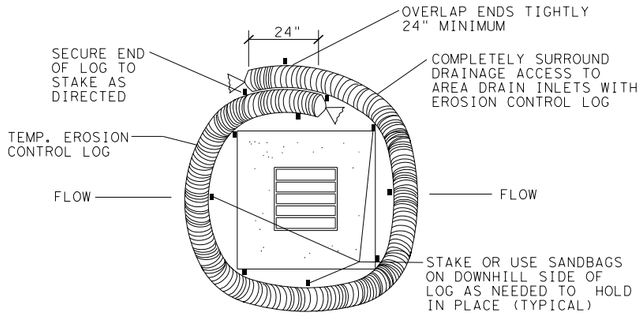
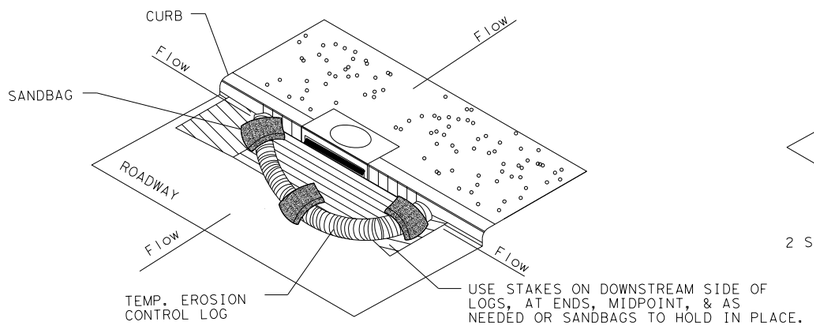


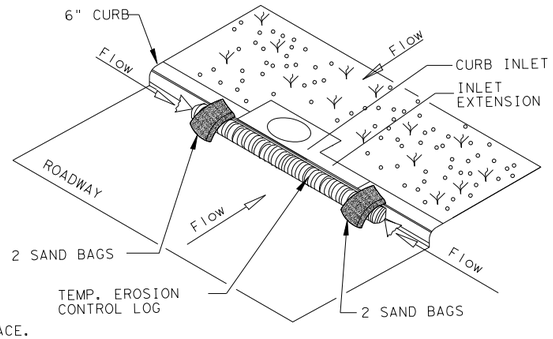
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

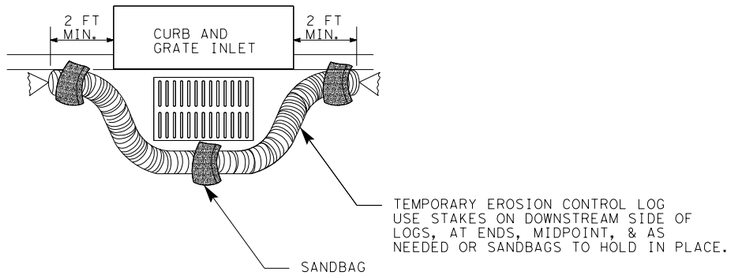
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

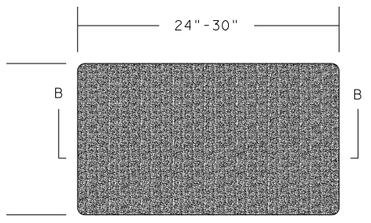
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS			
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY			
REVISIONS	0356	01	112, ETC	SH 136, ETC			
	DIST	COUNTY		SHEET NO.			
	AMA	HUTCHINSON, ETC		176			