INDEX OF SHEETS

SEE SHEET NO 2

FEDERAL AID PROJECT NO.			
BR 2025(036)			
CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		1

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NO. BR 2025(036)

TITUS COUNTY, ETC.
IH 30, ETC.

FOR THE CONSTRUCTION OF BRIDGE MAINTENANCE

CONSISTING OF CONCRETE STRUCTURE REPAIR, REPLACING ELASTOMERIC BEARING PADS, CLEANING AND SEALING JOINTS, ETC.

LOCATION	HIGHWAY	CROSSING	CSJ	REF.MARK	BRIDGE LENGTH		TOTAL LENGTH	FUNCTIONAL CLASS	ADT	
					(FT)	(MI)			2022 - YEAR	2042 - YEAR
1	IH 30 WB	TANKERSLEY CREEK	0610-03-104	159+0.675	132.00	0.025	132.00 FT = 0.025 MI	IH 30 - INTERSTATE	29,892	52,012
2	IH 30 EB	TANKERSLEY CREEK	0610-03-105	159-0.664	132.00	0.025	132.00 FT = 0.025 MI	IH 30 - INTERSTATE	29,892	52,012
3	IH 30 WB	US 271	0610-03-106	160+0.604	180.00	0.034	180 FT = 0.034 MI	IH 30 - INTERSTATE	29,892	52,012
4	IH 30 NFR	TANKERSLEY CREEK	0610-03-107	159+0.648	132.00	0.025	132.00 FT = 0.025 MI	NFR - INTERSTATE	230	230
5	IH 30 WB	US 259	0610-04-040	178+0.539	226.00	0.043	226.00 FT = 0.043 MI	IH 30 - INTERSTATE	24,566	39,797
6	IH 30 EB	US 259	0610-04-041	178+0.478	226.00	0.043	226.00 FT = 0.043 MI	IH 30 - INTERSTATE	24,566	39,797
7	IH 30 WB	CR 4008	0610-06-099	198+0.906	362.00	0.069	362.00 FT = 0.069 MI	IH 30 - INTERSTATE	25,757	40,696
8	IH 30 EB	CR 4008	0610-06-100	198-0.905	362.00	0.069	362.00 FT = 0.069 MI	IH 30 - INTERSTATE	25,757	40,696
9	IH 30 WB	US 82	0610-06-101	199+0.055	333.00	0.063	333.00 FT = 0.063 MI	IH 30 - INTERSTATE	31,408	45,856
10	IH 30 EB	US 82	0610-06-102	199+0.077	333.00	0.063	333.00 FT = 0.063 MI	IH 30 - INTERSTATE	31,408	45,856
11	IH 30 WB	SH 98	0610-06-103	198+0.200	230.00	0.044	230.00 FT = 0.044 MI	IH 30 - INTERSTATE	25,757	40,696
12	IH 30 EB	SH 98	0610-06-104	198+0.200	230.00	0.044	230.00 FT = 0.044 MI	IH 30 - INTERSTATE	25,757	40,696
13	SL 151 EB	FM 558	2050-03-009	744+0.042	4,798.00	0.909	4,798.00 FT = 0.909 MI	SL 151 - Principal Arterial	10,894	15,252
14	SL 151 WB	FM 558	2050-03-010	744+0.951	4,798.00	0.909	4,798.00 FT = 0.909 MI	SL 151 - Principal Arterial	10,894	15,252
15	SL 151 NB	SH 93	2050-03-011	742+0.181	423.00	0.080	423.00 FT = 0.080 MI	SL 151 - Principal Arterial	7,689	10,765
				TOTALS	12,897.00	2.443	12,897.00 FT = 2.443 MI			

FINAL PLANS

LETTING DATE: ________

DATE CONTRACTOR BEGAN WORK: ________

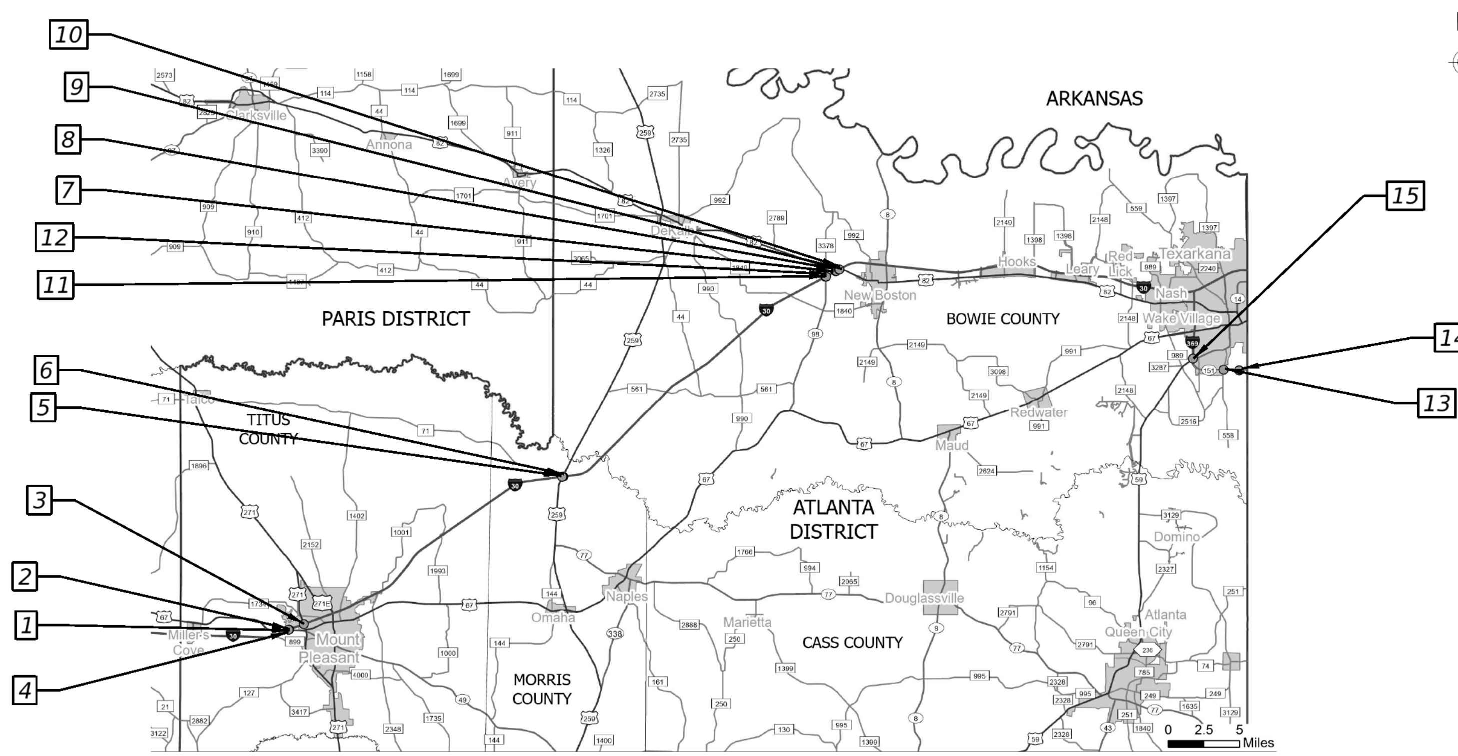
DATE WORK WAS COMPLETED & ACCEPTED: ________

FINAL CONTRACT COST: $ ________

CONTRACTOR : ________

CONTRACTOR ADDRESS: ________

LIST OF APPROVED FIELD CHANGES: ________



LOCATION MAP

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

THE CONSTRUCTION WORK WAS PERFORMED IN SUBSTANTIAL COMPLIANCE WITH THE CONTRACT.

________ P.E. ________ DATE

RECOMMENDED FOR LETTING: 8/6/2024

DocuSigned by:
Katie Martin, P.E.
3B337C5031074A4...

DISTRICT DIRECTOR OF TRANSPORTATION PLANNING AND DEVELOPMENT

APPROVED FOR LETTING: 8/6/2024

DocuSigned by:
Rebecca L Wells, P.E.

DISTRICT ENGINEER

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)

COUNTY TITUS, ETC. PROJ. NO. BR 2025(036)
HWY. NO. IH 30, ETC. LETTING DATE 09/05/2024
DATE ACCEPTED

DATE: 7/22/2024 1:15:08 PM
FILE: pw://txdot.projectwiseonline.com:TxDOTS/Documents/19 - ATL/Design Projects/0610031044 - Design/Master Design Files/PLANS SHEETS/TITLE SHEET AND INDEX OF SHEETS.dgn

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	6-9	QUANTITY SUMMARIES
		TRAFFIC CONTROL PLAN
	9A-9B	SEQUENCE OF WORK
	10-12	DETOUR LAYOUTS
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	13	TRAFFIC CONTROL PLAN (MOD)
	14	TCP(6-5)-12 (MOD)
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#	28B	TCP (2-2) - 18
#	28C	TCP (2-3) - 23
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	51	BRIDGE LAYOUT - IH30 WB AT US82
	52	BRIDGE LAYOUT - IH30 EB AT US82
	53	WINGWALL CONDITION PHOTOS
	54	ABUTMENT 1 EXISTING WINGWALL DETAILS - IH30 WB AT US82
	55	ABUTMENT 7 EXISTING WINGWALL DETAILS - IH30 WB AT US82
	56	ABUTMENT 1 EXISTING WINGWALL DETAILS - IH30 EB AT US82
	57	ABUTMENT 7 EXISTING WINGWALL DETAILS - IH30 EB AT US82

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	59	ROCKER BEARING REPLACEMENT AND ADJUSTMENT DETAILS
	60	ELASTOMERIC BEARING REPLACEMENT DETAILS FOR CONCRETE BEAMS
	61	ZONE PAINTING DETAILS
	62-63	FD (MOD)
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	65	BRIDGE DRAIN (MOD)
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		ENVIROMENTAL ISSUES
	88	ENVIROMENTAL PERMITS, ISSUES AND COMMENTS (EPIC)
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THE STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH A "#" HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

INDEX OF SHEETS

Texas Department of Transportation

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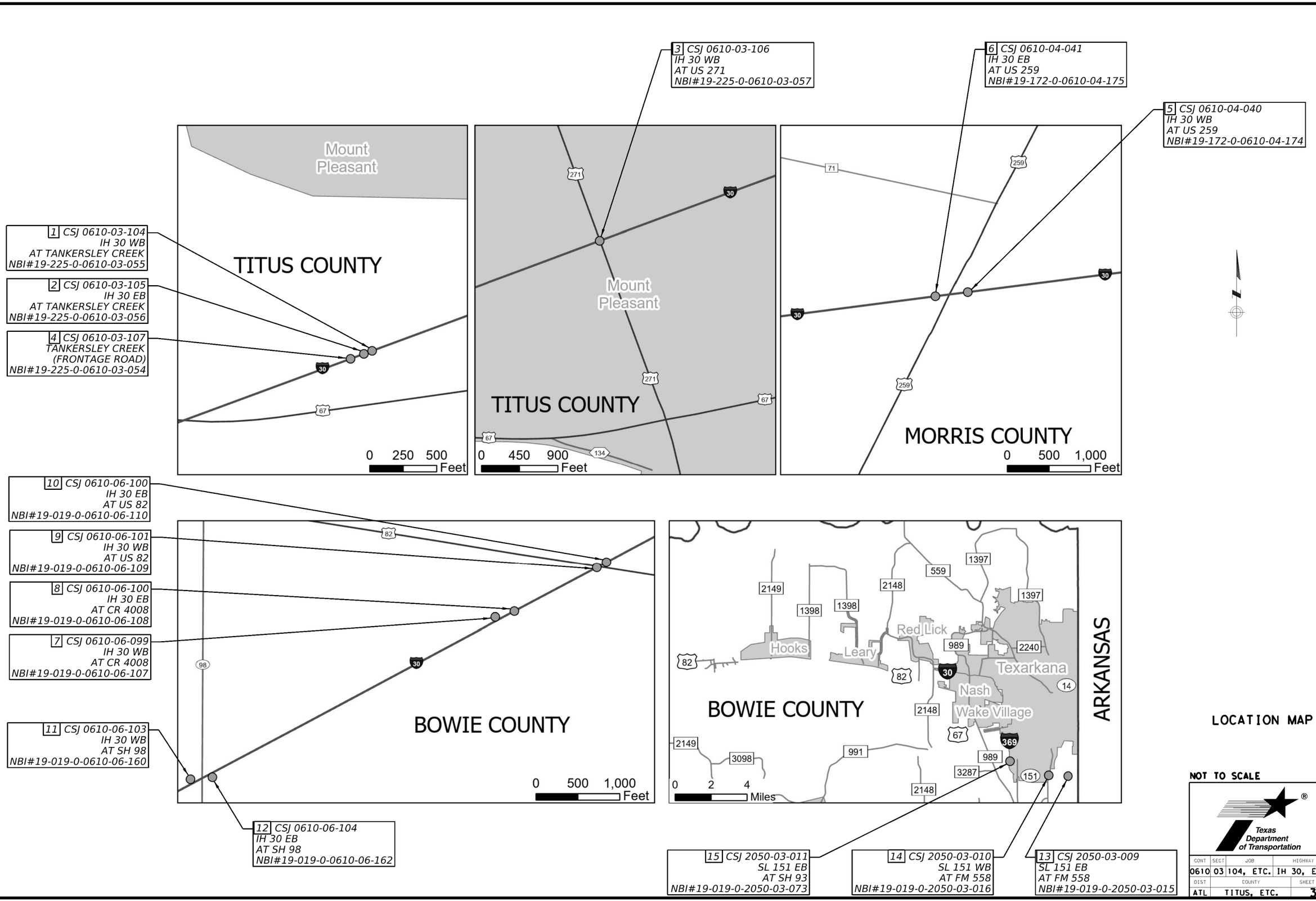
0610	03	104,ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		2

DATE: 7/22/2024 1:15:13 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/19 - ATL/Design Projects/061003104/4 - Design/Master Design Files/PLANS SHEETS/TITLE SHEET AND INDEX OF SHEETS.dgn


1 CSJ 0610-03-104
IH 30 WB
AT TANKERSLEY CREEK
NBI#19-225-0-0610-03-055
2 CSJ 0610-03-105
IH 30 EB
AT TANKERSLEY CREEK
NBI#19-225-0-0610-03-056
4 CSJ 0610-03-107
TANKERSLEY CREEK
(FRONTAGE ROAD)
NBI#19-225-0-0610-03-054
Mount Pleasant
TITUS COUNTY
0 250 500 Feet
3 CSJ 0610-03-106
IH 30 WB
AT US 271
NBI#19-225-0-0610-03-057
Mount Pleasant
TITUS COUNTY
0 450 900 Feet
6 CSJ 0610-04-041
IH 30 EB
AT US 259
NBI#19-172-0-0610-04-175
5 CSJ 0610-04-040
IH 30 WB
AT US 259
NBI#19-172-0-0610-04-174
MORRIS COUNTY
0 500 1,000 Feet
10 CSJ 0610-06-100
IH 30 EB
AT US 82
NBI#19-019-0-0610-06-110
9 CSJ 0610-06-101
IH 30 WB
AT US 82
NBI#19-019-0-0610-06-109
8 CSJ 0610-06-100
IH 30 EB
AT CR 4008
NBI#19-019-0-0610-06-108
7 CSJ 0610-06-099
IH 30 WB
AT CR 4008
NBI#19-019-0-0610-06-107
11 CSJ 0610-06-103
IH 30 WB
AT SH 98
NBI#19-019-0-0610-06-160
12 CSJ 0610-06-104
IH 30 EB
AT SH 98
NBI#19-019-0-0610-06-162
BOWIE COUNTY
0 500 1,000 Feet
Hooks
Leary
Red Lick
Texarkana
Nash
Wake Village
BOWIE COUNTY
ARKANSAS
0 2 4 Miles
15 CSJ 2050-03-011
SL 151 EB
AT SH 93
NBI#19-019-0-2050-03-073
14 CSJ 2050-03-010
SL 151 WB
AT FM 558
NBI#19-019-0-2050-03-016
13 CSJ 2050-03-009
SL 151 EB
AT FM 558
NBI#19-019-0-2050-03-015
LOCATION MAP
NOT TO SCALE
Texas Department of Transportation
CONT SECT JOB HIGHWAY
0610 03 104, ETC. IH 30, ETC.
DIST COUNTY SHEET NO.
ATL TITUS, ETC. 3
DATE: 6/26/2024 11:49:49 AM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/19 - ATL/Design Projects/061003104/4 - Design/Master Design Files/PLANS SHEETS/LOCATION MAP.dgn

GENERAL NOTES:

General Requirements and Covenants:

The following standard detail sheets have been modified: (See index of sheets for more information)

FD (MOD)
BRIDGE DRAIN (MOD)
CLEAN AND SEAL EXISTING BRIDGE JOINTS (MOD)
CLEAN AND SEAL EXISTING BRIDGE JOINTS (MOD) – PAN GIRDER BRIDGES
PRECOMPRESSED FOAM EXPENSION JOINT SEAL (MOD)
TCP(6-5)-12 (MOD)
TRAFFIC CONTROL PLAN (MOD)

Contractor questions on this project are to be addressed to the following individuals:

Wendy Starkes, P.E. – Area Engineer
Wendy.Starkes@Txdot.gov
Oscar Flores, P.E.– Assistant Area Engineer
Oscar.Flores@Txdot.gov

Questions may be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:

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

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

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

ITEM 5 – Control of the Work:

When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with "Standard Operating Procedure for Alternate Precast Proposal Submission" found online at: https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/bridge.html#design. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

ITEM 6 - Control of Material:

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

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

ITEM 7 – Legal Relations and Responsibilities:

This project is considered a maintenance activity and is exempt from the Construction General Permit (CGP) coverage.

The Contractor will not remove active nests from bridges and other structures during nesting season of the birds associated with the nests.

No significant traffic generator events.

ITEM 8 – Prosecution and Progress:

Working days will be charged in accordance with Section 8.3.1.6, ***"Other"*** and defined below:

> Working days for Phase 1 (Milestone 1) will be in accordance with Section 8.3.1.2 ***"Six-Day Workweek"*** after Phase 1 (Milestone 1) is substantially complete Working days (for Phase 2) will be in accordance with Section 8.3.1.4 ***"Standard Workweek"***.

A "no excuse" incentive of $250,000 will be credited if substantial completion of Milestone 1 (Phase 1) is completed within 204 working days. This incentive will not be adjusted for any reason except for approval of the Engineer.

A disincentive of $4,000 per day will begin 24 working days after the 204 working days of Milestone 1 (Phase 1) and last until Milestone 1 (Phase 1) is substantially complete.

Milestone 1 (Phase 1) begins the date (day) when any construction-related activity associated with Phase 1 begins including (but not limited to) the placement of Portable Changeable Message Boards, barricades, or erosion control measures. Milestone 1 (Phase 1) is substantially complete and ends on the date (day) when all work, as shown in the plans, associated with US 82 (EB and WB) and SH 98 (EB and WB) are completed to the satisfaction of the Engineer.

Phase 2 begins the date (day) after Milestone 1 (Phase 1) is substantially complete and to the satisfaction of the Engineer. For Phase 2 work, the number of NBI locations to be worked on concurrently will be limited to 3 locations unless otherwise approved by the Engineer.

ITEM 100 – Preparing Right of Way:

Do not burn trash, debris, etc. within the City limits without prior written city approval.

ITEM 104 – Remove Concrete (Riprap):

Remove only the amount of existing 4 inch concrete riprap that can be replace with proposed 24" stone protection and 6" bedding material for that day's work.

If rain occurs during the time of removal or before proposed stone protection is placed, plastic tarp will be pinned to the existing ground to minimize erosion. This work will be considered subsidiary to this item. Coordinate with the engineer prior to occurrence.

No equipment will be allowed in channel at Tankersley Creek (CSJ's 0610-03-104, 0610-03-105, and 0610-03-107).

ITEM 132 – Embankment:

Compact subgrade in earth cut sections, in accordance with section 132.3. 4.***1 Identify Ordinary Compaction***

Test borrow sources and furnish results to the Engineer.

Remove deleterious material, organic matter, and sediment, etc., from all ponds, lakes, sloughs, channels, and existing roadway ditches prior to placement of embankment. This work will be subsidiary to this item.

ITEM 164 – Seeding for Erosion Control:

PERMANENT PLANTING MIXTURE
Species and Rates
(lb. PLS/ac.)

(Season: February 1 to May 15)

Green Sprangletop	0.4
Bermudagrass	2.4
Sand Lovegrass	1.0
Lance-Leaf Coreopsis	1.25

(Season: September 1 to November 30)

Bermuda (Unhulled)	12
Crimson Clover	10

TEMPORARY SEEDING FOR EROSION CONTROL

Warm Season
(Season: May 15 to August 31)

Bermudagrass	6
Foxtail Millet	34

Cool Season
(Season: September 1 to November 30)

Tall Fescue	4.5
Oats	24
Wheat	34

Adjust the seeding mixture and rates if directed.

Inoculate crimson clover seed with a legume inoculant. Sow inoculated seed dry, with either hand operated or mechanical equipment, after the fertilizer is placed.

Do not use Bahia grass.

Use crimper immediately after spreading mulch. Apply ballast to machine to achieve an anchoring depth of 2 to 3 inches to form soil-binding mulch and to prevent loss or bunching of the mulch by wind. Anchor the machine to prevent the formation of ridges and ruts. Use coulters at least ten inches in diameter. Traverse slopes horizontally. The number of passes needed, not to exceed three, will be as directed. In areas where an anchoring machine cannot be used, the Department will require a tacking agent be used in the mulch as directed.

Use broadcast seeding for temporary erosion control, when and as directed. This will not be paid for directly but is subsidiary to the various bid items.

Use additional temporary seeding if permanent seeding is placed outside the optimum growing season shown for this item, if directed.

Finish slopes with a tracked vehicle running vertically up and down the slope.

ITEM 166 - Fertilizer:

When seeding between September 1 and January 1, place one-half of the amount of fertilizer specified for seeding with the seeds and place the remainder the following spring unless otherwise directed. When seeding is placed between January 1 and June 1, place one-half the amount of fertilizer specified for seeding with the seeds and place the remainder 30 days later unless otherwise directed.

Apply fertilizer (13-13-13) at a rate of 300 lbs. /5000 sq. yds.

ITEM 420 – Concrete Substructures:

Chamfer or tool exposed edges or joints of concrete as directed.

ITEM 421 – Hydraulic Cement Concrete:

The Department will furnish and maintain concrete compressive strength testing equipment.

Elevate curing tanks as directed.

Add air entrainment to all concrete used in bridge decks and decks of direct traffic structures in Bowie, Morris and Titus Counties. Target an entrained air content of no more than 5.5%.

When a curing tank is provided the following information must be provided. All items must always be clearly legible and visible from all directions.

- Post and maintain the message "Caution Lime Solution, Eye and Skin Irritant".
- Provide a copy of the SDS sheet for the lime in use.
- Provide the personal protective equipment (PPE) listed below for Department use only: Face shield, a pair of chemical gloves at least 18 inches in length and a chemical apron. Store the SDS sheet and PPE in a clean dry location adjacent to the curing tank.
- Provide an eye wash station capable of providing a 15-minute flush as required by the United States Occupational Safety and Health Administration (OSHA). The eye wash station shall be located within ten feet of the curing tank. When a tank heater is required ensure that all electrical wiring, receptacles, and devices meet National Electrical Code and Underwriters Laboratories Inc. requirements.

ITEM 432 - Riprap:

Provide ½" expansion joint material with an area equal to the area of contact between the two concrete surfaces. The joint material will be visually inspected for approval.

Gradation of stone riprap (24") and bedding material (6") shall be approved by the engineer by visual inspection.

ITEM 499 – Adjust Steel Shoes:

Replace damaged rocker bearings at IH 30 AT SH 98 (WB) - 0610-06-103 - NBI#19-019-0-0610-06-160 and IH 30 AT SH 98 (EB) - 0610-06-104 - NBI#19-019-0-0610-06-162. See Rocker Bearing Replacement and Adjustment Details for more information.

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's responsible person (CRP) will be responsible for ensuring that the signs and traffic control devices are in place and functioning properly.

The CRP will inspect and ensure any deficiencies are corrected each and every day throughout the duration of this contract. Notify the Engineer in writing of the name, address, and telephone number of this employee or these employees.

Length of lane closures will be as directed based on the demonstrated ability to prosecute the work within the closed section.

Restrict the movement of equipment across traffic lanes to an absolute minimum.

Use strobe lights or rotating beacons on all motorized equipment, operating on or adjacent to the road surface.

Install temporary rumble strips in accordance with WZ(RS) wherever short duration or short-term stationary lane closures are in place and workers are present.

There may be ongoing contracts on several of the roadways included in this contract. Coordinate work with these projects and consult with the Engineer when developing sequence of work.

Maintenance of driveways and intersections will not be paid for directly but is subsidiary to the pertinent bid items.

ITEM 503– Portable Changeable Message Sign:

Portable Changeable Message signs will be used on this contract. The Portable Changeable Message Signs will be used in advance of bridge work and as needed for traffic control. They may also be required at other locations as directed by the Engineer. The Engineer will provide the Contractor with the location and the messages to be displayed for each specific event. The Engineer or his representative will inspect each location once the Contractor has placed the message boards to verify that the placement and message is correct. The Contractor will change the message board location and modify the message being displayed as directed before leaving the location to the satisfaction of the Engineer or his representative. Refer to traffic control plan sheets for typical temporary portable changeable message sign layout.

ITEM 505–Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA):

The shadow vehicle with truck mounted attenuator (TMA) will not be optional but will be required as shown on the appropriate traffic control plan sheets.

A shadow vehicle with TMA will be required for work, except (0610-03-106 – IH 30 AT US 271) which will require the use of 2 shadow vehicles with TMA's. See Quantity Summaries and Detour Layouts for more information. 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 TMA's needed for the project.

A total of two (2) shadow vehicles with TMA will be required for Temporary Pavement Marking Operations.

ITEM 506 – Temporary Erosion, Sedimentation, and Environmental Controls:

Sprinkle water for dust control. Meet the requirements of Item 204, "Sprinkling" except for measurement and payment. Sprinkling will be considered subsidiary to this Item.

Provide the following Item(s), as directed, to be used for erosion and water pollution control measures and any additional erosion or water pollution control measure deemed necessary by the Engineer:

Rock filter dams (TY 3).

Provide and install additional erosion or water pollution control measures deemed necessary by the Engineer as prescribed by this item and in accordance with the appropriate specification. Payment for erosion control measures for which applicable pay items are not included in the Contract shall be made in accordance with Articles 4.4, "Changes in the Work" and 9.7, "Payment for Extra Work and Force Account Method".

ITEM 540 – Metal Beam Guard Fence:

Furnish round timber posts unless otherwise shown.

Patch concrete riprap with either Class "A" or Class "B" concrete or other approved concrete Surround all posts with 1/2 inch expansion joint material. Obtain the approval of the Engineer prior to placing expansion joint material and concrete riprap (visual inspection only).

Place sufficient dry batch concrete mix in holes to ensure minimum of 2-inch embedment of tubes and posts.

ITEM 544 – Guardrail End Treatments:

Place sufficient dry batch concrete mix in holes to ensure minimum of 2-inch embedment of tubes and posts.

ITEM 644 – Small Roadside Sign Assemblies:

Verify the elevation difference between the edge of the travel lane and bottom of the sign.

Do not remove existing sign assemblies until signs are ready to be installed on new mounts. Sign assemblies associated with warning signs or stop or yield signs will require Omni - Directional Post Wrap. Retroreflective sheeting wrapped around a warning sign is yellow. Stop or Yield signs will require red sheeting. Retroreflective sheeting wrapped around a sign has a height on the post of at least 12 inches. The bottom of the retroreflective sheeting will be placed two feet below the bottom of the sign. The Engineer will approve the retroreflective sheeting wrap prior to any installation. This work will not be paid for separately; but will be subsidiary to this Item.

ITEM 658 – Delineator and Object Marker Assemblies:

Install only round posts meeting the requirements of DMS-4400 or as directed.

SPECIFICATION DATA
TEST TO BE IN ACCORDANCE WITH DEPARTMENT OF TRANSPORTATION TEST METHODS

		GRADING REQUIREMENTS PERCENT RETAINED - SIEVES				SOIL CONSTANTS		
						L.L		P.I.
ITEM	DESCRIPTION	2-1/2"	1-3/4"	No. 4	No. 40	MAX.	MAX.	MIN.
132	Embankment (Type C)					50	25	4

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0610-03-104 **DISTRICT** Atlanta **COUNTY** Bowie, Morris, Titus
HIGHWAY IH 30, SL 151

			CONTROL SECTION JOB	**0610-03-104**		**0610-03-105**		**0610-03-106**		**0610-03-107**		**0610-04-040**		**0610-04-041**	
			PROJECT ID	**A00204944**		**A00204963**		**A00205003**		**A00205064**		**A00204904**		**A00204943**	
			COUNTY	**Titus**		**Titus**		**Titus**		**Titus**		**Morris**		**Morris**	
			HIGHWAY	**IH 30**		**IH 30**		**IH 30**		**IH 30**		**IH 30**		**IH 30**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	100-7001	PREPARING ROW	AC							0.100					
	104-7003	REMOV CONC (MOWSTRIP)	SY					54.000							
	104-7007	REMOV CONC (RIPRAP)	CY	118.000		157.000				139.000					
	104-7028	REMOV CONC (WINGWALL)	CY												
	132-7017	EMBANK (VEH)(OC)(TY C)	CY					10.000							
	164-7001	BROADCAST SEED (PERM_RURAL_SAND)	SY	200.000		120.000		120.000		140.000					
	164-7005	BROADCAST SEED (TEMP_WARM)	SY	100.000		60.000		60.000		70.000					
	164-7006	BROADCAST SEED (TEMP_COOL)	SY	100.000		60.000		60.000		70.000					
	168-7001	VEGETATIVE WATERING	TGL	6.400		3.800		3.800		4.500					
	401-7001	FLOWABLE BACKFILL	CY					1.000							
	416-7002	DRILL SHAFT (18 IN)	LF												
	420-7067	CL C CONC (MISC)	CY												
	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY)	SF	9.000								131.000		131.000	
	429-7002	CONC STR REPAIR (EPOXY MORTAR)	SF												
	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	61.000		43.000		39.000		5.000		51.000		14.000	
	429-7010	CONC STR REPAIR (PAN GIRDER HOLE REPR)	EA							33.000					
	432-7001	RIPRAP (CONC)(4 IN)	CY												
	432-7012	RIPRAP (CONC)(FLUME)	CY												
	432-7013	RIPRAP (MOW STRIP)(4 IN)	CY					7.000							
	432-7045	RIPRAP (STONE PROTECTION)(24 IN)	CY	921.000		1,279.000				1,206.000					
	432-7050	BEDDING MATERIAL (6 IN)	CY	157.000		208.000				211.000					
	438-7004	CLEANING AND SEALING EXIST JOINTS (CL3)	LF												
	438-7007	CLEANING AND SEALING EXIST JOINTS (CL7)	LF									172.000		172.000	
	438-7008	CLEANING EXISTING JOINTS	LF												
	438-7010	CLEANING AND SEALING JOINTS (FOAM)	LF	110.000		110.000		82.000				104.000		104.000	
	438-7012	CLEAN AND SEAL JNTS (PAN GIRDERS) (CL7)	LF							140.000					
	442-7011	STR STEEL (RAILS/POSTS/PLATES)	LB												
	481-7048	PIPE (GALV) (4 IN X 6 IN)	LF							18.000					
	499-7001	ADJUST STL SHOES	EA												
	500-7001	MOBILIZATION	LS									0.100		0.100	
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	2.000								2.000		2.000	
	503-7002	PORTABLE CHANGEABLE MESSAGE SIGN	EA					6.000							
	505-7001	TMA (STATIONARY)	DAY	39.000		35.000		65.000		36.000		18.000		12.000	
	505-7003	TMA (MOBILE OPERATION)	DAY					4.000							
	506-7003	ROCK FILTER DAMS (INSTALL) (TY 3)	LF			35.000									
	506-7011	ROCK FILTER DAMS (REMOVE)	LF			35.000									
	540-7001	MTL W-BEAM GD FEN (TIM POST)	LF					12.500							

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0610-03-104 **DISTRICT** Atlanta **COUNTY** Bowie, Morris, Titus
HIGHWAY IH 30, SL 151

				0610-03-104		0610-03-105		0610-03-106		0610-03-107		0610-04-040		0610-04-041	
		CONTROL SECTION JOB													
		PROJECT ID		A00204944		A00204963		A00205003		A00205064		A00204904		A00204943	
		COUNTY		Titus		Titus		Titus		Titus		Morris		Morris	
		HIGHWAY		IH 30		IH 30		IH 30		IH 30		IH 30		IH 30	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	540-7005	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA					1.000							
	542-7001	REMOVE METAL BEAM GUARD FENCE	LF					12.500							
	542-7004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA					1.000							
	544-7001	GUARDRAIL END TREATMENT (INSTALL)	EA					1.000							
	544-7003	GUARDRAIL END TREATMENT (REMOVE)	EA					1.000							
	644-7065	RELOCATE SM RD SN SUP&AM TY 10BWG	EA					1.000							
	658-7001	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GF2	EA					2.000							
	658-7078	REMOVE DELIN & OBJECT MARKER ASSMS	EA					2.000							
	662-7068	WK ZN PAV MRK REMOV (W)6"(SLD)	LF												
	662-7100	WK ZN PAV MRK REMOV (Y)6"(SLD)	LF					1,500.000							
	735-7072	DEBRIS REMOVAL (SPOT DEBRIS)	MI					1.000							
	738-7004	CLEANING / SWEEPING (CENTER MEDIAN)	CYC												
	738-7104	CLEANING / SWEEPING (SPOT)	MI					1.000							
	778-7004	CONCRETE RAIL REPLACEMENT (IN-KIND)	LF												
	780-7003	CONC CRCK REPR(DISCRETE)(ROUT AND SEAL)	LF												
	784-7003	REP STL BRIDGE MEMBER (DIAPHRAGM)	EA												
	787-7001	REPLACING ELASTOMERIC BEARING PADS	EA												
	788-7001	CONCRETE BEAM REPAIR	EA					1.000							
	4010-7001	STEEL BRIDGE ZONE PAINTING REF STR #1	EA												
	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	EA	4.000		4.000		5.000		4.000		4.000		4.000	
	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 0610-03-104 **DISTRICT** Atlanta **COUNTY** Bowie, Morris, Titus
HIGHWAY IH 30, SL 151

				0610-06-099		0610-06-100		0610-06-101		0610-06-102		0610-06-103		0610-06-104	
			CONTROL SECTION JOB												
			PROJECT ID	A00204705		A00204723		A00204725		A00204744		A00208880		A00208884	
			COUNTY	Bowie		Bowie		Bowie		Bowie		Bowie		Bowie	
			HIGHWAY	IH 30		IH 30		IH 30		IH 30		IH 30		IH 30	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	100-7001	PREPARING ROW	AC												
	104-7003	REMOV CONC (MOWSTRIP)	SY												
	104-7007	REMOV CONC (RIPRAP)	CY												
	104-7028	REMOV CONC (WINGWALL)	CY					27.000		27.000					
	132-7017	EMBANK (VEH)(OC)(TY C)	CY												
	164-7001	BROADCAST SEED (PERM_RURAL_SAND)	SY					500.000		500.000					
	164-7005	BROADCAST SEED (TEMP_WARM)	SY					250.000		250.000					
	164-7006	BROADCAST SEED (TEMP_COOL)	SY					250.000		250.000					
	168-7001	VEGETATIVE WATERING	TGL					16.000		16.000					
	401-7001	FLOWABLE BACKFILL	CY												
	416-7002	DRILL SHAFT (18 IN)	LF					280.000		280.000					
	420-7067	CL C CONC (MISC)	CY					27.000		27.000					
	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY)	SF	9.000		10.000		20.000		28.000					
	429-7002	CONC STR REPAIR (EPOXY MORTAR)	SF							12.000					
	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	59.000		38.000		29.000		47.000		11.000		64.000	
	429-7010	CONC STR REPAIR (PAN GIRDER HOLE REPR)	EA												
	432-7001	RIPRAP (CONC)(4 IN)	CY												
	432-7012	RIPRAP (CONC)(FLUME)	CY												
	432-7013	RIPRAP (MOW STRIP)(4 IN)	CY												
	432-7045	RIPRAP (STONE PROTECTION)(24 IN)	CY												
	432-7050	BEDDING MATERIAL (6 IN)	CY												
	438-7004	CLEANING AND SEALING EXIST JOINTS (CL3)	LF	1,496.000		1,632.000		1,212.000		1,024.000		844.000			
	438-7007	CLEANING AND SEALING EXIST JOINTS (CL7)	LF	428.000		313.000		595.000		469.000		166.000		166.000	
	438-7008	CLEANING EXISTING JOINTS	LF												
	438-7010	CLEANING AND SEALING JOINTS (FOAM)	LF	108.000		133.000		170.000		132.000		98.000		98.000	
	438-7012	CLEAN AND SEAL JNTS (PAN GIRDERS) (CL7)	LF												
	442-7011	STR STEEL (RAILS/POSTS/PLATES)	LB									56.000		56.000	
	481-7048	PIPE (GALV) (4 IN X 6 IN)	LF	35.000		35.000		30.000		30.000					
	499-7001	ADJUST STL SHOES	EA									12.000		12.000	
	500-7001	MOBILIZATION	LS	0.100		0.100						0.100		0.100	
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	2.000		2.000						2.000		4.000	
	503-7002	PORTABLE CHANGEABLE MESSAGE SIGN	EA					1.000		1.000					
	505-7001	TMA (STATIONARY)	DAY	34.000		31.000		172.000		182.000		24.000		29.000	
	505-7003	TMA (MOBILE OPERATION)	DAY					8.000		22.000					
	506-7003	ROCK FILTER DAMS (INSTALL) (TY 3)	LF												
	506-7011	ROCK FILTER DAMS (REMOVE)	LF												
	540-7001	MTL W-BEAM GD FEN (TIM POST)	LF												

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0610-03-104 **DISTRICT** Atlanta **COUNTY** Bowie, Morris, Titus
HIGHWAY IH 30, SL 151

			CONTROL SECTION JOB	**0610-06-099**		**0610-06-100**		**0610-06-101**		**0610-06-102**		**0610-06-103**		**0610-06-104**	
			PROJECT ID	**A00204705**		**A00204723**		**A00204725**		**A00204744**		**A00208880**		**A00208884**	
			COUNTY	**Bowie**		**Bowie**		**Bowie**		**Bowie**		**Bowie**		**Bowie**	
			HIGHWAY	**IH 30**		**IH 30**		**IH 30**		**IH 30**		**IH 30**		**IH 30**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	540-7005	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA					4.000		4.000					
	542-7001	REMOVE METAL BEAM GUARD FENCE	LF												
	542-7004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA					4.000		4.000					
	544-7001	GUARDRAIL END TREATMENT (INSTALL)	EA												
	544-7003	GUARDRAIL END TREATMENT (REMOVE)	EA												
	644-7065	RELOCATE SM RD SN SUP&AM TY 10BWG	EA												
	658-7001	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GF2	EA												
	658-7078	REMOVE DELIN & OBJECT MARKER ASSMS	EA												
	662-7068	WK ZN PAV MRK REMOV (W)6"(SLD)	LF					4,400.000		18,000.000					
	662-7100	WK ZN PAV MRK REMOV (Y)6"(SLD)	LF					4,400.000		9,900.000					
	735-7072	DEBRIS REMOVAL (SPOT DEBRIS)	MI					1.000		1.000					
	738-7004	CLEANING / SWEEPING (CENTER MEDIAN)	CYC											734.000	
	738-7104	CLEANING / SWEEPING (SPOT)	MI					1.000		1.000					
	778-7004	CONCRETE RAIL REPLACEMENT (IN-KIND)	LF					85.000		85.000					
	780-7003	CONC CRCK REPR(DISCRETE)(ROUT AND SEAL)	LF			3.000		4.000				6.000			
	784-7003	REP STL BRIDGE MEMBER (DIAPHRAGM)	EA									1.000		2.000	
	787-7001	REPLACING ELASTOMERIC BEARING PADS	EA					9.000		26.000					
	788-7001	CONCRETE BEAM REPAIR	EA												
	4010-7001	STEEL BRIDGE ZONE PAINTING REF STR #1	EA									1.000		1.000	
	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	EA	8.000		8.000		7.000		7.000		4.000		4.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS												
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS												

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0610-03-104 **DISTRICT** Atlanta **COUNTY** Bowie, Morris, Titus
HIGHWAY IH 30, SL 151

				2050-03-009		2050-03-010		2050-03-011		TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB									
		PROJECT ID		A00205005		A00205006		A00205143			
		COUNTY		Bowie		Bowie		Bowie			
		HIGHWAY		SL 151		SL 151		SL 151			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	100-7001	PREPARING ROW	AC							0.100	
	104-7003	REMOV CONC (MOWSTRIP)	SY							54.000	
	104-7007	REMOV CONC (RIPRAP)	CY					1.000		415.000	
	104-7028	REMOV CONC (WINGWALL)	CY							54.000	
	132-7017	EMBANK (VEH)(OC)(TY C)	CY							10.000	
	164-7001	BROADCAST SEED (PERM_RURAL_SAND)	SY					240.000		1,820.000	
	164-7005	BROADCAST SEED (TEMP_WARM)	SY					120.000		910.000	
	164-7006	BROADCAST SEED (TEMP_COOL)	SY					120.000		910.000	
	168-7001	VEGETATIVE WATERING	TGL					7.700		58.200	
	401-7001	FLOWABLE BACKFILL	CY							1.000	
	416-7002	DRILL SHAFT (18 IN)	LF							560.000	
	420-7067	CL C CONC (MISC)	CY							54.000	
	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY)	SF							338.000	
	429-7002	CONC STR REPAIR (EPOXY MORTAR)	SF			2.000		45.000		59.000	
	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	33.000		35.000		56.000		585.000	
	429-7010	CONC STR REPAIR (PAN GIRDER HOLE REPR)	EA							33.000	
	432-7001	RIPRAP (CONC)(4 IN)	CY					1.000		1.000	
	432-7012	RIPRAP (CONC)(FLUME)	CY					1.000		1.000	
	432-7013	RIPRAP (MOW STRIP)(4 IN)	CY							7.000	
	432-7045	RIPRAP (STONE PROTECTION)(24 IN)	CY							3,406.000	
	432-7050	BEDDING MATERIAL (6 IN)	CY							576.000	
	438-7004	CLEANING AND SEALING EXIST JOINTS (CL3)	LF							6,208.000	
	438-7007	CLEANING AND SEALING EXIST JOINTS (CL7)	LF			48.000		156.000		2,685.000	
	438-7008	CLEANING EXISTING JOINTS	LF	847.000		808.000		96.000		1,751.000	
	438-7010	CLEANING AND SEALING JOINTS (FOAM)	LF	88.000		88.000		76.000		1,501.000	
	438-7012	CLEAN AND SEAL JNTS (PAN GIRDERS) (CL7)	LF							140.000	
	442-7011	STR STEEL (RAILS/POSTS/PLATES)	LB							112.000	
	481-7048	PIPE (GALV) (4 IN X 6 IN)	LF							148.000	
	499-7001	ADJUST STL SHOES	EA							24.000	
	500-7001	MOBILIZATION	LS	0.100		0.200		0.100		1.000	
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	2.000		2.000		2.000		22.000	
	503-7002	PORTABLE CHANGEABLE MESSAGE SIGN	EA							8.000	
	505-7001	TMA (STATIONARY)	DAY	17.000		19.000		13.000		726.000	
	505-7003	TMA (MOBILE OPERATION)	DAY							34.000	
	506-7003	ROCK FILTER DAMS (INSTALL) (TY 3)	LF							35.000	
	506-7011	ROCK FILTER DAMS (REMOVE)	LF							35.000	
	540-7001	MTL W-BEAM GD FEN (TIM POST)	LF							12.500	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0610-03-104 **DISTRICT** Atlanta **COUNTY** Bowie, Morris, Titus
HIGHWAY IH 30, SL 151

			CONTROL SECTION JOB	**2050-03-009**		**2050-03-010**		**2050-03-011**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00205005**		**A00205006**		**A00205143**			
			COUNTY	**Bowie**		**Bowie**		**Bowie**			
			HIGHWAY	**SL 151**		**SL 151**		**SL 151**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	540-7005	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA							9.000	
	542-7001	REMOVE METAL BEAM GUARD FENCE	LF							12.500	
	542-7004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA							9.000	
	544-7001	GUARDRAIL END TREATMENT (INSTALL)	EA							1.000	
	544-7003	GUARDRAIL END TREATMENT (REMOVE)	EA							1.000	
	644-7065	RELOCATE SM RD SN SUP&AM TY 10BWG	EA							1.000	
	658-7001	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GF2	EA							2.000	
	658-7078	REMOVE DELIN & OBJECT MARKER ASSMS	EA							2.000	
	662-7068	WK ZN PAV MRK REMOV (W)6"(SLD)	LF							22,400.000	
	662-7100	WK ZN PAV MRK REMOV (Y)6"(SLD)	LF							15,800.000	
	735-7072	DEBRIS REMOVAL (SPOT DEBRIS)	MI							3.000	
	738-7004	CLEANING / SWEEPING (CENTER MEDIAN)	CYC							734.000	
	738-7104	CLEANING / SWEEPING (SPOT)	MI							3.000	
	778-7004	CONCRETE RAIL REPLACEMENT (IN-KIND)	LF							170.000	
	780-7003	CONC CRCK REPR(DISCRETE)(ROUT AND SEAL)	LF	3.000						16.000	
	784-7003	REP STL BRIDGE MEMBER (DIAPHRAGM)	EA							3.000	
	787-7001	REPLACING ELASTOMERIC BEARING PADS	EA							35.000	
	788-7001	CONCRETE BEAM REPAIR	EA							1.000	
	4010-7001	STEEL BRIDGE ZONE PAINTING REF STR #1	EA							2.000	
	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	EA	2.000		2.000		2.000		69.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS							1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS							1.000	

BRIDGE AND ROADWAY SUMMARY

LOCATION	104 7007 [1] REMOV CONC (RIPRAP)	104 7028 [2] REMOVE CONC (WINGWALL)	416 7002 [2] DRILL SHAFT (18 IN)	420 7067 [2] CL C CONC (MISC)	429 7001 CONC STR REPAIR(CLEAN & COAT WTH EPOXY)	429 7002 CONC STR REPAIR (EPOXY MORTAR)	429 7007 CONC STR REPAIR (VERTICAL & OVERHEAD)	429 7010 CONC STR REPAIR (PAN GIRDER HOLE REPR)	432 7001 RIPRAP (CONC)(4 IN)	432 7012 RIPRAP (CONC)(FLUME)
	CY	CY	LF	CY	SF	SF	SF	EA	CY	CY
IH 30 WB AT TANKERSLEY CREEK; (NBI#19-225-0-0610-03-055); (CSJ0610-03-104)					9		61			
IH 30 EB AT TANKERSLEY CREEK; (NBI#19-225-0-0610-03-056); (CSJ0610-03-105)							43			
IH 30 WB AT US 271; (NBI#19-225-0-0610-03-057); (CSJ0610-03-106)							39			
TANKERSLEY CREEK (FRONTAGE ROAD); (NBI#19-225-0-0610-03-054); (CSJ0610-03-107)							5	33		
IH 30 WB AT US 259; (NBI#19-172-0-0610-04-174); (CSJ0610-04-040)					131		51			
IH 30 EB AT US 259; (NBI#19-172-0-0610-04-175); (CSJ0610-04-041)					131		14			
IH 30 WB AT CR 4008; (NBI#19-019-0-0610-06-107); (CSJ0610-06-099)					9		59			
IH 30 EB AT CR 4008; (NBI#19-019-0-0610-06-108); (CSJ0610-06-100)					10		38			
IH 30 WB AT US 82; (NBI#19-019-0-0610-06-109); (CSJ0610-06-101)		27	280	27	20		29			
IH 30 EB AT US 82; (NBI#19-019-0-0610-06-110); (CSJ0610-06-102)		27	280	27	28	12	47			
IH 30 WB AT SH 98; (NBI#19-019-0-0610-06-160); (CSJ0610-06-103)							11			
IH 30 EB AT SH 98; (NBI#19-019-0-0610-06-162); (CSJ0610-06-104)							64			
SL 151 EB AT FM 558; (NBI#19-019-0-2050-03-015); (CSJ2050-03-009)							33			
SL 151 WB AT FM 558; (NBI#19-019-0-2050-03-016); (CSJ2050-03-010)						2	35			
SL 151 NB AT SH 93; (NBI#19-019-0-2050-03-073); (CSJ2050-03-011)	1					45	56		1	1
SUB-TOTAL: BRIDGE AND ROADWAY SUMMARY SHEET 1 OF 4)	1	54	560	54	338	59	585	33	1	1
PROJECT TOTAL:		**54**	**560**	**54**	**338**	**59**	**585**	**33**	**1**	**1**

[1] - SEE CHANNEL AND EROSION CONTROL SUMMARY SHEET 2 OF 3 FOR ADDITIONAL QUANTITIES.
[2] - SEE WINGWALL REPLACEMENT DETAILS FOR MORE INFORMATION.

BRIDGE AND ROADWAY SUMMARY (CONTINUED)

LOCATION	438 7004 CLEANING AND SEALING EXIST JOINTS (CL3)	438 7007 CLEANING AND SEALING EXIST JOINTS (CL7)	438 7008 CLEAN EXISTING JOINTS	438 7010 CLEANING AND SEALING JOINTS (FOAM)	438 7012 CLEAN AND SEAL JNTS (PAN GIRDERS) (CL7)	442 7011 [3] STR STEEL (RAILS/POSTS/PLATES)	481 7048 [4] PIPE (GALV)(4 IN X 6 IN)
	LF	LF	LF	LF	LF	LBS	LF
IH 30 WB AT TANKERSLEY CREEK; (NBI#19-225-0-0610-03-055); (CSJ0610-03-104)				110			
IH 30 EB AT TANKERSLEY CREEK; (NBI#19-225-0-0610-03-056); (CSJ0610-03-105)				110			
IH 30 WB AT US 271; (NBI#19-225-0-0610-03-057); (CSJ0610-03-106)				82			
TANKERSLEY CREEK (FRONTAGE ROAD); (NBI#19-225-0-0610-03-054); (CSJ0610-03-107)					140		18
IH 30 WB AT US 259; (NBI#19-019-0-0610-04-174); (CSJ0610-04-040)		172		104			
IH 30 EB AT US 259; (NBI#19-019-0-0610-04-175); (CSJ0610-04-041)		172		104			
IH 30 WB AT CR 4008 (WB); (NBI#19-019-0-0610-06-107); (CSJ0610-06-099)	1,496	428		108			35
IH 30 EB AT CR 4008; (NBI#19-019-0-0610-06-108); (CSJ0610-06-100)	1,632	313		133			35
IH 30 WB AT US 82; (NBI#19-019-0-0610-06-109); (CSJ0610-06-101)	1,212	595		170			30
IH 30 EB AT US 82; (NBI#19-019-0-0610-06-110); (CSJ0610-06-102)	1,024	469		132			30
IH 30 WB AT SH 98; (NBI#19-019-0-0610-06-160); (CSJ0610-06-103)	844	166		98		56	
IH 30 EB AT SH 98; (NBI#19-019-0-0610-06-162); (CSJ0610-06-104)	734	166		98		56	
SL 151 EB AT FM 558; (NBI#19-019-0-2050-03-015); (CSJ2050-03-009)			847	88			
SL 151 WB AT FM 558; (NBI#19-019-0-2050-03-016); (CSJ2050-03-010)		48	808	88			
SL 151 NB AT SH 93; (NBI#19-019-0-2050-03-073); (CSJ2050-03-011)		156	96	76			
PROJECT TOTAL:	**6,942**	**2,685**	**1,751**	**1,501**	**140**	**112**	**148**

[3] - NBI SIGNS AND ANCHORS ARE PAID UNDER ITEM 442, "METAL FOR STRUCTURES." - SEE NBIS STANDARD FOR MORE INFORMATION.
[4] - SEE BRIDGE DRAIN (MOD) DETAIL FOR MORE INFORMATION.

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QUANTITY SUMMARIES

Texas Department of Transportation

SHEET 1 OF 4

CONT	SECT	JOB	SHEET
0610	03	104, ETC.	6
DISTRICT	COUNTY	HIGHWAY	
ATL	TITUS, ETC.	IH 30, ETC.	

BRIDGE AND ROADWAY SUMMARY (CONTINUED)

LOCATION		499	735	738	778	780	784	787
		7001	7072	7104	7004	7003	7003	7001
	[1] RAISING EXIST STRUCT	[2] ADJUST STL SHOES	[3] DEBRIS REMOVAL (SPOT DEBRIS)	[3] CLEANING / SWEEPING (SPOT)	CONCRETE RAIL REPLACEMENT (IN-KIND)	CONC CRCK REPR(DISCRETE)(ROUT AND SEAL)	[4] REP STL BRIDGE MEMBER (DIAPHRAGM)	REPLACING ELASTOMERIC BEARING PADS
	EA	EA	MI	MI	LF	LF	EA	EA
IH 30 WB AT TANKERSLEY CREEK; (NBI#19-225-0-0610-03-055); (CSJ0610-03-104)								
IH 30 EB AT TANKERSLEY CREEK; (NBI#19-225-0-0610-03-056); (CSJ0610-03-105)								
IH 30 WB AT US 271; (NBI#19-225-0-0610-03-057); (CSJ0610-03-106)			1	1				
TANKERSLEY CREEK (FRONTAGE ROAD); (NBI#19-225-0-0610-03-054); (CSJ0610-03-107)								
IH 30 WB AT US 259; (NBI#19-019-0-0610-04-174); (CSJ0610-04-040)								
IH 30 EB AT US 259; (NBI#19-019-0-0610-04-175); (CSJ0610-04-041)								
IH 30 WB AT CR 4008 (WB); (NBI#19-019-0-0610-06-107); (CSJ0610-06-099)								
IH 30 EB AT CR 4008; (NBI#19-019-0-0610-06-108); (CSJ0610-06-100)						3		
IH 30 WB AT US 82; (NBI#19-019-0-0610-06-109); (CSJ0610-06-101)	1		1	1	85	4		9
IH 30 EB AT US 82; (NBI#19-019-0-0610-06-110); (CSJ0610-06-102)	4		1	1	85			26
IH 30 WB AT SH 98; (NBI#19-019-0-0610-06-160); (CSJ0610-06-103)	2	12				6	1	
IH 30 EB AT SH 98; (NBI#19-019-0-0610-06-162); (CSJ0610-06-104)	2	12					2	
SL 151 EB AT FM 558; (NBI#19-019-0-2050-03-015); (CSJ2050-03-009)						3		
SL 151 WB AT FM 558; (NBI#19-019-0-2050-03-016); (CSJ2050-03-010)								
SL 151 NB AT SH 93; (NBI#19-019-0-2050-03-073); (CSJ2050-03-011)								
PROJECT TOTAL:	9	24	3	3	170	16	3	35

[1] - FOR CONTRACTOR'S INFORMATION ONLY.
[2] - REPLACING PINS WILL BE SUBSIDARY TO THIS BID ITEM - SH 98 WB ABUTMENT 4 BEAM 3 PIN REPLACEMENT AND SH 98 EB ABUTMENT 1 BEAM 5 PIN REPLACEMENT.
[3] - CLEAN ALL PAVEMENT, MEDIANS, AND SHOULDERS ON BOTH SIDES OF LANES.
[4] - WELD LOCATIONS 1) WELD DIAPHRAGM SH 98 WB ABUTMENT 4 BEAM 3 BOTH SIDES AND 2) SH 98 EB ABUTMENT 1 BEAM 3.

BRIDGE AND ROADWAY SUMMARY (CONTINUED)

LOCATIONS	788	4010	7001
	7001	7001	7002
	CONCRETE BEAM REPAIR	STEEL BRIDGE ZONE PAINTING REF STR #1	BENT CAP/ABUTMENT CAP CLEANING
	EA	EA	EA
IH 30 WB AT TANKERSLEY CREEK; (NBI#19-225-0-0610-03-055); (CSJ0610-03-104)			4
IH 30 EB AT TANKERSLEY CREEK; (NBI#19-225-0-0610-03-056); (CSJ0610-03-105)			4
IH 30 WB AT US 271; (NBI#19-225-0-0610-03-057); (CSJ0610-03-106)	1		5
TANKERSLEY CREEK (FRONTAGE ROAD); (NBI#19-225-0-0610-03-054); (CSJ0610-03-107)			4
IH 30 WB AT US 259; (NBI#19-019-0-0610-04-174); (CSJ0610-04-040)			4
IH 30 EB AT US 259; (NBI#19-019-0-0610-04-175); (CSJ0610-04-041)			4
IH 30 WB AT CR 4008 (WB); (NBI#19-019-0-0610-06-107); (CSJ0610-06-099)			8
IH 30 EB AT CR 4008; (NBI#19-019-0-0610-06-108); (CSJ0610-06-100)			8
IH 30 WB AT US 82; (NBI#19-019-0-0610-06-109); (CSJ0610-06-101)			7
IH 30 EB AT US 82; (NBI#19-019-0-0610-06-110); (CSJ0610-06-102)			7
IH 30 WB AT SH 98; (NBI#19-019-0-0610-06-160); (CSJ0610-06-103)		1	4
IH 30 EB AT SH 98; (NBI#19-019-0-0610-06-162); (CSJ0610-06-104)		1	4
SL 151 EB AT FM 558; (NBI#19-019-0-2050-03-015); (CSJ2050-03-009)			2
SL 151 WB AT FM 558; (NBI#19-019-0-2050-03-016); (CSJ2050-03-010)			2
SL 151 NB AT SH 93; (NBI#19-019-0-2050-03-073); (CSJ2050-03-011)			2
PROJECT TOTAL:	1	2	69

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QUANTITY SUMMARIES

Texas Department of Transportation

SHEET 2 OF 4

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DISTRICT	COUNTY		SHEET
ATL	TITUS, ETC.		7

MBGF SUMMARY

LOCATION	104 7003 REMOV CONC (MOWSTRIP)	132 7017 EMBANK (VEH)(OC)(TY C)	401 7001 [1] FLOWABLE BACKFILL	432 7013 RIPRAP (MOW STRIP)(4 IN)	540 7001 MTL W-BEAM GD FEN (TIM POST)	540 7005 MTL BEAM GD FEN TRANS (THRIE-BEAM)	542 7001 REMOVE METAL BEAM GUARD FENCE	542 7004 RM MTL BM GD FENCE TRANS (THRIE-BEAM)
	SY	CY	CY	CY	LF	EA	LF	EA
IH 30 WB AT US 271; (NBI#19-225-0-0610-03-057); (CSJ0610-03-106)	54	10	1	7	12.5	1	12.5	1
IH 30 WB AT US 82; (NBI#19-019-0-0610-06-109); (CSJ0610-06-101)						4		4
IH 30 EB AT US 82; (NBI#19-019-0-0610-06-110); (CSJ0610-06-102)						4		4
PROJECT TOTAL	54	10	1	7	12.5	9	12.5	9

[1] - SEE IH 30 AT US 271 (WB) MBGF LAYOUT FOR MORE INFORMATION.

MBGF SUMMARY (CONTINUED)

LOCATION	544 7001 GUARDRAIL END TREATMENT (INSTALL)	544 7003 GUARDRAIL END TREATMENT (REMOVE)	644 7065 RELOCATE SM RD SN SUP&AM TY 10BWG	658 7001 INSTL DEL ASSM (D-SW)SZ 1(WFLX)GF2	658 7078 REMOVE DELIN & OBJECT MARKER ASSMS
	EA	EA	EA	EA	EA
IH 30 WB AT US 271; (NBI#19-225-0-0610-03-057); (CSJ0610-03-106)	1	1	1	2	2
PROJECT TOTAL:	1	1	1	2	2

WORK ZONE AND TRAFFIC CONTROL SUMMARY

LOCATIONS	503 7002 [2] PORTABLE CHANGEABLE MESSAGE SIGN	505 7001 TMA (STATIONARY)	505 7003 [3] TMA (MOBILE OPERATION)	662 7068 WK ZN PAV MRK REMOV (W)6"(SLD)	662 7100 WK ZN PAV MRK REMOV (Y)6"(SLD)
	EA	DAY	DAY	LF	LF
IH 30 WB AT TANKERSLEY CREEK; (NBI#19-225-0-0610-03-055); (CSJ0610-03-104)		39			
IH 30 EB AT TANKERSLEY CREEK; (NBI#19-225-0-0610-03-056); (CSJ0610-03-105)		35			
IH 30 WB AT US 271; (NBI#19-225-0-0610-03-057); (CSJ0610-03-106)		[C] 65	4		1,500
TANKERSLEY CREEK (FRONTAGE ROAD); (NBI#19-225-0-0610-03-054); (CSJ0610-03-107)		36			
IH 30 WB AT US 259; (NBI#19-019-0-0610-04-174); (CSJ0610-04-040)		18			
IH 30 EB AT US 259; (NBI#19-019-0-0610-04-175); (CSJ0610-04-041)		12			
IH 30 WB AT CR 4008; (NBI#19-019-0-0610-06-107); (CSJ0610-06-099)		34			
IH 30 EB AT CR 4008; (NBI#19-019-0-0610-06-108); (CSJ0610-06-100)	8	31			
IH 30 WB AT US 82; (NBI#19-019-0-0610-06-109); (CSJ0610-06-101)		172	8	[A] 4,400	[A] 4,400
IH 30 EB AT US 82; (NBI#19-019-0-0610-06-110); (CSJ0610-06-102)		182	22	[B] 18,000	[B] 9,900
IH 30 WB AT SH 98; (NBI#19-019-0-0610-06-160); (CSJ0610-06-103)		24			
IH 30 EB AT SH 98; (NBI#19-019-0-0610-06-162); (CSJ0610-06-104)		29			
SL 151 EB AT FM 558; (NBI#19-019-0-2050-03-015); (CSJ2050-03-009)		17			
SL 151 WB AT FM 558; (NBI#19-019-0-2050-03-016); (CSJ2050-03-010)		19			
SL 151 NB AT SH 93; (NBI#19-019-0-2050-03-073); (CSJ2050-03-011)		13			
PROJECT TOTAL:	8	726	34	22,400	15,800

[A] - THIS QUANTITY INCLUDES PLACING 2 TIMES DURING TCP WB LANE CLOSURES.
[B] - THIS QUANTITY INCLUDES PLACING 3 TIMES DURING TCP EB LANE CLOSURES.
[C] - THIS LOCATION WILL REQUIRE 2 TMA'S IN THE NB US 271 LANES AND WILL ALSO REQUIRE ONE FOR THE PRELOADING ON TOP OF BRIDGE.
[2] - INCLUDES 7 DAY ADVANCED NOTICE TO TRAFFIC.
[3] - QUANTITY IS FOR 2 TMA'S. SEE GENERAL NOTES FOR MORE INFORMATION.

QUANTITY SUMMARIES

Texas Department of Transportation

SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DISTRICT	COUNTY		SHEET
ATL	TITUS, ETC.		8

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CHANNEL AND EROSION CONTROL SUMMARY

LOCATIONS	100	104	164	164	164	[2]	168	432	432	506	506
	7001	7007	7001	7005	7006		7001	7045	7050	7003	7011
	PREPARING ROW	[1] REMOV CONC (RIPRAP)	BROADCAST SEED (PERM_RURAL_SAND)	BROADCAST SEED (TEMP_WARM)	BROADCAST SEED (TEMP_COOL)	FERTILIZER (13-13-13)	VEGETATIVE WATERING	RIPRAP (STONE PROTECTION)(24 IN)	BEDDING MATERIAL (6 IN)	[3] ROCK FILTER DAMS (INSTALL) (TY 3)	[3] ROCK FILTER DAMS (REMOVE)
	AC	CY	SY	SY	SY	TON	TGL	CY	CY	LF	LF
						300LB/5,000 SY	80 GAL/5,000 SY				
IH 30 WB AT TANKERSLEY CREEK; (NBI#19-225-0-0610-03-055); (CSJ0610-03-104)		118	200	100	100	24	6.4	921	157		
IH 30 EB AT TANKERSLEY CREEK; (NBI#19-225-0-0610-03-056); (CSJ0610-03-105)		157	120	60	60	14	3.8	1,279	208	35	35
IH 30 WB AT US 271; (NBI#19-225-0-0610-03-057); (CSJ0610-03-106)			120	60	60	14	3.8				
TANKERSLEY CREEK (FRONTAGE ROAD); (NBI#19-225-0-0610-03-054); (CSJ0610-03-107)	0.1	139	140	70	70	17	4.5	1,206	211		
IH 30 WB AT US 82; (NBI#19-019-0-0610-06-109); (CSJ0610-06-101)			500	250	250	60	16.0				
IH 30 EB AT US 82; (NBI#19-019-0-0610-06-110); (CSJ0610-06-102)			500	250	250	60	16.0				
SL 151 NB AT SH 93; (NBI#19-019-0-2050-03-073); (CSJ2050-03-011)			240	120	120	29	7.7				
SUB-TOTAL: (CHANNEL AND EROSION CONTROL SUMMARY SHEET 4 OF 4)	0.1	414	1,820	910	910	218	58.2	3,406	576	35	35
SUB-TOTAL: (BRIDGE AND ROADWAY SUMMARY SHEET 1 OF 4)		1									
PROJECT TOTAL	0.1	415	1,820	910	910	218	58.2	3,406	576	35	35

[1] - SEE BRIDGE AND ROADWAY SUMMARY SHEET 1 OF 3 FOR ADDITIONAL QUANTITIES.
[2] - FOR CONTRACTOR INFORMATION ONLY.
[3] - SEE IH 30 AT TANKERSLEY CREEK NBI#19-225-0-0610-03-056 CSJ:0610-03-105 FOR SPECIFIC ROCK FILTER DAM TY 3 LOCATION.

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QUANTITY SUMMARIES

Texas Department of Transportation

SHEET 4 OF 4

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DISTRICT	COUNTY		SHEET
ATL	TITUS, ETC.		9

GENERAL SEQUENCE OF CONSTRUCTION:

1. CONSTRUCT EACH NBI LOCATION AS DESCRIBED HERE OR AS SHOWN IN THE PLANS. BEFORE THE COMMENCEMENT OF EACH PHASE, INSTALL ADVANCE WARNING SIGNS AND TCP DEVICES AS SHOWN ON THE PLANS AND/OR AS DIRECTED.
2. PLACE PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) 7 CALENDAR DAYS IN ADVANCE OF LANE CLOSURES AND CHANGES IN TRAFFIC PATTERNS IN ACCORDANCE WITH THE LATEST TMUTCD AND BC(6)-21.
3. SEE GENERAL NOTES AND PLAN SHEETS FOR MORE INFORMATION CONCERNING PHASES.

PHASE 1:

INCLUDES ALL THE FOLLOWING NBI LOCATIONS LISTED BELOW:
IH 30 (WB) AT US 82 ;(0610-06-101),
IH 30 (EB) AT US 82 ;(0610-06-102),
IH 30 (WB) AT SH 98 ;(0610-06-103),
IH 30 (EB) AT SH 98 ;(0610-06-104):

A. IH 30 (WB) AT US 82 (0610-06-101):
   1. CLOSE THE OUTSIDE LANE USING "TRAFFIC CONTROL PLAN (MOD)" TO PERFORM THE REPLACEMENT OF WINGWALLS. COMPLETE THROUGH THE RESTORATION OF THE MBGF BEFORE REMOVING LANE CLOSURE.
   2. CLOSE THE INSIDE LANE USING "TRAFFIC CONTROL PLAN (MOD)" TO PERFORM THE REPLACEMENT OF WINGWALLS. COMPLETE THROUGH THE RESTORATION OF THE MBGF BEFORE REMOVING LANE CLOSURE.
   3. COORDINATE DETAILED PLANS TO RAISE THE EXISTING STRUCTURE WITH THE ENGINEER USING "TCP(6-7)-12". TO MEET THE REQUIREMENTS, PERFORM THIS WORK AT NIGHT AS COORDINATED WITH THE ENGINEER. IF THIS WORK CANNOT BE COMPLETED IN 15 MINUTES, USE "DETOUR LAYOUTS" AND "TCP(6-6)-12". THIS WORK WILL NOT BE PAID FOR SEPERATELY BUT WILL BE CONSIDERED SUBSIDIARY TO THE PERTINENT BID ITEMS.
   4. USE APPLICABLE DAYTIME TCPs FOR IH 30 OR US 82 FOR CLEANING AND SEALING JOINTS, GALVANIZED PIPE DRAINS USING, AND REMAINDER OF REQUIRED WORK.

B. IH 30 (EB) AT US 82 (0610-06-102):
   1. CLOSE THE OUTSIDE LANE USING "TRAFFIC CONTROL PLAN (MOD)" TO PERFORM THE REPLACEMENT OF WINGWALLS. COMPLETE THROUGH THE RESTORATION OF THE MBGF BEFORE REMOVING LANE CLOSURE.
   2. CLOSE THE INSIDE LANE USING "TRAFFIC CONTROL PLAN (MOD)" TO PERFORM THE REPLACEMENT OF WINGWALLS. COMPLETE THROUGH THE RESTORATION OF THE MBGF BEFORE REMOVING LANE CLOSURE.
   3. COORDINATE DETAILED PLANS TO RAISE THE EXISTING STRUCTURE WITH THE ENGINEER USING "TCP(6-7)-12". TO MEET THE REQUIREMENTS, PERFORM THIS WORK AT NIGHT AS COORDINATED WITH THE ENGINEER. IF THIS WORK CANNOT BE COMPLETED IN 15 MINUTES, USE "DETOUR LAYOUTS" AND "TCP(6-6)-12". THIS WORK WILL NOT BE PAID FOR SEPERATELY BUT WILL BE CONSIDERED SUBSIDIARY TO THE PERTINENT BID ITEMS.
   4. USE APPLICABLE DAYTIME TCPs FOR IH 30 OR US 82 FOR CLEANING AND SEALING JOINTS, GALVANIZED PIPE DRAINS USING, AND REMAINDER OF REQUIRED WORK.

C. IH 30 (WB) AT SH 98 (0610-06-103):
   1. COORDINATE DETAILED PLANS TO RAISE THE EXISTING STRUCTURE WITH THE ENGINEER USING "TCP(6-7)-12". TO MEET THE REQUIREMENTS, PERFORM THIS WORK AT NIGHT AS COORDINATED WITH THE ENGINEER. IF THIS WORK CANNOT BE COMPLETED IN 15 MINUTES, USE "DETOUR LAYOUTS" AND "TCP(6-6)-12". THIS WORK WILL NOT BE PAID FOR SEPERATELY BUT WILL BE CONSIDERED SUBSIDIARY TO THE PERTINENT BID ITEMS.

D. IH 30 (EB) AT SH 98 (0610-06-104):
   1. COORDINATE DETAILED PLANS TO RAISE THE EXISTING STRUCTURE WITH THE ENGINEER USING "TCP(6-7)-12". TO MEET THE REQUIREMENTS, PERFORM THIS WORK AT NIGHT AS COORDINATED WITH THE ENGINEER. IF THIS WORK CANNOT BE COMPLETED IN 15 MINUTES, USE "DETOUR LAYOUTS" AND "TCP(6-6)-12". THIS WORK WILL NOT BE PAID FOR SEPERATELY BUT WILL BE CONSIDERED SUBSIDIARY TO THE PERTINENT BID ITEMS.

E. IH 30 AT SH 98 (0610-06-103 & 0610-06-104):
   1. USE APPLICABLE DAYTIME TCPs FOR WESTBOUND OUTSIDE LANE THEN INSIDE LANE TO CLEAN AND SEAL JOINTS.
   2. USE APPLICABLE DAYTIME TCPs FOR EASTBOUND OUTSIDE LANE THEN INSIDE LANE TO CLEAN AND SEAL JOINTS.
   3. USE APPLICABLE DAYTIME TCPs ON IH 30 AND SH 98 FOR WORK UNDERNEATH THE BRIDGE

STATE OF TEXAS
TIMOTHY D. BERRY
95595
LICENSED
PROFESSIONAL ENGINEER

Timothy Berry, P.E.
8-5-2024

SEQUENCE OF WORK

SHEET 1 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		9A

GENERAL SEQUENCE OF CONSTRUCTION:

1. CONSTRUCT EACH NBI LOCATION AS DESCRIBED HERE OR AS SHOWN IN THE PLANS. BEFORE THE COMMENCEMENT OF EACH PHASE, INSTALL ADVANCE WARNING SIGNS AND TCP DEVICES AS SHOWN ON THE PLANS AND/OR AS DIRECTED.
2. PLACE PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) 7 CALENDAR DAYS IN ADVANCE OF LANE CLOSURES AND CHANGES IN TRAFFIC PATTERNS IN ACCORDANCE WITH THE LATEST TMUTCD AND BC(6)-21.
3. SEE GENERAL NOTES AND PLAN SHEETS FOR MORE INFORMATION CONCERNING PHASES.

PHASE 2:

PHASE 2 - WILL INCLUDE ALL THE FOLLOWING PROJECTS LISTED BELOW:
IH 30 (WB) AT TANKERSLEY CREEK (0610-03-104),
IH 30 (EB) AT TANKERSLEY CREEK (0610-03-105),
IH 30 (WB) AT US 271 (0610-03-106),
TANKERSLEY CREEK (FRONTAGE ROAD) (0610-03-107),
IH 30 (WB) AT US 259 (0610-04-040),
IH 30 (EB) AT US 259 (0610-04-041),
IH 30 (WB) AT CR 4008 (0610-06-099),
IH 30 (EB) AT CR 4008 (0610-06-100),
SL 151 (EB) AT FM 558 (2050-03-009),
SL 151 (WB) AT FM 558 (2050-03-010),
SL 151 (NB) AT SH 93 (2050-03-011):

F. INSIDE AND OUTSIDE LANE WORK FOR ALL BRIDGES AND ROADWAYS UNDER THE BRIDGE (EXCEPT AS SHOWN BELOW):
   1. USE APPLICABLE DAYTIME TCPs TO PERFORM BRIDGE REPAIRS AS DETAILED ON "WORK LOCATION LAYOUTS".

G. IH 30 (WB) AT US 271 (0610-03-106):
   US 271 (NB) LANES - BEAM REPAIR:
   1. USE APPLICABLE DAYTIME TCPs TO PERFORM BRIDGE REPAIRS AS DETAILED ON "WORK LOCATION LAYOUTS".
   2. SEE "DETOUR LAYOUTS" SHEET 3 OF 3, "WORK LOCATION LAYOUTS" AND PRESTRESSED CONCRETE BEAM DETAILS" FOR MORE INFORMATION.

STATE OF TEXAS
TIMOTHY D. BERRY
95595
LICENSED
PROFESSIONAL ENGINEER

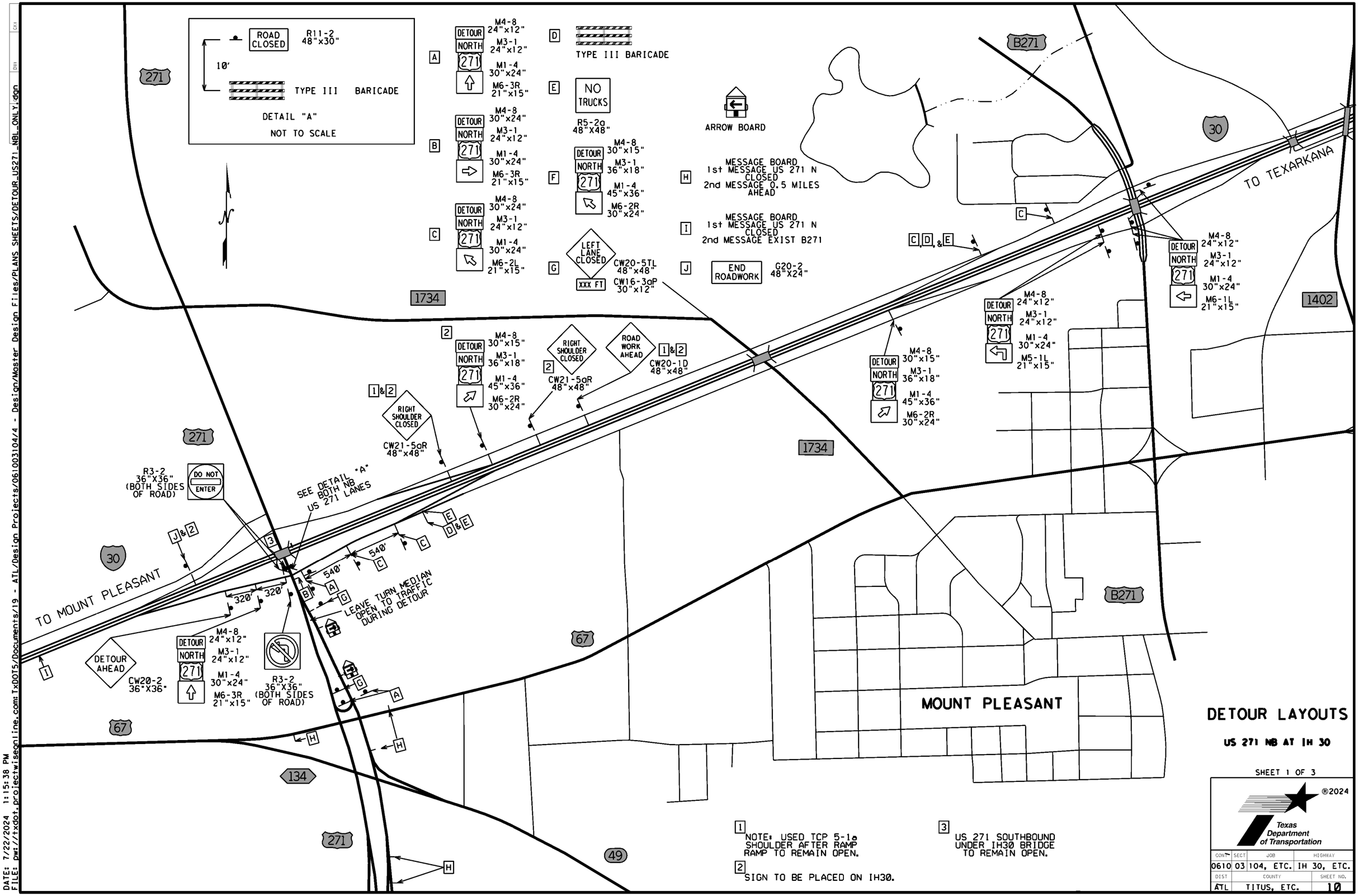
Timothy Berry P.E.
8-5-2024

SEQUENCE OF WORK

SHEET 2 OF 2

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		9B



DETOUR LAYOUTS

US 271 NB AT IH 30

SHEET 1 OF 3

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		10

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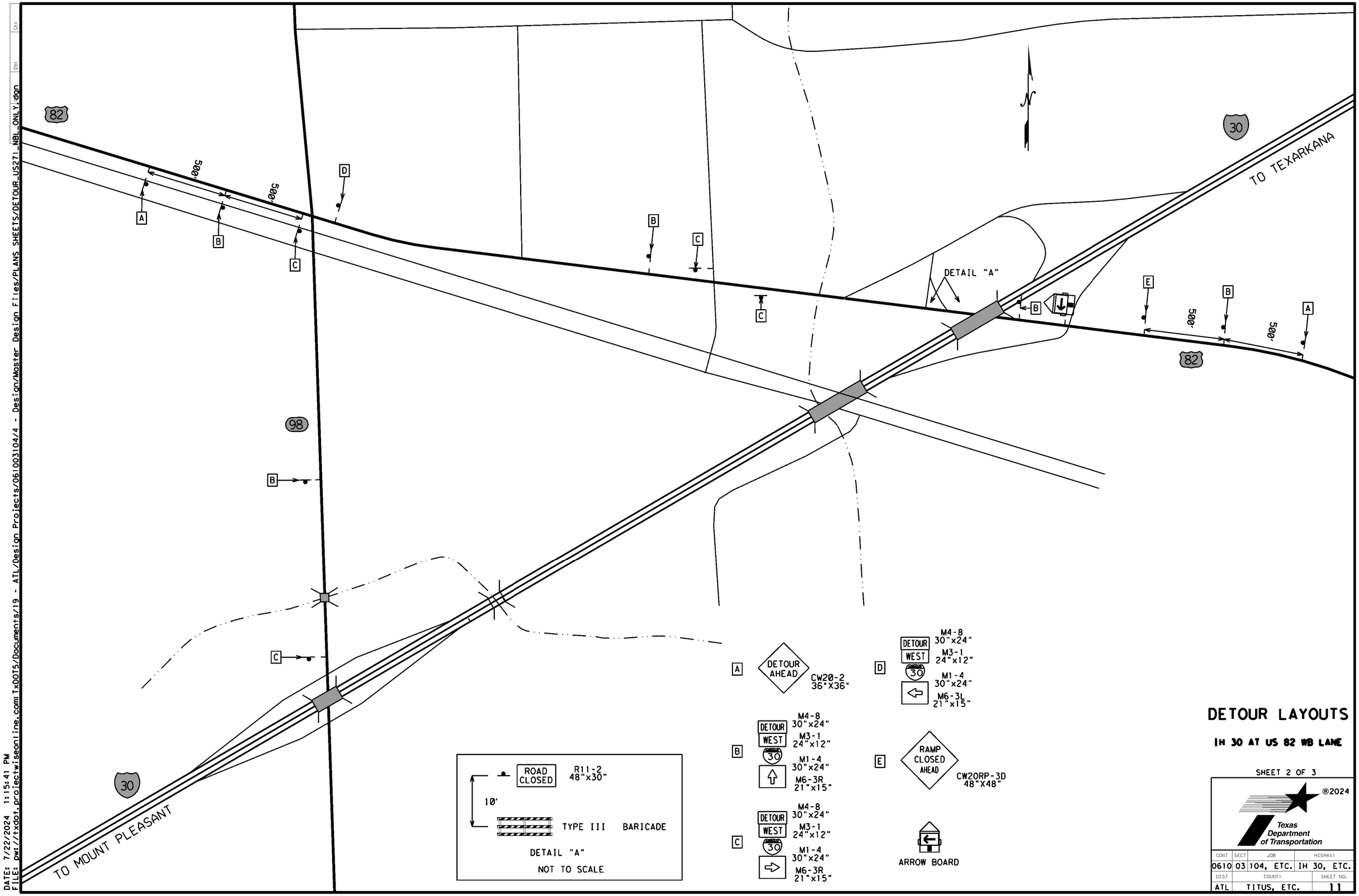

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DETOUR LAYOUTS

IH 30 AT US 82 WB LANE

SHEET 2 OF 3

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
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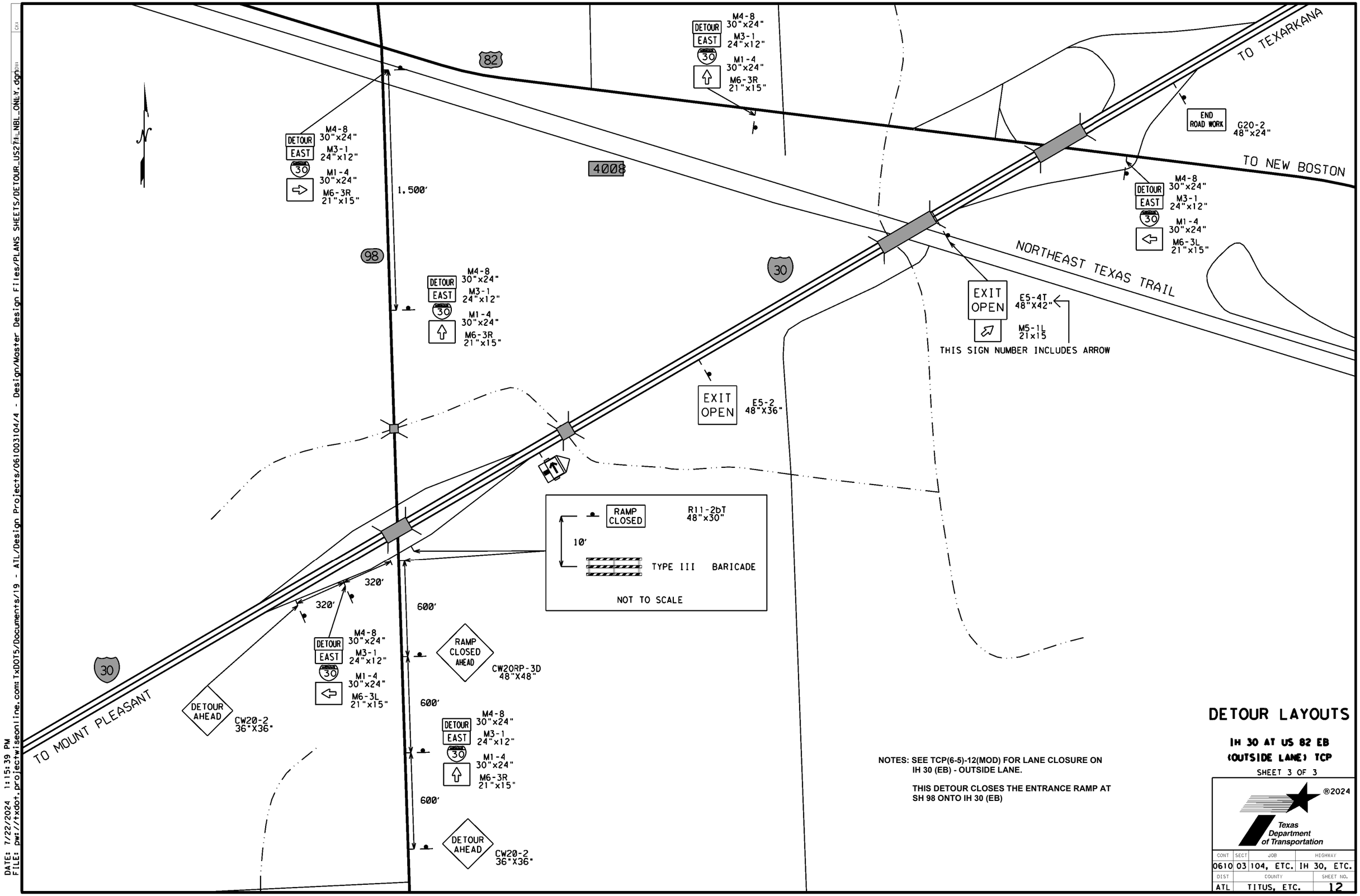
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		11



NOTES: SEE TCP(6-5)-12(MOD) FOR LANE CLOSURE ON IH 30 (EB) - OUTSIDE LANE.

THIS DETOUR CLOSES THE ENTRANCE RAMP AT SH 98 ONTO IH 30 (EB)

DETOUR LAYOUTS

IH 30 AT US 82 EB (OUTSIDE LANE) TCP

SHEET 3 OF 3

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		12

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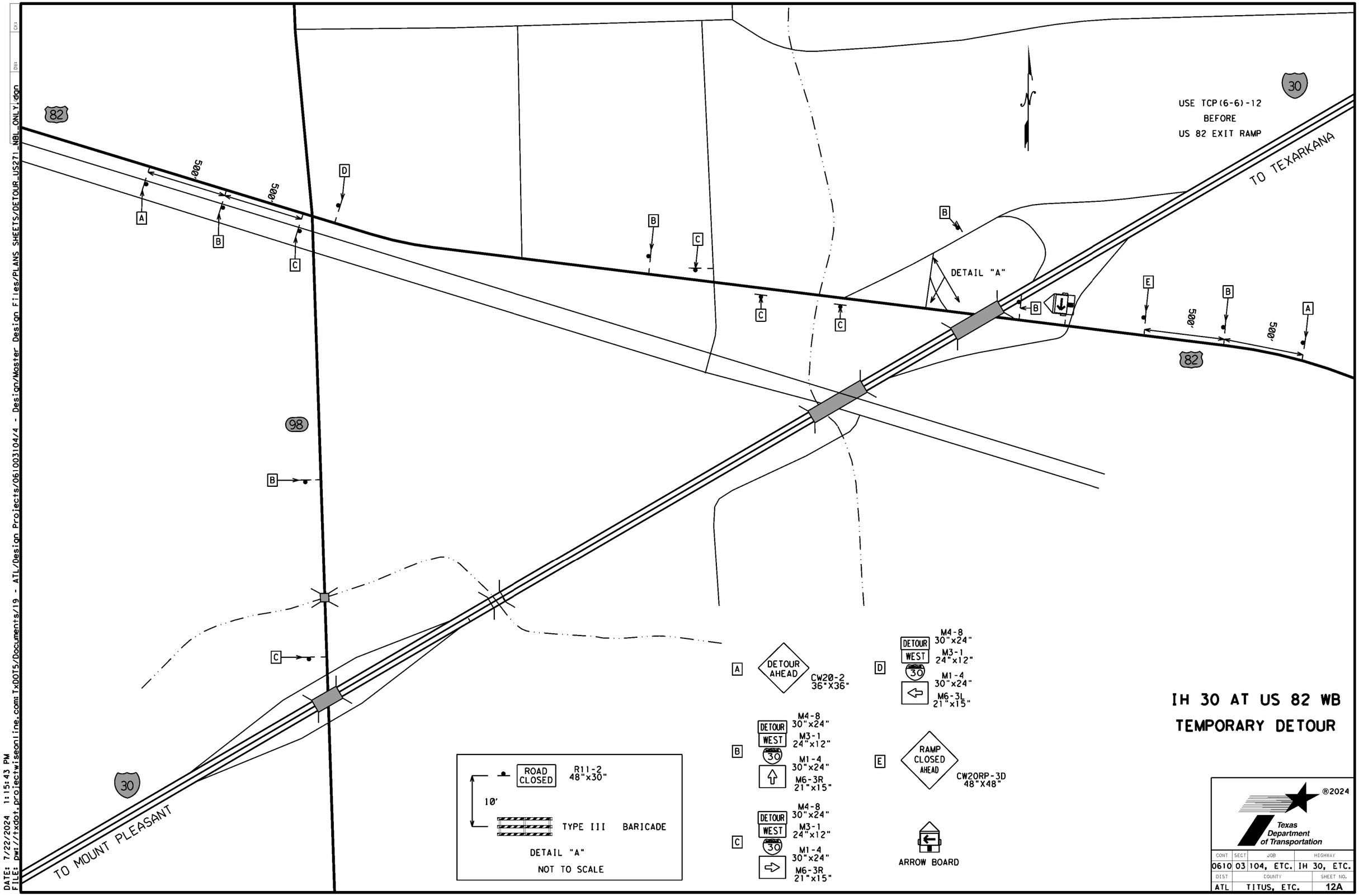

IH 30 AT US 82 WB
TEMPORARY DETOUR

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		12A

DATE: 7/22/2024 1:15:43 PM
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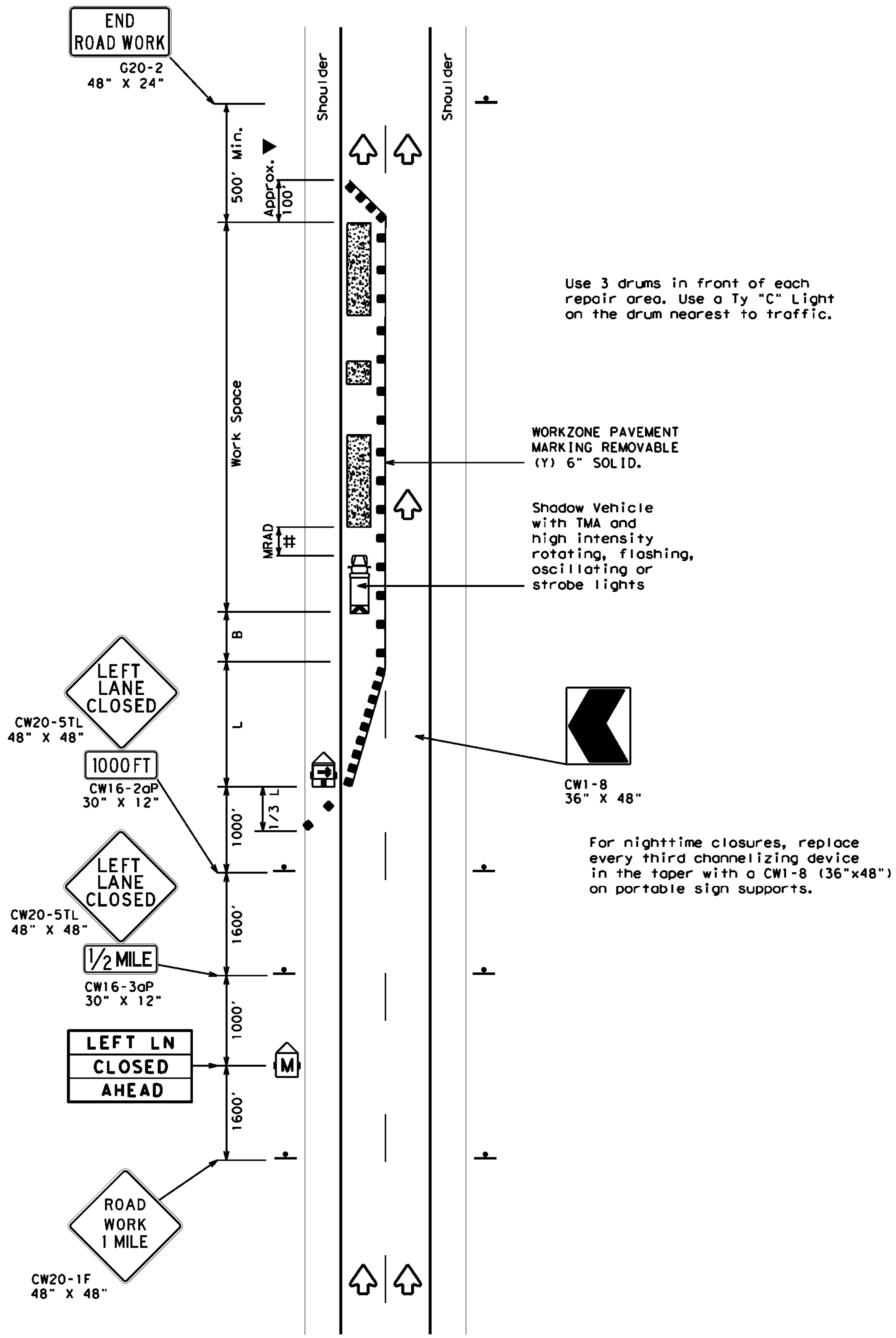

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans or when approved by the Engineer.
2. All construction signs and barricades placed during any phase of work shall remain in place until removal is approved by the Engineer.
3. The Engineer may direct the Contractor to furnish additional signs and barricades as required to maintain traffic flow, detours and motorist safety during construction.
4. Duplicate construction warning signs shall be erected on the median side of freeways.
5. The TCP details may require additional and/or relocation of route shields, guide signs, etc. to guide motorists along entire length of detour due to ramp and freeway closure.
6. See BC Standards for additional sign details.
7. When possible, changeable message signs should be located 500 feet in advance of the last available exit ramp prior to the lane closure to allow motorists an alternate route.
8. Static message boards or changeable message signs stating the date and duration of ramp or freeway lane closures shall be placed a minimum of seven (7) calendar days in advance of the actual closure.
9. A minimum of two PCMS per direction shall be placed in advance of the lane closure. PCMS shall be placed a minimum of 0.5 mile in advance of the taper. An additional PCMS shall be placed approximately 3 miles in advance of the taper or at the end of the queue, whichever is greater.
10. Channelizing devices shall be placed in accordance with BC Standards and "WORKSHEET FOR EDGE CONDITION TREATMENT TYPES."
11. Neither work activity nor storage of equipment, vehicles, or materials shall occur within the buffer space.
12. Warning signs shown shall be appropriately altered for left lane closures. When signs are mounted at 1' height for short term stationary, sign versions shown in the SHSD for Texas with distances on the sign face rather than mounted on a plaque below the sign may be used.
13. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used and positioned per the Manufacturer's Roll Ahead Distance (MRAD) in advance of the area of crew exposure without adversely affecting the work performance.

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.

Texas Department of Transportation
Atlanta District Standard

TRAFFIC CONTROL PLAN (MOD)

(FOR WINGWALL REPLACEMENT)

IH 30 EB AND WB AT US 82

FILE: atl-61.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT January 2014	CONT	SECT	JOB	HIGHWAY
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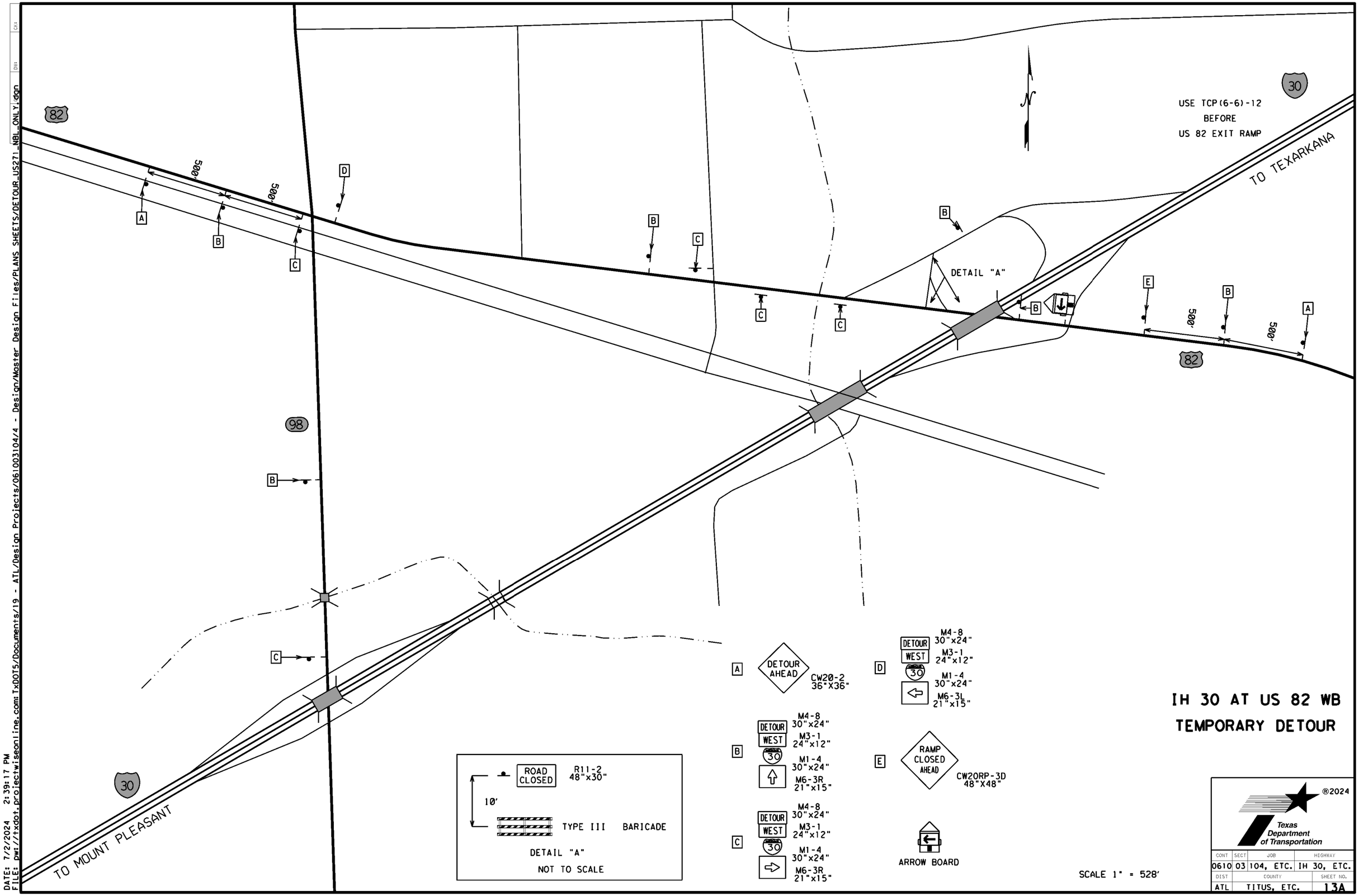
	ATL		TITUS, ETC.	13



IH 30 AT US 82 WB
TEMPORARY DETOUR

SCALE 1" = 528'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		13A

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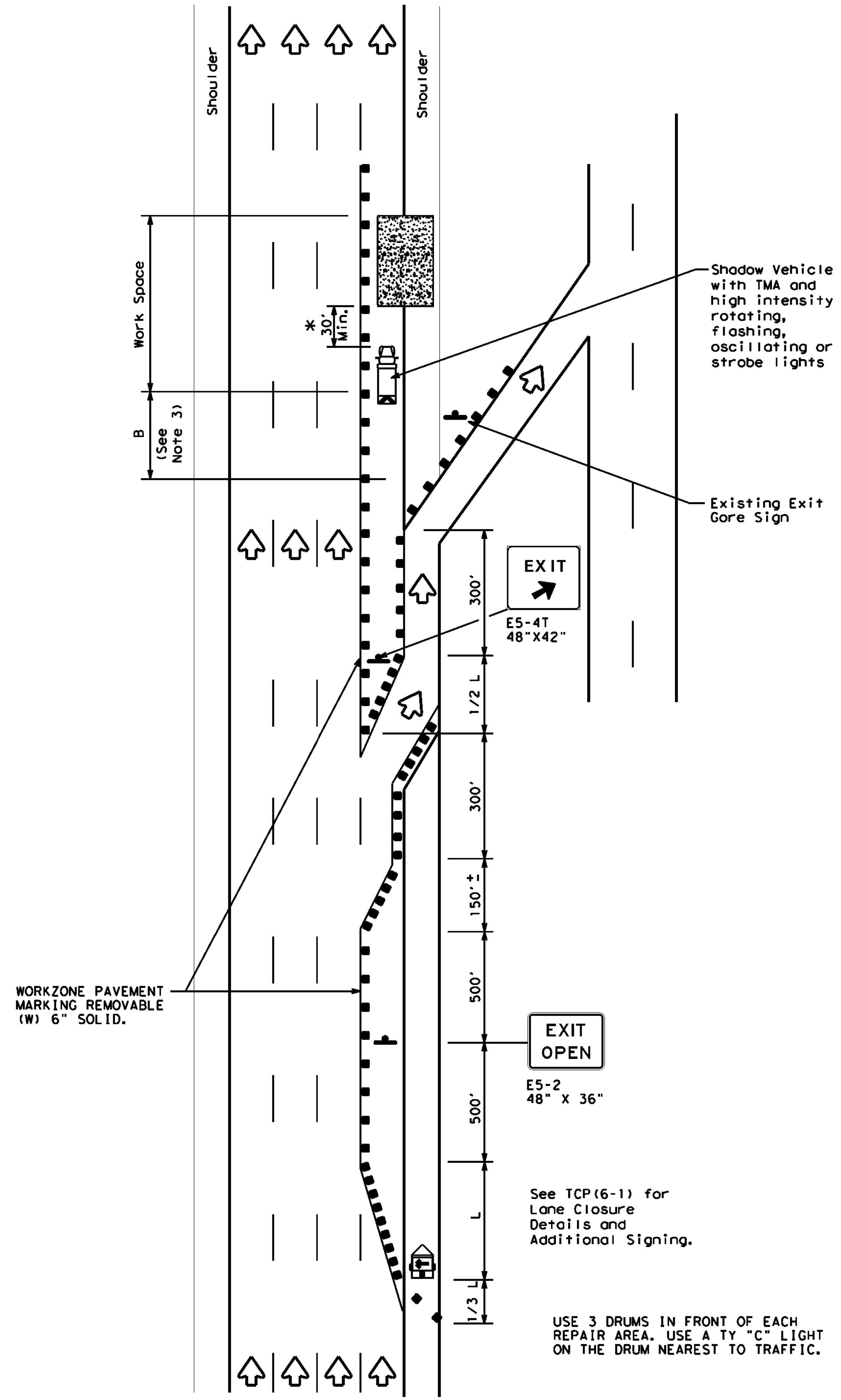

TCP (6-5a)

EXIT RAMP OPEN

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. See BC standards for sign details.
3. If adequate longitudinal buffer length "B" does not exist between the work space and the exit ramp, consideration should be given to closing the ramp.

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

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

STATE OF TEXAS
TIMOTHY D. BERRY
95595
LICENSED PROFESSIONAL ENGINEER
Timothy Berry, P.E.
7-1-2024

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN WORK AREA BEYOND EXIT RAMP

TCP(6-5)-12 (MOD)

FILE: tcp6-5.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT			
© TxDOT Feburary 1998	CONT	SECT	JOB		HIGHWAY		
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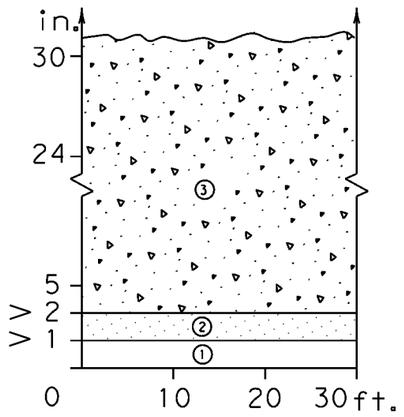
1-97 8-98	DIST		COUNTY		SHEET NO.		
4-98 8-12	ATL		TITUS, ETC.		14		

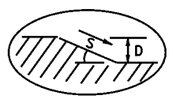
205

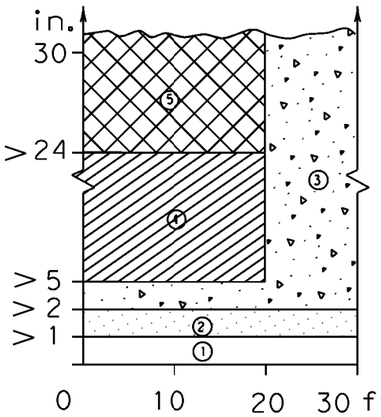
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

Edge Height (D) in Inches versus Lateral Clearance (Y) in Feet

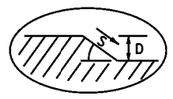


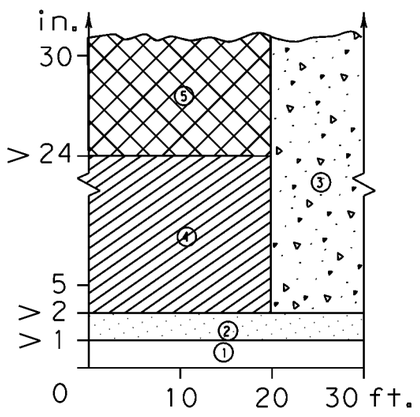
Edge Condition I
S = (3:1) (or flatter)



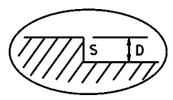


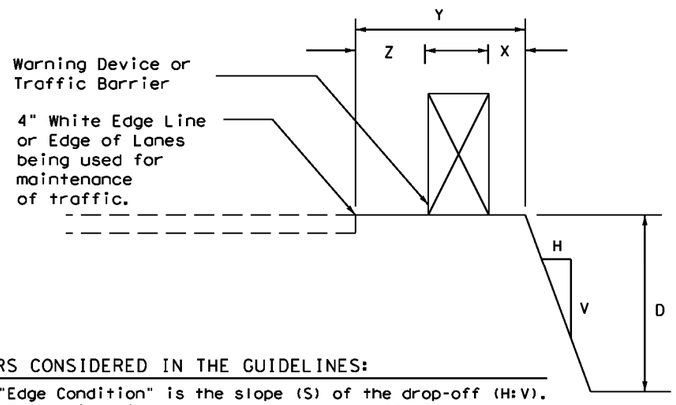
Edge Condition II
S = ((2.99):1) to (1:1)





Edge Condition III
S is steeper than (1:1)





FACTORS CONSIDERED IN THE GUIDELINES:

1. The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height is the depth of the drop-off "D".

2. Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of dropoff. Distance "Z" does not have a minimum.

3. In addition to the factors considered in the guidelines, each construction zone drop-off situation should be analyzed individually, taking into account other variables, such as: traffic mix, posted speed in the construction zone, horizontal curvature, and the practicality of the treatment options.

4. The conditions for indicating the use of positive or protective barriers are given by Zone-5 and Figure-1. Traffic barriers are primarily applicable for high speed conditions. Urban areas with speeds of 30 mph or less may have a lesser need for signing, delineation, and barriers. Right-angled edges, however, with "D" greater than 2 inches and located within a lateral offset of 6 feet, may indicate a higher level of treatment.

5. If the distance "Y" must be less than 3 feet, the use of a positive barrier may not be feasible. In such a case, consider either: 1) narrowing the lanes to a desired 11 to 12 feet or 10 foot minimum (see CW20-8 sign), or 2) provide an edge slope such as Edge Condition I.

Zone	Treatment Types Guidelines:
①	No treatment
②	CW 8-11 "Uneven Lanes" signs.
③	CW 8-9a Shoulder Drop-Off" or CW 8-11 signs plus vertical panels.
④	CW8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge slope to that of the profered Edge Condition I.
⑤	Check indications (Figure-1) for possitive barrier. Where positive barrier is not indicated, the treatment shown above for Zone-4 may be used after consideration of other applicable factors.

Edge Condition Notes:

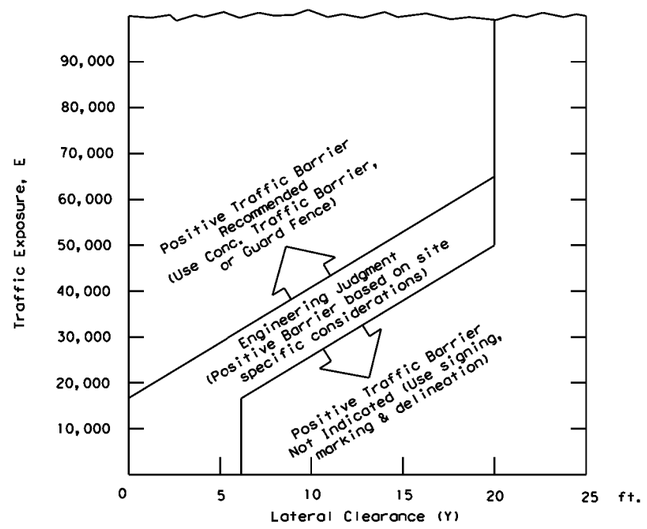
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

2. Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1 to 1) so long as "D" does not exceed 5 inches. Under-carriage drag on most automobiles will occur when "D" exceeds 6 inches. As "D" exeeds 24 inches, the possibility for rollover is greater in most vehicles.

3. Edge Condition III: When slopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles, if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control at different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularly those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.

4. Milling or overlay operations that result in Edge Condition III should not be in place without appropriate warning treatments, and these conditions should not be left in place for extended periods of time.

FIGURE-1: CONDITIONS INDICATING USE OF POSITIVE BARRIER FOR ZONE 5 (▨)



1. E = ADT x T
   Where ADT is that portion of the average daily traffic volume traveling within 20 feet (generally two adjacent lanes) of the edge dropoff condition; and, T is the duration time in years of the dropoff condition.

2. Figure-1 provides a practical approach to the use of positive barriers for the protection of vehicles from pavement drop-offs. Other factors, such as the presence of heavy machinery, construction workers, or the mix and volume of traffic may make the use of positive barriers appropriate, even when the edge condition alone may not justify the use of a barrier.

3. An approved end treatment should be provided for any positive barrier end located within the clear zone.

These guidelines apply to temporary traffic control areas or work zones where continuous pavement edges or drop-offs exists parallel and adjacent to a lane used by traffic. The edge conditions may be present between shoulders and travel lanes, between adjacent or opposing travel lanes, or at intermediate points across the width of the paved surface. Due to the variability in construction operations, tolerances in the variables may be allowed by the engineer. These guidelines do not apply to short term operations. These guidelines do not constitute a rigid standard or policy; rather, they are guidance to be used in conjunction with engineering judgement. These guidelines may be updated on the Design Division's on-line manuals.

Engineer's Seal

Date _____

Texas Department of Transportation

Traffic Safety Division Standard

TREATMENT FOR VARIOUS EDGE CONDITIONS

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©TxDOT August 2000	CONT	SECT	JOB	HIGHWAY
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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

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9-07 8-14	ATL	TITUS, ETC.		16
5-10 5-21				

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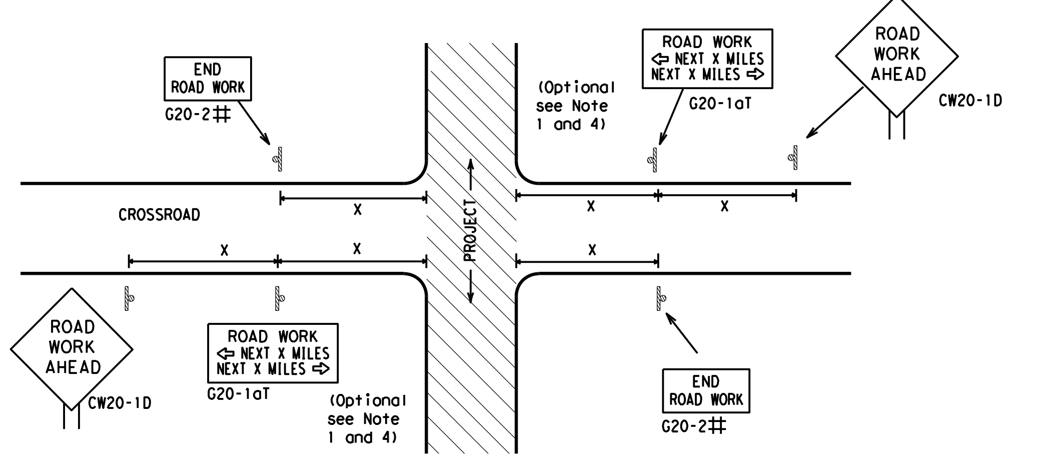
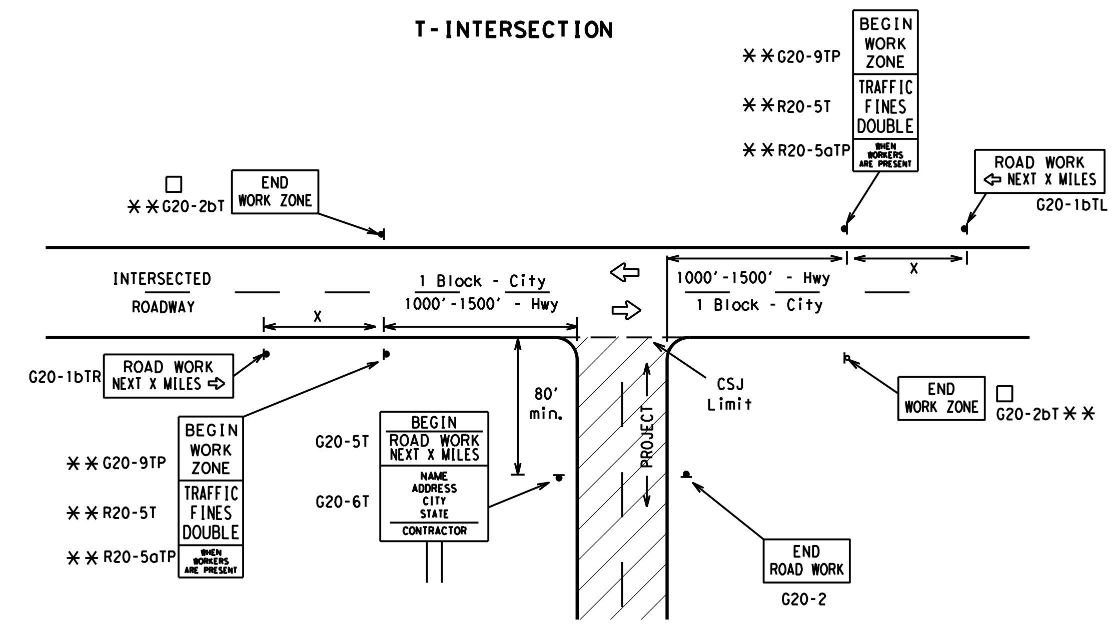
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.

2. If construction closes the road at a T-intersection, the Contractor shall place the "CONTRACTOR NAME"(G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow(G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR)" signs shall be replaced by the detour signing called for in the plans.

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

SIZE

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

SPACING

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

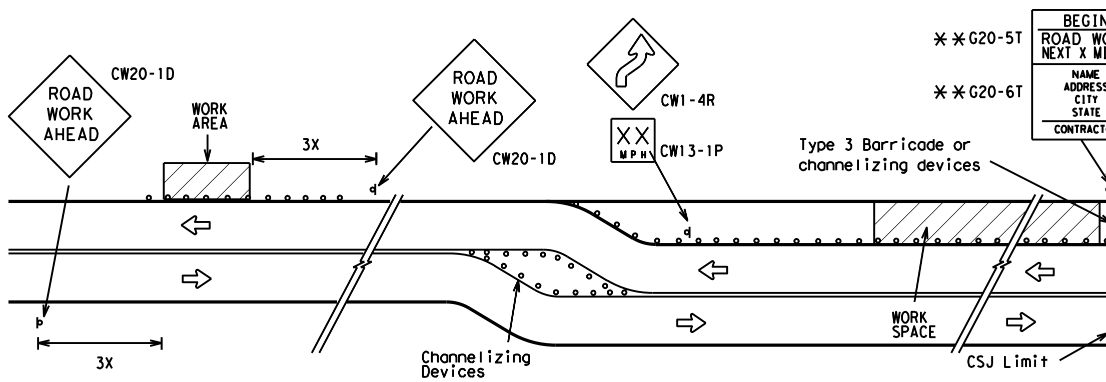
✱ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

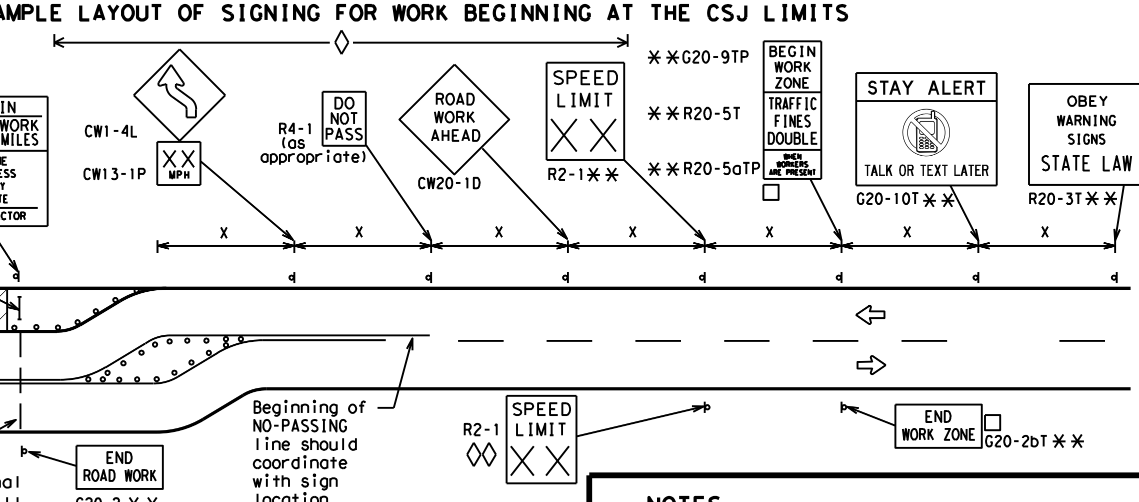
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

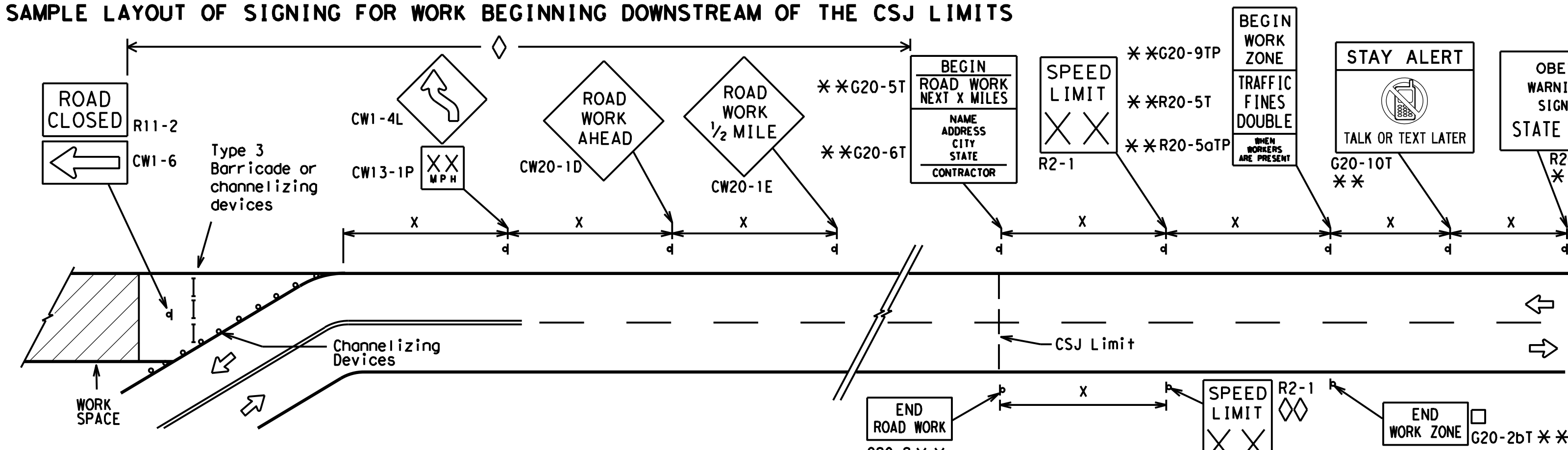


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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



NOTES

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

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

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

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

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

LEGEND

⊢⊣	Type 3 Barricade
○ ○ ○	Channelizing Devices
Sign symbol	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	0610	03	104, ETC.	IH 30, ETC.
9-07 8-14	DIST		COUNTY	SHEET NO.
7-13 5-21	ATL		TITUS, ETC.	17

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.

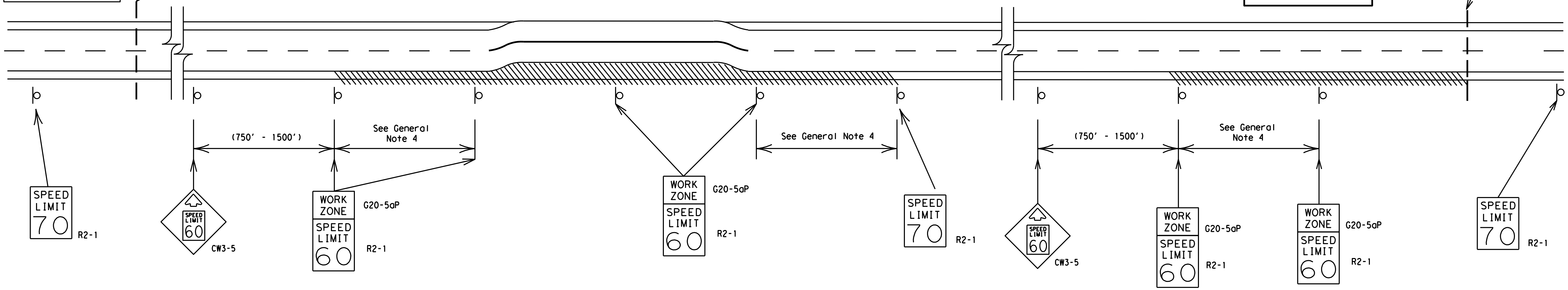
Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.

Signing shown for one direction only. See BC(2) for additional advance signing.

CSJ LIMITS

Signing shown for one direction only. See BC(2) for additional advance signing.

CSJ LIMITS



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	0610	03	104, ETC.	IH 30, ETC.
	DIST		COUNTY	SHEET NO.
	ATL		TITUS, ETC.	18

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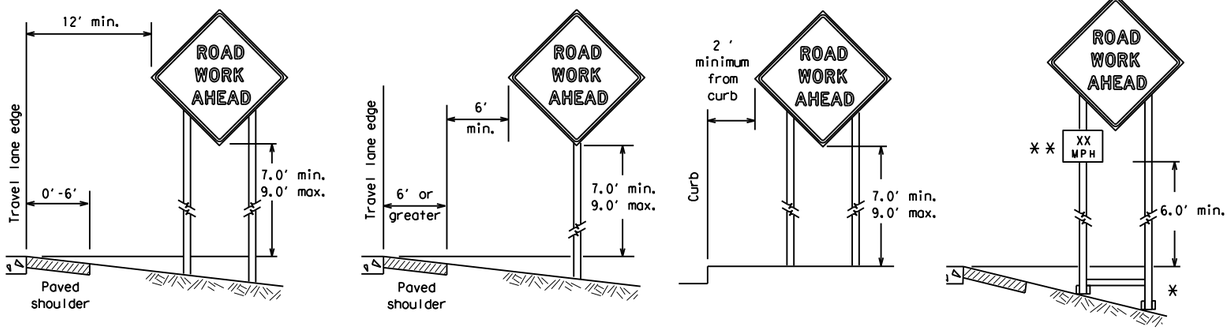
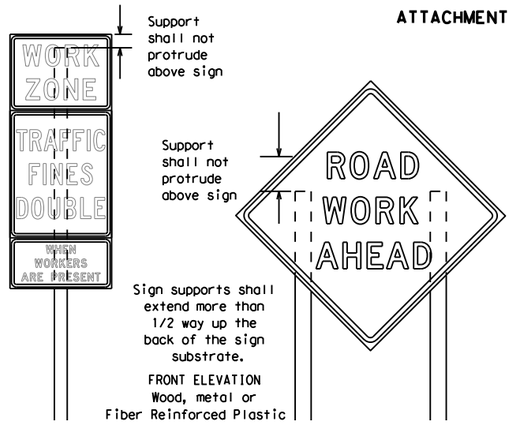
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

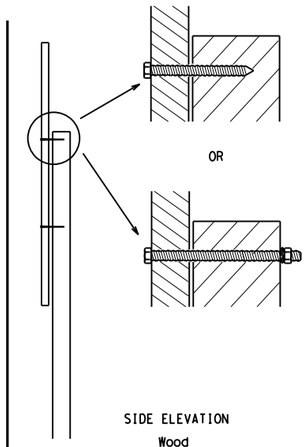


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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





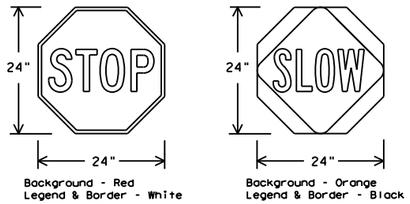
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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	ATL	TITUS, ETC.		19

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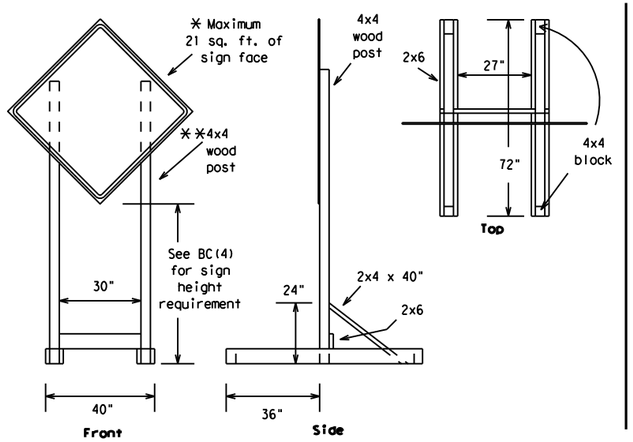
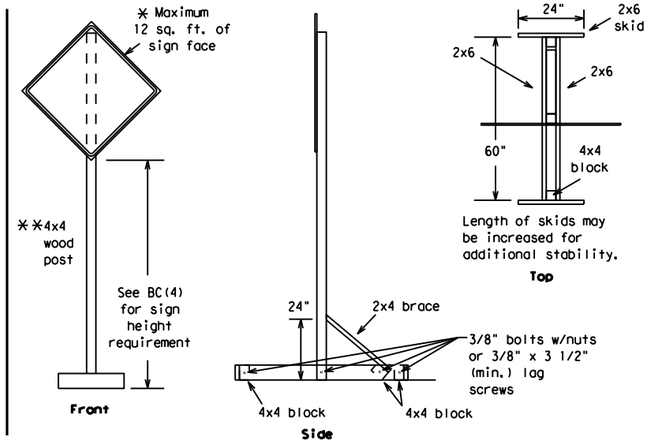
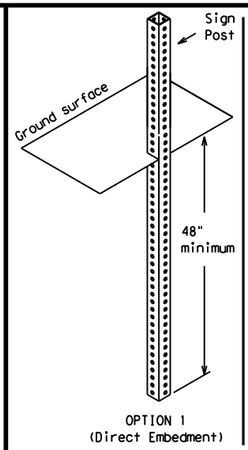
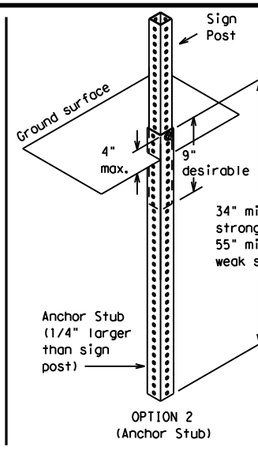


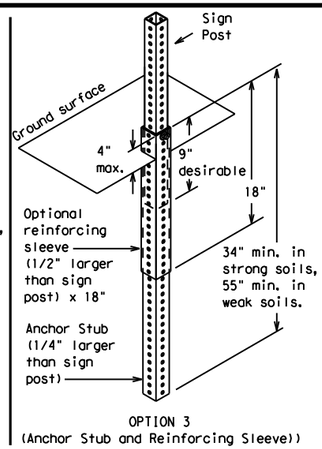


SKID MOUNTED WOOD SIGN SUPPORTS

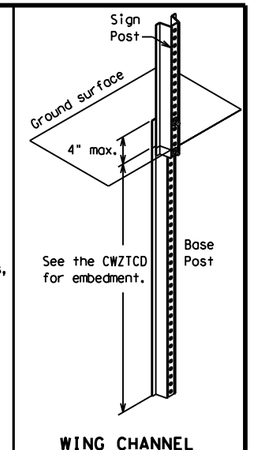
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS







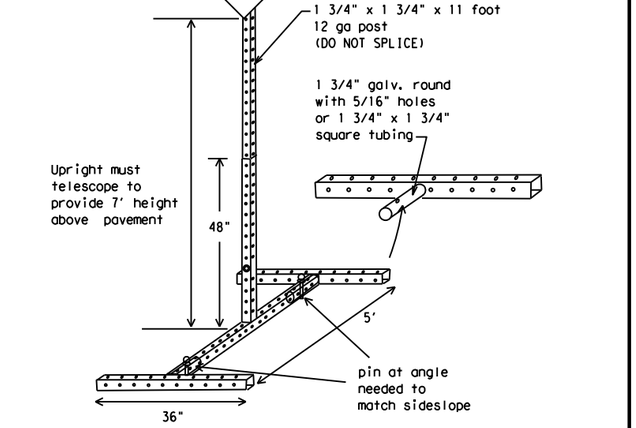
PERFORATED SQUARE METAL TUBING

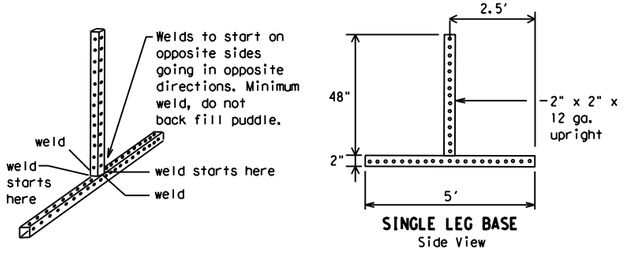


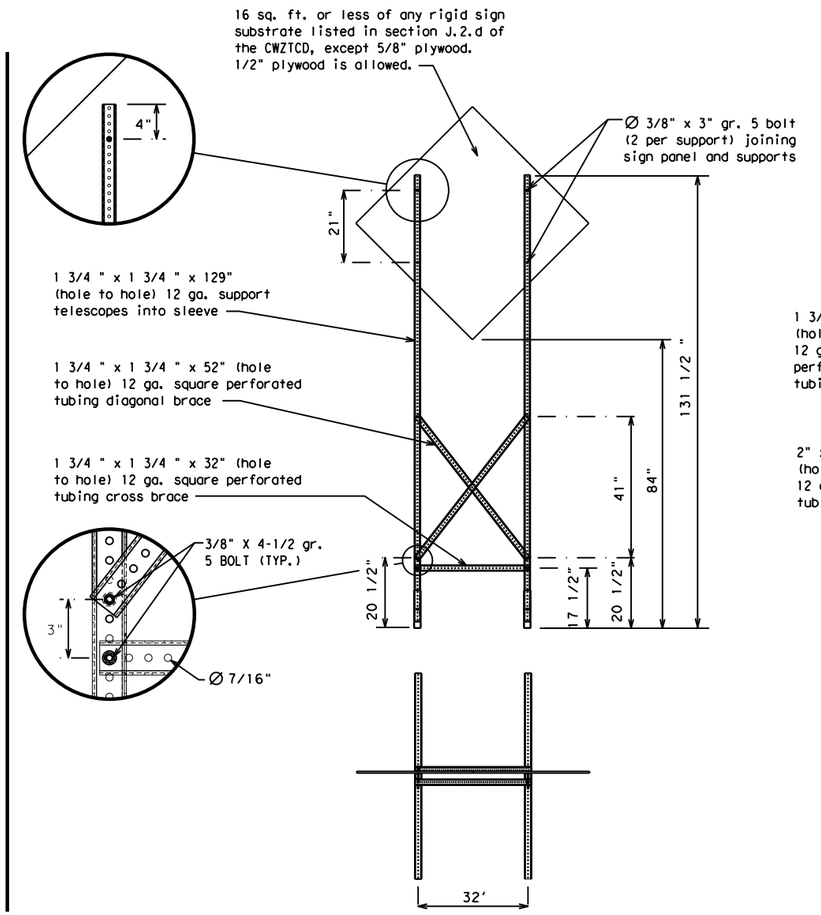
WING CHANNEL
Lap-splice/base bolted anchor

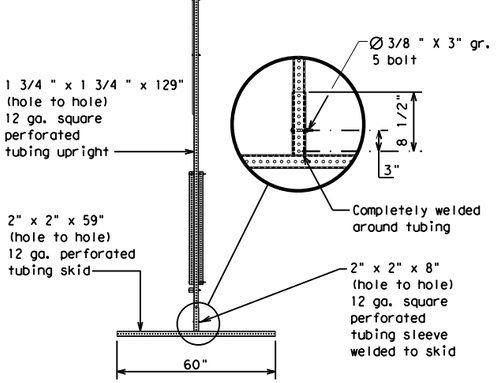
GROUND MOUNTED SIGN SUPPORTS

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









SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

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Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0610	03	104, ETC.	IH 30, ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ATL	TITUS, ETC.		20

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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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0610	03	104, ETC.	IH 30, ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ATL	TITUS, ETC.		21

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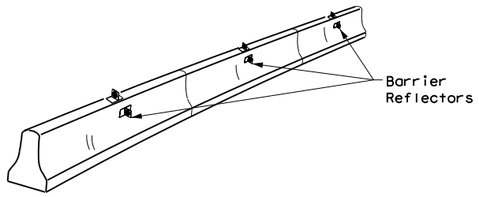
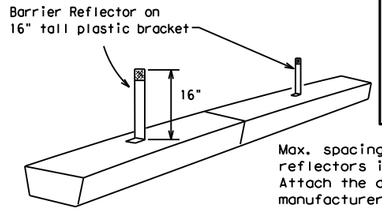
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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

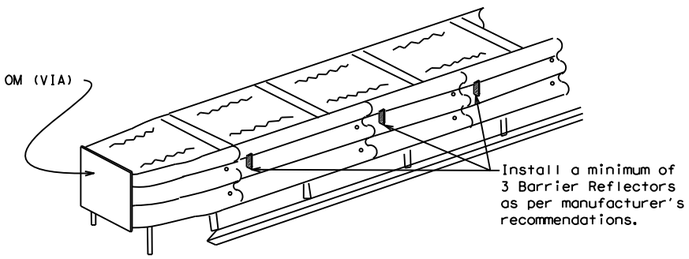


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) 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.

LOW PROFILE CONCRETE BARRIER (LPCB)

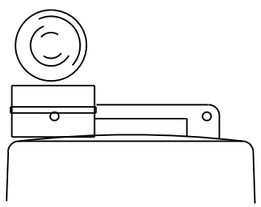


DELINEATION OF END TREATMENTS

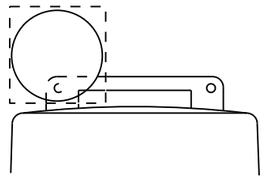
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

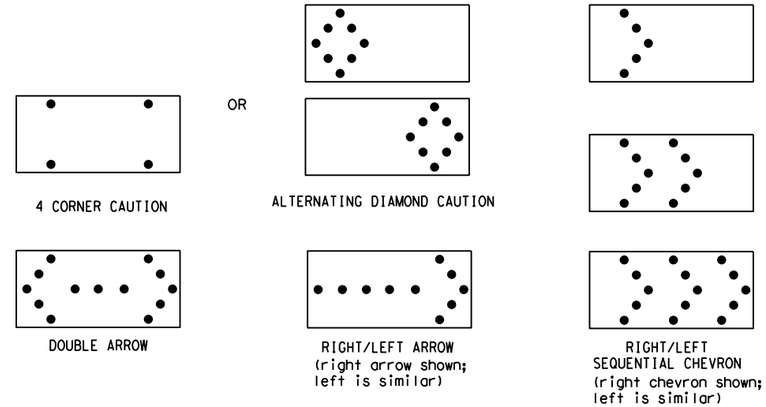
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0610	03	104, ETC.	IH 30, ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ATL	TITUS, ETC.		22

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

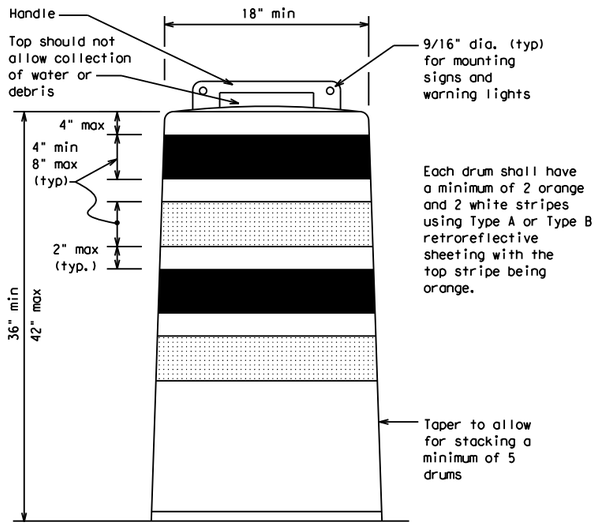
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

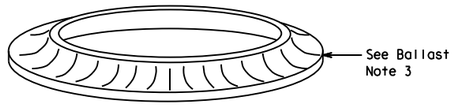
RETROREFLECTIVE SHEETING

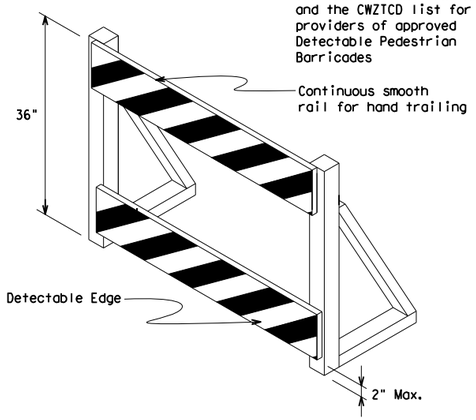
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

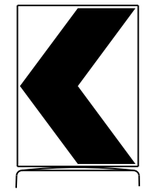




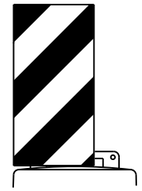


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0610	03	104, ETC.	IH 30, ETC.
4-03 8-14	DIST	COUNTY		SHEET NO.
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7-13				

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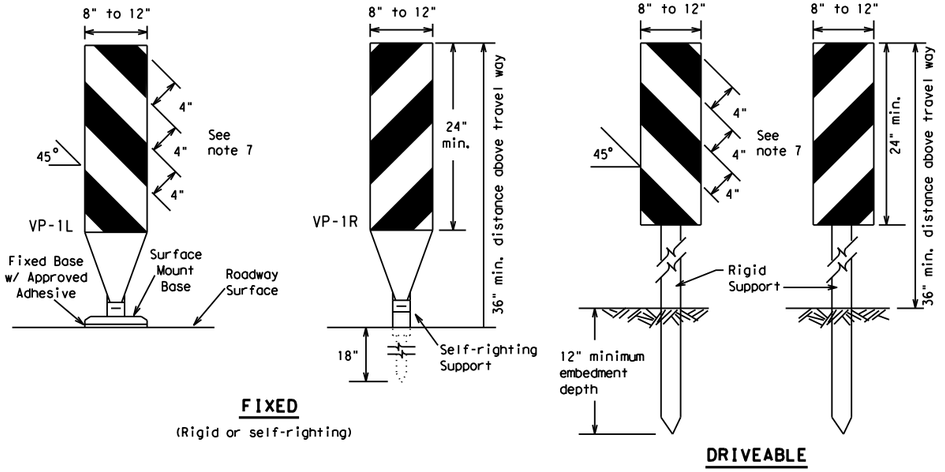
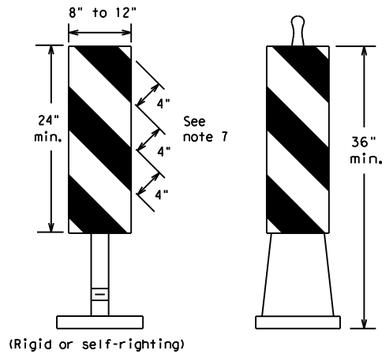


FIXED
(Rigid or self-righting)

DRIVEABLE

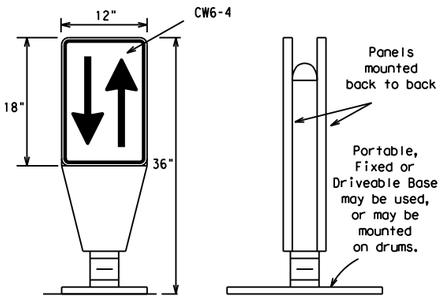


(Rigid or self-righting)

PORTABLE

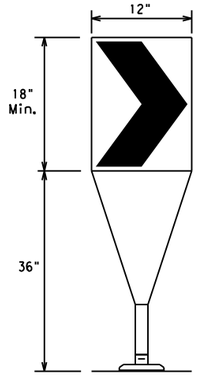
VERTICAL PANELS (VPs)

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



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



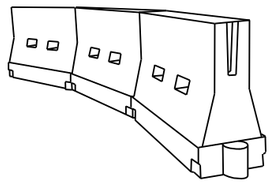
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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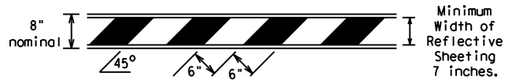
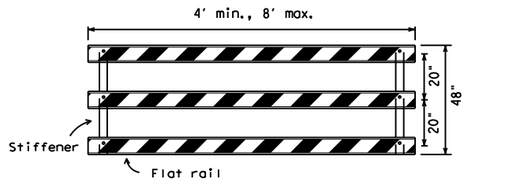
TYPE 3 BARRICADES

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.



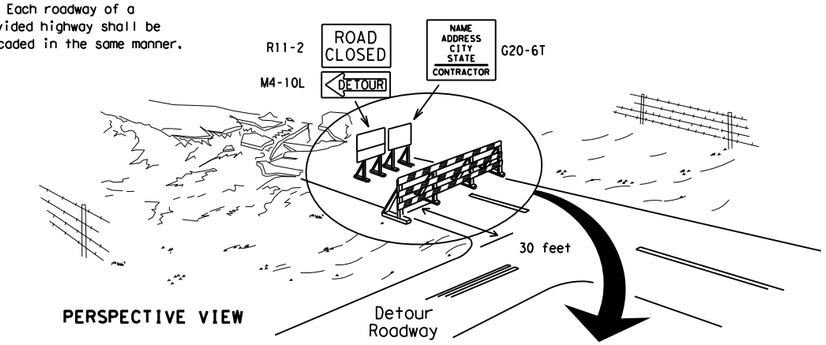
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

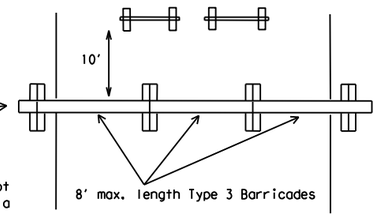
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

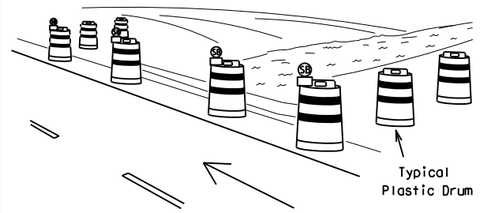
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

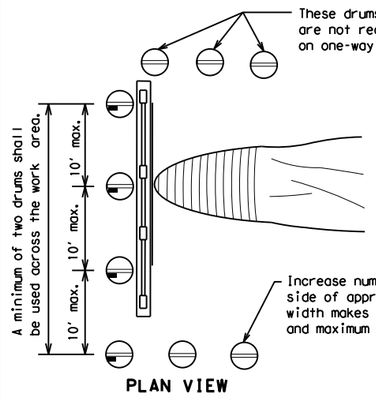
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

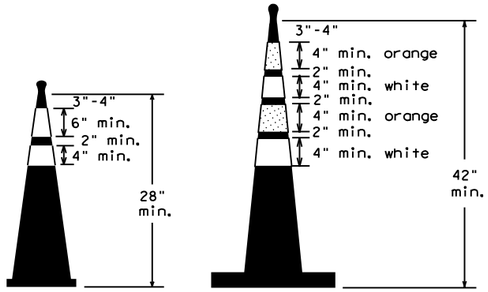
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



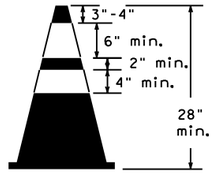
LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

PLAN VIEW

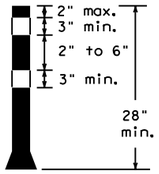
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

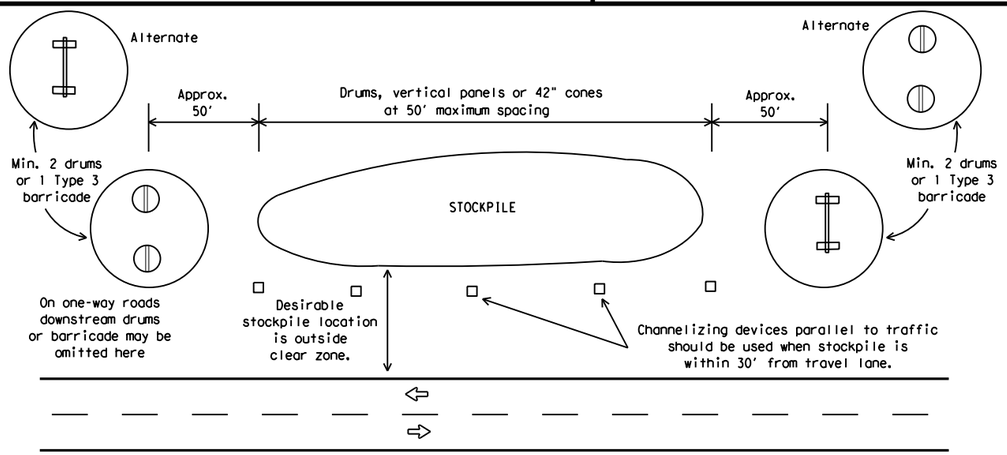


Tubular Marker

28" Cones shall have a minimum weight of 9 1/2 lbs.

42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0610	03	104, ETC.	IH 30, ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ATL	TITUS, ETC.		25

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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.

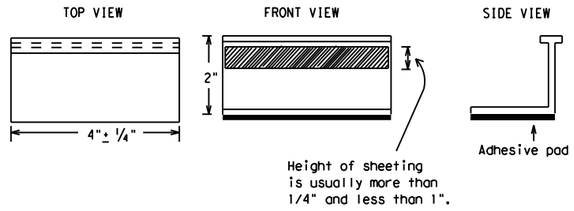
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

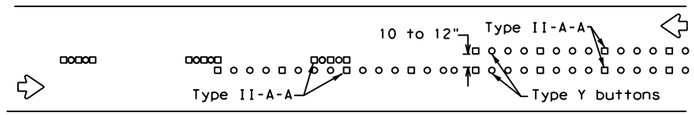
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0610	03	104, ETC.	IH 30, ETC.
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	ATL	TITUS, ETC.		26
11-02 8-14				

TDS

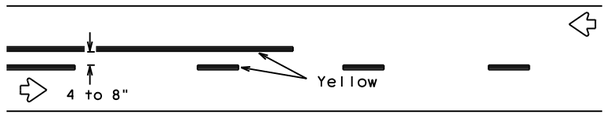
DATE: 6/24/2024 4:33:29 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/19 - ATL/Design Projects/061003104/00310104/4 - Design/Master Design Files/STANDARDS/016-027 BC (1-12) - 21

PAVEMENT MARKING PATTERNS

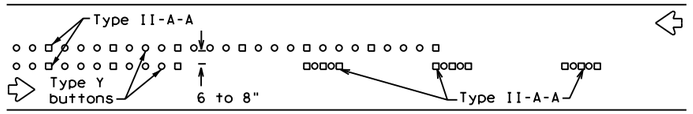
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



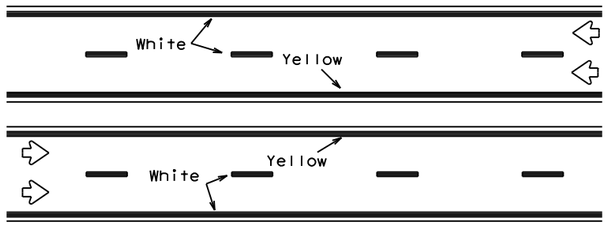
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



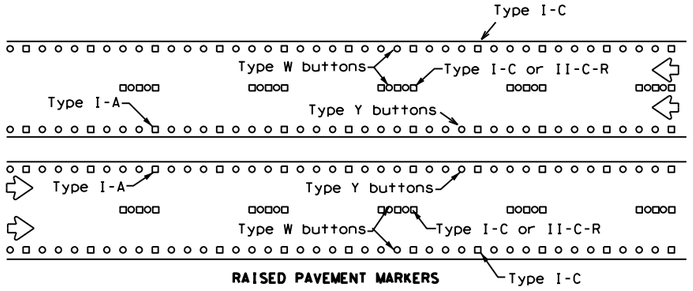
RAISED PAVEMENT MARKERS - PATTERN B

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



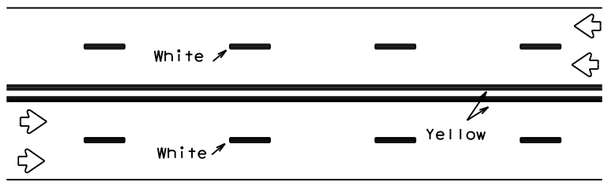
REFLECTORIZED PAVEMENT MARKINGS



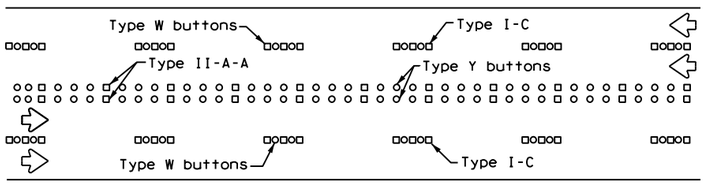
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



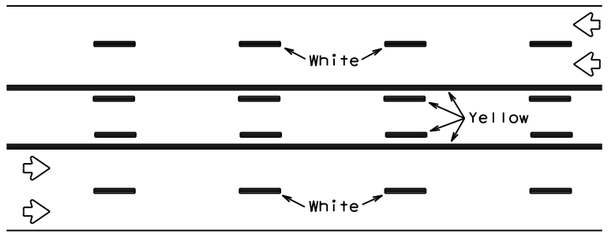
REFLECTORIZED PAVEMENT MARKINGS



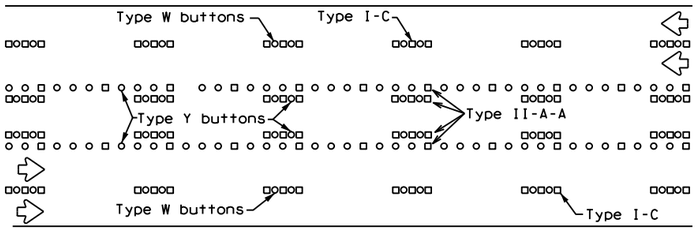
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

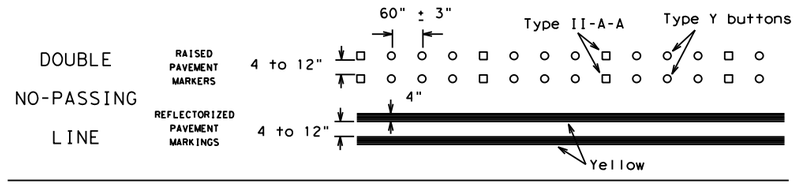
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

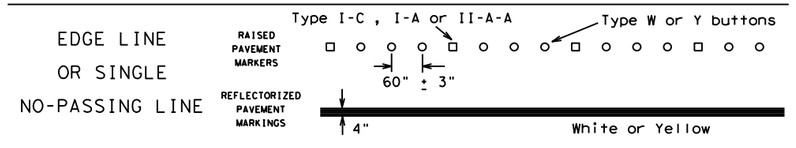
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

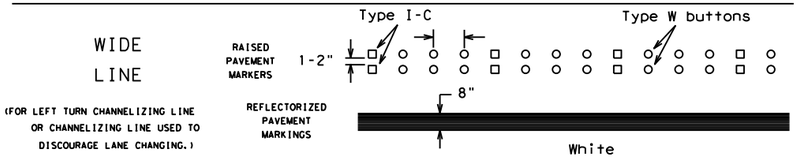


EDGE LINE OR SINGLE NO-PASSING LINE



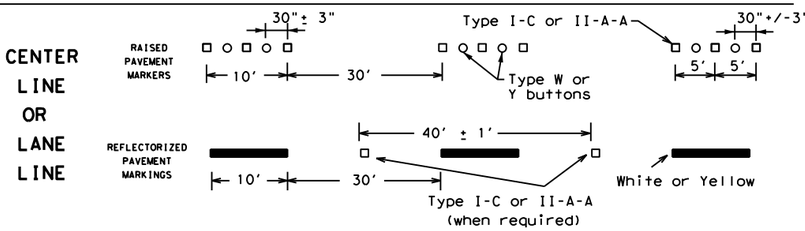
WIDE LINE

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

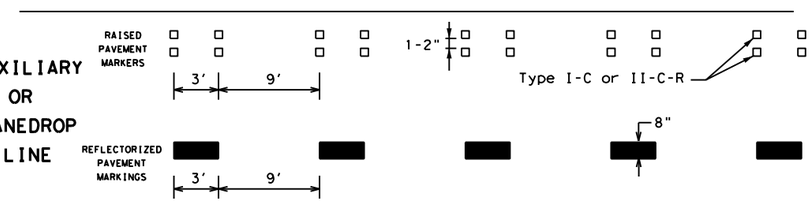


BROKEN LINES

CENTER LINE OR LANE LINE

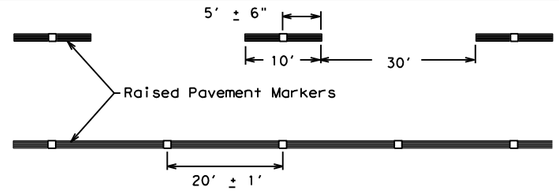


AUXILIARY OR LANEDROP LINE



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."

SHEET 12 OF 12

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	0610	03	104, ETC.	IH 30, ETC.
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	ATL	TITUS, ETC.		27

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TABLE 1: Guidance for Choosing Whether a Lead Vehicle Is Needed on Spot Edge Repair, Spot Pothole Patching, Herbicide, Sweeping, Retroreflectivity Measurements, and Tab Placement/Removal.

Volume (ADT)	Speed (mph)	Type of Roadway		
		Two-Lane, Two-Way	Multilane Undivided	Multilane Divided
<2000	≤45	NO	NO	NO
<2000	>45	NO	NO	NO
≥2000	≤45	NO	NO	NO
≥2000	>45	YES	YES	NO

When a LEAD vehicle is not used, the WORK vehicle must be equipped with an arrow board.

TABLE 2: Guidance for Choosing Whether a Shadow/Trail/Advance Warning Vehicle is Needed on Spot Edge Repair, Spot Pothole Patching, Herbicide, Sweeping, Retroreflectivity Measurements, and Tab Placement/Removal.

Volume (ADT)	Speed (mph)	Type of Roadway								
		Two-Lane, Two-Way			Multilane Undivided			Multilane Divided		
		SHADOW	TRAIL	ADVANCE	SHADOW	TRAIL	ADVANCE	SHADOW	TRAIL	ADVANCE
<2000	≤45	YES	NO	NO	YES[1]	NO	NO	YES	NO	YES
<2000	>45	YES	NO	NO	YES[1]	NO	NO	YES	NO	YES
≥2000	≤45	YES	NO	NO	YES[1]	NO	NO	YES	NO	YES
≥2000	>45	YES	YES	NO	YES[1]	YES	NO	YES	YES[2]	YES

[1] The shadow vehicle may be omitted if the work vehicle does not encroach into a travel lane.

[2] For Right Lane Closure, the Engineer will determine if the TRAIL VEHICLE is required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.

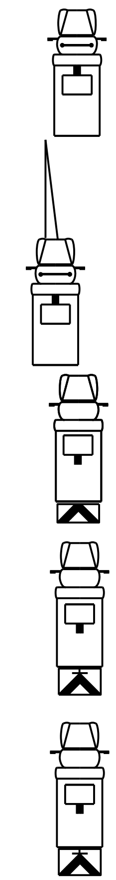
TABLE 3: Guidance for Choosing Whether a Shadow/Trail/Advance Warning Vehicle Is Needed on Striping, RPM Installation/Removal, and Shoulder Texture Operations.

Volume (ADT)	Speed (mph)	Type of Roadway								
		Two-Lane, Two-Way			Multilane Undivided			Multilane Divided		
		SHADOW	TRAIL	ADVANCE	SHADOW	TRAIL	ADVANCE	SHADOW	TRAIL	ADVANCE
<2000	≤45	YES	NO	NO	YES	NO	NO	YES	NO	YES
<2000	>45	YES	NO	NO	YES	NO	NO	YES	NO	YES
≥2000	≤45	YES	NO	NO	YES	NO	NO	YES	NO	YES
≥2000	>45	YES	YES	NO	YES	YES	NO	YES	YES[2]	YES

[2] For Right Lane Closure, the Engineer will determine if the TRAIL VEHICLE is required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.

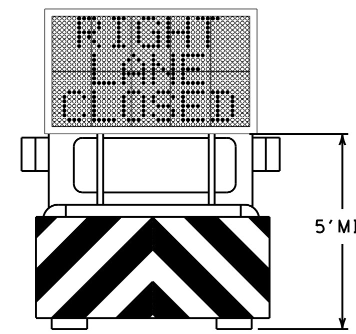
LIST OF VEHICLES

Refer to TCP(3-1) or TCP(3-2) for vehicle details.



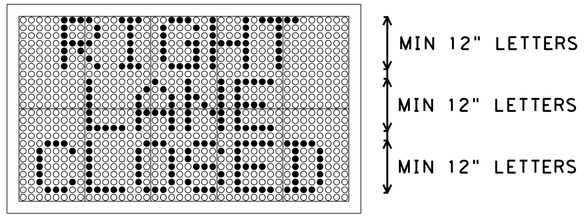
Guidance for Using a Dynamic Message Sign on an Advance Warning Vehicle

When shown in the plans, use a Truck Mounted Changeable Message Sign on Advance Warning Vehicle on multilane roadways with speed limit of 75 MPH.



Advance Warning Vehicle for speed =75 mph

Typical Advance Warning Sign



PORTABLE DYNAMIC MESSAGE SIGN

LETTERS = AMBER
BORDER = BLACK
BACKGROUND = BLACK

Texas Department of Transportation
Atlanta District Standard

TRAFFIC CONTROL PLAN
TMA USAGE GUIDELINES

TCP (ATL-10)-14

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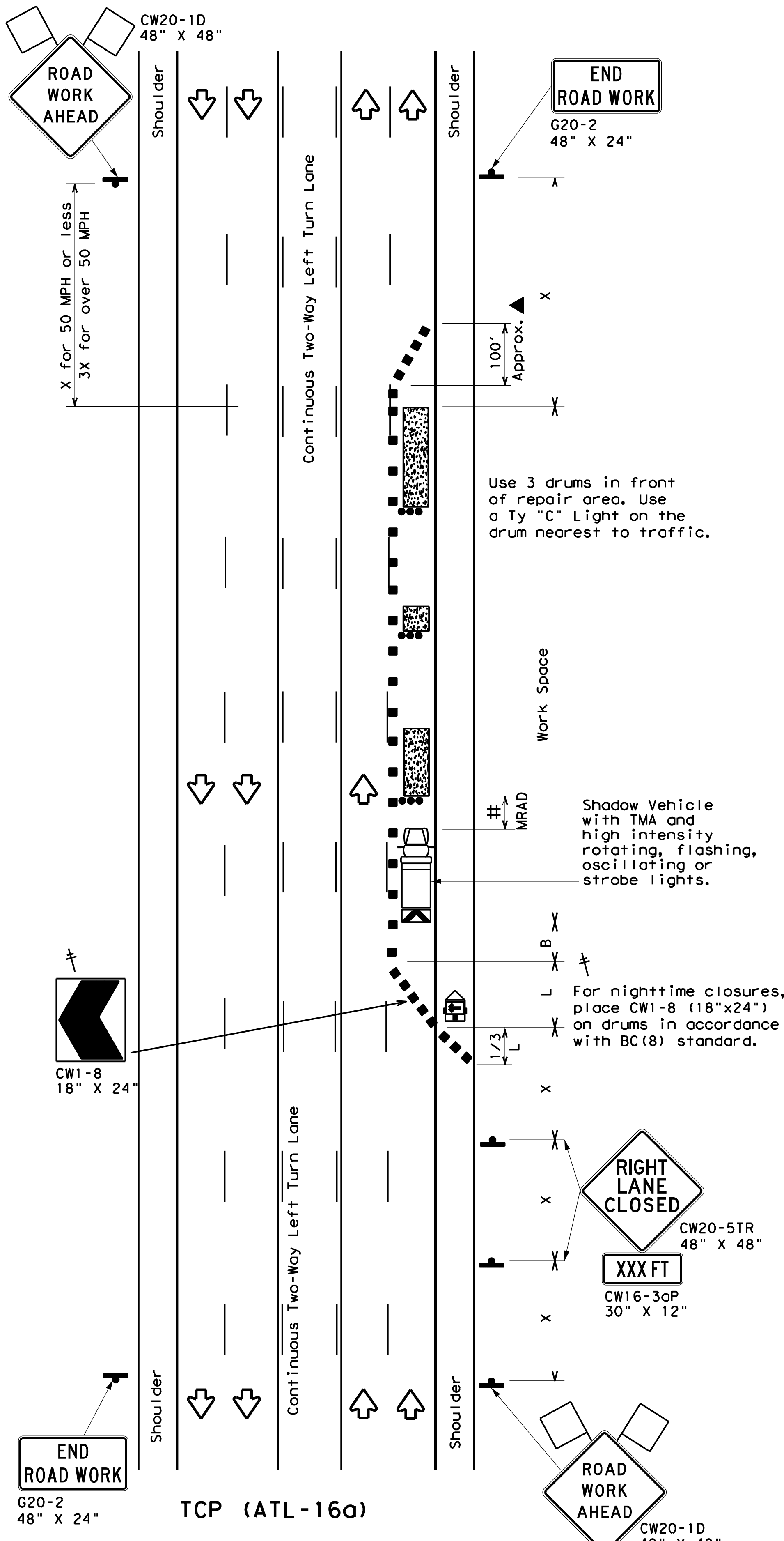
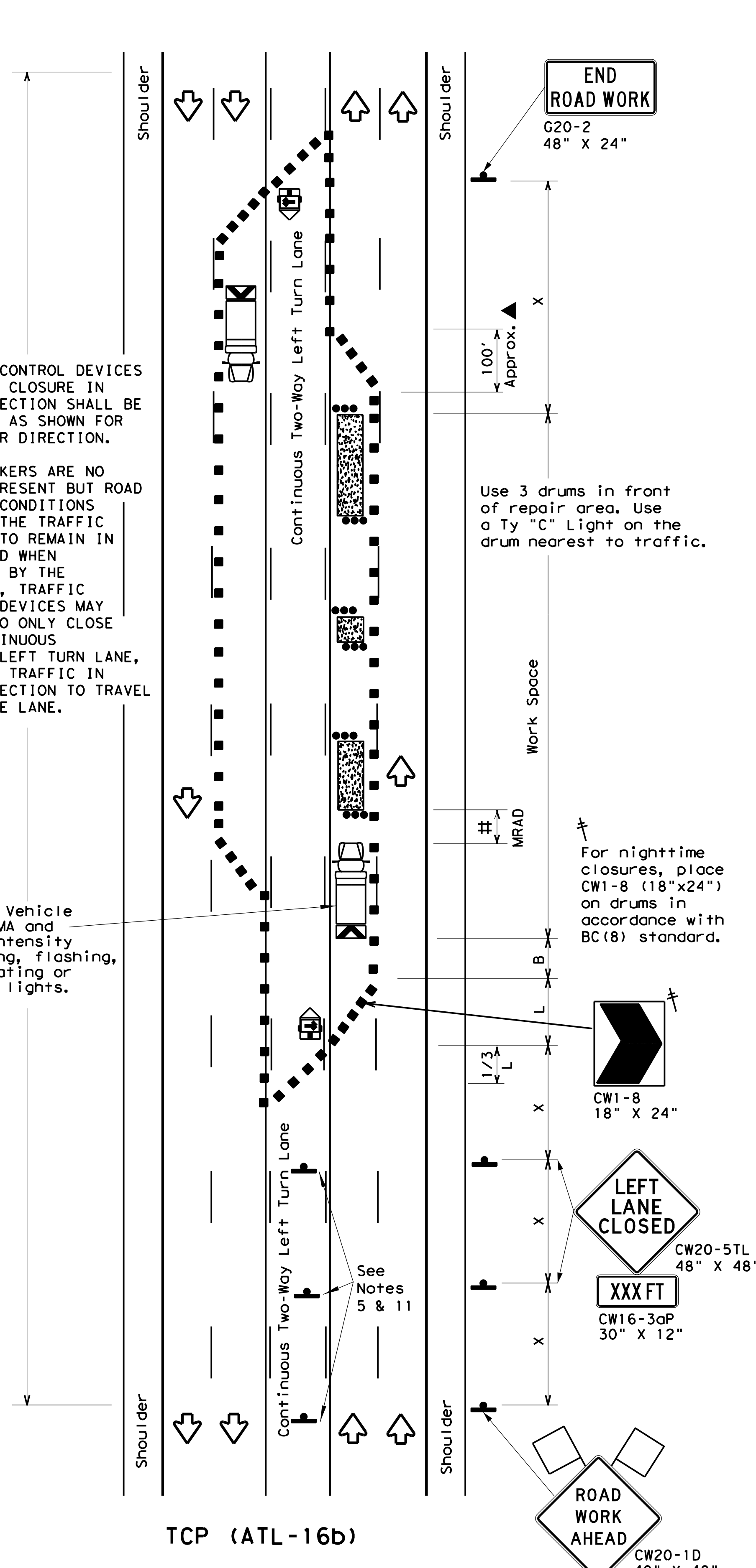


TCP (ATL-16a)

TYPICAL FLUSH MEDIAN
RIGHT LANE CLOSURE

NOTE:
TRAFFIC CONTROL DEVICES FOR LANE CLOSURE IN THIS DIRECTION SHALL BE THE SAME AS SHOWN FOR THE OTHER DIRECTION.

WHEN WORKERS ARE NO LONGER PRESENT BUT ROAD OR WORK CONDITIONS REQUIRE THE TRAFFIC CONTROL TO REMAIN IN PLACE AND WHEN APPROVED BY THE ENGINEER, TRAFFIC CONTROL DEVICES MAY BE SET TO ONLY CLOSE THE CONTINUOUS TWO-WAY LEFT TURN LANE, ALLOWING TRAFFIC IN THIS DIRECTION TO TRAVEL IN INSIDE LANE.



TCP (ATL-16b)

TYPICAL FLUSH MEDIAN
LEFT LANE CLOSURE

LEGEND

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans or when approved by the Engineer.
2. All construction signs and barricades placed during any phase of work shall remain in place until removal is approved by the Engineer.
3. The Engineer may direct the Contractor to furnish additional signs and barricades as required to maintain traffic flow, detours and motorist safety during construction.
4. High level warning flags should be used on advance warning signs during daytime operations. Warning lights may be used to add emphasis to advance warning signs during nighttime operations.
5. Duplicate construction warning signs shall be erected on the median side.
6. See BC Standards for additional sign details.
7. Drums are the typical channelizing device. Cones or other devices may be used if approved by the Engineer. Drums shall be used during nighttime operations. Channelizing devices shall also be placed in accordance with "WORKSHEET FOR EDGE CONDITION TREATMENT TYPES."
8. Neither work activity nor storage of equipment, vehicles, or materials shall occur within the buffer space.
9. When signs are mounted at 1' height for short term stationary, sign versions shown in the SHSD for Texas with distances on the sign face rather than mounted on a plaque below the sign may be used.
10. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.
11. For TCP (ATL-16b) Flush Median, median side signs shall be mounted at 7' height.

A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used and positioned per the Manufacturer's Roll Ahead Distance (MRAD) in advance of the area of crew exposure without adversely affecting the work performance.

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.

Texas Department of Transportation
Atlanta District Standard

TRAFFIC CONTROL PLAN PAVEMENT REPAIRS (FLUSH MEDIAN)

TCP (ATL-16)-15

FILE: atl-16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT January 2014	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	ATL	TITUS, ETC.		27B

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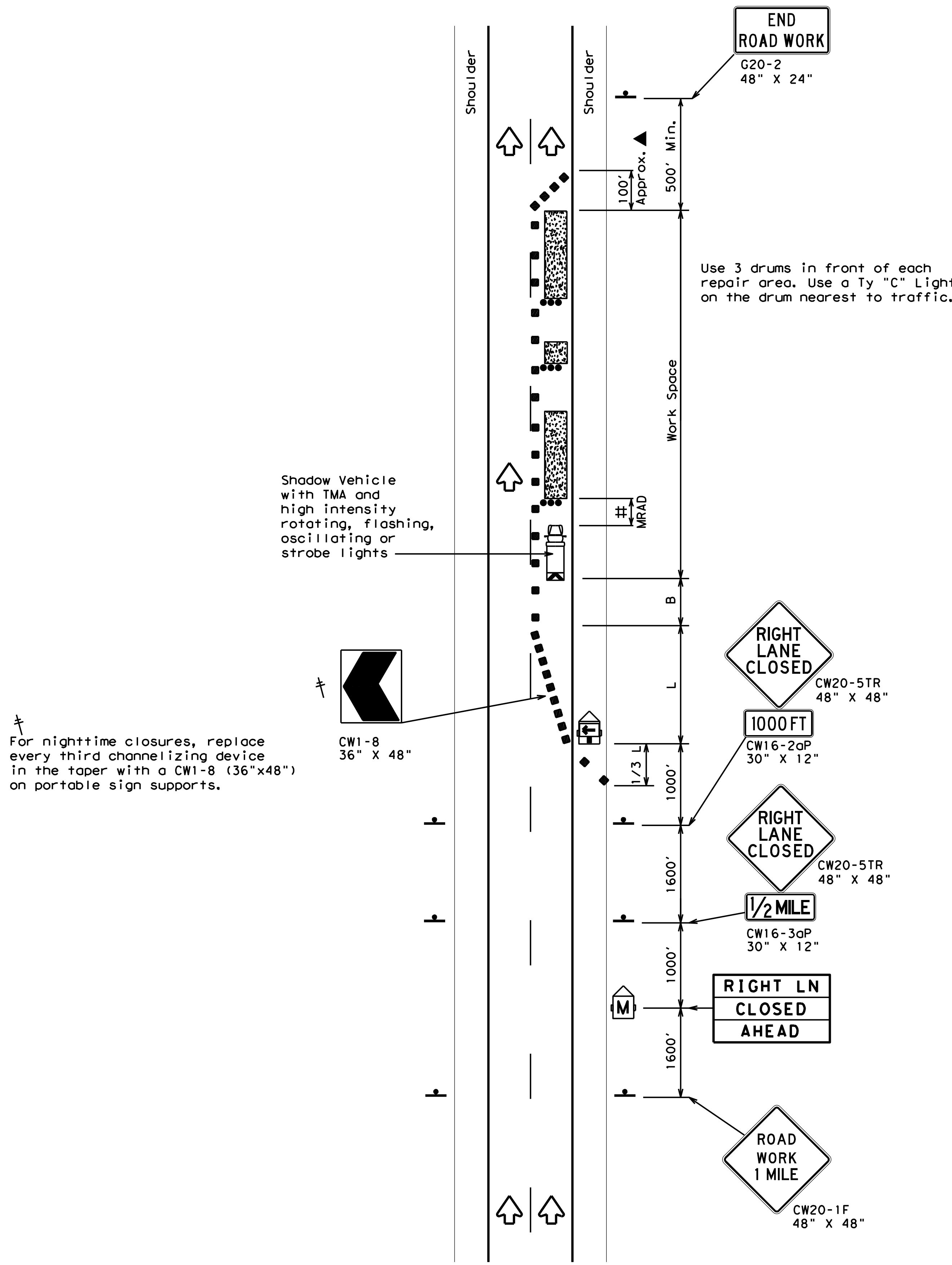


LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans or when approved by the Engineer.
2. All construction signs and barricades placed during any phase of work shall remain in place until removal is approved by the Engineer.
3. The Engineer may direct the Contractor to furnish additional signs and barricades as required to maintain traffic flow, detours and motorist safety during construction.
4. Duplicate construction warning signs shall be erected on the median side of freeways.
5. The TCP details may require additional and/or relocation of route shields, guide signs, etc. to guide motorists along entire length of detour due to ramp and freeway closure.
6. See BC Standards for additional sign details.
7. When possible, changeable message signs should be located 500 feet in advance of the last available exit ramp prior to the lane closure to allow motorists an alternate route.
8. Static message boards or changeable message signs stating the date and duration of ramp or freeway lane closures shall be placed a minimum of seven (7) calendar days in advance of the actual closure.
9. A minimum of two PCMS per direction shall be placed in advance of the lane closure. PCMS shall be placed a minimum of 0.5 mile in advance of the taper. An additional PCMS shall be placed approximately 3 miles in advance of the taper or at the end of the queue, whichever is greater.
10. Channelizing devices shall be placed in accordance with BC Standards and "WORKSHEET FOR EDGE CONDITION TREATMENT TYPES."
11. Neither work activity nor storage of equipment, vehicles, or materials shall occur within the buffer space.
12. Warning signs shown shall be appropriately altered for left lane closures. When signs are mounted at 1' height for short term stationary, sign versions shown in the SHSD for Texas with distances on the sign face rather than mounted on a plaque below the sign may be used.
13. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used and positioned per the Manufacturer's Roll Ahead Distance (MRAD) in advance of the area of crew exposure without adversely affecting the work performance.

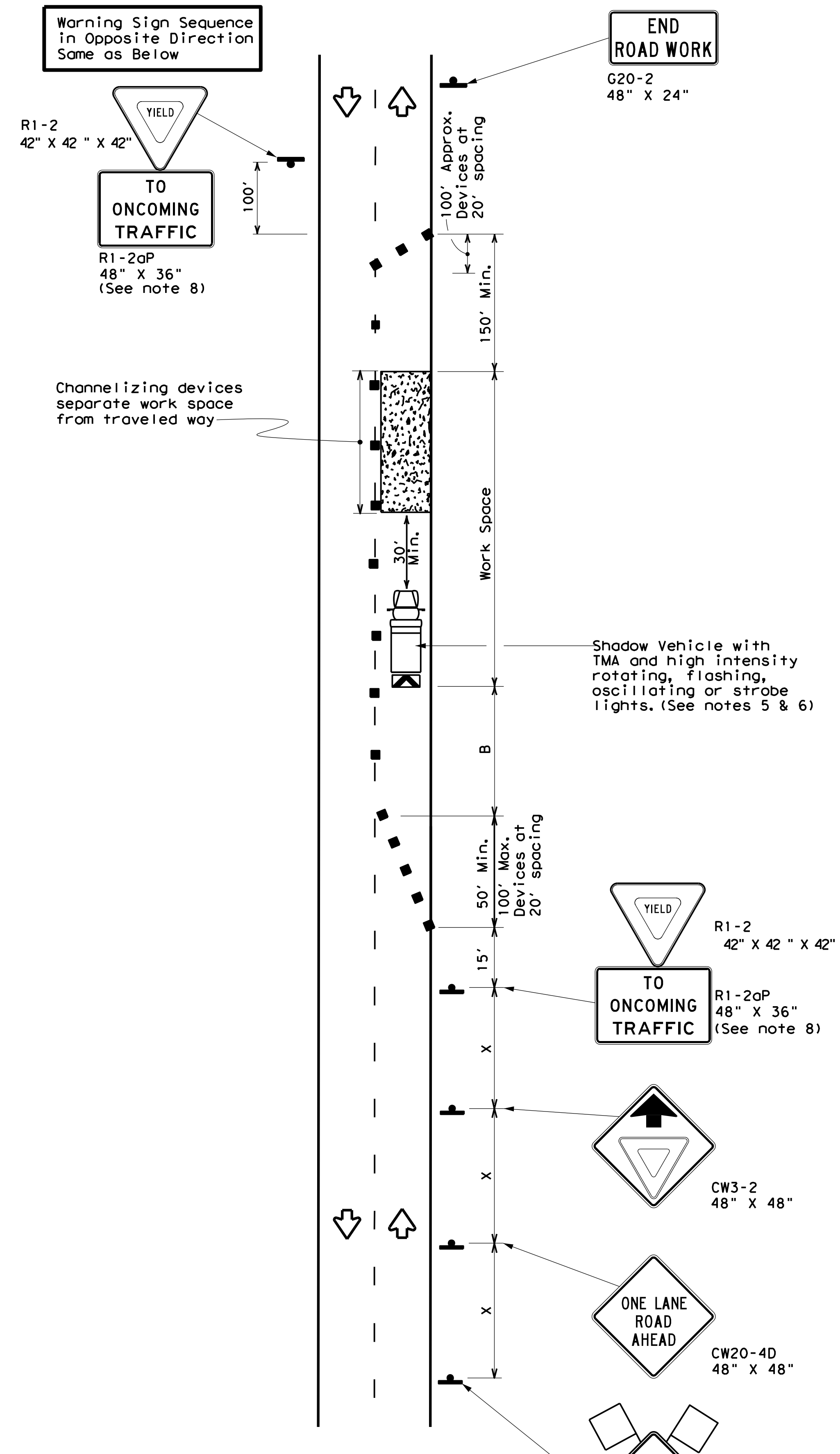
If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.

Texas Department of Transportation
Atlanta District Standard

TRAFFIC CONTROL PLAN FREEWAY PAVEMENT REPAIRS

TCP (ATL-61)-14

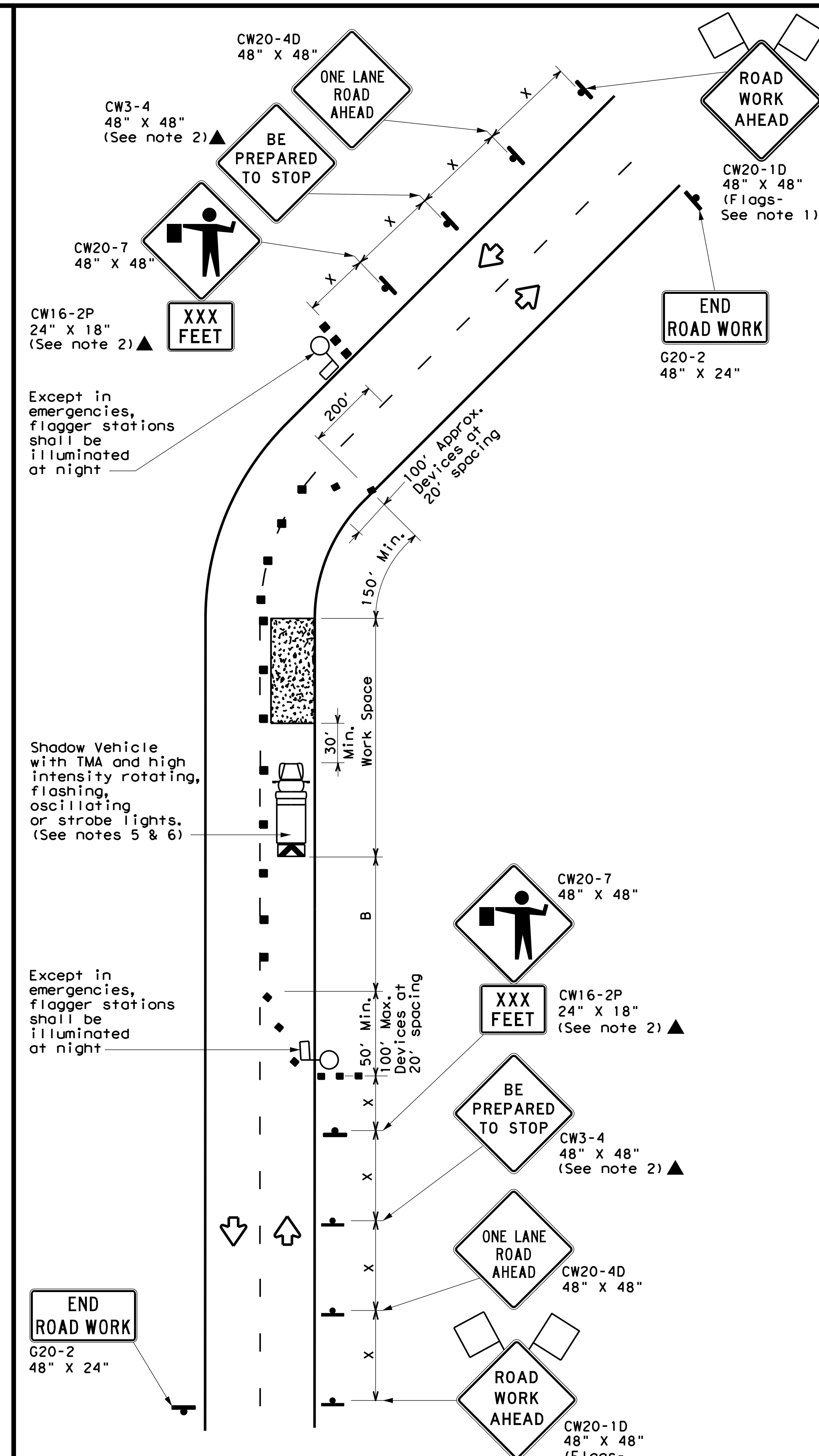
FILE: atl-61.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0610	03	104, ETC.	IH 30, ETC.
	DIST	COUNTY		SHEET NO.
	ATL	TITUS, ETC.		27C



TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY CONTROL WITH FLAGGERS

LEGEND

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

TCP (1-2a)

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

TCP (1-2b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-90 4-98 2-94 2-12 1-97 2-18	0610	03	104, ETC.	IH 30, ETC.
	DIST	COUNTY		SHEET NO.
	ATL	TITUS, ETC.		28

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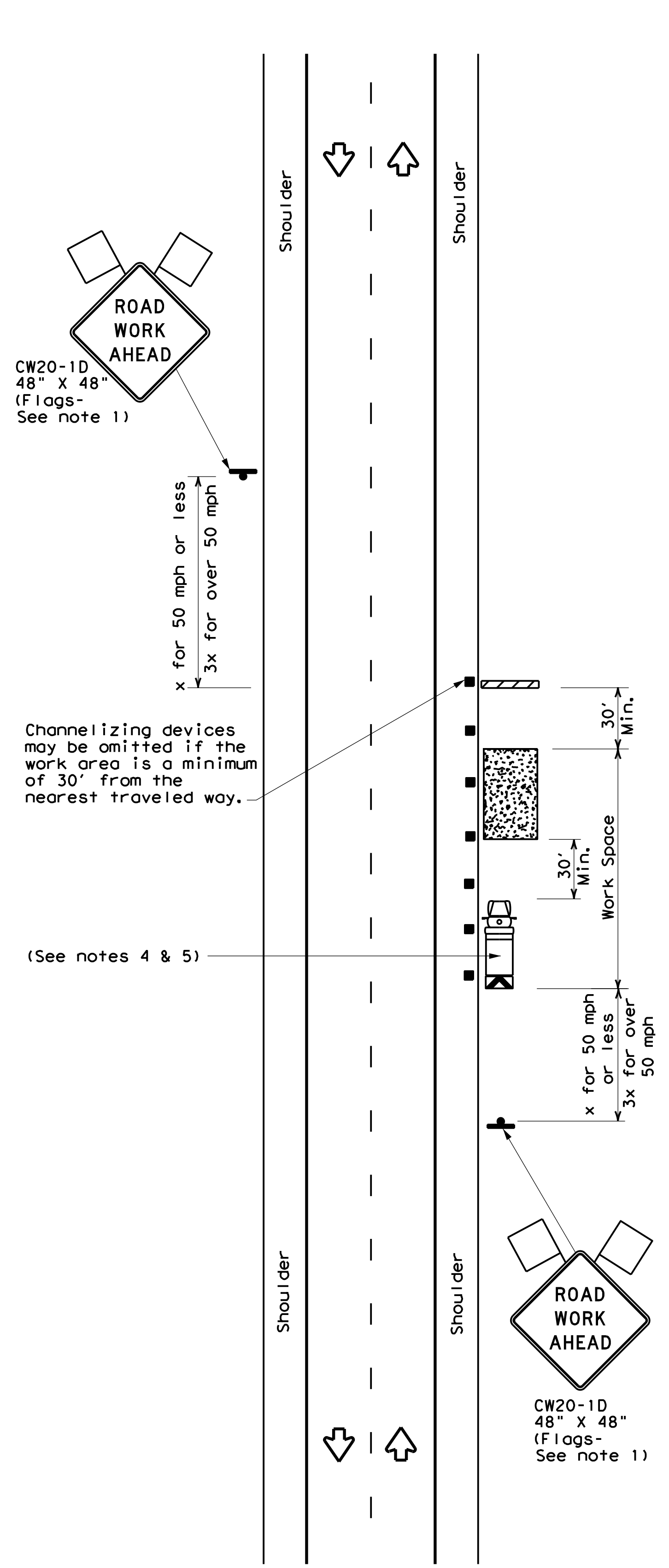
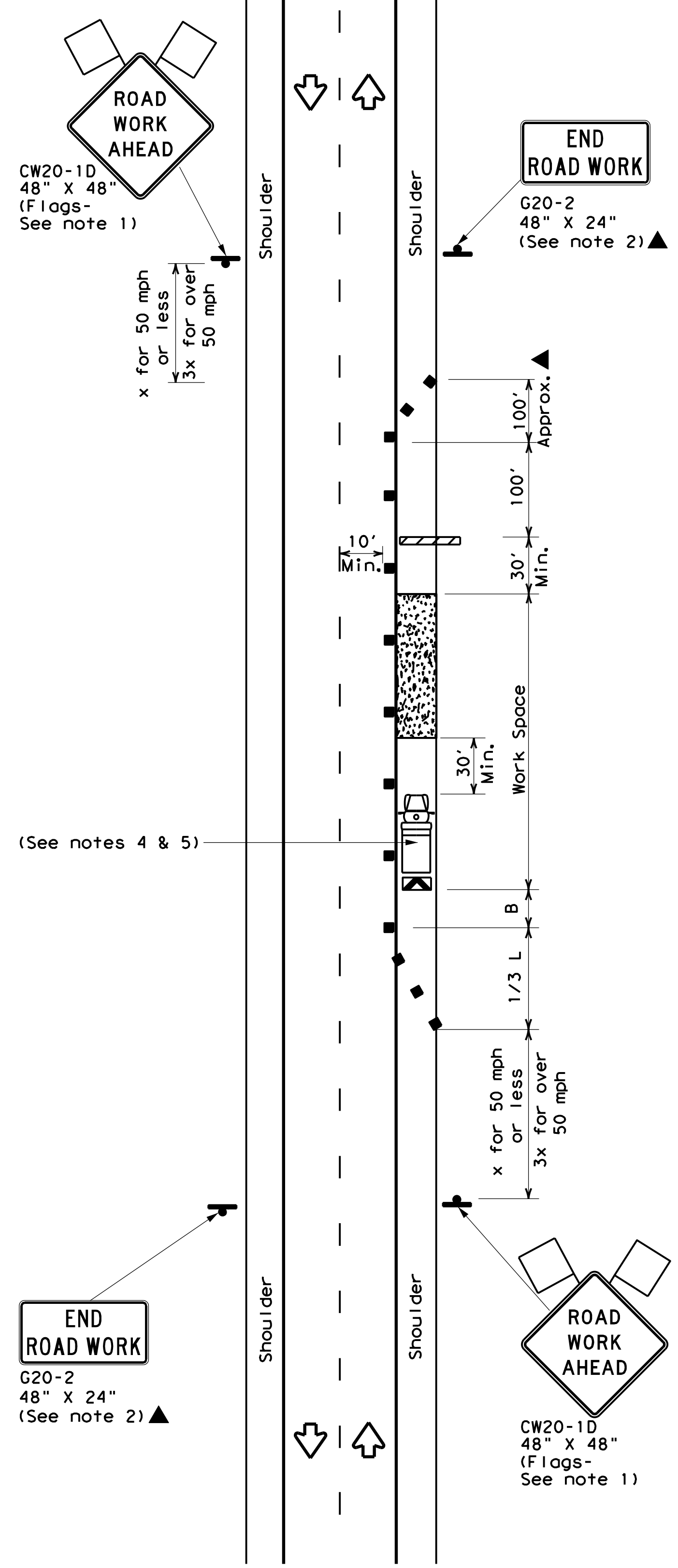


TCP (2-1a)

WORK SPACE NEAR SHOULDER

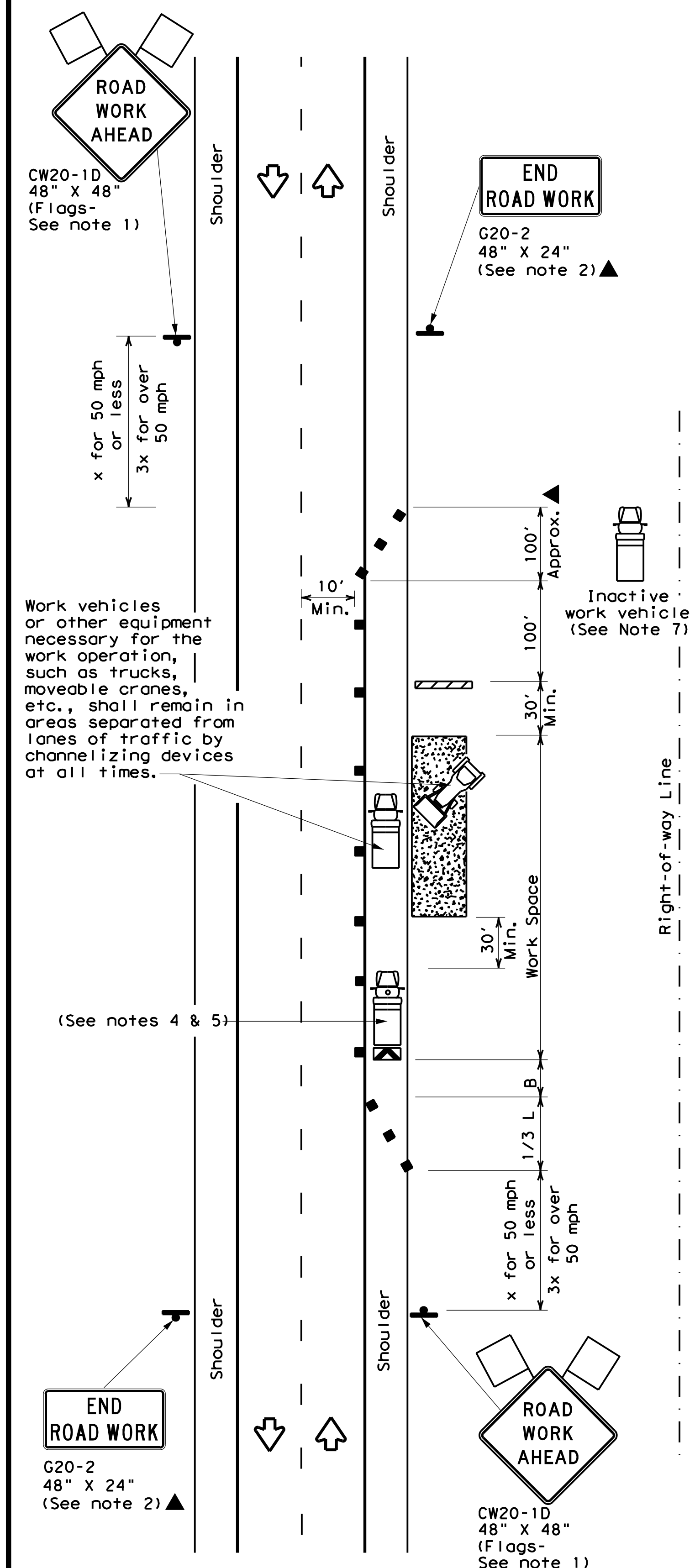
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER

Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER

Conventional Roads

LEGEND

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0610	03	104, ETC.	IH 30, ETC.
	DIST		COUNTY	SHEET NO.
	ATL		TITUS, ETC.	28A

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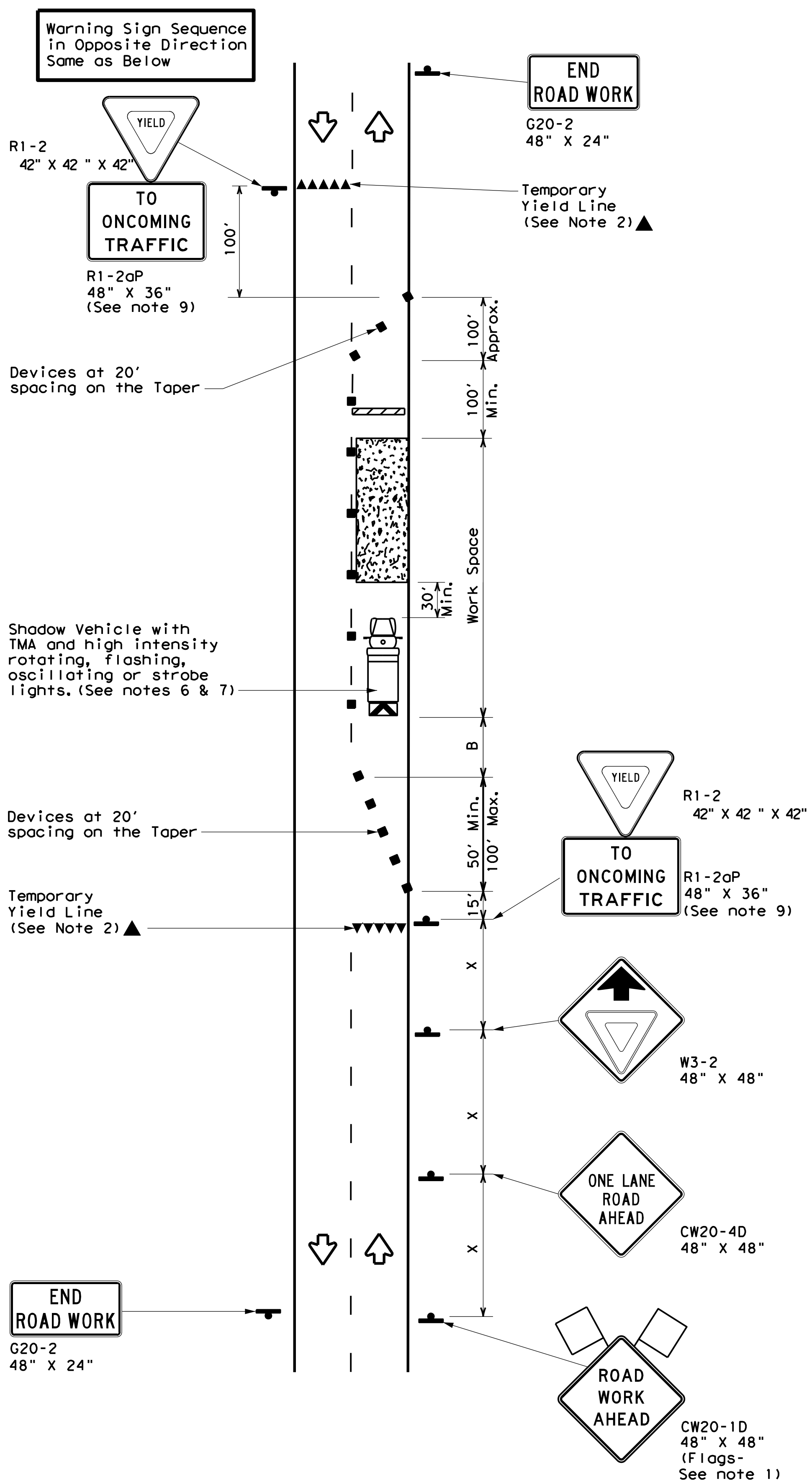
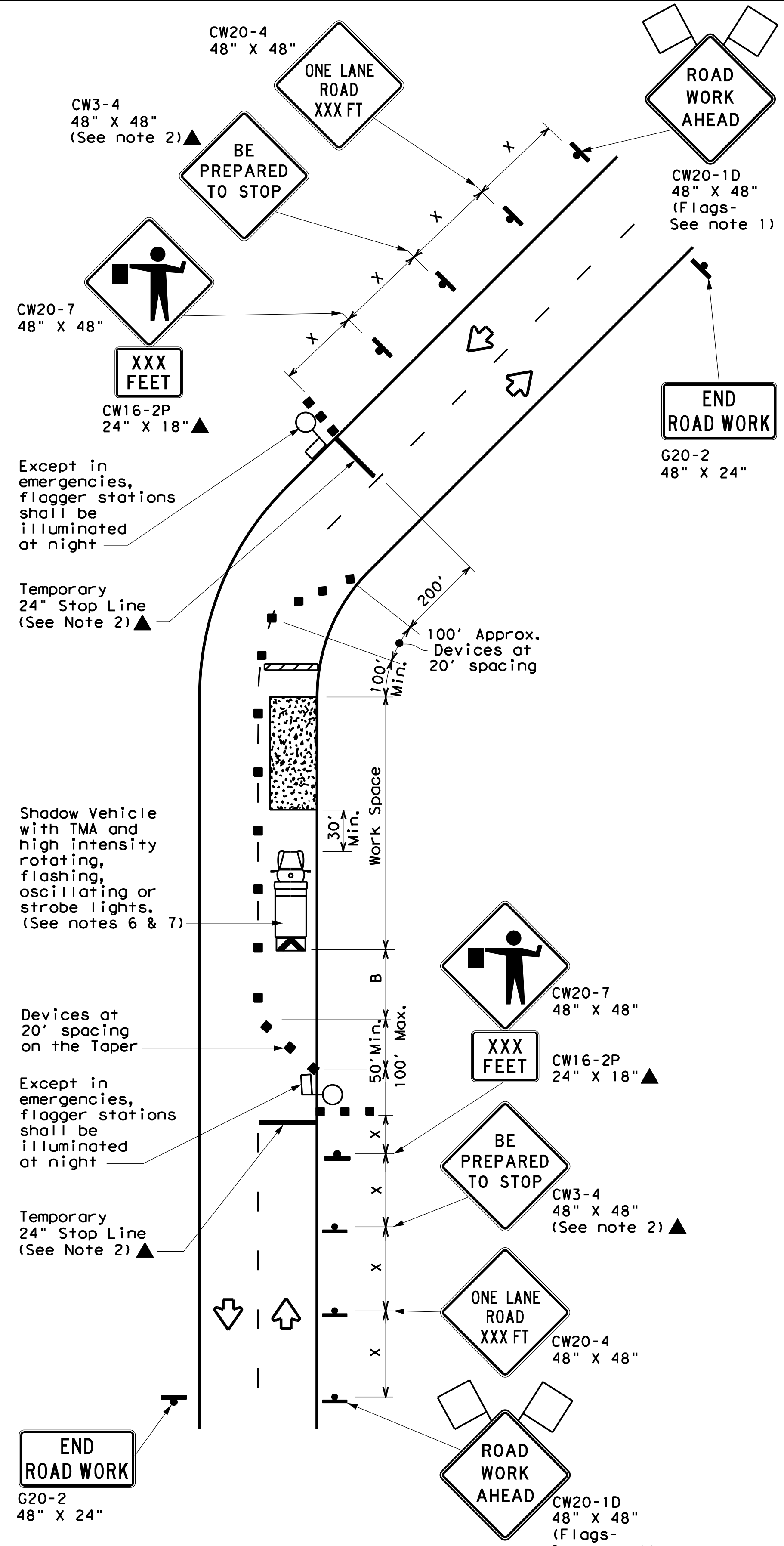


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



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

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

TCP (2-2a)

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

TCP (2-2b)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(2-2)-18

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© TxDOT December 1985	CONT 0610	SECT 03	JOB 104, ETC.	HIGHWAY IH 30, ETC.
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	DIST ATL		COUNTY TITUS, ETC.	SHEET NO. 28B

DATE: 7/3/2024 10:35:37 AM
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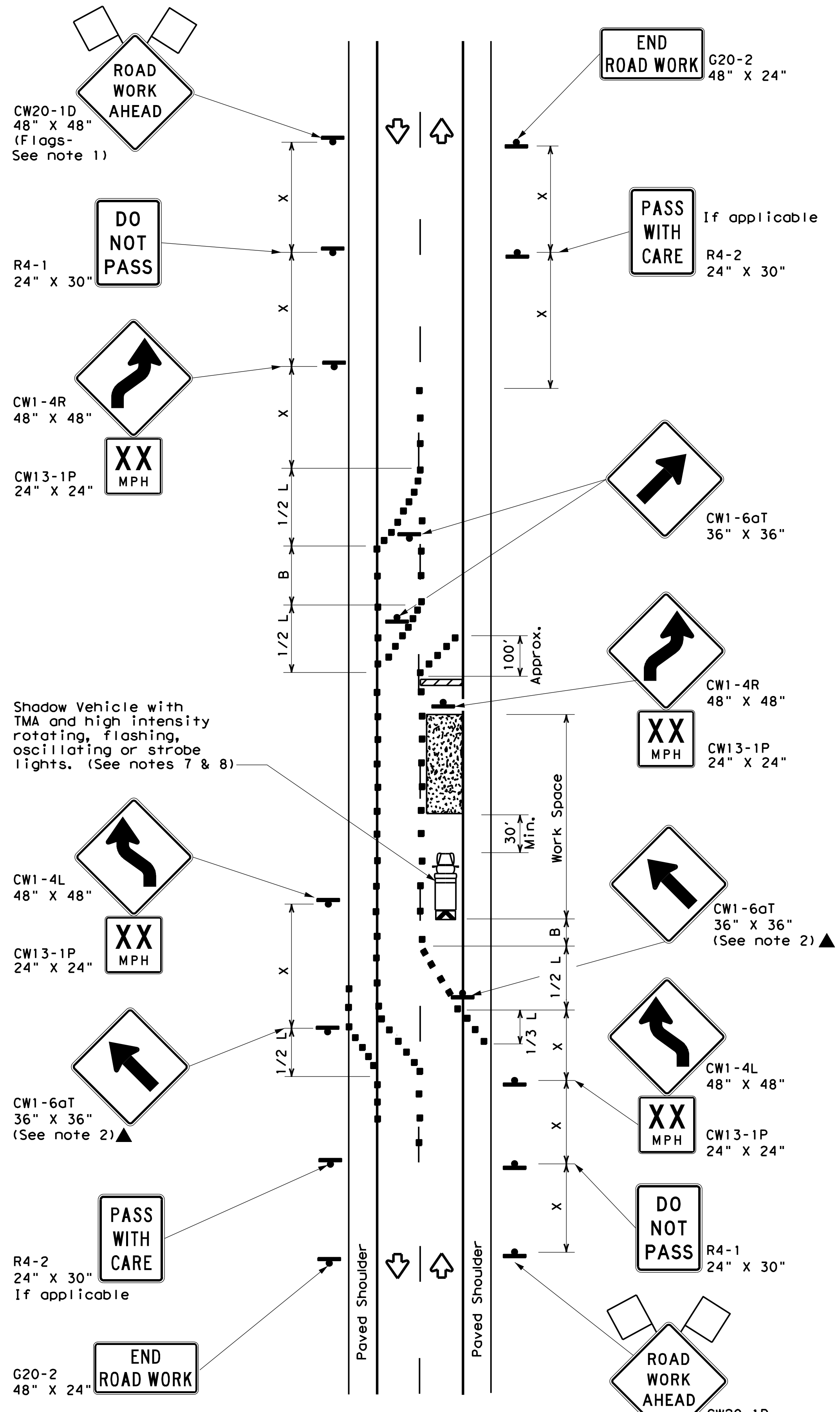
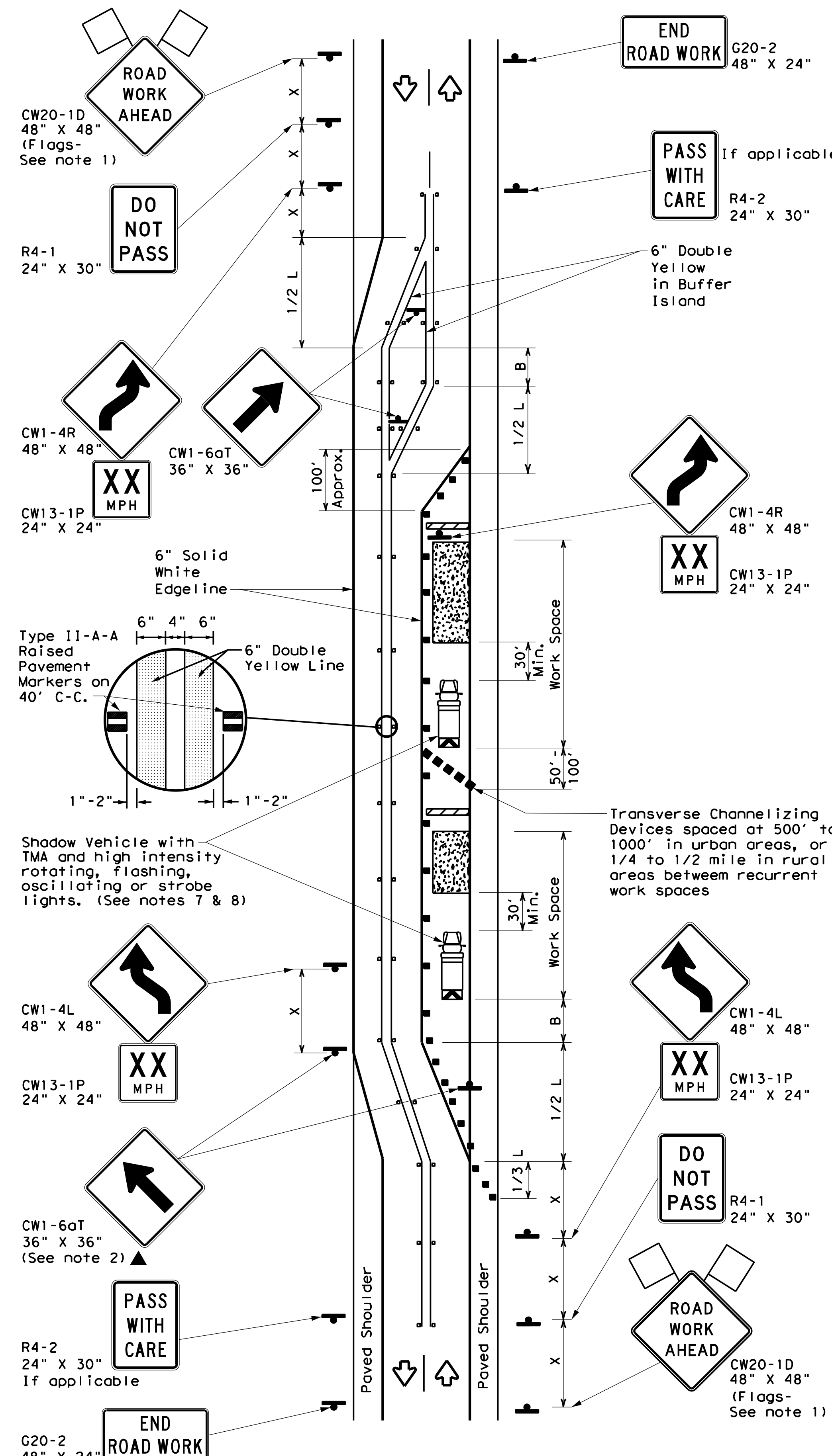


TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

LEGEND

	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Raised Pavement Markers Ty II-AA
	Sign		Traffic Flow
	Flag		Flagger

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

* Conventional Roads Only

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

TYPICAL USAGE

MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY TCP(2-3b)ONLY
			✓	✓

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. When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
4. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
5. The R4-1 "DO NOT PASS," R4-2 " PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
6. Conflicting pavement marking shall be removed for long term projects.
7. 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.
8. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-3a)

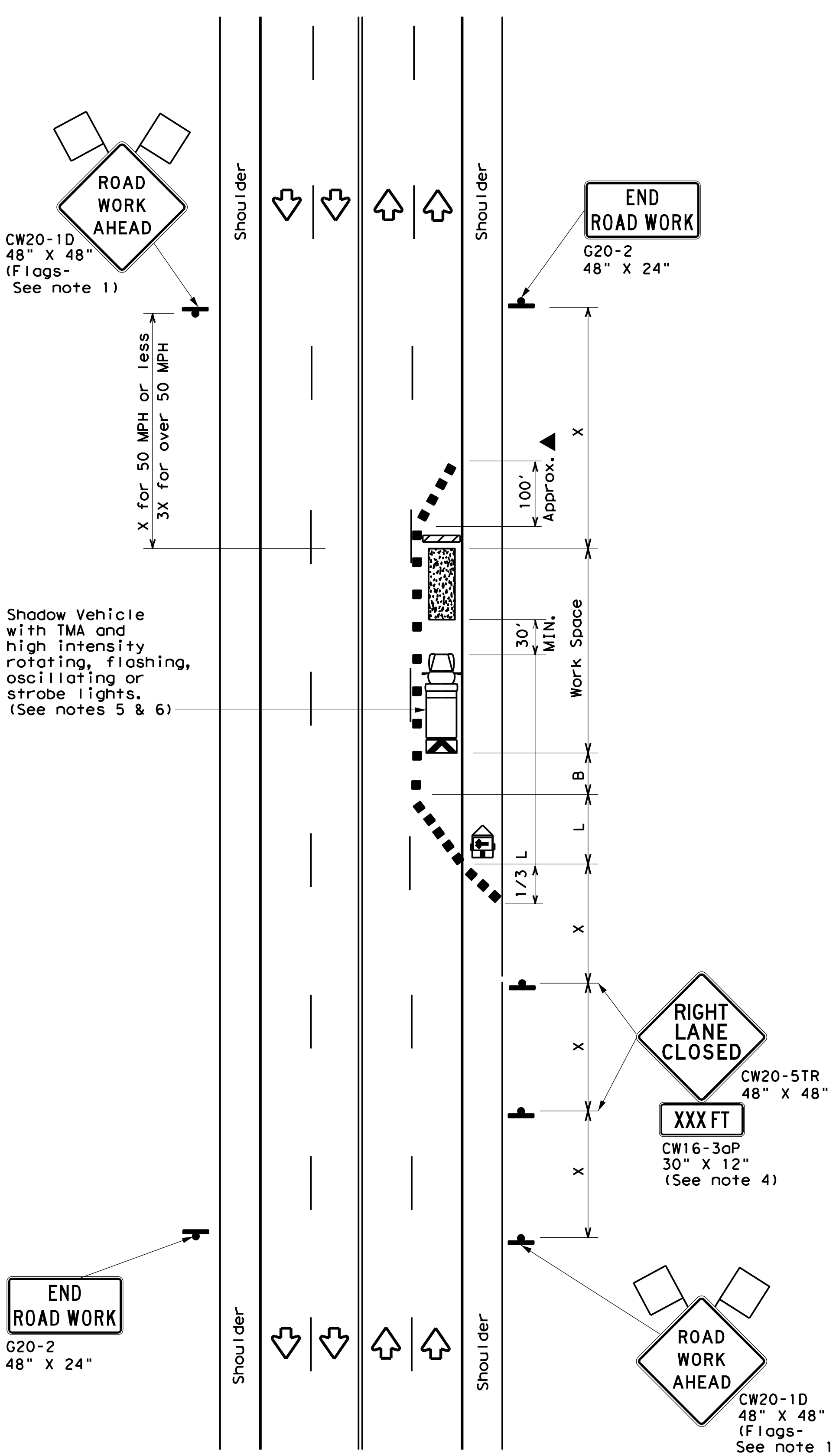
9. Conflicting pavement markings shall be removed for long-term projects. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections,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

Texas Department of Transportation
Traffic Safety Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

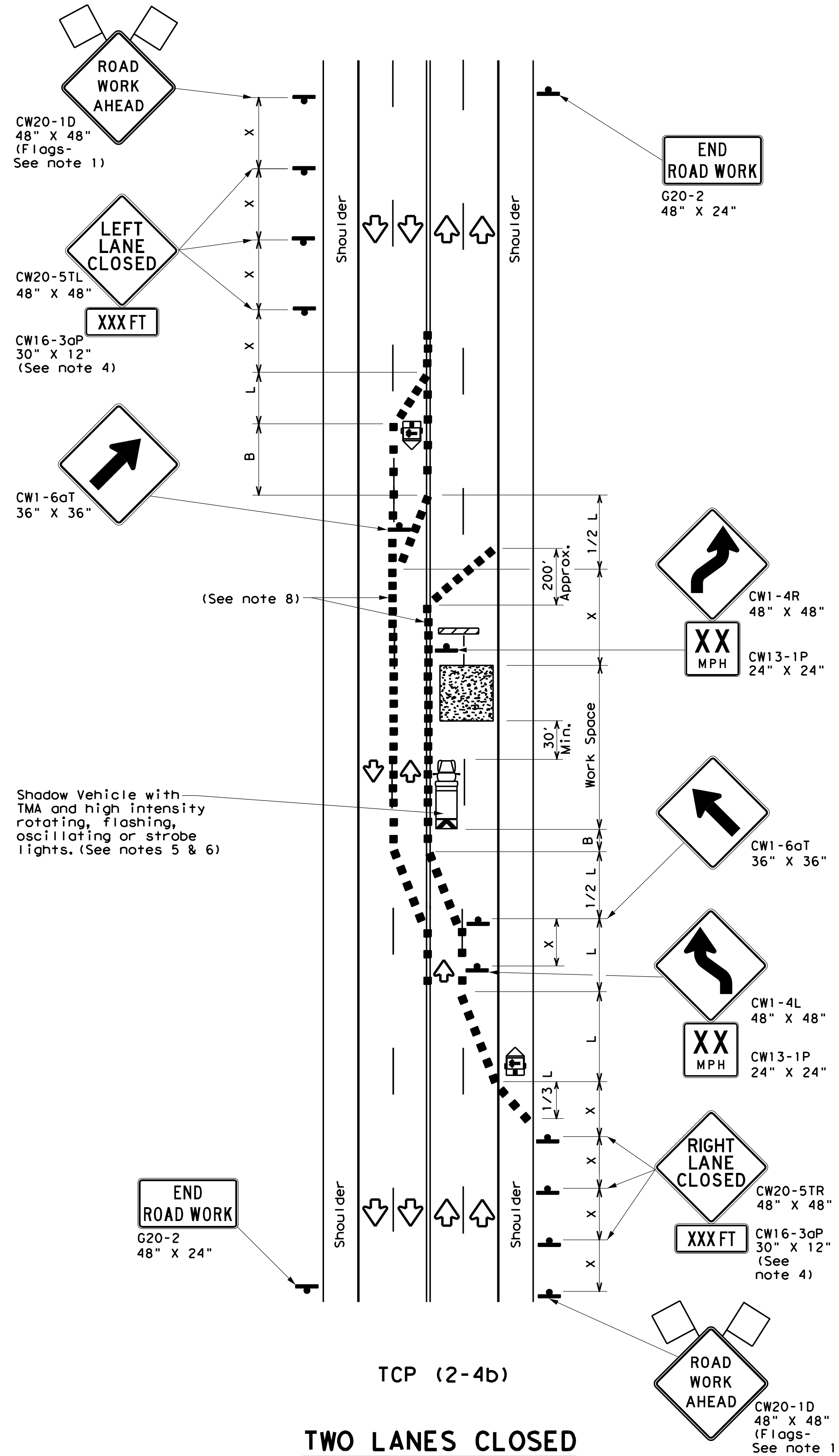
TCP(2-3)-23

FILE: tcp(2-3)-23.dgn	DN:	CK:	DW:	CK:
© TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-85 4-98 2-18 / 8-95 3-03 4-23 / 1-97 2-12	0610	03	104, ETC.	IH 30, ETC.
	DIST	COUNTY		SHEET NO.
	ATL	TITUS, ETC.		28C



TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

LEGEND

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

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

* Conventional Roads Only

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

TYPICAL USAGE

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation

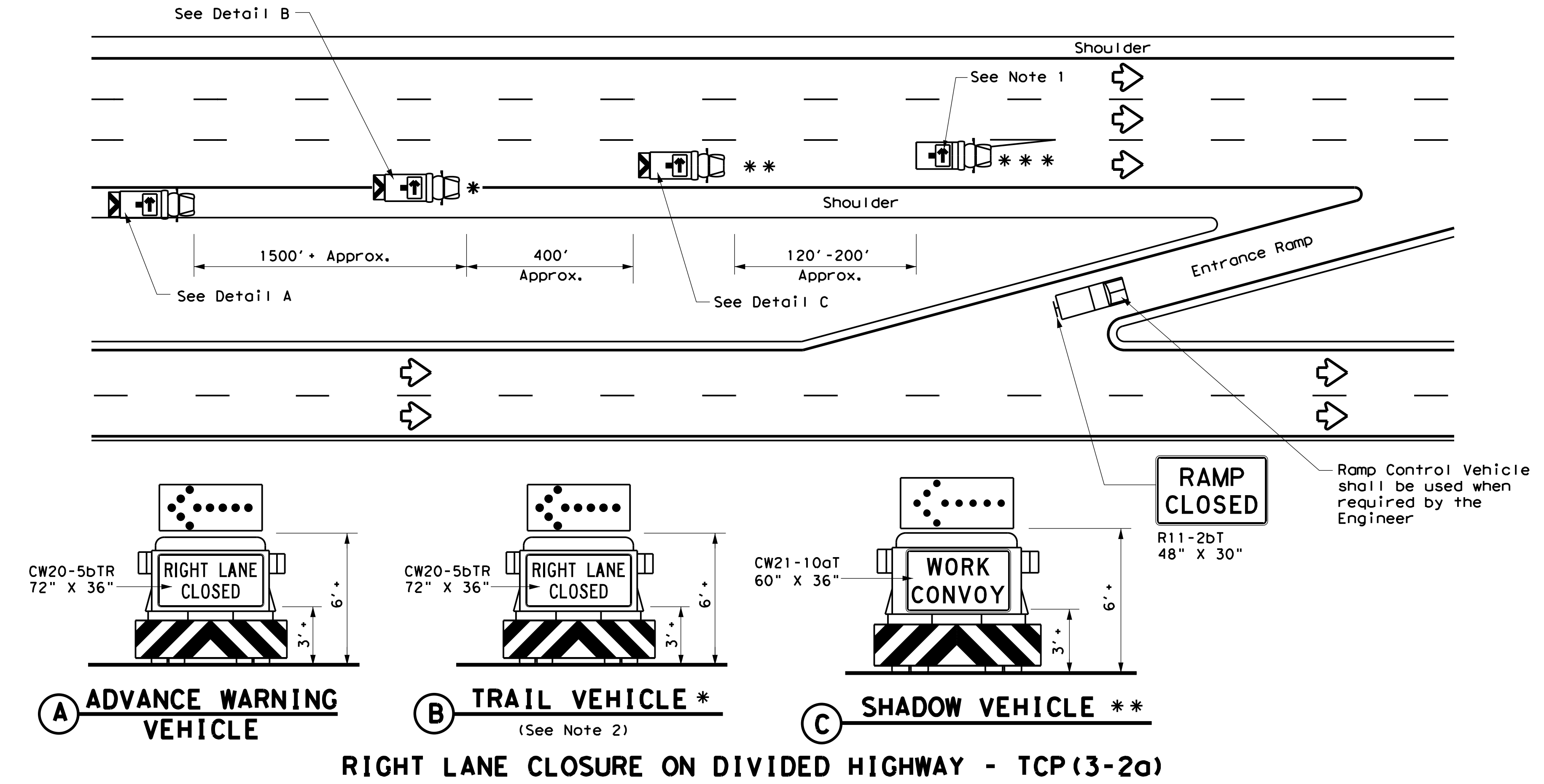
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

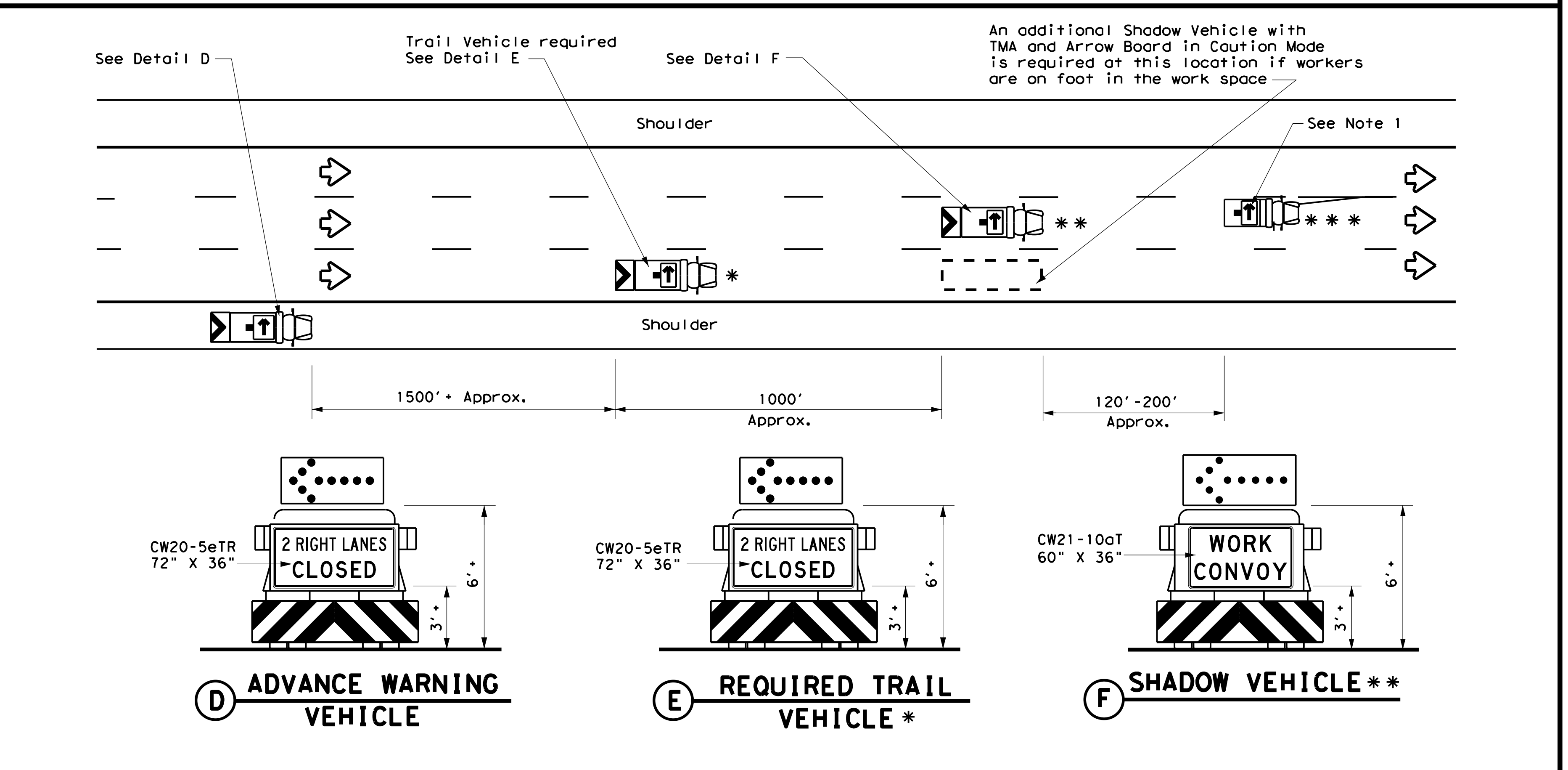
TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT 0610	SECT 03	JOB 104, ETC.	HIGHWAY IH 30, ETC.
REVISIONS 8-95 3-03 / 1-97 2-12 / 4-98 2-18	DIST ATL	COUNTY TITUS, ETC.		SHEET NO. 29

164



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



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

LEGEND

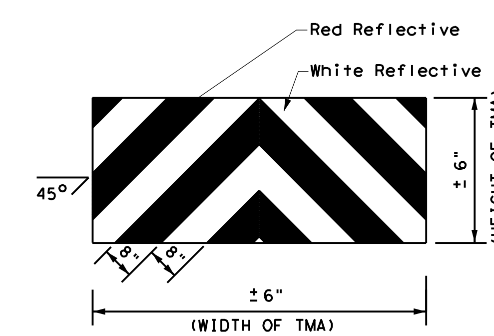
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

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	0610	03	104, ETC.	IH 30, ETC.
	DIST	COUNTY		SHEET NO.
	ATL	TITUS, ETC.		30

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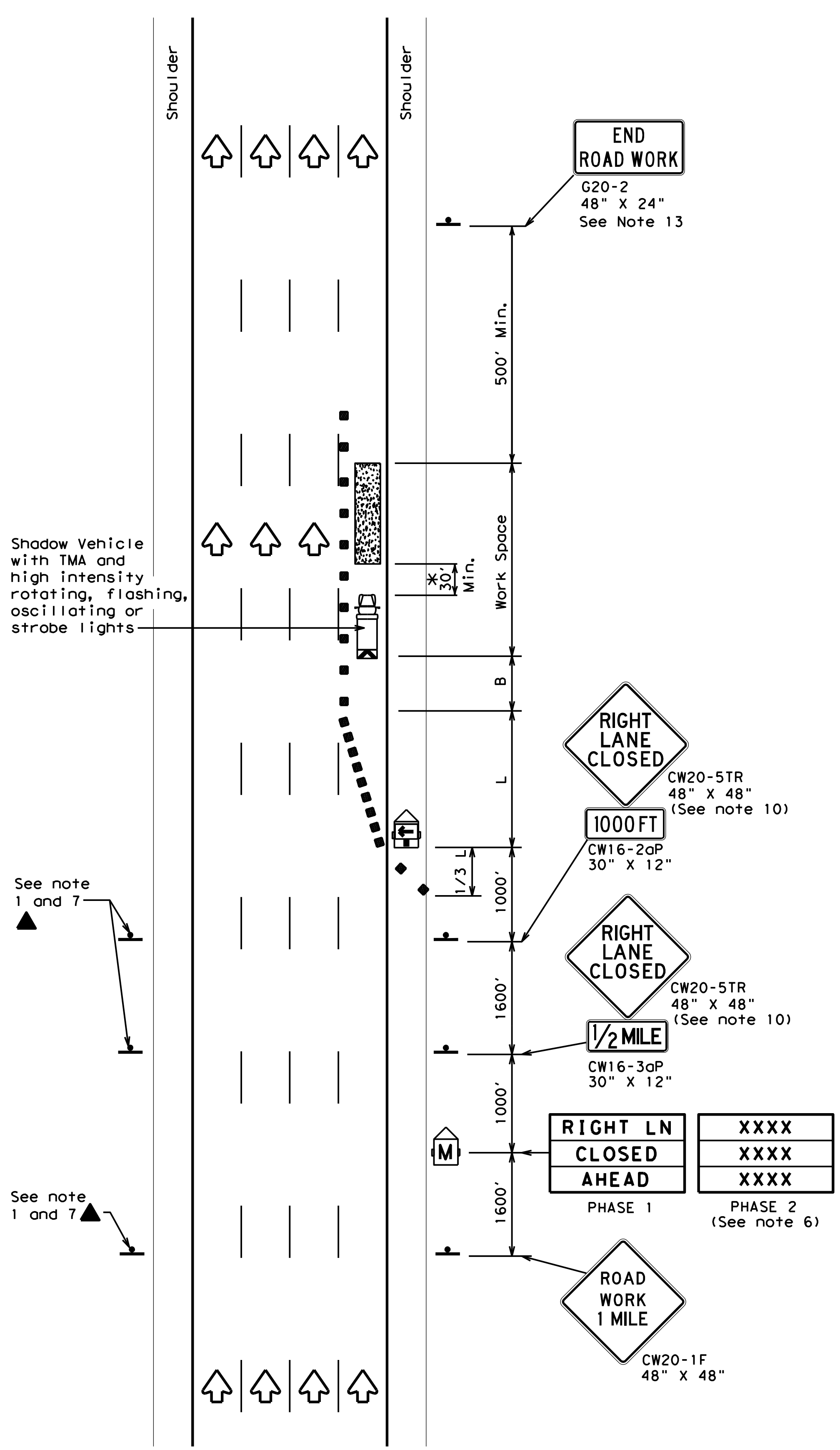
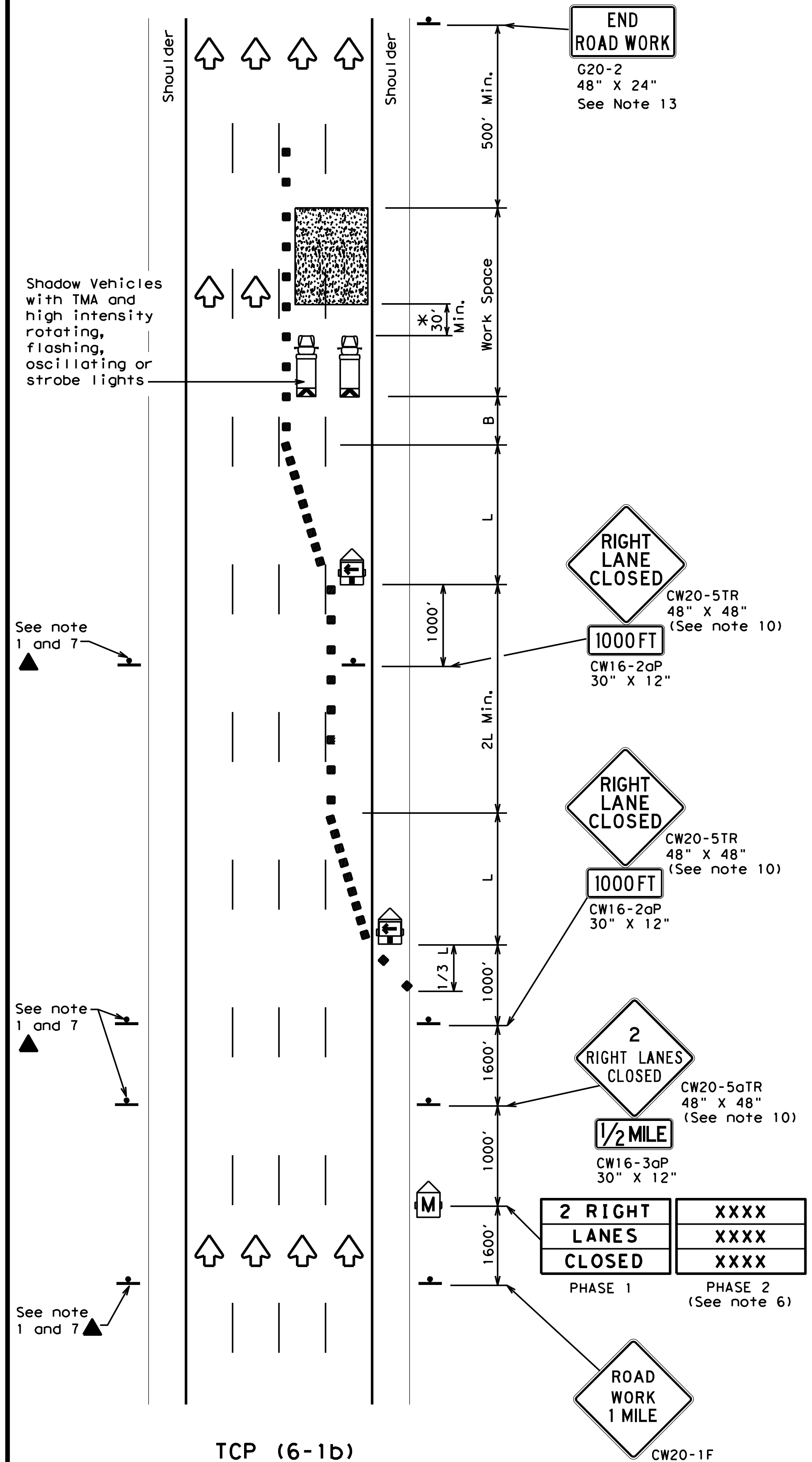


TCP (6-1a)

TYPICAL FREEWAY ONE LANE CLOSURE



TCP (6-1b)

TYPICAL FREEWAY TWO LANE CLOSURE

LEGEND

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

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

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

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

GENERAL NOTES

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

TCP(6-1)-12

FILE: tcp6-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
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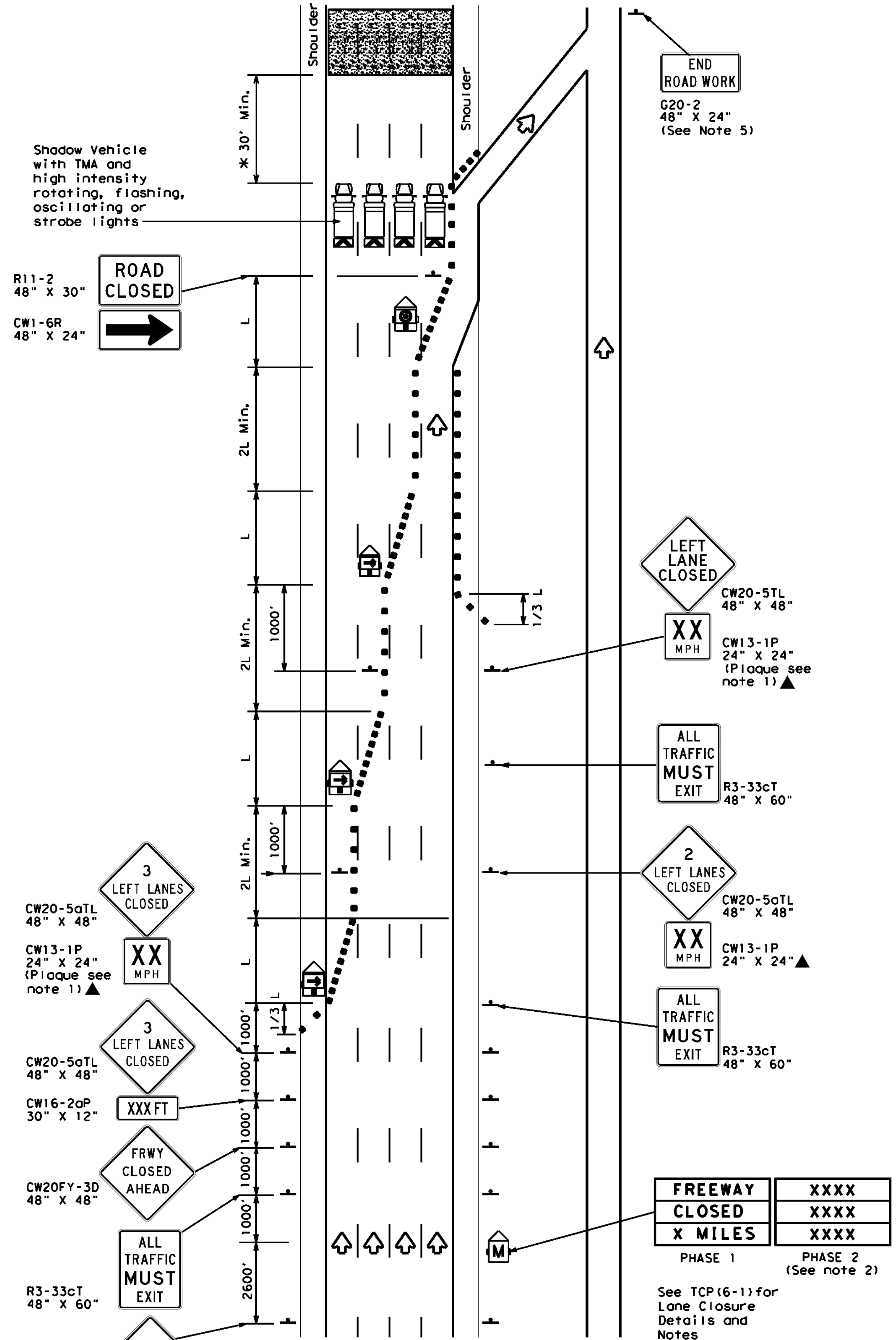

TCP (6-6)

COMPLETE FREEWAY CLOSURE

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. Phase 2 of the PCMS message should include appropriate information formatted as shown on BC(6), such as "MERGE RIGHT," recommended speed, delay, exit information, or other specific warnings.
3. Where queuing is anticipated beyond signing shown, additional PCMS signs, other warning signs, devices or Law Enforcement Officers should be available to warn approaching high speed traffic of the end of the queue, as directed by the Engineer.
4. Entrance ramps located from the advance warning area to the exit ramp should be closed whenever possible.
5. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

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

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY CLOSURE

TCP(6-6)-12

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© TxDOT February 1994	CONT	SECT	JOB	HIGHWAY			
REVISIONS	0610	03	104, ETC.	IH 30, ETC.			
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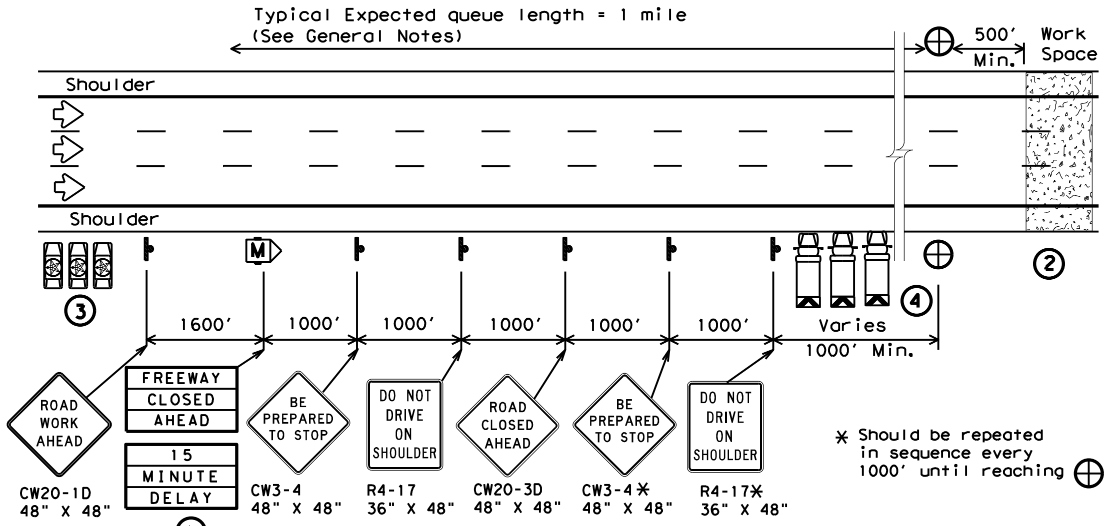


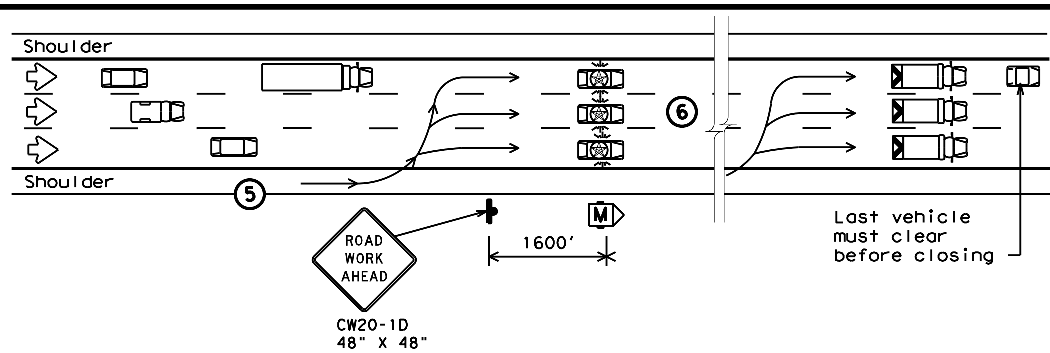
1 STARTING POSITION

1. Traffic control devices should be installed or located near their intended position prior to beginning temporary roadway closure sequence. Duplicate signs should be erected on the median side of the roadway when median width permits. Warning signs should not be placed on the paved shoulders that will be used by the WARNING LEOV, or where movement of the LEOVs or barrier vehicles will be impeded.

2. Prior to beginning the roadway closure sequence, all equipment, materials, personnel, and other items necessary to complete the work should be gathered near the work area. Entrance ramps located in the area where a queue is expected to build should be closed.

3. There should be one LEOV for every lane to be controlled, plus a minimum of one to warn traffic approaching a queue. An additional lead law enforcement officer is desirable to remain with the Engineer's or Contractor's point of contact (POC) during the operation in order to improve communication with all LEOVs involved.

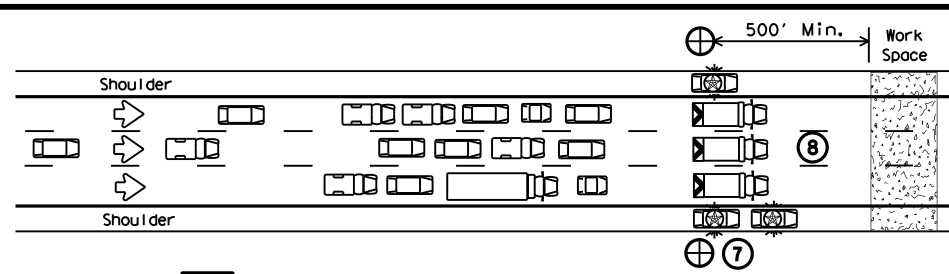
4. One barrier vehicle with a Truck Mounted Attenuator and amber or blue and amber high intensity flashing/oscillating/strobe lighting shall be used for each lane to be closed.



2 REDUCING SPEED OPERATION

5. Starting position of the LEOVs should be in advance of the most distant warning signs.

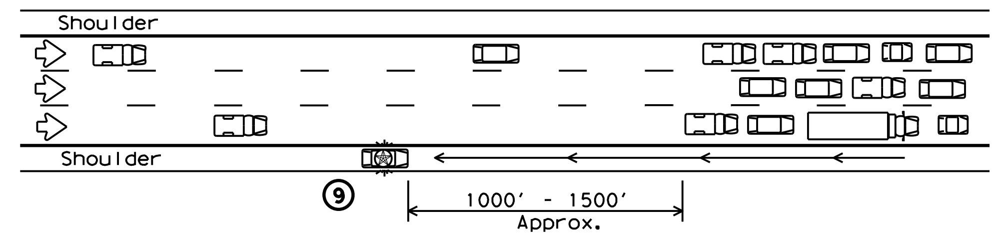
6. Once the LEOVs have achieved an abreast blocking formation while traveling toward the CP, emergency lights and headlights should be turned "ON". The LEOVs should maintain formation, not allow traffic to pass, and begin to decelerate. The LEOVs should continue to decelerate, giving the barrier vehicles opportunity to be staged upstream of the work space after traffic has cleared. The LEOVs should then continue to decelerate slowly until bringing traffic to a stop near the barrier vehicles.



3 ALL TRAFFIC STOPPED AT CP

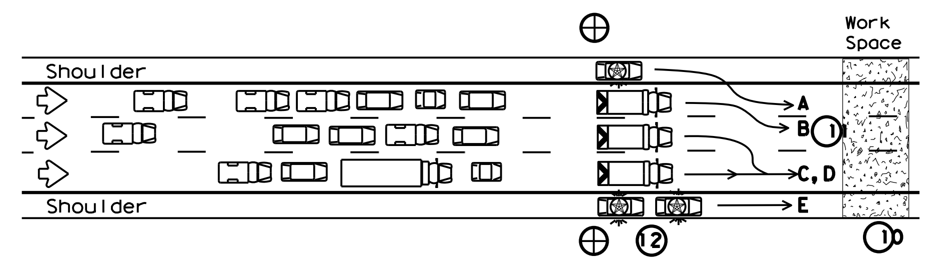
7. Once traffic is stopped the LEOVs should park on the shoulders with emergency lighting "ON" in order to provide law enforcement presence at the closure and keep shoulders blocked ahead of the work space. They should stay in radio contact with the WARNING LEOV.

8. The barrier vehicles should be parked, one in each lane, the parking brake set, with the high visibility flashing/oscillating/strobe lighting "ON," and the transmission in gear.



4 WARNING THE TRAFFIC QUEUE

9. The WARNING LEOV should proceed to the right shoulder of the roadway, with emergency lights on approximately 1000' in advance of the traffic queue (stopped traffic) as the queue develops. When determined that limited sight distance situations (crest of hills, sharp roadway curvature, etc.) may occur to motorists approaching the queue, the WARNING LEOV may proceed 1/4 mile or more in advance of the queue.



5 RELEASING STOPPED TRAFFIC

10. All equipment, materials, personnel, and other items should be removed from the roadway and maintain an adequate clear zone.

11. When the roadway is clear for traffic, the LEOV should proceed forward from the left shoulder followed by the barrier vehicles, from left to right, as shown alphabetically in the plan view.

12. The LEOV or LEOVs on the right shoulder may remain on the shoulder until satisfied that traffic is moving satisfactorily before merging or proceeding.

13. LEOVs and barrier vehicles should re-group at their respective starting positions if necessary.

LEGEND			
■ ■	Channelizing Devices	⊕	Control Position (CP)
(M)	Portable Changeable Message Sign (PCMS)		Barrier Vehicle with Truck Mounted Attenuator
	Law Enforcement Officer's Vehicle(LEOV)		Traffic Flow

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

GENERAL NOTES

1. All traffic control devices shall conform with the latest edition of the Texas Manual on Uniform Traffic Control Devices (TMUTCD). Additional guidelines for traffic control devices may be found in the TMUTCD. Signs conflicting with the roadway closure sequence should be completely removed or covered. Additional traffic control devices may be required for closure of access roads, cross streets, exit and entrance ramps as directed by the Engineer.
2. Law enforcement officers and all workers involved should review and understand all procedures before the roadway closure sequence begins. Pre-work meetings may be held for this purpose. Local emergency services and media should have advance notification of roadway closure, expected dates and approximate times of closures.
3. Law enforcement officers shall be in uniform and have jurisdiction in the locale of the work area. An additional WARNING Law Enforcement Officer's Vehicle (LEOV) may be used on the median side of the roadway where median shoulder width permits (See sequence #9).
4. The roadway closure should be during off-peak hours, as shown in the plans, or as directed by the Engineer.
5. Work should be limited to approximately 15 minutes maximum duration unless otherwise directed by the Engineer based on existing roadway conditions. If the work is not complete within 15 minutes, or if the end of the traffic queue extends past the most distant advance warning signs, the work area should be cleared of all equipment, materials, personnel, and other items, and the roadway reopened. When the queue has dissipated and the traffic flow appears normal the roadway closure sequence may be repeated.
6. For traffic volumes greater than 1000 Passenger Cars Per Hour Per Lane (PCPHPL), or for roadway closures that exceed 15 minutes, see details elsewhere in the plan.
7. If traffic queues beyond the advance warning signs during one road closure sequence, the advance warning should be extended prior to repeating the road closure sequence. When possible, PCMS signs should be located in advance of the last available exit prior to the closure to allow motorists the choice of an alternate route.

THIS PLAN IS INTENDED TO BE USED AT LOCATIONS/TIMES WHEN TRAFFIC VOLUMES ARE LESS THAN 1000 PASSENGER CARS PER HOUR PER LANE.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHORT DURATION FREEWAY CLOSURE SEQUENCE

TCP(6-7)-12

FILE: tcp6-7.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
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1-97 8-12 4-98	DIST		COUNTY	SHEET NO.
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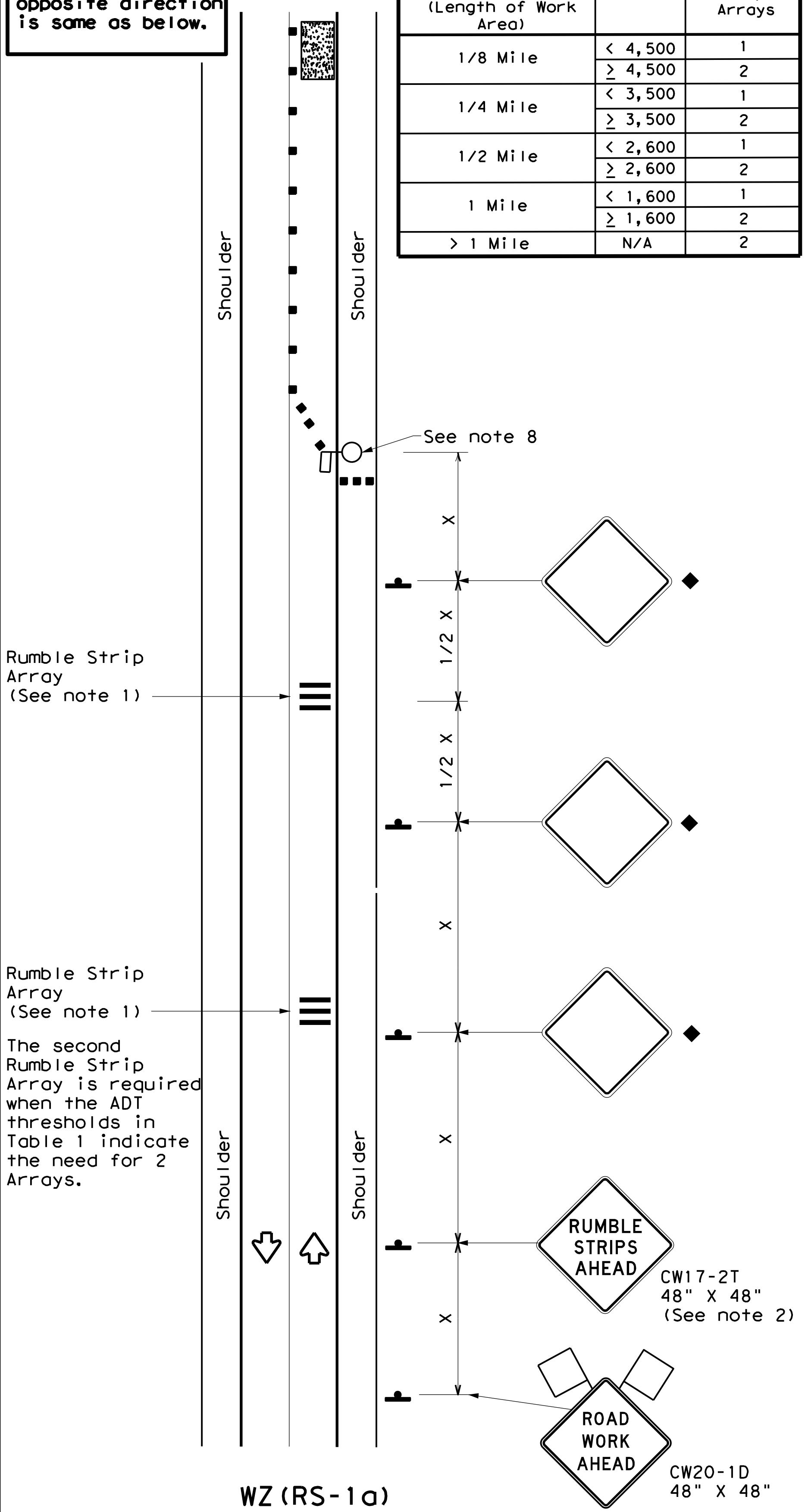
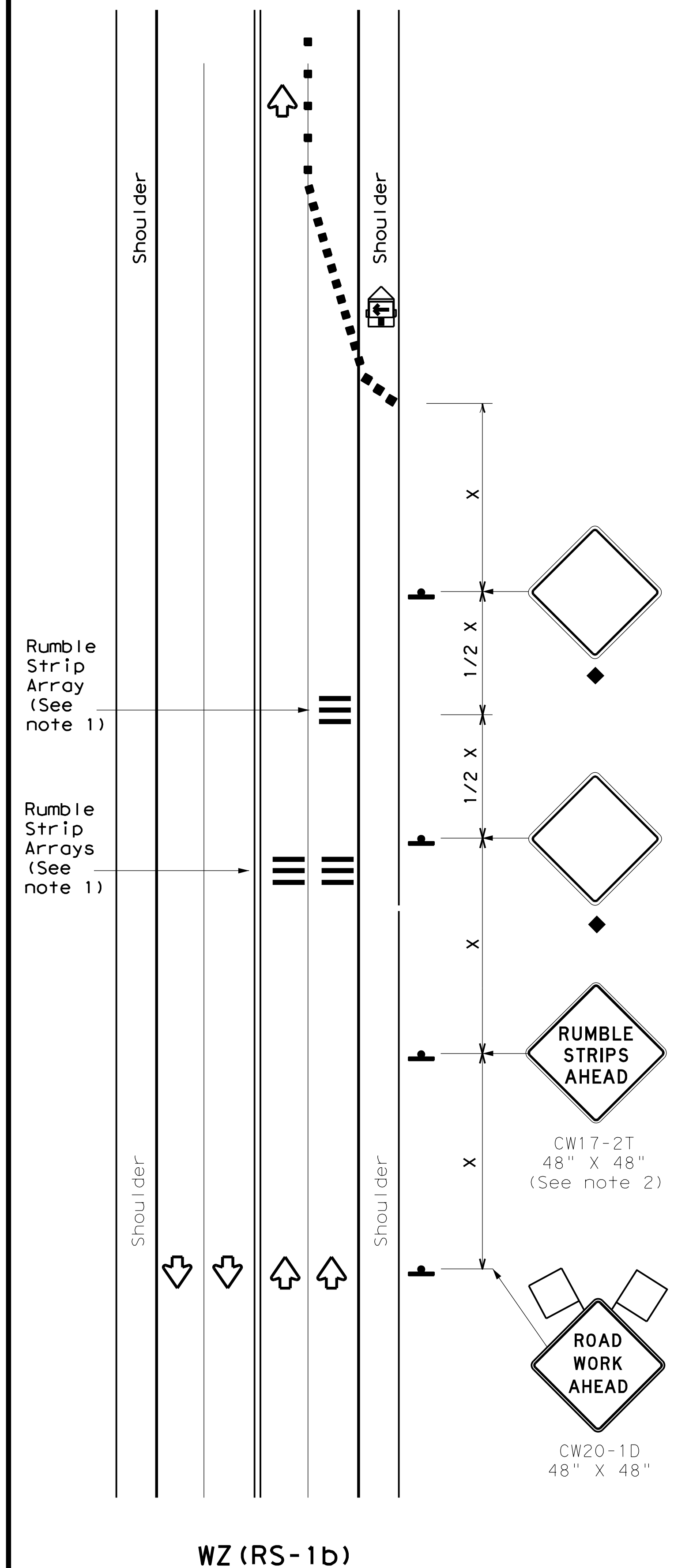
Warning sign and rumble strip sequence in opposite direction is same as below.

TABLE 1

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



RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

TABLE 2

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

LEGEND

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

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

* Conventional Roads Only

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

TYPICAL USAGE

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
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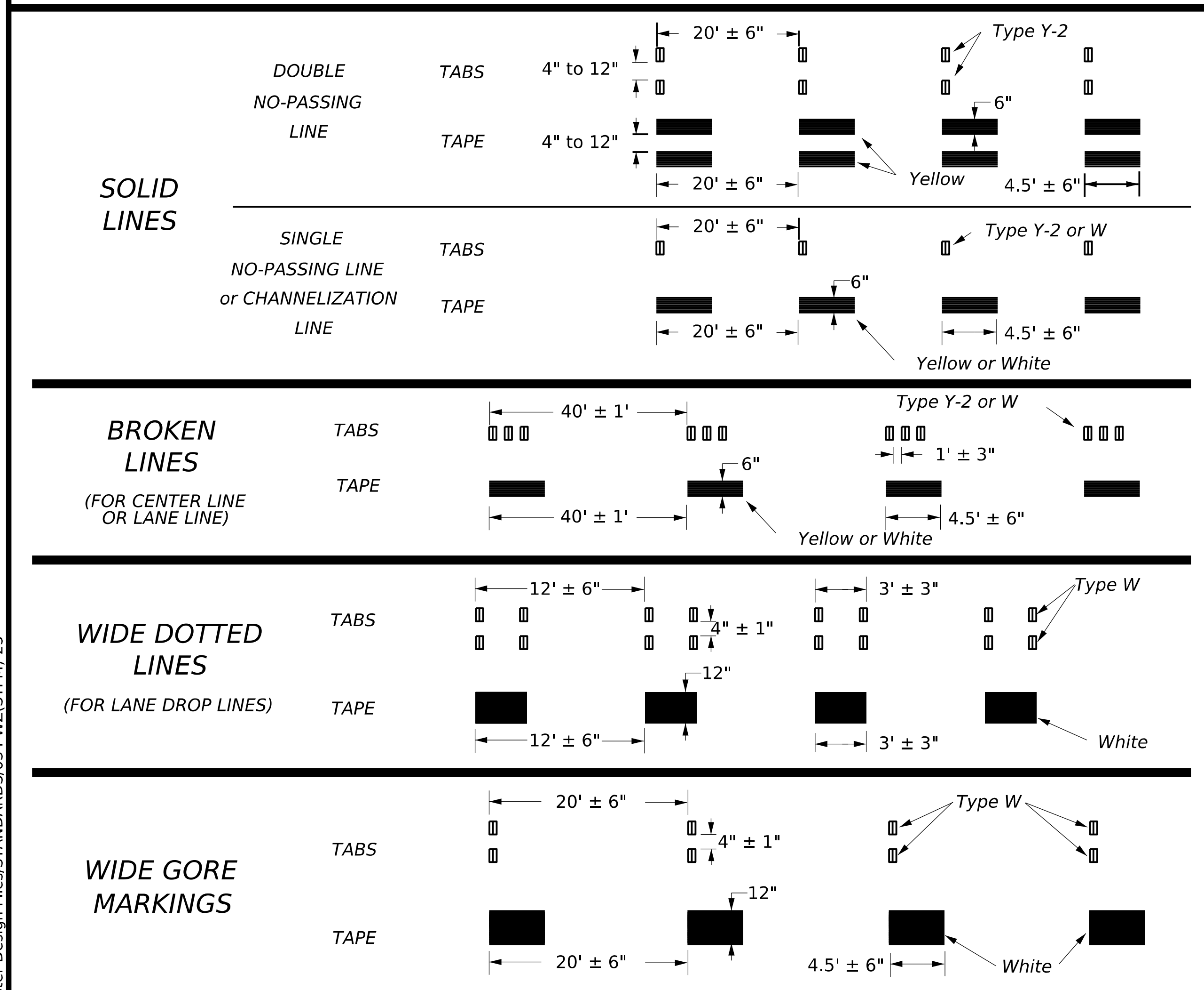
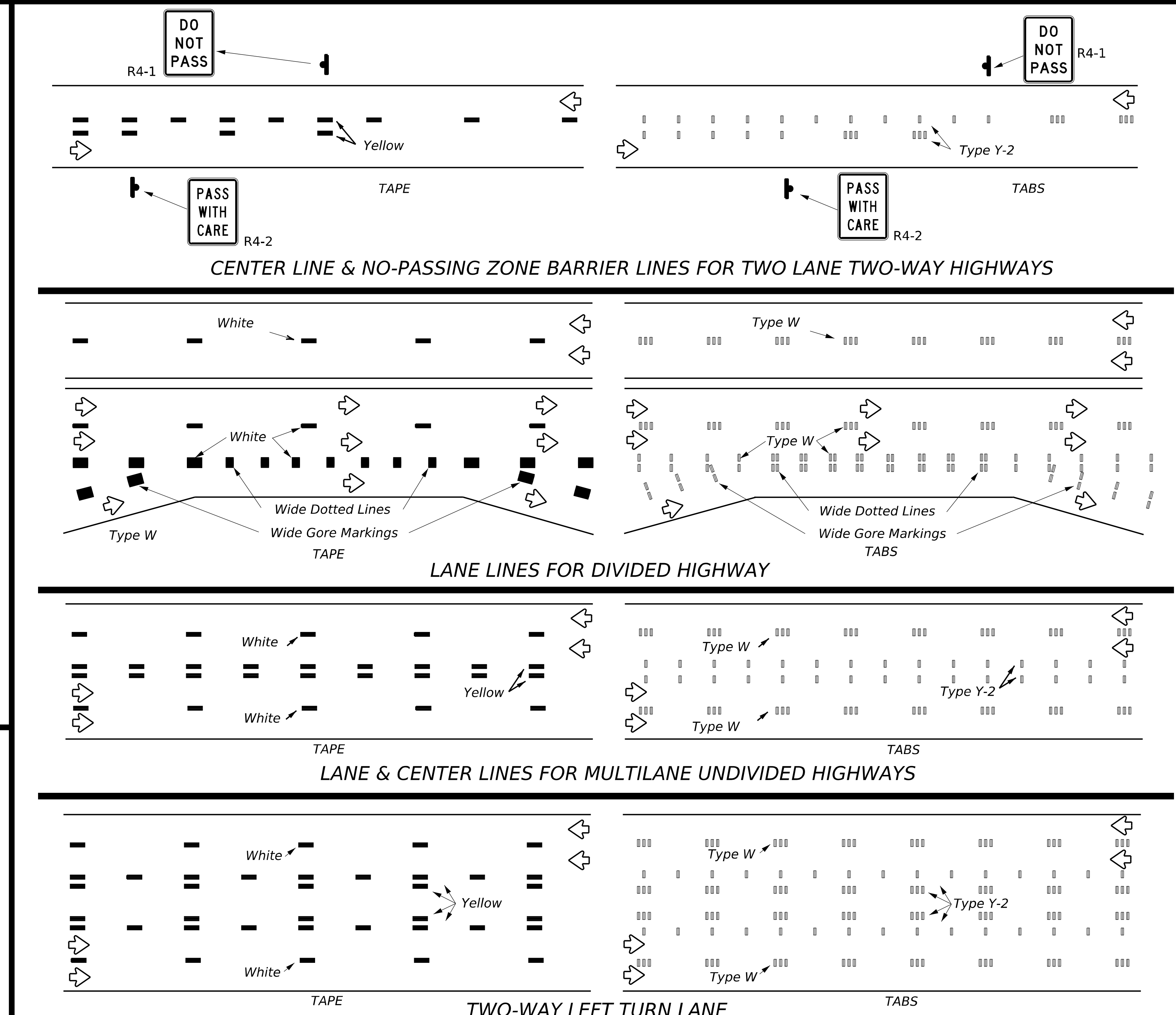
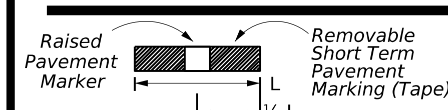
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS





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.

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.

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:

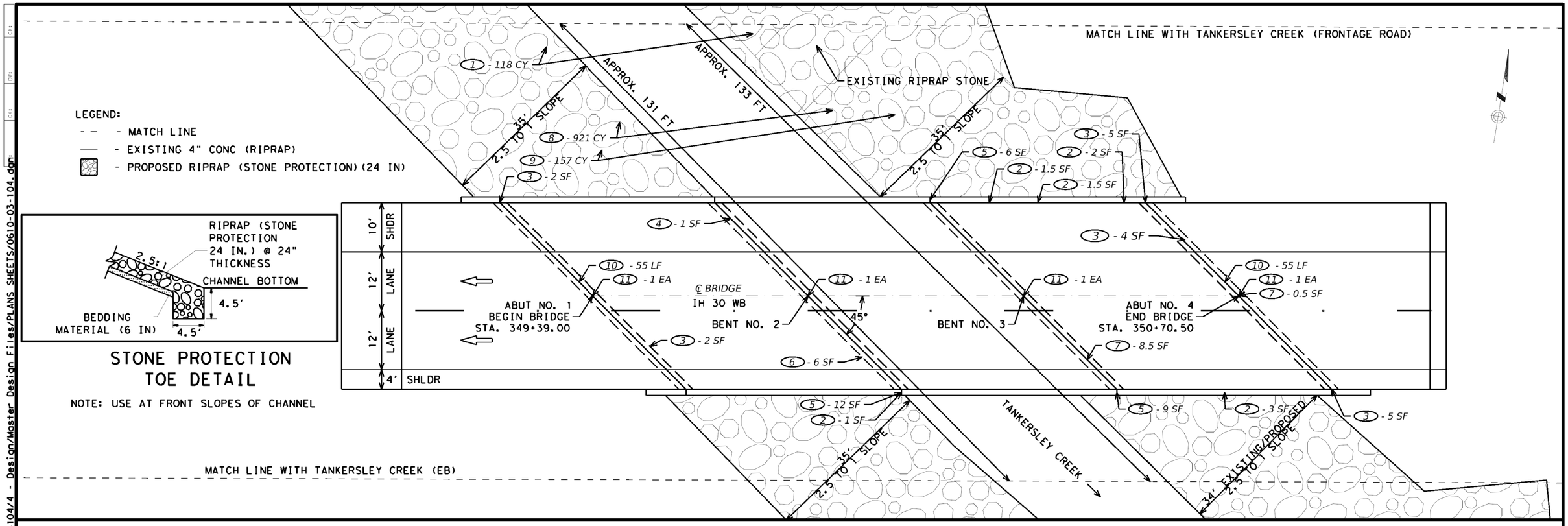
http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation | Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

FILE: wzstpm-23.dgn	DN:	CK:	DW:	CK:	
© TxDOT February 2023	CONT	SECT	JOB	HIGHWAY	
REVISIONS 4-92 7-13 1-97 2-23 3-03	0610	03	104, ETC.	IH 30, ETC.	
	DIST	COUNTY		SHEET NO.	
	ATL	TITUS, ETC.		34	



STONE PROTECTION TOE DETAIL

NOTE: USE AT FRONT SLOPES OF CHANNEL

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	BID ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
1	REMOVE EXISTING 4" CONCRETE RIPRAP IN CHANNEL	104-7007	REMOV CONC (RIPRAP)	118	CY	
2	CLEAN AND EPOXY SPOTS ON STEMS	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY)	9	SF	
3	REPAIR SPALLS AND DELAMINATION AT ABUTMENTS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	18	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
4	REPAIR SPALL ON PILE	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	1	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
5	REPAIR SPALLS AND DELAMINATION ON BOTTOM OF DECK OR PAN	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	27	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
6	REPAIR SPALLS AND DELAMINATION ON BENT CAPS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	6	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
7	REPAIR SPALL ON STEMS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	9	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
8	INSTALL PROPOSED 24" STONE RIPRAP AT A 24" THICKNESS	432-7045	RIPRAP (STONE PROTECTION)(24 IN)	921	CY	SEE STONE PROTECTION TOE DETAIL AND SRR STANDARD DETAIL
9	INSTALL PROPOSED 6" BEDDING MATERIAL	432-7050	BEDDING MATERIAL (6 IN)	157	CY	SEE STONE PROTECTION TOE DETAIL
10	CLEAN AND SEAL JOINTS (FOAM) AT APPROACH SLAB AND BRIDGE DECK	438-7010	CLEANING AND SEALING JOINTS (FOAM)	110	LF	SEE BRIDGE REPAIR DETAIL
11	CLEAN ALL ABUTMENT AND BENT CAPS	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	4	EA	

WORK LOCATION LAYOUTS

TANKERSLEY CREEK (WB)
PAN GIRDER BRIDGE
NBI=19-225-0-0610-03-055
CSJ:0610-03-104

SHEET 1 OF 15

NOT TO SCALE

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		35

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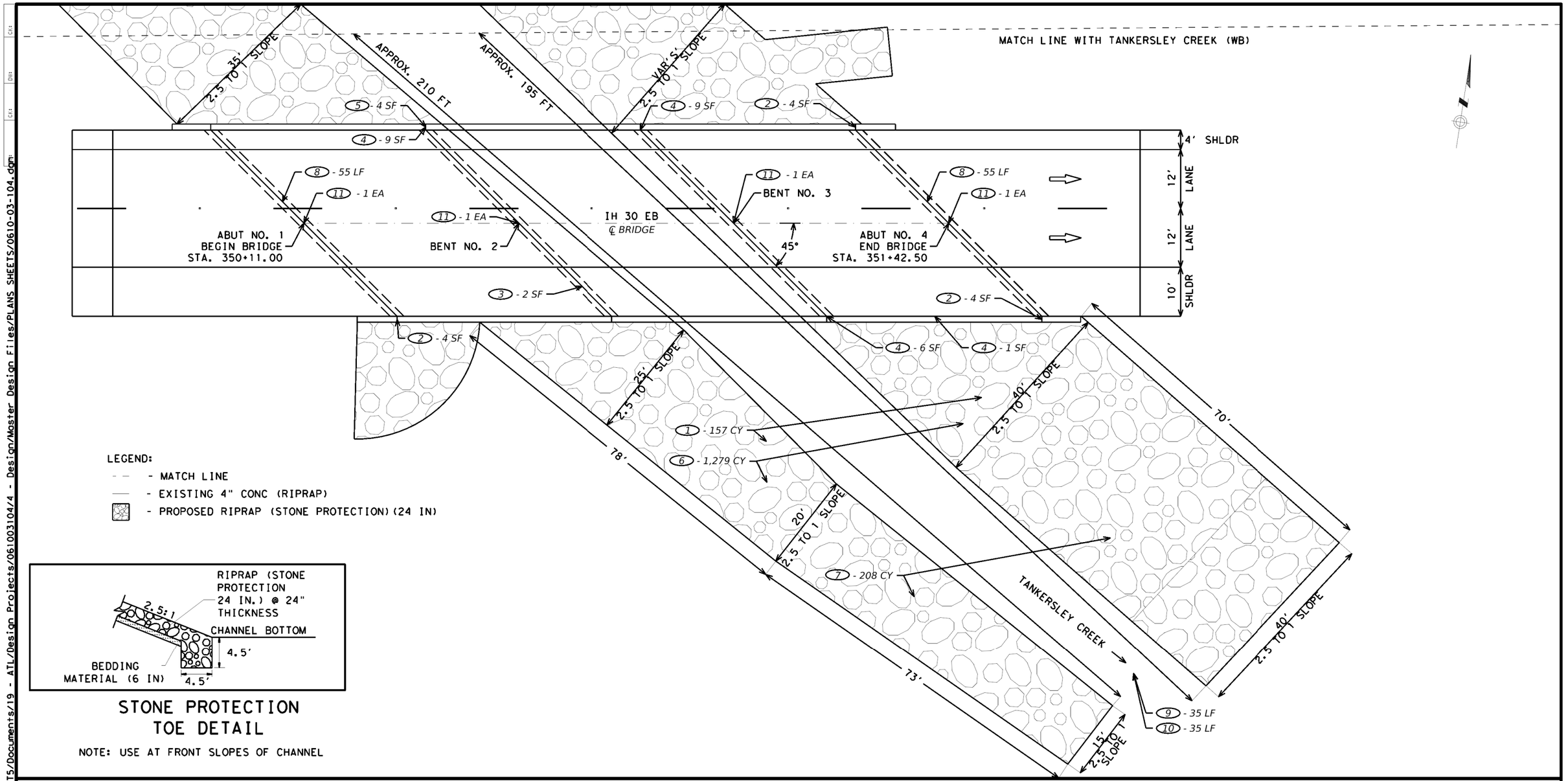

LEGEND:

- MATCH LINE
- EXISTING 4" CONC (RIPRAP)
- PROPOSED RIPRAP (STONE PROTECTION)(24 IN)

STONE PROTECTION TOE DETAIL

NOTE: USE AT FRONT SLOPES OF CHANNEL

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	BID ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
1	REMOVE EXISTING 4" CONCRETE RIPRAP	104-7007	REMOV CONC (RIPRAP)	157	CY	
2	REPAIR SPALLS AND DELAMINATION AT ABUTMENTS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	12	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
3	REPAIR BENT CAP	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	2	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
4	REPAIR SPALLS AND DELAMINATION ON BOTTOM OF DECK OR PAN	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	25	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
5	REPAIR SPALLS AND DELAMINATION ON STEM	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	4	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
6	INSTALL PROPOSED 24" STONE RIPRAP AT A 24" THICKNESS	432-7045	RIPRAP (STONE PROTECTION)(24 IN)	1,279	CY	SEE STONE PROTECTION TOE DETAIL AND SRR STANDARD DETAIL
7	INSTALL PROPOSED 6" BEDDING MATERIAL	432-7050	BEDDING MATERIAL (6 IN)	208	CY	SEE STONE PROTECTION TOE DETAIL
8	CLEAN AND SEAL JOINTS (FOAM) AT APPROACH SLAB AND BRIDGE DECK	438-7010	CLEANING AND SEALING JOINTS (FOAM)	110	LF	SEE BRIDGE REPAIR DETAIL
9	INSTALL TY 3 ROCK FILTER DAM IN CHANNEL	506-7003	ROCK FILTER DAMS (INSTALL) (TY 3)	35	LF	SEE EC(2)-16 DETAIL FOR MORE INFORMATION
10	REMOVE TY 3 ROCK FILTER DAM IN CHANNEL	506-7011	ROCK FILTER DAMS (REMOVED)	35	LF	
11	CLEAN ALL ABUTMENT AND BENT CAPS	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	4	EA	

WORK LOCATION LAYOUTS

TANKERSLEY CREEK (EB)
PAN GIRDER BRIDGE
NBI=19-225-0-0610-03-056
CSJ:0610-03-105

SHEET 2 OF 15

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		36

NOT TO SCALE

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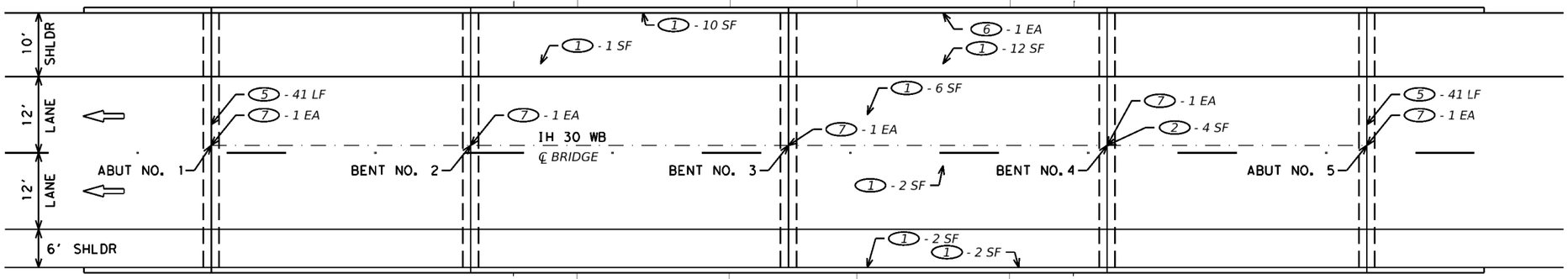

NOTES:

(3) - CLEAN DERIS UNDER BRIDGE AND ALONG ROADWAY.

(4) - CLEAN AND SWEEP UNDER BRIDGE AND ALONG ROADWAY.

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	BID ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	REPAIR SPALL AND DELAMINATION ON BEAMS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	35	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(2)	REPAIR SPALL AND DELAMINATION ON COLUMNS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	4	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(3)	CLEAN DEBRIS UNDER BRIDGE AND ALONG ROADWAY	735-7072	DEBRIS REMOVAL (SPOT DEBRIS)	1	MI	
(4)	CLEAN AND SWEEP UNDER BRIDGE AND ALONG ROADWAY	738-7104	CLEANING / SWEEPING (SPOT)	1	MI	
(5)	CLEAN AND SEAL JOINTS (FOAM) AT APPROACH SLAB AND BRIDGE DECK	438-7010	CLEANING AND SEALING JOINTS (FOAM)	82	LF	SEE BRIDGE REPAIR DETAIL
(6)	CONCRETE BEAM REPAIR	788-7001	CONCRETE BEAM REPAIR	1	EA	
(7)	CLEAN ABUTMENT AND BENT CAPS	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	5	EA	

WORK LOCATION LAYOUTS

IH 30 AT US 271 (WB)
NBI=19-225-0-0610-03-057
CSJ:0610-03-106

SHEET 3 OF 15

NOT TO SCALE

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		37

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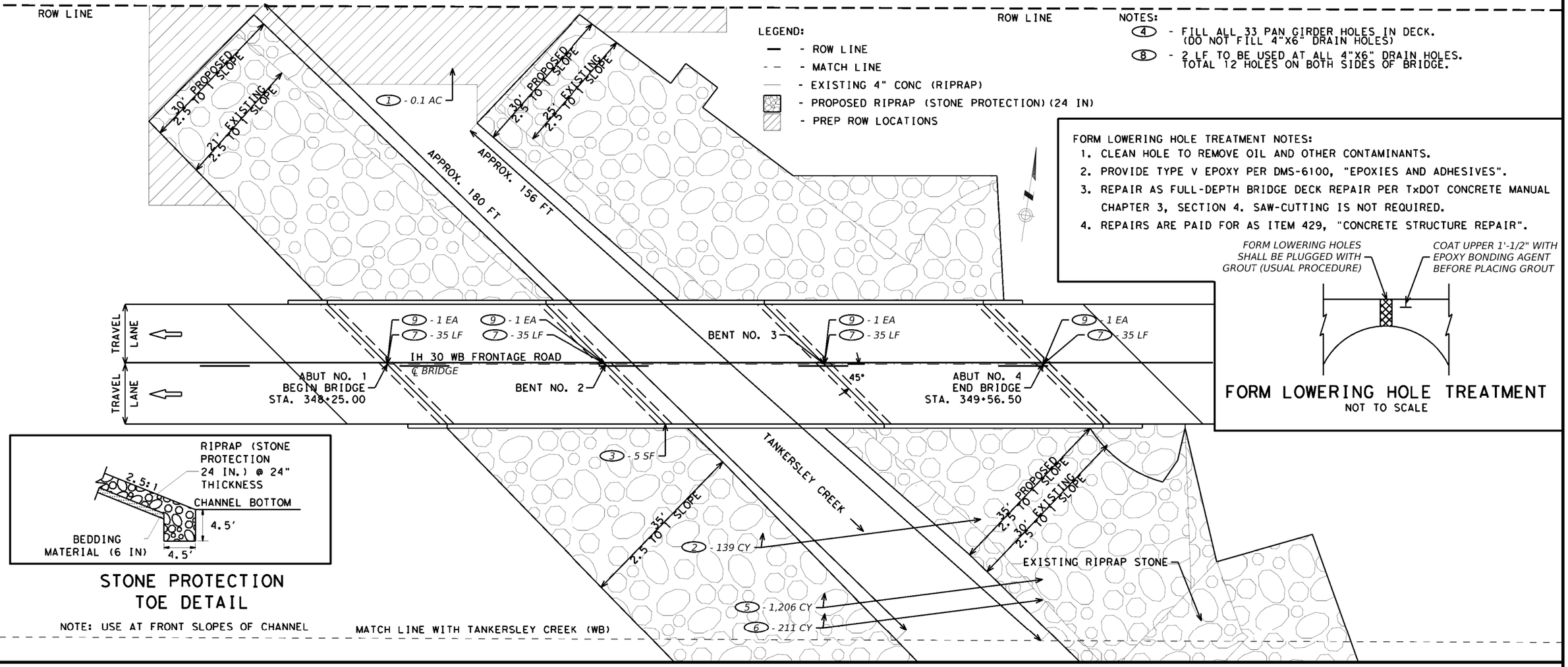


FORM LOWERING HOLE TREATMENT NOTES:

1. CLEAN HOLE TO REMOVE OIL AND OTHER CONTAMINANTS.
2. PROVIDE TYPE V EPOXY PER DMS-6100, "EPOXIES AND ADHESIVES".
3. REPAIR AS FULL-DEPTH BRIDGE DECK REPAIR PER TxDOT CONCRETE MANUAL CHAPTER 3, SECTION 4. SAW-CUTTING IS NOT REQUIRED.
4. REPAIRS ARE PAID FOR AS ITEM 429, "CONCRETE STRUCTURE REPAIR".

FORM LOWERING HOLE TREATMENT
NOT TO SCALE

STONE PROTECTION
TOE DETAIL

NOTE: USE AT FRONT SLOPES OF CHANNEL

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	BID ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
1	REMOVE TREES IN AREA IN ORDER TO INSTALL NEW 18" STONE RIPRAP	100-7001	PREPARING ROW	0.1	AC	
2	REMOVE EXISTING 4" CONCRETE RIPRAP	104-7007	REMOV CONC (RIPRAP)	139	CY	
3	REPAIR SPALL AND DELAMINATION ON STEM	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	5	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL
4	FILL PAN GIRDER FORM LOWERING HOLES WITH CEMENTITIOUS MATERIAL	429-7010	CONC STR REPAIR (PAN GIRDER HOLE REPR)	33	EA	SEE NOTES AND THE "FORM LOWERING HOLE TREATMENT DETAIL"
5	INSTALL PROPOSED 24" STONE RIPRAP AT A 24" THICKNESS	432-7045	RIPRAP (STONE PROTECTION)(24 IN)	1,206	CY	SEE STONE PROTECTION TOE DETAIL AND SRR STANDARD DETAIL
6	INSTALL 6" BEDDING MATERIAL	432-7050	BEDDING MATERIAL (6 IN)	211	CY	SEE STONE PROTECTION TOE DETAIL
7	CLEAN AND SEAL EXISTING JOINTS AT ABUTMENTS 1 AND 4. ALSO CLEAN AND SEAL EXSITNG JOINST AT BENTS 2 AND 3	438-7012	CLEAN AND SEAL JNTS (PAN GIRDERS) (CL7)	140	LF	SEE CLEANING AND SEALING EXISTING BRIDGE JOINTS (PAN GIRDER BRIDGES) DETAIL
8	ADD 4 IN X 6 IN GALVANIZED PIPE TO EXISTING DECK DRAINS	481-7048	PIPE (GALV) (4 IN X 6 IN)	18	LF	SEE NOTES AND THE MISCELLANEOUS DETAILS FOR CURB DRAIN DETAIL
9	CLEAN ALL ABUTMENT AND BENT CAPS	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	4	EA	

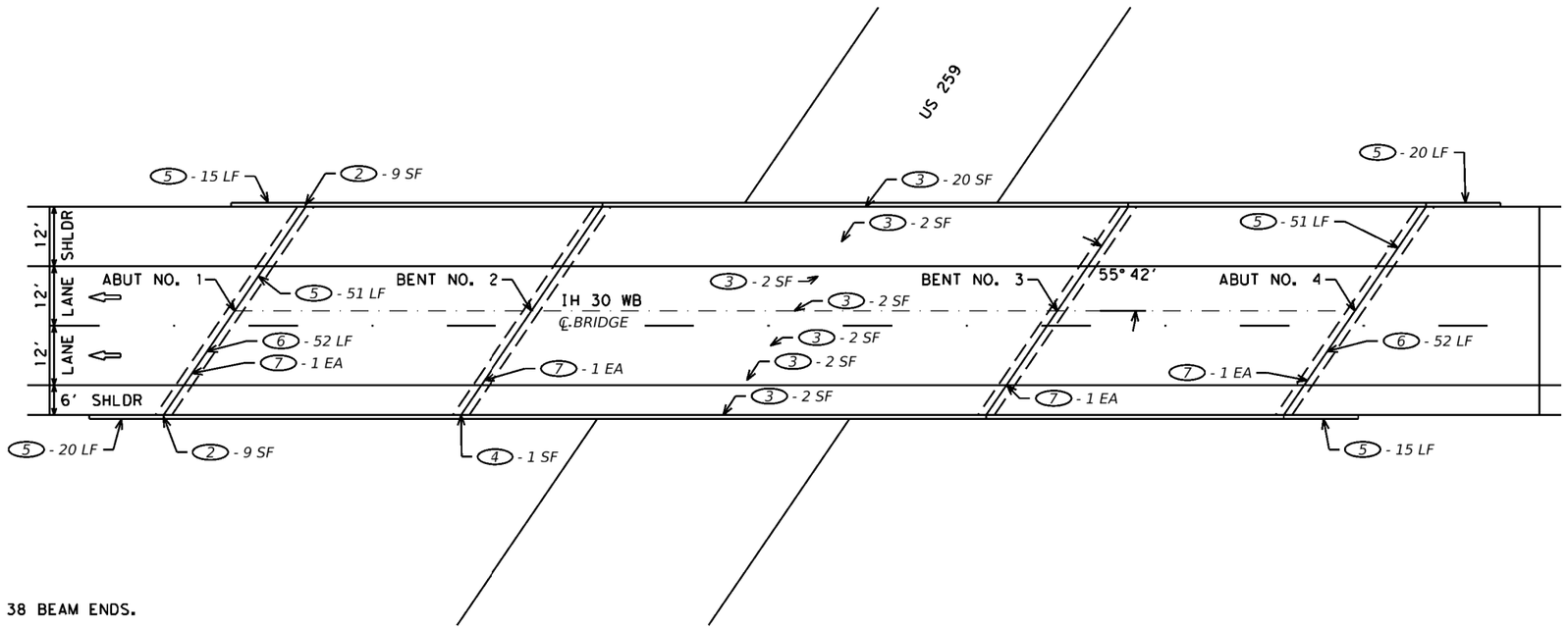
WORK LOCATION LAYOUTS

TANKERSLEY CREEK
PAN GIRDER BRIDGE
(FRONTAGE ROAD)
NBI=19-225-0-0610-03-054
CSJ: 0610-03-107

NOT TO SCALE

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		38



NOTES:

(1) - CLEAN AND EPOXY ALL 38 BEAM ENDS.

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	BID ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	CLEAN AND EPOXY ALL 38 BEAM ENDS	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY)	131	SF	
(2)	REPAIR SPALLS AND DELAMINATION AT ABUTMENTS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	18	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(3)	REPAIR SPALL AND DELAMINATION ON BEAMS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	32	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(4)	REPAIR SPALL AND DELAMINATION AT PEDISTAL CAP	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	1	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(5)	CLEAN AND SEAL BRIDGE ABUTMENT JOINTS AT RIPRAP WITH CLASS 7	438-7007	CLEANING AND SEALING EXIST JOINTS (CL7)	172	LF	
(6)	CLEAN AND SEAL JOINTS (FOAM) AT APPROACH SLAB AND BRIDGE DECK	438-7010	CLEANING AND SEALING JOINTS (FOAM)	104	LF	SEE BRIDGE REPAIR DETAIL
(7)	CLEAN ABUTMENT AND BENT CAPS	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	4	EA	

WORK LOCATION LAYOUTS

IH 30 AT US 259 (NB)

NBI=19-172-0-0610-04-174

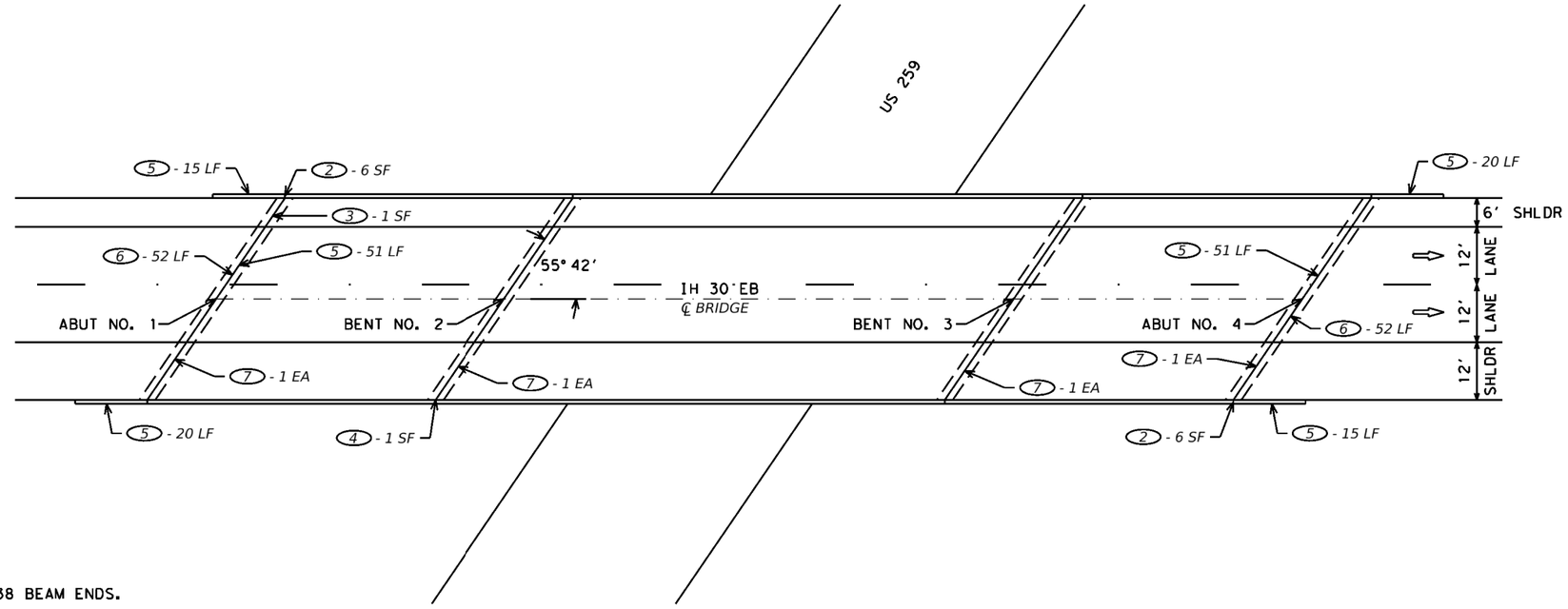
CSJ: 0610-04-040

SHEET 5 OF 15

NOT TO SCALE

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		39



NOTES:

(1) - CLEAN AND EPOXY ALL 38 BEAM ENDS.

TABLE OF REPAIRS

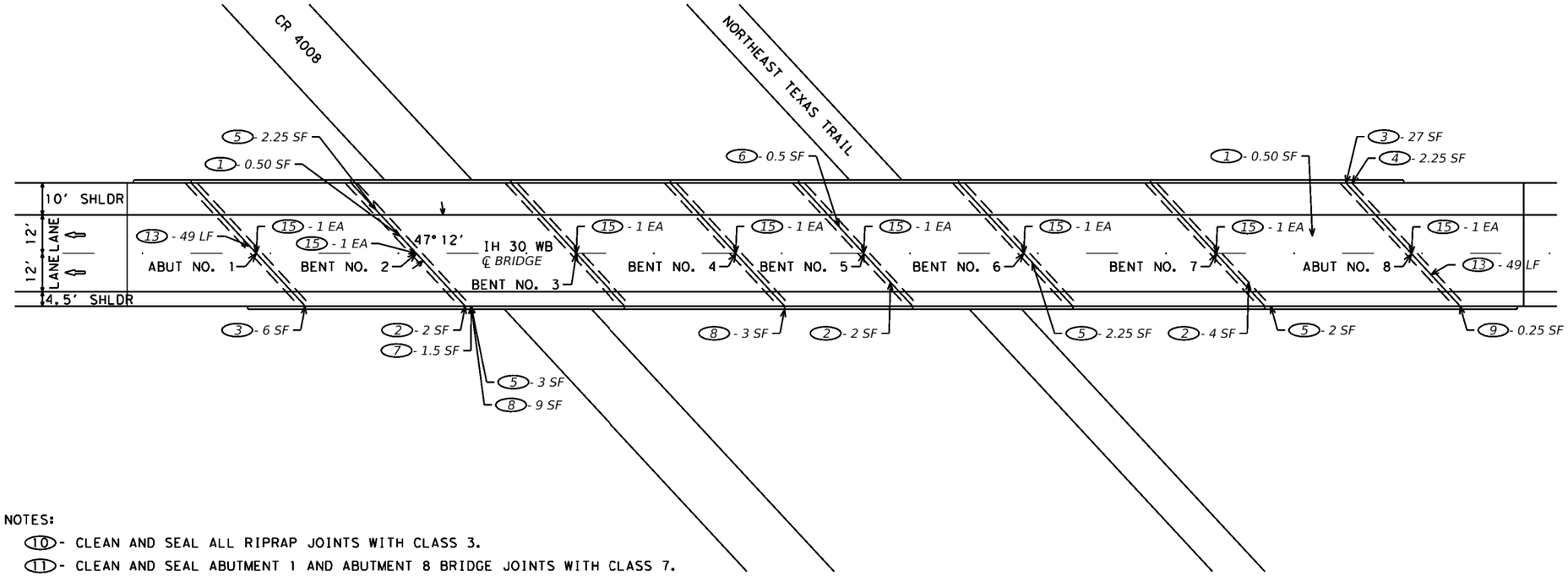
REPAIR NO.	REPAIR DESCRIPTION/LOCATION	BID ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	EPOXY PAINT ALL BRIDGE BEAM ENDS	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY)	131	SF	
(2)	REPAIR SPALLS AND DELAMINATION AT ABUTMENTS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	12	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(3)	REPAIR SPALLS ON BEAM	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	1	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(4)	REPAIR PEDESTAL ON EXTERIOR BENT	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	1	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(5)	CLEAN AND SEAL BRIDGE ABUTMENT JOINTS AT RIPRAP WITH CLASS 7	438-7007	CLEANING AND SEALING EXIST JOINTS (CL7)	172	LF	
(6)	CLEAN AND SEAL JOINTS (FOAM) AT APPROACH SLAB AND BRIDGE DECK	438-7010	CLEANING AND SEALING JOINTS (FOAM)	104	LF	SEE BRIDGE REPAIR DETAIL
(7)	CLEAN TOP OF BENT CAPS	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	4	EA	

WORK LOCATION LAYOUTS

IH 30 AT US 259 (EB)
NBI=19-172-0-0610-04-175
CSJ:0610-04-041

NOT TO SCALE

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		40



NOTES:

(10) - CLEAN AND SEAL ALL RIPRAP JOINTS WITH CLASS 3.

(11) - CLEAN AND SEAL ABUTMENT 1 AND ABUTMENT 8 BRIDGE JOINTS WITH CLASS 7.

(12) - CLEAN AND SEAL ALL ABUTMENT AND COLUMN JOINTS AT RIPRAP WITH CLASS 7.

(14) - ADD 14 - 4"X6" GALVANIZED DRAINS TO NORTH SIDE OF STRUCTURE.

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	BID ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	CLEAN AND EPOXY PAINT SPOTS ON BEAMS (BENT 2 BEAM 3, SPAN 7 BEAM 3)	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY)	1	SF	
(2)	CLEAN AND EPOXY PAINT SPOTS ON BENT CAPS	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY)	8	SF	
(3)	REPAIR SPALLS AND DELAMINATION AT ABUTMENTS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	33	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(4)	REPAIR SPALL ON BEAM	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	2.25	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(5)	REPAIR SPALLS AND DELAMINATION ON BENT CAPS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	9.5	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(6)	REPAIR SPALLS ON COLUMNS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	0.5	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(7)	REPAIR SPALL AND DELAMINATION ON DECK	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	1.5	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(8)	REPAIR SPALL AND DELAMINATION ON BOTTOM OF DECK	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	12	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(9)	REPAIR SPALL ON WING WALL	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	0.25	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(10)	CLEAN AND SEAL ALL RIPRAP JOINTS WITH CLASS 3 - HOT POURED RUBBER	438-7004	CLEANING AND SEALING EXIST JOINTS (CL3)	1,496	LF	
(11)	CLEAN AND SEAL ABUTMENT 1 AND 8 BRIDGE JOINTS WITH CLASS 7	438-7007	CLEANING AND SEALING EXIST JOINTS (CL7)	108	LF	
(12)	CLEAN AND SEAL ALL ABUTMENTS AND COLUMNS JOINTS AT RIPRAP WITH CLASS 7	438-7007	CLEANING AND SEALING EXIST JOINTS (CL7)	320	LF	
(13)	CLEAN AND SEAL JOINTS (FOAM) AT APPROACH SLAB AND BRIDGE DECK	438-7010	CLEANING AND SEALING JOINTS (FOAM)	108	LF	SEE BRIDGE REPAIR DETAIL
(14)	ADD 4 IN X 6 IN GALVANIZED PIPE TO EXISTING DECK DRAINS	481-7048	PIPE (GALV)(4 IN X 6IN)	35	LF	SEE BRIDGE DRAIN MOD
(15)	CLEAN ALL ABUTMENT AND BENT CAPS	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	8	EA	

WORK LOCATION LAYOUTS

IH 30 AT CR 4008 (WB)

CONCRETE I BEAM BRIDGE

NBI=19-019-0-0610-06-107

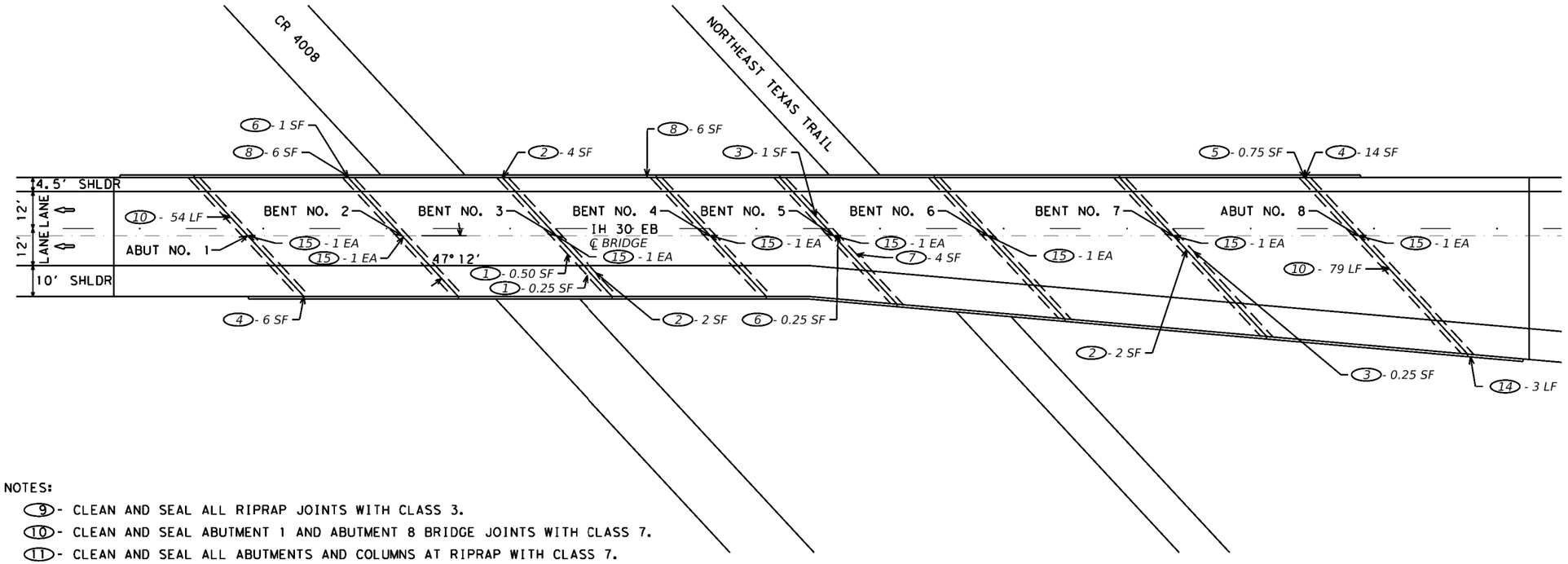
CSJ:0610-06-099

SHEET 7 OF 15

NOT TO SCALE

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		41



NOTES:

(9)- CLEAN AND SEAL ALL RIPRAP JOINTS WITH CLASS 3.

(10)- CLEAN AND SEAL ABUTMENT 1 AND ABUTMENT 8 BRIDGE JOINTS WITH CLASS 7.

(11)- CLEAN AND SEAL ALL ABUTMENTS AND COLUMNS AT RIPRAP WITH CLASS 7.

(13)- ADD 14 - 4"X6" GALVANIZED DRAINS TO NORTH SIDE OF STRUCTURE.

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	BID ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	CLEAN AND EPOXY PAINT SPOTS ON BEAMS (BENT 3 BEAM 4, BENT 3 BEAM 5)	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY	0.75	SF	
(2)	CLEAN AND EPOXY PAINT SPOTS ON BENT CAPS	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY	8	SF	
(3)	CLEAN AND EPOXY PAINT SPOTS ON COLUMNS	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY	1.25	SF	
(4)	REPAIR SPALLS AND DELAMINATION AT ABUTMENTS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	20	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(5)	REPAIR SPALL ON BEAM	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	0.75	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(6)	REPAIR SPALLS AND DELAMINATION ON BENT CAPS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	1.25	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(7)	REPAIR SPALLS ON COLUMNS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	4	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(8)	REPAIR SPALL AND DELAMINATION ON DECK	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	12	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(9)	CLEAN AND SEAL ALL RIPRAP JOINTS WITH CLASS 3 - HOT POURED RUBBER	438-7004	CLEANING AND SEALING EXIST JOINTS (CL3)	1,632	LF	
(10)	CLEANING AND SEALING JOINTS ON BRIDGE	438-7007	CLEANING AND SEALING EXIST JOINTS (CL7)	133	LF	
(11)	CLEAN AND SEAL RIPRAP JOINTS AROUND COLUMNS AND ABUTMENT AT RIPRAP JOINTS WITH CLASS 7	438-7007	CLEANING AND SEALING EXIST JOINTS (CL7)	180	LF	
(12)	CLEAN AND SEAL JOINTS (FOAM) AT APPROACH SLAB AND BRIDGE DECK	438-7010	CLEANING AND SEALING JOINTS (FOAM)	133	LF	SEE BRIDGE REPAIR DETAIL
(13)	ADD 4 IN X 6 IN GALVANIZED PIPE TO EXISTING DECK DRAINS	481-7048	PIPE (GALV)(4 IN X 6 IN)	35	LF	SEE BRIDGE DRAIN MOD
(14)	REPAIR CRACK USING CONCRETE CRACK REPAIR	780-7003	CONC CRCK REPR(DISCRETE)(ROUT AND SEAL)	3	LF	
(15)	CLEAN ALL ABUTMENT AND BENT CAPS	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	8	EA	

WORK LOCATION LAYOUTS

IH 30 AT CR 4008 (EB)

NBI=19-019-0-0610-06-108

CSJ: 0610-06-100

SHEET 8 OF 15

NOT TO SCALE

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		42

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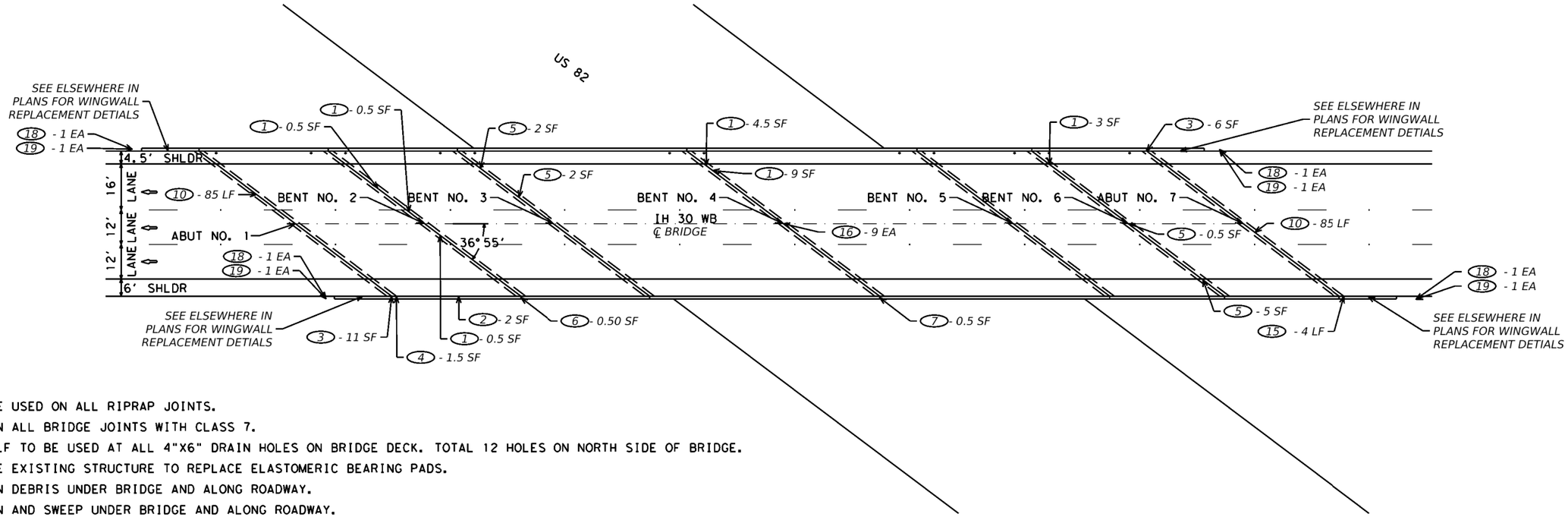

NOTES:

(8)- TO BE USED ON ALL RIPRAP JOINTS.

(9)- CLEAN ALL BRIDGE JOINTS WITH CLASS 7.

(11)- 2.5 LF TO BE USED AT ALL 4"X6" DRAIN HOLES ON BRIDGE DECK. TOTAL 12 HOLES ON NORTH SIDE OF BRIDGE.

(12)- RAISE EXISTING STRUCTURE TO REPLACE ELASTOMERIC BEARING PADS.

(13)- CLEAN DEBRIS UNDER BRIDGE AND ALONG ROADWAY.

(14)- CLEAN AND SWEEP UNDER BRIDGE AND ALONG ROADWAY.

(17)- CLEAN ALL 7 BENT AND ABUTMENT CAPS.

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	BID ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	EPOXY PAINT SPOTS ON BENT CAPS 2, 4, AND 6	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY)	18	SF	
(2)	EPOXY PAINT SPOTS ON OVERHANG	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY)	2	SF	
(3)	REPAIR SPALLS AND DELAMINATION AT ABUTMENTS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	17	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(4)	REPAIR SPALL ON BEAM	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	1.5	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(5)	REPAIR SPALLS AND DELAMINATION ON BENT CAPS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	9.5	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(6)	REPAIR SPALL AND DELAMINATION ON DECK	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	0.5	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(7)	REPAIR SPALL AND DELAMINATION ON BOTTOM OF DECK	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	0.5	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(8)	CLEAN AND SEAL ALL RIPRAP JOINTS WITH CLASS 3 - HOT POURED RUBBER	438-7004	CLEANING AND SEALING EXIST JOINTS (CL3)	1,212	LF	
(9)	CLEAN AND SEAL ALL BRIDGE DECK JOINTS WITH CLASS 7	438-7007	CLEANING AND SEALING EXIST JOINTS (CL7)	595	LF	CLEANING AND SEALING EXISTING BRIDGE JOINTS
(10)	CLEAN AND SEAL JOINTS (FOAM) AT APPROACH SLAB AND BRIDGE DECK	438-7010	CLEANING AND SEALING JOINTS (FOAM)	170	LF	SEE BRIDGE REPAIR DETAIL
(11)	ADD GALVANIZED DRAINS	481-7048	PIPE (GALV) (4 IN X 6 IN)	30	LF	SEE BRIDGE DRAIN MOD
(12)	RAISE EXISTING STRUCTURE TO REPLACE ELASTOMERIC BEARING PADS		RAISE EXISTING STRUCTURE (SUBSIDIARY TO ITEM 787)	1	EA	FOR CONTRACTORS INFORMATION ONLY
(13)	CLEAN DEBRIS UNDER BRIDGE AND ALONG ROADWAY	735-7072	DEBRIS REMOVAL (SPOT DEBRIS)	1	MI	
(14)	CLEAN AND SWEEP UNDER BRIDGE AND ALONG ROADWAY	738-7104	CLEANING / SWEEPING (SPOT)	1	MI	
(15)	REPAIR CRACK ON WINGWALL	780-7003	CONC CRCK REPR(DISCRETE)(ROUT AND SEAL)	4	LF	
(16)	REPLACE BEARING PADS AT (BENT 4 SPAN 3)	787-7001	REPLACING ELASTOMERIC BEARING PADS	9	EA	
(17)	CLEAN ALL ABUTMENT AND BENT CAPS	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	7	EA	
(18)	INSTALL THRIE-BEAM	540-7005	MTL BEAM GD FEN TRANS (THRIE-BEAM)	4	EA	SEE GF(31)TR TL3-20
(19)	REMOVE THRIE-BEAM	542-7004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	4	EA	

STATE OF TEXAS
TIMOTHY D. BERRY
95595
LICENSED
PROFESSIONAL ENGINEER

Timothy Berry P.E.

8-6-2024

WORK LOCATION LAYOUTS

IH 30 AT US 82 (WB)

NBI=19-019-0-0610-06-109

CSJ: 0610-06-101

SHEET 9 OF 15

NOT TO SCALE

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		43

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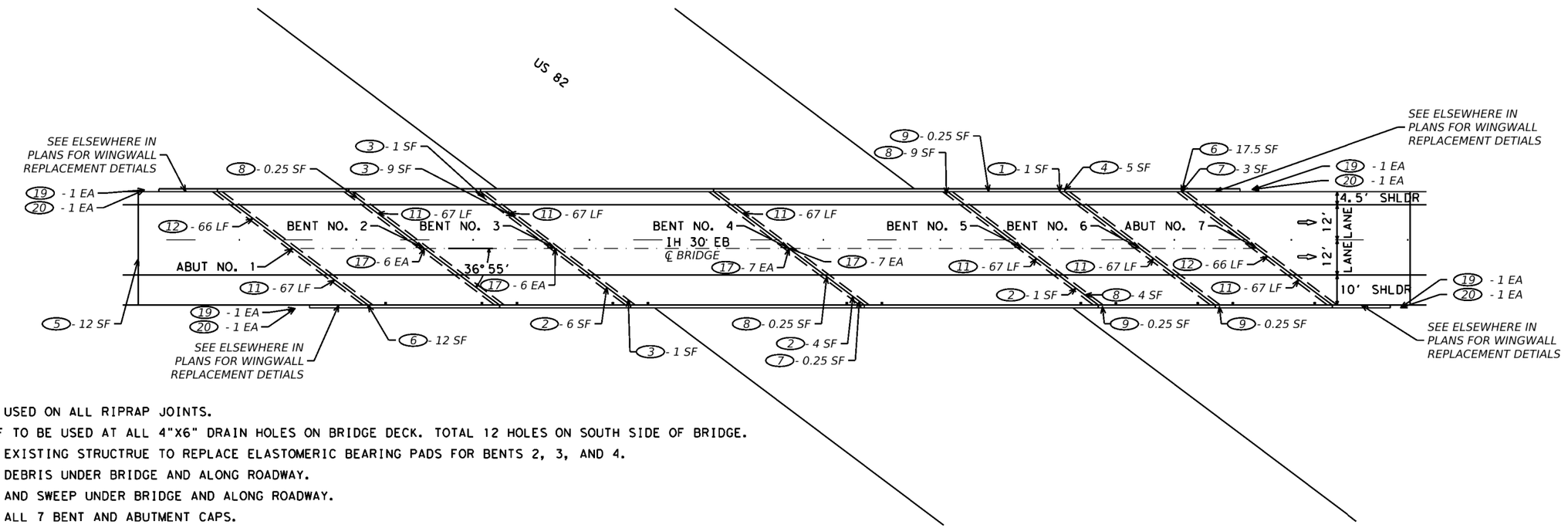

NOTES:

(10) - TO BE USED ON ALL RIPRAP JOINTS.

(13) - 2.5 LF TO BE USED AT ALL 4"X6" DRAIN HOLES ON BRIDGE DECK. TOTAL 12 HOLES ON SOUTH SIDE OF BRIDGE.

(14) - RAISE EXISTING STRUCTRUE TO REPLACE ELASTOMERIC BEARING PADS FOR BENTS 2, 3, AND 4.

(15) - CLEAN DEBRIS UNDER BRIDGE AND ALONG ROADWAY.

(16) - CLEAN AND SWEEP UNDER BRIDGE AND ALONG ROADWAY.

(18) - CLEAN ALL 7 BENT AND ABUTMENT CAPS.

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	BID ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	EPOXY PAINT SPOT ON BEAM	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY)	1	SF	
(2)	EPOXY PAINT SPOTS ON BENT CAPS 3, 4, AND 5	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY)	11	SF	
(3)	EPOXY PAINT SPOTS ON COLUMNS	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY)	11	SF	
(4)	EPOXY PAINT SPOTS ON OVERHANG	429-7001	CONC STR REPAIR(CLEAN & COAT WTH EPOXY)	5	SF	
(5)	REPAIR APPROACH SLAB WITH EPOXY MORTAR	429-7002	CONC STR REPAIR (EPOXY MORTAR)	12	SF	
(6)	REPAIR SPALLS AND DELAMINATION AT ABUTMENTS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	29.5	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(7)	REPAIR SPALL ON BEAM	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	3.25	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(8)	REPAIR SPALLS AND DELAMINATION ON BENT CAPS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	13.5	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(9)	REPAIR SPALL AND DELAMINATION ON BOTTOM OF DECK	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	0.75	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(10)	CLEAN AND SEAL ALL RIPRAP JOINTS WITH CLASS 3 - HOT POURED RUBBER	438-7004	CLEANING AND SEALING EXIST JOINTS (CL3)	1,024	LF	
(11)	CLEAN AND SEAL ALL BRIDGE DECK JOINTS WITH CLASS 7	438-7007	CLEANING AND SEALING EXIST JOINTS (CL7)	469	LF	SEE CLEANING AND SEALING EXISTING BRIDGE JOINTS
(12)	CLEAN AND SEAL JOINTS (FOAM) AT APPROACH SLAB AND BRIDGE DECK	438-7010	CLEANING AND SEALING JOINTS (FOAM)	132	LF	SEE BRIDGE REPAIR DETAIL
(13)	ADD GALVANIZED DRAINS	481-7048	PIPE (GALV) (4 IN X 6 IN)	30	LF	SEE BRIDGE DRAIN MOD
(14)	RAISE EXISTING STRUCTURE TO REPLACE ELASTOMERIC BEARING PADS FOR BENTS 2, 3, AND 4		RAISE EXISTING STRUCTURE (SUBSIDIARY TO ITEM 787)	4	EA	FOR CONTRACTORS INFORMATION ONLY
(15)	CLEAN DEBRIS UNDER BRIDGE AND ALONG ROADWAY	735-7072	DEBRIS REMOVAL (SPOT DEBRIS)	1	MI	
(16)	CLEAN AND SWEEP UNDER BRIDGE AND ALONG ROADWAY	738-7104	CLEANING / SWEEPING (SPOT)	1	MI	
(17)	REPLACE BEARING PADS AT (BENT 2 SPAN 1 , BENT 3 SPAN 2, BENT 4 SPAN 3, AND BENT 4 SPAN 4)	787-7001	REPLACING ELASTOMERIC BEARING PADS	26	EA	
(18)	CLEAN ALL ABUTMENT AND BENT CAPS	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	7	EA	
(19)	INSTALL THRIE-BEAM	540-7005	MTL BEAM GD FEN TRANS (THRIE-BEAM)	4	EA	SEE GF(31)TR TL3-20
(20)	REMOVE THRIE-BEAM	542-7004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	4	EA	

STATE OF TEXAS
TIMOTHY D. BERRY
95595
LICENSED
PROFESSIONAL ENGINEER

Timothy Berry P.E.
8-6-2024

NOT TO SCALE

WORK LOCATION LAYOUTS

IH 30 AT US 82 (EB)
NBI=19-019-0-0610-06-110
CSJ: 0610-06-102

SHEET 10 OF 15

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		44

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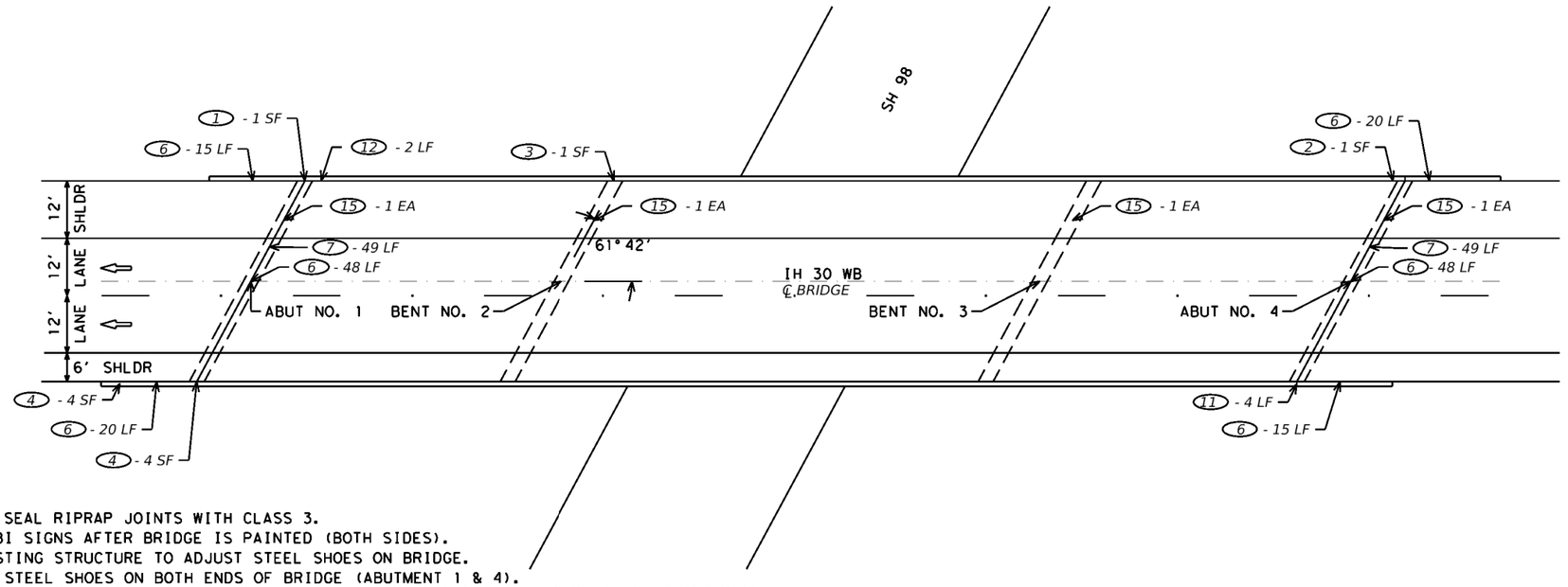


NOTES:

(5) - CLEAN AND SEAL RIPRAP JOINTS WITH CLASS 3.
(8) - INSTALL NBI SIGNS AFTER BRIDGE IS PAINTED (BOTH SIDES).
(9) - RAISE EXISTING STRUCTURE TO ADJUST STEEL SHOES ON BRIDGE.
(10) - ADJUST 12 STEEL SHOES ON BOTH ENDS OF BRIDGE (ABUTMENT 1 & 4). REPLACE ROCKER BEARING #3 AT ABUTMENT 4. ALL OTHER BEARINGS ARE TO BE AJUSTED AND RESET.
(13) - WELD BROKEN DIAPRAGM AT ABUTMENT 4 BEAM 3 (BOTH SIDES).
(14) - CLEAN AND PAINT BRIDGE (INCLUDE ALL ROCKER BEARINGS).

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	BID ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	REPAIR SPALLS AND DELAMINATION AT ABUTMENTS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	1	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(2)	REPAIR SPALL AND DELAMINATION ON DECK	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	1	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(3)	REPAIR SPALL AND DELAMINATION ON COLUMN	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	1	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(4)	REPAIR SPALL AND DELAMINATION ON WING	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	8	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(5)	CLEAN AND SEAL BRIDGE RIPRAP JOINTS WITH CLASS 3	438-7004	CLEANING AND SEALING EXIST JOINTS (CL3)	844	LF	
(6)	CLEAN AND SEAL BRIDGE ABUTMENT JOINTS AT RIPRAP WITH CLASS 7	438-7007	CLEANING AND SEALING EXIST JOINTS (CL7)	166	LF	
(7)	CLEAN AND SEAL JOINTS (FOAM) AT APPROACH SLAB AND BRIDGE DECK	438-7010	CLEANING AND SEALING JOINTS (FOAM)	98	LF	SEE BRIDGE REPAIR DETAIL
(8)	ADD NBI SIGNS TO BRIDGE AFTER PAINTING	442-7011	STR STEEL (RAILS/POSTS/PLATES)	56	LBS	SEE NBIS DETAIL
(9)	CLEAN AND PAINT EXISTING STRUCTURE	446-7020	CLEAN AND PAINT EXIST STR (REF NO. 1)	1	EA	
(10)	RAISE EXISTING STRUCTURE FOR ADJUSTING STEEL SHOES		RAISE EXISTING STRUCTURE (SUBSIDIARY TO ITEM 787)	2	EA	FOR CONTRACTORS INFORMATION ONLY
(11)	ADJUST STEEL SHOES	499-7001	ADJUST STL SHOES	12	EA	
(12)	REPAIR CRACKS AT ABUTMENT WITH CONC CRACK REPAIR	780-7003	CONC CRCK REPR(DISCRETE)(ROUT AND SEAL)	4	LF	
(13)	REPAIR CRACKS AT WING WALL WITH CONC CRACK REPAIR	780-7003	CONC CRCK REPR(DISCRETE)(ROUT AND SEAL)	2	LF	
(14)	WELD BROKEN DIAPRAGM AT ABUTMENT 4 BEAM 3 (BOTH SIDES)	784-7003	REP STL BRIDGE MEMBER (DIAPHRAGM)	1	EA	
(15)	CLEAN ABUTMENT AND BENT CAPS	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	4	EA	

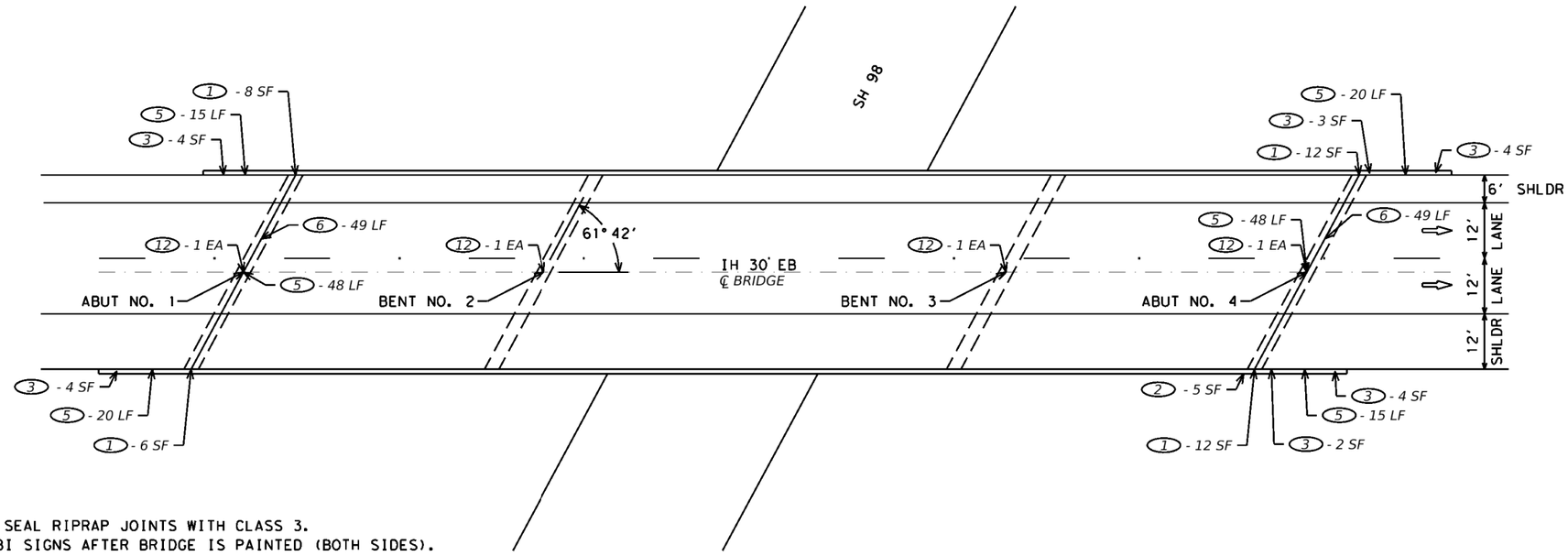
WORK LOCATION LAYOUTS

IH 30 AT SH 98 (WB)
NBI#19-019-0-0610-06-160
CSJ#0610-06-103

NOT TO SCALE

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		45



NOTES:

(4) - CLEAN AND SEAL RIPRAP JOINTS WITH CLASS 3.
(7) - INSTALL NBI SIGNS AFTER BRIDGE IS PAINTED (BOTH SIDES).
(8) - RAISE EXISTING STRUCTURE TO ADJUST STEEL SHOES ON BRIDGE.
(9) - ADJUST 12 STEEL SHOES ON BOTH ENDS OF BRIDGE (ABUTMENT 1 & 4).
REPLACE ROCKER BEARING #4 AT ABUTMENT 1. ALL OTHER BEARINGS ARE TO BE AJUSTED AND RESET.
(10) - WELD BROKEN DIAPRAGM AT ABUTMENT 1 BEAM 3 AND 4.
(11) - CLEAN AND PAINT BRIDGE (INCLUDE ALL ROCKER BEARINGS).

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	BID ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	REPAIR SPALLS AND DELAMINATION AT ABUTMENTS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	38	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(2)	REPAIR SPALL AND DELAMINATION ON DECK	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	5	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(3)	REPAIR SPALL AND DELAMINATION ON WING	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	21	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(4)	CLEAN AND SEAL BRIDGE RIPRAP JOINTS WITH CLASS 3	438-7004	CLEANING AND SEALING EXIST JOINTS (CL3)	734	LF	
(5)	CLEAN AND SEAL BRIDGE ABUTMENT JOINTS AT RIPRAP WITH CLASS 7	438-7007	CLEANING AND SEALING EXIST JOINTS (CL7)	166	LF	
(6)	CLEAN AND SEAL JOINTS (FOAM) AT APPROACH SLAB AND BRIDGE DECK	438-7010	CLEANING AND SEALING JOINTS (FOAM)	98	LF	SEE BRIDGE REPAIR DETAIL
(7)	ADD NBI SIGNS TO BRIDGE AFTER PAINTING	442-7011	STR STEEL (RAILS/POSTS/PLATES)	56	LBS	SEE NBIS DETAIL
(8)	CLEAN AND PAINT EXISTING STRUCTURE	446-7028	CLEAN AND PAINT EXIST STR (REF NO. 2)	1	EA	
(9)	RAISE EXISTING STRUCTURE FOR ADJUSTING STEEL SHOES		RAISE EXISTING STRUCTURE (SUBSIDIARY TO ITEM 787)	2	EA	FOR CONTRACTORS INFORMATION ONLY
(10)	ADJUST STEEL SHOES	499-7001	ADJUST STL SHOES	12	EA	
(11)	WELD BROKEN DIAPRAGMS AT ABUTMENT 1 BEAM 3 AND BEAM 4	784-7003	REP STL BRIDGE MEMBER (DIAPHRAGM)	2	EA	
(12)	CLEAN ABUTMENT AND BENT CAPS	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	4	EA	

WORK LOCATION LAYOUTS

IH 30 AT SH 98 (EB)
NBI#19-019-0-0610-06-162
CSJ:0610-06-104

NOT TO SCALE

SHEET 12 OF 15

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		46

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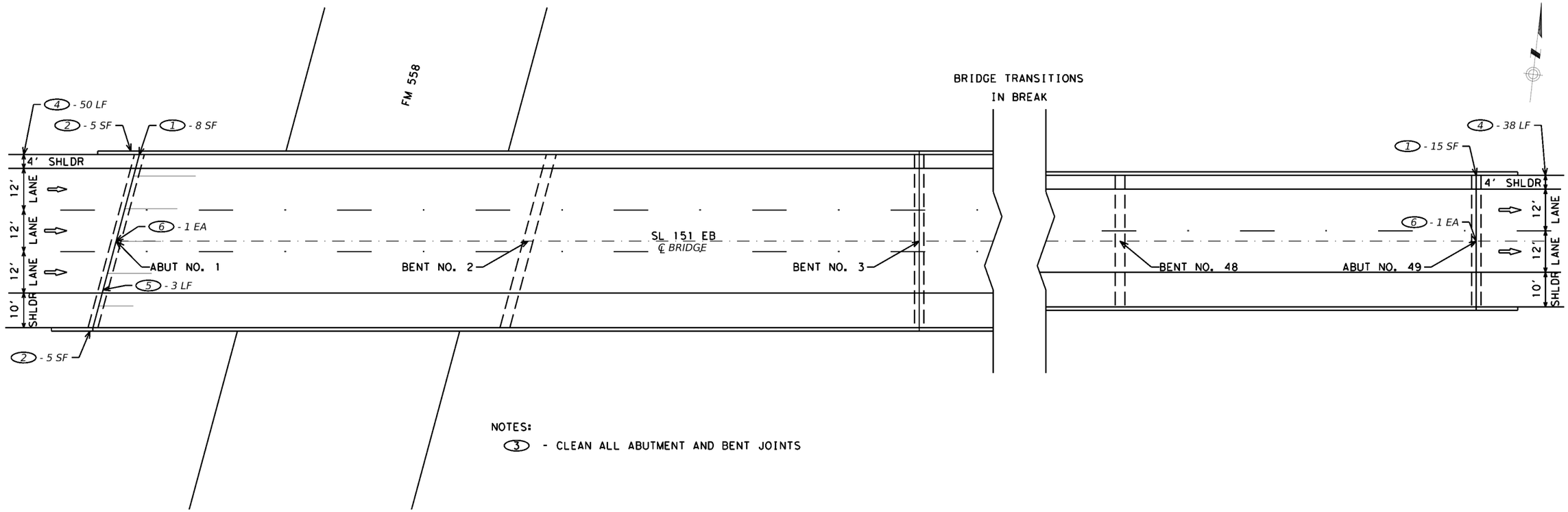


NOTES:

(3) - CLEAN ALL ABUTMENT AND BENT JOINTS

TABLE OF REPAIRS						
REPAIR NO.	REPAIR DESCRIPTION/LOCATION	BID ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	REPAIR SPALLS AND DELAMINATION AT ABUTMENTS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	23	SF	
(2)	REPAIR SPALLS AND DELAMINATION AT WINGS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	10	SF	
(3)	CLEAN EXISTING JOINTS	438-7008	CLEANING EXISTING JOINTS	847	LF	
(4)	ADDING FOAM JOINTS BOTH SIDES OF APPROACH SLAB	438-7010	CLEANING AND SEALING JOINTS (FOAM)	88	LF	
(5)	REPAIR CRACK AT ABUTMENTS BETWEEN 4 AND 5 BEAMS	780-7003	CONC CRCK REPR(DISCRETE)(ROUT AND SEAL)	3	LF	
(6)	CLEAN ABUTMENT CAPS	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	2	EA	

WORK LOCATION LAYOUTS

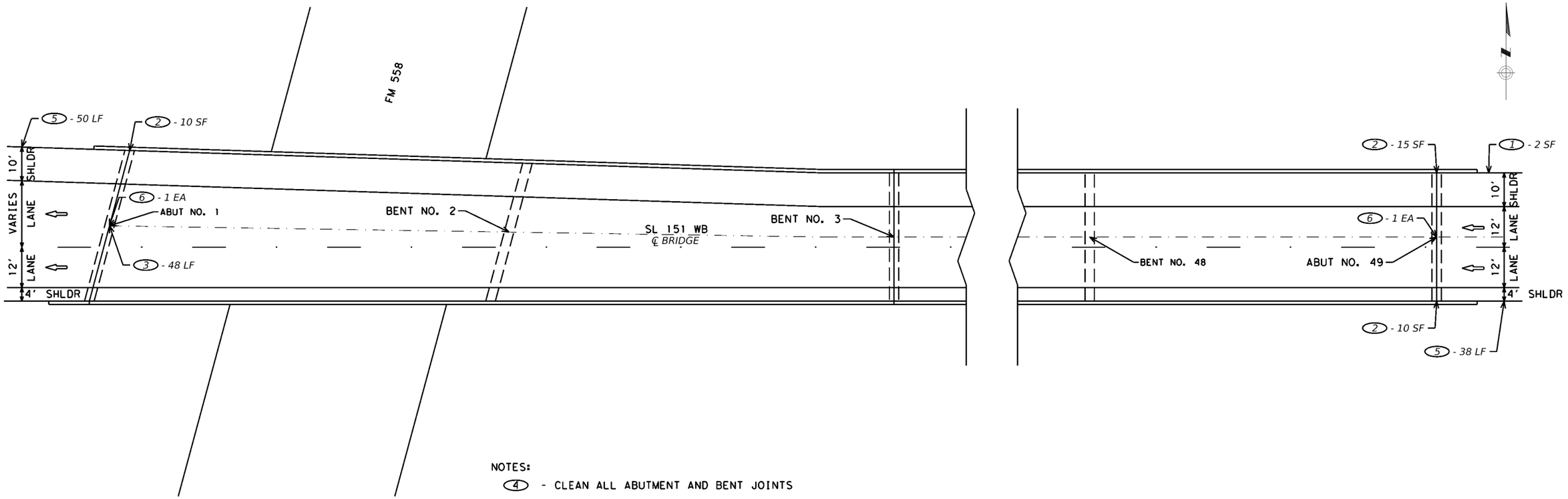
SL 151 AT FM 558 (EB)
NBI=19-019-0-2050-03-015
CSJ=2050-03-009

NOT TO SCALE

SHEET 13 OF 15

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		47



NOTES:

(4) - CLEAN ALL ABUTMENT AND BENT JOINTS

TABLE OF REPAIRS						
REPAIR NO.	REPAIR DESCRIPTION/LOCATION	BID ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	REPAIR CONCRETE ON APPROACH SLAB	429-7002	CONC STR REPAIR (EPOXY MORTAR)	2	SF	
(2)	REPAIR SPALLS AND DELAMINATION AT ABUTMENTS OR WINGS	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	35	SF	
(3)	CLEAN AND SEAL EXISTING JOINT AT ABUTMENT 1	438-7007	CLEANING AND SEALING EXIST JOINTS (CL7)	48	LF	SEE CLEANING AND SEALING EXISTING EXPANSION JOINT SEAL - DETAIL "C"
(4)	CLEAN EXISTING JOINTS	438-7008	CLEANING EXISTING JOINTS	808	LF	
(5)	CLEAN AND SEAL EXISTING JOINT AT APPROACH SLAB BOTH SIDES	438-7010	CLEANING AND SEALING JOINTS (FOAM)	88	LF	SEE PRECOMPRESSED FOAM EXPANSION JOINT SEAL DETAIL
(6)	CLEAN ABUTMENT CAPS	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	2	EA	

WORK LOCATION LAYOUTS

SL 151 AT FM 558 (NB)
NBI=19-019-0-2050-03-016
CSJ: 2050-03-010

NOT TO SCALE

SHEET 14 OF 15

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		48

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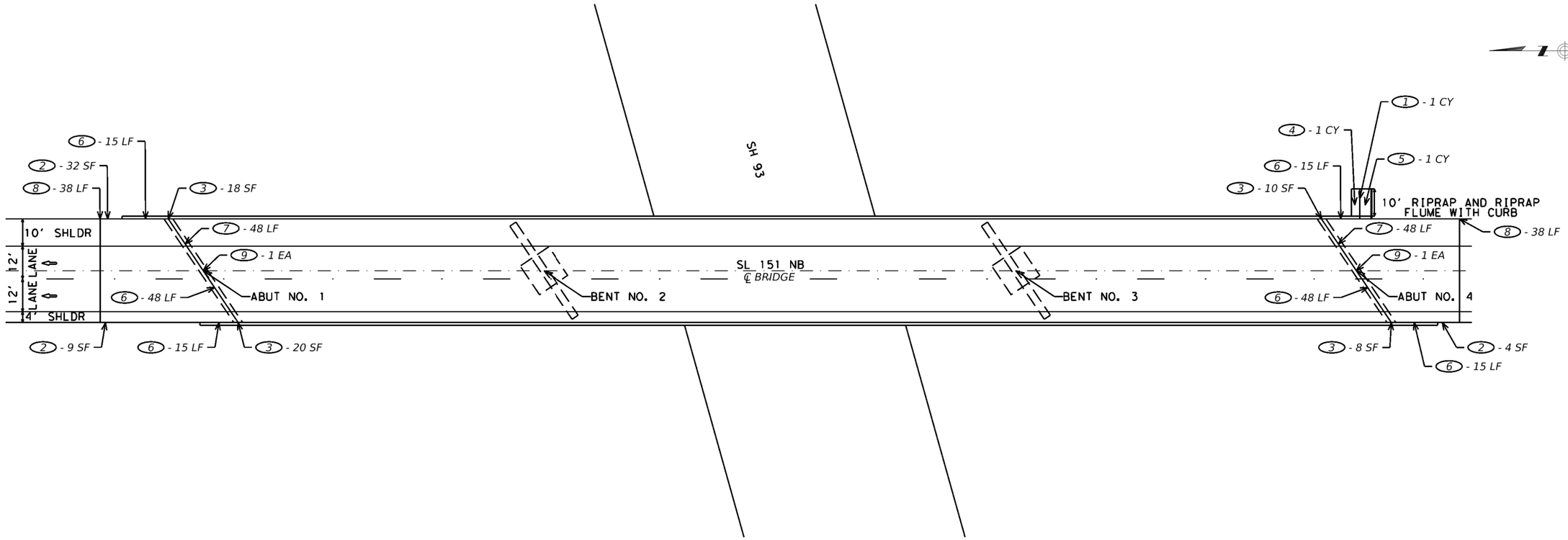


TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	BID ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	REMOVE EXISTING RIPRAP AND RIPRAP FLUME BECAUSE OF WASHOUT	104-7007	REMOV CONC (RIPRAP)	1	CY	
(2)	REPAIR CONCRETE APPROACH SLAB WITH EPOXY MORTAR	429-7002	CONC STR REPAIR (EPOXY MORTAR)	45	SF	
(3)	REPAIR SPALL AND DELIMINATION AT ABUTMENT	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	56	SF	REPAIR AS INTERMEDIATE SPALL PER TxDOT CONCRETE REPAIR MANUAL.
(5)	REPLACE RIPRAP APRON	432-7001	RIPRAP (CONC)(4 IN)	1	CY	
(4)	REPLACE RIPRAP FLUME	432-7012	RIPRAP (CONC)(FLUME)	1	CY	
(6)	CLEAN AND SEAL ABUTMENT JOINTS AT RIPRAP	438-7007	CLEANING AND SEALING EXIST JOINTS (CL7)	156	LF	
(7)	CLEAN EXISTING JOINTS	438-7008	CLEANING EXISTING JOINTS	96	LF	SEE CLEANING AND SEALING EXISTING BRIDGE JOINTS DETAIL - DETAIL "C"
(8)	ADDING FOAM JOINTS BOTH SIDES OF APPROACH SLAB	438-7010	CLEANING AND SEALING JOINTS (FOAM)	76	LF	SEE PRECOMPRESSED FOAM EXPANSION JOINT SEAL DETAIL
(9)	CLEAN ABUTMENTS CAPS	7001-7002	BENT CAP/ABUTMENT CAP CLEANING	2	EA	

WORK LOCATION LAYOUTS

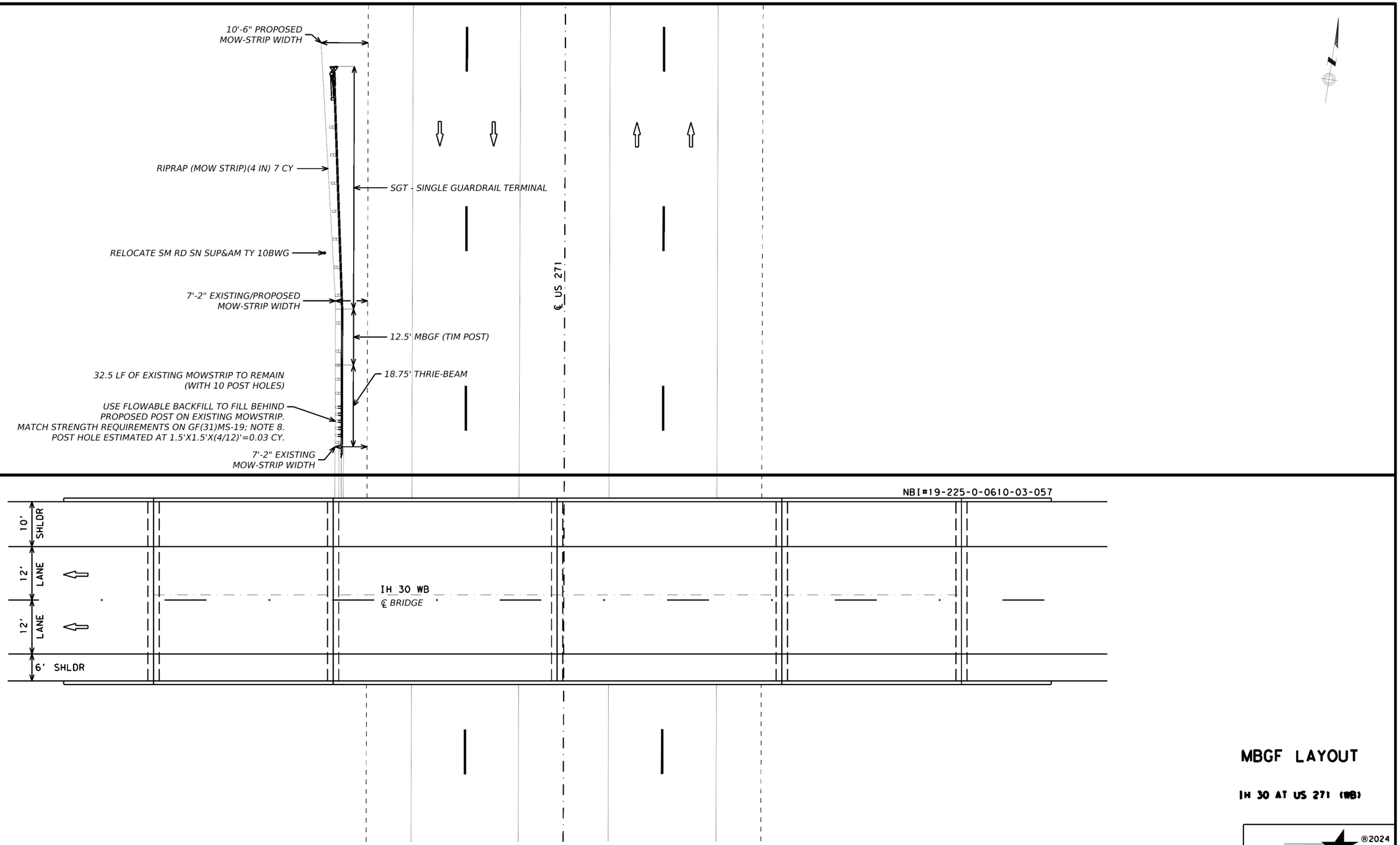
SL 151 AT SH 93 (NB)
NBI= 19-019-0-2050-03-073
CSJ: 2050-03-011

NOT TO SCALE

SHEET 15 OF 15

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ETC.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		49



MBGF LAYOUT

IH 30 AT US 271 (WB)

NOT TO SCALE

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0610	03	104, ECT.	IH 30, ETC.
DIST	COUNTY		SHEET NO.
ATL	TITUS, ETC.		50

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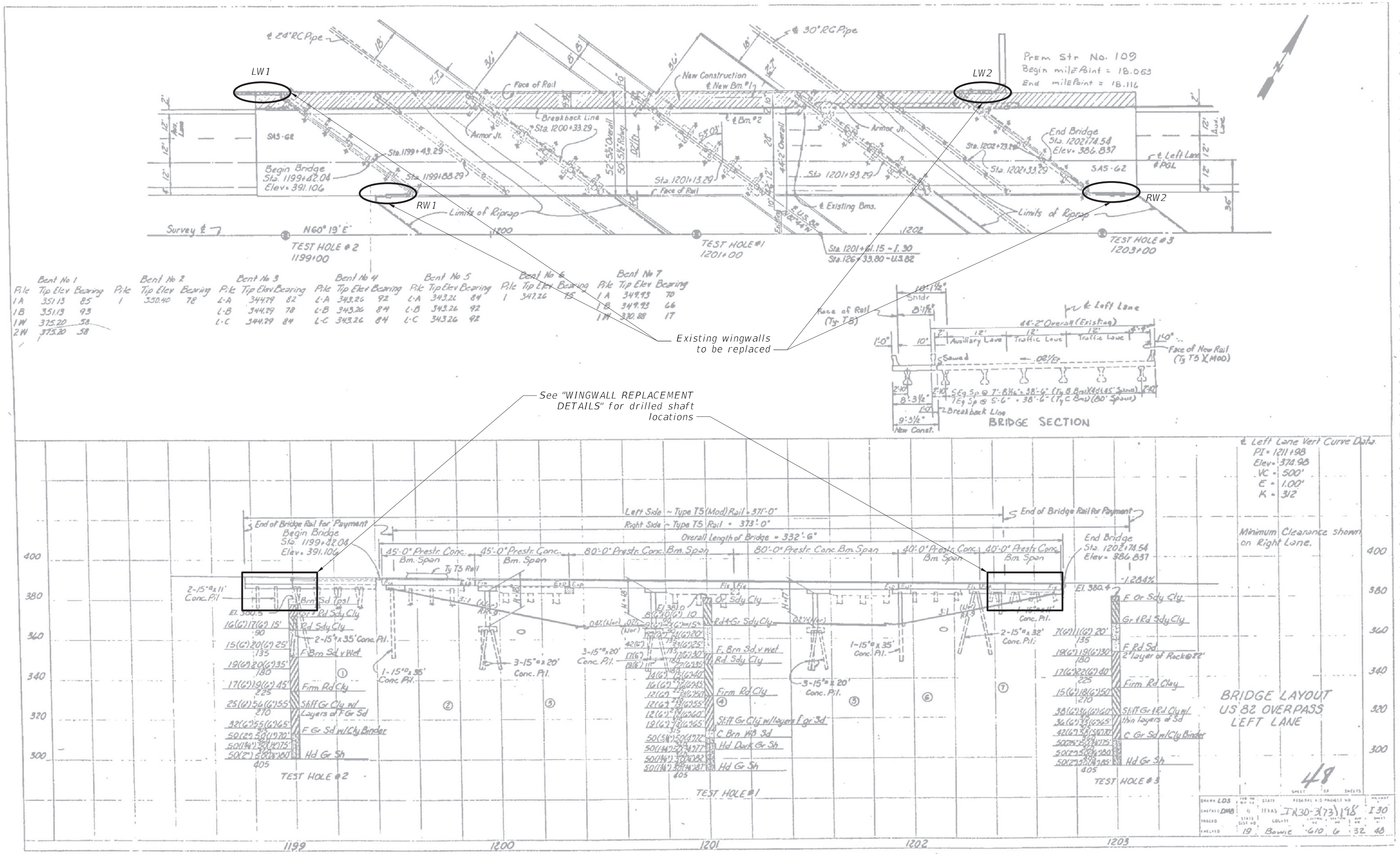


GENERAL NOTES

Repair locations and quantities are approximate. Current conditions may vary. Field verify locations and extent of repairs in the presence of the Engineer prior to ordering materials or performing work.

As-Built plans may be provided to the Conractor upon request.

Any damage to the structure beyond the limits of concrete removal and wingwall replacements indicated in these plans, shall be repaired at the Contractor's expense and in accordance with all applicable TxDOT Specifications.

See elsewhere in plans for repairs not specified in these details.

MATERIAL NOTES

Provide Class C concrete (f'c = 3600 psi) for drilled shafts and wingwalls.

Provide Grade 60 reinforcing steel.

CONSTRUCTION NOTES

Remove existing wingwalls in accordance with Item 104 "Removing Concrete". Concrete removal is limited to the existing wingwalls, wingwall caps, and the corner where the backwalls and wingwalls intersect.

Avoid damaging existing reinforcement that connects the backwalls and abutment caps to the wingwalls during concrete removal operations (L and U bars shown in wingwall elevations of as-built plans). Evaluate all exposed reinforcement for severe damage or deformation that would prevent its reuse (e.g. sheared bars, excessively bent, or warped). Replace damaged or severely corroded reinforcement with equivalent Grade 60 bars. Use a Type III anchoring adhesive conforming to DMS 6100 "Epoxies and Adhesives" to anchor replacement bars.

Lap splice wH1 bars to existing wH bars in wingwall cap. See "WINGWALL REPLACEMENT DETAILS" sheet for lap splice detail.

Cut flush any reinforcement extending into the existing wingwall caps from existing concrete pilings.

Ensure existing reinforcement that is to remain in place is clean of debris, concrete, rust, or other substances that may affect bond to new concrete.

Achieve SSD substrate condition prior to concrete placement.

Match all existing backwall/wingwall breakbacks.

Install drilled shafts in accordance with Item 416 "Drilled Shaft Foundations" and the "COMMON FOUNDATION DETAILS" standard sheets.

BRIDGE LAYOUT
FROM WIDENING AS-BUILTS

STATE OF TEXAS
AHMED J. AL-BASHA
151646
LICENSED PROFESSIONAL ENGINEER

05/01/2024

Texas Department of Transportation | Bridge Division

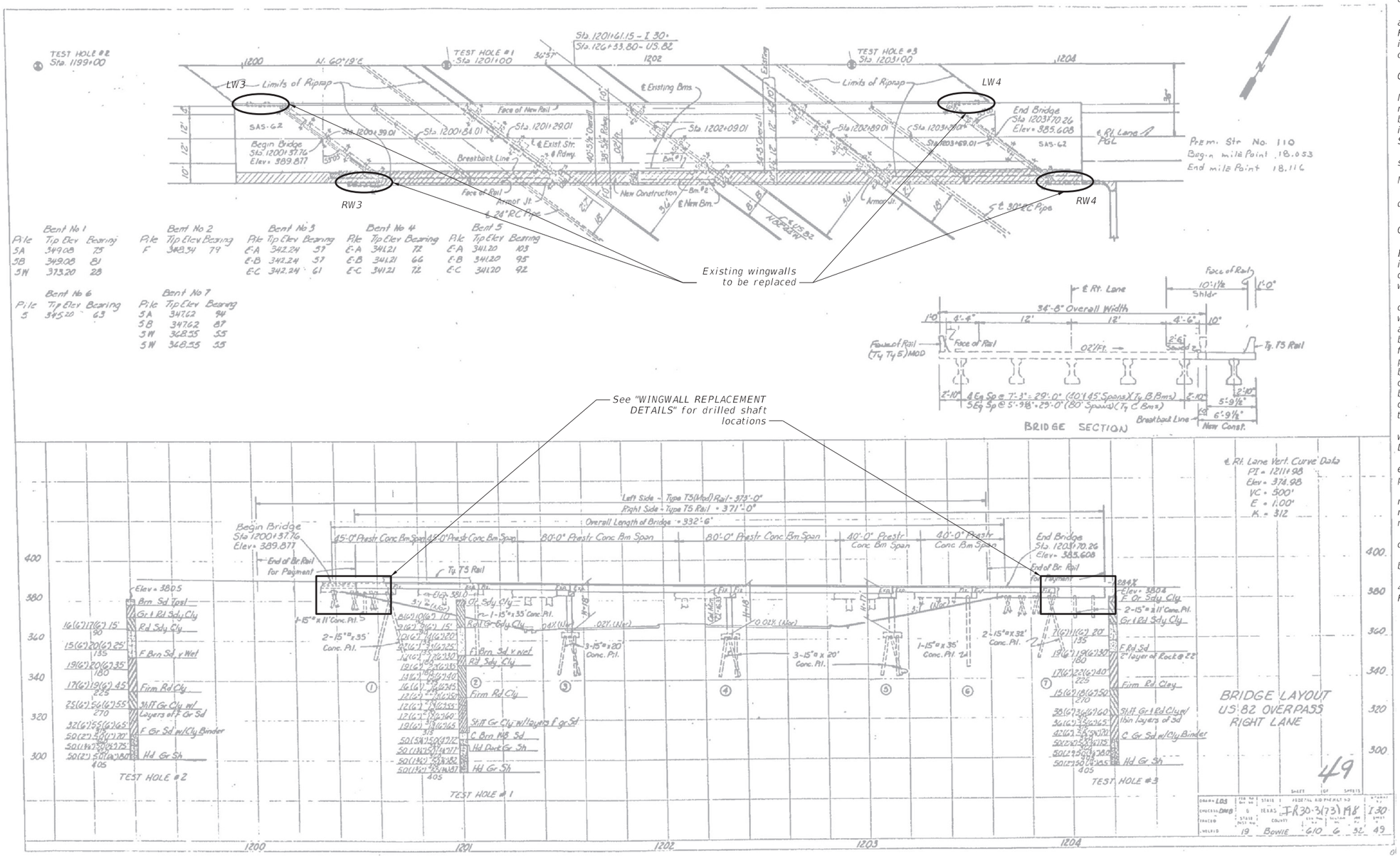
BRIDGE LAYOUT

NBI: 19-019-0-0610-06-109

IH30 WB @ US82

FILE:	DN: AA	CK: CRG	DW: AA	CK: CRG
©TxDOT JULY 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0610	03	104, ETC.	IH30
	DIST		COUNTY	SHEET NO.
	ATL		TITUS, ETC.	51

DATE:
FILE:



GENERAL NOTES

Repair locations and quantities are approximate. Current conditions may vary. Field verify locations and extent of repairs in the presence of the Engineer prior to ordering materials or performing work.

As-Built plans may be provided to the Conractor upon request.

Any damage to the structure beyond the limits of concrete removal and wingwall replacements indicated in these plans, shall be repaired at the Contractor's expense and in accordance with all applicable TxDOT Specifications.

See elsewhere in plans for repairs not specified in these details.

MATERIAL NOTES

Provide Class C concrete (f'c = 3600 psi) for drilled shafts and wingwalls.

Provide Grade 60 reinforcing steel.

CONSTRUCTION NOTES

Remove existing wingwalls in accordance with Item 104 "Removing Concrete". Concrete removal is limited to the existing wingwalls, wingwall caps, and the corner where the backwalls and wingwalls intersect.

Avoid damaging existing reinforcement that connects the backwalls and abutment caps to the wingwalls during concrete removal operations (L and U bars shown in wingwall elevations of as-built plans). Evaluate all exposed reinforcement for severe damage or deformation that would prevent its reuse (e.g. sheared bars, excessively bent, or warped). Replace damaged or severely corroded reinforcement with equivalent Grade 60 bars. Use a Type III anchoring adhesive conforming to DMS 6100 "Epoxies and Adhesives" to anchor replacement bars.

Lap splice wH1 bars to existing wH bars in wingwall cap. See "WINGWALL REPLACEMENT DETAILS" sheet for lap splice detail.

Cut flush any reinforcement extending into the existing wingwall caps from existing concrete pilings.

Ensure existing reinforcement that is to remain in place is clean of debris, concrete, rust, or other substances that may affect bond to new concrete.

Achieve SSD substrate condition prior to concrete placement.

Match all existing backwall/wingwall breakbacks.

Install drilled shafts in accordance with Item 416 "Drilled Shaft Foundations" and the "COMMON FOUNDATION DETAILS" standard sheets.

BRIDGE LAYOUT
FROM WIDENING AS-BUILTS

STATE OF TEXAS
AHMED J. AL-BASHA
151646
LICENSED
PROFESSIONAL ENGINEER

05/01/2024

Texas Department of Transportation | Bridge Division

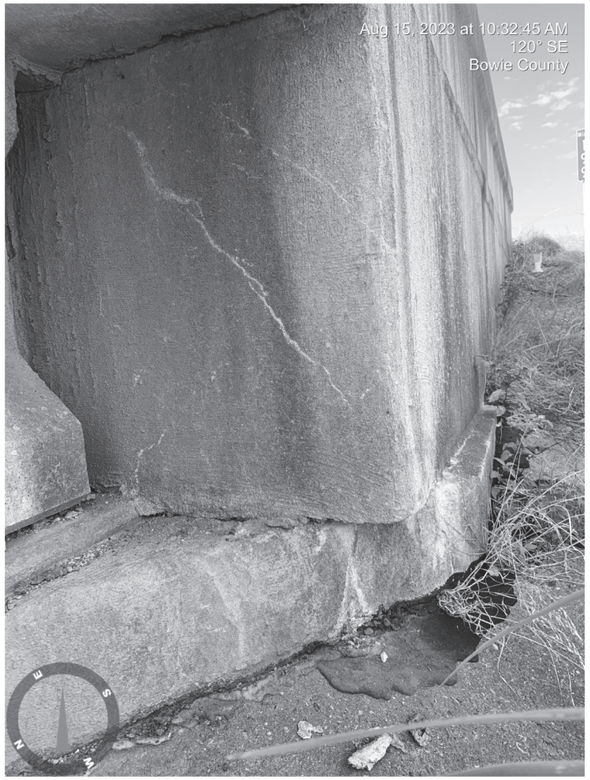
BRIDGE LAYOUT

NBI: 19-019-0-0610-06-110

IH30 EB @ US82

FILE:	DN: AA	CK: CRG	DW: AA	CK: CRG	
©TxDOT JULY 2021 REVISIONS	CONT.	SECT.	JOB	HIGHWAY	
	0610	03	104, ETC.	IH30	
	DIST.	COUNTY		SHEET NO.	
	ATL	TITUS, ETC.		52	

DATE:
FILE:



Photos are for Contractor information only. Photos are meant to depict a generalized condition of the structure. Extent of damage may vary from what is shown.

STATE OF TEXAS
AHMED J. AL-BASHA
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LICENSED
PROFESSIONAL ENGINEER

05/01/2024

Texas Department of Transportation

Bridge Division

WINGWALL CONDITION PHOTOS

NBI: 19-019-0-0610-06-109/110

IH30 WB/EB @ US82

DATE:
FILE:

FILE:	DN: AA	CK: CRG	DW: AA	CK: CRG
©TxDOT JULY 2021 REVISIONS	CONT.	SECT	JOB	HIGHWAY
	0610	03	104, ETC.	IH30
	DIST.	COUNTY		SHEET NO.
	ATL	TITUS, ETC.		53

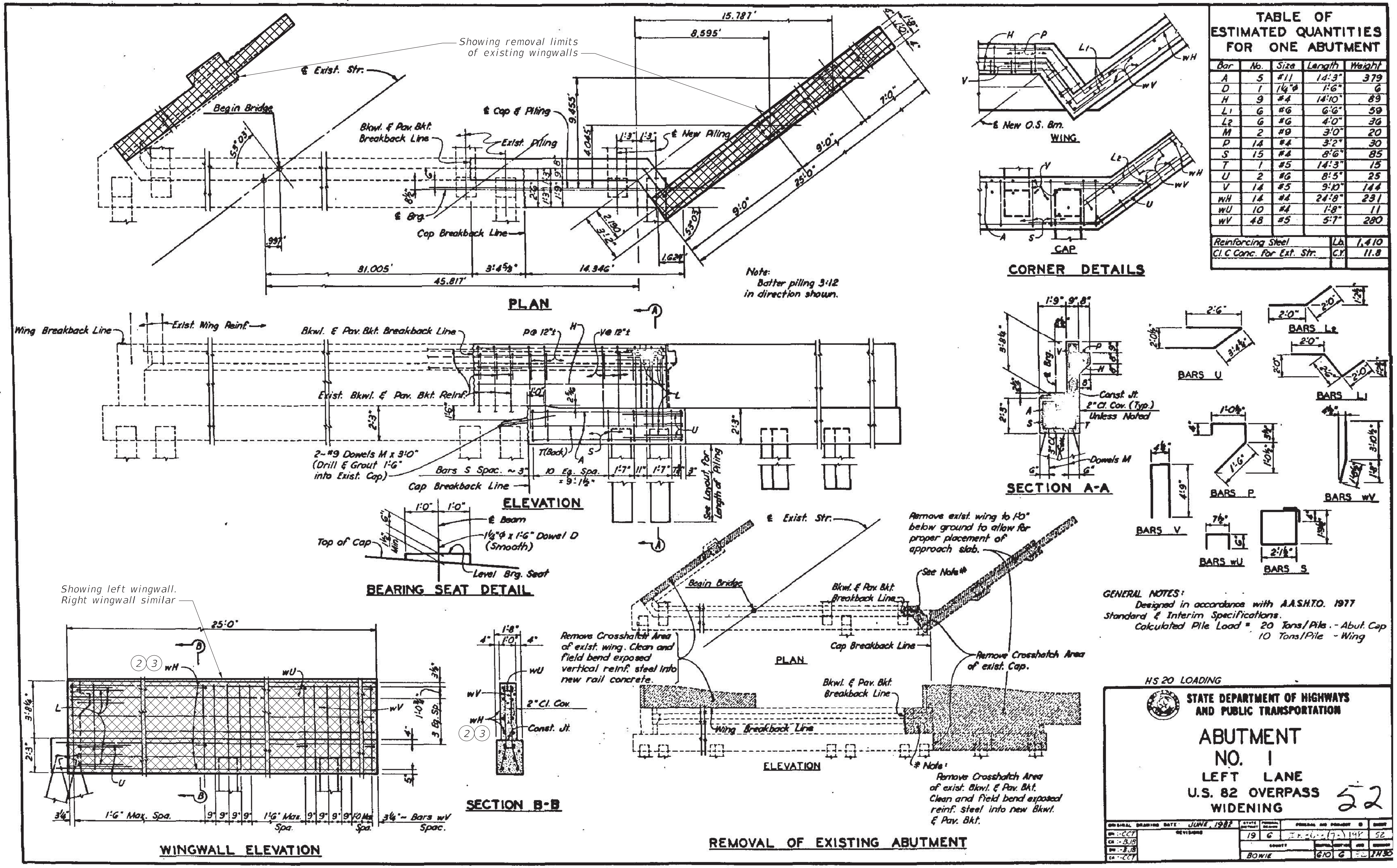
Showing removal limits of existing wingwalls
PLAN
ELEVATION
BEARING SEAT DETAIL
CORNER DETAILS
WING
CAP
SECTION A-A
SECTION B-B
WINGWALL ELEVATION
Showing left wingwall. Right wingwall similar
REMOVAL OF EXISTING ABUTMENT
Note: Batter piling 3:12 in direction shown.
BARS U
BARS L2
BARS L1
BARS P
BARS wV
BARS V
BARS wU
BARS S
GENERAL NOTES: Designed in accordance with A.A.S.H.T.O. 1977 Standard & Interim Specifications. Calculated Pile Load = 20 Tons/Pile - Abut. Cap 10 Tons/Pile - Wing
HS 20 LOADING
STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION
ABUTMENT NO. 1
LEFT LANE
U.S. 82 OVERPASS WIDENING
52
JUNE 1982
BOWIE

TABLE OF ESTIMATED QUANTITIES FOR ONE ABUTMENT

Bar	No.	Size	Length	Weight
A	5	#11	14'-3"	379
D	1	1¼"φ	1'-6"	6
H	9	#4	14'-10"	89
L1	6	#6	6'-6"	59
L2	6	#6	4'-0"	36
M	2	#9	3'-0"	20
P	14	#4	3'-2"	30
S	15	#4	8'-6"	85
T	1	#5	14'-3"	15
U	2	#6	8'-5"	25
V	14	#5	9'-10"	144
wH	14	#4	24'-8"	231
wU	10	#4	1'-8"	11
wV	48	#5	5'-7"	280
Reinforcing Steel			Lb.	1,410
Cl. C Conc. For Ext. Str.			C.Y.	11.8

EXISTING ABUTMENT & WINGWALL DETAILS

For Contractor's information only.

(2) See "LAP SPLICE DETAIL".

(3) Cut existing wH bars in wingwall cap to the minimum required lap splice length.

STATE OF TEXAS
AHMED J. AL-BASHA
151646
LICENSED PROFESSIONAL ENGINEER

05/01/2024

Texas Department of Transportation | Bridge Division

ABUTMENT 1 EXISTING WINGWALL DETAILS

NBI: 19-019-0-0610-06-109

IH30 WB @ US82

FILE:	DN: AA	CK: CRG	DW: AA	CK: CRG
©TxDOT JULY 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0610	03	104, ETC.	IH30
	DIST		COUNTY	SHEET NO.
	ATL		TITUS, ETC.	54

DATE:
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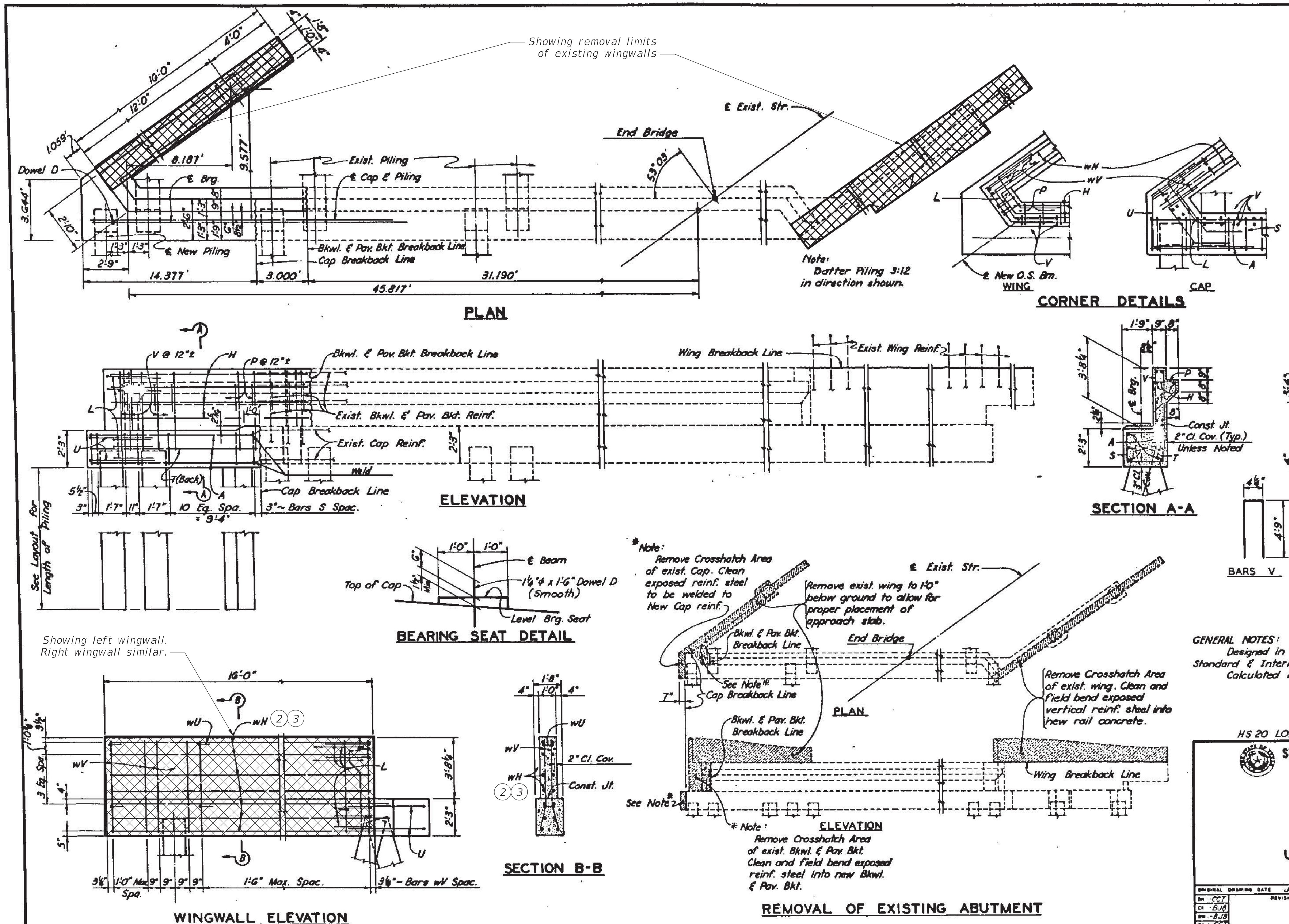
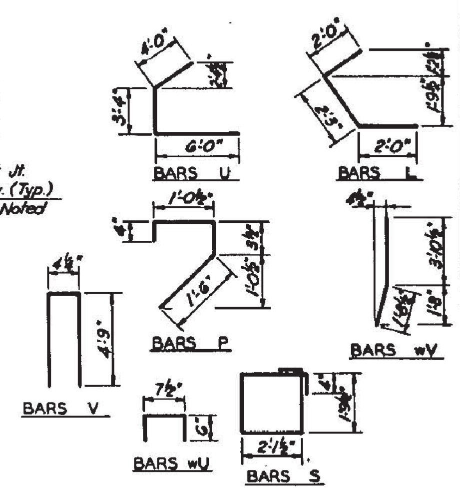


Bar	No.	Size	Length	Weight
A	5	#11	14'-0"	372
D	1	1¼"ϕ	1'-6"	6
H	9	#4	14'-4"	86
L	15	#6	6'-3"	141
P	18	#4	3'-2"	38
S	15	#4	8'-6"	85
T	1	#5	14'-0"	15
U	2	#6	13'-4"	39
V	18	#5	9'-10"	185
wH	14	#4	15'-8"	147
wU	8	#4	1'-8"	9
wV	30	#5	5'-7"	175
Reinforcing Steel			Lb.	1,298
Cl. C Conc. for Ext. Str.			C.Y.	9.7

TABLE OF ESTIMATED QUANTITIES FOR ONE ABUTMENT



GENERAL NOTES:
Designed in accordance with A.A.S.H.T.O. 1977 Standard & Interim Specifications.
Calculated Pile Load = 18 Tons/Pile - Abut Cap
10 Tons/Pile - Wing

HS 20 LOADING

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

ABUTMENT NO. 7
LEFT LANE
U.S. 82 OVERPASS
WIDENING

53

ORIGINAL DRAWING DATE JUNE, 1982 — REVISIONS — 19 — 6 — BOWIE — 610 — 6 — IH30 — 53

EXISTING ABUTMENT & WINGWALL DETAILS

For Contractor's information only.

(2) See "LAP SPLICE DETAIL".

(3) Cut existing wH bars in wingwall cap to the minimum required lap splice length.

STATE OF TEXAS
AHMED J. AL-BASHA
151646
LICENSED PROFESSIONAL ENGINEER

05/01/2024

Texas Department of Transportation — Bridge Division

ABUTMENT 7 EXISTING WINGWALL DETAILS

NBI: 19-019-0-0610-06-109

IH30 WB @ US82

FILE:	DN: AA	CK: CRG	DW: AA	CK: CRG
©TxDOT JULY 2021	CONT 0610	SECT 03	JOB 104, ETC.	HIGHWAY IH30
REVISIONS	DIST ATL		COUNTY TITUS, ETC.	SHEET NO. 55

DATE:
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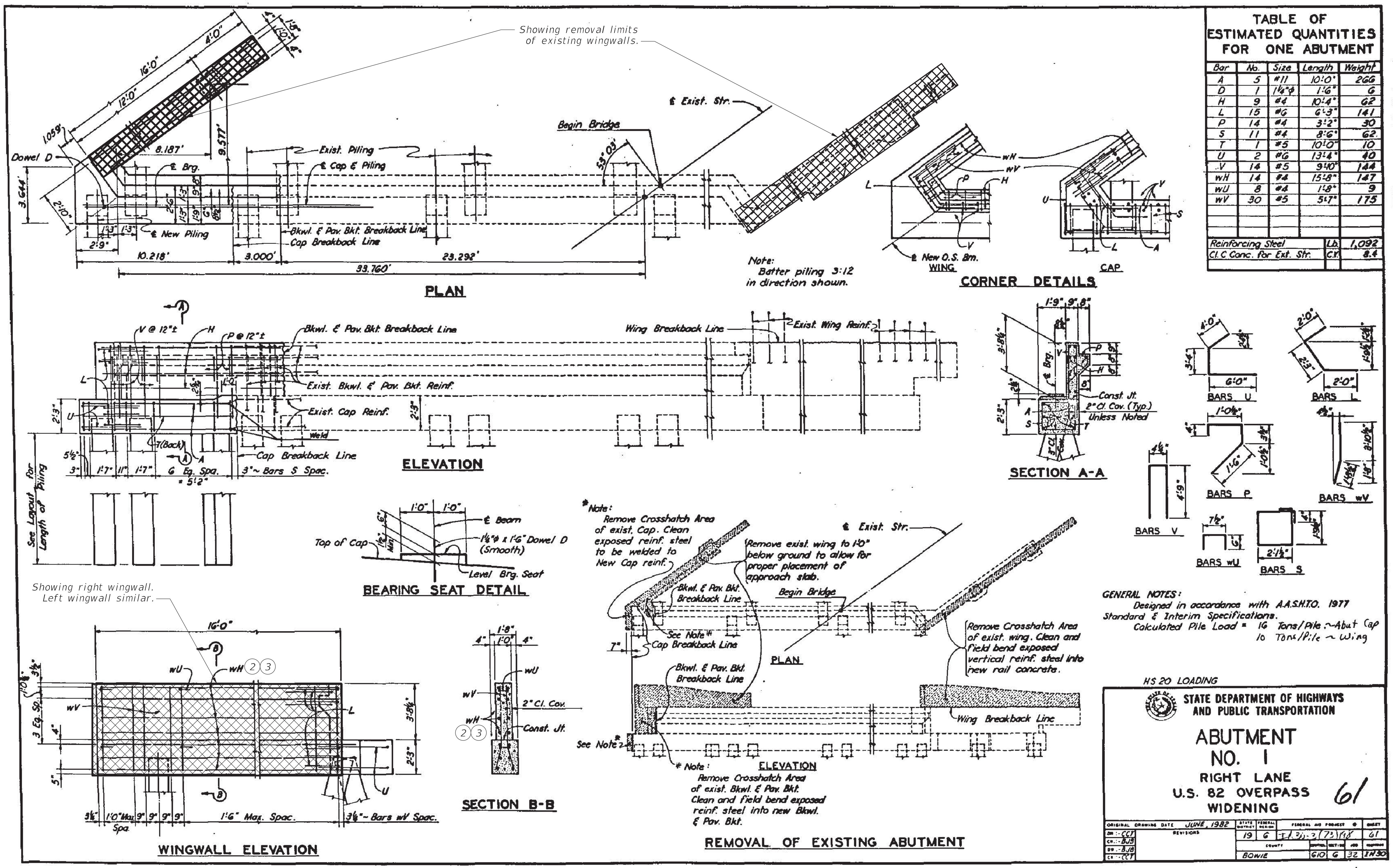

TABLE OF ESTIMATED QUANTITIES FOR ONE ABUTMENT

Bar	No.	Size	Length	Weight
A	5	#11	10'-0"	266
D	1	1¼"φ	1'-6"	6
H	9	#4	10'-4"	62
L	15	#6	6'-3"	141
P	14	#4	3'-2"	30
S	11	#4	8'-6"	62
T	1	#5	10'-0"	10
U	2	#6	13'-4"	40
V	14	#5	9'-10"	144
wH	14	#4	15'-8"	147
wU	8	#4	1'-8"	9
wV	30	#5	5'-7"	175
Reinforcing Steel			Lb.	1,092
Cl. C Conc. for Ext. Str.			C.Y.	8.4

(2) See "LAP SPLICE DETAIL".

(3) Cut existing wH bars in wingwall cap to the minimum required lap splice length.

EXISTING ABUTMENT & WINGWALL DETAILS

For Contractor's information only.

STATE OF TEXAS
AHMED J. AL-BASHA
151646
LICENSED PROFESSIONAL ENGINEER

05/01/2024

Texas Department of Transportation — Bridge Division

ABUTMENT 1 EXISTING WINGWALL DETAILS

NBI: 19-019-0-0610-06-110

IH30 EB @ US82

FILE:	DN: AA	CK: CRG	DW: AA	CK: CRG
©TxDOT JULY 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0610	03	104, ETC.	IH30
	DIST		COUNTY	SHEET NO.
	ATL		TITUS, ETC.	56

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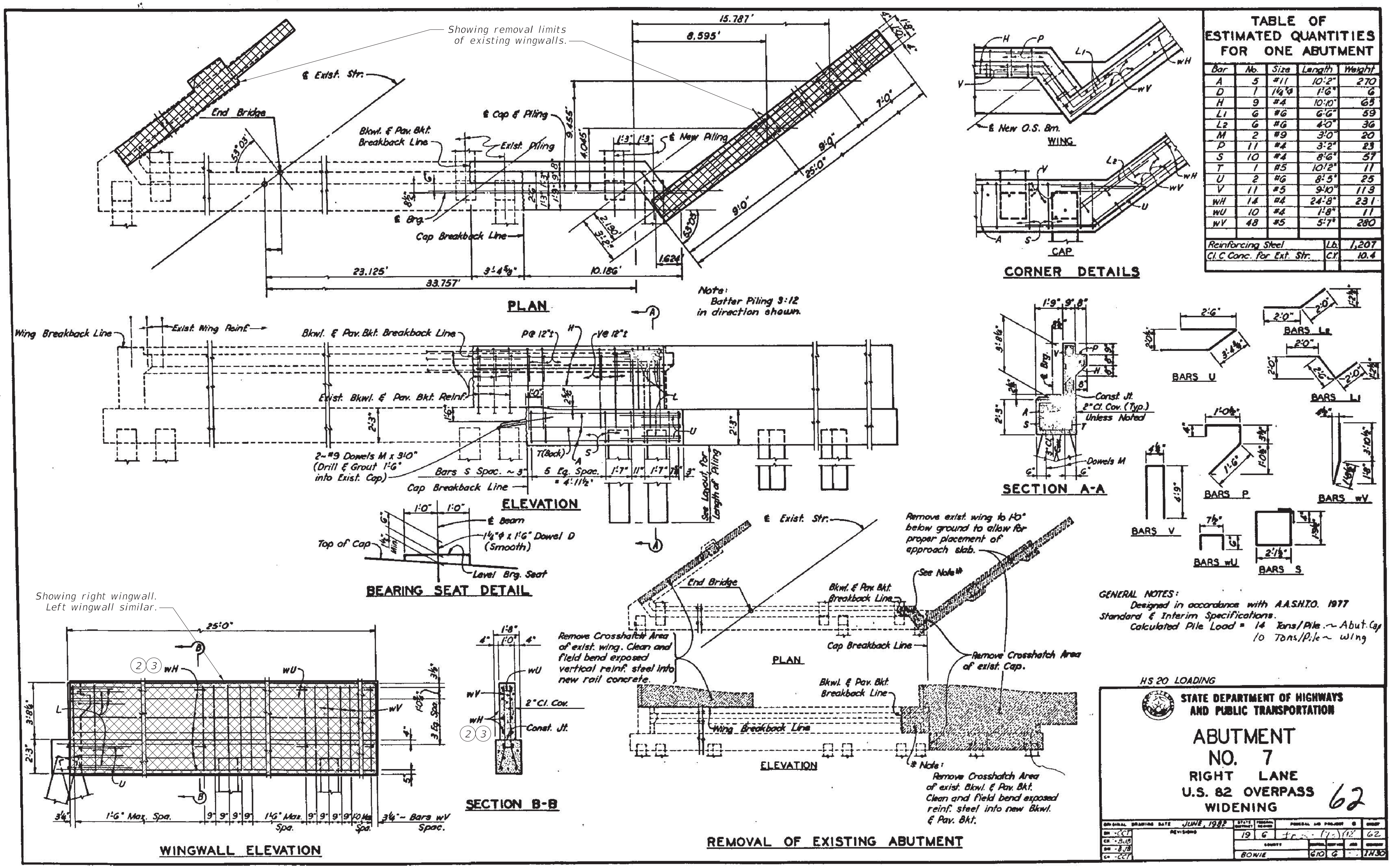

TABLE OF ESTIMATED QUANTITIES FOR ONE ABUTMENT

Bar	No.	Size	Length	Weight
A	5	#11	10'-2"	270
D	1	1¼"φ	1'-6"	6
H	9	#4	10'-10"	65
L1	6	#6	6'-6"	59
L2	6	#6	4'-0"	36
M	2	#9	3'-0"	20
P	11	#4	3'-2"	23
S	10	#4	8'-6"	57
T	1	#5	10'-2"	11
U	2	#6	8'-5"	25
V	11	#5	9'-10"	113
wH	14	#4	24'-8"	231
wU	10	#4	1'-8"	11
wV	48	#5	5'-7"	280
Reinforcing Steel			Lb.	1,207
Cl. C Conc. for Ext. Str.			C.Y.	10.4

EXISTING ABUTMENT & WINGWALL DETAILS

For Contractor's information only.

(2) See "LAP SPLICE DETAIL".

(3) Cut existing wH bars in wingwall cap to the minimum required lap splice length.

STATE OF TEXAS
AHMED J. AL-BASHA
151646
LICENSED PROFESSIONAL ENGINEER

05/01/2024

Texas Department of Transportation | Bridge Division

ABUTMENT 7 EXISTING WINGWALL DETAILS

NBI: 19-019-0-0610-06-110

IH30 EB @ US82

FILE:	DN: AA	CK: CRG	DW: AA	CK: CRG
©TxDOT JULY 2021	CONT 0610	SECT 03	JOB 104, ETC.	HIGHWAY IH30
REVISIONS	DIST ATL	COUNTY TITUS, ETC.		SHEET NO. 56

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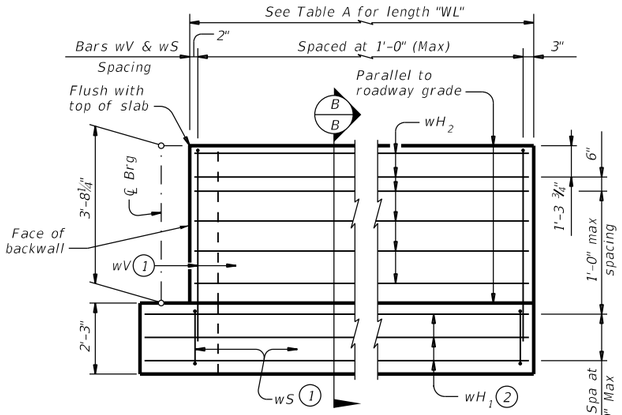
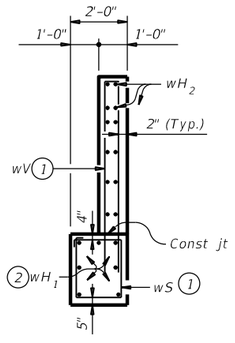
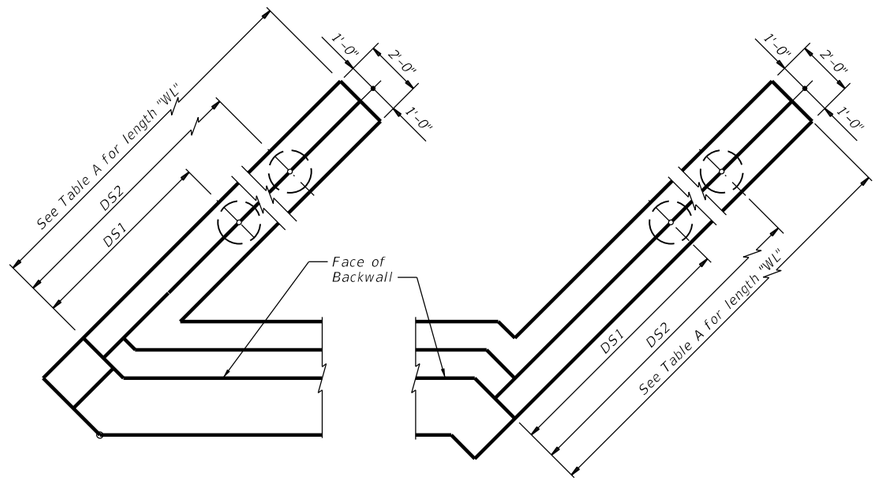


WINGWALL ELEVATION

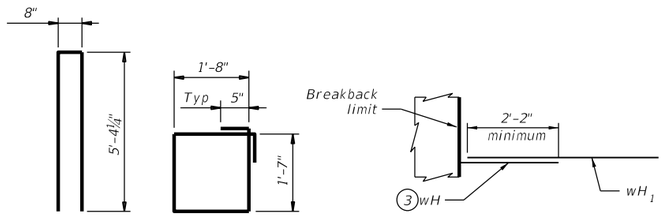
Existing Bars U and L not shown for clarity.



SECTION B-B



WINGWALL DRILLED SHAFT LOCATIONS



BARS wV BARS wS LAP SPLICE DETAIL

TABLE OF ESTIMATED QUANTITES (4)

BID ITEM	DESCRIPTION	UNIT	QTY
0104-7028	REMOVE CONC (WINGWALL)	CY	54
0416-7002	DRILL SHAFT (18 IN)	LF	560
0420-7067	CL C CONC (MISC)	CY	54
0778-7004	CONCRETE RAIL REPLACEMENT (IN-KIND)	LF	170

TABLE OF REINFORCEMENT QUANTITIES

Bar	No.	Size	Length	Weight
wV (WL = 16LF)	16	#5	11'-5"	191
wV (WL = 18LF)	18	#5	11'-5"	214
wV (WL = 25LF)	25	#5	11'-5"	298
wS (WL = 16LF)	16	#4	7'-4"	78
wS (WL = 18LF)	18	#4	7'-4"	88
wS (WL = 25LF)	25	#4	7'-4"	122
wH1 (WL = 16LF)	7	#6	15'-7"	164
wH1 (WL = 18LF)	7	#6	17'-7"	185
wH1 (WL = 25LF)	7	#6	24'-7"	258
wH2 (WL = 16LF)	5	#6	15'-7"	117
wH2 (WL = 18LF)	5	#6	17'-7"	132
wH2 (WL = 25LF)	5	#6	24'-7"	185
Reinforcement			lb	1252

TABLE A

NBI	Abutment	Wingwall	Designation	WL	Drilled Shaft Location DS1 (5)	Drilled Shaft Location DS2 (5)	Drilled Shaft Length
19-019-0-0610-06-109 IH30WB@US82	1	Left	LW1	25'-0"	12'-6"	21'-0"	35'-0"
		Right	RW1	18'-0"	7'-0"	14'-0"	
	7	Left	LW2	16'-0"	8'-0"	14'-0"	
		Right	RW2	25'-0"	12'-6"	21'-0"	
19-019-0-0610-06-110 IH30EB@US82	1	Left	LW3	25'-0"	12'-6"	21'-0"	
		Right	RW3	16'-0"	8'-0"	14'-0"	
	7	Left	LW4	18'-0"	7'-0"	14'-0'	
		Right	RW4	25'-0"	12'-6"	21'-0"	

(1) Adjust as required to avoid drilled shaft extended reinforcement.

(2) See "LAP SPLICE DETAIL".

(3) Cut existing wH bars in wingwall cap to the minimum required lap splice length.

(4) Quantities are for all wingwalls, on both structures.

(5) Measured from face of backwall.

CONSTRUCTION NOTES

Remove existing wingwalls in accordance with Item 104 "Removing Concrete". Concrete removal is limited to the existing wingwalls, wingwall caps, and the corner where the backwalls and wingwalls intersect.

Avoid damaging existing reinforcement that connects the backwalls and abutment caps to the wingwalls during concrete removal operations (L and U bars shown in wingwall elevations of as-built plans). Evaluate all exposed reinforcement for severe damage or deformation that would prevent its reuse (e.g. sheared bars, excessively bent, or warped). Replace damaged or severely corroded reinforcement with equivalent Grade 60 bars. Use a Type III anchoring adhesive conforming to DMS 6100 "Epoxies and Adhesives" to anchor replacement bars.

Lap splice wH1 bars to existing wH bars in wingwall cap. See "WINGWALL REPLACEMENT DETAILS" sheet for lap splice detail.

Cut flush any reinforcement extending into the existing wingwall caps from existing concrete pilings.

Ensure existing reinforcement that is to remain in place is clean of debris, concrete, rust, or other substances that may affect bond to new concrete.

Achieve SSD substrate condition prior to concrete placement.

Mathc all existing backwall/wingwall breakbacks.

Install drilled shafts in accordance with Item 416 "Drilled Shaft Foundations" and the "COMMON FOUNDATION DETAILS" standard sheets.

STATE OF TEXAS
AMINTA M. FLORES
149681
LICENSED PROFESSIONAL ENGINEER

Aminta M. Flores

7/3/2024

STATE OF TEXAS
CHRISTOPHER R. GOMEZ
147007
LICENSED PROFESSIONAL ENGINEER

07/03/2024

Signing for Drilled Shaft size and length

Texas Department of Transportation — Bridge Division

WINGWALL REPLACEMENT DETAILS

NBI: 19-019-0-0610-06-109/10

IH30 WB/EB @ US82

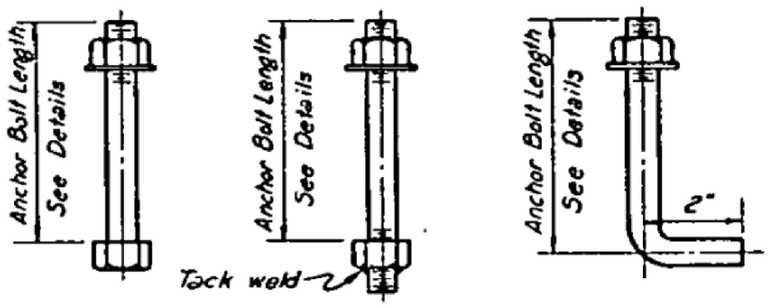
FILE:	DN: AA	CK: CRG	DW: AA	CK: CRG
©TxDOT JULY 2021 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0610	03	104, ETC.	IH 30, ETC.
	DIST	COUNTY		SHEET NO.
	ATL	BOWIE		58

DATE:
FILE:

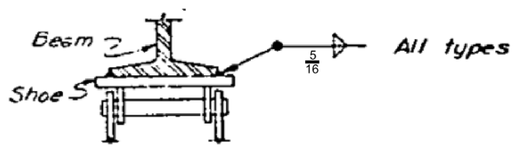
DATE:
FILE:

TABLE OF VARIABLE DIMENSIONS																	Anchor Bolt
Shoe	Wt. (#)	A	B	C	X	Y	E	F	G	H	J	K	L	M	R1	R2	P	
E-80	151	1'-5"	7"	6"	6 ¾"	~	7 ¼"	9"	1 ¾"	11"	3 ¾"	1 ¼"	¾" PL	¾" PL	6"	2"	2-¼" Φ x 1'-1-¼" Pin, ⅜" Cotters	4-¾"

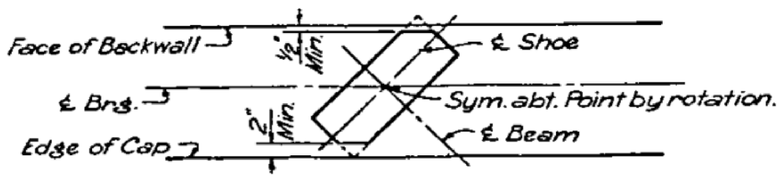
Field verify dimensions of existing bearings to ensure snug fit between top of bearing and bottom flange of beam.



ALTERNATE ANCHOR BOLTS

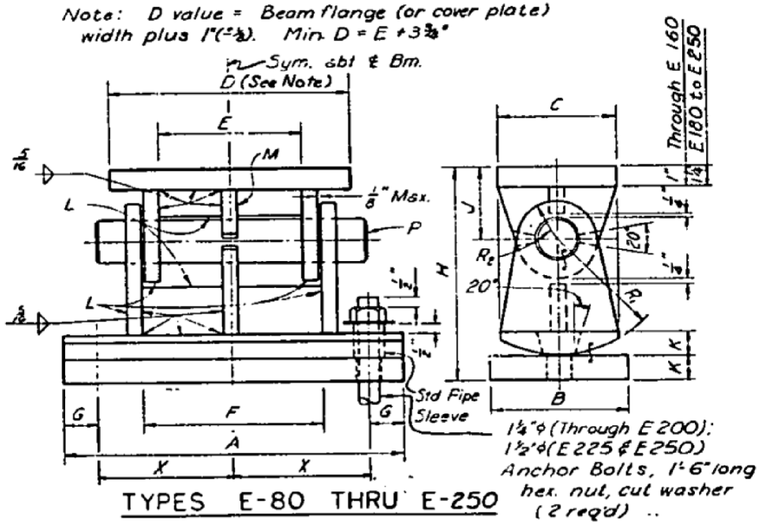


CONNECTION TO BEAM DETAIL

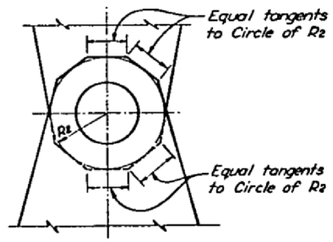


DETAIL OF SHOE @ SKEWED ABUTMENTS
(Cut corners of shoe as required)

Note: D value = Beam flange (or cover plate) width plus 1"(=⅛). Min. D = E + 3⅜"



TYPES E-80 THRU E-250



OPTIONAL METHOD OF FABRICATON

MATERIAL NOTES:

Provide steel shoes conforming to A709 Grade 36.

Reuse existing anchor bolt. If new anchor bolts are required, as determined by the Engineer, provide anchor bolts conforming to ASTM F1554 Grade 105 or ASTM A193 Grade B7.

Provide nuts conforming to ASTM A563 Grade DH, heavy hex or A194 Grade 2H, heavy hex.

Provide washers conforming to ASTM F436.

Provide pipe sleeves conforming to the requirements of ASTM A53 Grade B or A 500 Grade B.

Hot dip galvanize rod, nut, and washer as per Item 445, "Galvanizing." Sizing, drilling, and cleaning rod holes must follow the epoxy manufacturer's directions. Use a Type III (Class C, D, E, or F) epoxy meeting the requirements of DMS-6100, "Epoxies and Adhesives." Mix and dispense adhesive with the manufacturer's static mixing nozzle/dual cartridge system.

GENERAL NOTES:

Replace Rocker Bearings in kind as specified in the plans in accordance with Item 499, "Adjust Steel Shoes".

See span details for bearing type and location.

Submit shop drawings for approval. Dimension rocker bearings to the nearest 1/16" based on required thickness at centerline of bearing and slope of the girder in the finished structure. Thickness tolerance variation from the shop drawings is 1/16" +/-, except the variation from a plane parallel to the theoretical top surface can not exceed 1/16" total.

Install anchor bolt nuts finger-tight or loosely snug.

Adjust and reset steel shoes as specified in the plans in accordance with Item 499, "Adjust Steel Shoes".

Clean and Lubricate existing bearings using National Lubricating Grease Institute (NLGI) No. 2 grease or approved equivalent.

LIFTING NOTES:

1. All work and materials for rocker bearing replacement must be performed and paid for in accordance with Item 499 "Adjusting Steel Shoes". Verify all locations and beam slopes prior to ordering materials.

2. Submit lifting plans and calculations to the Engineer for approval. Design lifting device and supports for live load and dead load with appropriate load factors in accordance with Item 495, "Raising Existing Structures."
   Unfactored loads are as follows:
   DL = 31 kips per beam end
   LL = 56 kips per beam end
   (including impact)

3. Limit lifting to ½" maximum to allow for rocker bearing replacement. Do not damage deck, beams, or cap during any stage of rocker bearing replacement.

4. Supporting falsework on existing bent caps is permitted following requirements of Lifting Note 2 above.

5. Jacking against the slab is not allowed. Jacking from existing bent cap is permitted following requirements of Lifting Note 2 above.

6. Place new rocker bearings relatively plumb for a temperature of 70 degrees F, and lower beams back onto rockers. Weld top of rocker bearing to bottom flange and ensure no gaps exist.

STATE OF TEXAS
CHRISTOPHER R. GOMEZ
147007
LICENSED PROFESSIONAL ENGINEER

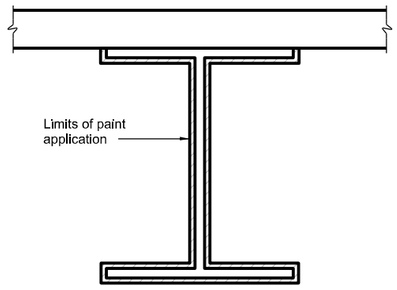
07/03/2024

Texas Department of Transportation | Bridge Division

ROCKER BEARING REPLACEMENT AND ADJUSTMENT DETAILS

NBI: 19-019-0-0610-06-160
NBI: 19-019-0-0610-06-162

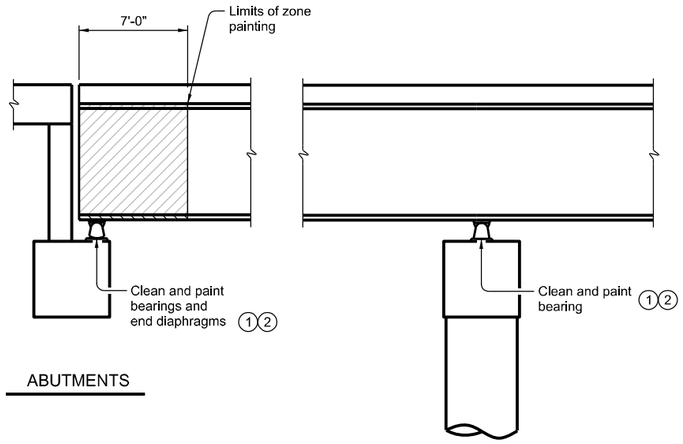
FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2024	CONT	SECT	JOB	HIGHWAY
REVISIONS	0610	03	104, ETC.	IH 30, ETC.
	DIST	COUNTY		SHEET NO.
	ATL	BOWIE		59



STEEL BEAM CROSS SECTION WITH ZONE PAINT LIMITS

(1) Bearings and diaphragms may vary from what is shown.

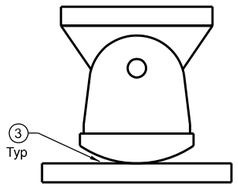
(2) See "Cleaning at Expansion Bearings" detail.



ABUTMENTS

INTERIOR BENTS

(3) Completely remove all debris and pack rust from under bearings before applying special protection system. Use tools and methods that will not damage the existing bearing or cap. Engineer may request demonstration of the tools and methods before beginning work.



CLEANING AT EXPANSION BEARINGS

Existing bearings may differ from those shown.

Dimensions shown are basis of paint estimate but do not define exact limits of repainting. Address deteriorated paint as directed by the Engineer. Painting perimeter does not need to be a vertical plane except on exterior surfaces of exterior beams.

TYPICAL ZONE PAINTING LIMITS

TABLE OF ESTIMATED QUANTITIES FOR ZONE PAINTING (4)

STRUCTURE NUMBER (& FEATURE CROSSED)	BEARINGS (SF)	BEAMS (SF) (5)
19-019-0-0610-06-160	185	3110
19-019-0-0610-06-162	185	3110
TOTAL QUANTITY (SF)	370	6220

(4) Quantities shown are for Contractor's information only.

(5) Quantity includes designated surfaces for a length of 7 feet from abutments for Beams 2-5 and the entire exterior facia surface of Beams 1 and 6.

SPECIAL PROTECTION SYSTEM

DEFAULT:
- Apply 0.5-1.0 mil DFT of penetrating seal to specified surfaces.
- Apply minimum 4.0 mils DFT topcoat to specified surfaces.
- Apply an additional 14-18 WFT protection coat of HRCSA to all exposed bearing surfaces after other coats have cured and in accordance with manufacturer recommendations.

ZONE PAINTING NOTES:

Prepare the surfaces to be cleaned by using hand tools, vacuuming, and water blasting as described in Special Specification 4207, "Steel Bridge Zone Painting" for Default Special Protection System.

Water blast all bearings for a minimum of 1 minute each while moving nozzle to thoroughly clean all surfaces. Keep nozzle no further than 6 inches from the surface. Blast concealed surfaces of end diaphragms below bridge expansion joints.

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

Probe around edges of remaining paint with hand scraper to ensure all delaminated paint is removed.

GENERAL NOTES:

Clean and paint the structure in accordance with Special Specification 4010 "Steel Bridge Zone Painting."

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

The default Special Protection System includes:
- Penetrating Sealer (DMS-8101)
- Top Coat (DMS-8105)

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

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

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

07/03/2024

Texas Department of Transportation | Bridge Division

ZONE PAINTING DETAILS

NBI: 19-019-0-0610-06-160
NBI: 19-019-0-0610-06-162

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	ATL	BOWIE		59A

DATE:
FILE:

DATE: 7/31/2024 4:00:12 PM
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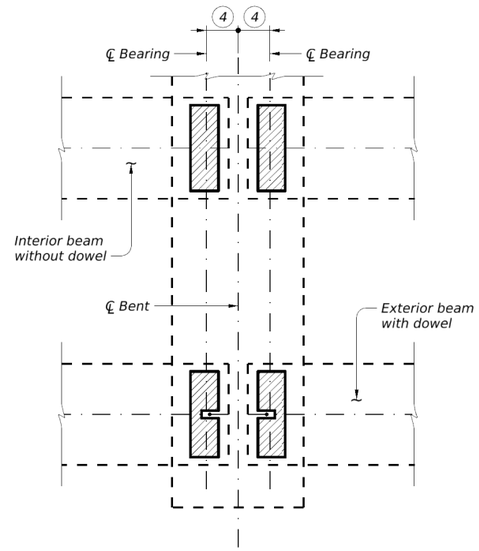
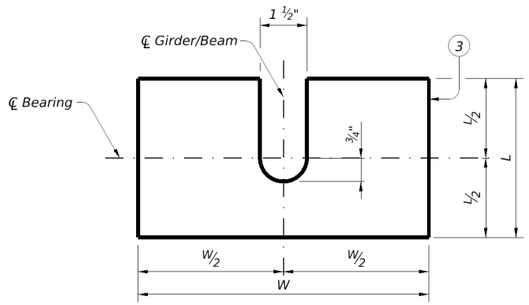
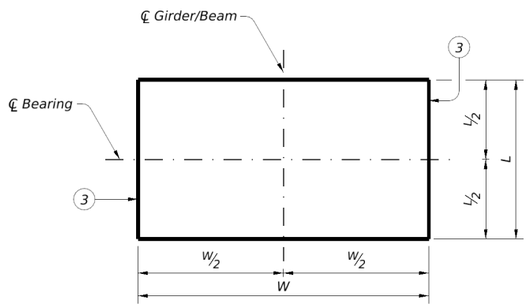


TYPICAL BEARING PAD PLACEMENT



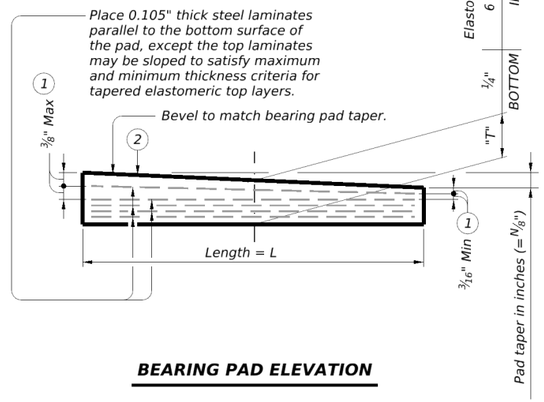
SLOTTED BEARING PAD PLAN

(To be used at locations with dowels)



BEARING PAD PLAN

(To be used at locations without dowels)



BEARING PAD ELEVATION

LAMINATED ELASTOMERIC BEARING REPLACEMENT DETAILS

(50 DUROMETER)

Note: Showing standard bearing pad design. Designer to determine layer thicknesses, pad durometer, and number of layers required and modify detail as needed.

BEARING PAD SUMMARY TABLE

NBI	Bent / Span No.	Dowels (Y/N)	Bearing Pad Dimensions L (inch)	W (inch)	T (inch)	Beam Slope	Bearing Pad Type	Quantity
19-019-0610-06-009	B4:S3	Y	6	19	1 1/8	1.26 %	SLOTTED	9
19-019-0610-06-110	B2:S1	Y	6	19	7/8	1.24 %	SLOTTED	6
	B3:S2	N	6	19	7/8	1.24 %	NON SLOTTED	6
	B4:S3	Y	6	19	1 1/8	1.26 %	SLOTTED	7
	B4:S4	Y	6	19	1 1/8	1.26 %	SLOTTED	7

(1) *Maximum and minimum layer thicknesses shown are for elastomer only, on tapered layers.*

(2) *Indicate BEARING TYPE on all pads. For tapered pads, locate BEARING TYPE on the high side. Include the value of "N" (amount of taper in ⅛" increments) in this mark.*
Examples: N=0, (for 0" taper)
N=1, (for ⅛" taper)
N=2, (for ¼" taper)
(etc.)
Fabricated pad top surface slope must not vary from plan beam slope by more than $\left(\frac{0.0625"}{Length}\right)$ *IN/IN.*

(3) *Locate permanent mark here.*

(4) *Match existing location.*

LIFTING NOTES:

1. All work and materials for bearing pad replacement must be performed and paid for in accordance with Item 787. "Replacing Elastomeric Bearing Pads." Verify all locations and beam slopes prior to ordering materials.

2. Submit lifting plans and calculations to the Engineer for approval. Design lifting device and supports for live load and dead load with appropriate load factors in accordance with Item 495, "Raising Existing Structures."
Unfactored loads are as follows:
DL = 54 kips per beam end
LL = 58 kips per beam end
(including impact)

3. Limit lifting to ½" maximum to allow for pad replacement. Note that dowels may restrain existing pads. Do not damage deck, beams, or cap during any stage of bearing pad replacement.

4. Supporting falsework on existing bent caps is permitted following requirements of Lifting Note 2 above.

5. Jacking against the slab is not allowed. Jacking from existing bent cap is permitted following requirements of Lifting Note 2 above.

6. Place new bearing pads and lower beams back onto pads. Ensure that all new bearing pads compress when jacking force is removed. If load is not transferred as intended, place steel shims under pad or use epoxy injection or grout mixture as specified in Article 784.4.3 to properly engage bearing pad and transfer load.

Live load is permitted on the bridge only after the structure has been raised and is supported by cribbing or temporary supports.

GENERAL NOTES:

Replace existing bearings per Item 787, "Replacing Elastomeric Bearing Pads."
Raise the existing span in accordance with Item 495, "Raising Existing Structures." The work performed to raise the spans or girders in accordance with Item 495 will not be paid for directly but is considered subsidiary to Item 787-7001. Existing pads may be cut to facilitate removal.
Following installation of new bearing pad apply stripe coat of Type V epoxy at interface of pad and concrete pedestal to secure pad.

STATE OF TEXAS
TIMOTHY D. BERRY
95595
LICENSED
PROFESSIONAL ENGINEER

Timothy Berry, P.E.
7-31-2024

Texas Department of Transportation | Bridge Division

ELASTOMERIC BEARING REPLACEMENT DETAILS FOR CONCRETE BEAMS

NBI: 19-019-0610-06-109
NBI: 19-019-0610-06-110

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REVISIONS	0610	03	104, ETC.	IH 30, ETC.
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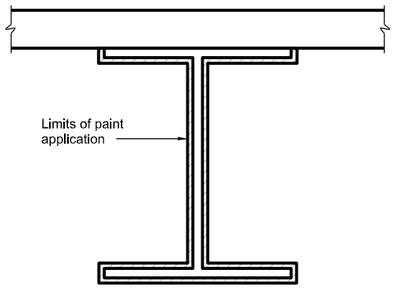
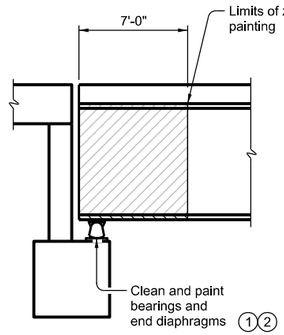
	ATL	TITUS, ETC.		60



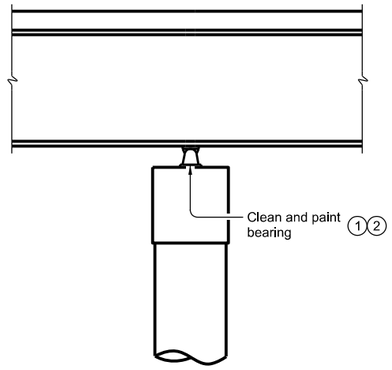
STEEL BEAM CROSS SECTION WITH ZONE PAINT LIMITS

(1) Bearings and diaphragms may vary from what is shown.

(2) See "Cleaning at Expansion Bearings" detail.

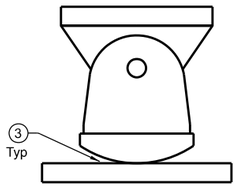


ABUTMENTS



INTERIOR BENTS

(3) Completely remove all debris and pack rust from under bearings before applying special protection system. Use tools and methods that will not damage the existing bearing or cap. Engineer may request demonstration of the tools and methods before beginning work.



CLEANING AT EXPANSION BEARINGS

Existing bearings may differ from those shown.

Dimensions shown are basis of paint estimate but do not define exact limits of repainting. Address deteriorated paint as directed by the Engineer. Painting perimeter does not need to be a vertical plane except on exterior surfaces of exterior beams.

TYPICAL ZONE PAINTING LIMITS

TABLE OF ESTIMATED QUANTITIES FOR ZONE PAINTING (4)

STRUCTURE NUMBER (& FEATURE CROSSED)	BEARINGS (SF)	BEAMS (SF) (5)
19-019-0-0610-06-160	185	3110
19-019-0-0610-06-162	185	3110
TOTAL QUANTITY (SF)	370	6220

(4) Quantities shown are for Contractor's information only.

(5) Quantity includes designated surfaces for a length of 7 feet from abutments for Beams 2-5 and the entire exterior facia surface of Beams 1 and 6.

SPECIAL PROTECTION SYSTEM

DEFAULT:
- Apply 0.5-1.0 mil DFT of penetrating seal to specified surfaces.
- Apply minimum 4.0 mils DFT topcoat to specified surfaces.
- Apply an additional 14-18 WFT protection coat of HRCSA to all exposed bearing surfaces after other coats have cured and in accordance with manufacturer recommendations.

ZONE PAINTING NOTES:

Prepare the surfaces to be cleaned by using hand tools, vacuuming, and water blasting as described in Special Specification 4010 "Steel Bridge Zone Painting" for Default Special Protection System.

Water blast all bearings for a minimum of 1 minute each while moving nozzle to thoroughly clean all surfaces. Keep nozzle no further than 6 inches from the surface. Blast concealed surfaces of end diaphragms below bridge expansion joints.

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

Probe around edges of remaining paint with hand scraper to ensure all delaminated paint is removed.

GENERAL NOTES:

Clean and paint the structure in accordance with Special Specification 4010 "Steel Bridge Zone Painting."

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

The default Special Protection System includes:
- Penetrating Sealer (DMS-8101)
- Top Coat (DMS-8105)

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

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

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

07/17/2024

Texas Department of Transportation | Bridge Division

ZONE PAINTING DETAILS

NBI: 19-019-0-0610-06-160
NBI: 19-019-0-0610-06-162

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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	DIST	COUNTY		SHEET NO.
	ATL	TITUS, ETC.		61

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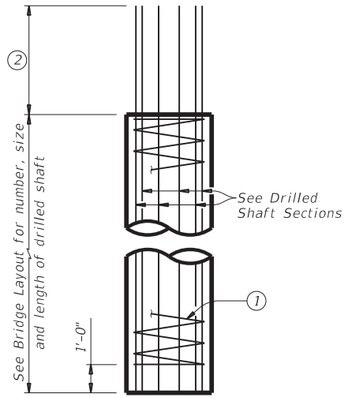
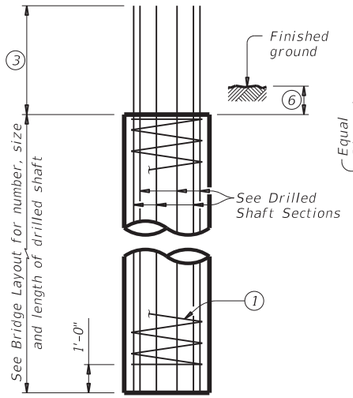
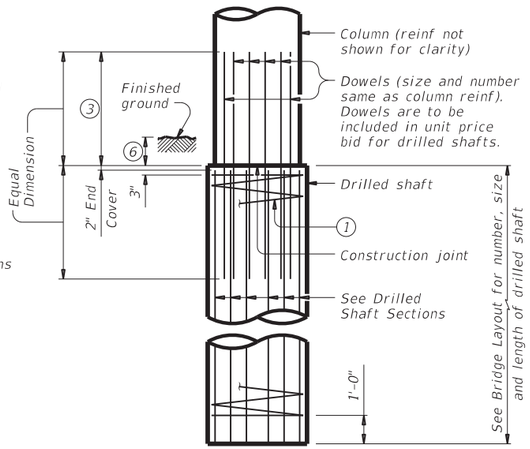


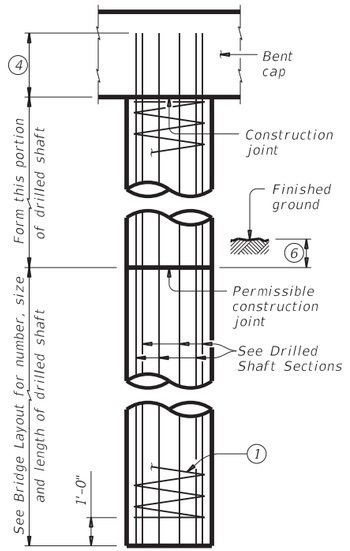
ABUTMENTS, WINGWALLS AND MULTI-DRILLED SHAFT FOOTINGS



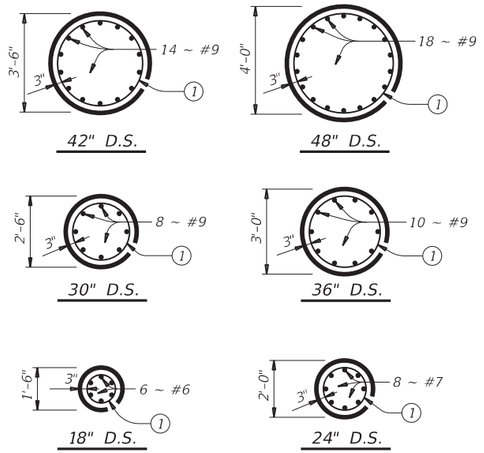
INTERIOR BENTS DRILLED SHAFT DIA EQUAL TO COLUMN DIA



INTERIOR BENTS DRILLED SHAFT DIA GREATER THAN COLUMN DIA



OPTIONAL INTERIOR BENT DRILLED SHAFT DETAIL (5)

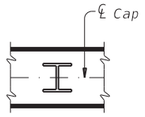


DRILLED SHAFT SECTIONS

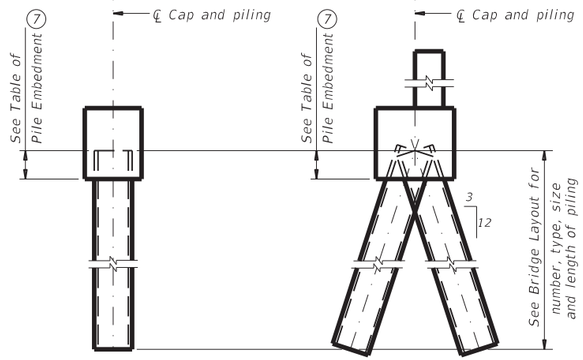
DRILLED SHAFT DETAILS

TABLE OF PILE EMBEDMENT	
Pile Type	Embedment Depth (Ft)
16" Sq Concrete 18" Sq Concrete HP14 Steel HP16 Steel	1'-0"
20" Sq Concrete 24" Sq Concrete HP18 Steel	1'-6"

See Prestressed Concrete Piling (CP) standard for additional details on concrete pile embedment.



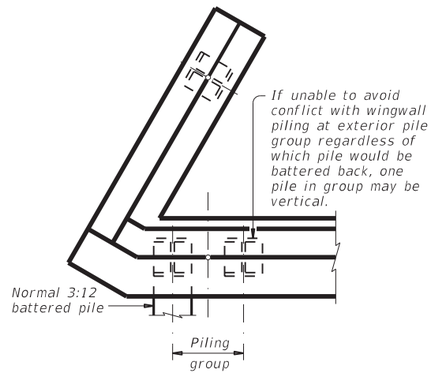
ORIENTATION OF STEEL H-PILING



VERTICAL PILE BATTERED PILE

PILING DETAILS

(Concrete or steel H)



DETAIL "A"

(Showing plan view of a 30° skewed abutment)

(1) #3 spiral at 6" pitch (one and a half flat turns top and bottom).

(2) Min extension into supported element:
#6 Bars = 1'-8"
#7 Bars = 2'-0"
#9 Bars = 2'-3"

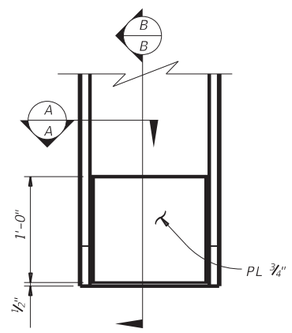
(3) Min lap with column reinf:
#7 Bars = 2'-11"
#9 Bars = 3'-9"
#11 Bars = 4'-8"

(4) Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-3"
#9 Bars = 2'-9"

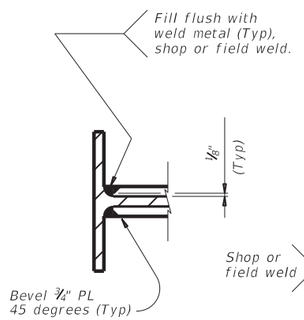
(5) Drilled shafts may extend to the bottom of bent caps for "H" heights of 6 ft and less (as shown on the Bridge Layout), if approved. This option can only be used when the drilled shaft diameter equals the column diameter. Obtain approval of the forming method above the ground line prior to construction. No adjustments in payment will be made if this option is used.

(6) 1'-0" Min, unless shown otherwise on plans.

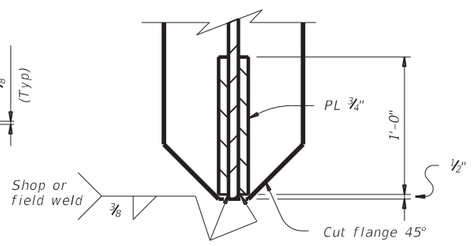
(7) Or as shown on plans.



ELEVATION



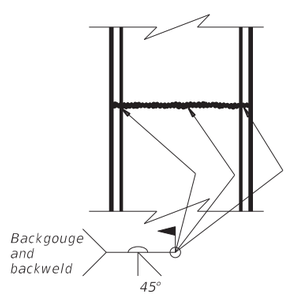
SECTION A-A



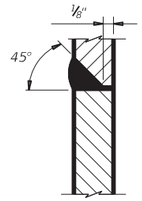
SECTION B-B

STEEL H-PILE TIP REINFORCEMENT

See Item 407 "Steel Piling" to determine when tip reinforcement is required and for options to the details shown.



SECTION THRU FLANGE OR WEB



STEEL H-PILE SPLICE DETAIL

Use when required.

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

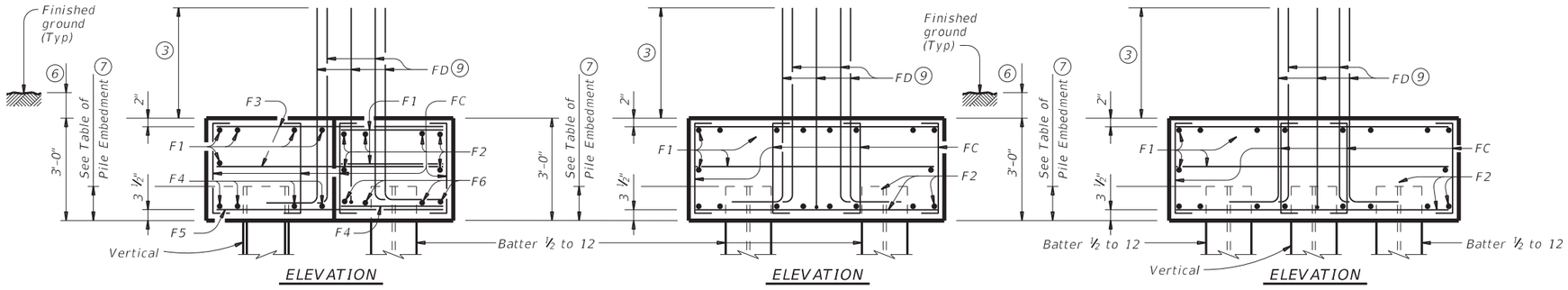
COMMON FOUNDATION DETAILS

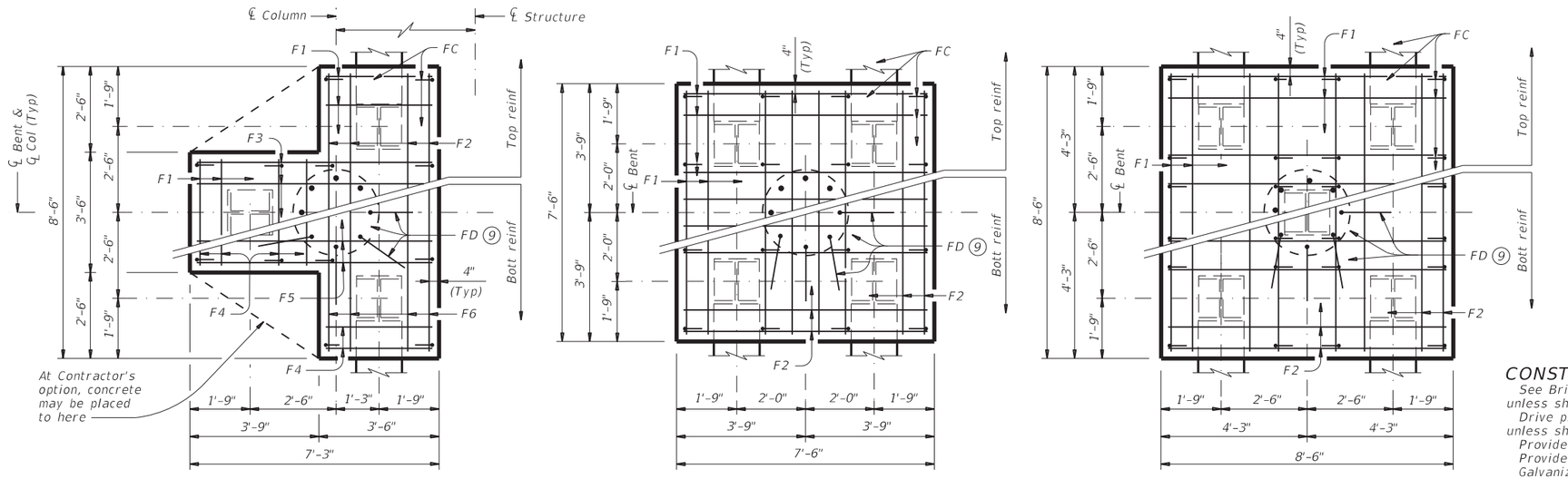
FD (MOD)

STATE OF TEXAS
AHMED J. AL-BASHA
151646
LICENSED PROFESSIONAL ENGINEER

05/01/2024

FILE:	DN: AA	CK: CRG	DW: AA	CK: CRG
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0610	03	104, ETC.	IH 30, ETC.
01-20: Added #11 bars to the FD bars. 4/29/2024 – Modified min. extension into supported element for #6 bars from 1'-11" to 1'-8"	DIST	COUNTY		SHEET NO.
	ATL	TITUS, ETC.		62





THREE PILE FOOTING (8)

For 36" Dia and smaller columns.

FOUR PILE FOOTING (8)

For 42" Dia and smaller columns.

FIVE PILE FOOTING (8)

For 42" Dia and smaller columns.

TABLE OF FOOTING QUANTITIES FOR 30" COLUMNS

ONE 3 PILE FOOTING				
Bar	No.	Size	Length	Weight
F1	11	#4	3'- 2"	23
F2	6	#4	8'- 2"	33
F3	6	#4	6'- 11"	28
F4	8	#9	3'- 2"	86
F5	4	#9	6'- 11"	94
F6	4	#9	8'- 2"	111
FC	12	#4	3'- 6"	28
FD (10)	8	#9	8'- 1"	220
Reinforcing Steel			Lb	623
Class "C" Concrete			CY	4.8

ONE 4 PILE FOOTING				
Bar	No.	Size	Length	Weight
F1	20	#4	7'- 2"	96
F2	16	#8	7'- 2"	306
FC	16	#4	3'- 6"	37
FD (10)	8	#9	8'- 1"	220
Reinforcing Steel			Lb	659
Class "C" Concrete			CY	6.3

ONE 5 PILE FOOTING				
Bar	No.	Size	Length	Weight
F1	20	#4	8'- 2"	109
F2	16	#9	8'- 2"	444
FC	24	#4	3'- 6"	56
FD (10)	8	#9	8'- 1"	220
Reinforcing Steel			Lb	829
Class "C" Concrete			CY	8.0

CONSTRUCTION NOTES:

See Bridge Layout for foundation type required. Use these foundation details unless shown otherwise.

Drive piling under abutment wingwalls to a minimum resistance of 10 Tons/Pile unless shown otherwise.

Provide Class C Concrete (f'c = 3,600 psi), unless shown otherwise.

Provide Grade 60 reinforcing steel.

Galvanize reinforcing if shown elsewhere in the plans.

Provide bar laps for drilled shaft reinforcing, where required, as follows:

Uncoated or galvanized (#6) ~ 2'-6"
Uncoated or galvanized (#7) ~ 2'-11"
Uncoated or galvanized (#9) ~ 3'-9"

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

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

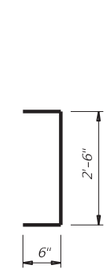
DESIGNER NOTES:

Do not use the drilled shaft details shown on this standard for retaining wall, noise wall, barrier, or sign foundations without structural evaluation.

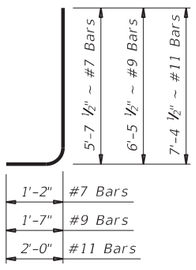
Do not use the footings shown on this standard in direct contact with salt water or exposed to salt water spray.

Maximum allowable pile loads for the footings shown are:

72 Tons/Pile with 24" Dia Columns
80 Tons/Pile with 30" Dia Columns
100 Tons/Pile with 36" Dia Columns
120 Tons/Pile with 42" Dia Columns



BARS FC



BARS FD (9)

(3) Min lap with column reinforcing:
#7 Bars = 2'-11"
#9 Bars = 3'-9"
#11 Bars = 4'-8"

(6) 1'-0" Min, unless shown otherwise on plans.

(7) Or as shown on plans.

(8) See Bridge Layout for type, size and length of piling.

(9) Number and size of FD bars must match column reinforcing. Tie FD bars to the top of the bottom reinforcing mat.

(10) Adjust FD quantity, size and weight as needed to match column reinforcing.

05/01/2024

SHEET 2 OF 2

Texas Department of Transportation

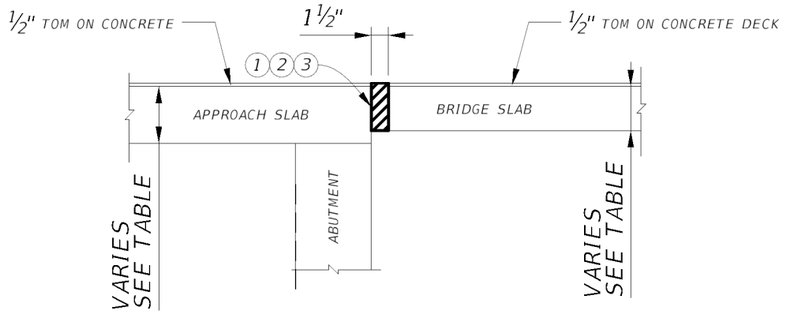
Bridge Division Standard

COMMON FOUNDATION DETAILS

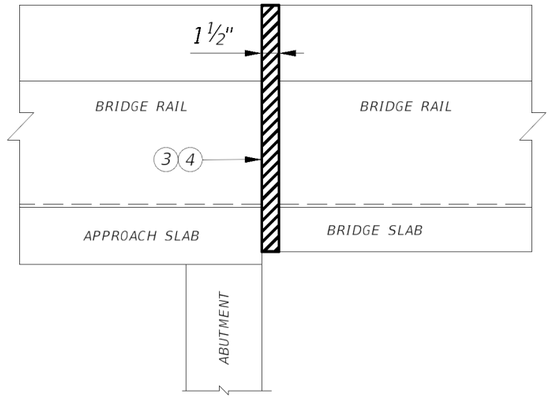
FD (MOD)

FILE:	DN: AA	CK: CRG	DW: AA	CK: CRG
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0610	03	104, ETC.	IH 30, ETC.
01-20: Added #11 bars to the FD bars.	DIST	COUNTY		SHEET NO.
	ATL	TITUS, ETC.		63

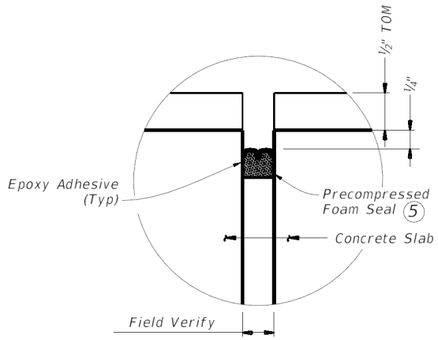
DATE:
FILE:



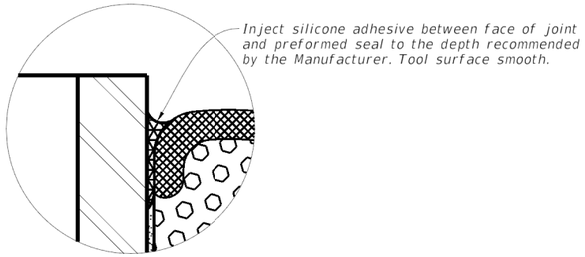
LOCATION OF SAW CUT THROUGH DECK/APPROACH SLAB



LOCATION OF SAW CUT THROUGH APPROACH RAIL



PRECOMPRESSED FOAM WITH SILICONE SEAL JOINT DETAIL 6



SILICONE INJECTION DETAIL

1. Saw cut a 1-½" wide joint, full-depth into the slab, the entire width of the bridge. See "PRECOMPRESSED FOAM WITH SILICONE SEAL JOINT DETAIL".
2. Paint all cut reinforcement with two coats of a zinc-rich paint conforming to Item 445 "Galvanizing".
3. Ensure that the newly saw-cut deck joints align with the cut ends of the approach rails.
4. Saw cut 1-½" inches of the approach rail. Apply a silane penetrating sealant to all cut faces of railing followed by neat Type VIII epoxy a minimum of 48 hours after silane is applied.
5. See "TABLE OF APPROVED FOAM SEAL MANUFACTURERS".
6. Follow minimum and maximum installation temperatures according to manufacturers recommendations.

PROCEDURE FOR CLEANING AND SEALING JOINT WITH PRECOMPRESSED FOAM WITH SILICONE SEAL:

1) Clean joint opening of dirt and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints."
2) Correctly size joint seal based on field measurement and in accordance with Manufacturer's specifications. Multiple seal widths may be required. Ensure proper seal is selected for each joint.
3) Abrasive blast clean newly saw-cut joint surfaces where seal is to be applied.
4) Wipe down joint surfaces to remove contaminants.
5) Mask areas adjacent to joint opening sufficiently to keep epoxy off deck surface.
6) Apply epoxy to joint opening side surfaces.
7) While epoxy is still tacky, remove shrink wrap from seal and install in joint opening.
8) Inject silicone adhesive along top interface of seal with joint side surface according to Manufacturer's recommendations. Tool to spread adhesive as necessary. See "SILICONE INJECTION DETAIL".

CONSTRUCTION NOTES:

Submit a detailed concrete repair procedure for approval prior to commencing work. All concrete repairs shall be performed in accordance with Item 429 and Chapter 3, Section 2 and 3 of TxDOT's Concrete Repair Manual. A copy of the Concrete Repair Manual must be available on site during all repair operations.

Remove all damaged or loose concrete without damaging surrounding sound concrete that is to remain in place. Only use hand tools or power-driven chipping hammers (15 lb max) to remove concrete, unless otherwise approved by the Engineer.

Clean all reinforcing steel exposed after concrete removal and saw-cutting operations.

Form and pour rail repairs to maintain the existing rails' cross section.

Additional damage caused to the structure during repair operations must be repaired at the Contractor's expense.

GENERAL NOTES:

Cleaning and preparing the newly saw-cut joint opening (full depth) of all debris, saw-cutting joint opening, and sealing joint is paid for by Item 438, "Cleaning and Sealing Joints" and measured by the foot of "Cleaning and Sealing of Existing Joints."

Obtain approval for all tools, equipment, materials and techniques proposed for use to prepare the joint.

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 3 inches on low side or sides of deck.Prepare surfaces where sealant is to be placed in accordance with manufacturer's specifications.

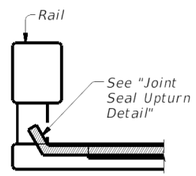
Saw cutting of rails is subsidiary to Item 438, "Cleaning and Sealing Joints (Foam)".

APPROVED PRECOMPRESSED FOAM SEAL MANUFACTURERS

Manufacturer (B)	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
TuffTex	As shown	RepJoint PF-UV

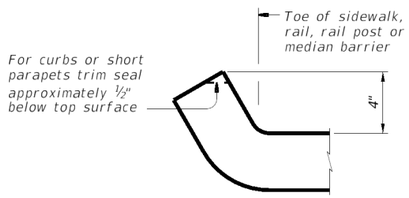
(A) Injection depth as recommended by Manufacturer.

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



AT CONCRETE BRIDGE RAIL

JOINT SEALANT TERMINATION DETAILS



JOINT SEAL UPTURN DETAIL

Texas Department of Transportation — Bridge Division

BRIDGE REPAIR DETAIL

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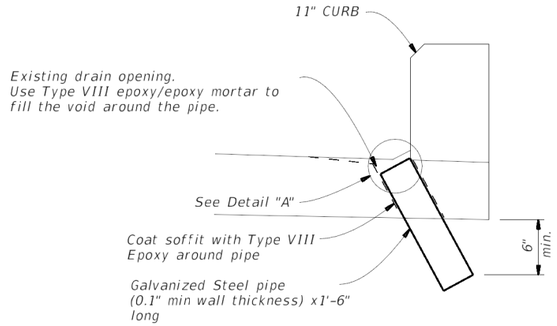
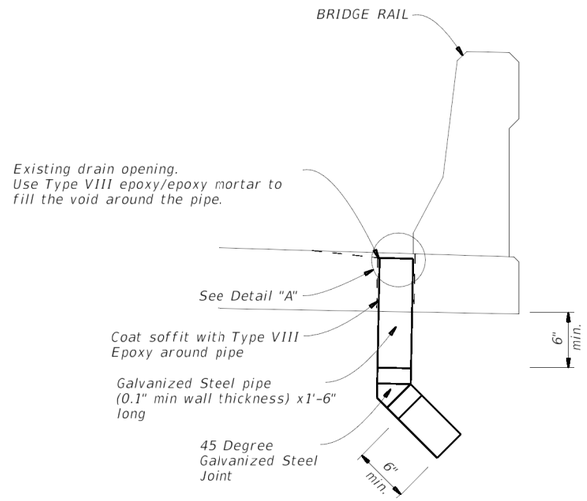
©TxDOT JULY 2021	CONT	SECT	JOB		HIGHWAY
REVISIONS	0610	03	104, ETC.		IH 30, ETC.
	DIST	COUNTY			SHEET NO.
	ATL	TITUS, ETC.			64

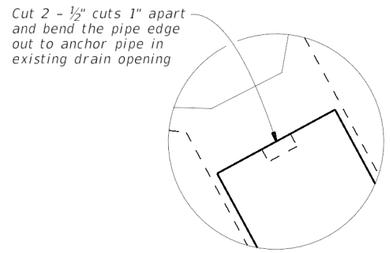
DATE:
FILE:



OPTION 1 - CURB DRAIN



OPTION 2 - BRIDGE RAIL



DETAIL "A"

TABLE OF ESTIMATED QUANTITIES (DRAINS)

STRUCTURE CSJ (FEATURE CROSSED)	OPTIONS 1 OR 2	PIPE SIZE (IN X IN)	ITEM	DESCRIPTION	NUMBER OF DRAINS	TOTAL QUANTITY (LF)
0610-03-107 TANKERSLEY CREEK	1	4 X 6	0481-7048	GAL PIPE (4" X 6")	12	18
0610-06-099 IH 30 AT CR 4008 (WB)	2	4 X 6	0481-7048	GAL PIPE (4" X 6")	14	35
0610-06-100 IH 30 AT CR 4008 (EB)	2	4 X 6	0481-7048	GAL PIPE (4" X 6")	14	35
0610-06-101 IH 30 AT US 82 (WB)	2	4 X 6	0481-7048	GAL PIPE (4" X 6")	12	30
0610-06-102 IH 30 AT US 82 (EB)	2	4 X 6	0481-7048	GAL PIPE (4" X 6")	12	30

Texas Department of Transportation — Bridge Division

BRIDGE DRAIN
(MOD)

FILE: WD-CSBJ-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS May 2024	0610	03	104, ETC.	IH 30, ETC.
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	ATL	TITUS, ETC.		65

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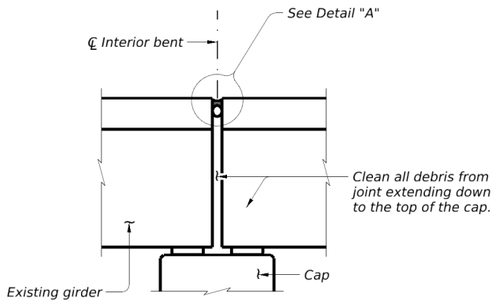
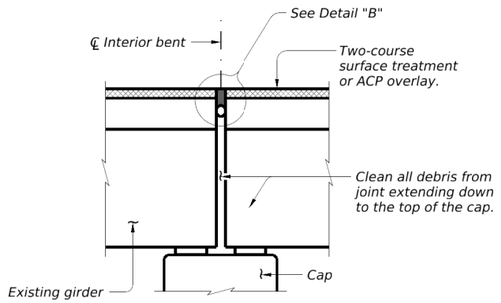


JOINT WITH SILICONE SEAL

(Used without ACP overlay)



JOINT W/ HOT-POURED RUBBER SEAL

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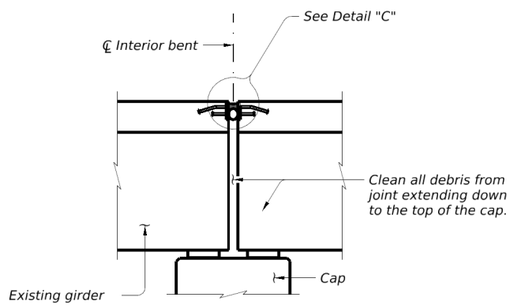
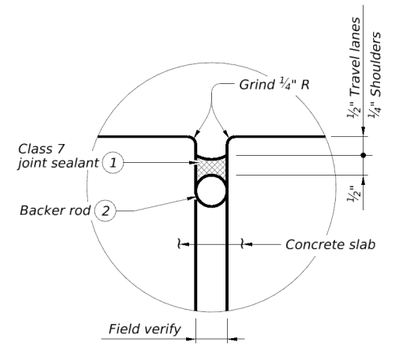


ARMOR JOINT

(Used without ACP overlay)

APPROVED PRECOMPRESSED FOAM SEAL MANUFACTURERS

MANUFACTURER	SEAL TYPE
Watson Bowman Acme	Wabo FS
SSI	Silspec SES
Sealtite	Sealtite 50N
EMSEAL	BEJS
TuffTex	RepJoint PF-UV



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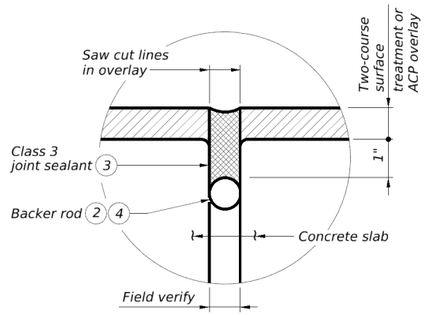

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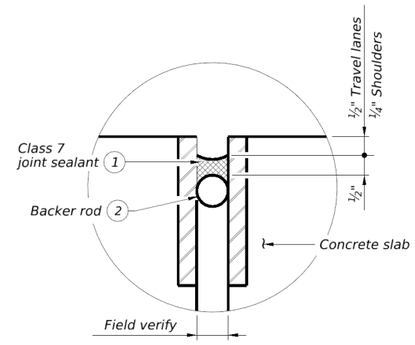


DETAIL "C"

(Stud anchors not shown for clarity.)

1. Use Class 7 joint sealant in accordance with DMS-6310, "Joint Sealants and Fillers." Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Joints."
2. Provide backer rod 25% larger than joint opening and compatible with the sealant. Use of multiple pieces to create a backer rod cross section is not permitted. Top of backer rod must be convex as shown.
3. Use Class 3 joint sealant in accordance with DMS-6310, "Joint Sealants and Fillers". Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Joints."
4. Backer rod must be compatible with the hot poured rubber sealant and rated for a minimum of 400°F.

PROCEDURE FOR CLEANING AND SEALING EXISTING JOINT WITH SILICONE SEAL:

1) Clean joint opening of all existing expansion materials/devices, dirt, and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints." Clean joint out full depth of the joint.
2) Obtain approval of cleaned joint prior to proceeding with joint sealing operation.
3) Place backer rod into joint opening 1" below the top of concrete. When sealing joints for slab spans, slab beam spans, or box beam spans, fill void below backer rod with extruded polystyrene foam before placing backer rod.
4) Seal the joint opening with a Class 7 joint sealant. Recess seal ½" below top of concrete in travel lanes and ¼" below top of concrete in shoulders.

PROCEDURE FOR CLEANING AND SEALING EXISTING JOINT WITH HOT-POURED RUBBER SEAL:

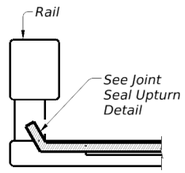
1) Saw cut through the asphalt at the centerline of joint. Make multiple saw cuts to create a ½" minimum joint opening or match the existing joint opening. Clean joint opening of all old expansion materials/devices, bituminous materials, dirt, grease and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints." Clean joint out full depth of the joint.
2) Obtain approval of cleaned joint prior to proceeding with joint sealing operation.
3) Place backer rod into joint opening 1" below the top of concrete. When sealing joints for slab spans, slab beam spans, or box beam spans, fill void below backer rod with extruded polystyrene foam before placing backer rod.
4) Seal the joint opening with a Class 3 joint sealant. Seal flush to the top of the asphaltic concrete pavement.

PROCEDURE FOR CLEANING AND SEALING EXISTING ARMOR JOINTS:

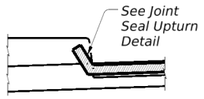
1) Remove existing seal, if present. Clean joint opening of all dirt and other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints." Clean joint out full depth of the joint.
2) Abrasive blast clean existing steel surface where silicone seal is to be placed.
3) Obtain approval of cleaned joint prior to proceeding with joint sealing operation.
4) Place backer rod into joint opening 1" below the top of concrete. When sealing joints for slab spans, slab beam spans, or box beam spans, fill void below backer rod with extruded polystyrene foam before placing backer rod.
5) Seal the joint opening with a Class 7 joint sealant. Recess seal ½" below top of concrete in travel lanes and ¼" below top of concrete in shoulders.

GENERAL NOTES:

Cleaning existing joint opening (full depth) of all debris, providing and placing backer rod, saw-cutting asphalt overlay, and sealing joint is paid for by Item 438, "Cleaning and Sealing Joints" and measured by the linear foot.
Obtain approval for all tools, equipment, materials and techniques proposed to clean and seal the joint.
Provide Class 3 joint sealant in accordance with DMS-6310, "Joint Sealants and Fillers" for joints in asphalt overlay.
Provide Class 7 joint sealant in accordance with DMS-6310, "Joint Sealants and Fillers" for joints in concrete.
Extend sealant up into rail or curb 3 inches on low side or sides of deck. If the Class 7 joint sealant cannot be effectively placed in the vertical position, a Class 4 joint sealant compatible with the Class 7 joint sealant is allowed for the extension of the seal into the curb or rail. Prepare surfaces where sealant is to be placed in accordance with Manufacturer's specifications.

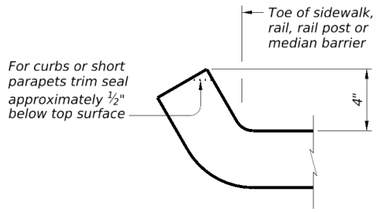


CONCRETE BRIDGE RAIL



SIDEWALK

JOINT SEALANT TERMINATION DETAILS



JOINT SEAL UPTURN DETAIL

Texas Department of Transportation — Bridge Division

CLEANING AND SEALING EXISTING BRIDGE JOINTS (MOD)

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© TxDOT February 2024	CONT.	SECT	JOB	HIGHWAY
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	ATL	TITUS, ETC.		66

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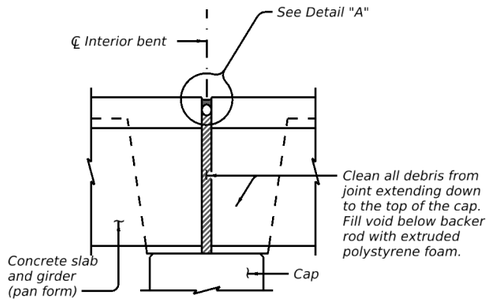

JOINT WITH SILICONE SEAL

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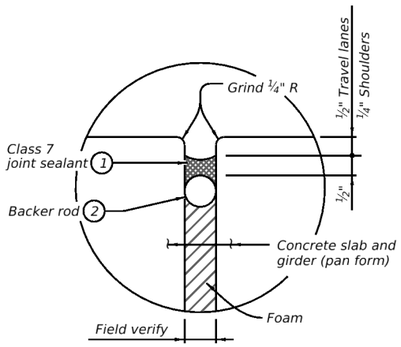


DETAIL "A"

PROCEDURE FOR CLEANING AND SEALING EXISTING CONCRETE GIRDER JOINT WITH SILICONE SEAL:

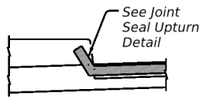
1) Clean joint opening of all existing expansion materials/devices, dirt, and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints." Clean joint out full depth of the joint.

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

3) Fill void with extruded polystyrene foam.

4) Place backer rod into joint opening 1" below the top of concrete.

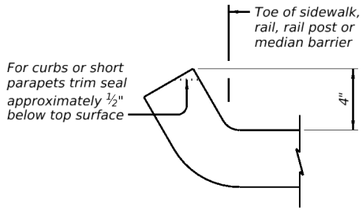
5) Seal the joint opening with a Class 7 joint sealant. Recess seal ½" below top of concrete in travel lanes and ¼" below top of concrete in shoulders.



SHOWN AT CURB

JOINT SEALANT TERMINATION DETAILS

(9) 1 ½" for precompressed foam and silicone seal



JOINT SEAL UPTURN DETAIL

(1) Use Class 7 joint sealant. Prepare joint and seal in accordance with Item 438, "Cleaning and Sealing Joints."

(2) Provide backer rod 25% larger than joint opening and compatible with the sealant. Use of multiple pieces to create a backer rod cross section is not permitted. Top of backer rod must be convex as shown.

GENERAL NOTES:

Cleaning existing joint opening (full depth) of all debris, providing and placing backer rod, saw-cutting asphalt overlay, and sealing joint is paid for by Item 438, "Cleaning and Sealing Joints" and measured by the linear foot.

Obtain approval for all tools, equipment, materials and techniques proposed to clean and seal the joint.

Provide Class 3 joint sealant in accordance with DMS-6310, "Joint Sealants and Fillers" for joints in asphalt overlay.

Provide Class 7 joint sealant in accordance with DMS-6310, "Joint Sealants and Fillers" for joints in concrete.

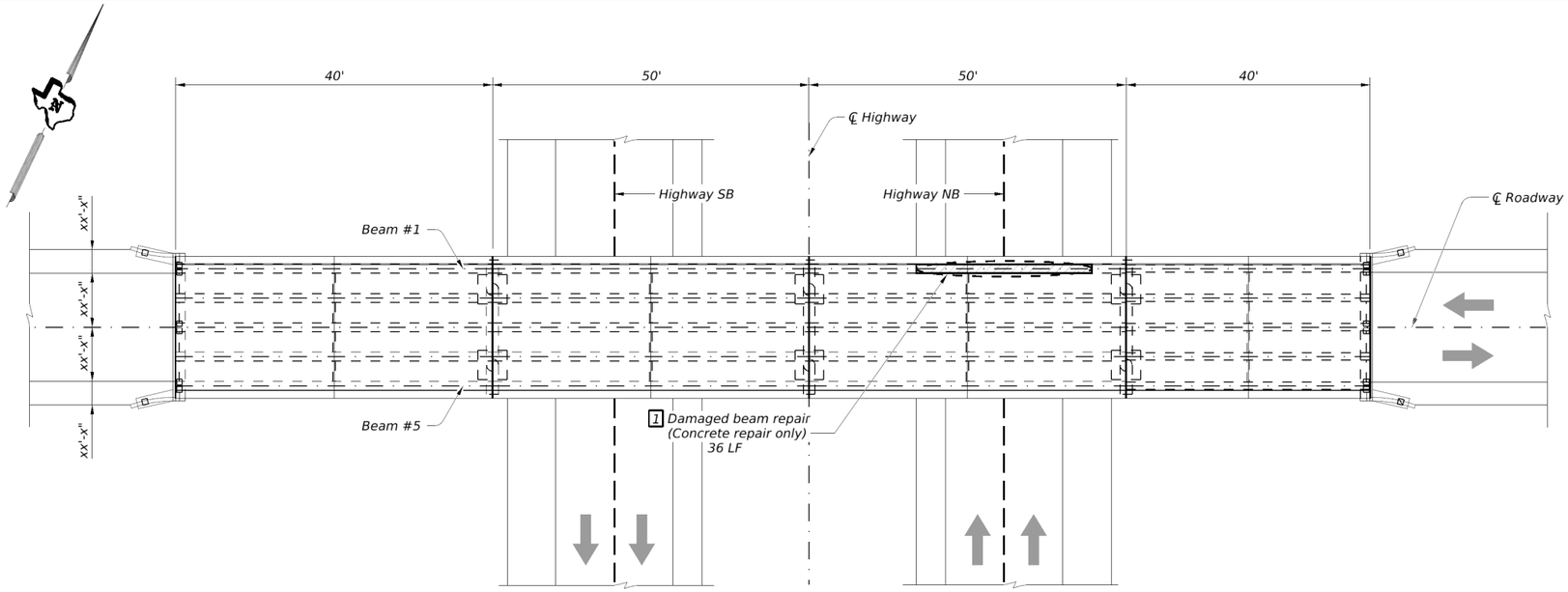
Extend sealant up into rail or curb 3 inches on low side or sides of deck. If the Class 7 joint sealant cannot be effectively placed in the vertical position, a Class 4 joint sealant compatible with the Class 7 joint sealant is allowed for the extension of the seal into the curb or rail. Prepare surfaces where sealant is to be placed in accordance with Manufacturer's specifications.

Texas Department of Transportation | Bridge Division

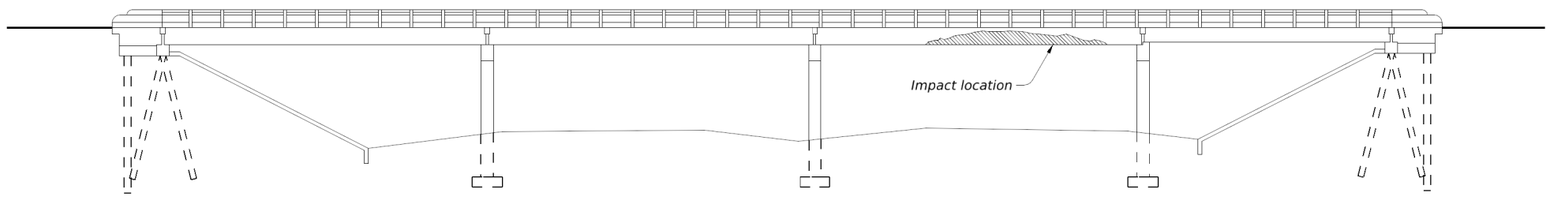
CLEANING AND SEALING EXISTING BRIDGE JOINTS (MOD)

(PAN GIRDER BRIDGES)

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2024	CONT	SECT	JOB	HIGHWAY
REVISIONS May 2024	0610	03	104, ETC.	IH 30, ETC.
	DIST	COUNTY		SHEET NO.
	ATL	TITUS, ETC.		67



PLAN



ELEVATION

TABLE OF ESTIMATED QUANTITIES

Item	Description	Unit	Quantity
0788-7001	CONCRETE BEAM REPAIR	EA	1

1 Item 788-7001, "Concrete Beam Repair"

MATERIAL NOTES:

Submit detailed concrete repair procedure for approval prior to beginning work.

Choose a FRP system prequalified for Structural Member Protection that meets the requirements of DMS 4700, "Externally Bonded Fiber Reinforced Polymer (FRP) System for Repairing and Strengthening Concrete Structure Members."

Perform CFRP pull-off test according to Item 786, "Carbon Fiber Reinforced Polymer" in the presence of the Engineer.

Use concrete repair materials listed on the current Material Producer List for DMS 4655 with a minimum 3-day compressive strength of 3,000 psi and a 28-day compressive strength of 6,000 psi for the repairs as approved by the Engineer.

GENERAL NOTES:

Verify impact damage locations and extents prior to starting work.

Immediately notify the Engineer if any discrepancies are noted between the plans and actual conditions.

Refer to TxDOT's Concrete Repair Manual, Chapter 3, Section 5 for details on Epoxy Injection.

All work for repairing and protecting the beam is paid for in accordance with Item 788, "Concrete Beam Repair."

The strand-splice assembly and dimensions depicted in the repair detail are for the GRABB-IT Cable Splice system as sold by Prestress Supply, Inc. Contractor may propose other strand-splice systems to Engineer for approval.

Damage locations and quantities are based on field assessment performed on 03/18/2024. Verify extent of damage and repairs prior to proceeding. Immediately notify Engineer if any discrepancies are noted between the plans and actual conditions.

Submit detailed repair procedures, including proposed proprietary materials, for approval prior to beginning work.

Perform work in accordance with the "TxDOT Concrete Repair Manual," Item 788, "Concrete Beam Repair" and the details shown in the plans.

LOAD RATING INFORMATION

Repairs performed in accordance with the details shown will result in the following superstructure load ratings:

Operating: HS 42
Inventory: HS 25

Texas Department of Transportation

Bridge Division

PRESTRESSED CONCRETE BEAM REPAIR DETAILS

NBI: 19-225-0-0610-03-057

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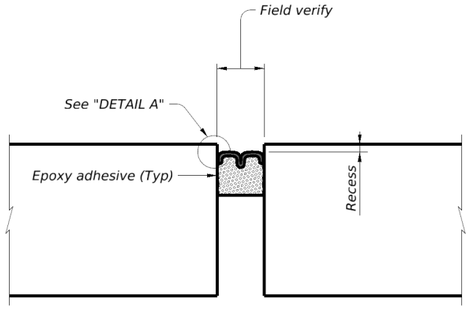
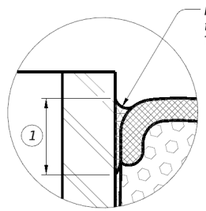
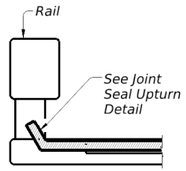


CONCRETE NOSING

JOINT SECTIONS

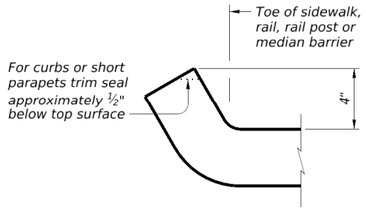


DETAIL A



CONCRETE BRIDGE RAIL

JOINT SEALANT TERMINATION DETAILS



JOINT SEAL UPTURN DETAIL

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
TuffTex	As shown	RepJoint PF-UV

(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.

CONSTRUCTION NOTES:

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

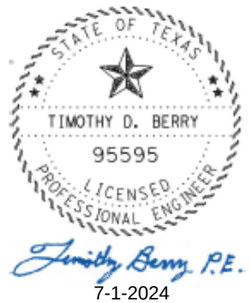
Splice and install seal in accordance with the Manufacturer's directions and with the adhesive provided by the Manufacturer.

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

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."



7-1-2024

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Bridge Division

PRECOMPRESSED FOAM EXPANSION JOINT SEAL (MOD)

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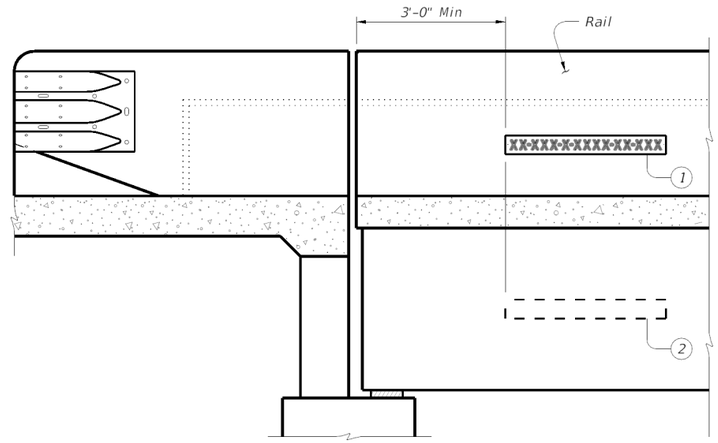
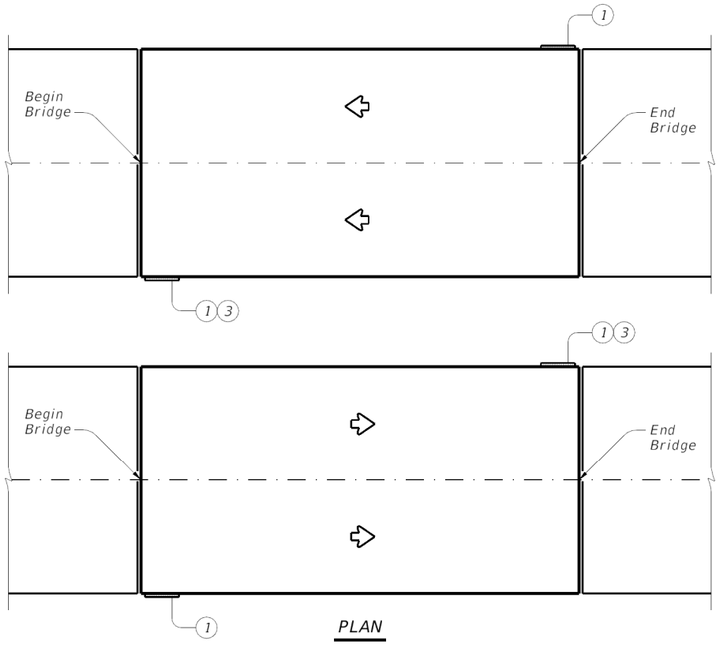
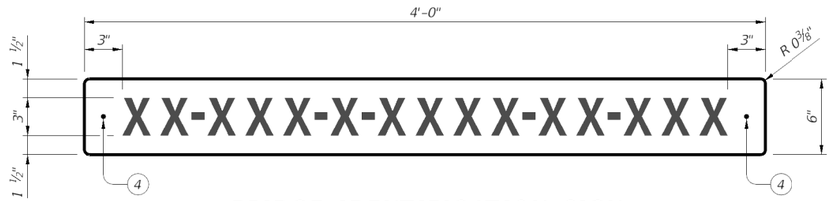


ELEVATION

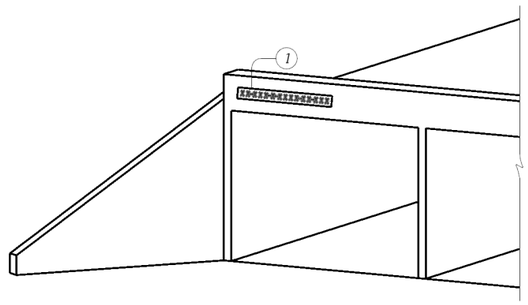


PLAN

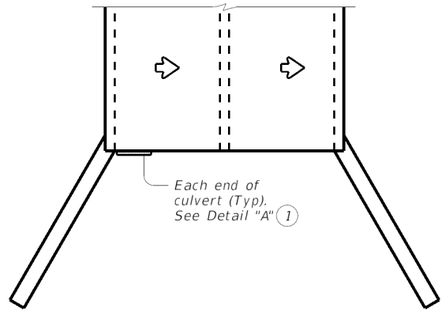
BRIDGE SIGN LOCATIONS



BRIDGE IDENTIFICATION SIGN

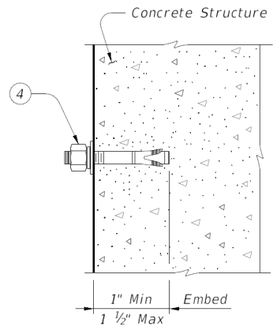


DETAIL "A"



PLAN

BRIDGE CLASS CULVERT SIGN PLACEMENT



ANCHOR DETAIL

SHEETING REQUIREMENTS

Usage	Color	Sign Face Material
Background	White	Type B or C Sheeting
Letters and Symbols	Black	Type B or C Sheeting

(1) Bridge identification sign location

(2) Alternate sign placement location for exterior concrete beams.

(3) If adjacent bridges are less than 2 feet apart, these signs may be omitted.

(4) ¼" Diameter stainless steel expansion anchor with hex nut, washer, and lock washer.

SIGN NOTES:

Standard sign designs can be found in the Standard Highway Sign Designs for Texas (SHSD).

Use the Clearview Alphabet CV-2W for the letters and symbols.

MATERIAL NOTES:

Provide lateral spacing between letters and numerals conforming with the SHSD, and any approved changes thereto. Provide a balanced appearance when spacing is not shown.

Provide aluminum sign blanks with a minimum thickness of 0.080" that meet the requirements of DMS-7110.

Provide sign face materials that meet the requirements of DMS-8300 and the sheeting requirements shown in the table.

Provide ¼" diameter stainless steel expansion anchors with one hex head nut, one flat washer, and one lock washer each.

Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). Provide anchor products that have a designated ICC-ES Evaluation Report number. The approval status must be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.

Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.

Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environments, provide both stainless steel anchor bodies and expansion wedges.

GENERAL NOTES:

Prior to hole drilling, locate rebar to ensure clearing of existing reinforcement and/or strands.

Prior to installation, obtain approval of sign locations from the Engineer. Avoid placement of sign over travel lanes and pedestrian walkways. Submit proposed installation method to Engineer prior to beginning work. Install anchors as shown on plans and in accordance with the anchor manufacturer's published installation instructions.

Do not install anchors sections of members under tension.

For new construction, the signs and anchors are subsidiary to the bridge. For installations on existing structures, the signs and anchors are paid under Item 442, "Metal for Structures." Each sign weighs 28 lbs.

Texas Department of Transportation

Bridge Division Standard

NBIS BRIDGE IDENTIFICATION SIGN STANDARD

NBIS

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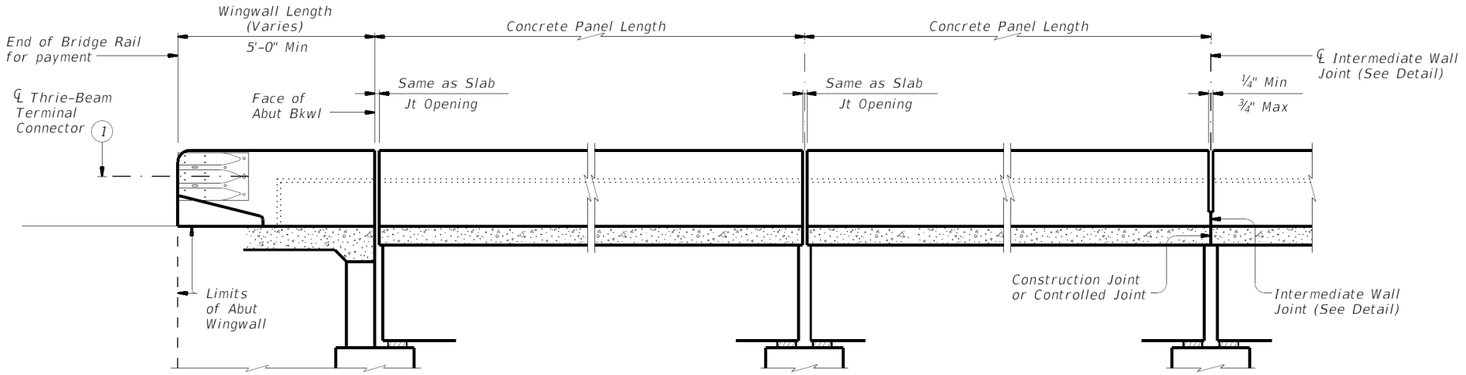
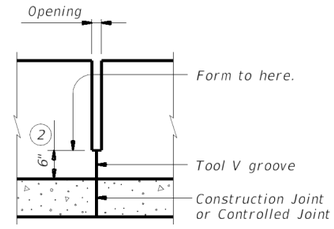


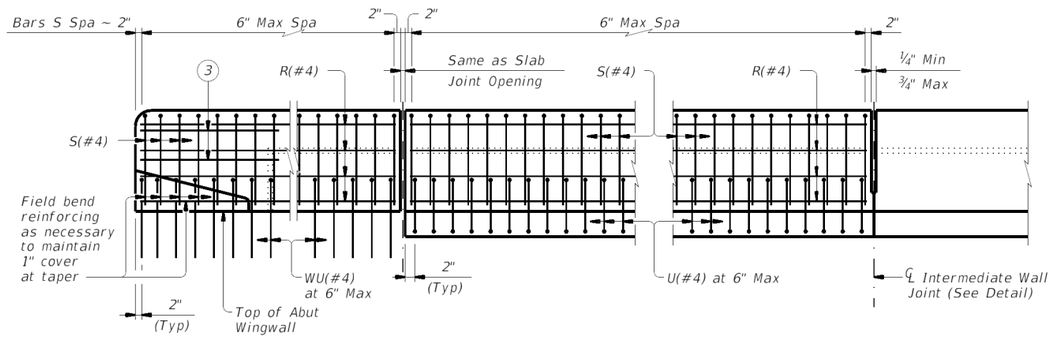
AT ABUTMENTS | AT BENTS WITH SLAB EXP JOINTS | AT BENTS WITHOUT SLAB EXP JOINTS

ROADWAY ELEVATION OF RAIL

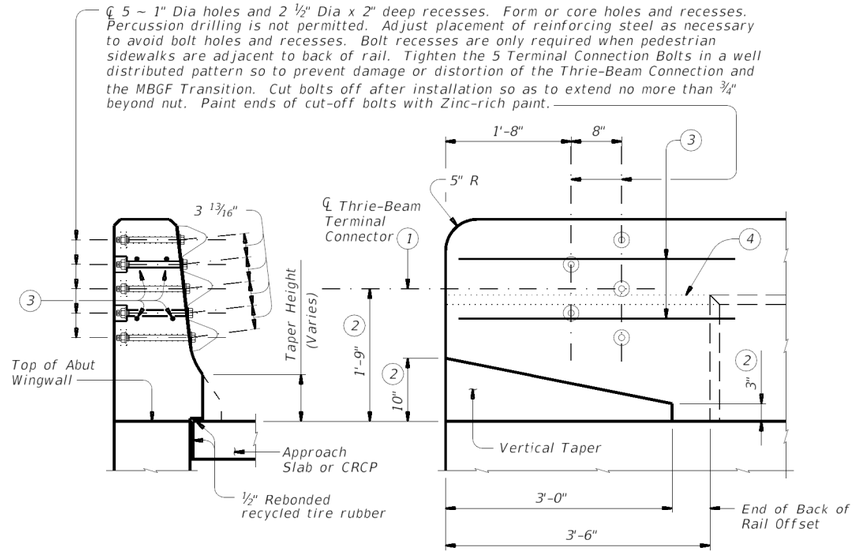


INTERMEDIATE WALL JOINT DETAIL

Provide at all interior bents without slab expansion joints.

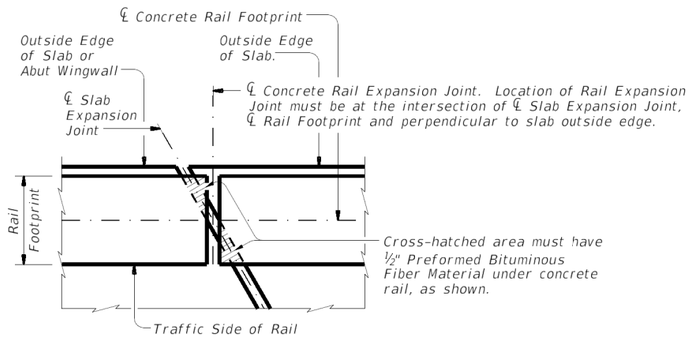


ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT



SECTION | ELEVATION

TERMINAL CONNECTION DETAILS



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

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

Texas Department of Transportation | Bridge Division Standard

TRAFFIC RAIL

TYPE T551

FILE:	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
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REVISIONS	0610	03	104, ETC.	IH 30, ETC.
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	ATL	TITUS, ETC.		71

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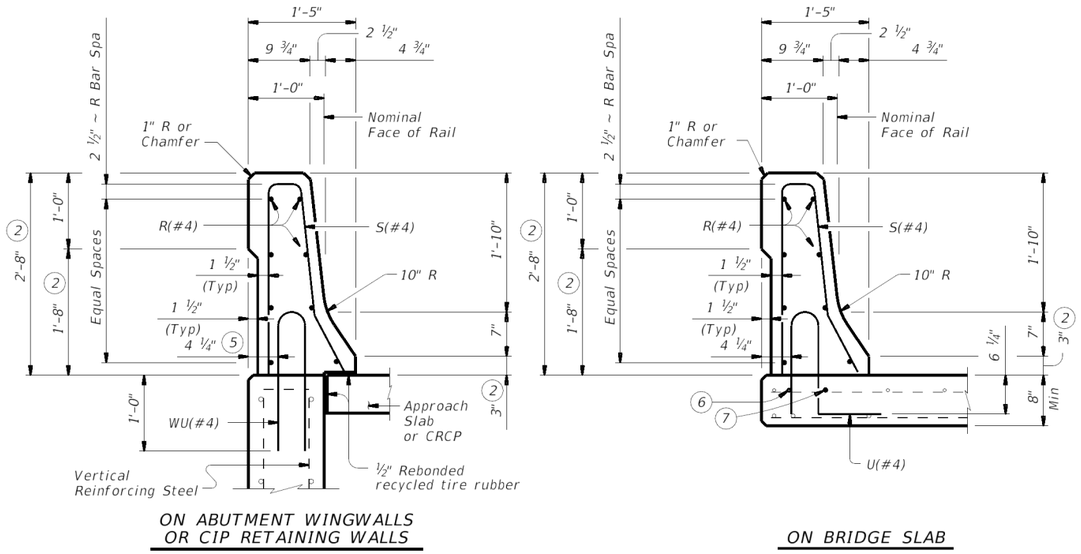
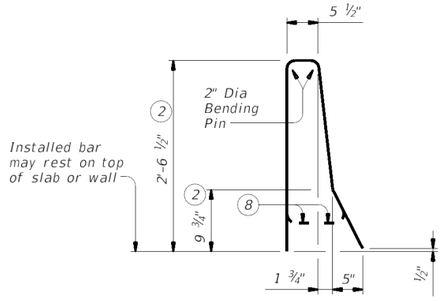


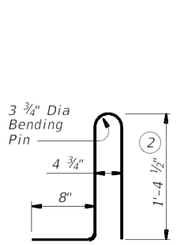
ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS

ON BRIDGE SLAB

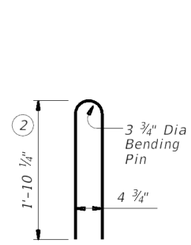
SECTIONS THRU RAIL



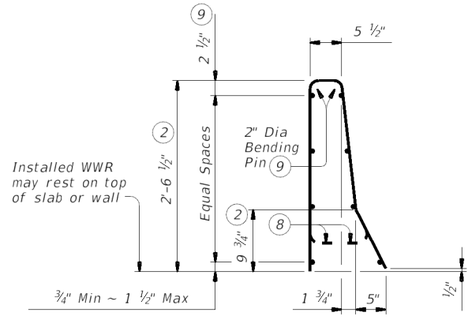
BARS S (#4)



BARS U (#4)

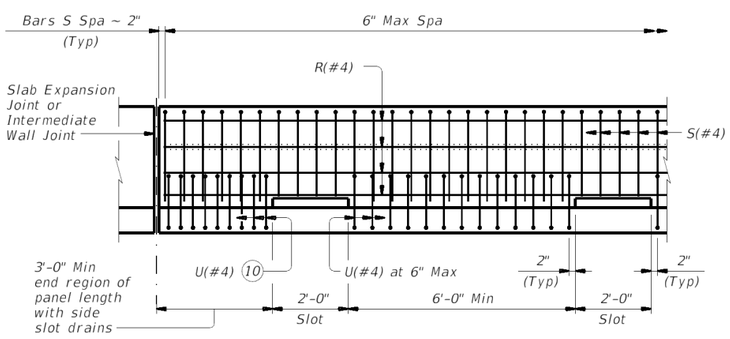


BARS WU (#4)



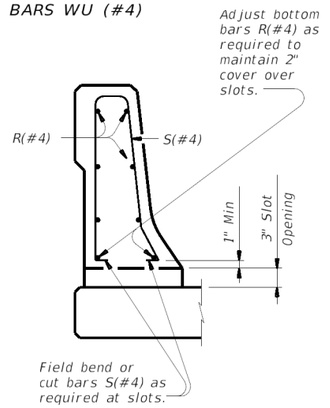
OPTIONAL WELDED WIRE REINFORCEMENT (WWR)

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.	



OPTIONAL SIDE SLOT DRAIN DETAIL

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



SECTION THRU OPTIONAL SIDE SLOT DRAIN

(2) Increase 2" for structures with overlay.

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

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

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

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

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

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

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 on the plans or approved by the Engineer.

MATERIAL NOTES:

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

Provide Grade 60 reinforcing steel.

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

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

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

GENERAL NOTES:

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

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

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

Shop drawings will not be required for this rail.

Average weight of railing with no overlay is 382 plf.

Cover dimensions are clear dimensions, unless noted otherwise.

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

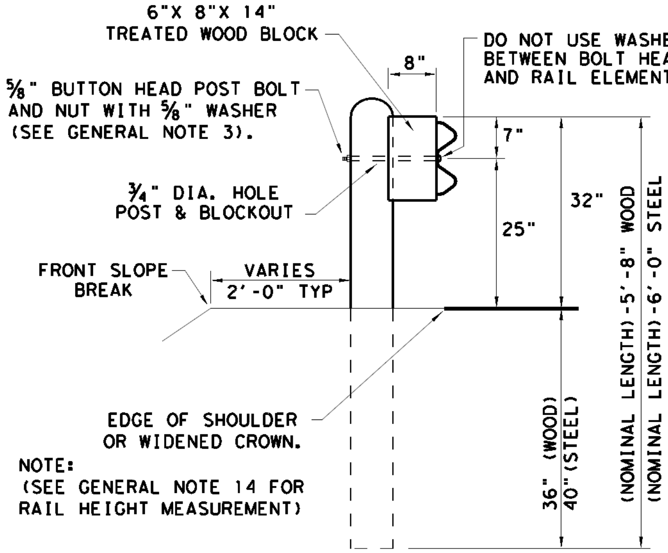
Texas Department of Transportation

Bridge Division Standard

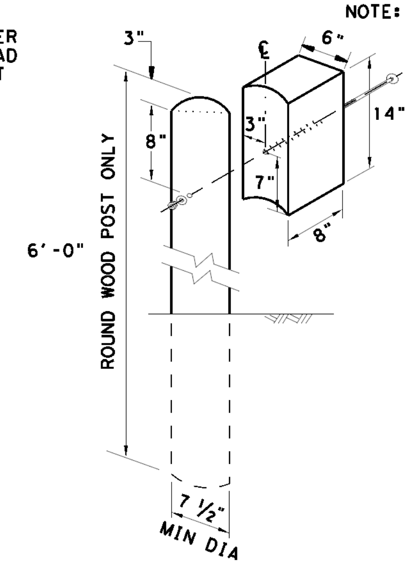
TRAFFIC RAIL

TYPE T551

FILE:	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT September 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0610	03	104, ETC.	IH 30, ETC.
	DIST	COUNTY		SHEET NO.
	ATL	TITUS, ETC.		72

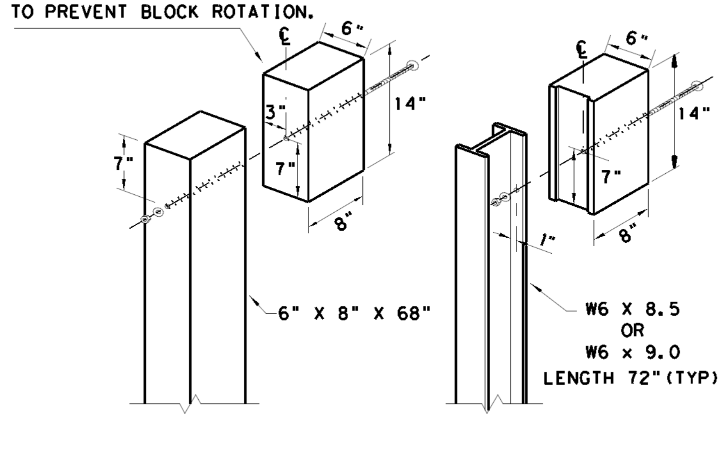


TYPICAL POST PLACEMENT



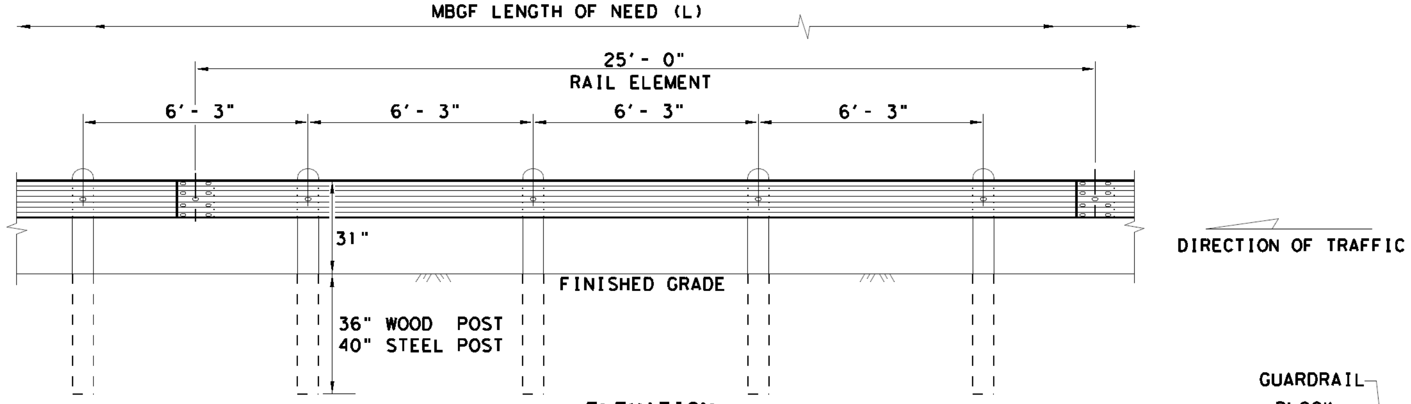
WOOD BLOCK TO ROUND WOOD POST

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



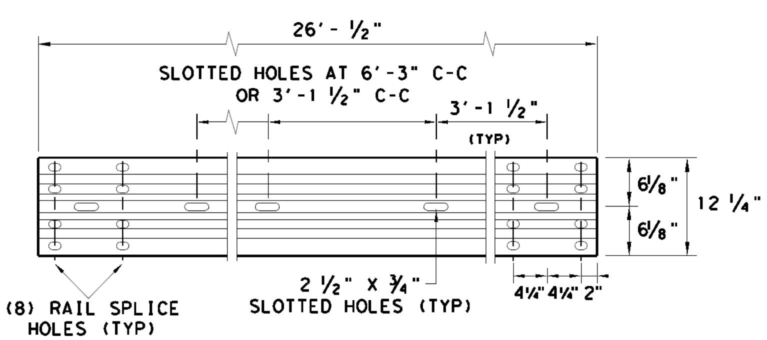
WOOD BLOCK TO RECTANGULAR WOOD POST

ROUTED WOOD BLOCK TO I-BEAM STEEL POST



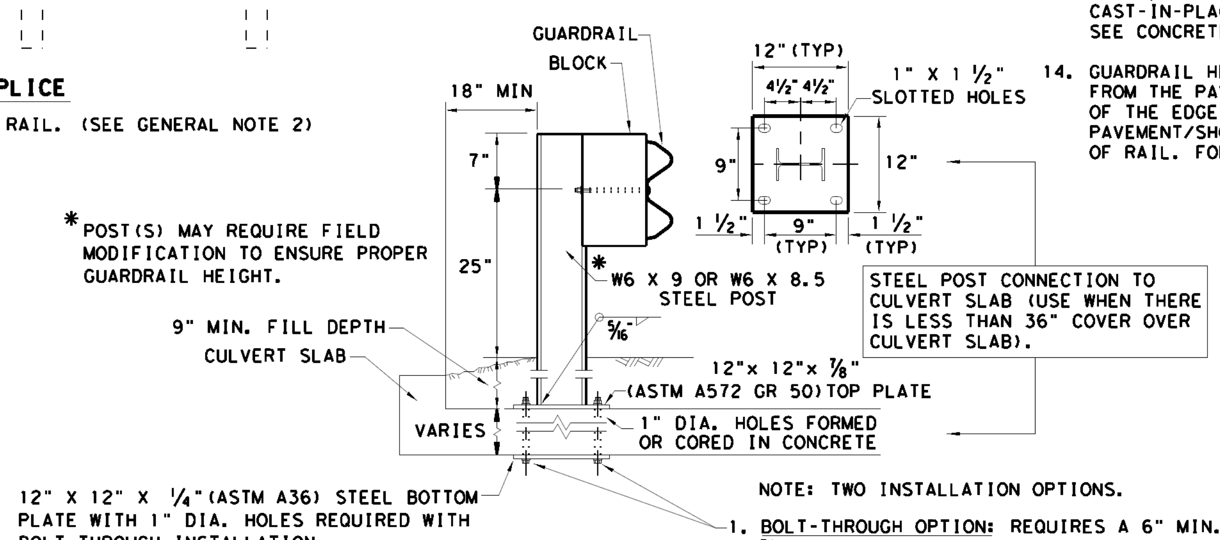
ELEVATION
MID-SPAN RAIL SPLICE

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.



LOW FILL CULVERT POST

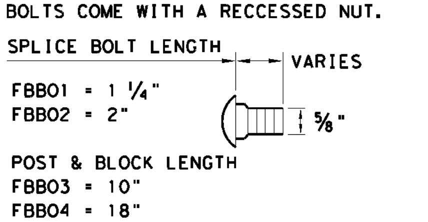
NOTE: TWO INSTALLATION OPTIONS.

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.

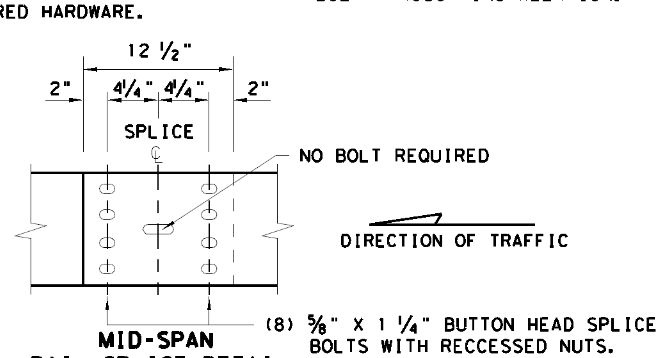
NOTE: CULVERTS OF 25 FT. OR LESS, SEE GF(31)LS STANDARD FOR "LONG SPAN" OPTION.

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



BUTTON HEAD BOLT

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



MID-SPAN RAIL SPLICE DETAIL

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

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.

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

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE TL-3 MASH COMPLIANT

GF(31)-19

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
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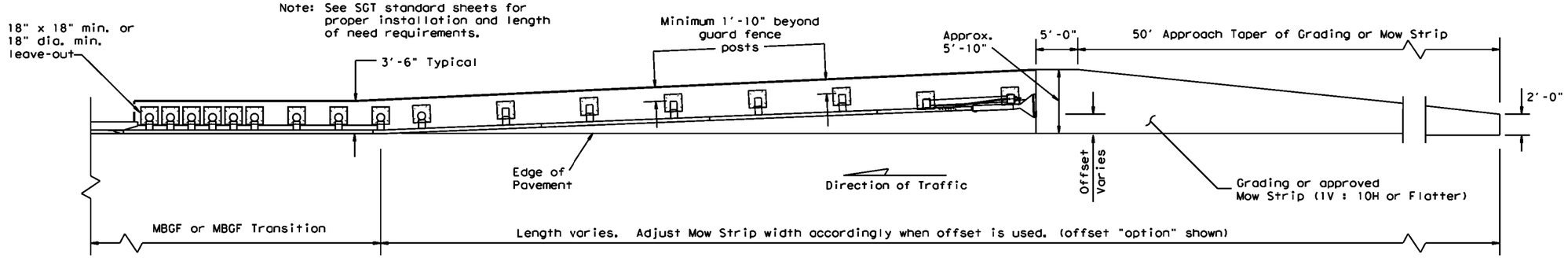
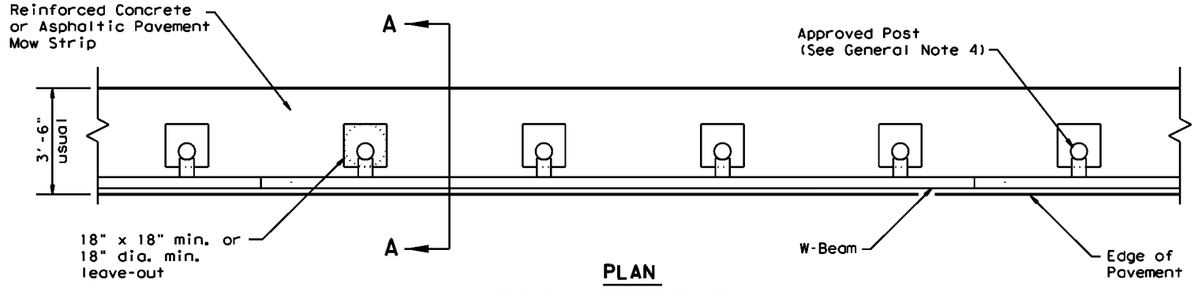
	ATL		TITUS, ETC.	73

DATE: 7/1/2024
FILE: pw://txdot.projectwiseonline.com:TxDOT5/Documents/19 - ATL/Design Projects/0610031044 - Design/Master Design Files/STANDARDS/077 GF(31)MS-19

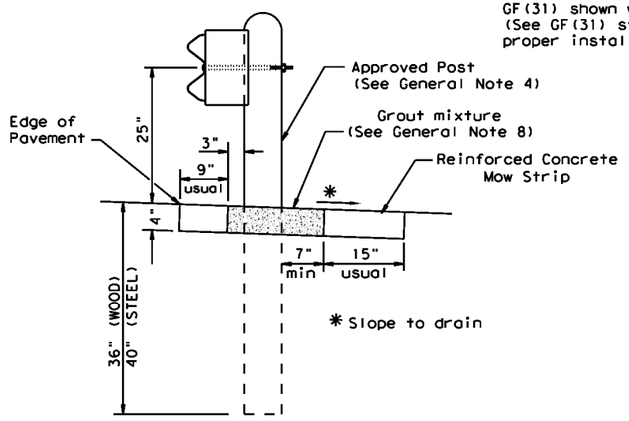


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



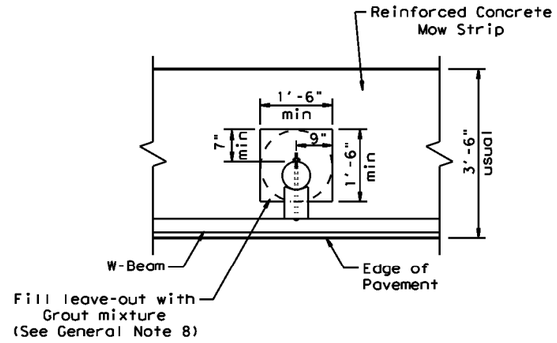
PLAN

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.

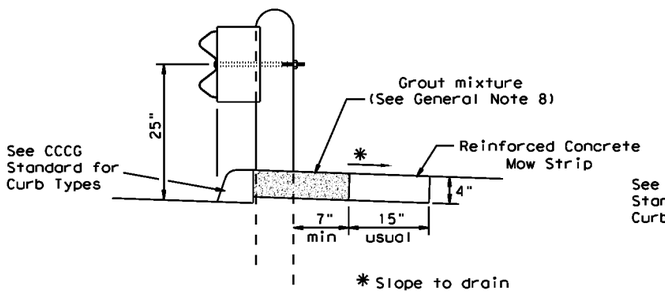
Note: Site Condition(s)

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.

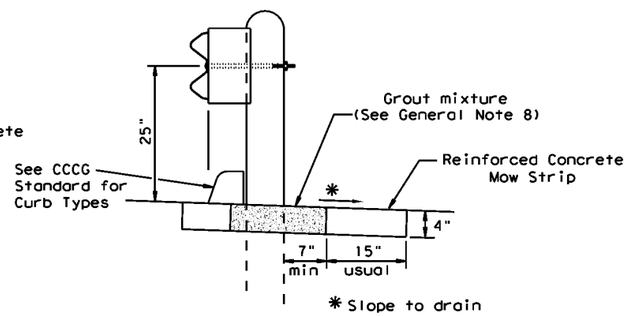
GENERAL NOTES

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.



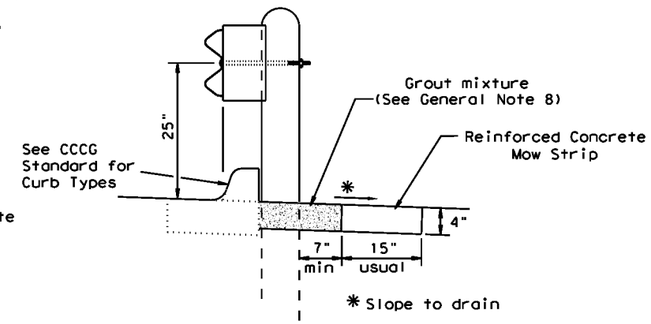
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

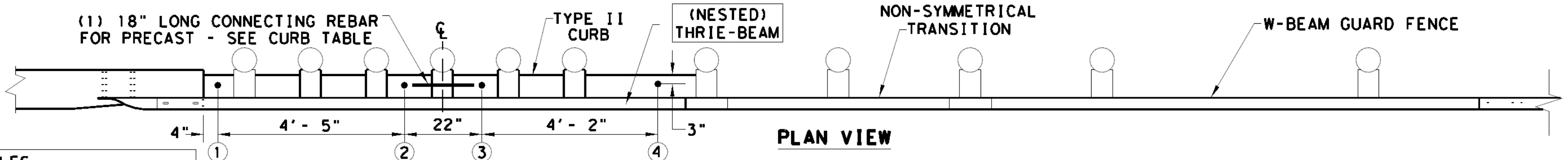
Texas Department of Transportation

Design Division Standard

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

GF(31)MS-19

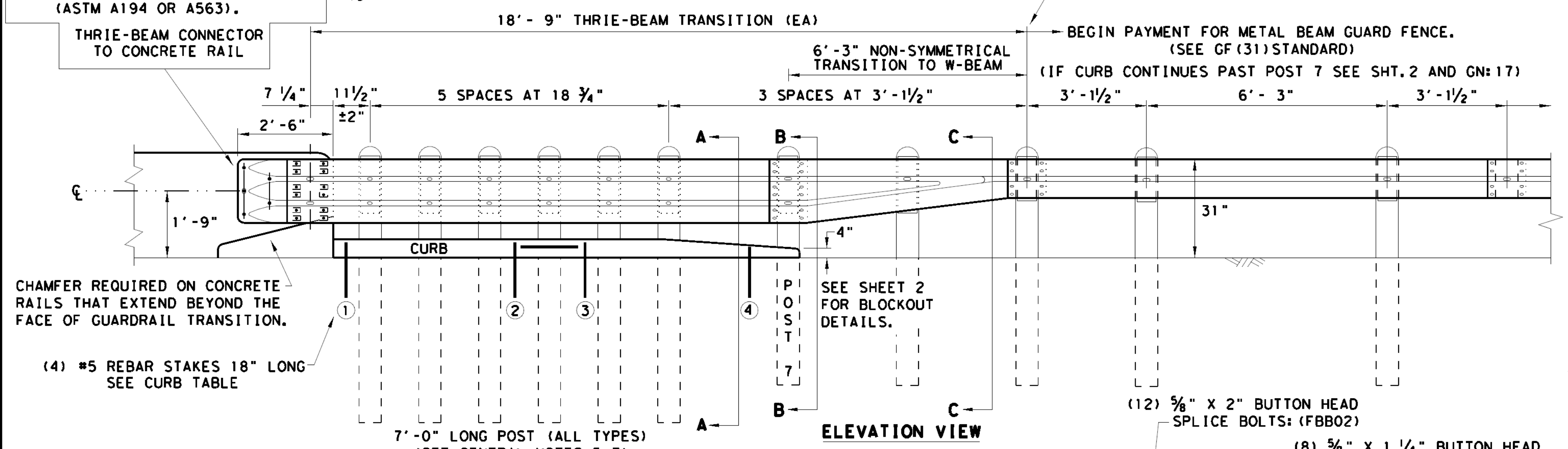
FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0610	03	104, ETC.	IH 30, ETC.	
	DIST	COUNTY		SHEET NO.	
	ATL	TITUS, ETC.		74	

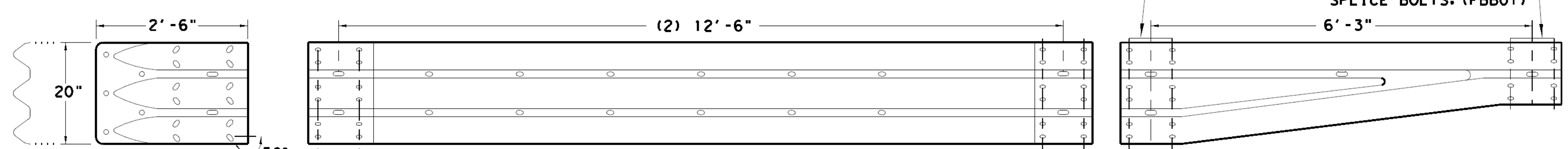


(5) 1" DIA. HOLES.
(5) ⅞" DIA. HEAVY HEX HEAD BOLTS (FACING TRAFFIC SIDE) (ASTM F3125 GR A325 OR A449).
(10) 1 ¾" O.D. WASHER UNDER EACH HEX BOLT HEAD AND NUT.
(5) ⅞" DIA. HEAVY HEX NUTS (ASTM A194 OR A563).

NOTE:
HEAVY HEX BOLT LENGTH WILL VARY DEPENDING ON WIDTH CONCRETE RAIL, LEAVE 1" OF BOLT LENGTH PAST THE ⅞" HEX NUT. TRIM AS REQUIRED.

NOTE:
CURB IS A REQUIRED COMPONENT FOR THE TRANSITION TO FUNCTION PROPERLY. SEE GENERAL NOTES: 2-4 AND 16-17.





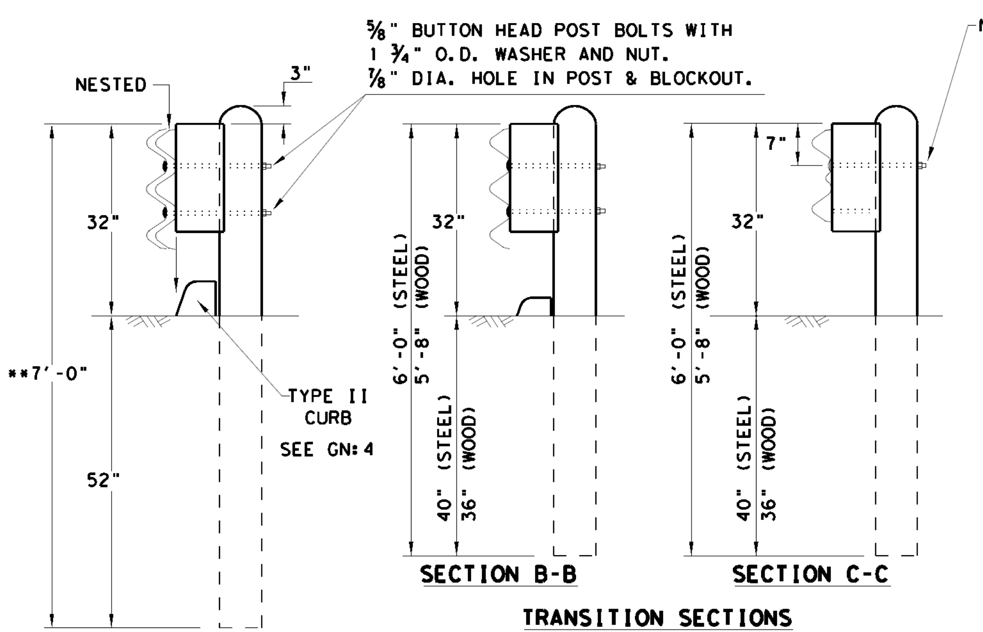
SIDE-VIEW

THRIE-BEAM TERMINAL CONNECTOR 10GA.
PART DESIGNATOR RTE01b
NOTE: SEE GENERAL NOTE: 9

NESTED THRIE-BEAM RAIL
PART DESIGNATOR RTM10a
(12) ⅝" X 2" BUTTON HEAD SPLICE BOLTS WITH RECESSED NUTS: (FBB02)
(12) RECTANGULAR GUARDRAIL PLATE WASHERS: (FWR03)

NON-SYMMETRICAL W-BEAM TO THRIE-BEAM TRANSISTION 10GA.
PART DESIGNATOR
RWT02a OR RWT02b

PLATE WASHER INSTRUCTIONS	
	BRIDGE APPROACH - UPSTREAM: THE NESTED RAIL LAPS OVER THE TERMINAL CONNECTOR. PLATE WASHERS ARE INSTALLED UNDER THE SPLICE NUTS AGAINST INSIDE OF CONNECTOR.
	BRIDGE EXIT - DOWNSTREAM: THE TERMINAL CONNECTOR LAPS OVER THE NESTED RAIL. PLATE WASHERS ARE INSTALLED UNDER THE BOLT HEAD AGAINST OUTSIDE OF CONNECTOR.



SECTION A-A

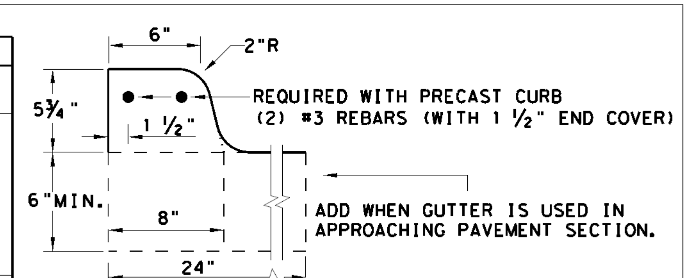
SECTION B-B

SECTION C-C

TRANSITION SECTIONS
NOTE: ALL POST TYPES, SEE GENERAL NOTE: 5 & 6

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

THRIE-BEAM TERMINAL - CURB TABLE
PRECAST CURB FULL LENGTH EQUALS 12'- 2" THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.
CURB (1) LENGTH 5'- 8" CURB (2) LENGTH 6'- 6" TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7
CONNECTING PRECAST CURB SECTIONS (1) & (2): FORM OR CORE 1" DIA. HOLE 9" LONG INTO EACH CURB END. USE (1) #5 GR. 60 REBAR 18" LONG TO CONNECT BOTH CURBS.
SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE *: FORM OR CORE (4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR. 60 REBAR STAKES 18" LONG INTO THE GROUND AND ½" BELOW TOP OF CURB. FILL HOLES WITH APPROVED GROUT MIXTURE.



TYPE II CURB

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

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

TYPE II CURB DETAILS

GENERAL NOTES

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

HIGH-SPEED TRANSITION

SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

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

GF(31)TR TL3-20

FILE: gf31trtl320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
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	DIST		COUNTY	SHEET NO.
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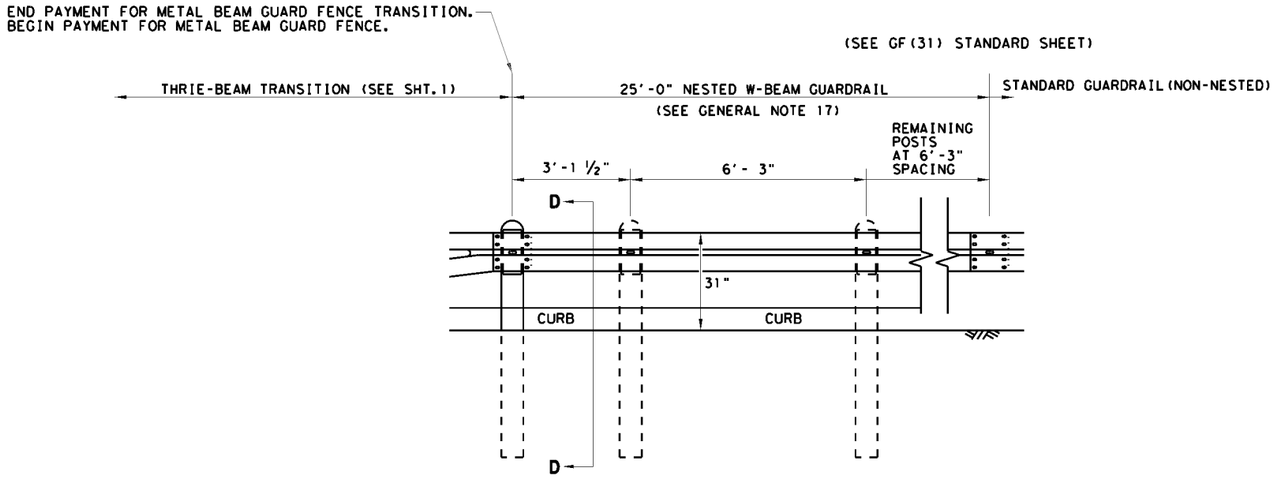
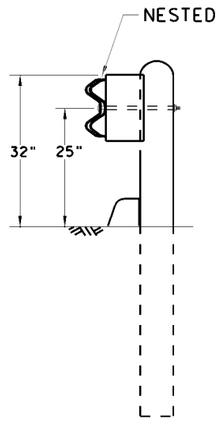
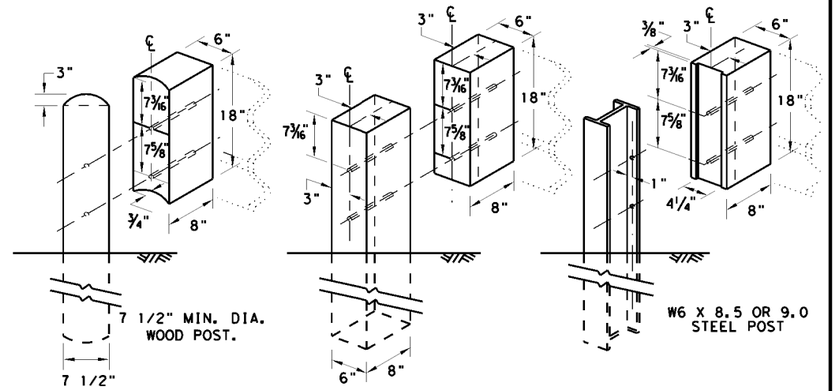
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



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: gf31trt1320.dgn	DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0610	03	104, ETC.	IH 30, ETC.	
	DIST	COUNTY		SHEET NO.	
	ATL	TITUS, ETC.		76	

DATE: 7/1/2024
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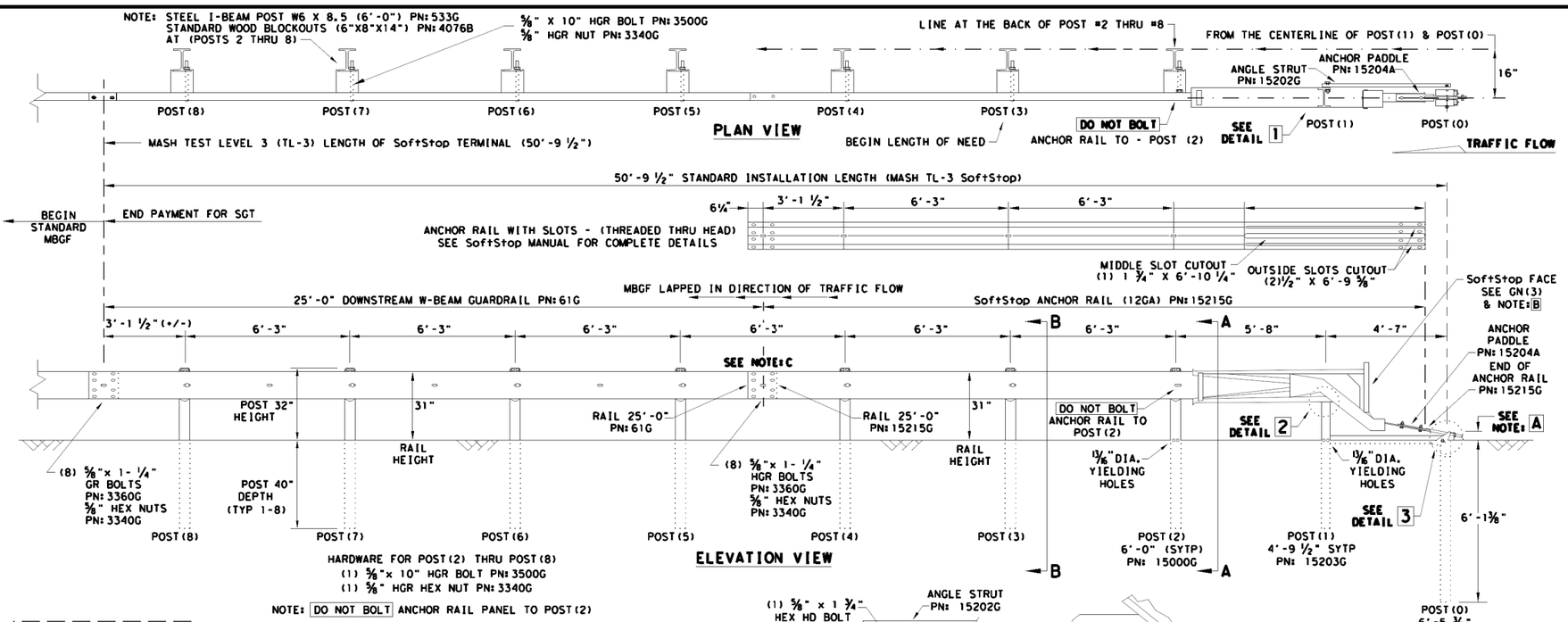


GENERAL NOTES

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 3-¾" 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 ⅜")
15203G	1	POST #1 - (SYTP) (4'- 9 ½")
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 ½" x 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (½" 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	¾" x 2 ½" HEX BOLT A325
3701G	4	¾" ROUND WASHER F436
3704G	2	¾" HEAVY HEX NUT A563 GR.DH
3360G	16	⅝" x 1 ¼" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	⅝" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	⅝" x 10" HGR POST BOLT A307
3391G	1	⅝" x 1 ¾" HEX HD BOLT A325
4489G	1	⅝" x 9" HEX HD BOLT A325
4372G	4	⅝" WASHER F436
105285G	2	⅝" x 2 ½" HEX HD BOLT GR-5
105286G	1	⅝" x 1 ½" HEX HD BOLT GR-5
3240G	6	⅝" ROUND WASHER (WIDE)
3245G	3	⅝" HEX NUT A563 GR.DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE:B

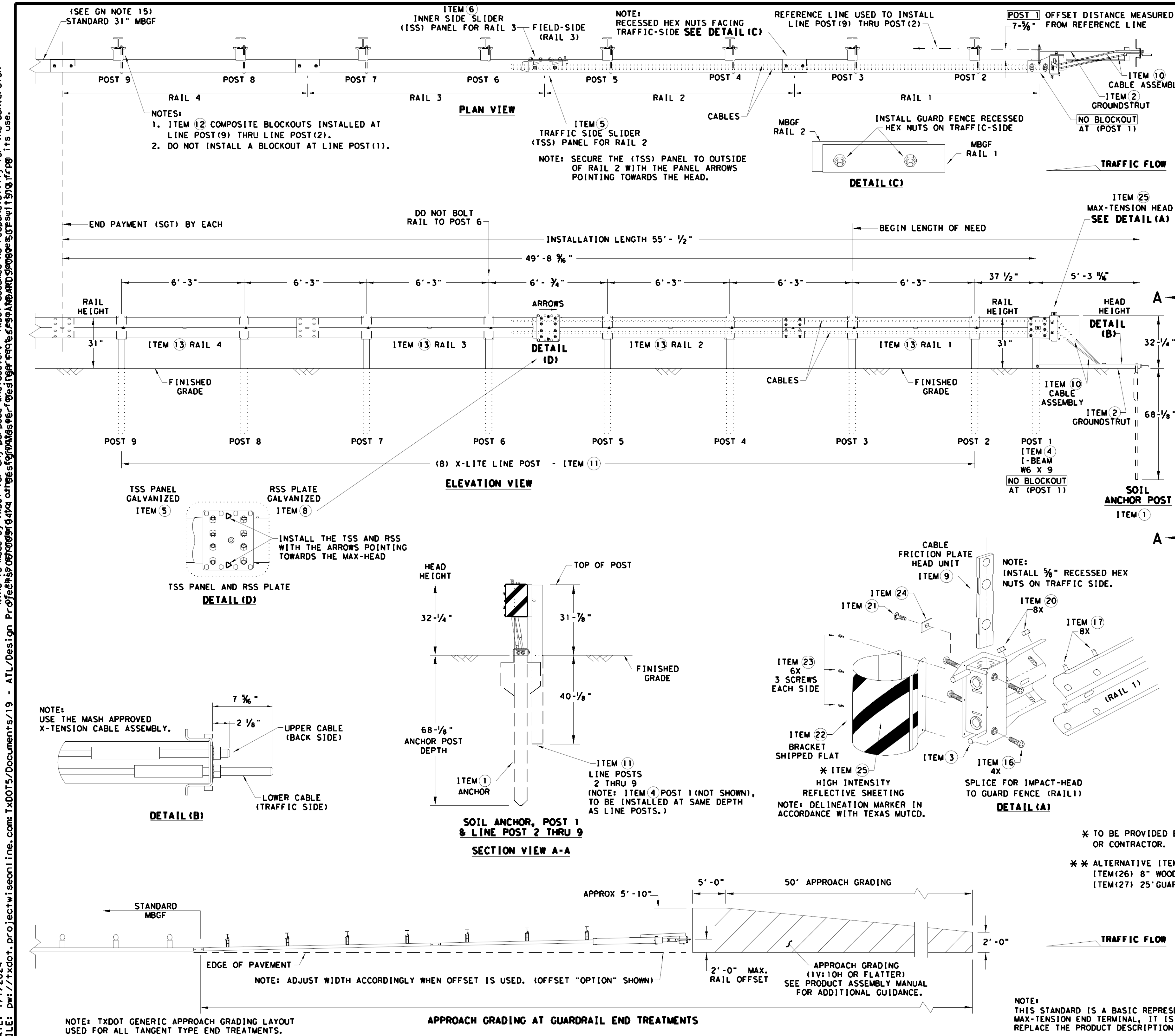
NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SoftStop END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

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	0610	03	104, ETC.	IH 30, ETC.
	DIST	COUNTY		SHEET NO.
	ATL	TITUS, ETC.		77


(SEE GN NOTE 15)
STANDARD 31" MBGF
ITEM 6 INNER SIDE SLIDER (ISS) PANEL FOR RAIL 3
FIELD-SIDE (RAIL 3)
NOTE: RECESSED HEX NUTS FACING TRAFFIC-SIDE SEE DETAIL (C)
REFERENCE LINE USED TO INSTALL LINE POST(9) THRU POST(2)
POST 1 OFFSET DISTANCE MEASURED FROM REFERENCE LINE
7-5/8"
POST 9
POST 8
POST 7
POST 6
POST 5
POST 4
POST 3
POST 2
ITEM 10 CABLE ASSEMBLY
ITEM 2 GROUNDSTRUT
NO BLOCKOUT AT (POST 1)
RAIL 4
RAIL 3
RAIL 2
RAIL 1
PLAN VIEW
NOTES:
1. ITEM 12 COMPOSITE BLOCKOUTS INSTALLED AT LINE POST(9) THRU LINE POST(2).
2. DO NOT INSTALL A BLOCKOUT AT LINE POST(1).
ITEM 5 TRAFFIC SIDE SLIDER (TSS) PANEL FOR RAIL 2
NOTE: SECURE THE (TSS) PANEL TO OUTSIDE OF RAIL 2 WITH THE PANEL ARROWS POINTING TOWARDS THE HEAD.
CABLES
MBGF RAIL 2
INSTALL GUARD FENCE RECESSED HEX NUTS ON TRAFFIC-SIDE
MBGF RAIL 1
DETAIL (C)
TRAFFIC FLOW
ITEM 25 MAX-TENSION HEAD SEE DETAIL (A)
END PAYMENT (SGT) BY EACH
DO NOT BOLT RAIL TO POST 6
INSTALLATION LENGTH 55'-1/2"
BEGIN LENGTH OF NEED
49'-8 9/16"
6'-3"
6'-3/4"
37 1/2"
5'-3 11/16"
ARROWS
RAIL HEIGHT
HEAD HEIGHT
DETAIL (B)
31"
ITEM 13 RAIL 4
ITEM 13 RAIL 3
DETAIL (D)
ITEM 13 RAIL 2
ITEM 13 RAIL 1
32-1/4"
FINISHED GRADE
CABLES
ITEM 10 CABLE ASSEMBLY
ITEM 2 GROUNDSTRUT
68-1/8"
POST 1 ITEM 4 I-BEAM W6 X 9
NO BLOCKOUT AT (POST 1)
(8) X-LITE LINE POST - ITEM 11
ELEVATION VIEW
SOIL ANCHOR POST ITEM 1
A
TSS PANEL GALVANIZED ITEM 5
RSS PLATE GALVANIZED ITEM 8
INSTALL THE TSS AND RSS WITH THE ARROWS POINTING TOWARDS THE MAX-HEAD
TSS PANEL AND RSS PLATE
DETAIL (D)
HEAD HEIGHT
TOP OF POST
32-1/4"
31-7/8"
FINISHED GRADE
40-1/8"
68-1/8" ANCHOR POST DEPTH
ITEM 1 ANCHOR
ITEM 11 LINE POSTS 2 THRU 9
(NOTE: ITEM 4 POST 1 (NOT SHOWN), TO BE INSTALLED AT SAME DEPTH AS LINE POSTS.)
SOIL ANCHOR, POST 1 & LINE POST 2 THRU 9
SECTION VIEW A-A
NOTE: USE THE MASH APPROVED X-TENSION CABLE ASSEMBLY.
7 5/16"
2 1/8"
UPPER CABLE (BACK SIDE)
LOWER CABLE (TRAFFIC SIDE)
DETAIL (B)
CABLE FRICTION PLATE HEAD UNIT ITEM 9
NOTE: INSTALL 5/8" RECESSED HEX NUTS ON TRAFFIC SIDE.
ITEM 24
ITEM 21
ITEM 20 8X
ITEM 17 8X
ITEM 23 6X 3 SCREWS EACH SIDE
(RAIL 1)
ITEM 22 BRACKET SHIPPED FLAT
ITEM 3
ITEM 16 4X
* ITEM 25 HIGH INTENSITY REFLECTIVE SHEETING
NOTE: DELINEATION MARKER IN ACCORDANCE WITH TEXAS MUTCD.
SPLICE FOR IMPACT-HEAD TO GUARD FENCE (RAIL1)
DETAIL (A)
STANDARD MBGF
APPROX 5'-10"
5'-0"
50' APPROACH GRADING
2'-0"
EDGE OF PAVEMENT
2'-0" MAX. RAIL OFFSET
NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)
APPROACH GRADING (1V:10H OR FLATTER) SEE PRODUCT ASSEMBLY MANUAL FOR ADDITIONAL GUIDANCE.
TRAFFIC FLOW
NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.
APPROACH GRADING AT GUARDRAIL END TREATMENTS

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
2. FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE; MAX-TENSION INSTALLATION INSTRUCTION MANUAL. P/N MANMAX REV D (ECN 3516).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURE'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. ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
7. COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST(MPL)FOR CERTIFIED PRODUCERS.
8. REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
9. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
10. POSTS SHALL NOT BE SET IN CONCRETE.
11. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POST TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST.
12. MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
13. IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
14. THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
15. A MINIMUM OF 12'-6" OF 12GA. MBGF IS REQUIRED IMMEDIATELY DOWNSTREAM OF THE MAX-TENSION SYSTEM.

ITEM#	PART NUMBER	DESCRIPTION	QTY
1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BSI-1610063-00	W6x9 I-BEAM POST 6FT.-GALVANIZED	1
5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
7	BSI-1610066-00	TOOTH - GEOMET	1
8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BSI-1012078-00	X-LITE LINE POST-GALVANIZED	8
12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BSI-1102027-00	X-LITE SQUARE WASHER	1
15	BSI-2001886	5/8" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	3/4" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	5/8" X 1 1/4" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	5/8" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	5/8" WASHER F436 STRUCTURAL MGAL	2
20	4001116	5/8" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	5/8" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	1/4" X 3/4" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWR03	1
* 25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
** 26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
** 27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL,8-SPACE,12GA.	2
28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

** ALTERNATIVE ITEMS NOT SHOWN. ITEM(26) 8" WOOD-BLOCKOUTS ITEM(27) 25'GUARD FENCE PANELS

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

Texas Department of Transportation — Design Division Standard

MAX-TENSION END TERMINAL MASH - TL-3

SGT(11S)31-18

FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0610	03	104, ETC.	IH 30, ETC.
	DIST		COUNTY	SHEET NO.
	ATL		TITUS, ETC.	78

DATE: 7/1/2024
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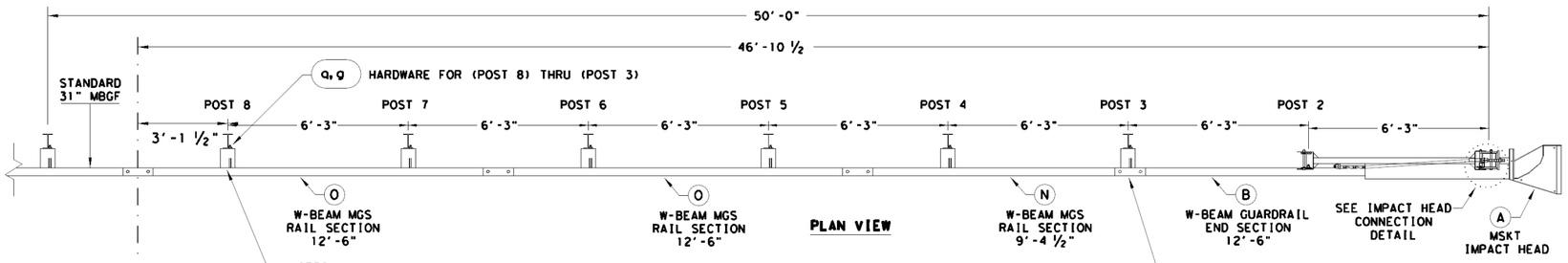
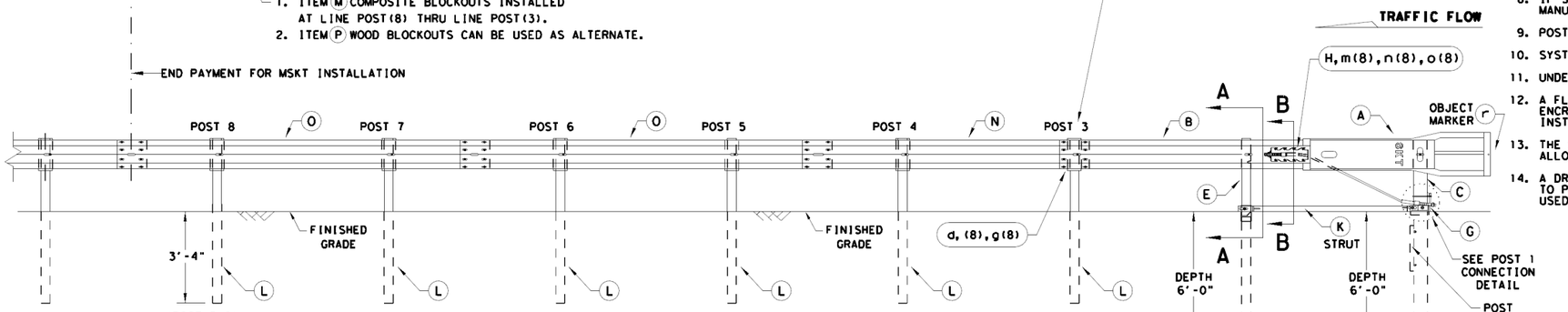
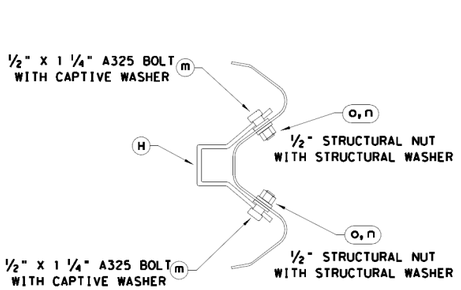


PLAN VIEW

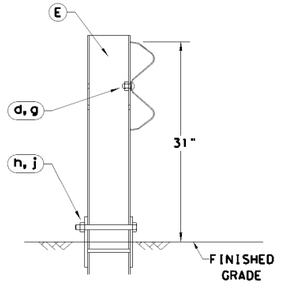


ELEVATION VIEW

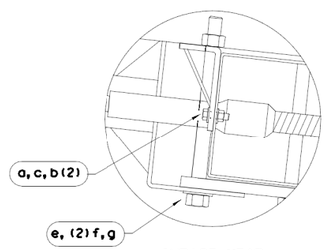
NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.



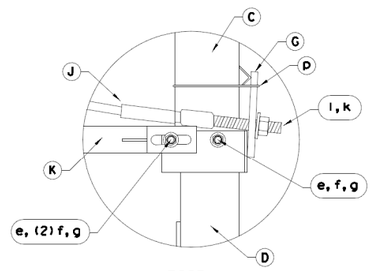
SECTION B-B
ANCHOR BRACKET



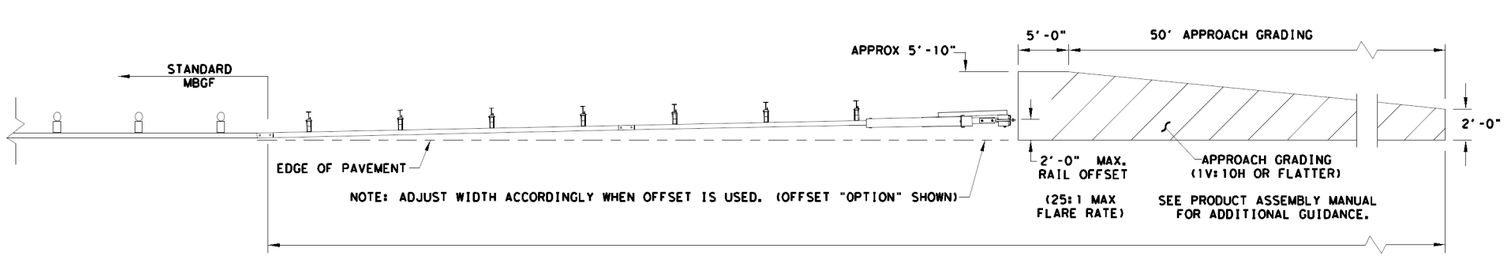
POST 2
SECTION A-A



IMPACT HEAD
CONNECTION DETAIL



POST 1
CONNECTION DETAIL



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 ⅛" 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 ½")	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	⅝" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	⅝" WASHER	W0516
c	2	⅝" HEX NUT	N0516
d	25	⅝" Dia. x 1 ¼" SPLICE BOLT (POST 2)	B580122
e	2	⅝" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	⅝" WASHER	W050
g	33	⅝" Dia. H.G.R NUT	N050
h	1	¾" Dia. x 8 ½" HEX BOLT (GRD A449)	B340854A
j	1	¾" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	½" x 1 ¼" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	½" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x ⅜" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	⅝" 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	0610	03 104, ETC.		IH 30, ETC.
	DIST	COUNTY		SHEET NO.
	ATL	TITUS, ETC.		79

DATE: 7/1/2024
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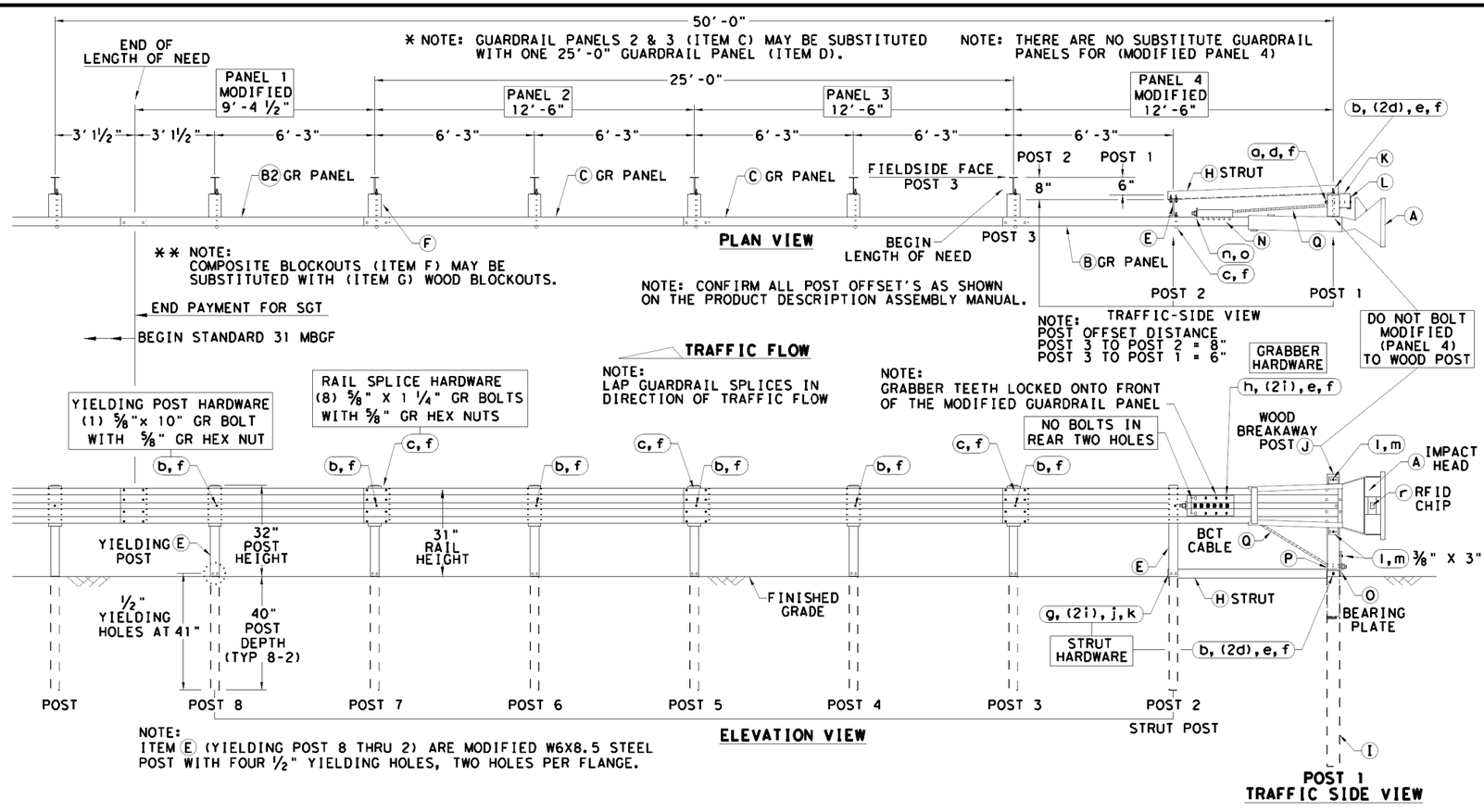
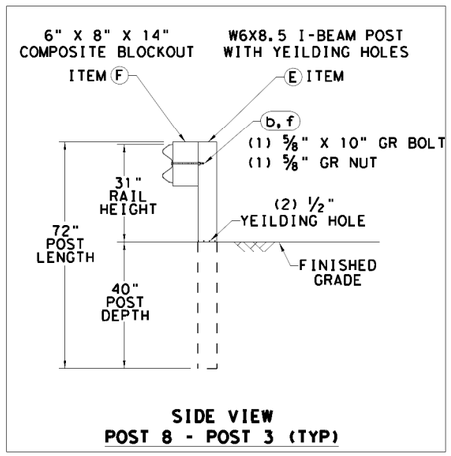


GENERAL NOTES

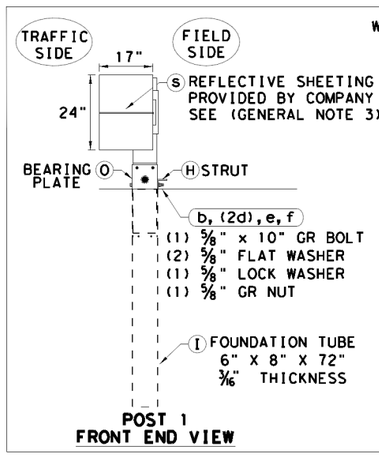
1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT 1(267) 644-9510. 14675 INDUSTRIAL PARK RD; BRISTOL, VA 24202
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL.
3. MANUFACTURER WILL APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" TO THE FACE PLATE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. THE OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. THE NOMINAL HEIGHT OF THE GUARDRAIL BEAM IS 31 INCHES WITH A TOLERANCE OF +/- ONE INCH.
5. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
6. (POST 2 THROUGH POST 8) ARE MODIFIED STEEL-YIELDING POSTS WITH YIELDING HOLES AT GROUND LEVEL. THERE ARE NO SUBSTITUTE POSTS.
7. POSTS SHALL NOT BE SET IN CONCRETE.
8. IF SOLID ROCK IS ENCOUNTERED FOR ANY OF THE POSTS IN THE SYSTEM, CONTACT THE MANUFACTURER FOR SPECIFIC INSTALLATION GUIDANCE.
9. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
10. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS DMS-7210 REQUIREMENTS MAY BE SUBSTITUTED FOR AN APPROVED WOOD BLOCKOUT. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
11. THE ENTIRE SYSTEM MUST BE INSTALLED IN A STRAIGHT LINE WITHOUT ANY CURVE. HOWEVER, THE SYSTEM CAN BE OFFSET BY TWO FEET AS SHOWN ON THE APPROACH GRADING DETAIL TO HELP OFF-SET THE IMPACT HEAD FROM SHOULDER OF THE ROAD.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM #
A	1	SGET IMPACT HEAD	SIH1A
B	1	MODIFIED GUARDRAIL PANEL 12'-6" 12GA	126SPZGP
B2	1	MODIFIED GUARDRAIL PANEL 9'-4 1/2" 12GA	GP94
C	2	STANDARD GUARDRAIL PANEL 12'-6" 12GA	GP126
D	1	STANDARD GUARDRAIL PANEL 25'-0" 12GA	GP25
E	7	MODIFIED YIELDING I-BEAM POST W6x8.5	YP6MOD
F	6	COMPOSITE BLOCKOUT 6" X 8" X 14"	CBO8
G	6	WOOD BLOCKOUT 6" X 8" X 14"	WBO8
H	1	STRUT 3" X 3" X 80" x 1/4" A36 ANGLE	STR80
I	1	FOUNDATION TUBE 6" X 8" X 72" x 3/16"	FNDT6
J	1	WOOD BREAKAWAY POST 5 1/2" x 7 1/2" x 50"	WBRK50
K	1	WOOD STRIKE BLOCK	WSBLK14
L	1	STRIKE PLATE 1/4" A36 BENT PLATE	SPLT8
M	1	REINFORCEMENT PLATE 12 GA. GR55	REPLT17
N	1	GUARDRAIL GRABBER 2 1/2" X 2 1/2" X 16 1/2"	GGR17
O	1	BEARING PLATE 8" X 8 5/8" X 5/8" A36	BPLT8
P	1	PIPE SLEEVE 4 1/4" X 2 3/8" O.D. (2 1/8" I.D.)	PSLV4
Q	1	BCT CABLE 3/4" X 81" LENGTH	CBL81
		SMALL HARDWARE	
a	1	5/8" X 12" GUARDRAIL BOLT 307A HDG	12GRBLT
b	7	5/8" X 10" GUARDRAIL BOLT 307A HDG	10GRBLT
c	33	5/8" X 1 1/4" GR SPLICE BOLTS 307A HDG	1GRBLT
d	3	5/8" FLAT WASHER F436 A325 HDG	58FW436
e	1	5/8" LOCK WASHER HDG	58LW
f	39	5/8" GUARDRAIL HEX NUT HDG	58HN563
g	2	1/2" X 2" STRUT BOLT A325 HDG	2BLT
h	6	1/2" X 1 1/4" PLATE BOLT A325 HDG	125BLT
i	16	1/2" FLAT WASHER F436 A325 HDG	12FWF436
j	8	1/2" LOCK WASHER HDG	12LW
k	8	1/2" HEX NUT A563 HDG	12HN563
l	4	3/8" X 3" HEX LAG SCREW GR5 HDG	38LS
m	4	3/8" FLAT WASHER F436 A325 HDG	38FW844
n	2	1" FLAT WASHER F436 A325 HDG	1FWF436
o	2	1" HEX NUT A563DH HDG	1HN563
p	1	18" TO 24" LONG ZIP TIE RATED 175-200LB	ZPT18
q	1	1 1/2" X 4" SCH-40 PVC PIPE	PSPCR4
r	1	RFID CHIP RATED MIL-STD-810F	RFID810F
s	1	IMPACT HEAD REFLECTIVE SHEETING	RS30M

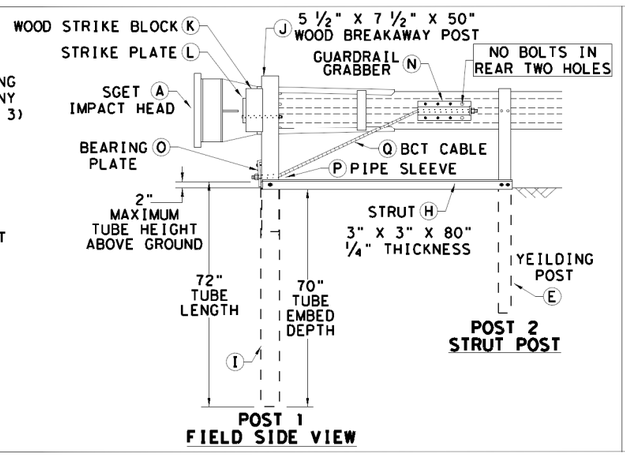
* ALTERNATIVE ITEMS
** NOTE: SEE PLAN VIEW



SIDE VIEW
POST 8 - POST 3 (TYP)

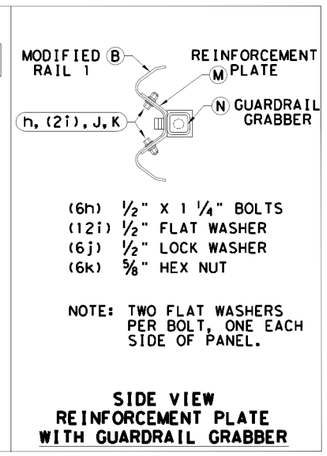


POST 1
FRONT END VIEW

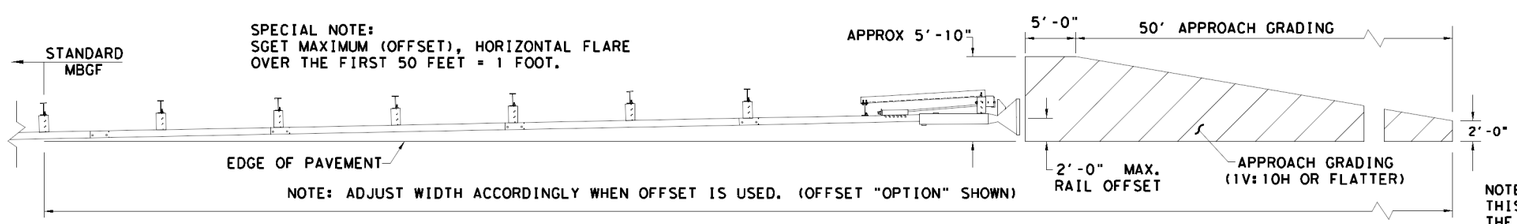


POST 1
FIELD SIDE VIEW

POST 2
STRUT POST



SIDE VIEW
REINFORCEMENT PLATE
WITH GUARDRAIL GRABBER



APPROACH GRADING AT GUARDRAIL END TREATMENTS

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SGET TERMINAL SYSTEM AND IS NOT INTENDED TO REPLACE THE MANUFACTURER'S ASSEMBLY MANUAL.

Texas Department of Transportation
Design Division Standard

SPIG INDUSTRY, LLC
SINGLE GUARDRAIL TERMINAL
SGET - TL-3 - MASH
SGT(15)31-20

FILE: sgt153120.dgn	DN: TxDOT	CK: KM	DW: VP	CK: VP
©TxDOT: APRIL 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0610	03	104, ETC.	IH 30, ETC.
	DIST	COUNTY		SHEET NO.
	ATL	TITUS, ETC.		80

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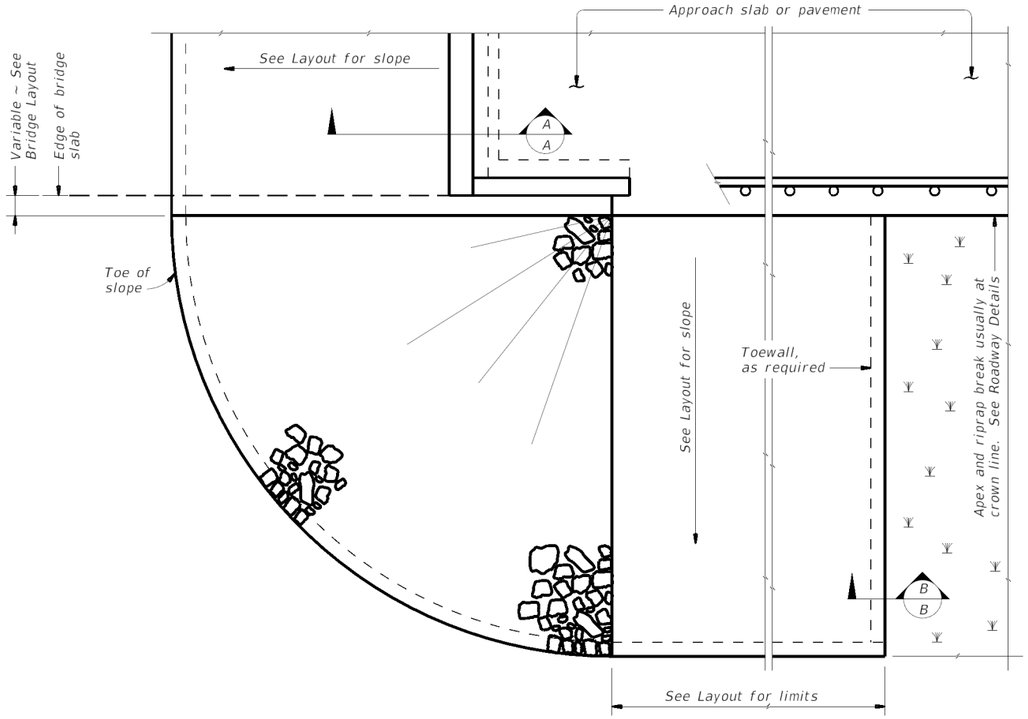
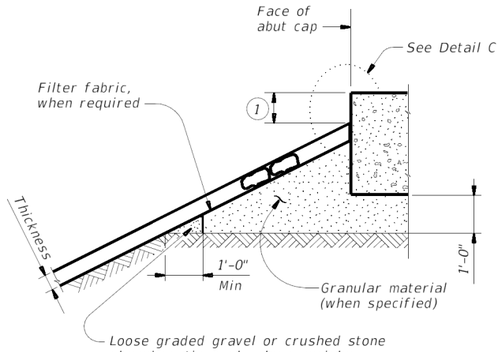
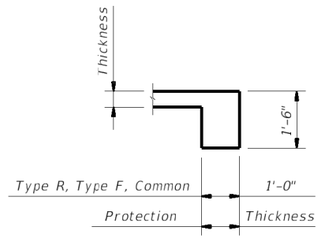


PLAN

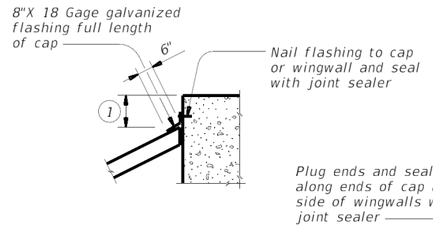


SECTION A-A AT CAP

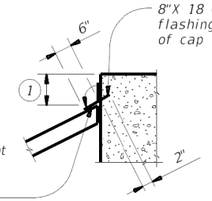


SECTION B-B

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

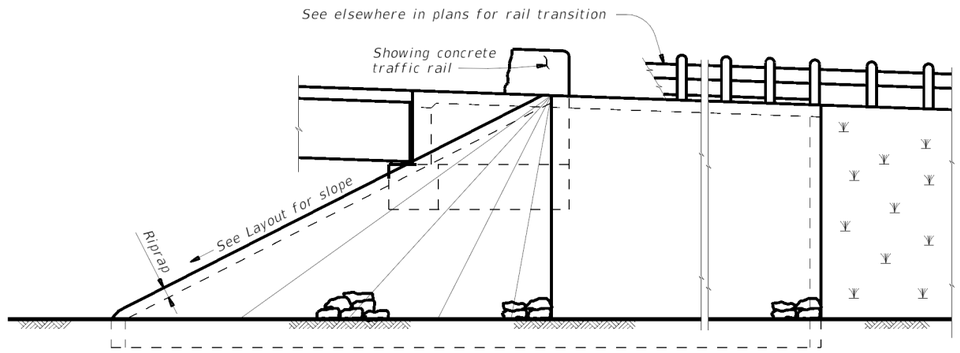


CAP OPTION A



CAP OPTION B

DETAIL C



ELEVATION

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

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

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE:	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0610	03	104, ETC.	IH 30, ETC.
	DIST	COUNTY		SHEET NO.
	ATL	TITUS, ETC.		81

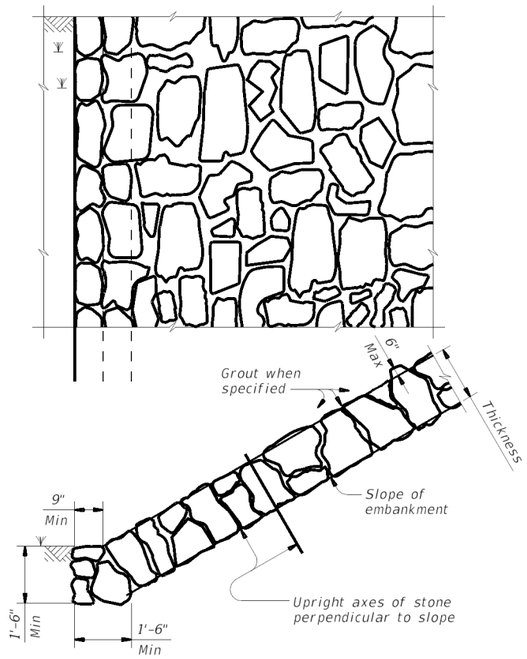


FIGURE 1 ~ TYPE R STONE RIPRAP

dry or grouted

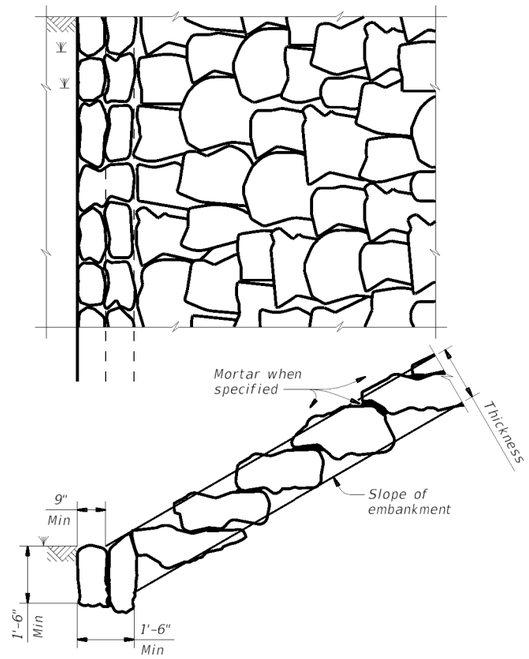


FIGURE 2 ~ TYPE F STONE RIPRAP

dry or mortared

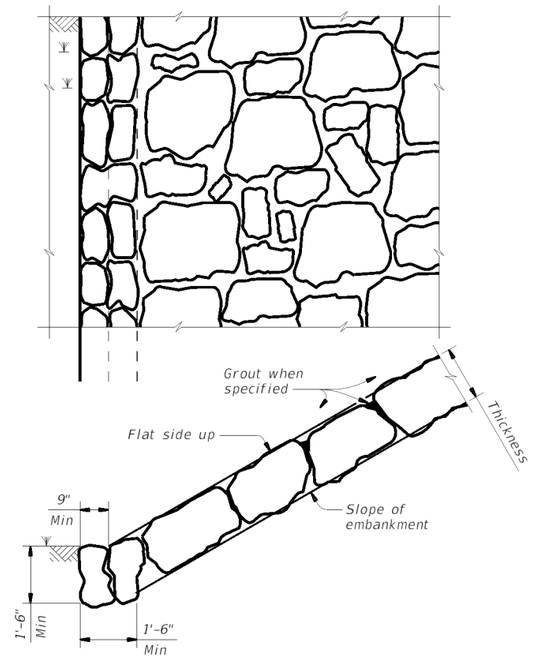


FIGURE 3 ~ TYPE F STONE RIPRAP

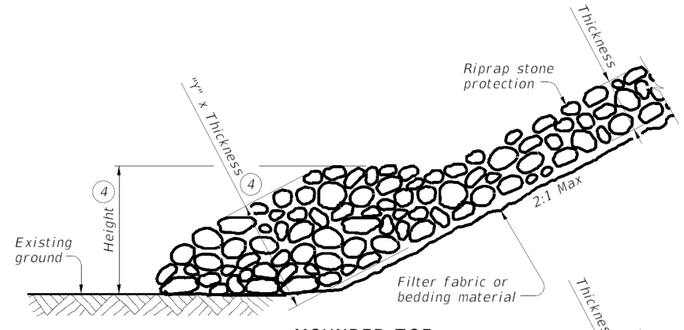
grouted

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

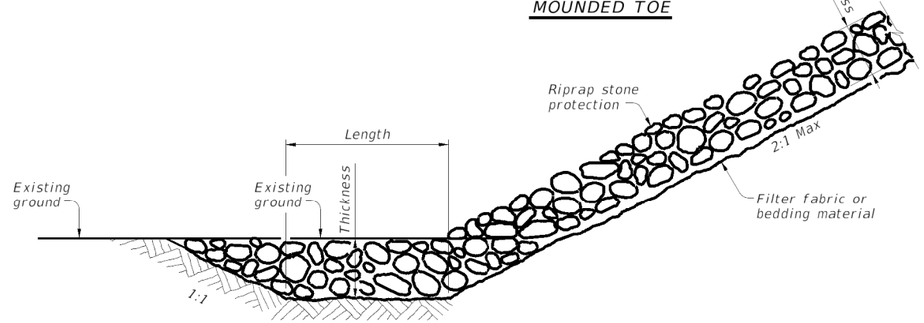
3 *Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.*

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

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



MOUNDED TOE



EXTENDED ROCK FILLED TRENCH

PROTECTION STONE RIPRAP TOE OPTIONS 5

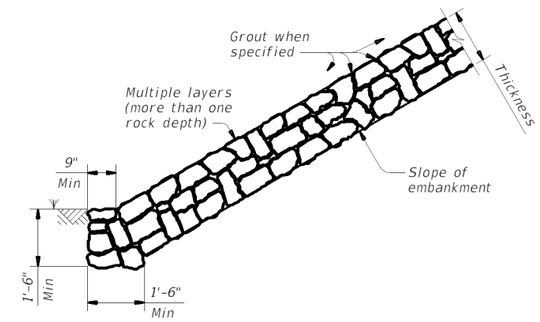


FIGURE 4 ~ COMMON STONE RIPRAP

dry or grouted

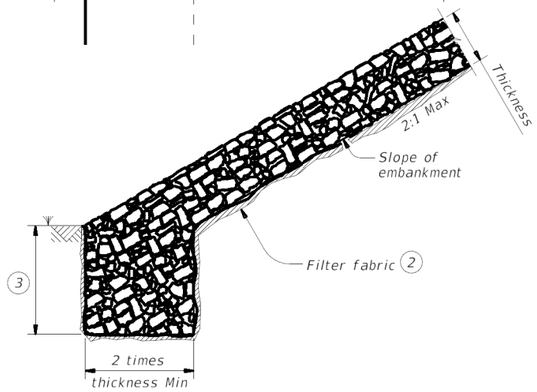


FIGURE 5 ~ PROTECTION STONE RIPRAP 5

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE:	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0610	03	104, ETC.	IH 30, ETC.
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	ATL	TITUS, ETC.		82

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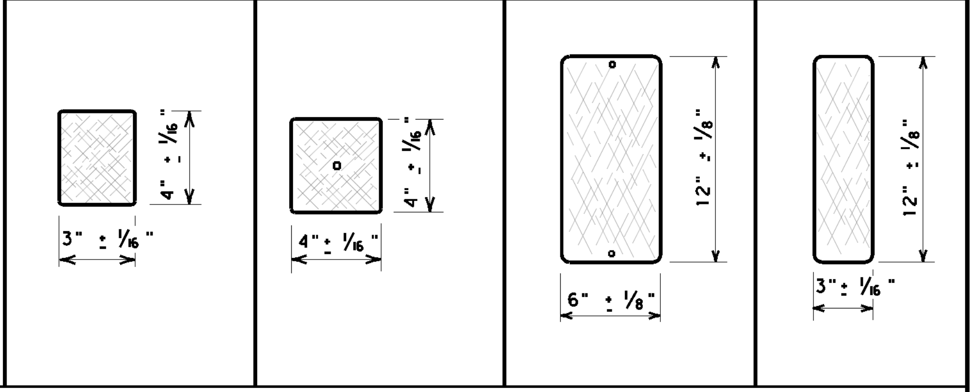
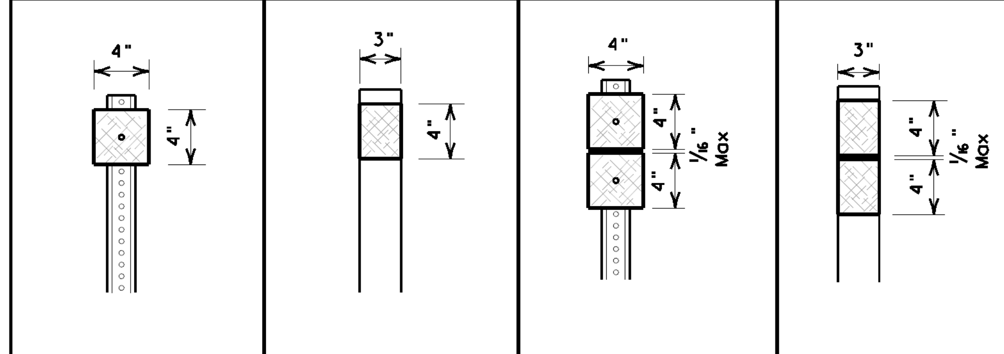
REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS



	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

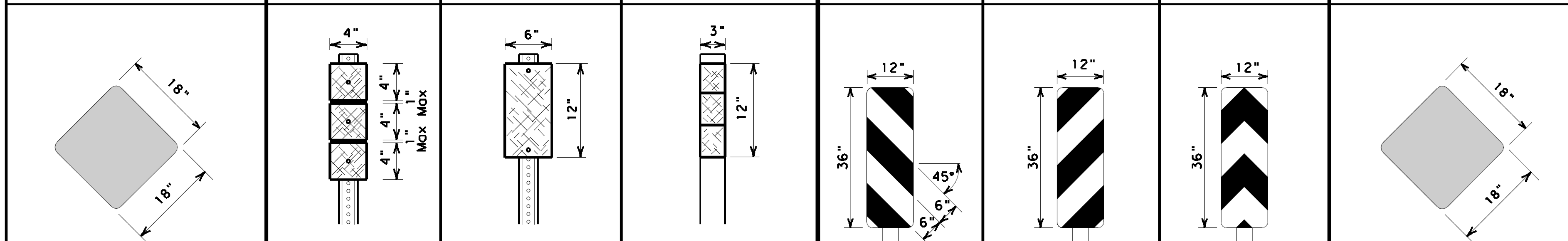
NUMBER OF REFLECTORS OR DIRECTION
- X = 3-Size 2 reflector units (Type 2 only)
- Y = 1-Size 3 reflector unit (Type 2 only)
- Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
- L = Left Side (Type 3 Object Marker only)
- R = Right Side (Type 3 Object Marker only)
- C = Center (Type 3 Object Marker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

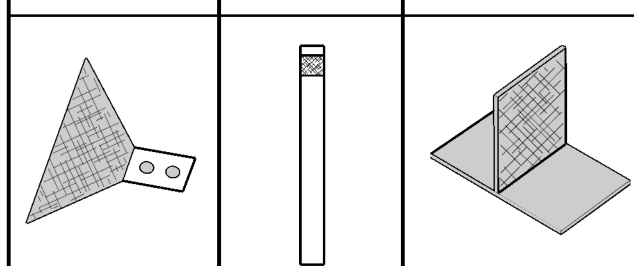


	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating 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

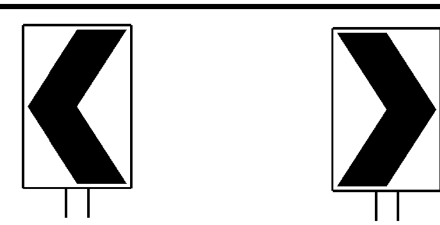
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)



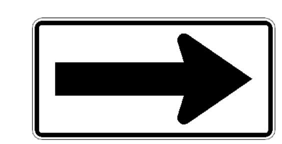
	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches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

CHEVRONS



W1-8

ONE DIRECTION LARGE ARROW



W1-6

	CHEVRONS				ONE DIRECTION LARGE ARROW		
DEVICE	W1-8				DEVICE	W1-6	
SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)	SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only		MOUNTING HEIGHT	7'-0"	
NOTE	1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies). 2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).						

NOTE:

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

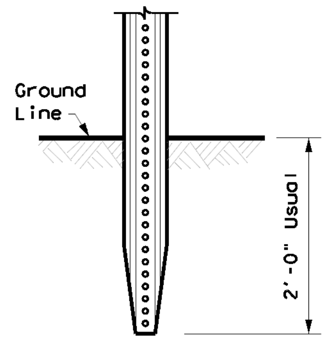
FILE:	dom1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS		0610	03	104, ETC.	IH 30, ETC.
10-09 3-15		DIST		COUNTY	SHEET NO.
4-10 7-20		ATL		TITUS, ETC.	83

20A

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

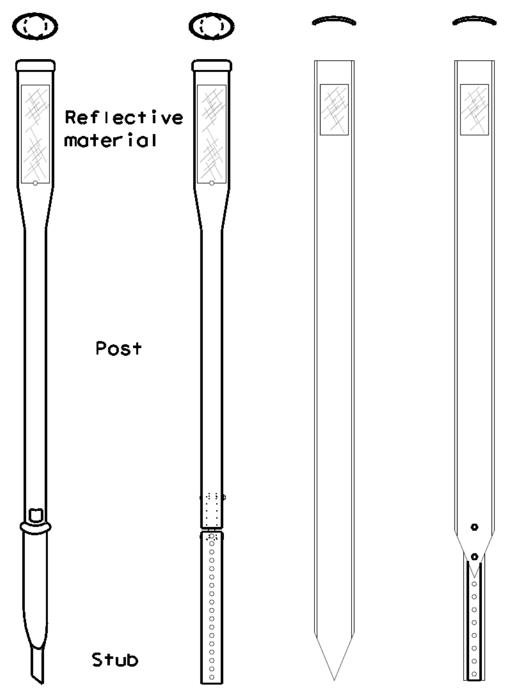


NOTES

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

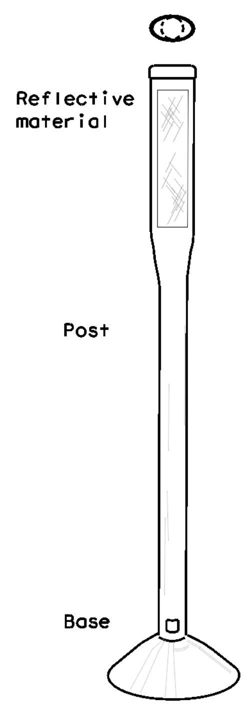
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



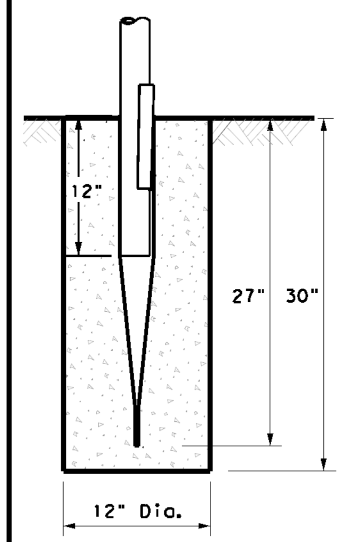
SURFACE MOUNT

NOTES

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

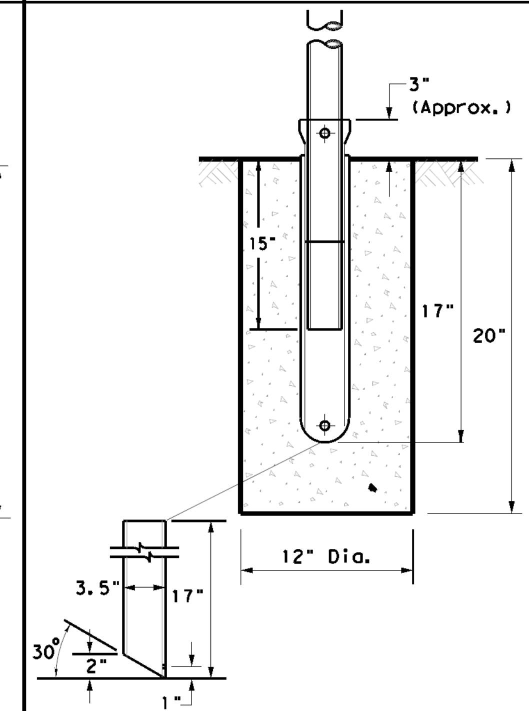
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

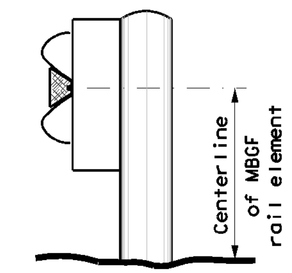
NOTE

1. Install per manufacturer's recommendations.

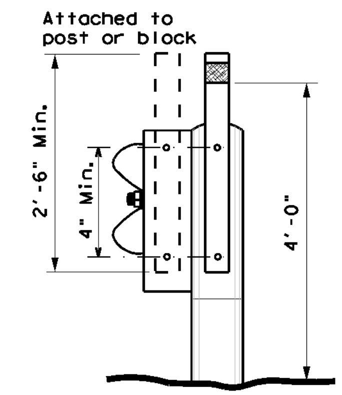
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

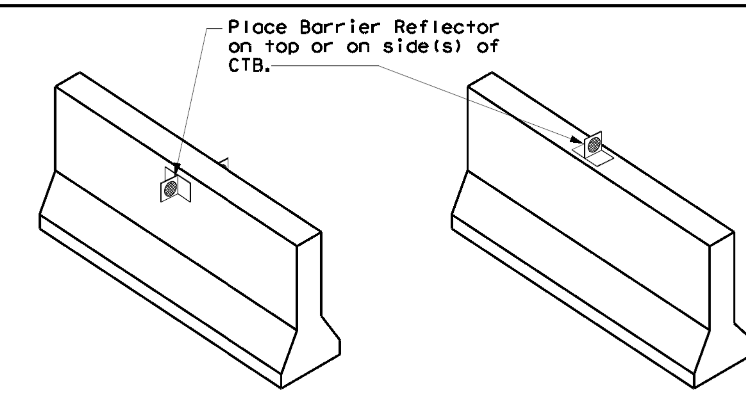
GF1



GF2



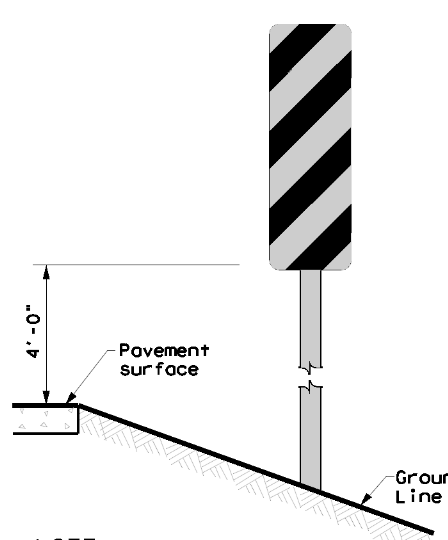
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

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

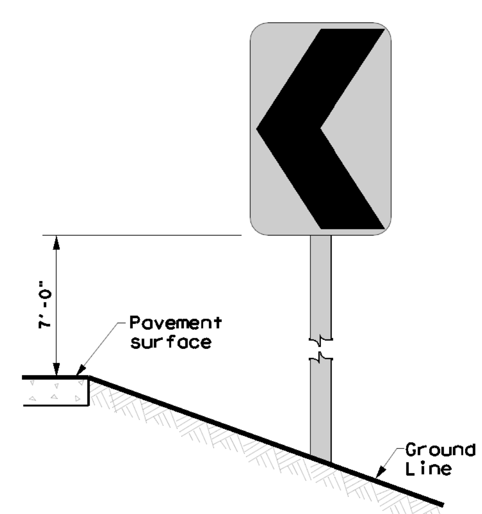
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

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

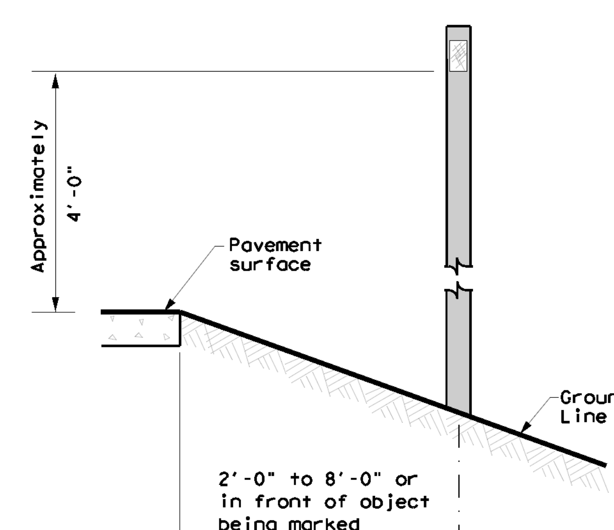
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

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

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT		CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB		HIGHWAY
REVISIONS	0610	03	104, ETC.		IH 30, ETC.
10-09 3-15	DIST	COUNTY			SHEET NO.
4-10 7-20	ATL	TITUS, ETC.			84

20B

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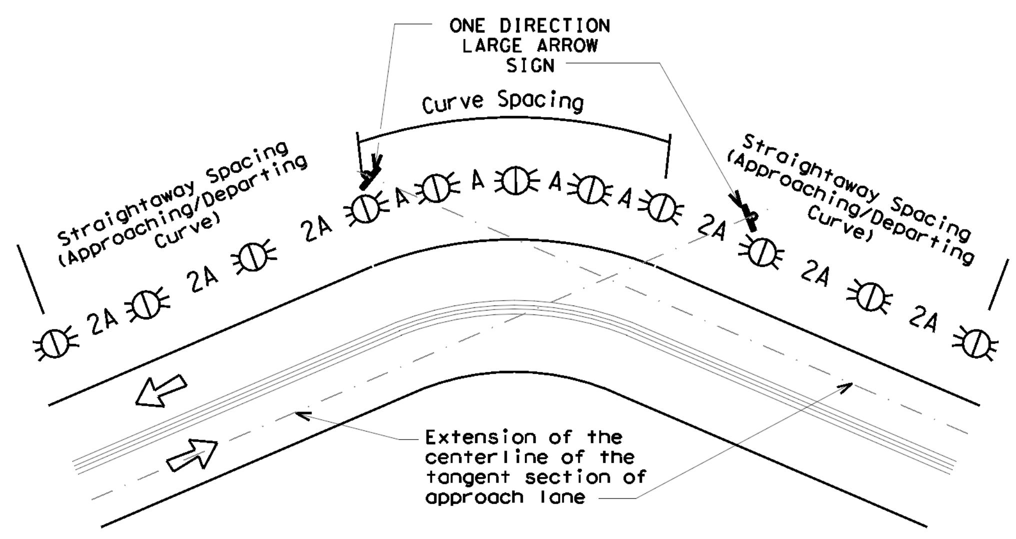
MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

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

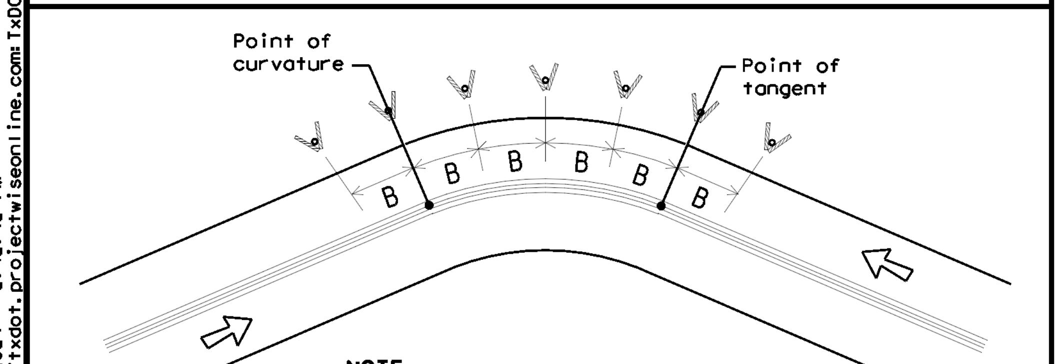
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

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

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

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

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

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

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

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

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

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

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

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

NOTES

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

LEGEND

Symbol	Meaning
	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 0610	SECT 03	JOB 104, ETC.	HIGHWAY IH 30, ETC.
REVISIONS 3-15 8-15 8-15 7-20	DIST ATL	COUNTY TITUS, ETC.		SHEET NO. 85

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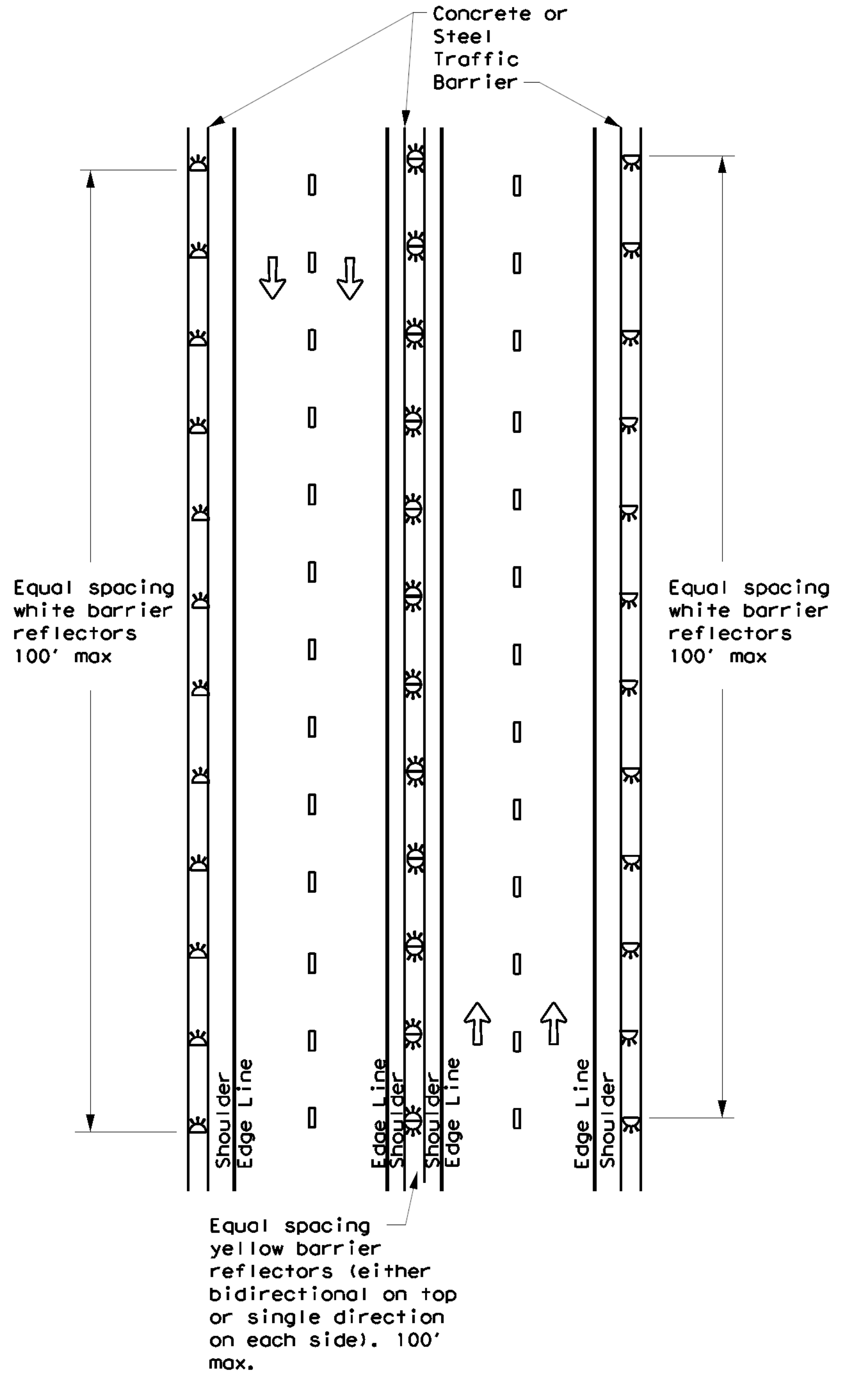
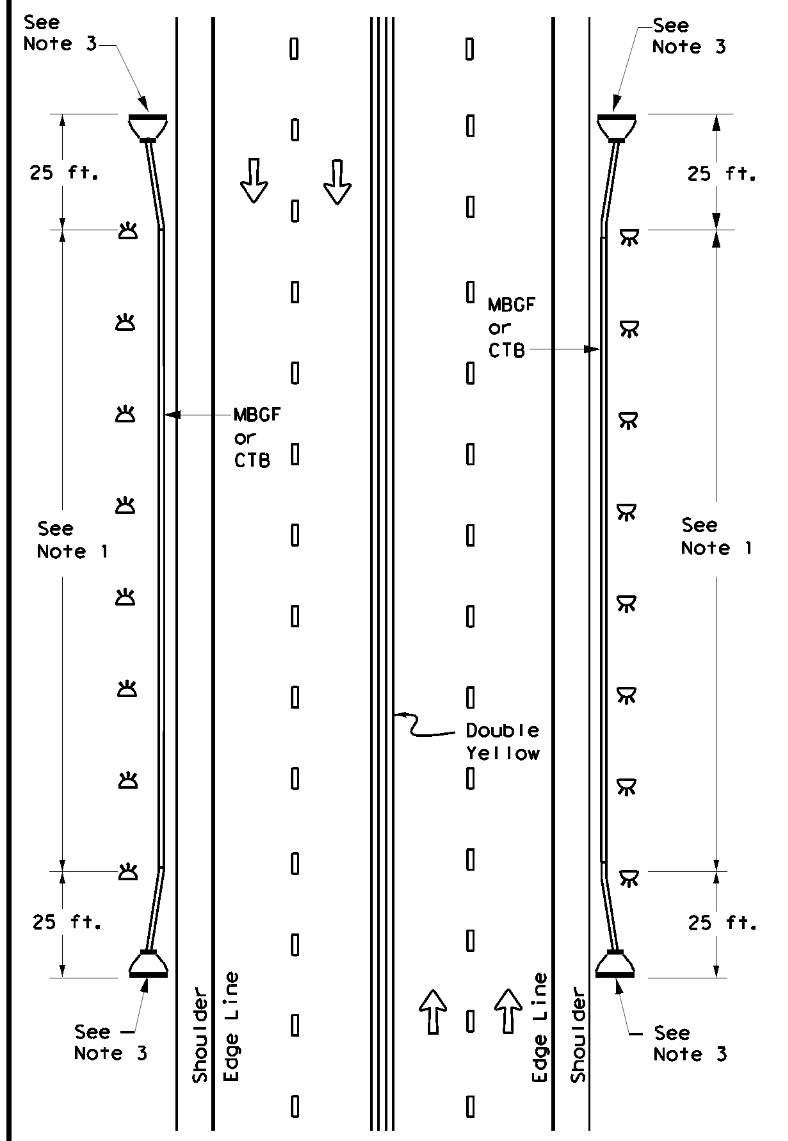
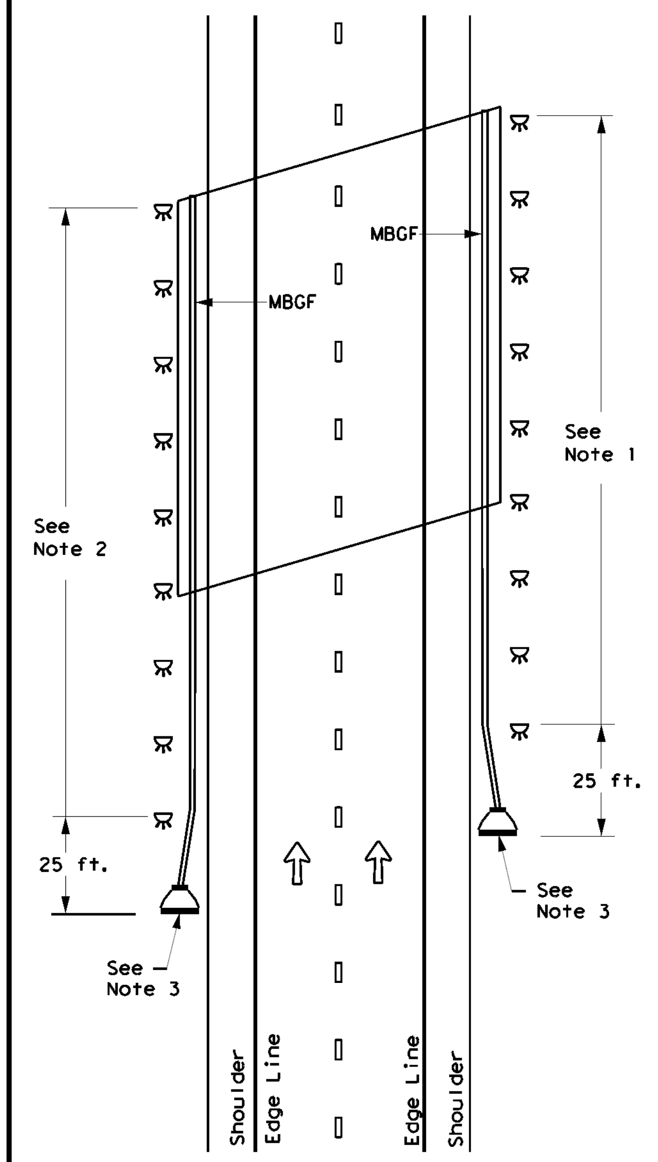
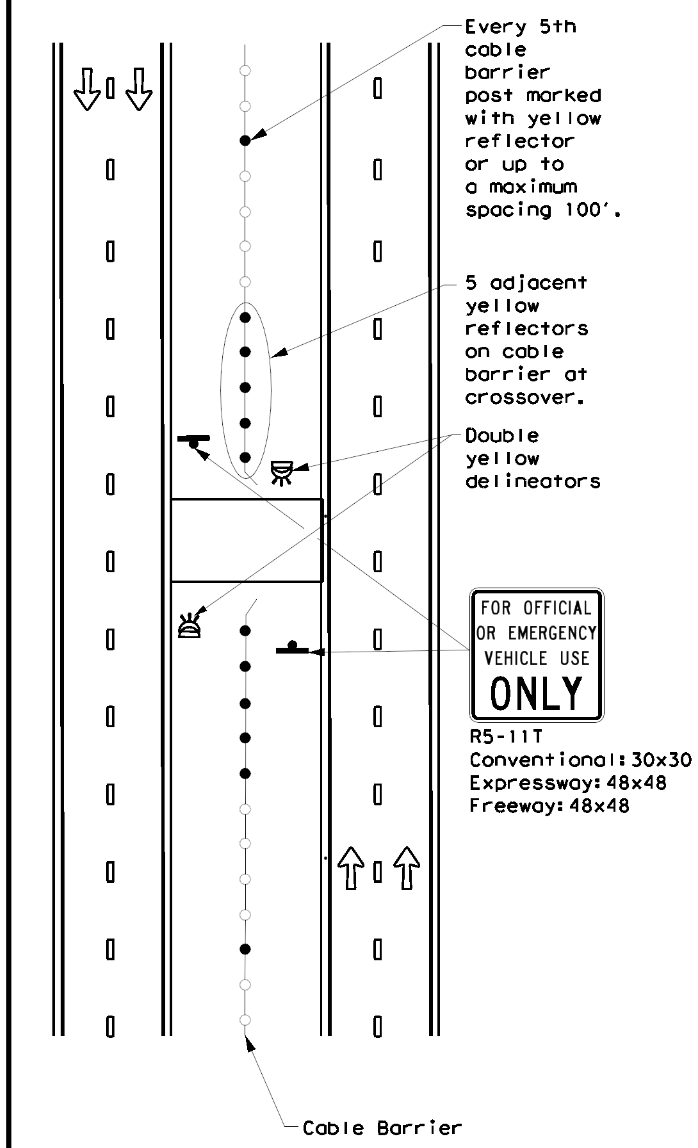
CONTINUOUS CONCRETE OR STEEL BARRIER	MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)	DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)	EMERGENCY CROSSOVER









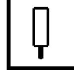
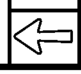
NOTES

1. Equal spacing (100' max), but not less than 3 single directional white barrier reflectors or delineators. On Continuos Barrier, equal spacing (100' max.)

2. Equal spacing (100' max), but not less than 3 single directional yellow barrier reflectors or delineators.

3. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

LEGEND

Symbol	Description
	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.
	ATL		TITUS, ETC.	86

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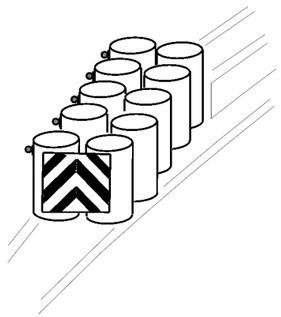
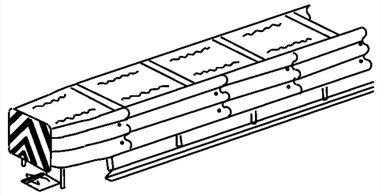
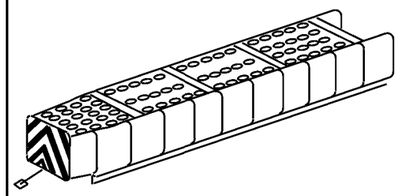
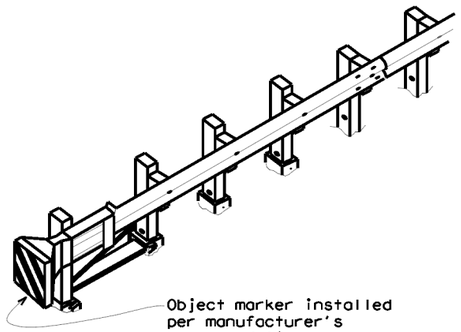
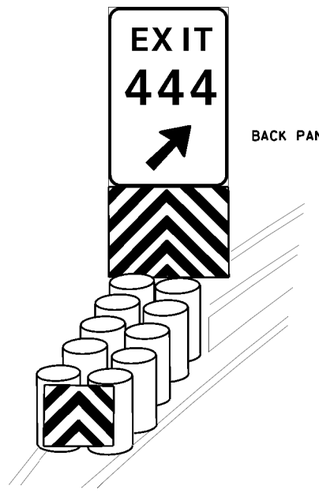
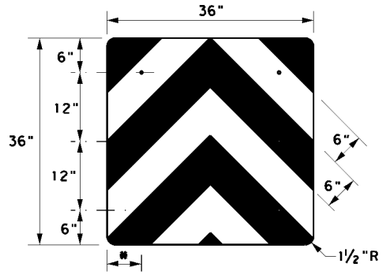


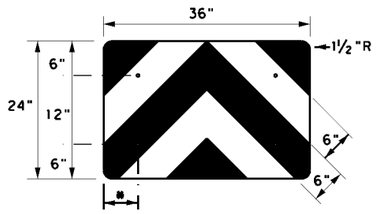




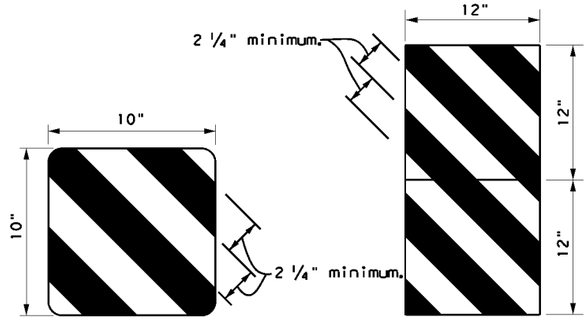




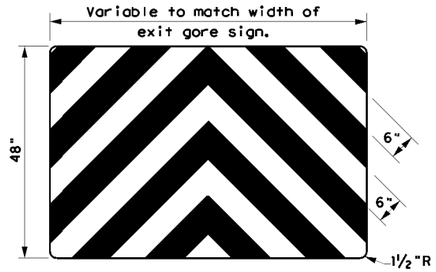


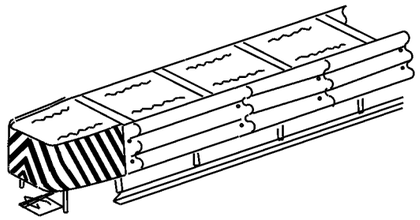


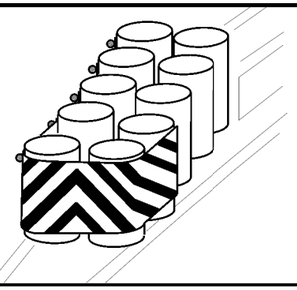
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

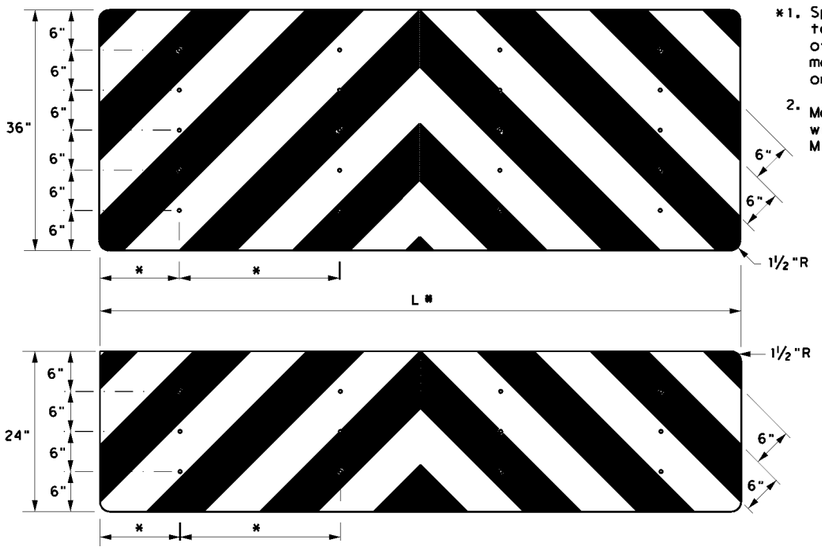


OBJECT MARKERS SMALLER THAN 3 FT^2









NOTES

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

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

NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS

D & OM(VIA)-20

FILE: domvia20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT December 1989	CONT	SECT	JOB	HIGHWAY
REVISIONS	0610	03	104, ETC.	IH 30, ETC.
4-92 8-04	DIST	COUNTY		SHEET NO.
8-95 3-15	ATL	TITUS, ETC.		87
4-98 7-20				

20G

DATE:
FILE:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1. N/A

☐ No Action Required ☒ Required Action

Action No.

1. This project is considered a maintenance activity and is exempt from the requirements of TPDES TXR 150000.

Commitment No.

1. Refer to the SWP3 Plan Sheet, BMPs, and Detail. It will address sweeping, chemical storage, sanitary waste, and all other management practices.

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

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

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

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

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1. Tankersley Creek
2.
3.
4.

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.
2.
3.
4.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☒ No Action Required ☐ Required Action

Action No.

1.
2.
3.
4.

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.
2.

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	SWSP:	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: Points, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

- Dead or distressed vegetation (not identified as normal)
- Trash piles, drums, canister, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

☒ Yes ☐ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☒ Yes ☐ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☐ No Action Required ☒ Required Action

Action No.

1. Spot abatement of asbestos and lead coatings will be performed by TxDOT prior to construction activities at the following bridges: IH 30 at US 82 (east & westbound), IH 30 at CR 4008 (east & westbound), IH 30 at SH 98 (east & westbound).

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.
2.
3.

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	0610	03	104, ETC.	IH 30, ETC.	
12-12-2011 (DS)	DIST	COUNTY		SHEET NO.	
05-07-14 ADDED NOTE SECTION IV.	ATL	TITUS, ETC.		88	
01-23-2015 SECTION I CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.					

7/1/2024
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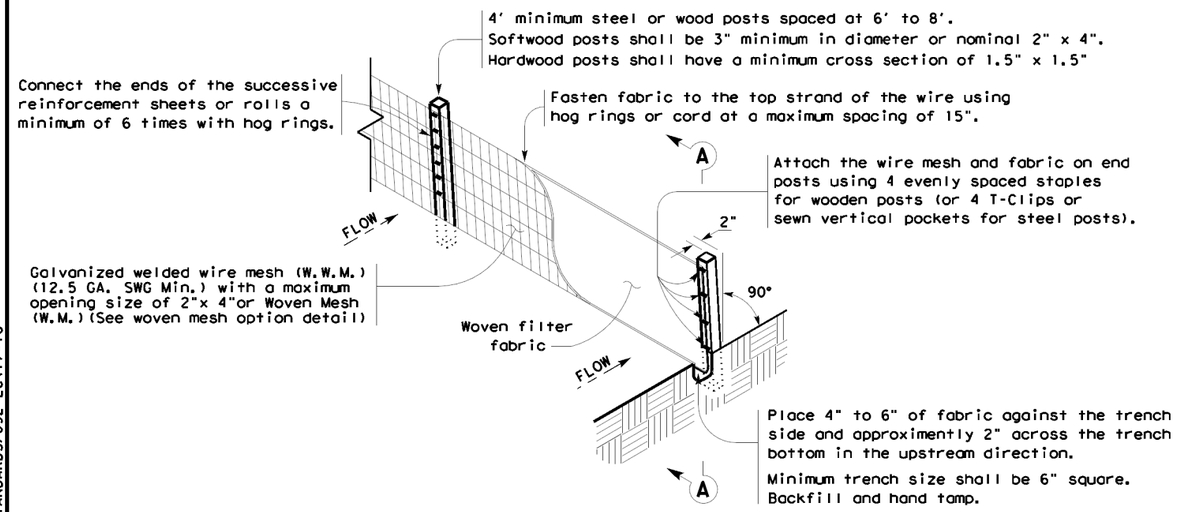
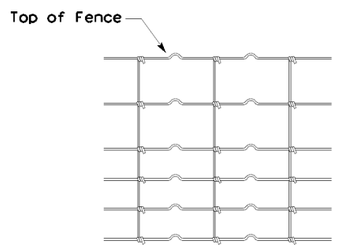
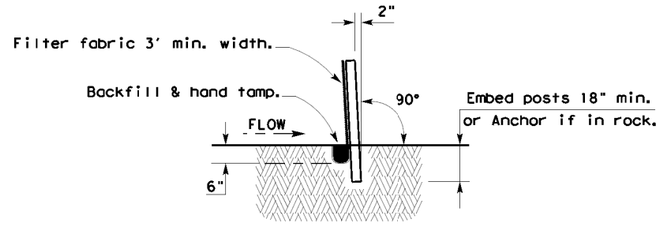


TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

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

SEDIMENT CONTROL FENCE USAGE GUIDELINES

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

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

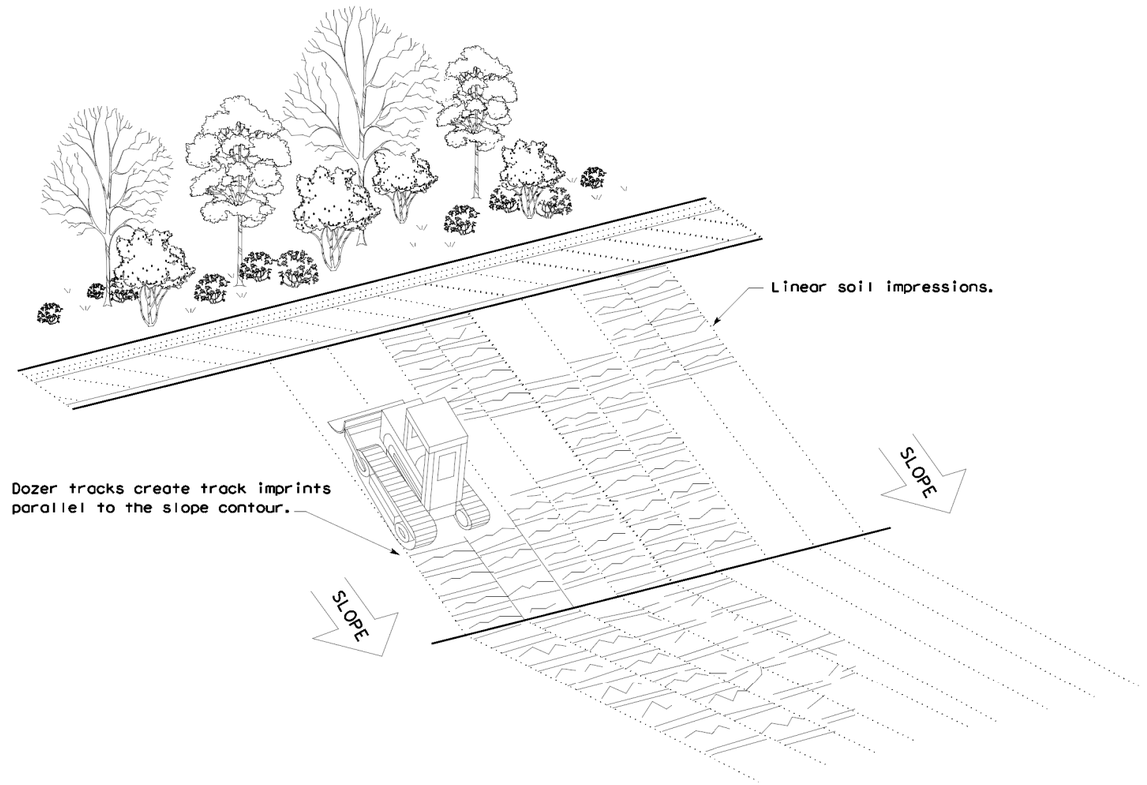
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

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



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0610	03	104, ETC.	IH 30, ETC.
	DIST	COUNTY		SHEET NO.
	ATL	TITUS, ETC.		89

DATE: 7/1/2024
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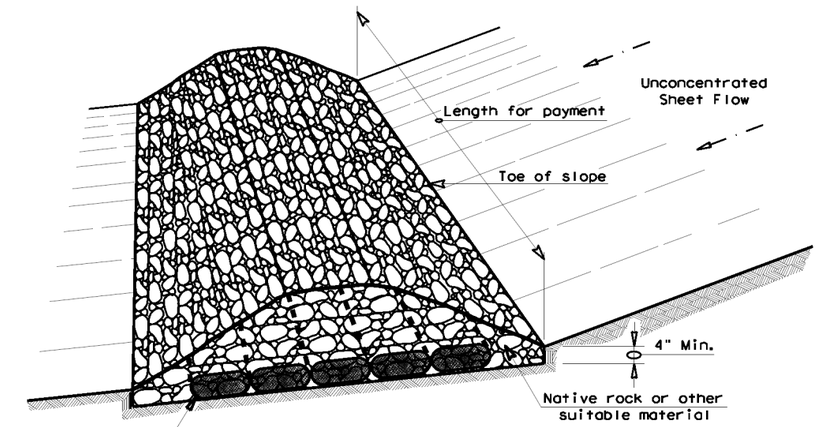
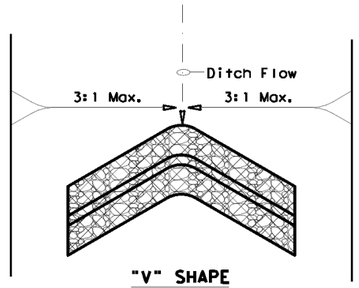
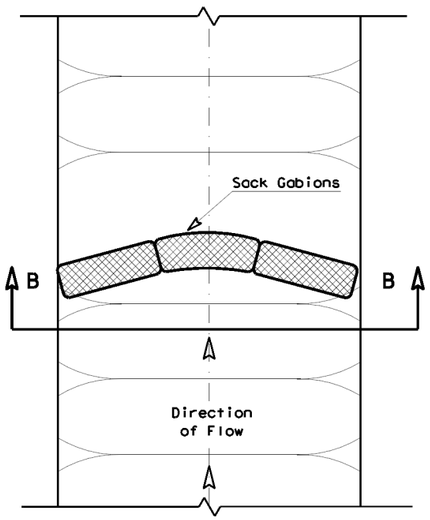


FILTER DAM AT TOE OF SLOPE

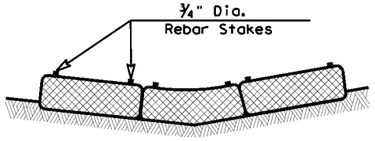
RFD1



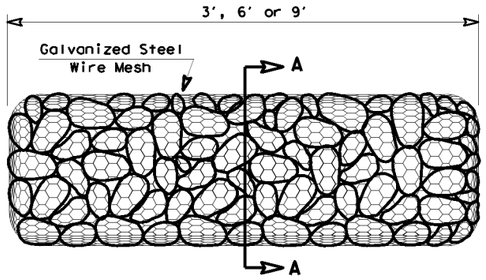
"V" SHAPE PLAN VIEW



PLAN VIEW

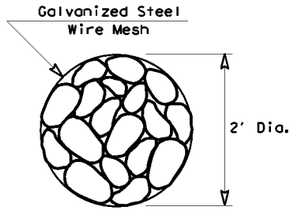


SECTION B-B

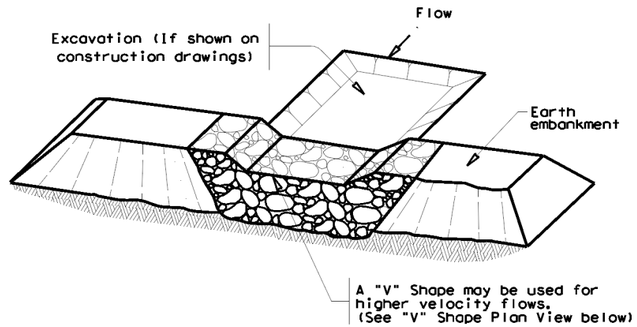


TYPE 4 (SACK GABIONS)

RFD4

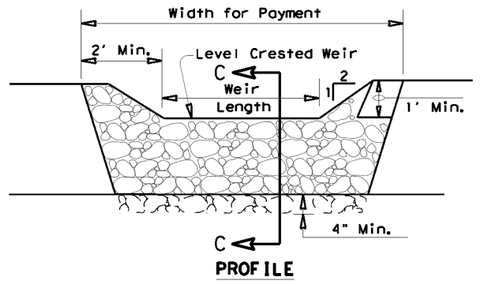


SECTION A-A

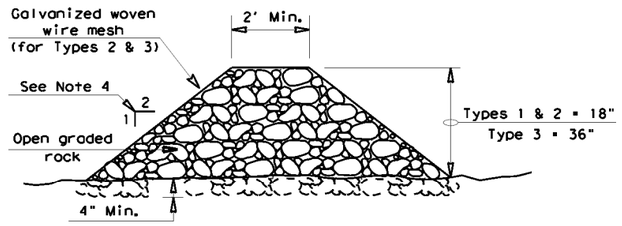


FILTER DAM AT SEDIMENT TRAP

RFD1 — OR — RFD2



PROFILE



SECTION C-C

ROCK FILTER DAM USAGE GUIDELINES

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

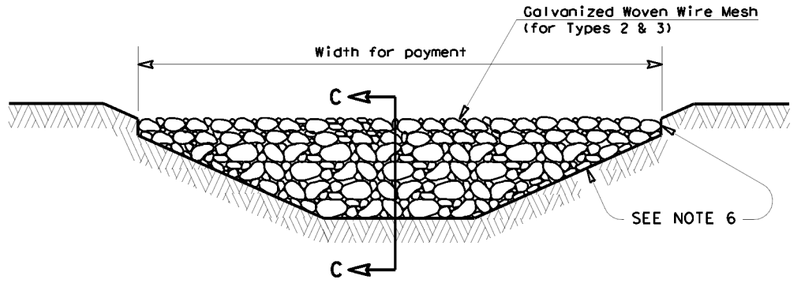
Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity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

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

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

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

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



FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

GENERAL NOTES

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

PLAN SHEET LEGEND

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

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	ATL	TITUS, ETC.		90