FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
	BR 2B23(191)		1
STATE	STATE DIST.	COUNTY	
TEXAS	BRY	WASHINGTON	
CONT.	SECT.	JOB	HIGHWAY NO.
0114	10	104	US290

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

SEE SHEET 2 FOR INDEX OF SHEETS AND SHEET 3 FOR PROJECT LOCATION MAPS

FINAL PLANS

LETTING DATE: _____

DATE CONTRACTOR BEGAN WORK: _____

DATE WORK WAS COMPLETED & ACCEPTED: _____

FINAL CONTRACT COST: $ _____

CONTRACTOR: _____

FEDERAL AID PROJECT NO: BR 2B23(191)

WASHINGTON COUNTY

US 290 AT FM 577

DESIGN SPEED: US 290 = 65 MPH

PROJECT LENGTH = 0.074 MILES
REPAIR OF BRIDGE APPROACH PAVEMENT, APPROACH SLAB, AND RAILING

HIGHWAY	CONTROL NO.	COUNTY	LIMITS FROM	LIMITS TO	2022 ADT	REFERENCE MARKERS		ROADWAY LENGTH (MI)	BRIDGE LENGTH (FT)	PROJECT LENGTH (MI)
						BEGIN	END			
US 290	0114-10-104	WASHINGTON	AT FM 577	-	32,657	676+0.39	676+0.465	0.074	--	0.074

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOV. 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, JULY 2022).

NO EXCEPTIONS
NO EQUATIONS
NO RAILROAD CROSSING

SUBMITTED FOR LETTING: 7/6/2023
DocuSigned by: Jann Keong Kam
E53991C5A294494... *DESIGN MANAGER*

RECOMMENDED FOR LETTING: 7/6/2023
DocuSigned by: Doug J. Marin, P.E.
DAA3B0624E5A19... *DIRECTOR OF TRANSPORTATION PLANNING AND DEVELOPMENT*

APPROVED FOR LETTING: 7/6/2023
DocuSigned by: Chad Bohne
60E5537715D24EA... *DISTRICT ENGINEER*

DATE: 6/23/2023
FILE: BRYCEC_TASK04_TITLE_SHEET.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

SHEET NO.	DESCRIPTION
	I. GENERAL
1	TITLE SHEET
2	INDEX OF SHEETS
3	PROJECT LOCATION MAP
4	EXISTING AND PROPOSED TYPICAL SECTIONS
5	GENERAL NOTES
6	ESTIMATE & QUANTITIES
7	QUANTITY SUMMARY
8	CRASH CUSHION SUMMARY SHEET
	II. TRAFFIC CONTROL PLAN
9-10	TCP NARRATIVE
11	TCP TYPICAL SECTIONS PHASE 1
12-19	TCP LAYOUT PHASE 1
20	TCP TYPICAL SECTIONS PHASE 2
21-28	TCP LAYOUT PHASE 2
	STANDARDS
29-40	* BC(1)-21 THRU BC(12)-12
41	* TCP(2-5)-18
42	* TCP(2-6)-18
43	* TCP(6-1)-12
44	* TCP(6-2)-12
45	* WZ(STPM)-23
46	* WZ(BRK)-13
47	* WZ(TD)-17
48	* WZ(RS)-22
49	* QGELITE(M10)(N)-20
49A	* SMTC(N)-16
50-51	* MISC DETAILS
	III. ROADWAY DETAILS
52	REMOVAL LAYOUT
53-54	CONTROL LAYOUT SHEETS
55-56	CONTROL INDEX SHEETS
57	HORIZONTAL ALIGNMENT DATA
58	ROADWAY LAYOUT
	STANDARDS
59-60	* CRCP(1)-23
61-62	* REPCP-14
63	* BAS-C
64	* CSB(3)-16
65	* RS(1)-23
	IV. DRAINAGE
66	DRAINAGE AREA MAPS
67	HYDRAULIC COMPUTATIONS
68	DRAINAGE PLAN AND PROFILE
	STANDARDS
69-70	# RW(RI)
	V. PAVEMENT MARKINGS
71-78	PAVEMENT MARKINGS LAYOUT
	STANDARDS
79	* CPM(1)-14
80	* PM(1)-20
81	* FPM(1)-22
82	* FPM(5)-22
83	* FPM(6)-22
	VI. ENVIRONMENTAL
84-85	SW3P LAYOUT PHASE 1
86-87	SW3P LAYOUT PHASE 2
88	EPIC
89	TxDOT STORM WATER POLLUTION PREVENTION PLAN (SWP3)
	STANDARDS
90-92	* EC(9)-16

STATE OF TEXAS
TARA T. ALEXANDER
109548
LICENSED PROFESSIONAL ENGINEER

Tara Alexander 7/25/2023

TARA T. ALEXANDER, P.E. — DATE

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

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED PROFESSIONAL ENGINEER

7/25/2023

DAVID K. NESHYBA, P.E. — DATE

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

JMT TBPE REGISTRATION NO. F-16341

INDEX OF SHEETS

SHEET 1 OF 1

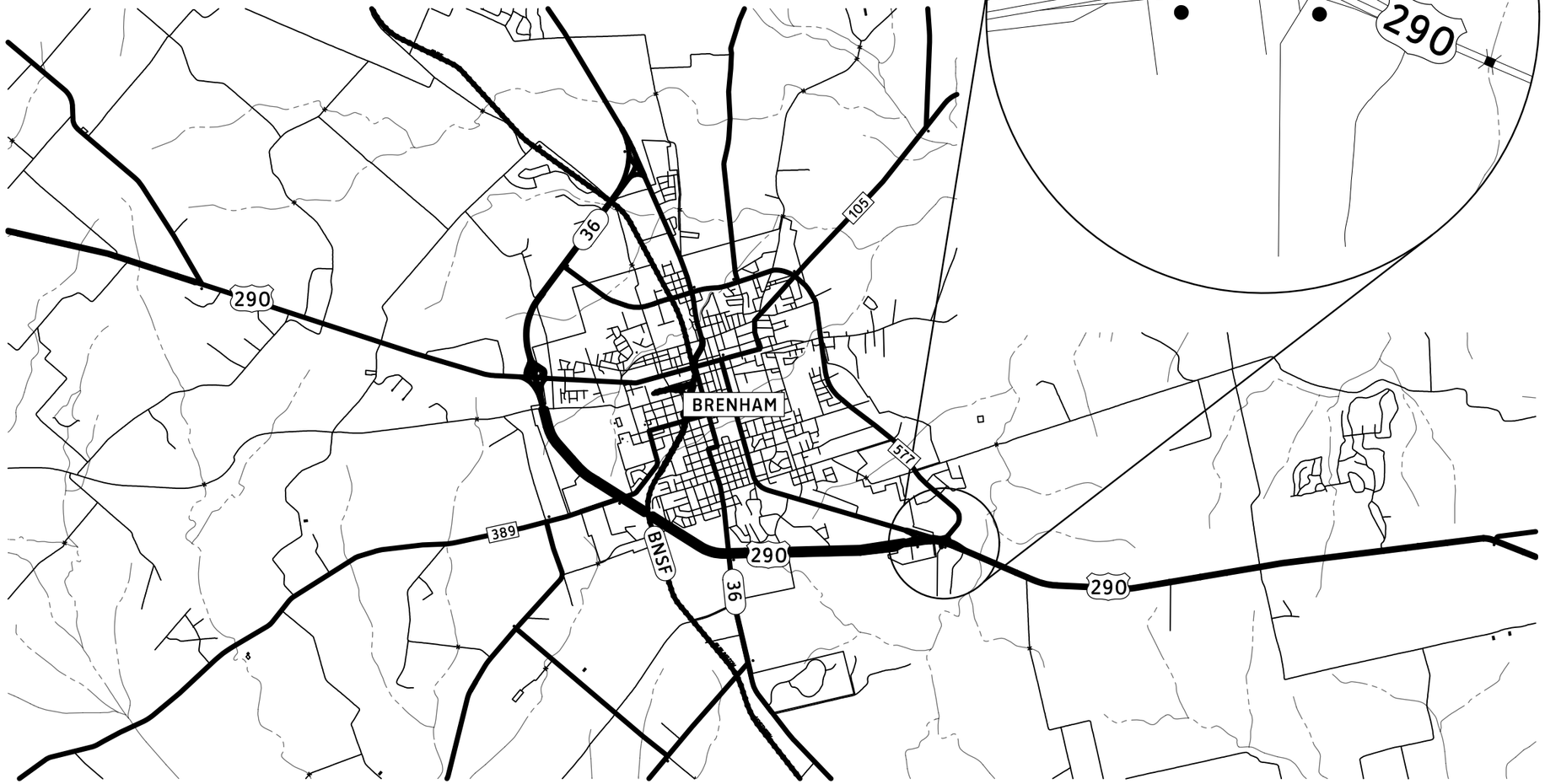
CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		2

DATE: 7/25/2023
FILE: JMT_BRYCEC_TASK04_INDEX_SHEETS_01.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

BEGIN PROJECT
CSJ 0114-10-104
STA 1410+00.00
REF. MRKR. 676+0.39
LAT: 30.1433412, LONG: -96.3644441

END PROJECT
CSJ 0114-10-104
STA 1412+05.82
REF. MRKR. 676+0.465
LAT: 30.1430004, LONG: -96.3632526



DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS
7/5/2023

0 3000' 6000'
SCALE IN FEET

TBPE REGISTRATION NO. F-16341

Texas Department of Transportation

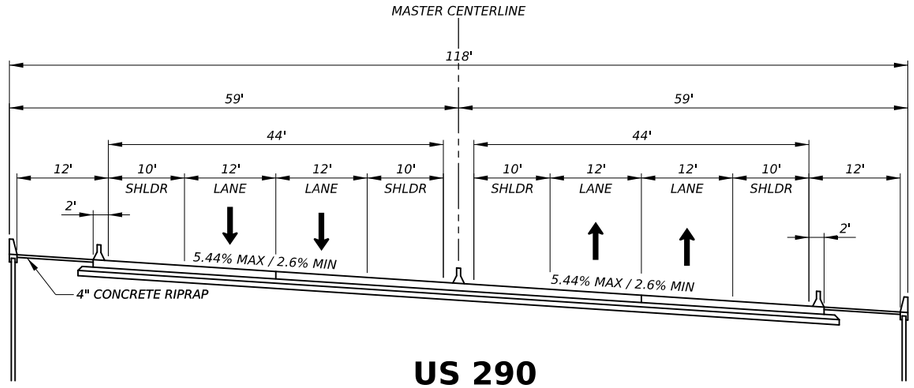
PROJECT LOCATION MAP

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		3

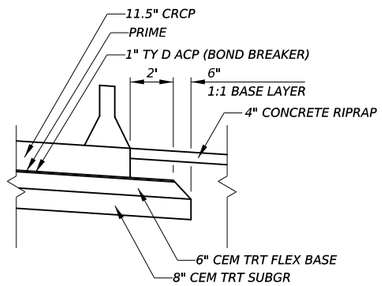
DATE: 7/5/2023
FILE: BRYCEC_TASK04_PRILOC.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT



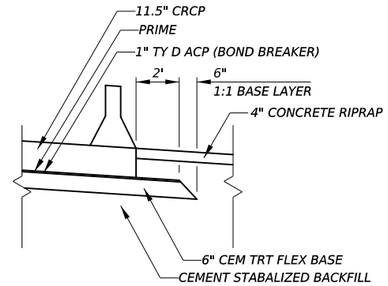
US 290

TYPICAL SECTION
EXISTING AND PROPOSED
STA 1399+00 TO STA 1420+11



US 290

EXISTING PAVEMENT SECTION
STA 1410+00.00 TO STA 1412+06.12



US 290

PROPOSED PAVEMENT SECTION
STA 1410+00.00 TO STA 1412+06.12

NOTES:
1. CONTRACTOR TO DETERMINE DEPTH OF TOP RETAINING WALL STRAPS (ALONG BOTH DIRECTIONS OF THE MAINLANES AND AT THE ABUTMENT) AFTER REMOVAL OF EXISTING CONCRETE PAVEMENT. LOCATE STRAP AT A MINIMUM OF THREE, EVENLY SPACED LOCATIONS. NOTIFY ENGINEER IN WRITING PRIOR TO BEGINNING EXCAVATION.

2. ENGINEER TO DETERMINE DEPTH OF EXCAVATION.

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

TBPE REGISTRATION NO. F-16341

Texas Department of Transportation

US 290
EXISTING AND PROPOSED
TYPICAL SECTIONS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		4

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_TYP_01.dgn

BASIS OF ESTIMATE					
ITEM	DESCRIPTION	COURSE	RATE	AMOUNT	QUANTITY
276	Cement (FOR PLANT MIXED)(BASE 6")(3.5%) (CONTRACTOR'S INFO ONLY)		0.0115 TON/SY	1943 SY	.0112 TONS
310	Prime Coat (MC – 30 OR AE-P)	Prime	0.20 GAL/SY	2203 SY	441 GAL
3076	D-GR HMA TY-B PG64-22	1"	110 LB/SY	2203 SY	122 TONS

Note: Rates are for estimating purposes only. Actual rates will be determined in the field.

GENERAL:

Contractor questions on this project are to be addressed to the following individuals:
James Kreamer, P.E., A.E., James.Kreamer@txdot.gov
Rene Pequeno, P.E., A.A.E., Rene.Pequeno@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.

Send eligible shop plan submittals with PDF attachments directly to the reviewing office.

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.

Sheet: 5
Highway: US 290 Control: 0114-10-104
County: WASHINGTON

ITEM 6 "CONTROL OF MATERIALS"

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"

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

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

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

In addition to lane closures, cease work 3 days prior to hurricane landfall on or near the roadway that adversely impacts the flow of traffic and reduces the capacity of the highway during an evacuation.

Prohibit the Contractor's, sub-contractors' or material suppliers' vehicles from entering or exiting the stream of traffic including material hauling and delivery, and mobilization or demobilization of equipment. When directed, this prohibition will include a reasonable time period for the evacuees to return to their point of origin.

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

Primary Evacuation Routes: IH 45, US 290, SH 6, SH 36.
Secondary Evacuation Routes: US 79, US 84, SH 7, SH 30, SH 21, SH 105.

Other routes may be designated.

No significant traffic generator events identified.

ITEM 8 "PROSECUTION AND PROGRESS"

By noon of each Wednesday, provide the Engineer a written outline of the daily work schedule for the following week. Include in the outline the times and places for proposed traffic control changes, lane and shoulder closures, and moving operations or other operations that affect traffic on the roadway. Unless otherwise authorized by the Engineer, prosecute the work on this project in accordance with the following sequence of work:
1) Set advance signing and barricades.
2) Place SW3P
3) Place the permanent striping and signing.
4) Remove the SW3P.
5) Final cleanup.

Some of these operations may be performed simultaneously.

Prepare Progress Schedule Bar Chart.

Equipment and material may be pre-staged at approved locations.

Road User Cost (RUC) for CSJ 0114-10-104 is $3,780, Liquidated Damages will be increased by the RUC per day.

ITEM 247 "FLEXIBLE BASE"

Place flexible base in equal lifts of 4 to 8 in. in depth unless otherwise approved by the Engineer.

Sheet: 5A

Highway: US 290 **Control:** 0114-10-104
County: WASHINGTON

ITEM 301 "ASPHALT ANTISTRIPPING AGENT"

When the Contractor adds lime as an anti-stripping agent (or an equivalent anti-stripping agent) the lime or equivalent shall be added to the asphaltic concrete in the methods specified in this item unless otherwise approved by the Engineer. If an alternate method is proposed, the Engineer's approval will be based on test method Tex-242-F performed on the asphaltic concrete produced through the plant.

ITEM 305 "SALVAGING, HAULING, AND STOCKPILING RECLAIMABLE ASPHALT CONCRETE"

Unless otherwise shown on the plans, RAP generated by this project will become the property of the Contractor for use in the current construction project or in future projects.

Estimated RAP quantities by location are as follows:
- US 290 – 383 CY

ITEM 310 "PRIME COAT"

Cure MC 30 for 7 days before placing subsequent surface courses unless otherwise directed by the engineer.

ITEM 320 "EQUIPMENT FOR ASPHALT CONCRETE PAVEMENT"

Unless otherwise approved by the Engineer, provide a Material Transfer Device with remixing capabilities as specified in Item 320.2.3.3 Placement and Compaction Equipment for all asphaltic concrete pavement.

ITEM 360 "CONCRETE PAVEMENT"

All concrete pavement mixes placed from April 1 to October 31 shall contain a minimum of 25 percent by weight of Class "F" Fly Ash or shall use Type IP cement.

If the concrete design requires more than 5.5 sacks of cementitious material per cubic yard, written approval by the Engineer will be required.

During the months of June, July, and August, sprinkle the aggregate at the stockpile with water to provide evaporative cooling.

ITEM 361 "REPAIR OF CONCRETE PAVEMENT"

Finishing and Surface Texture in accordance with Item 360. Surface texture shall match adjacent concrete.

ITEM 465 "JUNCTION BOXES, MANHOLES AND INLETS"

When furnishing precast Inlets, Manholes and Extensions, cast elements for specific project locations.

ITEM 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING"

Removal of ground mounted temporary signs and supports as specified on standard sheet BC (5), shall include the immediate backfilling of support holes with Type B embankment material and the compaction of the backfill material.

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

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

ITEM 512 "PORTABLE TRAFFIC BARRIER"

Do not pin PTB on bridge decks. For work zone safety, PTB shall not deflect more than (5').
Alternate anchoring methods may be required to meet these criteria. Refer to standard sheets.

Sheet: 5B

Highway: US 290 **Control:** 0114-10-104
County: WASHINGTON

ITEM 662 "WORK ZONE PAVEMENT MARKINGS"

Paint and beads may be used for non-removable work zone pavement markings.

All striping limits must be approved by the Engineer before striping operations may begin.

ITEM 666 "REFLECTORIZED PAVEMENT MARKINGS"

Unless authorized by the Engineer, the Contractor will not place the pavement markings on the resurfaced roadway until it has cured for 3 days.

All striping limits must be approved by the Engineer before striping operations may begin.

ITEM 672 "RAISED PAVEMENT MARKERS"

Use flexible bituminous adhesive for applications on all pavement types.

ITEM 6001 "PORTABLE CHANGEABLE MESSAGE SIGN"

Furnish, install, and operate up to 2 Portable Changeable Message Signs (PCMS) for this project. The signs can be used both on the project and within a ten (10) mile radius of the project. Locations, messages, and durations of use will be specified by the Engineer. The primary uses will be to inform the public of special events, lane and road closures, and changes in traffic control. Signs will be paid for only when used as directed by the Engineer.

ITEM 6158 "TRAILER MOUNTED SOLAR POWERED RADAR SPEED CONTROL MONITOR"

Truck mounted solar powered radar speed control monitor to be placed with work zone speed limit sign.

Highway: **US 290** **Control:** **0114-10-104**

County: **WASHINGTON**

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

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

provide one (1) shadow vehicle(s) with TMA for TCP(2-5)-18 as detailed on General Note 3 of this standard sheet.

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

provide one (1) shadow vehicle(s) with TMA for TCP(6-1)-12 as detailed on the bottom of this standard sheet.

provide one (1) shadow vehicle(s) with TMA for TCP(6-2)-12 as detailed on the bottom of this standard sheet.

Therefore, ten (4) total shadow vehicles with TMA will be required for this type of work. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

Six (6) TMA days are provided in the project estimate for stationary operations to be utilized per the standards listed in the TCP narrative.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0114-10-104 **DISTRICT** Bryan **COUNTY** Washington
HIGHWAY US 290

			CONTROL SECTION JOB		**0114-10-104**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00195177**		
			COUNTY		**Washington**		
			HIGHWAY		**US 290**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	104-6009	REMOVING CONC (RIPRAP)	SY	93.000		93.000	
	104-6023	REMOVING CONC (CTB)	LF	207.000		207.000	
	361-6051	FULL-DPTH REP(BR APPROACH SLAB)(9"-13")	SY	260.000		260.000	
	361-6066	FULL-DEPTH REPAIR CRCP (11"-12")	SY	1,943.000		1,943.000	
	400-6001	STRUCT EXCAV	CY	1,841.000		1,841.000	
	400-6005	CEM STABIL BKFL	CY	2,657.000		2,657.000	
	401-6001	FLOWABLE BACKFILL	CY	168.000		168.000	
	402-6001	TRENCH EXCAVATION PROTECTION	LF	75.000		75.000	
	403-6001	TEMPORARY SPL SHORING	SF	3,083.000		3,083.000	
	432-6001	RIPRAP (CONC)(4 IN)	CY	13.000		13.000	
	465-6235	INLET (COMPL)(RWI)(TY I)	EA	2.000		2.000	
	481-6016	PIPE (PVC) (SCH 40) (12 IN)	LF	25.000		25.000	
	481-6021	PIPE (PVC) (SCH 40) (24 IN)	LF	172.000		172.000	
	496-6002	REMOV STR (INLET)	EA	2.000		2.000	
	496-6007	REMOV STR (PIPE)	LF	197.000		197.000	
	496-6025	REMOV STR (APPROACH SLAB)	EA	2.000		2.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	6.000		6.000	
	506-6040	BIODEG EROSN CONT LOGS (INSTL) (8")	LF	755.000		755.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	755.000		755.000	
	512-6001	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	2,550.000		2,550.000	
	512-6025	PORT CTB (MOVE)(SGL SLP)(TY 1)	LF	2,370.000		2,370.000	
	512-6049	PORT CTB (REMOVE)(SGL SLP)(TY 1)	LF	2,730.000		2,730.000	
	514-6013	PERM CTB (F-SHAPE) (TY 1)	LF	207.000		207.000	
	533-6005	RUMBLE STRIPS (SHOULDER) CONCRETE	LF	364.000		364.000	
	545-6003	CRASH CUSH ATTEN (MOVE & RESET)	EA	2.000		2.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)	EA	3.000		3.000	
	545-6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	3.000		3.000	
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	13,572.000		13,572.000	
	662-6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	10,974.000		10,974.000	
	666-6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	2,178.000		2,178.000	
	666-6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	4,885.000		4,885.000	
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	303.000		303.000	
	666-6180	REFL PAV MRK TY II (W) 12" (SLD)	LF	43.000		43.000	
	666-6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	6,502.000		6,502.000	
	666-6218	REFL PAV MRK TY II (BLACK) 4"(SHADOW)	LF	1,455.000		1,455.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	121.000		121.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	13,565.000		13,565.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0114-10-104 **DISTRICT** Bryan **COUNTY** Washington
HIGHWAY US 290

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0114-10-104**			
		PROJECT ID		**A00195177**			
		COUNTY		**Washington**			
		HIGHWAY		**US 290**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	677-6002	ELIM EXT PAV MRK & MRKS (6")	LF	303.000		303.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	4.000		4.000	
	6158-6001	TMSP RADAR SPEED CONTROL MONITOR	EA	2.000		2.000	
	6185-6002	TMA (STATIONARY)	DAY	6.000		6.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	

CK: JMT
DW: JMT
CK: JMT
DW: JMT

SUMMARY OF TRAFFIC CONTROL ITEMS

LOCATION	403 6001	502 6001	512 6001	512 6025	512 6049	545 6003	545 6005	545 6019	662 6063	662 6095	677 6001	677 6002	6001 6002	6158 6001	6185 6002
	TEMPORARY SPL SHORING	BARRICADES, SIGNS AND TRAFFIC HANDLING	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	PORT CTB (MOVE)(SGL SLP)(TY 1)	PORT CTB (REMOVE)(SGL SLP)(TY 1)	CRASH CUSH ATTEN (MOVE & RESET)	CRASH CUSH ATTEN (REMOVE)	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	WK ZN PAV MRK REMOV (W)4"(SLD)	WK ZN PAV MRK REMOV (Y)4"(SLD)	ELIM EXT PAV MRK & MRKS (4")	ELIM EXT PAV MRK & MRKS (6")	PORTABLE CHANGEABLE MESSAGE SIGN	TMSP RADAR SPEED CONTROL MONITOR	TMA (STATIONARY)
	SF	MO	LF	LF	LF	EA	EA	EA	LF	LF	LF	LF	EA	EA	DAY
CSJ 0114-10-104															
TCP LAYOUT PHASE 1 SHEET 1 OF 8										60	67				
TCP LAYOUT PHASE 1 SHEET 2 OF 8									75	1,100	1,375				
TCP LAYOUT PHASE 1 SHEET 3 OF 8			171					1	1,185	1,604	2,107				
TCP LAYOUT PHASE 1 SHEET 4 OF 8	3,083		1,681						2,200	2,200	4,950				
TCP LAYOUT PHASE 1 SHEET 5 OF 8			698		360			1	1,509	2,025	3,929	303			
TCP LAYOUT PHASE 1 SHEET 6 OF 8									1,234	151	293				
TCP LAYOUT PHASE 1 SHEET 7 OF 8									1,100		275				
TCP LAYOUT PHASE 1 SHEET 8 OF 8									201		50				
TCP LAYOUT PHASE 2 SHEET 1 OF 8									27		26				
TCP LAYOUT PHASE 2 SHEET 2 OF 8									1,100		493				
TCP LAYOUT PHASE 2 SHEET 3 OF 8				363	363	1	1		1,099	799					
TCP LAYOUT PHASE 2 SHEET 4 OF 8				1,616	1,796				2,054	2,201					
TCP LAYOUT PHASE 2 SHEET 5 OF 8				211	211	1	1		1,767	834					
TCP LAYOUT PHASE 2 SHEET 6 OF 8									21						
TCP LAYOUT PHASE 2 SHEET 7 OF 8															
TCP LAYOUT PHASE 2 SHEET 8 OF 8															
CSJ 0114-10-104 TOTAL	3,083	6	2,550	2,190	2,730	2	2	2	13,572	10,914	13,565	303	4	2	6

SUMMARY OF REMOVAL ITEMS

LOCATION	104 6023	104 6009	105 6018	400 6001	496 6025	496 6002	496 6007	545 6005
	REMOVING CONC (CTB)	REMOVING CONC (RIPRAP)	REMOVING STAB BASE AND ASPH PAV (7")	STRUCT EXCAV	REMOV STR (APPROACH SLAB)	REMOV STR (INLET)	REMOV STR (PIPE)	CRASH CUSH ATTEN (REMOVE)
	LF	SY	SY	CY	EA	EA	LF	EA
CSJ 0114-10-104								
REMOVAL LAYOUT SHEET 1 OF 1	207	93	2,297	1,841	2	2	197	1
CSJ 0114-10-104 TOTAL	207	93	2,297	1,841	2	2	197	1

SUMMARY OF EROSION CONTROL ITEMS

LOCATION	506 6040	506 6043
	BIODEG EROSN CONT LOGS (INSTL) (8")	BIODEG EROSN CONT LOGS (REMOVE)
	LF	LF
CSJ 0114-10-104		
SW3P LAYOUT PHASE 1 SHEET 1 OF 2	400	375
SW3P LAYOUT PHASE 1 SHEET 2 OF 2	30	15
SW3P LAYOUT PHASE 2 SHEET 1 OF 2	325	350
SW3P LAYOUT PHASE 2 SHEET 2 OF 2		15
CSJ 0114-10-104 TOTAL	755	755

SUMMARY OF PAVEMENT MARKING ITEMS

LOCATION	666 6167	666 6170	666 6178	666 6180	666 6207	666 6218	672 6010
	REFL PAV MRK TY II (W) 4" (BRK)	REFL PAV MRK TY II (W) 4" (SLD)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (W) 12" (SLD)	REFL PAV MRK TY II (Y) 4" (SLD)	REFL PAV MRK TY II (BLACK) 4"(SHADOW)	REFL PAV MRKR TY II-C-R
	LF	LF	LF	LF	LF	LF	EA
CSJ 0114-10-104							
PAVEMENT MARKING LAYOUT SHEET 1 OF 8	7	26			60	7	1
PAVEMENT MARKING LAYOUT SHEET 2 OF 8	275	493			1,100	275	14
PAVEMENT MARKING LAYOUT SHEET 3 OF 8	319	556			1,232	319	16
PAVEMENT MARKING LAYOUT SHEET 4 OF 8	550	2,200			2,200	550	28
PAVEMENT MARKING LAYOUT SHEET 5 OF 8	427	1,610	303	43	1,892	304	31
PAVEMENT MARKING LAYOUT SHEET 6 OF 8	275				18		14
PAVEMENT MARKING LAYOUT SHEET 7 OF 8	275						14
PAVEMENT MARKING LAYOUT SHEET 8 OF 8	50						3
CSJ 0114-10-104 TOTAL	2,178	4,885	303	43	6,502	1,455	121

SUMMARY OF ROADWAY ITEMS

LOCATION	247 6064	310 6027	361 6051	361 6066	400 6005	432 6001	512 6025	514 6013	533 6005	545 6019	3076 6035
	FL BS (CMP IN PLC)(TY A GR 4) (6")	PRIME COAT(MC-30 OR AE-P)	FULL-DPTH REP(BR APPROACH SLAB)(9"-13")	FULL-DEPTH REPAIR CRCP (11"-12")	CEM STABIL BKFL	RIPRAP (CONC)(4 IN)	PORT CTB (MOVE)(SGL SLP)(TY 1)	PERM CTB (F-SHAPE) (TY 1)	RUMBLE STRIPS (SHOULDER) CONCRETE	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	D-GR HMA TY-D PG64-22
	SY	GAL	SY	SY	CY	CY	LF	LF	LF	EA	TON
CSJ 0114-10-104											
PLAN LAYOUT SHEET 1 OF 1	2,035	225	260	1,943	2,657	13	180	207	364	1	116
CSJ 0205-02-070 TOTAL	2,035	225	260	1,943	2,657	13	180	207	364	1	116

SUMMARY OF DRAINAGE ITEMS

LOCATION	401 6001	402 6001	465 6235	481 6016	481 6021
	FLOWABLE BACKFILL	TRENCH EXCAVATION PROTECTION	INLET (COMPL)(RWI)(TY I)	PIPE (PVC) (SCH 40) (12 IN)	PIPE (PVC) (SCH 40) (24 IN)
	CY	LF	EA	LF	LF
CSJ 0114-10-104					
DRAINAGE LAYOUT SHEET 1 OF 1	168	75	2	25	172
CSJ CSJ 0114-10-104 TOTAL	168	75	2	25	172

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_QUANTITY_01.dgn

JMT TBPE REGISTRATION NO: F-16341

Texas Department of Transportation

QUANTITY SUMMARY

SHEET 1 OF 1

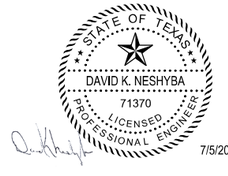
CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		7

LOC NO.	TCP PHASE	PLAN SHEET NUMBER	LOCATION	STA	TEST LEVEL	DIRECTION OF TRAFFIC (UNI/BI)	FOUNDATION PAD		BACKUP SUPPORT			AVAILABLE SITE LENGTH	CRASH CUSHION									
															MOVE / RESET		L	L	R	R	S	S
							PROPOSED MATERIAL	PROPOSED THICKNESS	DESCRIPTION	WIDTH	HEIGHT		INSTALL	REMOVE	MOVE/ RESET	FROM LOC.#	N	W	N	W	N	W
1	PHASE 1	13	US 290 SBML	1401+26.94	TL-3	UNI	CRCP	N/A	PCTB (F SHAPE)	24"	32"	>50'	X				X					
2	PHASE 1	15	US 290 NBML	1419+46.24	TL-3	UNI	CRCP	N/A	PCTB (F SHAPE)	24"	32"	>50'	X				X					
3	PHASE 2	22	US 290 SBML	1399+36.00	TL-3	UNI	CRCP	N/A	PCTB (F SHAPE)	24"	32"	>50'			X	1	X					
4	PHASE 2	24	US 290 NBML	1416+09.00	TL-3	UNI	CRCP	N/A	PCTB (F SHAPE)	24"	32"	>50'			X	2	X					
5	PHASE 2	22	US 290 SBML	1399+36.00	TL-3	UNI	CRCP	N/A	PCTB (F SHAPE)	24"	32"	>50'		X		3	X					
6	PHASE 2	24	US 290 NBML	1416+09.00	TL-3	UNI	CRCP	N/A	PCTB (F SHAPE)	24"	32"	>50'		X		4	X					
7	N/A	51	US 290 SBML	1409+50.00		UNI			PCTB (F SHAPE)			>50'		X								
8	N/A	57	US 290 SBML	1409+50.00	TL-3	UNI			PCTB (F SHAPE)	24"	32"	>50'	X				X					
												TOTALS	3	3	2							

LEGEND:

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

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



7/5/2023

NOTE:
1. CRASH CUSHION DEFINED AT LOCATION 8 TO REPLACE EXISTING CRASH CUSHION AT LOCATION 7. CONTRACTOR TO ENSURE FOUNDATION REQUIREMENTS DEFINED IN QGELITE(M10)(N)-20 STANDARD ARE SATASFIED.

CRASH CUSHION SUMMARY SHEET

FILE: ccss.dgn	DN: TxDOT	CK:	CK:	
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
	DIST	COUNTY		
	BRY	WASHINGTON		
	FEDERAL AID PROJECT			SHEET NO.
				8

CK: JMT
DW: JMT
CK: JMT
DW: JMT

TCP NARRATIVE
US 290 AT FM 577

DETOURS, BARRICADES, WARNING SIGNS, SEQUENCE OF WORK, ETC.

The contractor's attention is directed to the requirements of Item 7 "Legal Relations and Responsibilities to the Public", of the standard specifications. In addition to these requirements, the following notes shall also govern on this contract:

1. GENERAL

A. Traffic must be handled throughout the limits of the project during construction. Provide for the safe passage of vehicular and pedestrian traffic with minimal inconvenience to the public, as shown in the plans or as directed by the Engineer.
B. The contractor may propose/recommend modifications to the sequence of work for consideration by the Engineer. For any major recommended modification by the contractor, include any changes to the various bid items, the impact to traffic, and the effect on the overall project in time and cost, etc. If this proposal is implemented, develop detailed plan sheets to be sealed by a licensed professional engineer for inclusion with the change order. Do not proceed with any construction operations, based on a revised phase/sequence, until written approval is obtained from the Engineer. If at any time during construction the contractor's proposed plan of operation for handling traffic does not provide for the safe movement of traffic, immediately change the operation to correct the unsatisfactory condition.
C. Do not store any construction material or equipment at any location that will constitute a hazard or endanger traffic.
D. Provide advanced notification to the Engineer of impending/upcoming lane closures for all temporary and permanent lane, ramp, frontage, shoulder, etc. and for detours.
E. Temporary drainage is the responsibility of the contractor. At the preconstruction meeting the contractor shall submit a temporary drainage plan and a backup temporary drainage plan.
F. Contractor responsible for construction entrance and exit. Access will not be permitted on the east side of the project. At the preconstruction meeting the contractor shall submit construction entrance and exit locations.
G. At no time shall two consecutive ramps be closed at one time during construction.
H. Coordinate with adjacent projects as necessary.
I. Cover permanent signs if not used. This is subsidiary to pertinent bid items.
J. Coordinate with the Engineer for signal timing revisions as necessary.
K. Shoring design is to be provided by the contractor. Develop detailed plan sheets to be sealed by a licensed professional engineer. Temporary shoring to remain in place. Submit to Engineer for concurrence prior to beginning construction.
L. Use Law Enforcement Force Account for all traffic shifts and to move, reset and remove concrete traffic barriers.
M. Contractor has the option to use TCP standard WZ(RS)-16.
N. Portable Changeable Message Signs (PCMS) to be located at Indian Paint Brush Road to the east of the project and at the exit toward Bellville (Business 36) to the west of the project. PCMS to notify drivers of lane closures and traffic shifts. Follow BC(6)-21 standard for messaging.

SEQUENCE OF WORK

A. Construct the project in two (2) phases. Before the commencement of each phase or step, install SW3P items, advanced warning signs, temporary signs and barricades as shown in the plans or as directed/approved by the Engineer.
B. Use daily lane closures in accordance with TCP standards where needed.
C. Use portable changeable message signs (PCMS) for all lane closures and traffic shifts. Place the PCMS a minimum of 7 days in advance of upcoming changes.

PHASE 1: CONSTRUCTION OF INTERIOR SECTION

The intent of this phase is to reconstruct the interior lanes, interior shoulders, storm drain and median barrier.

STEP 1: EAST BOUND TRAFFIC SHIFT – Phase 1

1. Place advance warning signs on West Bound (WB) and East Bound (EB) project limits.
2. Close the EB entrance ramp. Utilize TCP Standard TCP (6-2b) – 12.
3. Close the EB outside lane as shown on plans. Utilize TCP (6-1a) – 12 for one-lane closure.
4. Eliminate existing pavement markings on EB outside lane.
5. Set PCTB and crash attenuators as shown on plans.
6. Install current phase work zone pavement markings on EB outside lane.
7. Install signs and barricades as shown in the plans.
8. Move EB traffic onto outside traffic handling lane.
9. Close EB inside lane.

STEP 2: WEST BOUND TRAFFIC SHIFT – Phase 1

1. Close WB outside lane as shown on plans. Utilize TCP (6-1a) – 12 for one-lane closure.
2. Eliminate existing pavement markings on WB outside lane.
3. Set PCTB and crash attenuators as shown on plans.
4. Install current phase work zone pavement markings on WB outside lane.
5. Install signs and barricades as shown in the plans.
6. Move WB traffic onto outside traffic handling lane.
7. Close WB inside lane.

STEP 3: CONSTRUCTION OF INTERIOR SECTION

1. Do not begin Step 3 until both Steps 1 and 2 have been completed.
2. Remove median barrier. Take ownership and remove from project.
3. Sawcut pavement to the limits shown on the plans.
4. Remove concrete pavement and underlying pavement structure. Take ownership of material and haul away from project site.
5. Sawcut and remove section of existing approach slab. Take ownership of material and haul away from project site.
6. Locate storm drain lateral at limits of proposed shoring. Report storm drain lateral location to the Engineer in writing. Adjust design of shoring to accommodate lateral replacement.
7. Construct shoring to the limits shown on the plans.
8. Excavate embankment to the limits shown on the plans. Take ownership of material and haul away from project site.
9. Construct ramp into work area as excavation allows.

TCP NARRATIVE

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		9

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_TCP_NAR_01.dgn

1. Once excavation is complete, compact existing embankment that remains to achieve density requirements.
2. Place and compact cement stabilized backfill in lifts as shown on the plans.
3. Construct storm drain during placement of cement stabilized backfill. Ensure placement and compaction operations do not damage storm drain.
4. Construct median inlets.
5. Construct bridge approach slabs.
6. Construct interior pavement.
7. Construct center barrier.

PHASE 2: CONSTRUCTION OF EXTERIOR SECTION

The intent of this phase is to reconstruct the exterior lanes and outside shoulders.

STEP 1: EAST BOUND TRAFFIC SHIFT – Phase 2

1. Install phase work zone pavement markings on EB inside lane.
2. Install signs and barricades as shown in the plans.
3. Move and reset concrete traffic barrier.
4. Move EB traffic to inside traffic handling lane.

STEP 2: WEST BOUND TRAFFIC SHIFT – Phase 2

1. Install phase work zone pavement markings on WB inside lane.
2. Install signs and barricades as shown in the plans.
3. Move and reset concrete traffic barrier.
4. Move WB traffic to inside traffic handling lane.

STEP 3: CONSTRUCTION OF EXTERIOR SECTION

1. Do not begin Step 3 until both Steps 1 and 2 have been completed.
2. Sawcut pavement/riprap to the limits shown on the plans.
3. Remove concrete pavement, riprap and underlying pavement structure. Take ownership of material and haul away from project site.
4. Remove remainder of existing approach slabs. Take ownership of material and haul away from project site.
5. Verify limits of existing straps. Determine depth of existing straps at a minimum of 3 locations along centerline of outside lane, prior to beginning excavation. Notify Engineer in writing. Engineer to determine depth of proposed excavation.
6. Excavate in a manner which will not disturb existing MSE walls or existing straps.
7. Take ownership of excavated material and haul away from project site.
8. Once excavation is complete, compact existing embankment that remains as directed by the Engineer.
9. Place flowable fill to the limits shown in the plans and as directed by the Engineer.
10. Construct remaining sections of bridge approach slab.
11. Construct concrete pavement to the limits shown on the plans.
12. Construct concrete riprap to the limits shown on the plans.
13. Install final pavement markings on outside lanes.
14. Install/uncover permanent signs as needed.
15. Remove concrete traffic barrier.

STEP 4: COMPLETION – East Bound

1. Move EB traffic to outside lane.
2. Install final pavement markings on EB inside lane.
3. Open EB inside lane to traffic.
4. Open EB ramp to traffic.

STEP 5: COMPLETION – West Bound

1. Move WB traffic to outside lane.
2. Install final pavement markings on WB inside lane.
3. Open inside lanes to traffic.

3. SAFETY

A. The contractor will provide, construct and maintain barricades and signs in accordance with BC (1-12) – 21. Any signs required that are not detailed in the standard sheets shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices for Streets and Highways" and the "Standard Highway Sign Design for Texas".
B. Barricades and warning signs shall be placed as indicated on the plans. This shall be considered the minimum required to provide for the safety of traffic during construction. The contractor shall provide and maintain other such barricades and signs as directed by the Engineer or as warranted by field conditions, to provide for the safe passage of traffic at all times.
C. The contractor shall provide and maintain flaggers as directed/approved by the Engineer, at such points, and for such periods of time, as may be required to provide for the safety of the traveling public and the contractor's personnel.
D. The contractor shall keep the roadway clean and free of dirt and other materials during hauling operations. If the contractor does not maintain a clean roadway, they shall cease all construction operations, when directed by the Engineer, and clean the roadway to the satisfaction of the Engineer.

4. HAULING

The use of rubber-tired equipment will be required for moving dirt and other materials along or across pavement surfaces. Where the contractor desires to move any equipment not licensed for operation on public highways, on or across pavement, they shall protect the pavement from damage as directed/approved by the Engineer.

5. FINAL CLEANUP

Upon completion of the work and before final acceptance and final payment is made, the contractor shall clear and remove from the site all surplus and discarded materials and debris of every kind and leave the entire project in a smooth, neat and sightly condition.

JMT TBPE REGISTRATION NO. F-16341

TCP NARRATIVE

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		10

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_TCP_NAR_02.dgn

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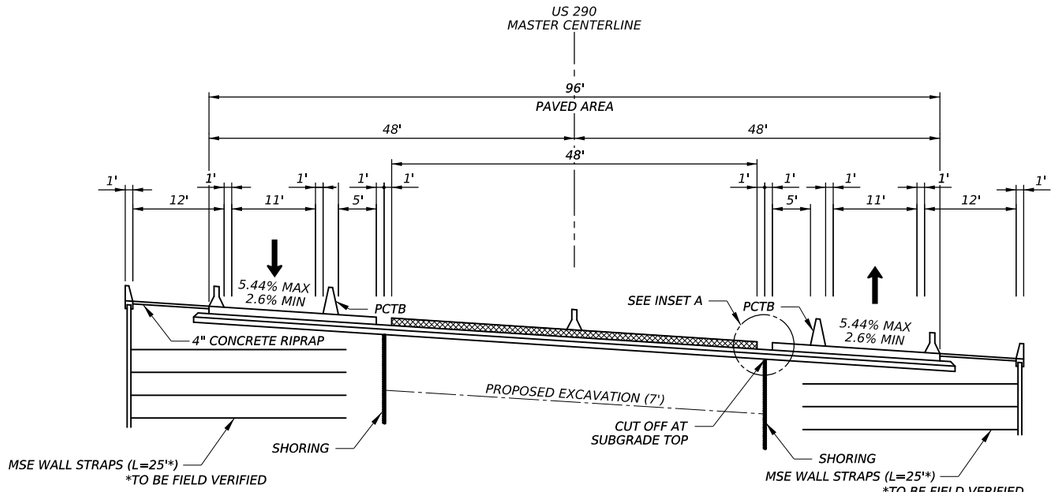
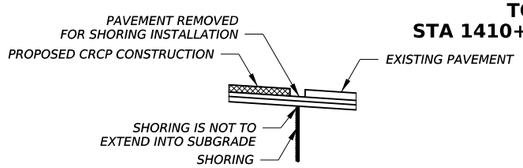
DW: JMT
CK: JMT
DW: JMT



US 290

TCP PHASE 1
STA 1410+00 TO STA 1412+00



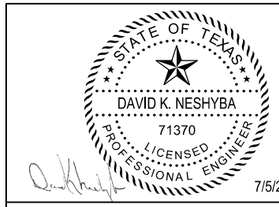
INSET A

LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
- PROPOSED LANE

NOTES:
1. CONTRACTOR TO DETERMINE DEPTH OF TOP RETAINING WALL STRAPS (ALONG BOTH DIRECTIONS OF THE MAINLANES AND AT THE ABUTMENT) AFTER REMOVAL OF EXISTING CONCRETE PAVEMENT. LOCATE STRAP AT A MINIMUM OF THREE, EVENLY SPACED LOCATIONS. NOTIFY ENGINEER IN WRITING PRIOR TO BEGINNING EXCAVATION.

2. ENGINEER TO DETERMINE DEPTH OF EXCAVATION.



TBPE REGISTRATION NO. F-16341

Texas Department of Transportation

US 290
TCP TYPICAL SECTIONS
PHASE 1

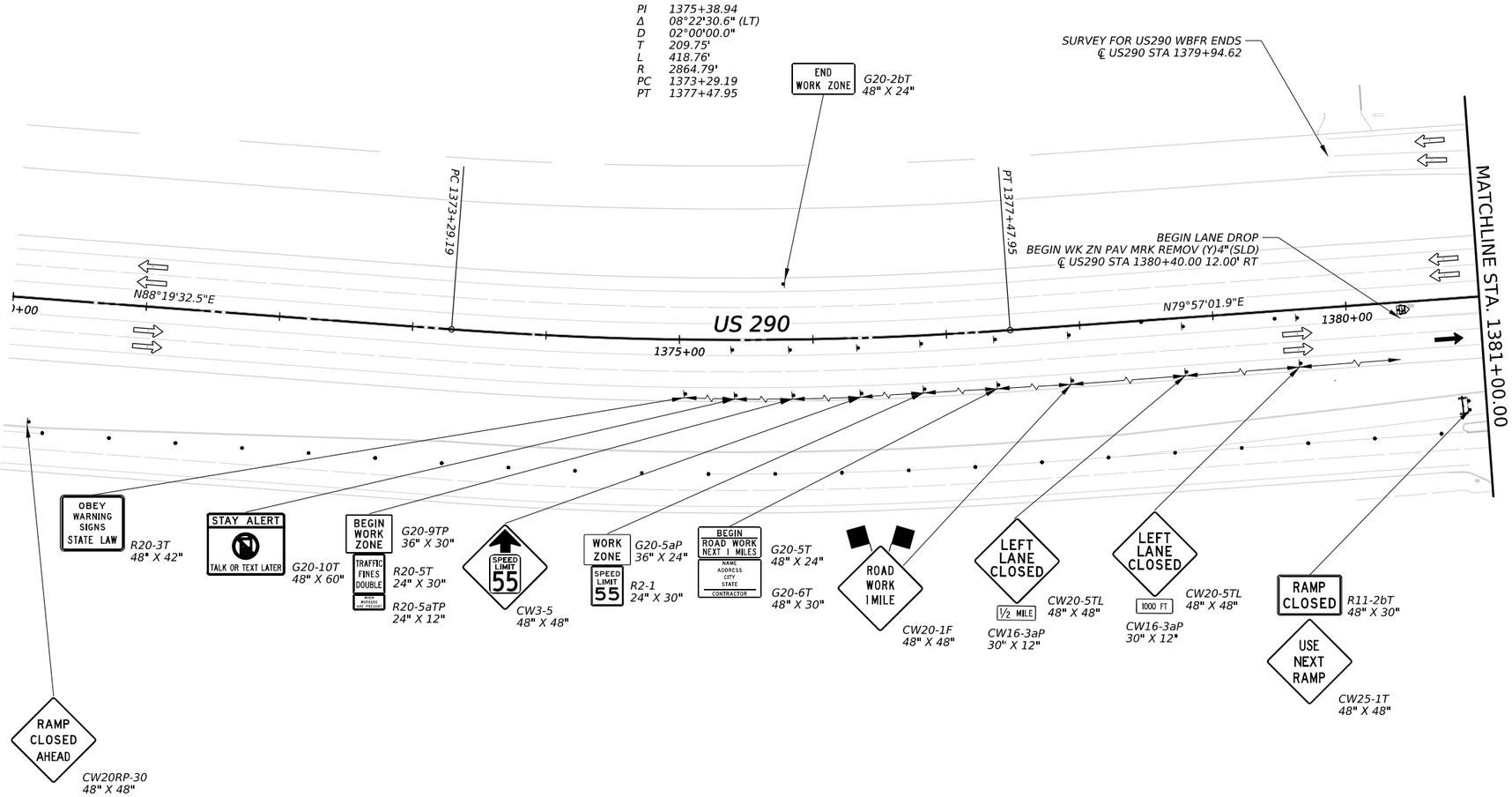
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		11

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_TYP_P1.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	**DESCRIPTION**	**UNIT**	**QUANTITY**
662 6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	60
677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	67



LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
- PROPOSED LANE
- CHANNELIZING DEVICES
- PORTABLE CTB
- BARRICADE
- FLASHING ARROW BOARD

NOTES:

1. *STATIONS AND OFFSETS ARE MEASURED FROM CENTERLINE OF ROADWAY UNLESS NOTED OTHERWISE.*
2. *FOR ADDITIONAL DETAILS ON THE PLACEMENT AND SPACING OF SIGNS, CHANNELIZING DEVICES, AND BARRICADES SEE THE INCLUDED BC AND TCP STANDARDS.*

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO. F-16341

Texas Department of Transportation

US 290
TCP LAYOUT
PHASE 1
STA 1370+00 TO STA 1381+00

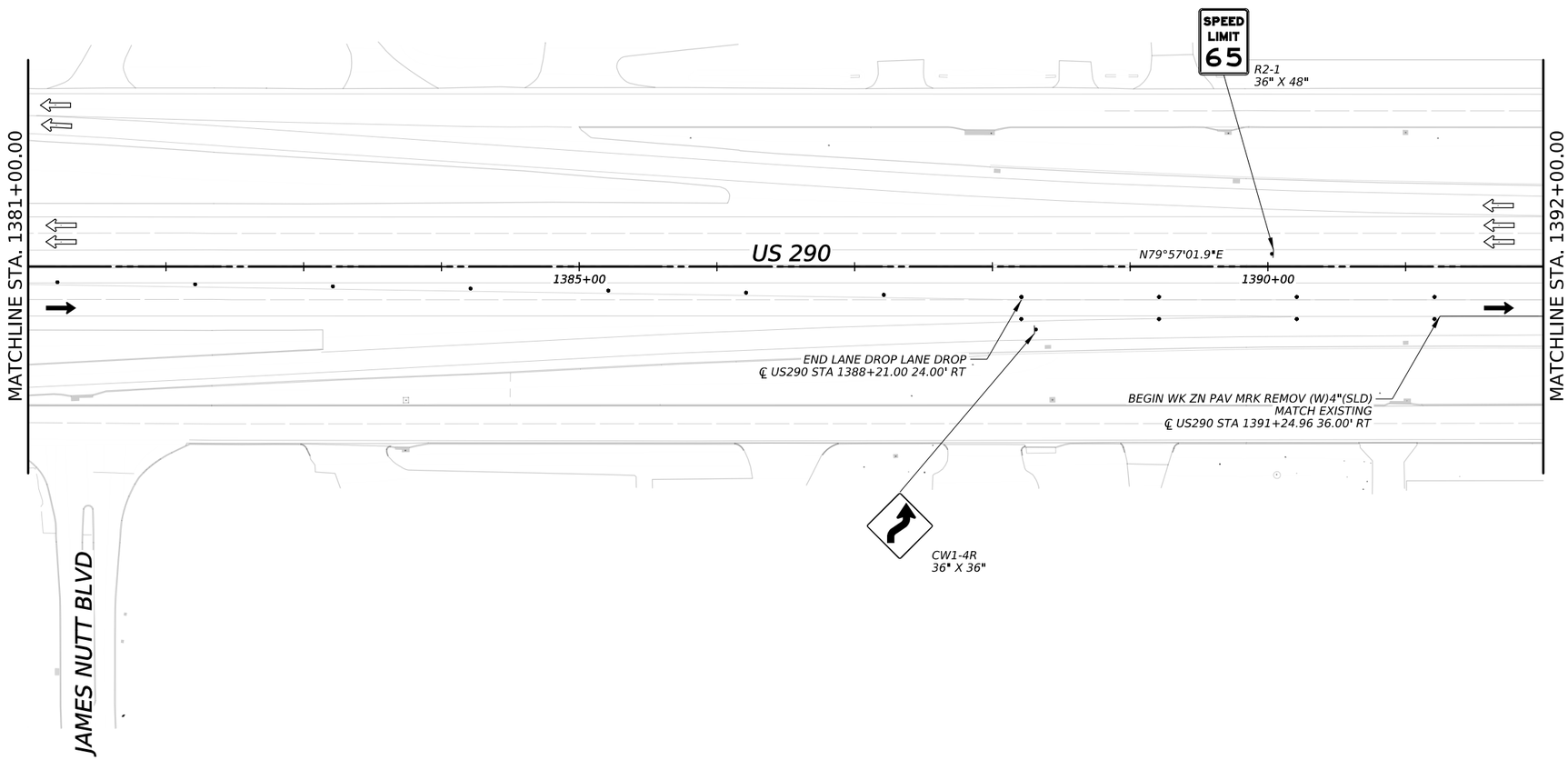
SHEET 1 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		12

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_US290_TCP01.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	**DESCRIPTION**	**UNIT**	**QUANTITY**
662 6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	75
662 6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	1,100
677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	1,375



LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
- PROPOSED LANE
- CHANNELIZING DEVICES
- PORTABLE CTB
- BARRICADE
- FLASHING ARROW BOARD

NOTES:

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STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO.: F-16341

US 290
TCP LAYOUT
PHASE 1
STA 1381+00 TO STA 1392+00

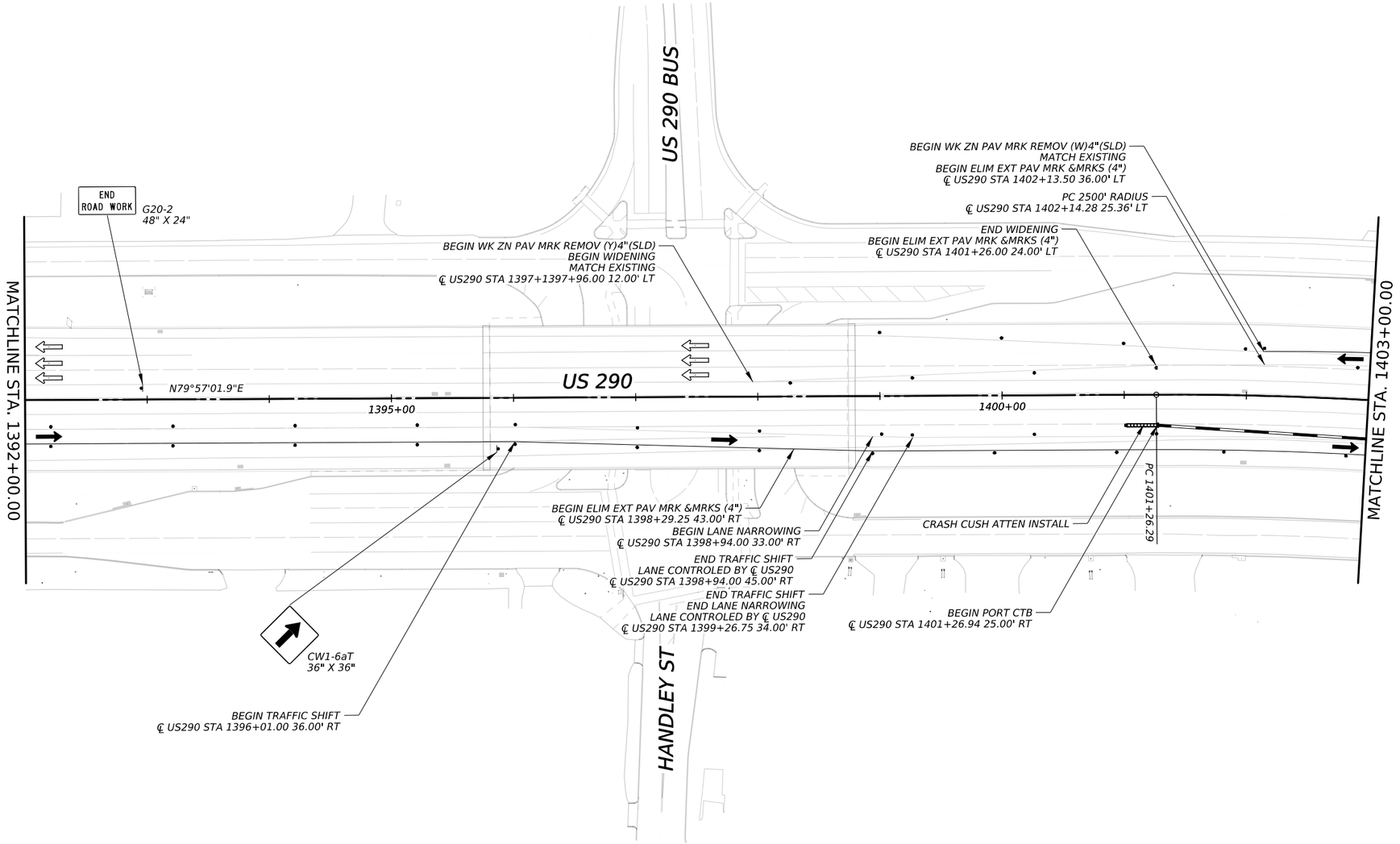
SHEET 2 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		13

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_US290_TCP02.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	DESCRIPTION	UNIT	QUANTITY
512 6001	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	171
545 6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	1
662 6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	1,185
662 6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	1,604
677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	2,107



LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
- PROPOSED LANE
- CHANNELIZING DEVICES
- PORTABLE CTB
- BARRICADE
- FLASHING ARROW BOARD

NOTES:

1. *STATIONS AND OFFSETS ARE MEASURED FROM CENTERLINE OF ROADWAY UNLESS NOTED OTHERWISE.*
2. *FOR ADDITIONAL DETAILS ON THE PLACEMENT AND SPACING OF SIGNS, CHANNELIZING DEVICES, AND BARRICADES SEE THE INCLUDED BC AND TCP STANDARDS.*

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO. F-16341

US 290
TCP LAYOUT
PHASE 1
STA 1392+00 TO STA 1403+00

SHEET 3 OF 8

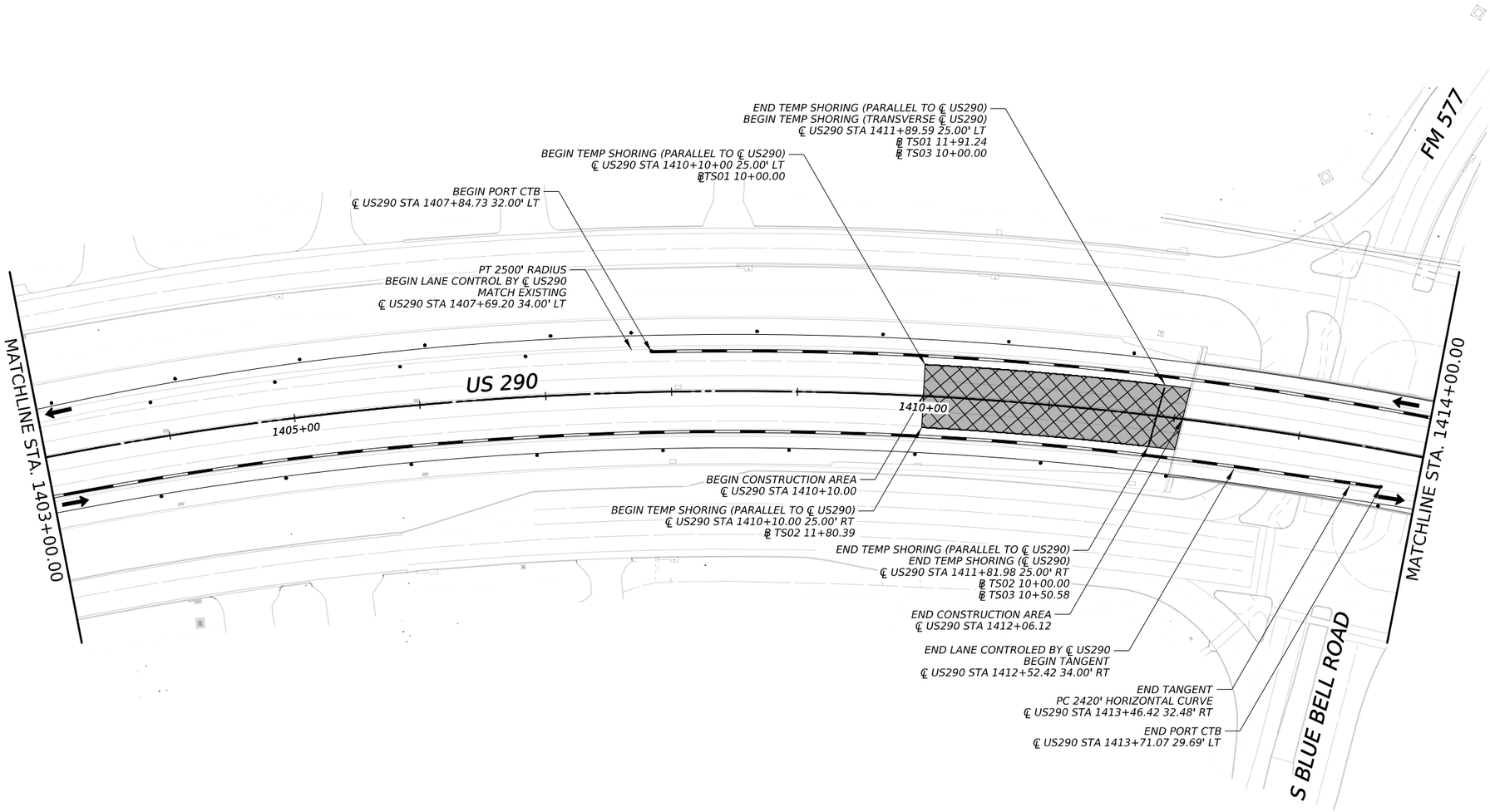
CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		14

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_US290_TCP03.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES

BID CODE	DESCRIPTION	UNIT	QUANTITY
403 6001	TEMPORARY SPL SHORING	SF	3,083
512 6001	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	1,681
662 6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	2,200
662 6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	2,200
677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	4,950



PI 1409+76.70
Δ 33°04'00.1" (RT)
D 02°00'00.0"
T 850.40'
L 1653.34'
R 2864.79'
PC 1401+26.29
PT 1417+79.63

LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
- PROPOSED LANE
- CHANNELIZING DEVICES
- PORTABLE CTB
- BARRICADE
- FLASHING ARROW BOARD

NOTES:

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STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO. F-16341

Texas Department of Transportation

US 290
TCP LAYOUT
PHASE 1
1403+00 STA TO STA 1414+00

SHEET 4 OF 8

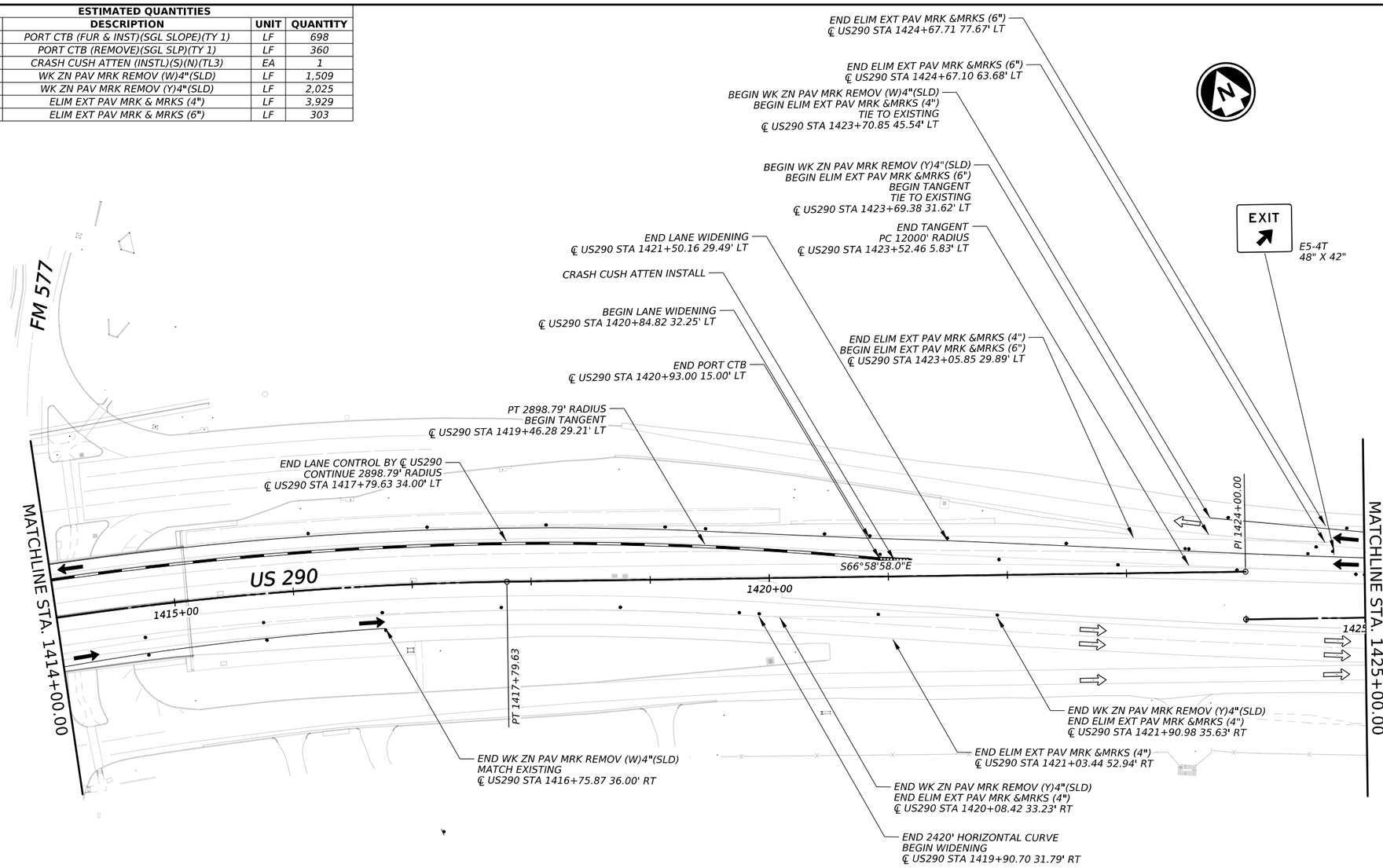
CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		15

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_US290_TCP04.dgn

CK: JMT
DW: JMT
CK: JMT
DN: JMT

ESTIMATED QUANTITIES

BID CODE	DESCRIPTION	UNIT	QUANTITY
512 6001	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	698
512 6049	PORT CTB (REMOVE)(SGL SLP)(TY 1)	LF	360
545 6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	1
662 6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	1,509
662 6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	2,025
677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	3,929
677 6002	ELIM EXT PAV MRK & MRKS (6")	LF	303



LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
- PROPOSED LANE
- CHANNELIZING DEVICES
- PORTABLE CTB
- BARRICADE
- FLASHING ARROW BOARD

NOTES:

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TBPE REGISTRATION NO.: F-16341

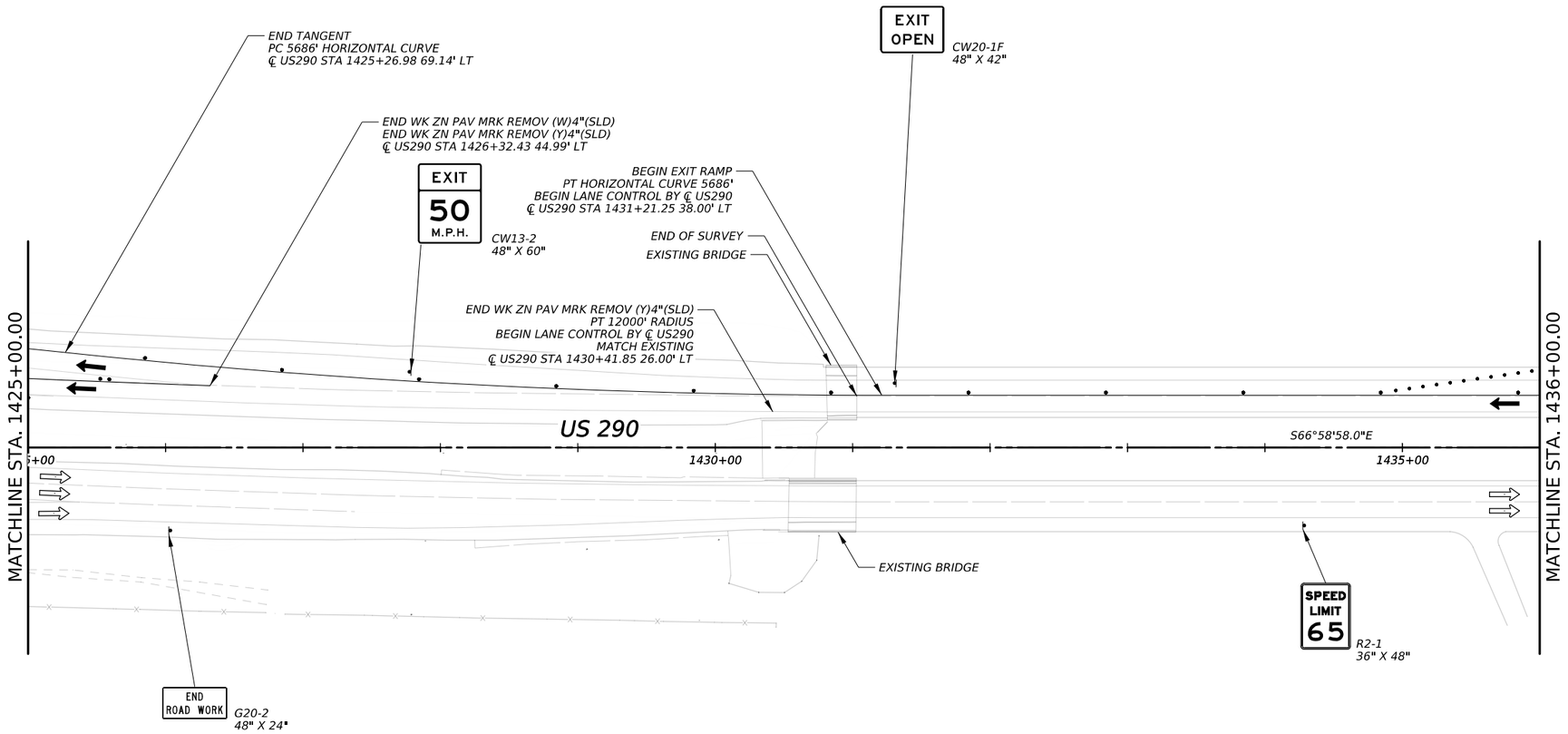
US 290
TCP LAYOUT
PHASE 1
STA 1414+00 TO STA 1425+00

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		16

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_US290_TCP05.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	**DESCRIPTION**	**UNIT**	**QUANTITY**
662 6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	1,234
662 6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	151
677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	293



LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
- PROPOSED LANE
- CHANNELIZING DEVICES
- PORTABLE CTB
- BARRICADE
- FLASHING ARROW BOARD

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TBPE REGISTRATION NO. F-16341

US 290
TCP LAYOUT
PHASE 1
STA 1425+00 TO STA 1436+00

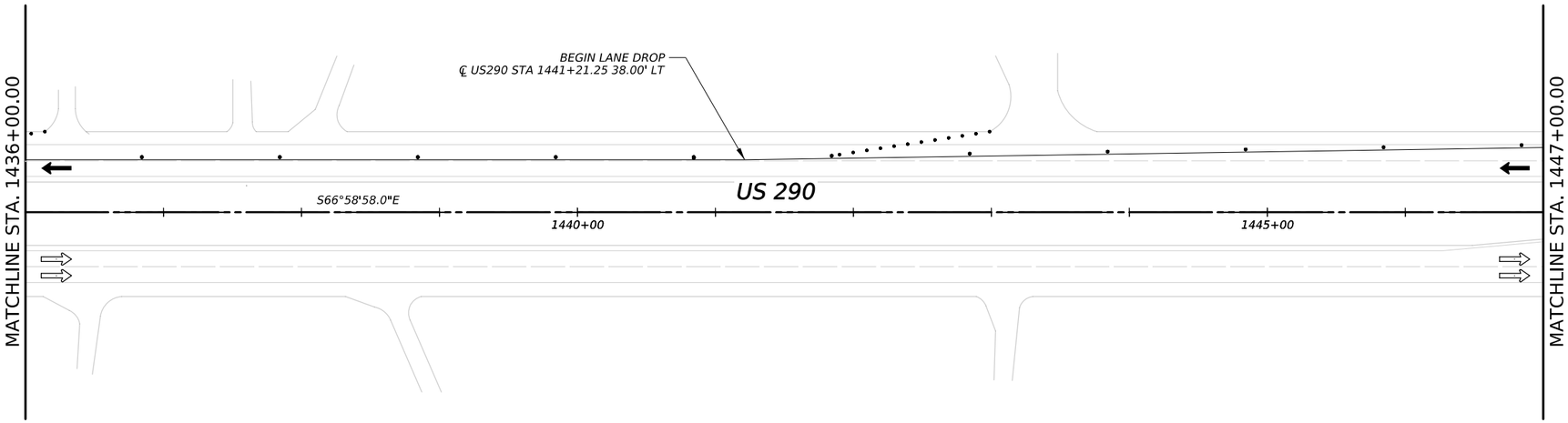
SHEET 6 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		17

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_US290_TCP06.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	**DESCRIPTION**	**UNIT**	**QUANTITY**
662 6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	1,100
677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	275



LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
- PROPOSED LANE
- CHANNELIZING DEVICES
- PORTABLE CTB
- BARRICADE
- FLASHING ARROW BOARD

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US 290
TCP LAYOUT
PHASE 1
STA 1436+00 TO STA 1447+00

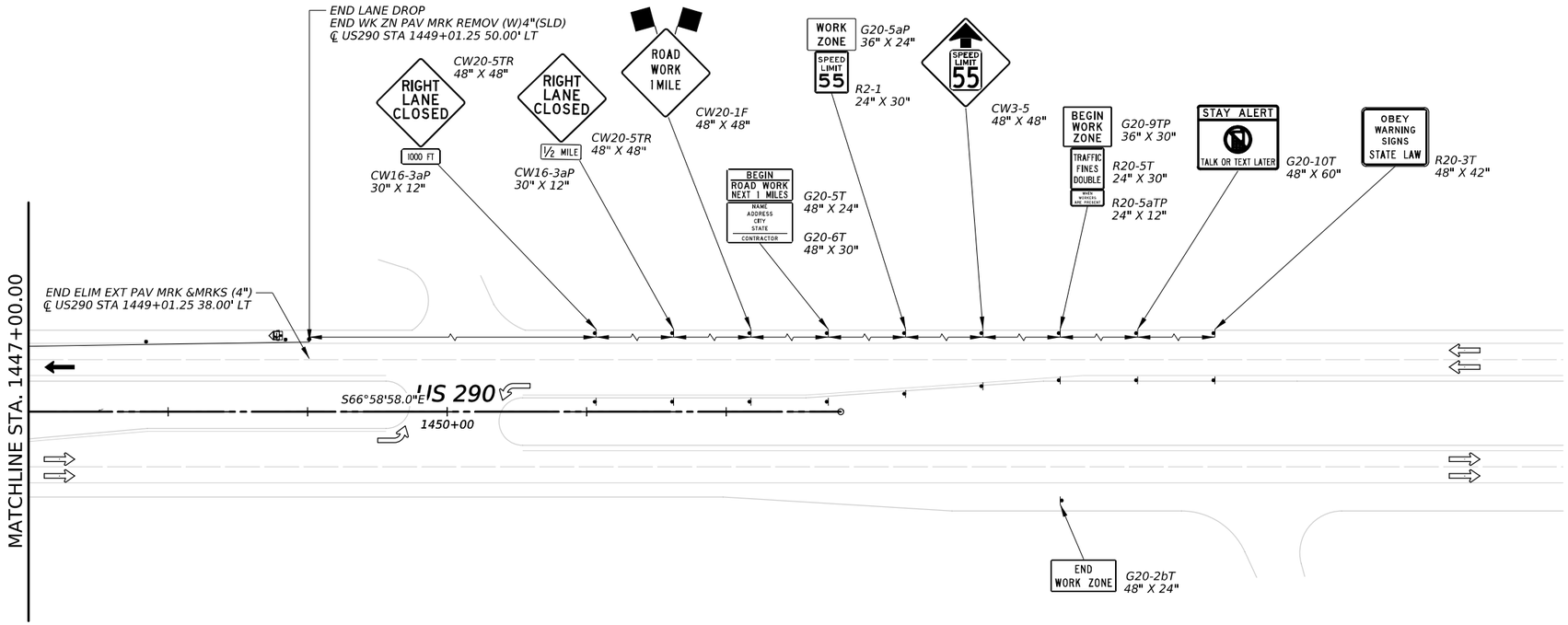
SHEET 7 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		18

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_US290_TCP07.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	**DESCRIPTION**	**UNIT**	**QUANTITY**
662 6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	201
677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	50



LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
- PROPOSED LANE
- CHANNELIZING DEVICES
- PORTABLE CTB
- BARRICADE
- FLASHING ARROW BOARD

NOTES:

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TBPE REGISTRATION NO. F-16341

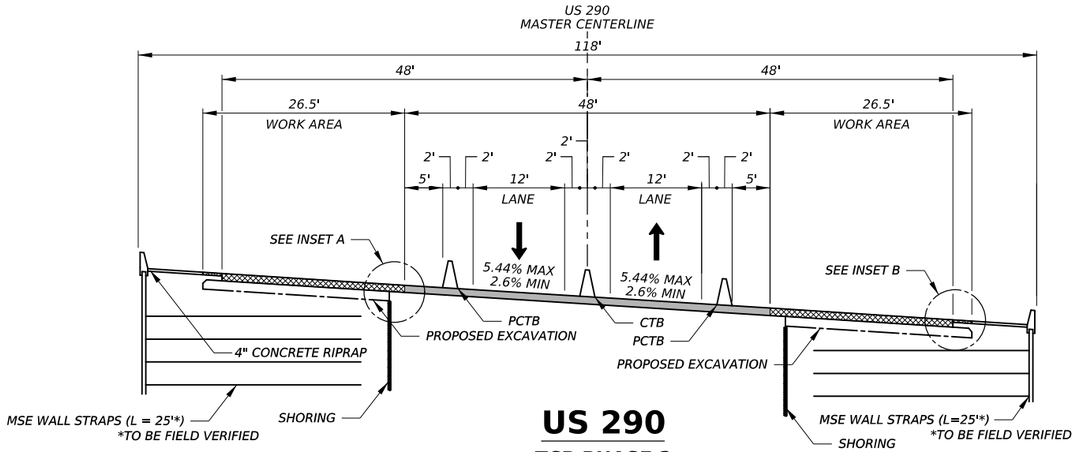
US 290
TCP LAYOUT
PHASE 1
STA 1447+00 TO END

SHEET 8 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		19

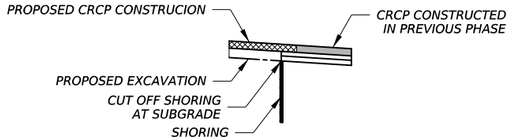
DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_US290_TCP08.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

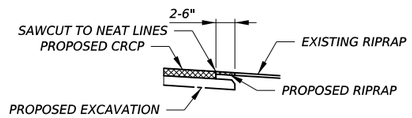


US 290

TCP PHASE 2
STA 1410+00 TO STA 1412+00



INSET A



INSET B

LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
- PROPOSED LANE

NOTES:
1. CONTRACTOR TO DETERMINE DEPTH OF TOP RETAINING WALL STRAPS (ALONG BOTH DIRECTIONS OF THE MAINLANES AND AT THE ABUTMENT) AFTER REMOVAL OF EXISTING CONCRETE PAVEMENT. LOCATE STRAP AT A MINIMUM OF THREE, EVENLY SPACED LOCATIONS. NOTIFY ENGINEER IN WRITING PRIOR TO BEGINNING EXCAVATION.

2. ENGINEER TO DETERMINE DEPTH OF EXCAVATION.

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TBPE REGISTRATION NO. F-16341

Texas Department of Transportation

US 290
TCP TYPICAL SECTIONS
PHASE 2

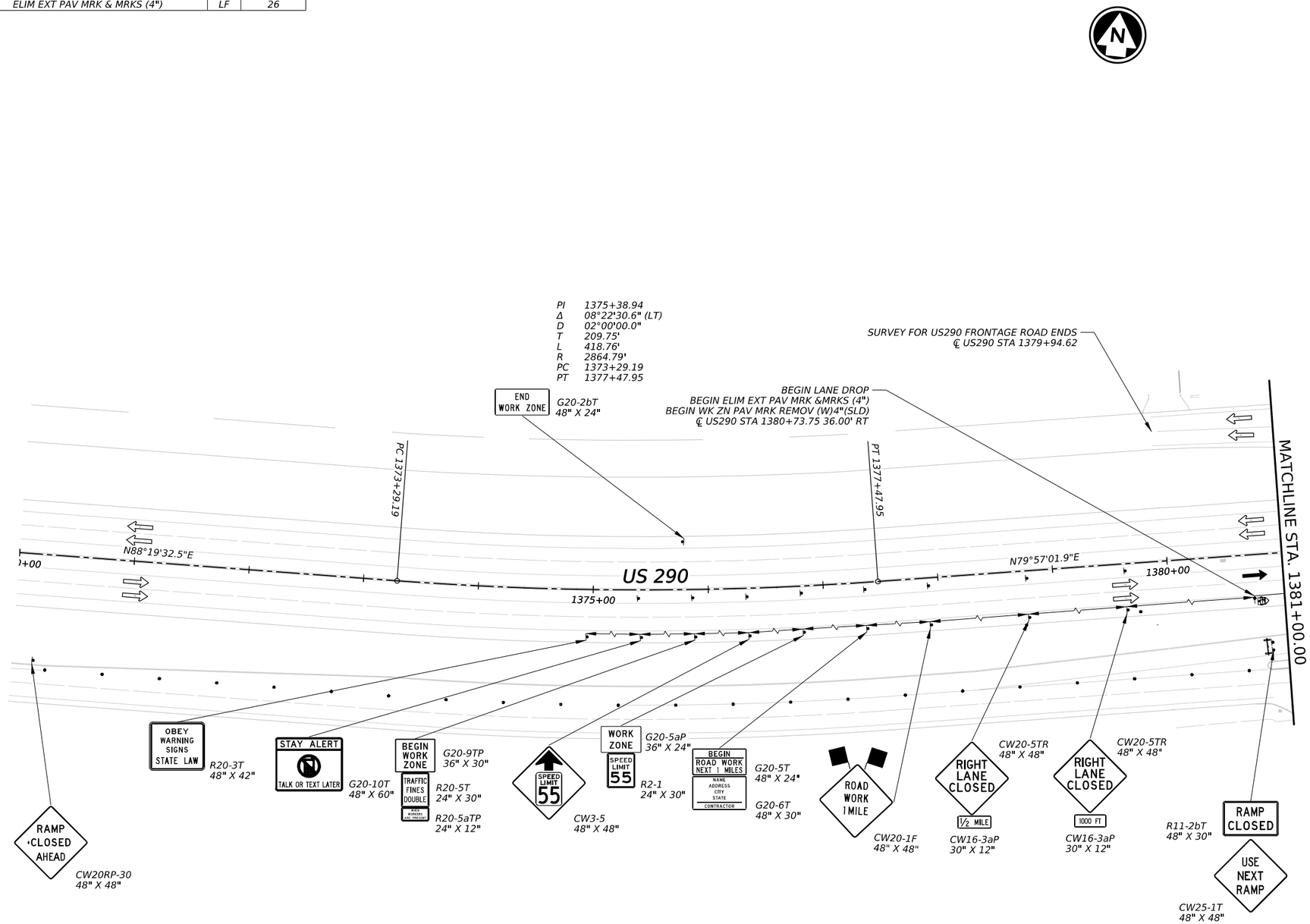
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		20

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_TYP_P2.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	**DESCRIPTION**	**UNIT**	**QUANTITY**
662 6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	27
677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	26



LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
- PROPOSED LANE
- CHANNELIZING DEVICES
- PORTABLE CTB
- BARRICADE
- FLASHING ARROW BOARD

NOTES:

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7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO. F-16341

US 290
TCP LAYOUT
PHASE 2
STA 1370+00 TO STA 1381+00

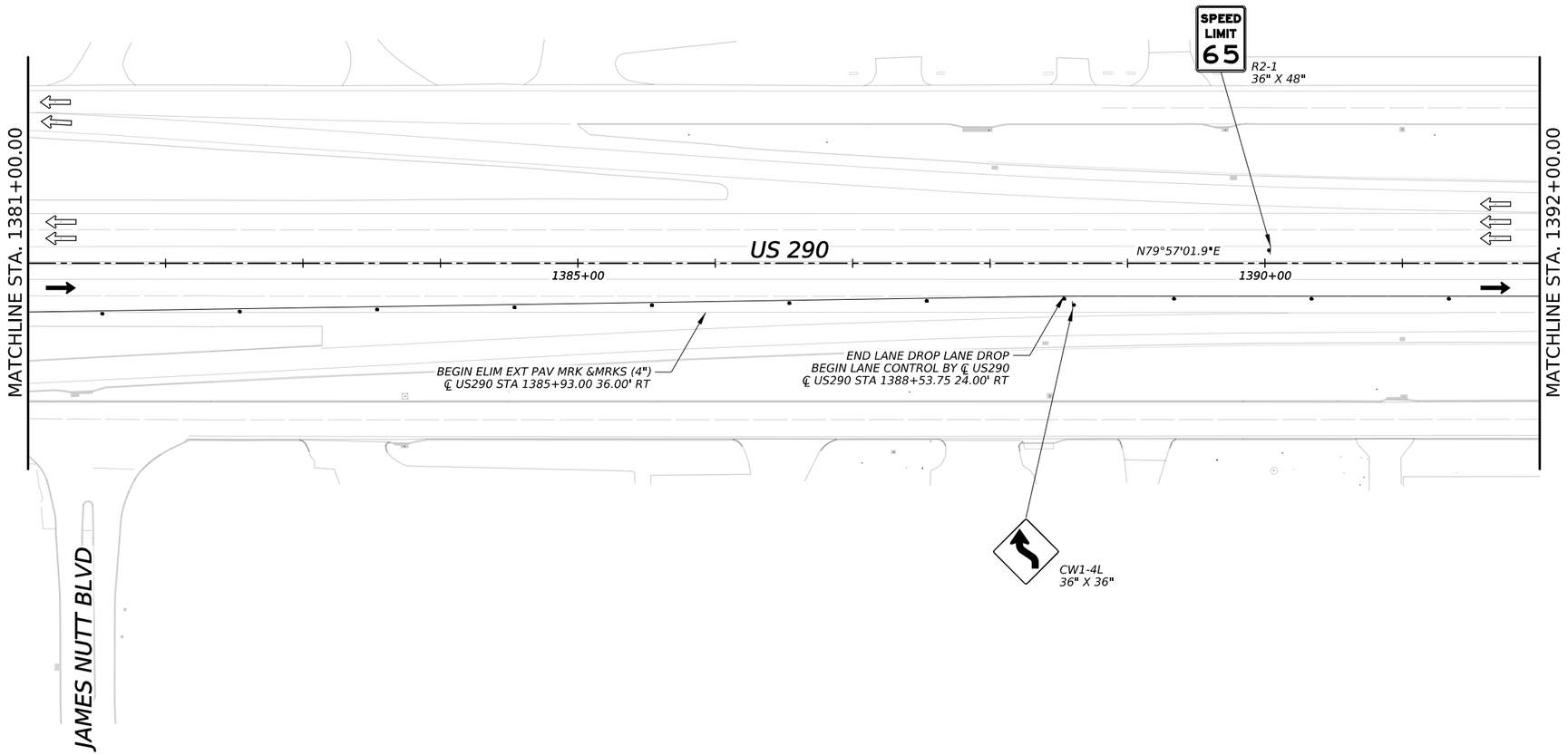
SHEET 1 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		21

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_US290_TCP2_011.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	**DESCRIPTION**	**UNIT**	**QUANTITY**
662 6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	1,100
677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	493



LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
- PROPOSED LANE
- CHANNELIZING DEVICES
- PORTABLE CTB
- BARRICADE
- FLASHING ARROW BOARD

NOTES:

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7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO.: F-16341

US 290
TCP LAYOUT
PHASE 2
STA 1381+00 TO STA 1392+00

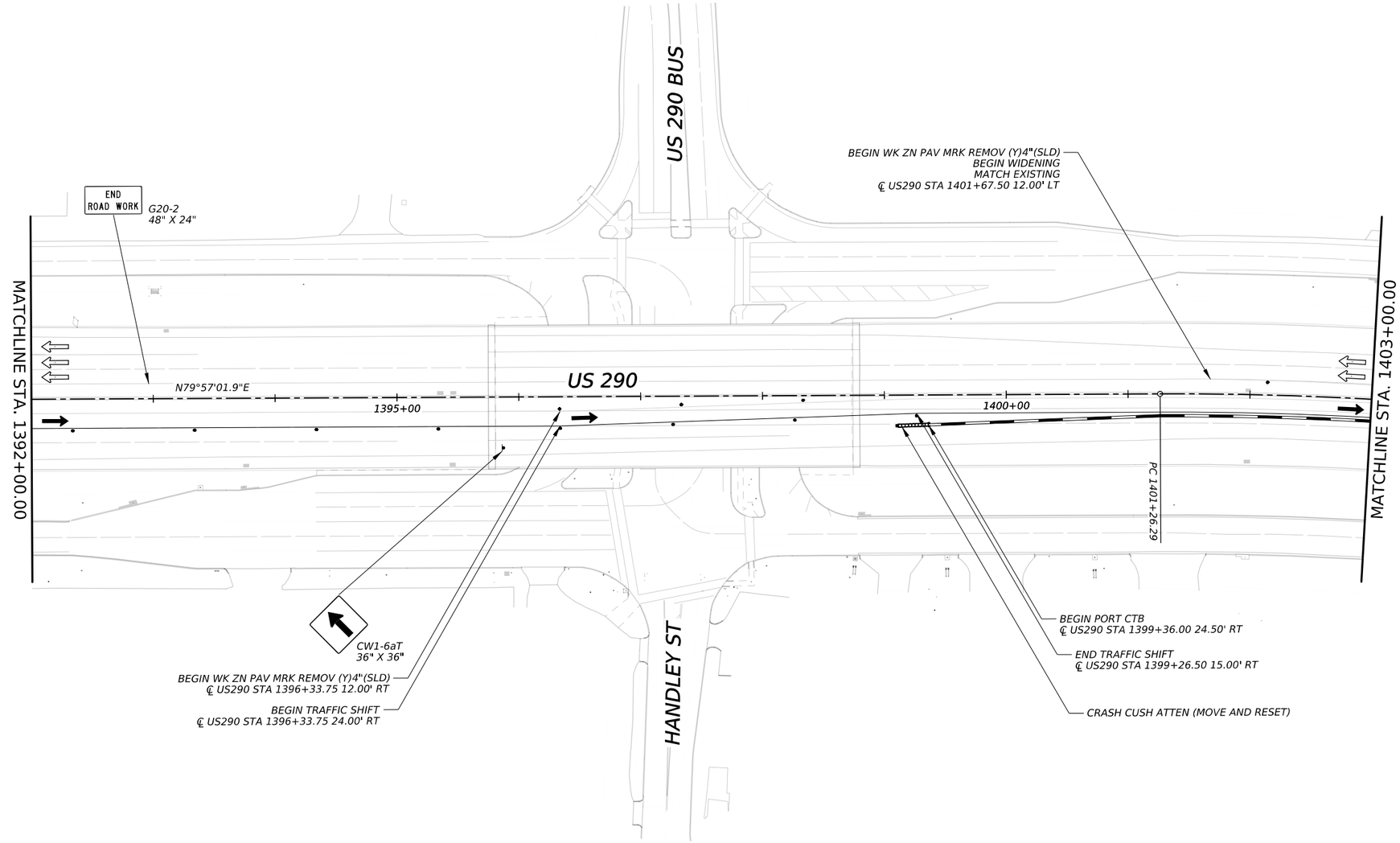
SHEET 1 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		22

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_US290_TCP2_021.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	**DESCRIPTION**	**UNIT**	**QUANTITY**
512 6025	PORT CTB (MOVE)(SGL SLP)(TY 1)	LF	363
512 6049	PORT CTB (REMOVE)(SGL SLP)(TY 1)	LF	363
545 6003	CRASH CUSH ATTEN (MOVE & RESET)	EA	1
545 6005	CRASH CUSH ATTEN (REMOVE)	EA	1
662 6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	1,099
662 6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	799



LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
- PROPOSED LANE
- CHANNELIZING DEVICES
- PORTABLE CTB
- BARRICADE
- FLASHING ARROW BOARD

NOTES:

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STATE OF TEXAS
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7/5/2023

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TBPE REGISTRATION NO.: F-16341

US 290
TCP LAYOUT
PHASE 2
STA 1392+00 TO STA 1403+00

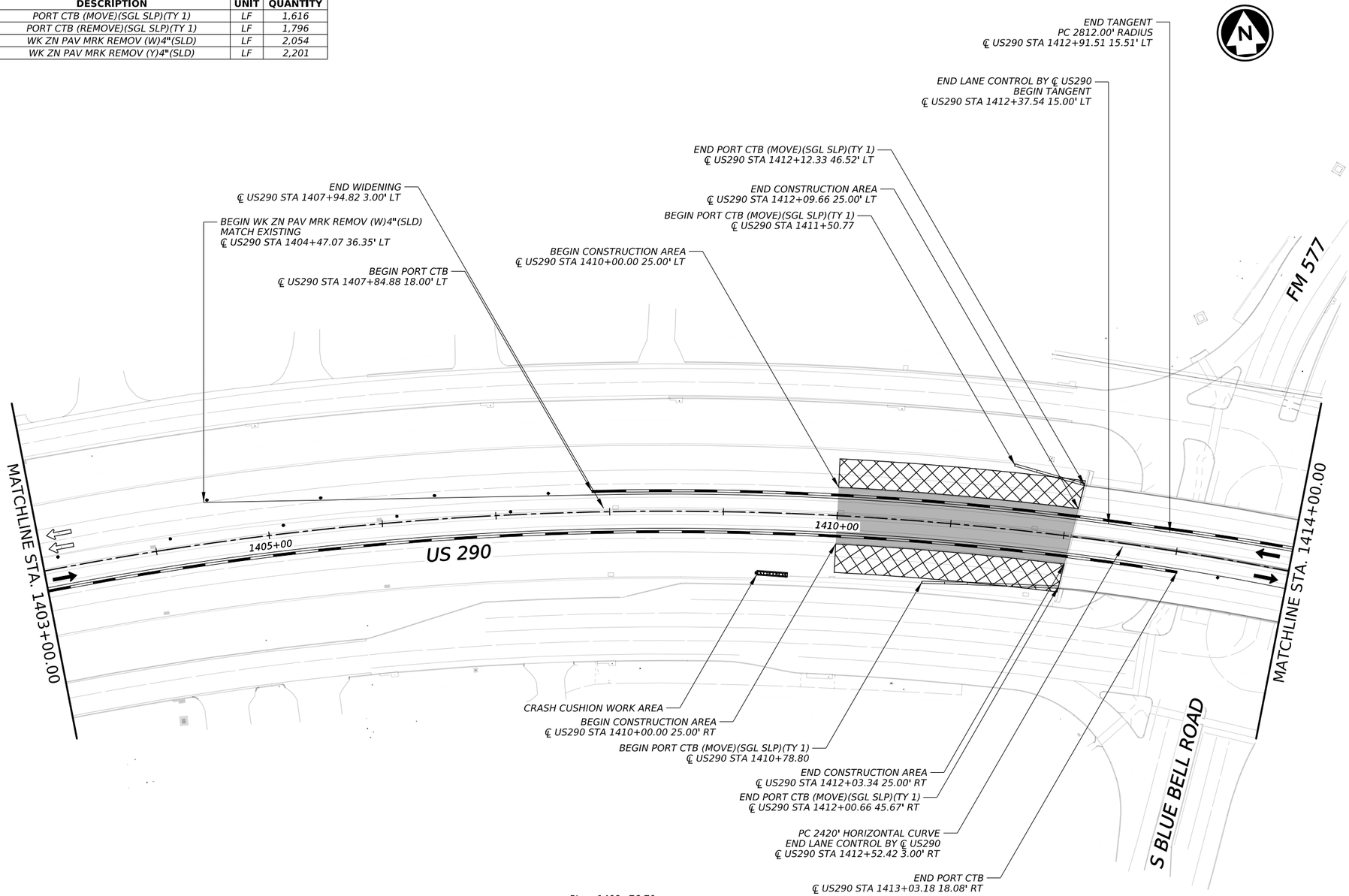
SHEET 3 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		23

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_US290_TCP2_031.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	**DESCRIPTION**	**UNIT**	**QUANTITY**
512 6025	PORT CTB (MOVE)(SGL SLP)(TY 1)	LF	1,616
512 6049	PORT CTB (REMOVE)(SGL SLP)(TY 1)	LF	1,796
662 6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	2,054
662 6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	2,201



PI	1409+76.70
Δ	33°04'00.1" (RT)
D	02°00'00.0"
T	850.40'
L	1653.34'
R	2864.79'
PC	1401+26.29
PT	1417+79.63

LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
- PROPOSED LANE
- CHANNELIZING DEVICES
- PORTABLE CTB
- BARRICADE
- FLASHING ARROW BOARD

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SCALE IN FEET

TBPE REGISTRATION NO.: F-16341

Texas Department of Transportation

US 290
TCP LAYOUT
PHASE 2
STA 1403+00 TO STA 1414+00

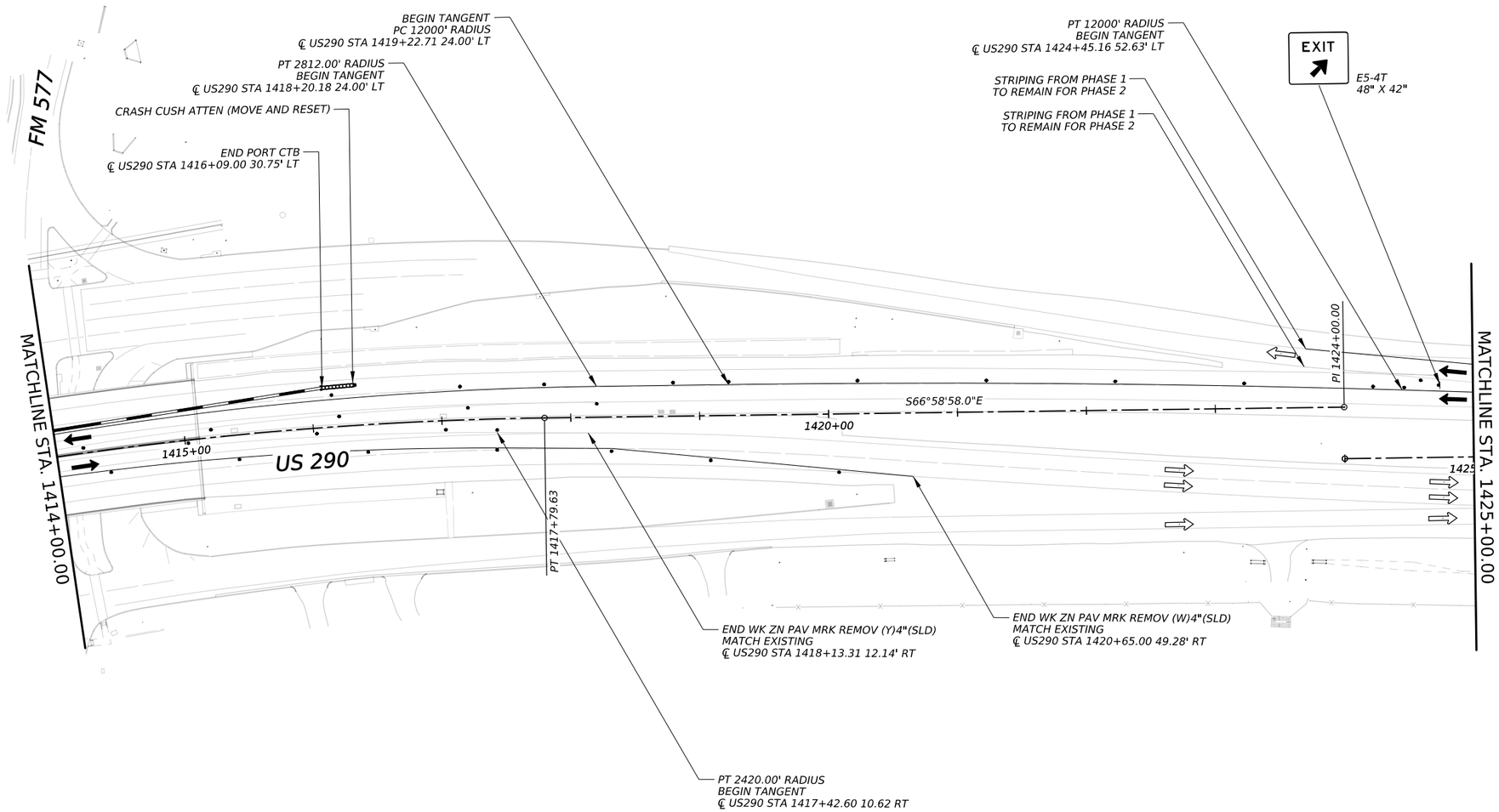
SHEET 4 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		24

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_US290_TCP2_041.dgn

CK: JMT
DW: JMT
CK: JMT
DN: JMT

ESTIMATED QUANTITIES			
BID CODE	**DESCRIPTION**	**UNIT**	**QUANTITY**
512 6025	PORT CTB (MOVE)(SGL SLP)(TY 1)	LF	211
512 6049	PORT CTB (REMOVE)(SGL SLP)(TY 1)	LF	211
545 6003	CRASH CUSH ATTEN (MOVE & RESET)	EA	1
545 6005	CRASH CUSH ATTEN (REMOVE)	EA	1
662 6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	1,767
662 6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	834



LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
- PROPOSED LANE
- CHANNELIZING DEVICES
- PORTABLE CTB
- BARRICADE
- FLASHING ARROW BOARD

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7/5/2023

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SCALE IN FEET

TBPE REGISTRATION NO. F-16341

US 290
TCP LAYOUT
PHASE 2
STA 1414+00 TO STA 1425+00

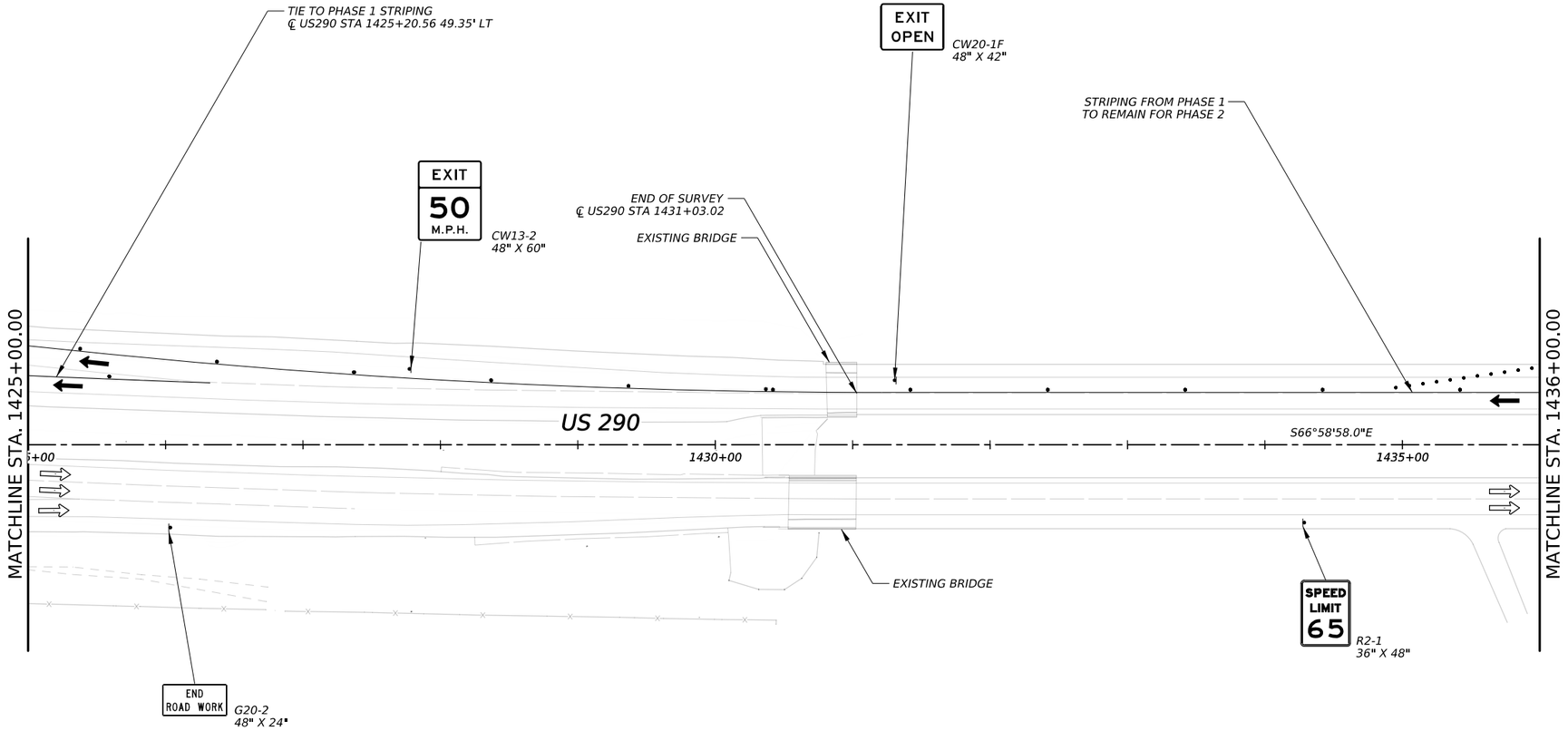
SHEET 5 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		25

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_US290_TCP2_051.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	DESCRIPTION	UNIT	QUANTITY
662 6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	21



LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
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- BARRICADE
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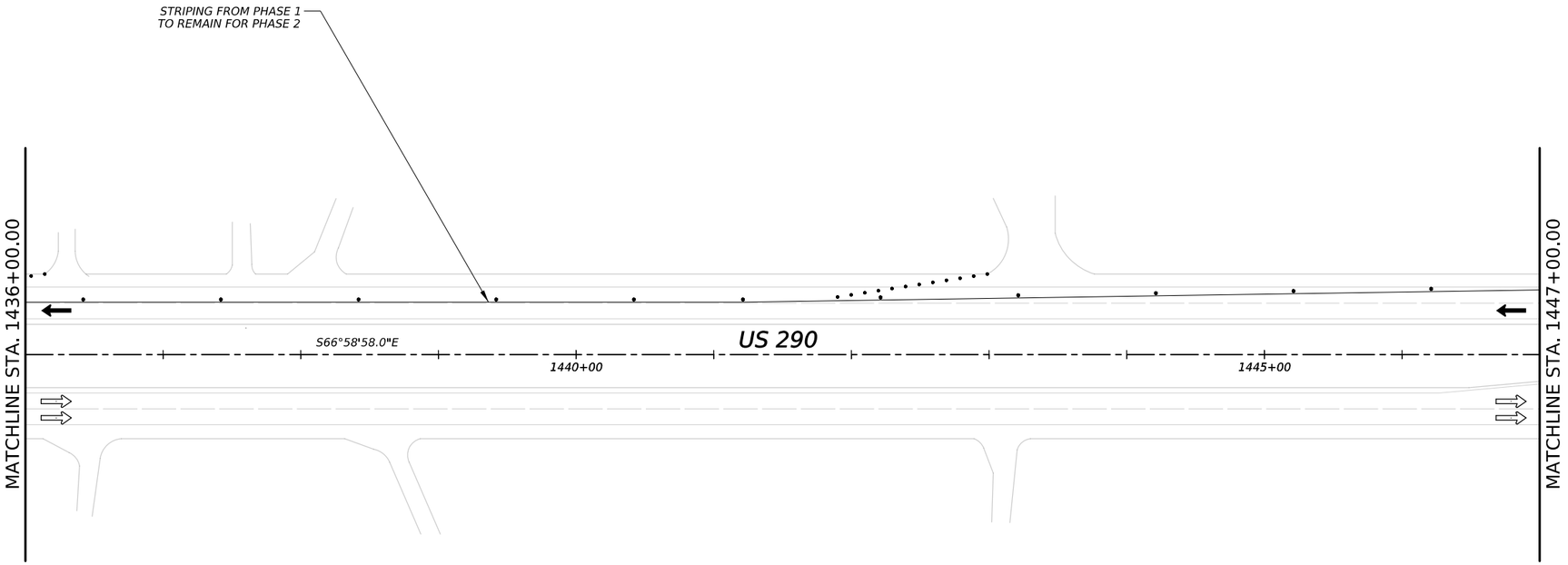
US 290
TCP LAYOUT
PHASE 2
STA 1425+00 TO STA 1436+00

SHEET 6 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		26

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_US290_TCP2_061.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT



LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
- PROPOSED LANE
- CHANNELIZING DEVICES
- PORTABLE CTB
- BARRICADE
- FLASHING ARROW BOARD

NOTES:

1. STATIONS AND OFFSETS ARE MEASURED FROM CENTERLINE OF ROADWAY UNLESS NOTED OTHERWISE.
2. FOR ADDITIONAL DETAILS ON THE PLACEMENT AND SPACING OF SIGNS, CHANNELIZING DEVICES, AND BARRICADES SEE THE INCLUDED BC AND TCP STANDARDS.

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO. F-16341

US 290
TCP LAYOUT
PHASE 2
STA 1436+00 TO STA 1447+00

SHEET 7 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		27

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_US290_TCP2_071.dgn

CK: JMT
DW: JMT
CK: JMT
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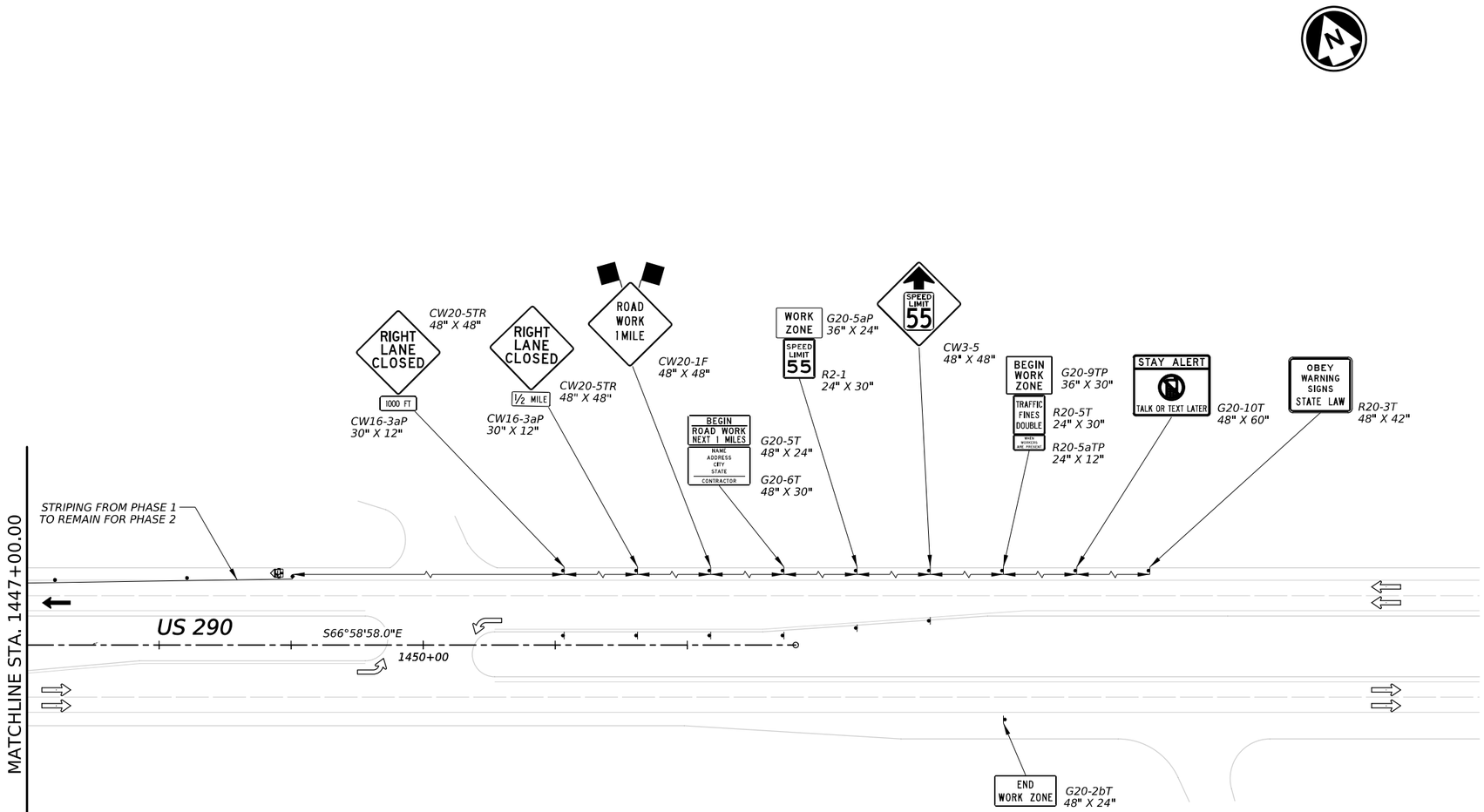

LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- EXISTING LANE
- PROPOSED LANE
- CHANNELIZING DEVICES
- PORTABLE CTB
- BARRICADE
- FLASHING ARROW BOARD

NOTES:

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STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO. F-16341

US 290
TCP LAYOUT
PHASE 2
STA 1447+00 TO END

SHEET 8 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		28

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_US290_TCP2_08.dgn

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

DATE: 7/5/2023
FILE: bc-21.dgn

SHEET 1 OF 12

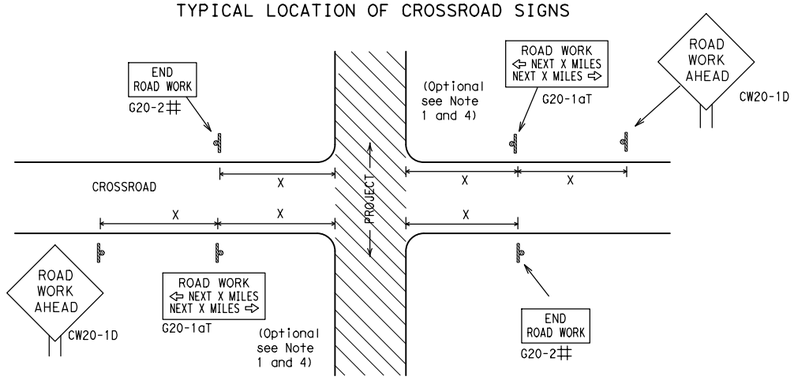
Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13	0114	10	104	US290
9-07 8-14	DIST	COUNTY		SHEET NO.
5-10 5-21	BRY	WASHINGTON		29

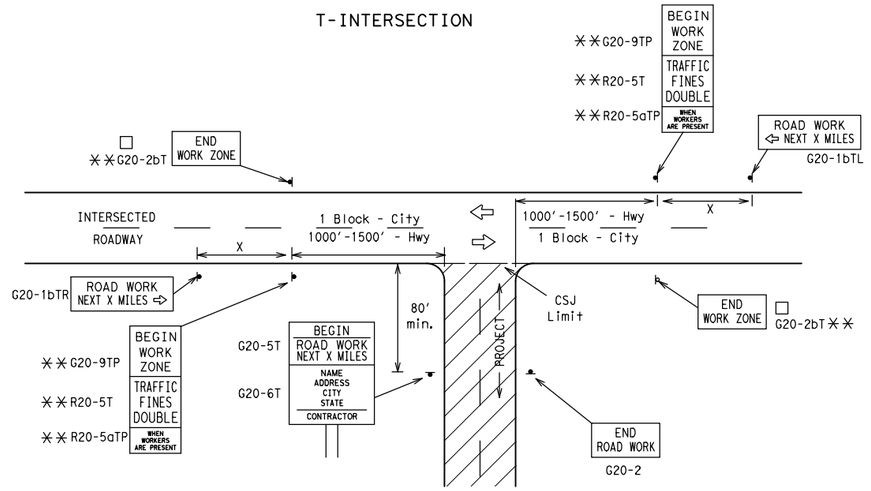
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

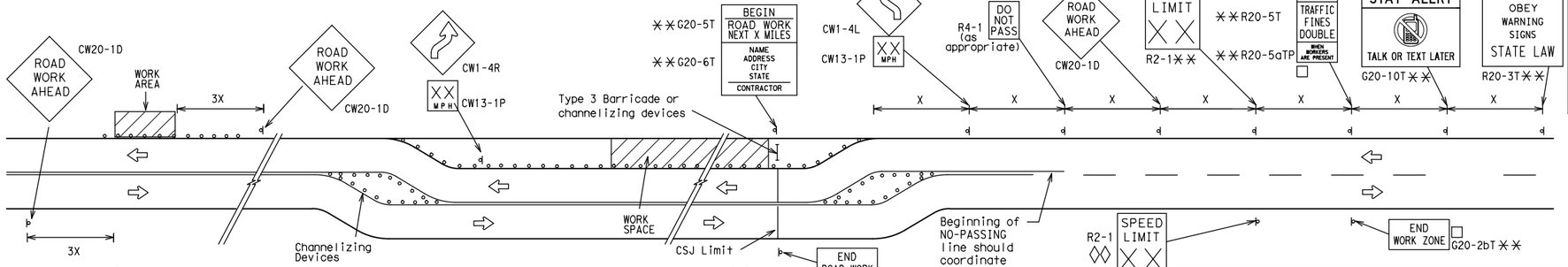
✳ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

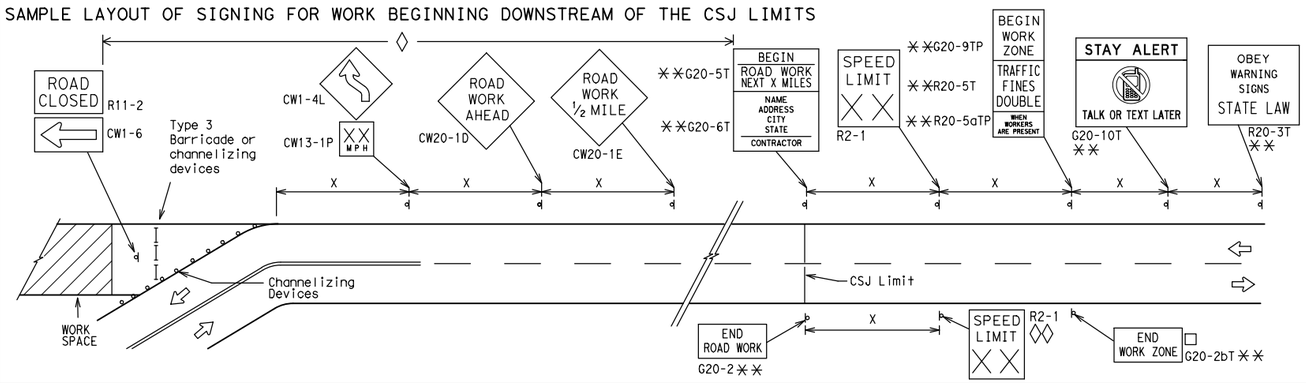
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

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

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

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

LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BRY	WASHINGTON		30

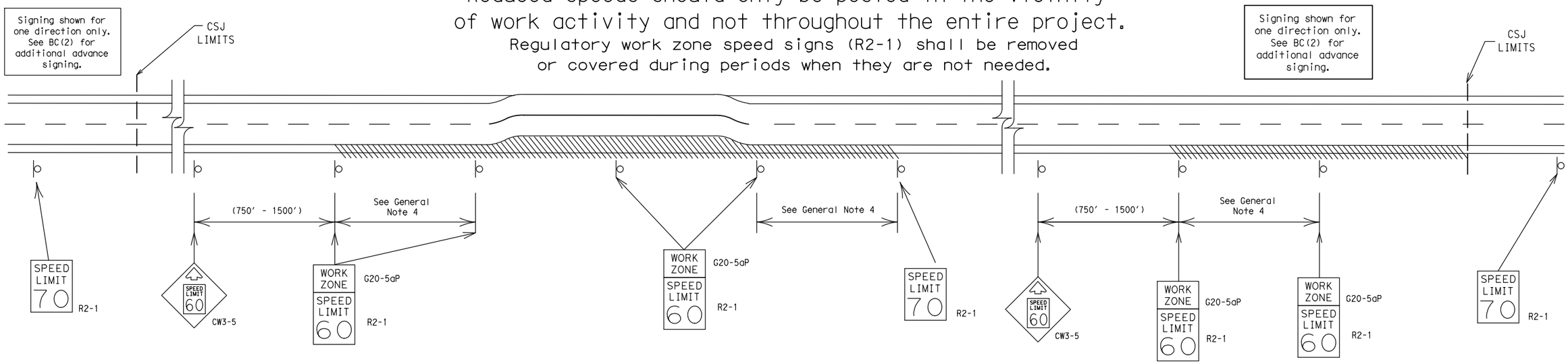
DATE: 7/5/2023
FILE: bc-21.dgn

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

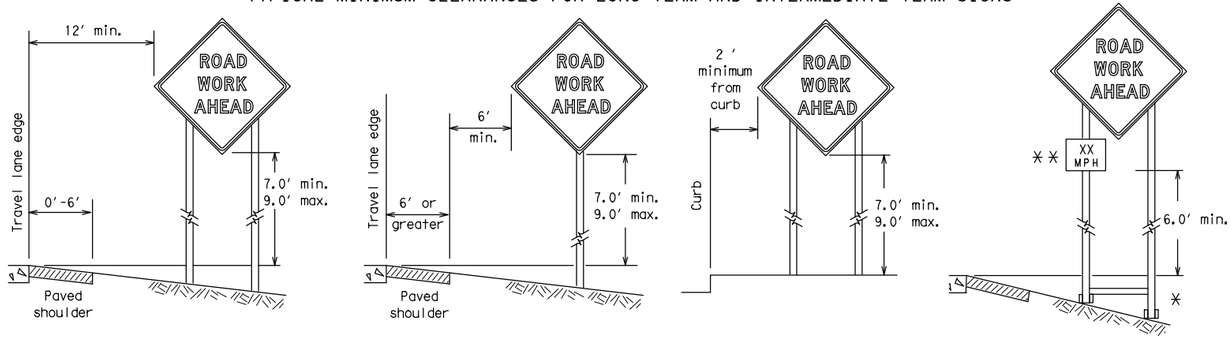
BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	0114	10	104	US290
	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		31

97

DATE: 7/5/2023
FILE: bc-21.dgn

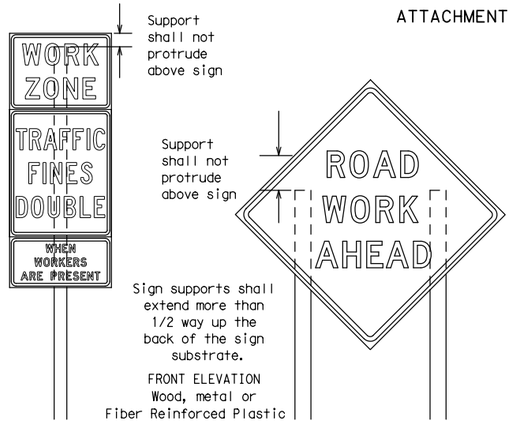
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



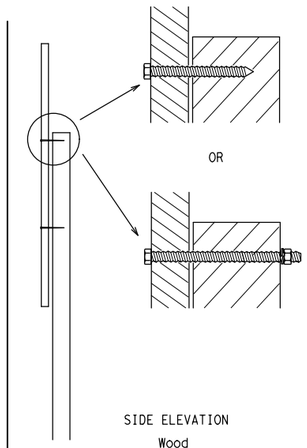
⚹ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS



FRONT ELEVATION
Wood, metal or
Fiber Reinforced Plastic



SIDE ELEVATION
Wood

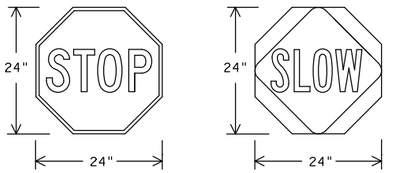
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



Background - Red
Legend & Border - White

Background - Orange
Legend & Border - Black

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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

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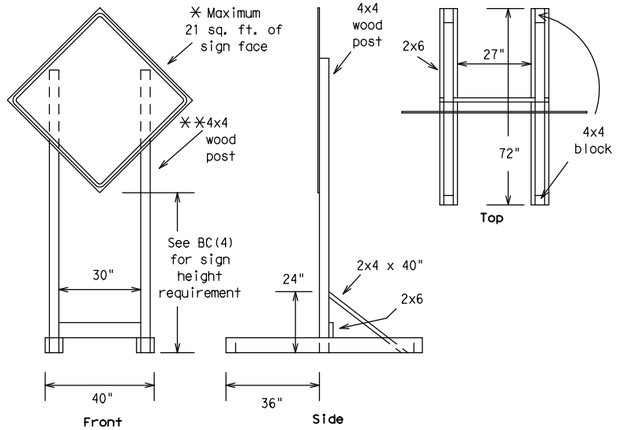
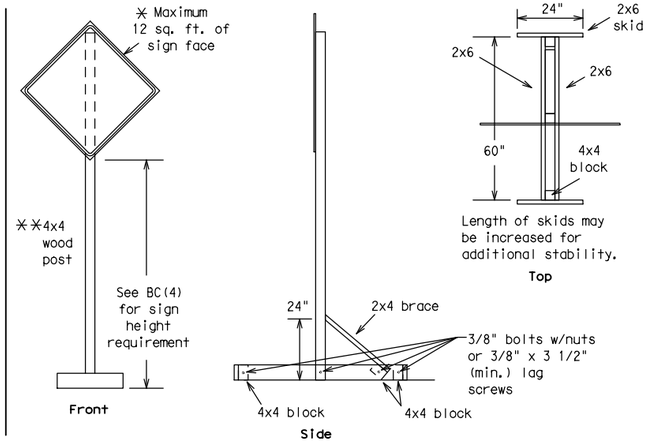
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BRY	WASHINGTON		32

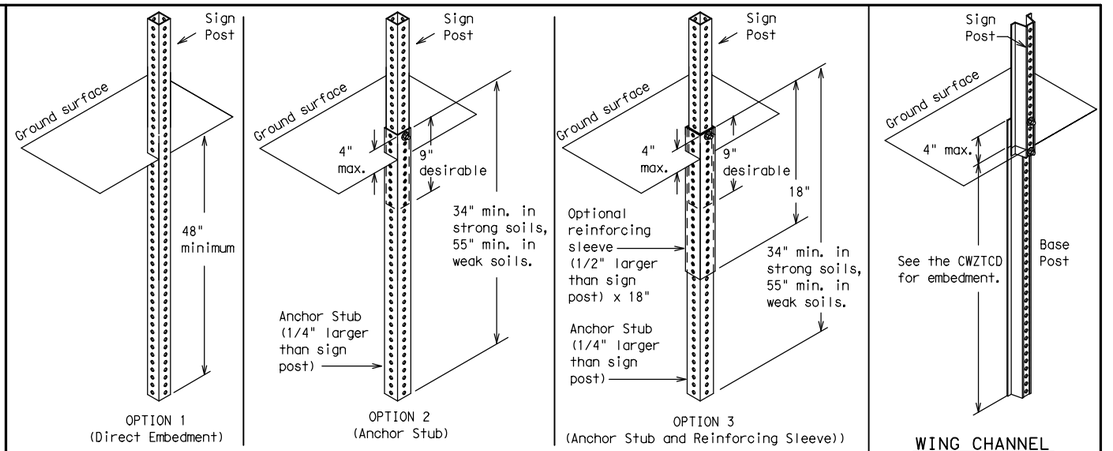
DATE: 7/5/2023
FILE: bc-21.dgn





SKID MOUNTED WOOD SIGN SUPPORTS

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

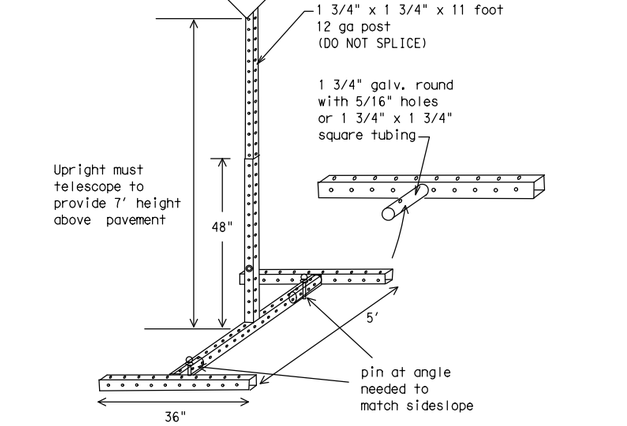


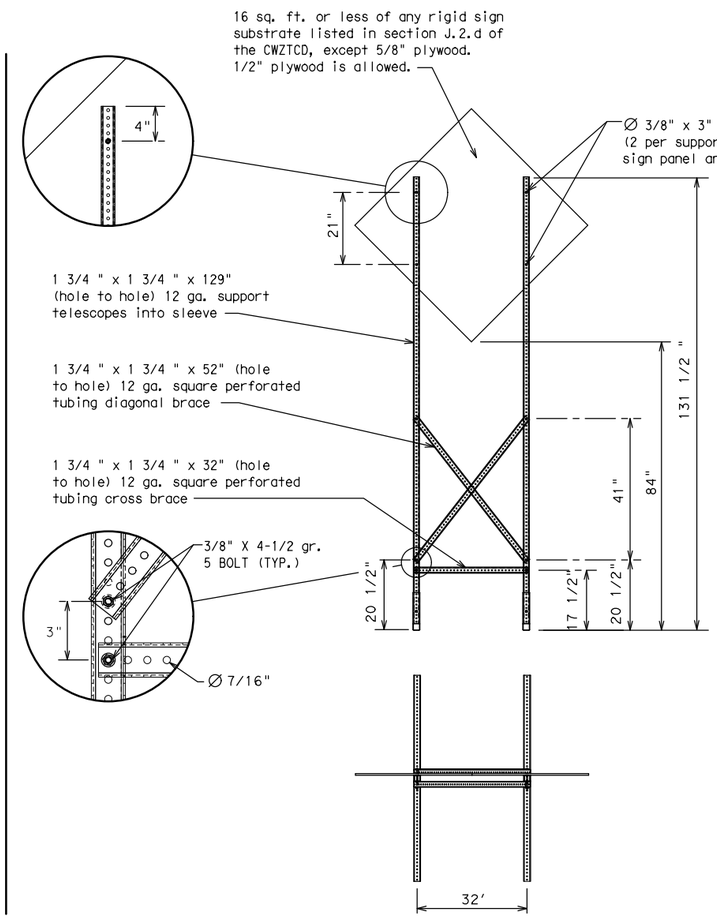
PERFORATED SQUARE METAL TUBING

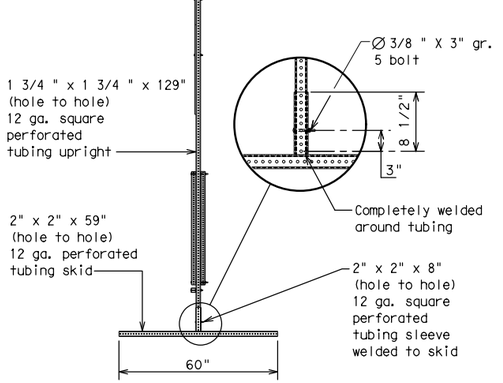
WING CHANNEL
Lap-splice/base bolted anchor

GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BRY	WASHINGTON		33

DATE: 7/5/2023
FILE: bc-21.dgn

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

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

Location List

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

Warning List

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

** Advance Notice List

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

** 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)

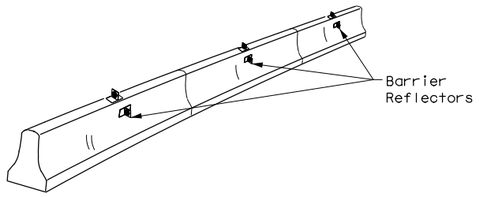
BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BRY	WASHINGTON		34

100

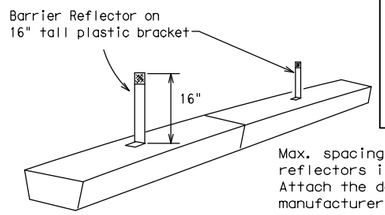
DATE: 7/5/2023
FILE: bc-21.dgn

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



CONCRETE TRAFFIC BARRIER (CTB)

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

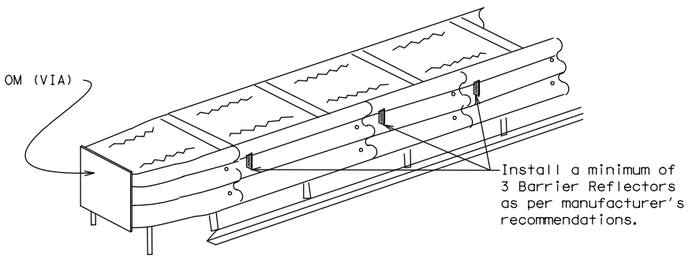


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

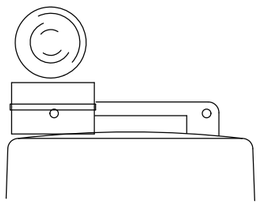


DELINEATION OF END TREATMENTS

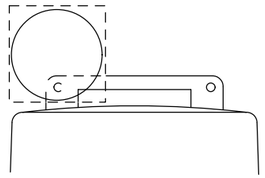
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

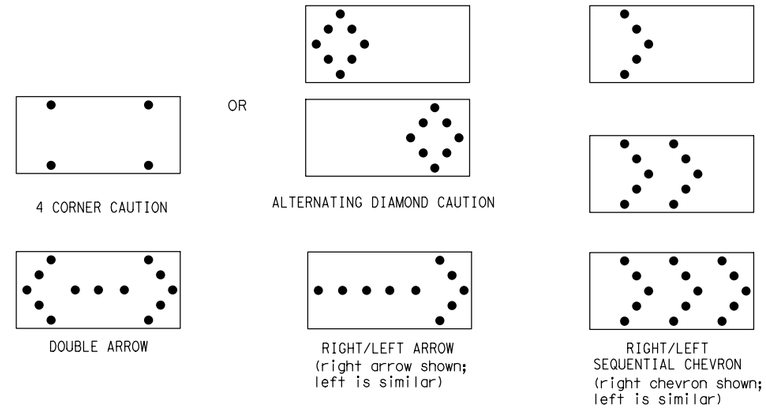
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



4 CORNER CAUTION

ALTERNATING DIAMOND CAUTION

DOUBLE ARROW

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

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

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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

SHEET 7 OF 12

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	0114	10	104	US290
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BRY	WASHINGTON		35

101

DATE: 7/5/2023
FILE: bc-21.dgn

GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

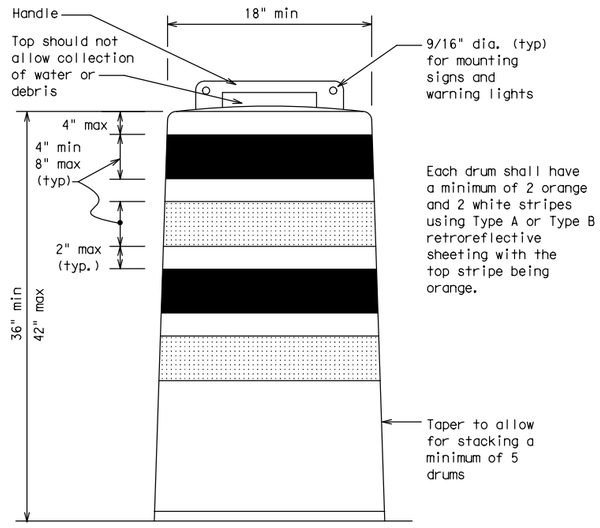
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

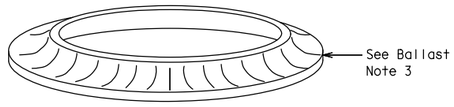
RETROREFLECTIVE SHEETING

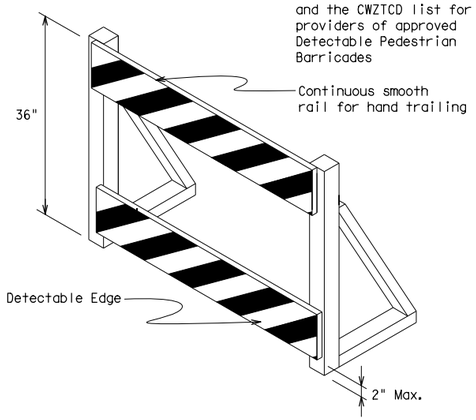
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

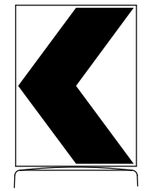




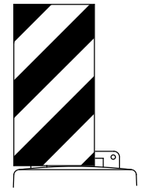


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

.

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	BRY	WASHINGTON		36
7-13				

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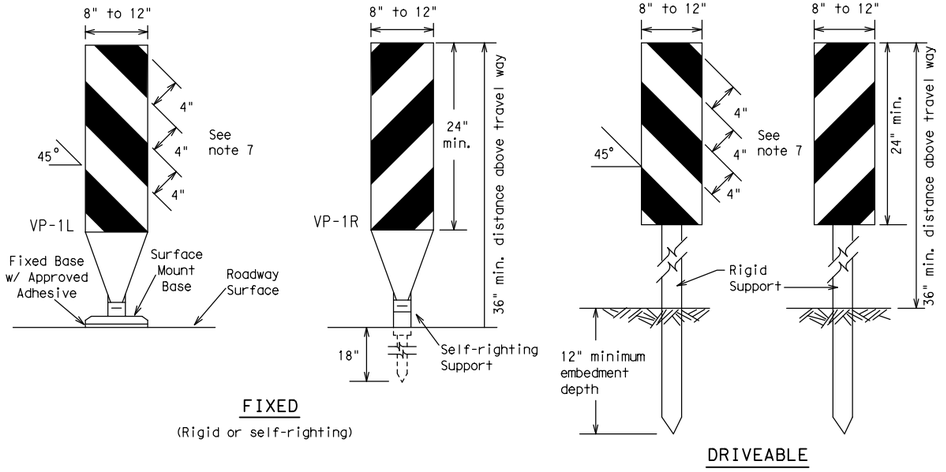
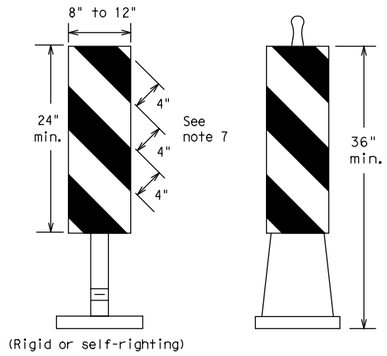
DATE: 7/5/2023
FILE: bc-21.dgn



FIXED
(Rigid or self-righting)

DRIVEABLE

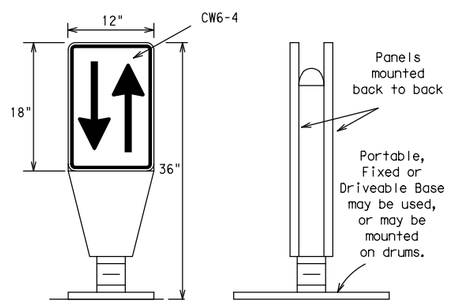


(Rigid or self-righting)

PORTABLE

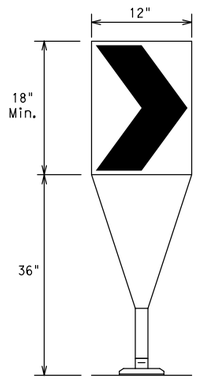
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



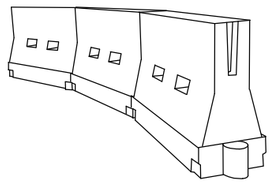
Fixed Base w/ Approved Adhesive
(Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
9-07 8-14	DIST	COUNTY		SHEET NO.
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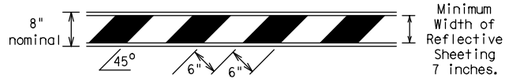
DATE: 7/5/2023
FILE: bc-21.dgn

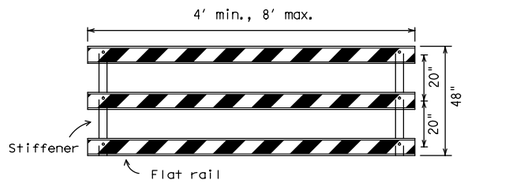
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



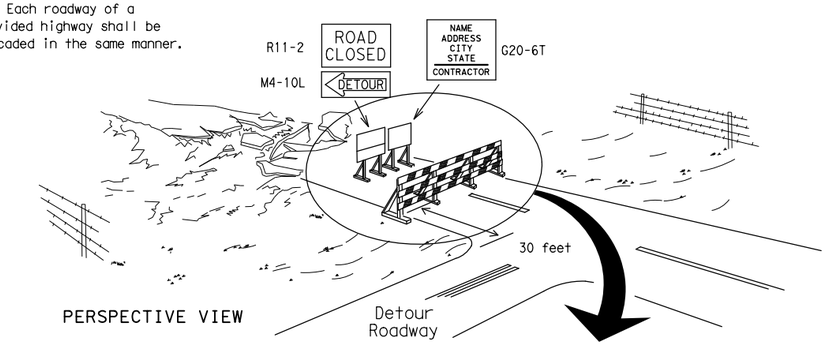
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

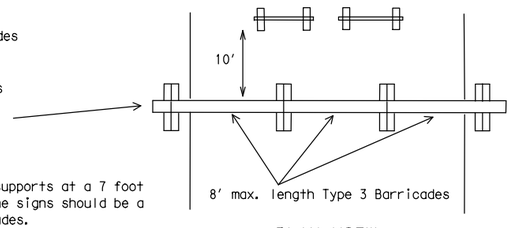
TYPICAL PANEL DETAIL
FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

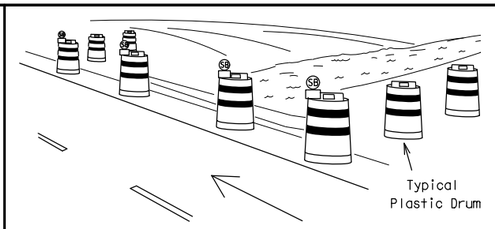
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

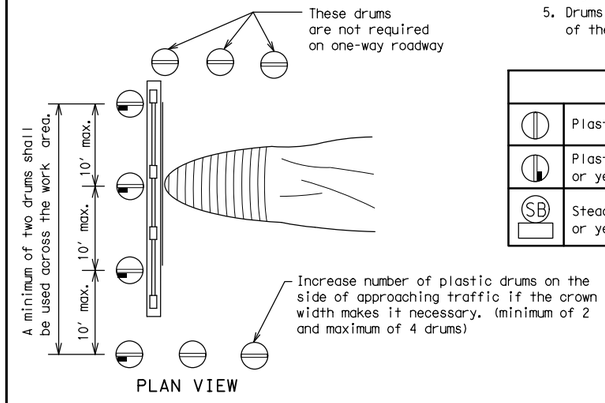
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

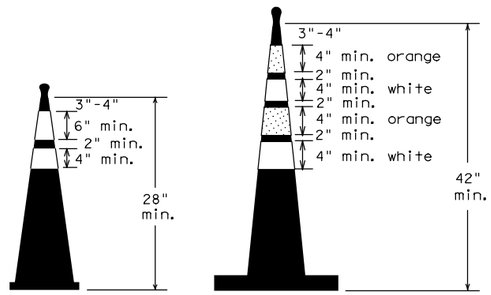
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



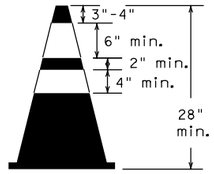
PLAN VIEW

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

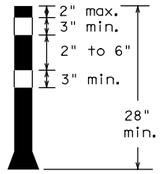
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

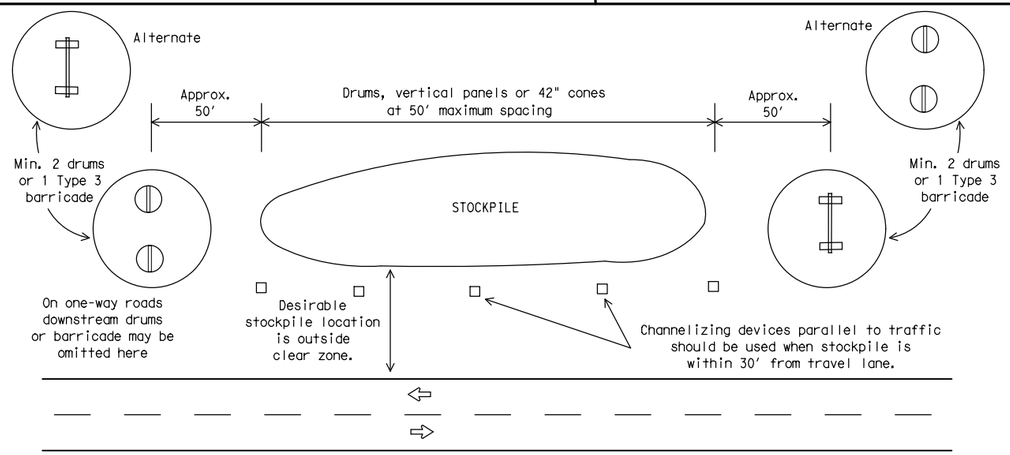


Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BRY	WASHINGTON		38

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DATE: 7/5/2023
FILE: bc-21.dgn

WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

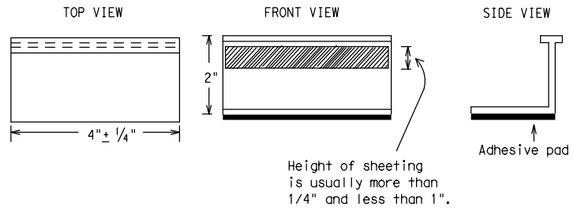
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

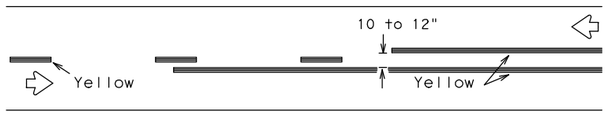
BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	BRY	WASHINGTON		39
11-02 8-14				

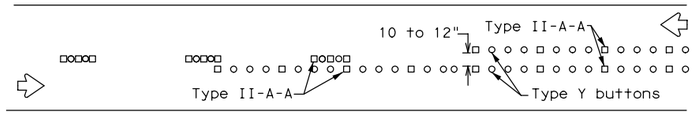
105

DATE: 7/5/2023
FILE: bc-21.dgn

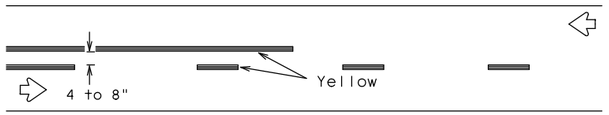
PAVEMENT MARKING PATTERNS



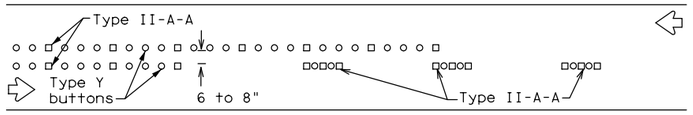
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



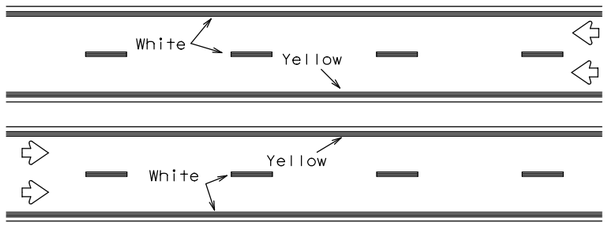
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



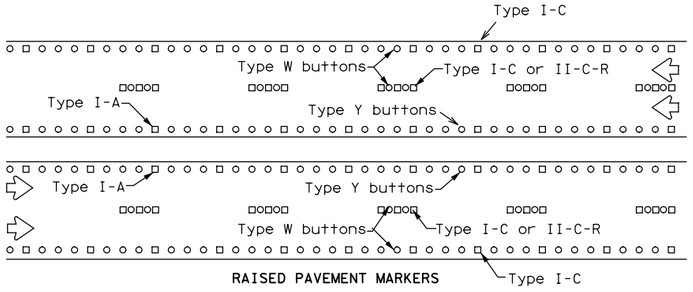
RAISED PAVEMENT MARKERS - PATTERN B

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

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



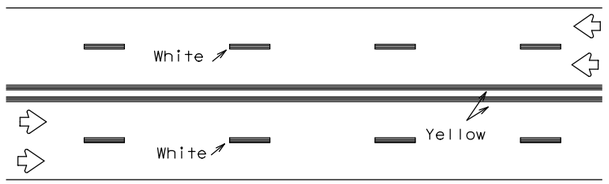
REFLECTORIZED PAVEMENT MARKINGS



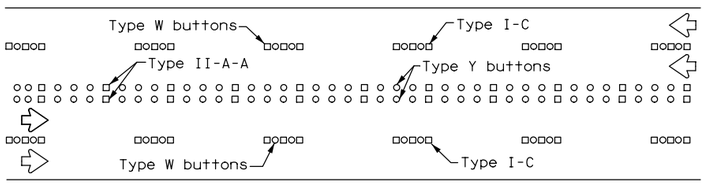
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



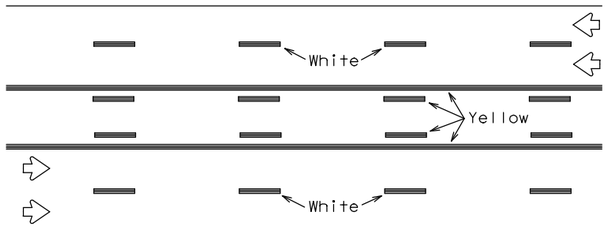
REFLECTORIZED PAVEMENT MARKINGS



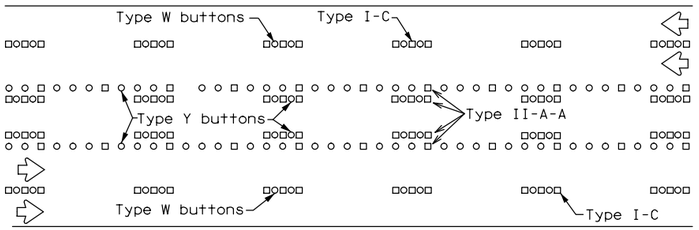
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

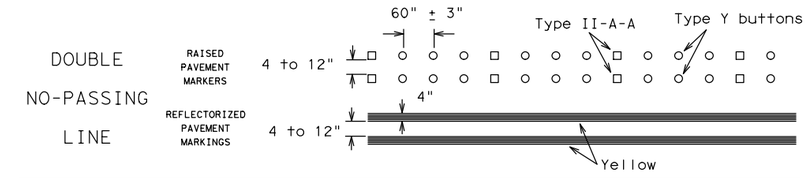
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

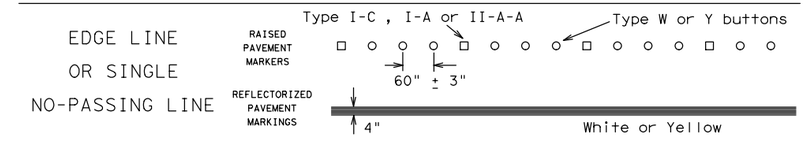
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

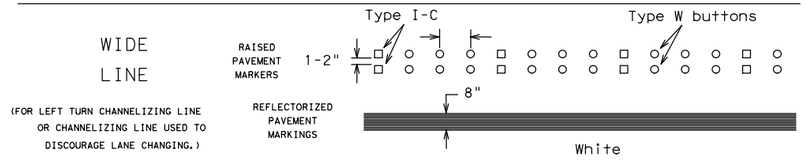


EDGE LINE OR SINGLE NO-PASSING LINE



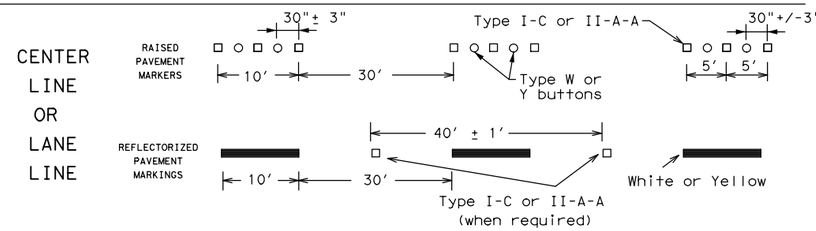
WIDE LINE

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

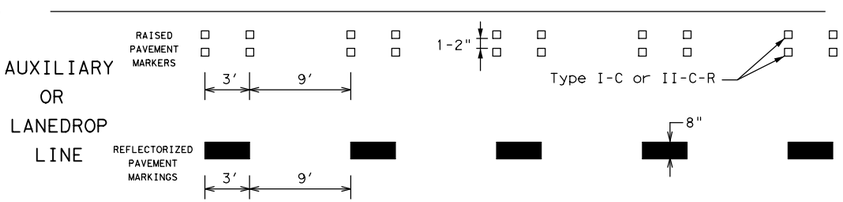


BROKEN LINES

CENTER LINE OR LANE LINE

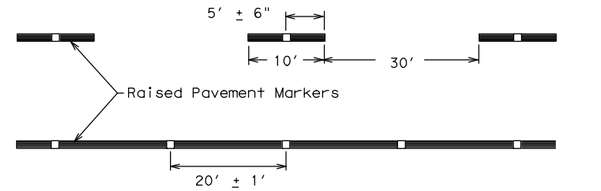


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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DATE: 7/5/2023
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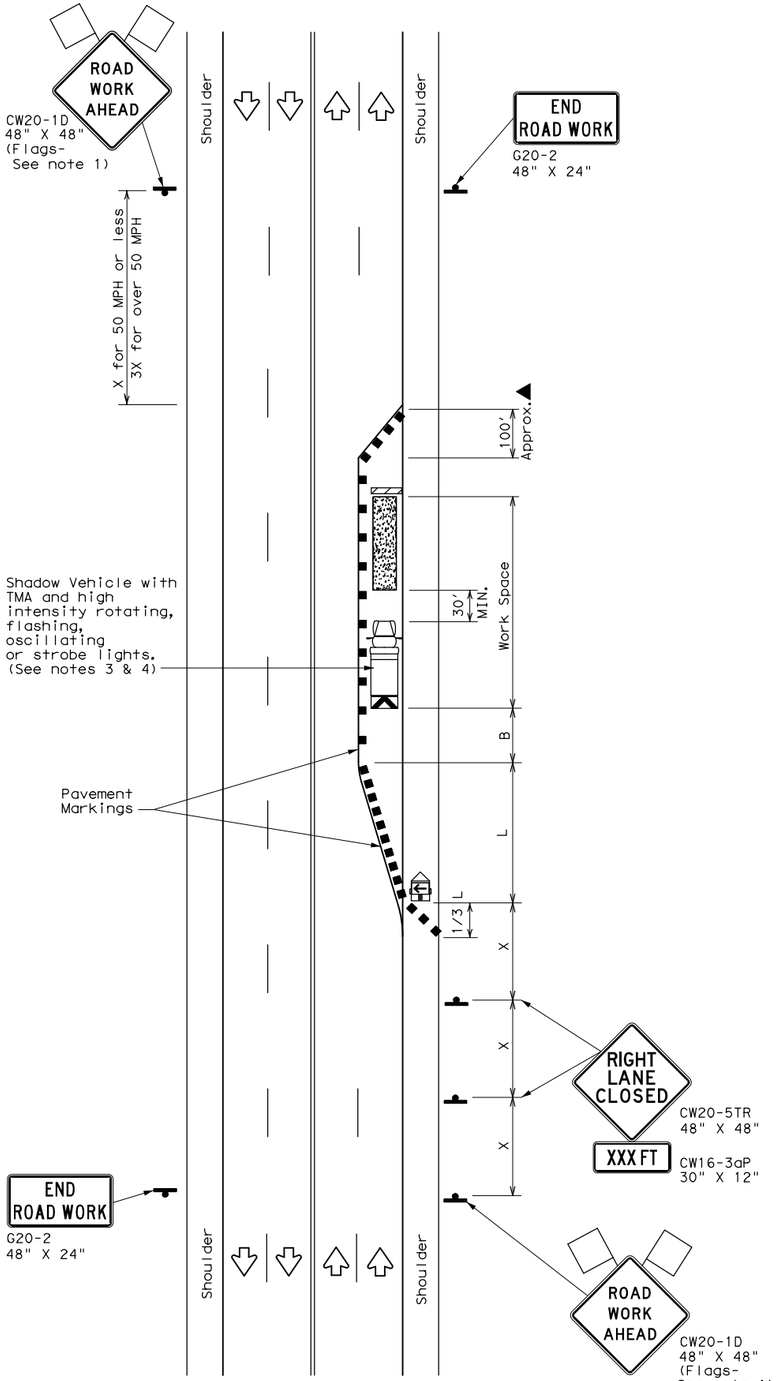
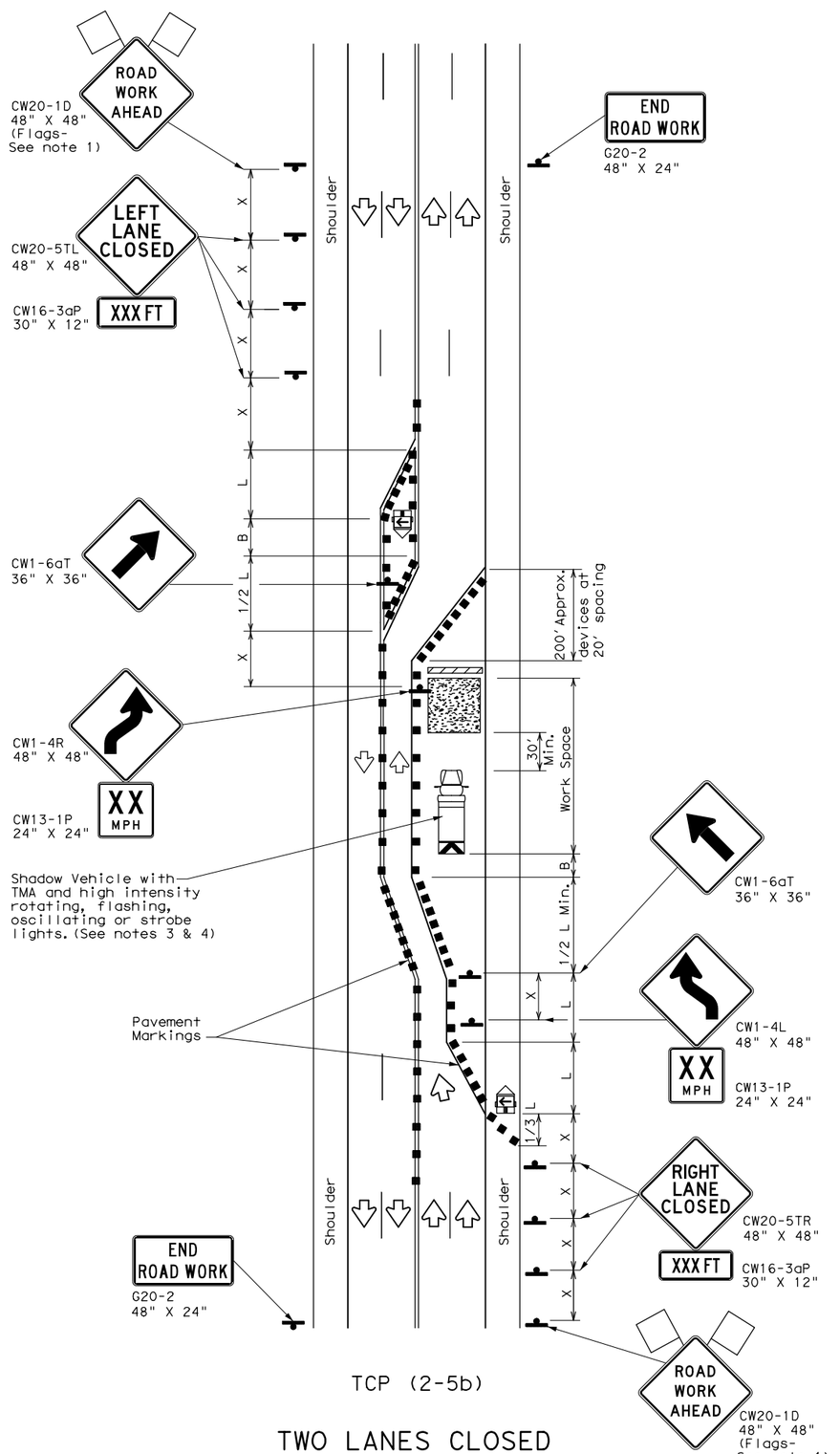


TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew eposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substitutued for the Shadow Vehicle and TMA.
4. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
5. The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

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

TCP (2-5b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

FILE: tcp2-5-18.dgn	DN:	CK:	DW:	CK:
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1-97 3-03	DIST	COUNTY		SHEET NO.
4-98 2-18	BRY	WASHINGTON		41

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DATE: 7/5/2023
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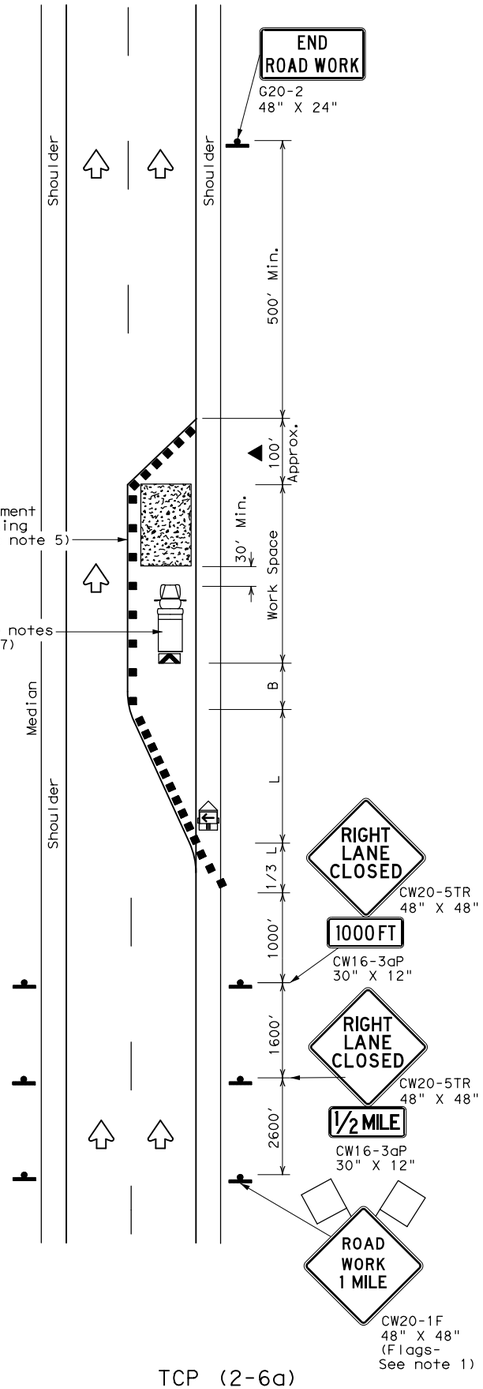
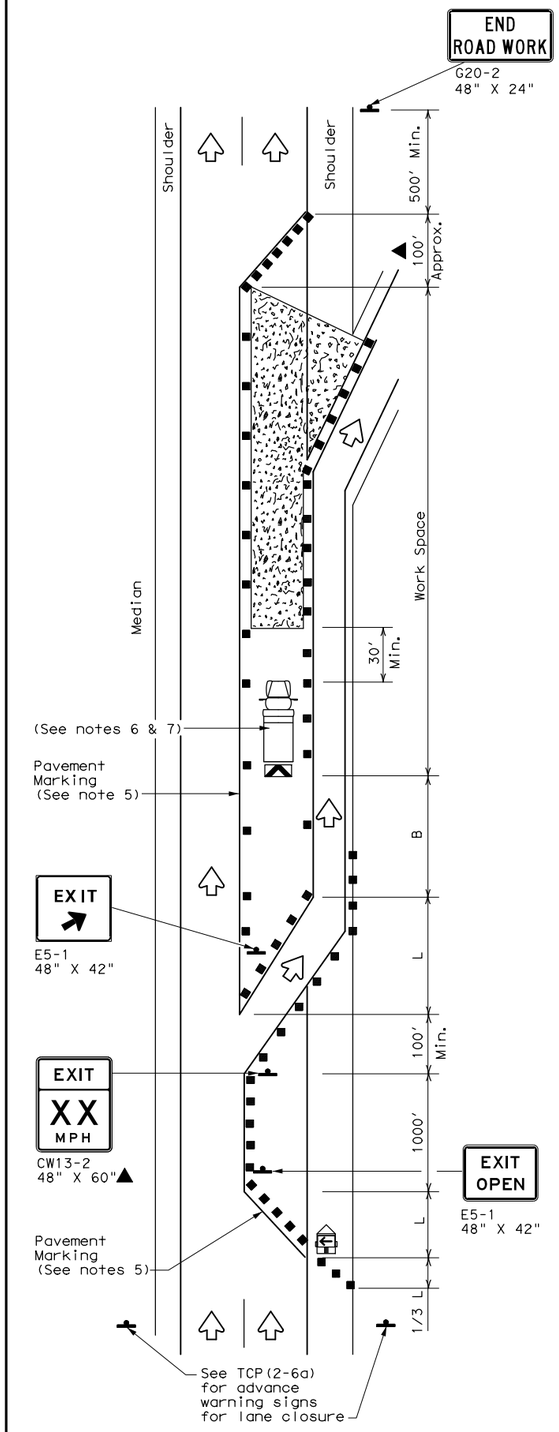


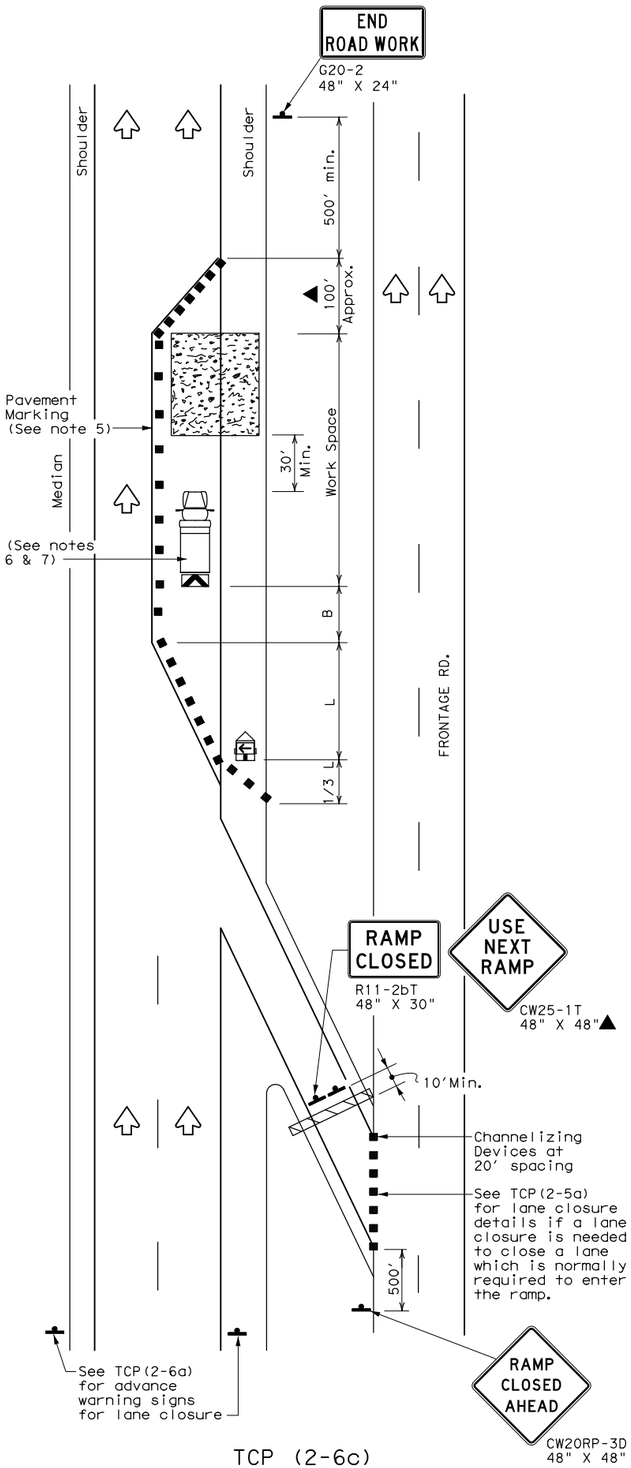
TCP (2-6a)

ONE LANE CLOSURE



TCP (2-6b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (2-6c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

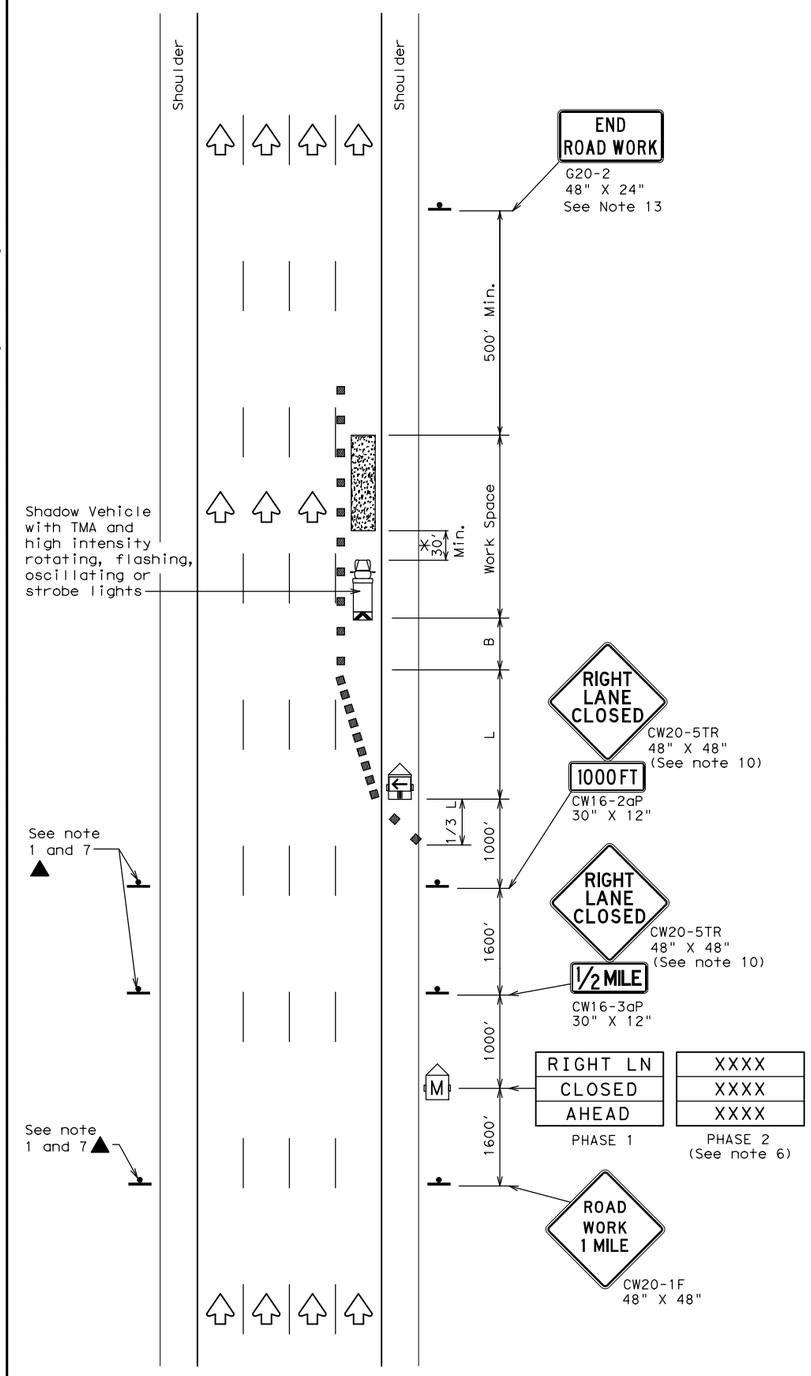
TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

TCP(2-6)-18

FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0114	10	104	US290
	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		42

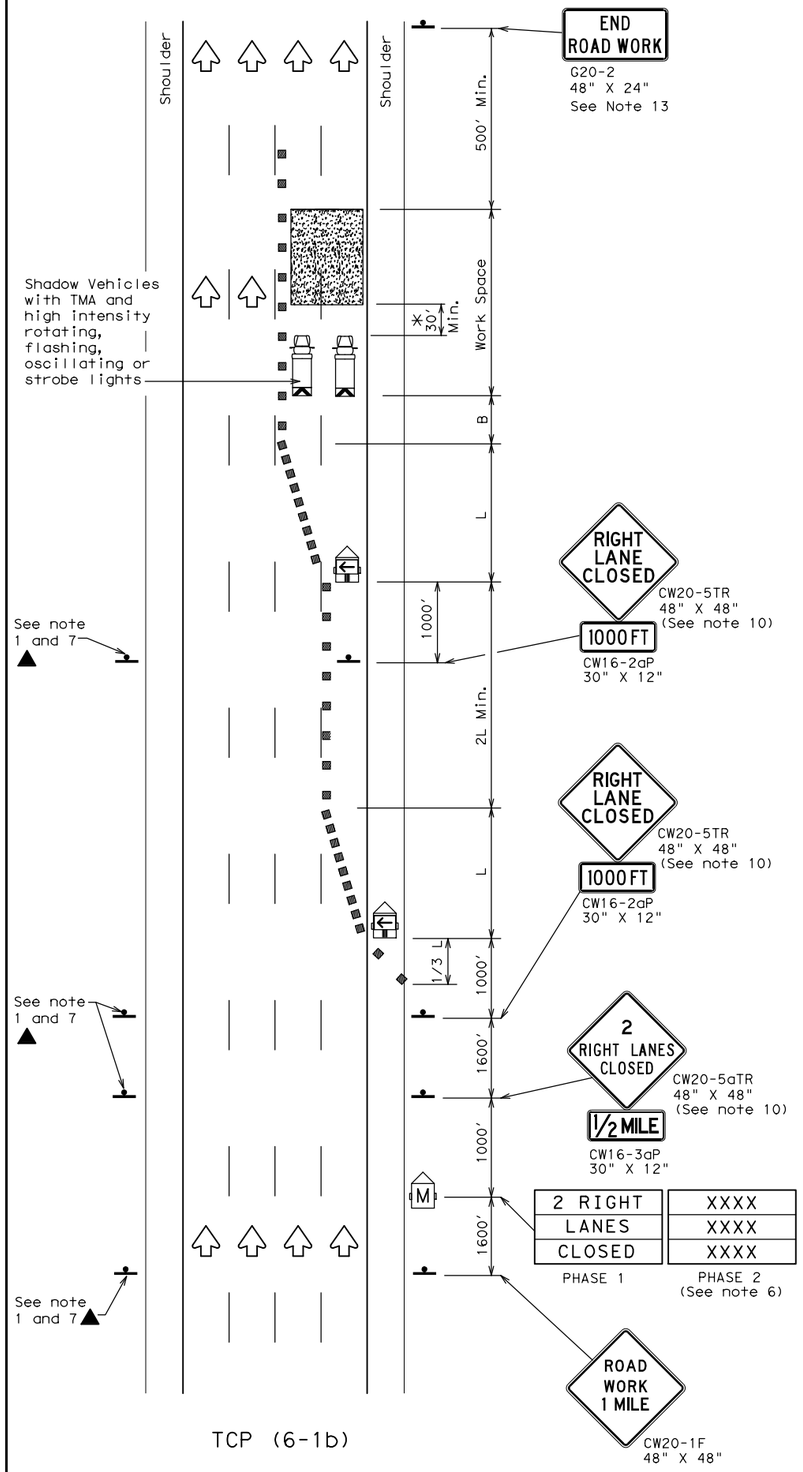
166

DATE: 7/5/2023
FILE: tcp2-6-18.dgn



TCP (6-1a)

TYPICAL FREEWAY ONE LANE CLOSURE



TCP (6-1b)

TYPICAL FREEWAY TWO LANE CLOSURE

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
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

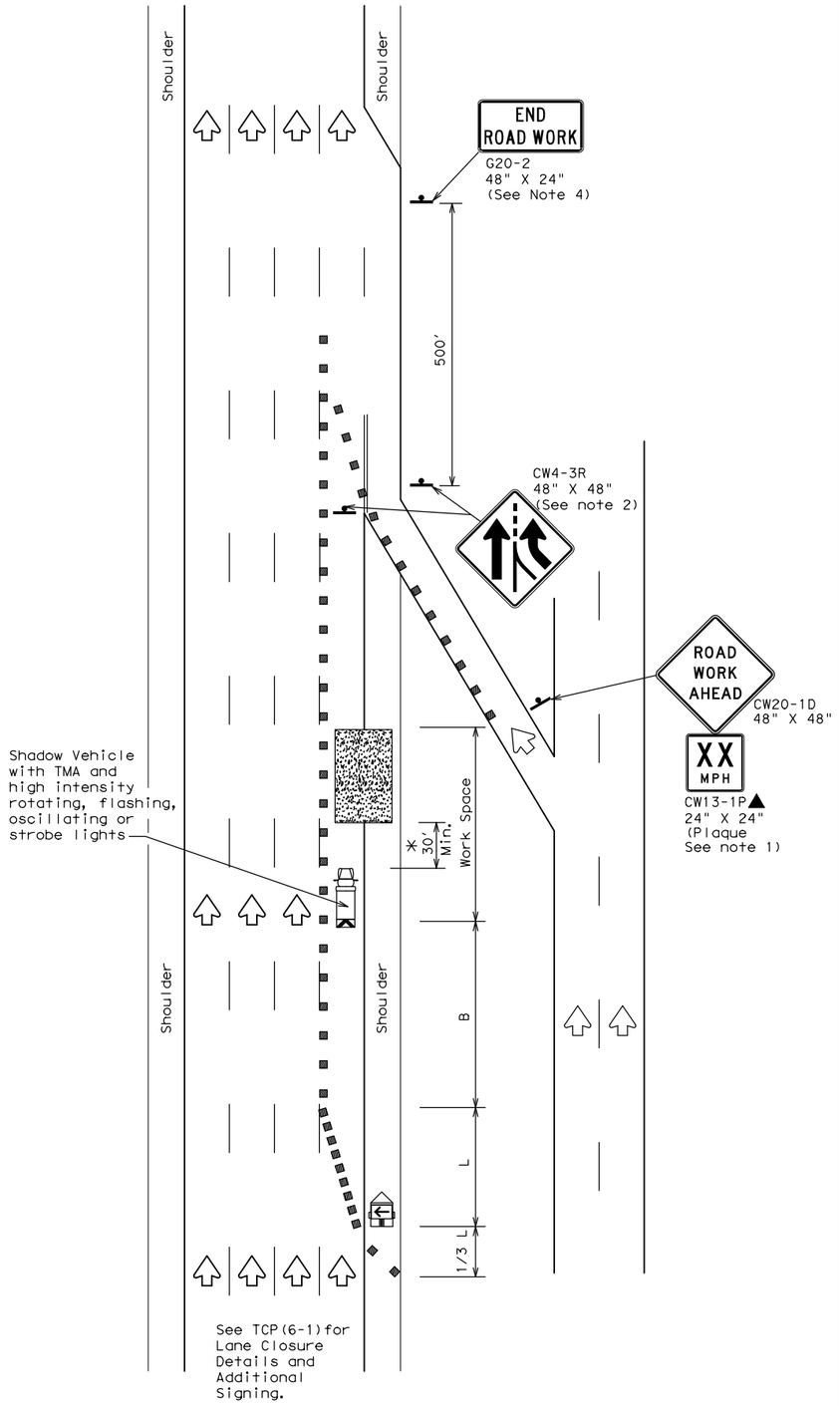
TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

TCP(6-1)-12

FILE: tcp6-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-12	0114	10	104	US290
	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		43

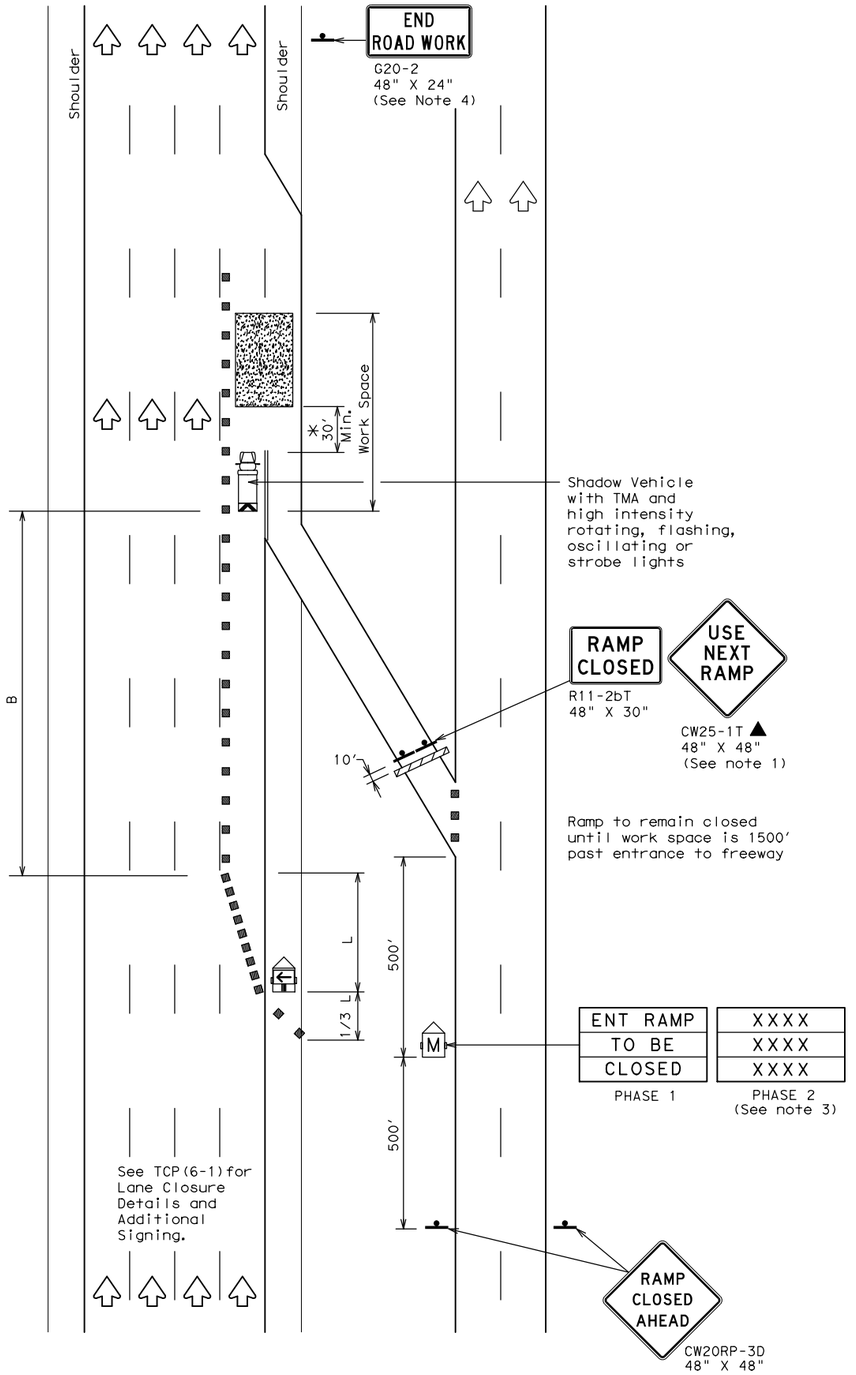
201

DATE: 7/5/2023
FILE: tcp6-1.dgn



TCP (6-2a)

ENTRANCE RAMP OPEN
WORK WITHIN 500' OF RAMP



TCP (6-2b)

ENTRANCE RAMP CLOSED

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "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. ADDED LANE Symbol (CW4-3) sign may be omitted when sign between ramp and mainlane can be seen from both roadways.
3. See "Advance Notice List" on BC(6) for recommended date and time formatting options for PCMS Phase 2 message.
4. 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
WORK AREA NEAR RAMP

TCP(6-2)-12

FILE: tcp6-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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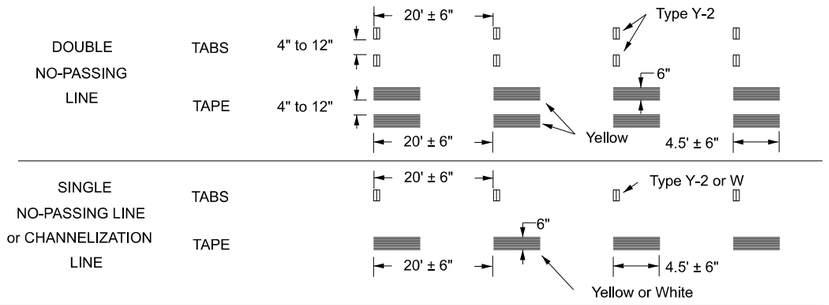
REVISIONS	0114	10	104	US290
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	BRY	WASHINGTON		44

202

DATE: 7/5/2023
FILE: tcp6-2.dgn

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



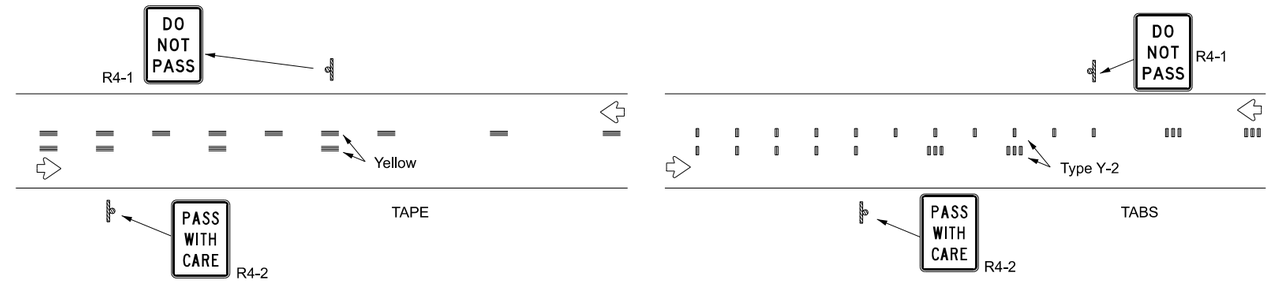
NOTES:

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

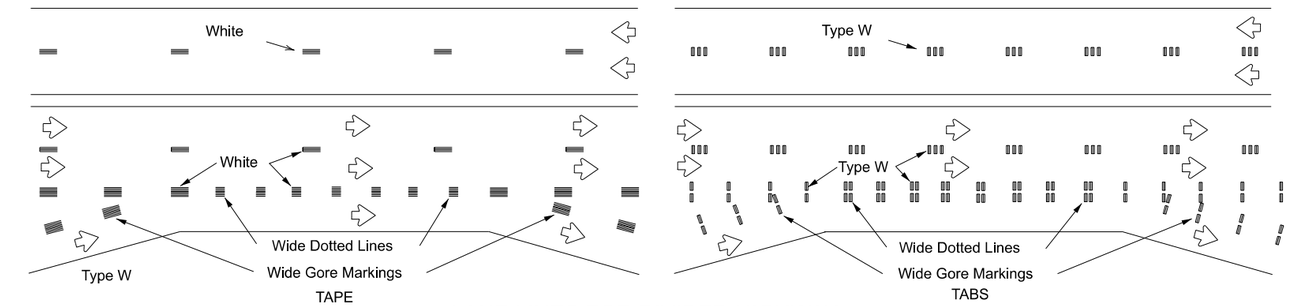
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

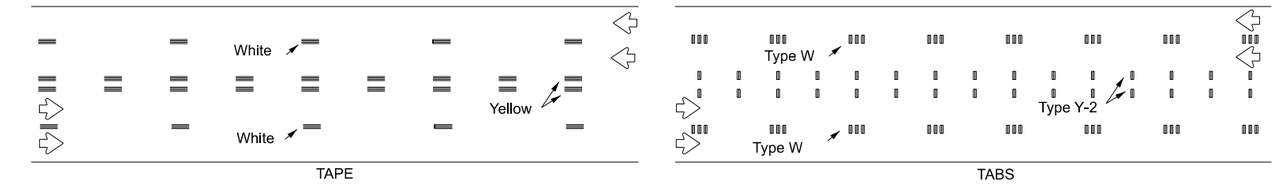
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



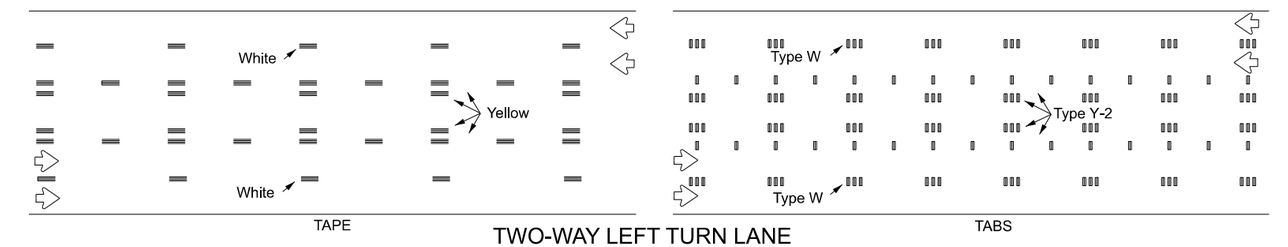
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



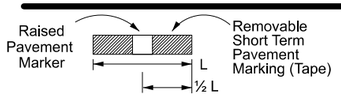
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

FILE: wzstpm-23.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
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4-92 7-13 1-97 2-23 3-03	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		45

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DATE:
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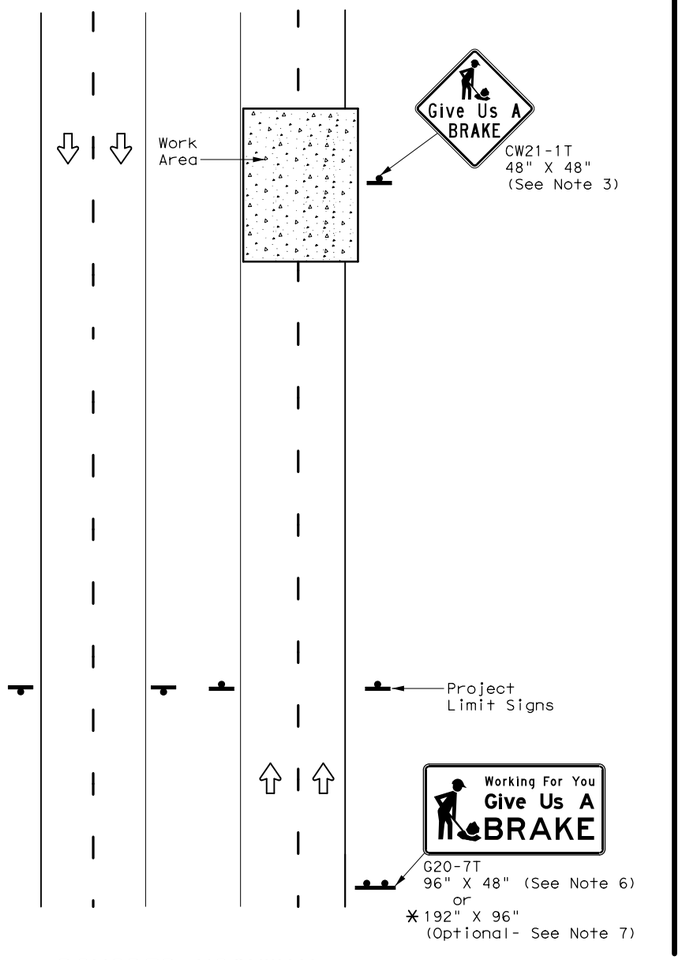
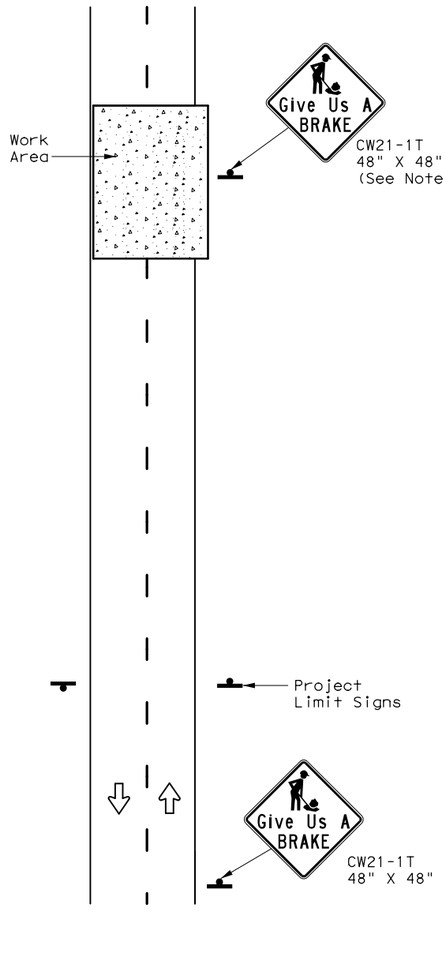


DIVIDED HIGHWAY



UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

DATE: 7/5/2023
FILE: wzbrk-13.dgn

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

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

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

GENERAL NOTES

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

Texas Department of Transportation

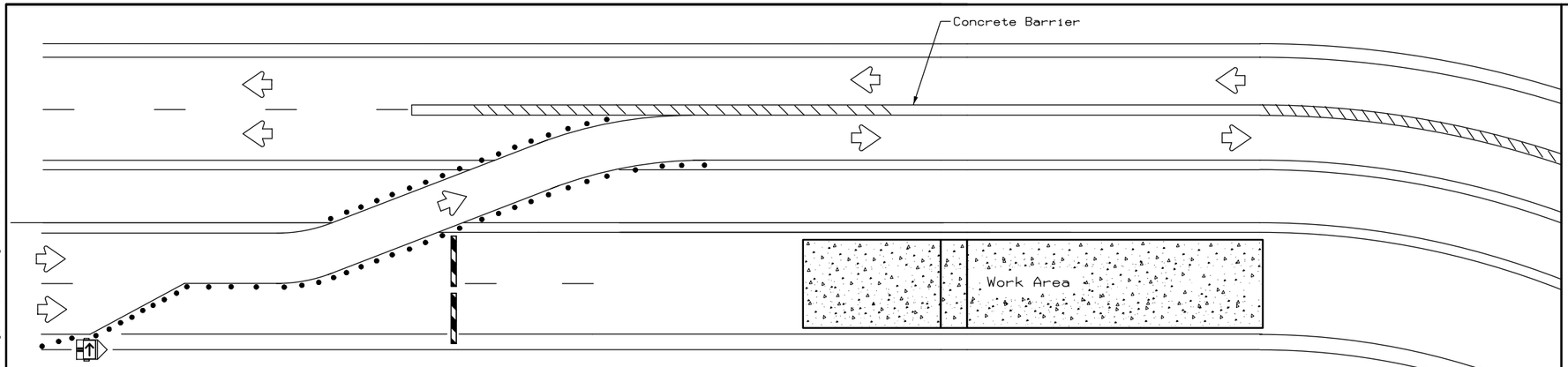
Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	BRY	WASHINGTON		46

116



NOTES:

1. Length of Safety Glare screen will be specified elsewhere in the plans.
2. The cumulative nominal length of the modular safety glare screen units shall equal the length of the individual sections of temporary concrete traffic barrier on which they are installed so the joint between barrier sections will not be spanned by any one safety glare screen unit.
3. Screen Panel/blades will be designed such that reflective sheeting conforming with Departmental Material Specification DMS-8300, Sign Face Materials, Type B or C Yellow, minimum size of 2 inches by 12 inches can be attached to the edge of the panel/blade. The sheeting shall be attached to one glare screen panel/blade per section of concrete barrier not to exceed a spacing of 30 feet. Barrier reflectors are not necessary when panel/blades are installed with reflective sheeting as described.
4. Payment for these devices will be under statewide Special Specification "Modular Glare Screens for Headlight Barrier."
5. This detail is only intended to show types of locations where Glare Screens would be appropriate. Required signing and other devices shall be as shown elsewhere in the plans.

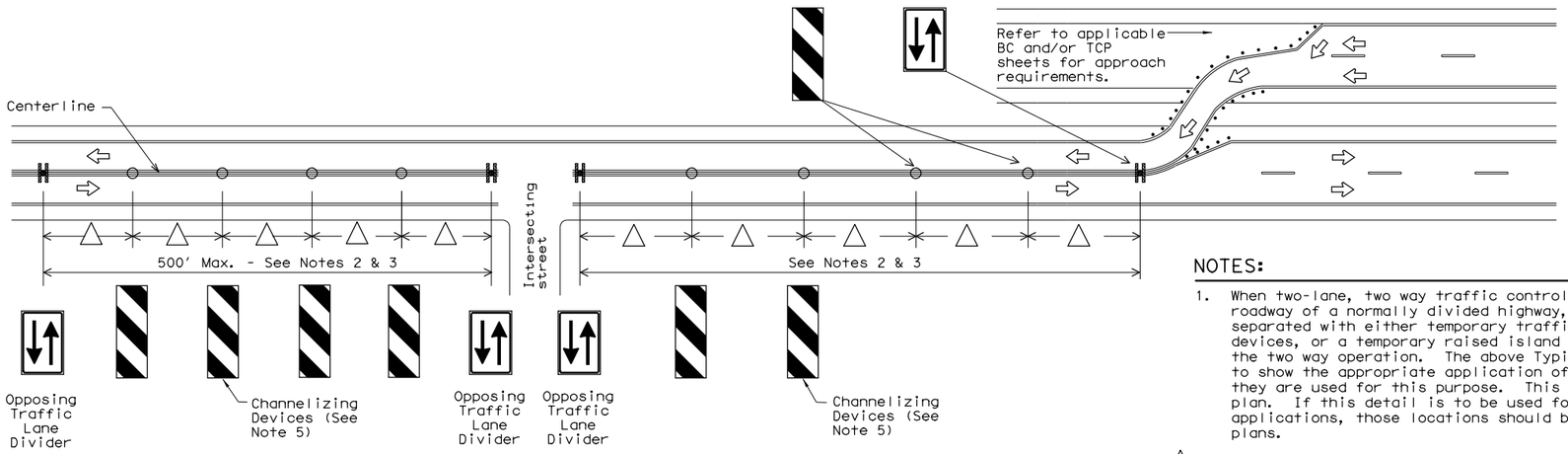
BARRIER DELINEATION WITH MODULAR GLARE SCREENS

LEGEND	
	Type 3 Barricade
• • •	Channelizing Devices
	Trailer Mounted Flashing Arrow Board
	Sign
\\\\	Safety glare screen

DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600
MODULAR GLARE SCREENS FOR HEADLIGHT BARRIER	DMS-8610

Only pre-qualified products shall be used. A copy of the Compliant Work Zone Traffic Control Devices List" CWZTCD)describes pre-qualified products and their sources and may be found at the following web address:

http://www.txdot.gov/business/resources/producer-list.html



VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS (OTLD) SEPARATING TWO-WAY TRAFFIC ON NORMALLY DIVIDED HIGHWAYS

NOTES:

1. When two-lane, two way traffic control must be maintained on one roadway of a normally divided highway, opposing traffic shall be separated with either temporary traffic barriers, channelizing devices, or a temporary raised island throughout the length of the two way operation. The above Typical Application is intended to show the appropriate application of channelizing devices when they are used for this purpose. This is not a traffic control plan. If this detail is to be used for other types of roads or applications, those locations should be stated elsewhere in the plans.

△2. Space devices according to the Tangent Spacing shown on the Device Spacing table on BC(9) but not exceeding 100′.

3. Every fifth device should be an OTLD except when spaced closer to accommodate an intersection. An OTLD should be the first device on each side of intersecting streets or roads.
4. Locations where surface mount bases with adhesives or self-righting devices will be required in order to maintain them in their proper position should be noted elsewhere in the plans.
5. Channelizing devices are to be vertical panels, 42" cones or tubular markers that are at least 36" tall. Tubular markers used to separate traffic should have a rubber base weighing at least 30 pounds. Tubular markers that are 42" tall or more shall have four bands of reflective material as detailed for 42" cones on BC(10). Tubular markers less than 42" but at least 36" tall shall have three bands of 3" wide white reflective material spaced 2" apart. Reflective material shall meet DMS-8300, Type A.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD)-17

FILE: wztd-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 4-98 2-17 3-03 7-13	0114	10	104	US290
	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		47

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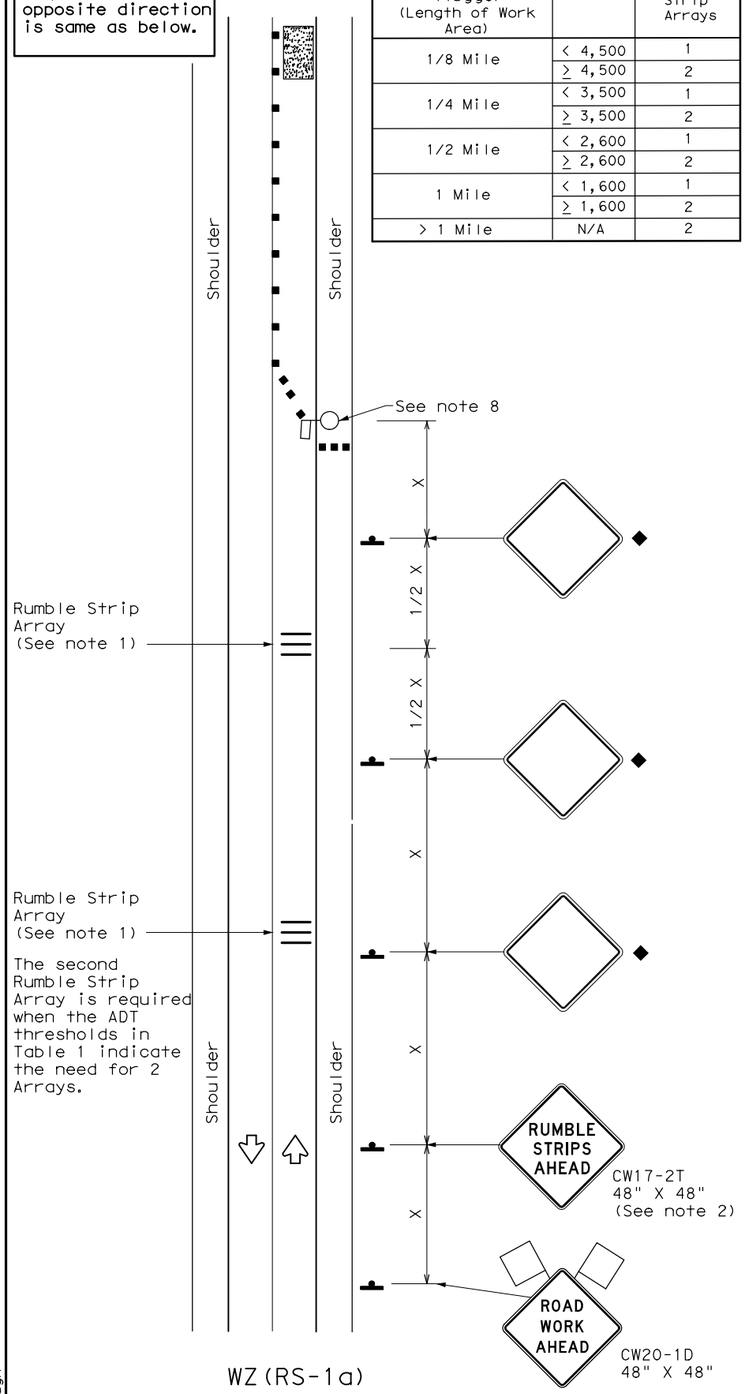
DATE: 7/5/2023
FILE: wztd-17.dgn

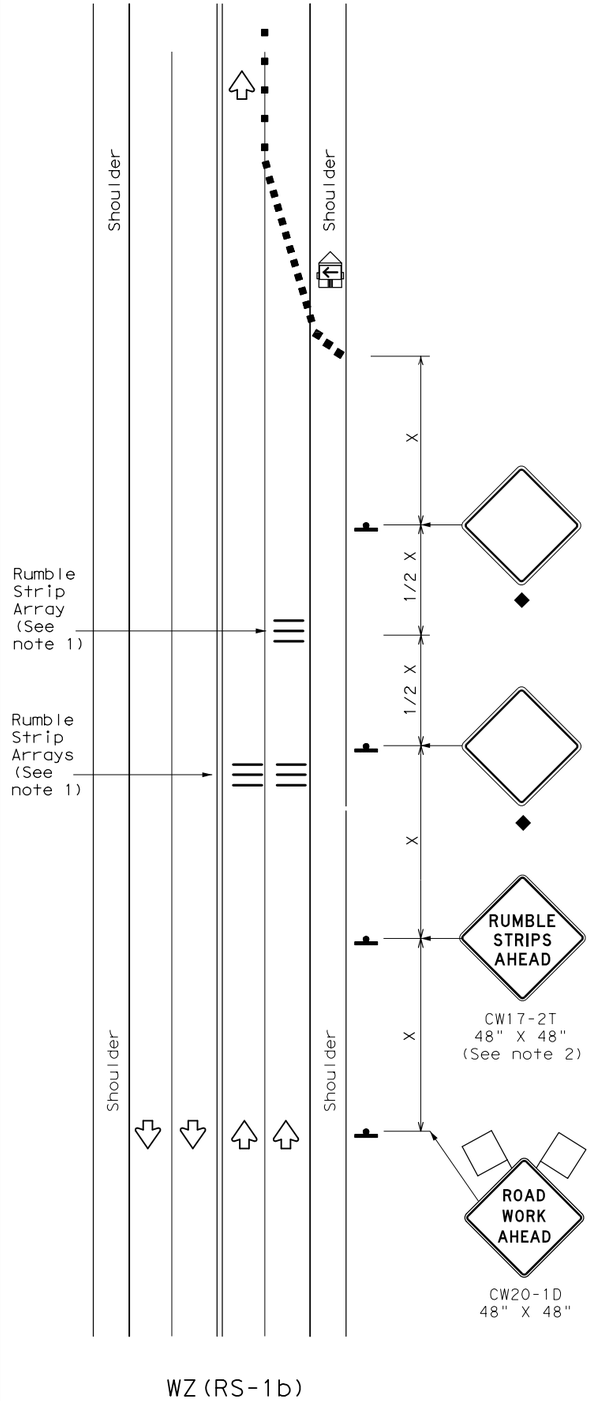
Warning sign and rumble strip sequence in opposite direction is same as below.

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



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

* Conventional Roads Only

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

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

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

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

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

Texas Department of Transportation — Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	0114	10	104	US290
	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		48

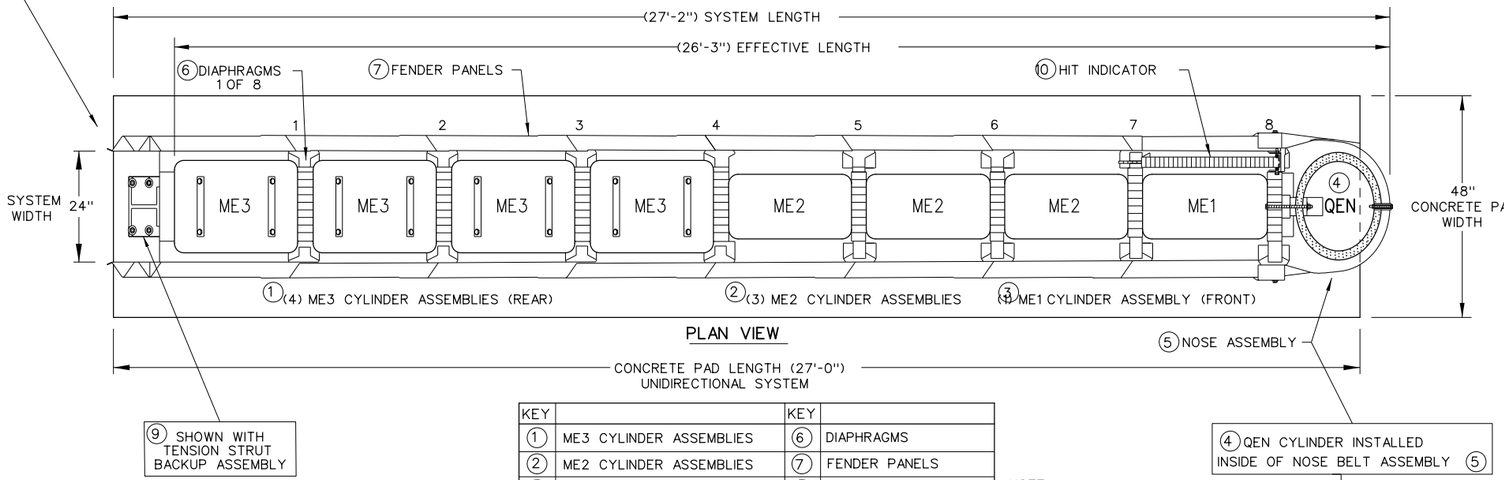
117

DATE: 7/5/2023
FILE: wzrs22.dgn

DATE: 7/5/2023
FILE: qgelitem10n20.dgn

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

QUADGUARD EITE M10 24" WIDE (8 BAY) SYSTEM

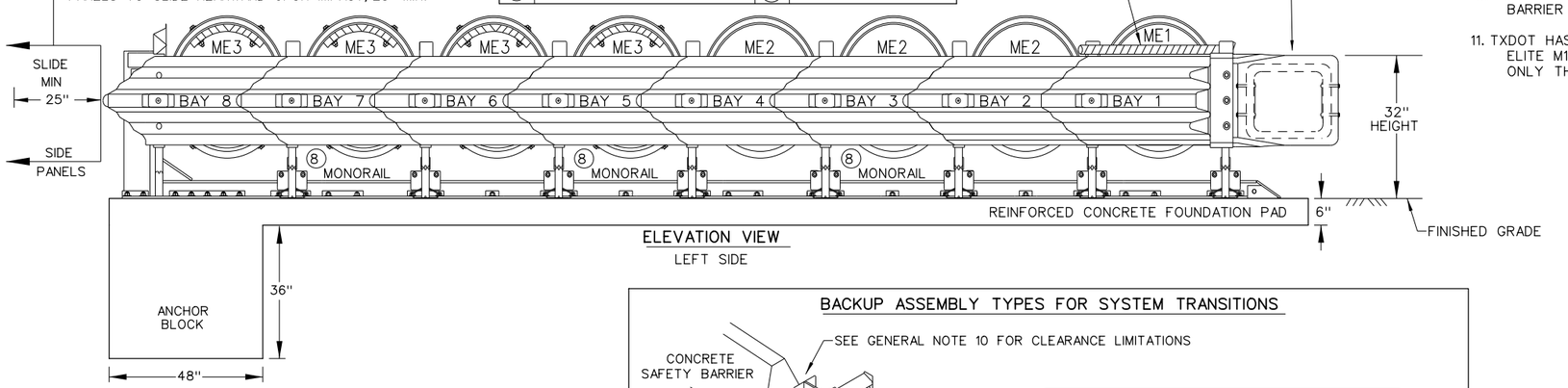


PLAN VIEW

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

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

NOTE:
HIT INDICATOR WILL RAISE UPON IMPACT.



ELEVATION VIEW
LEFT SIDE

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

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

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

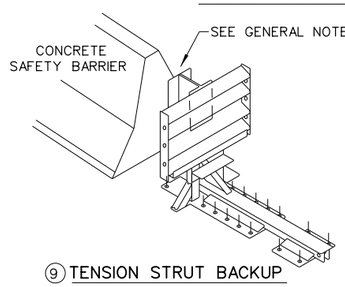
8" NON-REINFORCED CONCRETE PAD MAY NOT REQUIRE AN ANCHOR BLOCK, IF THE PAD IS INSTALLED AGAINST AN IMMOVABLE CONCRETE BACKUP.

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

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

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

BACKUP ASSEMBLY TYPES FOR SYSTEM TRANSITIONS

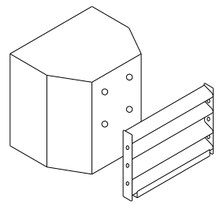


⑨ TENSION STRUT BACKUP

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

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

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



⑨ CONCRETE BACKUP

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

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

GENERAL NOTES

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

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

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

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

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

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

LOW MAINTENANCE

Texas Department of Transportation

Design Division Standard

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

QGELITE(M10)(N)-20

FILE: qgelitem10n20.dgn	DN: TxDOT	CK: KM	DW: VP	CK: AG
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
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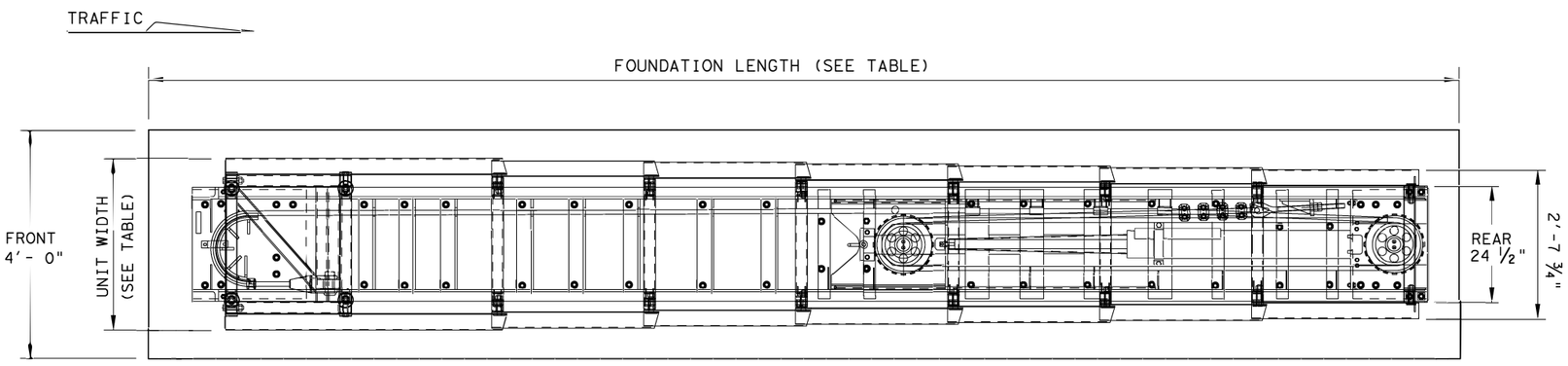
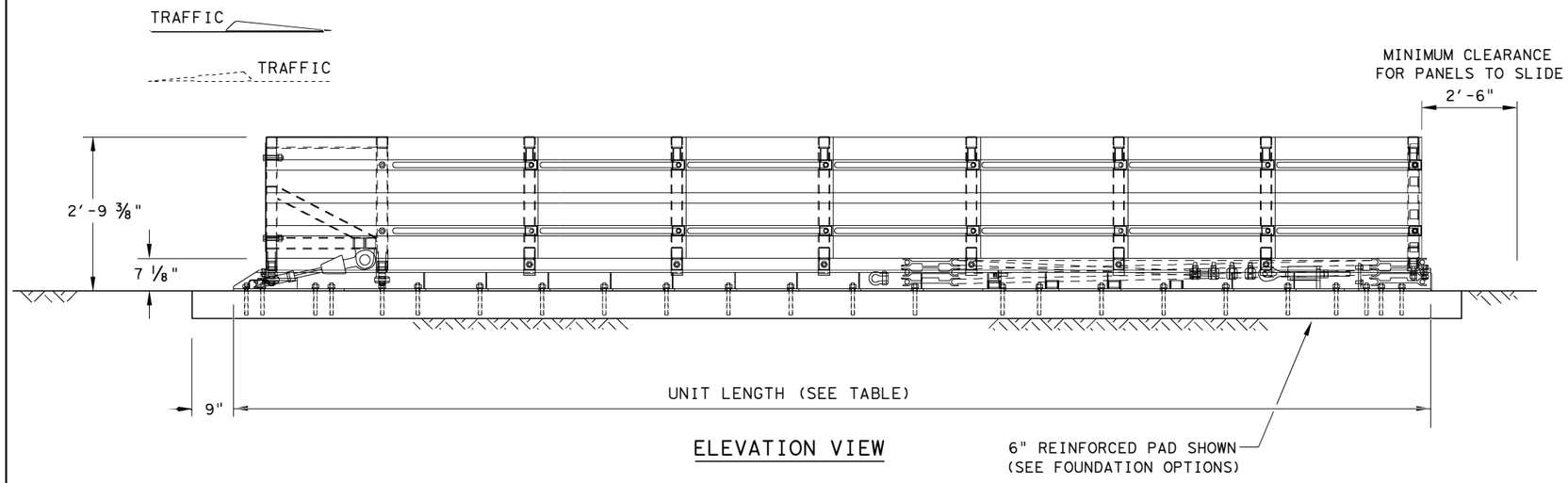
	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		49



PLAN VIEW



ELEVATION VIEW

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: WORK AREA PROTECTION, CORP. AT (800) 327-4417, OR (630) 377-9100.
2. FOR BI-DIRECTIONAL TRAFFIC, APPROPRIATE TRANSITION PANELS WILL BE REQUIRED.
3. ADDITIONAL DETAILS FOR THE TRANSITION OPTION AND FOUNDATION OPTION WILL BE SHOWN ON THE MANUFACTURER'S SHOP DRAWINGS FURNISHED TO THE ENGINEER.
4. CONCRETE SHALL BE CLASS "S" WITH A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.
5. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
6. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
7. THE SCI100GM & SCI70GM SYSTEMS SHOULD BE APPROXIMATELY PARALLEL WITH THE BARRIER OR CENTERLINE OF MERGING BARRIERS.

NOTE:
FOR ATTACHMENT AND TRANSITIONS TO OTHER SHAPES, BARRIERS, RAILINGS AND BI-DIRECTIONAL TRAFFIC FLOWS ARE AVAILABLE. (SEE MANUFACTURER'S PRODUCT MANUAL)

NOTE:
SIDE PANELS CAN TRAVEL 30" BEYOND THE LAST TERMINAL BRACE AT THE REAR OF THE CUSHION. ALL OBJECTS THAT MAY INTERFERE WITH THIS MOTION CAN AFFECT PERFORMANCE OF AND MAY CAUSE UNDUE DAMAGE TO THE CRASH CUSHION.

MODEL	TEST LEVEL	UNIT LENGTH (approx.)	UNIT WIDTH	FOUNDATION LENGTH	OBSTACLE WIDTH
SCI70GM	TL-2	13′-6"	2′-10 ⅝"	15′- 6 ¼"	24"to 36"
SCI100GM	TL-3	21′-6"	3′-1 ½"	23′- 0"	24"to 36"

SYSTEM AND PAD LENGTHS VARY DEPENDING ON BACKUP TYPE.

FOUNDATION OPTIONS
6" REINFORCED CONCRETE (5 ½" ANCHOR EMBEDMENT)
8" UNREINFORCED CONCRETE (5 ½" ANCHOR EMBEDMENT)
3" MIN. ASPHALT OVER 3" MIN. CONCRETE (16 ½" ANCHOR EMBED.)
6" ASPHALT OVER 6" COMPACT SUBBASE (16 ½" ANCHOR EMBED.)
8" MINIMUM ASPHALT (16 ½" ANCHOR EMBEDMENT)

FOR STEEL PLACEMENT IN CONCRETE FOUNDATIONS, SEE MANUFACTURER'S PRODUCT MANUAL.

TRANSITION OPTIONS
CONCRETE VERTICAL WALL
CONCRETE TRAFFIC BARRIERS
GUARDRAIL (W-BEAM)
GUARDRAIL (THRIE-BEAM)

TRANSITION TYPES ARE SHOWN ELSEWHERE ON THE PLANS (I.E. ATTENUATOR LOCATION DETAILS OR IN THE GENERAL NOTES).

FOR BI-DIRECTIONAL TRANSITION PANEL AND END SHOE DETAILS, SEE MANUFACTURER'S PRODUCT MANUAL.

LOW MAINTENANCE

Texas Department of Transportation

Design Division Standard

WORK AREA PROTECTION CORP (SMART-NARROW)

SMTC(N)-16

FILE: smtcn16.dgn	DN: TxDOT	CK: KM	DW: VP	CK: VP
©TxDOT: February 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED 06, 2013 (VP) REVISED 03, 2016 (VP)	0114	10	104	US290
	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		49A

DATE: 7/25/2023
FILE: smtcn16.dgn

CK: JMT
DW: JMT
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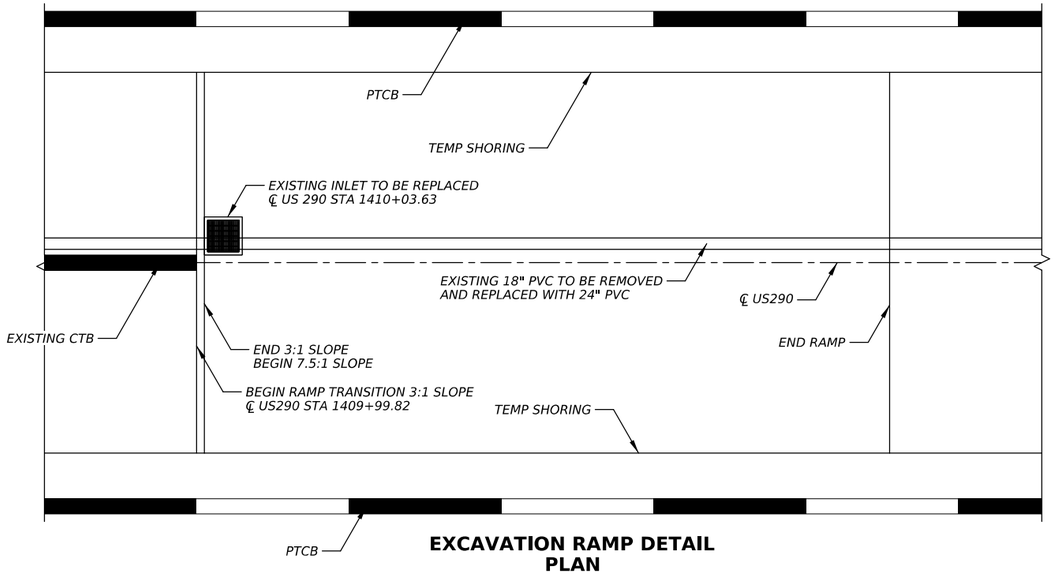
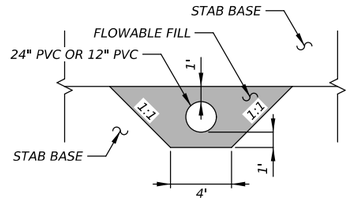
DW: JMT



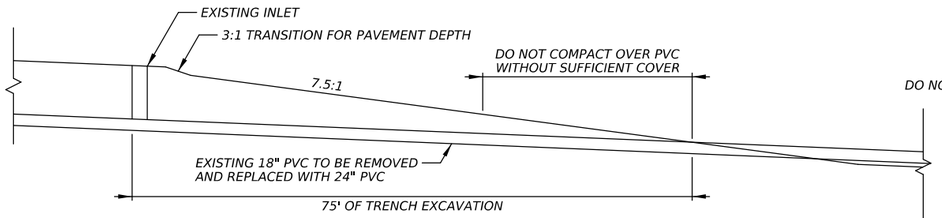
EXCAVATION RAMP DETAIL
PLAN



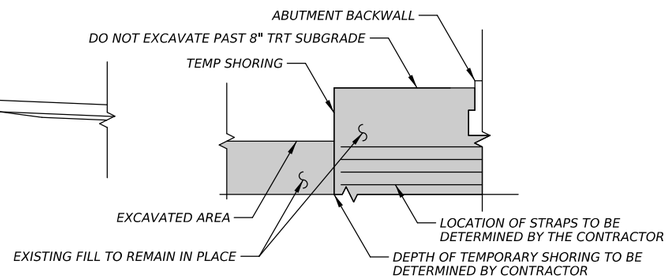
PVC INSTALLATION DETAIL
CROSS SECTION

NOTES:

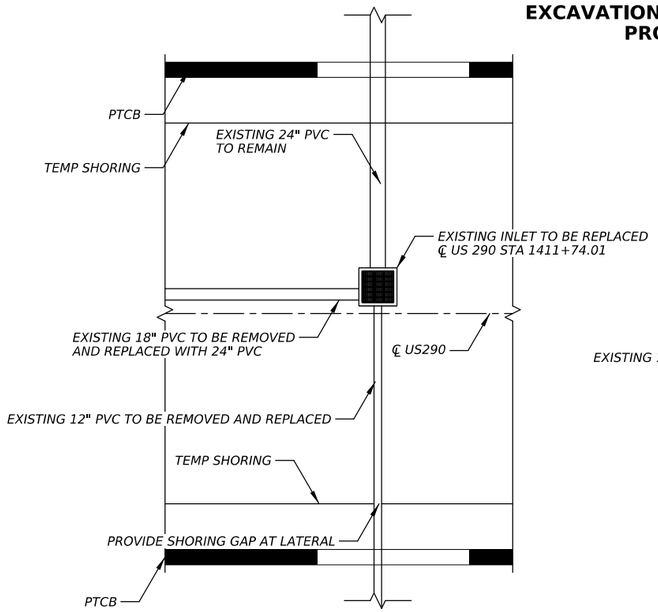
1. *CONTRACTOR TO SECURE PVC PIPE AGAINST BOUYANT FORCES PRIOR TO PLACEMENT OF FLOWABLE FILL.*



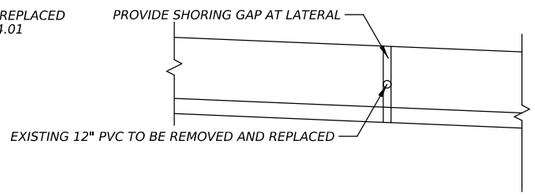
EXCAVATION RAMP DETAIL
PROFILE



CROSS SECTION
PERPENDICULAR TO CHAIN
AT APPROACH SLAB



LATERAL REPLACEMENT
PLAN



LATERAL REPLACEMENT DETAIL
PROFILE

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

TBPE REGISTRATION NO.: F-16341

US 290
MISC DETAILS

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		50

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_MISC_TCP_DET.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_MISC_TCP_DET02.dgn

NOTES:

1. TEMPORARY SHORING PROFILES ARE FOR INFORMATION ONLY. CONTRACTOR TO DESIGN THE TEMPORARY SHORING AND SUBMIT SEALED PLANS TO THE ENGINEER FOR APPROVAL.

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

TBPE REGISTRATION NO. F-16341

Texas Department of Transportation

US 290
MISC DETAILS

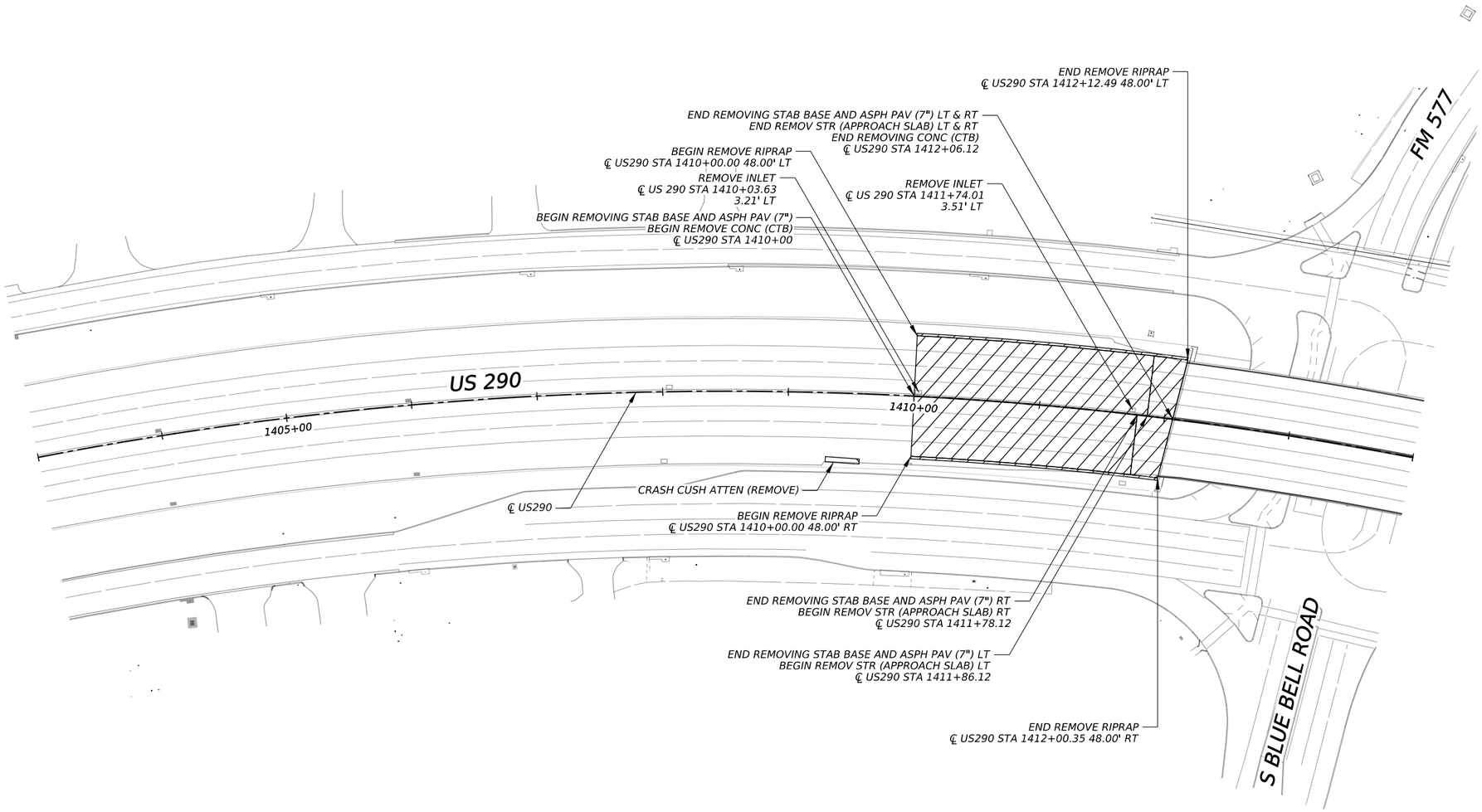
SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		51

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES

BID CODE	DESCRIPTION	UNIT	QUANTITY
104 6023	REMOVING CONC (CTB)	LF	207
104 6009	REMOVING CONC (RIPRAP)	SY	93
105 6018	REMOVING STAB BASE AND ASPH PAV (7")	SY	2,297
400 6001	STRUCT EXCAV	CY	1,841
496 6025	REMOV STR (APPROACH SLAB)	EA	2
496 6002	REMOV STR (INLET)	EA	2
496 6007	REMOV STR (PIPE)	LF	197
545 6005	CRASH CUSH ATTEN (REMOVE)	EA	1



LEGEND:

REMOVAL AREA

NOTES:

1. STATIONS AND OFFSETS ARE MEASURED FROM CENTERLINE OF ROADWAY UNLESS NOTED OTHERWISE.

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO.: F-16341

US 290
REMOVAL LAYOUT

STA 1403+00 TO STA 1414+00

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		52

DATE: 7/5/2023
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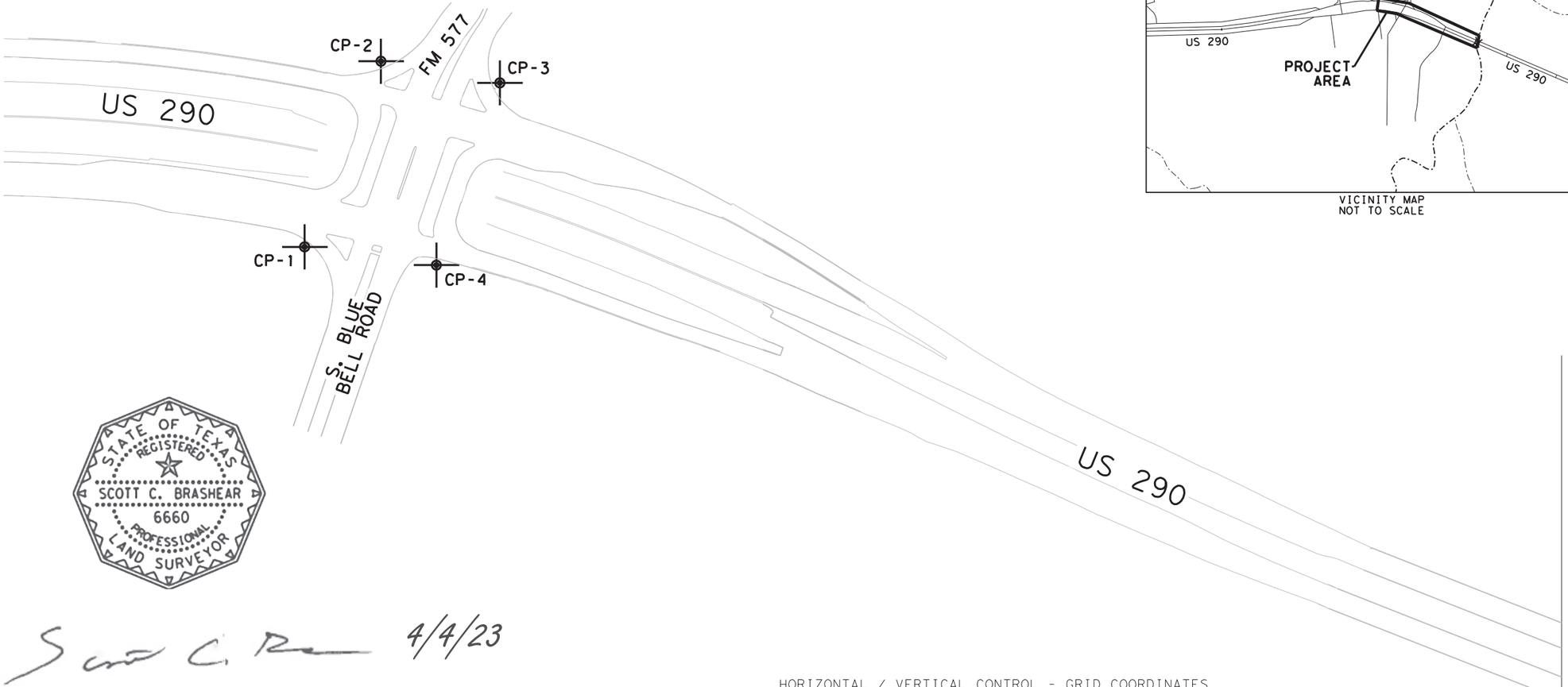
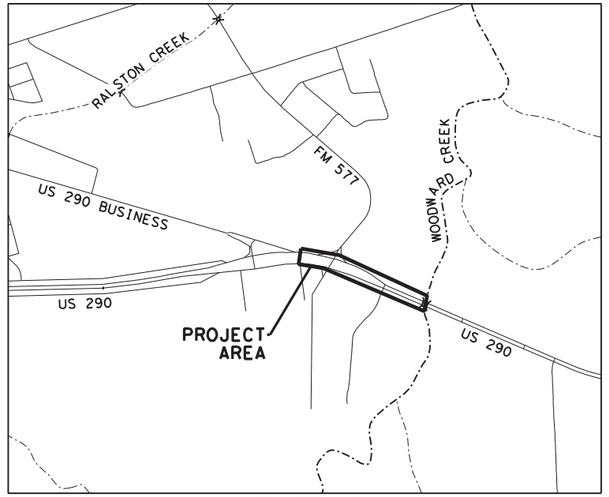
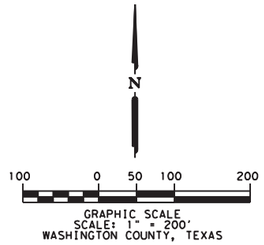




VICINITY MAP
NOT TO SCALE



GRAPHIC SCALE
SCALE: 1" = 200'
WASHINGTON COUNTY, TEXAS

STATE OF TEXAS
REGISTERED
SCOTT C. BRASHEAR
6660
PROFESSIONAL
LAND SURVEYOR

4/4/23

HORIZONTAL / VERTICAL CONTROL - GRID COORDINATES

PNT	NORTHING	EASTING	ELEV.	DESCRIPTION
CP-1	10,038,079.22	3,550,901.08	293.55′	5/8" IR W/PLASTIC SAM CAP SET IN CONCRETE
CP-2	10,038,387.85	3,551,027.91	287.79′	5/8" IR W/PLASTIC SAM CAP SET IN CONCRETE
CP-3	10,038,351.89	3,551,225.47	284.26′	5/8" IR W/PLASTIC SAM CAP SET IN CONCRETE
CP-4	10,038,049.03	3,551,120.08	291.10′	5/8" IR W/PLASTIC SAM CAP SET IN CONCRETE
HV-02	10,036,432.36	3,555,203.59	294.33′	5/8" IR
HV-03	10,036,870.81	3,554,188.65	300.99′	BRASS CAP STAMPED "HV-3"
HV-04	10,037,274.92	3,553,283.94	272.79′	5/8" IR W/ALUMINUM CAP STAMPED "HV-4"

HORIZONTAL / VERTICAL CONTROL - SURFACE COORDINATES

PNT	NORTHING	EASTING	ELEV.	DESCRIPTION
CP-1	10,038,306.54	3,550,981.49	293.55′	5/8" IR W/PLASTIC SAM CAP SET IN CONCRETE
CP-2	10,038,615.17	3,551,108.33	287.79′	5/8" IR W/PLASTIC SAM CAP SET IN CONCRETE
CP-3	10,038,579.21	3,551,305.89	284.26′	5/8" IR W/PLASTIC SAM CAP SET IN CONCRETE
CP-4	10,038,276.34	3,551,200.50	291.10′	5/8" IR W/PLASTIC SAM CAP SET IN CONCRETE
HV-02	10,036,659.64	3,555,284.10	294.33′	5/8" IR
HV-03	10,037,098.10	3,554,269.14	300.99′	BRASS CAP STAMPED "HV-3"
HV-04	10,037,502.22	3,553,364.40	272.79′	5/8" IR W/ALUMINUM CAP STAMPED "HV-4"

NOTES:

1. ALL PROJECT COORDINATES ARE BASED ON THE TEXAS COORDINATE SYSTEM, TEXAS CENTRAL ZONE (4203, NAD 83 (2011) / NAVD 88. ALL DISTANCES SHOWN HEREON ARE SURFACE. SURFACE COORDINATES MAY BE CONVERTED TO GRID BY DIVIDING BY A LOCAL SURFACE ADJUSTMENT FACTOR OF 1.000022645512808.
UNITS: U.S. SURVEY FEET

2. CONTROL 1 THROUGH 4 WAS ESTABLISHED USING STATIC AND GPS OBSERVATIONS PROCESSED TO CORS STATIONS TXBS, TXBX, TXCM AND TXHE. COORDINATES FOR EXISTING CONTROL POINTS HV-02, HV-03, HV-04 AS PROVIDED BY OTHERS WERE VERIFIED AND HELD.

3. A CALIBRATION SHOULD BE PERFORMED WHEN USING THE CONTROL SHOWN HEREON.

MATCH SHEET 2 OF 4

Survey Date: FEBRUARY, 2023

SAM
4801 Southwest Parkway
Building Two, Suite 100
Austin, Texas 78735
(512) 447-0575
Fax: (512) 326-3029
Texas Firm Registration No. 10064300

Texas Department of Transportation

CONTROL LAYOUT SHEET

FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
			53
STATE	DISTRICT	COUNTY	
TEXAS	BRY	WASHINGTON	
CONTROL	SECTION	JOB	HIGHWAY NO.
0114	10	104	US 290

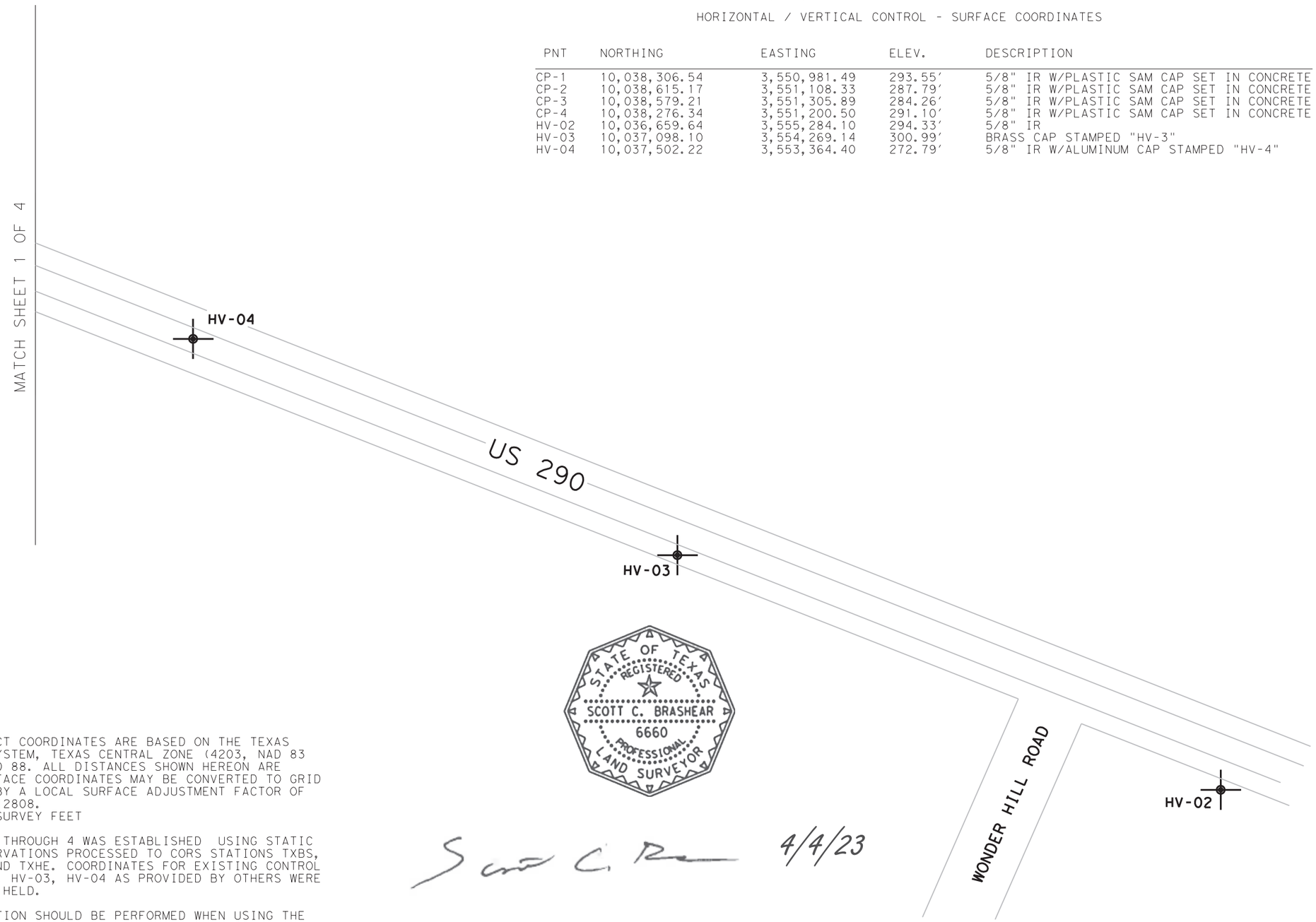
FILE#FILE#

HORIZONTAL / VERTICAL CONTROL - GRID COORDINATES

PNT	NORTHING	EASTING	ELEV.	DESCRIPTION
CP-1	10,038,079.22	3,550,901.08	293.55′	5/8" IR W/PLASTIC SAM CAP SET IN CONCRETE
CP-2	10,038,387.85	3,551,027.91	287.79′	5/8" IR W/PLASTIC SAM CAP SET IN CONCRETE
CP-3	10,038,351.89	3,551,225.47	284.26′	5/8" IR W/PLASTIC SAM CAP SET IN CONCRETE
CP-4	10,038,049.03	3,551,120.08	291.10′	5/8" IR W/PLASTIC SAM CAP SET IN CONCRETE
HV-02	10,036,432.36	3,555,203.59	294.33′	5/8" IR
HV-03	10,036,870.81	3,554,188.65	300.99′	BRASS CAP STAMPED "HV-3"
HV-04	10,037,274.92	3,553,283.94	272.79′	5/8" IR W/ALUMINUM CAP STAMPED "HV-4"

HORIZONTAL / VERTICAL CONTROL - SURFACE COORDINATES

PNT	NORTHING	EASTING	ELEV.	DESCRIPTION
CP-1	10,038,306.54	3,550,981.49	293.55′	5/8" IR W/PLASTIC SAM CAP SET IN CONCRETE
CP-2	10,038,615.17	3,551,108.33	287.79′	5/8" IR W/PLASTIC SAM CAP SET IN CONCRETE
CP-3	10,038,579.21	3,551,305.89	284.26′	5/8" IR W/PLASTIC SAM CAP SET IN CONCRETE
CP-4	10,038,276.34	3,551,200.50	291.10′	5/8" IR W/PLASTIC SAM CAP SET IN CONCRETE
HV-02	10,036,659.64	3,555,284.10	294.33′	5/8" IR
HV-03	10,037,098.10	3,554,269.14	300.99′	BRASS CAP STAMPED "HV-3"
HV-04	10,037,502.22	3,553,364.40	272.79′	5/8" IR W/ALUMINUM CAP STAMPED "HV-4"



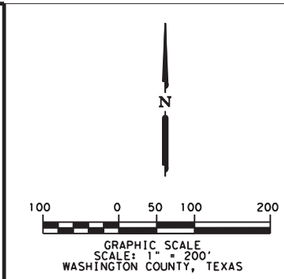
Scott C. Brashear 4/4/23

NOTES:

1. ALL PROJECT COORDINATES ARE BASED ON THE TEXAS COORDINATE SYSTEM, TEXAS CENTRAL ZONE (4203, NAD 83 (2011) / NAVD 88. ALL DISTANCES SHOWN HEREON ARE SURFACE. SURFACE COORDINATES MAY BE CONVERTED TO GRID BY DIVIDING BY A LOCAL SURFACE ADJUSTMENT FACTOR OF 1.000022645512808.
UNITS: U.S. SURVEY FEET

2. CONTROL 1 THROUGH 4 WAS ESTABLISHED USING STATIC AND GPS OBSERVATIONS PROCESSED TO CORS STATIONS TXBS, TXBX, TXCM AND TXHE. COORDINATES FOR EXISTING CONTROL POINTS HV-02, HV-03, HV-04 AS PROVIDED BY OTHERS WERE VERIFIED AND HELD.

3. A CALIBRATION SHOULD BE PERFORMED WHEN USING THE CONTROL SHOWN HEREON.



Survey Date: FEBRUARY, 2023

SAM
4801 Southwest Parkway
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Austin, Texas 78735
(512) 447-0575
Fax: (512) 326-3029
Texas Firm Registration No. 10064300

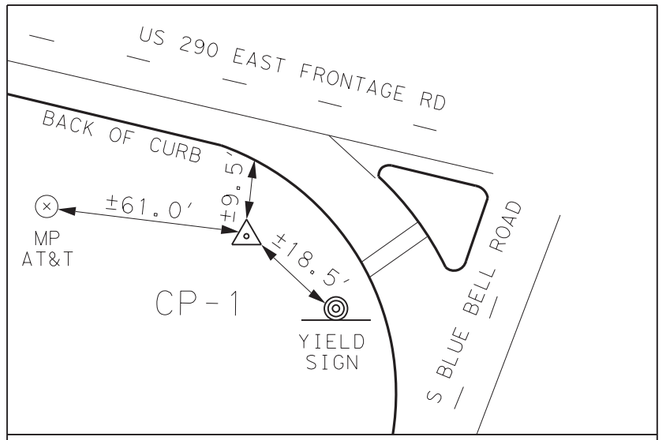
Texas Department of Transportation

CONTROL LAYOUT SHEET

FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
			54

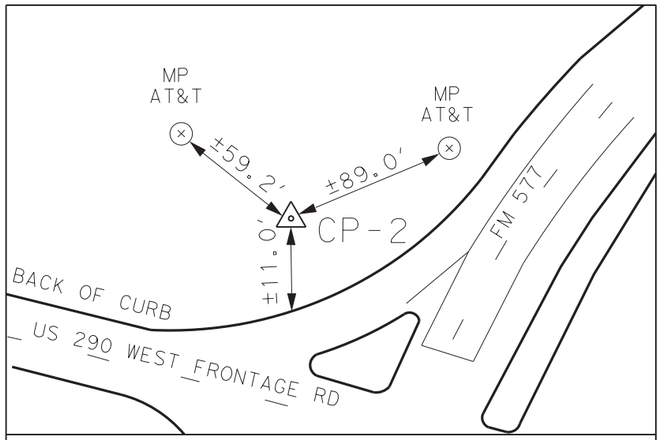
STATE	DISTRICT	COUNTY	
TEXAS	BRY	WASHINGTON	
CONTROL	SECTION	JOB	HIGHWAY NO.
0114	10	104	US 290

FILE=#FILE#



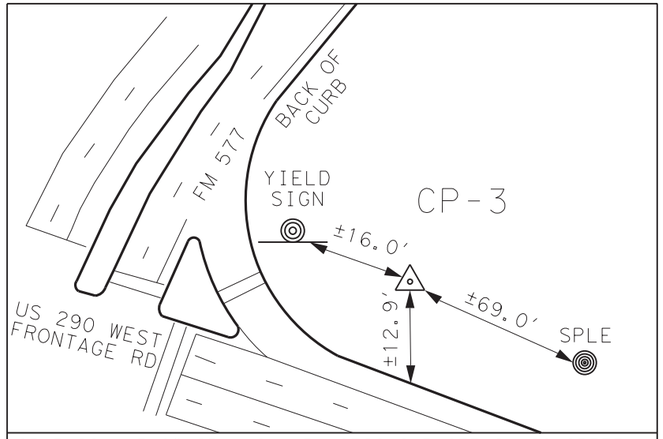
CP-1 IS A 5/8" IR W/SAM PLASTIC CAP SET IN CONCRETE LOCATED AT THE SOUTHWEST CORNER OF THE US 290 EAST FRONTAGE ROAD AND SOUTH BLUE BELL ROAD INTERSECTION IN THE SOUTH RIGHT-OF-WAY OF US 290 EAST ±9.5 FEET SOUTH OF THE BACK OF CURB, ±61.0 FEET EAST OF AN AT&T MARKER POST, AND ±18.5 FEET NORTHWEST OF A YIELD SIGN.

SURFACE COORDINATES	GRID COORDINATES
N = 10,038,306.54	N = 10,038,079.22
E = 3,550,981.49	E = 3,550,901.08
ELEV. = 293.55'	ELEV = 293.55'



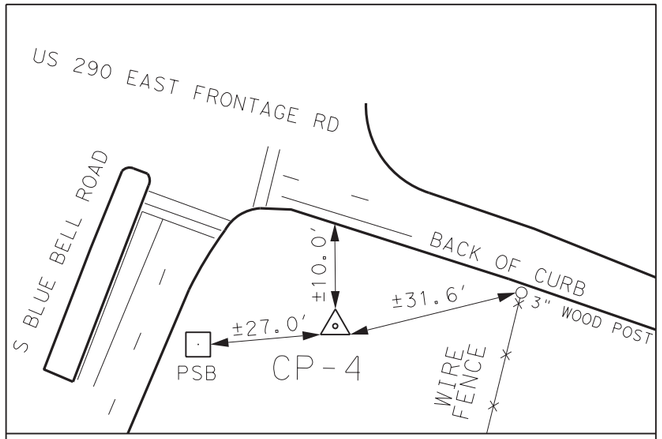
CP-2 IS A 5/8" IR W/SAM PLASTIC CAP SET IN CONCRETE LOCATED AT THE NORTHWEST CORNER OF THE US 290 WEST FRONTAGE ROAD AND FM 577 INTERSECTION IN THE NORTH RIGHT-OF-WAY OF US 290 WEST, ±11.0 FEET NORTH OF THE BACK OF CURB, ±59.2 FEET SOUTHEAST OF AN AT&T MARKER POST, AND ±89.0 FEET SOUTHWEST OF AN AT&T MARKER POST.

SURFACE COORDINATES	GRID COORDINATES
N = 10,038,615.17	N = 10,038,387.85
E = 3,551,108.33	E = 3,551,027.91
ELEV. = 287.79'	ELEV = 287.79'



CP-3 IS A 5/8" IR W/SAM PLASTIC CAP SET IN CONCRETE LOCATED AT THE NORTHEAST CORNER OF THE US 290 WEST FRONTAGE ROAD AND FM 577 INTERSECTION IN THE NORTH RIGHT-OF-WAY OF US 290 WEST, ±12.9 FEET NORTH OF THE BACK OF CURB, ±16.0 FEET SOUTHEAST OF A YIELD SIGN, AND ±69.0 FEET NORTHWEST OF AN ELECTRIC SERVICE POLE.

SURFACE COORDINATES	GRID COORDINATES
N = 10,038,579.21	N = 10,038,351.89
E = 3,551,305.89	E = 3,551,225.47
ELEV = 284.26'	ELEV = 284.26'



CP-4 IS A 5/8" IR W/SAM PLASTIC CAP SET IN CONCRETE LOCATED AT THE SOUTHEAST CORNER OF THE US 290 EAST FRONTAGE ROAD AND SOUTH BLUE BELL ROAD INTERSECTION IN THE SOUTH RIGHT-OF-WAY OF US 290 EAST ±10.0 FEET SOUTH OF THE BACK OF CURB, ±27.0 FEET EAST OF AN PEDESTRIAN SIGNAL BOX, AND ±31.6 FEET SOUTHWEST OF A 3" WOODEN POST.

SURFACE COORDINATES	GRID COORDINATES
N = 10,038,276.34	N = 10,038,049.03
E = 3,551,200.50	E = 3,551,120.08
ELEV = 291.10'	ELEV = 291.10'

NOTES:

1. ALL PROJECT COORDINATES ARE BASED ON THE TEXAS COORDINATE SYSTEM, TEXAS CENTRAL ZONE (4203, NAD 83 (2011) / NAVD 88. ALL DISTANCES SHOWN HEREON ARE SURFACE. SURFACE COORDINATES MAY BE CONVERTED TO GRID BY DIVIDING BY A LOCAL SURFACE ADJUSTMENT FACTOR OF 1.000022645512808.
UNITS: U.S. SURVEY FEET

2. CONTROL 1 THROUGH 4 WAS ESTABLISHED USING STATIC AND GPS OBSERVATIONS PROCESSED TO CORS STATIONS TXBS, TXBX, TXCM AND TXHE. COORDINATES FOR EXISTING CONTROL POINTS HV-02, HV-03, HV-04 AS PROVIDED BY OTHERS WERE VERIFIED AND HELD.

3. A CALIBRATION SHOULD BE PERFORMED WHEN USING THE CONTROL SHOWN HEREON.

FILE:#FILE#

NOT TO SCALE

Scott C. Brashear 4/4/23

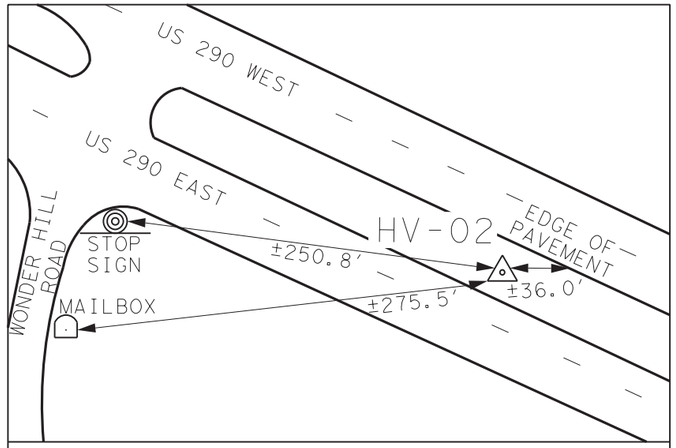
Survey Date: FEBRUARY, 2023

SAM
4801 Southwest Parkway
Building Two, Suite 100
Austin, Texas 78735
(512) 447-0575
Fax: (512) 326-3029
Texas Firm Registration No. 10064300

Texas Department of Transportation

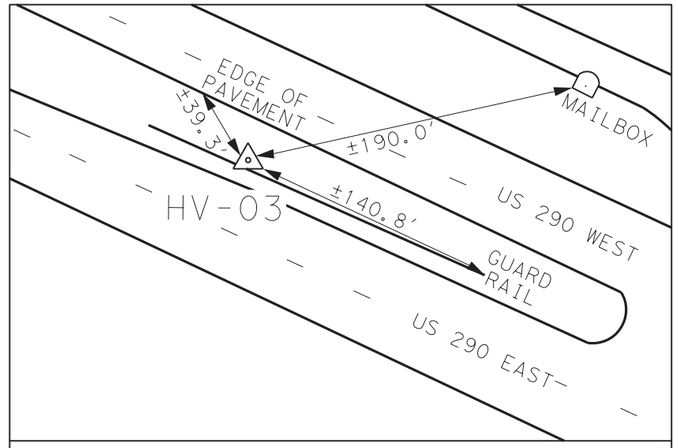
CONTROL INDEX SHEET

FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
			55
STATE	DISTRICT	COUNTY	
TEXAS	BRY	WASHINGTON	
CONTROL	SECTION	JOB	HIGHWAY NO.
0114	10	104	US 290



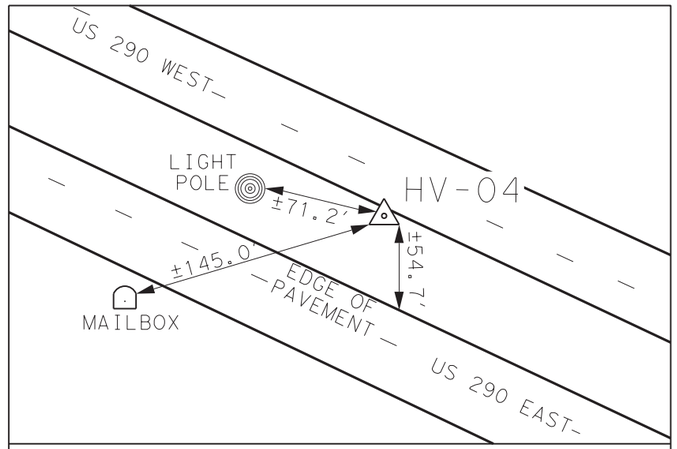
HV-02 IS A 5/8" IR LOCATED IN THE MEDIAN OF US 290, 270 FEET EAST OF THE INTERSECTION OF WONDER HILL ROAD AND US 290 EAST, ±36.0 FEET WEST OF THE EDGE OF PAVEMENT, ±250.8 FEET EAST OF A STOP SIGN, AND ±275.5 FEET NORTHEAST OF A MAILBOX.

SURFACE COORDINATES	GRID COORDINATES
N = 10,036,659.64	N = 10,036,432.36
E = 3,555,284.10	E = 3,555,203.59
ELEV = 294.33'	ELEV = 294.33'



HV-03 IS A BRASS CAP STAMPED "HV-3" LOCATED IN THE MEDIAN OF US 290, 840 FEET WEST OF THE INTERSECTION OF WONDER HILL ROAD AND US 290, ±39.3 FEET SOUTHEAST OF THE EDGE OF PAVEMENT, ±190.0 FEET SOUTHWEST OF A MAILBOX, AND ±140.8 FEET NORTHWEST OF THE END OF THE GUARD RAIL.

SURFACE COORDINATES	GRID COORDINATES
N = 10,037,098.10	N = 10,036,870.81
E = 3,554,269.14	E = 3,554,188.65
ELEV = 300.99'	ELEV = 300.99'



HV-04 IS A 5/8" IR W/ALUMINUM CAP STAMPED "HV-4" LOCATED IN THE MEDIAN OF US 290, 1,830 FEET WEST OF THE INTERSECTION OF WONDER HILL ROAD AND US 290, ±54.7 FEET NORTH OF THE EDGE OF PAVEMENT, ±71.2 FEET EAST OF A LIGHT POLE, AND ±145.0 FEET NORTHEAST OF A MAILBOX.

SURFACE COORDINATES	GRID COORDINATES
N = 10,037,502.22	N = 10,037,274.92
E = 3,553,364.40	E = 3,553,283.94
ELEV = 272.79'	ELEV = 272.79'

NOTES:

1. ALL PROJECT COORDINATES ARE BASED ON THE TEXAS COORDINATE SYSTEM, TEXAS CENTRAL ZONE (4203, NAD 83 (2011) / NAVD 88. ALL DISTANCES SHOWN HEREON ARE SURFACE. SURFACE COORDINATES MAY BE CONVERTED TO GRID BY DIVIDING BY A LOCAL SURFACE ADJUSTMENT FACTOR OF 1.000022645512808.
UNITS: U.S. SURVEY FEET

2. CONTROL 1 THROUGH 4 WAS ESTABLISHED USING STATIC AND GPS OBSERVATIONS PROCESSED TO CORS STATIONS TXBS, TXBX, TXCM AND TXHE. COORDINATES FOR EXISTING CONTROL POINTS HV-02, HV-03, HV-04 AS PROVIDED BY OTHERS WERE VERIFIED AND HELD.

3. A CALIBRATION SHOULD BE PERFORMED WHEN USING THE CONTROL SHOWN HEREON.

STATE OF TEXAS
REGISTERED
SCOTT C. BRASHEAR
6660
PROFESSIONAL
LAND SURVEYOR

Scott C. Brashear 4/4/23

N

NOT TO SCALE

Survey Date: FEBRUARY, 2023

SAM
4801 Southwest Parkway
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Austin, Texas 78735
(512) 447-0575
Fax: (512) 326-3029
Texas Firm Registration No. 10064300

Texas Department of Transportation

CONTROL INDEX SHEET

FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
			56
STATE	DISTRICT	COUNTY	
TEXAS	BRY	WASHINGTON	
CONTROL	SECTION	JOB	HIGHWAY NO.
0114	10	104	US 290

FILE#FILE#

CK: JMT
DW: JMT
CK: JMT
DW: JMT

* Alignment name: US290-CL
* Alignment description:
* Alignment style: Linear\Existing\Geometry\E_Road_Centerline
*

	STATION	NORTHING	EASTING
			Element: Linear
POT	1181+09.850 R1	10046087.002	3531852.927
PC	1202+18.215 R1	10044046.544	3532383.716
		Tangential Direction:	S14.581°E
		Tangential Length:	2108.365
			Element: Circular
PC	1202+18.215 R1	10044046.544	3532383.716
PI	1209+32.276 R1	10043355.482	3532563.483
	CC	10044771.595	3535170.955
PT	1216+18.108 R1	10042828.442	3533045.265
		Radius:	2880.000
		Delta:	27.850° Left
		Degree of Curvature(Arc):	1.989°
		Length:	1399.894
		Tangent:	714.062
		Chord:	1386.153
		Middle Ordinate:	84.639
		External:	87.201
		Tangent Direction:	S14.581°E
		Radial Direction:	S75.419°W
		Chord Direction:	S28.506°E
		Radial Direction:	S47.569°W
		Tangent Direction:	S42.431°E
			Element: Linear
PT	1216+18.108 R1	10042828.442	3533045.265
PC	1225+49.777 R1	10042140.790	3533673.867
		Tangential Direction:	S42.431°E
		Tangential Length:	931.669
			Element: Circular
PC	1225+49.777 R1	10042140.790	3533673.867
PI	1233+33.014 R1	10041562.693	3534202.322
	CC	10046006.570	3537902.793
PT	1241+06.601 R1	10041147.636	3534866.541
		Radius:	5729.578
		Delta:	15.568° Left
		Degree of Curvature(Arc):	1.000°
		Length:	1556.824
		Tangent:	783.237
		Chord:	1552.039
		Middle Ordinate:	52.796
		External:	53.287
		Tangent Direction:	S42.431°E
		Radial Direction:	S47.569°W
		Chord Direction:	S50.215°E
		Radial Direction:	S32.000°W
		Tangent Direction:	S58.000°E
			Element: Linear
PT	1241+06.601 R1	10041147.636	3534866.541
PC	1296+95.997 R1	10038185.670	3539606.594
		Tangential Direction:	S58.000°E
		Tangential Length:	5589.396
			Element: Circular
PC	1296+95.997 R1	10038185.670	3539606.594
PI	1303+89.573 R1	10037818.126	3540194.777
	CC	10040129.244	3540821.095
PT	1310+42.987 R1	10037838.391	3540888.058
		Radius:	2291.831
		Delta:	33.675° Left
		Degree of Curvature(Arc):	2.500°
		Length:	1346.990
		Tangent:	693.576
		Chord:	1327.686
		Middle Ordinate:	98.249
		External:	102.650
		Tangent Direction:	S58.000°E
		Radial Direction:	S32.000°W
		Chord Direction:	S74.837°E
		Radial Direction:	S1.674°E
		Tangent Direction:	N88.326°E
			Element: Linear
PT	1310+42.987 R1	10037838.391	3540888.058
PC	1373+29.187 R1	10038022.061	3547171.574
		Tangential Direction:	N88.326°E
		Tangential Length:	6286.200

* Alignment US290-CL Cont.

* Alignment US290-CL Cont.
*

	STATION	NORTHING	EASTING
			Element: Circular
PC	1373+29.187 R1	10038022.061	3547171.574
PI	1375+38.940 R1	10038028.189	3547381.237
	CC	10040885.626	3547087.870
PT	1377+47.945 R1	10038064.791	3547587.771
		Radius:	2864.789
		Delta:	8.375° Left
		Degree of Curvature(Arc):	2.000°
		Length:	418.758
		Tangent:	209.753
		Chord:	418.386
		Middle Ordinate:	7.648
		External:	7.669
		Tangent Direction:	N88.326°E
		Radial Direction:	S1.674°E
		Chord Direction:	N84.138°E
		Radial Direction:	S10.049°E
		Tangent Direction:	N79.951°E
			Element: Linear
PT	1377+47.945 R1	10038064.791	3547587.771
PC	1401+26.295 R1	10038479.809	3549929.631
		Tangential Direction:	N79.951°E
		Tangential Length:	2378.349
			Element: Circular
PC	1401+26.295 R1	10038479.809	3549929.631
PI	1409+76.698 R1	10038628.203	3550766.987
	CC	10035658.973	3550429.532
PT	1417+79.630 R1	10038295.688	3551549.687
		Radius:	2864.789
		Delta:	33.067° Right
		Degree of Curvature(Arc):	2.000°
		Length:	1653.335
		Tangent:	850.403
		Chord:	1630.486
		Middle Ordinate:	118.447
		External:	123.555
		Tangent Direction:	N79.951°E
		Radial Direction:	S10.049°E
		Chord Direction:	S83.516°E
		Radial Direction:	S23.017°W
		Tangent Direction:	S66.983°E
			Element: Linear
PT	1417+79.630 R1	10038295.688	3551549.687
PI	1424+00.000 R1	10038053.119	3552120.668
		Tangential Direction:	S66.983°E
		Tangential Length:	620.370
			Element: Linear
PI	1424+00.000 R1	10038016.303	3552105.028
POT	1452+82.100 R1	10036889.379	3554757.676
		Tangential Direction:	S66.983°E
		Tangential Length:	2882.100

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

TBPE REGISTRATION NO. F-16341

Texas Department of Transportation

HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		57

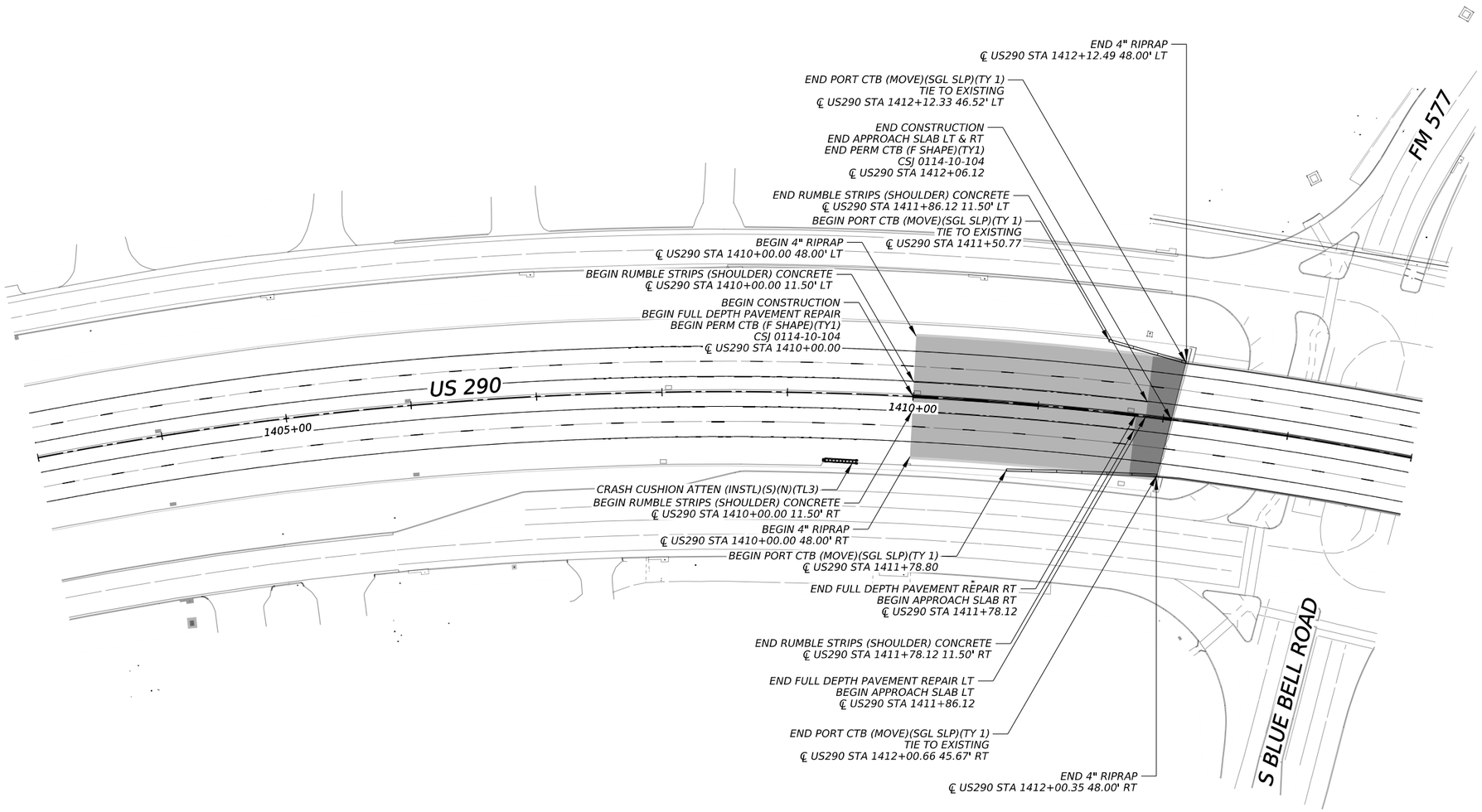
DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_HALN.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	DESCRIPTION	UNIT	QUANTITY
247 6064	FL BS (CMP IN PLC)(TY A GR 4) (6")	SY	2,035
310 6027	PRIME COAT(MC-30 OR AE-P)	GAL	225
361 6051	FULL-DPTH REP(BR APPROACH SLAB)(9"-13")	SY	260
361 6066	FULL-DEPTH REPAIR CRCP (11"-12")	SY	1,943
400 6005	CEM STABIL BKFL	CY	2,657
432 6001	RIPRAP (CONC)(4 IN)	CY	13
512 6025	PORT CTB (MOVE)(SGL SLP)(TY 1)	LF	180
514 6013	PERM CTB (F-SHAPE) (TY 1)	LF	207
533 6005	RUMBLE STRIPS (SHOULDER) CONCRETE	LF	364
545 6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	1
3076 6035	D-GR HMA TY-D PG64-22	TON	116

ELEVATION TABLE:

STATION / OFFSET	1410+00 (EXISTING ELEVATION)	1410+50 (PROPOSED ELEVATION)	1411+00 (PROPOSED ELEVATION)	1411+50 (PROPOSED ELEVATION)	1412+00 (PROPOSED ELEVATION)	STA VARIES WITH SKEW (EXISTING ELEVATION)
48 LT	335.90	333.91	331.92	329.93	327.94	327.45
36 LT	335.25	333.23	331.22	329.20	327.18	326.74
24 LT	334.52	332.52	330.52	328.53	326.53	326.15
12 LT	333.79	331.82	329.84	327.86	325.89	325.57
0	333.06	331.11	329.16	327.20	325.25	325.00
12 RT	332.38	330.45	328.51	326.57	324.64	324.44
24 RT	331.74	329.80	327.87	325.93	324.00	323.87
36 RT	331.38	329.37	327.35	325.34	323.32	323.25
48 RT	330.72	328.58	326.44	324.30	322.16	322.15



PI 1409+76.70
Δ 33°04'00.1" (RT)
D 02°00'00.0"
T 850.40'
L 1653.34'
R 2864.79'
PC 1401+26.29
PT 1417+79.63

LEGEND:

- PROPOSED CRCP
- PROPOSED BAS
- PROPOSED CTB
- EXISTING LANE
- PROPOSED LANE

NOTES:

1. STATIONS AND OFFSETS ARE MEASURED FROM CENTERLINE OF ROADWAY UNLESS NOTED OTHERWISE.
2. ELEVATION TABLE NOTES TARGET ELEVATIONS FOR CRCP FOR THE LIMITS OF REPAIR.
3. PROPOSED RIPRAP WILL BE GRADED LINEARLY BETWEEN THE PROPOSED CRCP AND THE EXISTING RIPRAP.
4. EXISTING PCTB AT BRIDGE APPROACH TO BE REINSTALLED AS IT CURRENTLY EXISTS IN THE FIELD. CONTRACTOR TO DOCUMENT FIELD CONDITIONS FOR PROPER REINSTALLATION.

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO. F-16341

US 290
ROADWAY LAYOUT

STA 1403+00 TO STA 1414+00

SHEET 1 OF 1

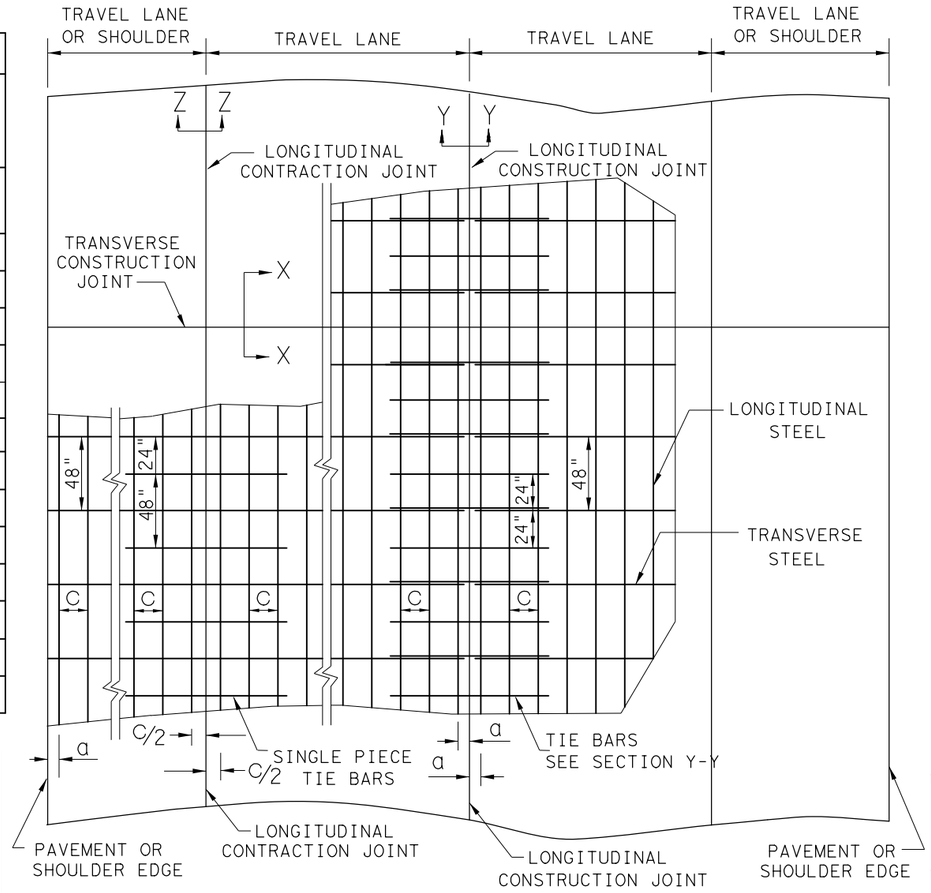
CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		58

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_US290_ROWY_PLAN_BDR (1)-3.dgn

TABLE NO. 1 LONGITUDINAL STEEL				
SLAB THICKNESS AND BAR SIZE		LONGITUDINAL STEEL BARS	FIRST SPACING AT EDGE OR JOINT	LONG. STEEL VERTICAL POSITION FROM BOTTOM OF PAVEMENT
T (IN.)	BAR SIZE	SPACING C (IN.)	SPACING a (IN.)	T1 (IN.)
7.0	#5	6.5	3 TO 4	3.5
7.5	#5	6.0	3 TO 4	3.75
8.0	#6	9.0	3 TO 4	4.0
8.5	#6	8.5	3 TO 4	4.25
9.0	#6	8.0	3 TO 4	4.5
9.5	#6	7.5	3 TO 4	4.75
10.0	#6	7.0	3 TO 4	5.0
10.5	#6	6.75	3 TO 4	5.5
11.0	#6	6.5	3 TO 4	6.0
11.5	#6	6.25	3 TO 4	6.5
12.0	#6	6.0	3 TO 4	7.0
12.5	#6	5.75	3 TO 4	7.5
13.0	#6	5.5	3 TO 4	8.0

TABLE NO. 2 TRANSVERSE STEEL AND TIE BARS						
SLAB THICKNESS (IN.)	TRANSVERSE STEEL		TIE BARS AT LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z)		TIE BARS AT LONGITUDINAL CONSTRUCTION JOINT (SECTION Y-Y)	
	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)
7.0 - 7.5	#5*	48	#5*	48	#5*	24
8.0 - 13.0	#5*	48	#6	48	#6	24

*CONTRACTOR MAY USE #6 REINFORCING STEEL INSTEAD OF #5 REINFORCING STEEL OR COMBINATION OF EACH SIZE

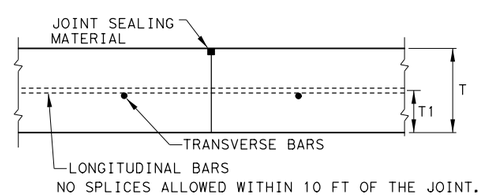


TYPICAL PAVEMENT LAYOUT

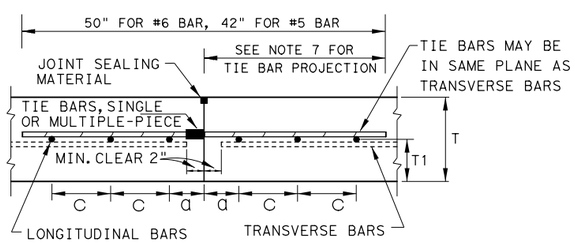
PLAN VIEW (NOT TO SCALE)

GENERAL NOTES

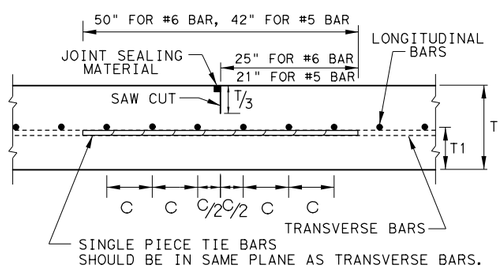
1. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. FOR PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT, ADDITIONAL DETAIL MAY BE SHOWN ELSEWHERE IN THE PLANS.
2. USE COARSE AGGREGATES WITH A RATED COEFFICIENT OF THERMAL EXPANSION (CoTE) OF NOT MORE THAN 5.5 X 10^{-6} IN/IN/ °F AS LISTED IN THE CONCRETE RATED SOURCE QUALITY CATALOG (CRSQC).
3. ALL THE REINFORCING STEEL AND TIE BARS SHALL BE DEFORMED STEEL BARS CONFORMING TO ASTM A 615 (GRADE 60) OR ASTM A 996 (GRADE 60) OR ABOVE. STEEL BAR SIZES AND SPACINGS SHALL CONFORM TO TABLE NO.1 AND TABLE NO.2.
4. STEEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1 IN. HORIZONTALLY AND +/- 0.5 IN. VERTICALLY. CALCULATED AVERAGE BAR SPACING (CONCRETE PLACEMENT WIDTH / NUMBER OF LONGITUDINAL BARS) SHALL CONFORM TO TABLE NO.1.
5. ADJUST REINFORCING STEEL VERTICALLY USING SHIMS OR OTHER METHODS, AS APPROVED, TO MEET VERTICAL TOLERANCES PRIOR TO CONCRETE PLACEMENT.
6. PAVEMENT WIDTHS OF MORE THAN 15 FT. SHALL HAVE A LONGITUDINAL JOINT (SECTION Z-Z OR SECTION Y-Y). THESE JOINTS SHALL BE LOCATED WITHIN 6 IN. OF THE LANE LINE UNLESS THE JOINT LOCATION IS SHOWN ELSEWHERE ON THE PLANS.
7. THE MINIMUM PROJECTION OF TIE BARS INTO THE ADJACENT PLACEMENT IS 22.5 IN. for #6 BARS AND 18.5 IN. FOR #5 BARS.
8. SEE STANDARD SHEET "CONCRETE CURB AND CURB AND GUTTER," FOR DETAILS WHEN TYING CONCRETE CURB OR CURB GUTTER AT A LONGITUDINAL JOINT.
9. REPLACE MISSING OR DAMAGED TIE BARS WITHOUT ADDITIONAL COMPENSATION BY DRILLING MIN.10 IN. DEEP AND GROUTING TIE BARS WITH TYPE III, CLASS C EPOXY. MEET THE PULL-OUT TEST REQUIREMENTS IN ITEM 361.
10. OMIT TIE BARS LOCATED WITHIN 18-IN. OF THE TRANSVERSE CONSTRUCTION JOINTS (SECTION X-X). USE HAND-OPERATED IMMERSION VIBRATORS TO CONSOLIDATE THE CONCRETE ADJACENT TO ALL FORMED JOINTS.
11. THE DETAIL FOR THE JOINT SEALANT AND RESERVOIR IS SHOWN ON STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



TRANSVERSE CONSTRUCTION JOINT
SECTION X - X



LONGITUDINAL CONSTRUCTION JOINT
SECTION Y - Y



LONGITUDINAL CONTRACTION JOINT
SECTION Z - Z

SHEET 1 OF 2

Texas Department of Transportation | Design Division Standard

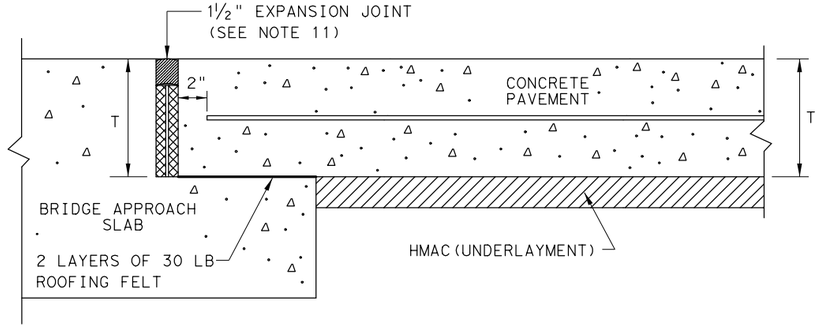
CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

ONE LAYER STEEL BAR PLACEMENT T - 7 to 13 INCHES

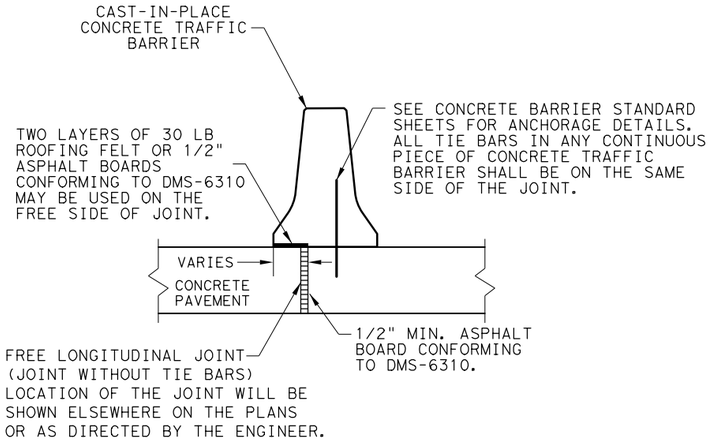
CRCP(1)-23

FILE: crcp123.dgn	DN: TxDOT	CK: KM	DW: CES	CK:
©TxDOT: APRIL 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
APRIL 2023: REVISED LONG. STEEL VERTICAL LOCATION REMOVED ADDITIONAL TIEBAR AT TRANSVERSE CONSTRUCTION JOINTS	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		59

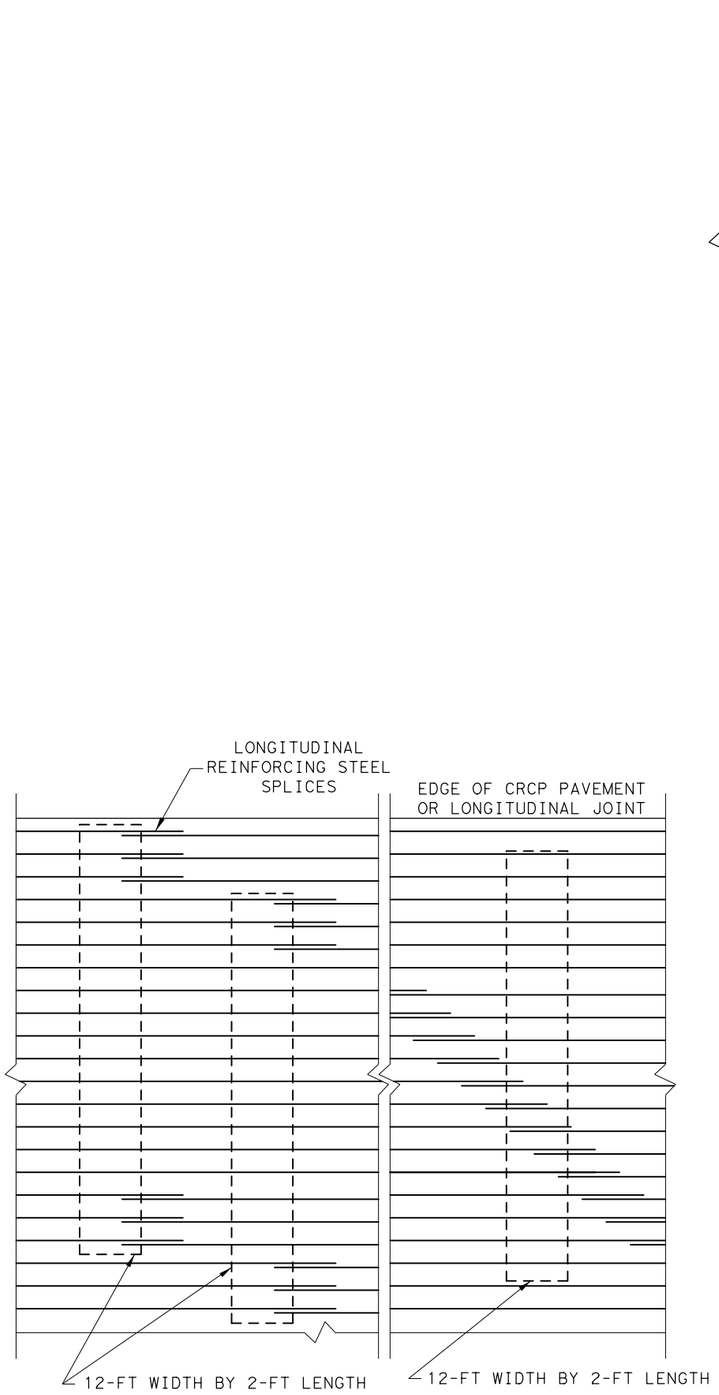
DATE: 7/5/2023
FILE: crcp123.dgn



TRANSVERSE EXPANSION JOINT DETAIL
AT BRIDGE APPROACH

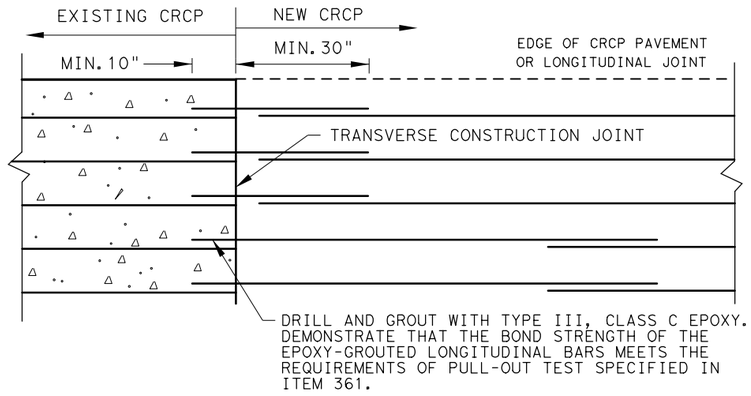


CENTERLINE FREE LONGITUDINAL JOINT DETAIL

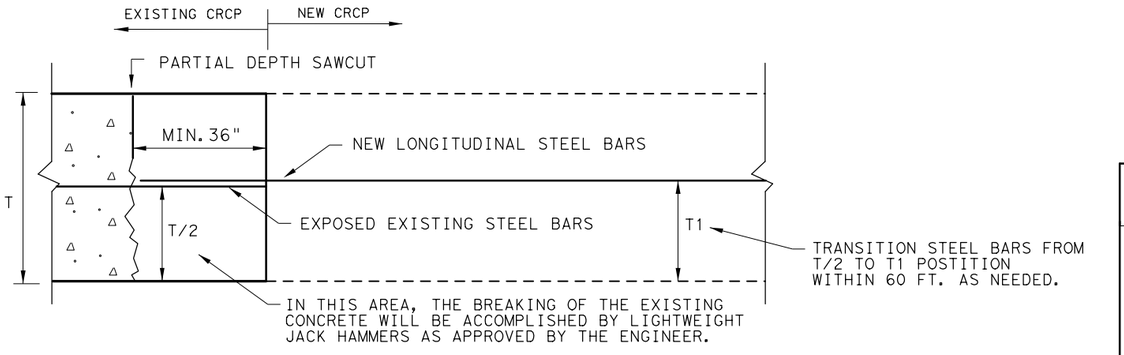


STAGGER THE LAP LOCATIONS SO THAT NO MORE THAN 1/3 OF THE LONGITUDINAL STEEL IS SPLICED IN ANY GIVEN 12-FT. WIDTH AND 2-FT. LENGTH OF THE PAVEMENT. ANY OTHER LAP CONFIGURATION MEETING THIS REQUIREMENT WILL BE ALLOWED.

EXAMPLES OF LAP CONFIGURATION
PLAN VIEW (NOT TO SCALE)

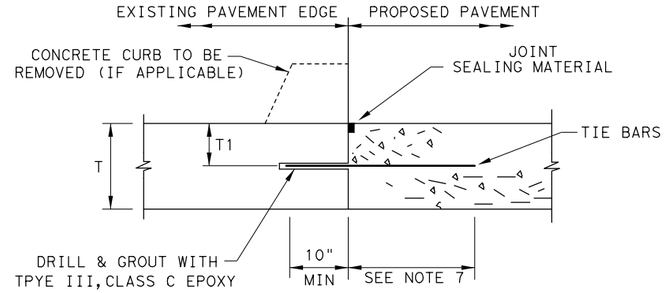


OPTION A: DRILL AND EPOXY
PLAN VIEW (NOT TO SCALE)



OPTION B: BREAKBACK AND LAP

TRANSVERSE TIE JOINT DETAIL
NEW CRCP TO EXISTING CRCP



1. BEFORE CONCRETE PLACEMENT, PERFORM PULL-OUT TESTS ON EPOXY-GROUTED TIE BARS IN ACCORDANCE WITH ITEM 360.
2. SPACE TIE BARS AT 24" SPACING. USE #6 TIE BARS FOR 8" AND THICKER PAVEMENTS, USE #5 TIE BARS FOR LESS THAN 8" THICK PAVEMENTS.

LONGITUDINAL WIDENING JOINT DETAIL

Texas Department of Transportation

Design Division Standard

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

ONE LAYER STEEL BAR PLACEMENT
T - 7 to 13 INCHES

CRCP(1)-23

FILE: crcp123.dgn	DN: TxDOT	CK: KM	DW: CES	CK:
©TxDOT: APRIL 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
APRIL 2023: MODIFIED EXPANSION JOINT DETAIL AT BRIDGE APPROACH SLAB	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		60

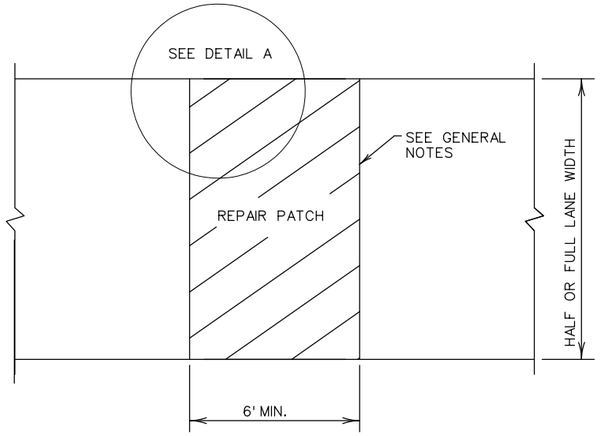
DATE: 7/5/2023
FILE: crcp123.dgn

TABLE NO.1 STEEL BAR SIZE AND SPACING						
TYPE PAVEMENT	SLAB THICKNESS AND BAR SIZE		LONGITUDINAL*		TRANSVERSE*	
			REGULAR BARS	TIEBARS	BARS	TIEBARS
	T (IN.)	BAR SIZE	SPACING (IN.)	SPACING (IN.)	SPACING (IN.)	SPACING (IN.)
CRCP	6.0	#5	7.5	7.5	24	24
	6.5		7.0	7.0		
	7.0		6.5	6.5		
	7.5		6.0	6.0		
	8.0	#6	9.0	9.0	24	24
	8.5		8.5	8.5		
	9.0		8.0	8.0		
	9.5		7.5	7.5		
	10.0		7.0	7.0		
	10.5		6.75	6.75		
	11.0		6.5	6.5		
	11.5		6.25	6.25		
	≥12.0		6.0	6.0		
JRCP	<8.0	#5	24.0	12.0	24	24
	≥8.0	#6	24.0	12.0	24	24
CPCD	<8.0	#5	NONE	12.0	NONE	24
	≥8.0	#6	NONE	12.0	NONE	24

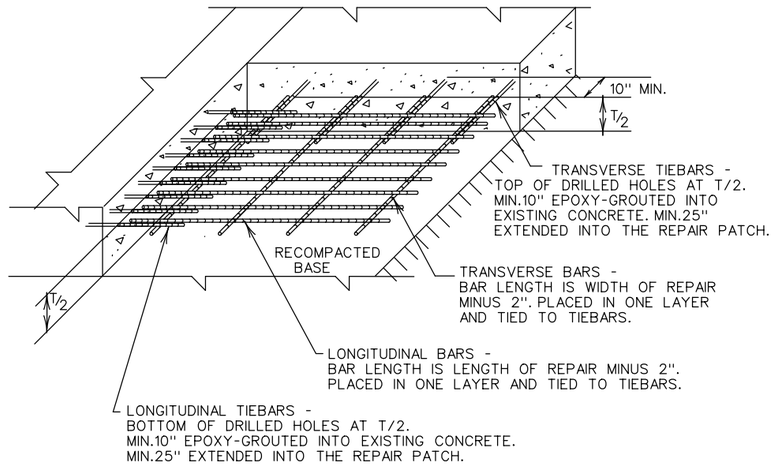
* USE 12" SPACING AS FIRST AND LAST SPACING AT END OR SIDE FOR ALL BARS.

GENERAL NOTES

1. ITEM 361,"REPAIR OF CONCRETE PAVEMENT"SHALL GOVERN FOR THIS WORK.
2. MULTIPLE PIECE TIEBARS SHALL BE USED WHEN THE REPAIR AREA MUST BE PLACED IN TWO STAGES DUE TO SEQUENCE OF CONSTRUCTION.
3. FULL DEPTH SAW CUTS SHALL BE MADE AROUND THE PERIMETER OF THE AREA TO BE REPAIRED. THE CUT SHALL BE MADE AT A RIGHT ANGLE TO THE PAVEMENT EDGE AND TO THE CENTER LINE OF THE PAVEMENT.
4. AT LEAST ONE LONGITUDINAL FULL DEPTH SAW CUT SHALL BE AT AN EXISTING LONGITUDINAL JOINT.
5. ADDITIONAL SAW CUTS MAY BE REQUIRED WITHIN THE AREA OF THE REPAIR TO FACILITATE REMOVAL OF THE CONCRETE OR TO ALLEVIATE BINDING OF THE FULL DEPTH SAW CUT AT THE REPAIR EDGE.
6. THE SAW CUTS WHICH EXTEND OUTSIDE THE AREA OF THE REPAIR WILL BE CLEANED AND FILLED WITH A CEMENTITIOUS GROUT APPROVED BY THE ENGINEER.
7. EXISTING LONGITUDINAL AND TRANSVERSE JOINTS REMOVED DUE TO REPAIR OPERATION SHOULD BE RESTORED IN ACCORDANCE WITH STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



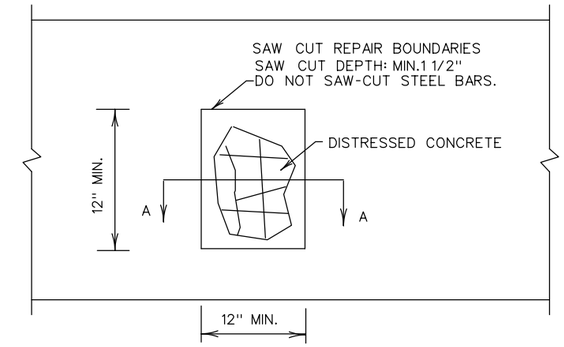
PLAN VIEW



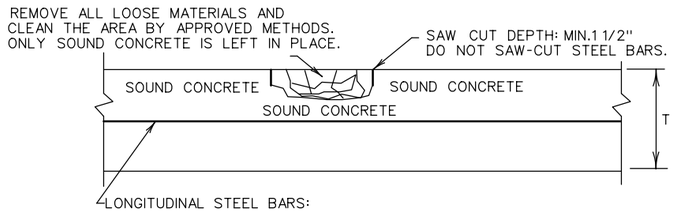
DETAIL A
GROUTED TIEBARS & REINFORCEMENT

GENERAL NOTES

1. ITEM 361,"REPAIR OF CONCRETE PAVEMENT"SHALL GOVERN FOR THIS WORK.
2. THE SAW CUTS WHICH EXTEND OUTSIDE THE AREA OF THE REPAIR WILL BE CLEANED AND FILLED WITH A CEMENTITIOUS GROUT APPROVED BY THE ENGINEER.
3. EXISTING LONGITUDINAL AND TRANSVERSE JOINTS REMOVED DUE TO REPAIR OPERATION SHOULD BE RESTORED IN ACCORDANCE WITH STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



PLAN VIEW



LONGITUDINAL STEEL BARS:

* REPAIR AREAS MAY BE ADJUSTED AFTER REMOVING DISTRESSED CONCRETE. SWITCH THE HALF-DEPTH REPAIR TO FULL-DEPTH REPAIR IF EXPOSED EXISTING LONGITUDINAL BARS ARE DEFICIENT, AS APPROVED. COMPENSATION WILL BE MADE FOR UNEXPECTED VOLUMES OF REPAIR AREAS OR CHANGES IN SCOPE OF WORK.
* INCREASE THE REPAIR AREA AND PERFORM A FULL-DEPTH REPAIR AS DIRECTED IF LONGITUDINAL STEEL BARS WERE DAMAGED BY THE REMOVAL OPERATIONS. NO ADDITIONAL COMPENSATION WILL BE MADE.

SECTION A-A

HALF-DEPTH REPAIR

FULL-DEPTH REPAIR OF CRCP, JRCP, AND CPCD

DATE: 7/5/2023
FILE: repcp14.dgn

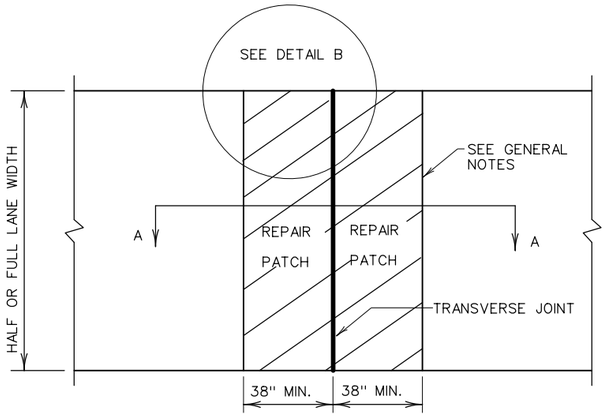
Texas Department of Transportation

Design Division Standard

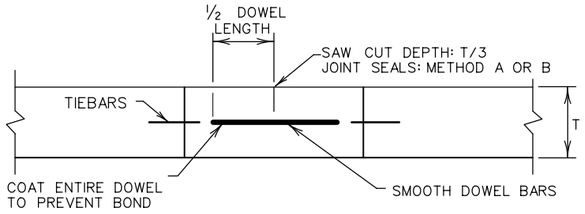
REPAIR OF CONCRETE PAVEMENT

REPCP-14

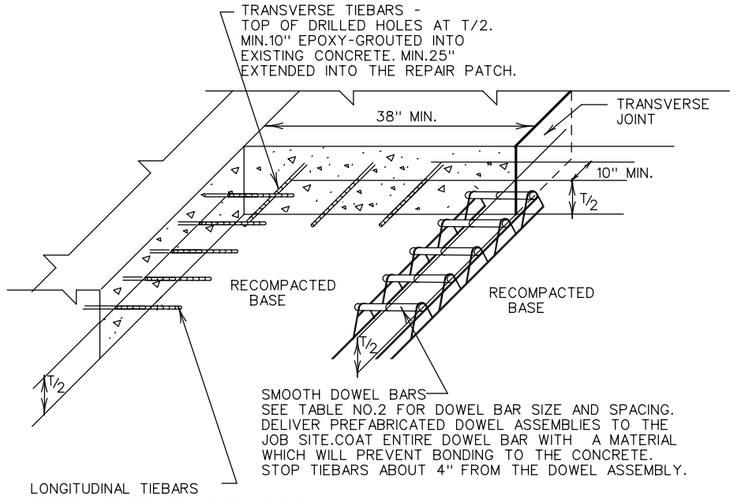
FILE: repcp14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
© TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		61



PLAN VIEW



SECTION A-A



DETAIL B
GROUTED TIEBARS & DOWELS

GENERAL NOTES

1. ITEM 361,"REPAIR OF CONCRETE PAVEMENT"SHALL GOVERN FOR THIS WORK.
2. MULTIPLE PIECE TIEBARS SHALL BE USED WHEN THE REPAIR AREA MUST BE PLACED IN TWO STAGES DUE TO SEQUENCE OF CONSTRUCTION.
3. FULL DEPTH SAW CUTS SHALL BE MADE AROUND THE PERIMETER OF THE AREA TO BE REPAIRED. THE CUT SHALL BE MADE AT A RIGHT ANGLE TO THE PAVEMENT EDGE AND TO THE CENTER LINE OF THE PAVEMENT.
4. AT LEAST ONE LONGITUDINAL FULL DEPTH SAW CUT SHALL BE AT AN EXISTING LONGITUDINAL JOINT.
5. ADDITIONAL SAW CUTS MAY BE REQUIRED WITHIN THE AREA OF THE REPAIR TO FACILITATE REMOVAL OF THE CONCRETE OR TO ALLEVIATE BINDING OF THE FULL DEPTH SAW CUT AT THE REPAIR EDGE.
6. THE SAW CUTS WHICH EXTEND OUTSIDE THE AREA OF THE REPAIR WILL BE CLEANED AND FILLED WITH A CEMENTITIOUS GROUT APPROVED BY THE ENGINEER.
7. EXISTING LONGITUDINAL AND TRANSVERSE JOINTS REMOVED DUE TO REPAIR OPERATION SHOULD BE RESTORED IN ACCORDANCE WITH STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."
8. DOWEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1/4 IN. HORIZONTALLY AND VERTICALLY UNLESS OTHERWISE SPECIFIED. WHERE DOWEL BAR BASKETS ARE USED, REMOVE THE SHIPPING WIRES.

TABLE NO. 2 DOWELS (SMOOTH BARS)

PAVEMENT THICKNESS (INCHES)	SIZE AND DIA.	LENGTH (IN.)	SPACING (IN.)
<10	#8 (1 IN.)	18.0	12.0
≥10	#10 (1¼IN.)		

REPAIR OF TRANSVERSE JOINT OF CPCD

SHEET 2 OF 2

Texas Department of Transportation | Design Division Standard

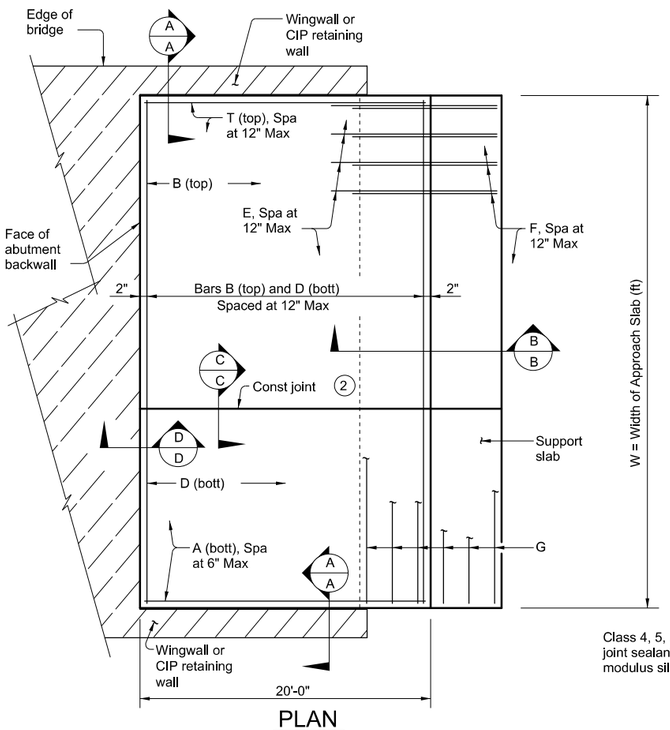
REPAIR OF CONCRETE PAVEMENT

REPCP-14

FILE: repcp14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
©TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		62

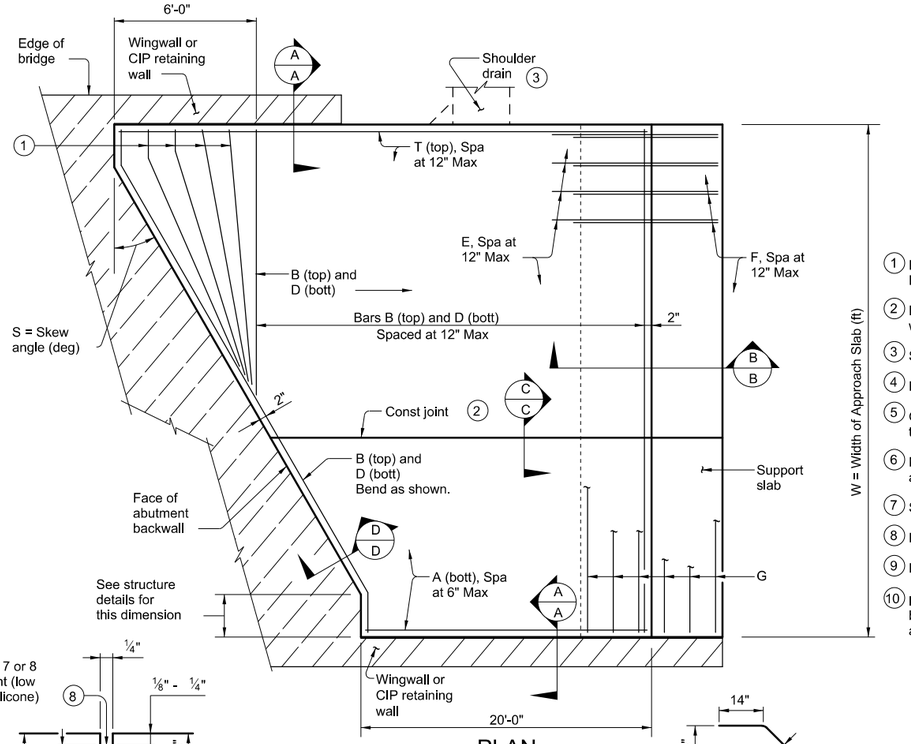
DATE: 7/5/2023
FILE: repcp14.dgn

DATE: 7/5/2023
FILE: MS-BASC-23.dgn



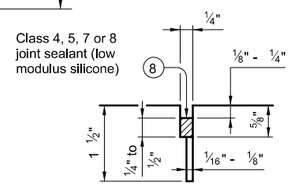
PLAN

(Showing non-skewed approach slab.)



PLAN

(Showing skewed approach slab.)



LONGITUDINAL SAW CUT JOINT DETAIL

BAR TABLE	
BAR	SIZE
A	#8
B	#5
D	#5
E	#5
F	#5
G	#5
T	#5

APPROXIMATE QUANTITIES (4)

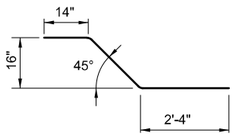
Reinf steel weight = 8.5 Lbs/SF of Approach Slab
= 18.4 Lbs/LF of Support Slab

Vol of Appr Slab Conc (CY) = 1.057W - 0.008W x T + 0.02W² Tan S
(Includes Support Slab)

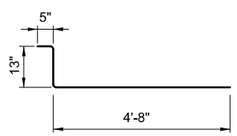
W = Width of Approach Slab (ft)

T = Conc Pavement Thickness (in)

S = Skew Angle (deg)



BARS E (#5)



BARS F (#5)

(1) Flare Bars B and D in this region (1'-6" Max Spa, 3" Min Spa). Minimum flared bar length = 2'-6". Bend bars as necessary.

(2) Provide longitudinal construction joints that align with longitudinal construction joints in the bridge slab with bridges built in stages. Other longitudinal construction joints must receive approval of the Engineer.

(3) See details elsewhere in plans for shoulder drain location and details.

(4) For Contractor's information only. Quantities shown are for one approach slab only.

(5) On portion of support slab that supports the concrete pavement, adjust top surface elevation, if required, to accommodate concrete pavement thickness. Smooth trowel finish. Place two layers of 30# roofing felt.

(6) Multiple piece tie bars are acceptable at longitudinal construction joints provided minimum laps shown are achieved.

(7) See details elsewhere in plans for required cross-slope.

(8) Place in accordance with Item 438.

(9) Provide backer rod that is 25% larger than joint opening and compatible with the sealant.

(10) If bridge rail is present at the wingwall or CIP retaining wall, place ½" rebonded recycled tire rubber between concrete railing and top of approach slab as shown when concrete railing projects over the approach slab.

GENERAL NOTES:

Construct approach slab in accordance with Item 422.

Provide Class "S" concrete with a minimum compressive strength of 4,000 psi.

Provide Grade 60 reinforcing steel.

Provide longitudinal joints as shown on the Longitudinal Saw Cut Joint Detail at lane lines and shoulders when width between longitudinal construction joints or edges of approach slab exceeds 16 feet. Saw cut joints within 24 hours of concrete placement to a depth of 1 ½" and seal in accordance with Item 438. Alternately, provide a controlled joint consisting of 1 ½" vinyl or plastic joint former (Stress Cap, Zip Strip, Stress Lock, or equal as approved by the Engineer.)

Provide rebonded recycled tire rubber joint filler that meets the requirements of DMS-6310. "Joint Sealants and Fillers."

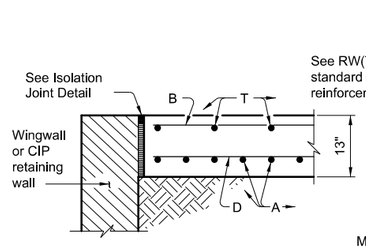
Construct the subgrade or subbase away from the bridge for a minimum distance of 100 feet prior to the approach slab, unless otherwise indicated on the plans.

Compact and finish the subgrade or foundation for the approach slab to the typical cross-section and to the lines and grades shown on the plans.

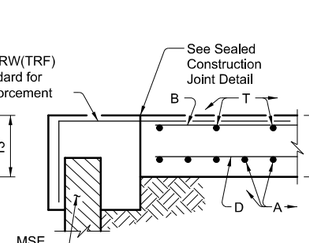
Cure for 4 days using water or membrane curing per Item 422.

All details shown herein are subsidiary to bridge approach slab.

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

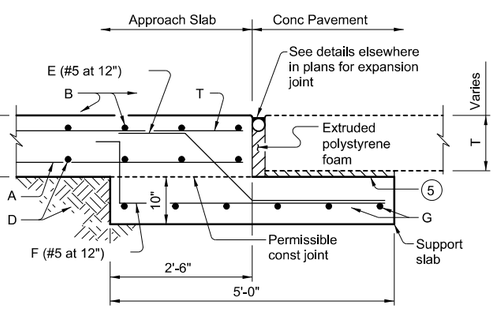


SHOWING WINGWALL OR CIP RETAINING WALL

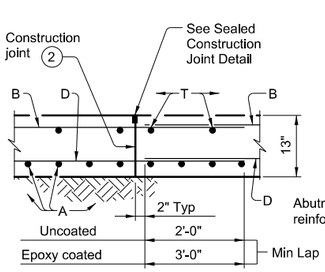


SHOWING MSE WALL

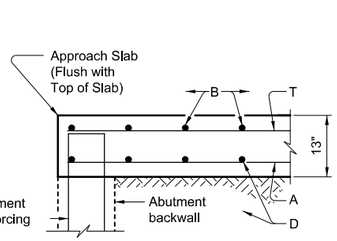
SECTION A-A



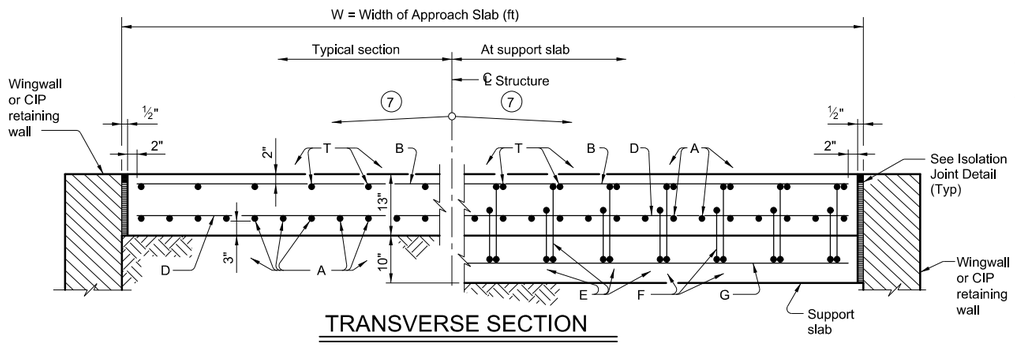
SECTION B-B



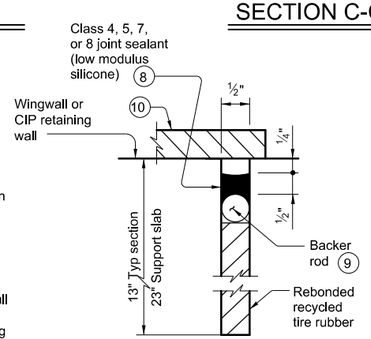
SECTION C-C (6)



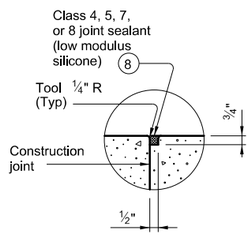
SECTION D-D



TRANSVERSE SECTION



ISOLATION JOINT DETAIL



SEALED CONSTRUCTION JOINT DETAIL

Texas Department of Transportation

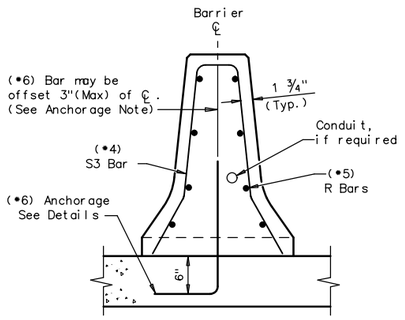
Bridge Division Standard

BRIDGE APPROACH SLAB

CONCRETE PAVEMENT

BAS-C

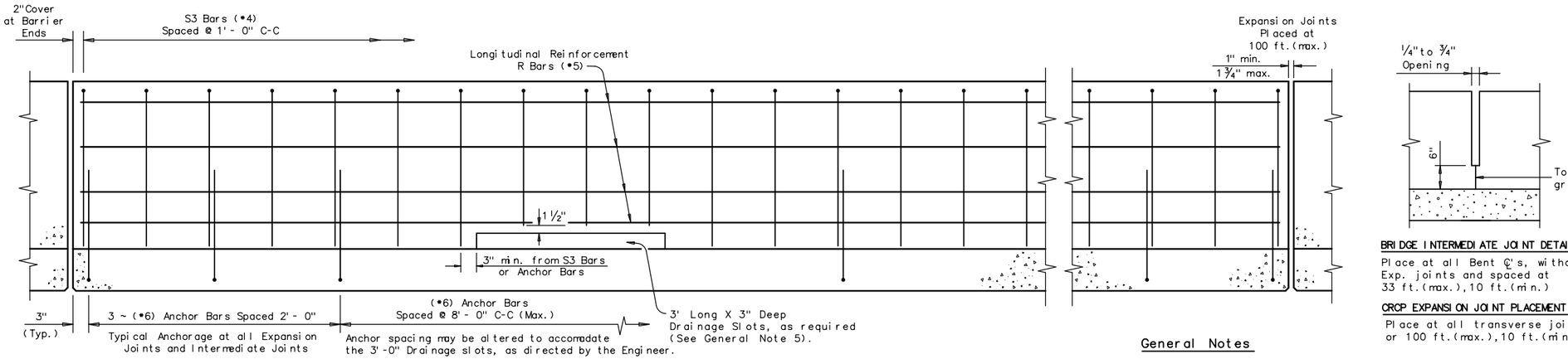
FILE: MAS-BASC-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
02-20: Removed stress relieving pad. 03-23: Note 5 changed.	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		63



END VIEW

Cast-in-Place (CIP) Barrier

Barrier is Symmetrical About the Center Line



BRIDGE INTERMEDIATE JOINT DETAIL

Place at all Bent ℄'s, without Exp. joints and spaced at 33 ft.(max.),10 ft.(min.)

CRCP EXPANSION JOINT PLACEMENT

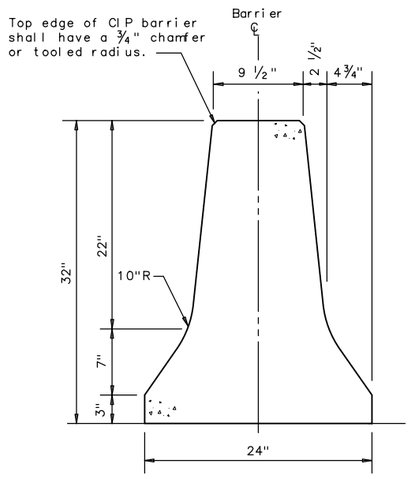
Place at all transverse joints or 100 ft.(max.),10 ft.(min.)

ELEVATION VIEW

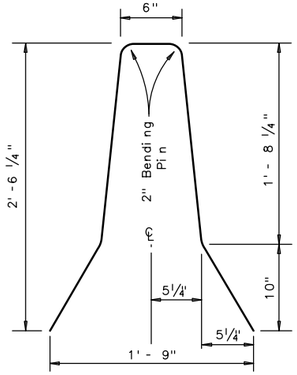
Cast-in-Place (CSB) on Bridge Decks or Continuously Reinforced Concrete Pavement (CRCP) (Showing Reinforcement and Anchor Requirement)

General Notes

1. Concrete shall be Class C, unless otherwise specified in the plans.
2. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615. If the bridge deck requires epoxy "coated" reinforcement, the barrier and/or anchorage may require the same, as shown elsewhere in the plans.
3. Axis of cast-in-place barrier shall be vertical, except where the roadway is superelevated, then axis shall be normal to roadway surface.
4. Top edges of cast-in-place barrier shall have a ¾" chamfer or tooled radius.
5. Anchorage: The "Optional" Anchor system shall be embedded 6" into fresh concrete or using a Type III, Class C Epoxy anchorage system Follow the manufacturer's directions for installing the expoxied anchor bars. All anchorage shown is the minimum required, and considered subsidiary to the bid item.
6. Drainage slot depths may be increased 1" to accommodate ACP. Slot locations (12' - 0", C-C Min. Spacing) are shown elsewhere, or as directed by the Engineer.
7. Cast-in-place barrier may be slip formed. Bracing may be tied or tack welded to the reinforcement cage to provide cage stability. Do not weld to anchor bars. The reinforcement cage may rest on the top of the finished grade.
8. For locations where lighting is required, see the CSB(4) sheet for the proper reinforcement and anchorage.



CONCRETE SAFETY BARRIER (CSB)



S3 Bar

(•4) Bar

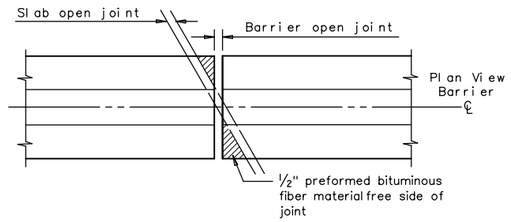
Note: Reinforcement cage may rest on top of the finished grade.

BARRIER PLACEMENT OVER (CRCP) JOINTS

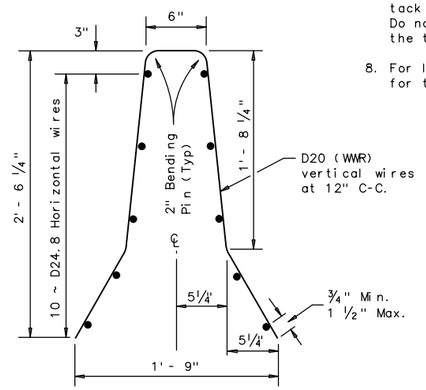
Barrier may be cast over a "Longitudinal" CRCP joint.

CRCP Joints (with or without tiebars): Two layers of 30# roofing felt or ½" preformed bituminous fiber material.

Barrier Anchorage Note: Anchorage must be located at least 3" from a longitudinal joint.



BARRIER OVER TRANSVERSE OPEN JOINT



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

(WWR) General Notes

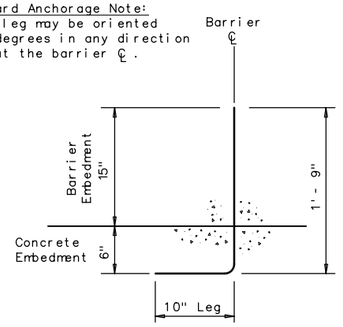
1. Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
2. The welded wire cage at the drainage slots may be cut or bent to accommodate the edge and top clearances, as directed by the Engineer.
3. The welded wire splice locations shall have a "minimum" splice lap length of 12".
4. Combinations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

Cast-In-Place or Slip-Formed (CSB)

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

The weight of Cast-in-Place (CSB)(F-Shape) is approx. 440 lbs per ft.

Standard Anchorage Note: 10" leg may be oriented 90 degrees in any direction about the barrier ℄.

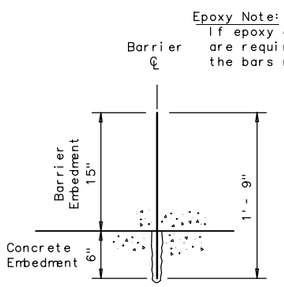


STANDARD ANCHORAGE

(•6) Bar

Concrete Pavement / Bridge Deck Anchorage: Cast-in-Place or Slip-Formed Barrier (See General Note 2)

Epoxy Note: If epoxy coated anchor bars are required, the lower 6" of the bars must not be epoxy coated.

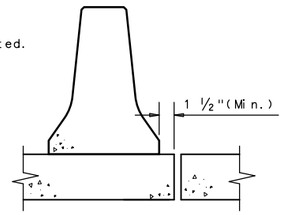


"OPTIONAL" ANCHORAGE

(•6) Bar

Fresh insertion method or Type III, Class C Epoxy Method

Concrete Pavement / Bridge Deck Anchorage: Cast-in-Place or Slip-Formed Barrier (See General Notes 2 & 5)



Minimum Edge Distance From Longitudinal Joint

Placement over a longitudinal bridge joint is not recommended.

Texas Department of Transportation

Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE)

CAST-IN-PLACE (TYPE 1) (BRIDGE DECK or CRCP)

CSB(3)-16

FILE: csb316.dgn	DN: TxDOT	CK: HC/AN	DW: BD/VP	CK: KM
© TxDOT January 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
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	BRY	WASHINGTON		64

DATE: 7/5/2023
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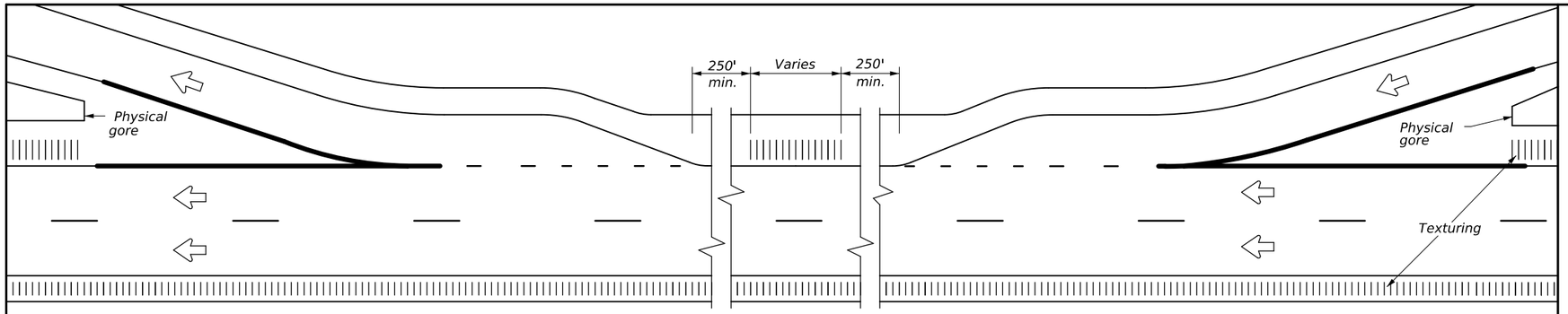
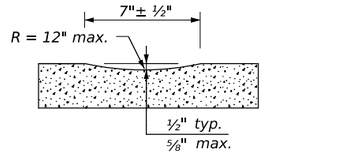
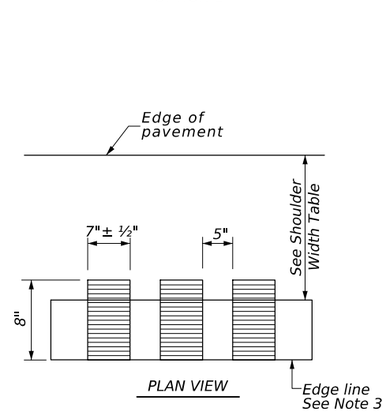


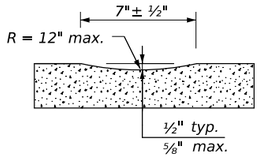
TYPICAL RUMBLE STRIP PLACEMENT AT EXIT AND ENTRANCE RAMPS



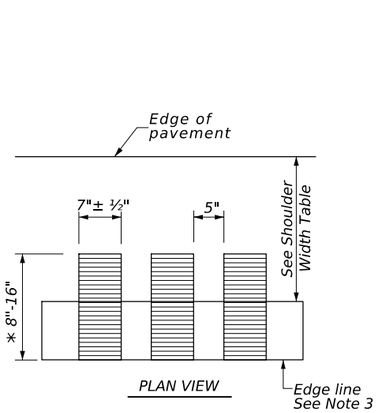
PROFILE VIEW
OPTION 1



CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)

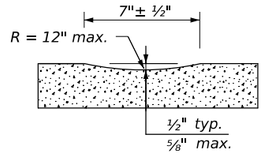


PROFILE VIEW
OPTION 2

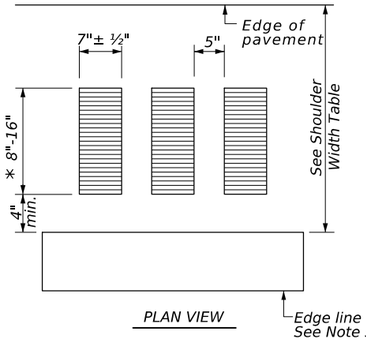


* This distance may vary based on width of shoulder

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)

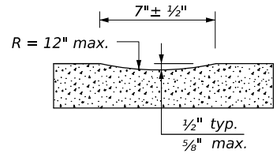


PROFILE VIEW
OPTION 3

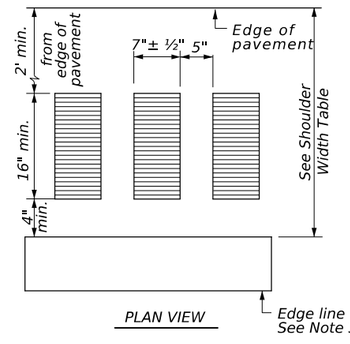


* This distance may vary based on width of shoulder

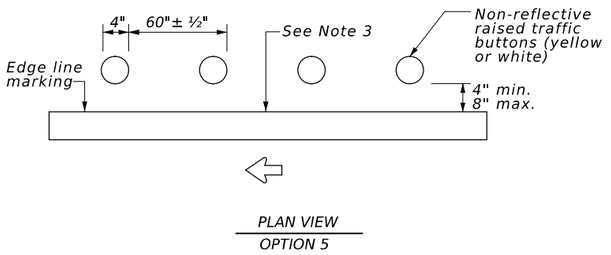
CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



PROFILE VIEW
OPTION 4

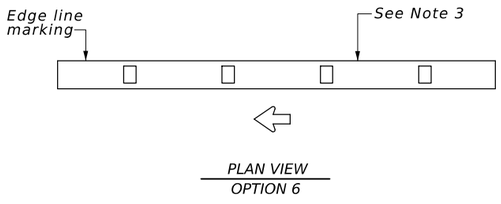


CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



PLAN VIEW
OPTION 5

RAISED EDGE LINE
(Rumble Strips)



PLAN VIEW
OPTION 6

PROFILE EDGE LINE MARKINGS
(Rumble Strips)

SHOULDER WIDTH TABLE

EQUAL TO OR LESS THAN 2 FEET	GREATER THAN 2 FEET LESS THAN 4 FEET	EQUAL TO OR GREATER THAN 4 FEET
Option 1, 5, or 6	Option 1, 2, 3, 5, or 6	Option 2, 4, 5, or 6

GENERAL NOTES

1. Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
2. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
3. Use standard sheets PM(2) and FPM(1) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
4. See the Shoulder Width Table below for determining what options may be used for edge line rumble strips.
5. Breaks in edge line rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections, or driveways with high usage of large trucks when installed on conventional highways.
6. Rumble strips shall not be placed across exit or entrance ramps, acceleration or deceleration lanes, crossovers, gore areas, or intersections with other roadways.
7. Consideration should be given to noise levels when edge line rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING MILLED DEPRESSION EDGE LINE RUMBLE STRIPS:

9. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
10. Pavement markings can be applied over milled shoulder rumble strips to create an edge line rumble stripe.

WHEN INSTALLING RAISED OR PROFILE EDGE LINE RUMBLE STRIPS:

11. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per the manufacturer's recommendations.
12. Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edge line when used as a rumble strip. The color of the button should match the color of the adjacent edge line marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
13. Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
14. The minimum distance between the edge line and the buttons should be used if the shoulder is less than 8 feet in width.
15. Raised profile thermoplastic markings used as edge lines may substitute for buttons.

Texas Department of Transportation

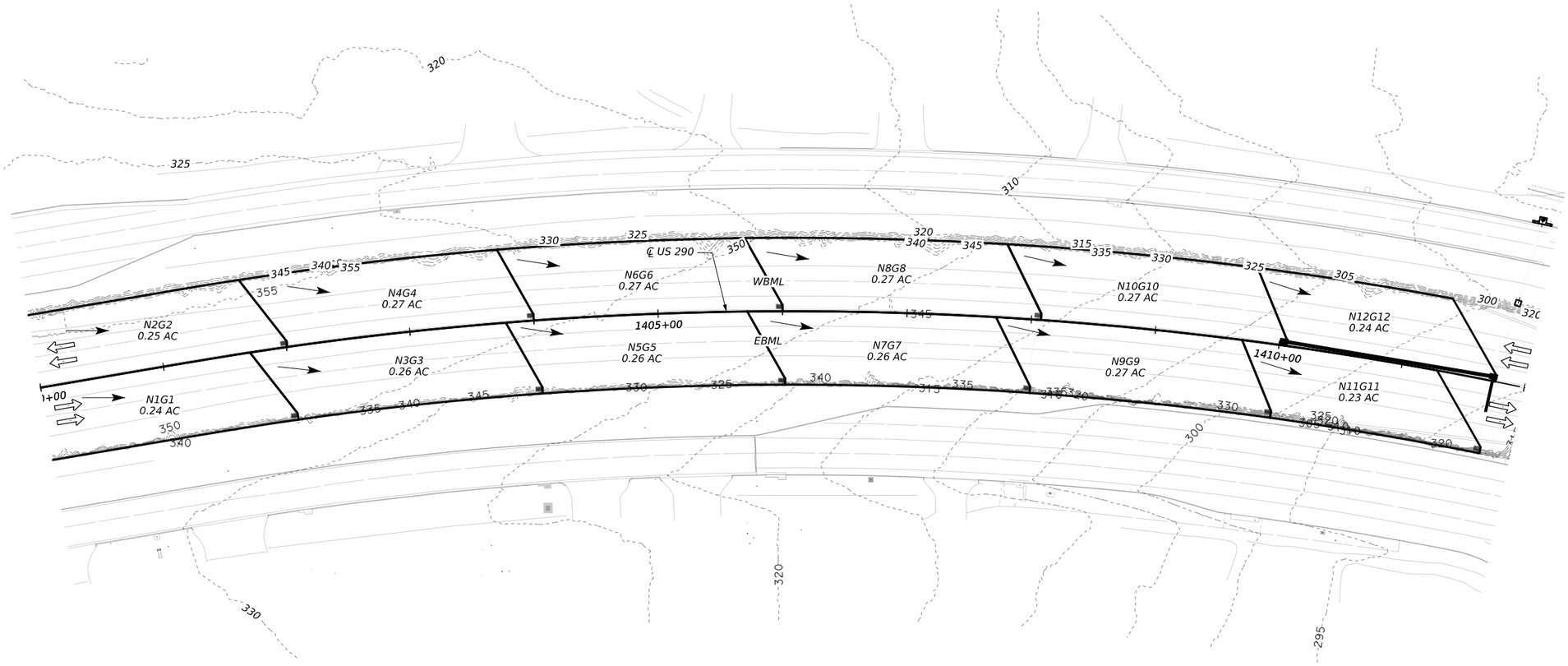
Traffic Safety Division Standard

EDGE LINE RUMBLE STRIPS ON FREEWAYS AND DIVIDED HIGHWAYS RS(1)-23

FILE:	rs(1)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS		0114	10	104	US290
4-06 1-23		DIST	COUNTY		SHEET NO.
2-10		BRY	WASHINGTON		65
10-13					

DATE: 7/5/2023
FILE: rs(1)-23.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT



LEGEND:

- EXISTING TNRIS 1-FT CONTOURS
- DRAINAGE AREA BOUNDARY
- FLOW DIRECTION

NOTES:

1. RUNOFF COMPUTATIONS ARE BASED ON AS-BUILT INFORMATION.

US 290 RUNOFF COMPUTATIONS (10 YEAR)

AREA ID	COMPOSITE AREA (ACRES)	COMPOSITE 'C' VALUE	DESIGN Tc (MIN)	INTENSITY I (IN/HR)	DISCHARGE Q (CFS)	REMARKS
SYSTEM N						
N1G1	0.24	0.90	10	8.36	1.81	
N2G2	0.25	0.90	10	8.36	1.88	
N3G3	0.26	0.90	10	8.36	1.96	
N4G4	0.27	0.90	10	8.36	2.03	
N5G5	0.26	0.90	10	8.36	1.96	
N6G6	0.27	0.90	10	8.36	2.03	
N7G7	0.26	0.90	10	8.36	1.96	
N8G8	0.27	0.90	10	8.36	2.03	
N9G9	0.27	0.90	10	8.36	2.02	
N10G10	0.27	0.90	10	8.36	2.03	
N11G11	0.23	0.90	10	8.36	1.69	
N12G12	0.24	0.90	10	8.36	1.81	

STATE OF TEXAS
TARA T. ALEXANDER
109548
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO. F-16341

Texas Department of Transportation

US 290
DRAINAGE AREA MAPS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		66

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_290_DRN_DAM2.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

US 290 CONVEYANCE COMPUTATIONS (10 YEAR)

LINK ID	UPSTREAM NODE	DOWNSTREAM NODE	ACTUAL LENGTH (FT)	SHAPE	NUMBER OF BARRELS	RISE (FT)	SPAN (FT)	MANNING'S N VALUE	SLOPE %	INVERT UPSTREAM (FT)	INVERT DOWNSTREAM (FT)	HGL UPSTREAM (FT)	HGL DOWNSTREAM (FT)	DISCHARGE (CFS)	CAPACITY (CFS)	UNIFORM VELOCITY (FT)	UNIFORM DEPTH (FT)	ACTUAL VELOCITY DOWNSTREAM (FT/S)	ACTUAL DEPTH DOWNSTREAM (FT)	COMMENTS
SYSTEM N																				
N10G10	N10G10	N12G12	171.75	Circular	1	2	n/a	0.01	3.12	323.14	317.65	329.03	318.61	19.83	46.59	13.49	0.95	13.28	0.96	
N11G11	N11G11	N12G12	53.08	Circular	1	1	n/a	0.01	4.25	319.15	316.72	320	317.05	1.83	8.56	8.24	0.33	8.14	0.33	

US 290 INLET COMPUTATIONS (10 YEAR)

AREA ID	NODE ID	TYPE	DESCRIPTION	STATION	REFERENCE CHAIN	OFFSET (FT)	LONGITUDINAL SLOPE (%)	SPREAD N	DISCHARGE (CFS)	CAPACITY (CFS)	BY PASS FLOW (CFS)	BY PASS FLOW INTO	ALLOWABLE PONDED WIDTH (FT)	COMPUTED PONDED WIDTH (FT)	ALLOWABLE PONDED DEPTH (FT)	COMPUTED PONDED DEPTH (FT)	CURB LENGTH (**) (FT)	LENGTH REQUIRED (FT)	COMMENTS
SYSTEM N																			
N10G10	N10G10	Grate	RW(RI)	1410+00	US 290	-3.00	4.20	0.01	2.17	2.17	0.00	0	17	3.75	0	0.2	n/a	n/a	
N12G12	N12G12	Grate	RW(RI)	1411+75	US 290	-3.00	4.20	0.01	1.92	1.92	0.00	0	17	3.59	0.5	0.2	n/a	n/a	

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_DRN_COMP.dgn

STATE OF TEXAS
TARA T. ALEXANDER
109548
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

TBPE REGISTRATION NO. F-16341

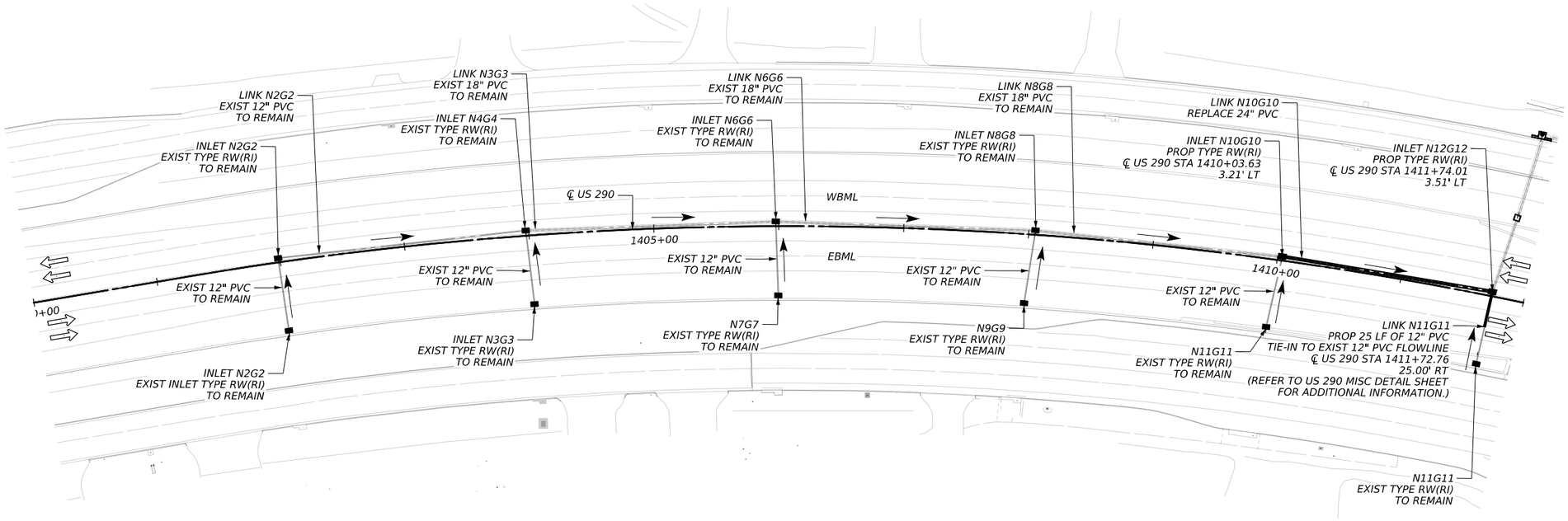
Texas Department of Transportation

US 290
HYDRAULIC COMPUTATIONS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		67

CK: JMT
DW: JMT
CK: JMT
DW: JMT



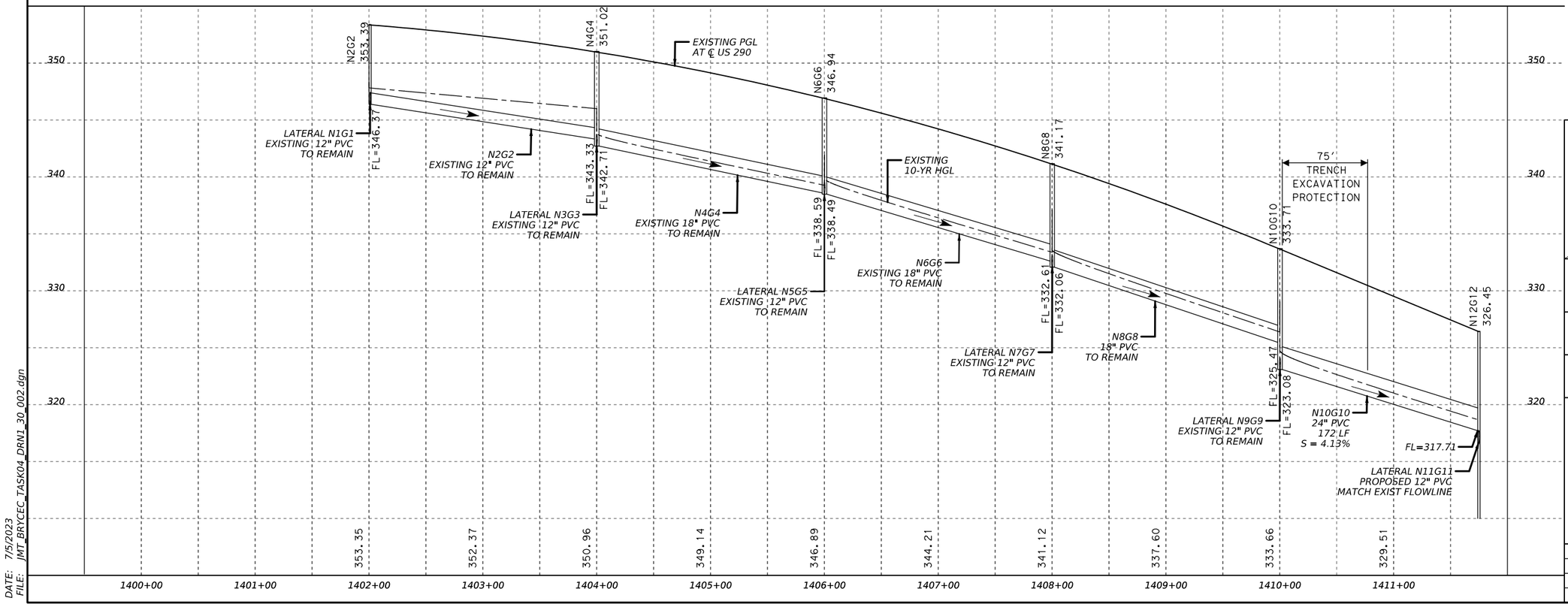
LEGEND:

PVC PIPE

FLOW DIRECTION

NOTES:

1. *CLEAN OUT EXISTING CULVERT TO REMAIN.*
2. *EXISTING FLOW LINES ARE BASED ON AS-BUILT INFORMATION. CONTRACTOR TO VERIFY AND ADJUST FINISHED GRADE AS REQUIRED.*
3. *STATIONS AND OFFSETS ARE MEASURED FROM CENTERLINE OF ROADWAY UNLESS NOTED OTHERWISE.*
4. *TYPE RWRI INLETS SHALL BE POSITIONED ADJACENT TO THE MEDIAN CSB AS APPROPRIATE.*



DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_DRN1_30_002.dgn

STATE OF TEXAS
TARA T. ALEXANDER
109548
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

HORZ 0' 50' 100'
VERT 0' 5' 10'
SCALE IN FEET

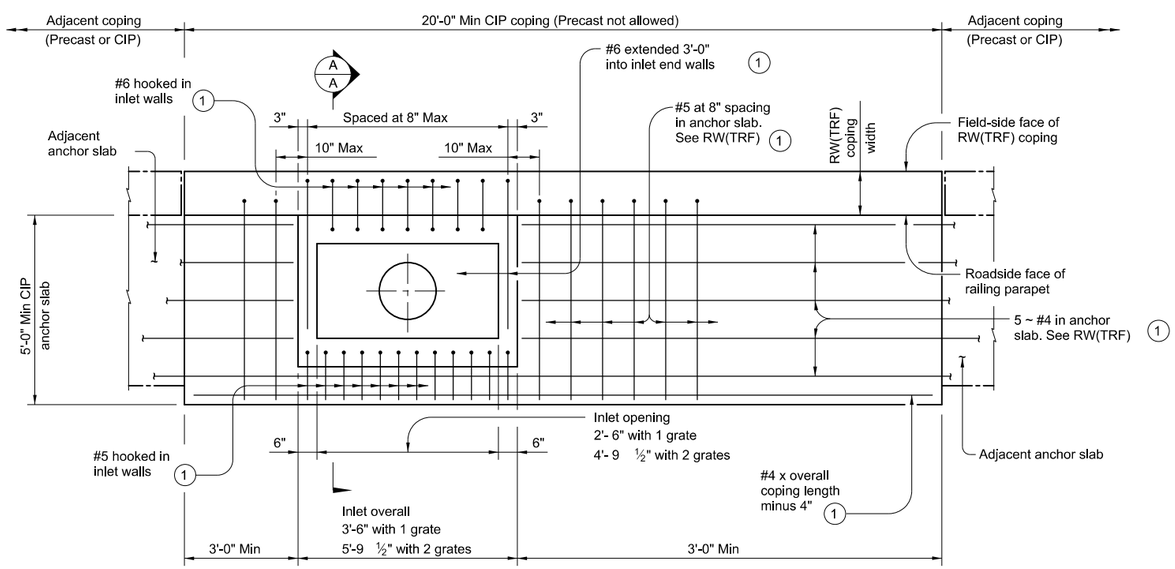
TBPE REGISTRATION NO. F-16341

US 290
DRAINAGE PLAN AND PROFILE

SHEET 1 OF 1

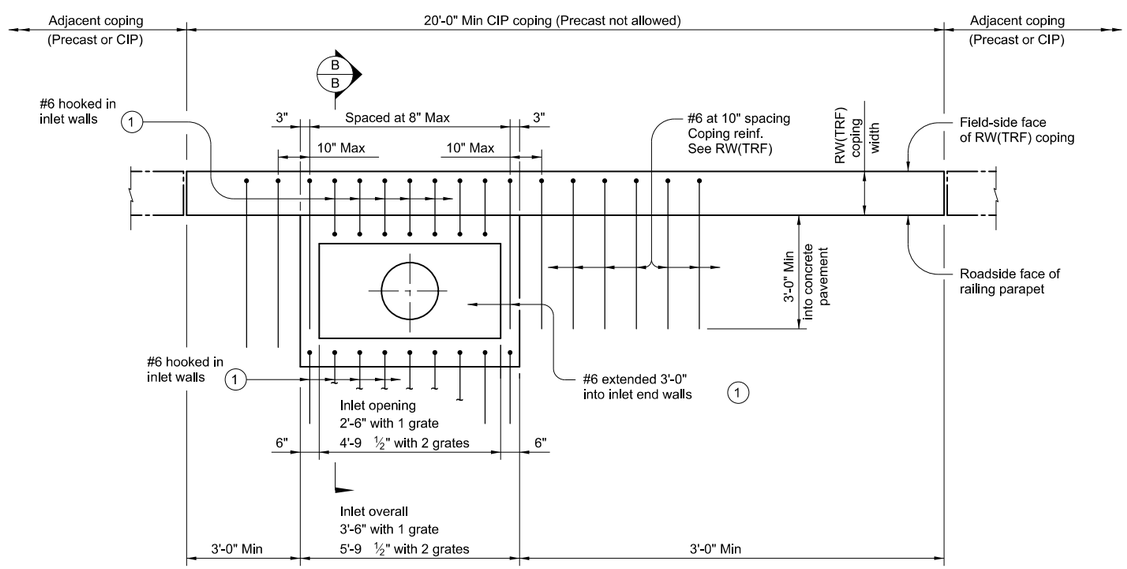
CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		68

DATE: 7/5/2023
FILE: RW-R1-22, dgn



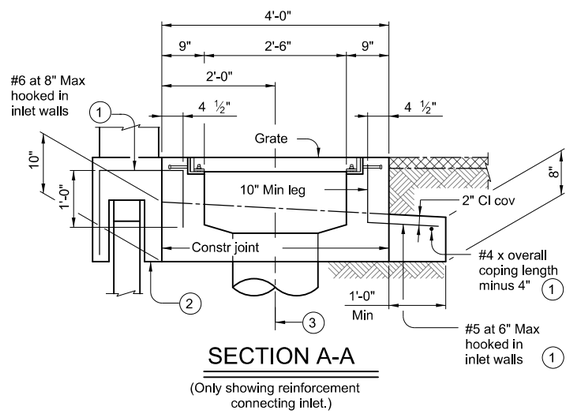
PLAN WITH ANCHOR SLAB (ADJACENT TO ACP)

(Frame and grate[s] not shown for clarity.)



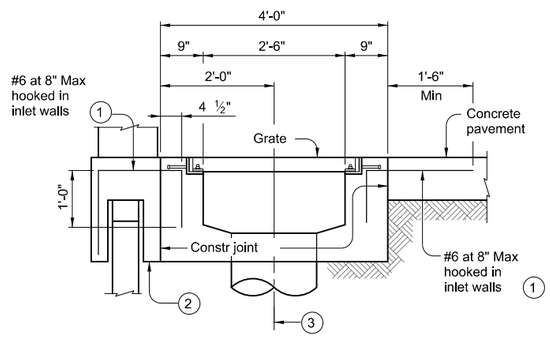
PLAN WITHOUT ANCHOR SLAB (ADJACENT TO CONCRETE PAVEMENT)

(Frame and grate[s] not shown for clarity.)



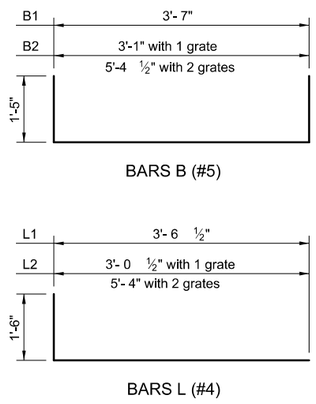
SECTION A-A

(Only showing reinforcement connecting inlet.)



SECTION B-B

(Only showing reinforcement connecting inlet.)



BARS B (#5)

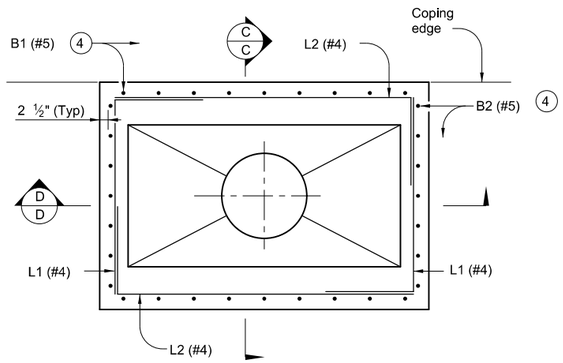
BARS L (#4)

(1) Reinforcement considered part of retaining wall coping and is subsidiary to Item 423, "Retaining Walls".

(2) Coping against inlet must extend to bottom of inlet or lower.

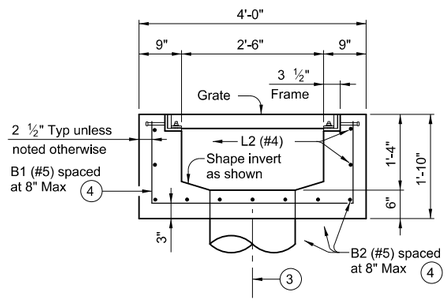
(3) 12 inch diameter or 18 inch diameter pipe, straight drop. See details elsewhere for size and location.

(4) Cut or bend to clear pipe.

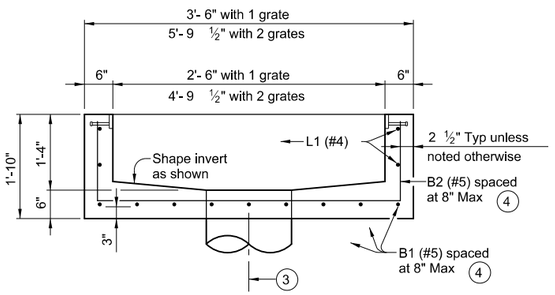


PLAN OF INLET

(Showing inlet reinforcing.)



SECTION C-C



SECTION D-D

HL93 LOADING

SHEET 1 OF 2

Texas Department of Transportation

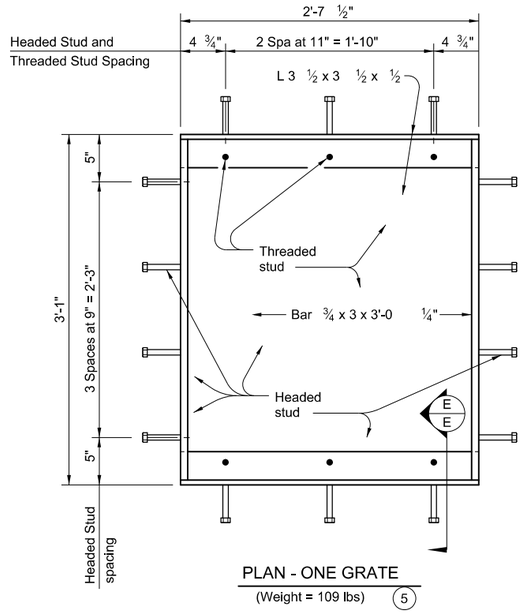
Bridge Division Standard

ROADWAY INLET FOR MSE RETAINING WALL TRAFFIC RAIL FOUNDATION

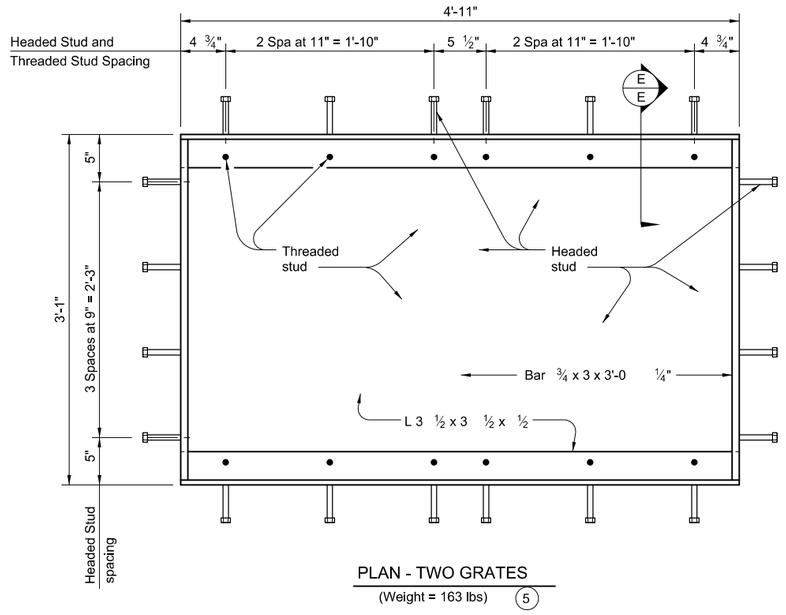
RW(RI)

FILE: RW-RI-22.dgn	DN: TxDOT	CK: TxDOT	DW: TXDOT	CK: TXDOT
©TxDOT June 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		69

DATE: 7/5/2023
FILE: RW-R1-22.dgn

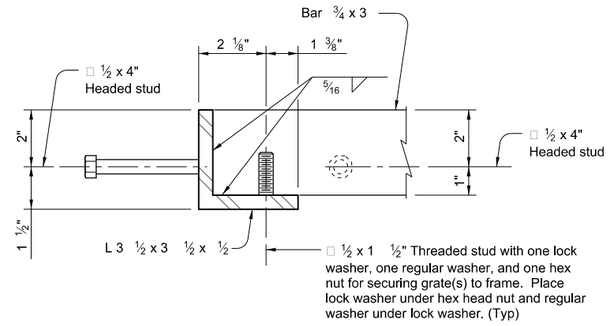


PLAN - ONE GRATE
(Weight = 109 lbs) (5)

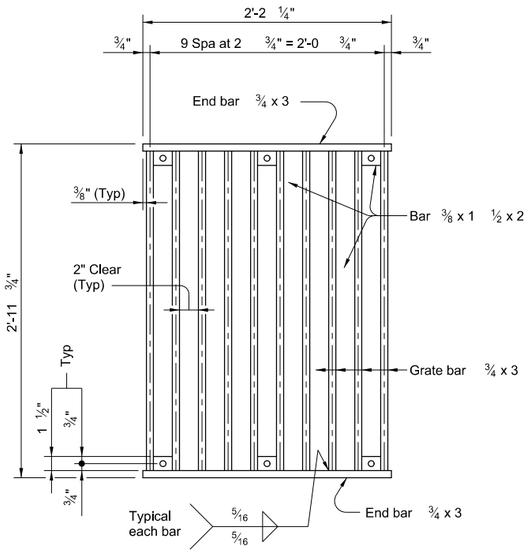


PLAN - TWO GRATES
(Weight = 163 lbs) (5)

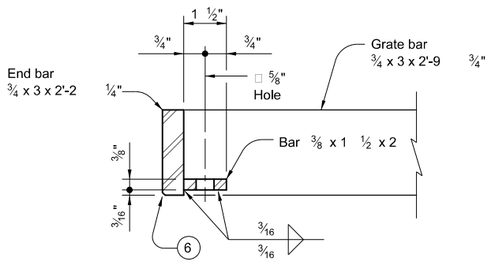
FRAME DETAILS



SECTION E-E



PLAN



SECTION THROUGH END

GRATE DETAILS

(Weight of one grate = 251 lbs) (5)

(5) Weight provided for Contractor's information only.

(6) Chamfer end bar as necessary to eliminate conflict with fillet on frame angles.

FABRICATION NOTES:

Assemble grate in shop to ensure fit in field.
Electric-arc end weld all headed and threaded studs to frame with complete fusion.

MATERIAL NOTES:

Provide Class C concrete (f'c = 3,600 psi.)
Provide Grade 60 reinforcing steel.
Provide A572 Grade 50 or A709 Grade 50 steel for grate and frame.
Galvanize grate, frame, nuts, and washers in accordance with Item 445, "Galvanizing."

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications.
The inlets shown are intended for use as roadway inlets adjacent to traffic rail foundations placed on mechanically stabilized earth (MSE) retaining walls. See Retaining Wall Traffic Railing Foundations (RW[TRF]) standard for details not shown.
These details must be used in conjunction with the RW(TRF) standard to develop specific details for submission with the shop drawings. The steel reinforcement shown is specifically for roadway inlet.
Payment for inlets shown on this standard, including frame and grates, will be in accordance with Item 465, "Junction Boxes, Manholes, and Inlets" by the following types:
Inlet (Complete) (Type MSE1) for one grate inlets
Inlet (Complete) (Type MSE2) for two grate inlets

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

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

ROADWAY INLET FOR MSE RETAINING WALL TRAFFIC RAIL FOUNDATION

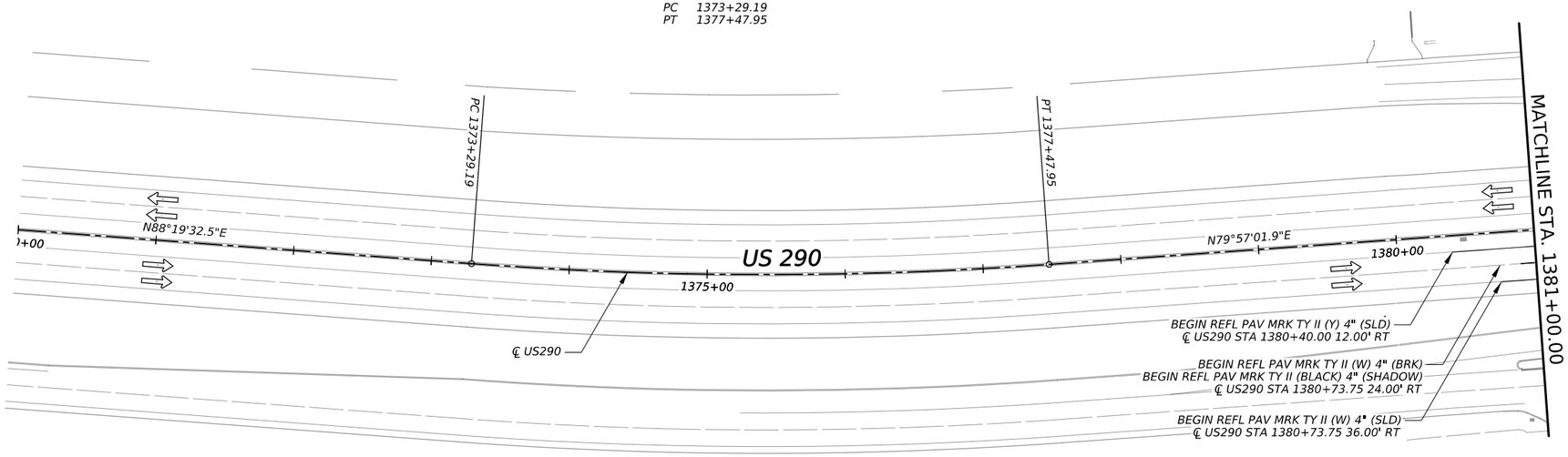
RW(RI)

FILE: RW-RI-22.dgn	DN: TXDOT	CK: TxDOT	DW: TXDOT	CK: TXDOT
©TxDOT June 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		70

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	**DESCRIPTION**	**UNIT**	**QUANTITY**
666 6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	7
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	26
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	60
666 6218	REFL PAV MRK TY II (BLACK) 4"(SHADOW)	LF	7
672 6010	REFL PAV MRKR TY II-C-R	EA	1

PI 1375+38.94
Δ 08°22'30.6" (LT)
D 02°00'00.0"
T 209.75'
L 418.76'
R 2864.79'
PC 1373+29.19
PT 1377+47.95



STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO. F-16341

US 290
PAVEMENT MARKINGS LAYOUT

STA 1370+00 TO STA 1381+00

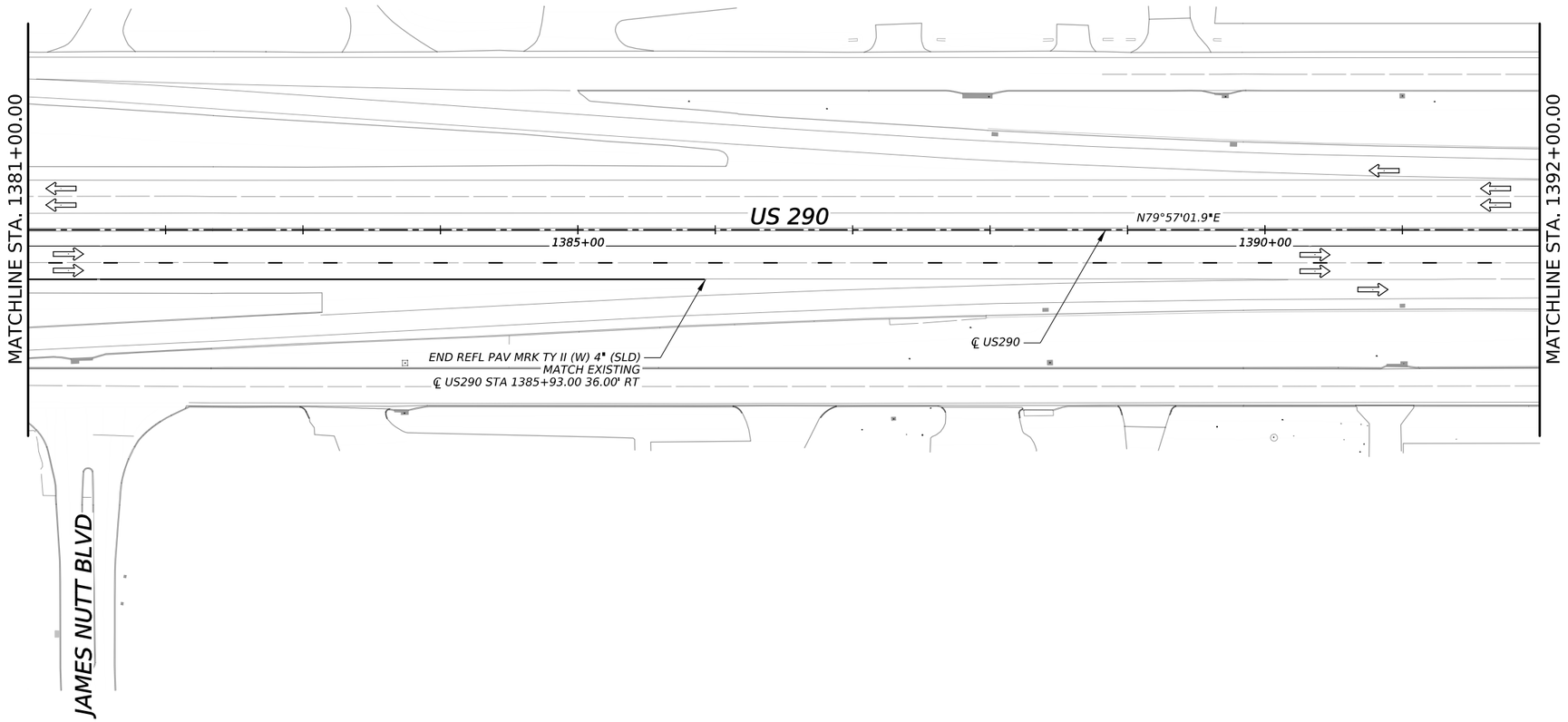
SHEET 1 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		71

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_290_PAVE_MARKINGS_01.dgn

CK: JMT
DW: JMT
CK: JMT
DN: JMT

ESTIMATED QUANTITIES			
BID CODE	DESCRIPTION	UNIT	QUANTITY
666 6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	275
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	493
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	1,100
666 6218	REFL PAV MRK TY II (BLACK) 4"(SHADOW)	LF	275
672 6010	REFL PAV MRKR TY II-C-R	EA	14



STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO. F-16341

Texas Department of Transportation

US 290
PAVEMENT MARKINGS LAYOUT

STA 1381+00 TO STA 1392+00

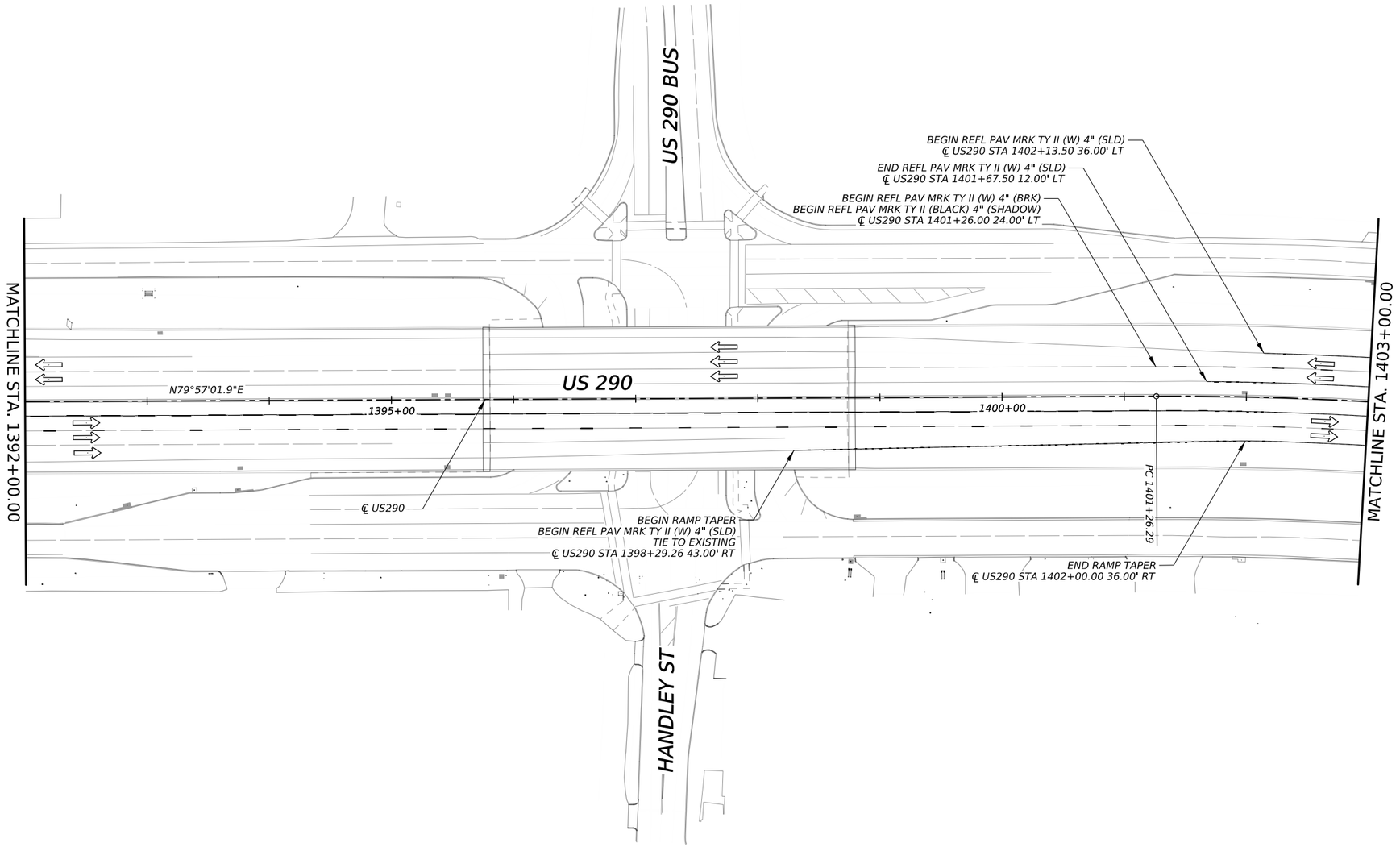
SHEET 2 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		72

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_290_PAVE_MARKINGS_02.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	DESCRIPTION	UNIT	QUANTITY
666 6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	319
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	556
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	1,232
666 6218	REFL PAV MRK TY II (BLACK) 4"(SHADOW)	LF	319
672 6010	REFL PAV MRKR TY II-C-R	EA	16



DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_290_PAVE_MARKINGS_03.dgn

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO.: F-16341

US 290
PAVEMENT MARKINGS LAYOUT

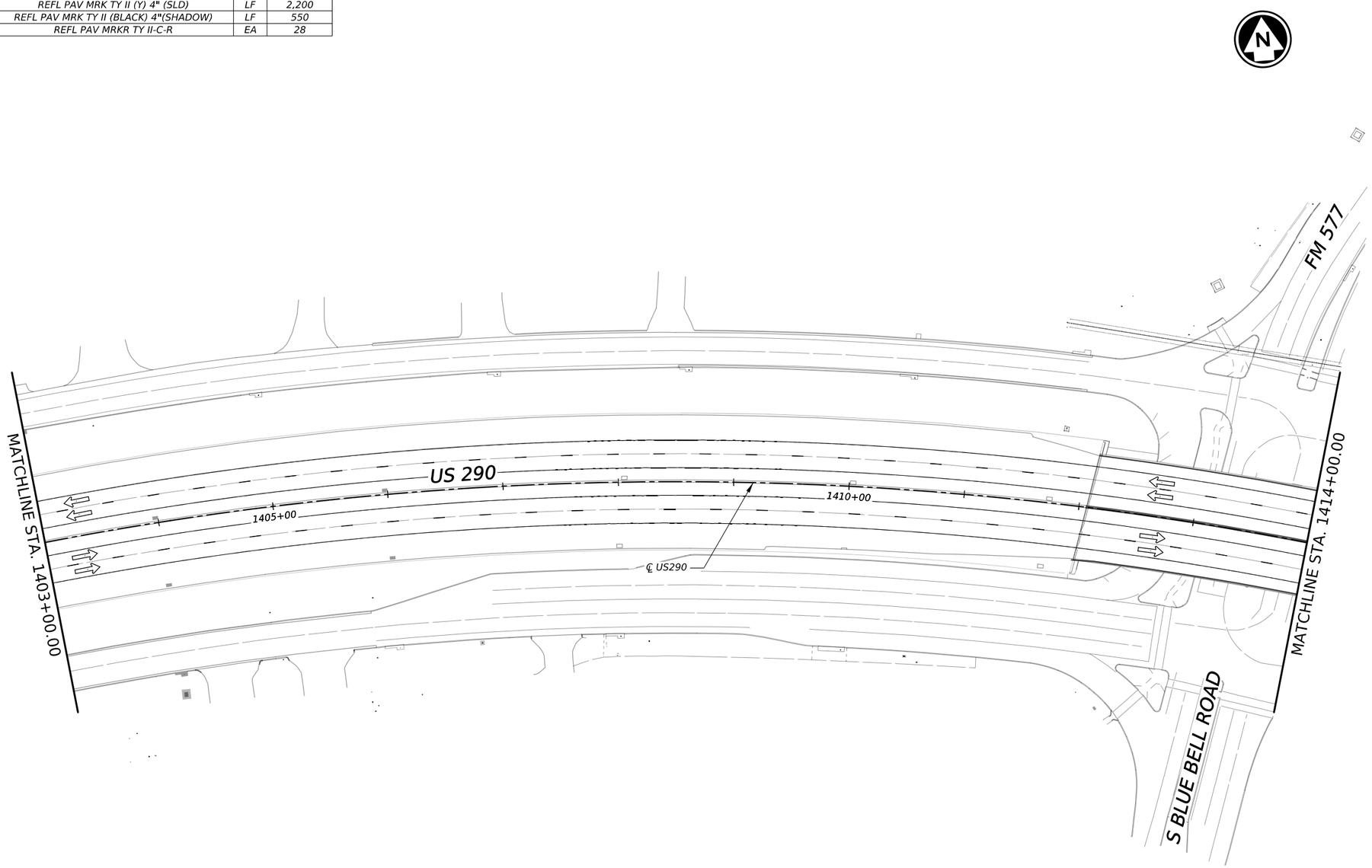
STA 1392+00 TO STA 1403+00

SHEET 3 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		73

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	DESCRIPTION	UNIT	QUANTITY
666 6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	550
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	2,200
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	2,200
666 6218	REFL PAV MRK TY II (BLACK) 4"(SHADOW)	LF	550
672 6010	REFL PAV MRKR TY II-C-R	EA	28



PI 1409+76.70
Δ 33°04'00.1" (RT)
D 02°00'00.0"
T 850.40'
L 1653.34'
R 2864.79'
PC 1401+26.29
PT 1417+79.63

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO. F-16341

Texas Department of Transportation

US 290
PAVEMENT MARKINGS LAYOUT

STA 1403+00 TO STA 1414+00

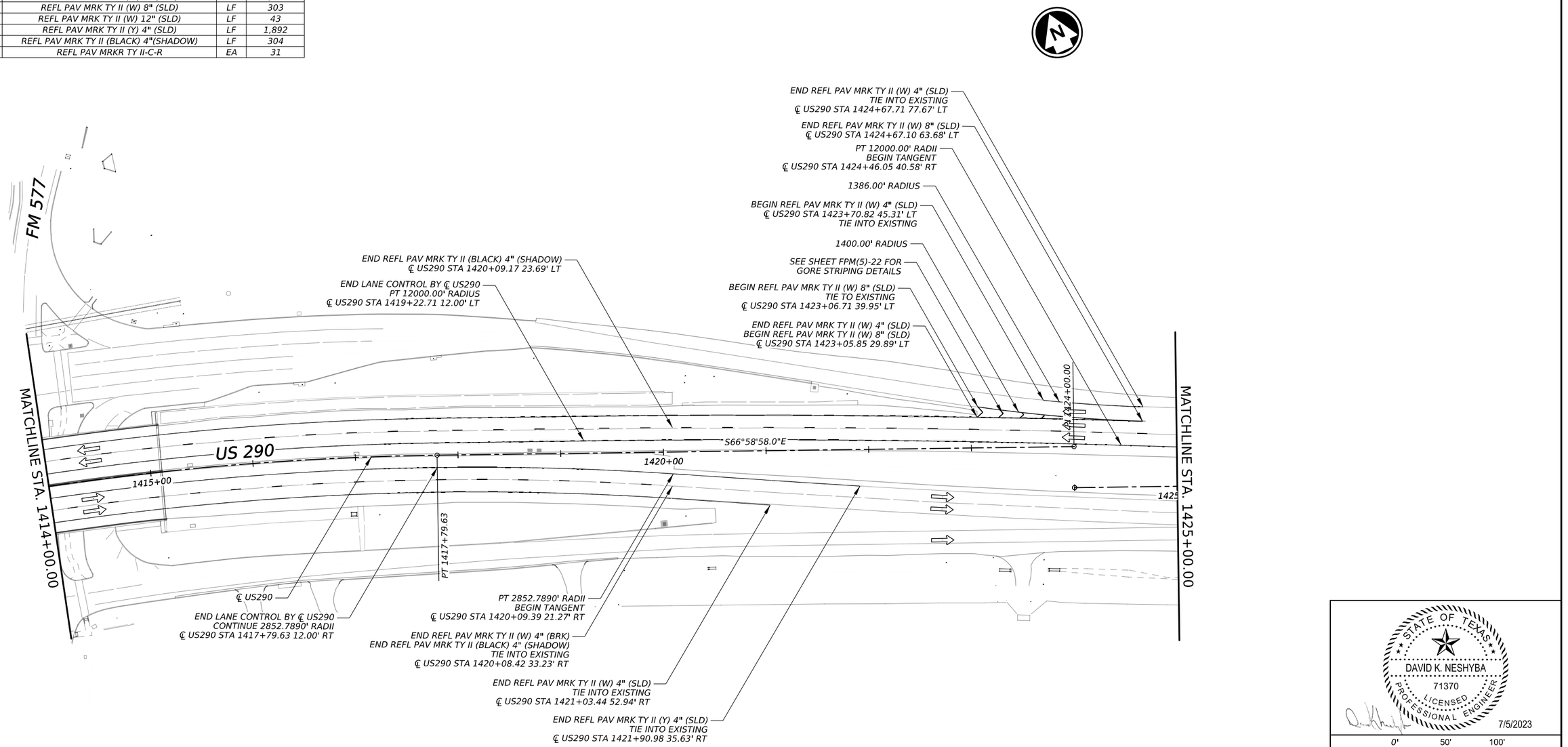
SHEET 4 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		74

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_290_PAVE_MARKINGS_04.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	DESCRIPTION	UNIT	QUANTITY
666 6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	427
666 6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	1,610
666 6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	303
666 6180	REFL PAV MRK TY II (W) 12" (SLD)	LF	43
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	1,892
666 6218	REFL PAV MRK TY II (BLACK) 4"(SHADOW)	LF	304
672 6010	REFL PAV MRKR TY II-C-R	EA	31



DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_290_PAVE_MARKINGS_05.dgn

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO.: F-16341

US 290
PAVEMENT MARKINGS LAYOUT

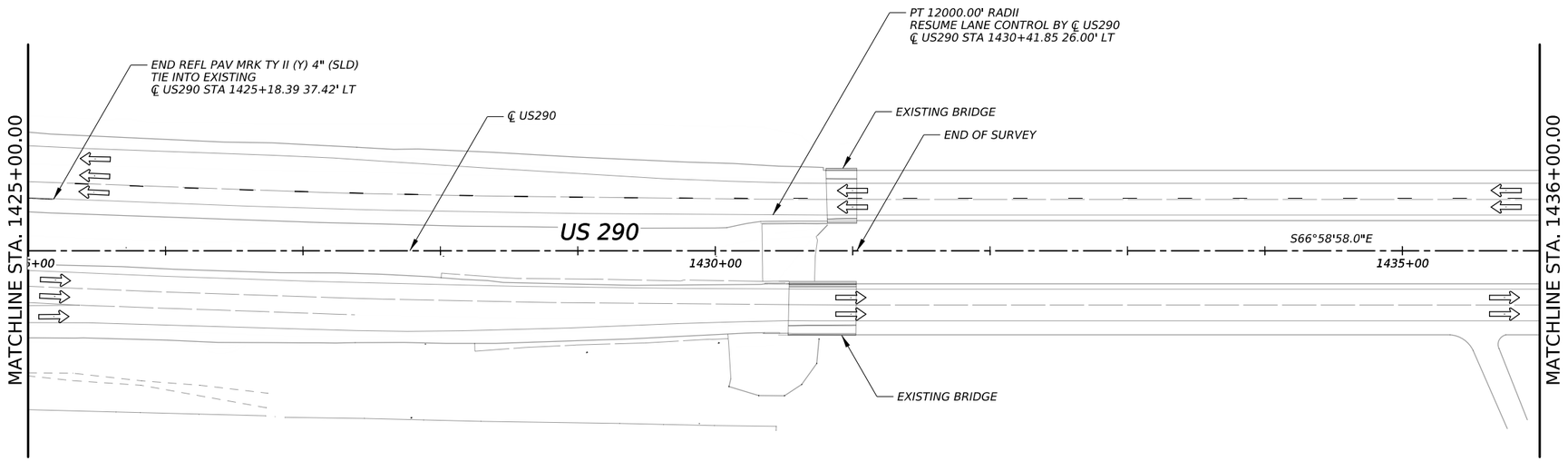
STA 1414+00 TO STA 1425+00

SHEET 5 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		75

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	DESCRIPTION	UNIT	QUANTITY
666 6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	275
666 6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	18
672 6010	REFL PAV MRKR TY II-C-R	EA	14



STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO. F-16341

US 290
PAVEMENT MARKINGS LAYOUT

STA 1425+00 TO STA 1436+00

SHEET 6 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		76

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_290_PAVE_MARKINGS_06.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	DESCRIPTION	UNIT	QUANTITY
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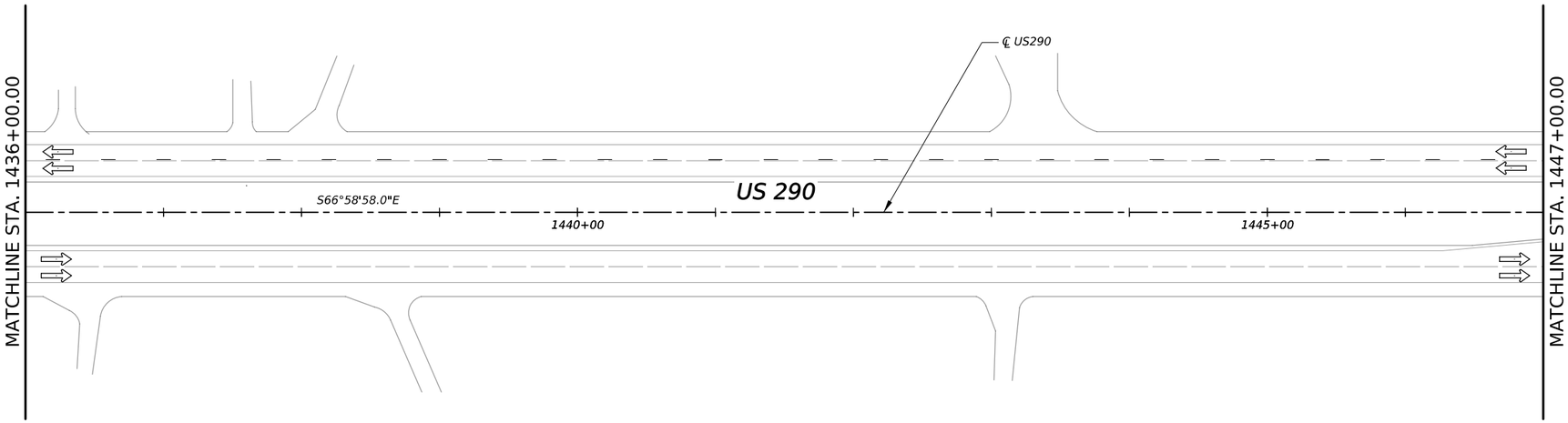
672 6010	REFL PAV MRKR TY II-C-R	EA	14



DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO. F-16341

Texas Department of Transportation

US 290
PAVEMENT MARKINGS LAYOUT

STA 1436+00 TO STA 1447+00

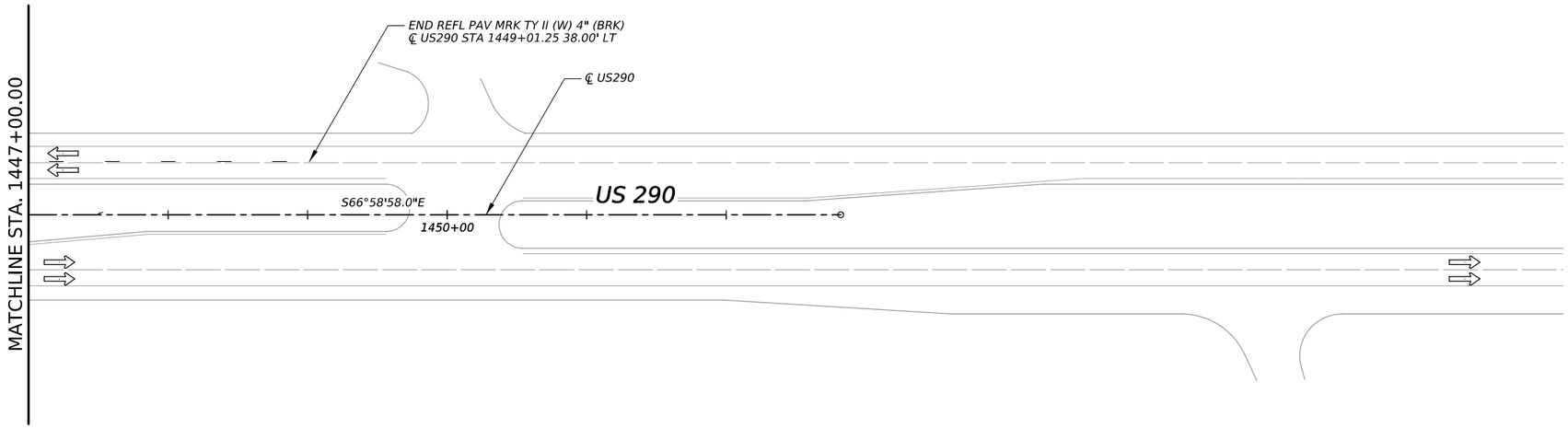
SHEET 7 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		77

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_290_PAVE_MARKINGS_07.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	DESCRIPTION	UNIT	QUANTITY
666 6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	50
672 6010	REFL PAV MRKR TY II-C-R	EA	3



DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_290_PAVE_MARKINGS_08.dgn

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO. F-16341

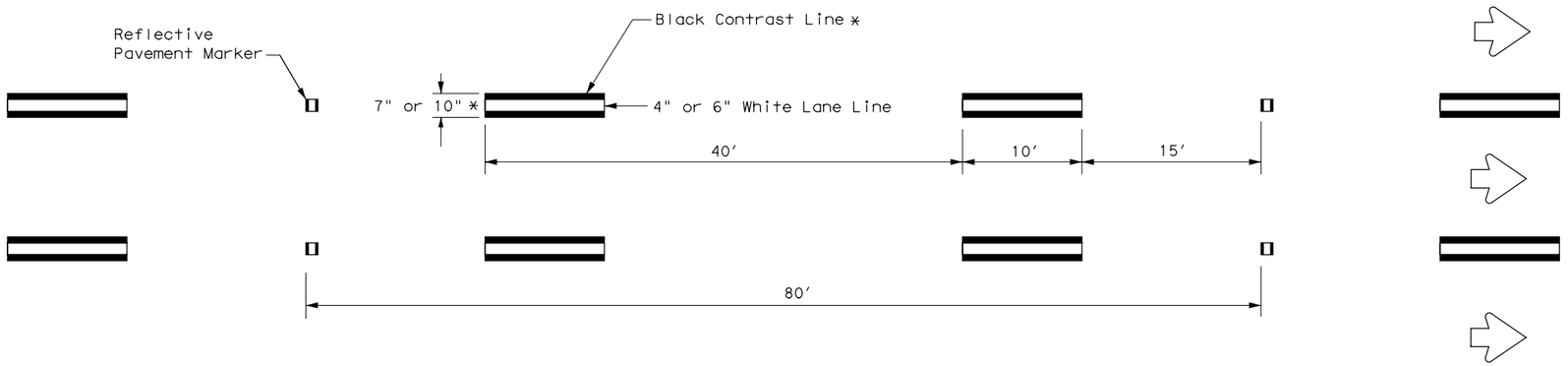
Texas Department of Transportation

US 290
PAVEMENT MARKINGS LAYOUT

STA 1447+00 TO END

SHEET 8 OF 8

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		78



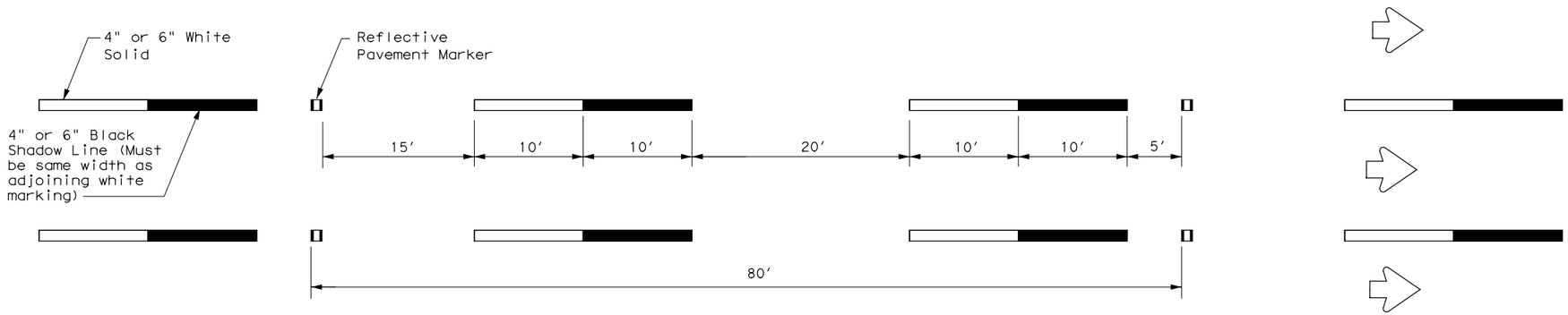
CONTRAST LANE LINE DESIGN

* See contrast line dimensions table for width of black line.

CONTRAST LINE DIMENSIONS		
White	Black (per side)	Total Width
4"	1.5"	7"
6"	2"	10"

GENERAL NOTES

1. Contrast and Shadow markings may only be used on concrete pavements.
2. Contrast and Shadow markings shall not be used on edge lines.
3. Contrast lane lines shall be permanent prefabricated pavement markings meeting DMS 8240.
4. Shadow lane line designs shall be a liquid markings system approved by TxDOT.
5. All raised reflective pavement markers placed in broken lines shall be placed in line with and midway between the white stripes.
6. See PM(2) for raised reflective pavement markings installation details.



SHADOW LANE LINE DESIGN

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

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

Texas Department of Transportation

Traffic Operations Division Standard

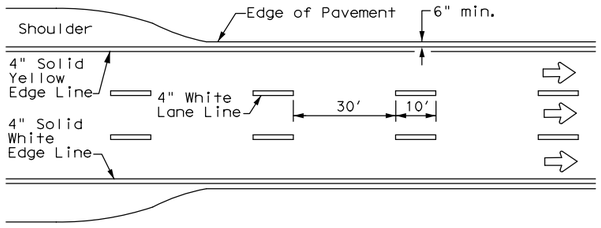
CONTRAST AND SHADOW PAVEMENT MARKINGS

CPM(1)-14

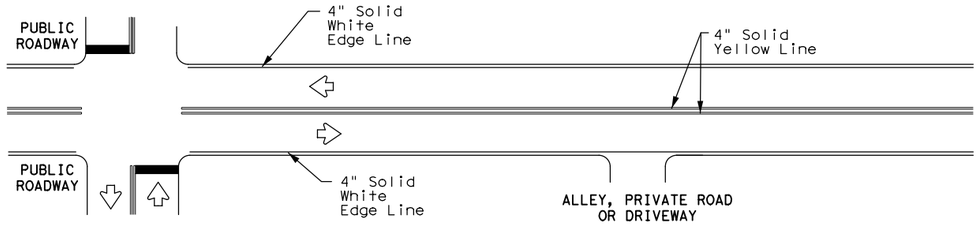
FILE: CPM(1)14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		79

22N

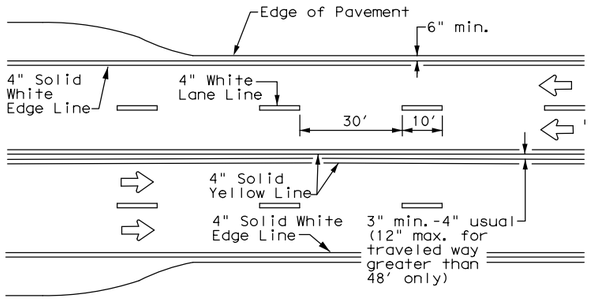
DATE: 7/5/2023
FILE: cpm(1)-14.dgn



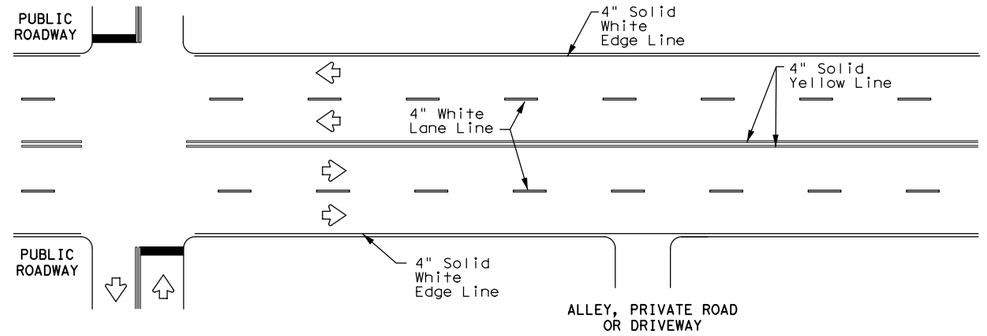
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



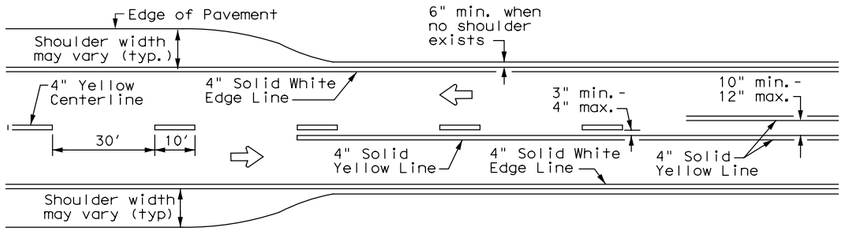
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



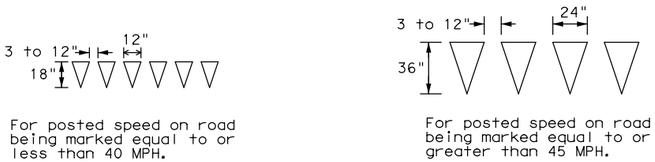
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



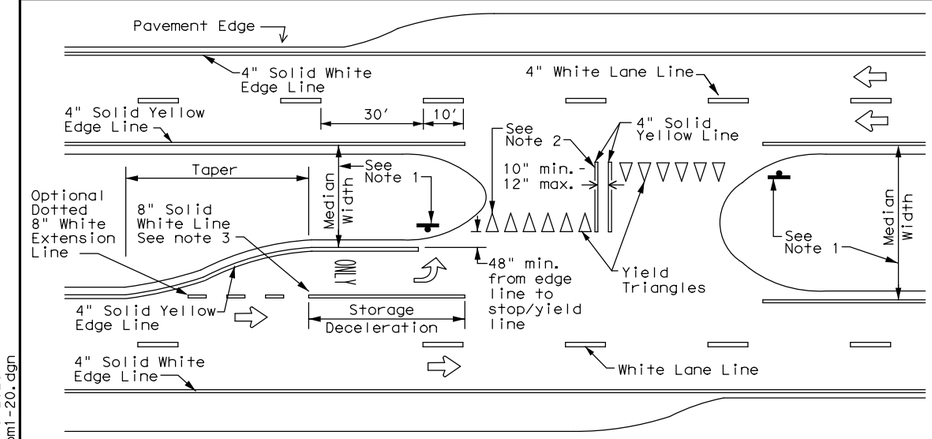
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.

2. Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield traingles shall only be used with yield signs.

3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

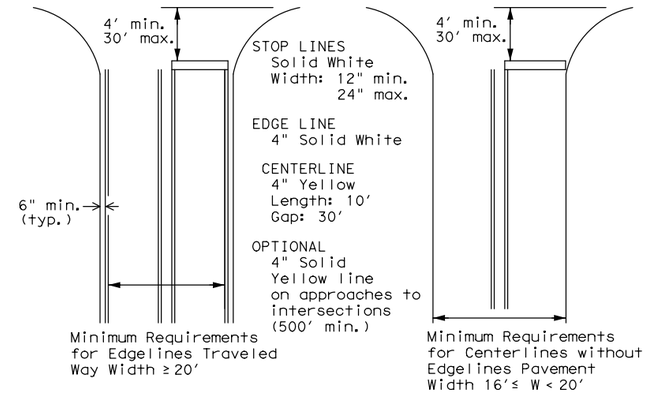
GENERAL NOTES

1. Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.

2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

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

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



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

Texas Department of Transportation

Traffic Safety Division Standard

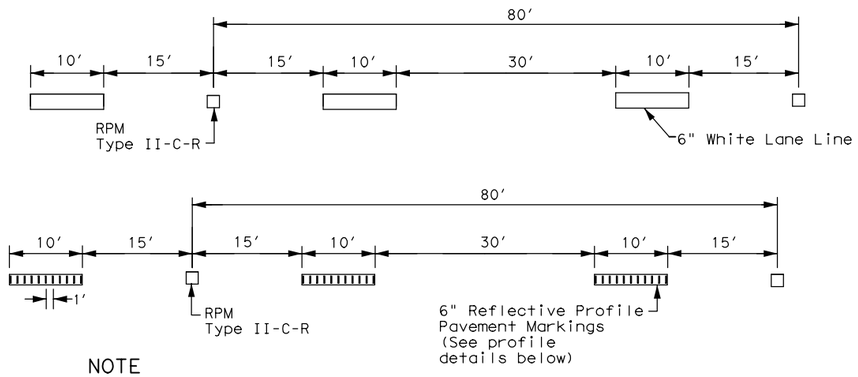
TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-20

FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0114	10	104	US290
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	BRY	WASHINGTON		80

22A

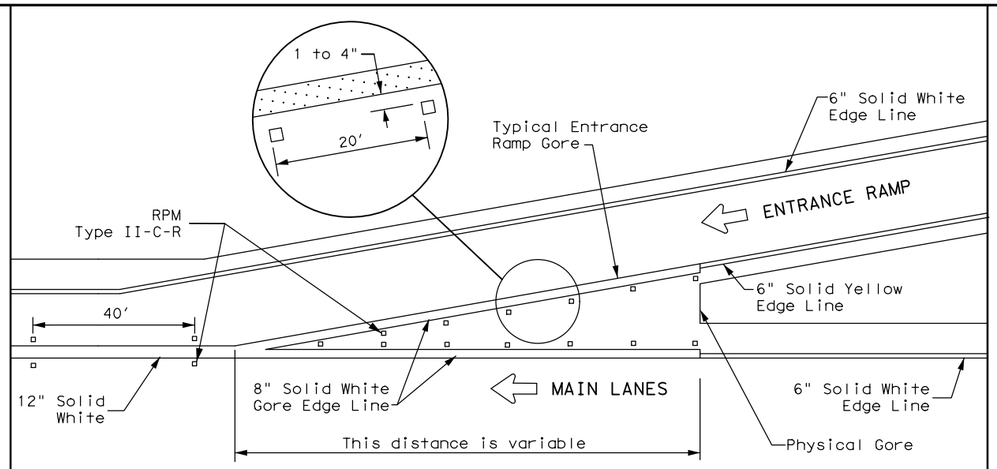
DATE: 7/5/2023
FILE: pm1-20.dgn



NOTE

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

TRAFFIC LANE LINES PAVEMENT MARKING



TYPICAL ENTRANCE RAMP GORE MARKING

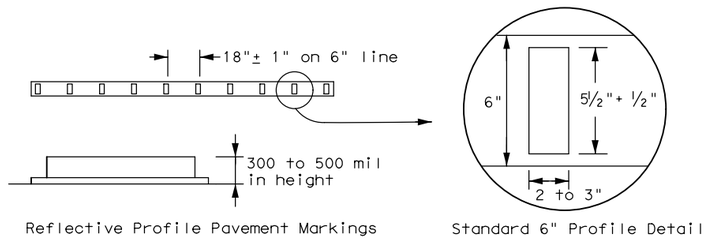
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

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

GENERAL NOTE

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



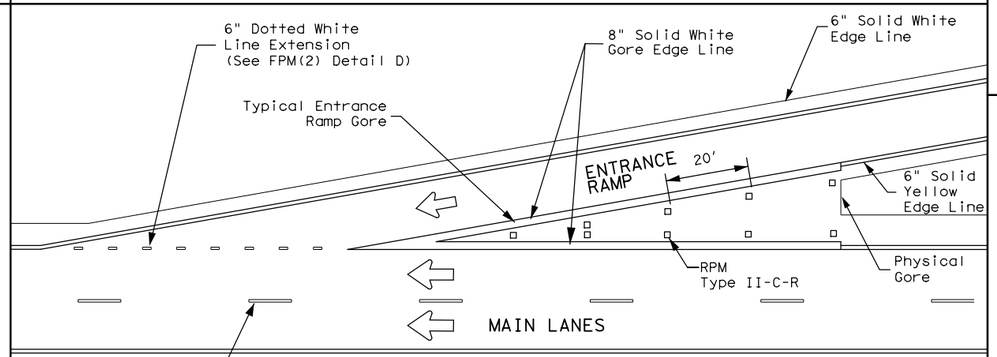
Reflective Profile Pavement Markings

Standard 6" Profile Detail

NOTE

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

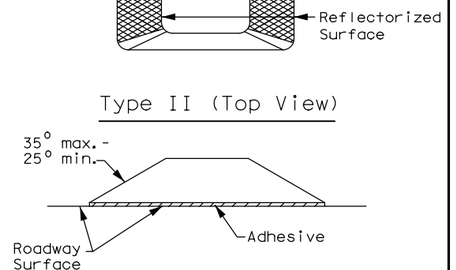
EDGE LINE PAVEMENT MARKINGS



NOTE

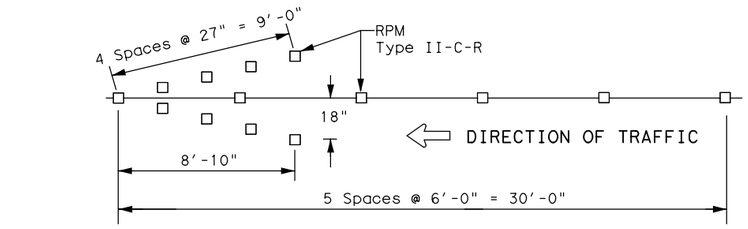
See the Roadway Design Manual Chapter 3 to determine if a tapered acceleration lane may be used.

TAPERED ACCELERATION LANE



SECTION A

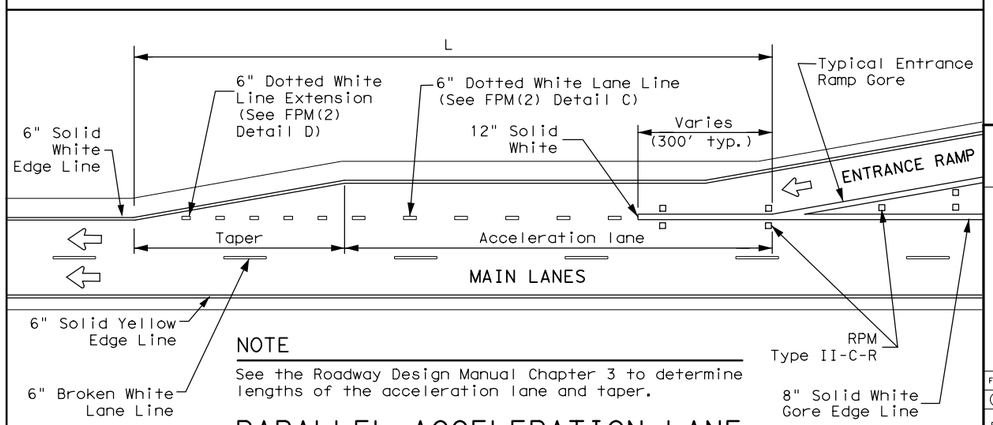
REFLECTORIZED RAISED PAVEMENT MARKER (RPM)



NOTES

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

WRONG WAY ARROW



NOTE

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

PARALLEL ACCELERATION LANE

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS WITH RAISED PAVEMENT MARKERS

FPM(1)-22

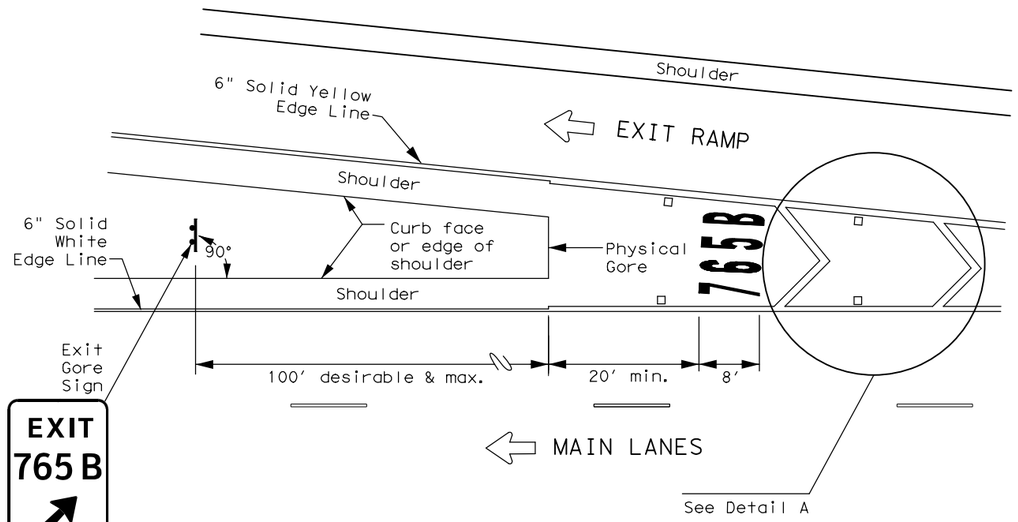
FILE: fpm(1)-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	10	104	US290
5-74 8-00 2-12	DIST	COUNTY		SHEET NO.
4-92 2-08 10-22	BRY	WASHINGTON		81
5-00 2-10				

23A

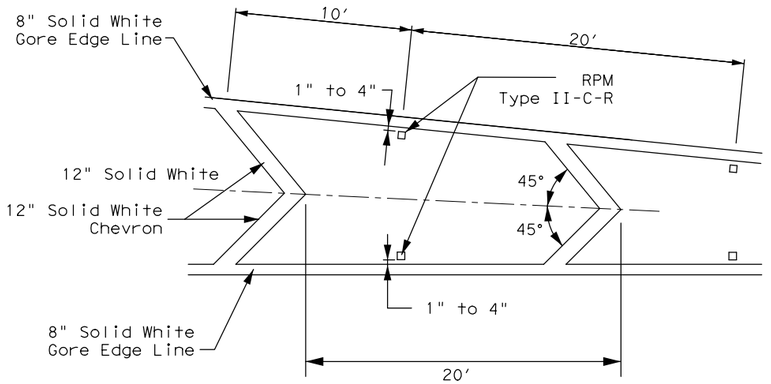
DATE: 7/5/2023
FILE: fpm(1)-22.dgn

EXIT NUMBER PAVEMENT MARKING NOTES

1. Minimum 8 foot white exit number pavement markings should be used, unless otherwise noted.
2. Spacing between letters and numbers should be approximately 4 inches.
3. Pavement markings are to be located as specified elsewhere in the plans.
4. Numbers and Letters details can be found in the Standard Highway Design for Texas (SHSD) Section 12 at http://www.txdot.gov



MARKINGS WITH EXIT NUMBER



NOTES

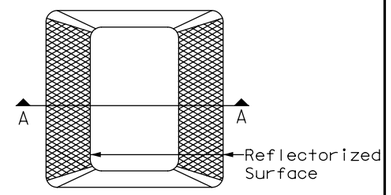
1. Raised pavement markers shall be centered between each chevron or neutral area line.
2. For more information, see Reflectorized Raised Pavement Marker Detail.

DETAIL A

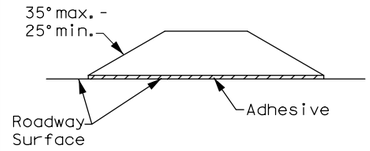
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

LEGEND	
⇦	Traffic flow
□	Reflectorized Raised Markers (RPM) Type II-C-R

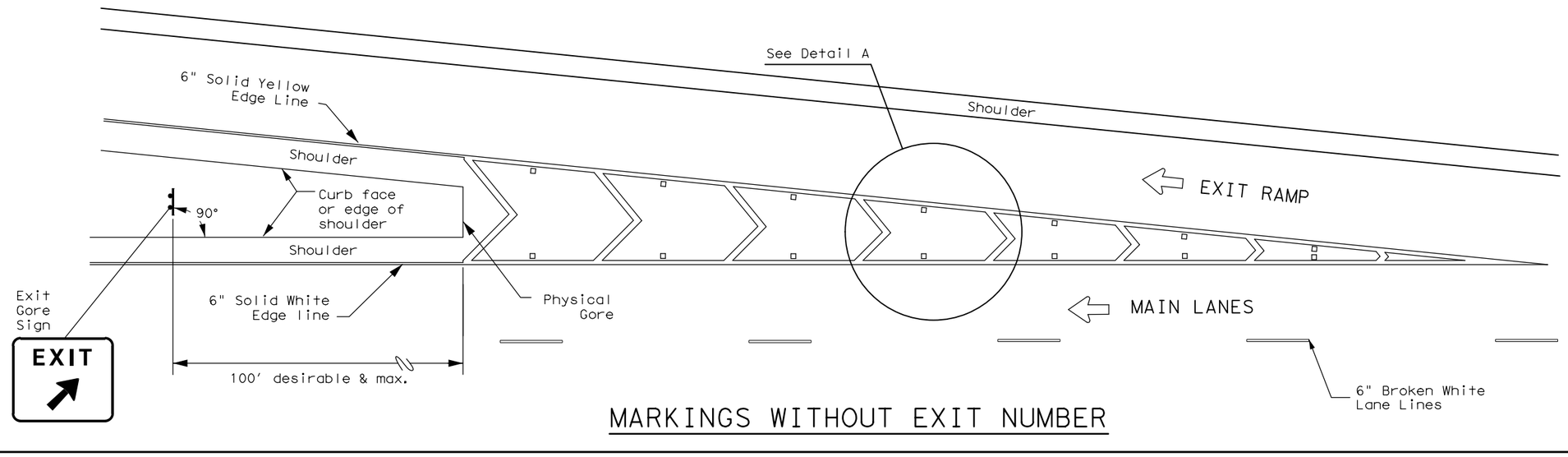


Type II (Top View)



SECTION A

REFLECTORIZED RAISED PAVEMENT MARKER (RPM)



MARKINGS WITHOUT EXIT NUMBER

Texas Department of Transportation

Traffic Safety Division Standard

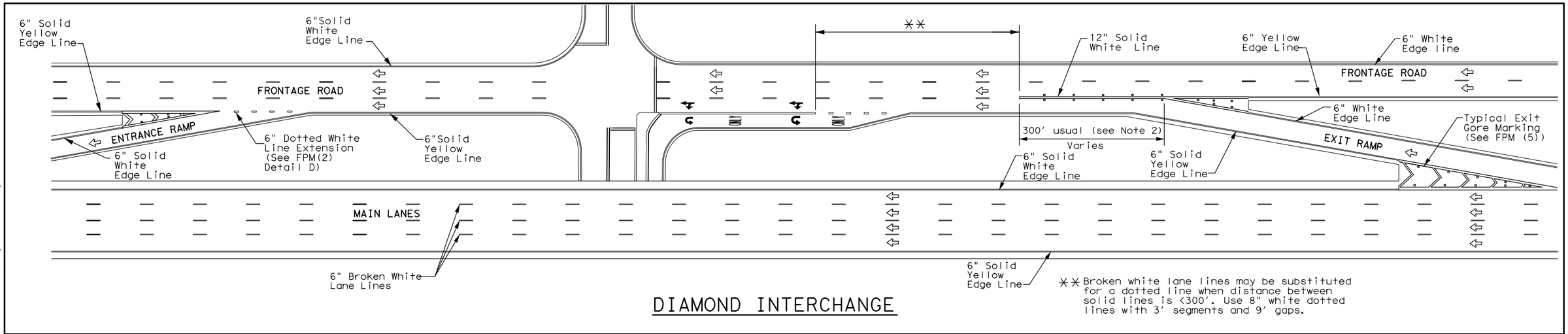
EXIT GORE PAVEMENT MARKINGS

FPM(5)-22

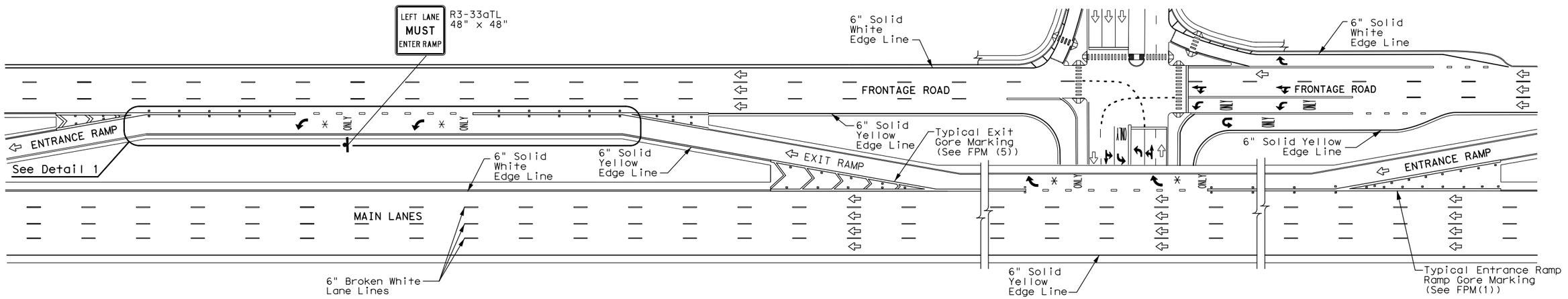
FILE: fpm(5)-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-19 10-22	0114	10	104	US290
	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		82

23E

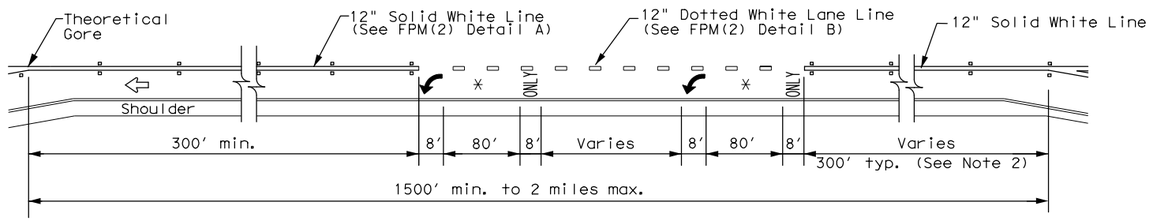
DATE: 7/5/2023
FILE: fpm(5)-22.dgn



DIAMOND INTERCHANGE



URBAN X-RAMP WITH FRONTAGE ROAD AUXILIARY LANE



DETAIL 1

(Frontage Road Auxiliary Lane for X-Ramps)

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

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

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") dotted lane line (see FPM(2) Detail B) is used to separate a through lane that continues beyond the interchange from an adjacent mandatory exit lane.
4. Edge lines are not required in curb and gutter sections of frontage roads.
5. See FPM(1) for traffic lane line pavement marking details.

LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R
✳	Arrow markings are optional, however "ONLY" is required if arrow is used

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD FREEWAY AND FRONTAGE ROAD PAVEMENT MARKINGS

FPM(6)-22

FILE: fpm(6)-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 10-22	0114	10	104	US290
	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		83

23F

DATE: 7/5/2023
FILE: fpm(6)-22.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	DESCRIPTION	UNIT	QUANTITY
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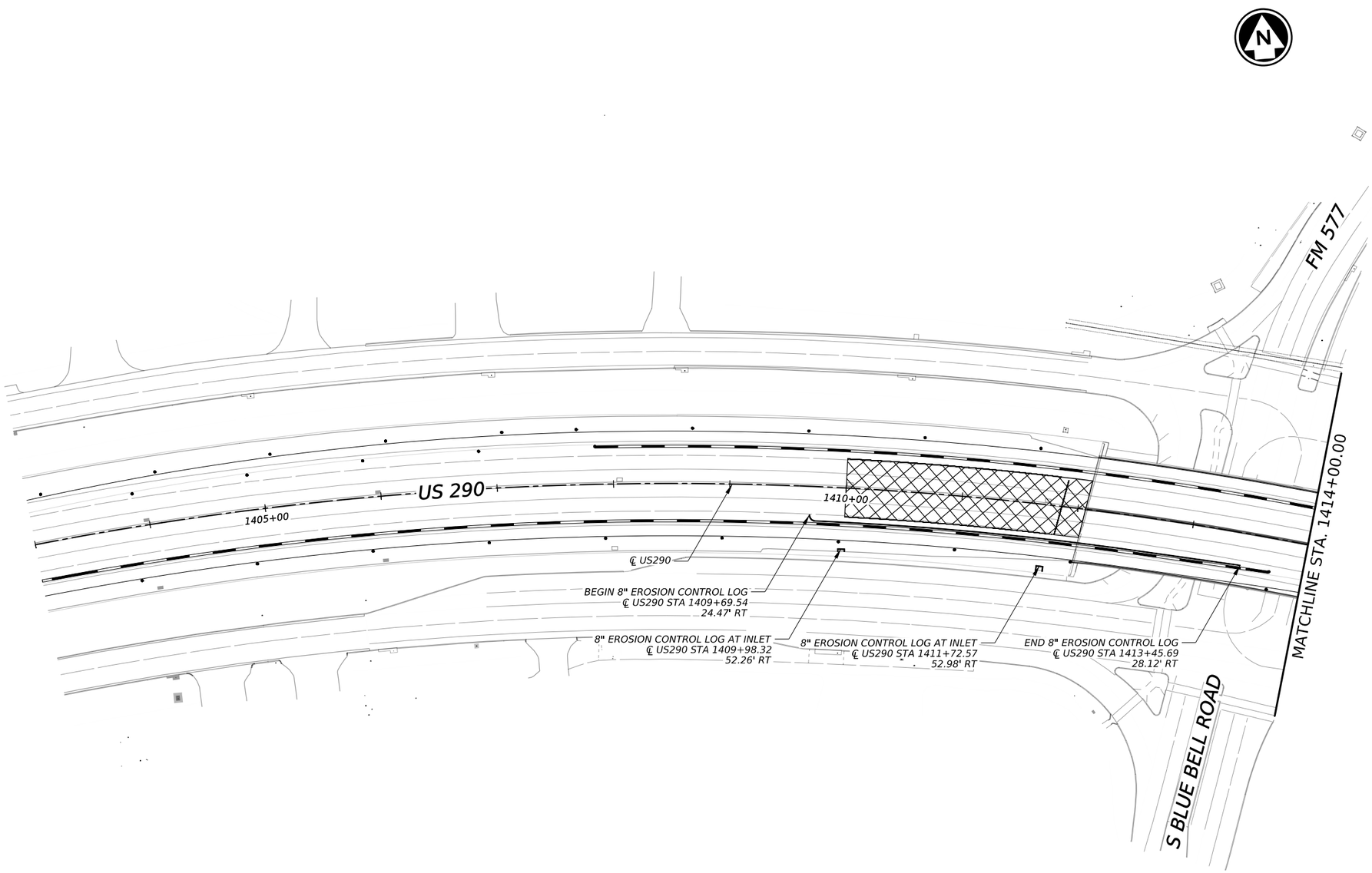
506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	375



LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- SOIL RET. BLANKET (TYPE E)
- CELL FBR MLCH SEED
- BLOCK SOD
- SCF — SEDIMENT CONTROL FENCE
- RFD1 — ROCK FILTER DAMS (TY I)
- EROSION CONTROL LOGS 8"

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO. F-16341

Texas Department of Transportation

US 290

SW3P LAYOUT
PHASE 1

STA 1403+00 TO STA 1414+00

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		84

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_290_SW3P_04.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES

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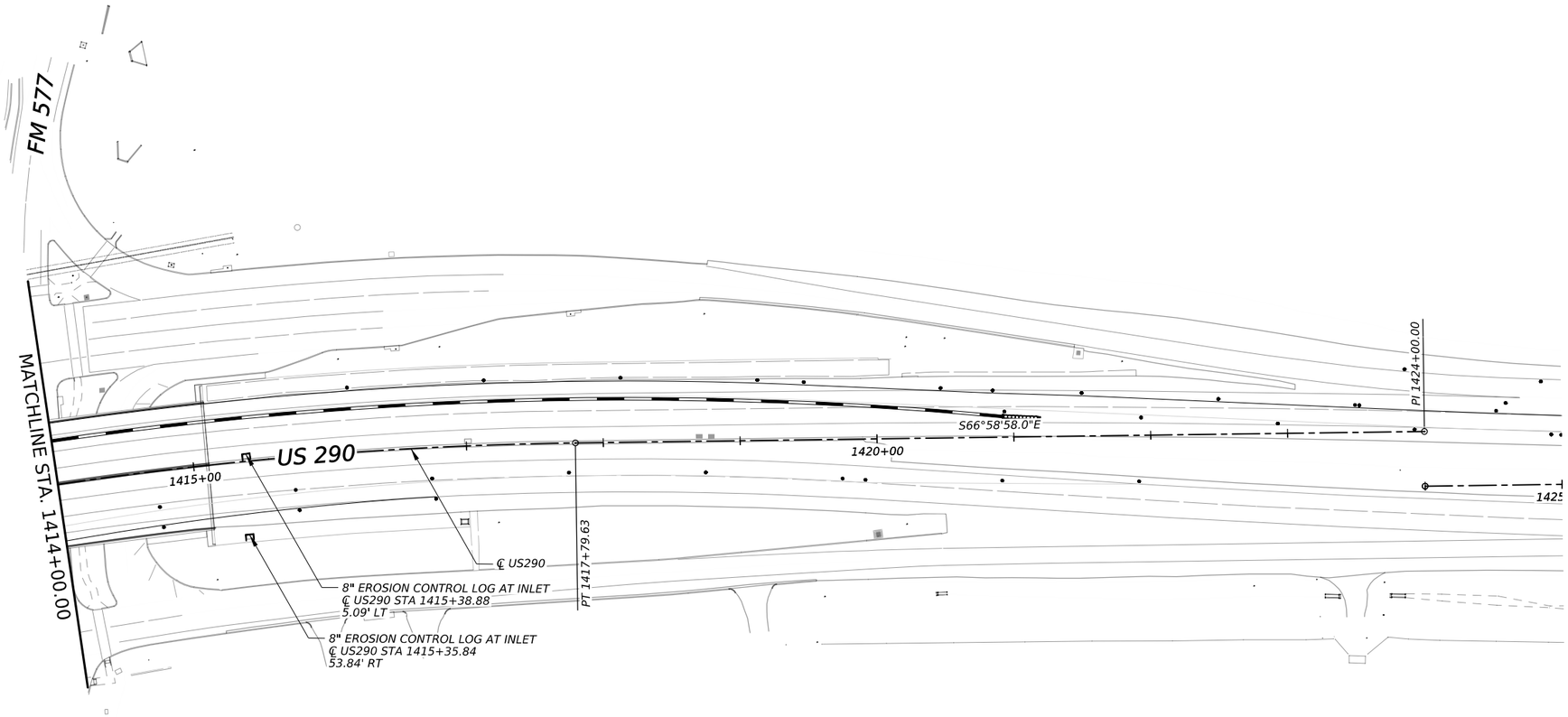

LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- SOIL RET. BLANKET (TYPE E)
- CELL FBR MLCH SEED
- BLOCK SOD
- (SCF) SEDIMENT CONTROL FENCE
- (RFD) ROCK FILTER DAMS (TY I)
- EROSION CONTROL LOGS 8"

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO.: F-16341

US 290
SW3P LAYOUT
PHASE 1
STA 1414+00 TO STA 1425+00

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		85

DATE: 7/5/2023
FILE: JMT_BRYCEC_TASK04_290_SW3P_05.dgn

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DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
BID CODE	**DESCRIPTION**	**UNIT**	**QUANTITY**
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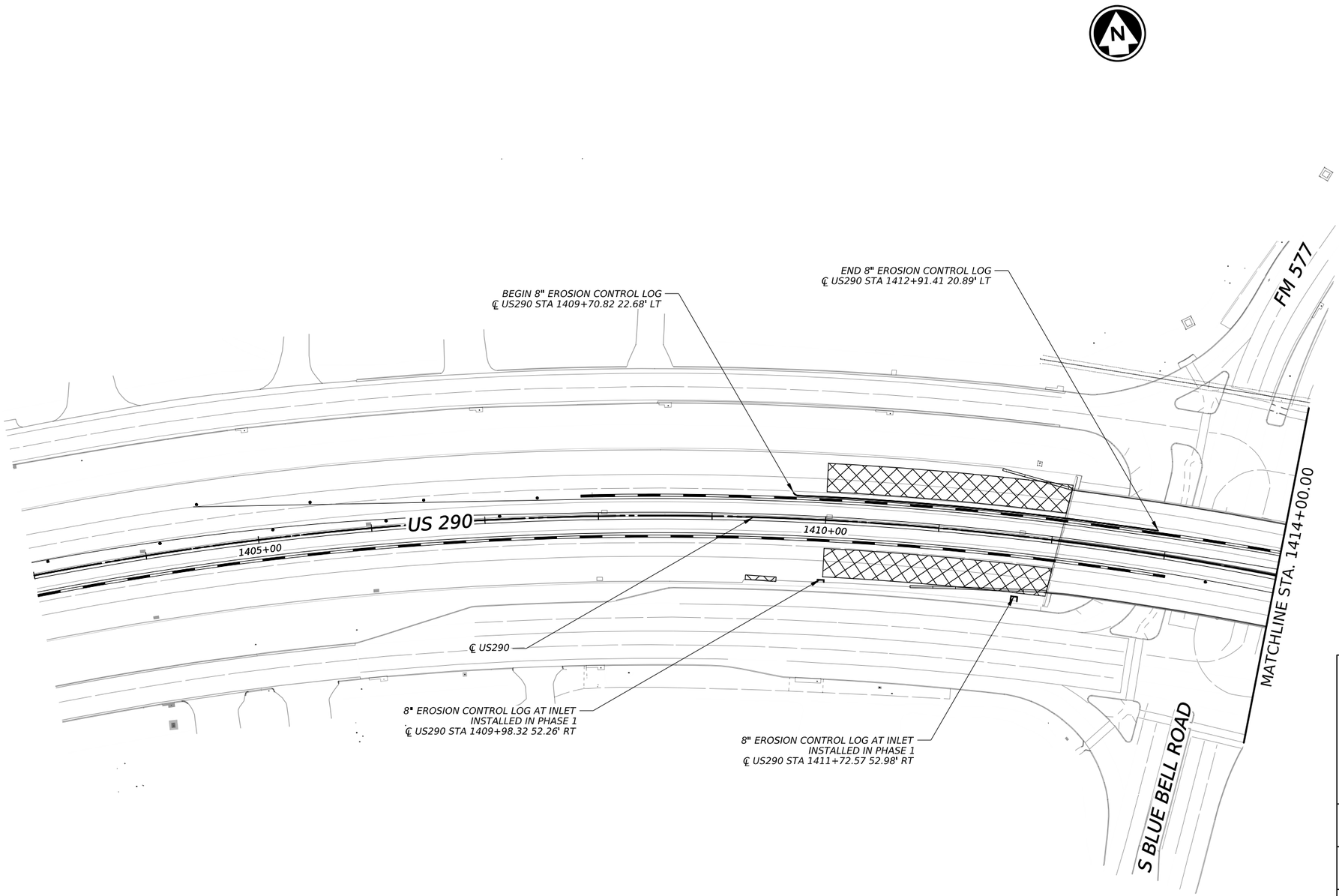

LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- SOIL RET. BLANKET (TYPE E)
- CELL FBR MLCH SEED
- BLOCK SOD
- SCF — SEDIMENT CONTROL FENCE
- RFD1 — ROCK FILTER DAMS (TY I)
- EROSION CONTROL LOGS 8"

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED
PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO.: F-16341

US 290
SW3P LAYOUT
PHASE 2

STA 1403+00 TO STA 1414+00

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		86

DATE: 7/5/2023
FILE: 290-CL - 290-CL-3-1.dgn

CK: JMT
DW: JMT
CK: JMT
DW: JMT

ESTIMATED QUANTITIES			
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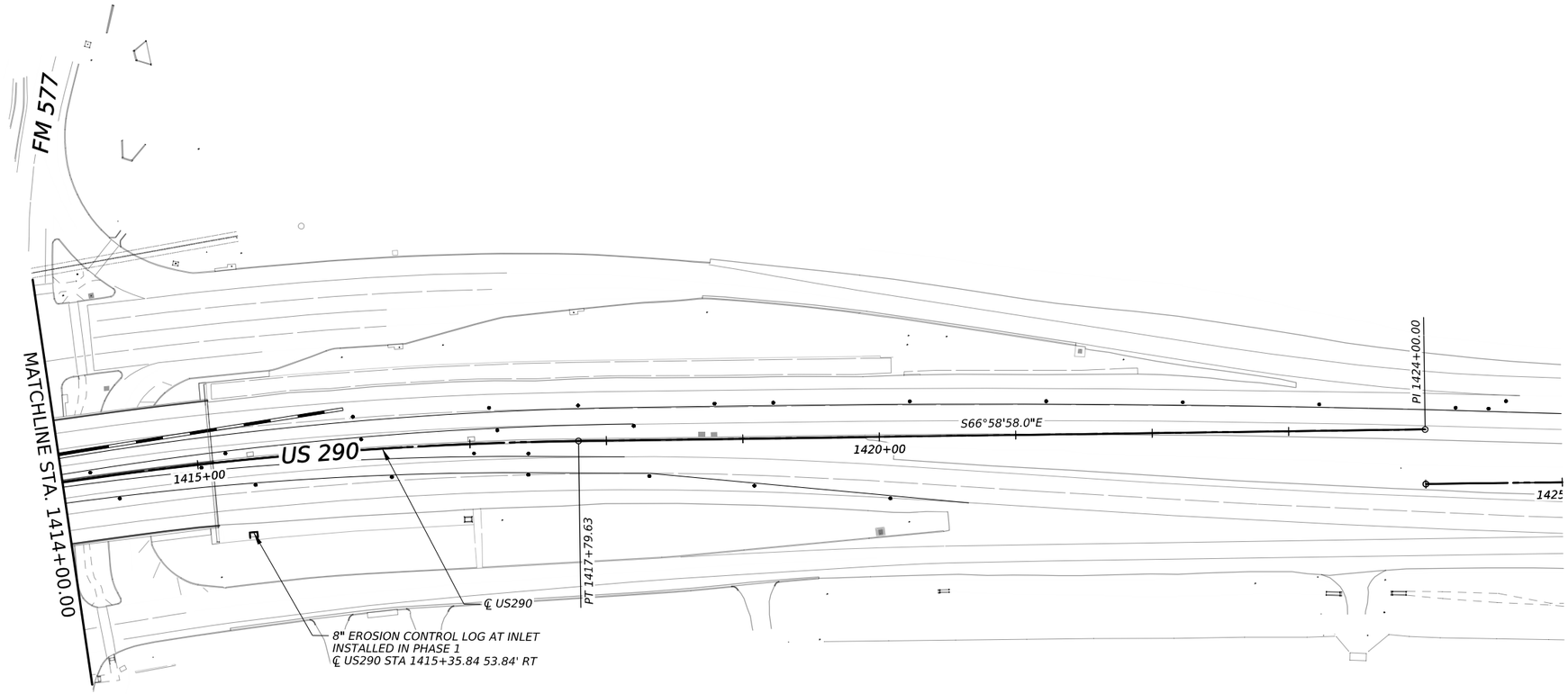


LEGEND:

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREV STEP
- SOIL RET. BLANKET (TYPE E)
- CELL FBR MLCH SEED
- BLOCK SOD
- (SCF) SEDIMENT CONTROL FENCE
- (RFD) ROCK FILTER DAMS (TY I)
- EROSION CONTROL LOGS 8"

STATE OF TEXAS
DAVID K. NESHYBA
71370
LICENSED PROFESSIONAL ENGINEER
7/5/2023

0' 50' 100'
SCALE IN FEET

TBPE REGISTRATION NO. F-16341

US 290
SW3P LAYOUT
PHASE 2

STA 1414+00 TO STA 1425+00

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0114	10	104	US290
DIST	COUNTY		SHEET NO.
BRY	WASHINGTON		87

DATE: 7/5/2023
FILE: 290-CL - 290-CL-4.dgn

DATE: 7/5/2023
FILE: JMF_BRY_EC_TASK04_290_EPIC.dgn

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

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

☒ Required Action ☐ No Action Required

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction
1. City of Bryan
2. Brazos County

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

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

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

☒ No Permit Required

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

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

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP#

Required Actions: List locations of waters of the US.

1. NEPA CLEARANCE 06/27/2023
2. ENVIRONMENTAL CLEAR TO LET DATE 06/27/2023

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

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

III. CULTURAL RESOURCES

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

☐ Required Action ☒ No Action Required

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.

☐ Required Action ☒ No Action Required

Action No.

1.

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

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

☒ Required Action ☐ No Action Required

Action No.

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

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

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

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

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

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

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

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

LIST OF ACRONYMS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used. Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act. Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the Engineerimmediately. The Contractor shall be responsiblefor the proper containment and cleanup of all product spills.

Contact the Engineer if any of the follwing are detected:
* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☒ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notifiy DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discoverd on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ Required Action ☐ No Action Required

Action No.

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

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

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

VII. OTHER ENVIRONMENTAL ISSUES

☐ Required Action ☒ No Action Required

Action No.

1.

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

Contacts:

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

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	0114	10	104	US290
	DIST	COUNTY		SHEET NO.
	BRY	WASHINGTON		88

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

For all projects with any soil disturbing activities, TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office. If no field office is available, then this SWP3 shall be kept at the appropriate TxDOT Area Office.

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0114-10-104

1.2 PROJECT LIMITS:
From: At FM 577 Overpass

To:

1.3 PROJECT COORDINATES:
BEGIN: (Lat)30.1433412 ,(Long)-96.3644441

END: (Lat)30.1430004, (Long) -96.3632526

1.4 TOTAL PROJECT AREA (Acres):1.08 AC

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.00 AC

1.6 NATURE OF CONSTRUCTION ACTIVITY:
Repair of Bridge Approach Pavement, Approach Slab, and Railing

1.7 MAJOR SOIL TYPES:

Soil Type	Description
SELECT RETAINING WALL FILL	SELECT RETAINING WALL FILL

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

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

Type	Sheet #s

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

1.9 CONSTRUCTION ACTIVITIES:
(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.3.)

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

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

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

Tributaries	Classified Waterbody
N/A	

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

1.12 ROLES AND RESPONSIBILITIES: TxDOT

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

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

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

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			89
STATE	STATE DIST.	COUNTY	
TEXAS	BRY	WASHINGTON	
CONT.	SECT.	JOB	HIGHWAY NO.
0114	10	104	US 290

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

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

2.2 SEDIMENT CONTROL BMPs:

T / P

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

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
N/A		

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

- ☐ Chemical Management
- ☒ Concrete and Materials Waste Management
- ☒ Debris and Trash Management
- ☐ Dust Control
- ☐ Sanitary Facilities
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To
N/A		

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3 .

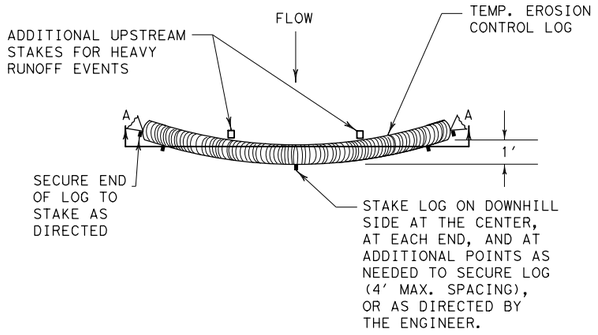
2.9 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3.

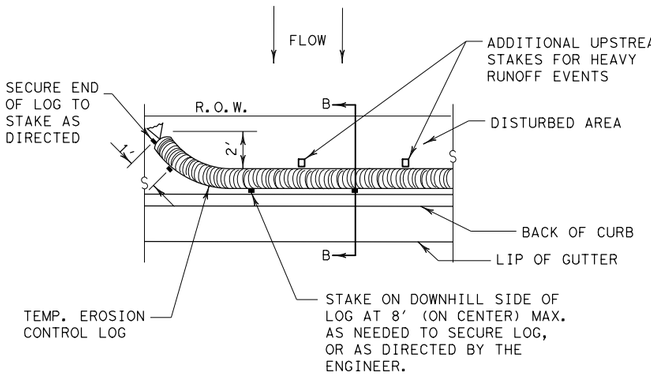
STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

Texas Department of Transportation

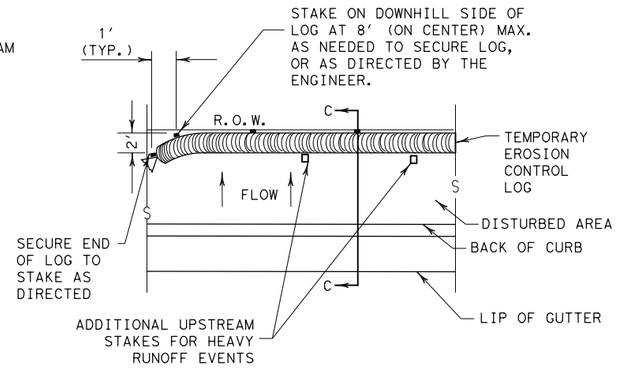
FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			89A
STATE	STATE DIST.	COUNTY	
TEXAS	BRY	WASHINGTON	
CONT.	SECT.	JOB	HIGHWAY NO.
0114	10	104	US 290



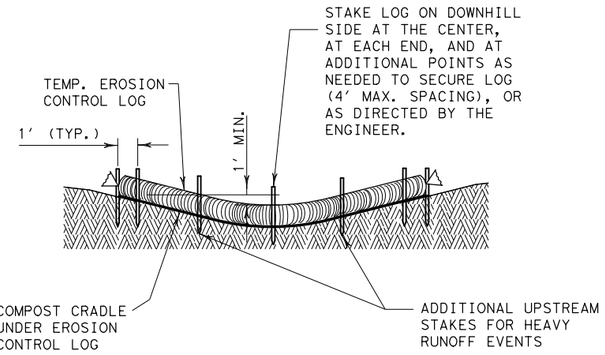
PLAN VIEW



PLAN VIEW



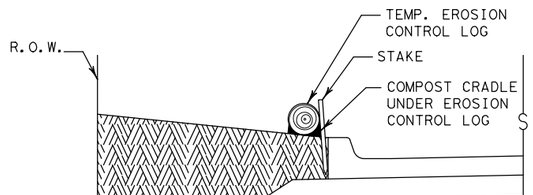
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

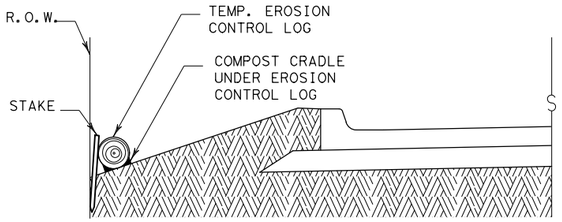
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

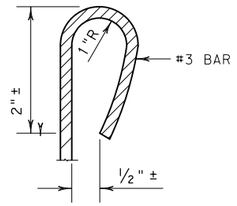
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL

LEGEND

- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

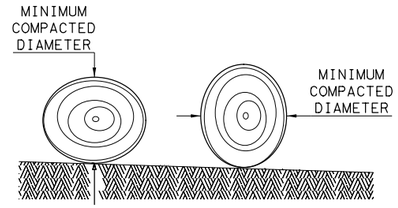
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

Texas Department of Transportation | Design Division Standard

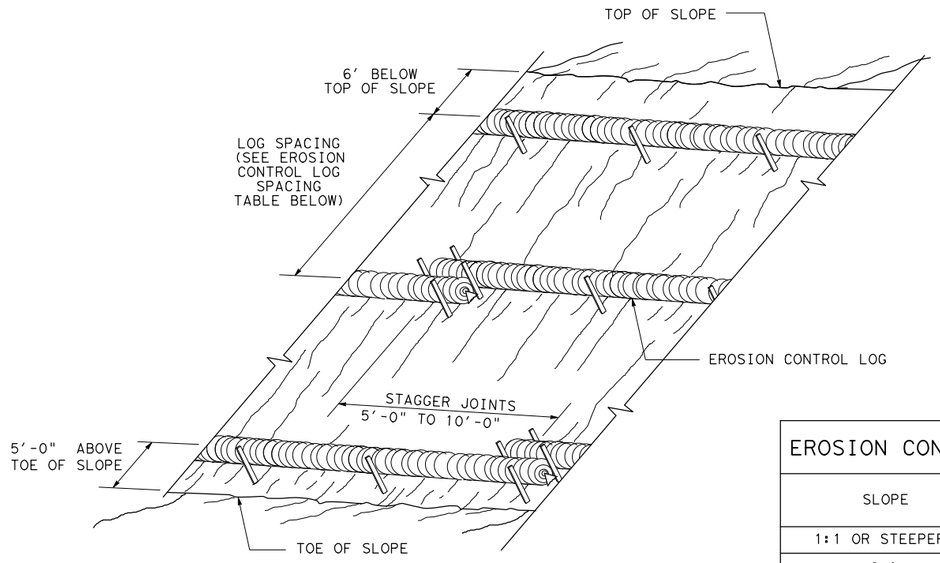
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

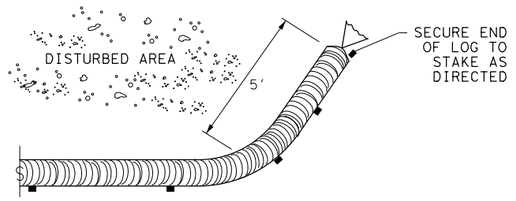
FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0114	10	104		US290		
	DIST	COUNTY			SHEET NO.		
	BRY	WASHINGTON			90		

DATE: 7/5/2023
FILE: ec916.dgn



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

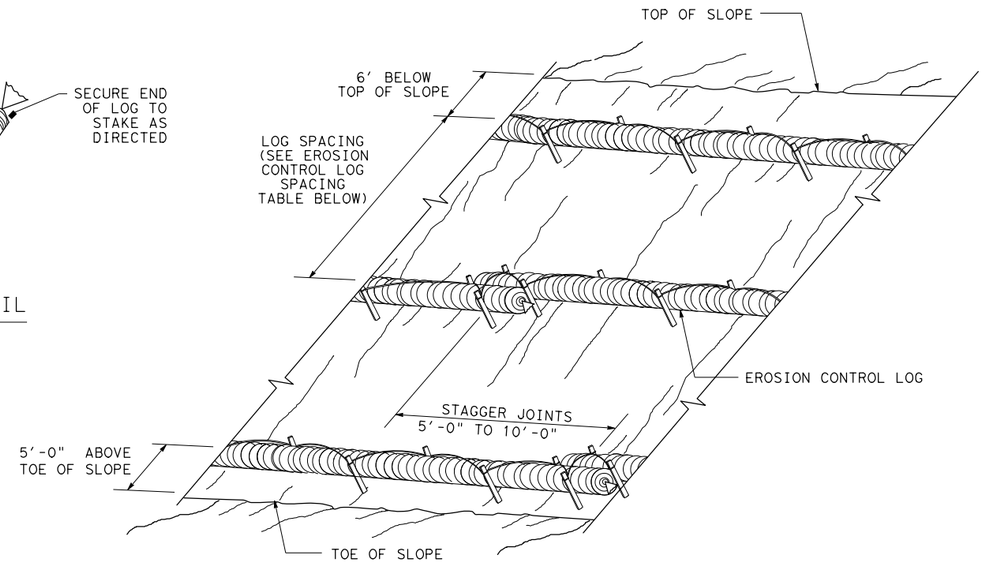
CL-SST



END SECTION RAP DETAIL

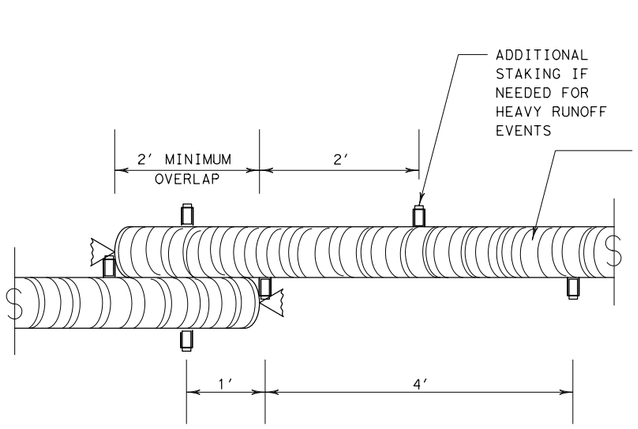
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5′	10′	15′	20′
2:1	10′	20′	30′	40′
3:1	15′	30′	45′	60′
4:1 OR FLATTER	20′	40′	60′	80′

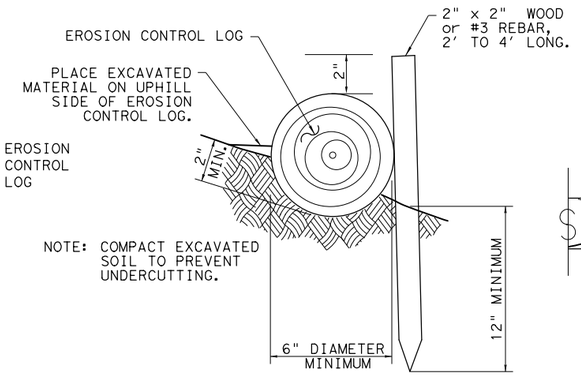
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

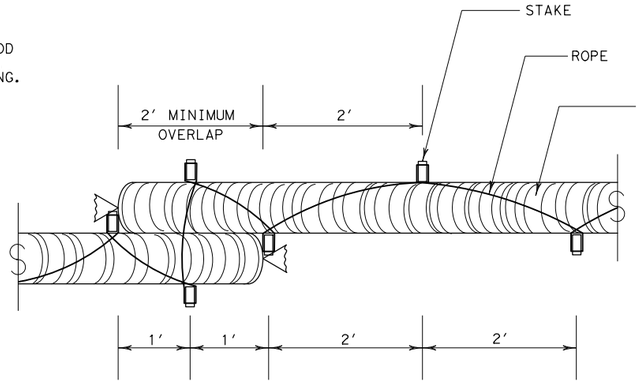


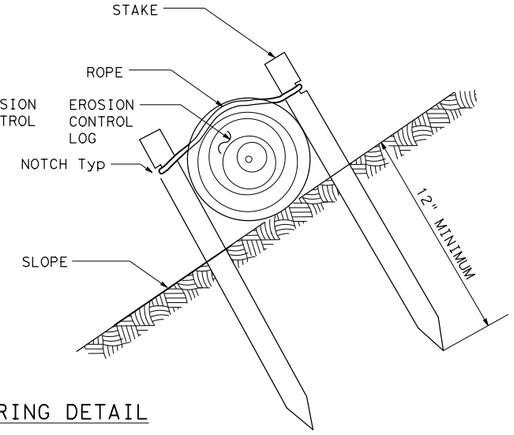


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

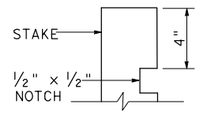
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

DATE: 7/5/2023
FILE: ec916.dgn

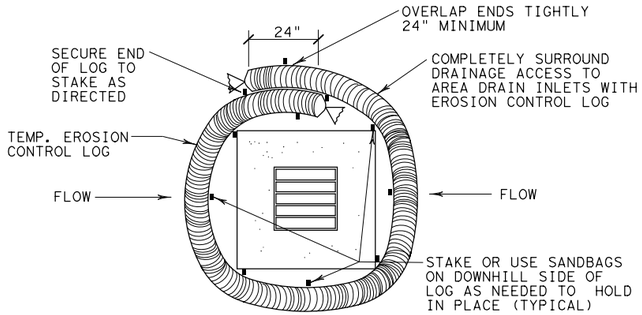
Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

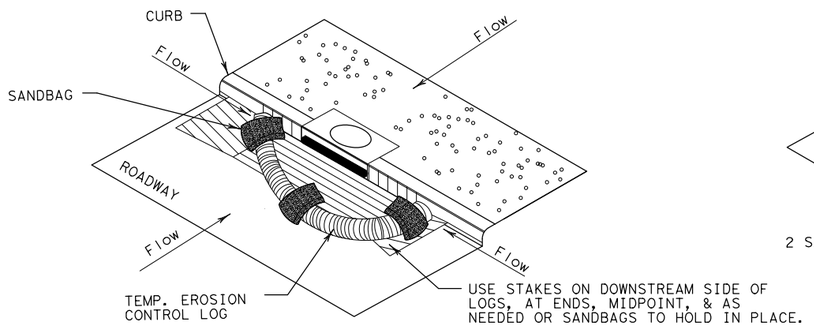
EC(9)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0114	10	104		US290	
	DIST	COUNTY			SHEET NO.	
	BRY	WASHINGTON			91	



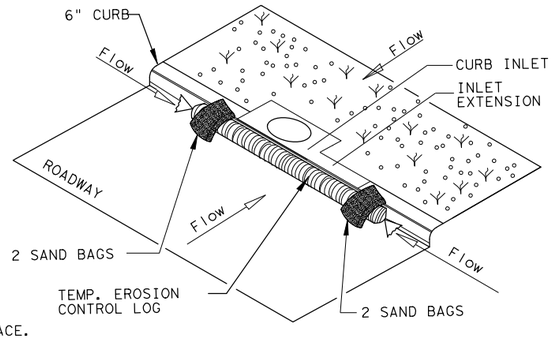
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

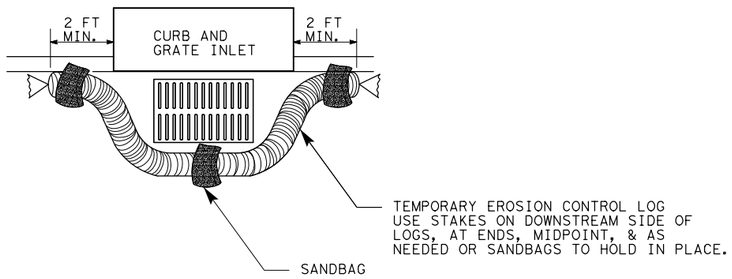
CL-CI



EROSION CONTROL LOG AT CURB INLET

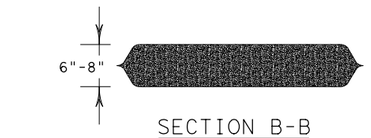
CL-CI

NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.

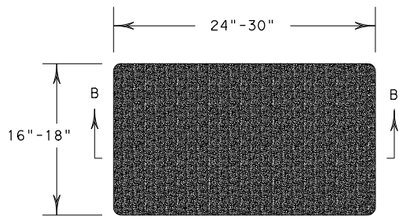


EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI



SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS			
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0114	10	104		US290		
	DIST	COUNTY			SHEET NO.		
	BRY	WASHINGTON			92		

DATE: 7/5/2023
FILE: ec916.dgn