SEE SHEET 2 FOR INDEX OF SHEETS

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	BR 2021(701)		1
STATE	DIST.	COUNTY	
TEXAS	WFS	WICHITA	
CONT.	SECT.	JOB	HIGHWAY NO.
0043	09	144,Etc.	IH 44,Etc.

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NO. : BR 2021(701)
CONTROL SECTION JOB : 0043-09-144, ETC.

WICHITA COUNTY
IH 44, ETC

LIMITS: FROM 8TH STREET
TO 6TH STREET, ETC.

TOTAL LENGTH OF PROJECT =				
	BRIDGE	=14,020.00FT.	=	2.655MI.
	ROADWAY	= 0.00FT.	=	0.000MI.
	TOTAL	=14,020.00FT.	=	2.655MI.

TYPE OF WORK: FOR THE CONSTRUCTION OF BRIDGE MAINTENANCE
CONSISTING OF: CRACK SEALING, SPALL REPAIR, AND DECK REPLACEMENT

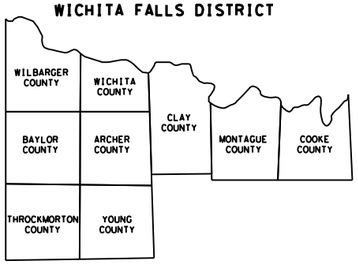
IH 44
MAIN LANE DESIGN SPEED = 60 MPH
ADT (2019) = 68658
ADT (20 YR PROJECTED ADT) = 82390
FUNCTIONAL CLASSIFICATION: INTERSTATE

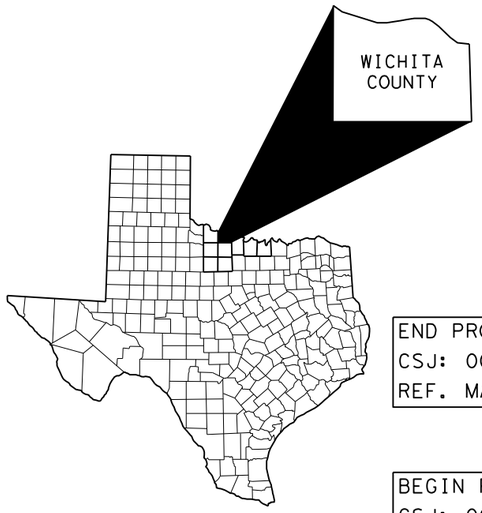
US 82
MAIN LANE DESIGN SPEED = 60 MPH
ADT (2019) = 46868
ADT (20 YR PROJECTED ADT) = 65615
FUNCTIONAL CLASSIFICATION: PRINCIPAL ARTERIAL

US 277
MAIN LANE DESIGN SPEED = 60 MPH
ADT (2019) = 59410
ADT (20 YR PROJECTED ADT) = 83174
FUNCTIONAL CLASSIFICATION: PRINCIPAL ARTERIAL

CONTRACTOR NAME:_____
CONTRACTOR ADDRESS:_____
LETTING DATE:_____
DATE WORK BEGAN:_____
DATE WORK COMPLETED:_____
DATE OF ACCEPTANCE:_____

WICHITA FALLS DISTRICT



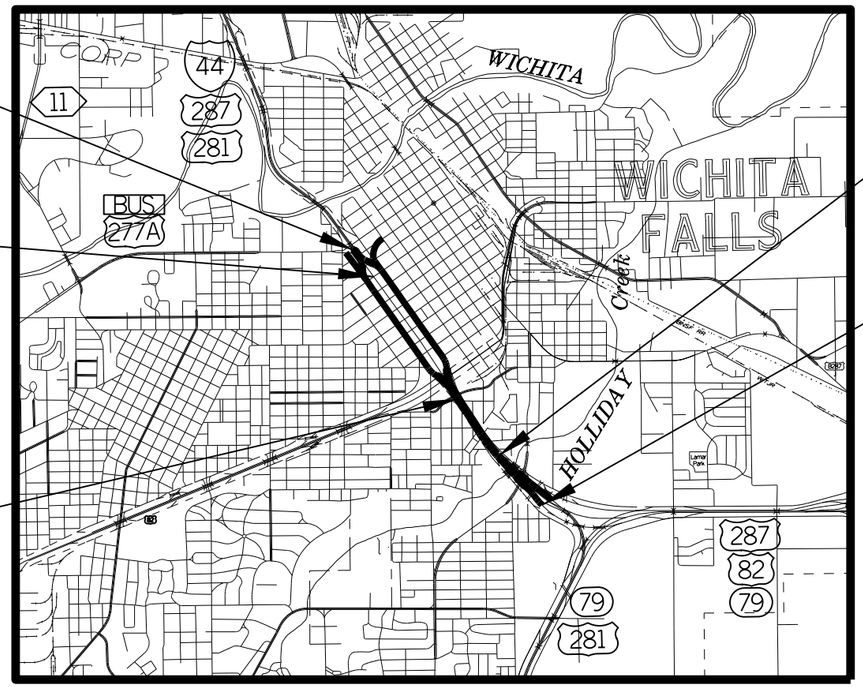


END PROJECT
CSJ: 0043-09-144
REF. MARKER 000+0.186

BEGIN PROJECT
CSJ: 0043-09-144
REF. MARKER 000+0.000

END PROJECT
CSJ: 0044-01-108
REF. MARKER 190+0.832

BEGIN PROJECT
CSJ: 0044-01-108
REF. MARKER 190-0.043



BEGIN PROJECT
CSJ: 0044-01-109
REF. MARKER 522+1.920

END PROJECT
CSJ: 0044-01-109
REF. MARKER 524+0.166

0 ½ 1
SCALE IN MILES

NO EXCEPTIONS
NO EQUATIONS
NO RAILROAD CROSSINGS

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014, AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, MAY 2012).

COUNTY_____ PROJ. NO._____
HWY. NO._____ LETTING DATE_____
DATE ACCEPTED_____

Texas Department of Transportation ®

SUBMITTED FOR LETTING 06/02/2021	APPROVED FOR LETTING
Monty F. Brown, P.E.	
DESIGN ENGINEER	DIRECTOR, TRAFFIC OPERATIONS DIVISION
RECOMMENDED FOR LETTING 06/03/2021	APPROVED FOR LETTING
James S. Reaves P.E.	
DISTRICT DIRECTOR OF TRANSPORTATION PLANNING AND DEVELOPMENT	DIRECTOR, BRIDGE DIVISION
RECOMMENDED FOR LETTING 06/03/2021	APPROVED FOR LETTING
Michael D. Brown P.E.	
DISTRICT ENGINEER	DIRECTOR, DESIGN DIVISION

FILE: T:\WFSDESGN\Plans\0043-09\144\4 - Design\Plan Set\1. General\TITLESHEET.dgn
DATE: 6/2/2021

INDEX OF SHEETS

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		GENERAL
	1	TITLE SHEET
	2	INDEX OF SHEETS
	3	PROJECT LOCATION MAP
	4-5	GENERAL NOTES
	6-6A	ESTIMATE & QUANTITY
	7-8	QUANTITY SUMMARY
		TRAFFIC CONTROL PLAN
	9	TCP NARRATIVE
	10-11	TCP PHASE I DETOUR
	12	TCP PHASE II DETOUR
	13	TCP PHASE III DETOUR
		TRAFFIC CONTROL PLAN STANDARDS
★	14	BC(1)-21
★	15	BC(2)-21
★	16	BC(3)-21
★	17	BC(4)-21
★	18	BC(5)-21
★	19	BC(6)-21
★	20	BC(7)-21
★	21	BC(8)-21
★	22	BC(9)-21
★	23	BC(10)-21
★	24	BC(11)-21
★	25	BC(12)-21
★	26	TCP(1-1)-18
★	27	TCP(1-2)-18
★	28	TCP(1-4)-18
★	29	TCP(1-5)-18
★	30	TCP(2-1)-18
★	31	TCP(2-2)-18
★	32	TCP(2-4)-18
★	33	TCP(3-2)-13
★	34	TCP(3-3)-14
★	35	TCP(5-1)-18
★	36	TCP(6-1)-12
★	37	TCP(6-2)-12
★	38	TCP(6-3)-12
★	39	TCP(6-4)-12
★	40	TCP(6-5)-12
★	41	TCP(6-6)-12
	42	TCP(6-6)-12 (MOD)
★	43	TCP(6-8)-14
★	44	WZ(BRK)-13
★	45	WZ(UL)-13
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		BRIDGE DETAILS & STANDARDS
	47	REPAIR QUANTITY SUMMARY
	48	BRIDGE REPAIR DETAILS
	49	BACKWALL REPAIRS
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	86-88	BRIDGE LAYOUT - 6TH ST. ENTRANCE RAMP
	89	BRIDGE LAYOUT - US 82 WB/US281/287 NB AT HOLLIDAY CREEK
	90	BRIDGE LAYOUT - US 82 EB/US281/287 SB AT HOLLIDAY CREEK
	91	BRIDGE LAYOUT - US 82 WB/US281/287 NB AT LOOP 473
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STATE OF TEXAS
CHRISTIAN J. SIERRA
137368
LICENSED PROFESSIONAL ENGINEER

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH A ★ HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

Christian J. Sierra, P.E. — 06/02/2021

NAME — DATE

IH 44, ETC
INDEX OF SHEETS

Texas Department of Transportation®

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0043	09	144,Etc	IH 44, Etc.
DIST	COUNTY		SHEET NO.
WFS	WICHITA		2

DATE: 6/2/2021 10:02:59 AM
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NBI: 032430004309198
(IH 44 at Seventh and Eighth St Entrance)

NBI: 032430004309187
(IH 44 at Sixth St Exit)

NBI: 032430004401084
(Broad St)

NBI: 032430004401085
(Holliday St)

NBI: 032430004401091
(US 82 WB/US 281/US 287 NB at Holliday Creek)

NBI: 032430004401092
(US 82 EB/US 281/US 287 SB at Holliday Creek)

NBI: 032430004401093
(US 82 WB/US 281/US 287 NB at Loop 473)

NBI: 032430004401094
(US 82 EB/US 281/US 287 SB at Loop 473)

44 287 281 82 287 82

N

DATE: 6/2/2021 10:57:18 AM
FILE: T:\WFSDESGN\Plans\0043-09\144x4 - Design\Plan Set\1. General\PROJECT LOCATION MAP.dgn

STATE OF TEXAS
CHRISTIAN J. SIERRA
137368
LICENSED PROFESSIONAL ENGINEER

Christian J. Sierra, P.E.

06/02/2021

IH 44, ETC
PROJECT LOCATION MAP

Texas Department of Transportation

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0043	09	144, Etc	IH 44, Etc.
DIST	COUNTY		SHEET NO.
WFS	WICHITA		3

County: WICHITA **Control:** 0043-09-144, Etc.

Highway: IH 44, Etc.

GENERAL NOTES

General Requirements

Contractor questions on this project are to be addressed to the following individual(s):

Callan Coltharp, P.E.: Callan.Coltharp@txdot.gov
Cody Bates, P.E.: Cody.Bates@txdot.gov

Contractor questions will be accepted through email, phone, and in person by the above individuals.

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:

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

All questions submitted that generate a response will be posted through this site. The site is organized by District, Project Type (Construction or Maintenance), Letting Date, CCSJ/Project Name.

The following standard detail sheets have been modified: TCP (6-6)-12 (MOD)

Bid Item Specific General Notes

Item 4 - Scope of Work
For the preconstruction conference submit a work schedule; temporary water pollution control plan; material sources; the person responsible for the SW3P; written utility coordination plan; certification statements; request for proposed subcontractors and letters designating the project superintendent, safety officer, and payroll officer at the preconstruction conference.

Item 5 - Control of the Work
Provide the Engineer a minimum 24 hours' notice for work requiring inspection or testing.

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

Item 7 - Legal Relations and Responsibilities

- No significant traffic generator events identified for this project.

County: WICHITA **Control:** 0043-09-144, Etc.

Highway: IH 44, Etc.

The Contractor's responsible person as described in item 7.2.6.1 must be able to respond within 45 minutes of being notified.

Item 8 - Prosecution and Progress
Progress schedule format shall be critical path method unless otherwise directed.

Nighttime work will be permitted as approved by the Engineer as described in item 8.3.3.

Item 429 – Concrete Structure Repair
Areas to be repaired at each location shall be repaired in accordance with the Department's Concrete Repair Manual. The Contractor must prepare and submit formal procedures outlining repair plans and which proprietary implementation so the Engineer has sufficient time to review. The Engineer must approve in writing any procedures that differ from those in the Concrete Repair Manual or materials that are not included in one of TxDOT's MPLS materials they plan to utilize. Submit the package a minimum of two weeks prior to performing repairs.

The Contractor shall maintain a hardcopy of the Department's Concrete Repair Manual on-site when concrete repair work is taking place.

Item 502 - Barricades, Signs, and Traffic Handling
Contractor shall store all traffic control devices not currently being used at a location approved by the Engineer.

The Traffic Control Plan (TCP) for this project includes the plans, the Texas Manual on Traffic Control Devices, Barricade and Construction Standard Sheets, Standard TCP Sheets, and as otherwise required by the Engineer.

Work will not be permitted without adequate traffic control devices in place. Work will only be permitted on one side of the roadway at any time, or as approved by the Engineer.

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

The Contractor Force Account "Law Enforcement" has been established for this project. 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 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.

County: WICHITA **Control:** 0043-09-144, Etc.

Highway: IH 44, Etc.

Work vehicles within 30 feet of the traveled way shall have strobe lights or rotating beacons in use.

Wear appropriate personal protective equipment at all times while outside of vehicles and equipment on the project.
All work and traffic control operations shall be completed prior to advancing to next location unless otherwise directed by the Engineer.

Provide adequate flagging on side roads to ensure that traffic flow is not compromised during one way traffic control operations.

Repair barricades within 48 hours after barricade report has been delivered to the Contractor. Failure to comply will cease all work until barricades are repaired to the satisfaction of the Department. Replace all damaged traffic control devices immediately. Remove any damaged traffic control devices from the project within 24 hours.

Failure to make necessary corrections to Traffic Control items based on barricade inspections will be cause for withholding the monthly estimate until such corrections are made.

Remove from the roadway and store in a central location approved by the Engineer all temporary traffic control devices, such as cones, barrels, portable signs, vertical panels, etc., which will not be used within 24 hours. This includes removal of temporary traffic control devices from the roadway over the weekend.

Refer to the “Worksheet for Edge Condition Treatment Types” for the proper traffic control devices to be used for the various edge conditions.

This project will require a Construction Speed Zone as per the Barricade and Construction standards. The Construction Speed Zone will only be applicable for detour work, or as direct by the Engineer.

Cover or remove portable CW 8-12 "NO CENTER STRIPE" signs immediately upon completion of striping of the roadway.

Coordinate all detours and traffic shifts with the TxDOT District Traffic Office at (940) 720-7844. Give a minimum of 48-hours’ notice to update Dynamic Message Signs in the area.

Coordinate with the City of Wichita Falls Traffic Superintendent at (940) 761-7640. Give the City a 24-hour notice prior to the beginning of each phase to coordinate signal timing.

County: WICHITA **Control:** 0043-09-144, Etc.

Highway: IH 44, Etc.

Item 506 - Temporary Erosion, Sedimentation, and Environmental Controls
It is not anticipated that any erosion control devices will be required for this project. However, in the event that erosion control measures are needed, the storm water pollution and prevention plan (SW3P) for this project shall consist of using the following items:

Sediment control fence
Permanent seeding
Vegetative watering

If it is determined that other erosion control devices are needed, payment for the work will be determined in accordance with Article 4.4, "Changes in the Work".

Item 666 - Reflectorized Pavement Markings
Contractor is responsible for verifying passing/no-passing zones for final stripe. Poly-dot the locations of the proposed reflectorized pavement markings and obtain approval from the Engineer prior to placement.

Use Type II beads on all striping.

Remove temporary tabs from all roads prior to striping. Removal of tabs will be subsidiary to pertinent items.

The Trail vehicle will be required for all striping operations as shown on TCP(3-2)-13.

Item 672 - Raised Pavement Markers
Raised pavement marker adhesive will meet the requirements of Departmental Materials Specifications DMS-6130, “Bituminous Adhesive for Pavement Markers”.

The lead vehicle and trail vehicle(s) will be required for all marker installation operations as shown on TCP(3-3)-14.

Item 4106 - Polyester Polymer Concrete Bridge Deck Overlay
Grooving will be required.

QUANTITY SHEET

CONTROLLING PROJECT ID 0043-09-144 **DISTRICT** Wichita Falls **COUNTY** Wichita
HIGHWAY IH 44, US 277, US 82

			CONTROL SECTION JOB	**0043-09-144**		**0044-01-108**		**0044-01-109**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00135483**		**A00135485**		**A00135486**			
			COUNTY	**Wichita**		**Wichita**		**Wichita**			
			HIGHWAY	**IH 44**		**US 277**		**US 82**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	104-6009	REMOVING CONC (RIPRAP)	SY			20.000				20.000	
	401-6001	FLOWABLE BACKFILL	CY			10.000		12.000		22.000	
	420-6007	CL A CONC (FLUME)	CY			3.000				3.000	
	428-6001	PENETRATING CONCRETE SURFACE TREATMENT	SY	8,261.000		61,450.000				69,711.000	
	429-6002	CONC STR REPAIR (EPOXY MORTAR)	SF			25.000				25.000	
	429-6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF			1,088.000		707.000		1,795.000	
	431-6003	PNEUMATICALLY PLACED CONCRETE (2")	SF			60.000		10.000		70.000	
	432-6003	RIPRAP (CONC)(6 IN)	CY			3.000				3.000	
	438-6004	CLEANING AND SEALING EXIST JOINTS(CL7)	LF	351.000		3,248.000		467.000		4,066.000	
	483-6017	MILLING CONCRETE SLAB (3IN)	SY					6,678.000		6,678.000	
	500-6001	MOBILIZATION	LS	40.00%		30.00%		30.00%		100.00%	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	4.000						4.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA			1,235.000		156.000		1,391.000	
	666-6138	REFL PAV MRK TY I (Y)8"(SLD)(100MIL)	LF			3,605.000		212.000		3,817.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF			3,513.000		488.000		4,001.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	2,074.000		9,007.000		1,038.000		12,119.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	2,107.000		8,981.000		1,034.000		12,122.000	
	666-6350	REFL PAV MRK TY I (W)12"(DOT)(100MIL)	LF			50.000				50.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA			4.000				4.000	
	668-6087	PREFAB PAV MRK TY C (W) (EXIT GORE)	EA			2.000				2.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA			381.000		35.000		416.000	
	678-6001	PAV SURF PREP FOR MRK (4")	LF	4,181.000		21,501.000		2,560.000		28,242.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF			3,605.000		212.000		3,817.000	
	678-6006	PAV SURF PREP FOR MRK (12")	LF			50.000				50.000	
	678-6016	PAV SURF PREP FOR MRK (WORD)	EA			4.000				4.000	
	678-6018	PAV SURF PREP FOR MRK (EXIT GORE)	EA			2.000				2.000	
	712-6009	JT / CRCK SEAL (HOT - POURED RUBBER)	LF			1,877.000				1,877.000	
	778-6001	CONCRETE RAIL REPAIR (IN-KIND)	LF			15.000				15.000	
	780-6002	CNC CRACK REPAIR (DISCRETE)(INJECT)	LF			275.000				275.000	
	4002-6001	REPLACE ELASTOMERIC BEARING PADS	EA			10.000				10.000	
	4106-6005	POLYESTER POLYMER CONC OVERLAY (3")	SY					6,678.000		6,678.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	75.000						75.000	
	6185-6002	TMA (STATIONARY)	DAY	100.000						100.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	21.000						21.000	
	7013-6001	VACUUM CLEAN DRAIN INLETS AND RACEWAYS	CYC	2.000		2.000				4.000	
	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	16.000		82.000				98.000	
	18	LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000						1.000	

QUANTITY SHEET

CONTROLLING PROJECT ID 0043-09-144 **DISTRICT** Wichita Falls **COUNTY** Wichita
HIGHWAY IH 44, US 277, US 82

			CONTROL SECTION JOB		**0043-09-144**		**0044-01-108**		**0044-01-109**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00135483**		**A00135485**		**A00135486**			
			COUNTY		**Wichita**		**Wichita**		**Wichita**			
			HIGHWAY		**IH 44**		**US 277**		**US 82**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)		LS	1.000						1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)		LS	1.000						1.000	

SUMMARY OF BRIDGE ITEMS

LOCATION	104 6009 REMOVING CONC (RIPRAP) SY	401 6001 FLOWABLE BACKFILL CY	420 6007 CL A CONC (FLUME) CY	428 6001 PENETRATING CONCRETE SURFACE TREATMENT SY	429 6002 CONC STR REPAIR (EPOXY MORTAR) SF	429 6007 CONC STR REPAIR (VERTICAL & OVERHEAD) SF	431 6003 PNEUMATICALLY PLACED CONCRETE (2") SF	432 6003 RIPRAP (CONC) (6 IN) CY	438 6004 CLEANING AND SEALING EXIST JOINTS(CL7) LF	483 6017 MILLING CONCRETE SLAB (3IN) SY	712 6009 JT / CRCK SEAL (HOT - POURED RUBBER) LF	778 6001 CONCRETE RAIL REPAIR (IN-KIND) LF	780 6002 CNC CRACK REPAIR (DISCRETE)(INJECT) LF	4002 6001 REPLACE ELASTOMERIC BEARING PADS EA
Tag	D10	D12	D13	D1	D9	D3	D14	D11	D2	D7	D8	D15	D5	D6
CCSJ: 0043-09-144														
NBI: 032430004309187 (IH 44 at Sixth St Exit)				5,673					211					
NBI: 032430004309198 (IH 44 at Seventh and Eighth St Entrance)				2,588					140					
CSJ Total	0	0	0	8,261	0	0	0	0	351	0	0	0	0	0
CSJ: 0044-01-108														
NBI: 032430004401084 (Broad St)	20	10	3	29,865	20	558	30	3	1,469		958	15	60	5
NBI: 032430004401085 (Holliday St)				31,585	5	530	30		1,779		919		215	5
CSJ Total	20	10	3	61,450	25	1,088	60	3	3,248	0	1,877	15	275	10
CSJ: 0044-01-109														
NBI: 032430004401091 (US 82 WB/US 281/US 287 NB at Holliday Creek)		6				184			120	1,548				
NBI: 032430004401092 (US 82 EB/US 281/US 287 SB at Holliday Creek)		6				325			108	1,386				
NBI: 032430004401093 (US 82 WB/US 281/US 287 NB at Loop 473)						88			129	1,937				
NBI: 032430004401094 (US 82 EB/US 281/US 287 SB at Loop 473)						110	10		110	1,807				
CSJ Total	0	12	0	0	0	707	10	0	467	6,678	0	0	0	0
PROJECT TOTALS:	**20**	**22**	**3**	**69,711**	**25**	**1,795**	**70**	**3**	**4,066**	**6,678**	**1,877**	**15**	**275**	**10**

SUMMARY OF BRIDGE ITEMS

LOCATION	4106 6005 POLYESTER POLYMER CONC OVERLAY (3 IN) SY	7013 6001 VACUUM CLEAN DRAIN INLETS AND RACEWAYS CYC	7212 6001 CLEANING SUBSTRUCTURE (BENT) EA
Tag	D7	D16	D4
CCSJ: 0043-09-144			
NBI: 032430004309187 (IH 44 at Sixth St Exit)		1	10
NBI: 032430004309198 (IH 44 at Seventh and Eighth St Entrance)		1	6
CSJ Total	0	2	16
CSJ: 0044-01-108			
NBI: 032430004401084 (Broad St)		1	41
NBI: 032430004401085 (Holliday St)		1	41
CSJ Total	0	2	82
CSJ: 0044-01-109			
NBI: 032430004401091 (US 82 WB/US 281/US 287 NB at Holliday Creek)	1,548		
NBI: 032430004401092 (US 82 EB/US 281/US 287 SB at Holliday Creek)	1,386		
NBI: 032430004401093 (US 82 WB/US 281/US 287 NB at Loop 473)	1,937		
NBI: 032430004401094 (US 82 EB/US 281/US 287 SB at Loop 473)	1,807		
CSJ Total	6,678	0	0
PROJECT TOTALS	**6,678**	**4**	**98**

DATE: 6/2/2021 9:12:44 AM
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IH 44, ETC
QUANTITY SUMMARY

CONT	SECT	JOB	HIGHWAY
0043	09	144,Etc	IH 44, Etc.
DIST	COUNTY		SHEET NO.
WFS	WICHITA		7

SUMMARY OF PAVEMENT MARKING ITEMS

LOCATION	662 6109	666 6138	666 6300	666 6303	666 6315	666 6350	668 6085	668 6087	672 6010	678 6001	678 6004	678 6006	678 6016	678 6018
	WK ZN PAV MRK SHT TERM (TAB)TY W	REFL PAV MRK TY I (Y)8"(SLD)(100MIL)	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	REFL PAV MRK TY I (W)12"(DOT)(100MIL)	PREFAB PAV MRK TY C (W)(WORD)	PREFAB PAV MRK TY C (W)(EXIT GORE)	REFL PAV MRKR TY II-C-R	PAV SURF PREP FOR MRK (4")	PAV SURF PREP FOR MRK (8")	PAV SURF PREP FOR MRK (12")	PAV SURF PREP FOR MRK (WORD)	PAV SURF PREP FOR MRK (EXIT GORE)
	EA	LF	LF	LF	LF	LF	EA	EA	EA	LF	LF	LF	EA	EA
CCSJ: 0043-09-144														
NBI: 032430004309187 (IH 44 at Sixth St Exit)				1,306	1,335					2,641				
NBI: 032430004309198 (IH 44 at Seventh and Eighth St Entrance)				768	772					1,540				
CSJ Total	0	0	0	2,074	2,107	0	0	0	0	4,181	0	0	0	0
CSJ: 0044-01-108														
NBI: 032430004401084 (Broad St)	616	1,521	1,798	4,470	4,428			1	166	10,696	1,521			1
NBI: 032430004401085 (Holliday St)	619	2,084	1,715	4,537	4,553	50	4	1	215	10,805	2,084	50	4	1
CSJ Total	1,235	3,605	3,513	9,007	8,981	50	4	2	381	21,501	3,605	50	4	2
CSJ: 0044-01-109														
NBI: 032430004401091 (US 82 WB/US 281/US 287 NB at Holliday Creek)	36		121	242	242				6	605				
NBI: 032430004401092 (US 82 EB/US 281/US 287 SB at Holliday Creek)	36		121	242	242				6	605				
NBI: 032430004401093 (US 82 WB/US 281/US 287 NB at Loop 473)	44	212	110	278	278				16	666	212			
NBI: 032430004401094 (US 82 EB/US 281/US 287 SB at Loop 473)	40		136	276	272				7	684				
CSJ Total	156	212	488	1,038	1,034	0	0	0	35	2,560	212	0	0	0
PROJECT TOTALS	**1,391**	**3,817**	**4,001**	**12,119**	**12,122**	**50**	**4**	**2**	**416**	**28,242**	**3,817**	**50**	**4**	**2**

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS

LOCATION	6001 6001	6185 6002	6185 6005
	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)
	DAY	DAY	DAY
CSJ: 0043-09-144,Etc.	75	100	21
PROJECT TOTALS	**75**	**100**	**21**

DATE: 6/2/2021 9:12:46 AM
FILE: T:\WFSDESGN\Plans\0043-09\144\4 - Design\Plan Set\1. General\QUANTITY SUMMARY.dgn

IH 44, ETC
QUANTITY SUMMARY

CONT	SECT	JOB	HIGHWAY
0043	09	144,Etc	IH 44, Etc.
DIST	COUNTY		SHEET NO.
WFS	WICHITA		8

PHASE I: SB IH 44/US 281/287 AT NORTH ABUTMENT OF SB OVERHEAD
STAGE A = FREEWAY CLOSURE (NIGHTTIME OPERATION)

1. THE CONTRACTOR SHALL SUBMIT AN APPROVED LIFTING PLAN TO THE ENGINEER PRIOR TO SETTING UP TRAFFIC CONTROL AND DETOUR.
2. CLOSE SB IH 44/US 281/287 OVERHEAD BRIDGE STRUCTURE (NBI:03-243-0-0044-01-085), AND SET UP DETOUR AS SHOWN ON:"TCP PHASE I DETOUR - TCP PHASE I-A" SHEET #10
3. THE CONTRACTOR SHALL SET UP ALL NECESSARY PREP WORK AND LIFT EQUIPMENT DURING DAYLIGHT HOURS.
4. PERFORM THE FOLLOWING WORK BETWEEN THE NIGHTTIME HOURS OF 10 P.M. TO 6 A.M.: BEARING PAD REPLACEMENT
5. CLEAN UP AND REMOVE TCP & DETOUR

PHASE I: NB IH 44/US 281/287 AT NORTH ABUTMENT OF NB OVERHEAD
STAGE B = FREEWAY CLOSURE (NIGHTTIME OPERATION)

1. THE CONTRACTOR SHALL SUBMIT AN APPROVED LIFTING PLAN TO THE ENGINEER PRIOR TO SETTING UP TRAFFIC CONTROL AND DETOUR.
2. CLOSE NB IH 44/US 281/287 OVERHEAD BRIDGE STRUCTURE (NBI:03-243-0-0044-01-084) & RAMP STRUCTURE (NBI:03-243-0-0044-01-129), AND SET UP DETOUR AS SHOWN ON:"TCP PHASE I DETOUR - TCP PHASE I-B" SHEET # 11
3. THE CONTRACTOR SHALL SET UP ALL NECESSARY PREP WORK AND LIFT EQUIPMENT DURING DAYLIGHT HOURS.
4. PERFORM THE FOLLOWING WORK BETWEEN THE NIGHTTIME HOURS OF 10 P.M. TO 6 A.M.: BEARING PAD REPLACEMENT
5. CLEAN UP AND REMOVE TCP & DETOUR

PHASE II: US 82 EB/US 281/287 SB AT HOLLIDAY CREEK & LP 473
STAGE A = INSIDE LANE CLOSURE W/MERGING ENTRANCE RAMP CLOSURES

1. CLOSE SB US 281/287 INSIDE LANES, MERGING US 82 ENTRANCE RAMP, & MERGING FRONTAGE ROAD ENTRANCE RAMP, AND SET UP DETOUR AS SHOWN ON: "TCP PHASE II DETOUR" SHEET #12
2. PERFORM THE FOLLOWING WORK AS SHOWN ON "US 82 EB/US 281/287 SB AT HOLLIDAY CREEK" AND "US 82 EB/US 281/287 SB AT LOOP 473" SHEETS:
   -CLEAN AND SEAL JOINTS
   -MILLING
   -POLYESTER POLYMER CONCRETE OVERLAY
3. CLEAN UP AND REMOVE TCP

PHASE II: US 82 EB/US 281/287 SB AT HOLLIDAY CREEK & LP 473
STAGE B = OUTSIDE LANE CLOSURE W/MERGING ENTRANCE RAMP CLOSURES

1. CLOSE SB US 281/287 OUTSIDE LANE, MERGING US 82 ENTRANCE RAMP, & MERGING FRONTAGE ROAD ENTRANCE RAMP, AND SET UP DETOUR AS SHOWN ON: "TCP PHASE II DETOUR" SHEET #12
2. PERFORM THE FOLLOWING WORK AS SHOWN ON "US 82 EB/US 281/287 SB AT HOLLIDAY CREEK" AND "US 82 EB/US 281/287 SB AT LOOP 473" SHEETS:
   -CLEAN AND SEAL JOINTS
   -MILLING
   -POLYESTER POLYMER CONCRETE OVERLAY
3. CLEAN UP AND REMOVE TCP & DETOUR

PHASE III: US 82 WB/US 281/287 NB AT HOLLIDAY CREEK & LP 473
STAGE A = INSIDE LANE CLOSURE WITH MERGING ENTRANCE RAMP CLOSURE

1. CLOSE US 82 WB/US 281/287 NB INSIDE LANES & MERGING US 281 ENTRANCE RAMP AND SET UP DETOUR AS SHOWN ON: "TCP PHASE III DETOUR" SHEET #13
2. PERFORM THE FOLLOWING WORK AS SHOWN ON "US 82 WB/US 281/287 NB AT HOLLIDAY CREEK" AND "US 82 WB/US 281/287 NB AT LOOP 473" SHEETS:
   -CLEAN AND SEAL JOINTS
   -MILLING
   -POLYESTER POLYMER CONCRETE OVERLAY
3. CLEAN UP AND REMOVE TCP

PHASE III: NB US 281/287 AT HOLLIDAY CREEK & LP 473
STAGE B = OUTSIDE LANE CLOSURE WITH MERGING ENTRANCE RAMP CLOSURE

1. CLOSE US 82 WB/US 281/287 NB OUTSIDE LANES & MERGING US 281 ENTRANCE RAMP AND SET UP DETOUR AS SHOWN ON: "TCP PHASE III DETOUR" SHEET #13
2. PERFORM THE FOLLOWING WORK AS SHOWN ON "US 82 WB/US 281/287 NB AT HOLLIDAY CREEK" AND "US 82 WB/US 281/287 NB AT LOOP 473" SHEETS:
   -CLEAN AND SEAL JOINTS
   -MILLING
   -POLYESTER POLYMER CONCRETE OVERLAY
3. CLEAN UP AND REMOVE TCP & DETOUR

PHASE IV: IH 44 NB & SB/US 281/287 NB & SB AT VARIOUS STRUCTURES
STAGE A = LANE CLOSURE

1. SET UP MOST APPROPRIATE TCP AS SHOWN ON:"TCP (1-1)-14.....
2. PERFORM THE FOLLOWING WORK AS SHOWN ON "BRIDGE LAYOUTS AND BRIDGE REPAIR DETAILS":
   -PENETRATING CONCRETE SURFACE TREATMENT
   -CLEANING AND SEALING EXIST JOINTS
   -BRIDGE SUBSTRUCTURE CLEANING
   -CONCRETE STRUCTURE REPAIR (VERT AND OVERHD)
   -CNC CRACK REPAIR
   -CRACK SEAL
   -CONCRETE RAIL REPAIR
3. CLEAN UP AND REMOVE TCP

NOTES:

1. SEE GENERAL NOTES FOR ADDITIONAL TRAFFIC CONTROL NOTES.
2. TCP CHANNELIZING DEVICES ARE PLASTIC DRUMS AS DESCRIBED ON BC(8)-14. OTHER APPROVED DEVICES MAY BE USED WITH APPROVAL FROM THE ENGINEER.
3. OTHER TCP PHASING OPTIONS MAY BE USED IF APPROVED. THE CONTRACTOR MUST SUBMIT PROPOSED TCP IN WRITING AT LEAST TWO WEEKS PRIOR TO BEGINNING REVISED PHASING OF WORK.

STATE OF TEXAS
CHRISTIAN J. SIERRA
137368
LICENSED PROFESSIONAL ENGINEER

Christian J. Sierra, P.E.

06/02/2021

IH 44, ETC
TCP
NARRATIVE

Texas Department of Transportation

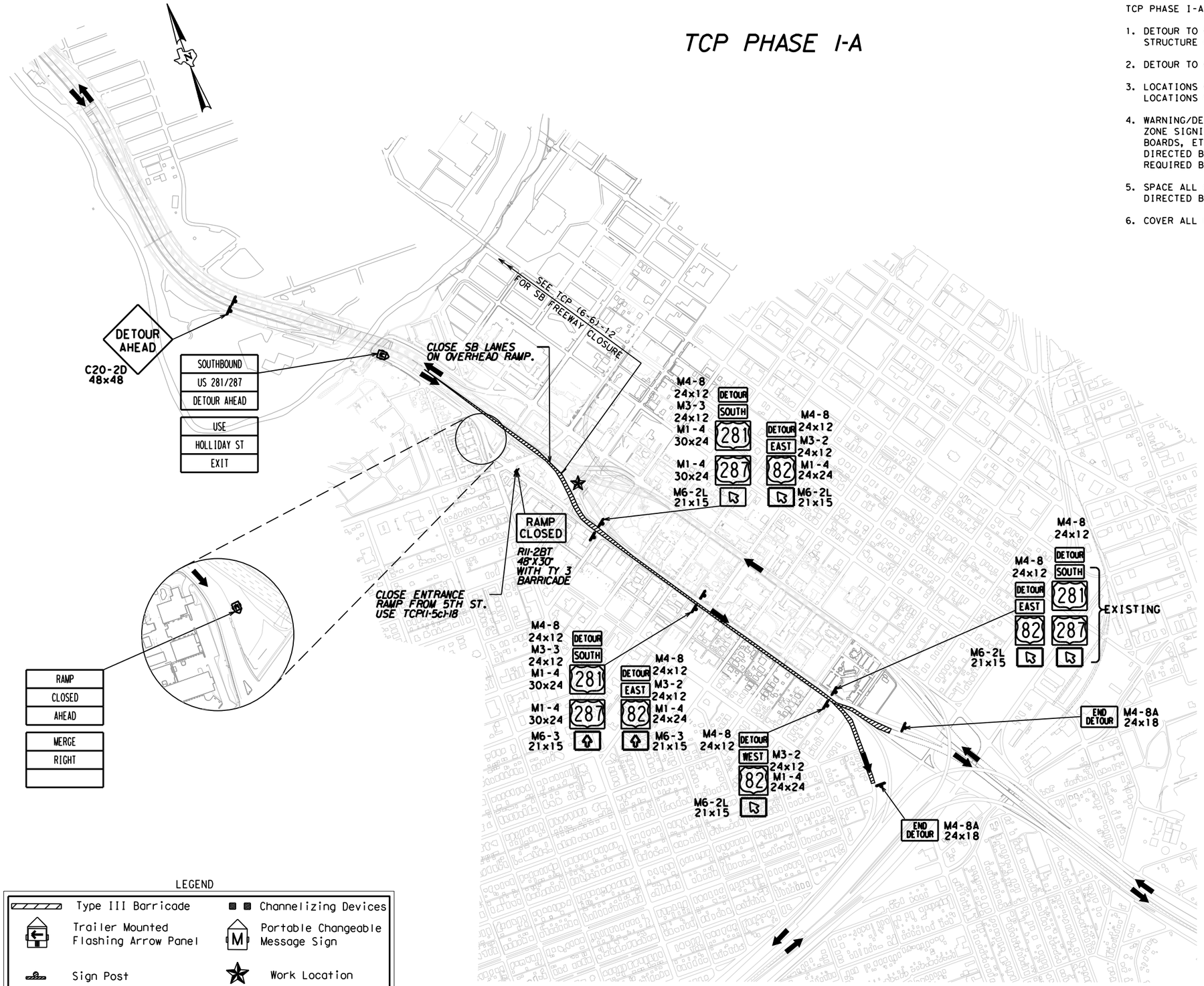
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0043	09	144,Etc	IH 44, Etc.
DIST	COUNTY		SHEET NO.
WFS	WICHITA		9

DATE: 6/2/2021 9:12:49 AM
FILE: T:\WFSDESIGN\Plans\0043-09\144\4 - Design\Plan Set\2. TCP\TCP NARRATIVE.dgn

DN: | CK: | DW: | CK:

TCP PHASE I-A



LEGEND

Type III Barricade	Channelizing Devices
Trailer Mounted Flashing Arrow Panel	Portable Changeable Message Sign
Sign Post	Work Location
Traffic Direction	Detour Route

TCP PHASE I-A NOTES:

1. DETOUR TO ONLY BE USED WHEN PERFORMING BEARING PAD REPLACEMENT ON STRUCTURE 03-243-0-0044-01-085 (SB OVERHEAD BRIDGE) AT NORTH ABUTMENT.
2. DETOUR TO ONLY BE USED AT NIGHT FROM 10 P.M TO 6 A.M.
3. LOCATIONS OF TCP DEVICES ARE FOR ILLUSTRATION PURPOSES ONLY, EXACT LOCATIONS MAY VARY IN THE FIELD AS DIRECTED BY THE ENGINEER.
4. WARNING/DETOUR SIGNS SHOWN ON THIS SHEET ARE THE MINIMUM CONSTRUCTION ZONE SIGNING. INSTALL ADDITIONAL BARRICADES, WARNING SIGNS, MESSAGE BOARDS, ETC. IN ACCORDANCE WITH THE BC SHEETS AND THE MUTCD OR AS DIRECTED BY THE ENGINEER. ANY ADDITIONAL TRAFFIC CONTROL DEVICES REQUIRED BY THE ENGINEER WILL BE CONSIDERED SUBSIDIARY TO ITEM 502.
5. SPACE ALL WORK ZONE SIGNS IN ACCORDANCE WITH THE BC SHEETS OR AS DIRECTED BY THE ENGINEER.
6. COVER ALL EXISTING SIGNS IN CONFLICT WITH THE WORK ZONE SIGNS.

STATE OF TEXAS
CHRISTIAN J. SIERRA
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LICENSED PROFESSIONAL ENGINEER

Christian J. Sierra, P.E.

06/02/2021

IH 44, ETC
TCP
PHASE I
DETOUR

NOT TO SCALE

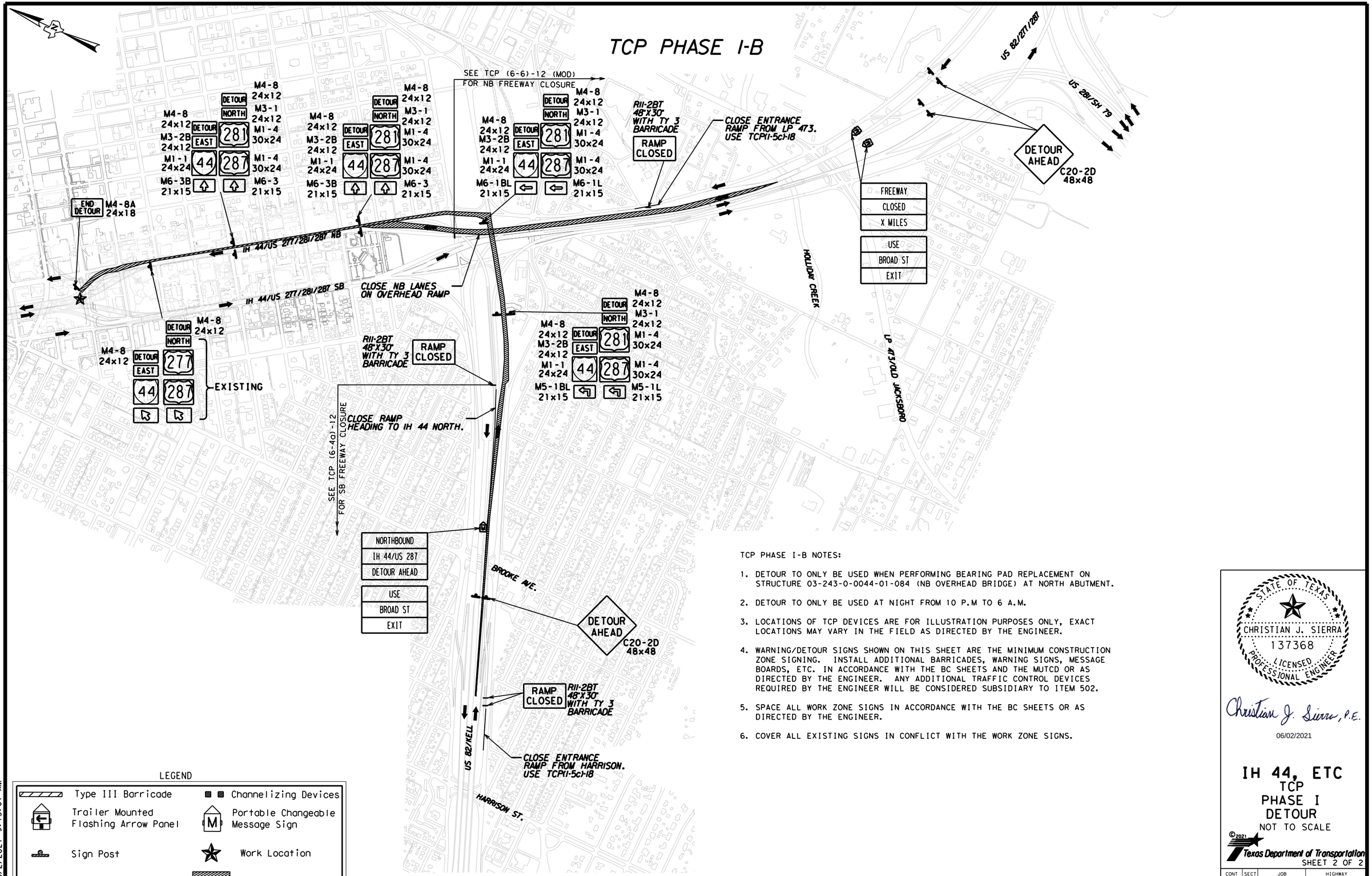
Texas Department of Transportation

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0043	09	144,Etc	IH 44, Etc.
DIST	COUNTY		SHEET NO.
WFS	WICHITA		10

FILE: T:\WFSDESGN\Plans\0043-09\144\4 - Design\Plan Set\2. TCP\TCP PHASE I DETOUR.dgn
DATE: 6/2/2021 9:12:54 AM

TCP PHASE I-B



LEGEND

Type III Barricade	Channelizing Devices
Trailer Mounted Flashing Arrow Panel	Portable Changeable Message Sign
Sign Post	Work Location
Traffic Direction	Detour Route

TCP PHASE I-B NOTES:

1. DETOUR TO ONLY BE USED WHEN PERFORMING BEARING PAD REPLACEMENT ON STRUCTURE 03-243-0-0044-01-084 (NB OVERHEAD BRIDGE) AT NORTH ABUTMENT.
2. DETOUR TO ONLY BE USED AT NIGHT FROM 10 P.M TO 6 A.M.
3. LOCATIONS OF TCP DEVICES ARE FOR ILLUSTRATION PURPOSES ONLY, EXACT LOCATIONS MAY VARY IN THE FIELD AS DIRECTED BY THE ENGINEER.
4. WARNING/DETOUR SIGNS SHOWN ON THIS SHEET ARE THE MINIMUM CONSTRUCTION ZONE SIGNING. INSTALL ADDITIONAL BARRICADES, WARNING SIGNS, MESSAGE BOARDS, ETC. IN ACCORDANCE WITH THE BC SHEETS AND THE MUTCD OR AS DIRECTED BY THE ENGINEER. ANY ADDITIONAL TRAFFIC CONTROL DEVICES REQUIRED BY THE ENGINEER WILL BE CONSIDERED SUBSIDIARY TO ITEM 502.
5. SPACE ALL WORK ZONE SIGNS IN ACCORDANCE WITH THE BC SHEETS OR AS DIRECTED BY THE ENGINEER.
6. COVER ALL EXISTING SIGNS IN CONFLICT WITH THE WORK ZONE SIGNS.

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Christian J. Sierra, P.E.

06/02/2021

IH 44, ETC
TCP
PHASE I
DETOUR
NOT TO SCALE

Texas Department of Transportation

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0043	09	144,Etc	IH 44, Etc.
DIST	COUNTY		SHEET NO.
WFS	WICHITA		11

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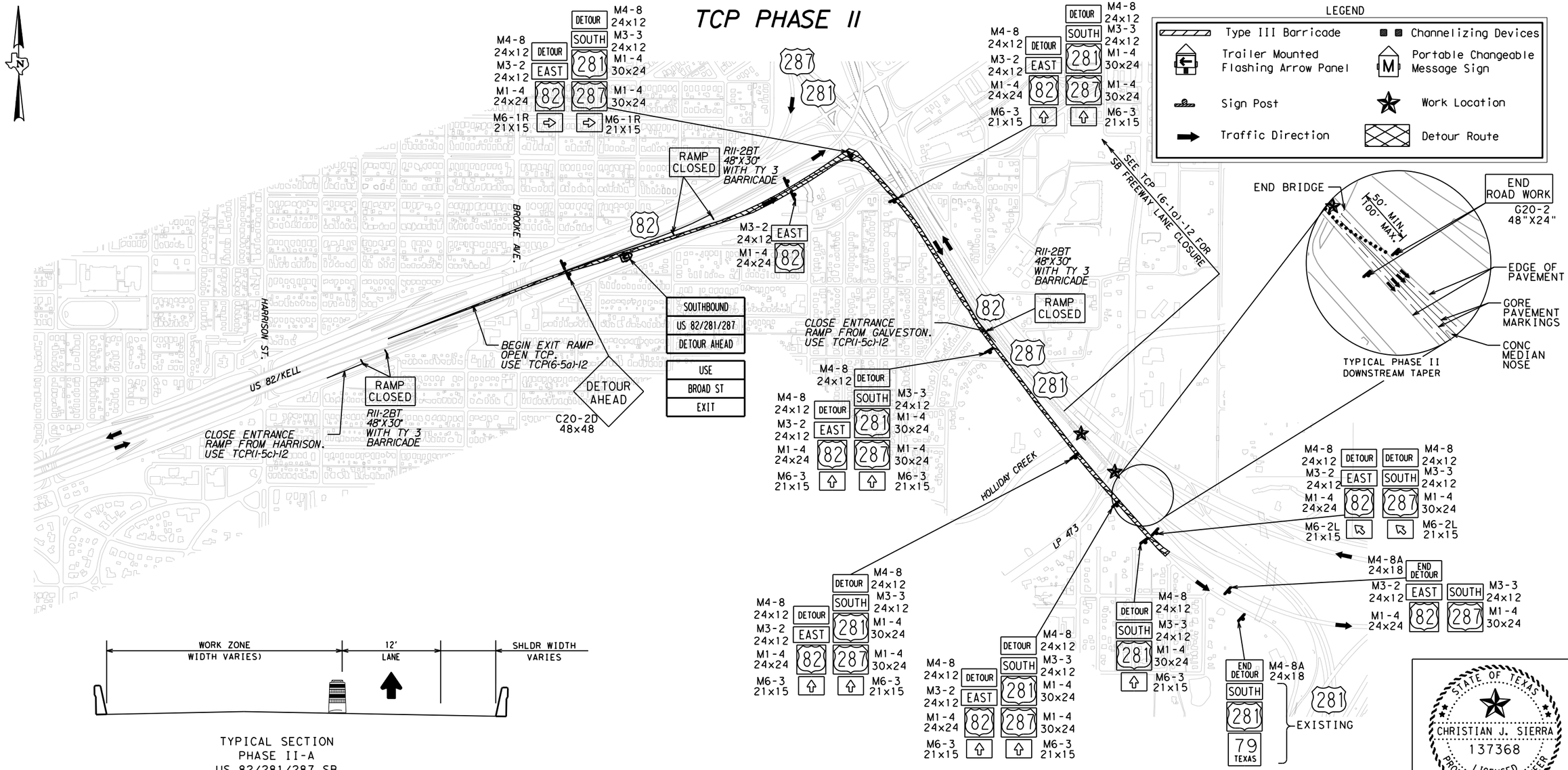
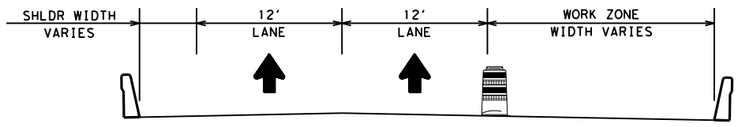
TCP PHASE II



TYPICAL SECTION
PHASE II-A
US 82/281/287 SB
NBI: 03-243-0044-01-092
03-243-0044-01-094



TYPICAL SECTION
PHASE II-B
US 82/281/287 SB
NBI: 03-243-0044-01-092
03-243-0044-01-094

NOTES:

1. DETOUR TO ONLY BE USED WHEN PERFORMING BRIDGE DECK WORK ON STRUCTURES 03-243-0044-01-092 & 03-243-0044-01-094.
2. LOCATIONS OF TCP DEVICES ARE FOR ILLUSTRATION PURPOSES ONLY, EXACT LOCATIONS MAY VARY IN THE FIELD AS DIRECTED BY THE ENGINEER.
3. WARNING/DETOUR SIGNS SHOWN ON THIS SHEET ARE THE MINIMUM CONSTRUCTION ZONE SIGNING. INSTALL ADDITIONAL BARRICADES, WARNING SIGNS, MESSAGE BOARDS, ETC. IN ACCORDANCE WITH THE BC SHEETS AND THE MUTCD OR AS DIRECTED BY THE ENGINEER. ANY ADDITIONAL TRAFFIC CONTROL DEVICES REQUIRED BY THE ENGINEER WILL BE CONSIDERED SUBSIDIARY TO ITEM 502.
4. SPACE ALL WORK ZONE SIGNS IN ACCORDANCE WITH THE BC SHEETS OR AS DIRECTED BY THE ENGINEER.
5. COVER ALL EXISTING SIGNS IN CONFLICT WITH THE WORK ZONE SIGNS.

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06/02/2021

IH 44, ETC
TCP
PHASE II
DETOUR
NOT TO SCALE

Texas Department of Transportation

SHEET 1 OF 1

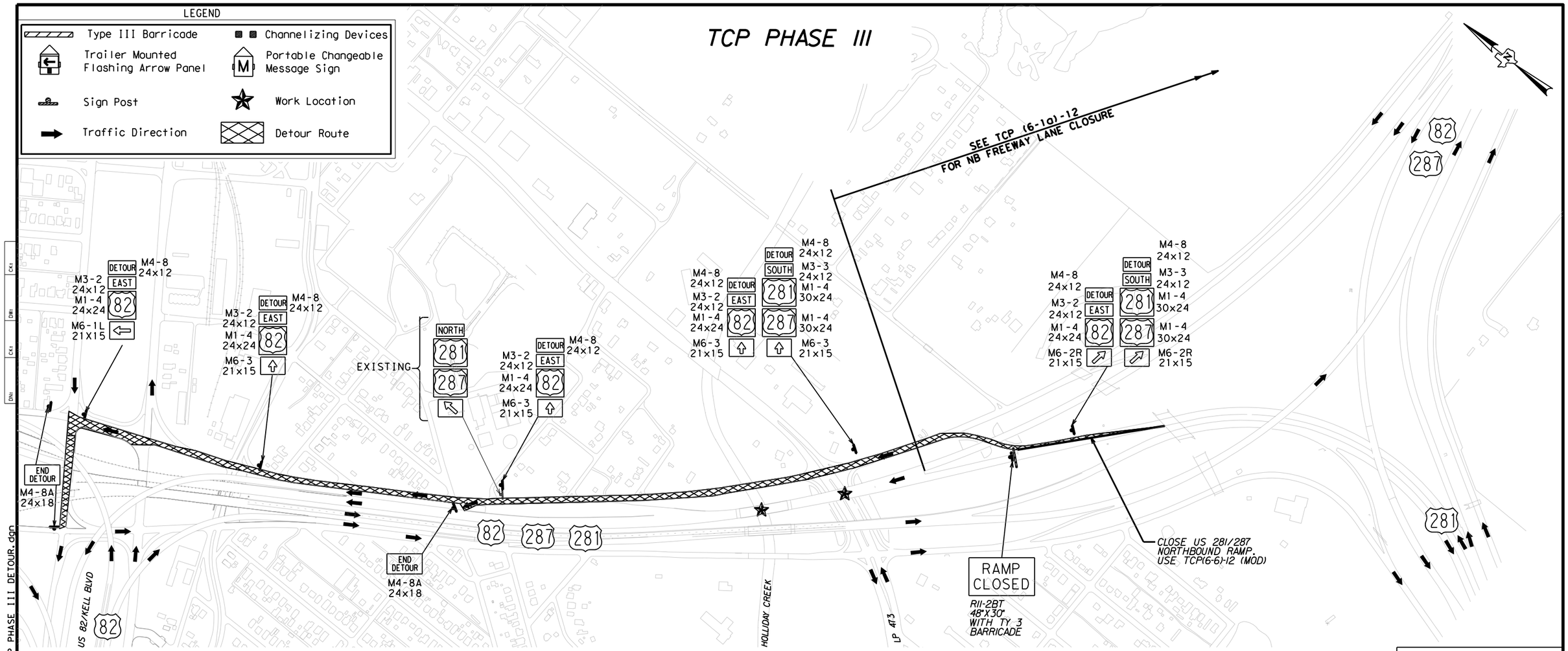
CONT	SECT	JOB	HIGHWAY
0043	09	144,Etc	IH 44, Etc.
DIST	COUNTY		SHEET NO.
WFS	WICHITA		12

FILE: T:\WFSDESGN\Plans\0043-09\144\4 - Design\Plan Set\2. TCP\TCP PHASE II DETOUR.dgn
DATE: 6/2/2021 11:10:46 AM

TCP PHASE III

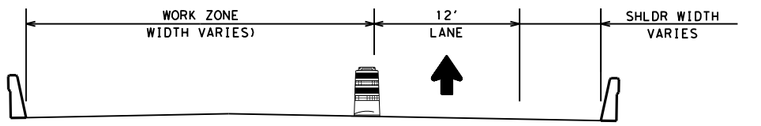
LEGEND

- Type III Barricade
- Channelizing Devices
- Trailer Mounted Flashing Arrow Panel
- Portable Changeable Message Sign
- Sign Post
- Work Location
- Traffic Direction
- Detour Route

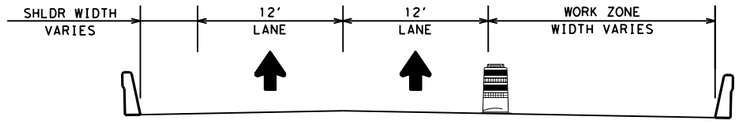


NOTES:

1. DETOUR TO ONLY BE USED WHEN PERFORMING BRIDGE DECK WORK ON STRUCTURES 03-243-0044-01-091 & 03-243-0044-01-093.
2. LOCATIONS OF TCP DEVICES ARE FOR ILLUSTRATION PURPOSES ONLY, EXACT LOCATIONS MAY VARY IN THE FIELD AS DIRECTED BY THE ENGINEER.
3. WARNING/DETOUR SIGNS SHOWN ON THIS SHEET ARE THE MINIMUM CONSTRUCTION ZONE SIGNING. INSTALL ADDITIONAL BARRICADES, WARNING SIGNS, MESSAGE BOARDS, ETC. IN ACCORDANCE WITH THE BC SHEETS AND THE MUTCD OR AS DIRECTED BY THE ENGINEER. ANY ADDITIONAL TRAFFIC CONTROL DEVICES REQUIRED BY THE ENGINEER WILL BE CONSIDERED SUBSIDIARY TO ITEM 502.
4. SPACE ALL WORK ZONE SIGNS IN ACCORDANCE WITH THE BC SHEETS OR AS DIRECTED BY THE ENGINEER.
5. COVER ALL EXISTING SIGNS IN CONFLICT WITH THE WORK ZONE SIGNS.



TYPICAL SECTION
PHASE III-A
US 82/281/287 NB
NBI: 03-243-0044-01-091
03-243-0044-01-093



TYPICAL SECTION
PHASE III-B
US 82/281/287 NB
NBI: 03-243-0044-01-091
03-243-0044-01-093

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06/02/2021

IH 44, ETC
TCP
PHASE III
DETOUR
NOT TO SCALE

Texas Department of Transportation

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0043	09	144,Etc	IH 44, Etc.
DIST	COUNTY		SHEET NO.
WFS	WICHITA		13

DATE: 6/2/2021 11:11:11 AM
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DATE: 6/2/2021 9:13:13 AM
FILE: T:\WFSDESGN\Plans\WFS Standards\DGNs\TCP\BC (1)-21 .dgn

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

SHEET 1 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

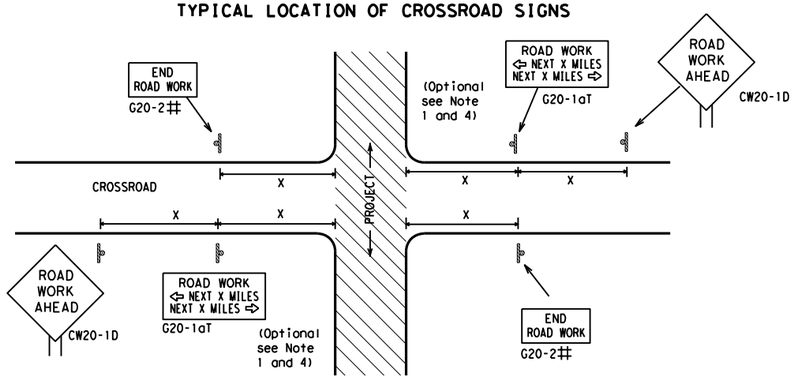
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144,Etc	IH 44, Etc.
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	WFS	WICHITA		14
5-10 5-21				

DATE: 6/2/2021 9:13:16 AM
FILE: I:\WFSDESGN\Plans\WFS Standards\DGNs\TCP\BC (2)-21.dgn

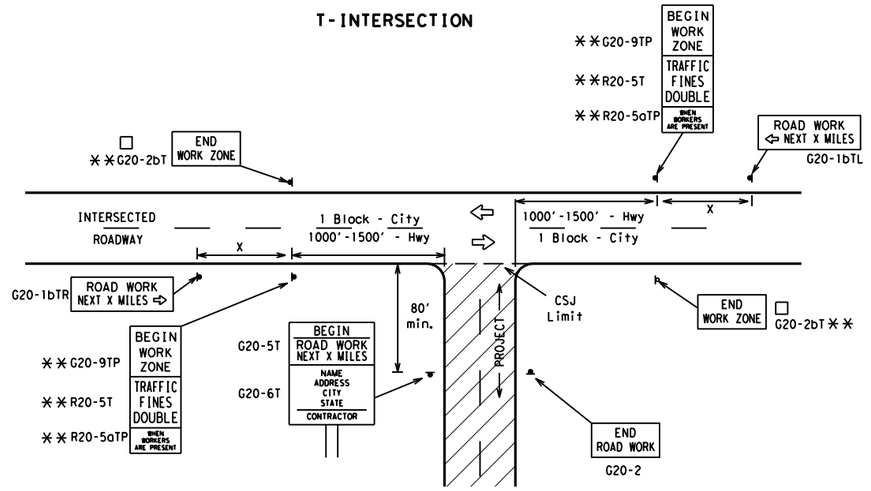
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

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

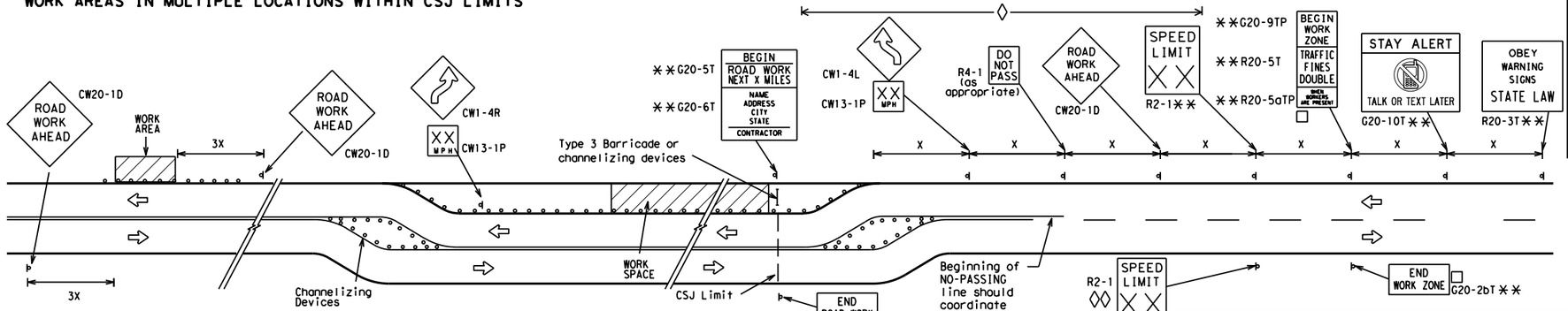
△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

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

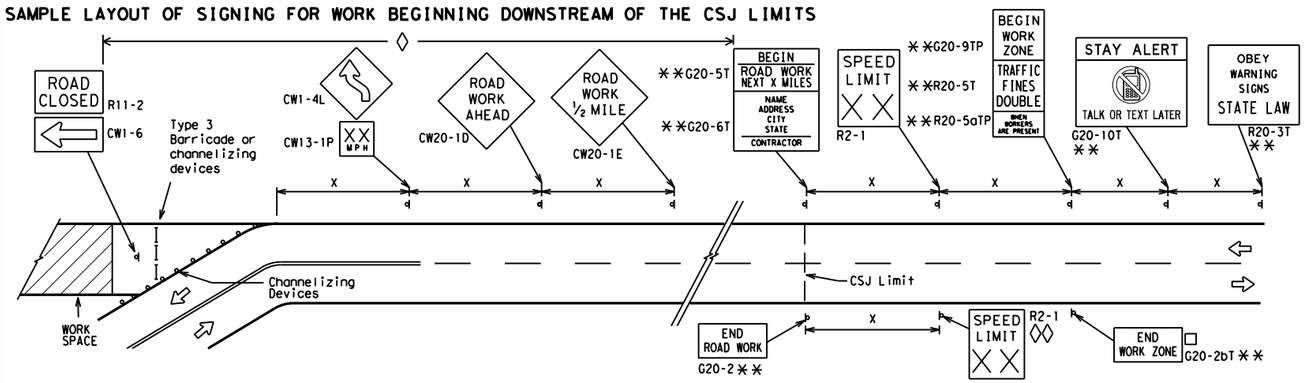
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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

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



NOTES

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

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

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

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

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

LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

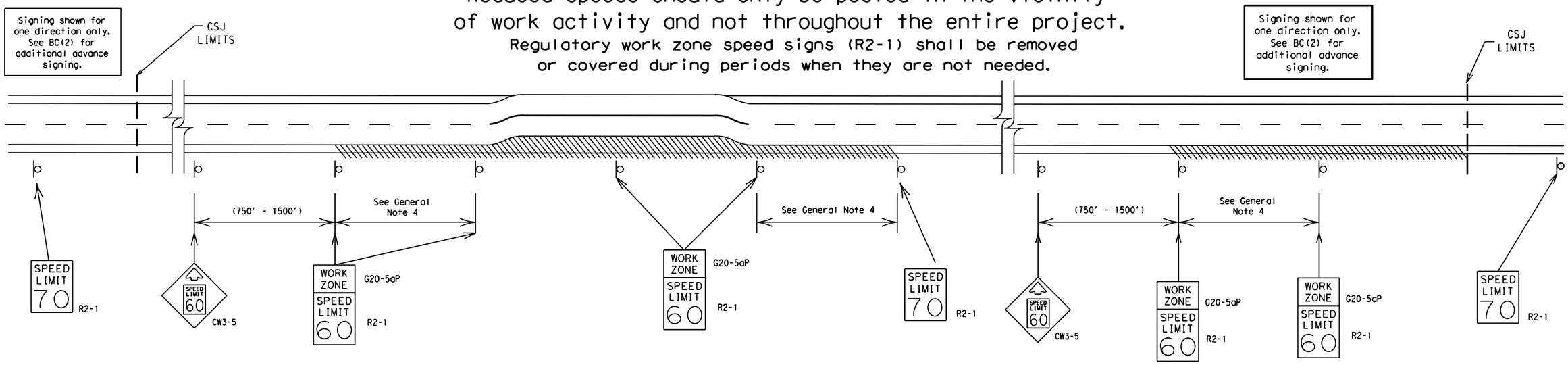
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144,Etc	IH 44, Etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	WFS	WICHITA		15

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	0043	09	144,Etc	IH 44, Etc.
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		16

DATE: 6/2/2021 9:13:18 AM
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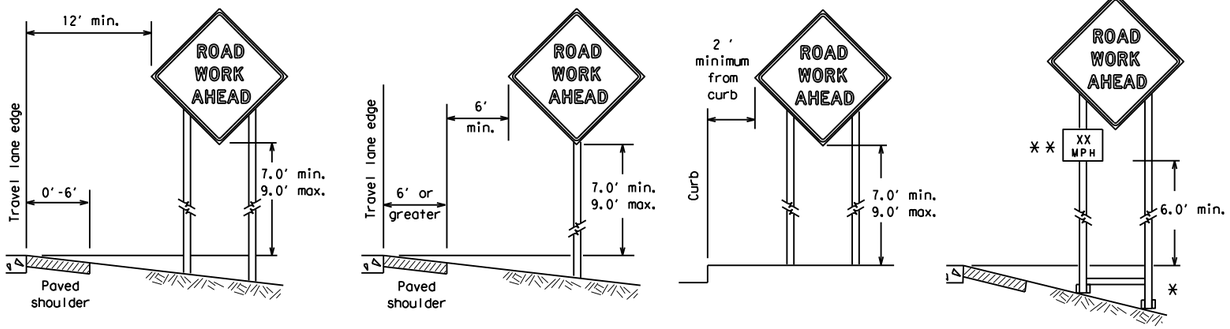
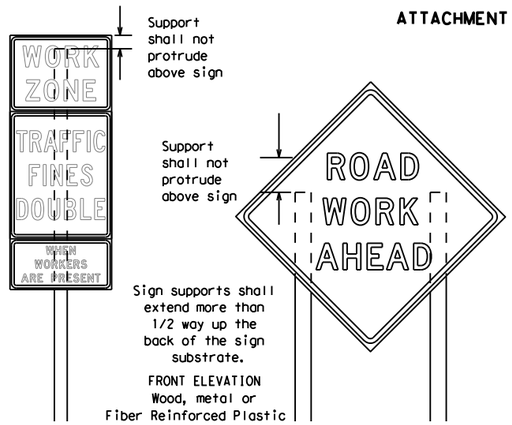
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

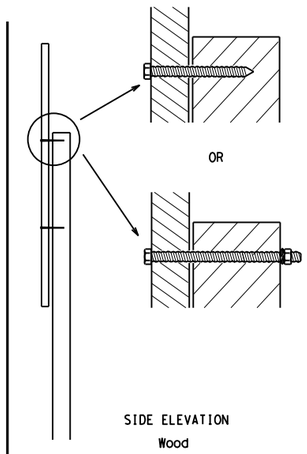


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





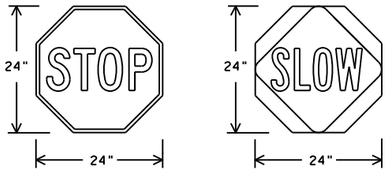
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	WFS	WICHITA		17

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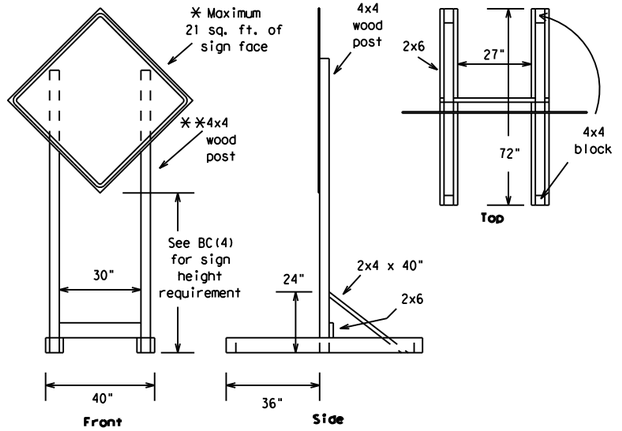
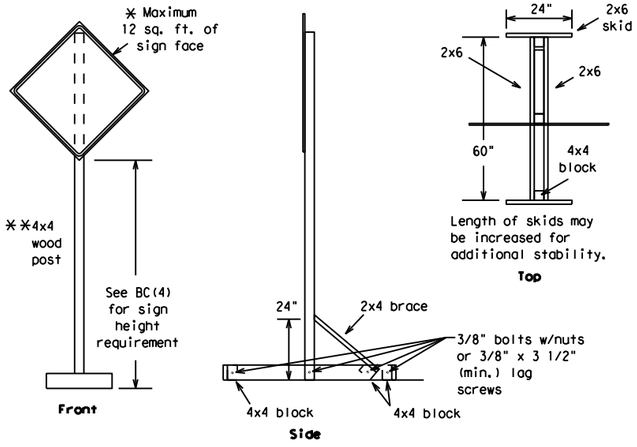
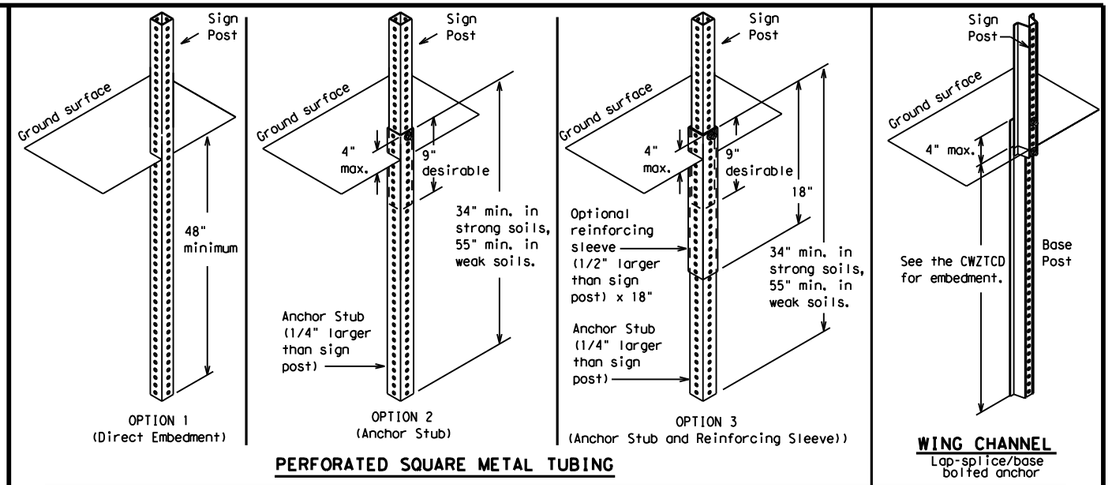




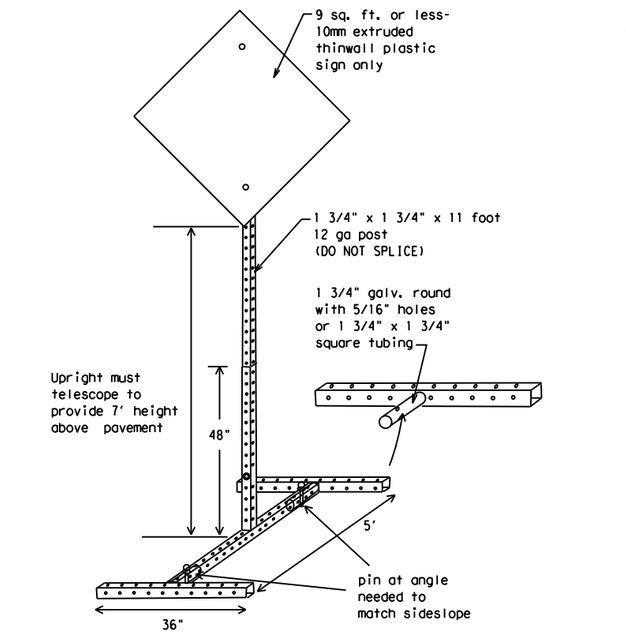
SKID MOUNTED WOOD SIGN SUPPORTS

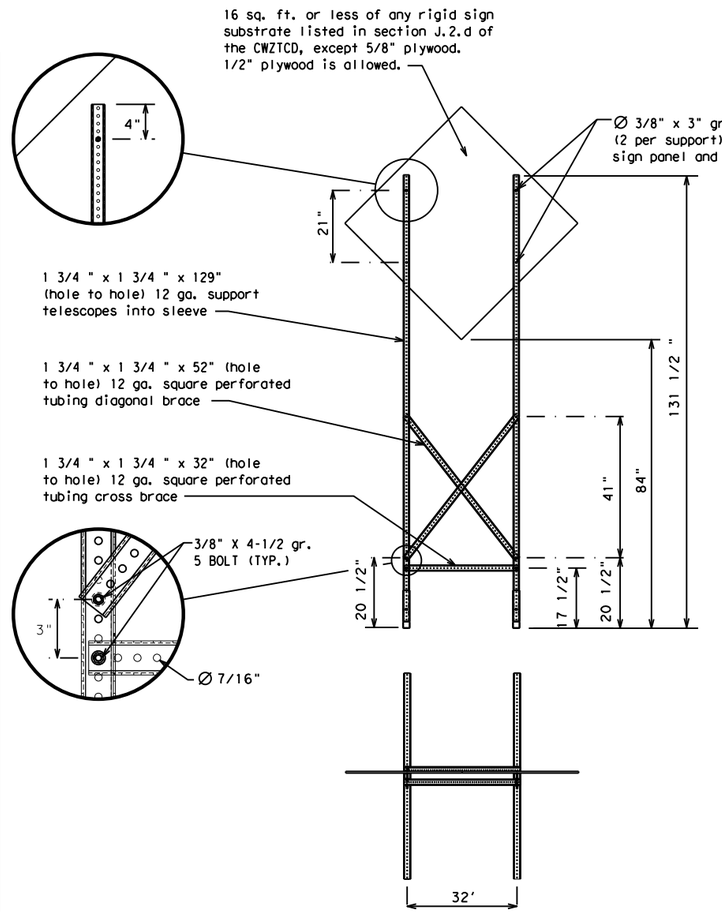
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

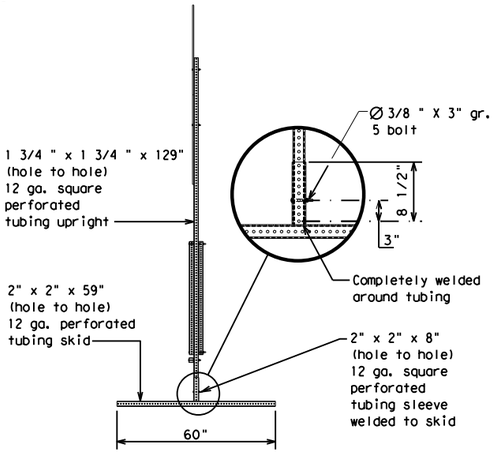


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144,Etc	IH 44, Etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
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WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

PORTABLE CHANGEABLE MESSAGE SIGNS

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

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy	HOV
Vehicle Highway	HWY
Hour(s)	HR, HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	LFT
Left Lane	LFT LN
Lane Closed	LN CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT
Major	MAJ
Miles	MI
Miles Per Hour	MPH
Minor	MNR
Monday	MON
Normal	NORM
North	N
Northbound	(route) N
Parking	PKING
Road	RD
Right Lane	RT LN
Saturday	SAT
Service Road	SERV RD
Shoulder	SHLDR
Slippery	SLIP
South	S
Southbound	(route) S
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Thursday	THURS
To Downtown	TO DWNTN
Traffic	TRAF
Travelers	TRVLRS
Tuesday	TUES
Time Minutes	TIME MIN
Upper Level	UPR LEVEL
Vehicles (s)	VEH, VEHS
Warning	WARN
Wednesday	WED
Weight Limit	WT LIMIT
West	W
Westbound	(route) W
Wet Pavement	WET PVMT
Will Not	WONT

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14		DIST	COUNTY		SHEET NO.
7-13 5-21		WFS	WICHITA		19

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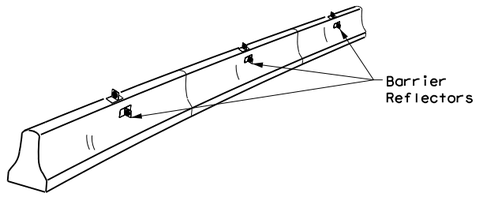
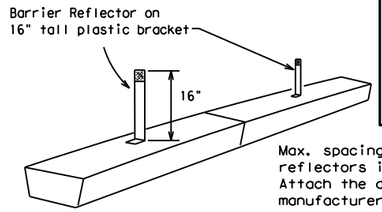
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



CONCRETE TRAFFIC BARRIER (CTB)

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

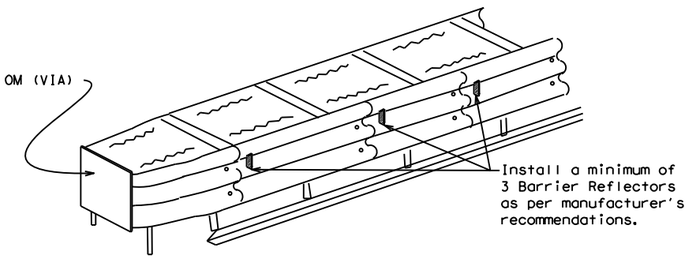


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)

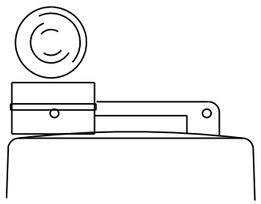


DELINEATION OF END TREATMENTS

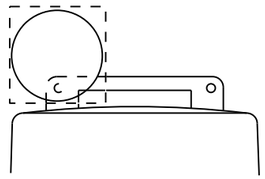
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

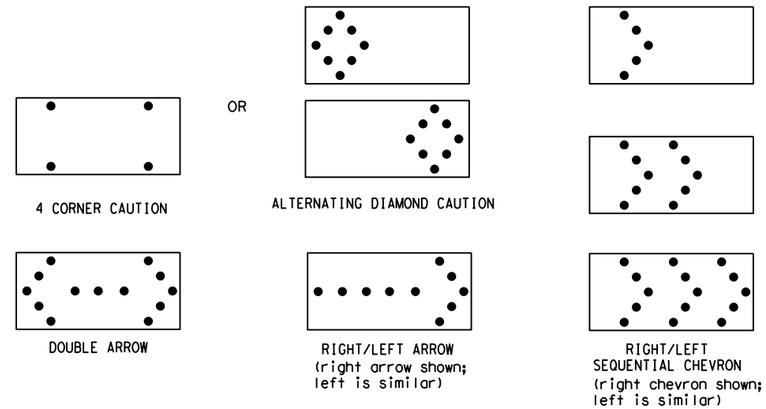
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144,Etc	IH 44, Etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	WFS	WICHITA		20

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

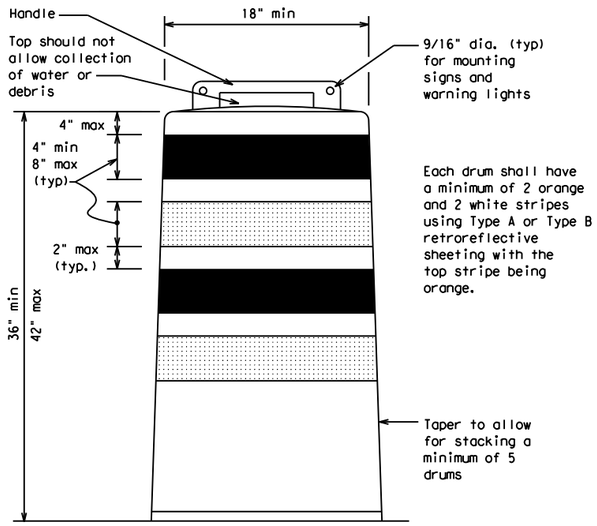
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

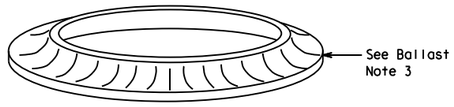
RETROREFLECTIVE SHEETING

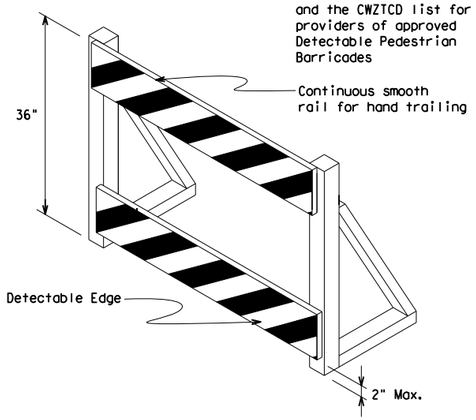
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

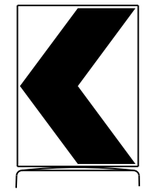




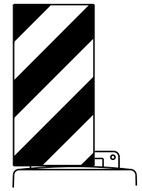


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0043	09	144,Etc	IH 44, Etc.
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	WFS	WICHITA		21
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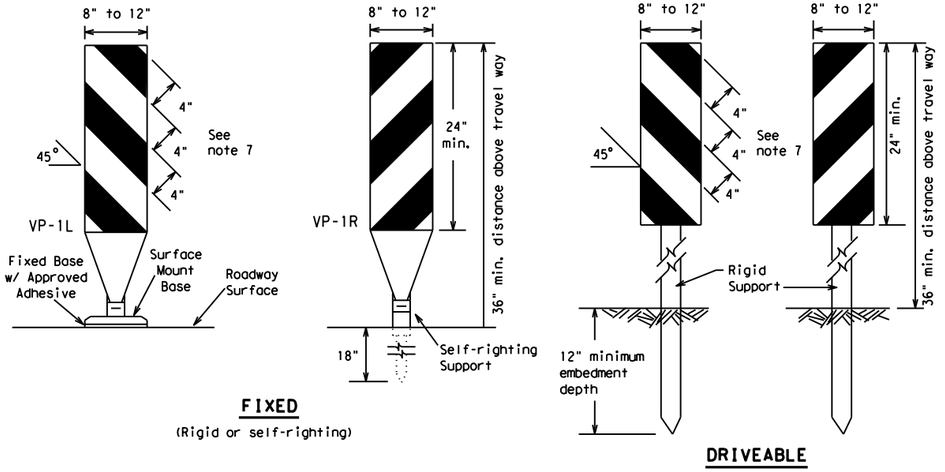
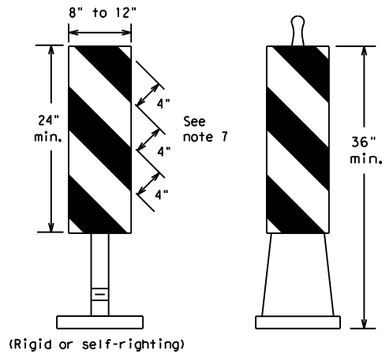


FIXED
(Rigid or self-righting)

DRIVEABLE

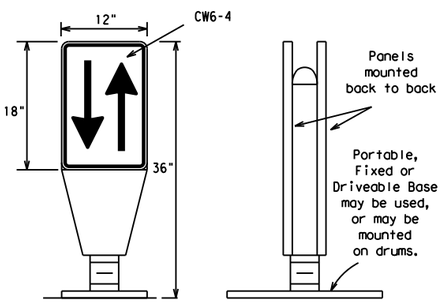


(Rigid or self-righting)

PORTABLE

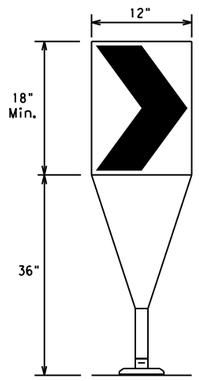
VERTICAL PANELS (VPs)

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



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

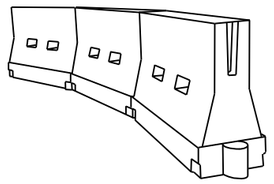
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



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

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

CHEVRONS



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

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.

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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REVISIONS	0043	09	144,Etc	IH 44, Etc.
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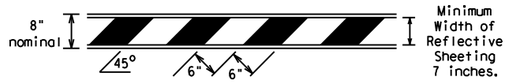
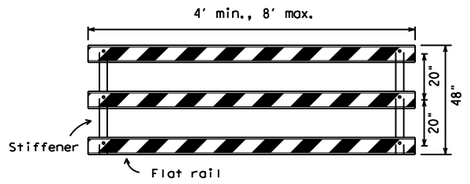
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



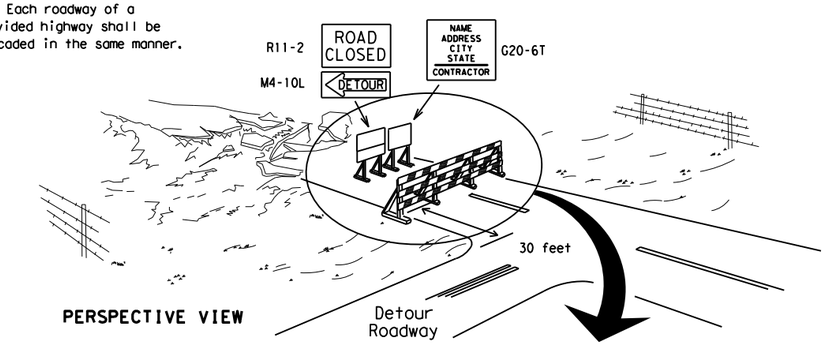
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

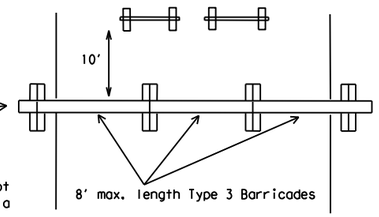
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

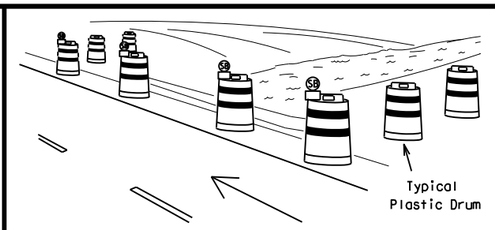
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

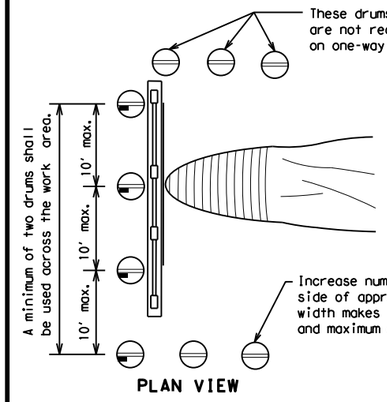
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

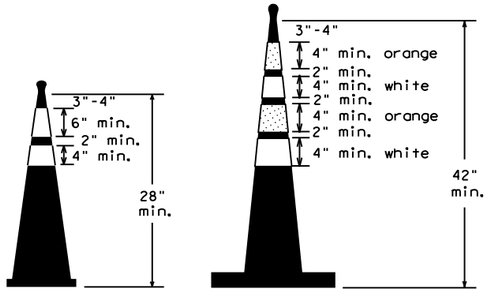
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



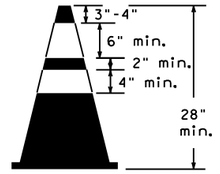
LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

PLAN VIEW

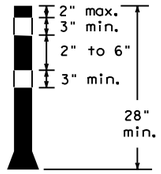
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

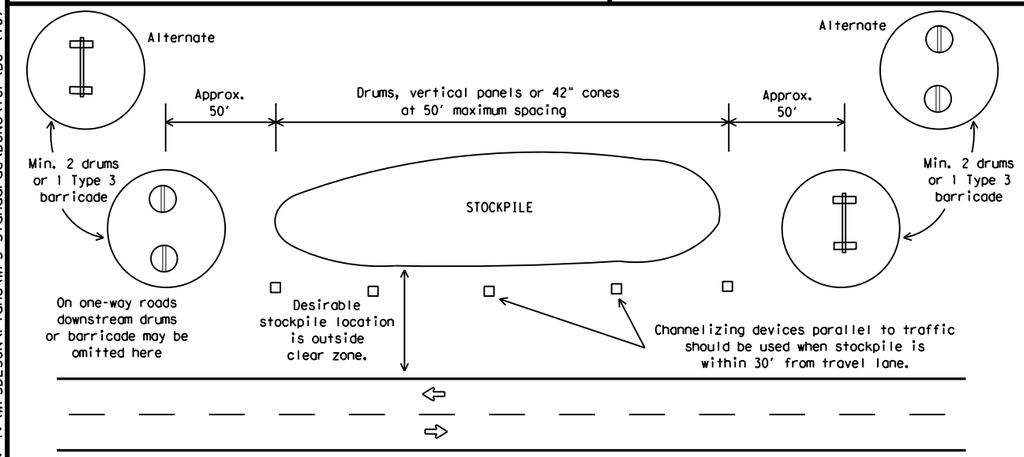


Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144,Etc	IH 44, Etc.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	WFS	WICHITA		23

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

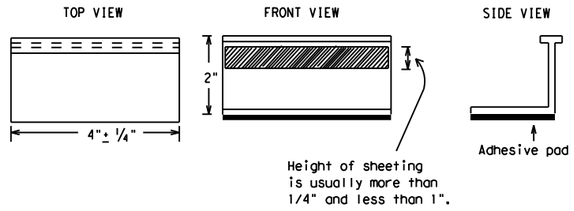
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144,Etc	IH 44, Etc.
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	WFS	WICHITA		24
11-02 8-14				

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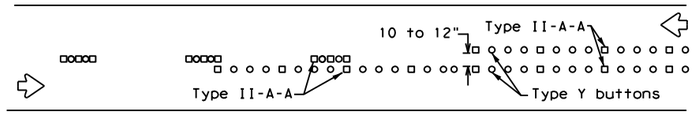
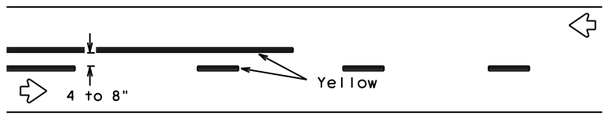
PAVEMENT MARKING PATTERNS

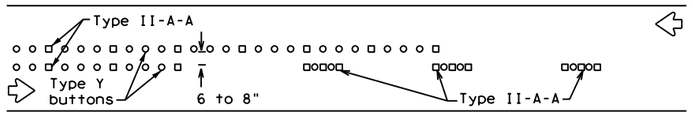
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



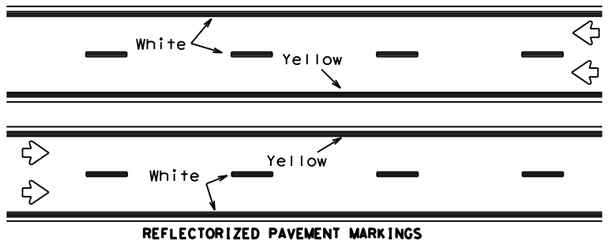
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



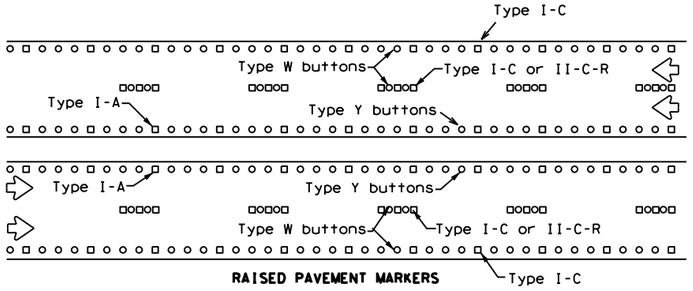
RAISED PAVEMENT MARKERS - PATTERN B

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

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



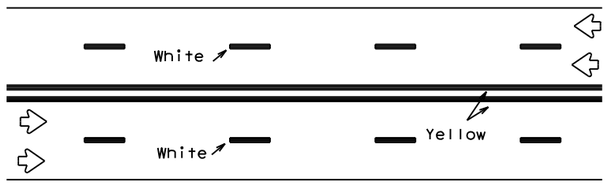
REFLECTORIZED PAVEMENT MARKINGS



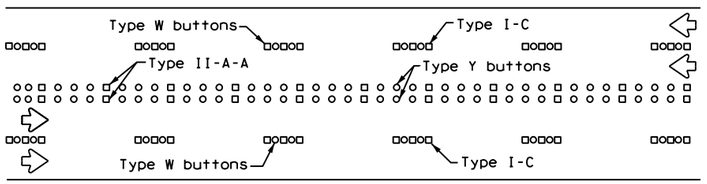
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



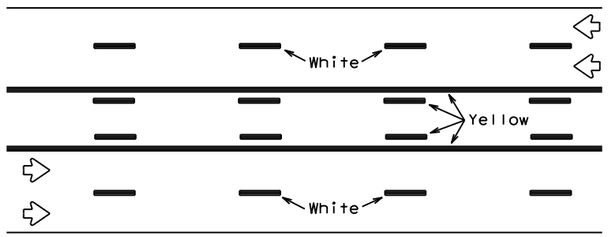
REFLECTORIZED PAVEMENT MARKINGS



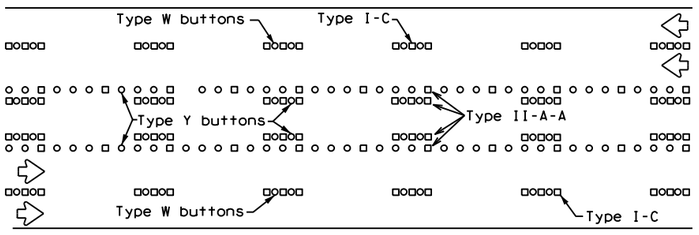
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

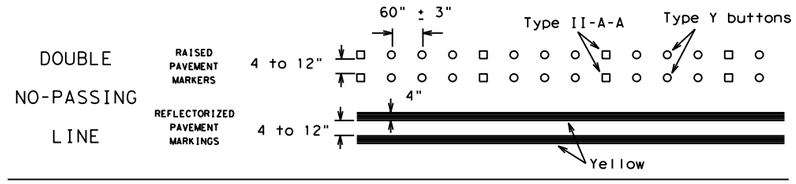
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

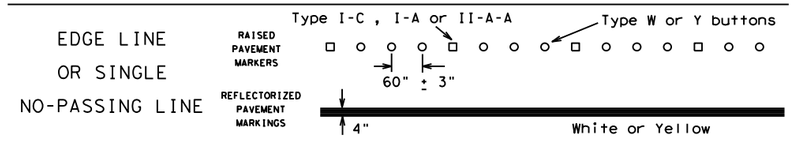
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

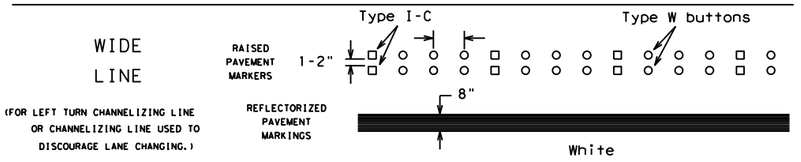


EDGE LINE OR SINGLE NO-PASSING LINE



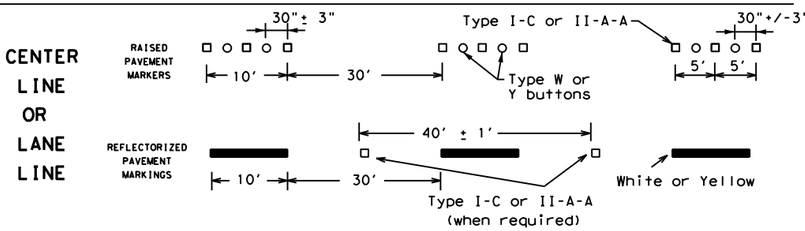
WIDE LINE

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

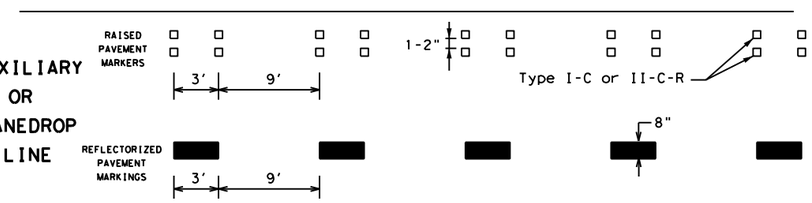


BROKEN LINES

CENTER LINE OR LANE LINE

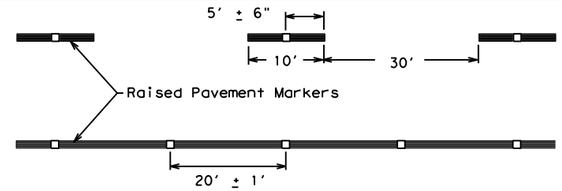


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0043	09	144,Etc	IH 44, Etc.
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		25

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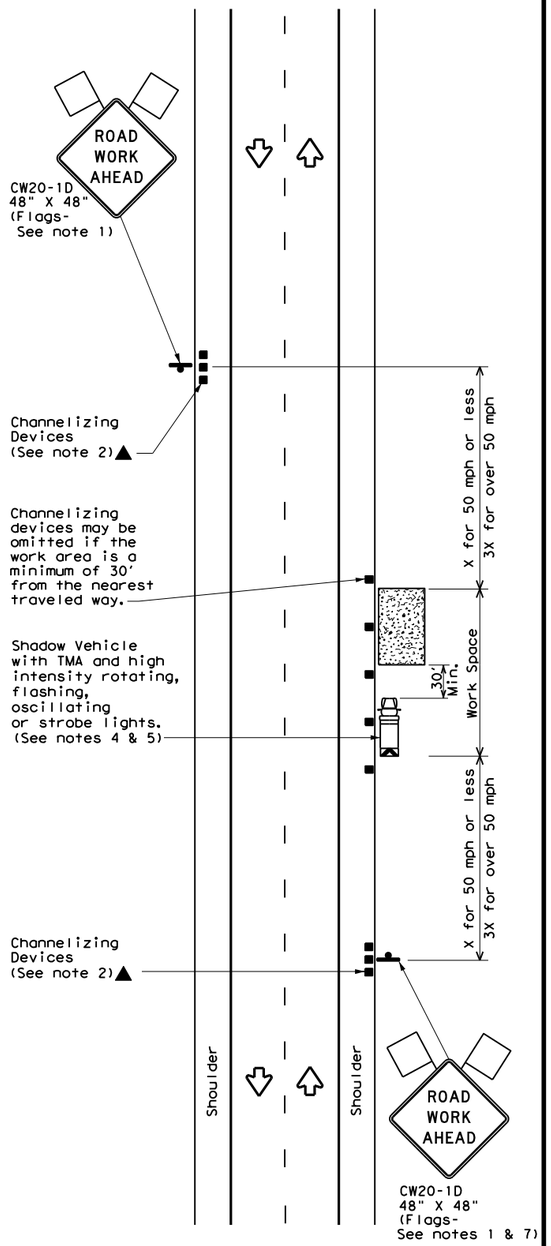
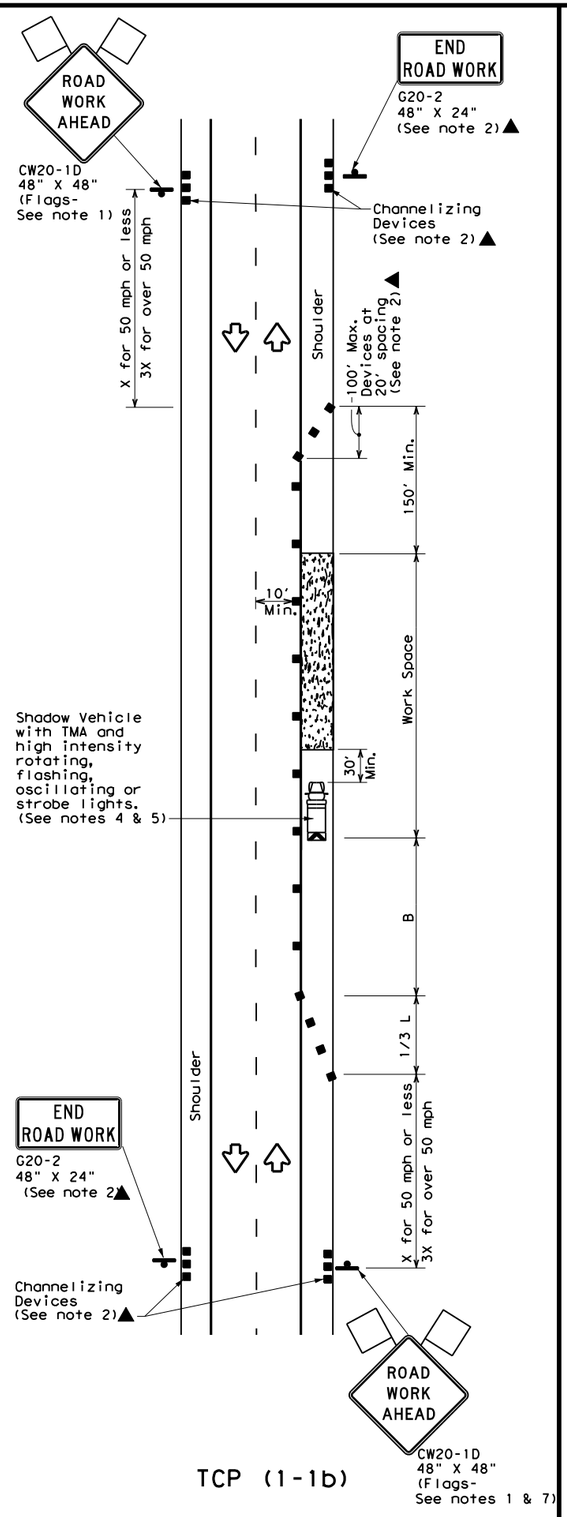


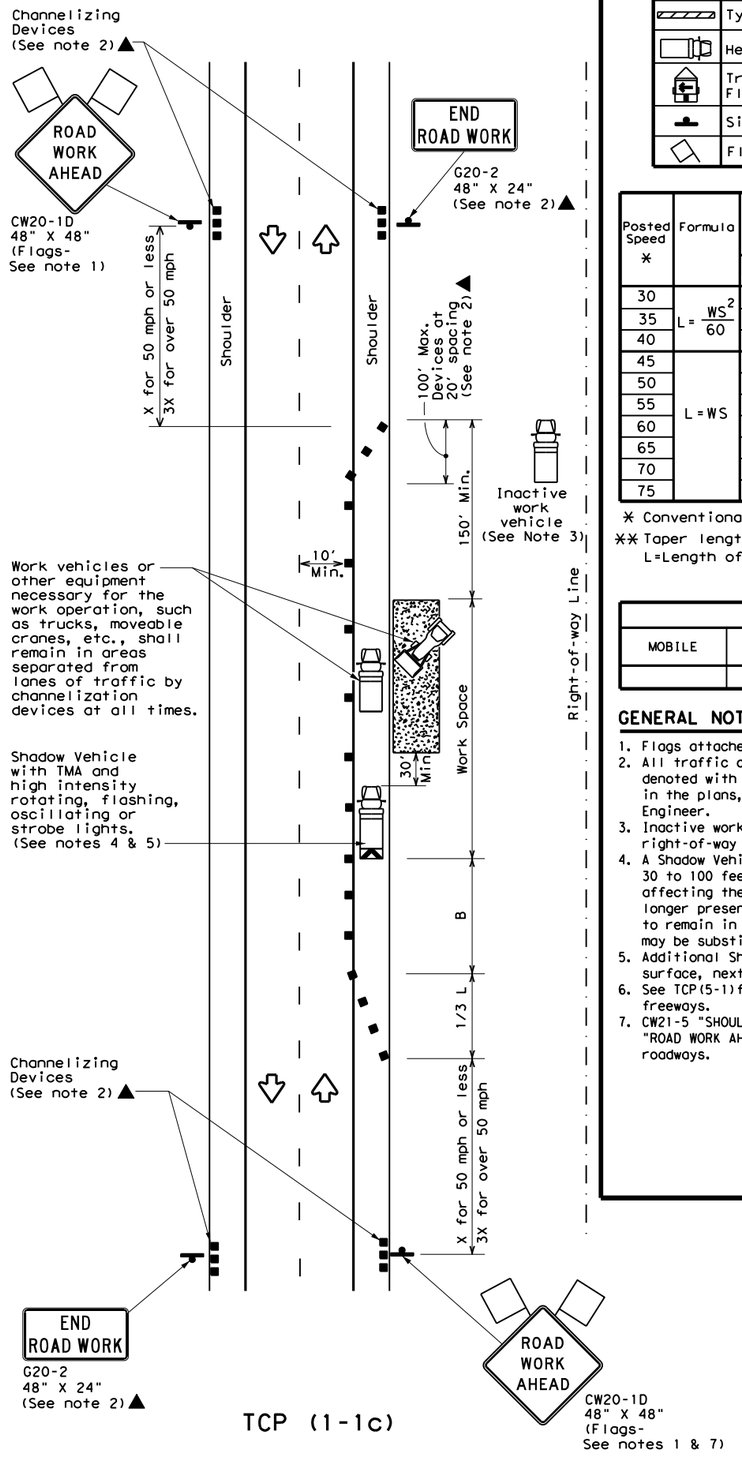
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0043	09	144,Etc	IH 44, Etc.
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		26

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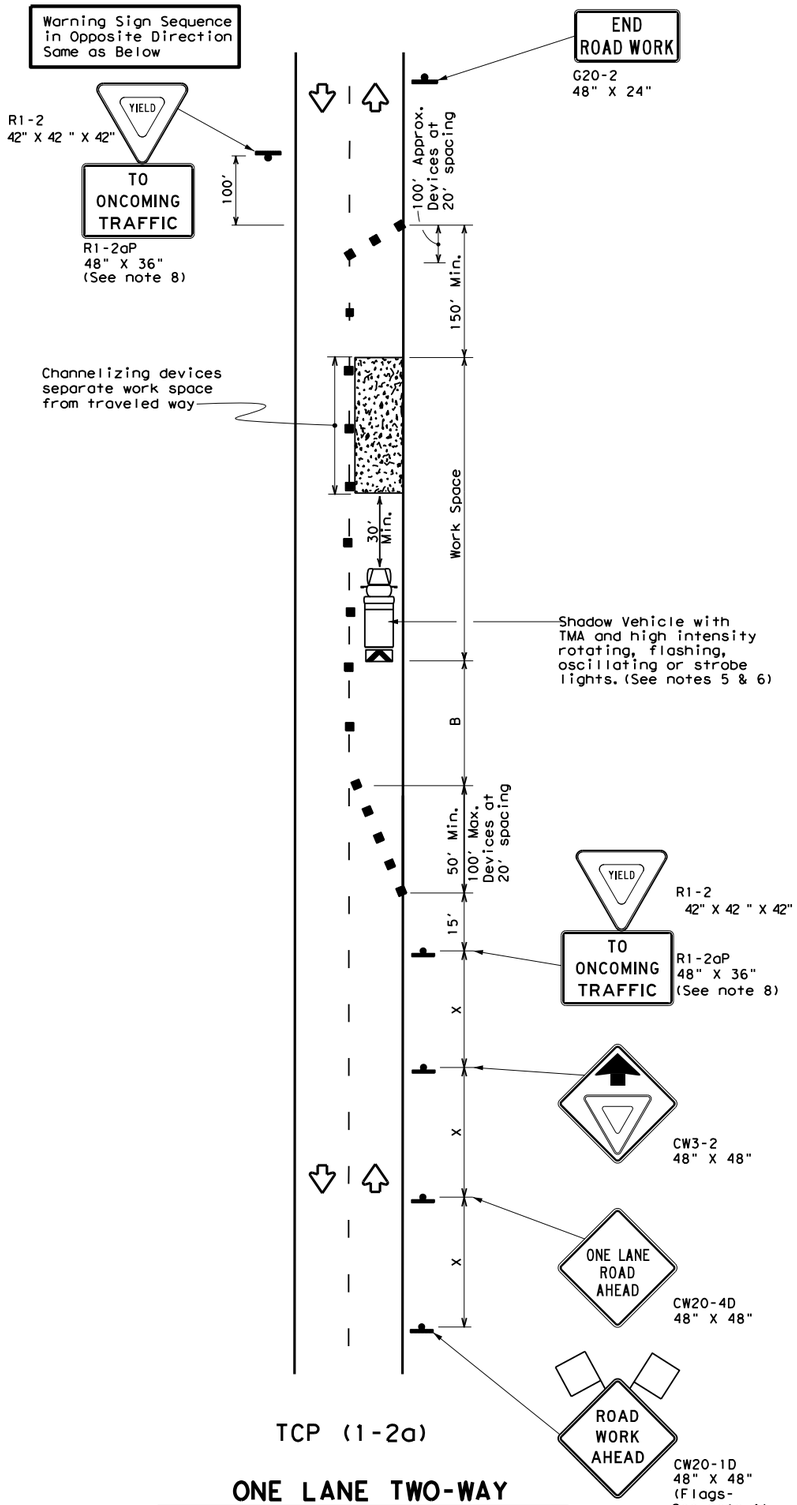
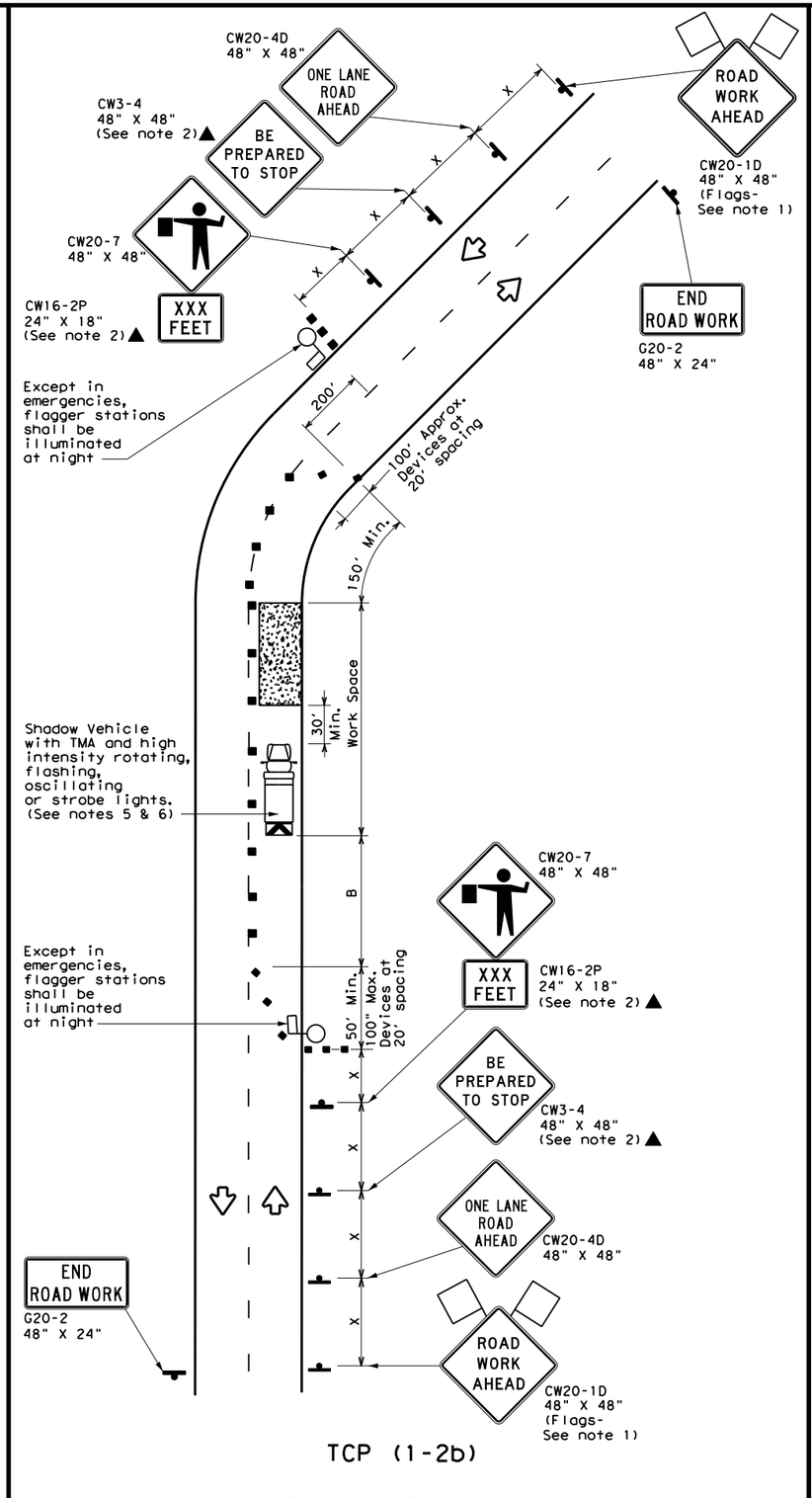


TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY CONTROL WITH FLAGGERS

LEGEND

	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"	Stopping Sight Distance
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L = WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

TYPICAL USAGE

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

GENERAL NOTES

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

TCP (1-2a)

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

TCP (1-2b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-90 4-98 2-94 2-12 1-97 2-18	0043	09	144,Etc	IH 44, Etc.
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		27

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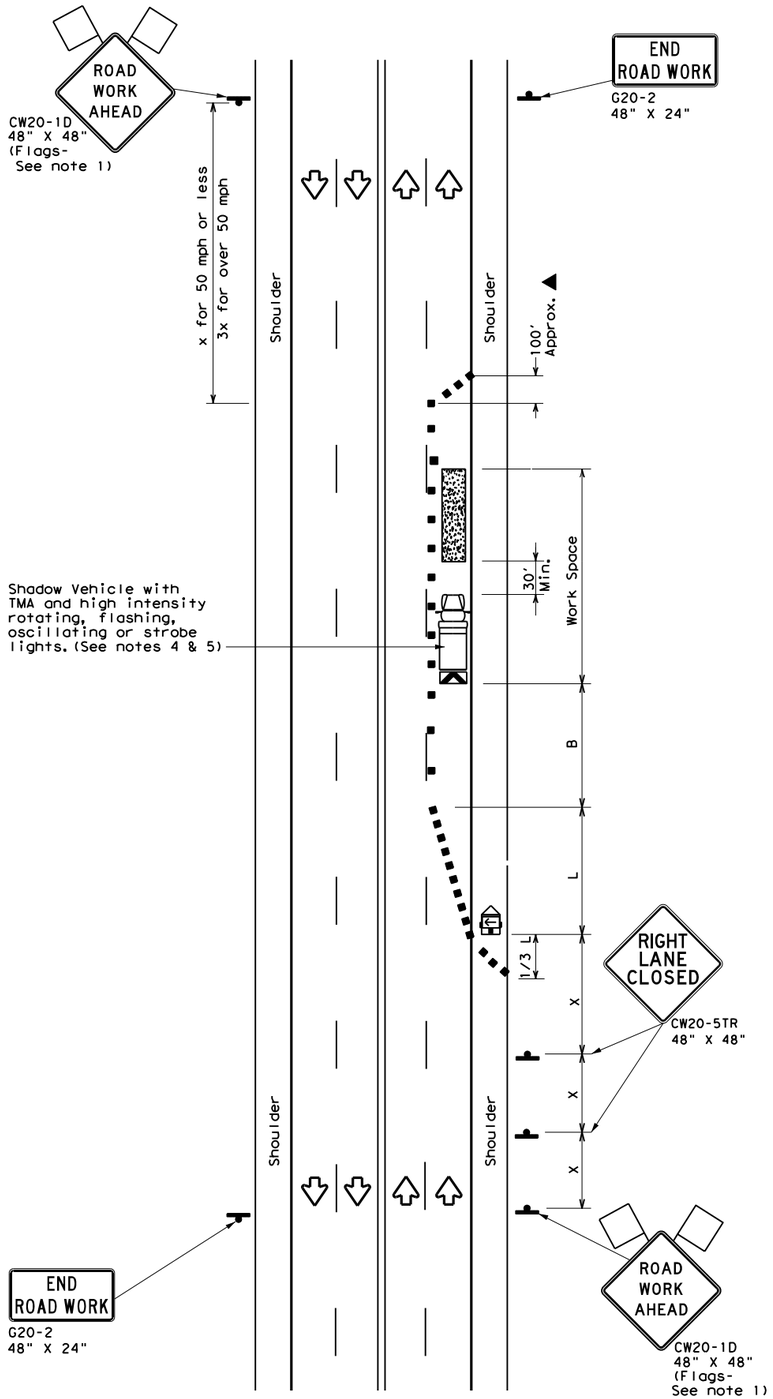
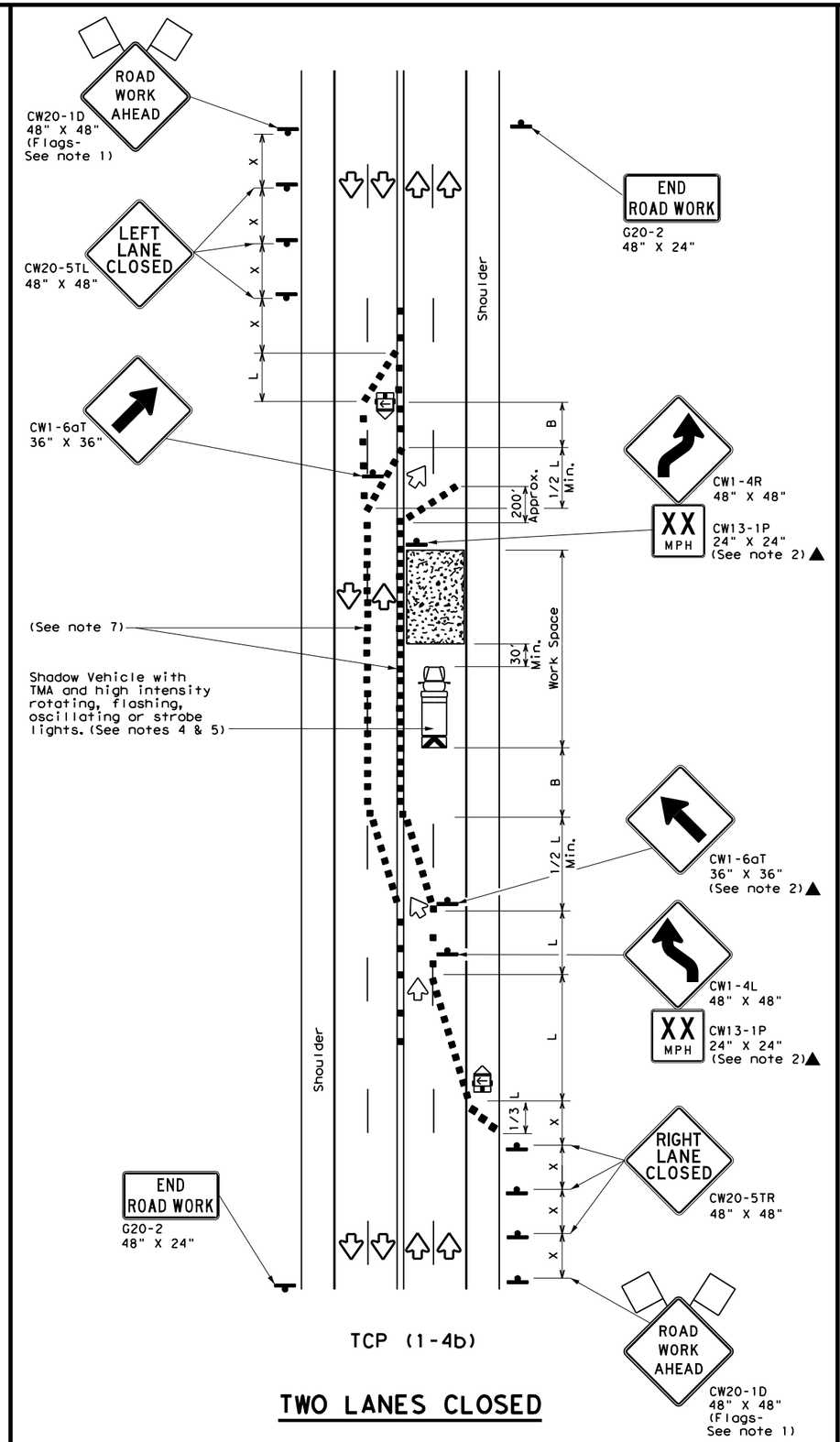


TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

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

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

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

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

GENERAL NOTES

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

TCP (1-4a)

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

TCP (1-4b)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-18

FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144,Etc	IH 44, Etc.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	WFS	WICHITA		28
1-97 2-18				

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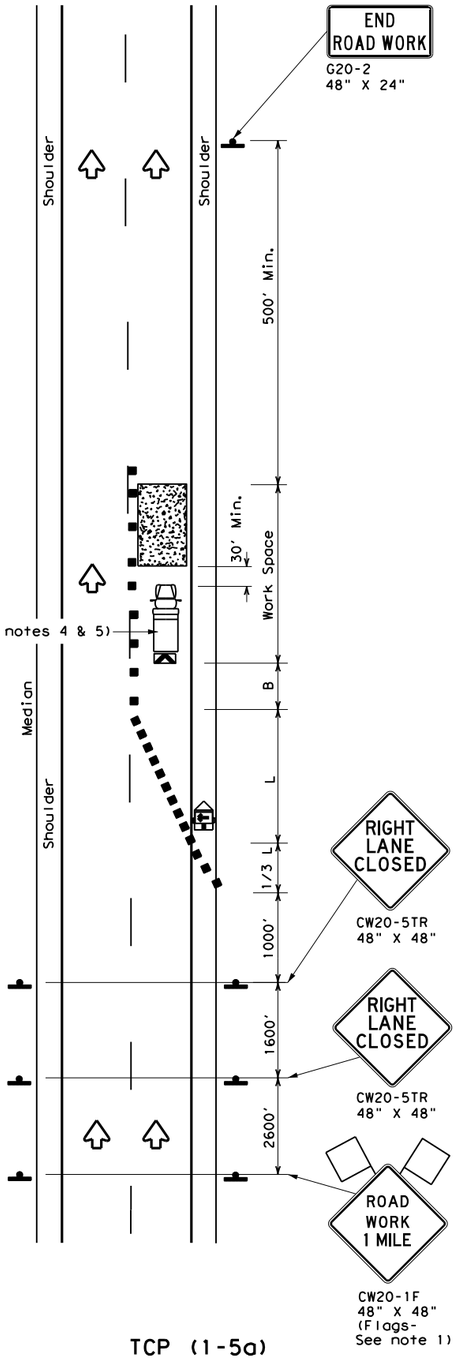
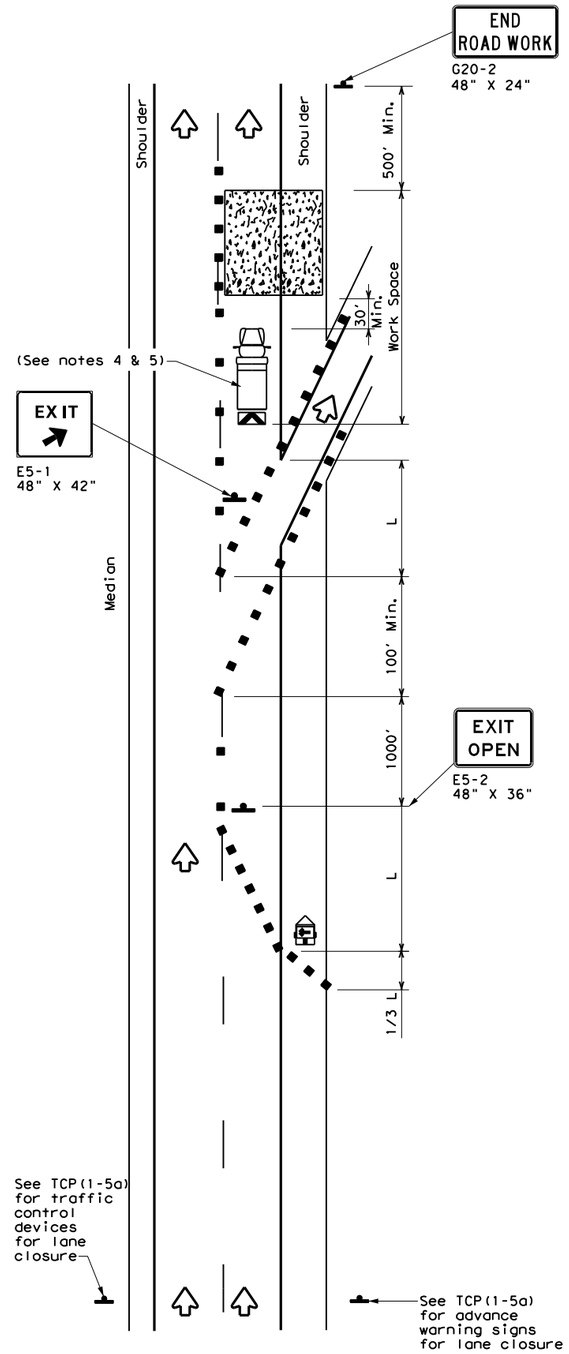


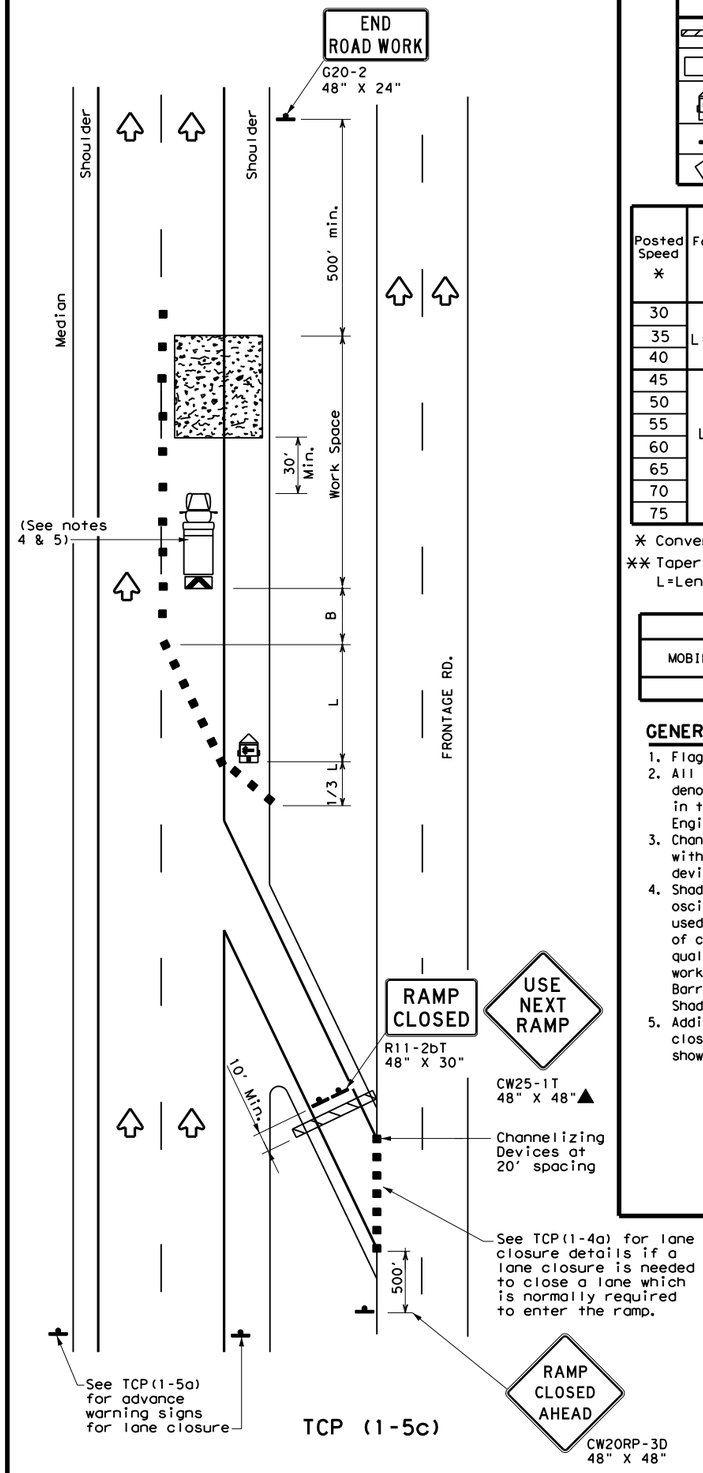
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-18

FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
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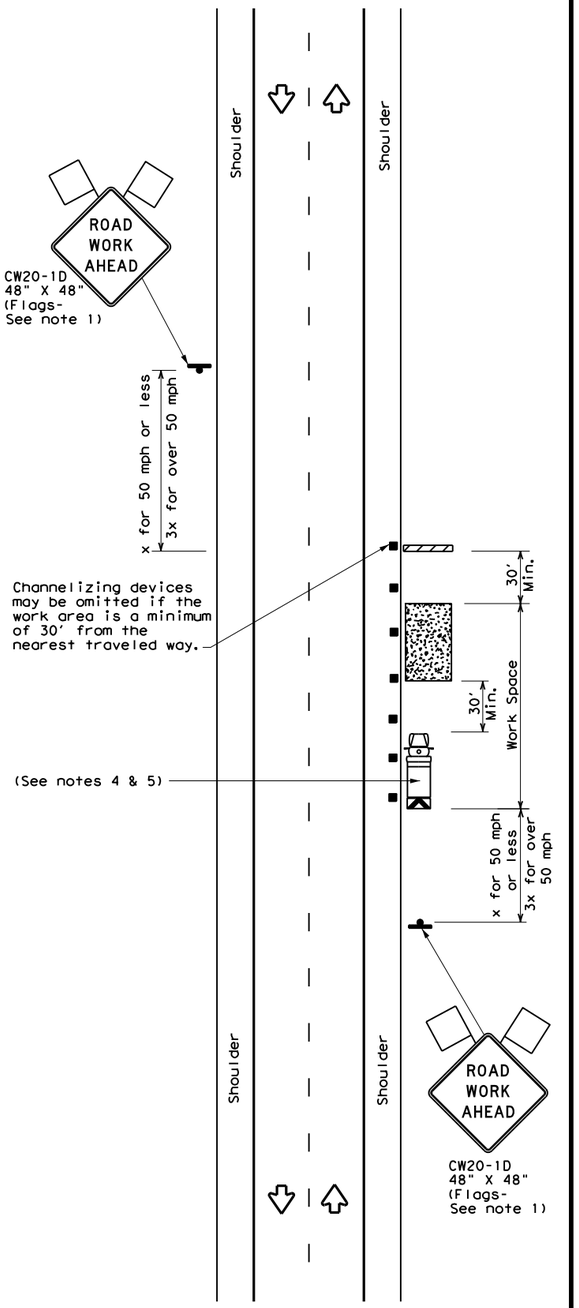
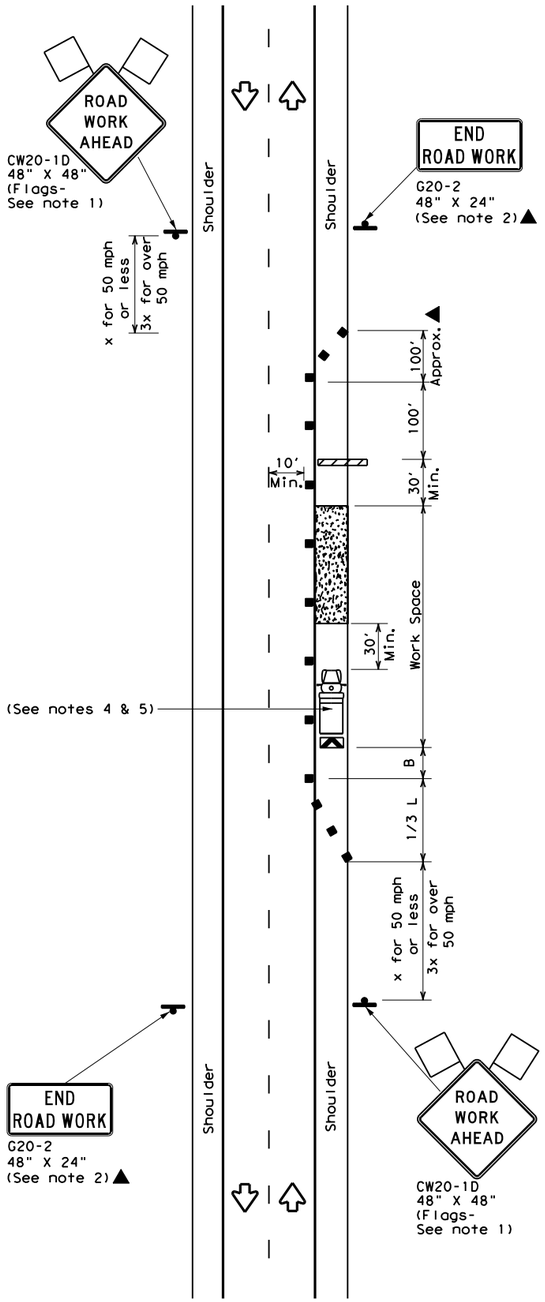
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		29



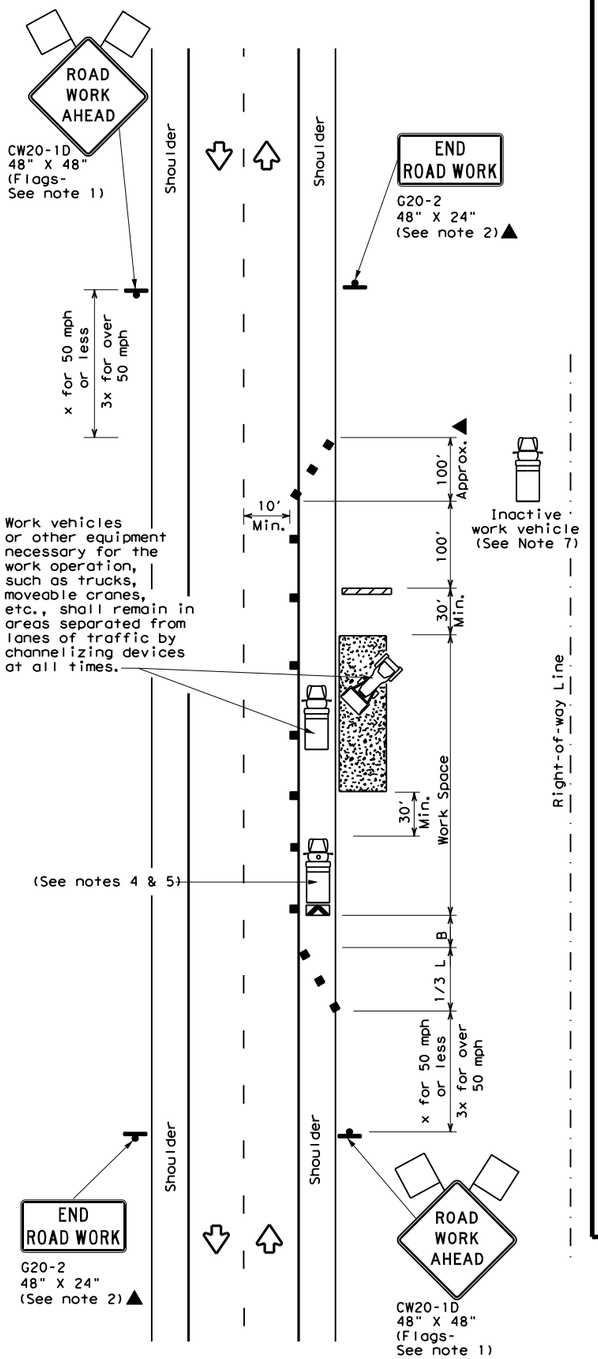
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	WFS	WICHITA		30
1-97 2-18				

DATE: 6/2/2021 9:13:52 AM
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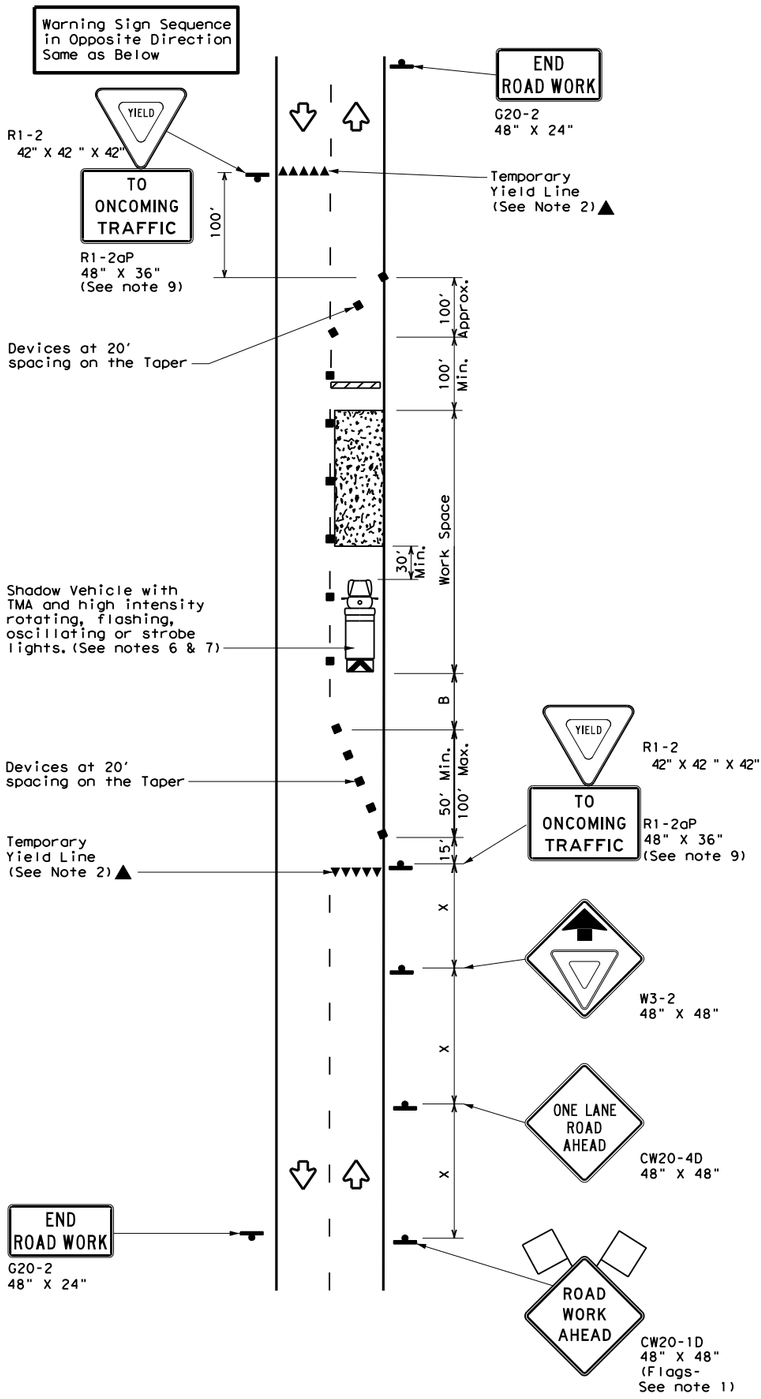
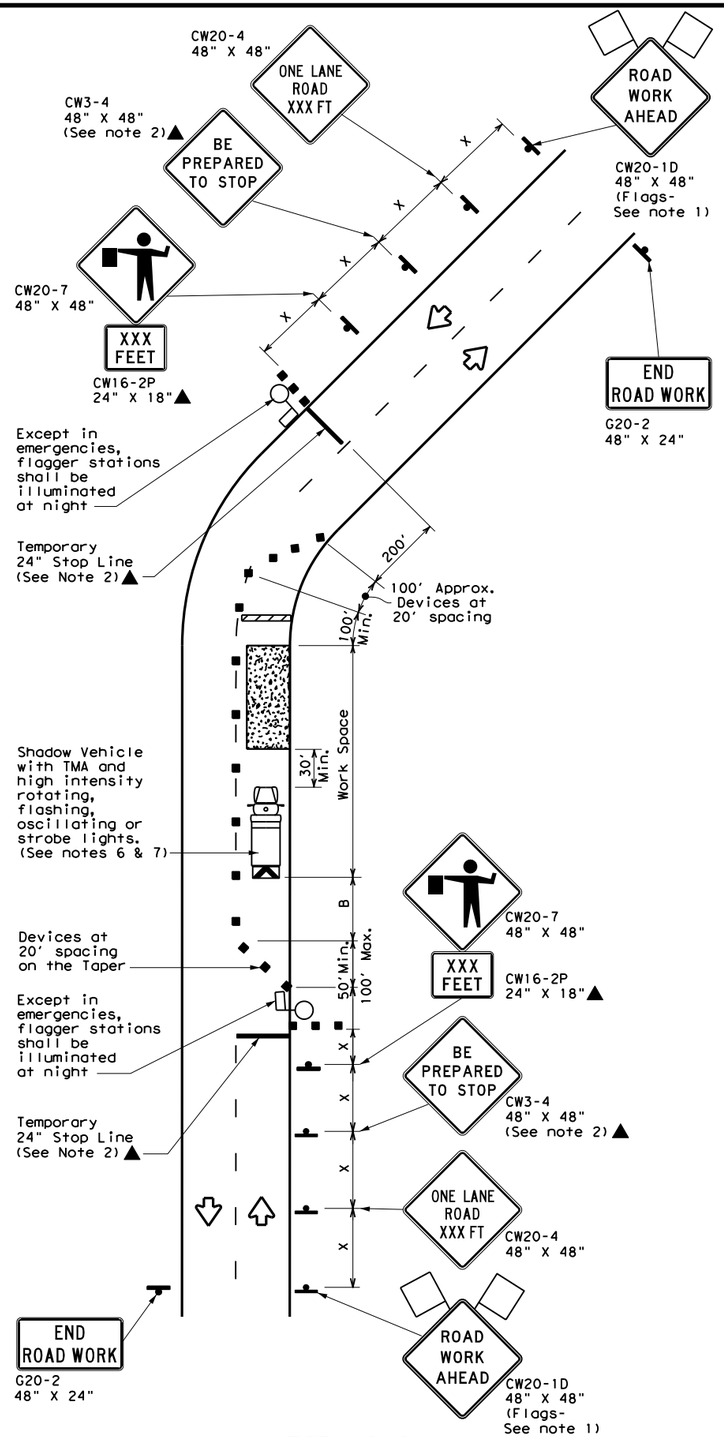


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



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

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	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"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

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

GENERAL NOTES

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

TCP (2-2a)

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

TCP (2-2b)

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0043	09	144,Etc	IH 44, Etc.
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		31

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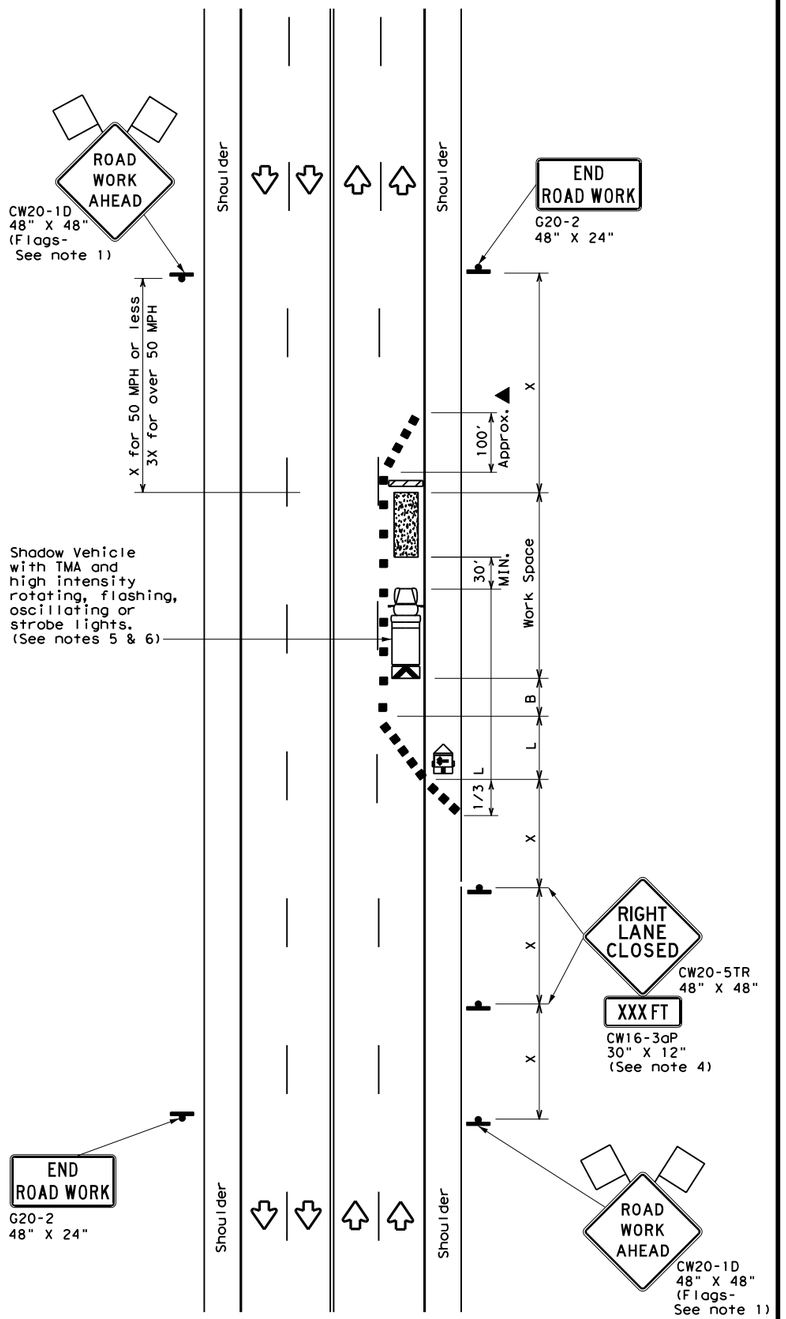
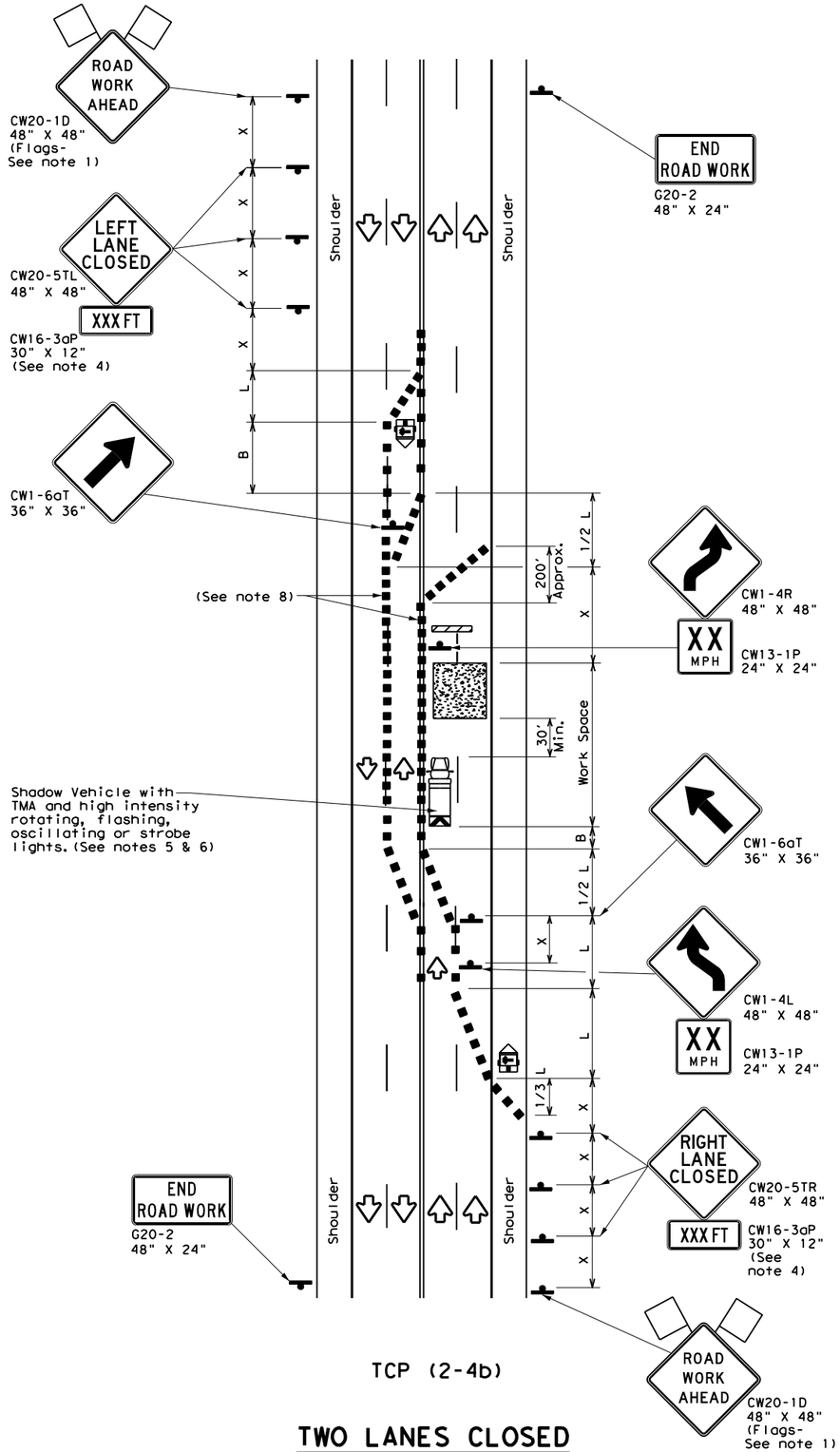


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0043	09	144,Etc	IH 44, Etc.
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	WFS	WICHITA		32

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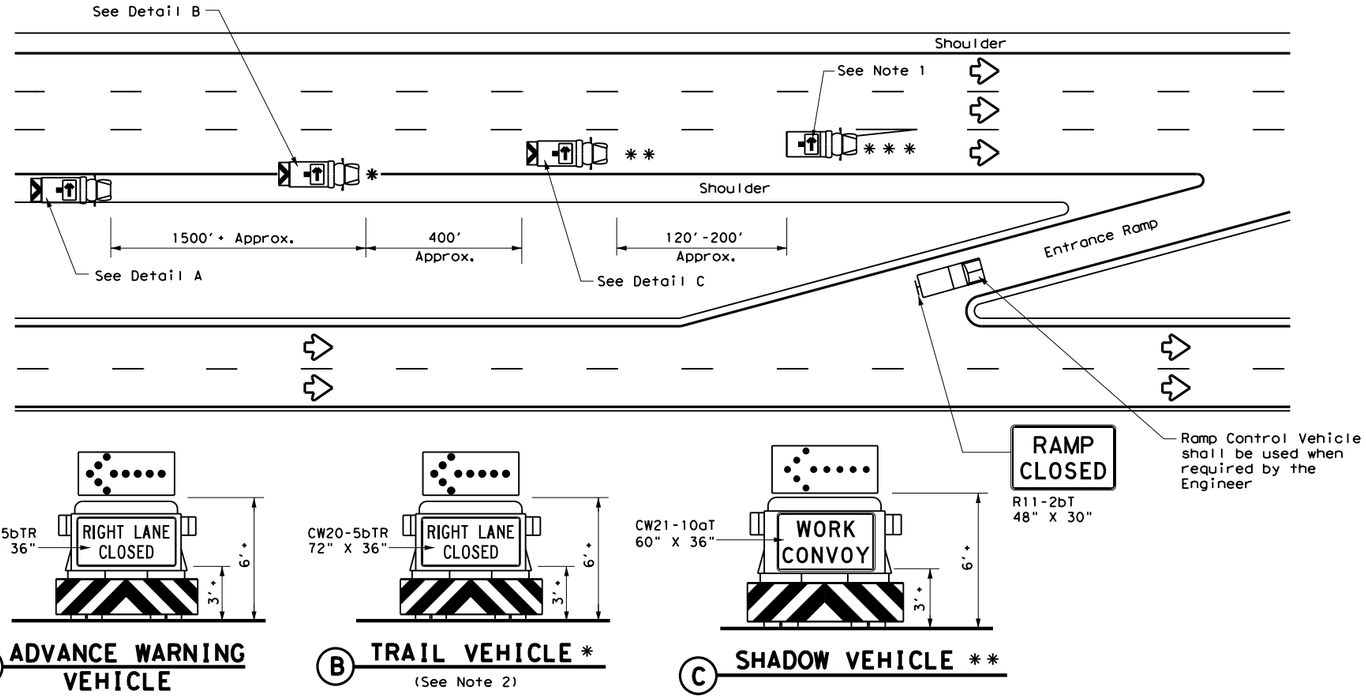
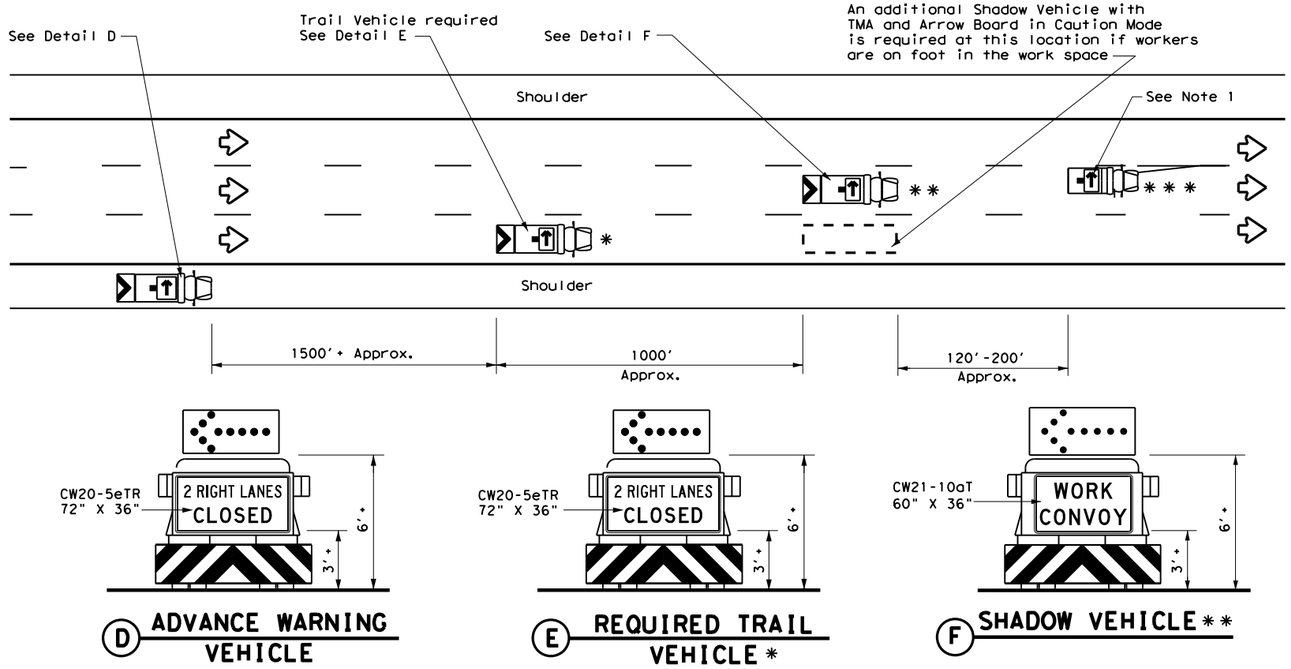


RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



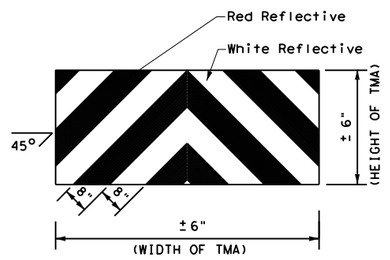
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0043	09	144,Etc	IH 44, Etc.
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		33

176

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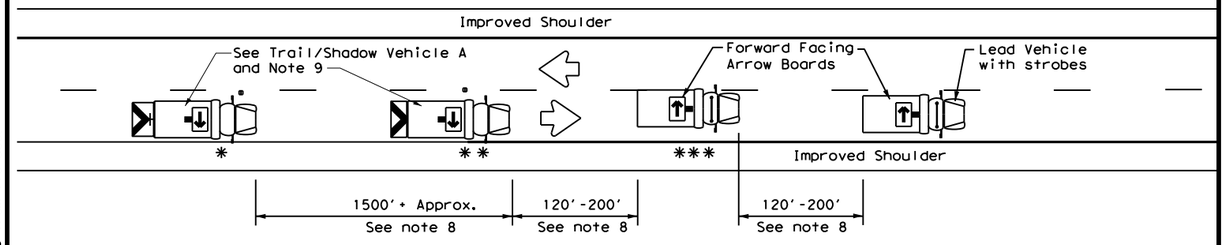
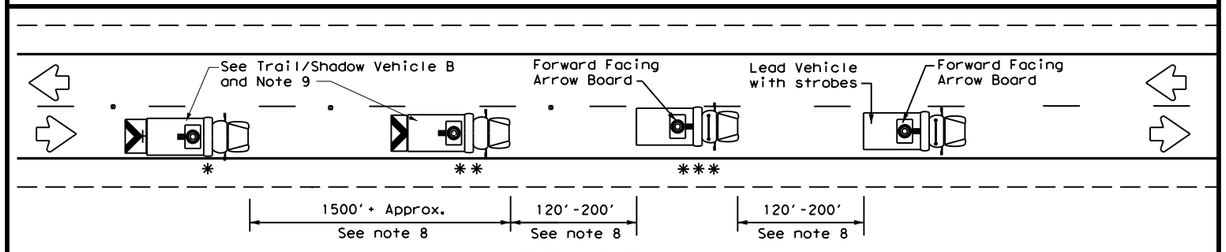


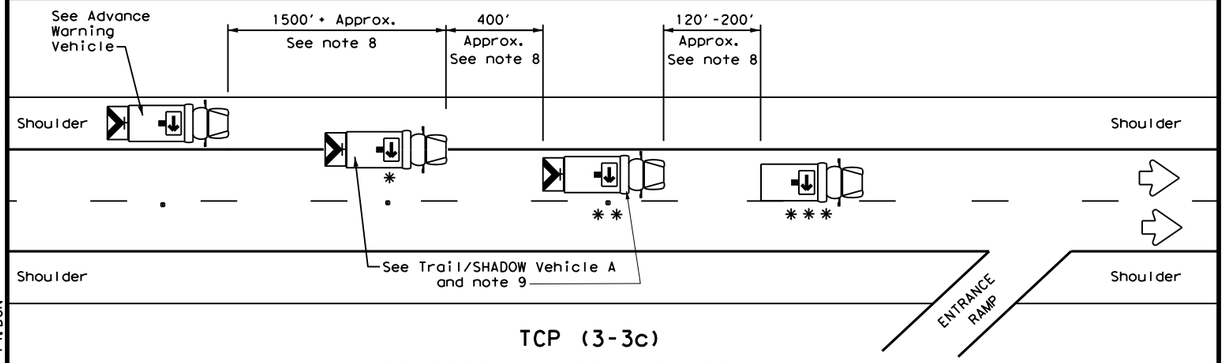
TCP (3-3a)

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



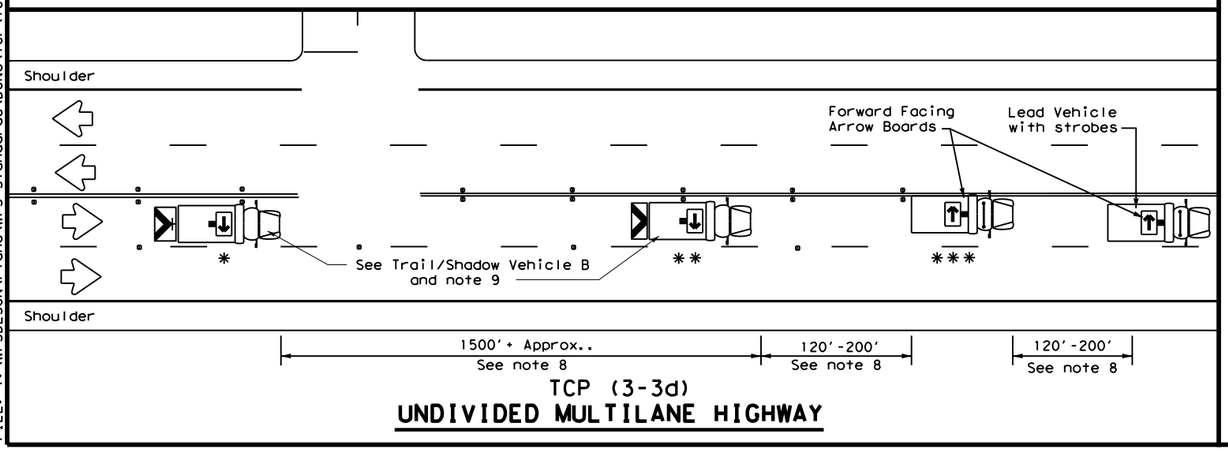
TCP (3-3b)

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



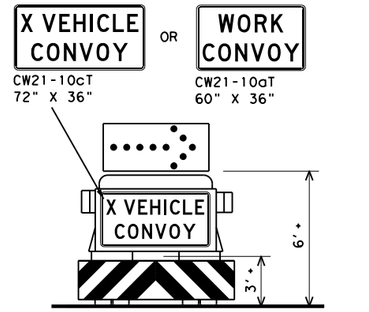
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



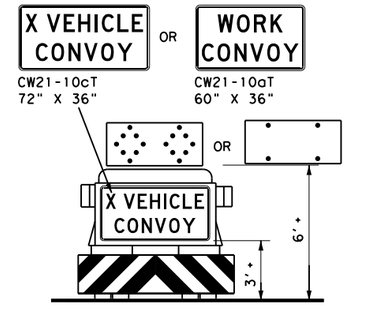
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



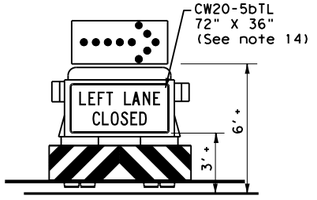
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

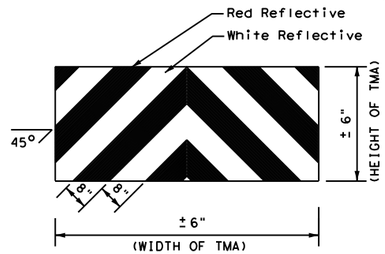


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
MOBILE OPERATIONS
RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL
TCP(3-3)-14

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, Etc	IH 44, Etc.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	WFS	WICHITA		34
1-97 7-14				

177

DATE: 6/2/2021 9:14:03 AM
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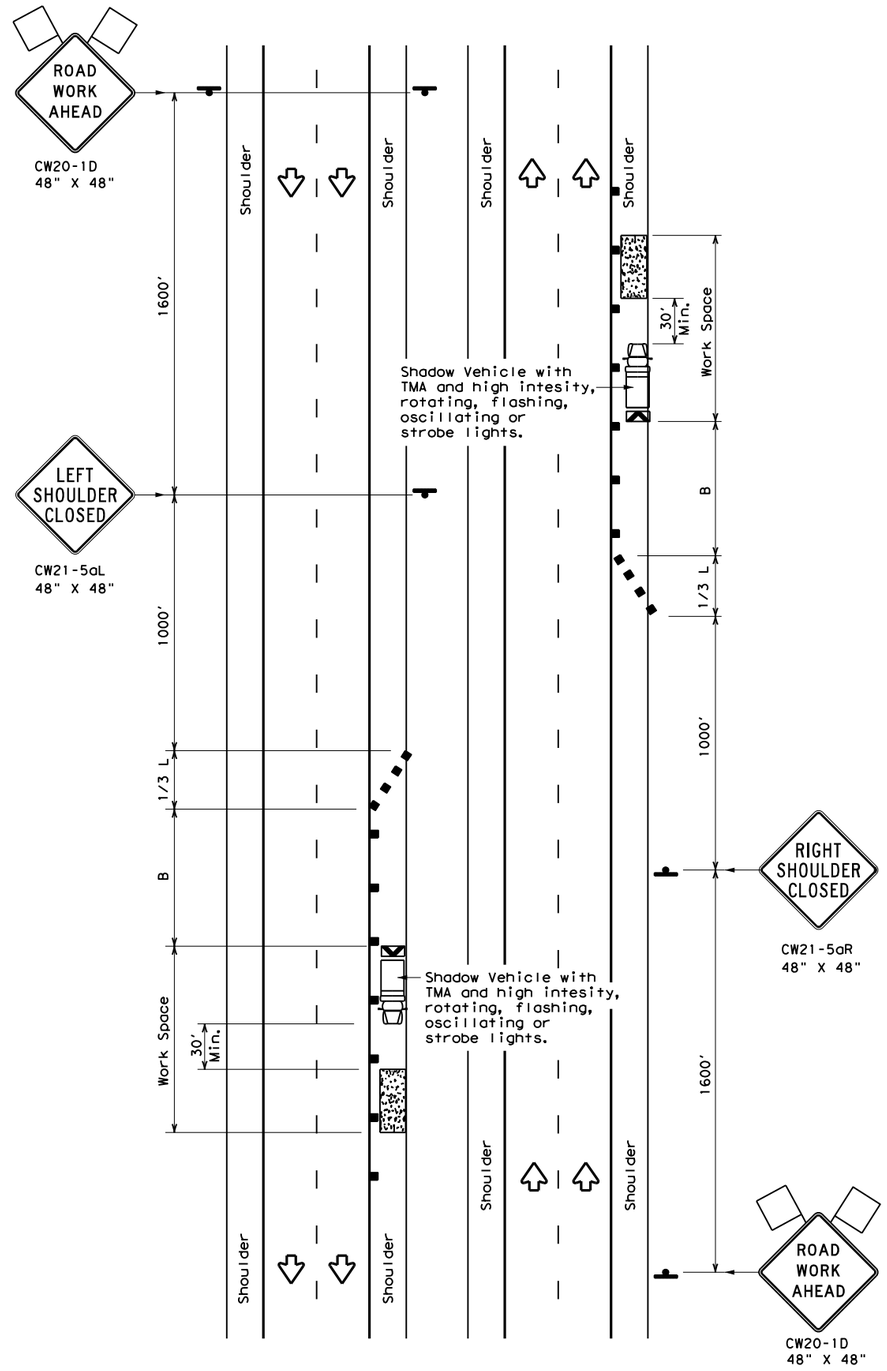
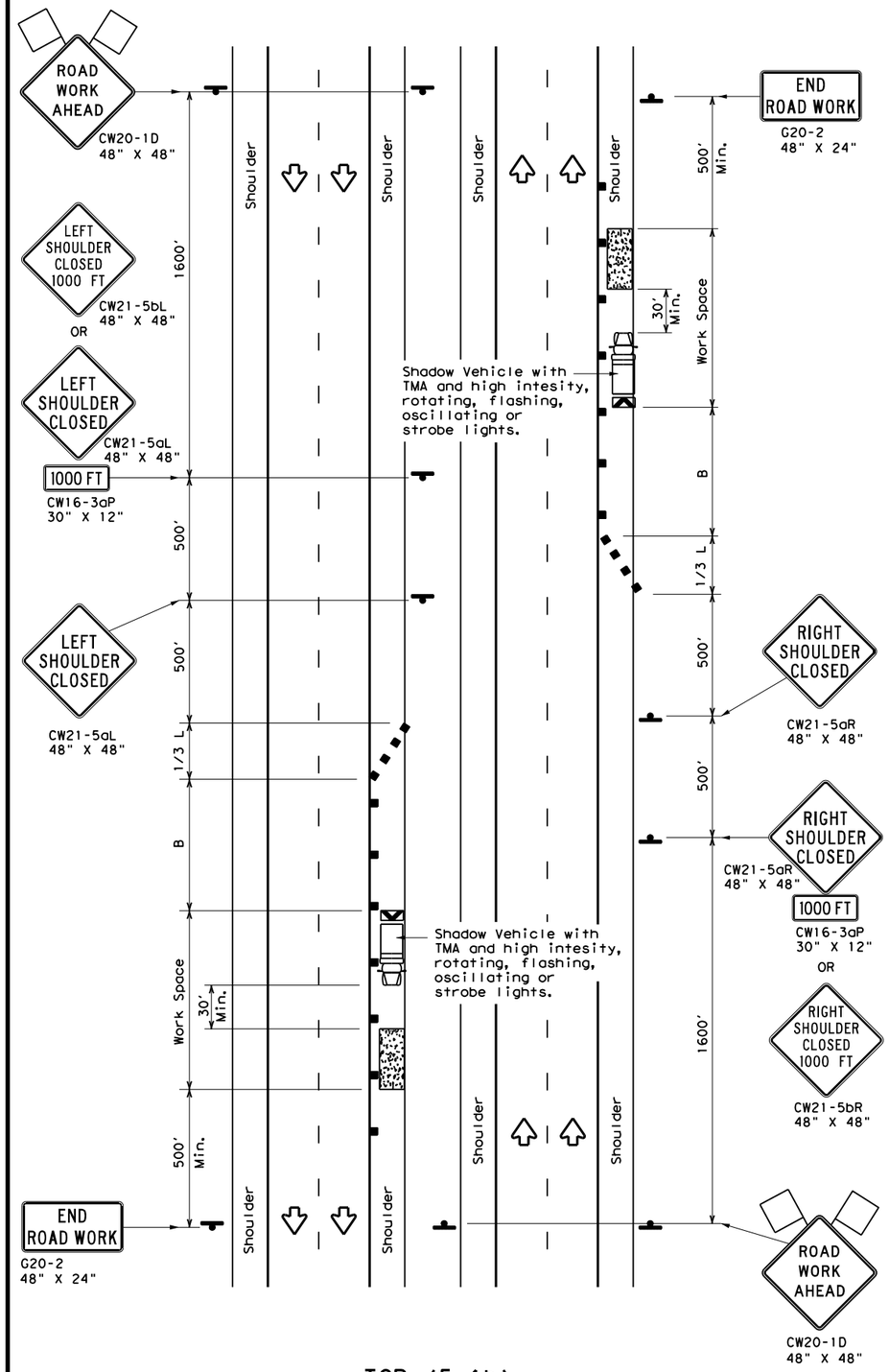


TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	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	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	90'
35		205'	225'	245'	35'	70'	120'
40		265'	295'	320'	40'	80'	155'
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

* Conventional Roads Only

** Taper lengths have been rounded off.

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

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

GENERAL NOTES

1. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30' to 100' in advance of the area of crew exposure without adversely effecting the performance or quality of the work. Type 3 barricades or drums may be substituted when workers on foot are no longer present when approved by the Engineer.
2. 28" tall or taller one-piece cones will be allowed only for Short Duration or Short Term stationary operations when workers are present to maintain the devices upright and in proper location. Intermediate Term stationary work areas should use Drums, Vertical Panels or 42" tall two-piece cones.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

TCP(5-1)-18

FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	0043	09	144,Etc	IH 44, Etc.
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		35

DATE: 6/2/2021 9:14:05 AM
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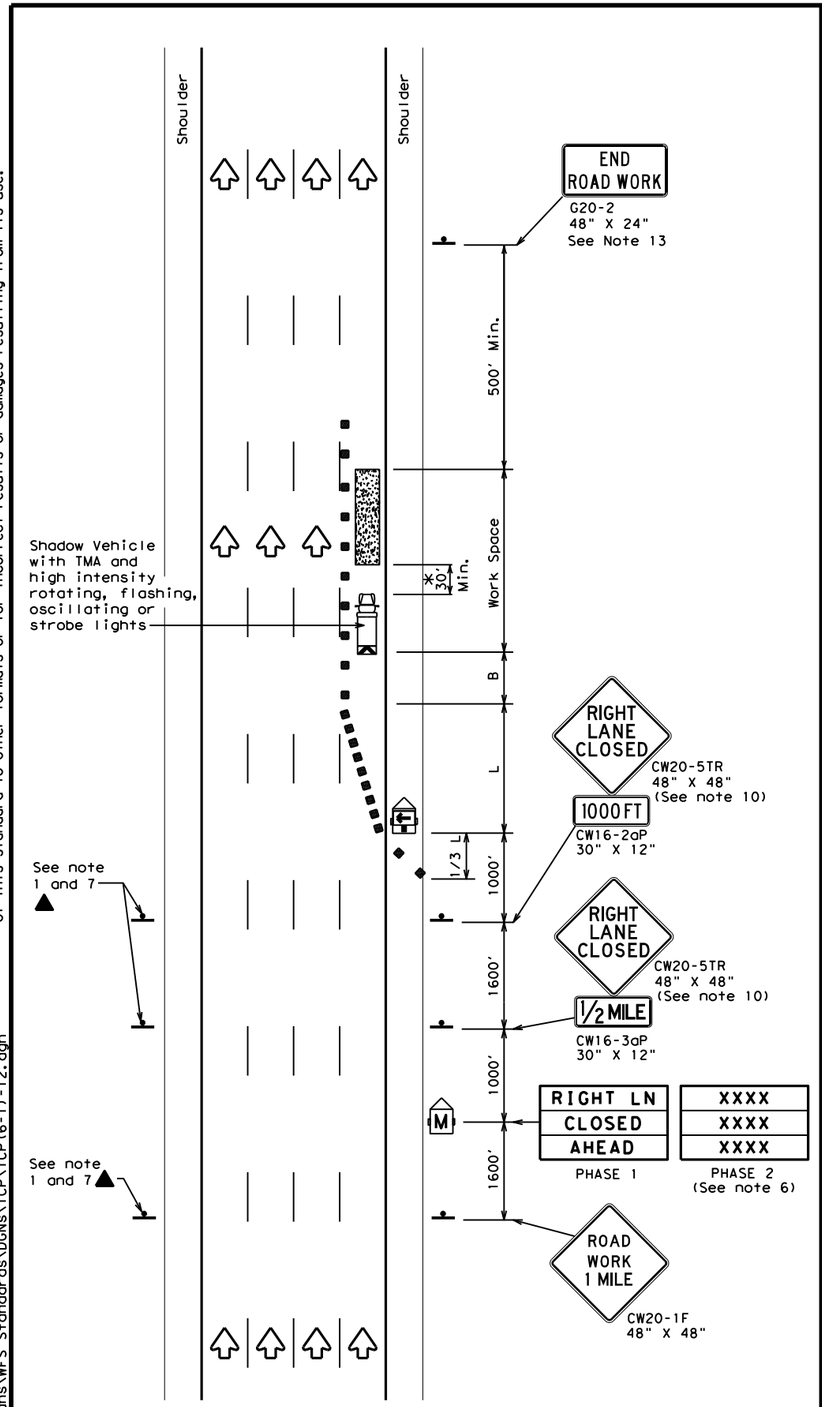
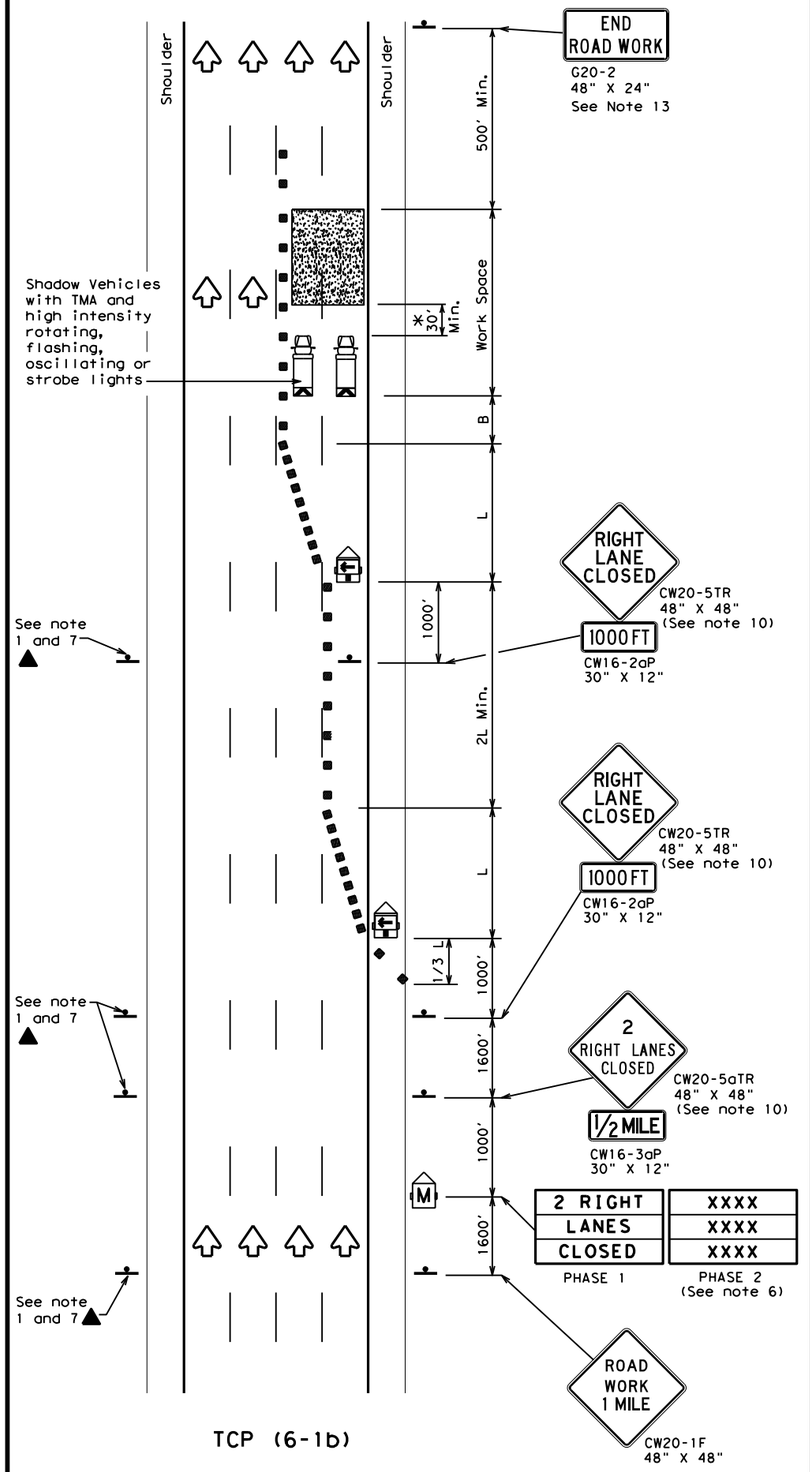


TCP (6-1a)

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	0043	09	144,Etc	IH 44, Etc.
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		36

201

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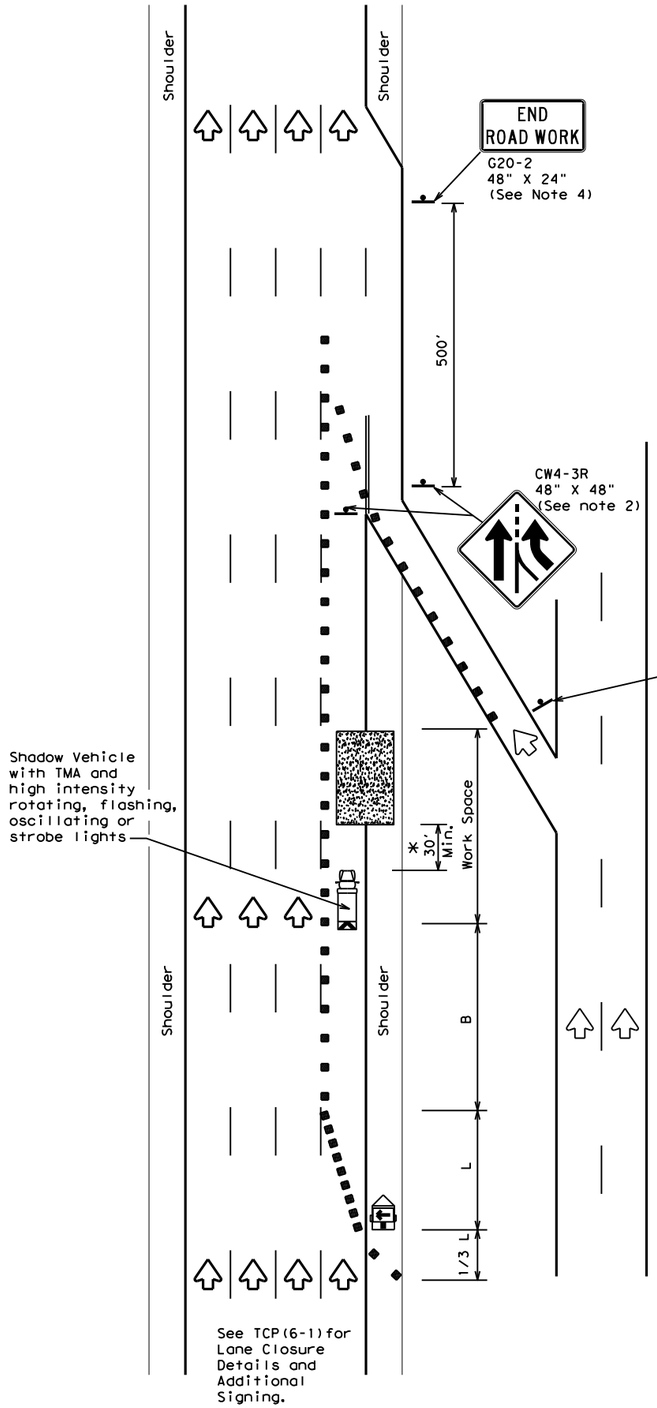
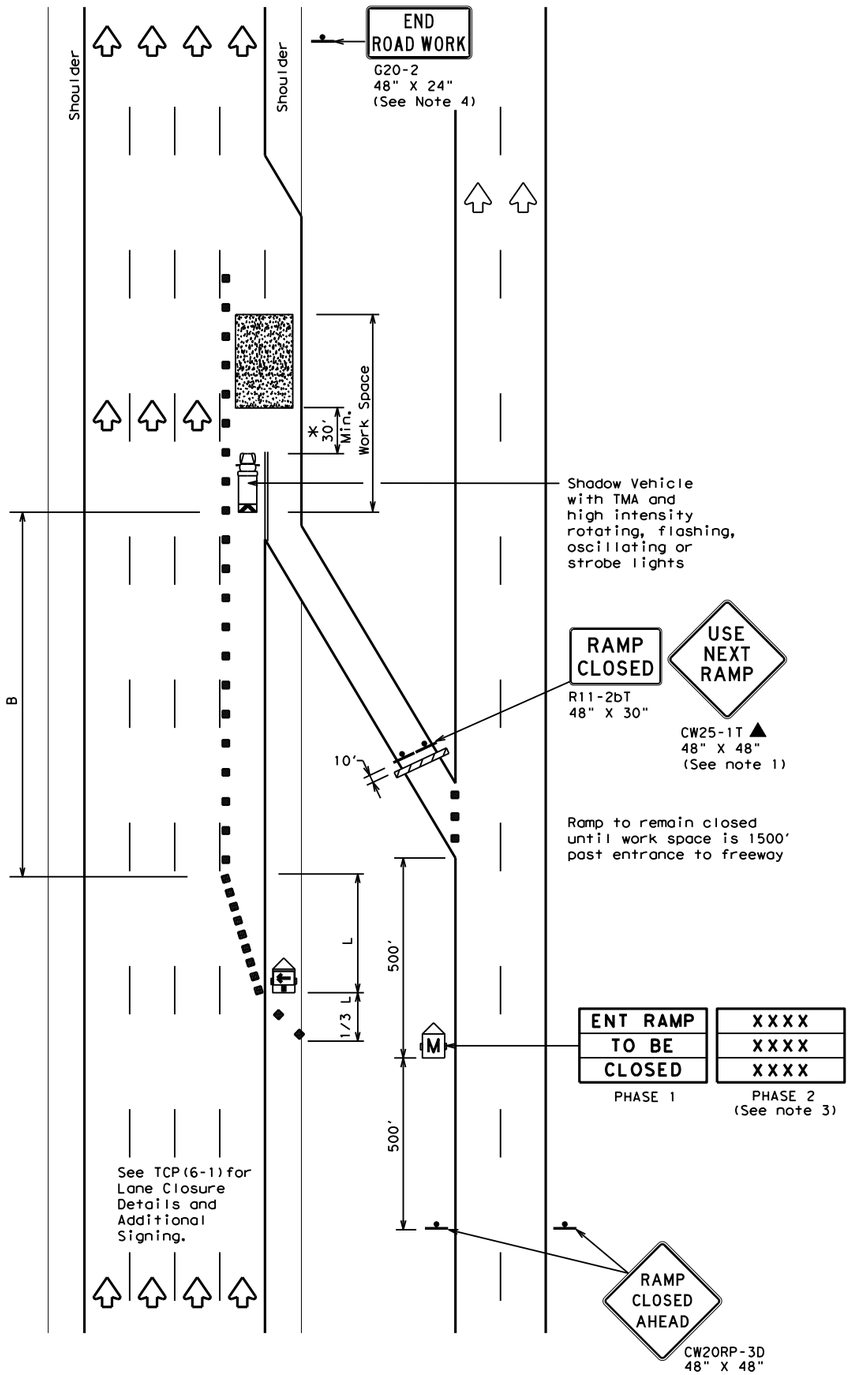


TCP (6-2a)

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" ** 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. 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
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144,Etc	IH 44, Etc.
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	WFS	WICHITA		37

202

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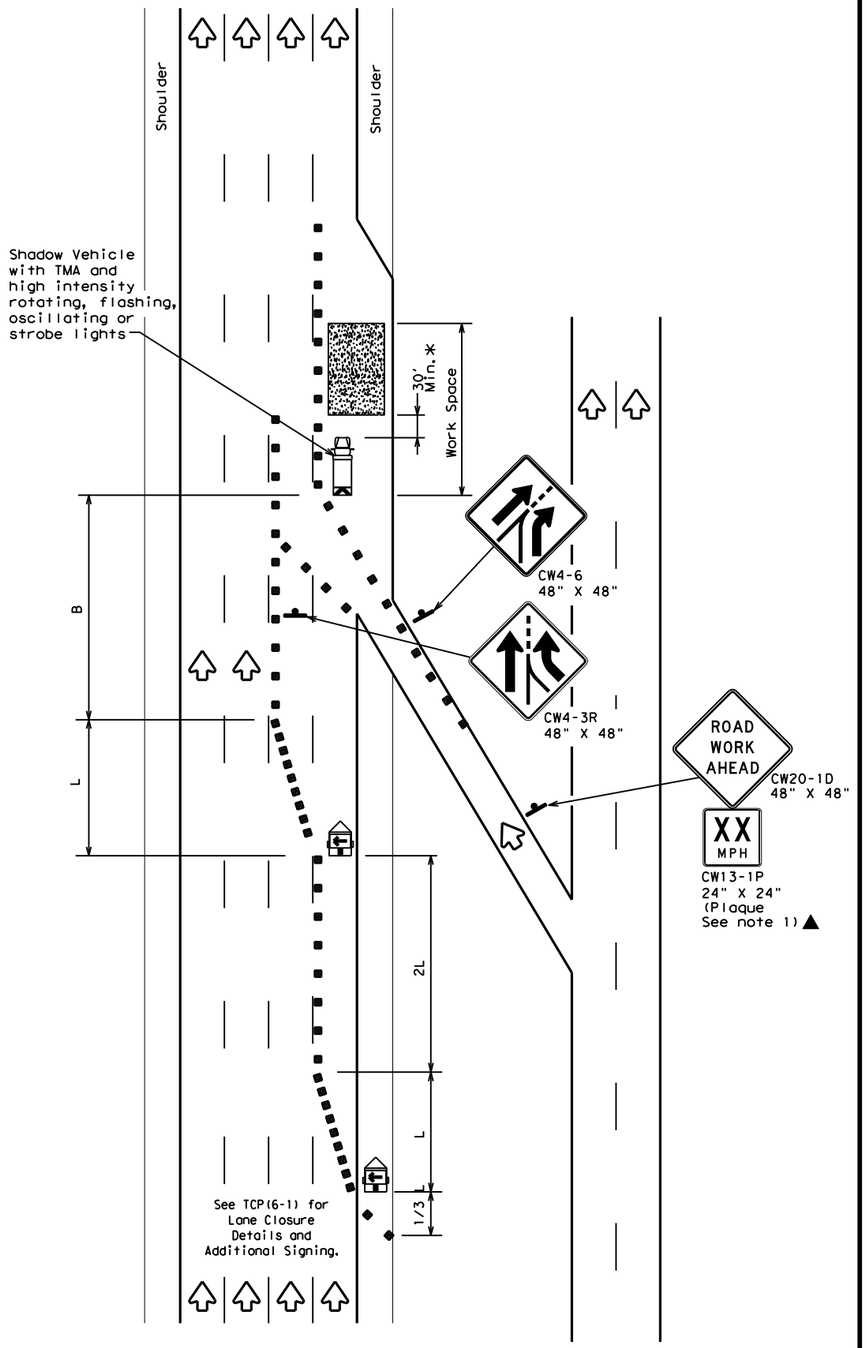
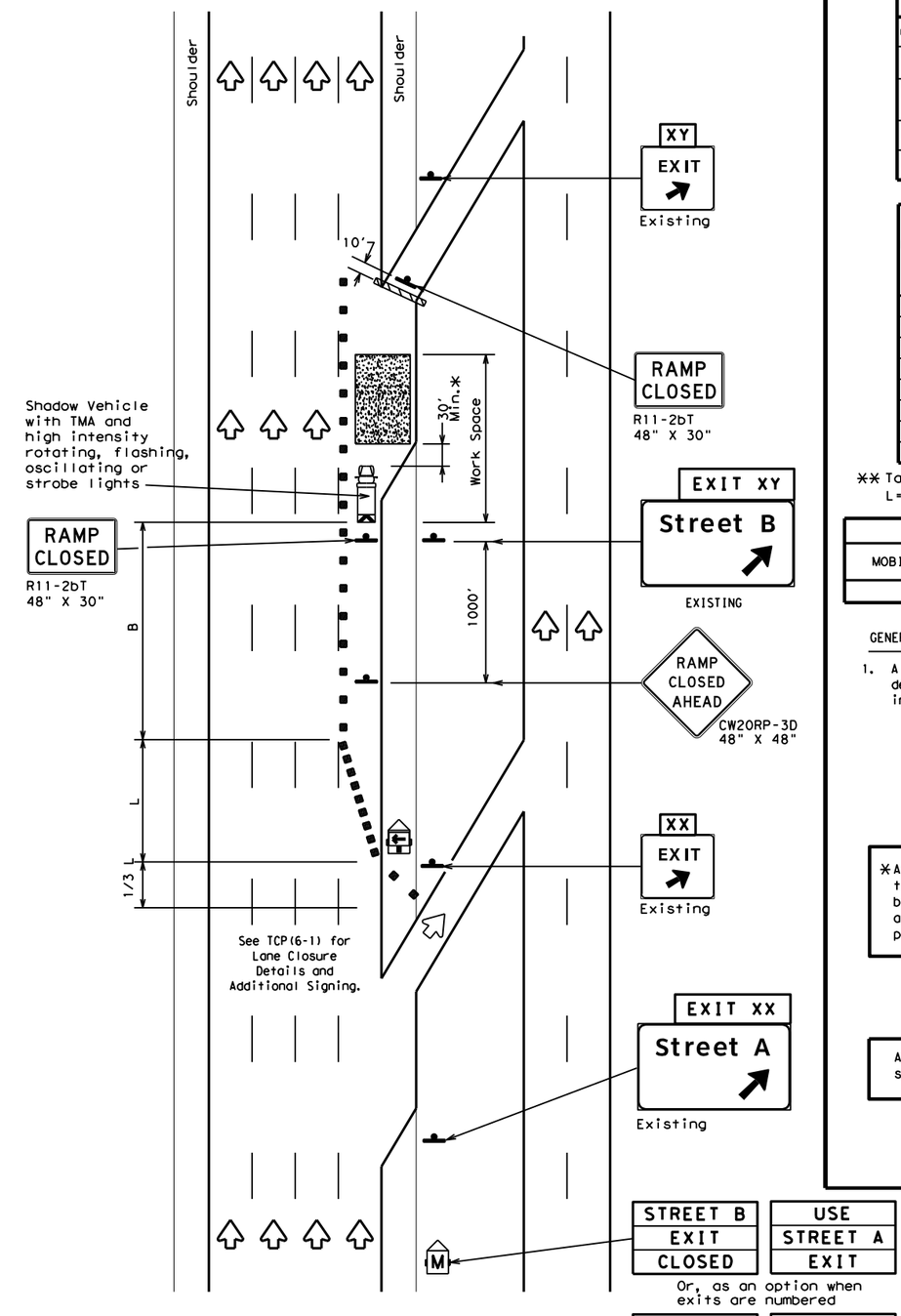


TCP (6-3a)

ENTRANCE RAMP OPEN



STREET B	USE
EXIT	STREET A
CLOSED	EXIT

Or, as an option when exits are numbered

EXIT XY	USE
CLOSED	EXIT XX

Place 1 mile (approx.) in advance of Street A exit.

TCP (6-3b)

EXIT RAMP CLOSED

TRAFFIC EXITS PRIOR TO CLOSED RAMP

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.

*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 BEYOND RAMP

TCP(6-3)-12

FILE: tcp6-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144,Etc	IH 44, Etc.
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	WFS	WICHITA		38

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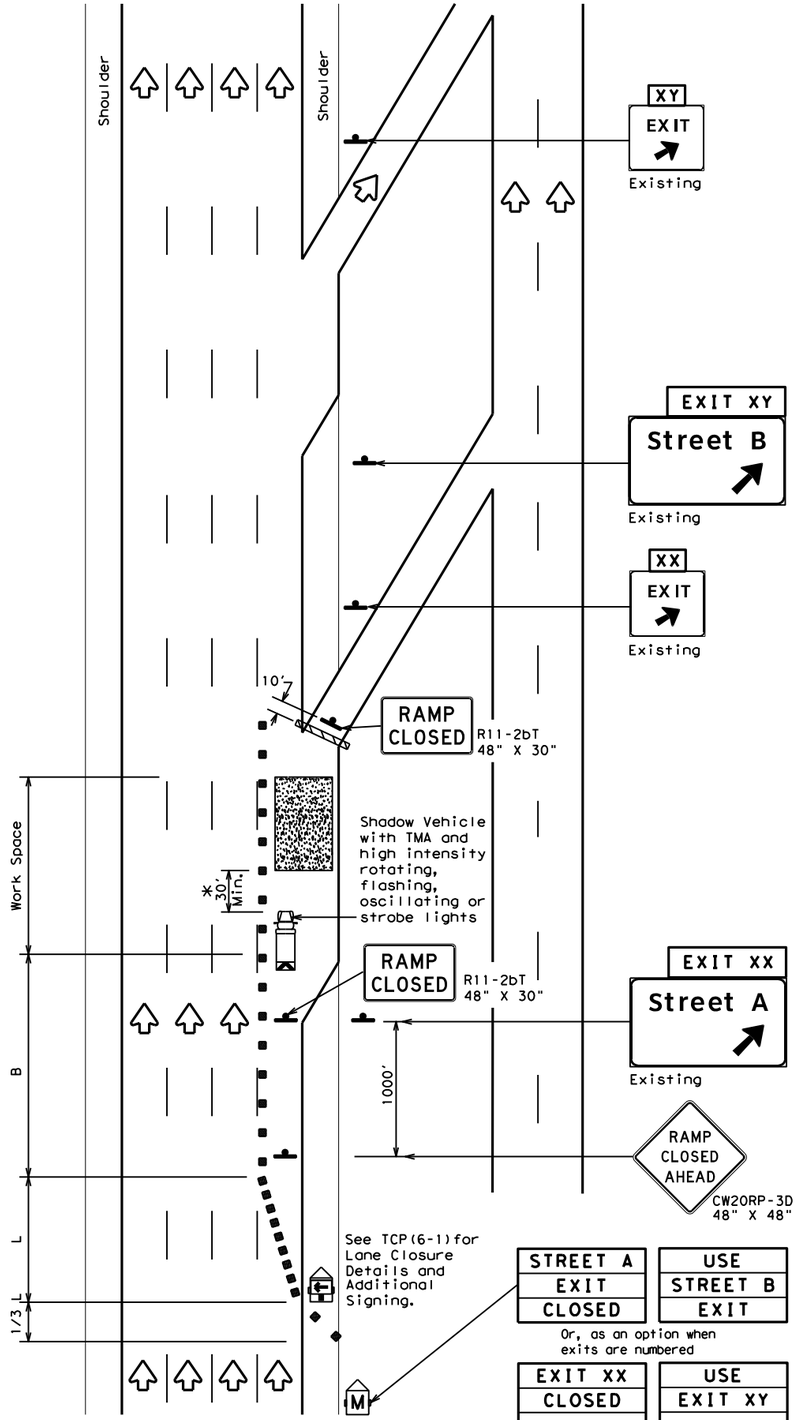
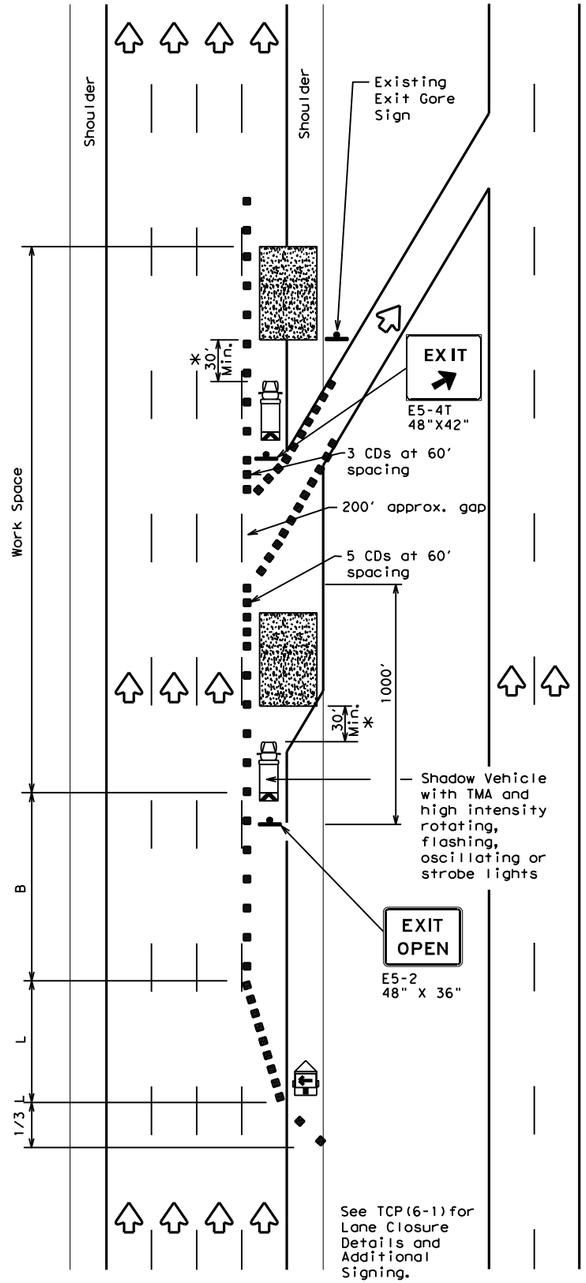


TCP (6-4a)

EXIT RAMP CLOSED
TRAFFIC EXITS PAST CLOSED RAMP



TCP (6-4b)

EXIT RAMP OPEN

LEGEND

	Type 3 Barricade		Channelizing Devices (CDs)
	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. See BC Standards for sign details.

*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 AT EXIT RAMP

TCP(6-4)-12

FILE: tcp6-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144,Etc	IH 44, Etc.
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	WFS	WICHITA		39

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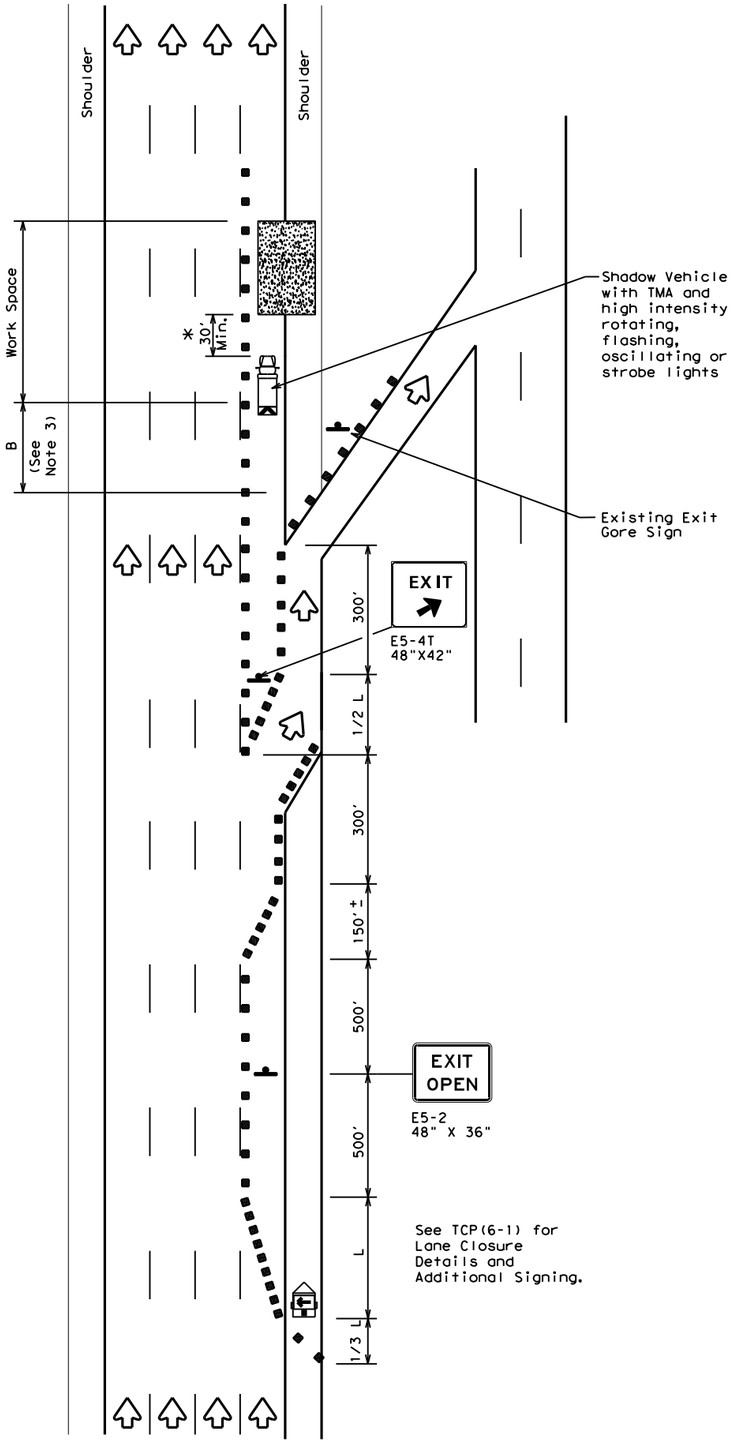
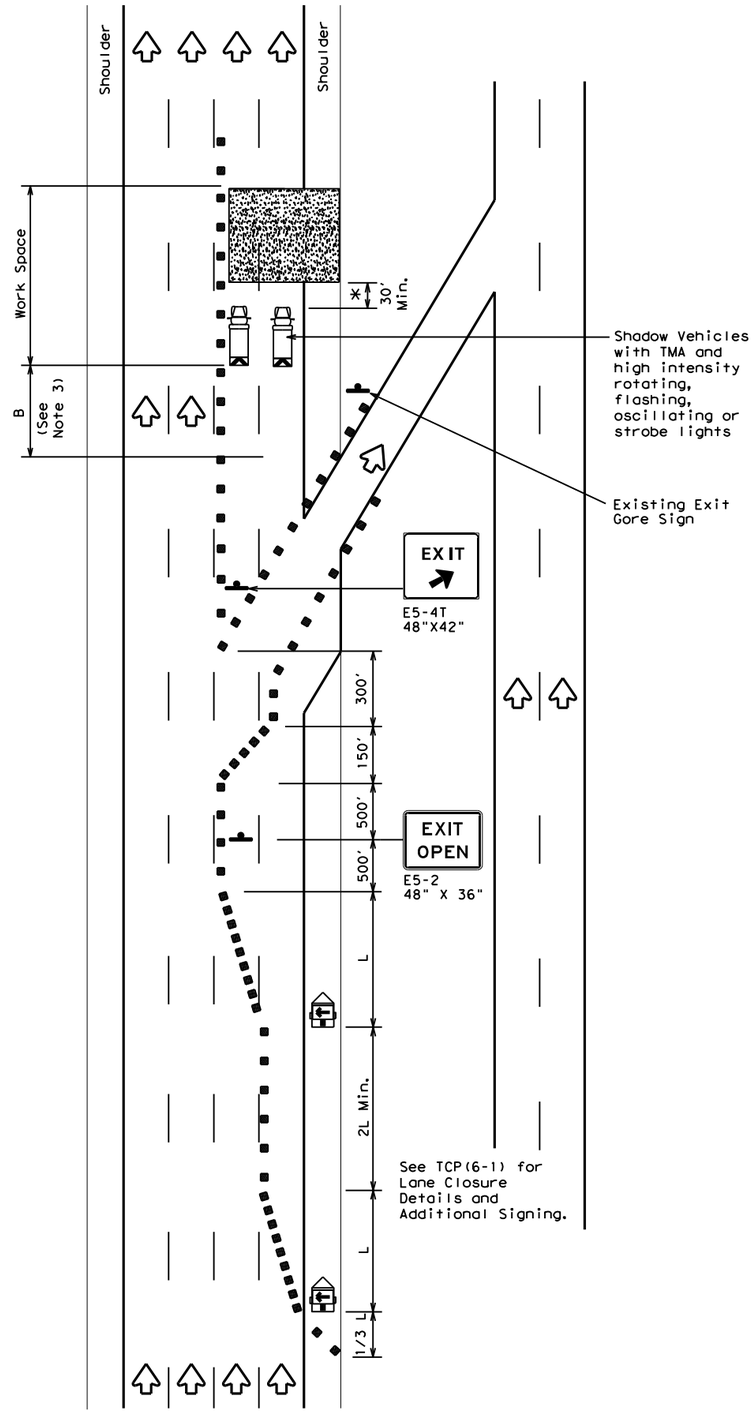


TCP (6-5a)

EXIT RAMP OPEN



TCP (6-5b)

EXIT RAMP OPEN
TWO LANE CLOSURE WITHIN 1500' PAST EXIT RAMP

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. See BC standards for sign details.
3. If adequate longitudinal buffer length "B" does not exist between the work space and the exit ramp, consideration should be given to closing the ramp.

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA BEYOND EXIT RAMP

TCP(6-5)-12

FILE: tcp6-5.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144,Etc	IH 44, Etc.
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	WFS	WICHITA		40

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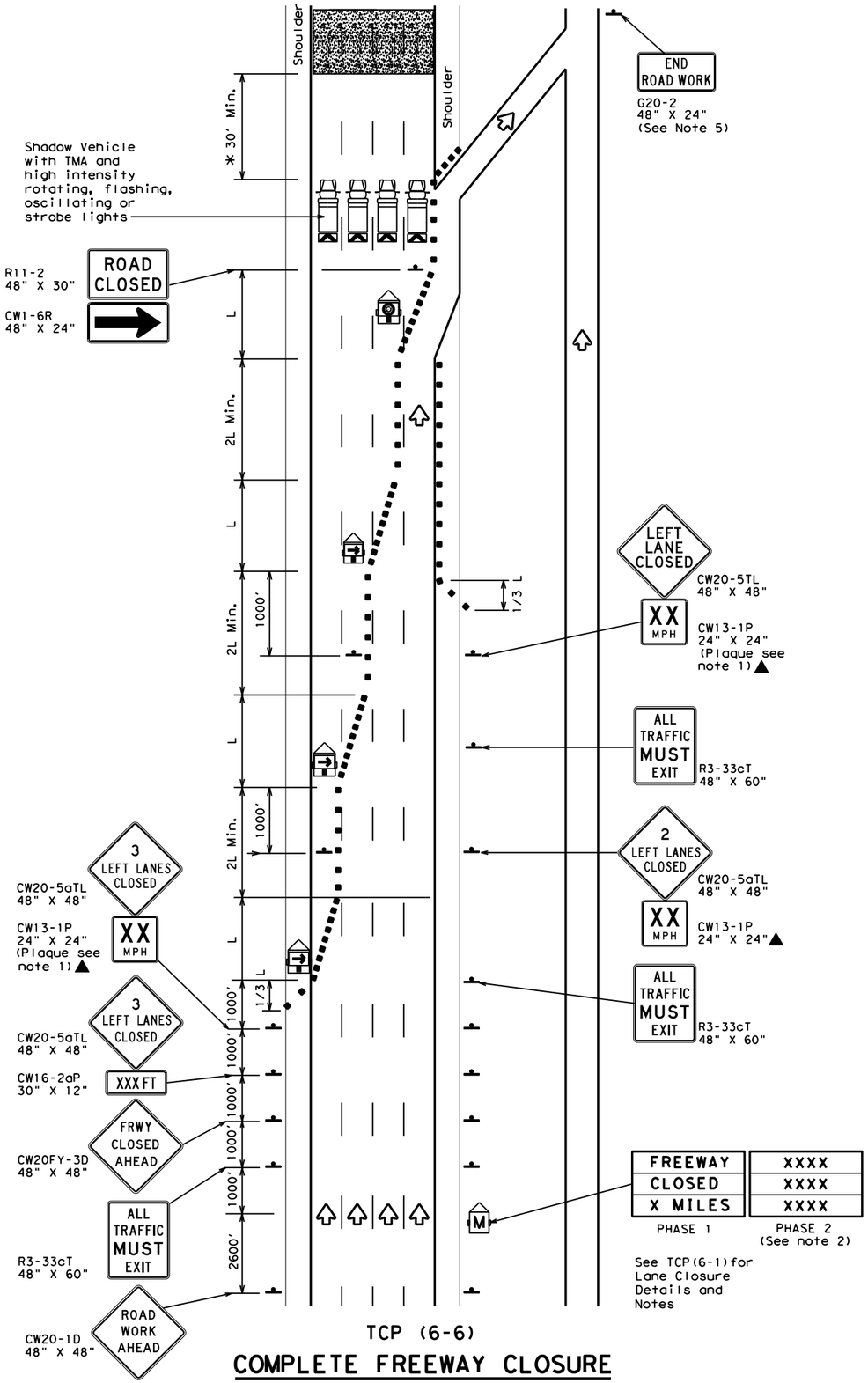

TCP (6-6)

COMPLETE FREEWAY 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)
	Flashing Arrow Board in Caution Mode		Traffic Flow
	Sign		

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

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
FREEWAY CLOSURE

TCP(6-6)-12

FILE: tcp6-6.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, Etc	IH 44, Etc.
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	WFS	WICHITA		41

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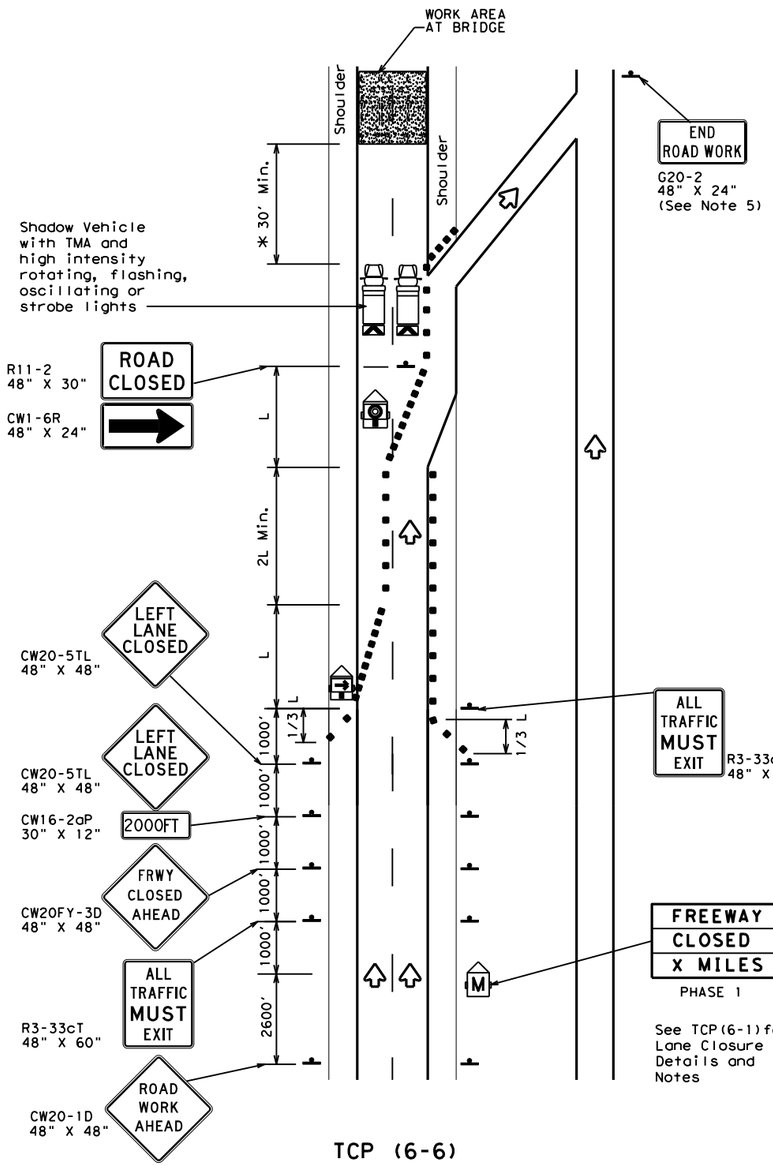

TCP (6-6)

COMPLETE FREEWAY 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)
	Flashing Arrow Board in Caution Mode		Traffic Flow
	Sign		

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

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

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

STATE OF TEXAS
CHRISTIAN J. SIERRA
137368
LICENSED PROFESSIONAL ENGINEER

Christian J. Sierra, P.E.

06/02/2021

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
FREEWAY CLOSURE
TCP(6-6)-12 (MOD)
(ONE TIME USE ONLY)

FILE: tcp6-6.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
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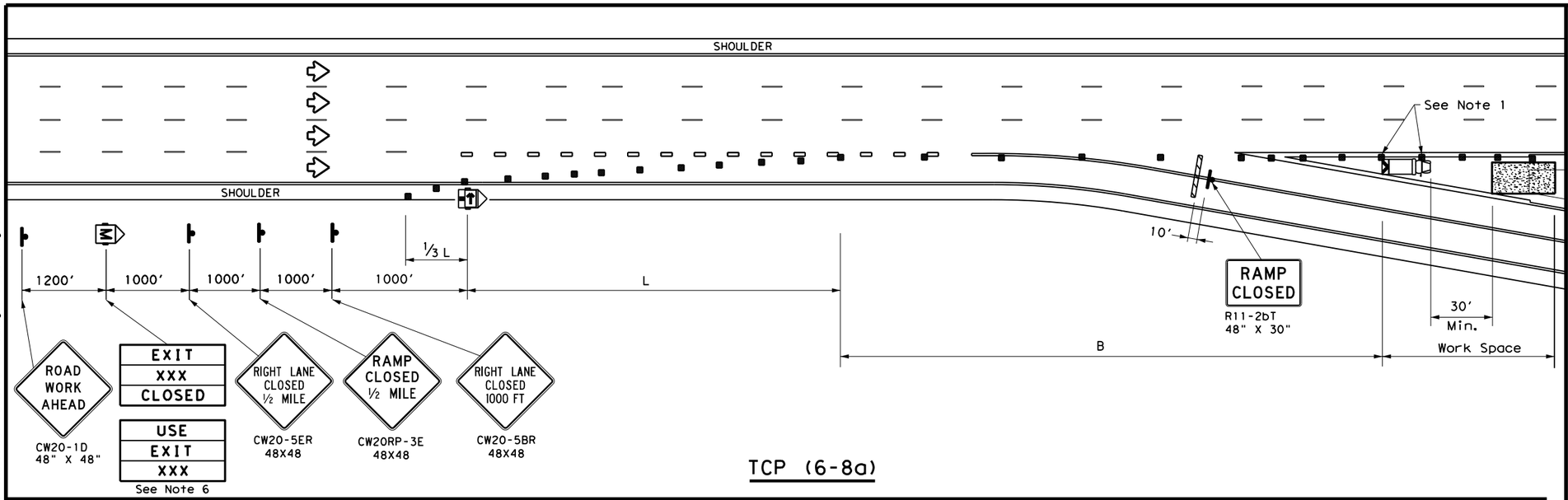
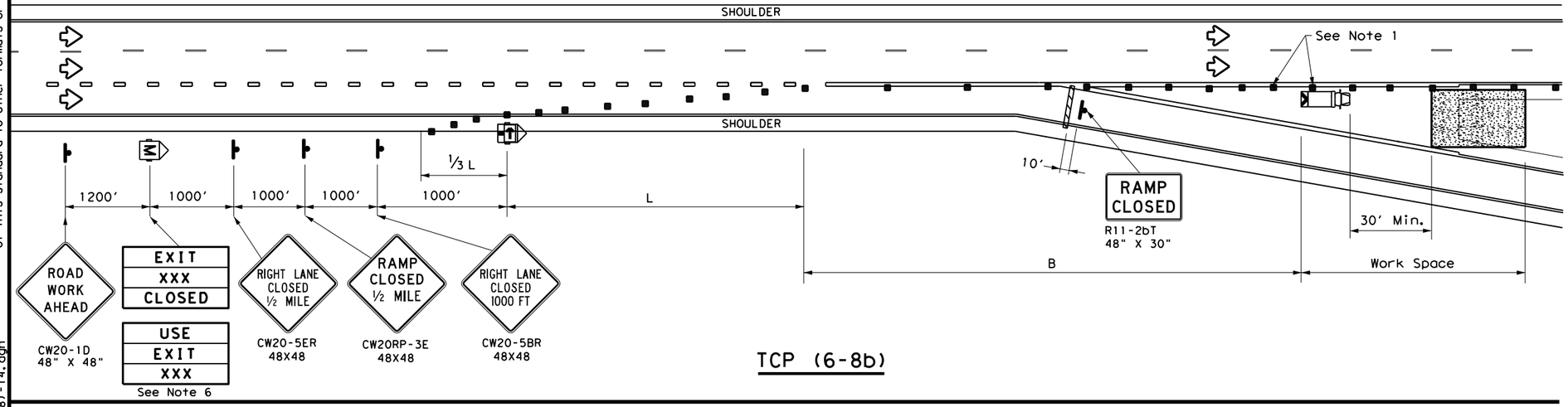
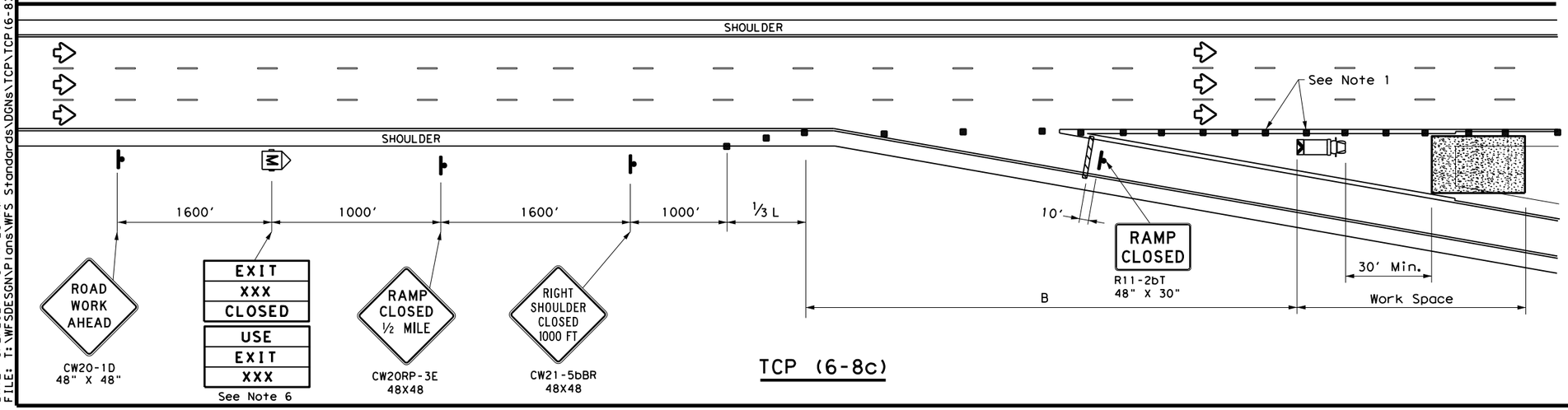
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	WFS	WICHITA		42



TCP (6-8a)



TCP (6-8b)



TCP (6-8c)

LEGEND

	Type 3 Barricade	▪▪	Channelizing Devices (CDs)
	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. Place channelizing devices in the gore at 20' spacing.
2. See the Standard Highway Sign Design for Texas (SHSD) for sign details.
3. The PCMS may be omitted when a permanent DMS sign is available in an appropriate location to display a similar message as called for on the PCMS.
4. When it is determined that a through lane should be closed in addition to the exit ramp, refer to TCP(6-4) for traffic control details.
5. Truck mounted attenuator is required.
6. The PCMS may be omitted if replaced with a "RAMP CLOSED" AHEAD (CW20RP-3D) Sign.
7. Roadway ADT should be greater than 10,000.

Texas Department of Transportation

Traffic Operations Division Standard

WORK IN EXIT GORE FOR ADT GREATER THAN 10,000

TCP(6-8)-14

FILE: tcp6-8.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		43

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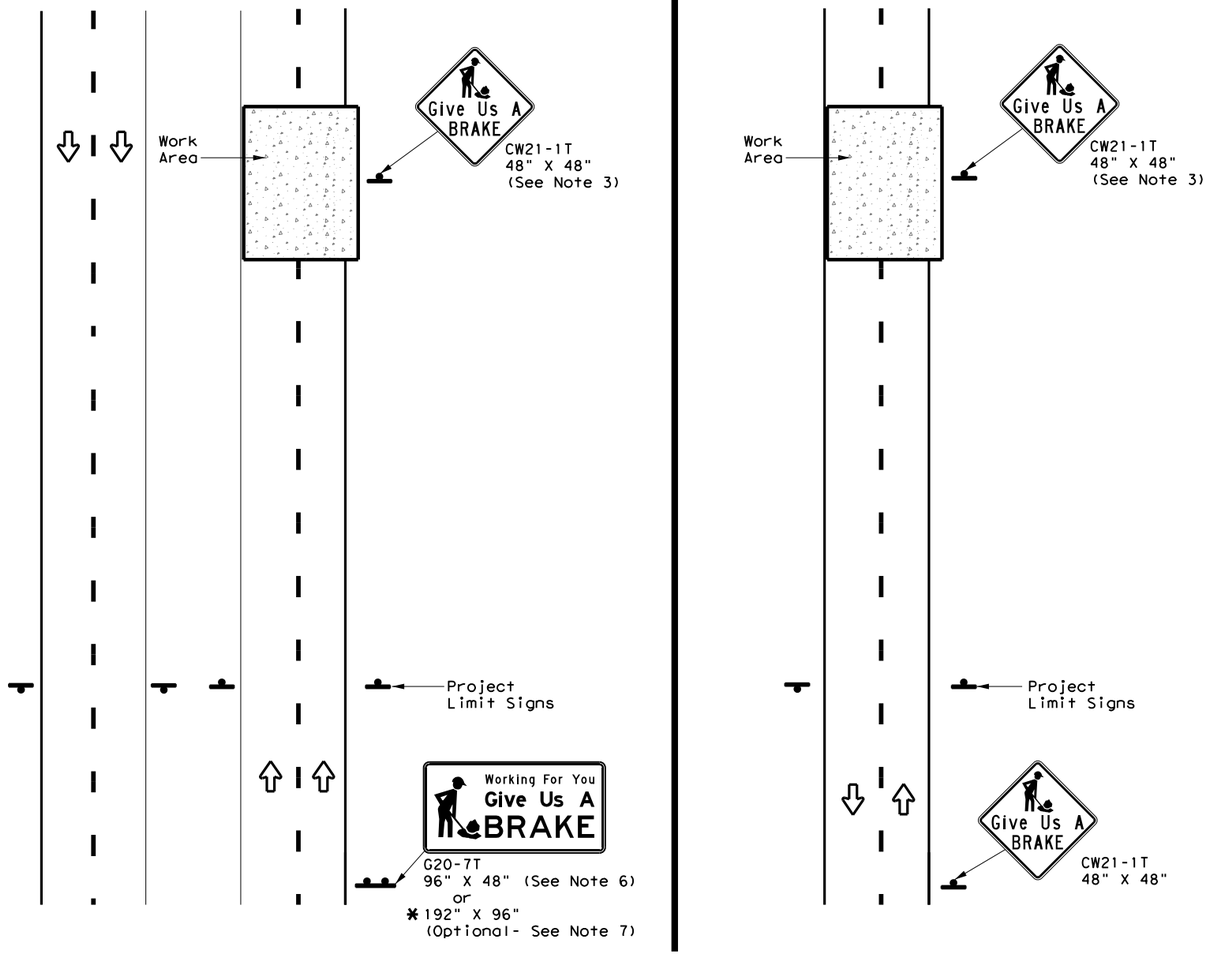

DIVIDED HIGHWAY

UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144,Etc	IH 44, Etc.
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	WFS	WICHITA		44

116

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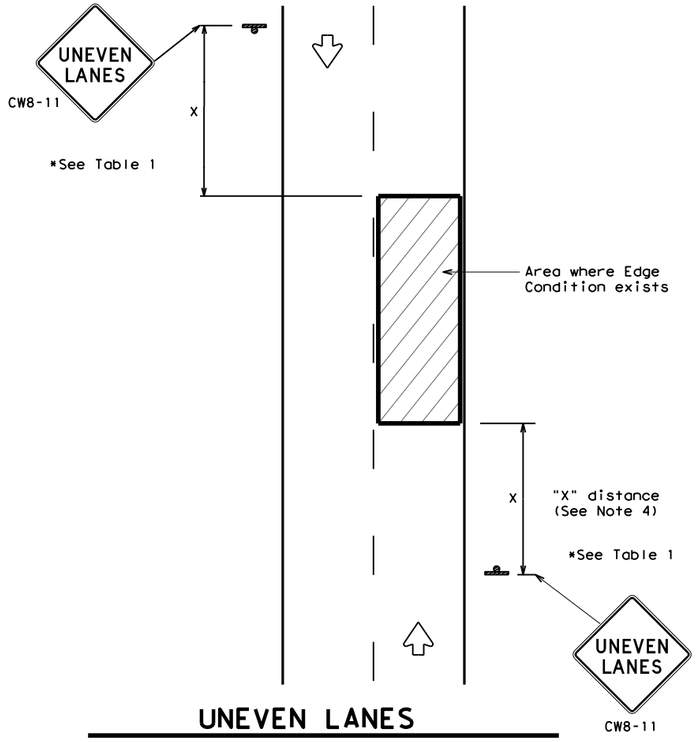
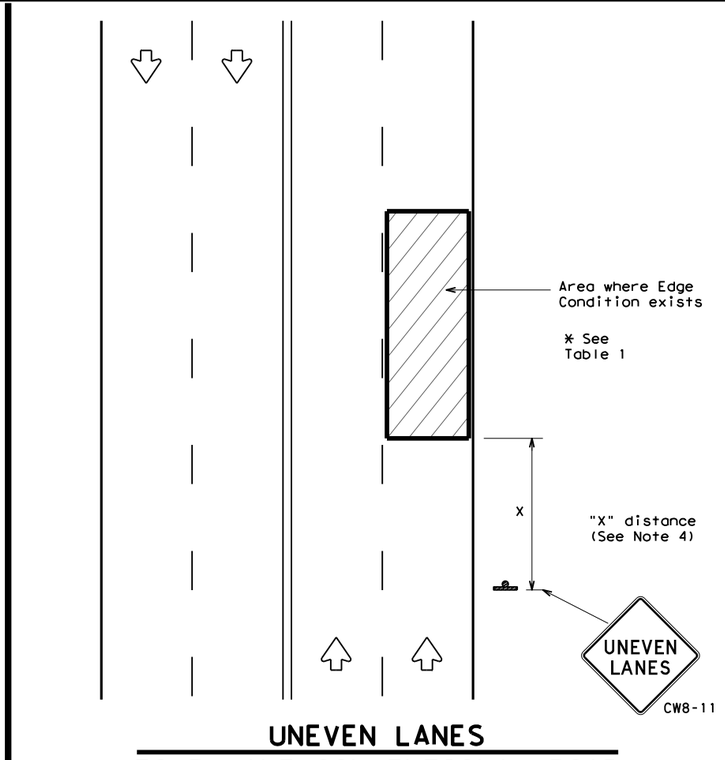
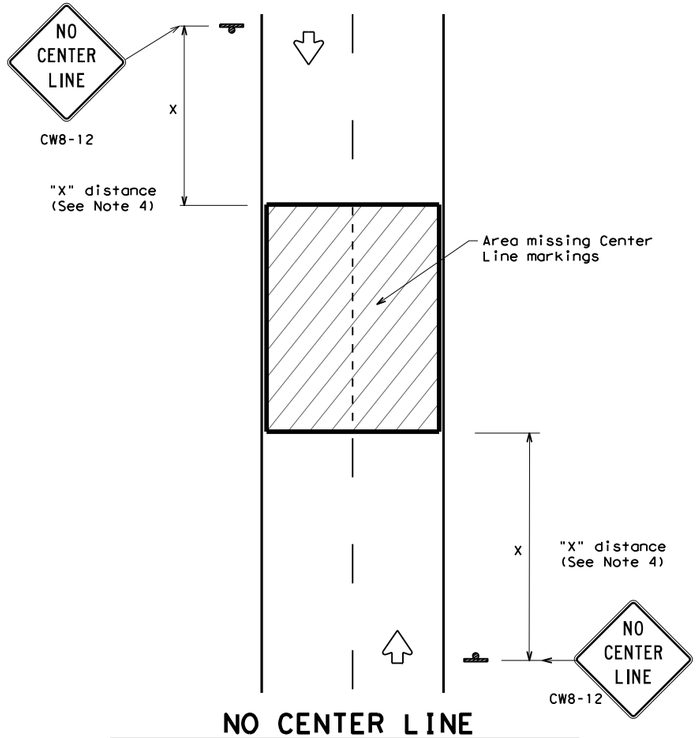


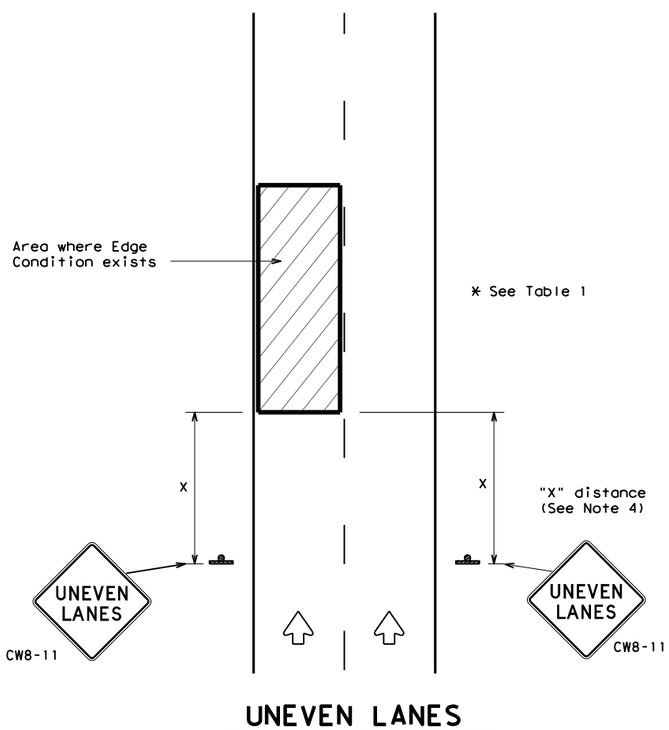
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

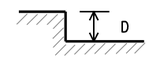
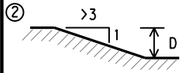
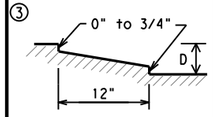
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

1. If spalling or holes occur, ROUGH ROAD (CW8-8) signs should be placed in advance of the condition and be repeated every two miles where the condition persists.
2. UNEVEN LANES (CW8-11) signs shall be installed in advance of the condition and repeated every mile. Signs installed along the uneven lane condition may be supplemented with the NEXT XX MILES (CW7-3aP) plaque or Advisory Speed (CW13-1P) plaque.
3. NO CENTER LINE (CW8-12) signs and temporary pavement markings as per the WZ(STPM) standard shall be installed if yellow centerlines separating two way traffic are obscured or obliterated. Repeat NO CENTER LINE signs every two miles where the center line markings are not in place. The signs and markings shall remain in place until permanent pavement markings are installed.
4. Signs shall be spaced at the distances recommended as per BC standards.
5. Additional signs may be required as directed by the Engineer. Signs shall remain in place until final surface is applied. Signs shall be considered subsidiary to Item 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING."
6. Signs shall be fabricated and mounted on supports as shown on the BC standards and/or listed on the "Compliant Work Zone Traffic Control Devices" list.
7. Short term markings shall not be used to simulate edge lines.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition.

TABLE 1

Edge Condition	Edge Height (D)	* Warning Devices
① 	Less than or equal to: 1¼" (maximum-planing) 1½" (typical-overlay)	Sign: CW8-11
	Distance "D" may be a maximum of 1 1/4 " for planing operations and 2" for overlay operations if uneven lanes with edge condition 1 are open to traffic after work operations cease.	
② 	Less than or equal to 3"	Sign: CW8-11
③  Notched Wedge Joint	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

TRAFFIC CONTROL DURING PLANING, OVERLAY AND LEVELING OPERATIONS ARE SHOWN ELSEWHERE IN THE PLANS.

MINIMUM WARNING SIGN SIZE	
Conventional roads	36" x 36"
Freeways/expressways, divided roadways	48" x 48"

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE:	wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS		0043	09	144,Etc	IH 44, Etc.
8-95 2-98 7-13		DIST	COUNTY		SHEET NO.
1-97 3-03		WFS	WICHITA		45

DATE: 6/2/2021 9:14:31 AM
FILE: T:\WFSDESGN\Plans\WFS Standards\DGNs\Work Zone\WZ(UL)-13.dgn

DATE:
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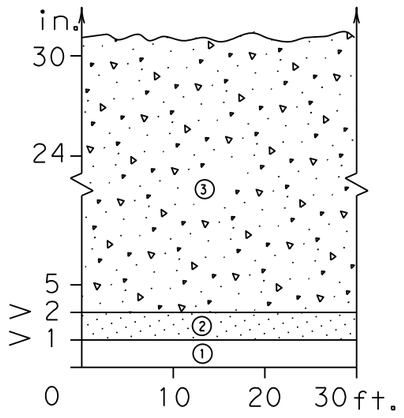
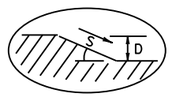
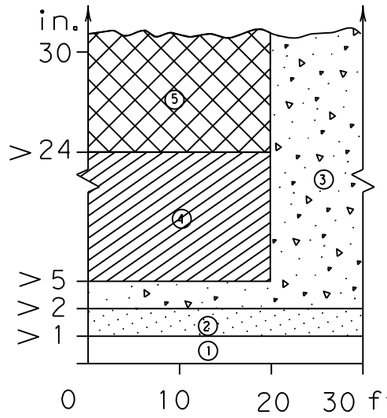
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

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

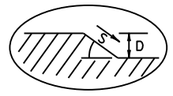


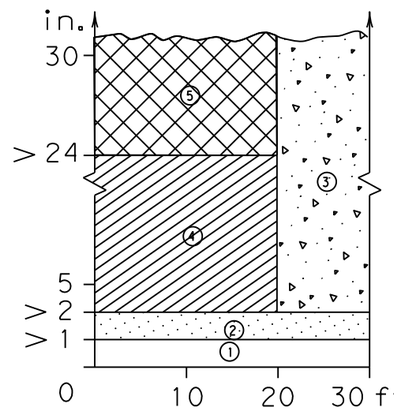
Edge Condition I
S = (3:1) (or flatter)



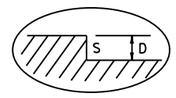


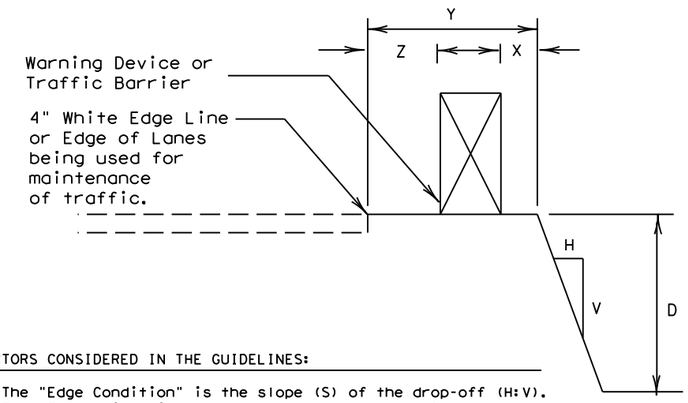
Edge Condition II
S = ((2.99):1) to (1:1)





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





FACTORS CONSIDERED IN THE GUIDELINES:

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

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

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

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

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

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

Edge Condition Notes:

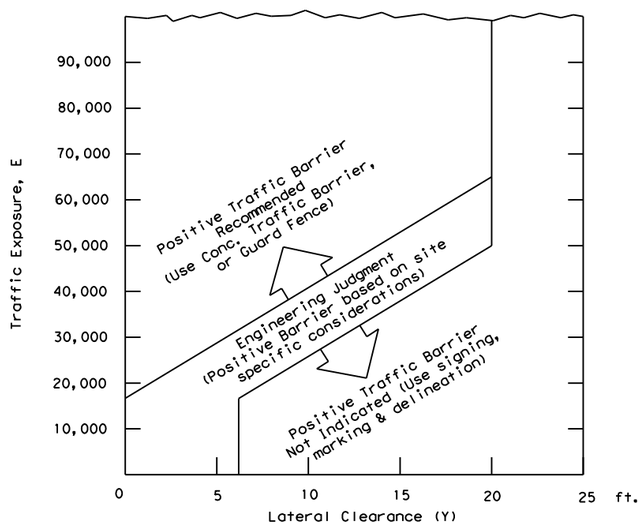
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

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

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

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

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



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

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

3 An approved end treatment should be provided for any positive barrier end located within a lateral offset of 20 feet from the edge of the travel lane.

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

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LICENSED
PROFESSIONAL ENGINEER

Christian J. Sierra, P.E.

06/02/2021

Texas Department of Transportation
Traffic Operations Division

TREATMENT FOR VARIOUS EDGE CONDITIONS

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
03-01
08-01 correct typos

CONT	SECT	JOB	HIGHWAY
0043	09	144,Etc	IH 44, Etc

DIST	COUNTY	SHEET NO.
WFS	WICHITA	46

SUMMARY OF REPAIRS

REPAIR NO.	ITEM NO	ITEM	UNIT	QUANTITY	REPAIR DESCRIPTION/LOCATOR
D1	0428 6001	PENETRATING CONCRETE SURFACE TREATMENT	SY	69,711	Apply penetrating surface treatment to top of deck and full surface area of substructure units at locations shown on the plans. See Bridge Repair Detail Sheet for application limits on the top of the deck.
D2	0438 6004	CLEANING AND SEALING EXISTING JOINTS (CL 7)	LF	4,066	Seal existing joints with a Class 7 Silicone Joint Sealant at locations indicated on the plans.
D3	0429 6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	1,795	Repair concrete spalls at the locations shown on the plans. Perform all repairs in accordance with Item 429 and Chapter 3, Sections 2 and 3 of the TxDOT Concrete Repair Manual. A copy of this manual must be available onsite during all concrete repair operations.
D4	7212 6001	CLEANING SUBSTRUCTURE (BENT)	EA	98	Clean bents in accordance with Item 7212. Pidgeon barriers may be present. Remove and salvage for reinstallation after cleaning is complete. If barriers cannot be salvaged, replace in kind.
D5	0780 6002	CNC CRACK REPAIR (DISCRETE)(INJECT)	LF	275	Seal cracks at substructure locations shown on the plans.
D6	4002 6001	REPLACE ELASTOMERIC BEARING PADS	EA	10	Replace all bearing pads at Abutments A43 and B42. See UBEB standard for details. Refer to Bearing Pad Replacement Notes below for replacement procedures. Field verify existing pad dimensions before ordering materials.
D7	0483 6017	MILLING CONCRETE SLAB (3 IN)	SY	6,678	Remove approximately 1 1/2" of existing PFC and 1 1/2" of existing LMC overlay from bridge deck prior to shot blasting and applying PPC overlay. See PPC Overlay Notes on Typical Sections sheet.
	4106 6005	POLYESTER POLYMER CONC OVERLAY (3")	SY	6,678	See PPC Overlay Notes on Typical Sections sheet.
D8	0712 6009	JT / CRCK SEAL (HOT – POURED RUBBER)	LF	1,877	Seal joints and cracks in asphalt pavement at the locations shown on the plans.
D9	0429 6002	CONC STR REPAIR (EPOXY MORTAR)	CY	25	Repair minor spalls at the locations shown. Perform all repairs in accordance with Item 429 and Chapter 3, Section 1 of the TxDOT Concrete Repair Manual. A copy of this manual must be available onsite during all concrete repair operations.
D10	0104 6009	REMOVING CONC (RIPRAP)	SY	20	Remove existing concrete riprap as directed by the Engineer
D11	0432 6003	RIPRAP (CONC)(6 IN)	CY	3	Install new riprap after installation of flowable backfill
D12	0401 6001	FLOWABLE BACKFILL	CY	22	Install flowable backfill to repair voids as directed by the Engineer
D13	0420 6007	CL A CONC (FLUME)	CY	3	Install shoulder drains at the locations shown in the plans. See SD-EBR standard.
D14	0431 6003	PNEUMATICALLY PLACED CONCRETE (2")	SF	70	Repair spalls along backwalls and wingwalls at locations shown in the plans.
D15	0778 6001	CONCRETE RAIL REPAIR (IN-KIND)	LF	15	At span 12 of IH 44 over Broad St (Original Structure)
D16	7013 6001	VACUUM CLEAN DRAIN INLETS AND RACEWAYS	CYC	4	Vacuum clean drain inlets for bridges – 03-243-0-0044-01-084 (19 Inlets), 03-243-0-0044-01-085 (23 Inlets), 03-243-0043-09-187 (6 Inlets) & 03-243-0043-09-198 (4 Inlets)

BEARING PAD REPLACEMENT NOTES

1. Perform all work in acordance with Special Specification 4002, "Elastomeric Bearing Pads." Field verify existing pad dimensions before ordering materials.
2. Submit lifting plans and calculations to the Engineer for approval. Design liftng devices and supports for live load and dead load with appropriate load factors in accordance with Item 495, "Raising Existing Structures." Total unfactored dead load at the end of each beam is approximately 135 kips.

   Note: The above loads do not account for the stiffness of the concrete deck and girder system. Actual jacking load may need to be increased to lift beams as necessary to insert elastomeric bearing pads.
3. Lift each beam end up to 1/4" max to permit installation of bearing pads. Cease lifting operations and notify the Engineer immediately if jacking causes damage to any part of the structure.
4. Supporting falsework on existing cap is permitted following the requirements of Note 2 above. Jacking from existing cap is permitted following the requirement of Note 2 above. Do not jack against the existing slab.
5. Place new bearing pads and lower beams back onto pads. Ensure the new bearing pad compresses when jacking force is removed.

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

GENERAL NOTES

Repair quantities shown are based on 2020 inspection reports and 2019 Condition Surveys. Existing conditions and repair areas may differ from those shown in the plans. Refer to Bridge Layouts for repair locations.

Field verify repair locations in the presence of the Engineer before ordering materials and beginning work.

Apply Pentrating Concrete Surface Treatment to the deck surface at the locations shown and on the full surface area of substructure units at the locations shown. Quantities for substructure treatment are based on neat dimensions only and are the quantites to be paid. No adjustment will be made for architectural reliefs, details or other measurements.

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/202

Texas Department of Transportation — Bridge Division

REPAIR QUANTITY SUMMARY

DATE:
FILE:

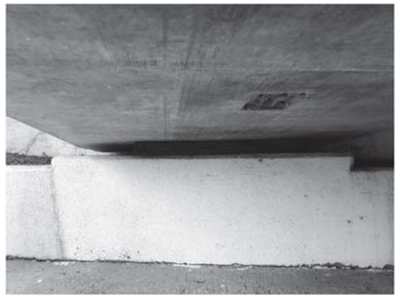
FILE:	DN: RC	CK: JDB	DW: SDC	CK: RC
©TxDOT APRIL 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, etc	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		47

SUBSTRUCTURE A33 CRACKING

Approximately 100 LF cracking

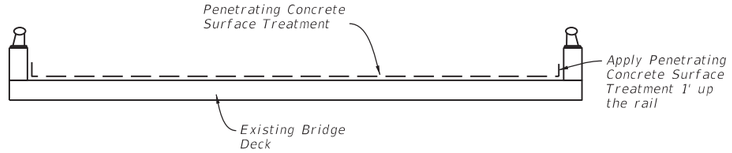
BERM WITH CONCRETE SPALLS

Typical at all Bents



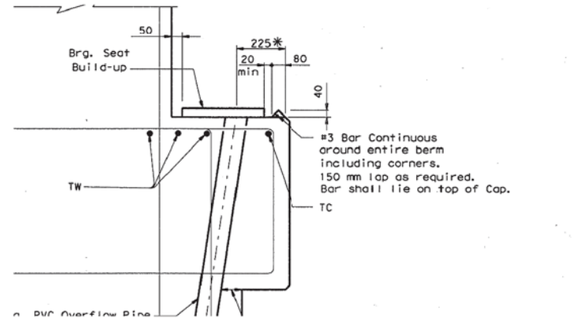
SLIPPED BEARING PAD, TYPICAL AT ABUTMENTS A43 (IH 44 OVER HOLLIDAY ST) & B42 (IH 44 OVER BROAD ST)

To be replaced with elastomeric bearing pads



PENETRATING CONCRETE SURFACE TREATMENT ON BRIDGE DECK TYPICAL DETAIL

IH 44 At Sixth Street Exit Ramp, Entrance Ramp, Broad Street, & Holliday Street (New Structure)



BERM CONSTRUCTION DETAIL FROM AS-BUILT

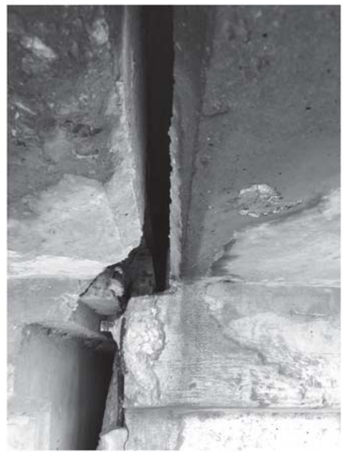
Apply a bead of epoxy behind the berm
Note: All units shown are in millimeter

SUBSTRUCTURE A33 CRACKING

Approximately 100 LF cracking

PIGEON BARRIER

Temporarily detach the pigeon barrier to blast clean the top of the bent.
If the detached pigeon barrier can't be salvaged, replace in-kind.
This work is subsidiary to Item 7212 6001 CLEANING SUBSTRUCTURE (BENT).



EXTERIOR BEAM END CONCRETE SPALLING, TYPICAL AT SUBSTRUCTURE A12 AND A27

Locations shown on plans

STATE OF TEXAS
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5/28/2021

Texas Department of Transportation — Bridge Division

BRIDGE REPAIR DETAILS

03-243-0-0044-01-084,
03-243-0-0044-01-085,
03-243-0043-09-187,
03-243-0043-09-198 &
IH 44 AT SIXTH STREET EXIT, ENTRANCE RAMP, BROAD STREET, & HOLLIDAY STREET

FILE:	DN:	CK:	DW: RC	CK:
©TxDOT FEBRUARY 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		48

TYPICAL BACKWALL/WINGWALL REPAIR AT STRUCTURES -084 AND -085

TYPICAL BACKWALL/WINGWALL REPAIR AT STRUCTURE -094

GENERAL NOTES

Pictures shown are taken from 2020 inspection reports and 2019 Condition Surveys. Existing conditions and repair areas may differ from those shown. Refer to Bridge Layouts for repair locations.

Photographs are representative only and are not intended to provide a comprehensive view of all repair areas. Field verify repair locations in the presence of the Engineer before ordering materials and beginning work.

Perform repairs in accordance with Item 431, "Pneumatically Placed Concrete."

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5/28/2021

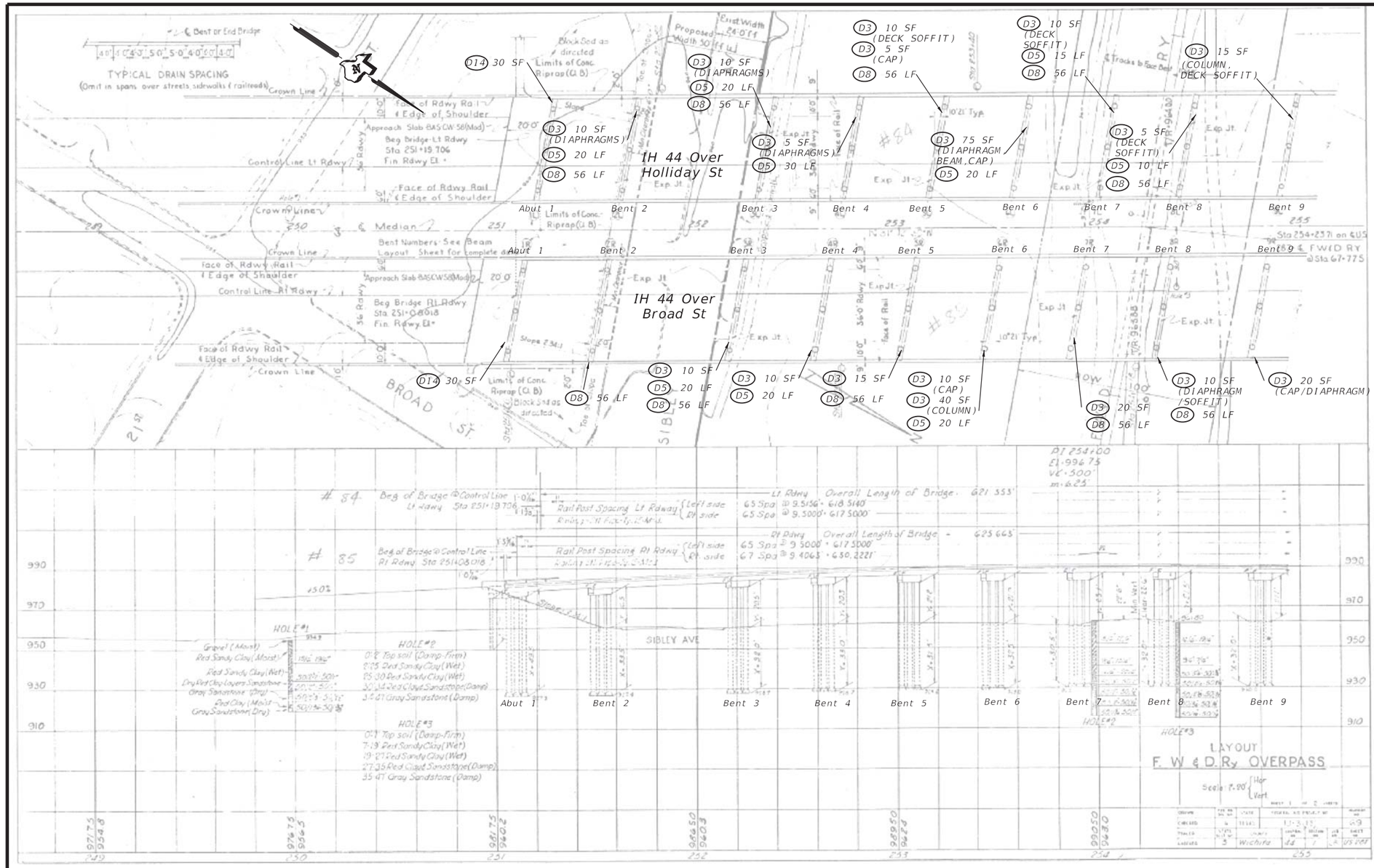
Texas Department of Transportation

Bridge Division

BACKWALL REPAIRS

FILE:	DN: RC	CK: JDB	DW: SDC	CK: RC
©TxDOT APRIL 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, etc	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		49

DATE:
FILE:



REPAIR CALL-OUT LEGEND

XX XX XX

- Unit of measure
- Estimated repair quantity at each location
- Repair number – See "Table of Repairs"

SHEET 1 OF 5

BRIDGE LAYOUT - AS-BUILT

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5/28/2021

Texas Department of Transportation | Bridge Division

BRIDGE LAYOUT

NBI: 03-243-0-0044-01-084 & 03-243-0-0044-01-085

SPANS 1 - 8 FOR IH 44 OVER BROAD STREET, & HOLLIDAY STREET (ORIGINAL STRUCTURE)

FILE:	DN:	CK:	DW: RC	CK:
©TxDOT FEBRUARY 2021 REVISIONS	CONT	SECT	JOB	HIGHWAY
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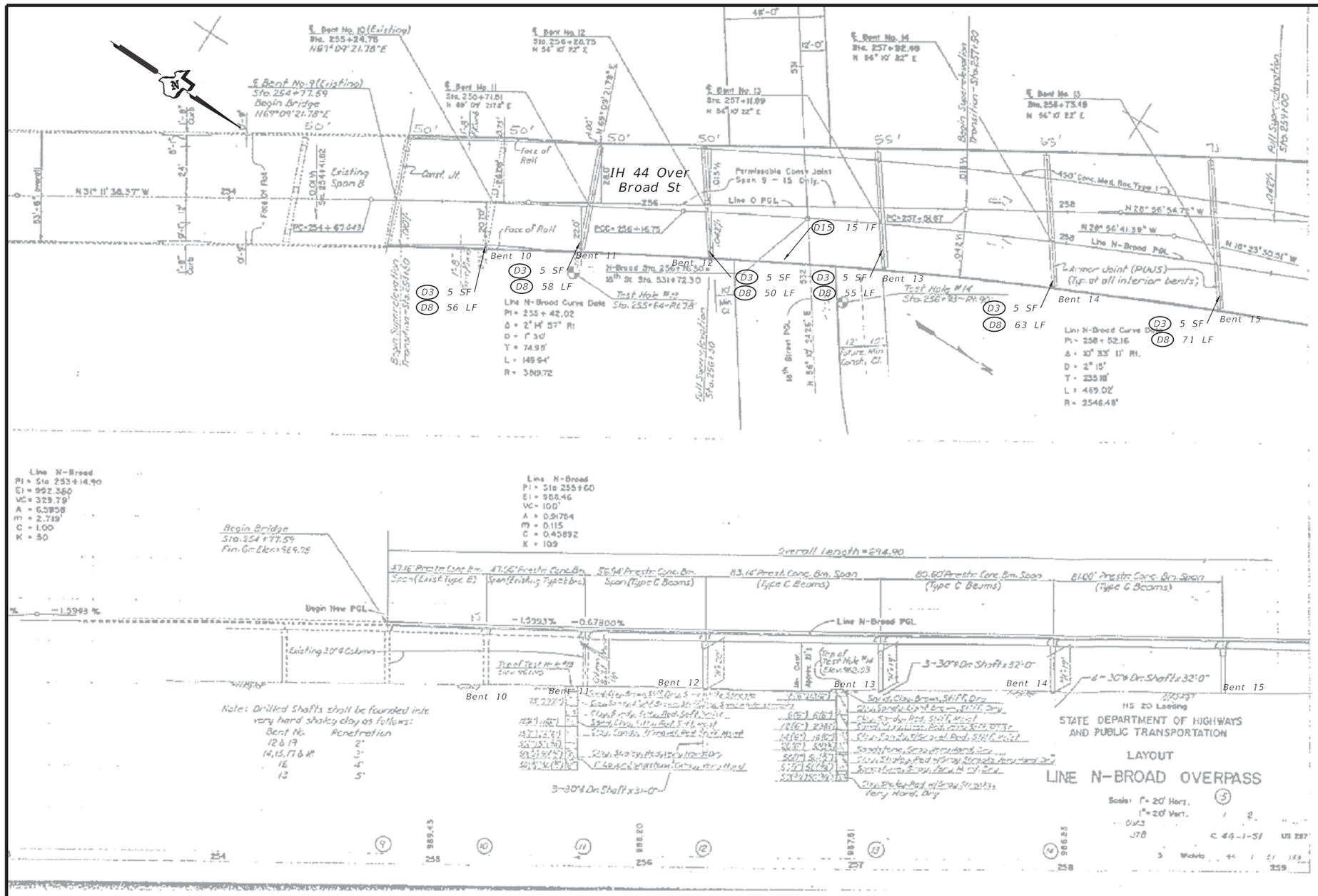
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		50



REPAIR CALL-OUT LEGEND

(XX) XX XX
- XX — Unit of measure
- XX — Estimated repair quantity at each location
- (XX) — Repair number – See "Table of Repairs"

BRIDGE LAYOUT - AS-BUILT

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5/28/2021

SHEET 2 OF 5

Texas Department of Transportation | Bridge Division

BRIDGE LAYOUT

NBI: 03-243-0-0044-01-084

SPANS 9 - 14 FOR IH 44 OVER BROAD STREET (ORIGINAL STRUCTURE)

FILE:	DN:	CK:	DW: RC	CK:
©TxDOT FEBRUARY 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144	IH 44/US 287
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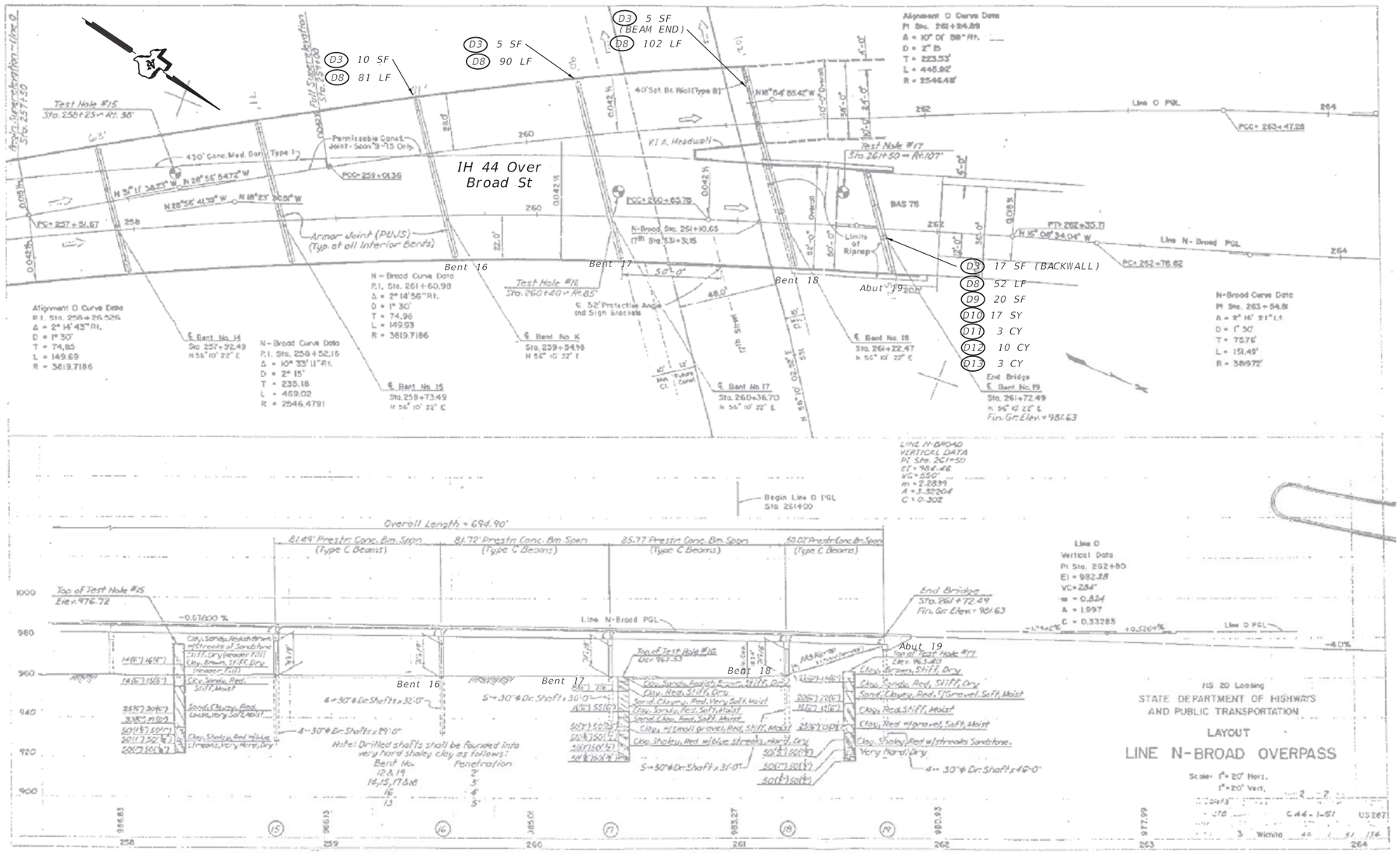
	WFS	WICHITA		51



BRIDGE LAYOUT - AS-BUILT

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5/28/2021

Texas Department of Transportation — Bridge Division

BRIDGE LAYOUT

NBI: 03-243-0-0044-01-084

SPANS 14 - 18 FOR IH 44 OVER BROAD STREET (ORIGINAL STRUCTURE)

FILE:	DN:	CK:	DW: RC	CK:
©TxDOT FEBRUARY 2021	CONT	SECT	JOB	HIGHWAY
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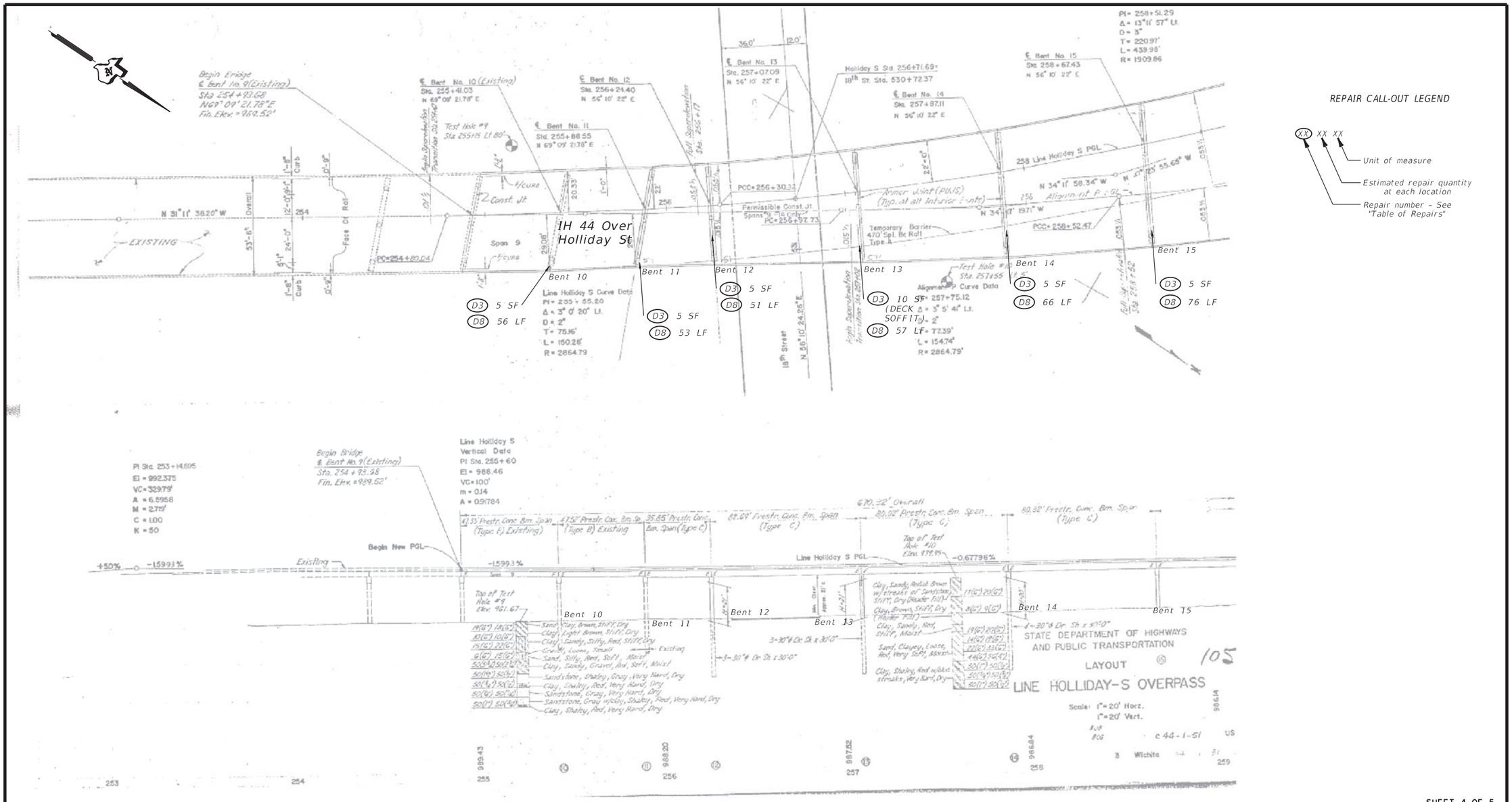
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		52



REPAIR CALL-OUT LEGEND

XX XX XX

- Unit of measure
- Estimated repair quantity at each location
- Repair number – See "Table of Repairs"

BRIDGE LAYOUT - AS-BUILT

STATE OF TEXAS
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5/28/2021

SHEET 4 OF 5

Texas Department of Transportation — Bridge Division

BRIDGE LAYOUT

NBI: 03-243-0-0044-01-085

SPANS 9 - 14 FOR IH 44
OVER HOLLIDAY STREET
(ORIGINAL STRUCTURE)

FILE:	DN:	CK:	DW: RC	CK:
©TxDOT FEBRUARY 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144	IH 44/US 287
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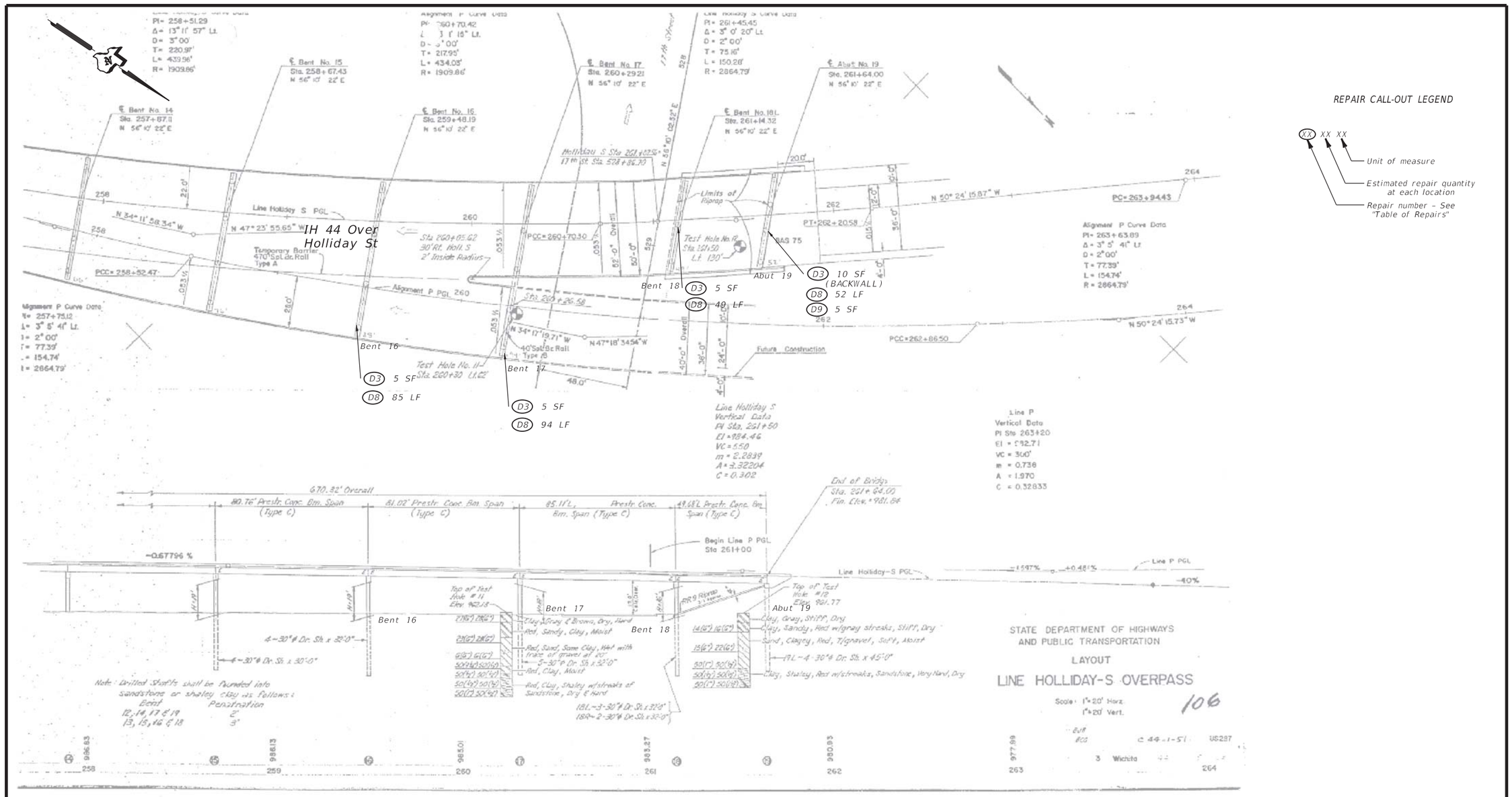

REPAIR CALL-OUT LEGEND

XX XX XX

- Unit of measure
- Estimated repair quantity at each location
- Repair number – See "Table of Repairs"

BRIDGE LAYOUT - AS-BUILT

STATE OF TEXAS
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5/28/2021

SHEET 5 OF 5

Texas Department of Transportation | Bridge Division

BRIDGE LAYOUT

NBI: 03-243-0-0044-01-085

SPANS 14 - 18 FOR IH 44 OVER HOLLIDAY STREET (ORIGINAL STRUCTURE)

FILE:	DN:	CK:	DW: RC	CK:
©TxDOT FEBRUARY 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144	IH 44/US 287
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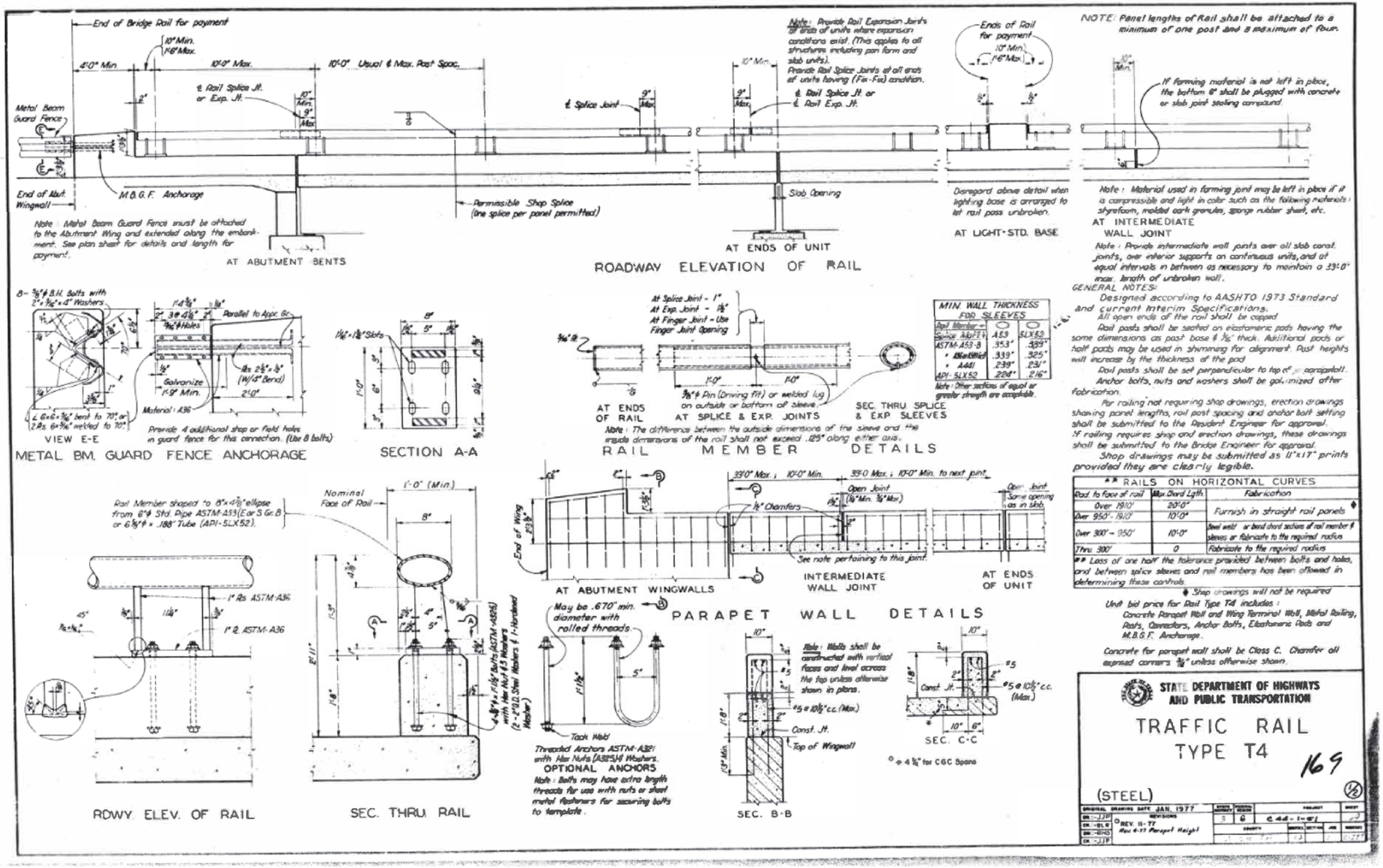
	WFS	WICHITA		54



SHEET 1 OF 2

T4 TRFFIC RAIL - AS-BUILT

Texas Department of Transportation | Bridge Division

T4 TRAFFIC RAIL

NBI: 03-243-0-0044-01-084 & 03-243-0-0044-01-085

SPANS 1 - 18 FOR IH 44 OVER BROAD STREET, & HOLLIDAY STREET (ORIGINAL STRUCTURE)

FILE:	DN:	CK:	DW: RC	CK:
©TxDOT FEBRUARY 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144	IH 44/US 287
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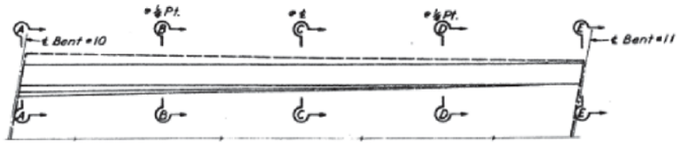
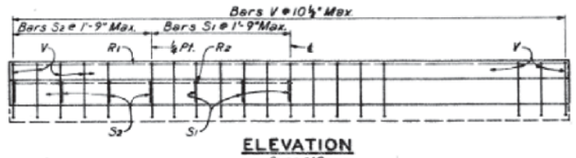
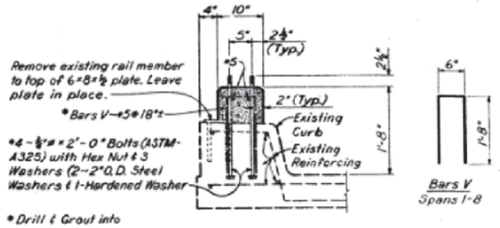
	WFS	WICHITA		55



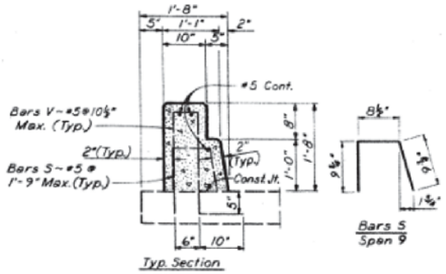
PLAN
Span #10



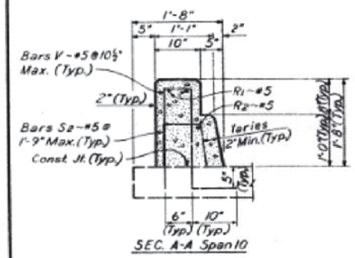
ELEVATION
Span #10



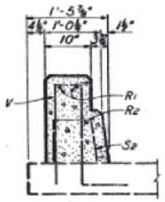
SPECIAL RAIL
SPANS 1-8



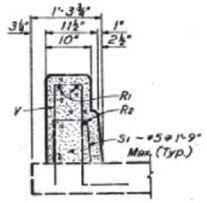
RAIL TYPE T4 MOD. (STEEL)
SPAN 9



SEC. A-A Span 10



SEC. B-B Span 10



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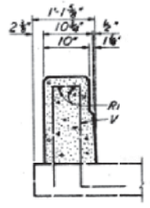

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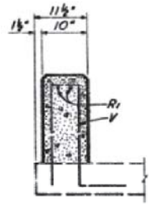

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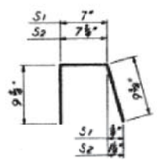
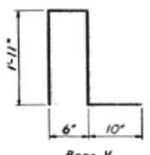


Bars S1 & S2
Span 10



Bars V
Spans 9 & 10

RAIL TYPE T4 MOD (STEEL)
SPAN 10

GENERAL NOTES
See Type T4 (Steel) Rail sheet for general notes, rail member, rail post, anchor bolts and other details not shown.

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

SPECIAL RAIL
SPANS 1-8
T4 (MOD) RAIL SPANS 9 & 10

LINE N-BROAD OVERPASS 170
LINE HOLLIDAY-S OVERPASS

ORIGINAL DRAWING DATE	REVISIONS	STATE DISTRICT	FEDERAL REGION	PROJECT ID	SHEET
DN: APK		3	6	C-44-1-67	170
CK: JSW		COUNTY			
DW: APK		WICHITA			
CK: APK					

SHEET 2 OF 2

Texas Department of Transportation — Bridge Division

T4 TRAFFIC RAIL

NBI: 03-243-0-0044-01-084 &
03-243-0-0044-01-085

SPANS 1 - 18 FOR IH 44
OVER BROAD STREET,
& HOLLIDAY STREET
(ORIGINAL STRUCTURE)

FILE:	DN:	CK:	DW: RC	CK:
©TxDOT FEBRUARY 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		56

T4 TRFFIC RAIL - AS-BUILT

TABLE OF REPAIRS - BROAD OVERPASS

ITEM	0429 6007, CONC STR REPAIR (VERTICAL & OVERHEAD) (D3)	0780 6002, CNC CRACK REPAIR (DISCRETE)(INJECT) (D5)	0712 6009 JT / CRCK SEAL (HOT - POURED RUBBER) (D8)	OTHER
UNIT	SF	LF	LF	-
ABUT 1				(D14) 0431 6003 PNEUMATICALLY PLACED CONCRETE(2")-30 SF
BENT 2			56	
BENT 3	10	20	56	
BENT 4	10	20		
BENT 5	15		56	
BENT 6	50	20		
BENT 7	20		56	
BENT 8	10		56	
BENT 9	20			
BENT 10	5		56	
BENT 11	5		58	
BENT 12	5		50	(D15) 0778 6001 CONCRETE RAIL REPAIR(IN-KIND)-15 LF
BENT 13	5		55	
BENT 14	5		63	
BENT 15	5		71	
BENT 16	10		81	
BENT 17	5		90	
BENT 18	5		102	
ABUT 19	17		52	(D9) 0429 6002,CONC STR REPAIR (EPOXY MORTAR)-20 SF (D10) 0104 6009,REMOVING CONC (RIPRAP)-17 SY (D11) 0432 6003,RIPRAP (CONC)(6 IN)-3 CY (D12) 0401 6001,FLOWABLE BACKFILL-10 CY (D13) 0420 6007,CL A CONC (FLUME)-3 CY
TOTAL	202	60	958	

TABLE OF REPAIRS - HOLLIDAY OVERPASS

ITEM	0429 6007, CONC STR REPAIR (VERTICAL & OVERHEAD) (D3)	0780 6002, CNC CRACK REPAIR (DISCRETE)(INJECT) (D5)	0712 6009 JT / CRCK SEAL (HOT - POURED RUBBER) (D8)	OTHER
UNIT	SF	LF	LF	-
ABUT 1				(D14) 0431 6003 PNEUMATICALLY PLACED CONCRETE(2")-30 SF
BENT 2	10	20	56	
BENT 3	10	20	56	
BENT 4	5	30		
BENT 5	15		56	
BENT 6	75	20		
BENT 7	10	15	56	
BENT 8	5	10	56	
BENT 9	15			
BENT 10	5		56	
BENT 11	5		53	
BENT 12	5		51	
BENT 13	10		57	
BENT 14	5		66	
BENT 15	5		76	
BENT 16	5		85	
BENT 17	5		94	
BENT 18	5		49	
ABUT 19	10		52	(D9) 0429 6002 CONC STR REPAIR (EPOXY MORTAR)-5 SF
TOTAL	205	115	919	

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED
PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

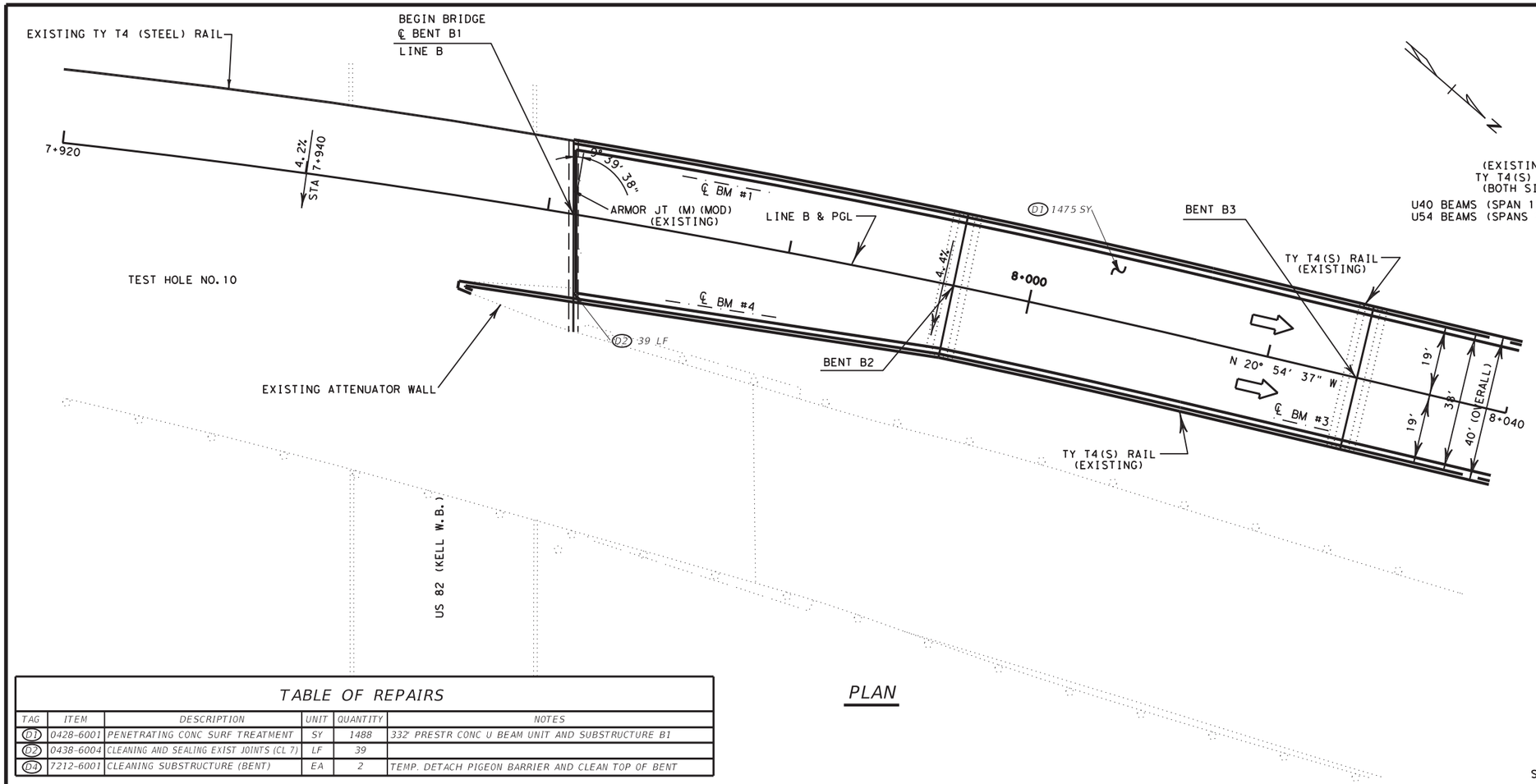
Texas Department of Transportation | Bridge Division

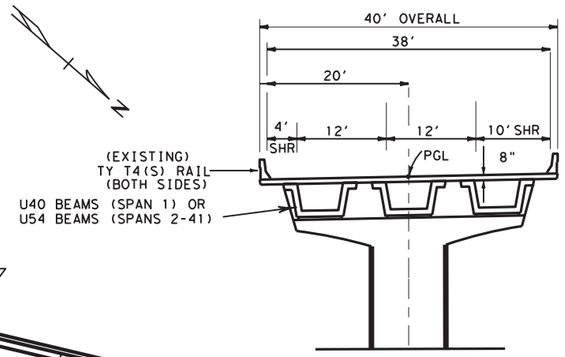
TABLE OF REPAIRS

NBI: 03-243-0-0044-01-084 &
03-243-0-0044-01-085

SPANS 1 - 18 FOR IH 44
OVER BROAD STREET,
& HOLLIDAY STREET
(ORIGINAL STRUCTURE)

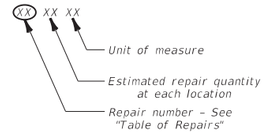
FILE:	DN:	CK:	DW: RC	CK:
©TxDOT FEBRUARY 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		57





TYPICAL SECTION

REPAIR CALL-OUT LEGEND



PLAN

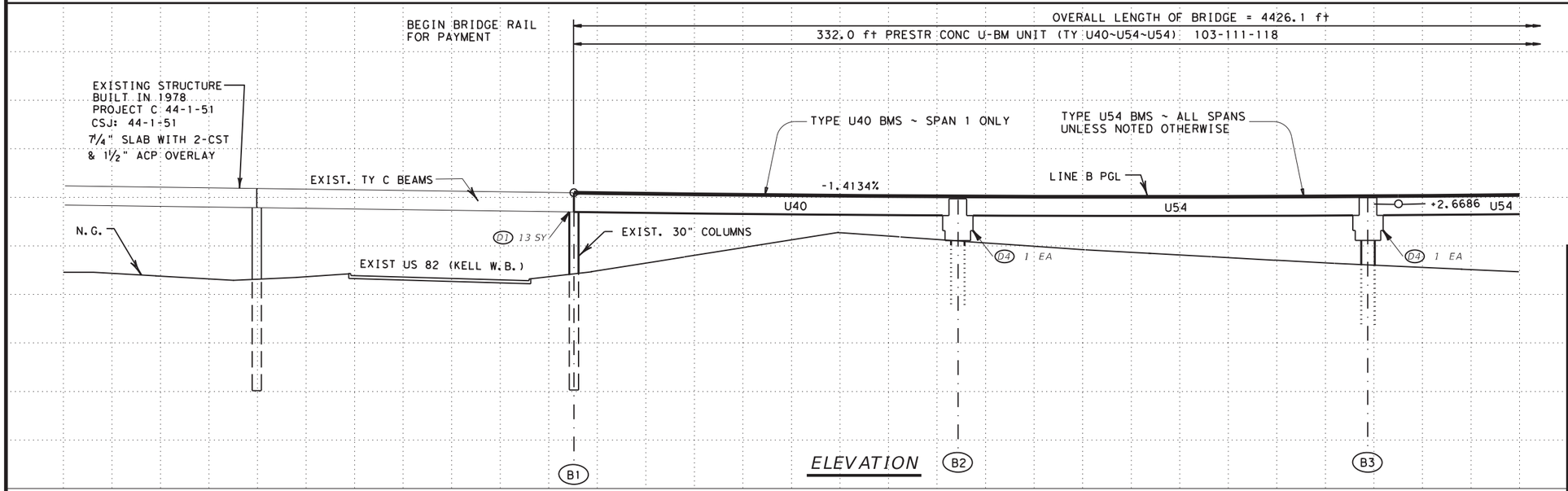
SCALE: 1:400

TOTAL LENGTH OF STRUCTURE = 4426.1 ft

TABLE OF REPAIRS					
TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	1488	332' PRESTR CONC U BEAM UNIT AND SUBSTRUCTURE B1
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	39	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	2	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

GENERAL NOTES

Stations, elevations, and cross sectional or geometric information is taken from as-built plans and is shown for Contractor's information only. Copies of available portions of as-built plans may be provided upon request. Note that original plans were developed using the metric system. Actual dimensions may not exactly match dimensions shown.



ELEVATION

SHEET 1 OF 12

Texas Department of Transportation — Bridge Division

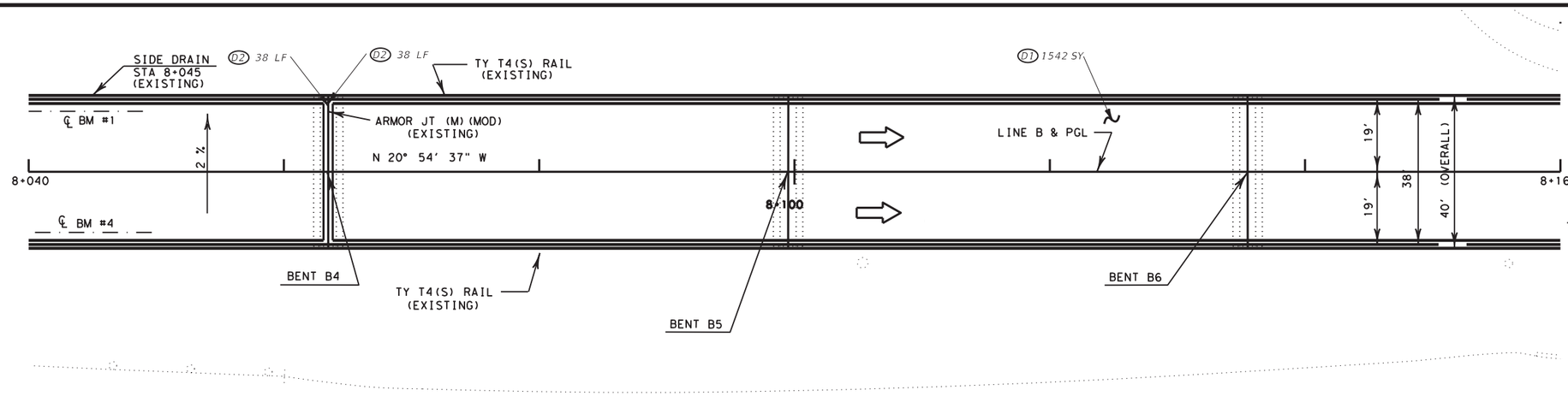
BRIDGE LAYOUT

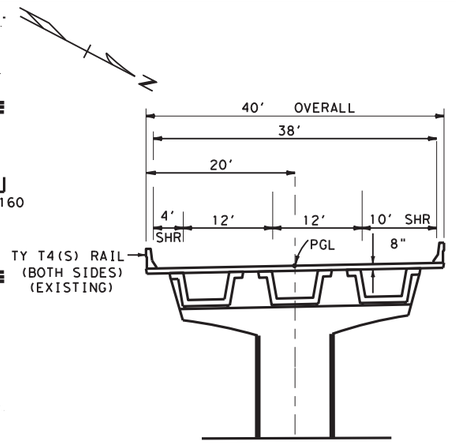
NBI NO: 03-243-0-0044-01-084

IH 44 AT BROAD STREET

FILE: 03243004401084.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		58

5560 | y01 . dgn





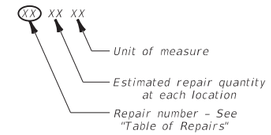
TYPICAL SECTION

PLAN

TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	1631	332' PRESTR CONC U BEAM UNIT AND SUBSTRUCTURE B4
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	76	
D3	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	16	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	3	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

REPAIR CALL-OUT LEGEND



GENERAL NOTES

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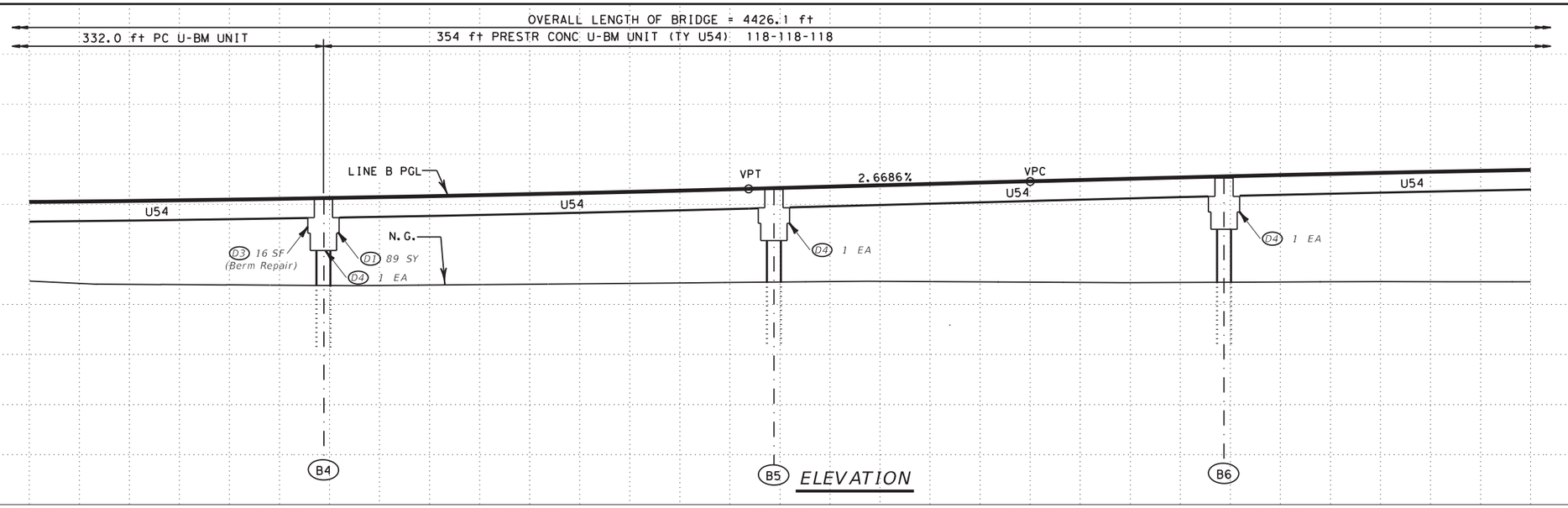
SCALE: 1:400 TOTAL LENGTH OF STRUCTURE = 4426.1 ft



ELEVATION

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STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED
PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

Texas Department of Transportation

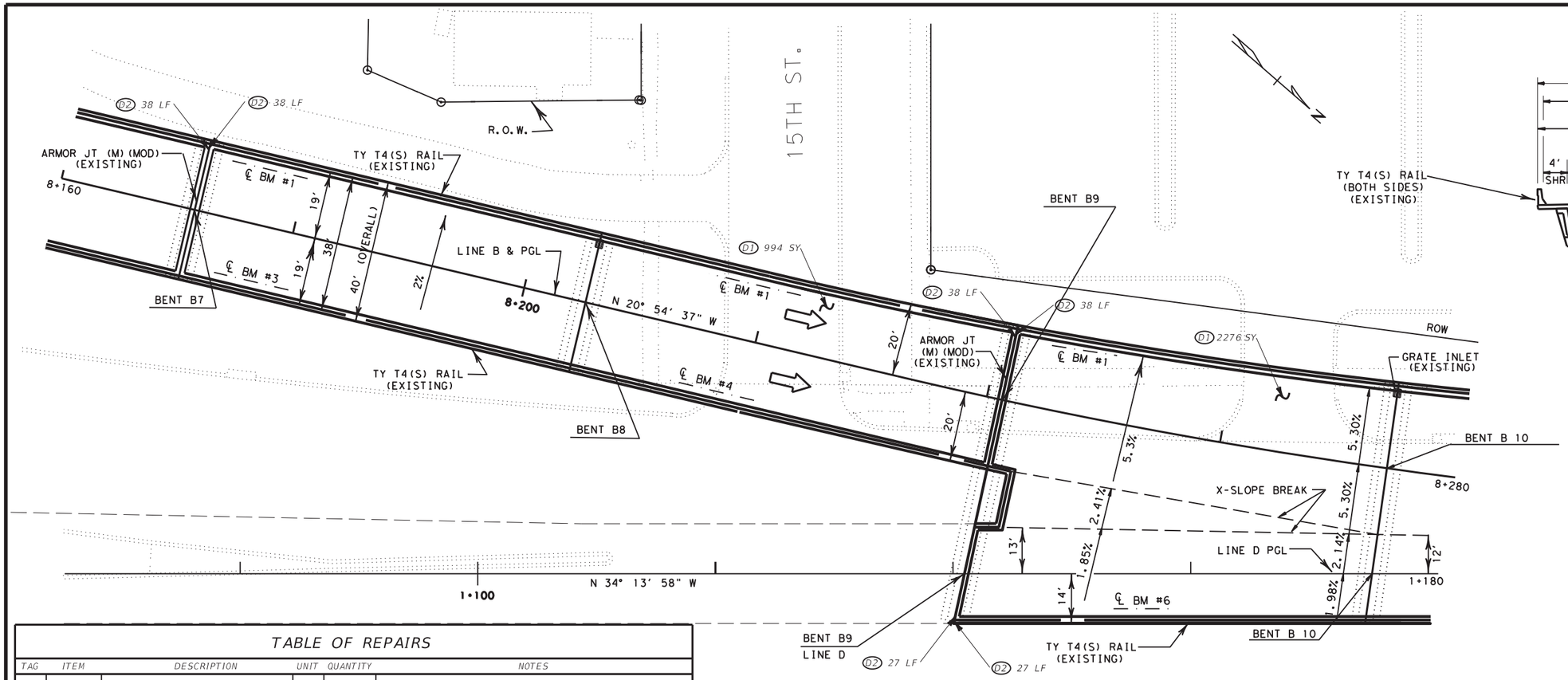
Bridge Division

BRIDGE LAYOUT

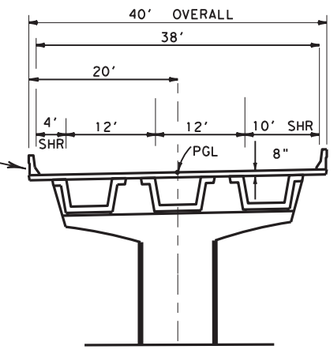
NBI NO: 03-243-0-0044-01-084

IH 44 AT
BROAD STREET

FILE: 0324300440 1084.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		59



PLAN



TYPICAL SECTION

REPAIR CALL-OUT LEGEND

XX XX XX

- XX — Repair number – See "Table of Repairs"
- XX — Estimated repair quantity at each location
- XX — Unit of measure

TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	3533	229' PRESTR CONC U BEAM UNIT, 318' PRESTR CONC U BEAM UNIT, AND SUBSTRUCTURE B7 AND B9
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	206	
D3	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	56	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	4	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

GENERAL NOTES

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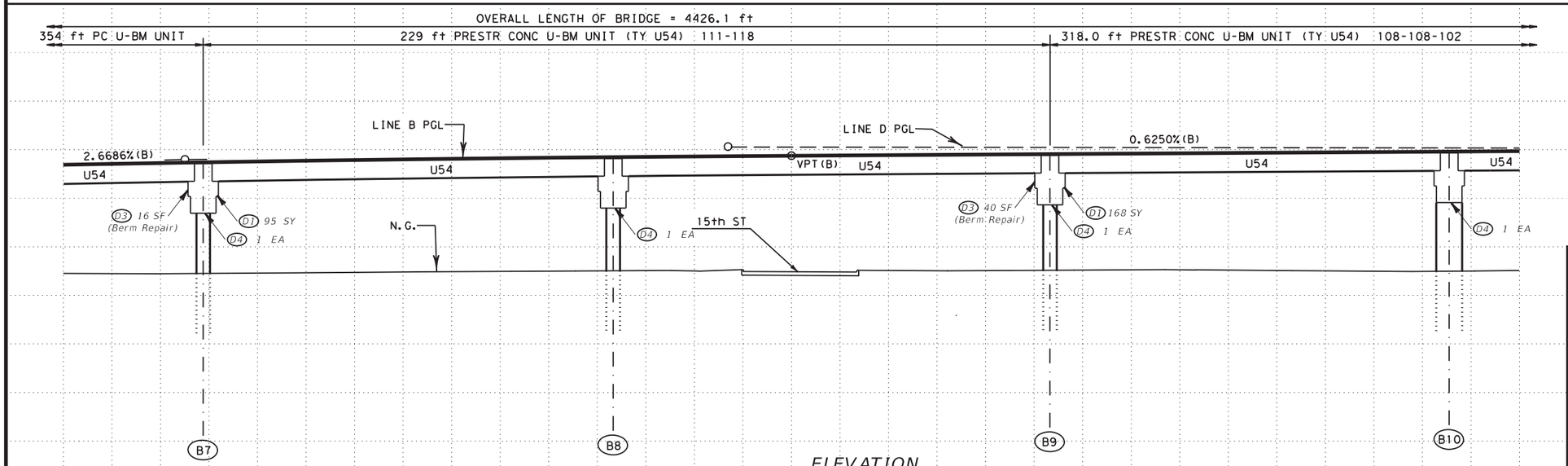
SCALE: 1:400 TOTAL LENGTH OF STRUCTURE = 4426.1 ft



ELEVATION

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STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED
PROFESSIONAL ENGINEER

John Douglas Beer, P.E.
5/28/2021

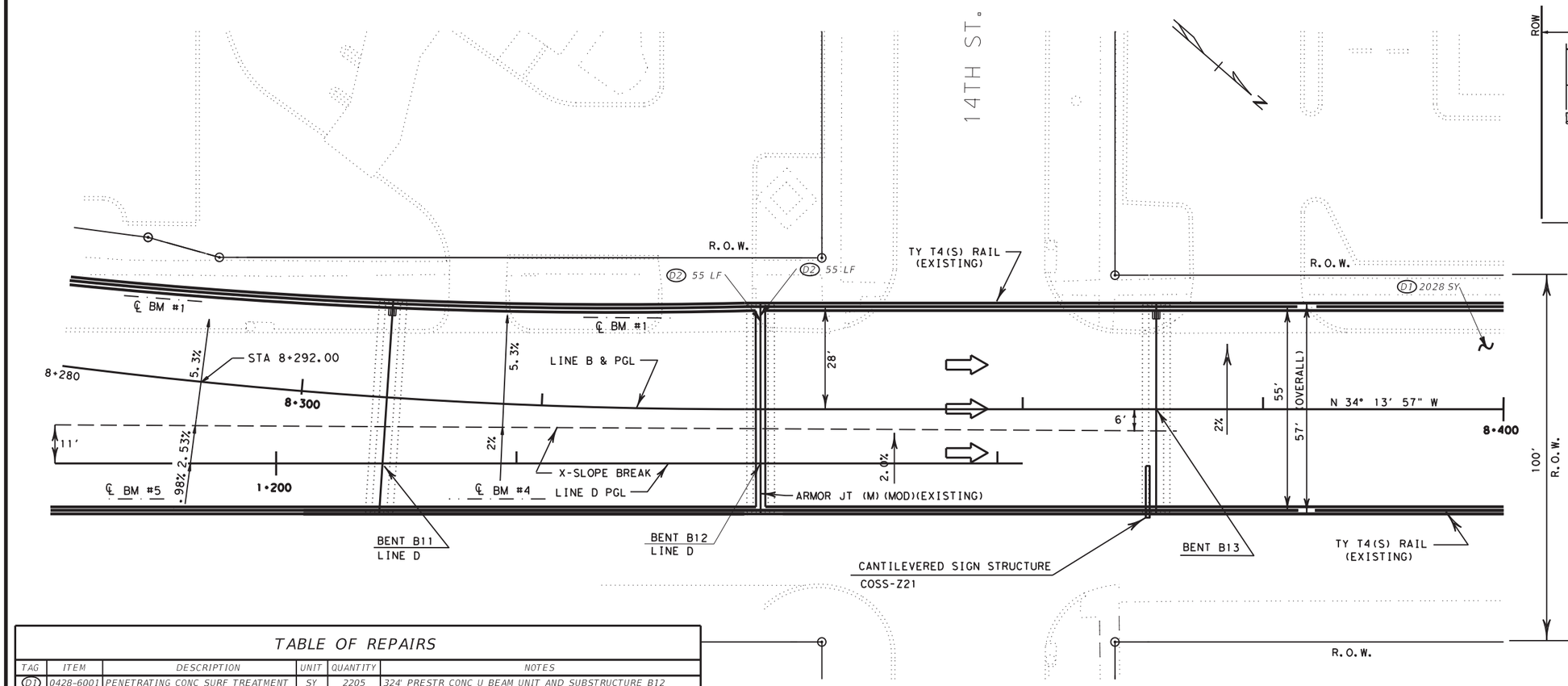
Texas Department of Transportation — Bridge Division

BRIDGE LAYOUT

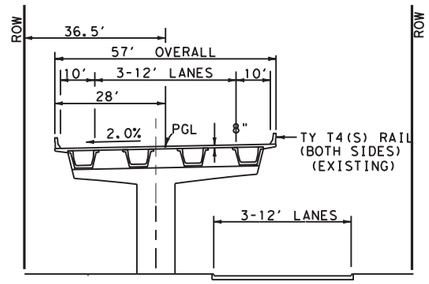
NBI NO: 03-243-0-0044-01-084

IH 44 AT BROAD STREET

FILE: 03243004401084.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		60



PLAN



TYPICAL SECTION

REPAIR CALL-OUT LEGEND

XX XX XX
- Unit of measure
- Estimated repair quantity at each location
- Repair number - See "Table of Repairs"

TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	2205	324' PRESTR CONC U BEAM UNIT AND SUBSTRUCTURE B12
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	110	
D3	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	23	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	3	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

GENERAL NOTES

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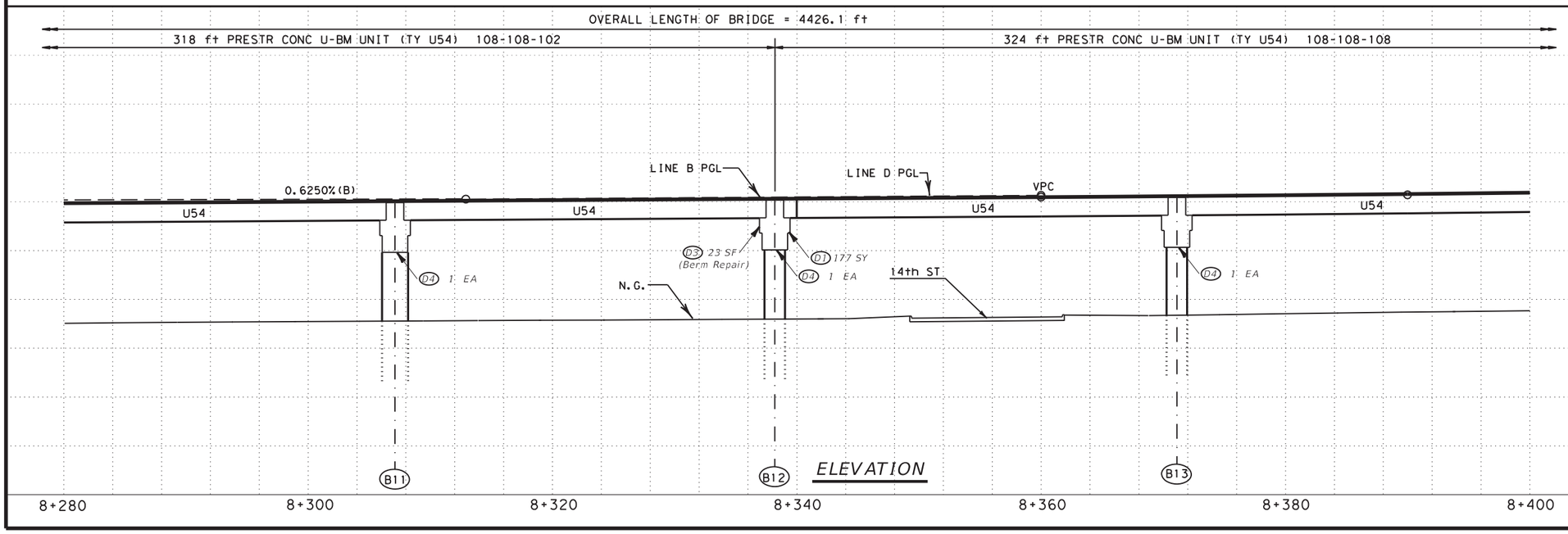
SCALE: 1:400 TOTAL LENGTH OF STRUCTURE = 4426.1 ft



ELEVATION

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

SHEET 4 OF 12

Texas Department of Transportation — Bridge Division

BRIDGE LAYOUT

NBI NO: 03-243-0-0044-01-084

IH 44 AT
BROAD STREET

FILE: 0324300440108 4.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		61

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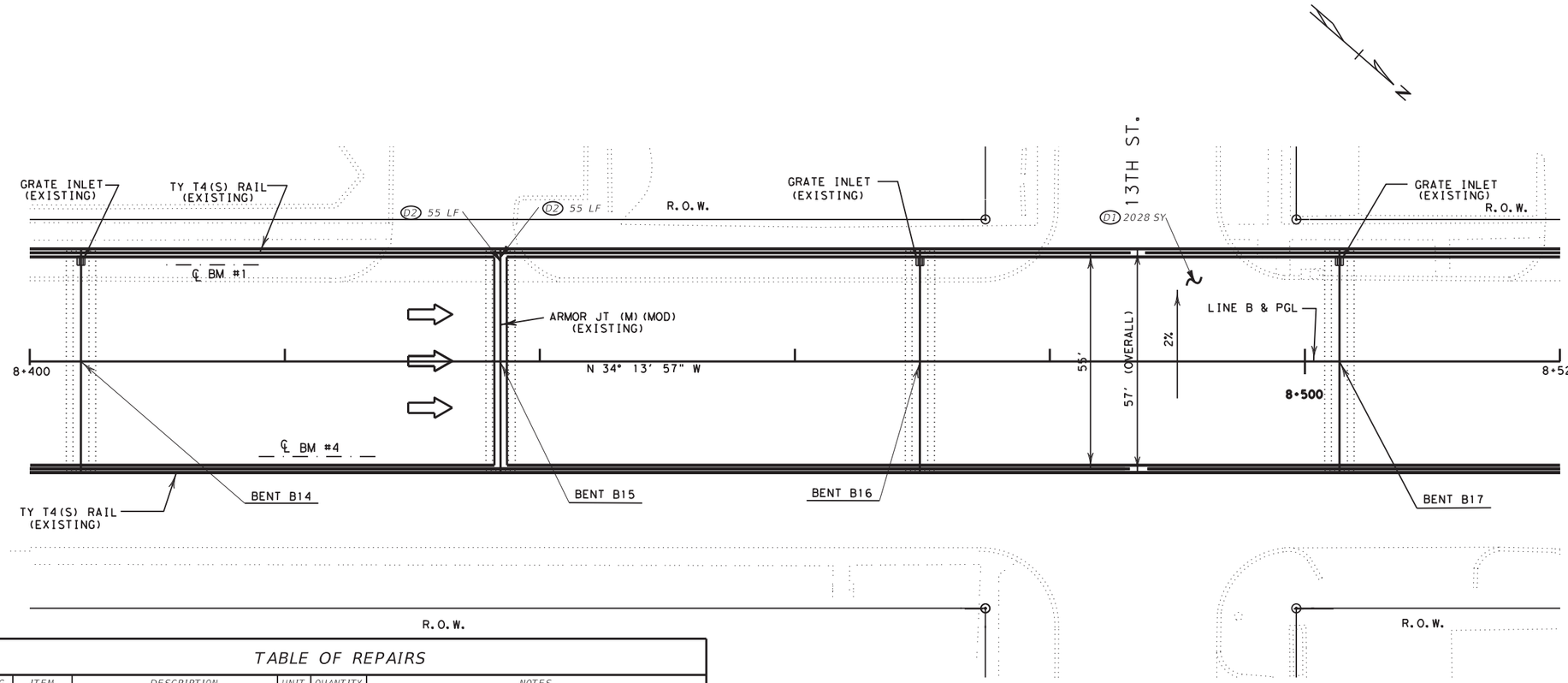
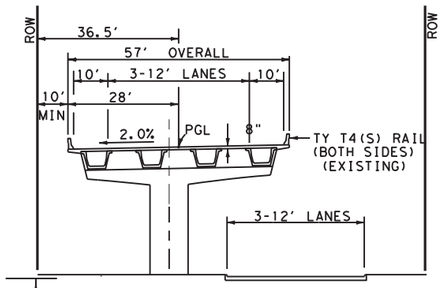


PLAN



TYPICAL SECTION

REPAIR CALL-OUT LEGEND

XX XX XX
- Unit of measure
- Estimated repair quantity at each location
- Repair number – See "Table of Repairs"

100' R.O.W

GENERAL NOTES

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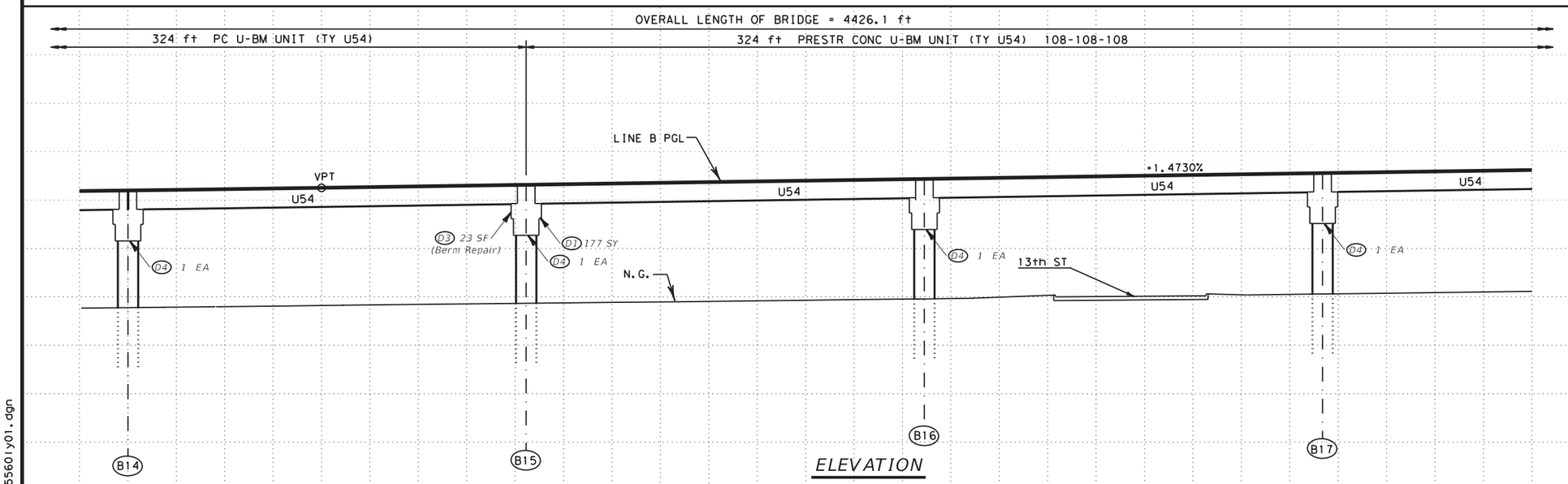
TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	2205	324' PRESTR CONC U BEAM UNIT AND SUBSTRUCTURE B15
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	110	
D3	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	23	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	4	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

SCALE: 1:400 TOTAL LENGTH OF STRUCTURE = 4426.1 ft



ELEVATION

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

SHEET 5 OF 12

Texas Department of Transportation — Bridge Division

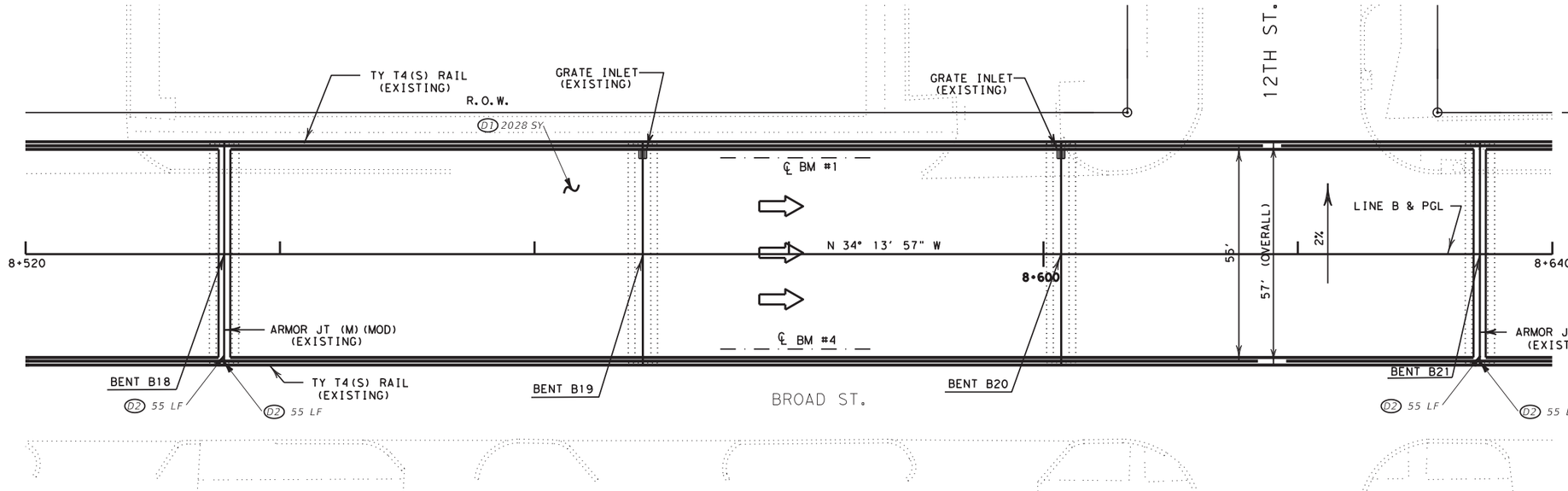
BRIDGE LAYOUT

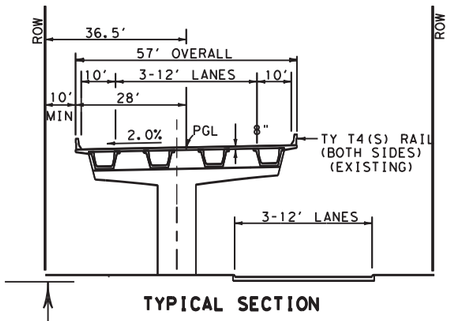
NBI NO: 03-243-0-0044-01-084

IH 44 AT BROAD STREET

FILE: 03243004401084.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		62

5560 1y01.dgn





TYPICAL SECTION

REPAIR CALL-OUT LEGEND

(XX) XX XX
- XX — Unit of measure
- XX — Estimated repair quantity at each location
- (XX) — Repair number - See "Table of Repairs"

PLAN

SCALE: 1:400

TOTAL LENGTH OF STRUCTURE = 4426.1 ft

TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
(D1)	0428-6001	PENETRATING CONC SURF TREATMENT	SY	2208	324' PRESTR CONC U BEAM UNIT AND SUBSTRUCTURE B18
(D2)	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	220	
(D3)	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	23	
(D4)	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	4	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

GENERAL NOTES

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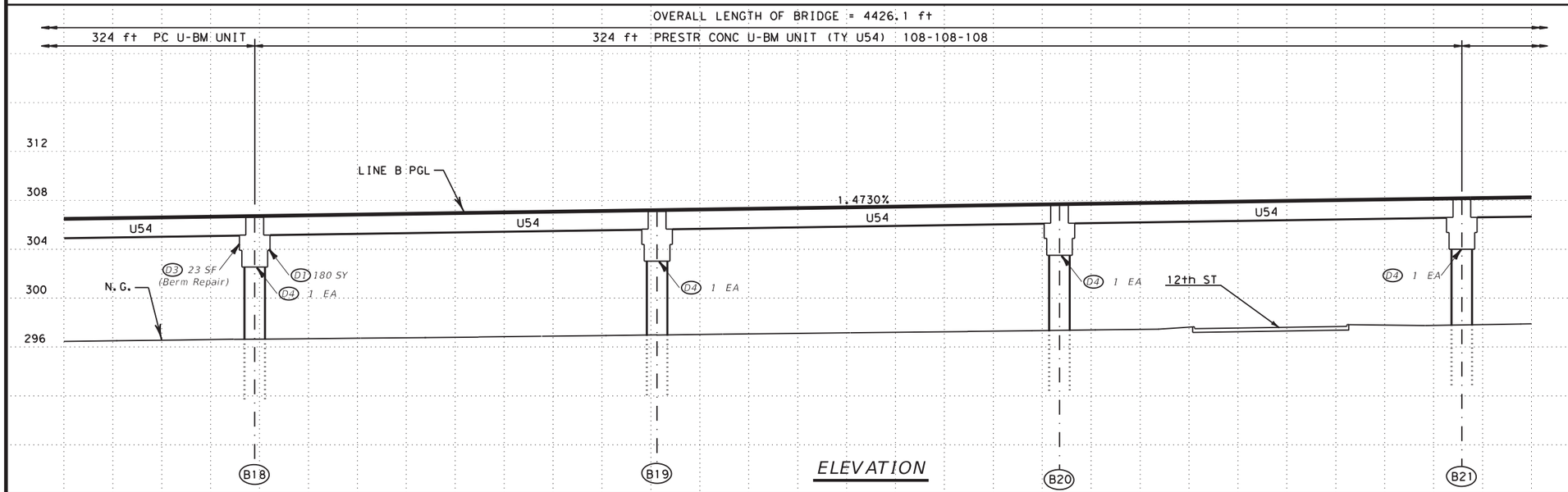

ELEVATION

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

SHEET 6 OF 12

Texas Department of Transportation — Bridge Division

BRIDGE LAYOUT

NBI NO: 03-243-0-0044-01-084

IH 44 AT BROAD STREET

FILE:	03243004401084.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT	JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS		0043	09	144, ETC	IH 44/US 287
		DIST	COUNTY		SHEET NO.
		WFS	WICHITA		63

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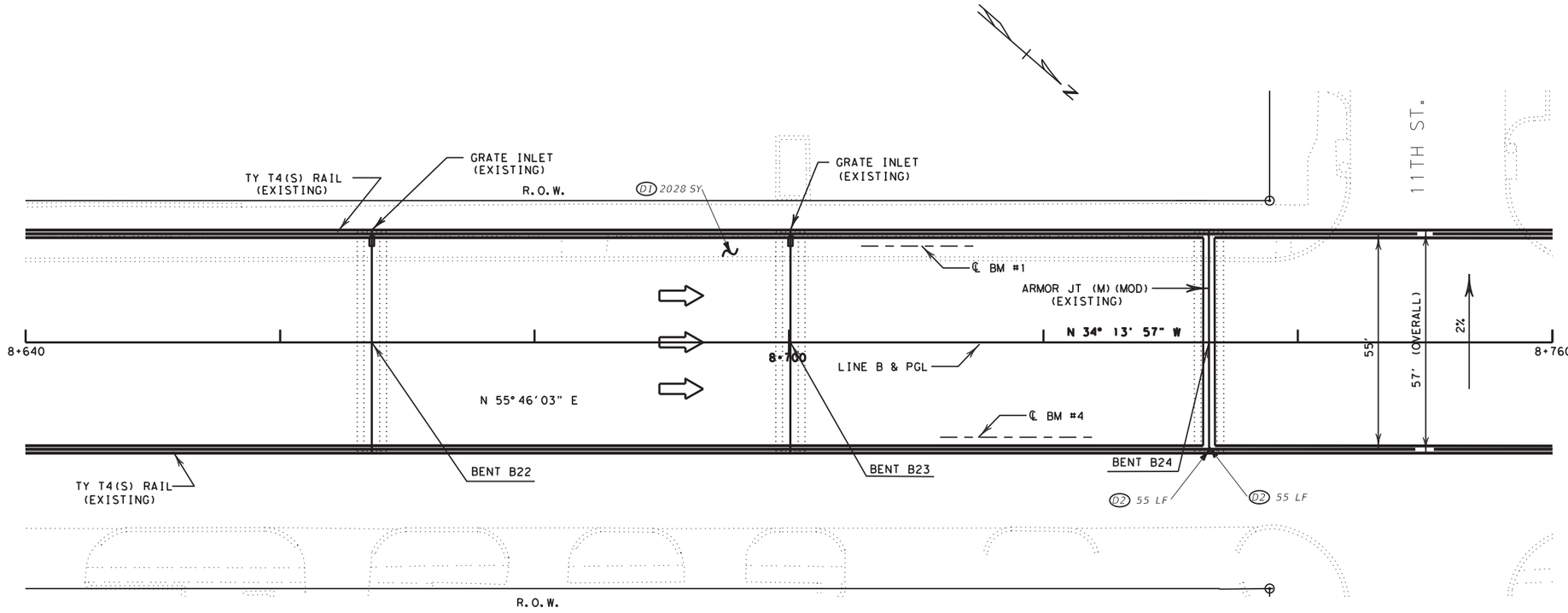
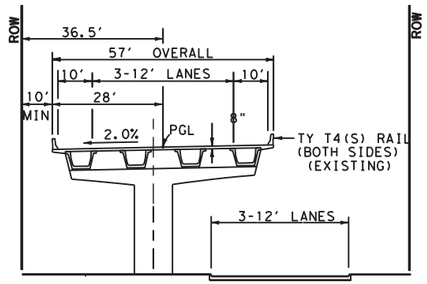
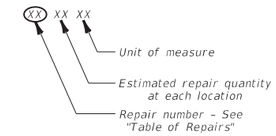




TYPICAL SECTION

REPAIR CALL-OUT LEGEND



GENERAL NOTES

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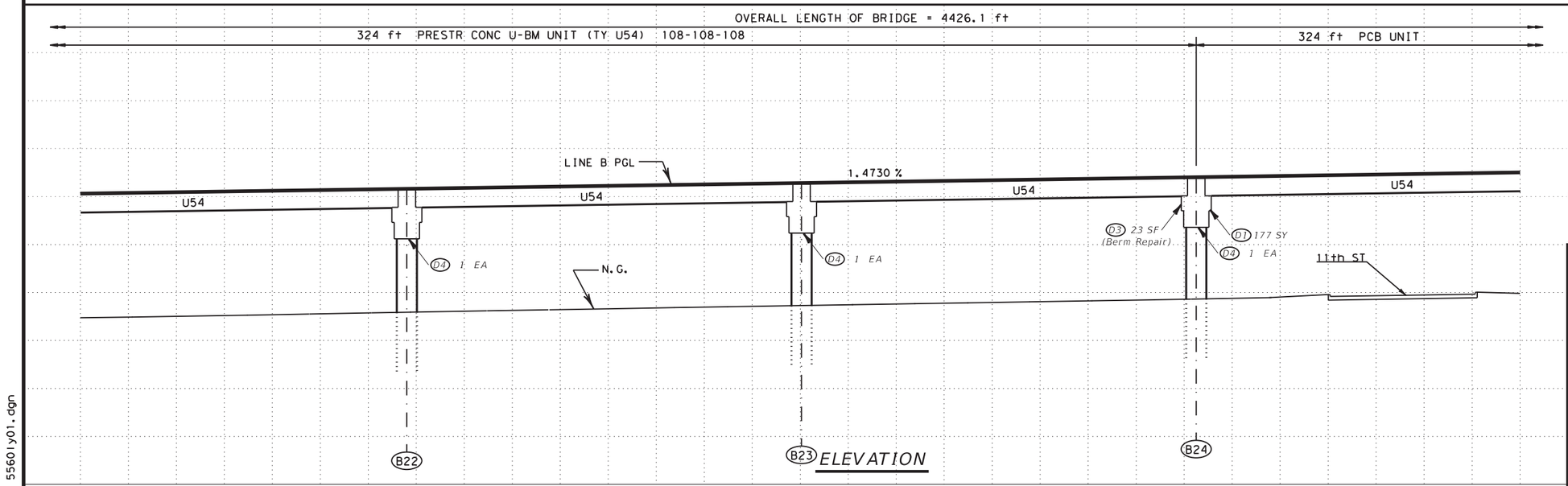
TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
(D1)	0428-6001	PENETRATING CONC SURF TREATMENT	SY	2205	324' PRESTR CONC U BEAM UNIT AND SUBSTRUCTURE B24
(D2)	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	110	
(D3)	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	23	
(D4)	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	3	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

PLAN

SCALE: 1:400 TOTAL LENGTH OF STRUCTURE = 4426.1 ft



ELEVATION

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

SHEET 7 OF 12

Texas Department of Transportation — Bridge Division

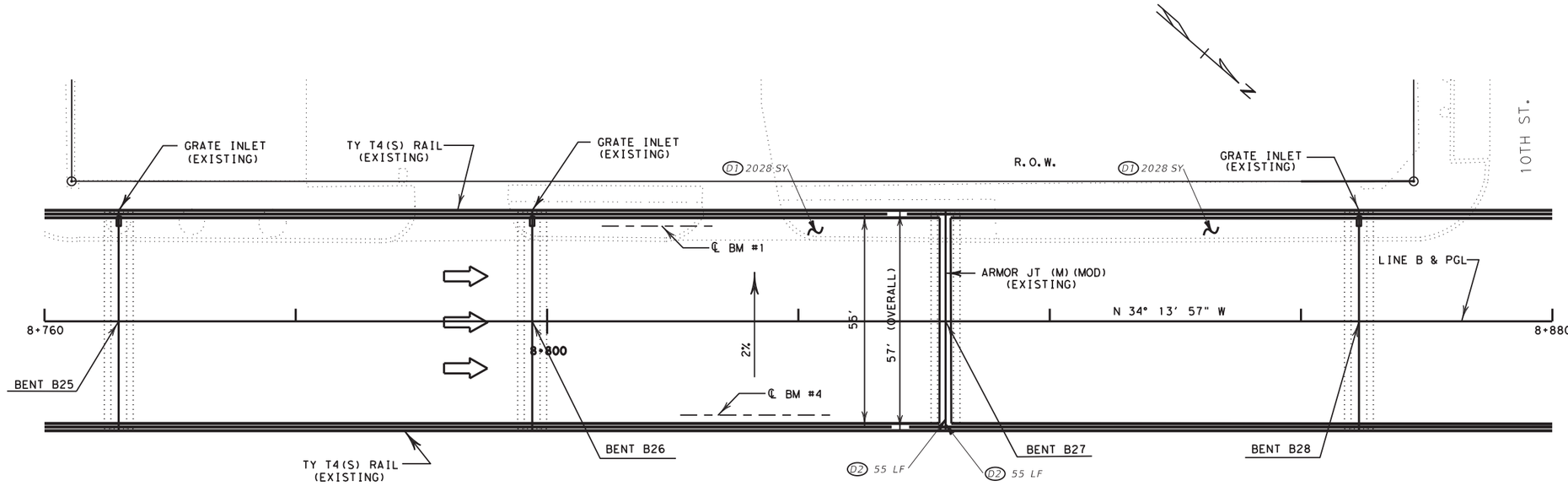
BRIDGE LAYOUT

NBI NO: 03-243-0-0044-01-084

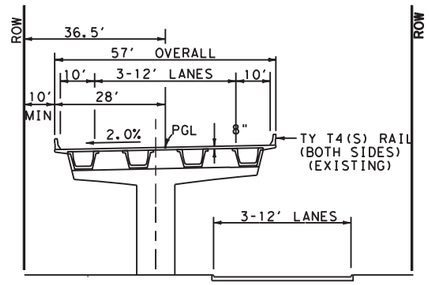
IH 44 AT BROAD STREET

FILE: 032430044010 84.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		64

5560 l y01. dgn

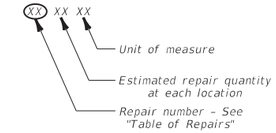


PLAN



TYPICAL SECTION

REPAIR CALL-OUT LEGEND



GENERAL NOTES

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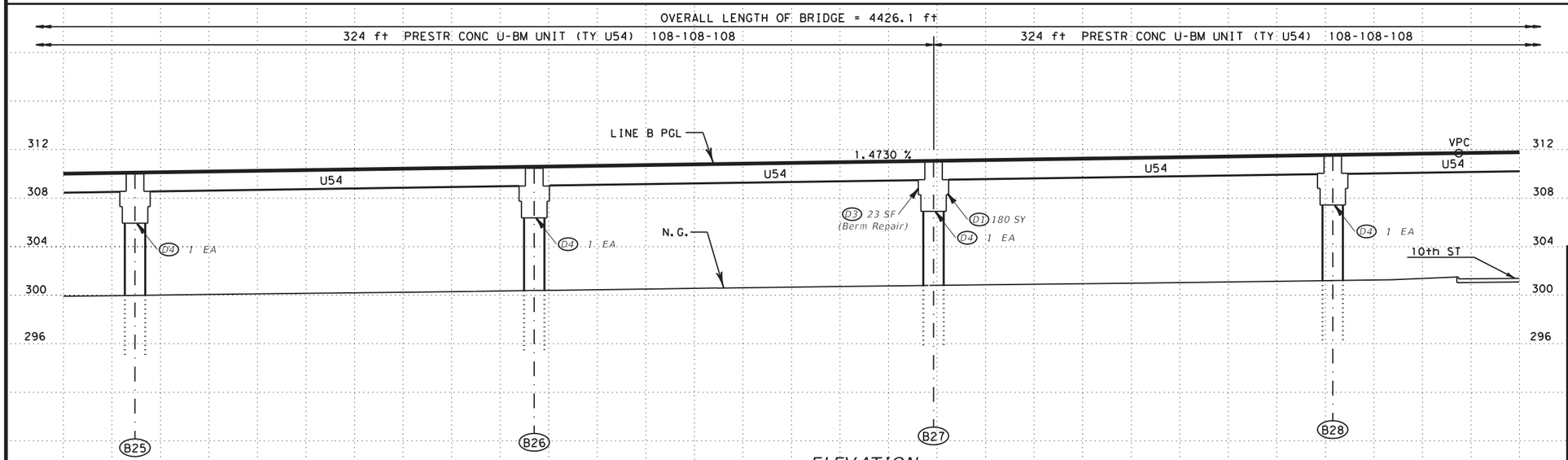
SCALE: 1:400 TOTAL LENGTH OF STRUCTURE = 4426.1 ft

TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	4236	2 - 324' PRESTR CONC U BEAM UNITS AND SUBSTRUCTURE B27
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	110	
D3	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	23	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	4	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT



ELEVATION

Texas Department of Transportation — Bridge Division

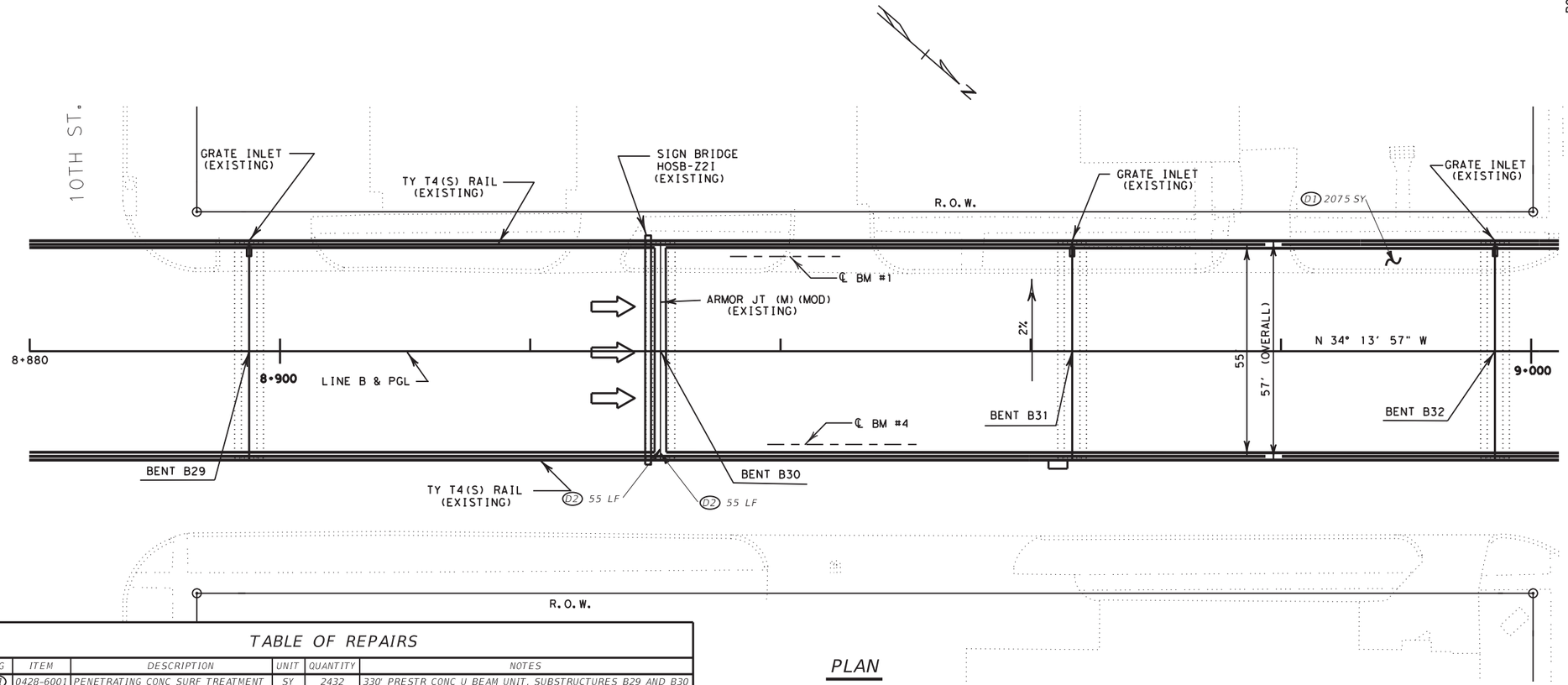
BRIDGE LAYOUT

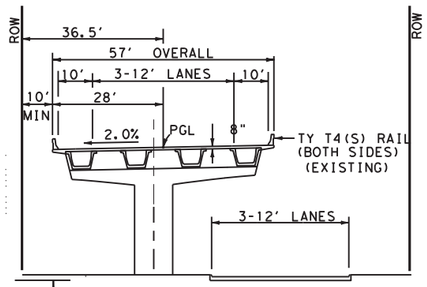
NBI NO: 03-243-0-0044-01-084

IH 44 AT BROAD STREET

FILE: 03243004401084.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		65

5560ly01.dgn





TYPICAL SECTION

100' R.O.W.

REPAIR CALL-OUT LEGEND

XX XX XX
- Unit of measure
- Estimated repair quantity at each location
- Repair number – See "Table of Repairs"

PLAN

SCALE: 1:400 TOTAL LENGTH OF STRUCTURE = 4426.1 ft

TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	2432	330' PRESTR CONC U BEAM UNIT, SUBSTRUCTURES B29 AND B30
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	110	
D3	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	46	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	4	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

GENERAL NOTES

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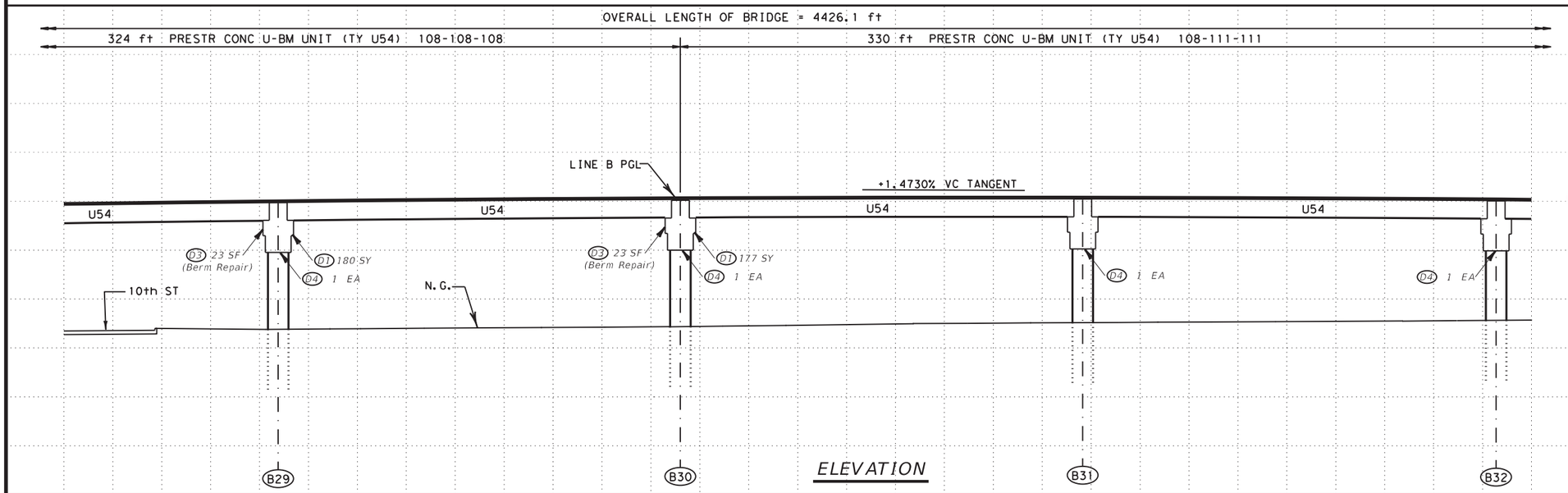


ELEVATION

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

SHEET 9 OF 12

Texas Department of Transportation — Bridge Division

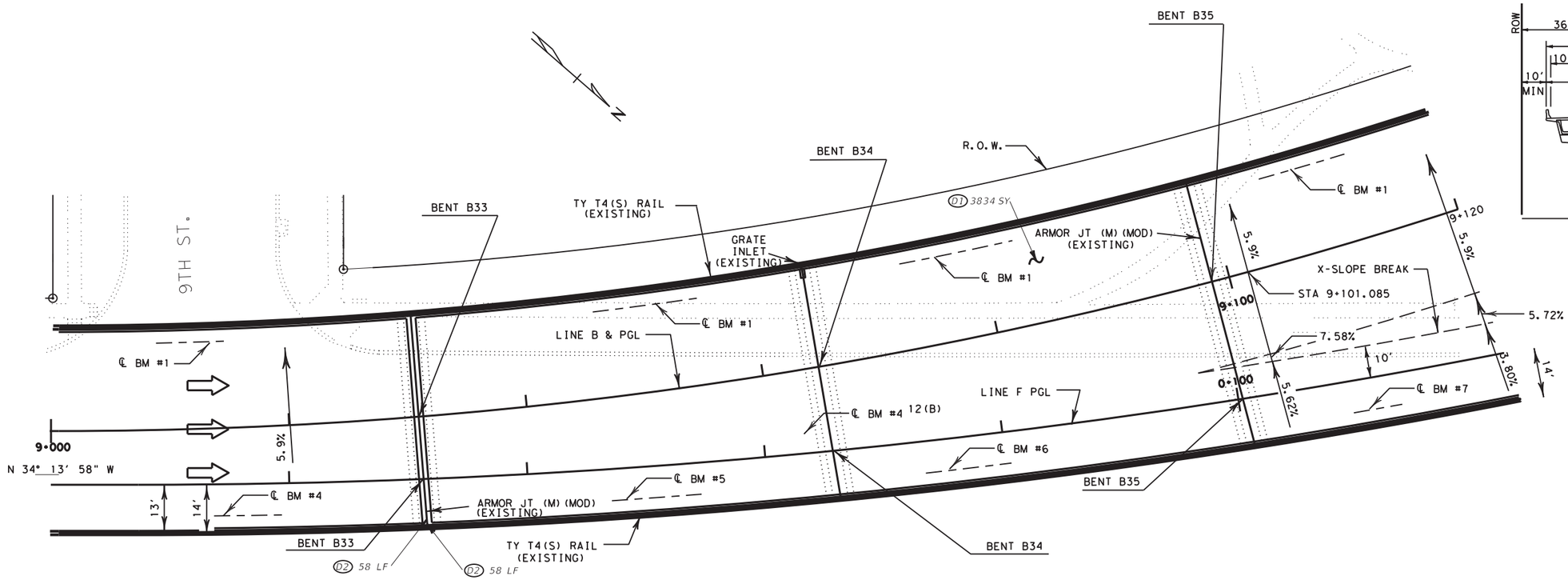
BRIDGE LAYOUT

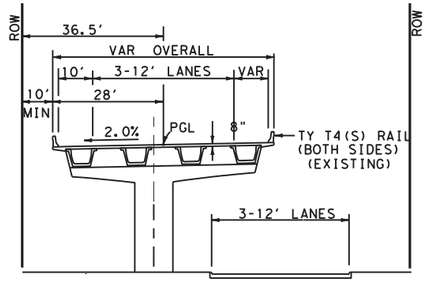
NBI NO: 03-243-0-0044-01-084

IH 44 AT BROAD STREET

FILE: 032430044401084.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		66

5560 | y01.dgn





TYPICAL SECTION

REPAIR CALL-OUT LEGEND

(XX) XX XX
- Unit of measure
- Estimated repair quantity at each location
- Repair number – See "Table of Repairs"

TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	4255	2 - 222' PRESTR CONC U BEAM UNITS (SPANS 33-36), SUBSTRUCTURES B33 AND B35
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	116	
D3	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	60	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	3	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

PLAN

GENERAL NOTES

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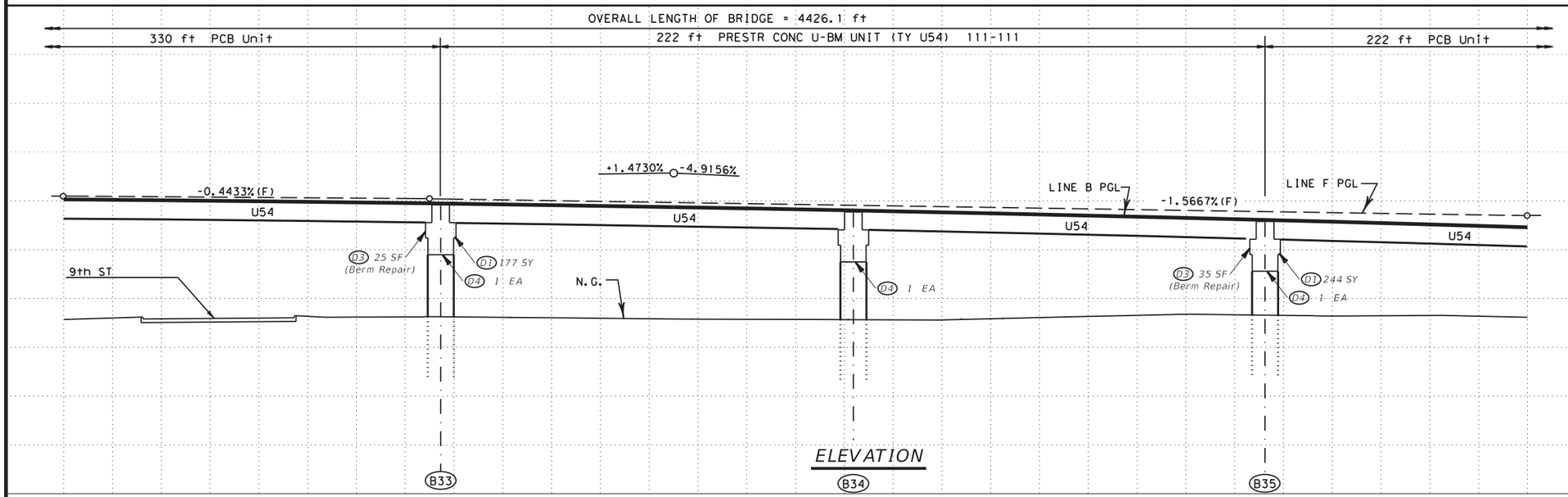
SCALE: 1:400 TOTAL LENGTH OF STRUCTURE = 4426.1 ft



ELEVATION

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED PROFESSIONAL ENGINEER
John Douglas Beer, P.E.
5/28/2021

Texas Department of Transportation — Bridge Division

BRIDGE LAYOUT

NBI NO: 03-243-0-0044-01-084

IH 44 AT
BROAD STREET

FILE: 032430044010 84.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		67

5560ly01.dgn

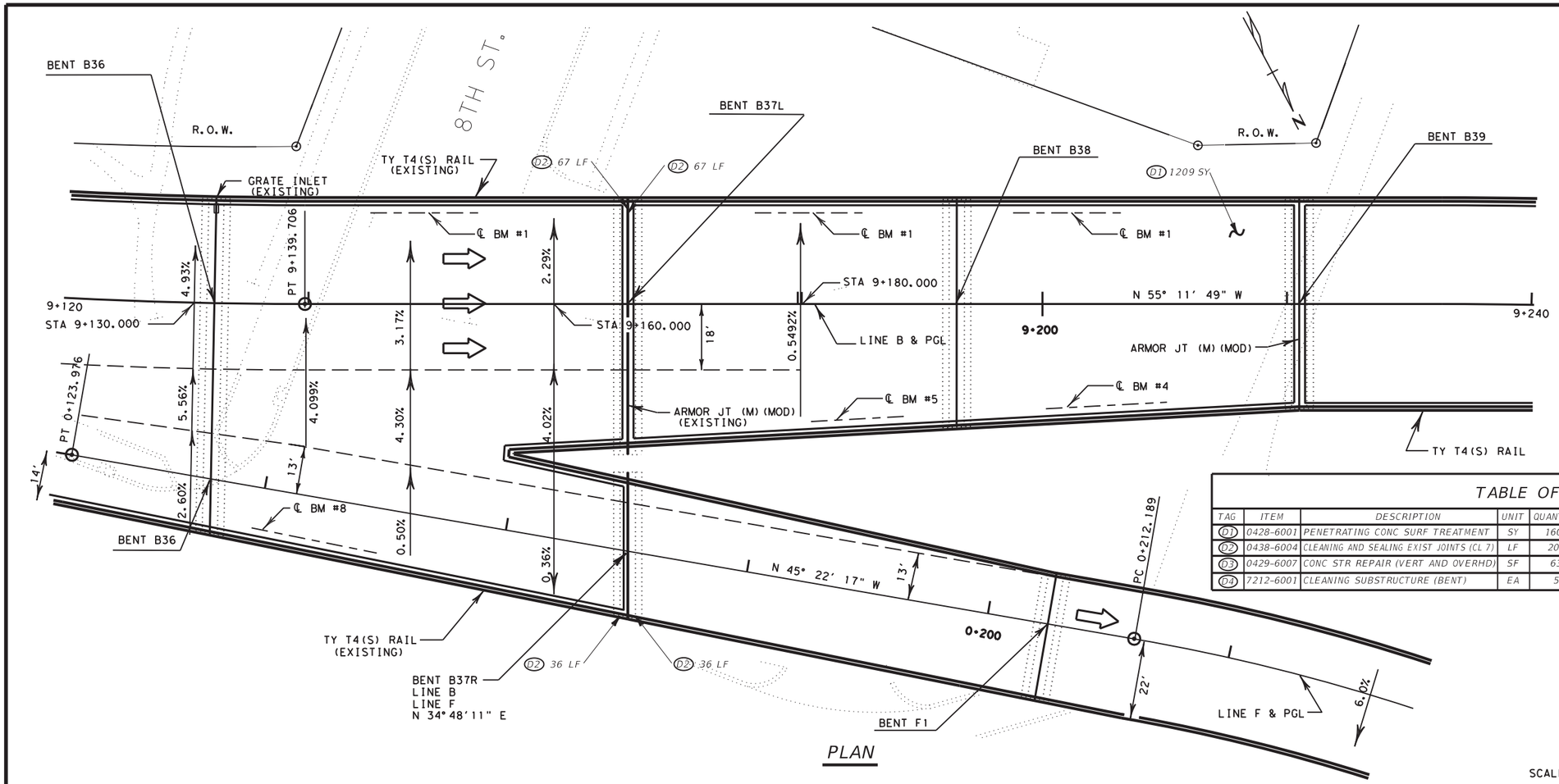


TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	1602	180' PRESTR CONC U BEAM UNIT, SUBSTRUCTURES B37 AND B39
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	206	
D3	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	63	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	5	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

GENERAL NOTES

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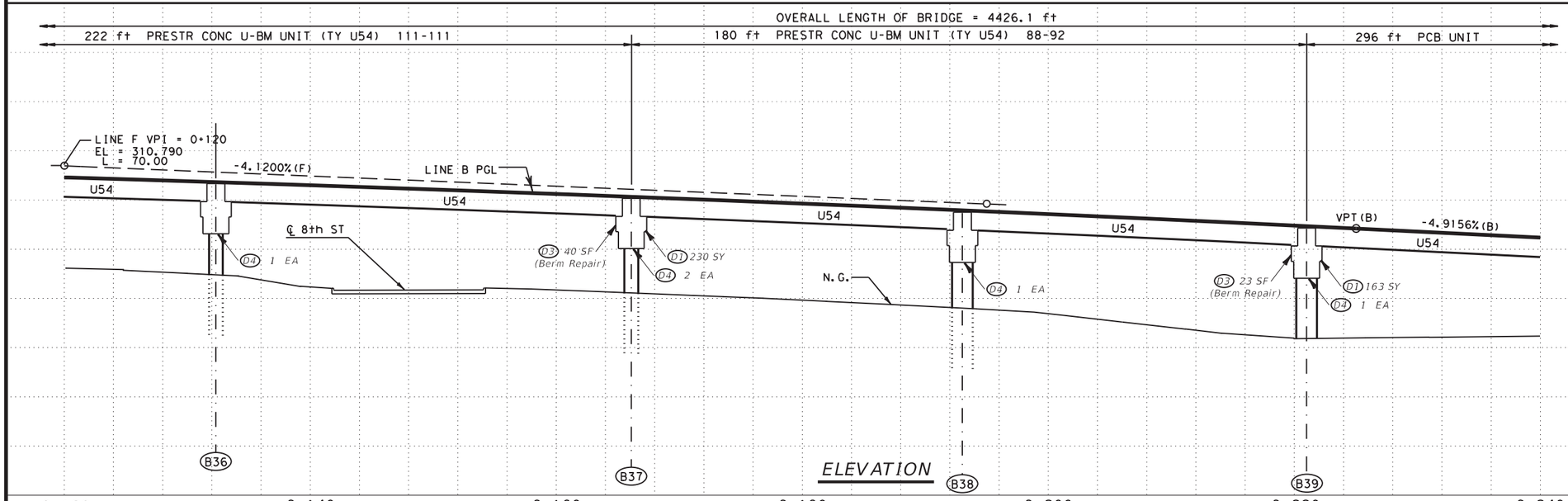
SCALE: 1:400 TOTAL LENGTH OF STRUCTURE = 4426.1 ft



STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED
PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

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Texas Department of Transportation | Bridge Division

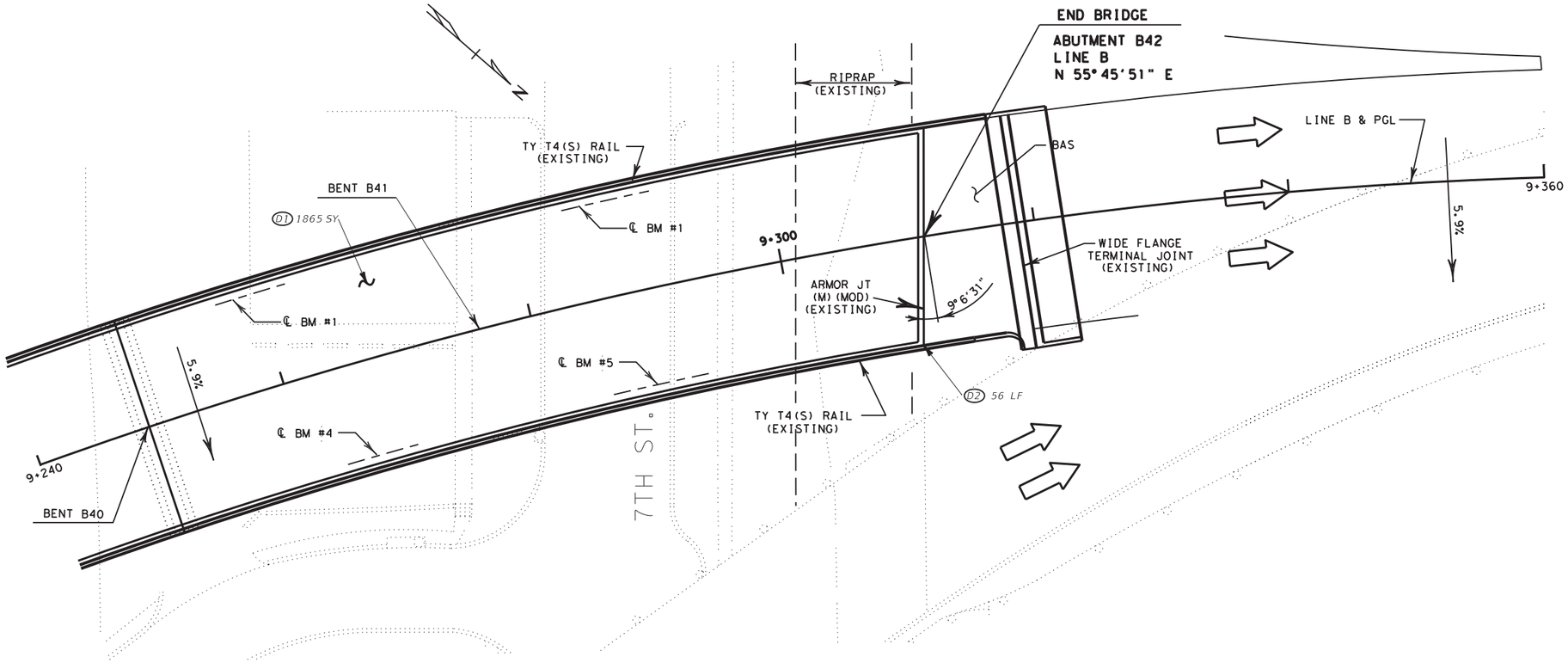
BRIDGE LAYOUT

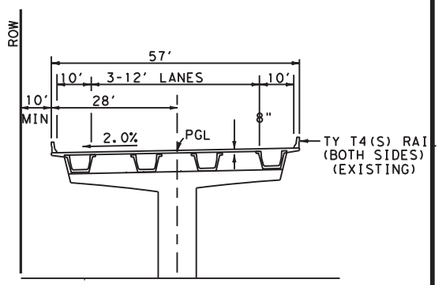
NBI NO: 03-243-0-0044-01-084

IH 44 AT BROAD STREET

FILE: 03243004401084.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		68

5560101.dgn





TYPICAL SECTION

REPAIR CALL-OUT LEGEND

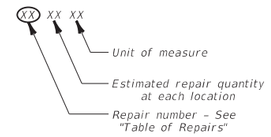


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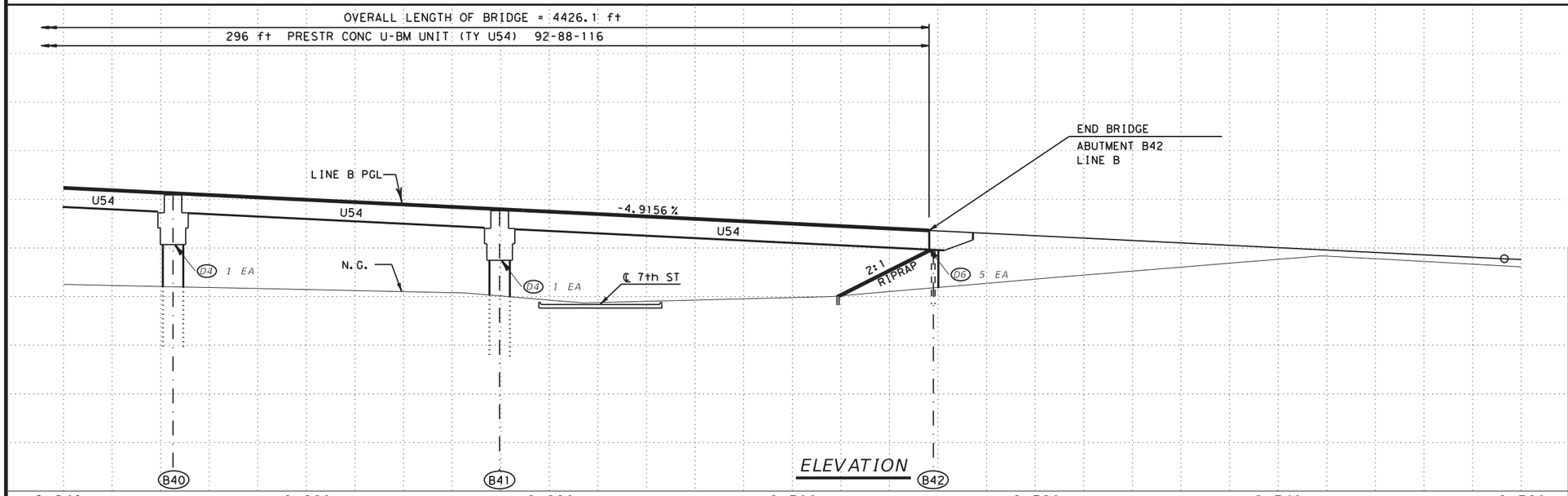
TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	1865	330' PRESTR CONC U BEAM UNIT
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	56	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	2	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT
D6	4002-6001	REPLACE ELASTOMERIC BEARING PADS	EA	5	

PLAN

SCALE: 1:400 TOTAL LENGTH OF STRUCTURE = 4426.1 ft



ELEVATION

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STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED
PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

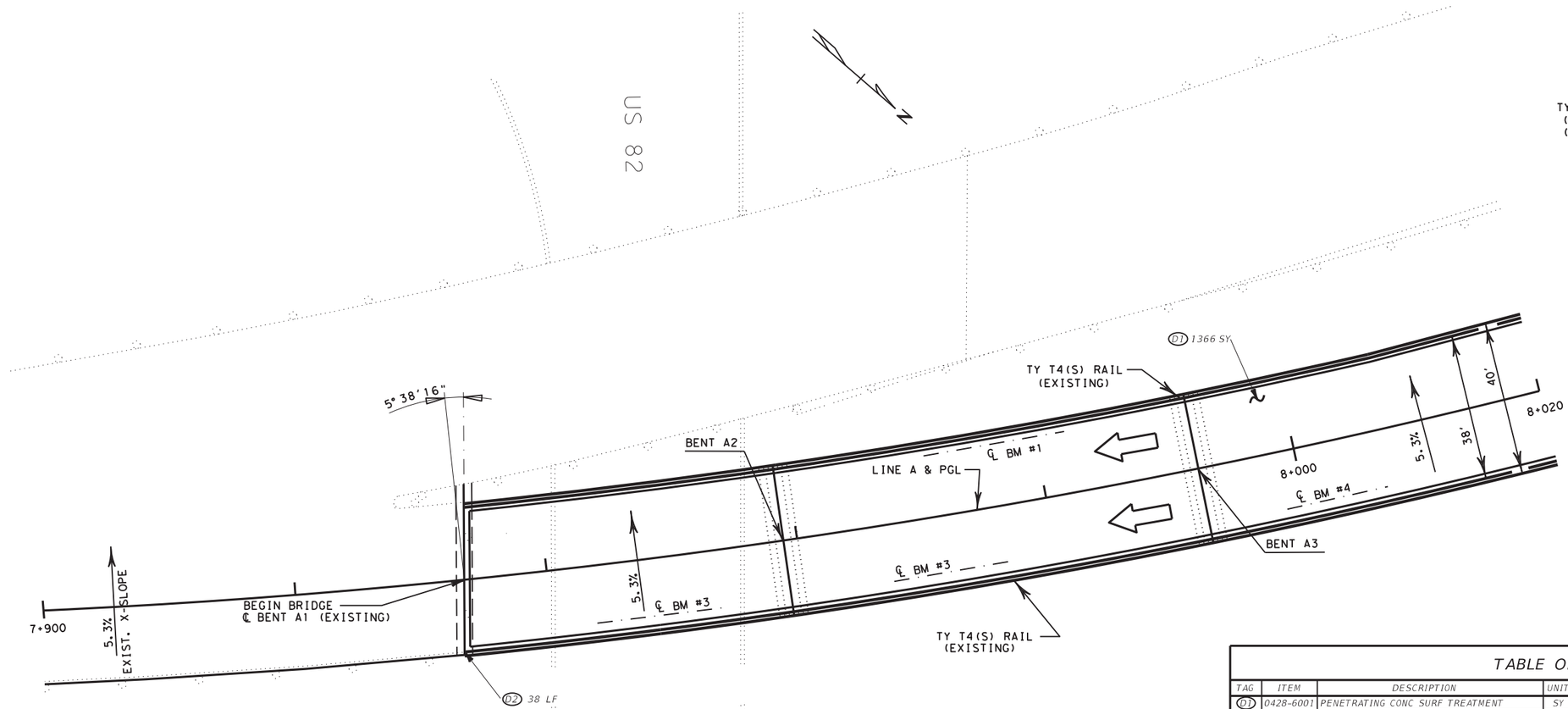
Texas Department of Transportation — Bridge Division

BRIDGE LAYOUT

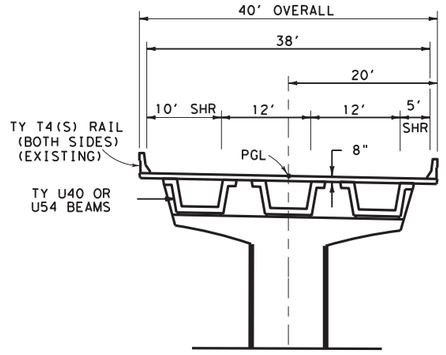
NBI NO: 03-243-0-0044-01-084

IH 44 AT BROAD STREET

FILE: 032430044010 84.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		69



PLAN



TYPICAL SECTION

REPAIR CALL-OUT LEGEND

XX XX XX
- Unit of measure
- Estimated repair quantity at each location
- Repair number – See "Table of Repairs"

GENERAL NOTES

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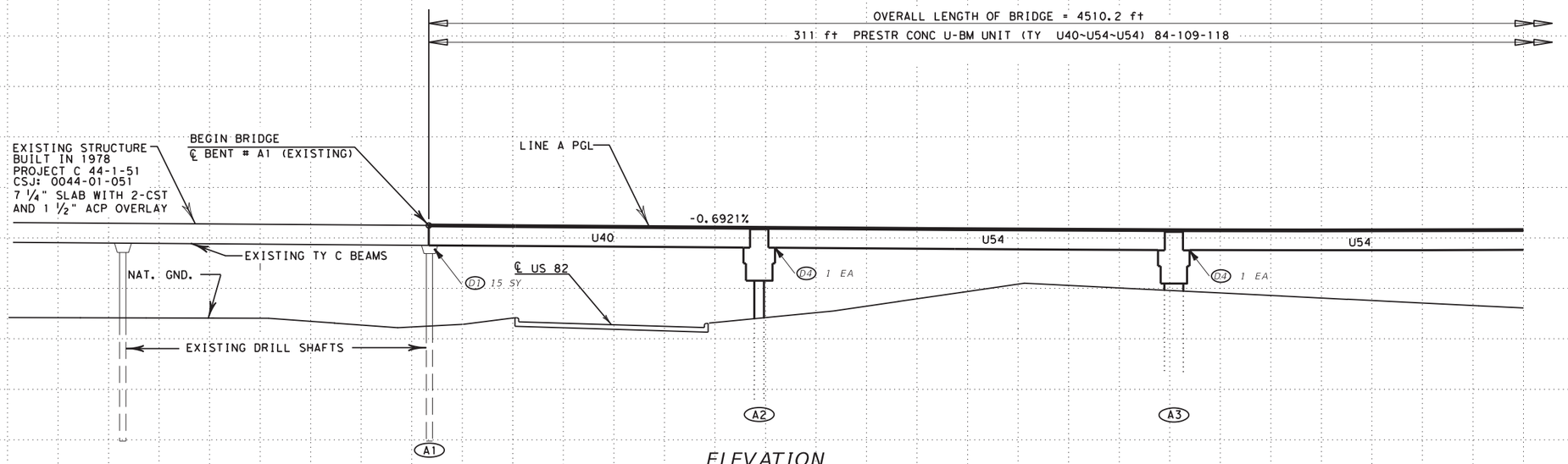
TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	1381	311' PRESTR CONC U BEAM UNIT AND SUBSTRUCTURE A1
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	38	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	2	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

SCALE: 1:400

TOTAL LENGTH OF STRUCTURE = 4510.2 ft



ELEVATION

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STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED
PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

SHEET 1 OF 12

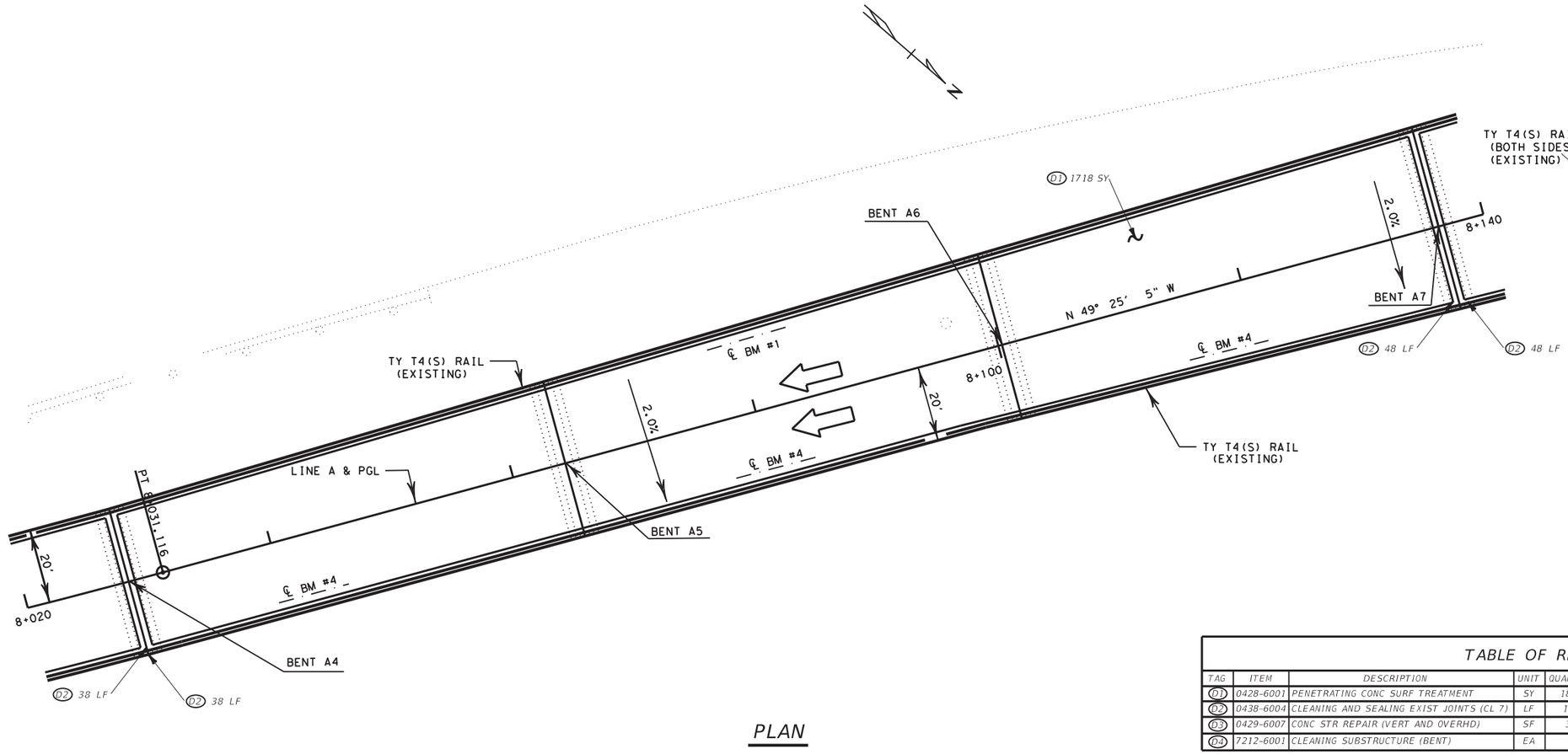
Texas Department of Transportation | Bridge Division

BRIDGE LAYOUT

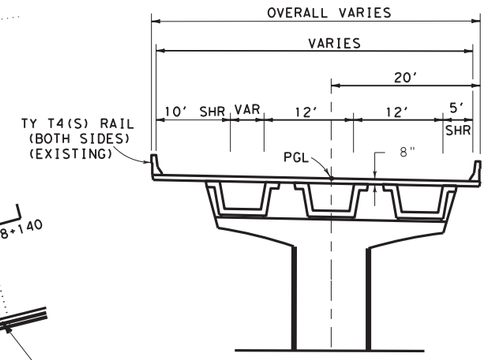
NBI NO: 03-243-0-0044-01-085

IH 44 AT HOLLIDAY STREET

FILE: 03243004401085.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		70



PLAN



TYPICAL SECTION

REPAIR CALL-OUT LEGEND

XX XX
- Unit of measure
- Estimated repair quantity at each location
- Repair number – See "Table of Repairs"

GENERAL NOTES

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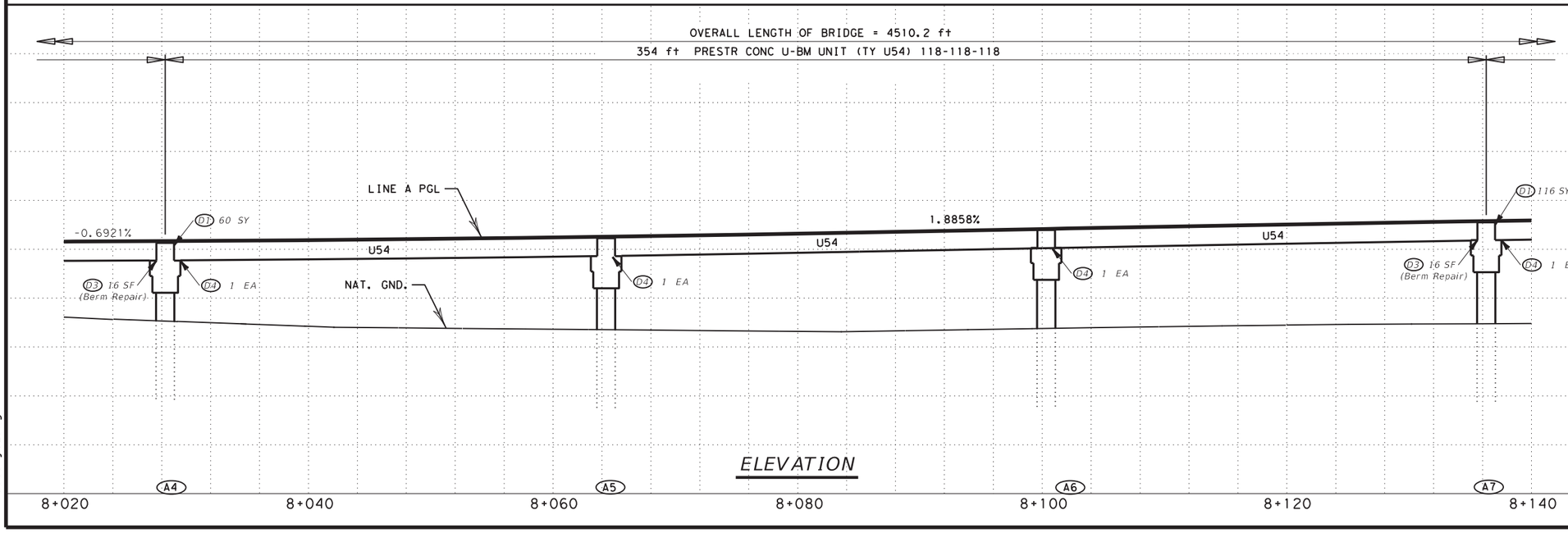
TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	1894	354' PRESTR CONC U BEAM UNIT, SUBSTRUCTURE A4 AND A7
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	172	
D3	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	32	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	4	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

SCALE: 1:400

TOTAL LENGTH OF STRUCTURE = 4510.2 ft



ELEVATION

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STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED
PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

SHEET 2 OF 12

Texas Department of Transportation — Bridge Division

BRIDGE LAYOUT

NBI NO: 03-243-0-0044-01-085

IH 44 AT
HOLLIDAY STREET

FILE: 032430044401085.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC	
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0043	09	144, ETC	IH 44/US 287	
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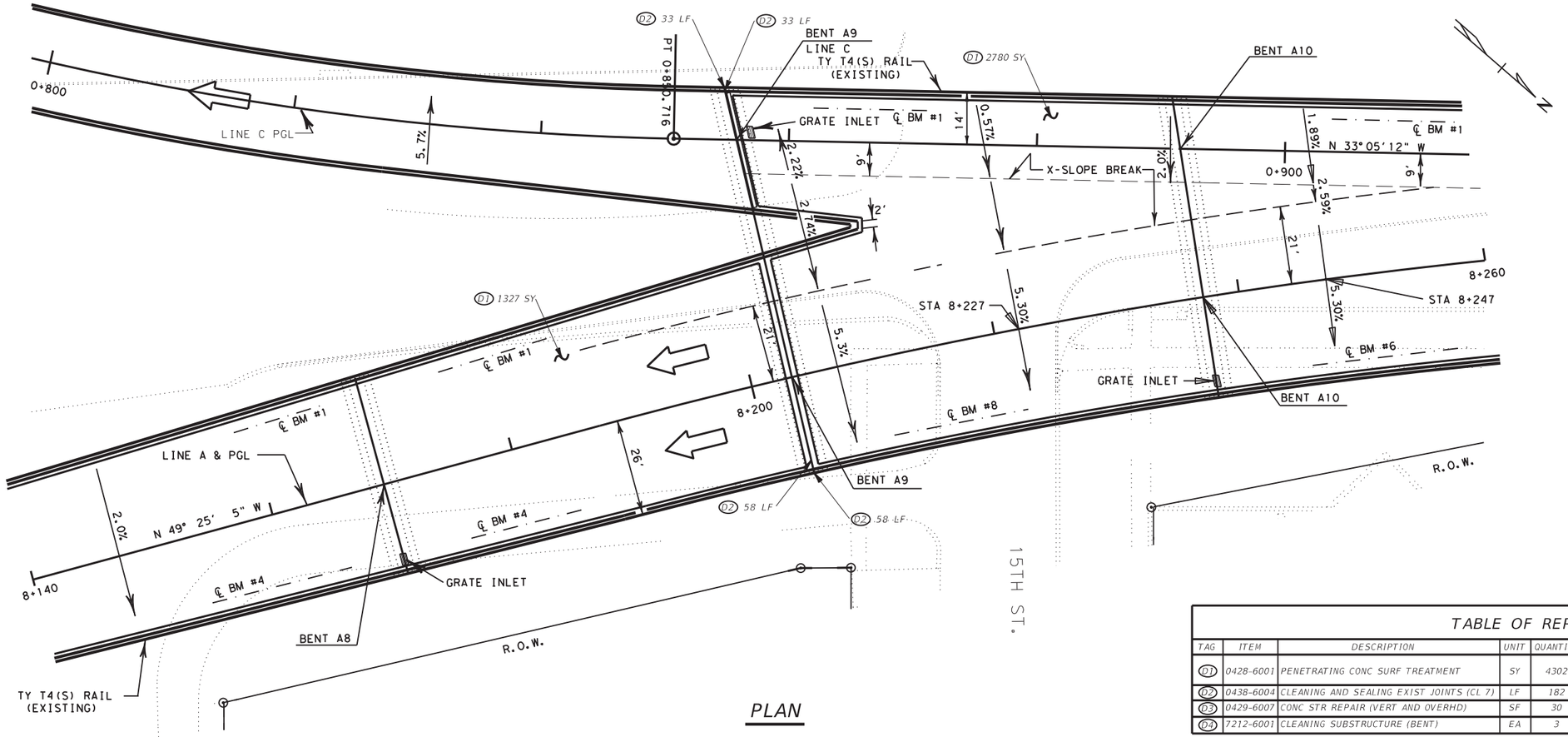
	WFS	WICHITA		71	



PLAN

SCALE: 1:400

REPAIR CALL-OUT LEGEND

XX XX XX

- XX — Repair number – See "Table of Repairs"
- XX — Estimated repair quantity at each location
- XX — Unit of measure

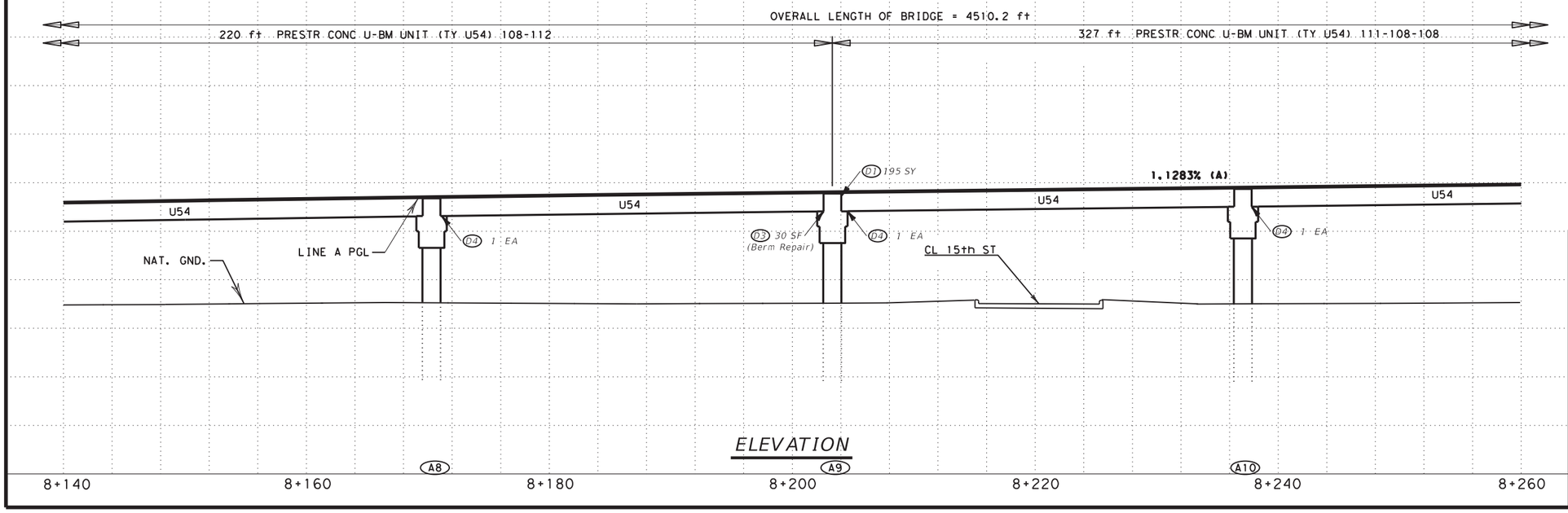
GENERAL NOTES

Stations, elevations, and cross sectional or geometric information is taken from as-built plans and is shown for Contractor's information only. Copies of available portions of as-built plans may be provided upon request. Note that original plans were developed using the metric system. Actual dimensions may not exactly match dimensions shown.

TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	4302	220' PRESTR CONC U BEAM UNIT, 327' PRESTR CONC U BEAM UNIT, AND SUBSTRUCTURE A9
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	182	
D3	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	30	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	3	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

TOTAL LENGTH OF STRUCTURE = 4510.2 ft



ELEVATION

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED
PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

SHEET 3 OF 12

Texas Department of Transportation | Bridge Division

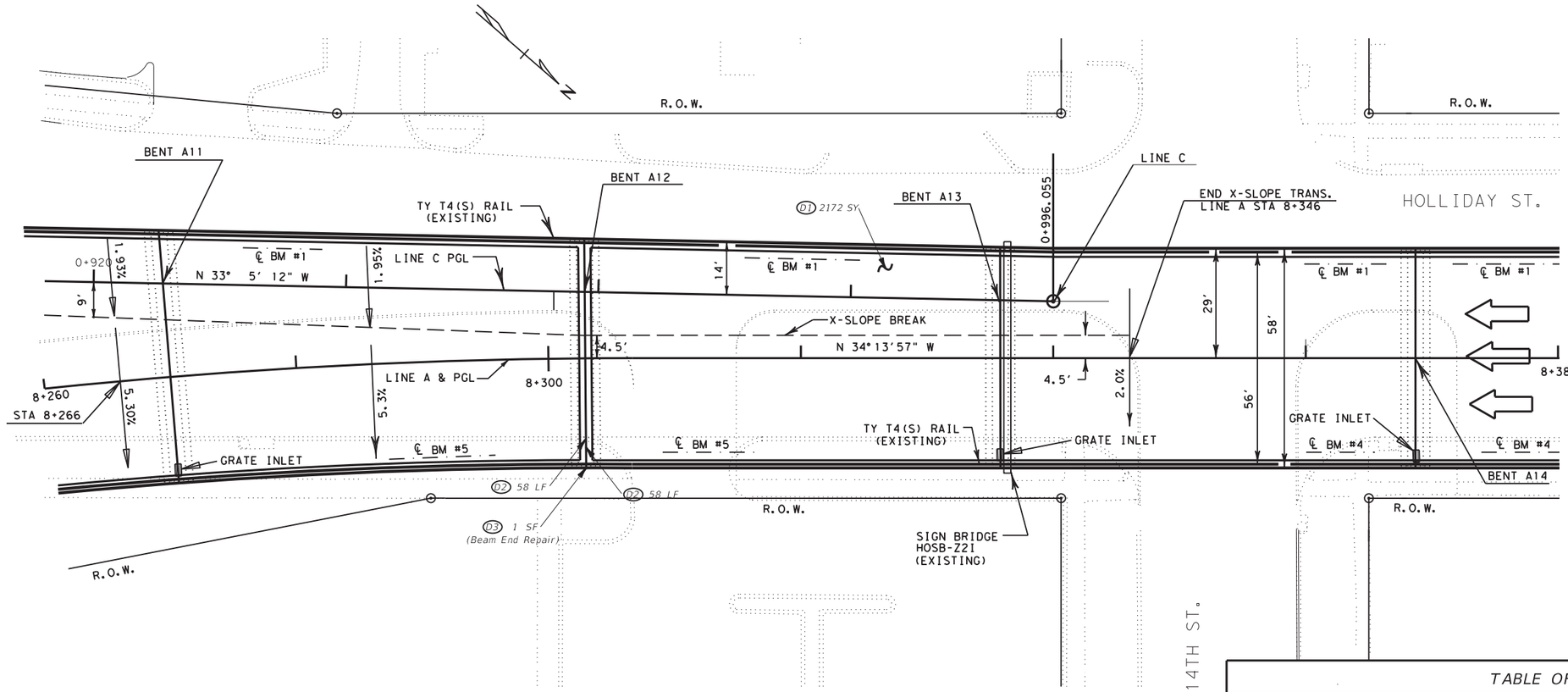
BRIDGE LAYOUT

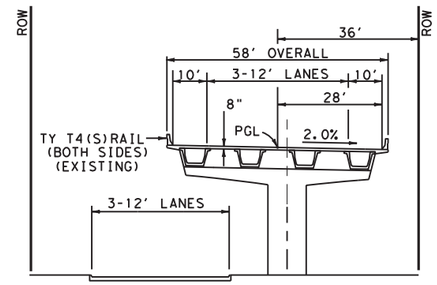
NBI NO: 03-243-0-0044-01-085

IH 44 AT
HOLLIDAY STREET

FILE: 03243004401085.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		72

5560Iy02.dgn





TYPICAL SECTION

REPAIR CALL-OUT LEGEND

(YY) XX XX
- Unit of measure
- Estimated repair quantity at each location
- Repair number – See "Table of Repairs"

GENERAL NOTES

Stations, elevations, and cross sectional or geometric information is taken from as-built plans and is shown for Contractor's information only. Copies of available portions of as-built plans may be provided upon request. Note that original plans were developed using the metric system. Actual dimensions may not exactly match dimensions shown.

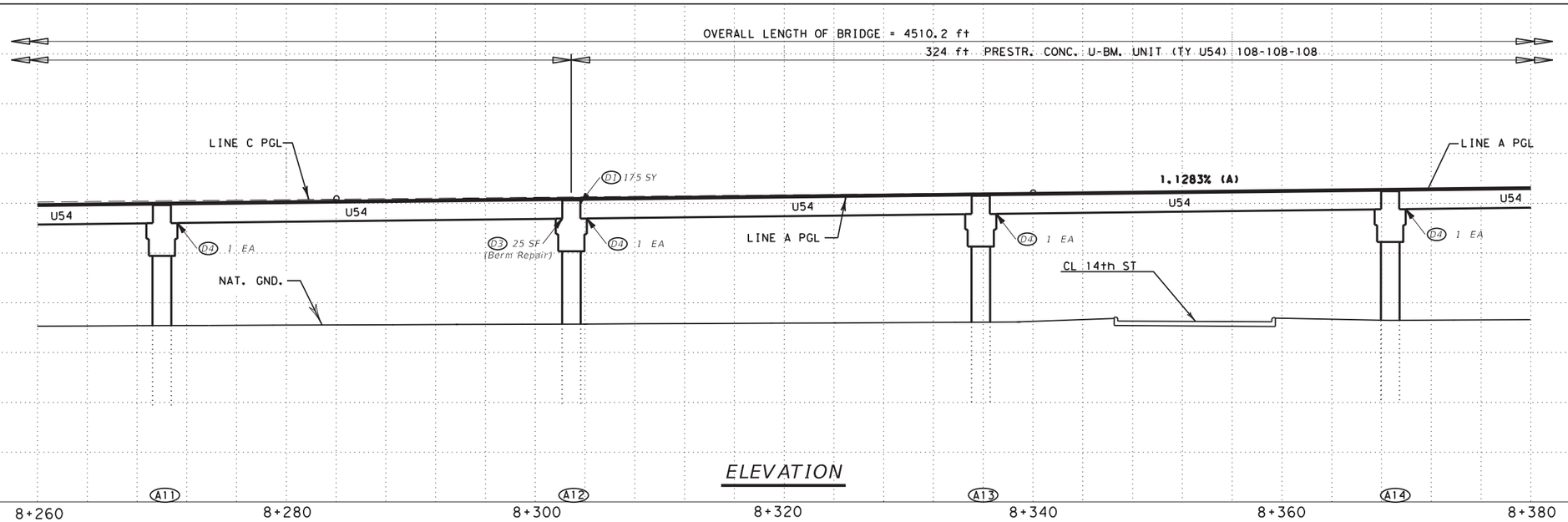
TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
(D1)	0428-6001	PENETRATING CONC SURF TREATMENT	SY	2347	324' PRESTR CONC U BEAM UNIT AND SUBSTRUCTURE A12
(D2)	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	116	
(D3)	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	26	
(D4)	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	4	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

PLAN

SCALE: 1:400

TOTAL LENGTH OF STRUCTURE = 4510.2 ft



ELEVATION

55601y02.dgn

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

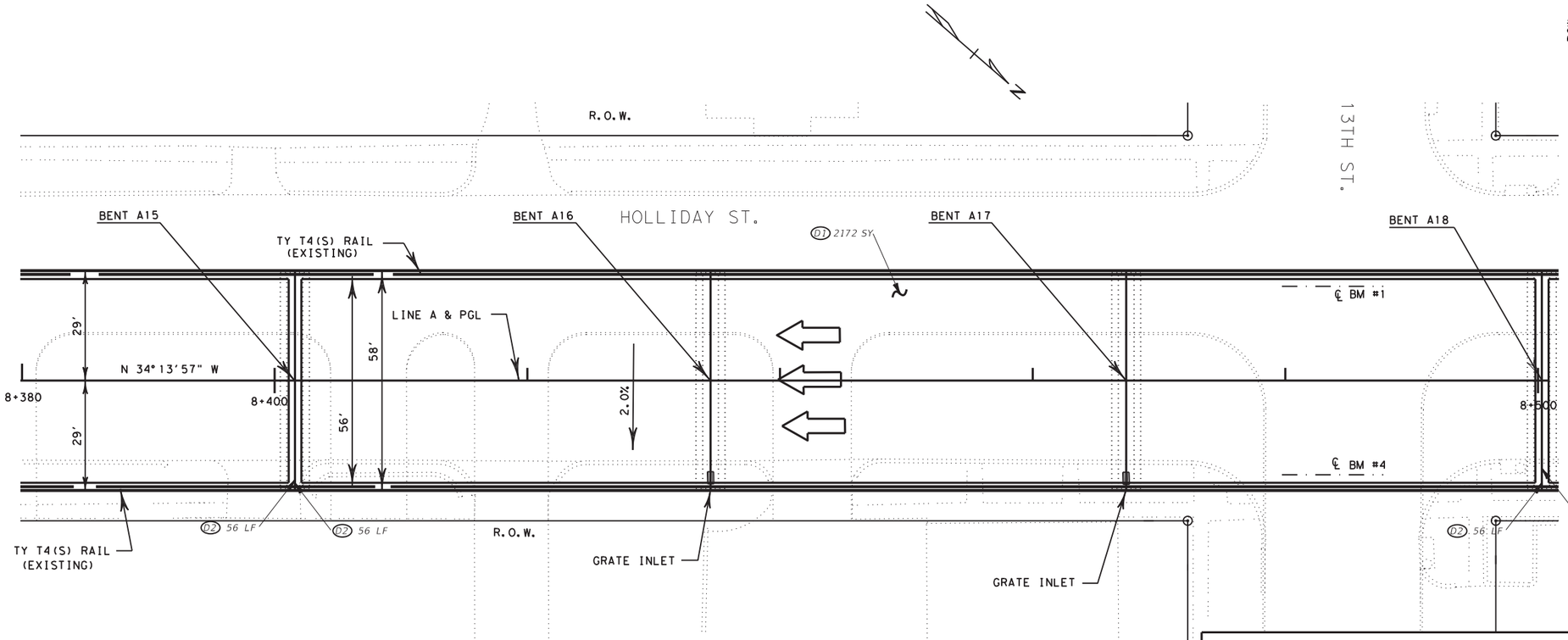
Texas Department of Transportation — Bridge Division

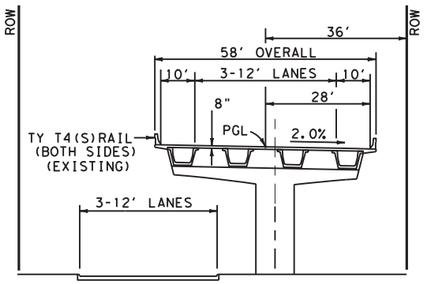
BRIDGE LAYOUT

NBI NO: 03-243-0-0044-01-085

IH 44 AT HOLLIDAY STREET

FILE: 03243004401085.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		73





TYPICAL SECTION

PLAN

REPAIR CALL-OUT LEGEND

(XX) XX XX
- Unit of measure
- Estimated repair quantity at each location
- Repair number – See "Table of Repairs"

GENERAL NOTES

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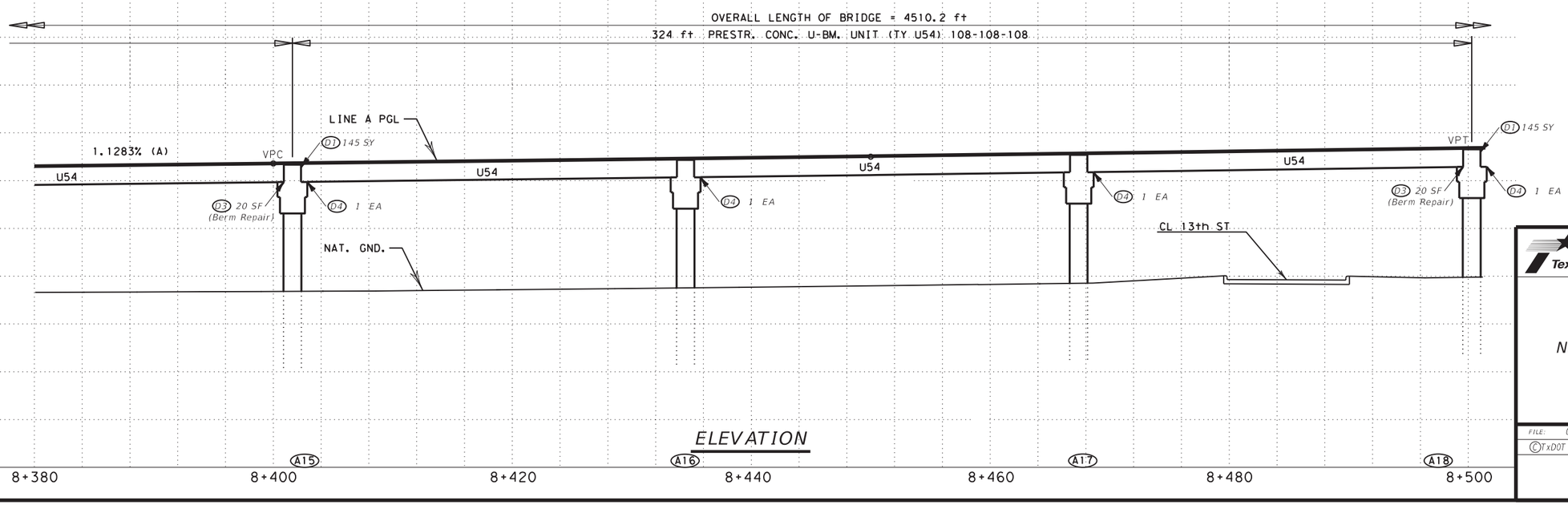
TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
(D1)	0428-6001	PENETRATING CONC SURF TREATMENT	SY	2462	324' PRESTR CONC U BEAM UNIT, SUBSTRUCTURE A15 AND A18
(D2)	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	224	
(D3)	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	40	
(D4)	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	4	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

SCALE: 1:400

TOTAL LENGTH OF STRUCTURE = 4510.2 ft



ELEVATION

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

SHEET 5 OF 12

Texas Department of Transportation | Bridge Division

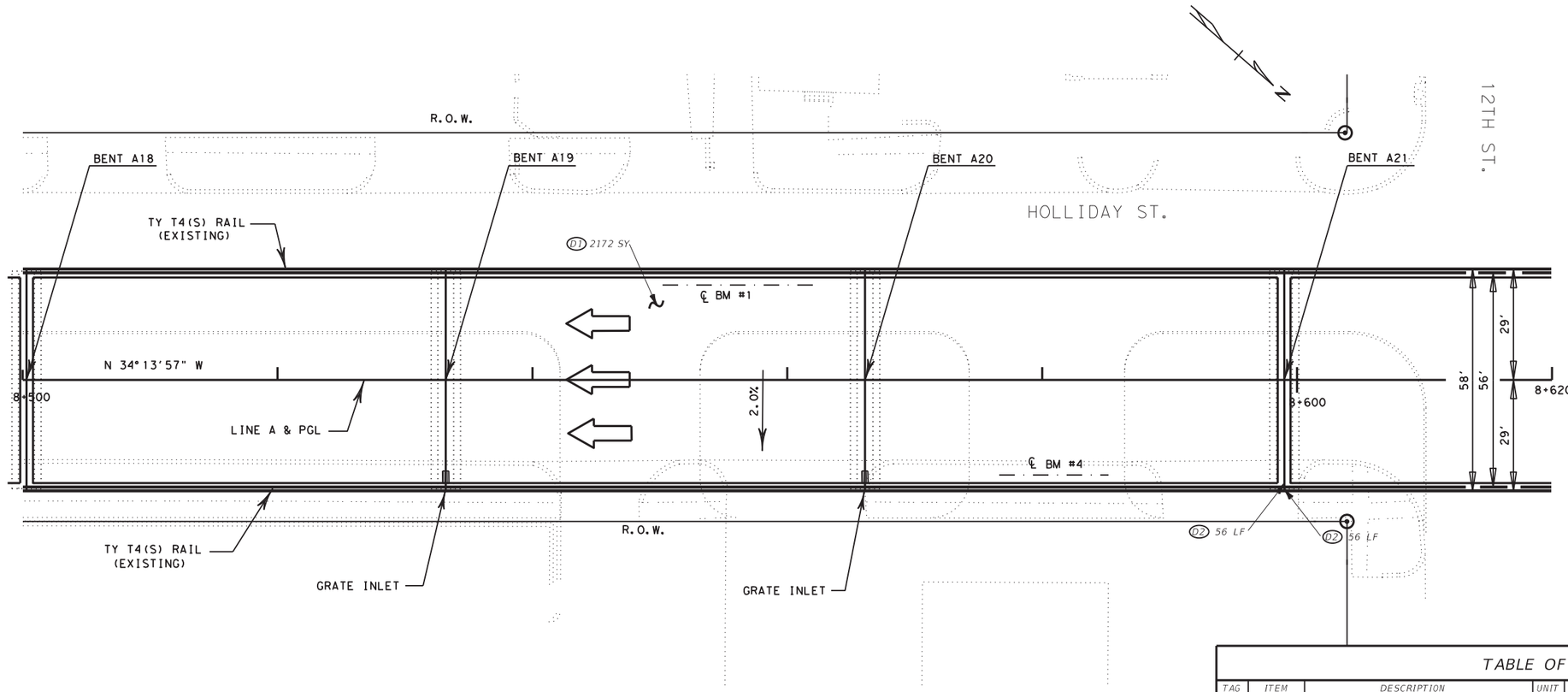
BRIDGE LAYOUT

NBI NO: 03-243-0-0044-01-085

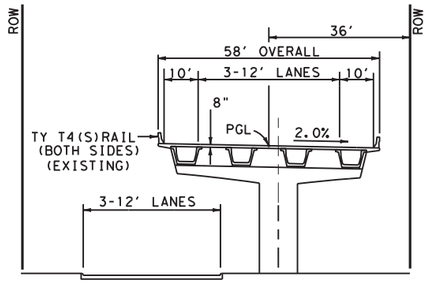
IH 44 AT HOLLIDAY STREET

FILE: 03243004401085.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		74

5560 1y02.dgn



PLAN



TYPICAL SECTION

REPAIR CALL-OUT LEGEND

XX XX XX

- Unit of measure
- Estimated repair quantity at each location
- Repair number – See "Table of Repairs"

GENERAL NOTES

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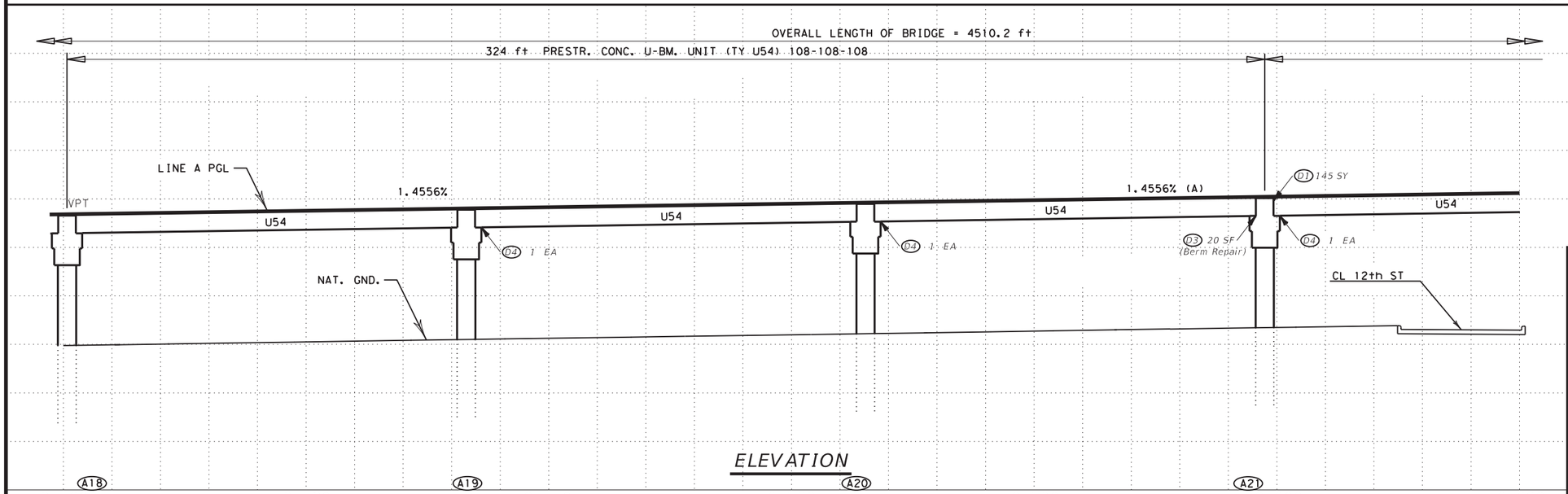
TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	2317	324' PRESTR CONC U BEAM UNIT AND SUBSTRUCTURE A21
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	112	
D3	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	20	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	3	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

SCALE: 1:400

TOTAL LENGTH OF STRUCTURE = 4510.2 ft



ELEVATION

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED
PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

SHEET 6 OF 12

Texas Department of Transportation | Bridge Division

BRIDGE LAYOUT

NBI NO: 03-243-0-0044-01-085

IH 44 AT HOLLIDAY STREET

FILE: 03243004401085.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST.	COUNTY		SHEET NO.
	WFS	WICHITA		75

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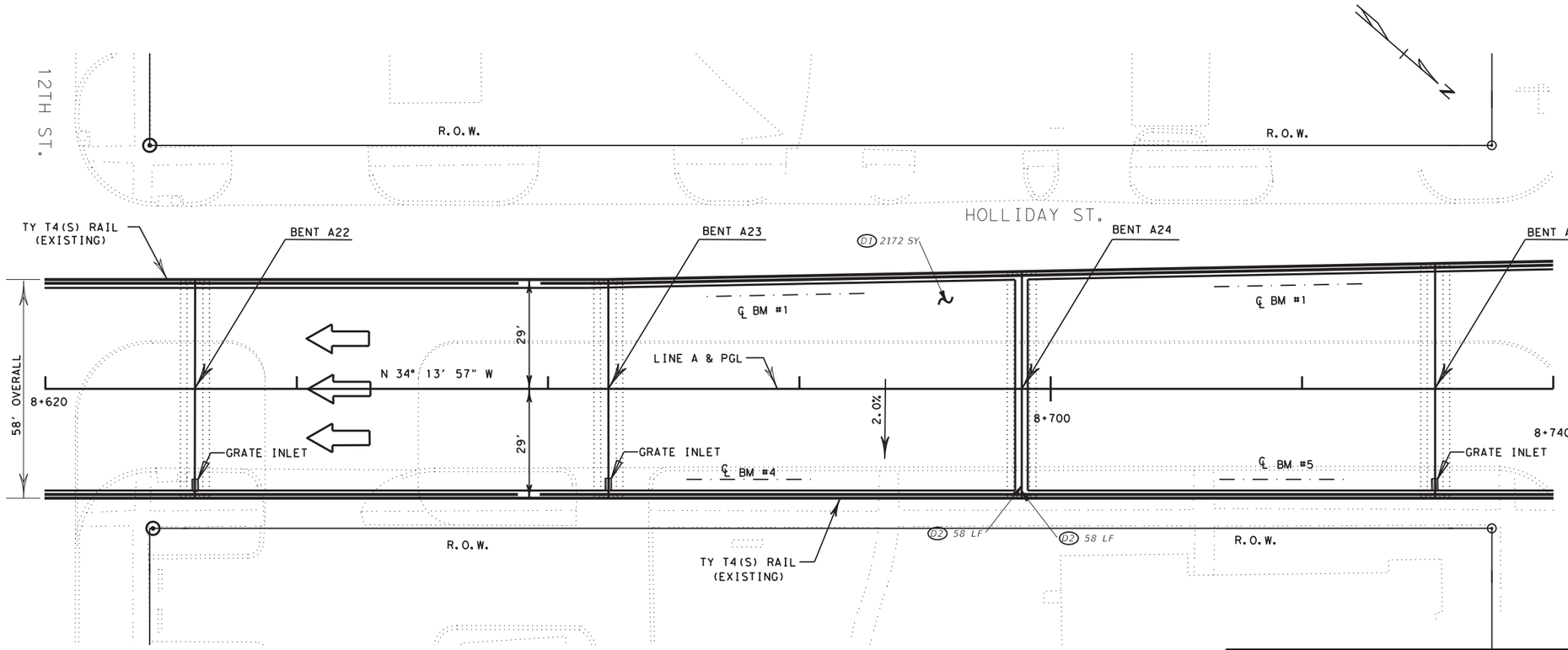

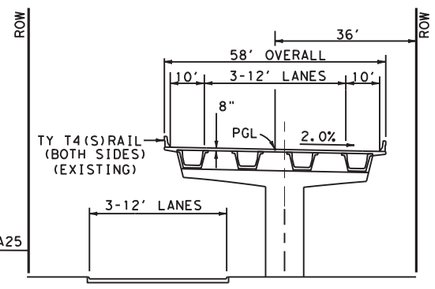

TYPICAL SECTION

REPAIR CALL-OUT LEGEND

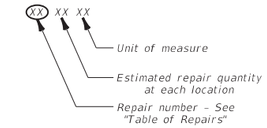

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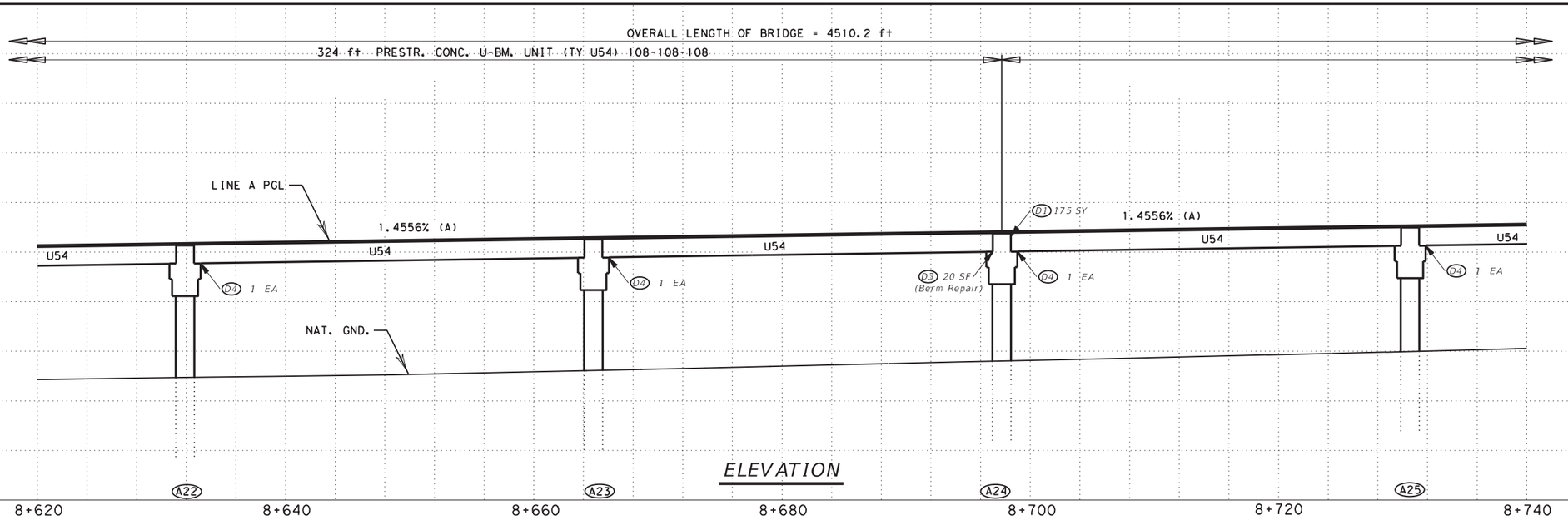
TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
(D1)	0428-6001	PENETRATING CONC SURF TREATMENT	SY	2347	324' PRESTR CONC U BEAM UNIT AND SUBSTRUCTURE A24
(D2)	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	116	
(D3)	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	20	
(D4)	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	4	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

PLAN

SCALE: 1:400

TOTAL LENGTH OF STRUCTURE = 4510.2 ft



ELEVATION

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

SHEET 7 OF 12

Texas Department of Transportation | Bridge Division

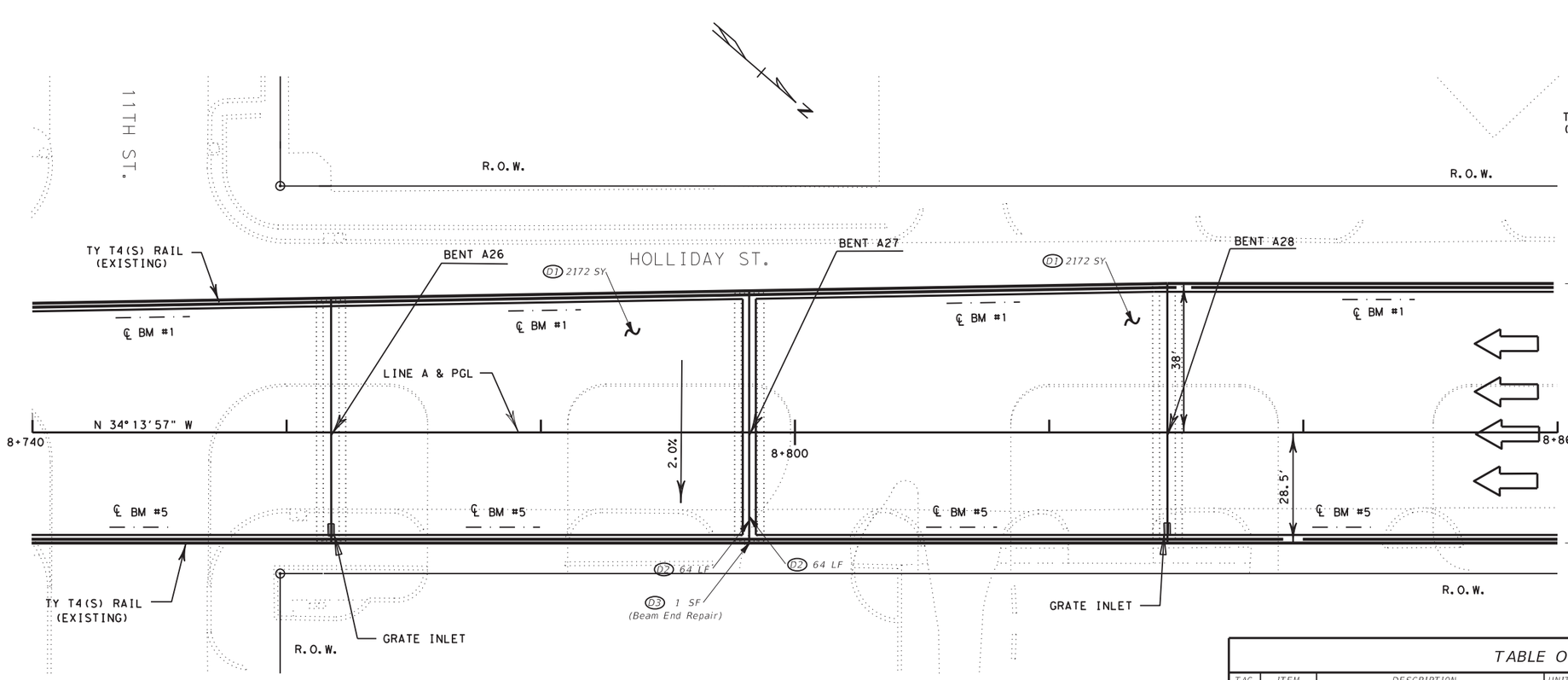
BRIDGE LAYOUT

NBI NO: 03-243-0-0044-01-085

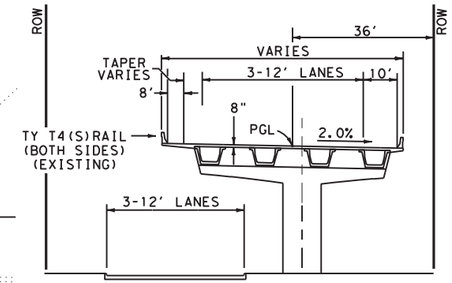
IH 44 AT HOLLIDAY STREET

FILE: 03243004401085.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		76

5560 1y02. dgn



PLAN



TYPICAL SECTION

REPAIR CALL-OUT LEGEND

XX XX XX
- Unit of measure
- Estimated repair quantity at each location
- Repair number – See "Table of Repairs"

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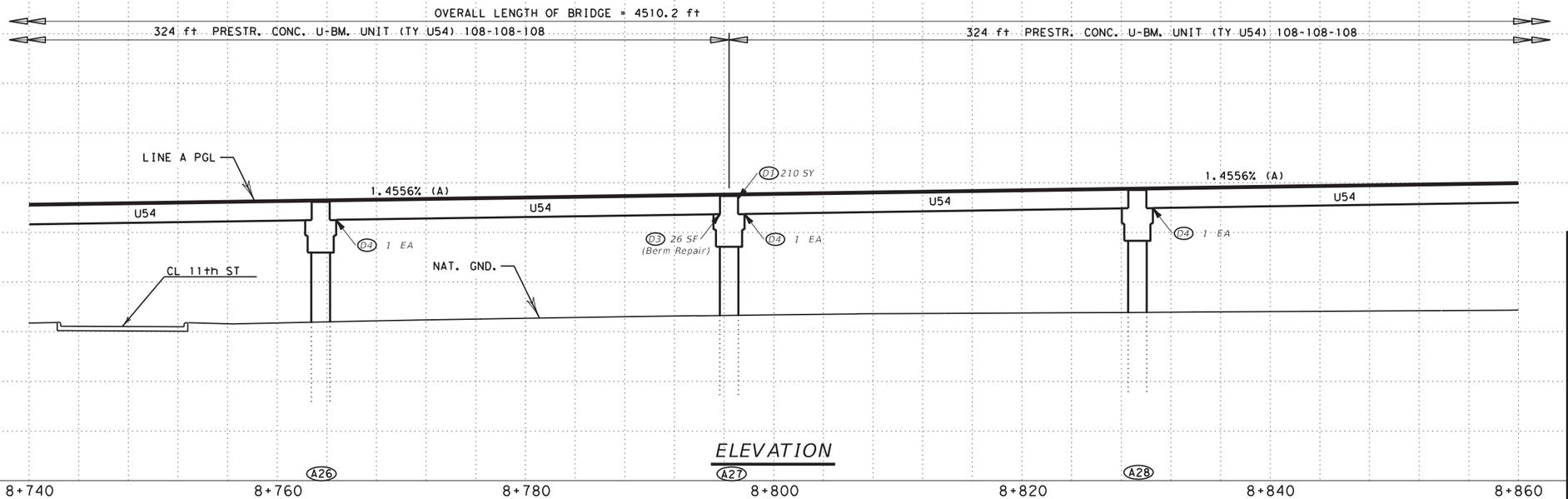
TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
(D1)	0428-6001	PENETRATING CONC SURF TREATMENT	SY	4554	2 - 324' PRESTR CONC U BEAM UNITS AND SUBSTRUCTURE A27
(D2)	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	128	
(D3)	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	27	
(D4)	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	3	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

SCALE: 1:400

TOTAL LENGTH OF STRUCTURE = 4510.2 ft



ELEVATION

STATE OF TEXAS
JOHN DOUGLAS BEER
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LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

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Texas Department of Transportation | Bridge Division

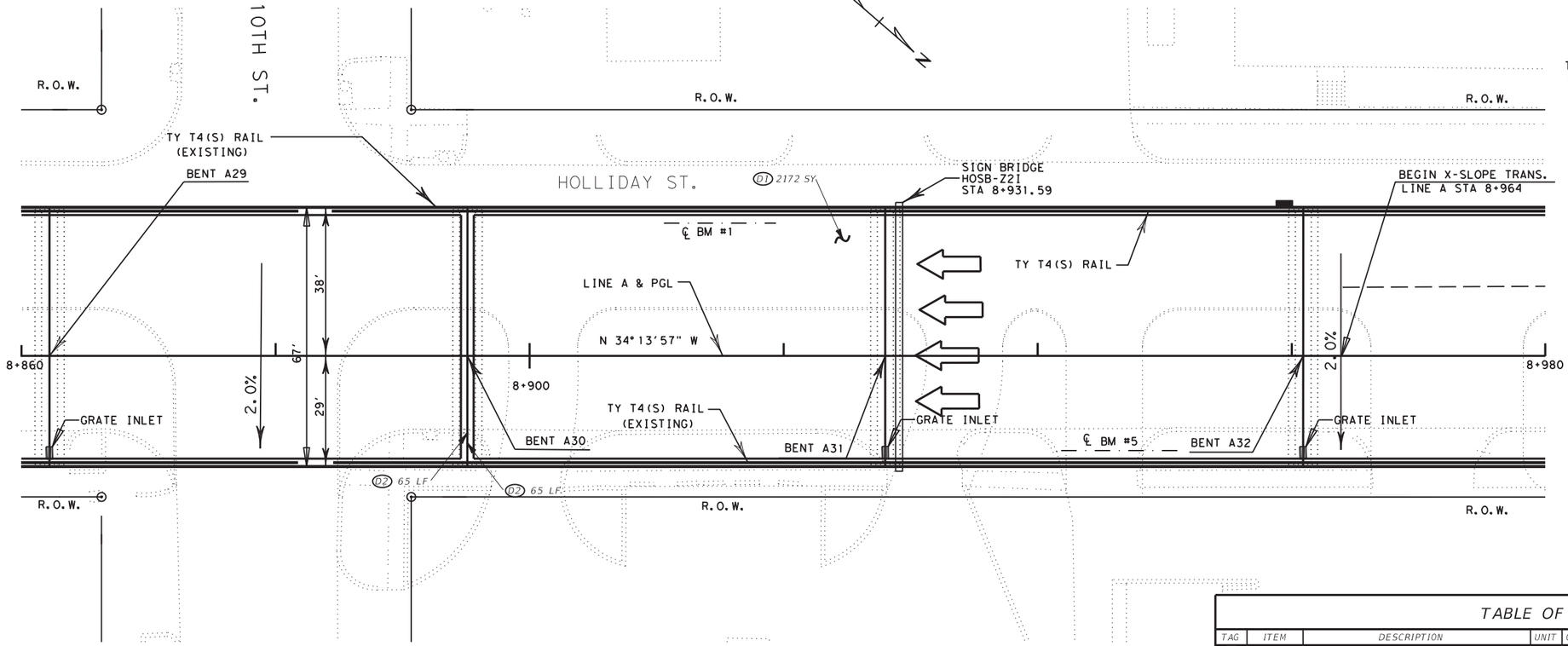
BRIDGE LAYOUT

NBI NO: 03-243-0-0044-01-085

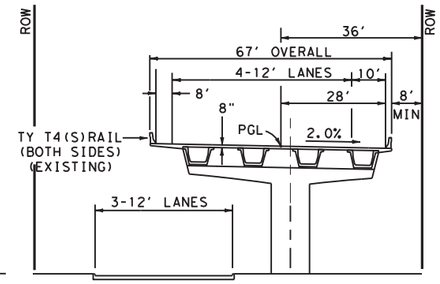
IH 44 AT HOLLIDAY STREET

FILE: 032430044401085.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		77

5560 1y02.dgn



PLAN



TYPICAL SECTION

REPAIR CALL-OUT LEGEND

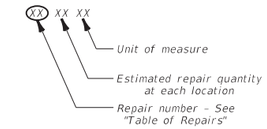


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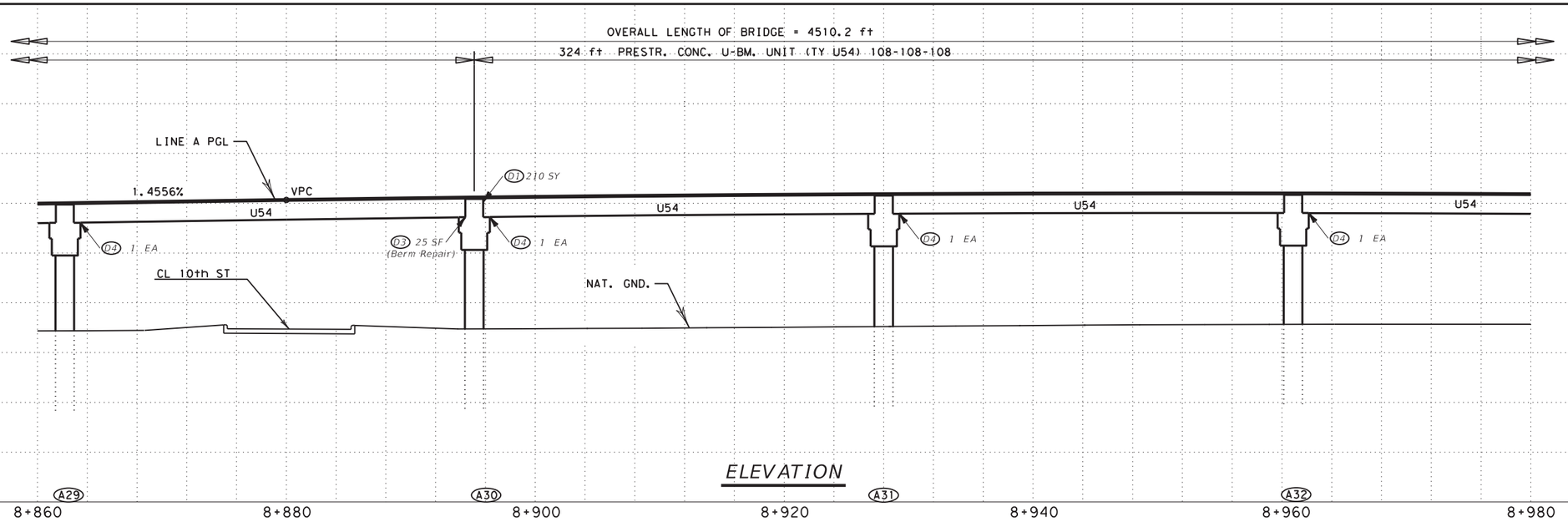
TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	2382	324' PRESTR CONC U BEAM UNIT AND SUBSTRUCTURE A30
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	130	
D3	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	25	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	4	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT

SCALE: 1:400

TOTAL LENGTH OF STRUCTURE = 4510.2 ft



ELEVATION

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED
PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

SHEET 9 OF 12

Texas Department of Transportation | Bridge Division

BRIDGE LAYOUT

NBI NO: 03-243-0-0044-01-085

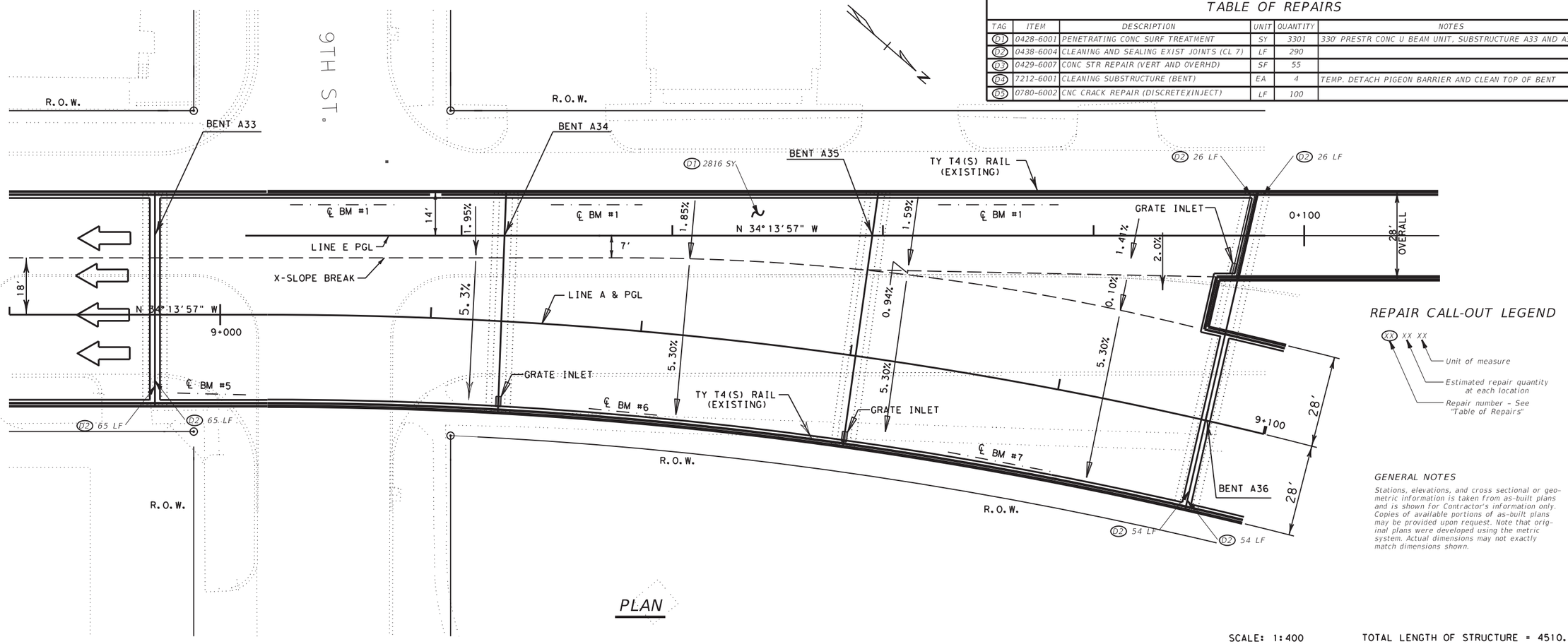
IH 44 AT
HOLLIDAY STREET

FILE: 03243004401085.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		78

5560Iy02.dgn

TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	3301	330' PRESTR CONC U BEAM UNIT, SUBSTRUCTURE A33 AND A36
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	290	
D3	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	55	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	4	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT
D5	0780-6002	CNC CRACK REPAIR (DISCRETE)(INJECT)	LF	100	



PLAN

SCALE: 1:400

TOTAL LENGTH OF STRUCTURE = 4510.2 ft

REPAIR CALL-OUT LEGEND

(XX) XX XX

- XX XX — Unit of measure
- Estimated repair quantity at each location
- Repair number – See "Table of Repairs"

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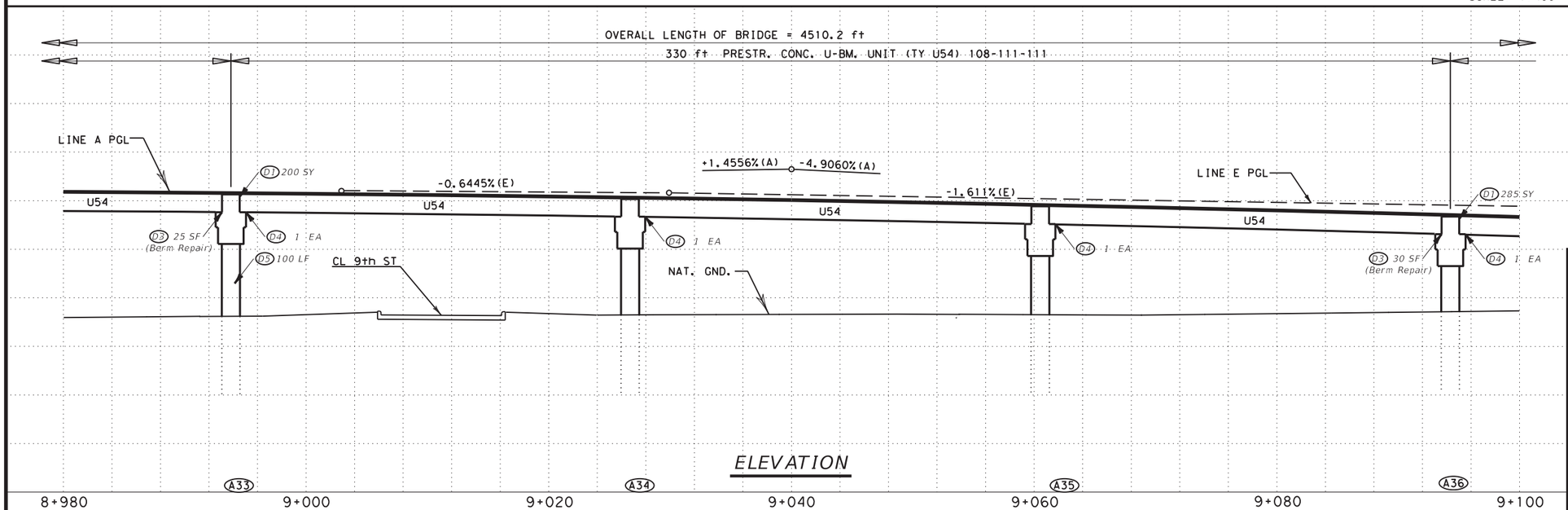

ELEVATION

STATE OF TEXAS
JOHN DOUGLAS BEER
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John Douglas Beer, P.E.
5/28/2021

SHEET 10 OF 12

Texas Department of Transportation — Bridge Division

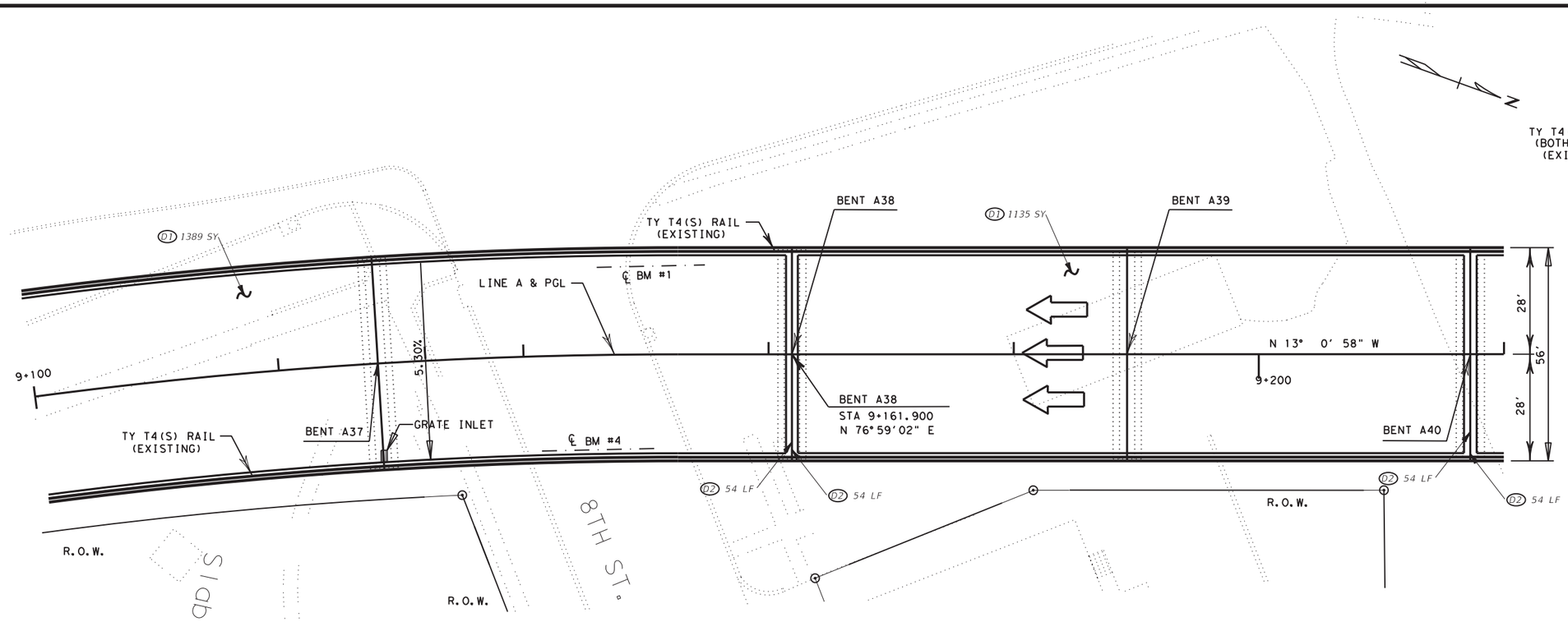
BRIDGE LAYOUT

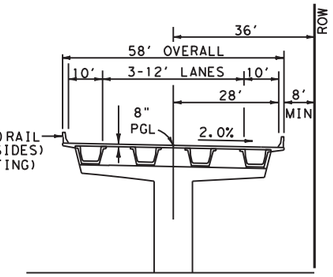
NBI NO: 03-243-0-0044-01-085

IH 44 AT HOLLIDAY STREET

FILE: 03243004401085.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		79

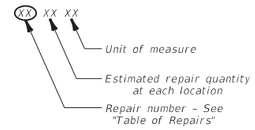
5560Iy02.dgn





TYPICAL SECTION

REPAIR CALL-OUT LEGEND



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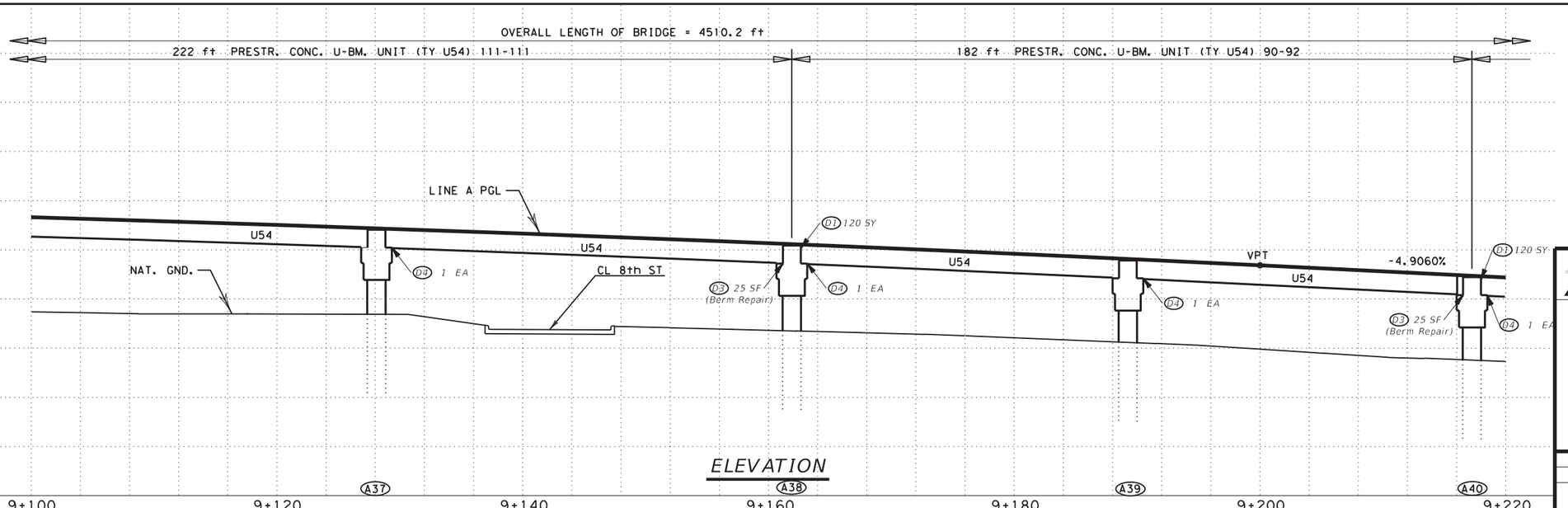
PLAN

SCALE: 1:400

TOTAL LENGTH OF STRUCTURE = 4510.2 ft

TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	2764	222' & 182' PRESTR CONC U BEAM UNITS AND SUBSTR A38
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	216	
D3	0429-6007	CONC STR REPAIR (VERT AND OVERHD)	SF	50	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	4	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT



ELEVATION

STATE OF TEXAS
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5/28/2021

SHEET 11 OF 12

Texas Department of Transportation | Bridge Division

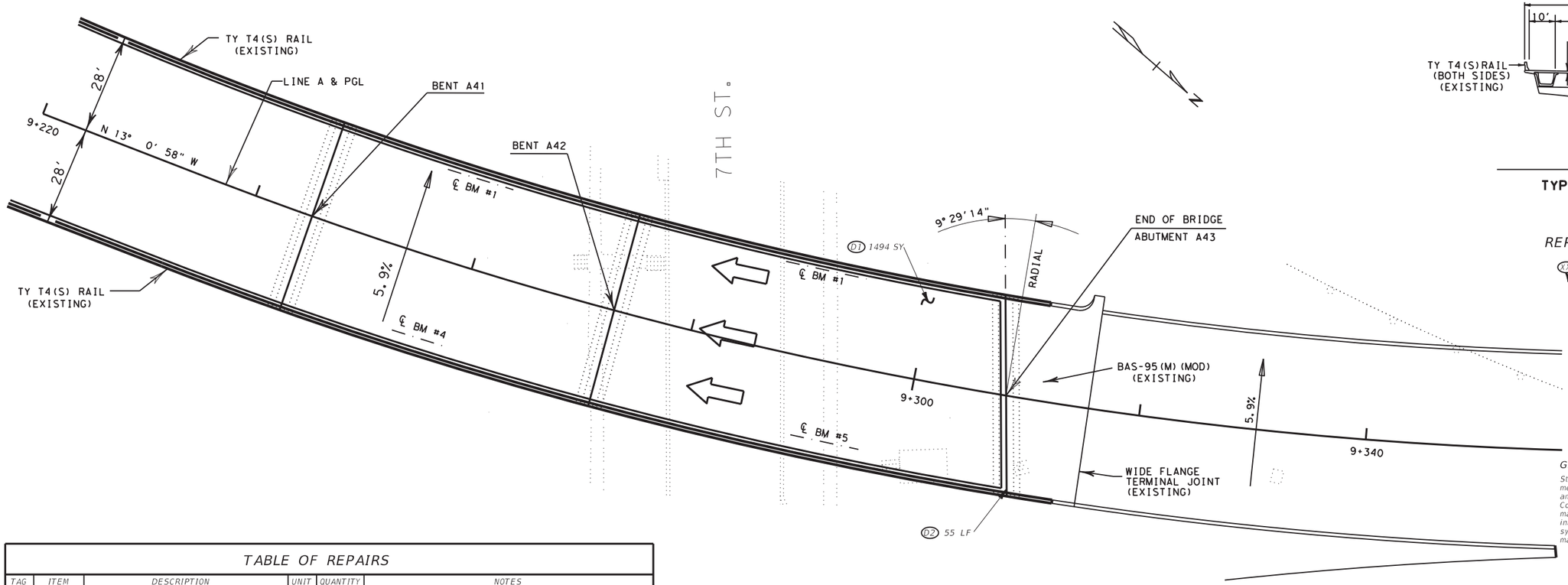
BRIDGE LAYOUT

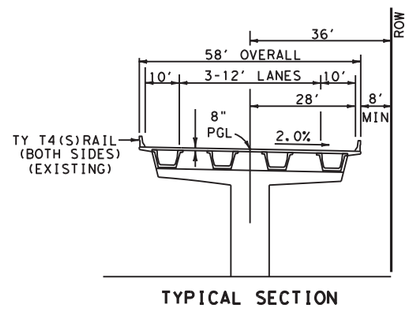
NBI NO: 03-243-0-0044-01-085

IH 44 AT HOLLIDAY STREET

FILE: 03243004401085.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST.	COUNTY		SHEET NO.
	WFS	WICHITA		80

5560Iy02.dgn





TYPICAL SECTION

REPAIR CALL-OUT LEGEND

XX XX XX

- XX — Repair number – See "Table of Repairs"
- XX — Estimated repair quantity at each location
- XX — Unit of measure

GENERAL NOTES

Stations, elevations, and cross sectional or geometric information is taken from as-built plans and is shown for Contractor's information only. Copies of available portions of as-built plans may be provided upon request. Note that original plans were developed using the metric system. Actual dimensions may not exactly match dimensions shown.

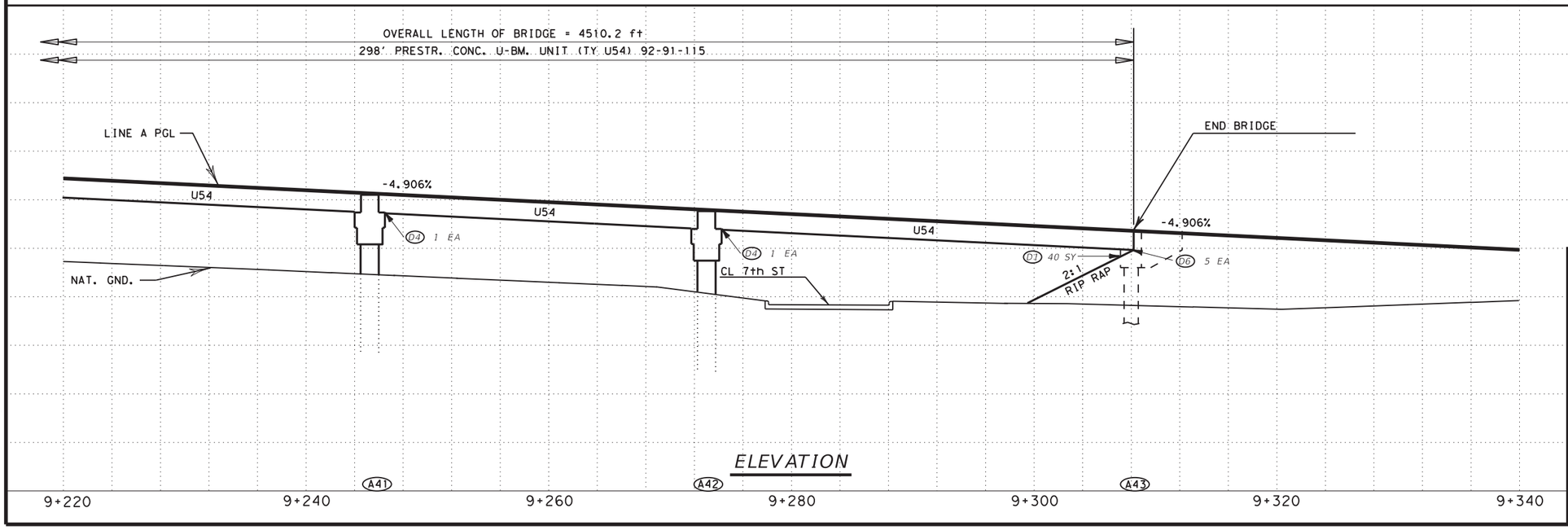
TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	1534	298' PRESTR CONC U BEAM UNIT AND SUBSTRUCTURE A43
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	55	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	2	TEMP. DETACH PIGEON BARRIER AND CLEAN TOP OF BENT
D6	4002-6001	REPLACE ELASTOMERIC BEARING PADS	EA	5	

PLAN

SCALE: 1:400

TOTAL LENGTH OF STRUCTURE = 4510.2 ft



ELEVATION

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED
PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

SHEET 12 OF 12

Texas Department of Transportation | Bridge Division

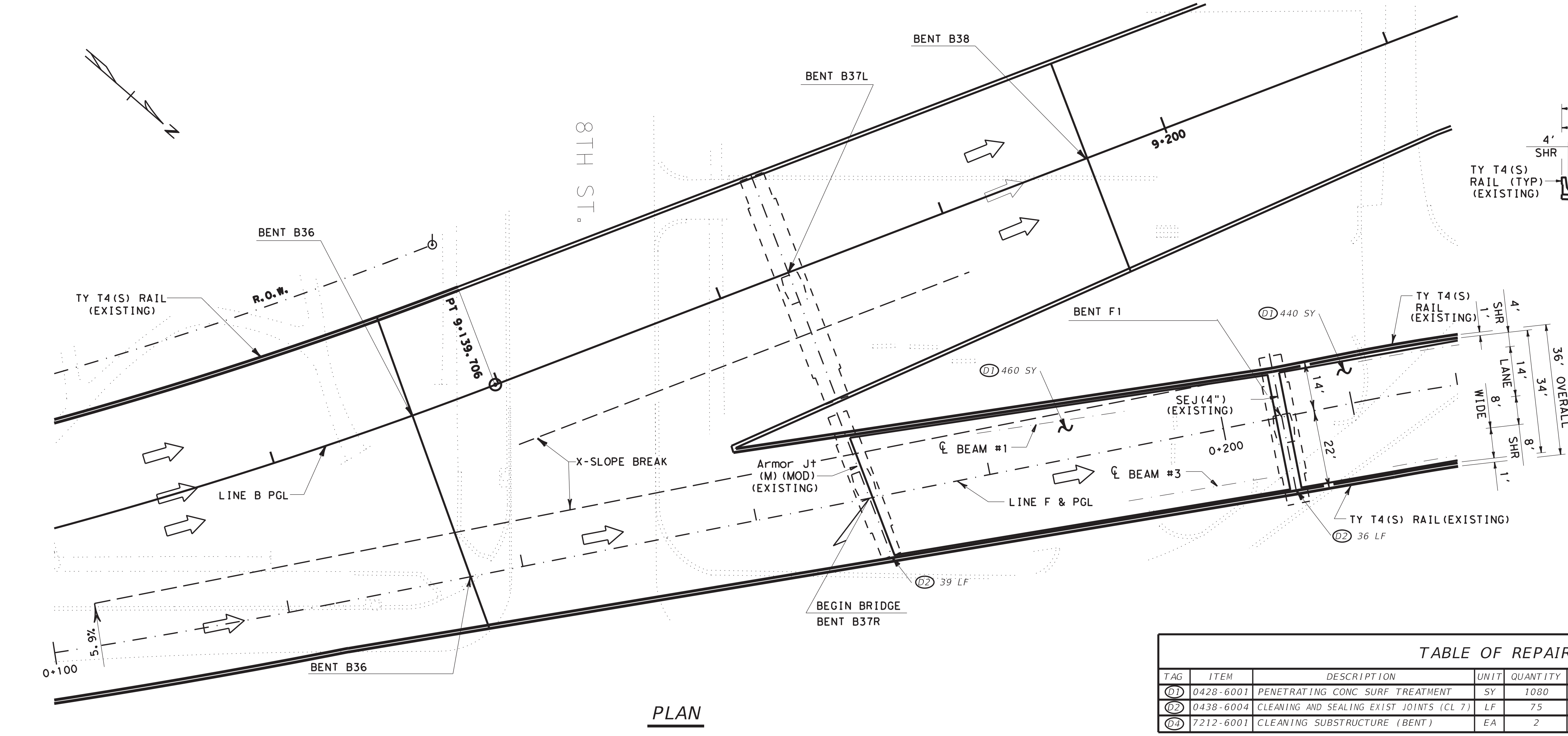
BRIDGE LAYOUT

NBI NO: 03-243-0-0044-01-085

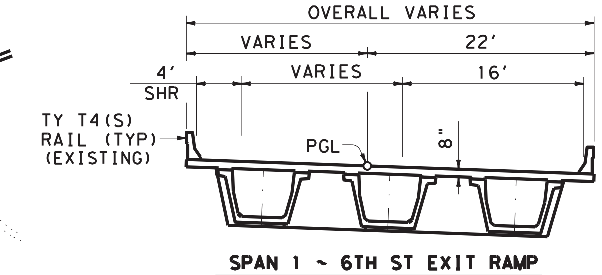
IH 44 AT
HOLLIDAY STREET

FILE: 03243004401085.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		81

5560|y02.dgn



PLAN



SPAN 1 ~ 6TH ST EXIT RAMP

REPAIR CALL-OUT LEGEND

XX XX XX
- Unit of measure
- Estimated repair quantity at each location
- Repair number - See "Table of Repairs"

GENERAL NOTES

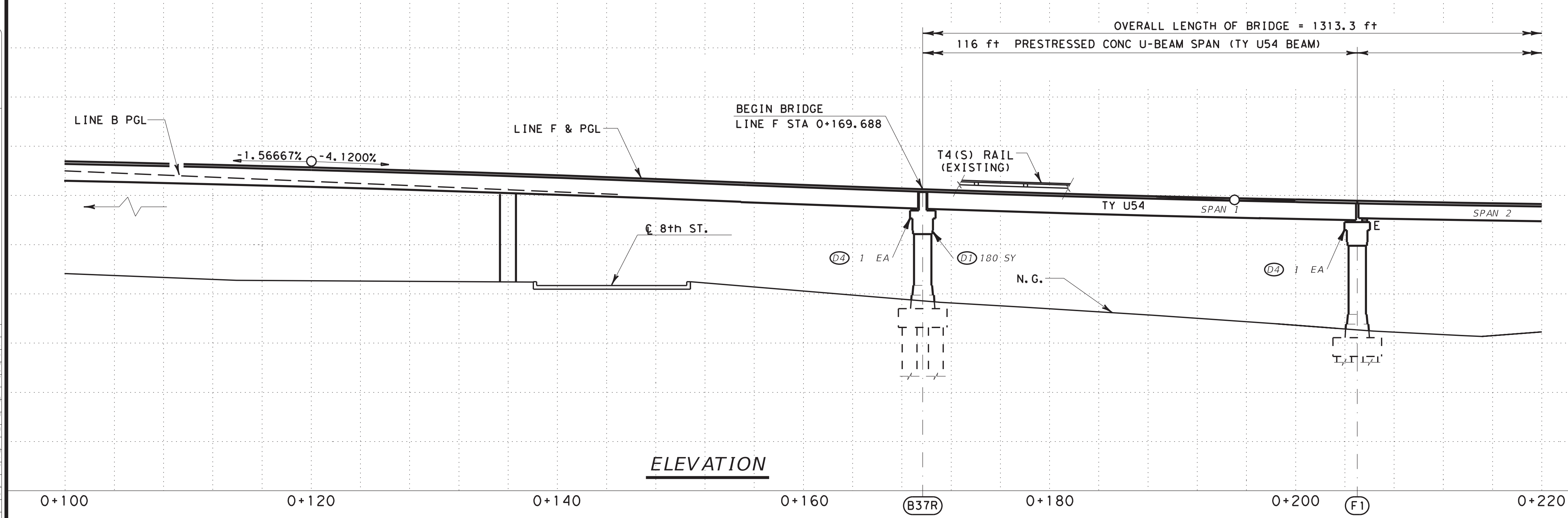
Stations, elevations, and cross sectional or geometric information is taken from as-built plans and is shown for Contractor's information only. Copies of available portions of as-built plans may be provided upon request. Note that original plans were developed using the metric system. Actual dimensions may not exactly match dimensions shown.

TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	1080	SPANS 1 and 2, AND SUBSTRUCTURE B37R
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	75	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	2	TEMP. DETACH PIGEON BARR. AND CLEAN TOP OF BENT

SCALE: 1:400

TOTAL LENGTH OF STRUCTURE = 1336.3 ft



ELEVATION

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED
PROFESSIONAL ENGINEER

John Douglas Beer, P.E.
5/28/2021

SHEET 1 OF 4

Texas Department of Transportation — Bridge Division

BRIDGE LAYOUT

NBI NO: 03-243-0043-09-187

IH 44 AT
SIXTH STREET EXIT

FILE: 03243004309187.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		82

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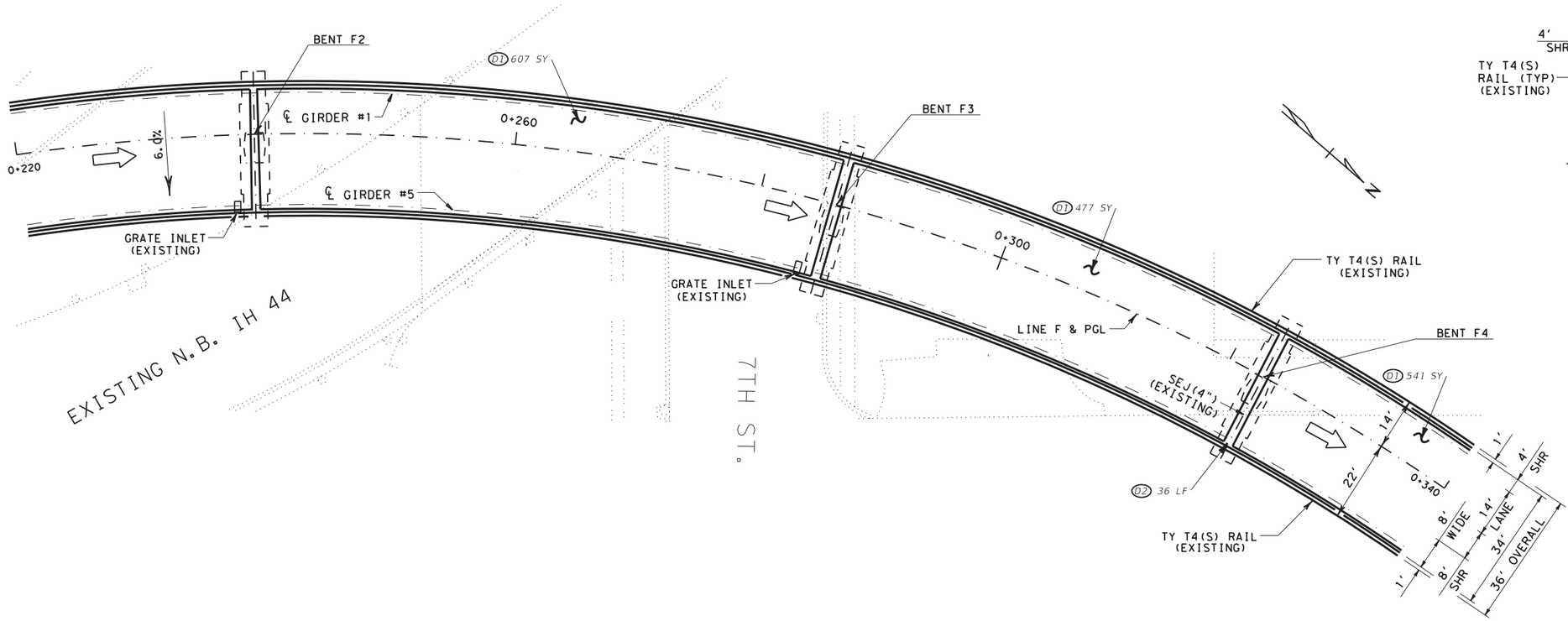
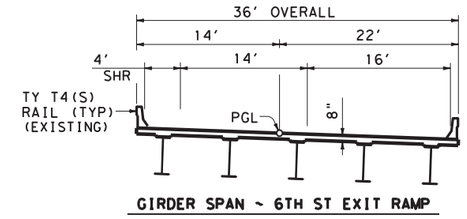
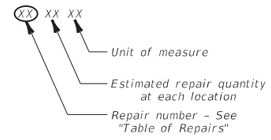




GIRDER SPAN ~ 6TH ST EXIT RAMP

REPAIR CALL-OUT LEGEND



GENERAL NOTES

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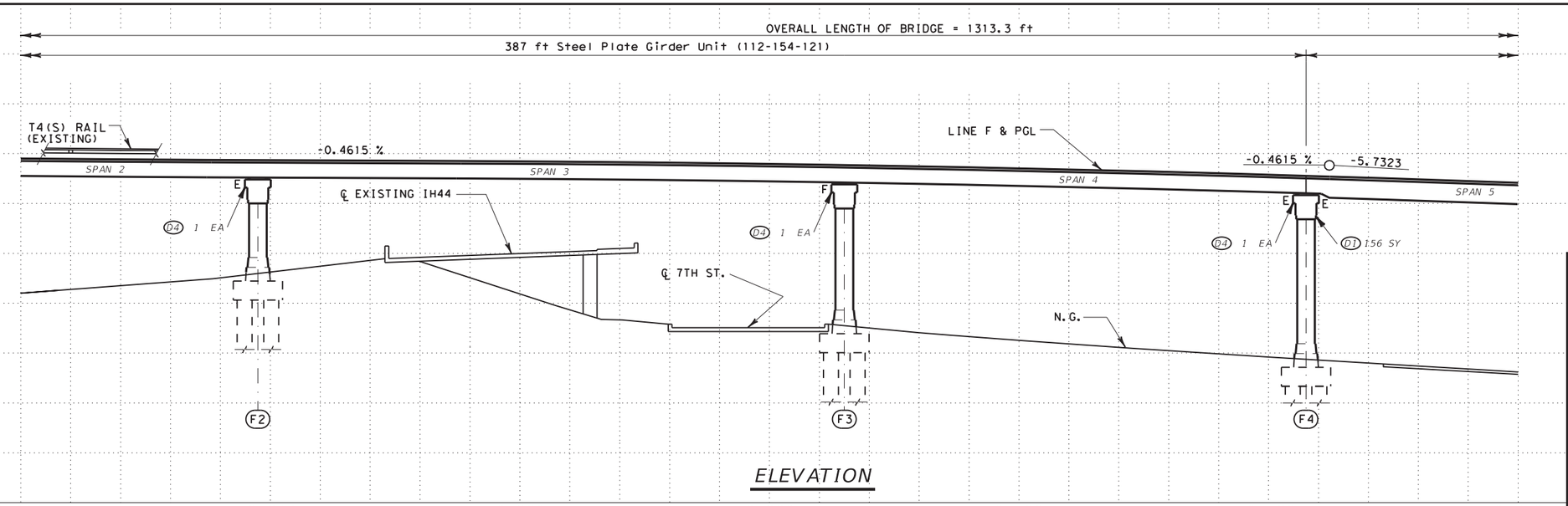
TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
(D1)	0428-6001	PENETRATING CONC SURF TREATMENT	SY	1781	SPANS 3, 4, 5, AND SUBSTRUCTURE F4
(D2)	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	36	
(D4)	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	3	TEMP. DETACH PIGEON BARR. AND CLEAN TOP OF BENT

PLAN

SCALE: 1:400

TOTAL LENGTH OF STRUCTURE = 1336.3 ft



ELEVATION

Texas Department of Transportation | Bridge Division

BRIDGE LAYOUT

NBI NO: 03-243-0043-09-187

IH 44 AT SIXTH STREET EXIT

FILE: 03243004309187.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		83

DN: DM
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DW:
CK:

DATE: JULY 98 NODE: d48pc3c
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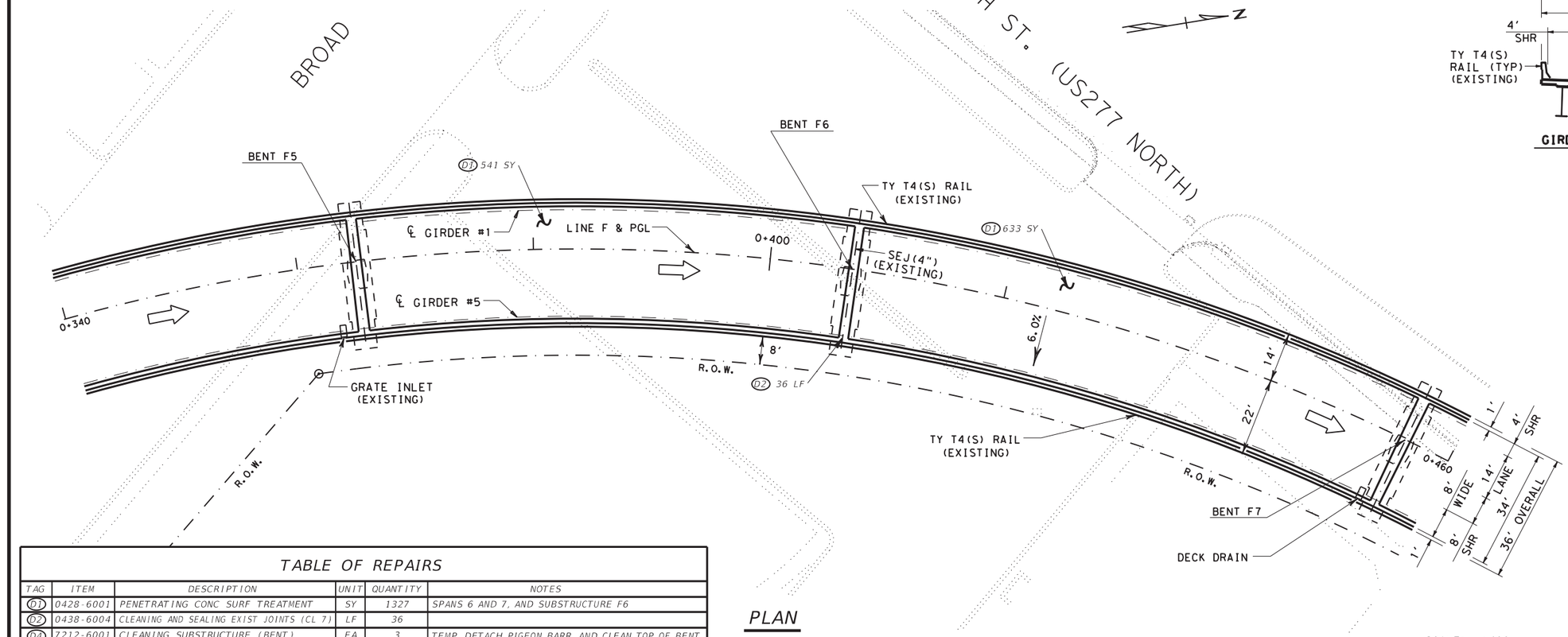
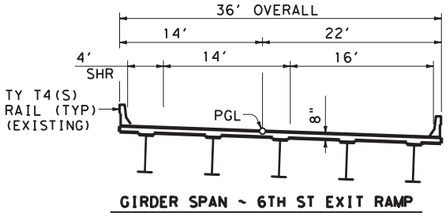


PLAN

SCALE: 1:400



GIRDER SPAN ~ 6TH ST EXIT RAMP

REPAIR CALL-OUT LEGEND

XX XX XX
- Unit of measure
- Estimated repair quantity at each location
- Repair number - See "Table of Repairs"

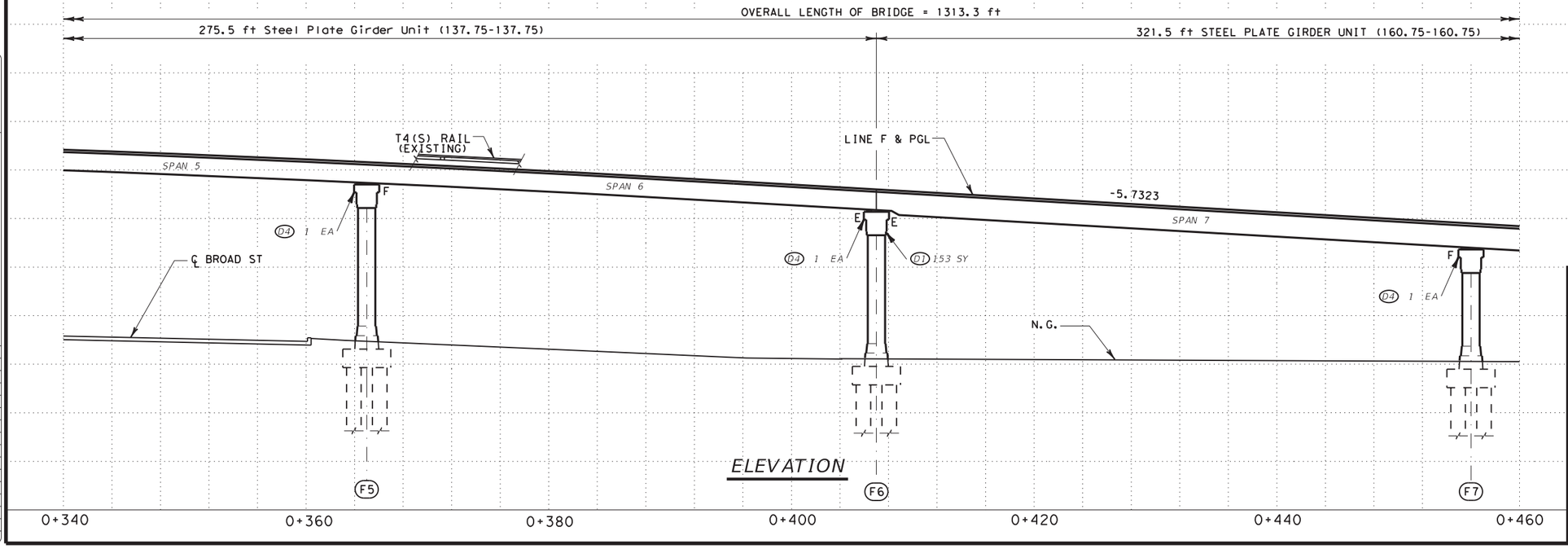
TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	1327	SPANS 6 AND 7, AND SUBSTRUCTURE F6
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	36	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	3	TEMP. DETACH PIGEON BARR. AND CLEAN TOP OF BENT

GENERAL NOTES

Stations, elevations, and cross sectional or geometric information is taken from as-built plans and is shown for Contractor's information only. Copies of available portions of as-built plans may be provided upon request. Note that original plans were developed using the metric system. Actual dimensions may not exactly match dimensions shown.

TOTAL LENGTH OF STRUCTURE = 1336.3 ft



ELEVATION

SHEET 3 OF 4

Texas Department of Transportation — Bridge Division

BRIDGE LAYOUT

NBI NO: 03-243-0043-09-187

IH 44 AT
SIXTH STREET EXIT

FILE: 03243004309187.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		84

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DATE: JULY 98 NODE: d48pc3c
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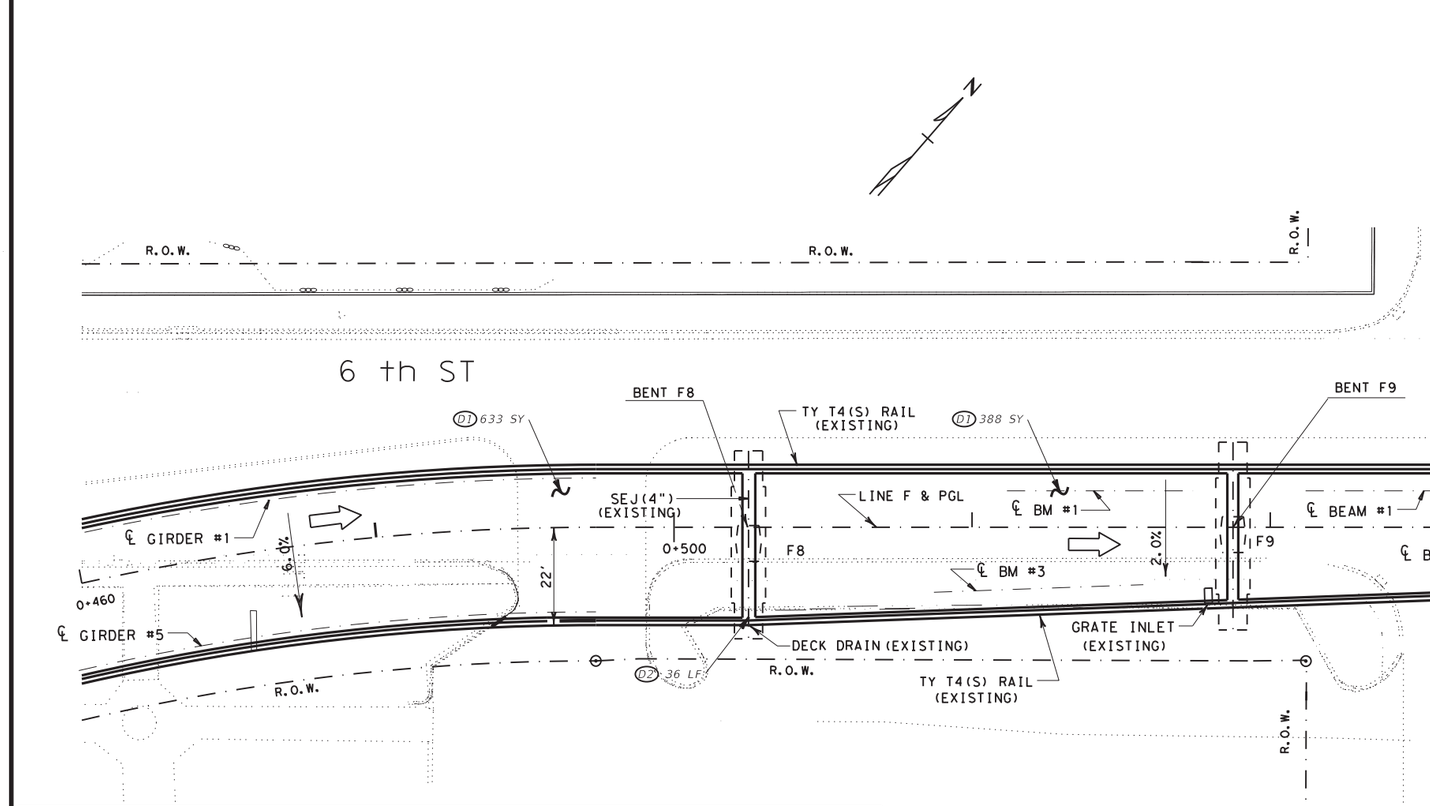
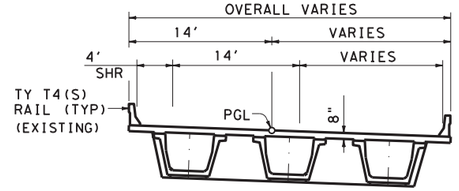
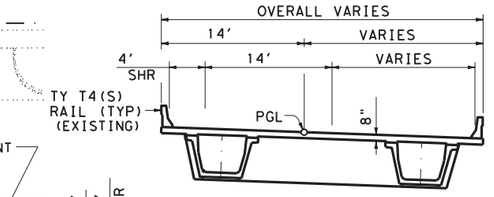




SPAN 9 ~ 6TH ST EXIT RAMP



SPAN 10 ~ 6TH ST EXIT RAMP

REPAIR CALL-OUT LEGEND

XX XX XX
- Unit of measure
- Estimated repair quantity at each location
- Repair number – See "Table of Repairs"

TABLE OF REPAIRS

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONC SURF TREATMENT	SY	1485	SPANS 8, 9, 10, AND SUBSTRUCTURE F8
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	64	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	2	TEMP. DETACH PIGEON BARR. AND CLEAN TOP OF BENT

PLAN

SCALE: 1:400

TOTAL LENGTH OF STRUCTURE = 1336.3 ft

GENERAL NOTES

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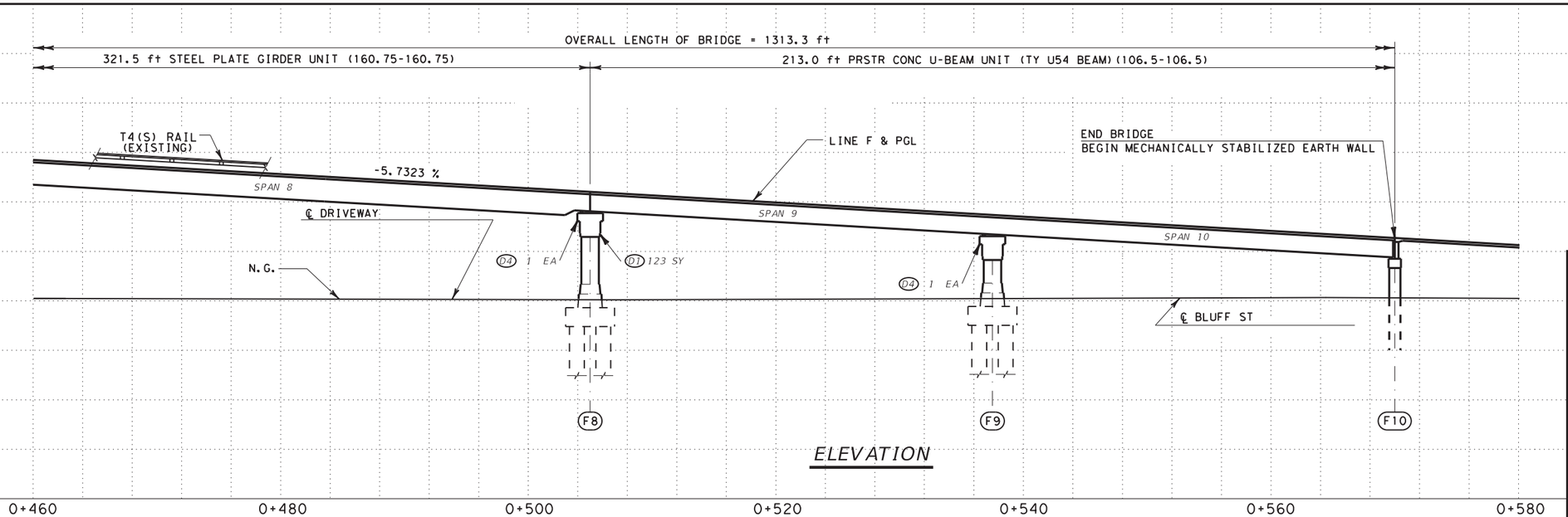

ELEVATION

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

SHEET 4 OF 4

Texas Department of Transportation | Bridge Division

BRIDGE LAYOUT

NBI NO: 03-243-0043-09-187

IH 44 AT SIXTH STREET EXIT

FILE: 032430043091 87.dgn	DN: RC	CK: JDB	DW: SMG	CK: SDC
©TxDOT JULY 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, ETC	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		85

DN: DM
CK: KC
DW:
CK:

DATE: JULY 98 NODE: d48pc3c
PATH: d:\mydocs\55661y01.dgn

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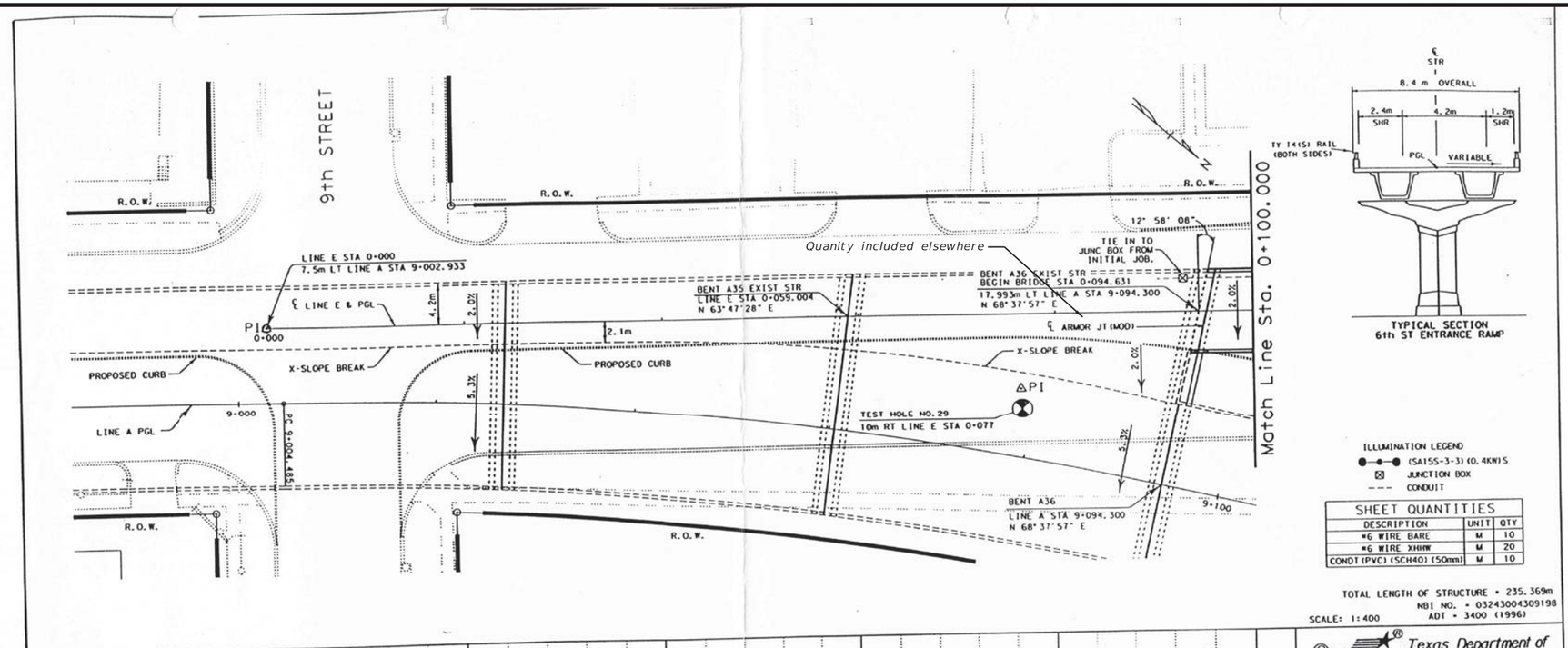
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50

USR:GOVERHD\BRLAMG.DGN

TOTAL LENGTH OF STRUCTURE: 772'-0"
NBI NO: 03243004301198



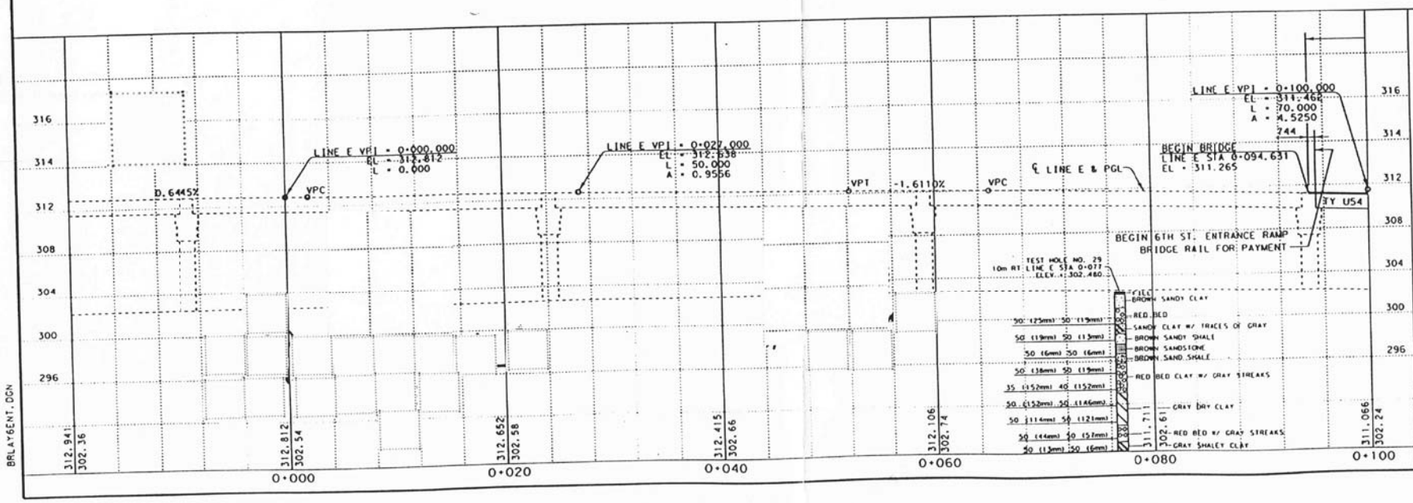
TYPICAL SECTION
6th ST ENTRANCE RAMP

ILLUMINATION LEGEND
(SA15S-3-3) (0.4KW)S
JUNCTION BOX
CONDUIT

SHEET QUANTITIES		
DESCRIPTION	UNIT	QTY
#6 WIRE BARE	M	10
#6 WIRE XHHW	M	20
CONDT (PVC) (SCH40) (50mm)	M	10

TOTAL LENGTH OF STRUCTURE = 235.369m
NBI NO. = 03243004309198
ADT = 3400 (1996)

SCALE: 1:400



MS-18 LOADING
BRIDGE LAYOUT

6th ST ENTRANCE RAMP
STA. 0+000.000
TO 0+100.000

CHANGE ORDER NO. 22

SHEET 1 OF 3

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		1068
STATE	DIST.	COUNTY
TEXAS	WFS	WICHITA
CONT.	SECT.	JOB / HIGHWAY NO.
0043	09	069 / IH 44 / US 287

REPAIR CALL-OUT LEGEND

(XX) XX XX
- XX — Unit of measure
- XX — Estimated repair quantity at each location
- (XX) — Repair number – See "Table of Repairs"

BRIDGE LAYOUT - AS-BUILT

No repair quantities this sheet.
For Contractor's information only.

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.
5/28/2021

SHEET 1 OF 3

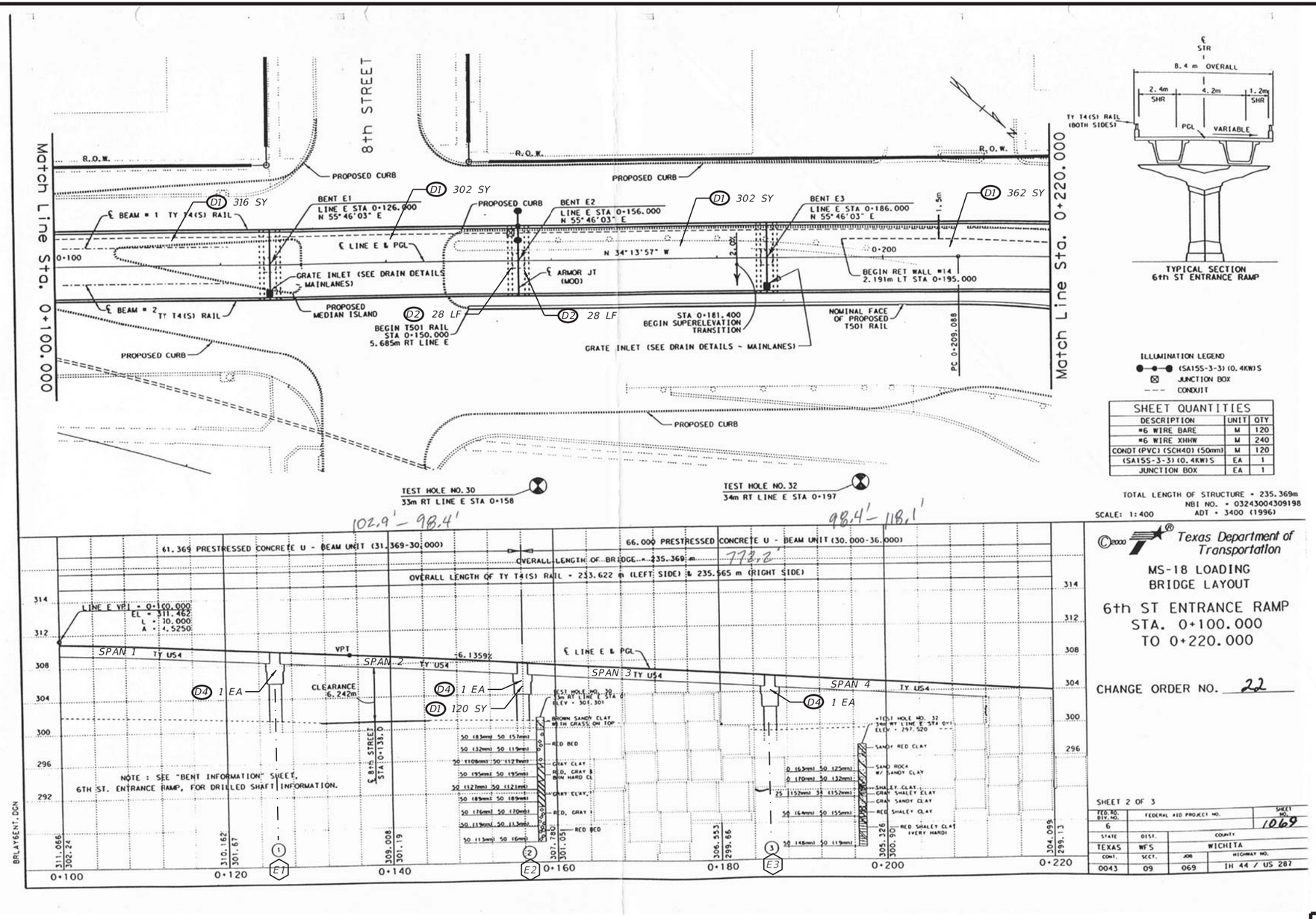
Texas Department of Transportation — Bridge Division

BRIDGE LAYOUT

NBI: 03-243-0-0043-09-198
6th St. ENTRANCE RAMP

DATE:
FILE:

FILE:	DN: JDB	CK: RC	DW: SDC	CK: JDB
©TxDOT MARCH 2021 REVISIONS	CONT.	SECT	JOB	HIGHWAY
	0043	09	144, etc	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		86



TOTAL LENGTH OF STRUCTURE: 772'-0"
NBI NO: 03243004301198

REPAIR CALL-OUT LEGEND

XX XX XX
- Unit of measure
- Estimated repair quantity at each location
- Repair number – See "Table of Repairs"

SHEET 2 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		1069
STATE	DIST.	COUNTY
TEXAS	WFS	WICHITA
CONT.	SECT.	JOB	HIGHWAY NO.
0043	09	069	IH 44 / US 287

Texas Department of Transportation

MS-18 LOADING
BRIDGE LAYOUT

6th ST ENTRANCE RAMP
STA. 0+100.000
TO 0+220.000

CHANGE ORDER NO. 22

BRIDGE LAYOUT - AS-BUILT

TABLE OF ESTIMATED QUANTITIES

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONCRETE SURFACE TREATMENT	SY	1402	
D2	0438-6004	CLEANING AND SEALING EXISTING JOINTS (CL 7)	LF	56	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	3	Clean Bents E1, E2, and E3

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

SHEET 2 OF 3

Texas Department of Transportation — Bridge Division

BRIDGE LAYOUT

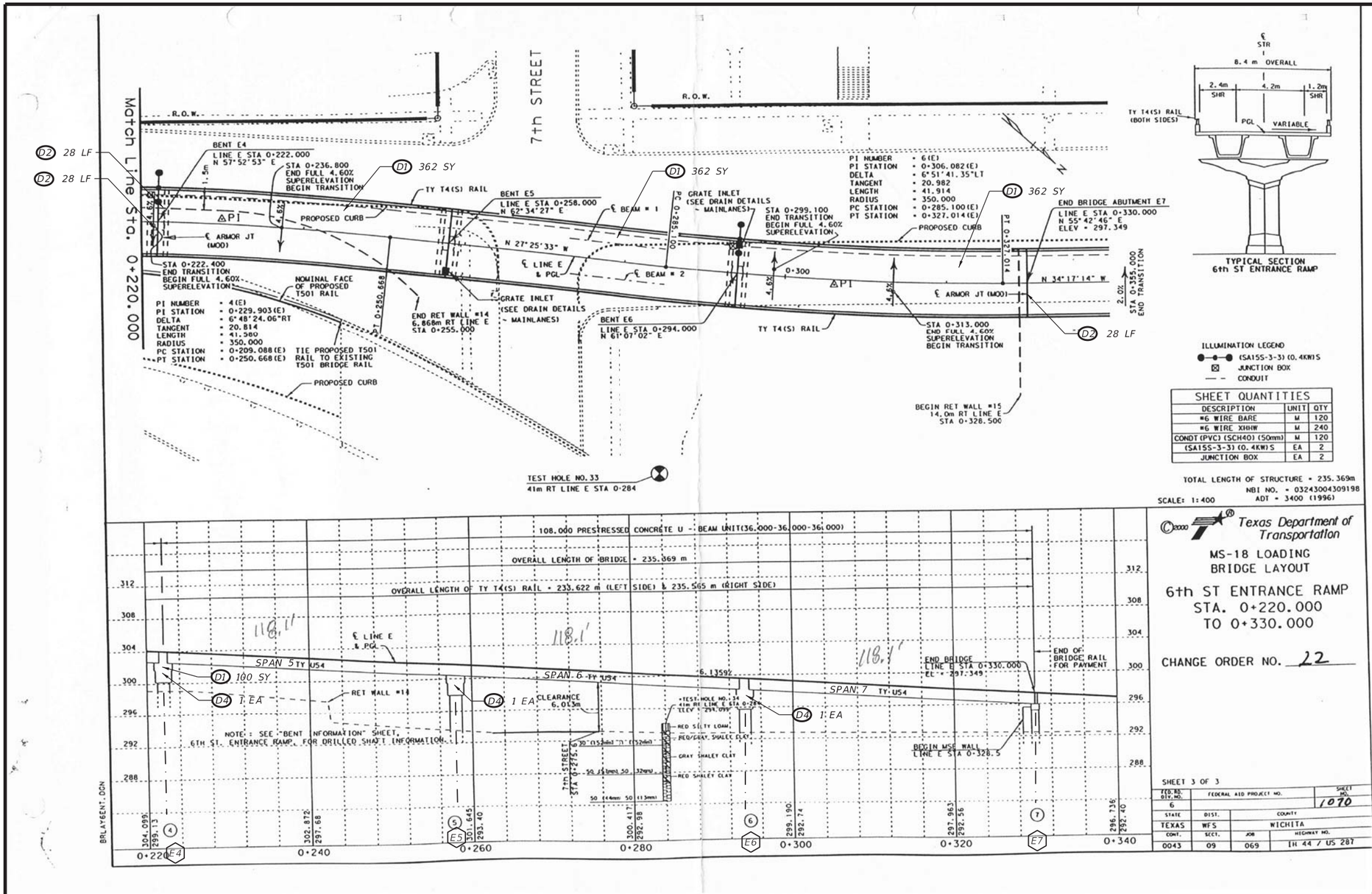
NBI: 03-243-0-0043-09-198

6th St. ENTRANCE RAMP

FILE:	DN: JDB	CK: RC	DW: SDC	CK: JDB
©TxDOT MARCH 2021	CONT.	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, etc	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		87

DATE:
FILE:

TOTAL LENGTH OF STRUCTURE: 772'-0"
NBI NO: 03243004301198



TYPICAL SECTION
6th ST ENTRANCE RAMP

ILLUMINATION LEGEND
(SA15S-3-3) (0.4KW)S
JUNCTION BOX
CONDUIT

SHEET QUANTITIES		
DESCRIPTION	UNIT	QTY
#6 WIRE BARE	M	120
#6 WIRE XHHW	M	240
CONDT (PVC) (SCH40) (50mm)	M	120
(SA15S-3-3) (0.4KW) S	EA	2
JUNCTION BOX	EA	2

TOTAL LENGTH OF STRUCTURE = 235.369m
NBI NO. = 03243004309198
ADT = 3400 (1996)
SCALE: 1:400

BRLAY6ENT.DGN

Texas Department of Transportation
MS-18 LOADING
BRIDGE LAYOUT
6th ST ENTRANCE RAMP
STA. 0+220.000
TO 0+330.000

CHANGE ORDER NO. 22

SHEET 3 OF 3

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6		1070
STATE	DIST.	COUNTY
TEXAS	WFS	WICHITA
CONT.	SECT.	JOB / HIGHWAY NO.
0043	09	069 / IH 44 / US 287

REPAIR CALL-OUT LEGEND

XX XX XX
- Unit of measure
- Estimated repair quantity at each location
- Repair number - See "Table of Repairs"

BRIDGE LAYOUT - AS-BUILT

TABLE OF ESTIMATED QUANTITIES

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D1	0428-6001	PENETRATING CONCRETE SURFACE TREATMENT	SY	1186	
D2	0438-6004	CLEANING AND SEALING EXISTING JOINTS (CL 7)	LF	84	
D4	7212-6001	CLEANING SUBSTRUCTURE (BENT)	EA	3	Clean Bents E4, E5, and E6

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.
5/28/2021

DATE:
FILE:

SHEET 3 OF 3

Texas Department of Transportation — Bridge Division

BRIDGE LAYOUT

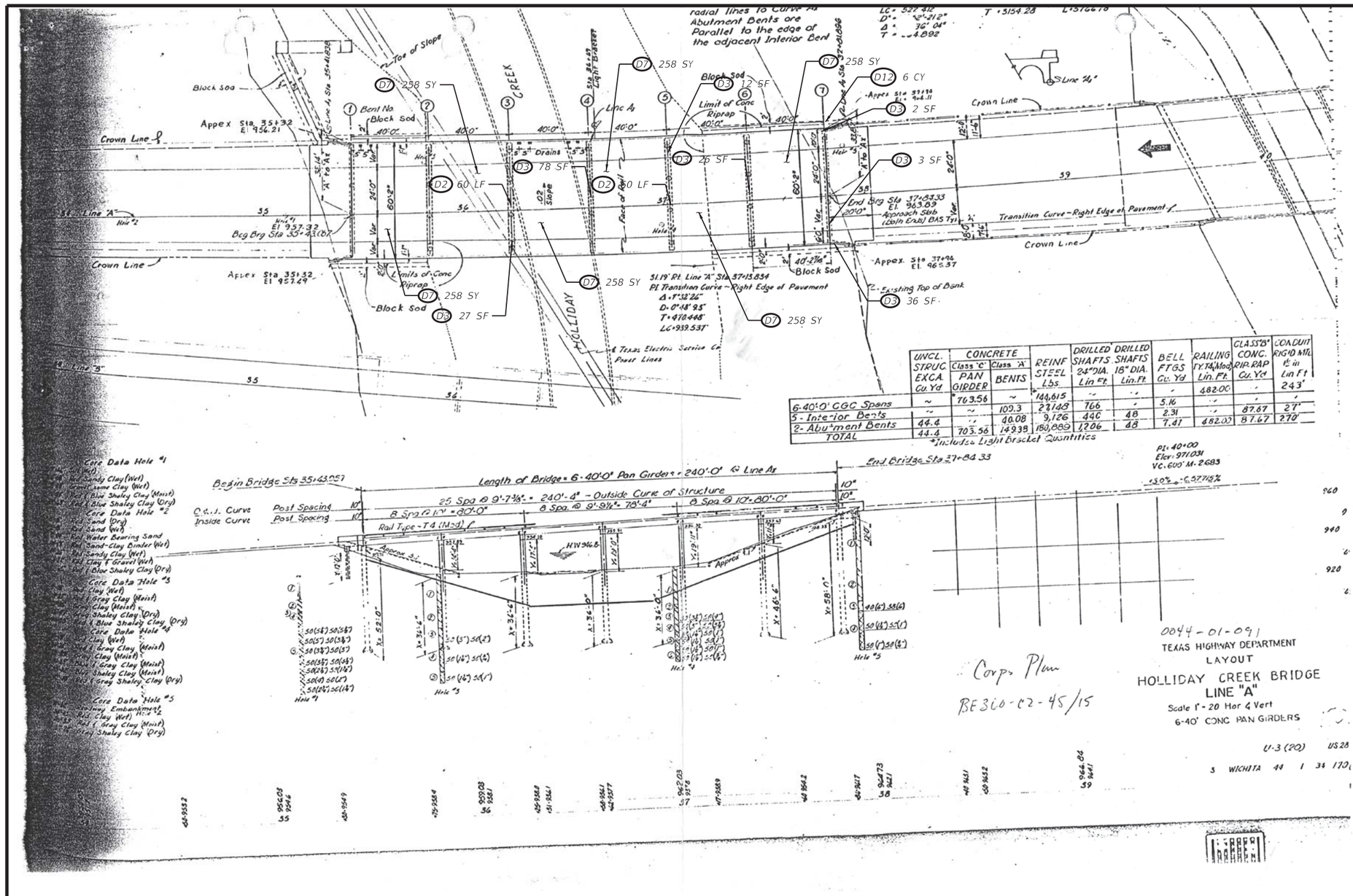
NBI: 03-243-0-0043-09-198
6th St. ENTRANCE RAMP

FILE:	DN: JDB	CK: RC	DW: SDC	CK: JDB
©TxDOT MARCH 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, etc	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		88

TOTAL LENGTH OF STRUCTURE: 240'-0"
NBI NO: 03243004401091

REPAIR CALL-OUT LEGEND

(XX) XX XX
- Unit of measure
- Estimated repair quantity at each location
- Repair number – See "Table of Repairs"



	UNCL. STRUC EXCA. Cu Yd	CONCRETE Class "C" PAN GIRDER	CONCRETE Class "A" BENTS	REINF STEEL Lbs	DRILLED SHAFTS 24" DIA. Lin Ft	DRILLED SHAFTS 18" DIA. Lin Ft	BELL FTGS Cu Yd	RAILING TY T4 Mod. Lin Ft	CLASS "B" CONC. RIP RAP Cu Yd	CONDUIT RIGID MTL 1" in Lin Ft
6-40'-0" CGC Spans	~	703.56	~	144,615	--	--	--	482.00	-	243'
5 - Interior Bents	~	~	109.3	27,148	766	-	5.16	--	-	-
2 - Abutment Bents	44.4	--	40.08	9,126	440	48	2.31	--	87.67	27'
TOTAL	44.4	703.56	149.38	180,889	1206	48	7.47	482.00	87.67	270'

*Includes Light Bracket Quantities

BRIDGE LAYOUT - AS-BUILT

TABLE OF ESTIMATED QUANTITIES

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	120	
D3	0429-6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	184	
D7	0483-6017	MILLING CONCRETE SLAB (3 IN)	SY	1548	See PPC Overlay Notes on Typical Sections
	4106-6005	POLYESTER POLYMER CONC OVERLAY (3 IN)	SY	1548	See PPC Overlay Notes on Typical Sections
D12	0401-6001	FLOWABLE BACKFILL	CY	6	Fill void at NE corner

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

Texas Department of Transportation — Bridge Division

BRIDGE LAYOUT

NBI: 03-243-0-0044-01-091

US82 WB/US281/287 NB
AT HOLLIDAY CREEK

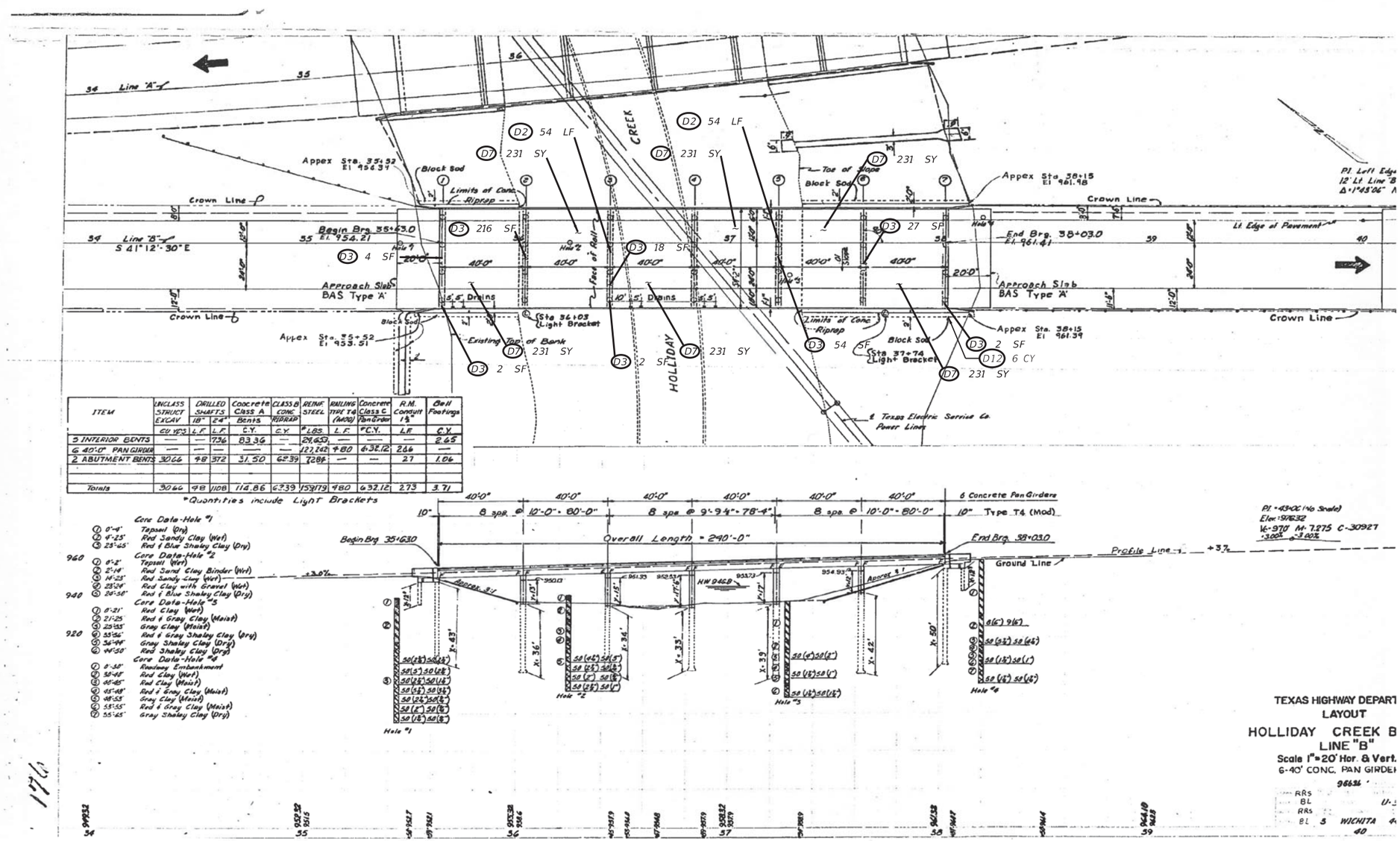
FILE:	DN: JDB	CK: RC	DW: SDC	CK: JDB
©TxDOT MARCH 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, etc	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		89

DATE:
FILE:

TOTAL LENGTH OF STRUCTURE: 240'-0"
NBI NO: 03243004401092

REPAIR CALL-OUT LEGEND

(XX) XX XX
- Unit of measure
- Estimated repair quantity at each location
- Repair number – See "Table of Repairs"



ITEM	UNCLASS STRUCT EXCAV	DRILLED SHAFTS 18"	DRILLED SHAFTS 24"	Concrete Class A Bents	CLASS B CONC RIPRAP	REINF. STEEL	RAILING TYPE T6 (MOD)	Concrete Class C Pan Girder	R.M. Conduit 1½"	Bell Footings
	CU YDS	L.F.	L.F.	C.Y.	C.Y.	#LBS	L.F.	*C.Y.	L.F.	C.Y.
5 INTERIOR BENTS	—	—	736	83.36	—	29,653	—	—	—	2.65
6 40'-0" PAN GIRDER	—	—	—	—	—	122,262	480	632.12	2.86	—
2 ABUTMENT BENTS	30.66	48	372	31.50	62.39	7284	—	—	2.7	1.06
Totals	30.66	48	1108	114.86	62.39	159,179	480	632.12	2.73	3.71

*Quantities include Light Brackets

TEXAS HIGHWAY DEPART
LAYOUT
HOLLIDAY CREEK B
LINE "B"
Scale 1"=20' Hor. & Vert.
6-40' CONC. PAN GIRDE

DATE:
FILE:

BRIDGE LAYOUT - AS-BUILT

TABLE OF ESTIMATED QUANTITIES

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	108	
D3	0429-6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	325	
D7	0483-6017	MILLING CONCRETE SLAB (3 IN)	SY	1386	See PPC Overlay Notes on Typical Sections
	4106-6005	POLYESTER POLYMER CONC OVERLAY (3 IN)	SY	1386	See PPC Overlay Notes on Typical Sections
D12	0401-6001	FLOWABLE BACKFILL	CY	6	Fill void at SE corner

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.
5/28/2021

Texas Department of Transportation | Bridge Division

BRIDGE LAYOUT

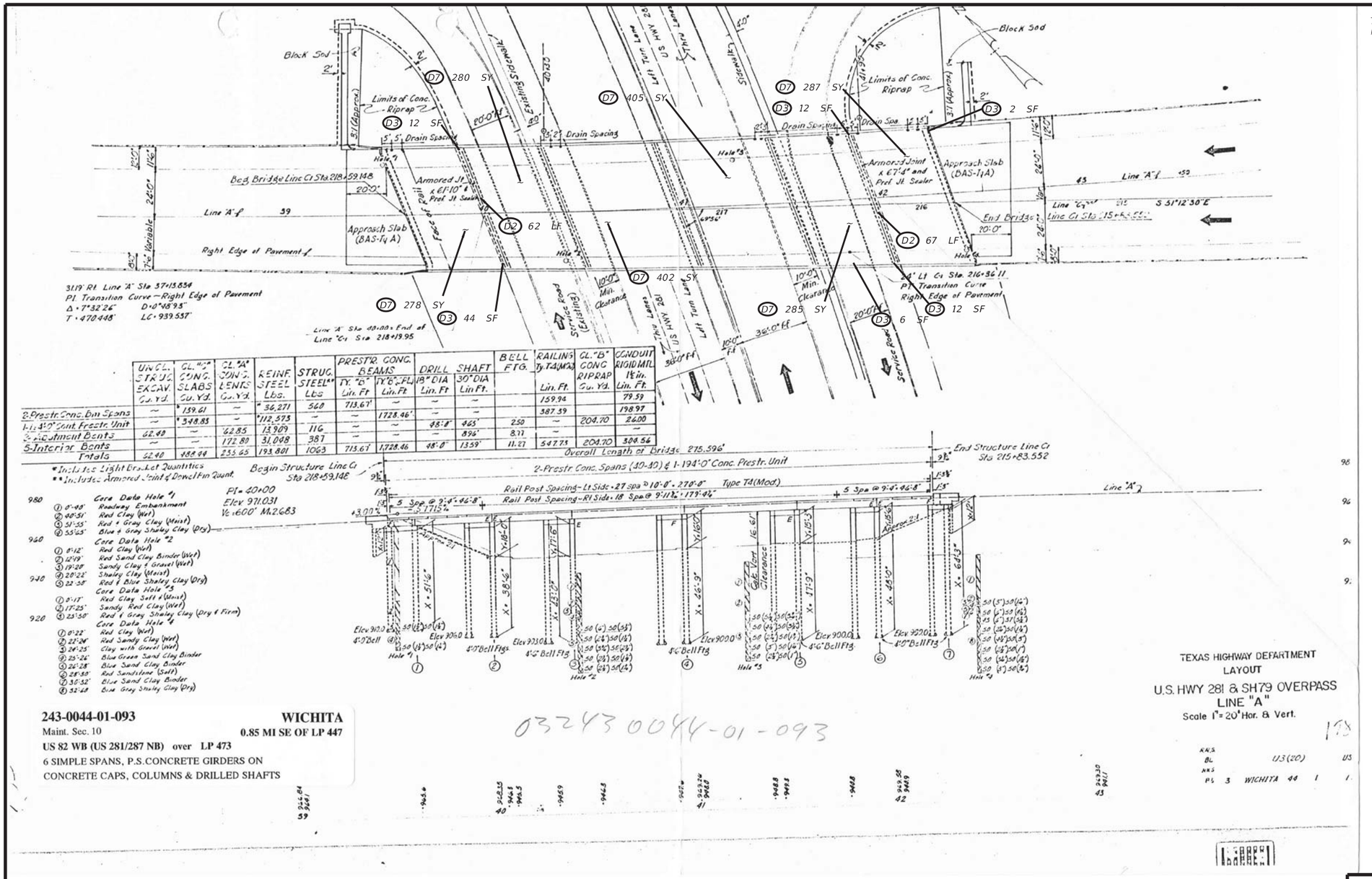
NBI: 03-243-0-0044-01-092
US82 EB/US281/287 SB
AT HOLLIDAY CREEK

FILE:	DN: JDB	CK: RC	DW: SDC	CK: JDB
©TxDOT MARCH 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, etc	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		90

TOTAL LENGTH OF STRUCTURE: 275.596 ft
NBI NO: 03243004401093

REPAIR CALL-OUT LEGEND

(XX) XX XX
- Unit of measure
- Estimated repair quantity at each location
- Repair number - See "Table of Repairs"



	Unc'l. Strc. Excav. Cu. Yd.	Cl. "H" Conc. Slabs Cu. Yd.	Cl. "A" Conc. Lenks Cu. Yd.	Reinf. Steel Lbs.	Strug. Steel* Lbs	Prestr. Conc. Beams Ty. "D" Lin. Ft.	Ty. "C"-FL Lin. Ft.	Drill Shaft 18" Dia Lin. Ft.	Drill Shaft 30" Dia Lin. Ft.	Bell Ftg.	Railing Ty. T4(Mod) Lin. Ft.	Cl. "B" Conc Riprap Cu. Yd.	Conduit Rigid Mtl. 1½ in. Lin. Ft.
2-Prestr. Conc. Bm Spans	—	* 159.61	—	* 36,271	560	713.67'	—	—	—		159.94		79.59
1-194'-0" Cont. Prestr. Unit	—	* 348.85	—	* 112,373	—	—	1728.46'	—	—		387.59		198.97
2-Abutment Bents	62.80	—	62.85	13,909	116	—	—	98.8'	96.5'	2.50	—	204.70	26.00
5-Interior Bents	—	—	172.80	31,048	387	—	—	—	89.6'	8.77	—		—
Totals	62.80	508.46	235.65	193,801	1063	713.67	1,728.46	98.8'	135.9'	11.27	547.73	204.70	304.56

* Includes Light Bracket Quantities
** Includes Armored Joint & Dowel Fin Quant.

980
① 0'-9.8' Core Data Hole #1 Roadway Embankment
② 8.8'-51' Red Clay (Wet)
③ 51'-55' Red & Gray Clay (Moist)
④ 55'-65' Blue & Gray Shaley Clay (Dry)

960
Core Data Hole #2
① 0'-12' Red Clay (Wet)
② 12'-19' Red Sand Clay Binder (Wet)
③ 19'-20' Sandy Clay & Gravel (Wet)
④ 20'-22' Shaley Clay (Moist)
⑤ 22'-30' Red & Blue Shaley Clay (Dry)

940
Core Data Hole #3
① 0'-17' Red Clay Soft & (Moist)
② 17'-25' Sandy Red Clay (Wet)
③ 25'-50' Red & Gray Shaley Clay (Dry & Firm)

920
Core Data Hole #4
① 0'-22' Red Clay (Wet)
② 22'-24' Red Sandy Clay (Wet)
③ 24'-25' Clay with Gravel (Wet)
④ 25'-26' Blue Green Sand Clay Binder
⑤ 26'-28' Blue Sand Clay Binder
⑥ 28'-30' Red Sandstone (Soft)
⑦ 30'-32' Blue Sand Clay Binder
⑧ 32'-40' Blue Grey Shaley Clay (Dry)

243-0044-01-093 **WICHITA**
Maint. Sec. 10 **0.85 MI SE OF LP 447**
US 82 WB (US 281/287 NB) over LP 473
6 SIMPLE SPANS, P.S.CONCRETE GIRDERS ON CONCRETE CAPS, COLUMNS & DRILLED SHAFTS

03243004401-01-093

TEXAS HIGHWAY DEPARTMENT
LAYOUT
U.S. HWY 281 & SH79 OVERPASS
LINE "A"
Scale 1"=20' Hor. & Vert.

BRIDGE LAYOUT - AS-BUILT

TABLE OF ESTIMATED QUANTITIES

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	129	
D3	0429-6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	88	
D7	0483-6017	MILLING CONCRETE SLAB (3 IN)	SY	1937	See PPC Overlay Notes on Typical Sections
	4106-6005	POLYESTER POLYMER CONC OVERLAY (3 IN)	SY	1937	See PPC Overlay Notes on Typical Sections

STATE OF TEXAS
JOHN DOUGLAS BEER
90079
LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.
5/28/2021

Texas Department of Transportation — Bridge Division

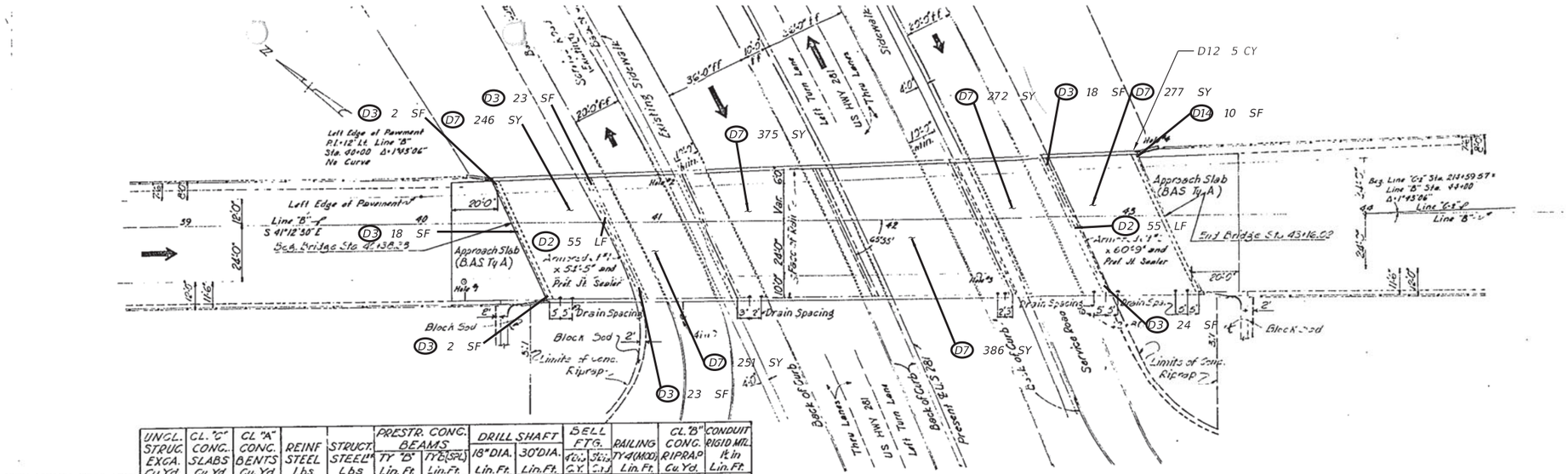
BRIDGE LAYOUT

NBI: 03-243-0-0044-01-093
US82 WB/US281/287 NB
AT LOOP 473

FILE:	DN: JDB	CK: RC	DW: SDC	CK: JDB
©TxDOT MARCH 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, etc	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		91

DATE:
FILE:

TOTAL LENGTH OF STRUCTURE: 277.640 ft
NBI NO: 03243004401094

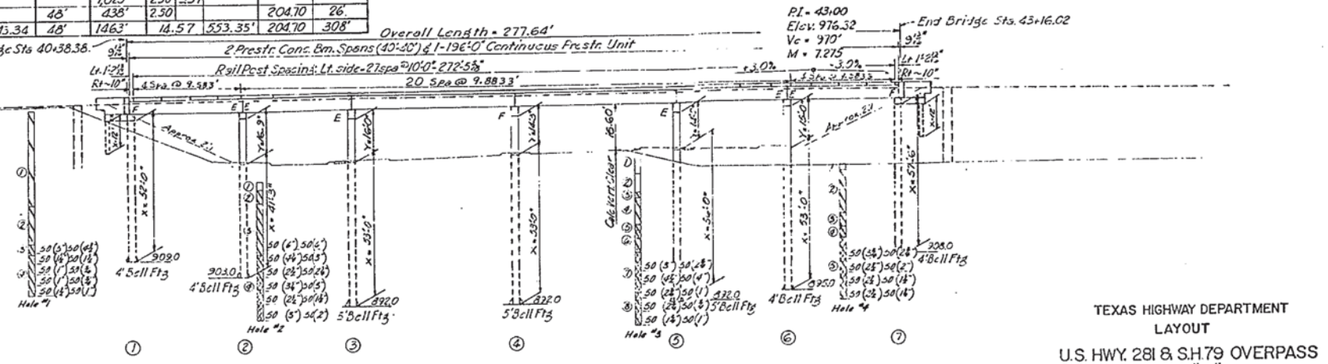


REPAIR CALL-OUT LEGEND

(XX) XX XX
- XX — Unit of measure
- XX — Estimated repair quantity at each location
- (XX) — Repair number – See "Table of Repairs"

	UNCL. STRUC. EXCA. Cu.Yd.	CL. "C" CONC. SLABS Cu Yd.	CL "A" CONC. BENTS Cu. Yd.	REINF STEEL Lbs	STRUCT. STEEL* Lbs	PRESTR. CONC. BEAMS TY "B" Lin. Ft.	PRESTR. CONC. BEAMS TYC(SPL) Lin.Ft.	DRILL SHAFT 18"DIA. Lin.Ft.	DRILL SHAFT 30"DIA. Lin.Ft.	BELL FTG. 4000 C.Y.	BELL FTG. 3600 C.Y.	RAILING TY-4(MOD) Lin. Ft.	CL."B" CONC. RIPRAP Cu.Yd.	CONDUIT RIGID MTL. ℄ in Lin.Ft.
2 Prestr. Conc. Bm. Spans		*122.91		*32009	499	630.54						158.72'		85'
1-136'-0" Cont. Prestr. Unit		*316.62		*100,734			1543.34					394.63'		202'
5 Interior Bents			148.83	26,340	342				1,025	2.50	9.57			
2 Acutment Bents	70.2		56.87	10,648	102			48'	438'	2.50			204.70	26'
Totals	70.2	439.53	205.70	169,731	943	630.54	1543.34	48'	1463'	14.57	553.35'		204.70	308'

* Includes Light Bracket Quantities. ** Includes Armored Joint & Dowel Pin Quant.



980
- ① 0'-35' Roadway Embankment
- ② 35'-49' Red Clay (Wet & Soft)
- ③ 49'-55' Red & Gray Clay (Moist)
- ④ 55'-68' Gray Clay (Dry)

960 Core Data Hole #2
- ① 0'-3' Topsoil (Wet)
- ② 3'-8' Red Clay (Wet)
- ③ 8'-27' Red Sandy Clay (Wet)
- ④ 27'-51' Red & Blue Shaley Clay (Dry)

940 Core Data Hole #3
- ⑤ 0'-9' Fill Soil (Moist)
- ⑥ 9'-16' Topsoil (Moist)
- ⑦ 16'-18' Red Clay (Moist)
- ⑧ 18'-28' Red Sandy Clay (Moist)
- ⑨ 28'-30' Red Sand Clay Binder (Wet)
- ⑩ 30'-38' Sandy Clay some Gravel (Wet)
- ⑪ 38'-55' Blue Shaley Clay (Dry)
- ⑫ 55'-65' Red Shaley Clay (Hard & Dry)

920 Core Data Hole #4
- ① 0'-2' Top Soil (Wet)
- ② 2'-18' Red Clay (Wet)
- ③ 18'-23' Slightly Sandy Clay (Wet)
- ④ 23'-27' Red Sand Clay Binder (Wet)
- ⑤ 27'-52' Red Shaley Clay (Same Moisture)

243-0044-01-094 **WICHITA**
Maint. Sec. 10 **0.85 MI SE OF LP 447**
US 82 EB (US 281/287 SB) over LP 473
6 SIMPLE SPANS, P.S.CONCRETE GIRDERS ON CONCRETE CAPS, COLUMNS & DRILLED SHAFTS

03243 0044 01 094

TEXAS HIGHWAY DEPARTMENT
LAYOUT
U.S. HWY. 281 & S.H. 79 OVERPASS
LINE "B"
Scale 1"=20' Hor. & Vert.

19

GND UL U3(20)
GND DL 3 WICHITA 44 1 34

BRIDGE LAYOUT - AS-BUILT

TABLE OF ESTIMATED QUANTITIES

TAG	ITEM	DESCRIPTION	UNIT	QUANTITY	NOTES
D2	0438-6004	CLEANING AND SEALING EXIST JOINTS (CL 7)	LF	110	
D3	0429-6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	110	
D7	0483-6017	MILLING CONCRETE SLAB (3 IN)	SY	1807	See PPC Overlay Notes on Typical Sections
	4106-6005	POLYESTER POLYMER CONC OVERLAY (3 IN)	SY	1807	See PPC Overlay Notes on Typical Sections
D14	0431-6003	PNEUMATICALLY PLACED CONCRETE (2 IN)	SF	10	

STATE OF TEXAS
JOHN DOUGLAS BEER
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LICENSED PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

Texas Department of Transportation — Bridge Division

BRIDGE LAYOUT

NBI: 03-243-0-0044-01-094
US82 EB/US281/287 SB
AT LOOP 473

FILE:	DN: JDB	CK: RC	DW: SDC	CK: JDB
©TxDOT MARCH 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, etc	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		92

DATE:
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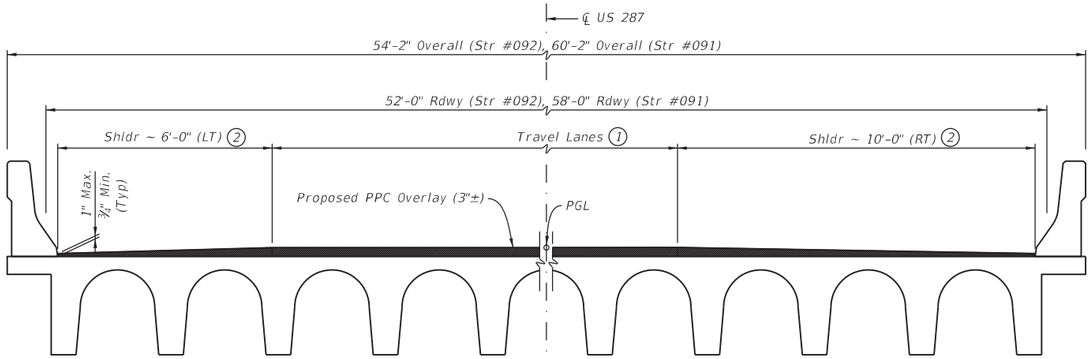
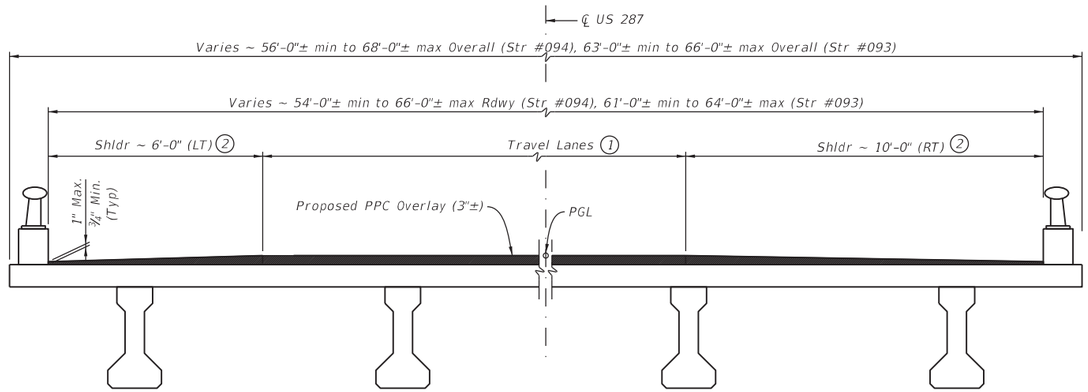


US 287 NB & SB at HOLLIDAY CREEK



US 287 NB & SB at LP 473

PPC OVERLAY NOTES

1. Mill approximatley 1½" existing PFC overlay and 1½" existing LMC overlay from bridge deck surface in accordance with Item 483, "Concrete Bridge Deck Surfacing." Note that existing LMC overlay contains steel fibers.
2. Remove dirt, debris, and other material that may interfere with the bond between deck and PPC overlay.
3. Mask existing joints and deck drains/grate inlets.
4. Apply primer in accordance with Special Specification 4106, "Polyester Polymer Concrete Bridge Deck Overlay."
5. Apply PPC overlay and cure in accordance with Special Specification 4106, "Polyester Polymer Concrete Bridge Deck Overlay." Groove surface in accordance with Article 422.4.11 "Final Surface Texture."
6. Apply roadway striping to match original striping.
7. Seal joints after placement of overlay.

(1) Match existing profile and cross slope.

(2) Taper PPC overlay in shoulders to a maximum of 1" at the toe of rail (¾" minimum). Taper shall be no steeper than 10:1, unless approved by the Engineer.

STATE OF TEXAS
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90079
LICENSED
PROFESSIONAL ENGINEER

John Douglas Beer, P.E.

5/28/2021

DATE:
FILE:

Texas Department of Transportation — Bridge Division

TYPICAL SECTIONS

NBI: 03-243-0-0044-01-091, etc

FILE:	DN: JDB	CK: RC	DW: SDC	CK: JDB
©TxDOT MARCH 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144, etc	IH 44/US 287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		93

DATE: 6/2/2021 9:16:11 AM
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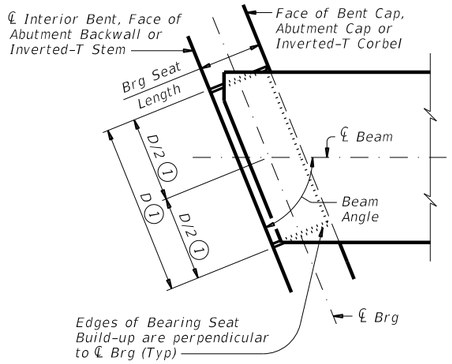
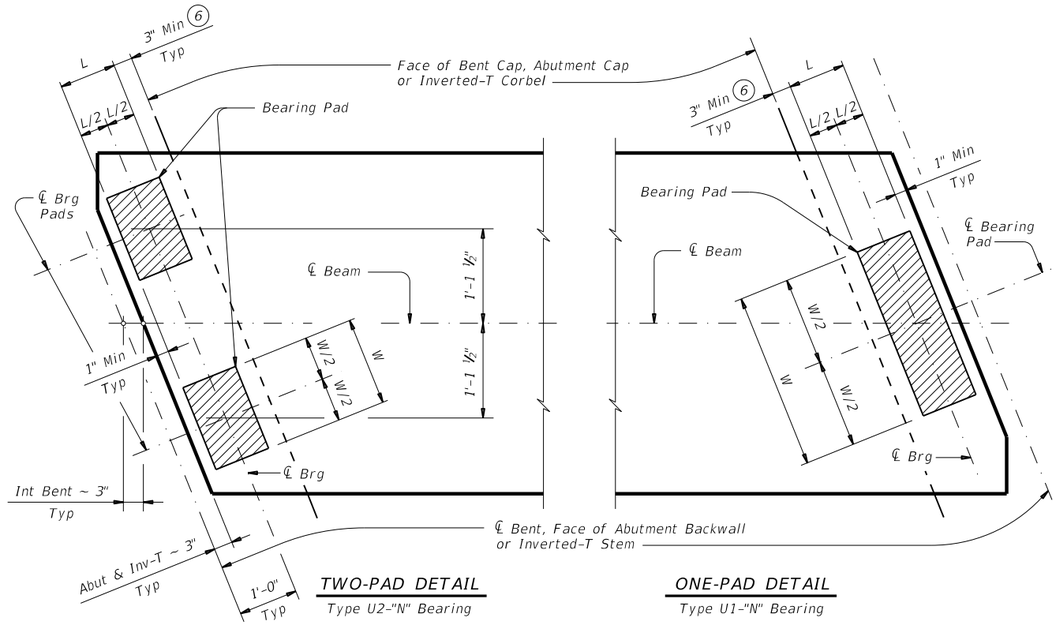


BEARING SEAT DIMENSION "D" (2)	
BEAM ANGLE	"D"
75° + thru 90°	4'-6"
60° + thru 75°	5'-0"
45°thru 60°	5'-6"

BEARING SEAT DIMENSIONS

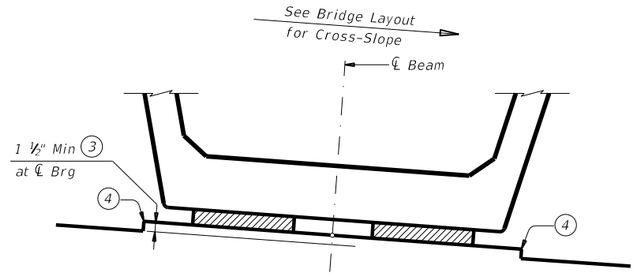


TWO-PAD DETAIL
Type U2-"N" Bearing

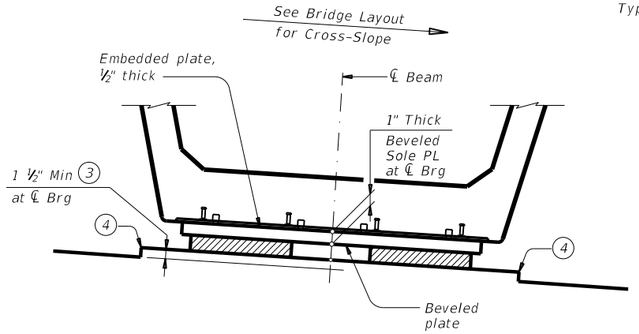
ONE-PAD DETAIL
Type U1-"N" Bearing

BEARING PAD PLACEMENT AND BEAM END DIAGRAMS

Place one bearing pad at forward station beam end.
Place two bearing pads at back station beam end.



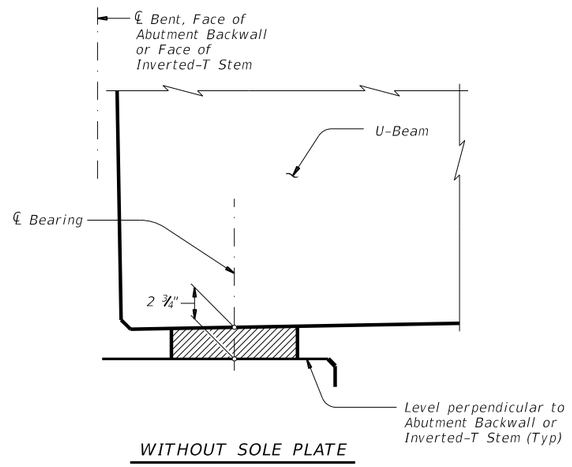
CROSS-SLOPE 5 PERCENT AND LESS AND LONGITUDINAL SLOPE 5 PERCENT AND LESS (5)
Sole Plate not required



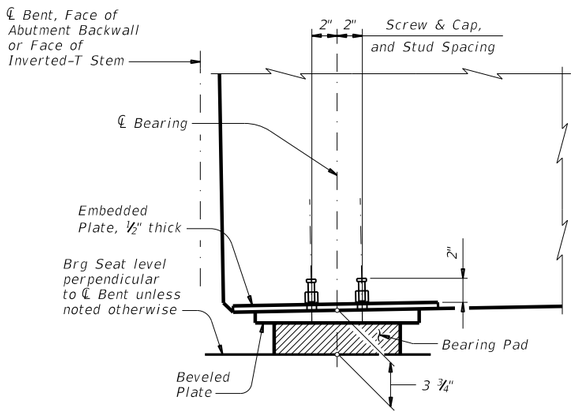
CROSS-SLOPE OVER 5 PERCENT OR LONGITUDINAL SLOPE OVER 5 PERCENT (5)
Sole Plate required

TYPICAL SECTIONS

Showing two pad end, one pad end similar



WITHOUT SOLE PLATE



WITH SOLE PLATE

SHOWING SIDE ELEVATION AT BEAM END

(1) Measured along ℄ of Bearing.

(2) Unless noted otherwise in the plans.

(3) Reinforce bearing seat build-ups greater than 3" high with #4 bars at 12" Max Spa as per Item 420, "Concrete Substructures".

(4) See elsewhere in plans for right and left elevations and locations.

(5) Longitudinal slope is defined as bearing pad taper as shown in Bearing Pad Taper Report.

(6) With or without sole plate.

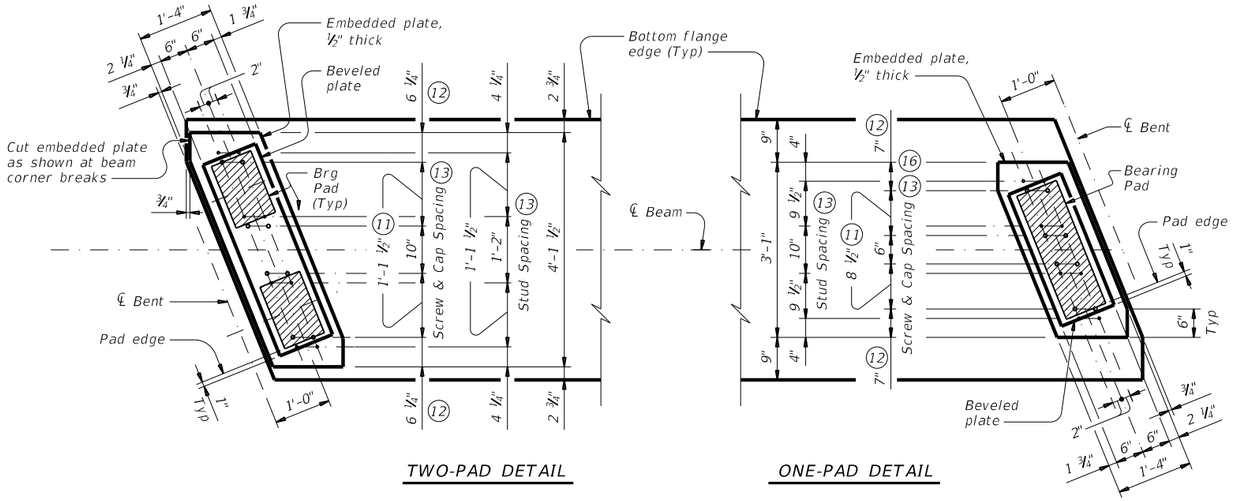
HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation | Bridge Division Standard

ELASTOMERIC BEARING AND BEAM END DETAILS
PRESTR CONC U-BEAMS

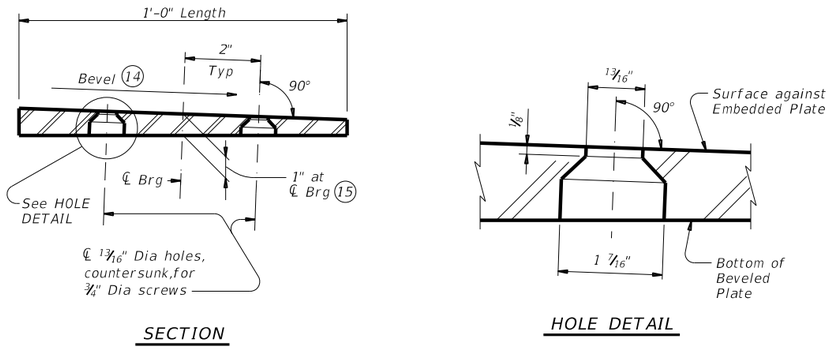
UBEB

FILE: ubstds02.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT July 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144,Etc	IH 44, Etc.
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		94

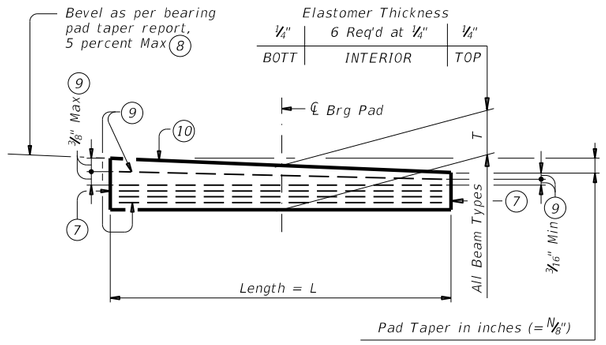


PLAN VIEW OF SOLE PLATE DETAILS

Provide ½" Dia x 2" headed studs and ¾" Dia screws. Electric-arc end weld studs to embedded plate with complete fusion.



BEVELED PLATE DETAILS



LAMINATED ELASTOMERIC BEARING PAD

(50 DUROMETER)

GENERAL NOTES:

Shop drawings for approval are required and must include a bearing pad layout which identifies location and orientation of all bearing pads. Permanently mark each bearing pad in accordance with the bearing pad layout. Provide a copy of the bearing pad layout to the Engineer.

Finish Bearing Surface with a wood float finish. Bearing Surface must be clean and free of all loose material before placing Bearing Pads.

For Transition Bents with backwall, the beams and bearing pads must receive the same treatment as shown for Abutments.

See Bearing Pad Taper Report sheet for Fabricator's Report of bearing pad taper.

Cost of furnishing and installing bearing pads, including beveled and embedded steel plates, is included in unit price bid for "Prestressed Concrete U-Beams".

SOLE PLATE NOTES:

Provide constant thickness bearing pads with beveled and embedded steel sole plates in accordance with these details if the required bearing pad taper exceeds 5 percent, if the roadway cross-slope exceeds 5 percent or if otherwise required in the plans. Provide for all beams in the span.

On the shop drawings, dimension sole plates to the nearest 1/16" based on required thickness at centerline of bearing and required bevel. Thickness tolerance variation from the approved shop drawings is 1/16" +/-, except variation from a plane parallel to the theoretical top surface can not exceed 1/16" total. Bearing surface tolerances listed in Item 424 apply to embedded and beveled plates.

Steel plate must conform to ASTM A 36, A 572 Gr 50, or A 709 Gr 36 or Gr 50. Hot dip galvanize both the embedded plate and beveled sole plate after fabrication. Seal weld caps to embedded plate before galvanizing.

Tap threads in the embedded plate only. Drill and tap prior to galvanizing.

¾" Dia screws must be electroplated, socket flat head countersunk cap screws conforming to ASTM F 835. Electroplating must conform to ASTM B 633, SC 2, Type I. Provide screws long enough to maintain a ¾" minimum embedment into the embedded plate and galvanized cap. Provide galvanized steel caps (16 ga Min) with a nominal 1" inside diameter and deep enough to accommodate the screws, but not less than ½" deep or deeper than 1".

Install beveled sole plates prior to shipping beams. Installed screw heads must not protrude below the bottom of the beveled plate.

(7) *Locate permanent mark here.*

(8) *Use beveled sole plate if required bearing pad taper exceeds 5 percent or if cross-slope on span exceeds 5 percent.*

(9) *Place 0.105" thick steel laminates parallel to the bottom surface of the pad, except the top laminate(s) may be sloped to satisfy maximum and minimum thickness criteria for tapered elastomeric layers.*

(10) *Indicate BEARING TYPE on all pads. For tapered pads, locate BEARING TYPE on the high side. The Fabricator must include the value of "N" (amount of taper in 1/8" increments) in this mark.*
Examples: N=0, (for 0" taper)
N=1, (for 1/8" taper)
N=2, (for 1/4" taper)
(etc.)
Fabricated pad top surface slope must not vary from plan bearing pad taper by more than $\left(\frac{0.0625"}{Length}\right)$ *(IN/IN).*

(11) *Decrease by 2" for skews 30° and over.*

(12) *Increase by 2" for skews 30° and over.*

(13) *Stud and screw locations may be adjusted slightly to locate them between strand positions.*

(14) *Bevel to the slope listed in the Bearing Pad Taper Report.*

(15) *Accommodates bevels up to 0.085 ft per foot.*

(16) *Omit screws within 1" of beveled plate edge.*

TABLE OF BEARING PAD DIMENSIONS						
Beam Type	One-Pad (Ty U1-"N") (10)			Two-Pad (Ty U2-"N") (10)		
	W	L	T	W	L	T
U40	24"	9"	2 ¾"	12"	9"	2 ¾"
U54	32"	9"	2 ¾"	16"	9"	2 ¾"

HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation — Bridge Division Standard

ELASTOMERIC BEARING AND BEAM END DETAILS
PRESTR CONC U-BEAMS

UBEB

FILE: ubstds02.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT July 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144,Etc	IH 44, Etc.
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		95

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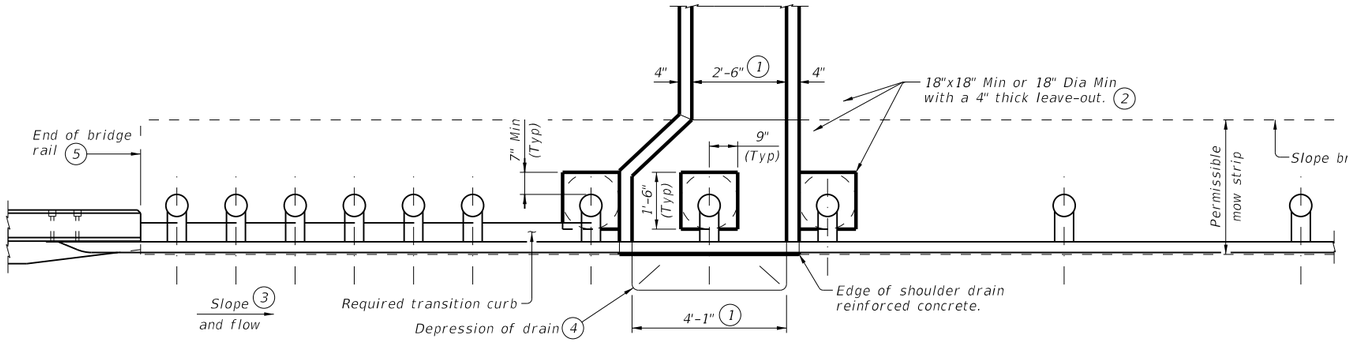
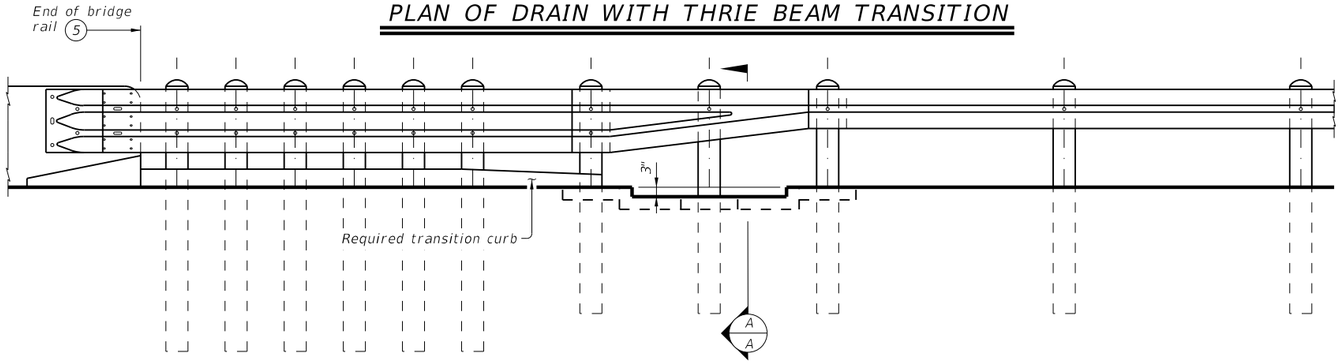
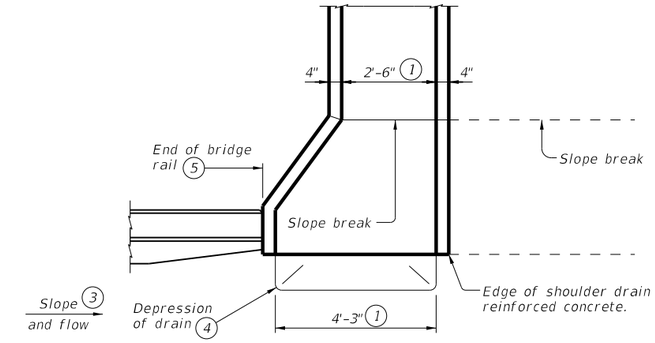


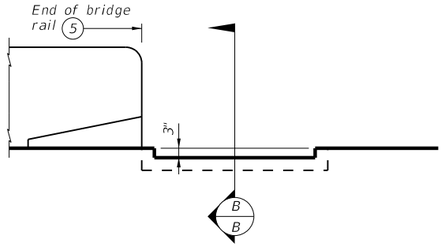
PLAN OF DRAIN WITH THRIE BEAM TRANSITION



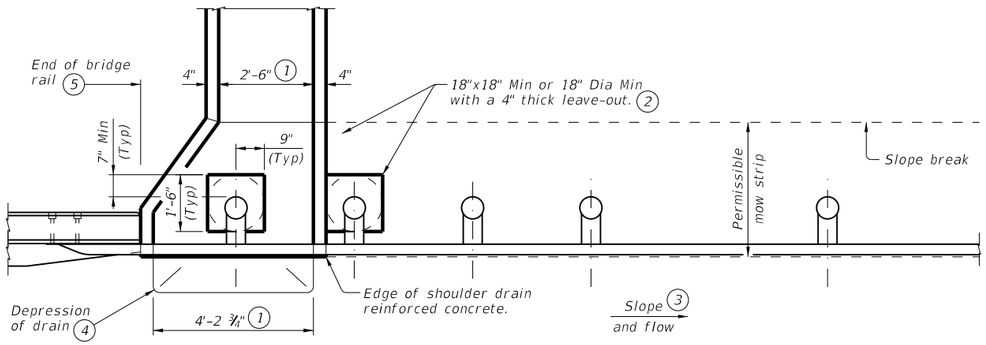
ROADWAY ELEVATION OF DRAIN WITH THRIE BEAM TRANSITION



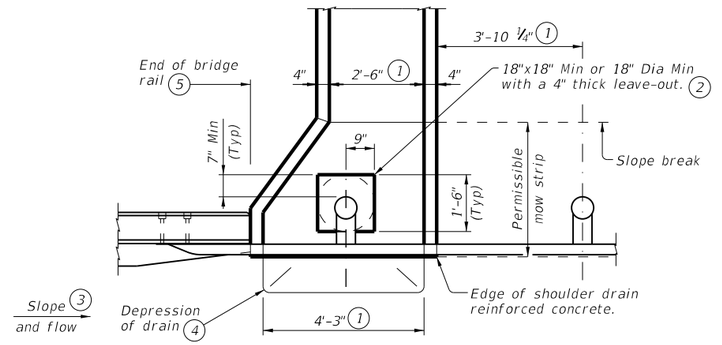
PLAN OF DRAIN WITHOUT MBGF TRANSITION



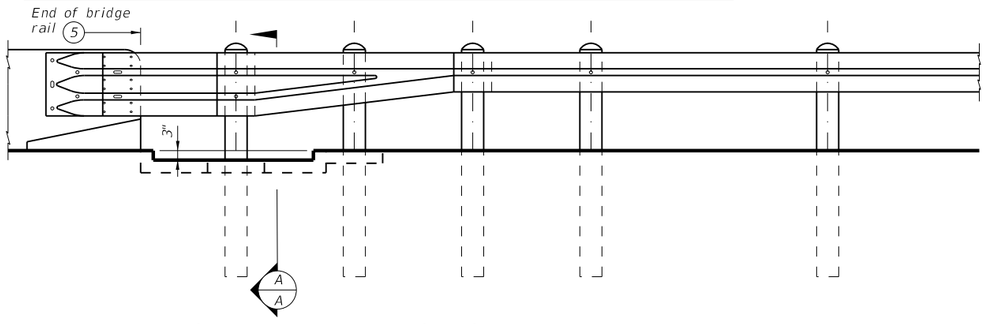
ROADWAY ELEVATION OF DRAIN WITHOUT MBGF TRANSITION



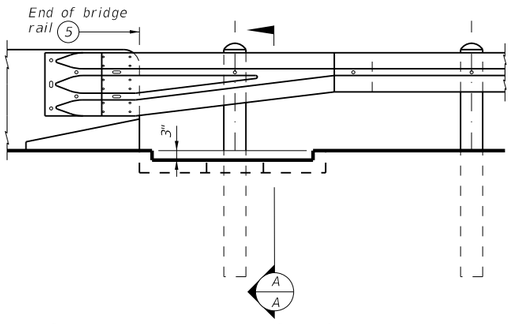
PLAN OF DRAIN WITH TL-2 (LOW SPEED) TRANSITION



PLAN OF DRAIN WITH DOWNSTREAM ANCHOR TERMINAL



ROADWAY ELEVATION OF DRAIN WITH TL-2 (LOW SPEED) TRANSITION



ROADWAY ELEVATION OF DRAIN WITH DOWNSTREAM ANCHOR TERMINAL

(1) Use wider or other drain configurations if shown elsewhere in plans or if directed by the Engineer. Location of shoulder drain must consider limitation imposed by rail transition. Do not locate shoulder drains at expansion joints between approach slab and concrete pavement.

(2) Fill leave-outs with no more than a 2-sack grout mixture (1 part cement, 5 parts water, and 14 parts sand by volume) with a 28-day compressive strength of approximately 120 psi or less. Provide grout of a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (20" Max leave-out).

(3) For other slope and flow directions drain configuration may be mirrored wider or tapered wider if shown elsewhere in the plans or directed by the Engineer.

(4) Form depression into concrete, asphalt pavement, or approach slab.

(5) See Bridge Layout for rail type.

Texas Department of Transportation

Bridge Division Standard

SHOULDER DRAIN AT END OF BRIDGE RAIL

SD-EBR

FILE: sdebr001-19.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144,Etc	IH 44, Etc.
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		96

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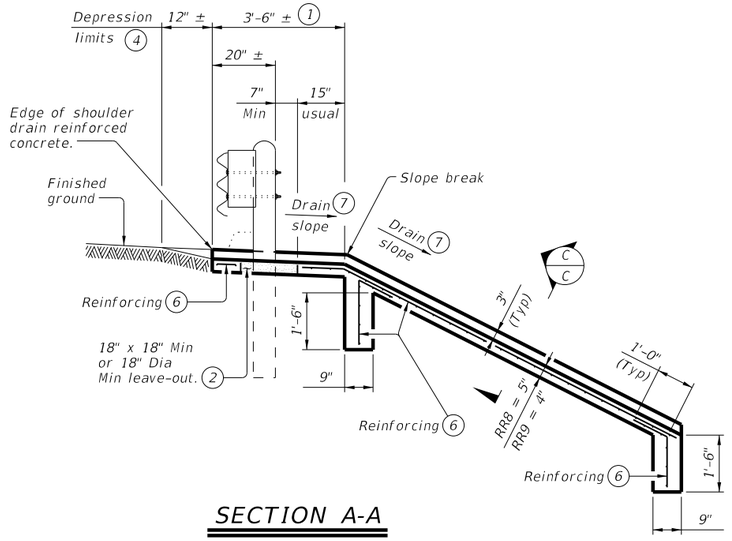
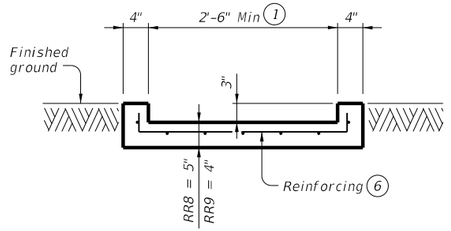
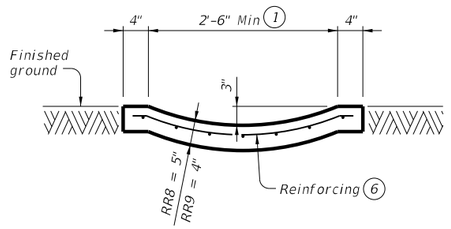


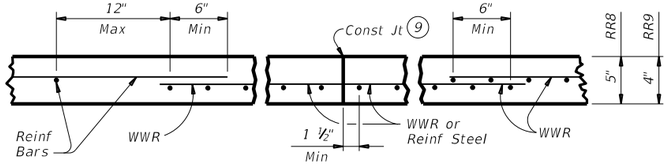
SECTION A-A





SECTION C-C

Sections shown without integrated riprap.



REINFORCEMENT DETAILS (6)

See General Notes for optional synthetic fiber reinforcement.

(1) Use wider or other drain configurations if shown elsewhere in plans or if directed by the Engineer. Location of shoulder drain must consider limitation imposed by rail transition. Do not locate shoulder drains at expansion joints between approach slab and concrete pavement.

(2) Fill leave-outs with no more than a 2-sack grout mixture (1 part cement, 5 parts water, and 14 parts sand by volume) with a 28-day compressive strength of approximately 120 psi or less. Provide grout of a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (20" Max leave-out).

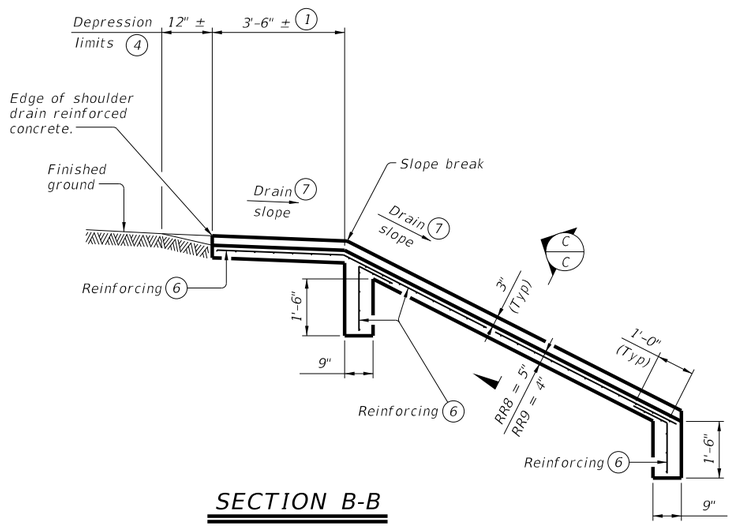
(4) Form depression into concrete, asphalt pavement, or approach slab.

(6) Provide (#3) reinforcing bar at 18" spacing c-c or welded wire reinforcement (WWR) as 6x6-D2.9xD2.9 or D3xD3. Combinations of WWR and reinforcing bars may be used if both are permitted. Use lap splices of a minimum 6 inches, measured from the transverse wire of WWR, and the ends of reinforcing bars, unless shown otherwise.

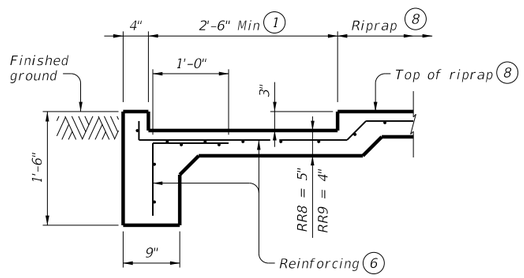
(7) See elsewhere in plans or as directed by the Engineer.

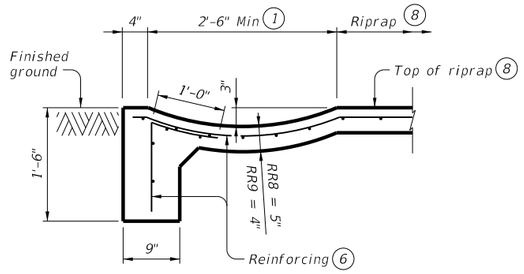
(8) See CRR standard for details and notes not shown.

(9) WWR or reinforcing steel is continuous through riprap construction joints. Provide WWR or reinforcing steel that extends 1'-1" minimum into adjacent riprap on each side of construction joint even if synthetic fiber is utilized.



SECTION B-B





SECTION C-C

Sections shown with integrated riprap.

GENERAL NOTES:

Provide Class "B" concrete with a minimum compressive strength of 2,000 psi unless noted elsewhere in plans.

Provide Grade 60 reinforcing steel.

Provide deformed welded wire reinforcement (WWR) meeting ASTM A1064, unless otherwise shown.

Provide reinforcing bars, deformed WWR, or any suitable combination of both types for riprap reinforcing, unless specified elsewhere in the plans.

Optionally synthetic fibers may be used if approved by the Engineer. Provide synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) in lieu of steel reinforcing in riprap concrete.

See Metal Beam Guard Fence (Mow Strip) standard for details and notes not shown.

Payment for furnishing and placing 2-sack grout mixture will be subsidiary to shoulder drain.

Payment for shoulder drain will be as per Item 420, "Cl B Conc (Flume)". All details shown herein are subsidiary to shoulder drain.

See Layout for limits of shoulder drain.

RR8 is to be used on stream crossings.

RR9 is to be used on other embankments.

Texas Department of Transportation

Bridge Division Standard

SHOULDER DRAIN AT END OF BRIDGE RAIL

SD-EBR

FILE: sdebr001-19.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
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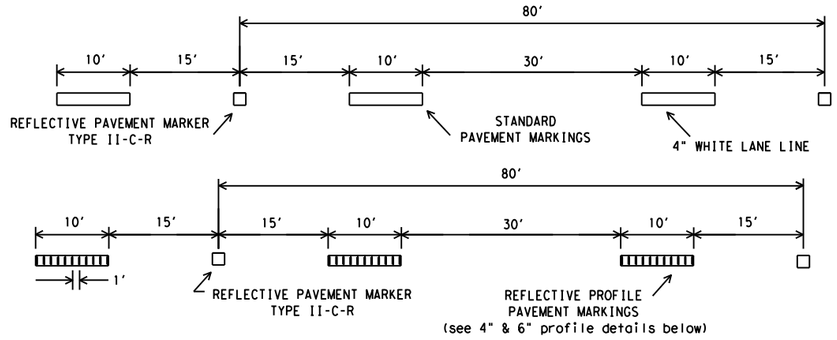
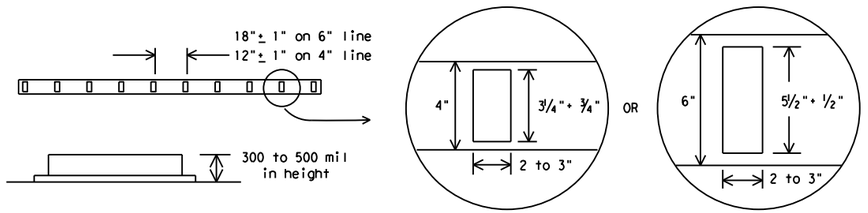
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		97



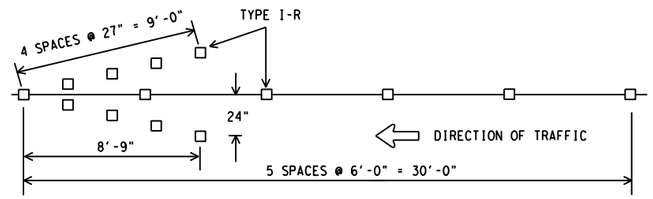
PAVEMENT MARKERS (REFL) TYPE II-C-R SHALL BE SPACED ON 80' CENTERS WITH THE CLEAR FACE TOWARD NORMAL TRAFFIC AND THE RED FACE TOWARD WRONG WAY TRAFFIC.

TRAFFIC LANE LINES PAVEMENT MARKING DETAILS

EDGELINES SHOULD TYPICALLY BE 4" WIDE AND THE MATERIALS SHALL BE AS SPECIFIED IN THE PLANS.
IF RAISED PROFILE PAVEMENT MARKINGS ARE USED SEE DETAILS BELOW.



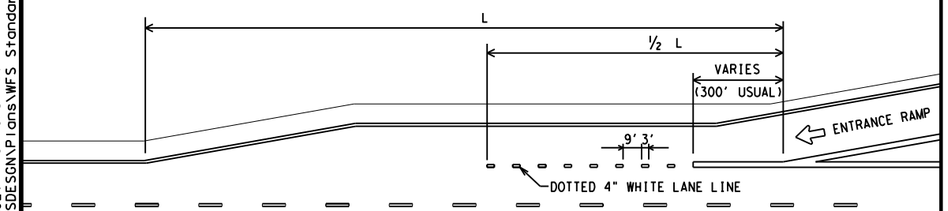
EDGELINE PAVEMENT MARKINGS



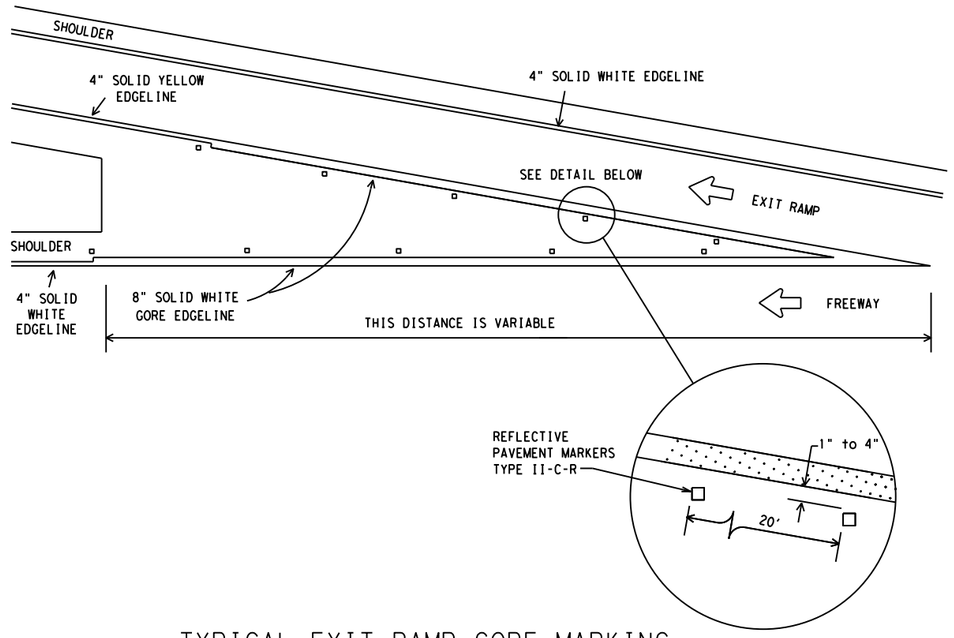
ALL RAISED MARKERS IN THE WRONG WAY ARROW SHALL BE TYPE I-R REFLECTORIZED PAVEMENT MARKERS WITH THE REFLECTORIZED SURFACE FACING THE WRONG WAY TRAFFIC. TYPE II-C-R SHALL NOT BE USED.

REFLECTORIZED WRONG WAY ARROWS, NOT TO EXCEED TWO, MAY BE PLACED ON EXIT RAMPS.
LOCATION OF THE ARROWS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.

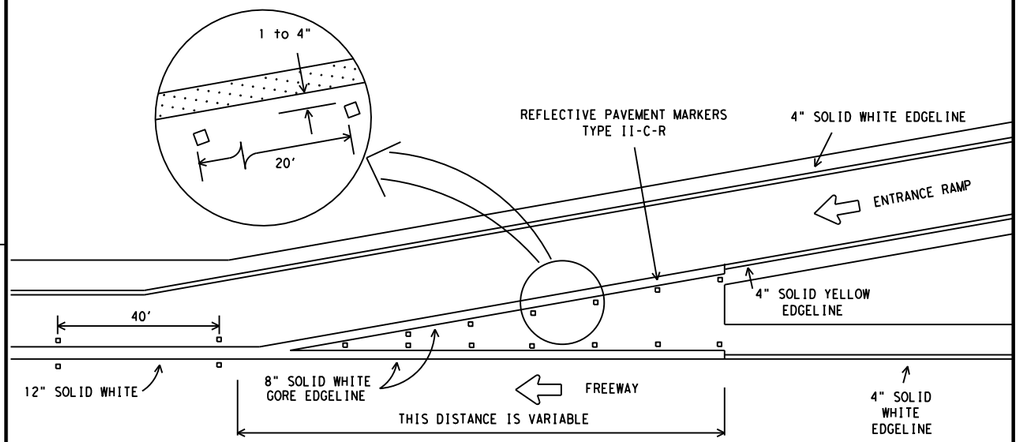
WRONG WAY ARROW DETAIL



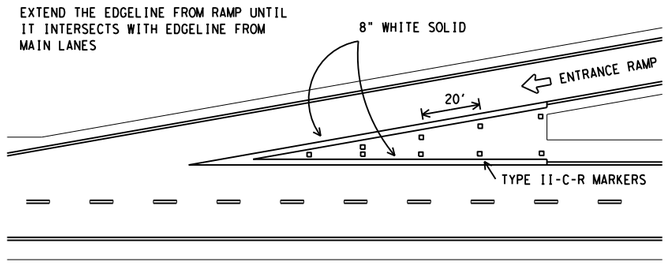
PARALLEL ACCELERATION LANE



TYPICAL EXIT RAMP GORE MARKING



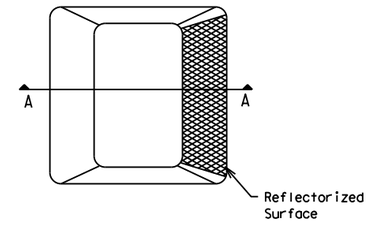
TYPICAL ENTRANCE RAMP GORE MARKING



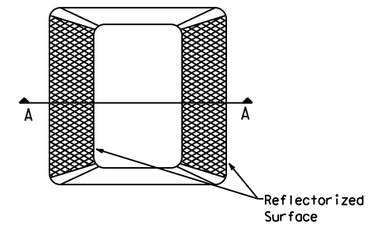
TAPERED ACCELERATION LANE

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

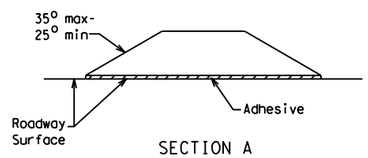
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS WITH RAISED PAVEMENT MARKERS

FPM(1)-12

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS		CONT	SECT	JOB	HIGHWAY
4-92	2-10	0043	09	144,Etc	IH 44, Etc.
5-00	2-12	DIST	COUNTY		SHEET NO.
8-00		WFS	WICHITA		98
2-08					

23A

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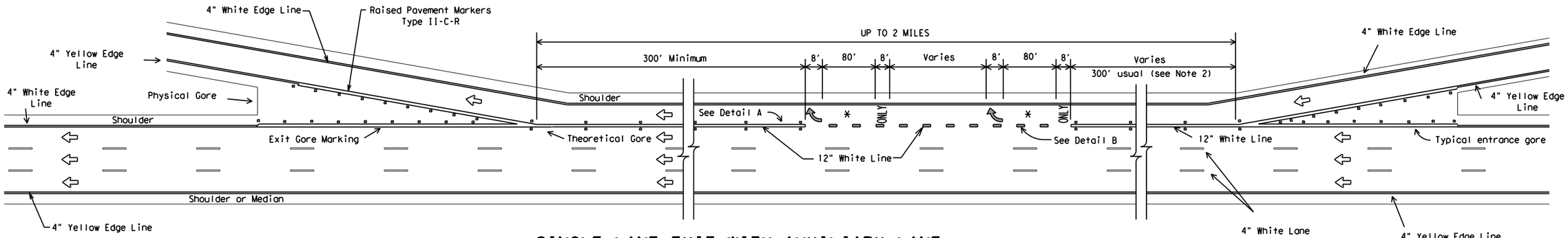
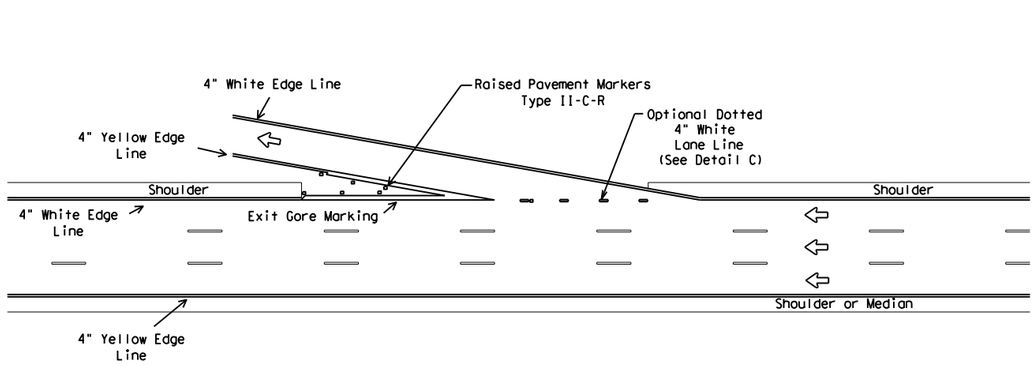
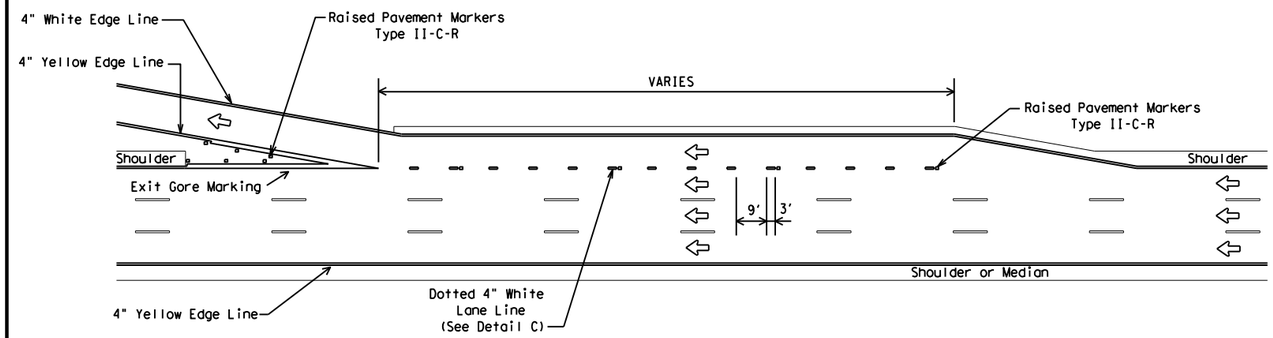


SINGLE LANE EXIT WITH AUXILIARY LANE

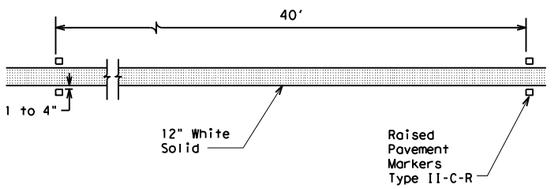
(See Note 2)



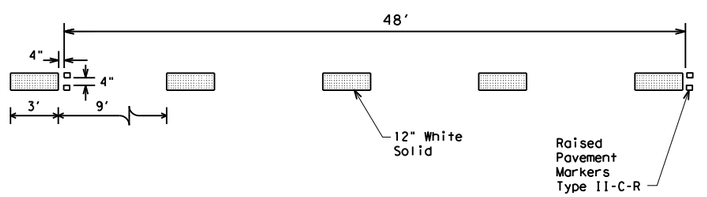
TAPERED DECELERATION LANE



PARALLEL DECELERATION LANE

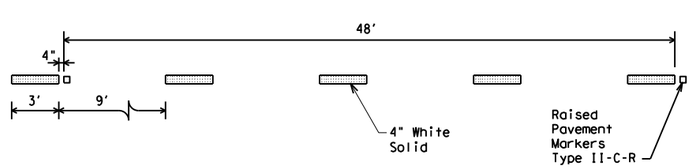


DETAIL A



DETAIL B

Wide (12") Dotted Lane Line (See Note 3)



DETAIL C

Normal (4") Dotted Lane Line (See Note 4)

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 Detail B) is used to separate a through lane from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.
4. Normal (4") Dotted Lane Line (See Detail C) is used at parallel acceleration and deceleration lanes.

LEGEND	
⇦	Denotes direction of traffic.
↱	Pavement marking arrows (white)
✳	Arrow markings are optional, however "ONLY" is required if arrow is used

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

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS ENTRANCE AND EXIT RAMPS

FPM(2)-12

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
4-92 2-10
8-95 2-12
5-00
8-00

CONT	SECT	JOB	HIGHWAY
0043	09	144,Etc	IH 44, Etc.
DIST	COUNTY		SHEET NO.
WFS	WICHITA		99

23B

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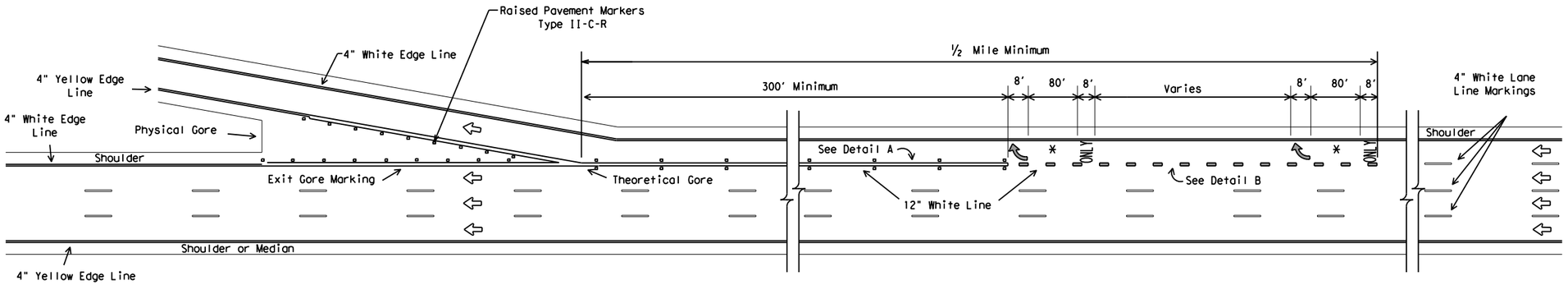
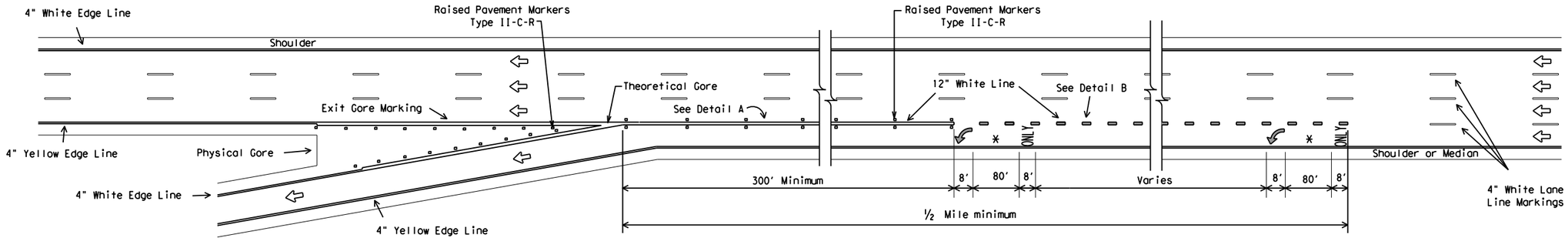


SINGLE LANE EXIT - LANE DROP OR EXIT ONLY

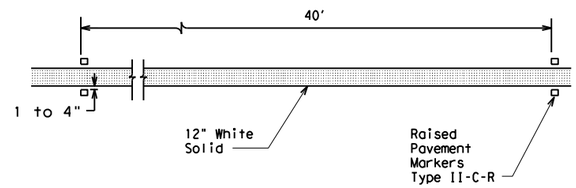


SINGLE LANE EXIT - LANE DROP OR EXIT ONLY (LEFTHAND)

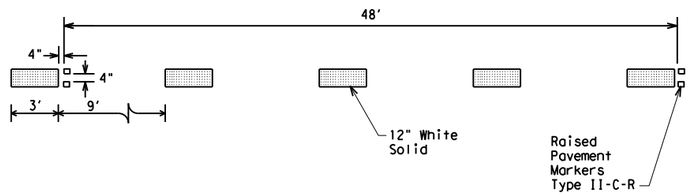
LEGEND	
⇦	Denotes direction of traffic.
↱	Pavement marking arrows (white)
✳	Arrow markings are optional, however "ONLY" is required if arrow is used

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 Detail B) is used to separate a through lane from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.



DETAIL A



DETAIL B

Wide (12") Dotted Lane Line (See Note 3)

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

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

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS LANE DROP (EXIT ONLY) EXIT RAMPS

FPM(3)-12

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
5-00
8-00
2-10
2-12

CONT	SECT	JOB	HIGHWAY
0043	09	144,Etc	IH 44, Etc.

DIST	COUNTY	SHEET NO.
WFS	WICHITA	100

23C

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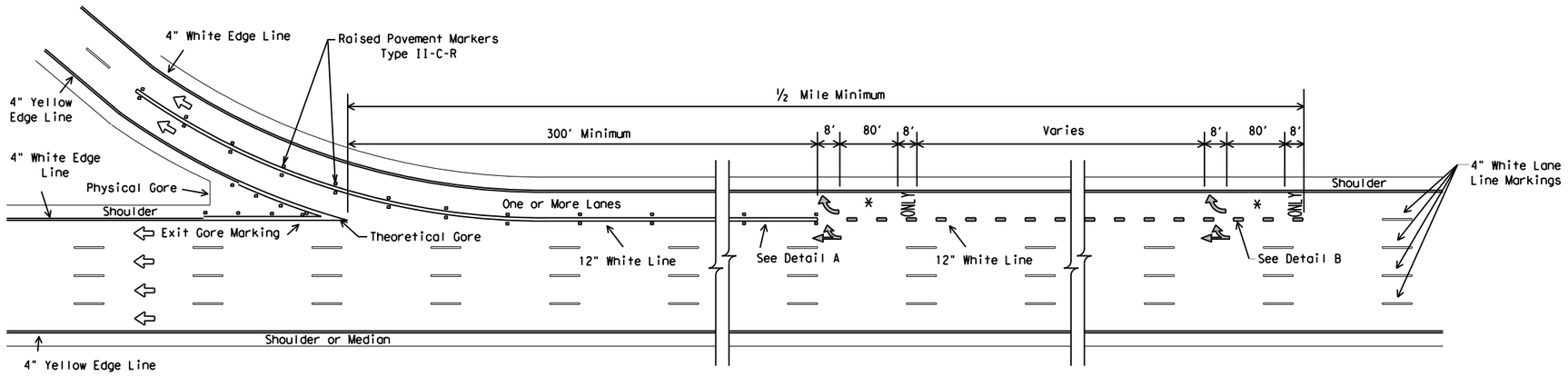
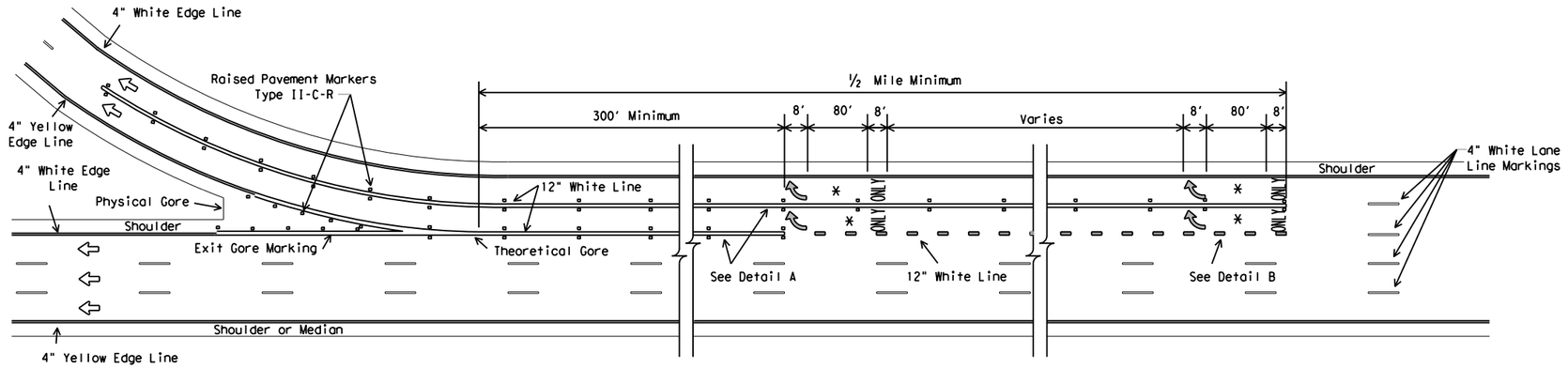


MULTIPLE LANE EXIT - EXIT ONLY WITH OPTION LANE

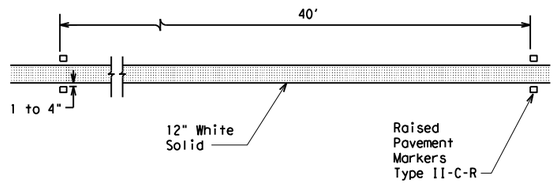


MULTIPLE LANE EXIT ONLY

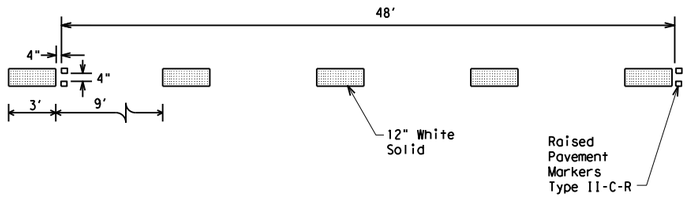
LEGEND	
⇦	Denotes direction of traffic
	Pavement marking arrow (white)
	Optional Pavement Marking Arrows (white)
✳	Arrow markings are optional, however "ONLY" is required if arrow is used

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 Detail B) is used to separate a through lane from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.



DETAIL A



DETAIL B

Wide (12") Dotted Lane Line (See Note 3)

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

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

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS LANE DROP (EXIT ONLY) DETAILS

FPM(4)-12

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
5-00
8-00
2-10
2-12

CONT	SECT	JOB	HIGHWAY
0043	09	144,Etc	IH 44, Etc.
DIST	COUNTY		SHEET NO.
WFS	WICHITA		101

23D

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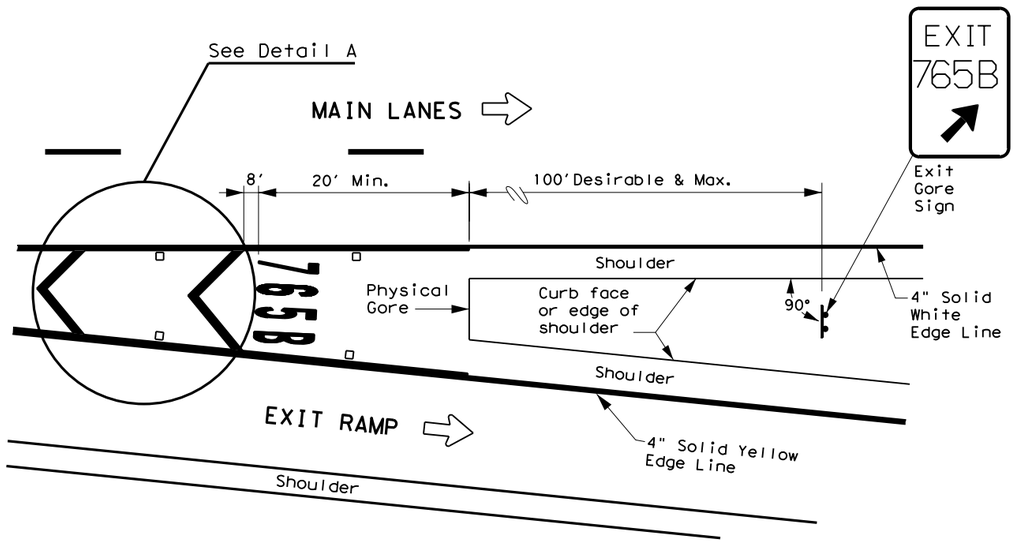
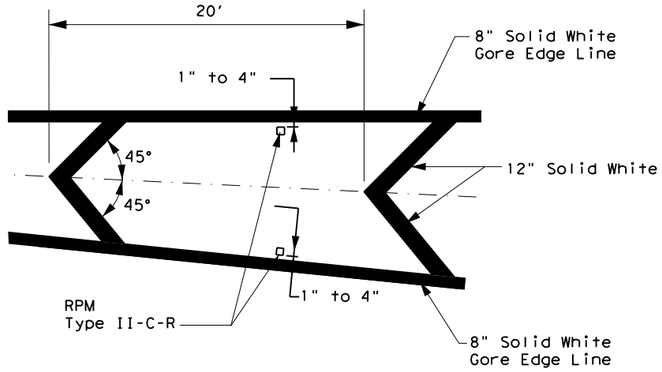
EXIT NUMBER PAVEMENT MARKING NOTES

1. Minimum 8 foot white 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. All pavement marking materials shall meet the required Departmental Material Specifications or as specified in these plans.
5. Numbers and Letters details can be found in the Standard Highway Design for Texas (SHSD) Chapter 12 at http://www.txdot.gov



MARKINGS WITH EXIT NUMBER



NOTES

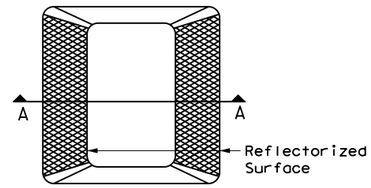
1. Raised pavement markers shall be centered between chevron or gore lines.
2. For more information, see Reflectorized Raised Pavement Marker Detail.

DETAIL A

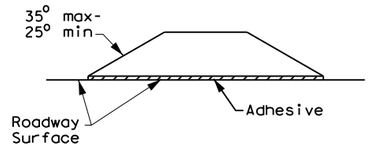
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

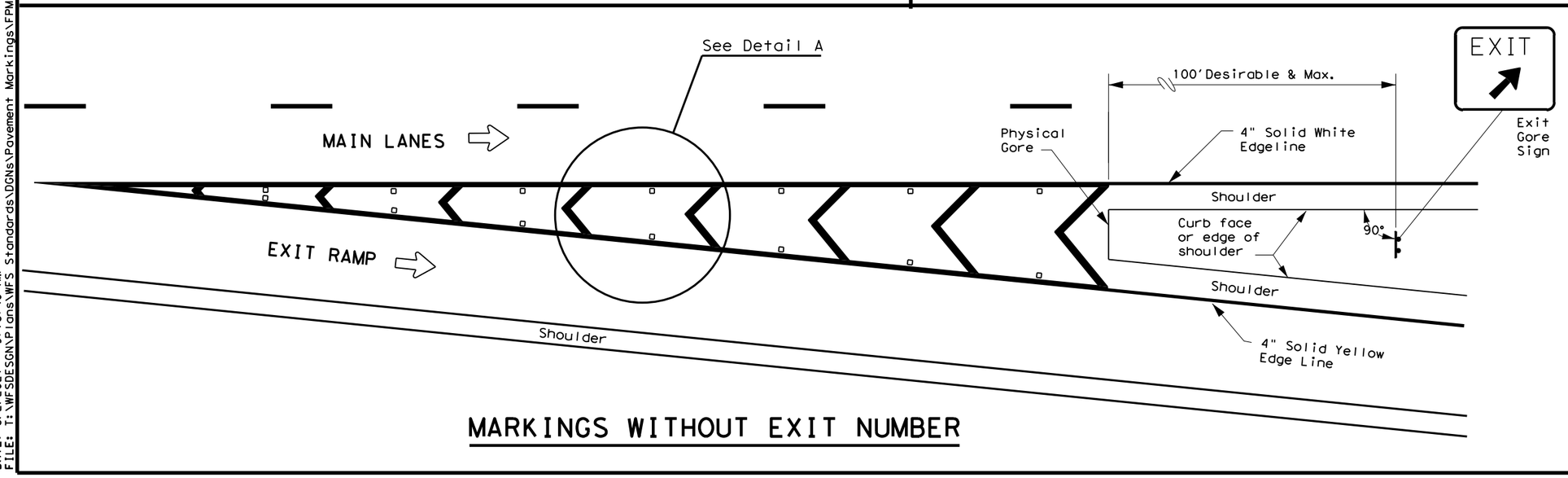
LEGEND	
⇦	Traffic flow
▫	Reflectorized Raised Markers (RPM) Type II-C-R



Type II (Top View)



SECTION A



MARKINGS WITHOUT EXIT NUMBER

REFLECTORIZED RAISED PAVEMENT MARKER (RPM)

Texas Department of Transportation

Traffic Safety Division Standard

EXIT GORE PAVEMENT MARKINGS

FPM(5)-19

FILE: fpm(5)-19.dgn	DN:	CK:	DW:	CK:
© TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	09	144,Etc	IH 44, Etc.
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		102

23F

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I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1. City of Wichita Falls

☐ No Action Required ☑ Required Action

Action No.

LESS THAN 1 ACRE:
1. The project disturbs less than one acre of surface area. The contractor is responsible for the PSL as defined in the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges. The total disturbed acreage is the combined acreage to be disturbed on the project and the contractors PSL.
2. Prevent stormwater pollution by controlling erosion and sedimentation to the maximum extent practical. Comply with the SW3P and revise as necessary or as required by the Engineer.
3. This EPIC must be updated if the disturbed area increases to one or more acres during the course of construction.
4. It may become necessary to post a site notice and/or NOI for the project and/or PSL in a location accessible to the public and TCEQ, EPA, or other inspector if the disturbed area increases to more than 1 acre.

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

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☑ No Permit Required
☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
☐ Individual 404 Permit Required
☐ Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☐ Temporary Vegetation	☑ Silt Fence	☐ Vegetative Filter Strips
☐ Blankets/Matting	☐ Rock Filter Dams	☐ Retention/Irrigation Systems
☐ Mulch	☐ Vegetative Filter Strips	☐ Extended Detention Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost
☐ Erosion Control Compost	☑ Erosion Control Logs	☐ Mulch Filter Berm and Socks
☐ Mulch Filter Berm and Socks	☐ Mulch Filter Berm and Socks	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☐ Vegetation Lined Ditches
	☐ Stone Outlet Sediment Traps	☐ Sand Filter Systems
	☐ Sediment Basins	☐ Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☐ No Action Required ☑ Required Action

Action No.

1. Work outside the TxDOT Right of Way is not authorized without prior coordination with the TxDOT Environmental Coordinator.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☐ No Action Required ☑ Required Action

Action No.

1. Vegetation disturbances should be limited to the minimum necessary to complete the project.
2. Trim rather than removing trees or shrubs, whenever possible. Prior to impacting trees and shrubs check for birds, bees, bats and other wildlife.
3. Re-vegetation of disturbed areas shall be done in accordance with TxDOT's standard practices for rural areas in compliance with the Executive Memorandm on Beneficial Landscaping.

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

☐ No Action Required ☑ Required Action

Action No.

1. Migratory Bird Treaty Act: Migratory birds may arrive in the project area to breed during construction of the proposed project. Measures would be taken to avoid the take of migratory birds, their occupied nests, eggs, or young, in accordance with the Migratory Bird Treaty Act, through phasing of work or preventative measures. Between October 1 and February 15, the contractor would remove all old migratory bird nests from any structures that would be affected by the proposed project, and complete any bridge work/demolition and/or vegetation clearing. In addition, the contractor would be prepared to prevent migratory birds from building nests by utilizing nest prevention methods, such as bird-deterrent netting and bird-repelling sprays and/or gels, between February 15 and October 1. In the event that migratory birds are encountered on-site during project construction, adverse impacts on protected birds, active nests, eggs, and/or young would be avoided.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):
Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.
Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.
Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup
of all product spills.

Contact the Engineer if any of the following are detected:
* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

☑ Yes ☐ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☑ Yes ☐ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working daysprior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☑ No Action Required ☐ Required Action

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

☐ No Action Required ☑ Required Action

Action No.

1. Keep noise to a minimum. Reduce idling of vehicles and equipment.
2. Maintain project site. Minimize dust and airborne particles to the maximum extent practical.
3. Collect sanitary waste in accordance with local regulations by a sanitary waste collector. Portable units shall not be placed near a waterway or drainage area.

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR	
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0043	09	144,Etc	IH 44, Etc.	
12-12-2011 (DS)	DIST	COUNTY		SHEET NO.	
05-07-14 ADDED NOTE SECTION IV.	WFS	WICHITA		103	
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.					