SEE SHEET 2 FOR INDEX OF SHEETS

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 2024(778)TP		1
STATE	DIST.	COUNTY	
TEXAS	WFS	WICHITA	
CONT.	SECT.	JOB	HIGHWAY NO.
0043	08	088	US 287

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NO. : STP 2024(778)TP

CONTROL SECTION JOB : 0043-08-088

WICHITA COUNTY
US 287

US 287
MAINLANE DESIGN SPEED = 75 MPH
ADT (2021) = 16,748
FUNCTIONAL CLASSIFICATION: RURAL FREEWAY

FRONTAGE ROAD DESIGN SPEED (NB) = 30 MPH
ADT (2021) = 8

FRONTAGE ROAD DESIGN SPEED (SB) = 45 MPH
ADT (2021) = 17

RAMP DESIGN SPEED = 40 MPH
ADT (2021) = 322

LIMITS: FROM **SB US 287 REST AREA WEST OF IOWA PARK**
TO **NB US 287 REST AREA WEST OF IOWA PARK**

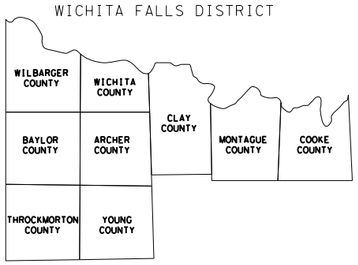
TOTAL LENGTH OF PROJECT =

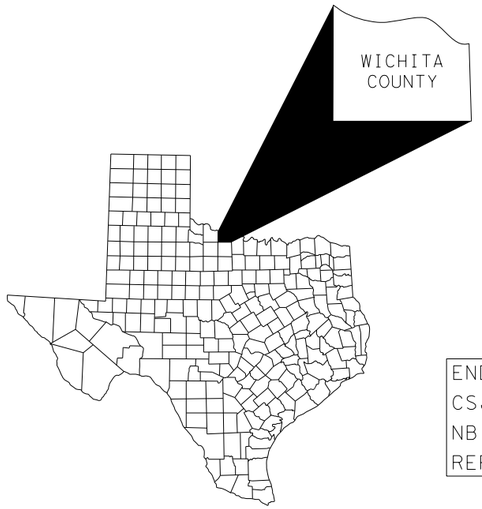
BRIDGE	=	0.00FT.	=	0.000MI.
ROADWAY	=	2766.72FT.	=	0.524MI.
TOTAL	=	2766.72FT.	=	0.524MI.

TYPE OF WORK: FOR THE CONSTRUCTION OF TRUCK PARKING AREAS
CONSISTING OF: GRADING, PAVING, SIGNING, PAVEMENT MARKINGS, AND ILLUMINATION

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

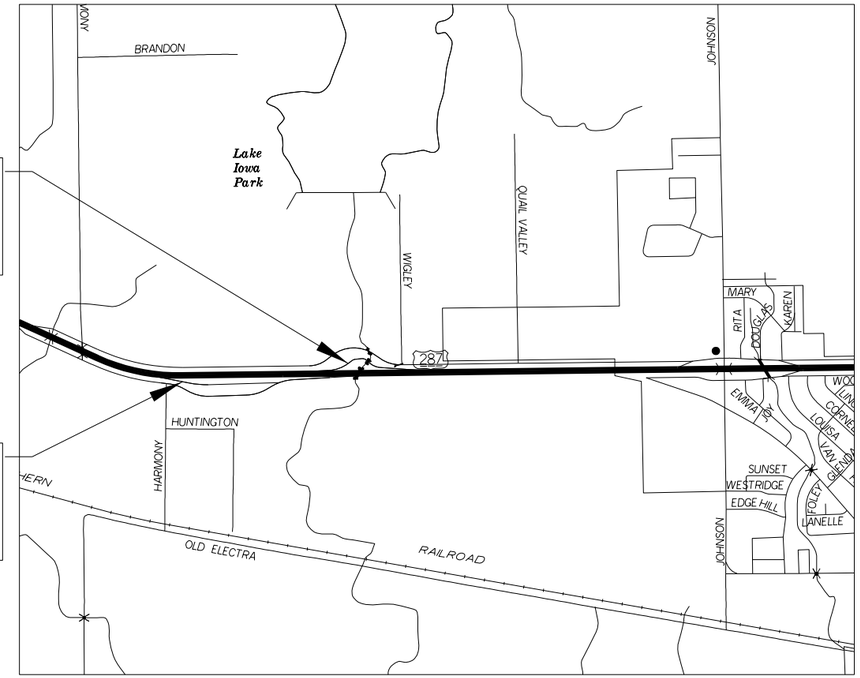
WICHITA FALLS DISTRICT





END PROJECT
CSJ: 0043-08-088
NB RAMP STA. 1950+58.41
REF. MARKER 330-0.159

BEGIN PROJECT
CSJ: 0043-08-088
SB RAMP STA. 2922+59.49
REF. MARKER 330-0.683



NOT TO SCALE

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, OCTOBER 2023).

Texas Department of Transportation ®
© TxDOT 2023

SUBMITTED FOR LETTING 12/21/2023
Bryson Lawrence, P.E.
DESIGN ENGINEER

RECOMMENDED FOR LETTING 12/22/2023
James S. Reaves P.E.
DISTRICT DIRECTOR OF TRANSPORTATION PLANNING AND DEVELOPMENT

RECOMMENDED FOR LETTING 12/22/2023
Michael D. Brown P.E.
DISTRICT ENGINEER

AtkinsRéalis
11801 DOMAIN BLVD SUITE 500
AUSTIN, TEXAS 78758
TBPE REG: NO. F-474

COUNTY WICHITA PROJ. NO. STP 2024(778)TP
HWY. NO. US 287 LETTING DATE _____
DATE ACCEPTED _____

FILE: ...\US 287\TITLESHEET.dgn
DATE: 12/19/2023

100% SUBMITTAL
DATE: 12/19/2023 TIME: 8:54:27 AM

SHEET NO.	DESCRIPTION
	GENERAL
1	TITLE SHEET
2	INDEX OF SHEETS
3, 3A-3C	GENERAL NOTES
4, 4A-4B	E&Q SHEETS
5	SUMMARY OF TRAFFIC CONTROL PLAN QUANTITIES
6	SUMMARY OF REMOVAL QUANTITIES
7	SUMMARY OF ROADWAY QUANTITIES
8	SUMMARY OF DRAINAGE QUANTITIES
9	SUMMARY OF STRIPING AND SIGNING QUANTITIES
10	SUMMARY OF ITS ILLUMINATION QUANTITIES
11	SUMMARY OF EROSION CONTROL QUANTITIES
12	PROJECT LAYOUT
13	TYPICAL SECTIONS - NORTHBOUND RAMP
14	TYPICAL SECTIONS - PARKING LOTS
	TRAFFIC CONTROL PLAN
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16-18	TCP LAYOUT NB RAMP AND NB PARKING LOT PHASE 1
19-21	TCP LAYOUT NB RAMP AND NB PARKING LOT PHASE 2
22-23	TCP LAYOUT SB PARKING LOTS PHASE 1A
24-25	TCP LAYOUT SB PARKING LOTS PHASE 1B
26-27	TCP LAYOUT SB PARKING LOTS PHASE 2
	TCP STANDARDS
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40	* TCP(1-1)-18
41	* TCP(3-2)-13
42	* TCP(3-3)-14
43	* TCP(5-1)-18
44	* TCP(6-1)-12
45	* TCP(6-2)-12
46	* TCP(6-4)-12
47	* TCP(6-8)-14
48	* WZ(STPM)-23
49	* WZ(BRK)-13
50-51	* CSB(1)-10
52	* ABSORB(M)-19
53	* SLED -19
54	* VIA(SFPM)- 19
	ROADWAY
55	SURVEY CONTROL INDEX SHEET
56	HORIZONTAL AND VERTICAL CONTROL SHEET
57	ALIGNMENT DATA
58-60	REMOVAL LAYOUT
61	NORTHBOUND PARKING LOT GRADING PLAN
62-63	SOUTHBOUND PARKING LOT GRADING PLAN
64-65	NORTHBOUND RAMP RECONSTRUCTION
66	NORTHBOUND PARKING LOT LAYOUT
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71	* JS - 14
72	* CCCG - 22
73-76	* PED - 18
77-78	* TRB - 15(1) AND TRB - 15(2)
	DRAINAGE
79	DRAINAGE AREA MAP AND HYDROLOGIC DATA
80	HYDRAULIC DATA SHEET
81	DRAINAGE DETAIL - SIDEWALK

SHEET NO.	DESCRIPTION
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83	EXISTING UTILITY LAYOUTS OVERALL LAYOUT
84-87	EXISTING UTILITY LAYOUTS
88	EXISTING UTILITY LAYOUTS SB REST AREA
89	EXISTING UTILITY LAYOUTS NB REST AREA
	SIGNING AND PAVEMENT MARKINGS
90-92	SIGNING AND PAVEMENT MARKING PLAN
93	SIGN DETAILS
94	SUMMARY OF SMALL SIGNS
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97	** FPM(2) - 22
98	** SMD(GEN) - 08
99	** SMD(SLIP-1) - 08
100	** SMD(SLIP-2) - 08
101	** SMD(SLIP-3) - 08
102	** SMD(TWT) - 08
103	** SMD(FRP) - 08
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107	** D & OM (4) - 20
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114	ITS COMMUNICATION DIAGRAMS
115-116	PANEL SCHEDULE
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119	** ED(4) - 14
120	** ED(11) - 14
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130-131	STORM WATER POLLUTION PREVENTION PLAN (SW3P)
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133-135	EROSION CONTROL PLAN
	ENVIRONMENTAL STANDARDS
136	* EC(1) - 16
137	* EC(2) - 16
138	* EC(3) - 16
139	* EC(6) - 16
140-142	* EC(9) - 16

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

LACEY L. HEBERT, P.E. 134840 , 12/19/2023 DATE

STATE OF TEXAS
LACEY L. HEBERT
134840
LICENSED
PROFESSIONAL ENGINEER
12/19/2023
Lacey L Hebert, PE

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

JENELLE N. ROMERO, P.E. 97940 , 12/19/2023 DATE

STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER
12/19/2023
Jenelle N Romero, P.E.

AtkinsRéalis
11801 DOMAIN BLVD STE 500
AUSTIN, TEXAS 78758
PH (512) 327-6840
TBPE REG; NO. F-474

 Texas Department of Transportation

US 287 REST AREAS

INDEX OF SHEETS

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	2
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_indexsht.dgn

GENERAL NOTES

Basis of Estimate:

Item - Description	Rate*	Unit
166 - Fertilizer	100 LB of Nitrogen / acre with a 3:1:1 ratio of N, P, K	LB
168 - Vegetative Watering	1.4 GAL/SY per Application every week for 3 months	MG
275 - Cement	3% by weight Est @ 120 LB /Cu Ft	TON
3076 – Dense Graded Hot Mix Asphalt	110 LB / SY / Inch	TON
3084 – Bonding Course	0.06 Gal / SY Residual Asphalt (For New Asphalt Overlay)	GAL

*For Contractor's information only, actual production rates may vary.

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

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

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

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

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.

The progress schedule format shall be critical path method unless otherwise directed.

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

Item 6 - Control of Materials

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

Refer to the Buy America Material Classification Sheet for clarification on material categorization.

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

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

Item 7 - Legal Relations and Responsibilities

- No significant traffic generator events identified for this project.

Use an all-weather material in conjunction with item 7.2.4. This work will not be paid for directly, but will be subsidiary to various bid items.

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

For this project, contract time will be computed as described in Item 8 based on a Standard Workweek (8.3.1.4.)

Item Specific

Item 100 – Preparing Right of Way
Areas of brush removal and tree trimming shown in the plans will be paid for under Item 100, Preparing Right of Way. Mulch and/or shred brush and trimmed limbs and place material on the backslope in those areas as an erosion deterrent. Follow procedures for tree trimming as shown on Maintenance Standard TRB-15(1).

Item 132 - Embankment
All borrow/aggregate sites shall meet the requirements of the Texas Aggregate Quarry and Pit Safety Act which can be found at https://www.txdot.gov/business/resources/materials/aggregate-quarry-pit-safety.html This material shall consist of suitable earth material such as loam, clay or other materials that will form a stable embankment and be free from vegetation or other objectionable matter. Any embankment needed from a borrow pit must first be approved by the Engineer.

Windrow approximately 4" of existing grass and topsoil adjacent to the right of way line or vegetative buffer zone prior to beginning earthwork operations. Upon completion of earthwork operations scarify the slopes and ditches longitudinally to a depth of approximately 4 inches and return the windrowed material to the slopes and the ditches as a permanent erosion control measure. This work will not be paid for directly but is considered subsidiary to the various bid items.

Item 164 - Seeding for Erosion Control
Temporary seeding will be required in several small areas as work progresses to comply with the storm water pollution prevention plan and may require multiple mobilizations of seeding crew. The Engineer may blend temporary and permanent seeding according to the temperatures and time of year in order to achieve maximum coverage in the least amount of time.

The contractor is responsible for the protection and maintenance of all seeded areas until final acceptance of the project. Maintenance includes:

1. Protection of seeded and mulched areas against traffic.

2. Mowing of weeds and tall vegetation, if needed, to prevent loss of soil moisture or choking out of grass seedlings. Mowing will be done as directed by the Engineer and will not be paid for directly.

Item 166 - Fertilizer
Fertilize all areas of the project that are seeded.

Item 168 - Vegetative Watering
Water as directed by the Engineer all areas that receive seed to sustain grass growth to obtain a minimum 70% vegetative cover within the right of way. This may require the contractor to water the newly established grass for a period of up to three months after all other work on the contract is completed and before the project is accepted. Watering shall be done at times determined by the Engineer in order to minimize any loss due to evaporation.

Item 275 – Cement Treatment (Road Mixed)
Cement percentage in the Basis of Estimate are for estimating purposes only. The target range value of 150 to 200 psi Unconfined Compressive Strength is required.

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.

The Contractor's person responsible for TCP compliance is available by local telephone 24 hours a day and must respond to traffic control needs within 45 minutes of being notified.

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.

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.

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.

Contractor shall not set up traffic control at multiple locations. All work and traffic control operations shall be complete prior to advancing to next location unless otherwise directed by the Engineer.

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.

Item 506 - Temporary Erosion, Sedimentation, and Environmental Controls

The disturbed area for this project, as shown on the plans, is 0.95 acres. The total disturbed area (TDA) will establish the required authorization for storm water discharges. The TDA of the project will be determined as described by the Environmental Permits Issues and Commitments (EPIC) sheet.

Contractor shall meet the requirements for the Project SW3P binder as described on the SW3P sheet.

The Contractor shall collect and dispose of all waste material as required by the Storm Water Pollution Prevention Plan (SW3P).

If sediment escapes the construction site, immediately stop all work on the project, remove the sediment, and modify the SW3P site plan to prevent future non-compliance issues.

The Contractor shall meet the requirements for concrete truck washouts as described in Part V of the TPDES General Permit TXR150000. This work including materials and labor will not be measured or paid for directly but will be subsidiary to Item 506.

Anticipate multiple mobilizations for SWP3 work.

Verify locations and dimensions of BMP's and obtain the Engineer's approval prior to placement. BMP locations indicated on the plans are approximate and may be adjusted as necessary by the Engineer.

Item 618 - Conduit

Install pits for jacking and boring PVC conduit a minimum of 3 feet from the back of the curb or the outside edge of the shoulder.

Where PVC, duct cable, and HDPE conduit 1" and larger is allowed and installed as per TxDOT standards, provide a PVC elbow in place of the galvanized rigid metal elbow required by the Electrical Detail standards. Ensure the PVC elbow is of the same schedule rating as the conduit to which it is connected.

Ensure only a flat, high tensile strength polyester fiber pull tape is used for pulling conductors through the PVC conduit system. Leave one non-metallic pull string in each conduit for future use. This will be considered subsidiary to Item 618.

The location of conduits and ground boxes are diagrammatic only and may be shifted to accommodate field conditions as directed.

Secure permission and approval from the Engineer prior to cutting into or removing any sidewalks or curbs for installation of this Item.

Do not use a pneumatically driven device for punching holes beneath the pavement (commonly known as a "missile").

Use a colored cleaner-primer on all PVC to PVC joints before application of PVC cement.
Seal all conduit ends with lighting circuits with polyurethane foam approved by the Engineer that will not adversely affect other plastic materials or corrode metals.

Existing conduit shall not be reused.

Avoid crossing high and low voltage cables in ground boxes where possible.

2" Schedule 80 PVC will be used at the power pole to supply electricity to underground services.

Item 620 – Electrical Conductors

Where conductors are spliced in ground boxes, provide Tyco Gel splices or equivalent, and use option 3 as shown on ED(3)-14.

Maintain conductor color continuity throughout the entire system.

Item 644 – Small Roadside Sign Assemblies

TxDOT will provide the slip base, stub, and base hardware for all slip base assemblies. TxDOT will also provide the socket and wedge for all thin wall tubing assemblies.

The Wichita Falls Maintenance office will provide the materials noted above for the new signs on this project. Contact the Wichita Falls Area Office at least 45 days prior to placing signs to allow ample time to order required bases.

Item 658 - Delineator and Object Marker Assemblies
Use wedge anchor system (WAP) for all delineators and object markers on this project.

Cast wedge anchor system for object markers into proposed headwalls as directed by the Engineer.

Item 662 – Work Zone Pavement Markings
Use traffic buttons in conjunction with removable temporary work zone pavement markings.

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.

Type I striping to be placed on contract for the retracing of existing markings and may begin prior to sealcoat operations.

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 677 – Eliminating Existing Pavement Markings and Markers
Removal of existing stripe will be paid for under Item 677, Eliminate Existing Pavement Markings and Markers. Use Blasting or Mechanical Method for the removal of existing striping. Polydot the locations of the proposed work zone pavement markings and obtain approval from the Engineer prior to placement.

Item 3076 – Dense-Graded Hot-Mix Asphalt
In accordance with Production Sampling the sampler will split each sample into three (3) equal portions in accordance with TEX-200-F and label these portions as “Contractor, “Engineer”, and

“Referee”. Deliver Engineer and Referee samples to the Wichita Falls Area Office Laboratory for testing.

Provide mixture Type B using PG binder 70-22 and Type D using PG binder 70-28. No Substitute PG Binder will be allowed on this project.

The use of Recycled Asphalt Shingles (RAS) or Recycled Asphalt Pavement (RAP) will not be permitted in the surface mix for this project.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0043-08-088 **DISTRICT** Wichita Falls **COUNTY** Wichita
HIGHWAY US 287

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0043-08-088**			
		PROJECT ID		**A00191028**			
		COUNTY		**Wichita**			
		HIGHWAY		**US 287**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	100-6006	PREP ROW (TREE)(LESS THAN 24" DIA)	EA	7.000		7.000	
	104-6015	REMOVING CONC (SIDEWALKS)	SY	83.000		83.000	
	104-6021	REMOVING CONC (CURB)	LF	2,357.000		2,357.000	
	105-6026	REMOVE STAB BASE & ASPH PAV (13"-18")	SY	7,350.000		7,350.000	
	110-6001	EXCAVATION (ROADWAY)	CY	6,722.000		6,722.000	
	132-6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	2,336.000		2,336.000	
	160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY	11,287.000		11,287.000	
	162-6002	BLOCK SODDING	SY	1,331.000		1,331.000	
	164-6009	BROADCAST SEED (TEMP) (WARM)	SY	5,644.000		5,644.000	
	164-6011	BROADCAST SEED (TEMP) (COOL)	SY	5,644.000		5,644.000	
	164-6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	9,956.000		9,956.000	
	166-6001	FERTILIZER	AC	1.460		1.460	
	168-6001	VEGETATIVE WATERING	MG	139.560		139.560	
	192-6003	PLANT MATERIAL (3-GAL)	EA	1.000		1.000	
	192-6006	PLANT MATERIAL (30-GAL)	EA	4.000		4.000	
	192-6007	PLANT MATERIAL (45-GAL)	EA	2.000		2.000	
	275-6001	CEMENT	TON	188.000		188.000	
	275-6010	CEMENT TREAT (SUBGRADE) (8")	SY	4,046.000		4,046.000	
	275-6019	CEMENT TREAT (SUBGRADE)(6")	SY	17,390.000		17,390.000	
	360-6004	CONC PVMT (CONT REINF - CRCP) (10")	SY	16,658.000		16,658.000	
	416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	264.000		264.000	
	420-6074	CL C CONC (MISC)	CY	1.140		1.140	
	432-6001	RIPRAP (CONC)(4 IN)	CY	83.000		83.000	
	471-6003	GRATE & FRAME	EA	3.000		3.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	8.000		8.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	60.000		60.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	60.000		60.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	224.000		224.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	224.000		224.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	360.000		360.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	360.000		360.000	
	506-6040	BIODEG EROSN CONT LOGS (INSTL) (8")	LF	480.000		480.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	480.000		480.000	
	512-6005	PORT CTB (FUR & INST)(F-SHAPE)(TY 1)	LF	2,100.000		2,100.000	
	512-6053	PORT CTB (REMOVE)(F-SHAPE)(TY 1)	LF	2,100.000		2,100.000	
	529-6005	CONC CURB (MONO) (TY II)	LF	4,860.000		4,860.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0043-08-088 **DISTRICT** Wichita Falls **COUNTY** Wichita
HIGHWAY US 287

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0043-08-088**			
		PROJECT ID		**A00191028**			
		COUNTY		**Wichita**			
		HIGHWAY		**US 287**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	531-6001	CONC SIDEWALKS (4")	SY	330.000		330.000	
	531-6005	CURB RAMPS (TY 2)	EA	3.000		3.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)	EA	1.000		1.000	
	545-6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	1.000		1.000	
	610-6004	RELOCATE RD IL ASM (TRANS-BASE)	EA	4.000		4.000	
	618-6023	CONDT (PVC) (SCH 40) (2")	LF	4,180.000		4,180.000	
	620-6010	ELEC CONDR (NO.6) INSULATED	LF	11,665.000		11,665.000	
	624-6002	GROUND BOX TY A (122311)W/APRON	EA	5.000		5.000	
	624-6028	REMOVE GROUND BOX	EA	7.000		7.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2.000		2.000	
	644-6060	IN SM RD SN SUP&AM TYTWT(1)WS(P)	EA	18.000		18.000	
	644-6061	IN SM RD SN SUP&AM TYTWT(1)WS(T)	EA	13.000		13.000	
	644-6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA	3.000		3.000	
	644-6071	RELOCATE SM RD SN SUP&AM TY TWT	EA	4.000		4.000	
	644-6075	RELOCATE SM RD SN SUP&AM(SIGN ONLY)	EA	1.000		1.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	9.000		9.000	
	658-6092	INSTL DEL ASSM (D-DW)SZ 1(WFLX)GND	EA	17.000		17.000	
	662-6056	WK ZN PAV MRK REMOV (TRAF BTN) TY W	EA	94.000		94.000	
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	3,746.000		3,746.000	
	666-6018	REFL PAV MRK TY I (W)6"(DOT)(100MIL)	LF	331.000		331.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	1,065.000		1,065.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	681.000		681.000	
	666-6102	REF PAV MRK TY I(W)36"(YLD TRI)(100MIL)	EA	9.000		9.000	
	666-6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	2,825.000		2,825.000	
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	1,065.000		1,065.000	
	666-6180	REFL PAV MRK TY II (W) 12" (SLD)	LF	681.000		681.000	
	666-6225	PAVEMENT SEALER 6"	LF	455.000		455.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	2,825.000		2,825.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	455.000		455.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	1,908.000		1,908.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	77.000		77.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	79.000		79.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	3,738.000		3,738.000	
	678-6001	PAV SURF PREP FOR MRK (4")	LF	2,825.000		2,825.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF	848.000		848.000	
	678-6006	PAV SURF PREP FOR MRK (12")	LF	799.000		799.000	
	678-6023	PAV SURF PREP FOR MRK (36")(YLD TRI)	EA	9.000		9.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0043-08-088 **DISTRICT** Wichita Falls **COUNTY** Wichita
HIGHWAY US 287

							TOTAL EST.	TOTAL FINAL
			CONTROL SECTION JOB		**0043-08-088**			
			PROJECT ID		**A00191028**			
			COUNTY		**Wichita**			
			HIGHWAY		**US 287**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**		EST.	FINAL		
	1004-6001	TREE PROTECTION	EA		5.000		5.000	
	3076-6006	D-GR HMA TY-B PG70-22	TON		2,142.000		2,142.000	
	3076-6044	D-GR HMA TY-D PG70-28	TON		410.000		410.000	
	3084-6001	BONDING COURSE	GAL		308.000		308.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY		28.000		28.000	
	6007-6001	FIBER OPTIC CBL (MULTI-MODE)(6 FIBER)	LF		290.000		290.000	
	6007-6021	FIBER OPTIC SPLICE ENCLOSURE	EA		1.000		1.000	
	6084-6001	MODIFY EXISTING ELECTRICAL SERVICE	EA		2.000		2.000	
	6163-6001	REMOVE EXISTING CABLES (FIBER)	LF		755.000		755.000	
	6163-6002	REMOVE EXISTING CABLES (POWER)	LF		4,335.000		4,335.000	
	6185-6002	TMA (STATIONARY)	DAY		28.000		28.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY		28.000		28.000	
	6186-6002	ITS GND BOX(PCAST) TY 1 (243636)W/APRN	EA		4.000		4.000	
	6186-6008	ITS GND BOX(PCAST) TY 2 (366036)W/APRN	EA		1.000		1.000	
	6512-6001	AESTHETIC LIGHTING FIXTURE & POLE	EA		33.000		33.000	
	6512-6002	AESTHTIC LGHT FIXTURE & POLE (LUM ONLY)	EA		1.000		1.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS		1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS		1.000		1.000	

100% SUBMITTAL
DATE: 12/7/2023 TIME: 9:52:37 AM

SUMMARY OF TRAFFIC CONTROL QUANTITIES

ITEM NO. DESC. CODE				512 6005	512 6053	545 6019	545 6005	662 6056	662 6063	6001 6001	6185 6002	6185 6005
LOCATION		BEGINING STATION	ENDING STATION	PORT CTB (FUR & INST)(F-SHAPE)(TY 1)	PORT CTB (REMOVE)(F-SHAPE)(TY 1)	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	CRASH CUSH ATTEN (REMOVE)	WK ZN PAV MRK REMOV (TRAF BTN) TY W	WK ZN PAV MRK REMOV (W)4"(SLD)	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)
				LF	LF	EA	EA	EA	LF	DAY	DAY	DAY
NB Ramp and Parking 1 of 3	Phase 1	1925+00	1935+00	1073	1073			54	2146			
NB Ramp and Parking 2 of 3	Phase 1	1935+00	1945+00	1002	1002			40	1600			
NB Ramp and Parking 3 of 3	Phase 1	1945+00	1955+00	25	25	1	1			28	28	28
NB Ramp and Parking 1 of 3	Phase 2	1925+00	1935+00									
NB Ramp and Parking 2 of 3	Phase 2	1935+00	1945+00									
NB Ramp and Parking 3 of 3	Phase 2	1945+00	1955+00									
SB Parking 1 of 2	Phase 1A	2925+00	2930+00									
SB Parking 2 of 2	Phase 1A	2930+00	2935+00									
SB Parking 1 of 2	Phase 1B	2925+00	2930+00									
SB Parking 2 of 2	Phase 1B	2930+00	2935+00									
SB Parking 1 of 2	Phase 2	2925+00	2930+00									
SB Parking 2 of 2	Phase 2	2930+00	2935+00									
PROJECT TOTAL				2100	2100	1	1	94	3746	28	28	28

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PH (512) 327-6840
TBPE REG: NO. F-474

 Texas Department of Transportation

US 287 REST AREAS
SUMMARY OF TRAFFIC CONTOL PLAN QUANTITIES

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2024(778)TP		US287
CHECK	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	WFS	WICHITA	5
CHECK	CONTROL	SECTION	JOB	
	0043	08	088	

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287__pentable.tbl
FILE: US 287_TCP QUAN.dgn

100% SUBMITTAL

DATE: 12/8/2023 TIME: 10:50:49 AM

SUMMARY OF REMOVAL QUANTITIES							
ITEM NO. DESC. CODE			100 6006	104 6015	104 6021	105 6026	677 6001
LOCATION	BEGINING STATION	ENDING STATION	PREP ROW (TREE)(LESS THAN 24" DIA)	REMOVING CONC (SIDEWALKS)	REMOVING CONC (CURB)	REMOVE STAB BASE & ASPH PAV (13"-18")	ELIM EXT PAV MRK & MRKS (4")
			EA	SY	LF	SY	LF
1 OF 3	1924+00	1933+00	5	83	1232	3798	1746
2 OF 3	1933+00	1943+50			277	1405	1992
3 OF 3	1943+50	1955+50	2		848	2147	
PROJECT TOTAL			7	83	2357	7350	3738

* ITEM 105 6020 INCLUDES REMOVAL OF ACP, ASPHALT STABILIZED BASE, AND FOUNDATION COURSE

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_REM QUAN.dgn

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US 287 REST AREAS
SUMMARY OF REMOVAL QUANTITIES

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2024(778)TP		US287
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	WFS	WICHITA	
CHECK	CONTROL	SECTION	JOB	6
	0043	08	088	

100% SUBMITTAL
DATE: 12/7/2023 TIME: 9:54:27 AM

SUMMARY OF ROADWAY QUANTITIES

ITEM NO. DESC. CODE			110 6001	132 6003	275 6001	275 6010	275 6019	360 6004	432 6001	529 6005	531 6001	531 6005	3076 6006	3076 6044	3084 6001
LOCATION	BEGINING STATION	ENDING STATION	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CEMENT	CEMENT TREAT (SUBGRADE) (8")	CEMENT TREAT (SUBGRADE)(6")	CONC PVMT (CONT REINF - CRCP) (10")	RIPRAP (CONC)(4 IN)	CONC CURB (MONO) (TY II)	CONC SIDEWALKS (4")	CURB RAMPS (TY 2)	D-GR HMA TY-B PG70-22	D-GR HMA TY-D PG70-28	BONDING COURSE
			CY	CY	TON	SY	SY	SY	CY	LF	SY	EA	TON	TON	GAL
Basis of Estimate					3% BY WEIGHT BASED ON 120 LB/CF								110 LB/SY-IN	110 LB/SY-IN	0.06 GAL/SY
NB Ramp 1 of 2	1925+26	1935+00	884	606	23	2062							1075	203	154
NB Ramp 2 of 2	1935+00	1943+38	1048	197	22	1984							1067	207	154
NB Parking 1 of 1	1943+38	1950+58	1230	517	48		5835	5603	74	1856	211	1			
SB Parking 1 of 2	2922+57	2930+00	526	886	47		5727	5493		1406	17	1			
SB Parking 2 of 2	2930+00	2937+23	3034	130	48		5828	5562	9	1598	102	1			
PROJECT TOTAL			6722	2336	188	4046	17390	16658	83	4860	330	3	2142	410	308

* BONDING COURSE APPLIED IN TWO LIFTS

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_RDY QUAN.dgn

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US 287 REST AREAS

SUMMARY OF ROADWAY QUANTITIES

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2024(778)TP		US287
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	WFS	WICHITA	7
CHECK	CONTROL	SECTION	JOB	
	0043	08	088	

100% SUBMITTAL

DATE: 11/14/2023 TIME: 5:09:16 PM

SUMMARY OF DRAINAGE QUANTITIES				
ITEM NO, DESC, CODE			420 6074	471 6003
LOCATION	BEGINING STATION	ENDING STATION	CL C CONC (MISC)	GRATE & FRAME
			CY	EA
NB Parking 1 of 1	1943+38	1950+58	1.14	3
PROJECT TOTAL			1.14	3

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_DRA_QUAN.dgn

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US 287 REST AREAS

SUMMARY OF DRAINAGE QUANTITIES

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS SD	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK RAW	TEXAS	WFS	WICHITA	8
CHECK JNR	CONTROL 0043	SECTION 08	JOB 088	

100% SUBMITTAL
DATE: 12/7/2023 TIME: 3:02:41 PM

SUMMARY OF STRIPING QUANTITIES												
ITEM NO. DESC.	ITEM 658	ITEM 666										
	658-6092	666-6018	666-6036	666-6042	666-6102	666-6170	666-6178	666-6180	666-6225	666-6303	666-6306	666-6309
PLAN SHEET NO.	INSTL DEL ASSM (D-DW)SZ 1(WFLX)GND	REFL PAV MRK TY I (W)6"(DOT) (100MIL)	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	REFL PAV MRK TY I (W)12"(SLD) (100MIL)	REF PAV MRK I(W)36"(YLD TRI)(100MIL)	REFL PAV MRK TY II(W) 4"(SLD)	REFL PAV MRK TY II(W) 8"(SLD)	REFL PAV MRK TY II(W) 12"(SLD)	PAVEMENT SEALER 6"	RE PM W/RET REQ TY I(W)4"(BRK) (100MIL)	RE PM W/RET REQ TY I(W)6"(BRK) (100MIL)	RE PM W/RET REQ TY I(W)6"(SLD) (100MIL)
	LF	LF	LF	LF	EA	LF	LF	LF	LF	LF	LF	LF
SHEET 1 OF 3	8	194	409	237		1580	409	237	218	1580	218	873
SHEET 2 OF 3	9	138	317	350	9	158	317	350	237	158	237	1035
SHEET 3 OF 3			339	94		1087	339	94		1087		
PROJECT TOTAL	**17**	**331**	**1065**	**681**	**9**	**2825**	**1065**	**681**	**455**	**2825**	**455**	**1908**

SUMMARY OF STRIPING QUANTITIES						
ITEM NO. DESC. CODE	ITEM 666	ITEM 672	ITEM 678			
	666-6321	672-6010	678-6001	678-6004	678-6006	678-6023
PLAN SHEET NO.	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	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 (36")(YLD TRI)
	LF	EA	LF	LF	LF	EA
SHEET 1 OF 3		30	1580	409	409	
SHEET 2 OF 3	77	49	158	100	51	9
SHEET 3 OF 3			1087	339	339	
PROJECT TOTAL	**77**	**79**	**2825**	**848**	**799**	**9**

SUMMARY OF SIGNING QUANTITIES							
ITEM NO. DESC. CODE							
	644-6004	644-6060	644-6061	644-6068	644-6071	644-6075	644-6076
PLAN SHEET NO.	IN SM RD SN SUP&AM TY 10BWG(1) SA (T)	IN SM RD SN SUP&AMTY TWT(1) WS(P)	IN SM RD SN SUP&AMTY TWT(1) WS(T)	RELOCATE SM RD SN SUP&AM TY 10BWG	RELOCATE SM RD SN SUP&AM TY TWT	RELOCATE SM RD SN SUP&AM (SIGN ONLY)	REMOVE SM RD SN SUP&AM
	EA	EA	EA	EA	EA	EA	EA
SHEET 1 OF 3		9	8	1	1	1	3
SHEET 2 OF 3	2	5	3	2	2		3
SHEET 3 OF 3		4	2		1		3
PROJECT TOTAL	**2**	**18**	**13**	**3**	**4**	**1**	**9**

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US 287 REST AREAS
SUMMARY OF STRIPING AND SIGNING QUANTITIES

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2024(778)TP		US287
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	WFS	WICHITA	9
CHECK	CONTROL	SECTION	JOB	
	0043	08	088	

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287__pentable.tbl
FILE: US 287_SPM QUAN.dgn

100% SUBMITTAL

DATE: 12/8/2023 TIME: 10:55:19 AM

SUMMARY OF ILLUMINATION QUANTITIES															
ITEM-CODE	416 6029	610 6004	618 6023	620 6010	624 6002	624 6028	6007 6001	6007 6021	6084 6001	6163 6001	6163 6002	6186 6002	6186 6008	6512 6001	6512 6002
DESCRIPTION	DRILL SHAFT (RDWY ILL POLE) (30	RELOCATE RD IL ASM (TRANS-BASE)	CONDT (PVC) (SCH 40) (2")	ELEC CONDR (NO.6) INSULATED	GROUND BOX TY A (122311) W/APRON	REMOVE GROUND BOX	FIBER OPTIC CBL (MULTI-MODE) (6 FIBER)	FIBER OPTIC SPLICE ENCLOSURE	MODIFY EXISTING ELECTRICAL SERVICE	REMOVE EXISTING CABLES (FIBER)	REMOVE EXISTING CABLES (POWER)	ITS GND BOX(PCAST) TY 1 (243636)W	ITS GND BOX(PCAST) TY 2 (366036)W	AESTHETIC SITE LIGHTING FIXTURE &	AESTHETIC SITE LIGHTING FIXTURE & POLE (LUM
UNIT	LF	EA	LF	LF	EA	EA	LF	EA	EA	LF	LF	EA	EA	EA	EA
SHEET 1 OF 3	96	3	1840	5140	2	2			1	335	2610	2		12	
SHEET 2 OF 3	64		890	2580		1				90	270	1		8	
SHEET 3 OF 3	104	1	1450	3945	3	4	290	1	1	330	1455	1	1	13	1
PROJECT TOTAL	264	4	4180	11665	5	7	290	1	2	755	4335	4	1	33	1

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_ILLUM QUAN.dgn

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TBPE REG: NO. F-474

US 287 REST AREAS
SUMMARY OF ITS ILLUMINATION QUANTITIES

SCALE: 1"=100' SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	
CHECK	CONTROL	SECTION	JOB	10
RAW				
CHECK	0043	08	088	
JNR				

100% SUBMITTAL
DATE: 11/14/2023 TIME: 5:10:17 PM

SUMMARY OF EROSION CONTROL QUANTITIES

ITEM NO. DESC. CODE			160 6003	162 6002	164 6009	164 6011	164 6035	166 6001	168 6001	192 6003	192 6006	192 6007	506 6002	506 6011	506 6020	506 6024	506 6038
LOCATION	BEGINING STATION	ENDING STATION	FURNISHING AND PLACING TOPSOIL (4")	BLOCK SODDING	BROADCAST SEED (TEMP) (WARM)	BROADCAST SEED (TEMP) (COOL)	DRILL SEEDING (PERM) (RURAL) (CLAY)	FERTILIZER	VEGETATIVE WATERING	PLANT MATERIAL (3-GAL)	PLANT MATERIAL (30-GAL)	PLANT MATERIAL (45-GAL)	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)
			SY	SY	SY	SY	SY	AC	MG	EA	EA	EA	LF	LF	SY	SY	LF
Basis of Estimate									1.4 GAL/SY EVERY WK FOR 3 MOS								
1 OF 3	1924+00	1933+00	4426	618	2213	2213	3808	0.59	57.95	1	3	1			112	112	220
2 OF 3	1933+00	1943+50	3755	462	1878	1878	3293	0.49	47.08				20	20			
3 OF 3	1943+50	1955+50	3106	251	1553	1553	2855	0.38	34.53		1	1	40	40	112	112	140
PROJECT TOTAL			11287	1331	5644	5644	9956	1.46	139.56	1	4	2	60	60	224	224	360

SUMMARY OF EROSION CONTROL QUANTITIES

ITEM NO. DESC. CODE			506 6039	506 6040	506 6043	1004 6001
LOCATION	BEGINING STATION	ENDING STATION	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (8")	BIODEG EROSN CONT LOGS (REMOVE)	TREE PROTECTION
			LF	LF	LF	EA
Basis of Estimate						
1 OF 3	1924+00	1933+00	220	240	240	2
2 OF 3	1933+00	1943+50		160	160	
3 OF 3	1943+50	1955+50	140	80	80	3
PROJECT TOTAL			360	480	480	5

** FOR ESTIMATION PURPOSES, THE LENGTH OF EACH ROCK FILTER DAM IS 20'.

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TBPE REG: NO. F-474

 Texas Department of Transportation

US 287 REST AREAS
SUMMARY OF EROSION CONTROL QUANTITIES

SHEET 1 OF 1

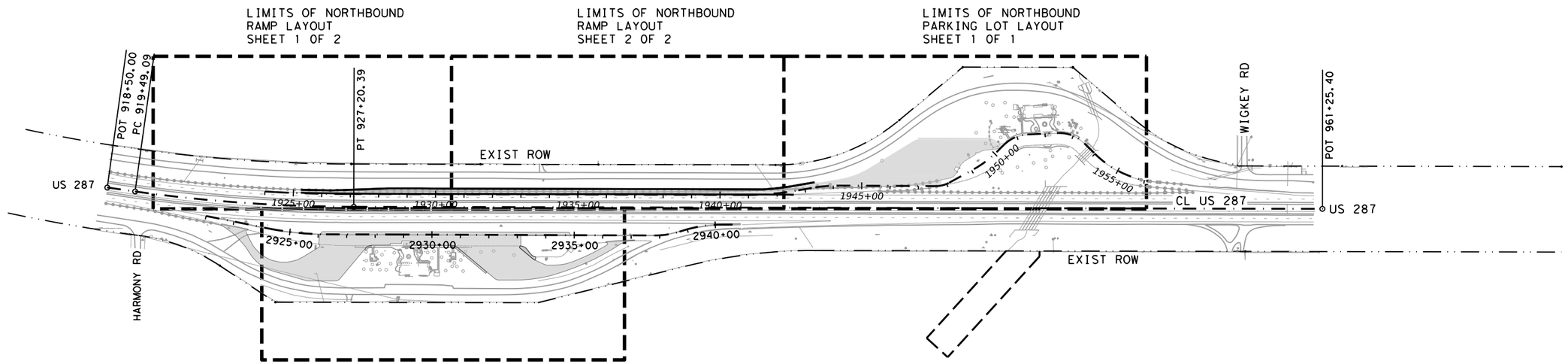
DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2024(778)TP		US287
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	WFS	WICHITA	11
CHECK	CONTROL	SECTION	JOB	
	0043	08	088	

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_SW3P QUAN.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 11:28:42 AM

SCALE = 1"=400' H



JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS
12/11/2023

AtkinsRéalis
11801 DOMAIN BLVD STE 500
AUSTIN, TEXAS 78758
PH (512) 327-6840
TBPE REG: NO. F-474

 Texas Department of Transportation

US 287 REST AREAS

PROJECT LAYOUT

SCALE: 1"=400' SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS SD	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK RAW	TEXAS	WFS	WICHITA	12
CHECK JNR	CONTROL 0043	SECTION 08	JOB 088	

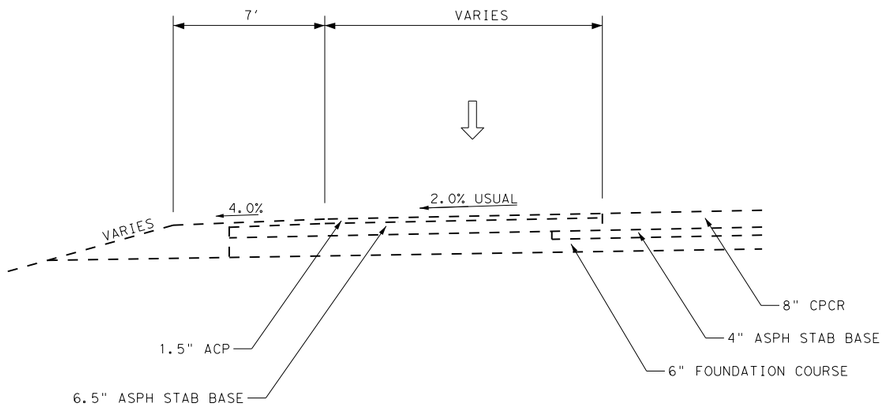
PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_Project Layout.dgn

100% SUBMITTAL

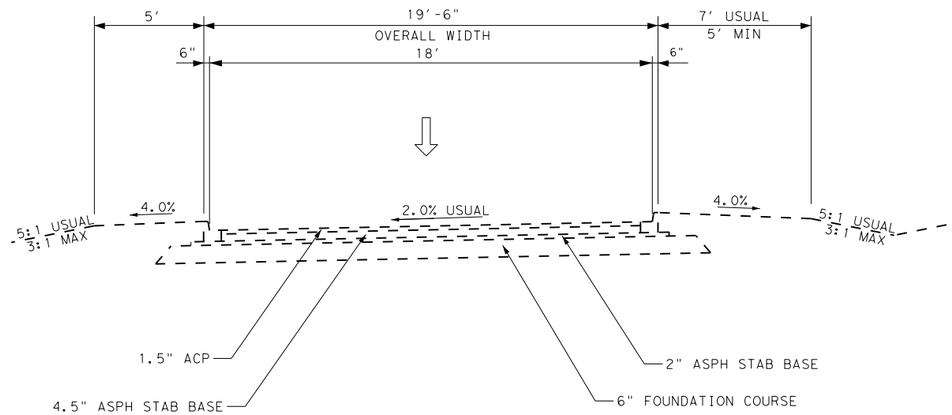
DATE: 12/11/2023 TIME: 11:29:01 AM

NOTES

1. SEE PLAN LAYOUTS FOR ADDITIONAL INFORMATION.



EXISTING TYPICAL SECTION
STA 1925+26.37 TO STA 1942+58.37



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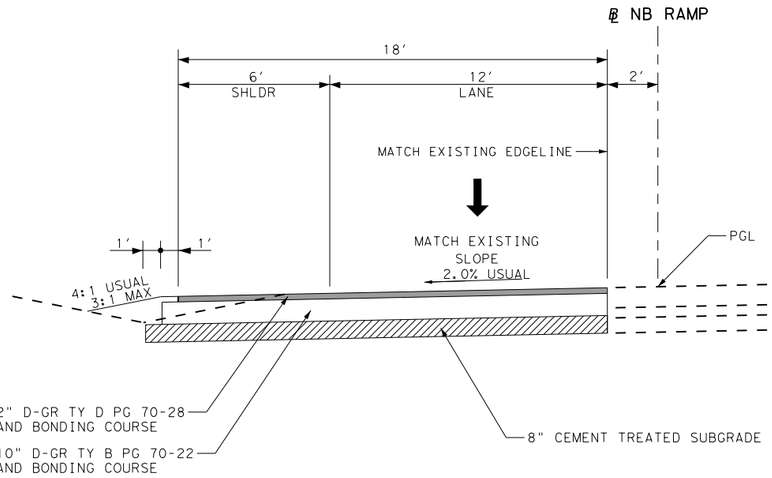
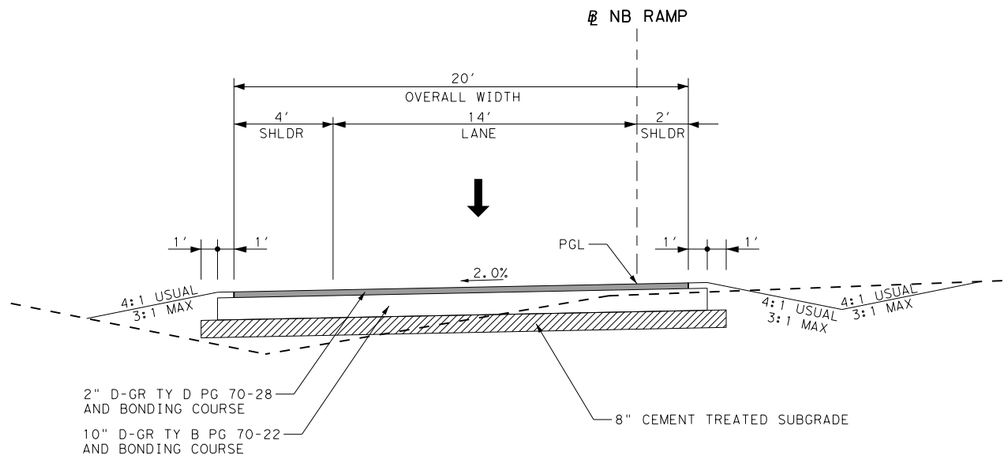
STA 1942+58.37 TO STA 1943+37.20



PROPOSED TYPICAL SECTION
STA 1925+26.37 TO STA 1942+58.37



PROPOSED TYPICAL SECTION
STA 1942+58.37 TO STA 1943+37.20

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TBPE REG: NO. F-474

US 287 REST AREAS

TYPICAL SECTIONS

NORTH BOUND RAMP

SCALE: N. T. S. SHEET 1 OF 2

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	13
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_typsect.dgn

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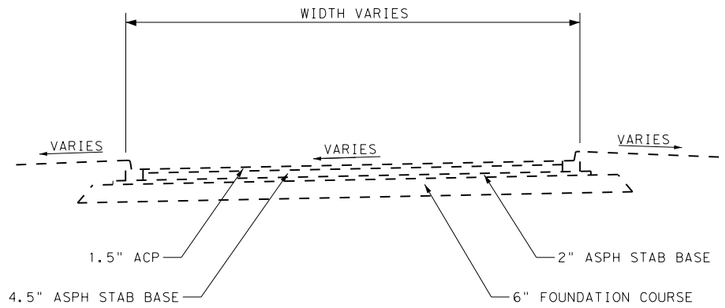
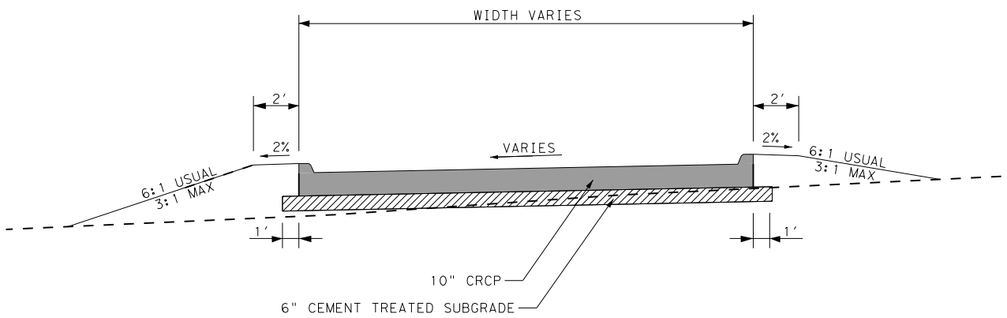
DATE: 12/11/2023 TIME: 11:29:23 AM



EXISTING TYPICAL SECTION
NB RAMP STA 1943+37.20 TO STA 1950+58.41
SB RAMP STA 2922+59.49 TO STA 2937+23.23



PROPOSED TYPICAL SECTION
NB RAMP STA 1943+37.20 TO STA 1950+58.41
SB RAMP STA 2922+59.49 TO STA 2937+23.23

NOTES

1. SEE PLAN LAYOUTS FOR ADDITIONAL INFORMATION.

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US 287 REST AREAS
TYPICAL SECTIONS
PARKING LOTS

SCALE: N. T. S. SHEET 2 OF 2

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS SD	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK RAW	TEXAS	WFS	WICHITA	14
CHECK JNR	CONTROL	SECTION	JOB	
	0043	08	088	

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_typsect2.dgn

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DATE: 12/11/2023 TIME: 11:30:59 AM

TCP GENERAL CONSTRUCTION NOTES

1. PLACE AND MAINTAIN ALL SIGNS, BARRICADES, PAVEMENT MARKINGS, AND OTHER WARNING DEVICES AS SHOWN IN THESE PLANS, ACCORDING TO THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND ALL APPLICABLE STANDARDS. THE SIGNS, BARRICADES, OR WARNING DEVICES DEEMED NECESSARY BY THE ENGINEER OR DICTATED BY FIELD CONDITIONS SHALL BE PROVIDED ACCORDING TO ALL APPLICABLE STANDARDS. ADDITIONAL SIGNS OR BARRICADES WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE SUBSIDIARY TO THE BID ITEM, "BARRICADES, SIGNS AND TRAFFIC HANDLING".

2. THE SEQUENCE OF WORK PROVIDED IS NOT TO BE CONSIDERED RESTRICTIVE. THE CONTRACTOR, WITH THE WRITTEN APPROVAL OF THE ENGINEER, MAY ALTER THE SEQUENCE OF CONSTRUCTION. TRAFFIC MUST BE MAINTAINED, AND THE CRITERIA ESTABLISHED MUST BE FOLLOWED.

3. THE CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE THROUGHOUT THE CONSTRUCTION OF THE PROJECT. THE CONTRACTOR SHALL CORRECT DRAINAGE DEFICIENCIES THAT PRESENT A HAZARD TO THE TRAVELING PUBLIC OR PROPERTY.

4. NO CONSTRUCTION ACTIVITY SHALL BE PERFORMED IN THE TRAVELED WAY, INCLUDING LOADING AND UNLOADING OF TRUCKS.

5. THE CONTRACTOR SHALL ENSURE THAT ALL BARRICADES, SIGNS, CHANNELIZING DEVICES, WARNING LIGHTS, AND TRAFFIC HANDLING DEVICES ARE MAINTAINED IN A CLEAN FUNCTIONAL CONDITION AT ALL TIMES.

6. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE TEMPORARY AND EXISTING PAVEMENT MARKINGS IN A GOOD AND VISIBLE CONDITION THROUGHOUT THE PROJECT DURATION.

7. THE CONTRACTOR SHALL REMOVE ALL EXISTING SIGNS AND STRIPING THAT CONFLICT WITH THE CONSTRUCTION SIGNS AND STRIPING. EXISTING PAVEMENT MARKINGS SHALL BE REMOVED IN AREAS WHERE TRAFFIC IS DIRECTED TO CROSS THEM. THE SIGNS SHALL BE PROPERLY STORED IN A SAFE PLACE UNTIL THE CONSTRUCTION HAS BEEN COMPLETED.

8. STATIONS AND OFFSETS ARE MEASURED FROM EITHER NB RAMP OR SB RAMP BASELINES UNLESS NOTED OTHERWISE. DIMENSIONS ARE FROM BACK OF CURB TO BACK OF CURB UNLESS OTHERWISE NOTED.

9. THE CONTRACTOR WILL BE RESPONSIBLE FOR DAILY CLEANUP OF MISCELLANEOUS TRASH WITHIN THE PROJECT LIMITS.

10. THE CONTRACTOR WILL BE ALLOWED TO HAND POUR CONCRETE WHERE NECESSARY.

11. THE CONTRACTOR MUST CONTROL DUST CAUSED BY CONSTRUCTION OPERATIONS. REFER TO THE GENERAL NOTES FOR TYPES OF SWEEPERS AND APPROVED EQUALS FOR SWEEPING FINISHED CONCRETE PAVEMENT AND BASE MATERIAL IN PREPARATION FOR LAYING ASPHALT.

12. THE CONTRACTOR IS RESPONSIBLE FOR THE REPAIR OF ANY UTILITIES THAT ARE DAMAGED DURING CONSTRUCTION.

13. IRRIGATION SYSTEMS DAMAGED BY ANY CONSTRUCTION ACTIVITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR AND SHALL BE CONSIDERED SUBSIDIARY TO BID ITEM 100 PREPARING ROW.

14. THE TABLE BELOW LISTS THE CONTACTS FOR UTILITIES FOUND WITHIN THE PROJECT AREA:

UTILITY COMPANY	CONTACT NAME	PHONE NUMBER	E-MAIL
CITY OF IOWA PARK	MIKE McCARTY	(940) 592-2131	mmccarty@iowapark.com
FIBERLIGHT	ADAM NICKERSON	(682) 321-8437	maintenance@fiberlight.com
AT&T TEXAS	JAMES DORGAN	(817) 598-2025	jd2697@att.com
TEXOMA BROADBAND SERVICES, LLC	MAINTENANCE TEAM	(903) 813-4500	-
ONCOR ELECTRIC DELIVERY COMPANY, LLC	JUSTIN STANLEY MIGUEL ARMIJO	(817) 215-5016 (817) 215-6263	justin.stanley@oncor.com miguel.armijo@oncor.com

TCP GENERAL CONSTRUCTION NARRATIVE

THE FOLLOWING NARRATIVE IS A SUPPLEMENT TO THE TRAFFIC CONTROL PLAN (TCP) SHEETS. THE TRAFFIC CONTROL PLAN RECOMMENDS SEGMENTAL CONSTRUCTION TO BALANCE CONSTRUCTION EFFICIENCY WITH THE SAFETY AND CONVENIENCE OF THE TRAVELING PUBLIC AND ABUTTERS.

CONSTRUCTION OF NB RAMP AND NB PARKING LOT SHALL OCCUR SEQUENTIALLY. PRIORITIZE CONSTRUCTION OF RAMP WIDENING BEFORE PARKING LOT CONSTRUCTION; OPEN IN STAGES AS DIRECTED BY ENGINEER. CONSTRUCTION OF THE NB AND SB PARKING LOTS SHALL OCCUR SEQUENTIALLY.

1. INSTALL TRAFFIC CONTROL DEVICES AND STORM WATER POLLUTION DEVICES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

2. TO CONSTRUCT RAMP WIDENING, REDUCE MAINLANE SPEED TO 65 MPH. MERGE TWO LANES OF MAINLANE TRAFFIC TO INSIDE LANE OF MAINLANES, AND USE OUTSIDE LANE OF MAINLANES FOR ENTERING RAMP TRAFFIC. REDIRECT RAMP TRAFFIC USING DRUMS OR OTHER CHANNELIZING DEVICES. FOLLOW TxDOT STANDARDS TCP(6-1)-12, TCP(6-2)-12, TCP(6-4)-12, AND/OR TCP(6-8)-14. RESTRICT WIDE LOADS DURING RAMP CONSTRUCTION.

3. PLACE FINAL RAMP STRIPING AND OPEN RAMP TO TRAFFIC IMMEDIATELY FOLLOWING COMPLETION OF RAMP WIDENING.

4. MAINTAIN OPERATION OF THE REST AREAS DURING CONSTRUCTION OF PARKING LOT LAYOUT IMPROVEMENTS. CLOSE OUTSIDE SHOULDER OF MAINLANES WHEN NECESSARY TO COMPLETE CONSTRUCTION FOLLOWING TxDOT STANDARD TCP(5-1)-18.

5. MAINTAIN OPERATION OF PUMP OUT STATIONS AT ALL TIMES.

6. MAINTAIN ACCESS TO ADA PARKING SPACES AT ALL TIMES.

7. PLACE FINAL PARKING LOT STRIPING IN PHASES SHOWN. RESTRICT USE OF SB WEST PARKING LOT UNTIL ALL CONSTRUCTION IS COMPLETE.

8. PLACE ALL OTHER APPURTENANCES REQUIRED TO COMPLETE PROJECT TO THE FINAL CONFIGURATION AS SHOWN IN THE PLANS AND STANDARDS.

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US 287 REST AREAS

TCP NARRATIVE

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	
CHECK	CONTROL	SECTION	JOB	15
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
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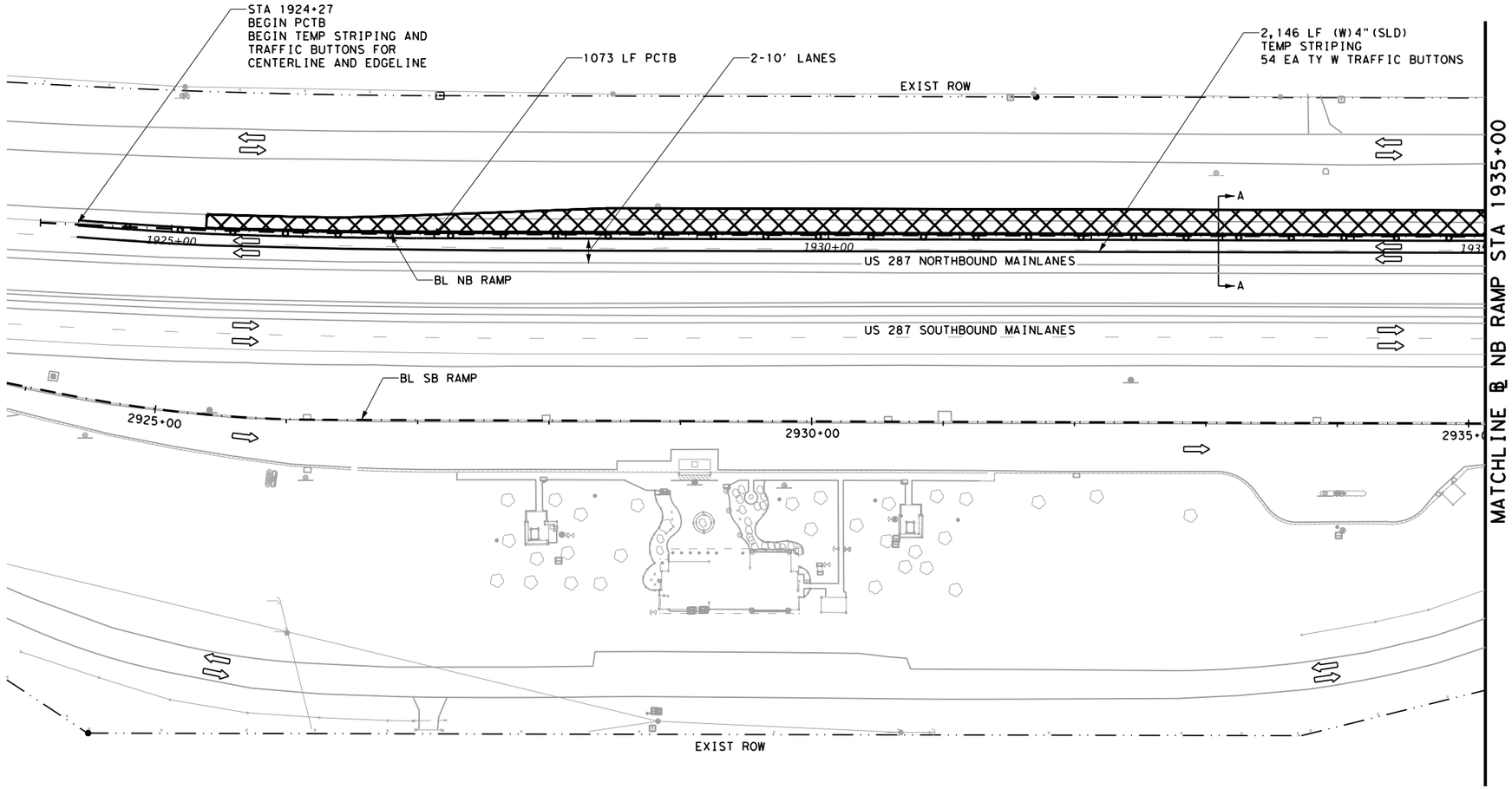
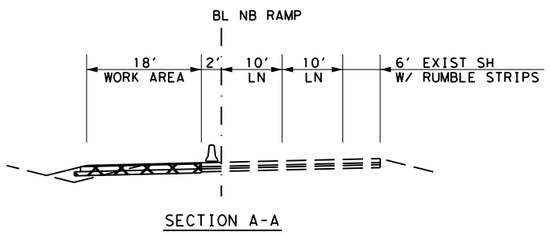
DATE: 12/11/2023 TIME: 11:31:22 AM





SECTION A-A

SCALE = 1"=100' H

LEGEND

- DRUM
- DIRECTION OF TRAFFIC
- PORTABLE CONCRETE TRAFFIC BARRIER
- CONSTRUCT THIS PHASE
- WORK COMPLETED
- TYPE III BARRICADE

NOTES:

1. WHEN NOT IN USE, CONSTRUCTION EQUIPMENT AND VEHICLES SHALL NOT BE WITHIN 30 FT OF US 287 TRAVEL LANES.
2. ACCESS TO THE WORK ZONE SHALL BE AS APPROVED BY THE ENGINEER, BUT SHALL NOT BE PERMITTED DIRECTLY OFF OR ONTO US 287 FREEWAY.
3. AS APPROVED BY THE ENGINEER, WORK TO BE STAGED SUCH THAT TRAFFIC IS MAINTAINED AT ALL TIMES.
4. REFER TO BC(2)-21 FOR ADVANCED WARNING SIGNS.
5. REFER TO TCP(6-1)-12 FOR FREEWAY LANE CLOSURE.
6. REFER TO TCP(1-1)-18 FOR FRONTAGE ROAD TCP.

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US 287 REST AREAS

TCP LAYOUT

NB RAMP AND NB PARKING LOT PHASE 1

SCALE: 1"=100' SHEET 1 OF 3

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	16
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
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FILE: US 287_TCP NB 1-1.dgn

100% SUBMITTAL

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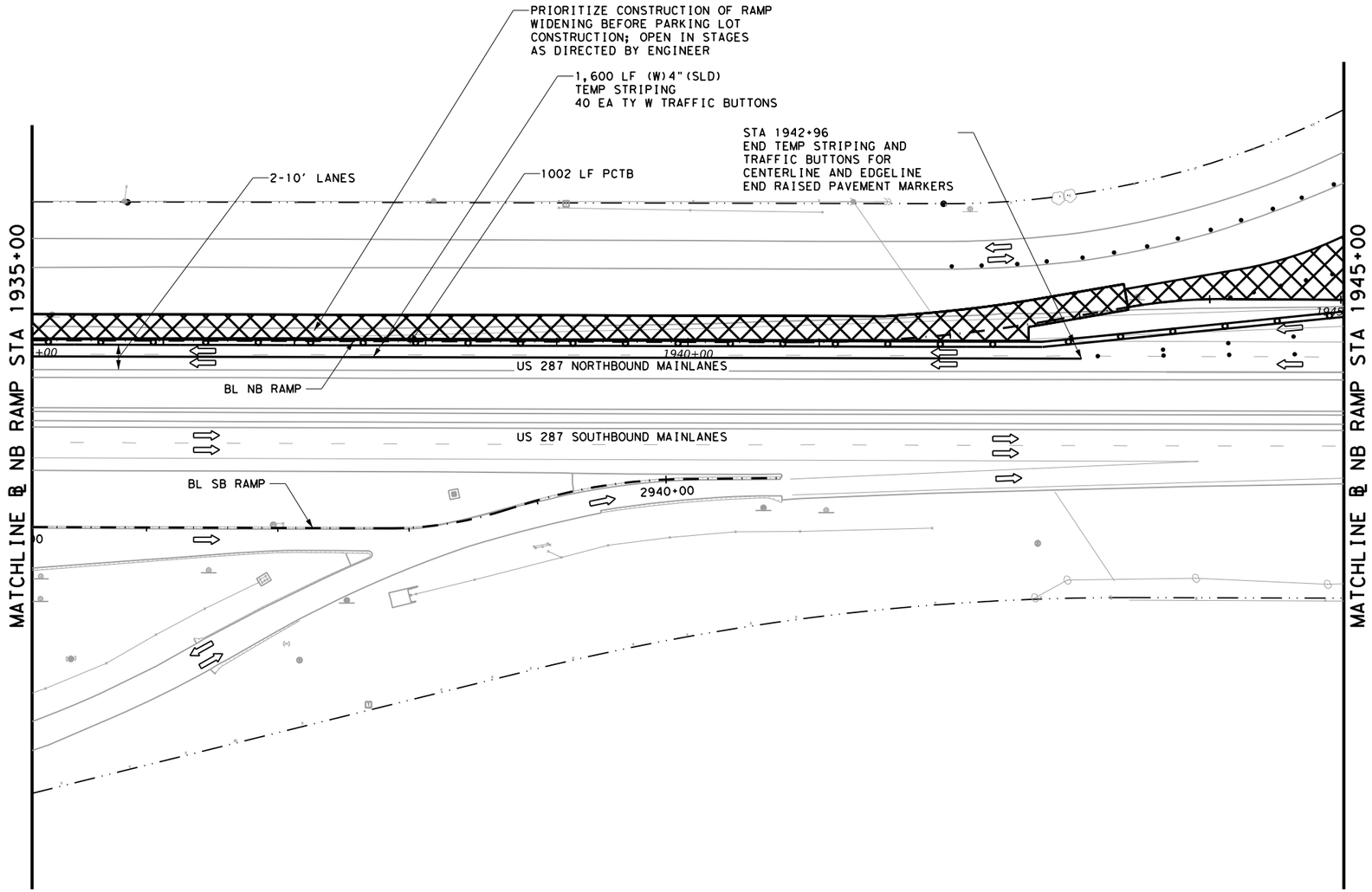

SCALE = 1"=100' H

LEGEND

- DRUM
- DIRECTION OF TRAFFIC
- PORTABLE CONCRETE TRAFFIC BARRIER
- CONSTRUCT THIS PHASE
- WORK COMPLETED
- TYPE III BARRICADE

NOTES:

1. WHEN NOT IN USE, CONSTRUCTION EQUIPMENT AND VEHICLES SHALL NOT BE WITHIN 30 FT OF US 287 TRAVEL LANES.
2. ACCESS TO THE WORK ZONE SHALL BE AS APPROVED BY THE ENGINEER, BUT SHALL NOT BE PERMITTED DIRECTLY OFF OR ONTO US 287 FREEWAY.
3. AS APPROVED BY THE ENGINEER, WORK TO BE STAGED SUCH THAT TRAFFIC IS MAINTAINED AT ALL TIMES.
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US 287 REST AREAS

TCP LAYOUT

NB RAMP AND NB PARKING LOT PHASE 1

SCALE: 1"=100' SHEET 2 OF 3

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS SD	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK RAW	TEXAS	WFS	WICHITA	17
CHECK JNR	CONTROL	SECTION	JOB	
	0043	08	088	

PLOT DRIVER: pdf-c.pltcfg
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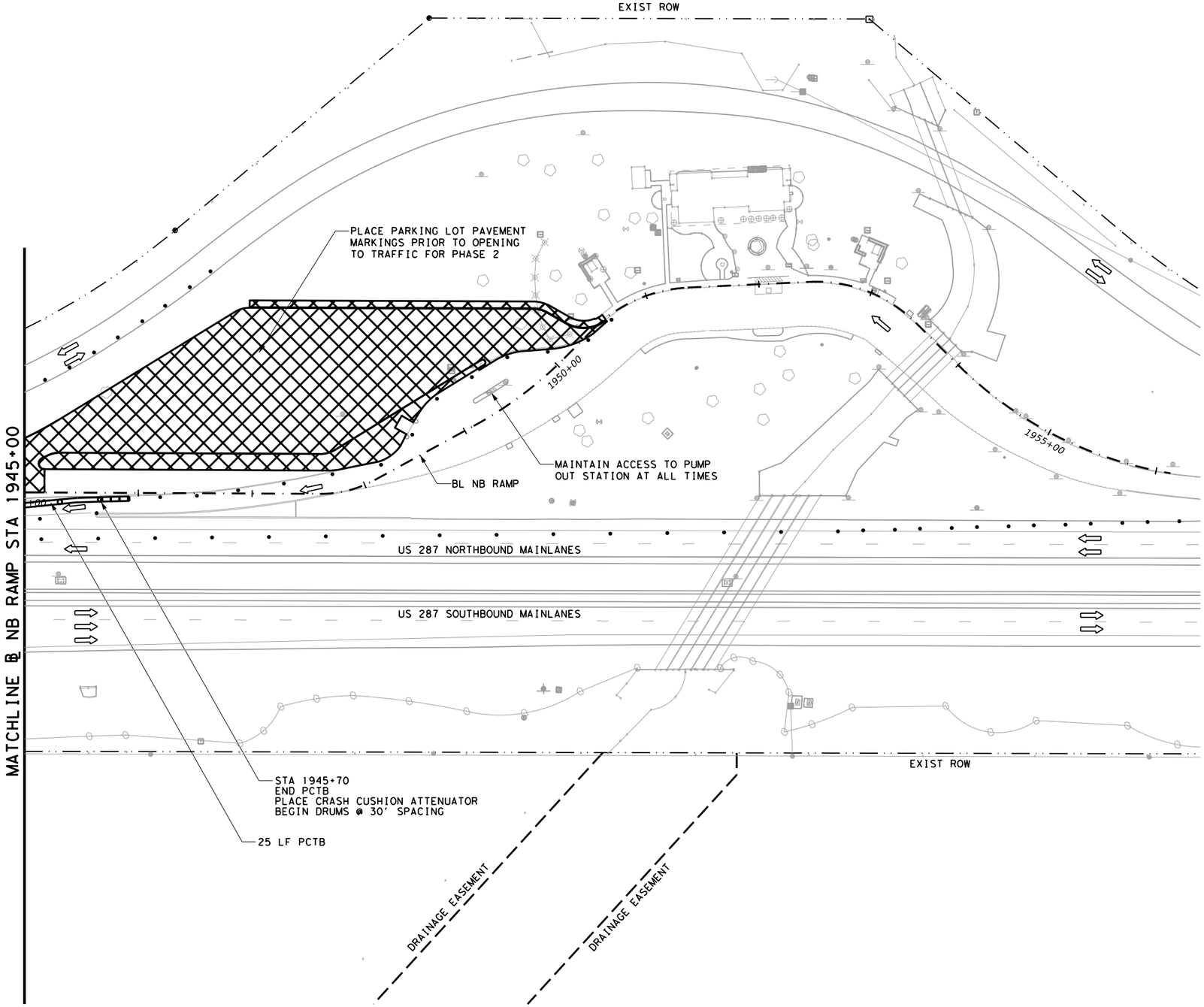
FILE: US 287_TCP NB 2-1.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 11:32:04 AM



SCALE = 1"=100' H

LEGEND

- DRUM
- DIRECTION OF TRAFFIC
- PORTABLE CONCRETE TRAFFIC BARRIER
- CONSTRUCT THIS PHASE
- WORK COMPLETED
- TYPE III BARRICADE

NOTES:

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US 287 REST AREAS

TCP LAYOUT

NB RAMP AND NB PARKING LOT PHASE 1

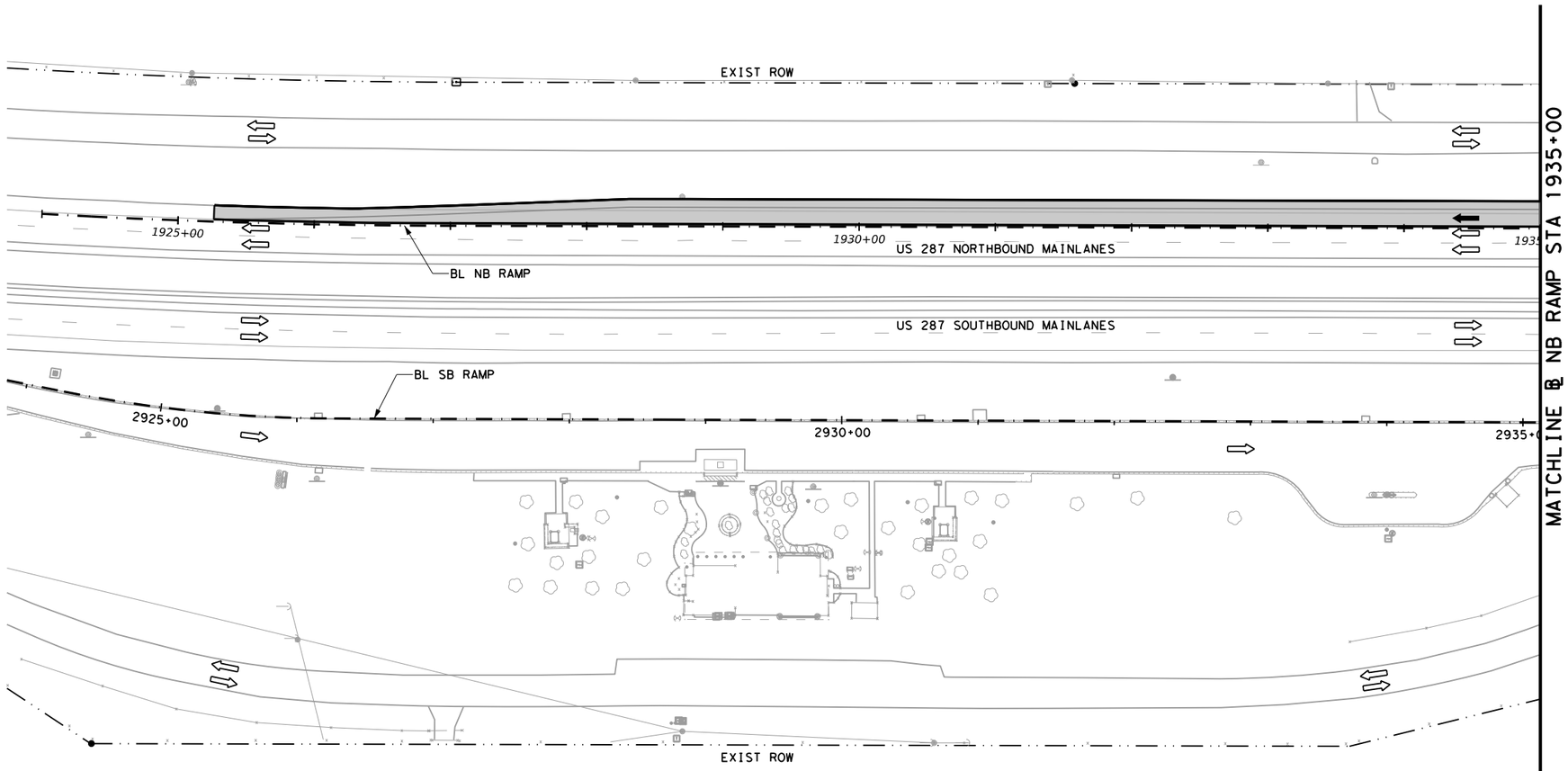
SCALE: 1"=100' SHEET 3 OF 3

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS SD	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK RAW	TEXAS	WFS	WICHITA	18
CHECK JNR	CONTROL 0043	SECTION 08	JOB 088	

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_TCP NB 3-1.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 11:32:25 AM



SCALE = 1"=100' H

N

LEGEND

- DRUM
- DIRECTION OF TRAFFIC
- PORTABLE CONCRETE TRAFFIC BARRIER
- CONSTRUCT THIS PHASE
- WORK COMPLETED
- TYPE III BARRICADE

NOTES:

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US 287 REST AREAS

TCP LAYOUT

NB RAMP AND NB PARKING LOT PHASE 2

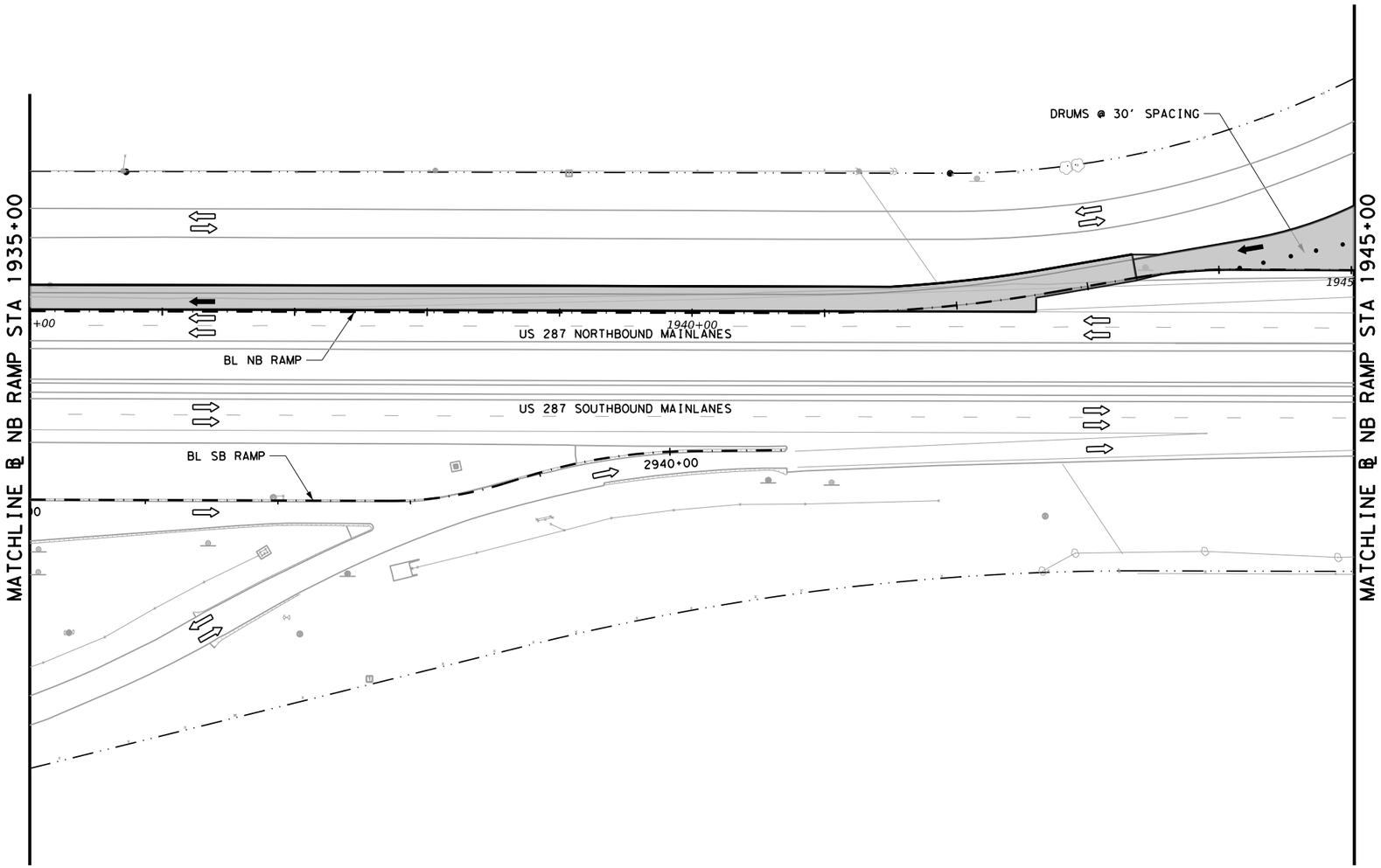
SCALE: 1"=100' SHEET 1 OF 3

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	19
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_TCP NB 1-2.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 11:32:45 AM



SCALE = 1"=100' H

LEGEND

- DRUM
- DIRECTION OF TRAFFIC
- PORTABLE CONCRETE TRAFFIC BARRIER
- CONSTRUCT THIS PHASE
- WORK COMPLETED
- TYPE III BARRICADE

NOTES:

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TCP LAYOUT

NB RAMP AND NB PARKING LOT PHASE 2

SCALE: 1"=100' SHEET 2 OF 3

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS SD	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK RAW	TEXAS	WFS	WICHITA	20
CHECK JNR	CONTROL	SECTION	JOB	
	0043	08	088	

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_TCP NB 2-2.dgn

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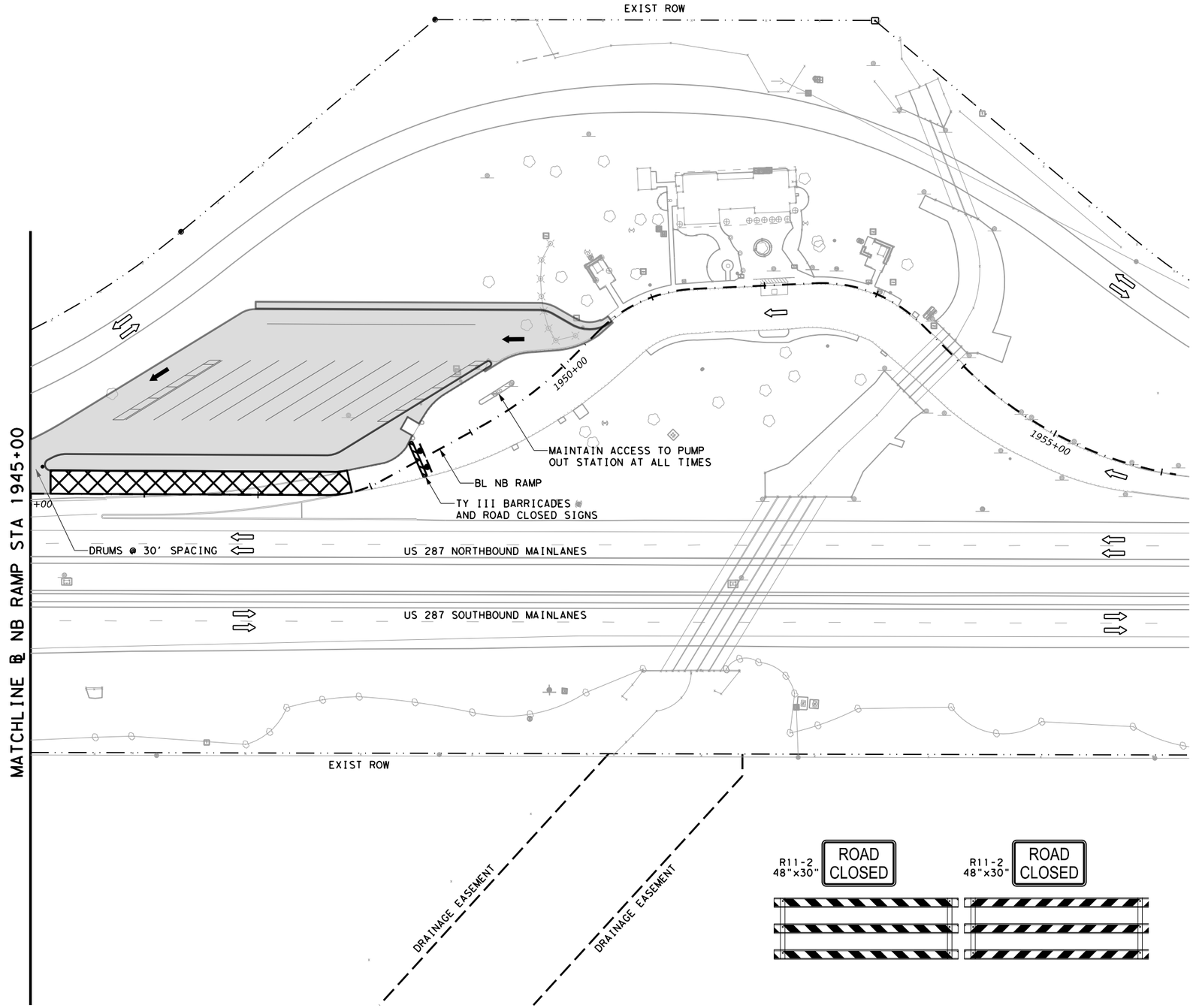

SCALE = 1"=100' H

LEGEND

- DRUM
- DIRECTION OF TRAFFIC
- PORTABLE CONCRETE TRAFFIC BARRIER
- CONSTRUCT THIS PHASE
- WORK COMPLETED
- TYPE III BARRICADE

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TCP LAYOUT

NB RAMP AND NB PARKING LOT PHASE 2

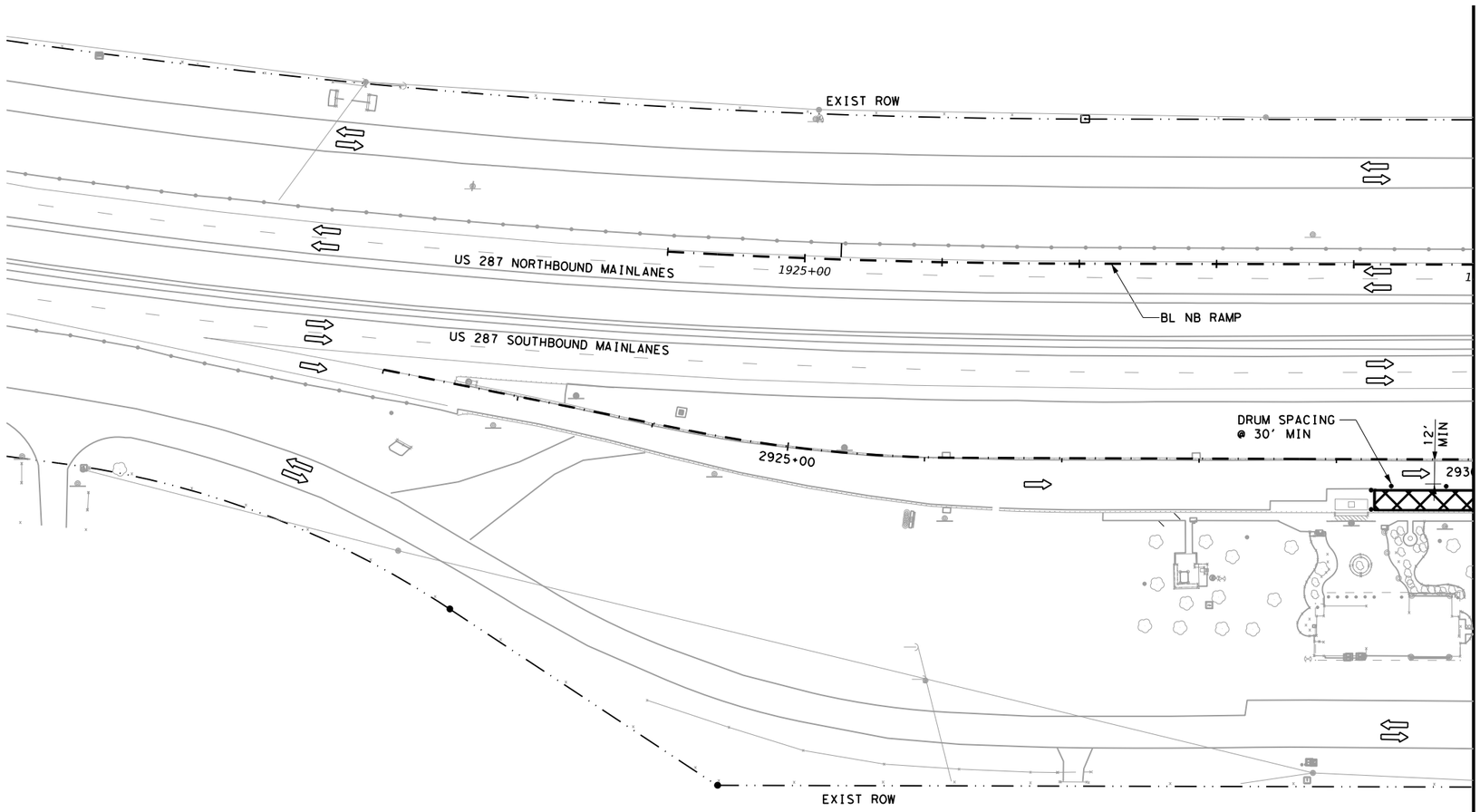
SCALE: 1"=100' SHEET 3 OF 3

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS SD	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK RAW	TEXAS	WFS	WICHITA	21
CHECK JNR	CONTROL 0043	SECTION 08	JOB 088	

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_TCP NB 3-2.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 11:33:27 AM



SCALE = 1"=100' H

N

LEGEND

- DRUM
- DIRECTION OF TRAFFIC
- PORTABLE CONCRETE TRAFFIC BARRIER
- CONSTRUCT THIS PHASE
- WORK COMPLETED
- TYPE III BARRICADE

NOTES:

1. WHEN NOT IN USE, CONSTRUCTION EQUIPMENT AND VEHICLES SHALL NOT BE WITHIN 30 FT OF US 287 TRAVEL LANES.
2. ACCESS TO THE WORK ZONE SHALL BE AS APPROVED BY THE ENGINEER, BUT SHALL NOT BE PERMITTED DIRECTLY OFF OR ONTO US 287 FREEWAY.
3. AS APPROVED BY THE ENGINEER, WORK TO BE STAGED SUCH THAT TRAFFIC IS MAINTAINED AT ALL TIMES.
4. REFER TO BC(2)-21 FOR ADVANCED WARNING SIGNS.
5. REFER TO TCP(6-1)-12 FOR FREEWAY LANE CLOSURE.
6. REFER TO TCP(1-1)-18 FOR FRONTAGE ROAD TCP.

STATE OF TEXAS
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97940
LICENSED
PROFESSIONAL ENGINEER
12/11/2023

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PH (512) 327-6840
TBPE REG. NO. F-474

US 287 REST AREAS

TCP LAYOUT

SB PARKING LOTS PHASE 1A

SCALE: 1"=100' SHEET 1 OF 2

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS SD	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK RAW	TEXAS	WFS	WICHITA	22
CHECK JNR	CONTROL	SECTION	JOB	
	0043	08	088	

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_TCP_SB 1-1A.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 11:33:46 AM

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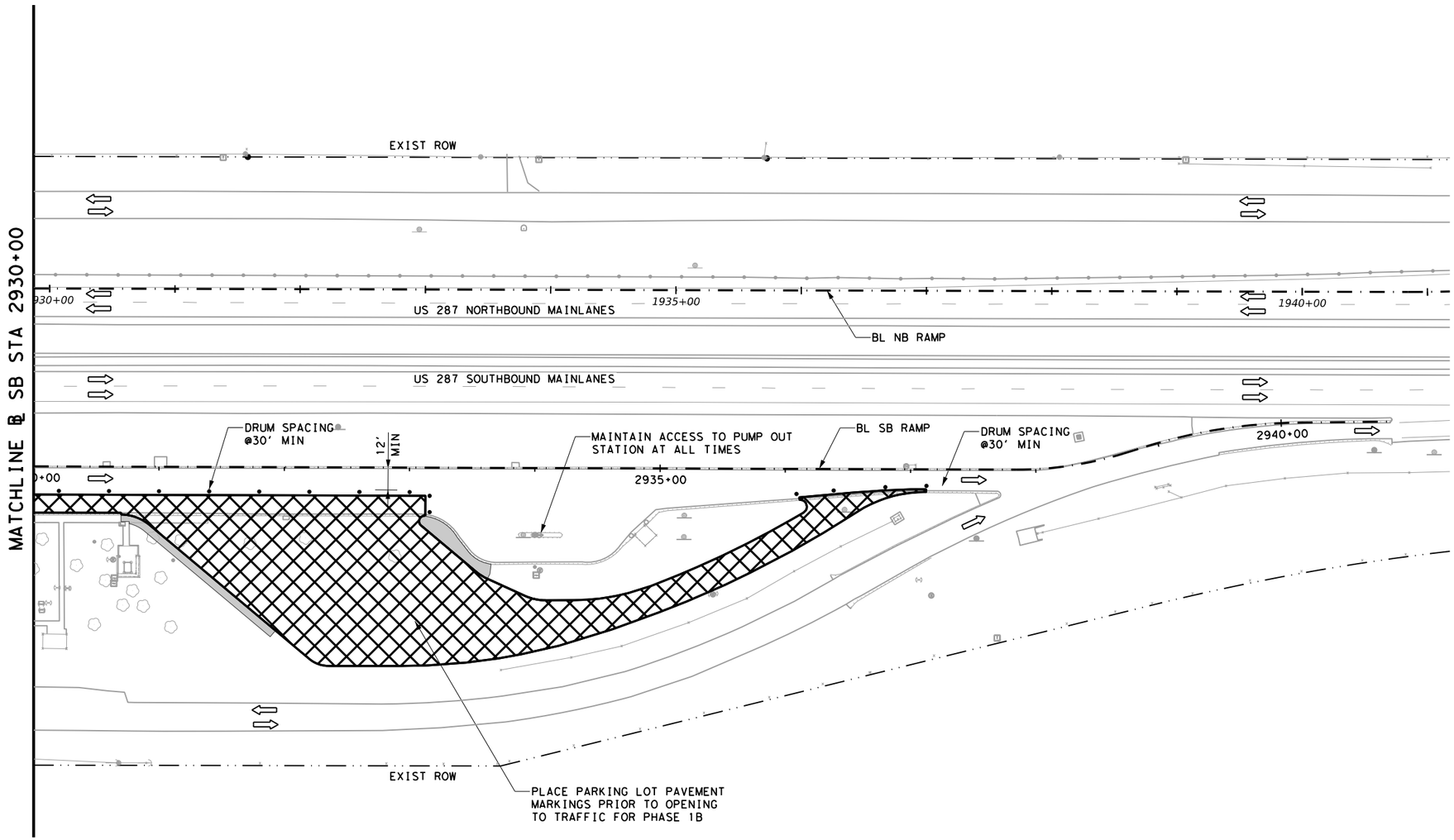

LEGEND

- DRUM
- DIRECTION OF TRAFFIC
- PORTABLE CONCRETE TRAFFIC BARRIER
- CONSTRUCT THIS PHASE
- WORK COMPLETED
- TYPE III BARRICADE

NOTES:

1. WHEN NOT IN USE, CONSTRUCTION EQUIPMENT AND VEHICLES SHALL NOT BE WITHIN 30 FT OF US 287 TRAVEL LANES.
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 Texas Department of Transportation

US 287 REST AREAS

TCP LAYOUT

SB PARKING LOTS PHASE 1A

SCALE: 1"=100' SHEET 2 OF 2

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	23
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_TCP SB 2-1A.dgn

100% SUBMITTAL

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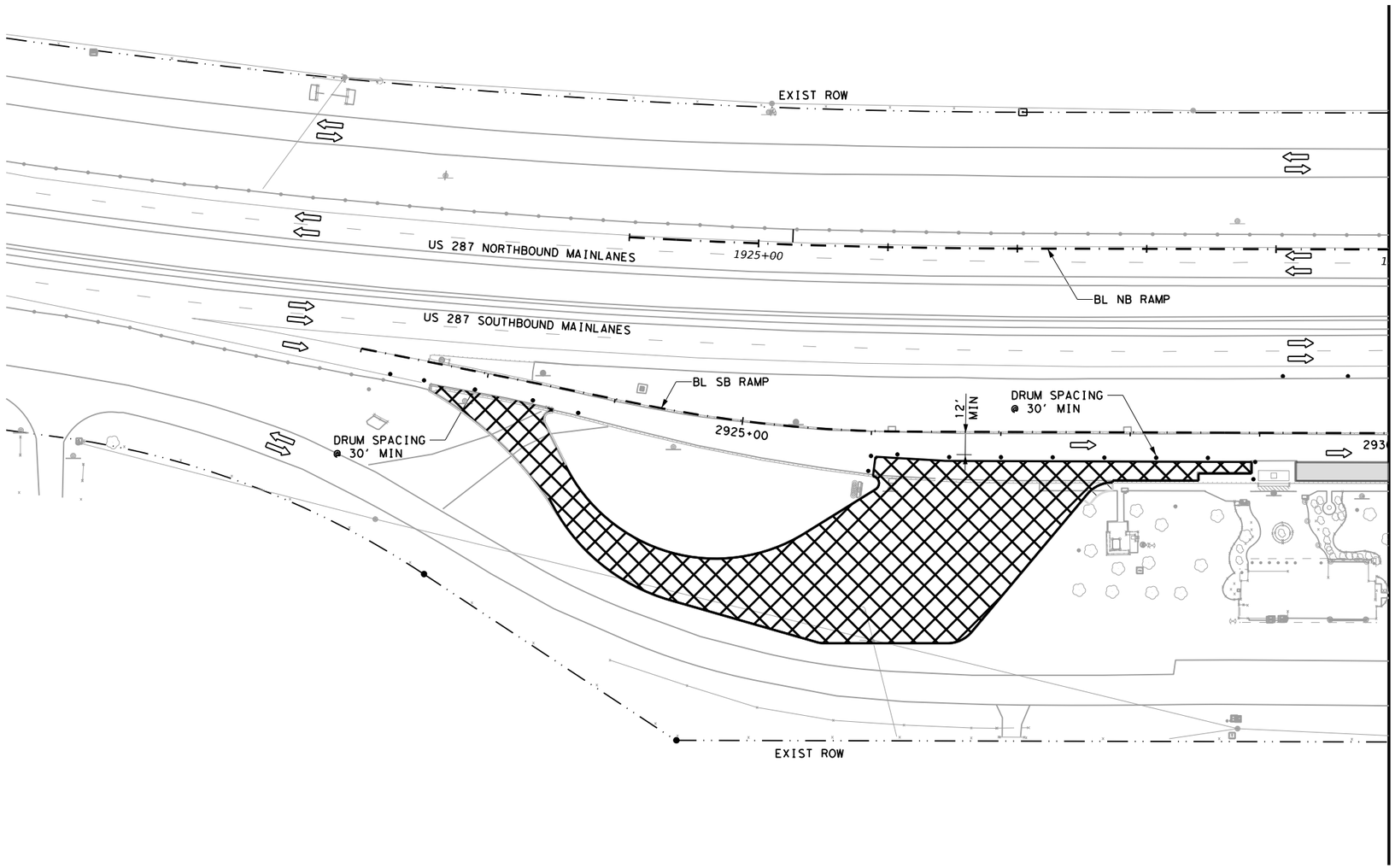

SCALE = 1"=100' H

LEGEND

- DRUM
- DIRECTION OF TRAFFIC
- PORTABLE CONCRETE TRAFFIC BARRIER
- CONSTRUCT THIS PHASE
- WORK COMPLETED
- TYPE III BARRICADE

NOTES:

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6. REFER TO TCP(1-1)-18 FOR FRONTAGE ROAD TCP.

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US 287 REST AREAS

TCP LAYOUT

SB PARKING LOTS PHASE 1B

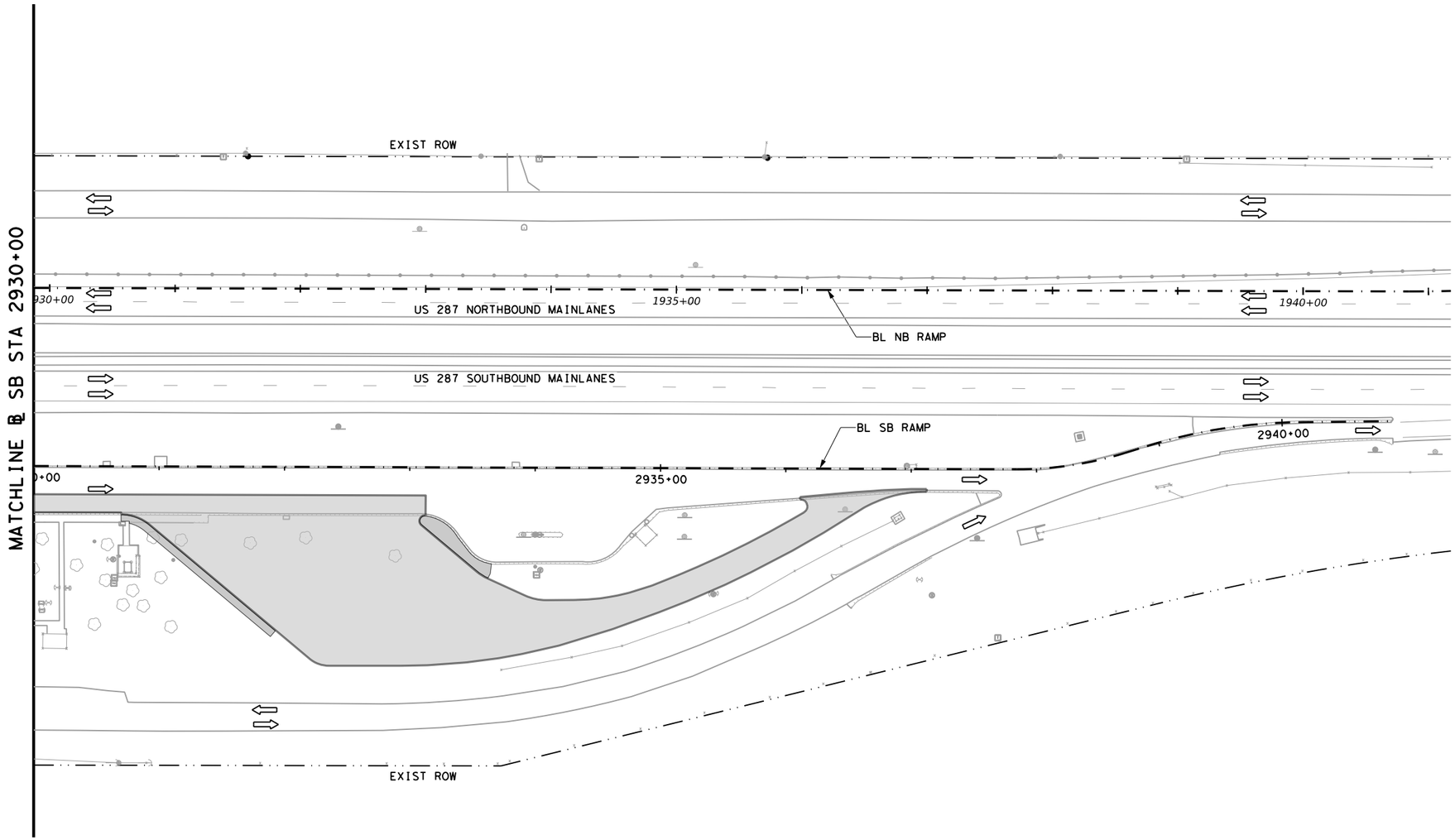
SCALE: 1"=100' SHEET 1 OF 2

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	
CHECK	CONTROL	SECTION	JOB	24
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_TCP SB 1-1B.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 11:34:26 AM



SCALE = 1"=100' H

LEGEND

- DRUM
- DIRECTION OF TRAFFIC
- PORTABLE CONCRETE TRAFFIC BARRIER
- CONSTRUCT THIS PHASE
- WORK COMPLETED
- TYPE III BARRICADE

NOTES:

1. WHEN NOT IN USE, CONSTRUCTION EQUIPMENT AND VEHICLES SHALL NOT BE WITHIN 30 FT OF US 287 TRAVEL LANES.
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5. REFER TO TCP(6-1)-12 FOR FREEWAY LANE CLOSURE.
6. REFER TO TCP(1-1)-18 FOR FRONTAGE ROAD TCP.

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 Texas Department of Transportation

US 287 REST AREAS

TCP LAYOUT

SB PARKING LOTS PHASE 1B

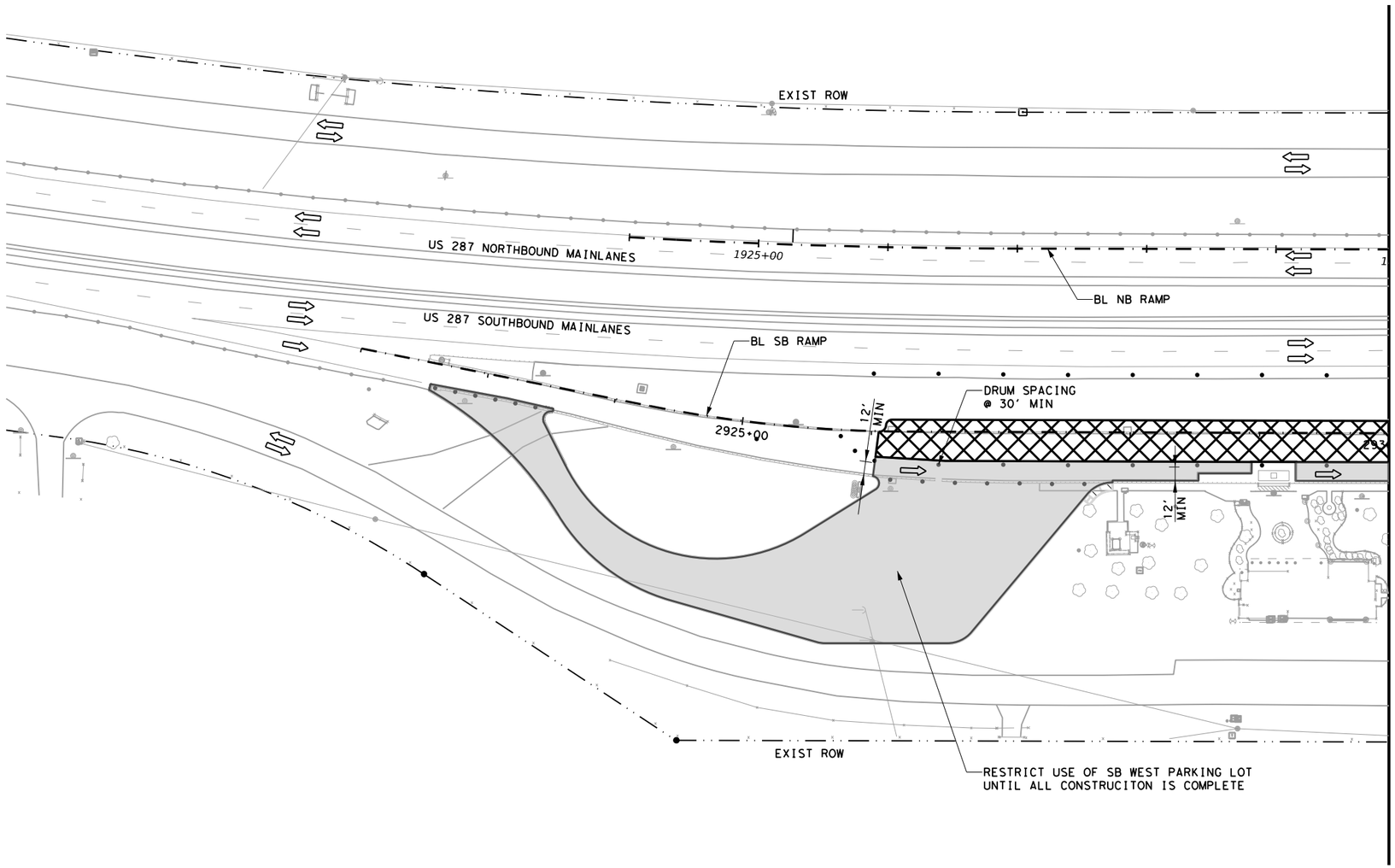
SCALE: 1"=100' SHEET 2 OF 2

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS SD	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK RAW	TEXAS	WFS	WICHITA	25
CHECK JNR	CONTROL	SECTION	JOB	
	0043	08	088	

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_TCP SB 2-1B.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 11:34:46 AM



SCALE = 1"=100' H

N

LEGEND

- DRUM
- DIRECTION OF TRAFFIC
- PORTABLE CONCRETE TRAFFIC BARRIER
- CONSTRUCT THIS PHASE
- WORK COMPLETED
- TYPE III BARRICADE

NOTES:

1. WHEN NOT IN USE, CONSTRUCTION EQUIPMENT AND VEHICLES SHALL NOT BE WITHIN 30 FT OF US 287 TRAVEL LANES.
2. ACCESS TO THE WORK ZONE SHALL BE AS APPROVED BY THE ENGINEER, BUT SHALL NOT BE PERMITTED DIRECTLY OFF OR ONTO US 287 FREEWAY.
3. AS APPROVED BY THE ENGINEER, WORK TO BE STAGED SUCH THAT TRAFFIC IS MAINTAINED AT ALL TIMES.
4. REFER TO BC(2)-21 FOR ADVANCED WARNING SIGNS.
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Texas Department of Transportation

US 287 REST AREAS

TCP LAYOUT

SB PARKING LOTS PHASE 2

SCALE: 1"=100' SHEET 1 OF 2

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS SD	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK RAW	TEXAS	WFS	WICHITA	26
CHECK JNR	CONTROL 0043	SECTION 08	JOB 088	

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_TCP_SB 1-2.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 11:35:07 AM

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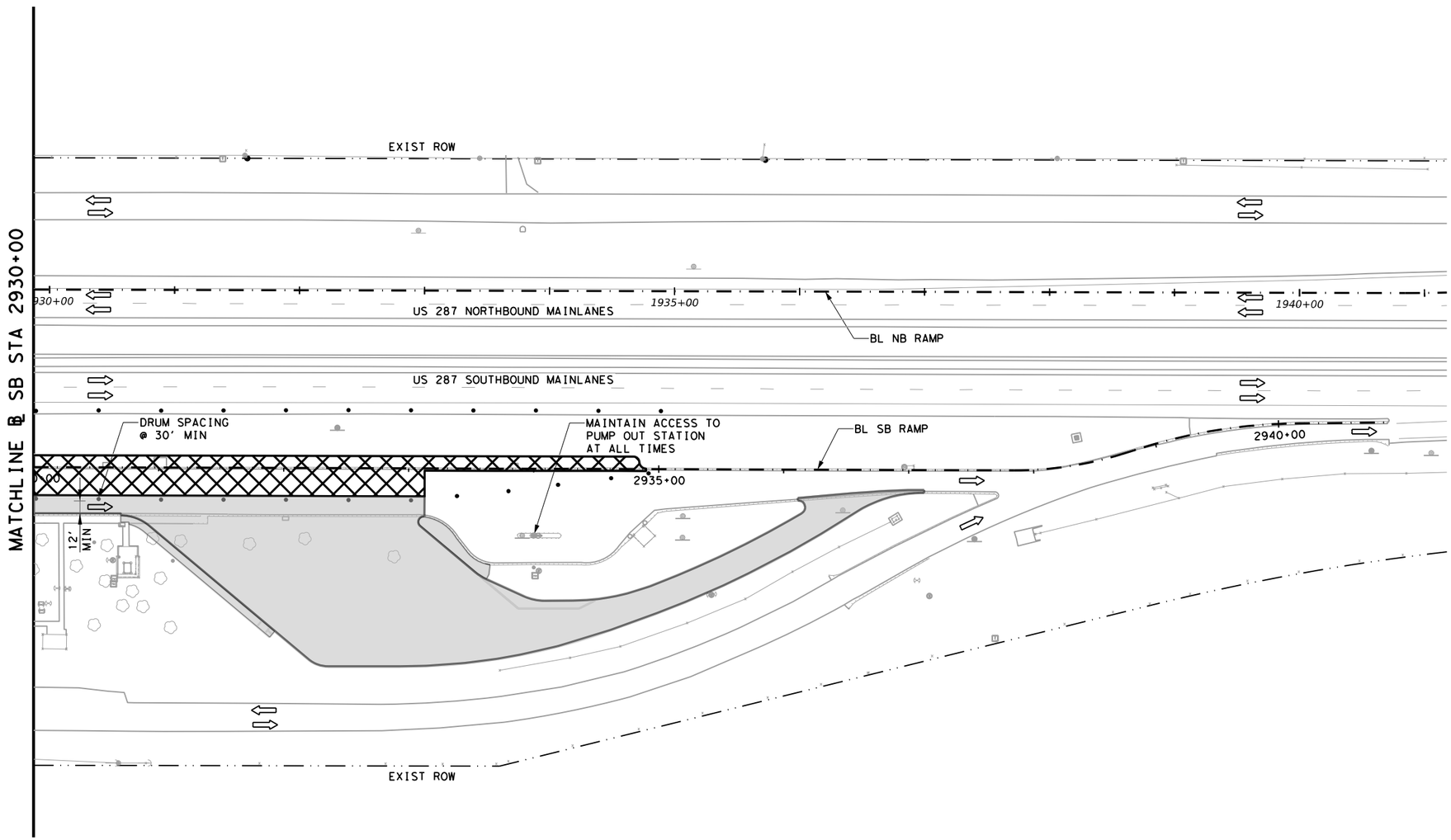

LEGEND

- DRUM
- DIRECTION OF TRAFFIC
- PORTABLE CONCRETE TRAFFIC BARRIER
- CONSTRUCT THIS PHASE
- WORK COMPLETED
- TYPE III BARRICADE

NOTES:

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2. ACCESS TO THE WORK ZONE SHALL BE AS APPROVED BY THE ENGINEER, BUT SHALL NOT BE PERMITTED DIRECTLY OFF OR ONTO US 287 FREEWAY.
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 Texas Department of Transportation

US 287 REST AREAS

TCP LAYOUT

SB PARKING LOTS PHASE 2

SCALE: 1"=100' SHEET 2 OF 2

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	27
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_TCP_SB 2-2.dgn

DATE:
FILE:

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

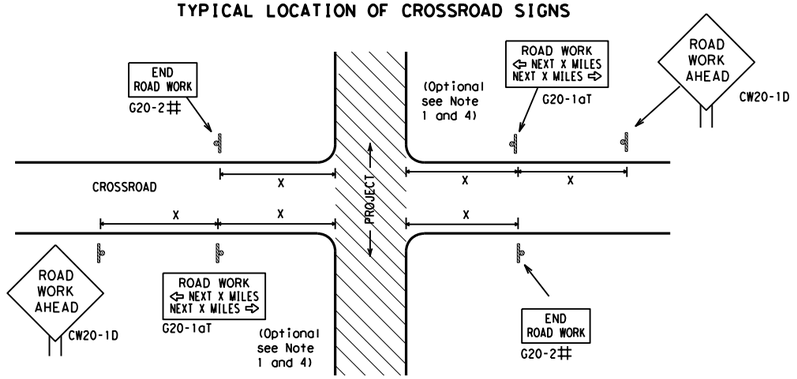
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	08	088	US287
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	WFS	WICHITA		28
5-10 5-21				

DATE:
FILE:

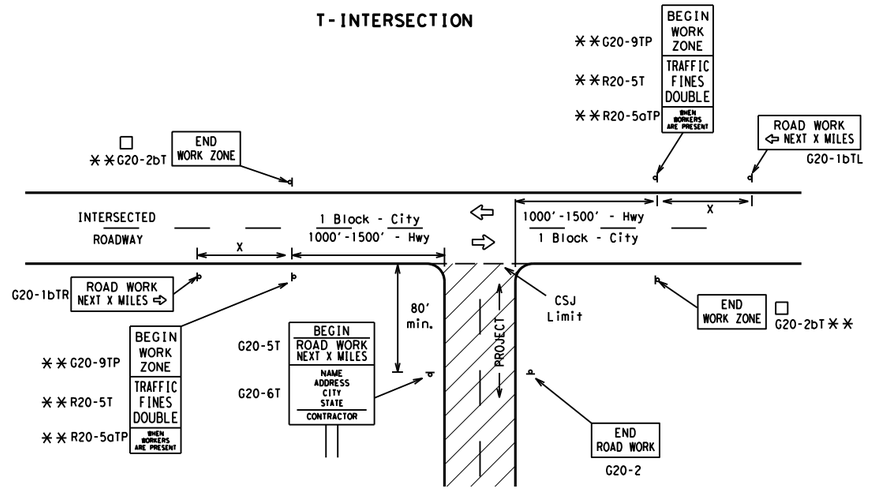
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

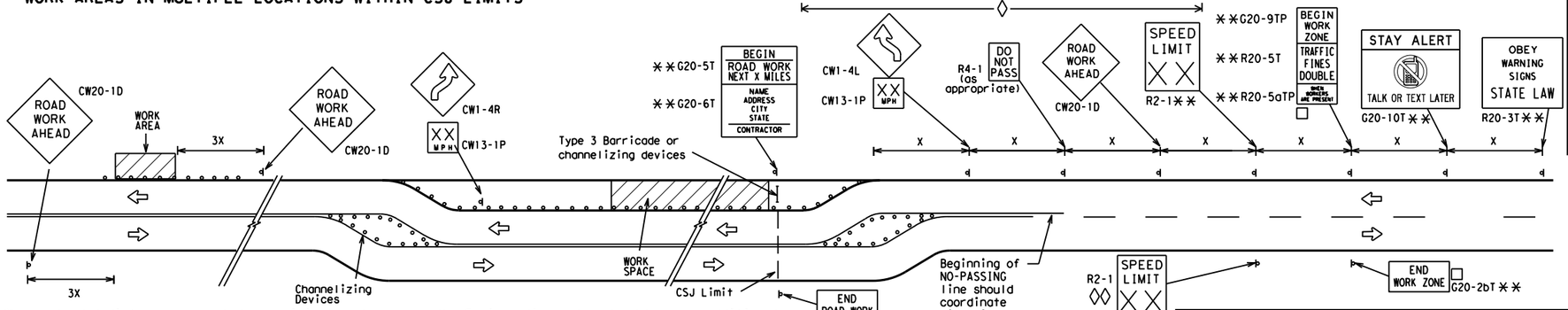
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

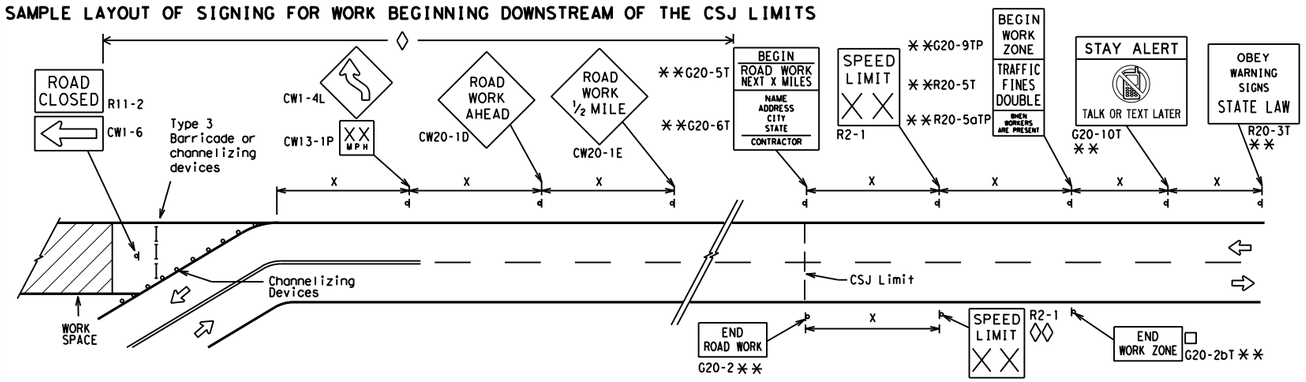
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING 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.

SHEET 2 OF 12

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	08	088	US287
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	WFS	WICHITA		29

96

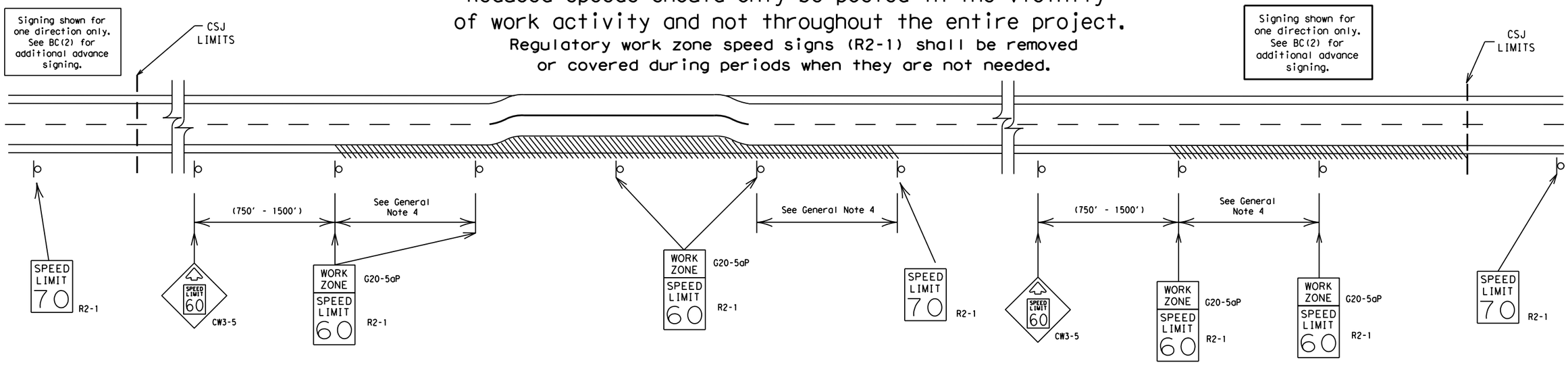
DATE:
FILE:

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
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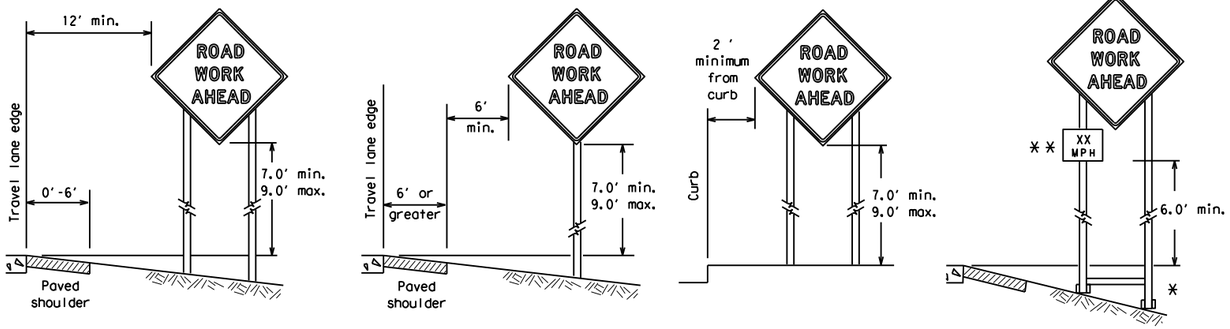
REVISIONS	0043	08	088	US287
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	WFS	WICHITA		30

DATE:
FILE:

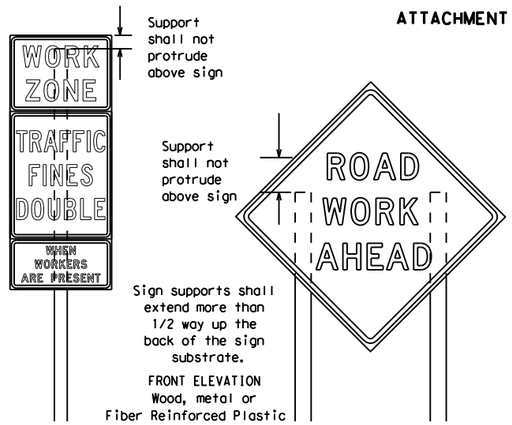
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



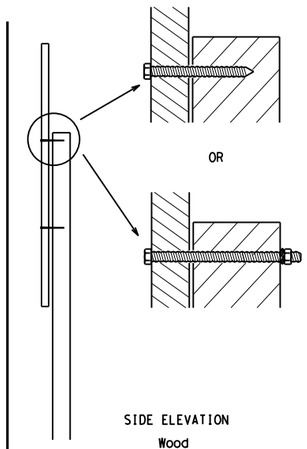
* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS



FRONT ELEVATION
Wood, metal or
Fiber Reinforced Plastic



SIDE ELEVATION
Wood

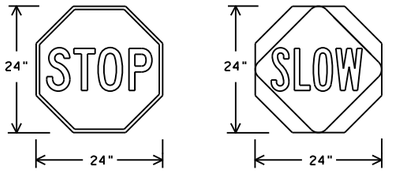
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



Background - Red
Legend & Border - White

Background - Orange
Legend & Border - Black

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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

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
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REVISIONS	0043	08	088	US287
9-07 8-14	DIST	COUNTY		SHEET NO.
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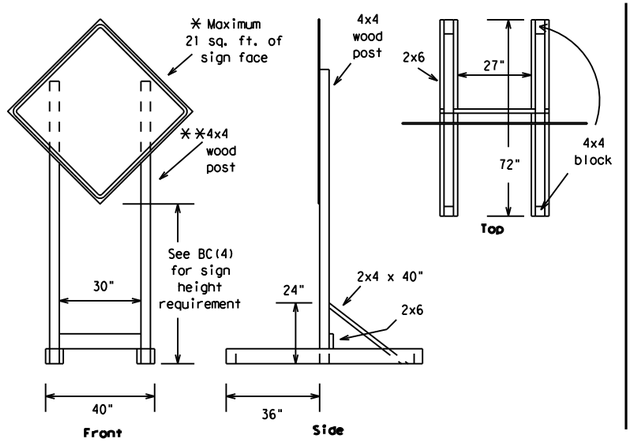
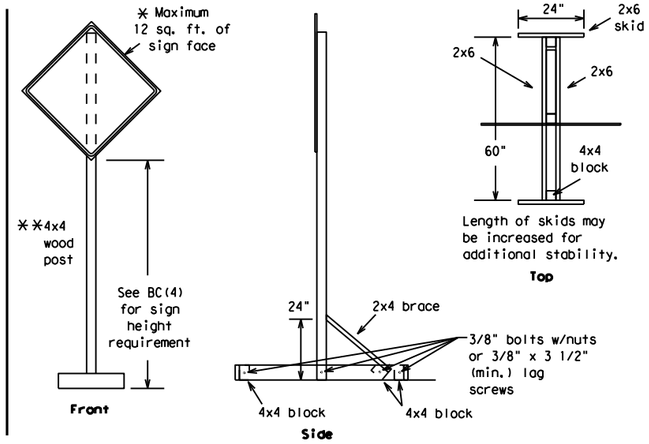
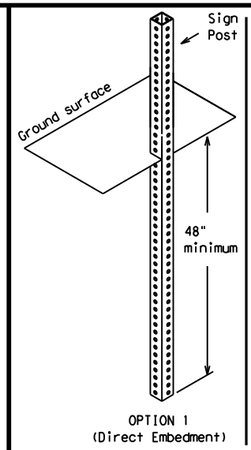


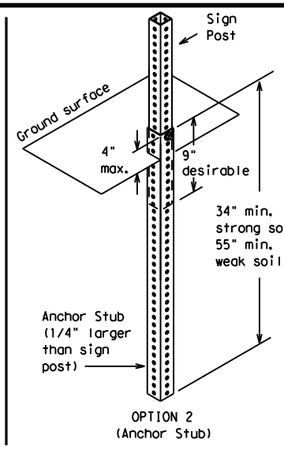


SKID MOUNTED WOOD SIGN SUPPORTS

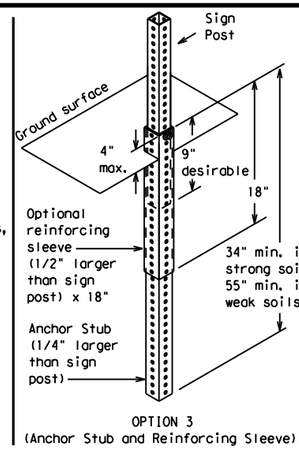
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS



OPTION 1
(Direct Embedment)

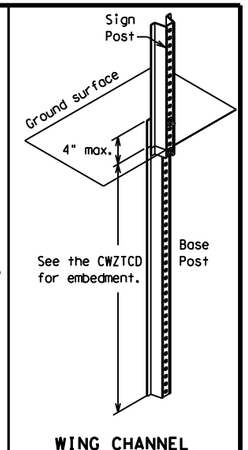


OPTION 2
(Anchor Stub)



OPTION 3
(Anchor Stub and Reinforcing Sleeve))

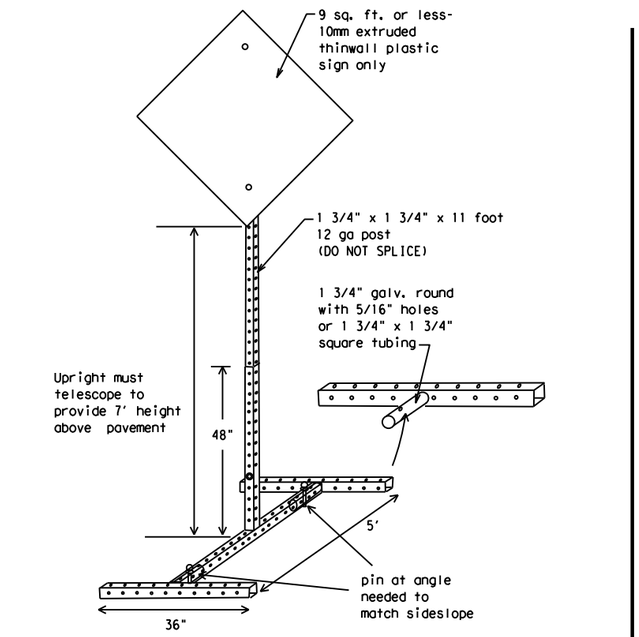
PERFORATED SQUARE METAL TUBING

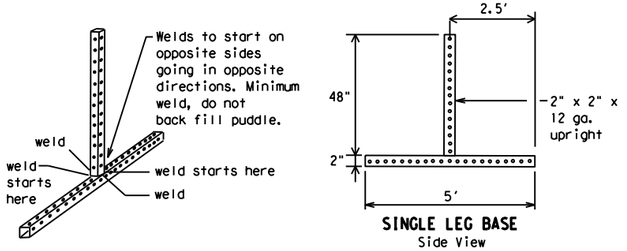


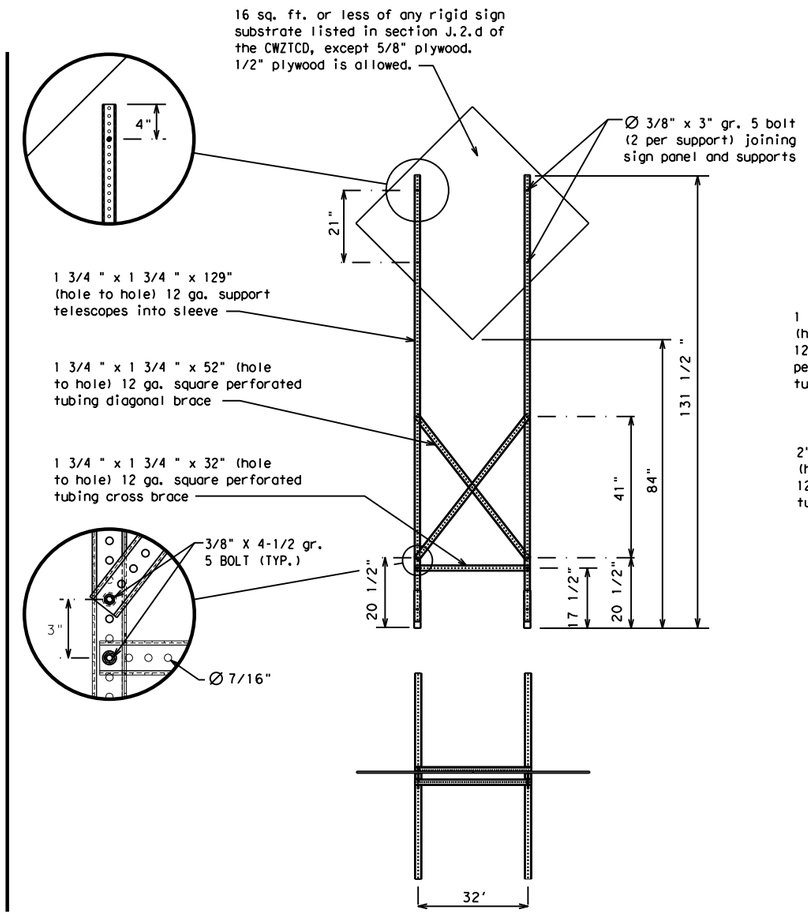
WING CHANNEL
Lap-splice/base bolted anchor

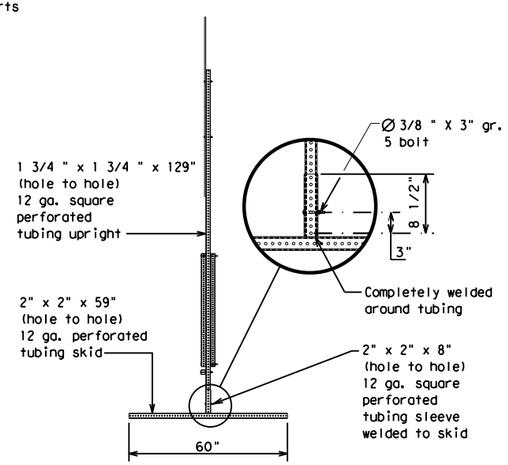
GROUND MOUNTED SIGN SUPPORTS

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









SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

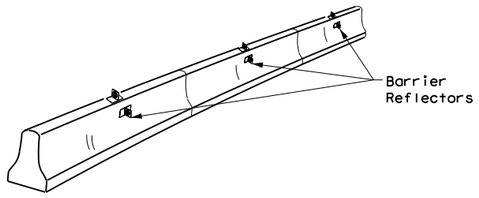
BC(6)-21

FILE:	bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS		0043	08	088	US287
9-07 8-14		DIST	COUNTY		SHEET NO.
7-13 5-21		WFS	WICHITA		33

100

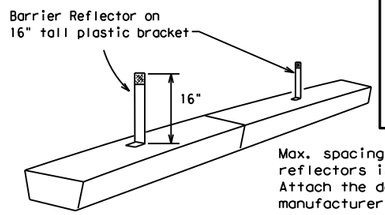
DATE:
FILE:

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



CONCRETE TRAFFIC BARRIER (CTB)

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

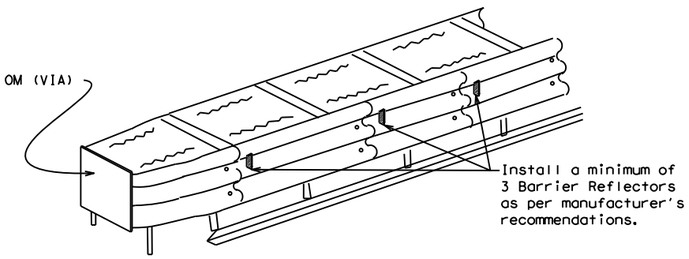


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)

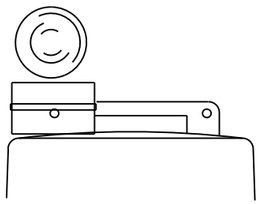


DELINEATION OF END TREATMENTS

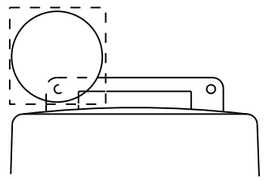
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

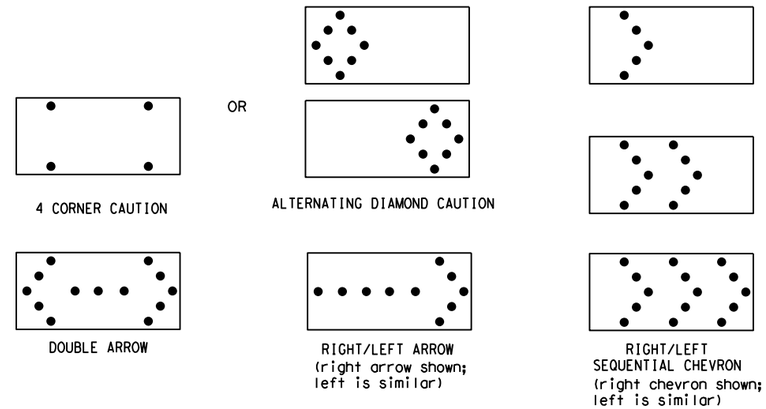
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

SHEET 7 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	08	088	US287
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	WFS	WICHITA		34

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

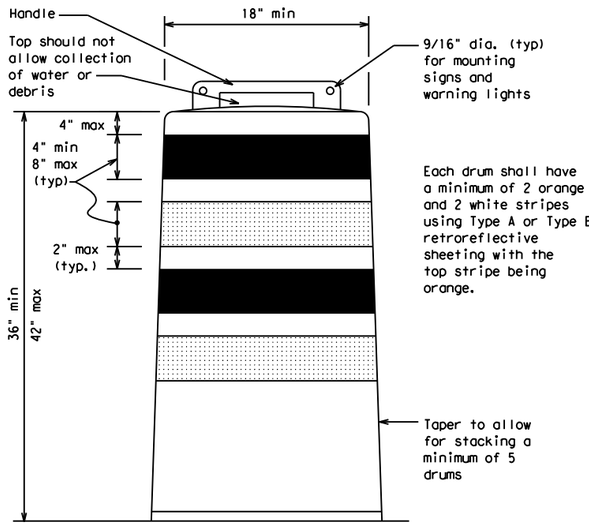
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

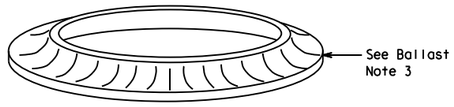
RETROREFLECTIVE SHEETING

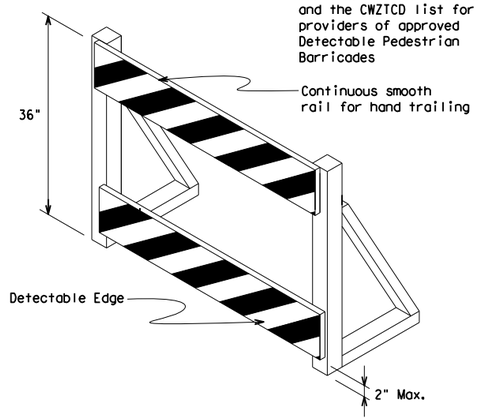
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

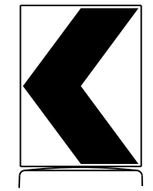




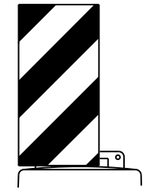


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	08	088	US287
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	WFS	WICHITA		35
7-13				

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DATE:
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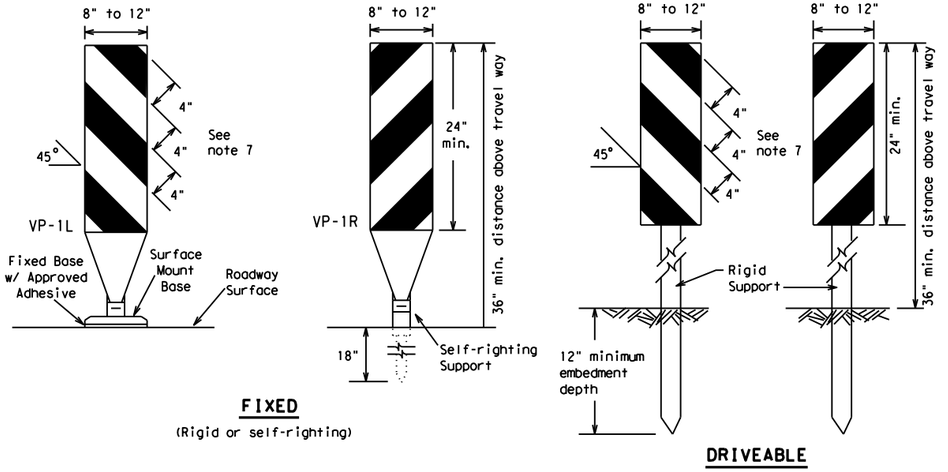


FIXED
(Rigid or self-righting)

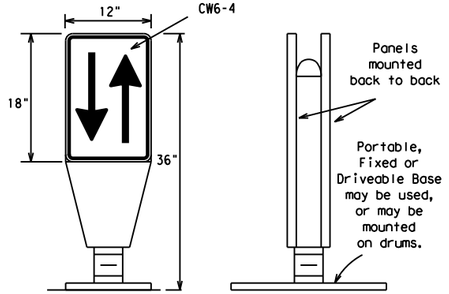
DRIVEABLE

(Rigid or self-righting)

PORTABLE

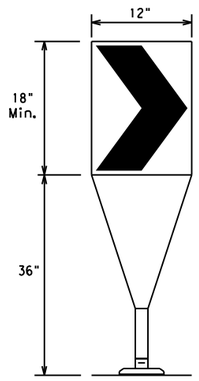
VERTICAL PANELS (VPs)

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



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



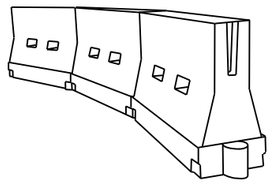
Fixed Base w/ Approved Adhesive
(Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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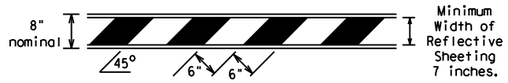
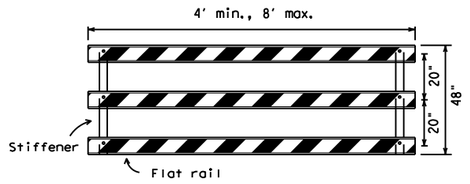
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



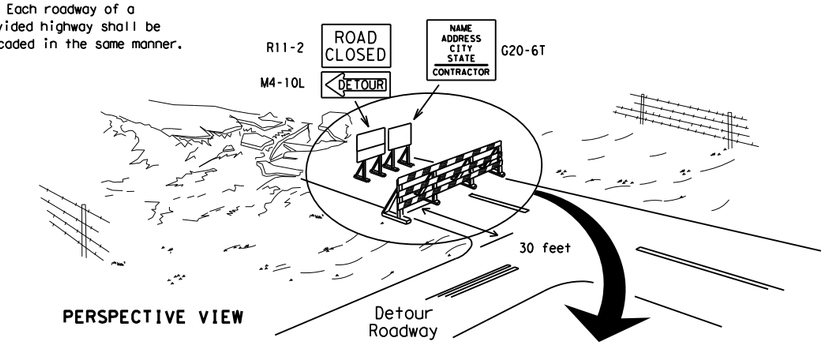
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

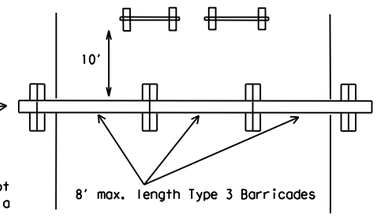
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

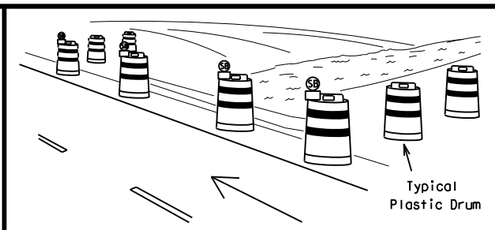
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

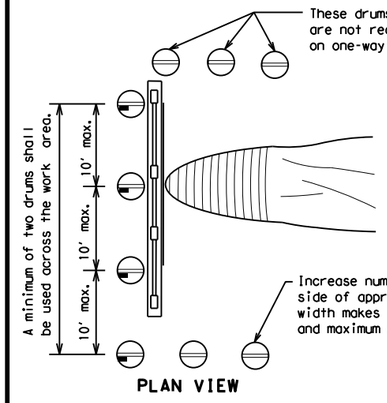
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

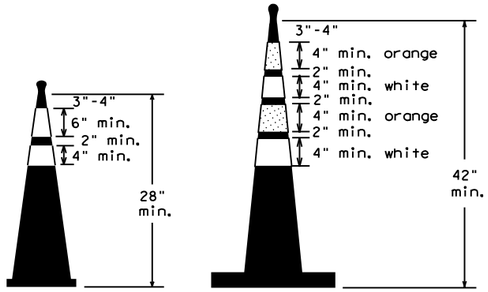
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

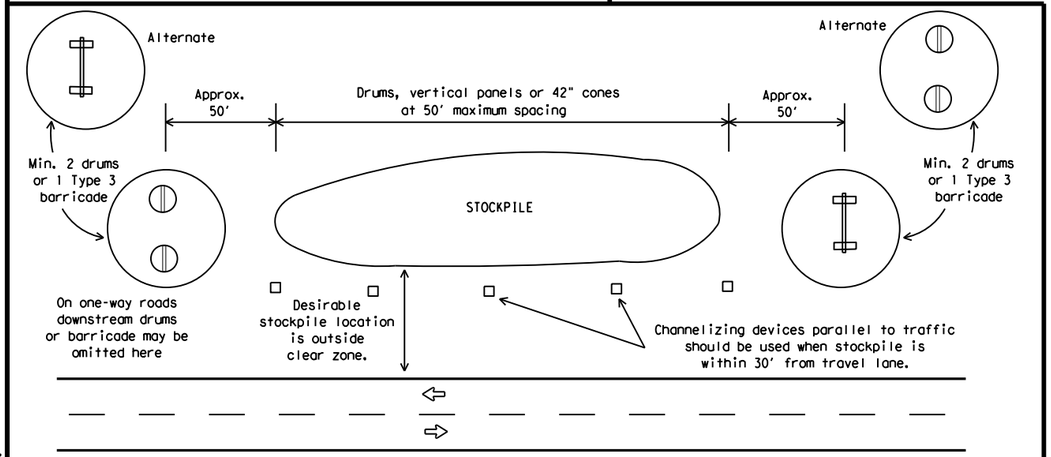
PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



28" Cones shall have a minimum weight of 9 1/2 lbs.
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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SHEET 10 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

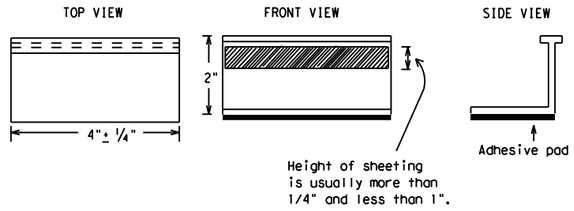
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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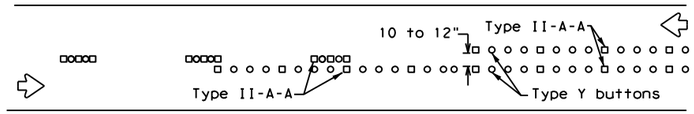
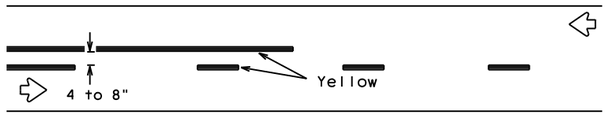
PAVEMENT MARKING PATTERNS

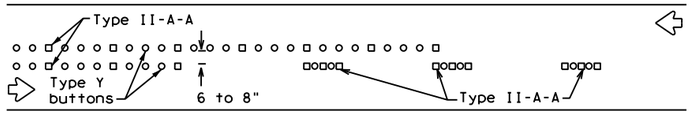
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



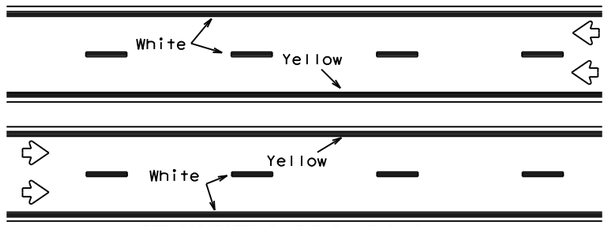
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



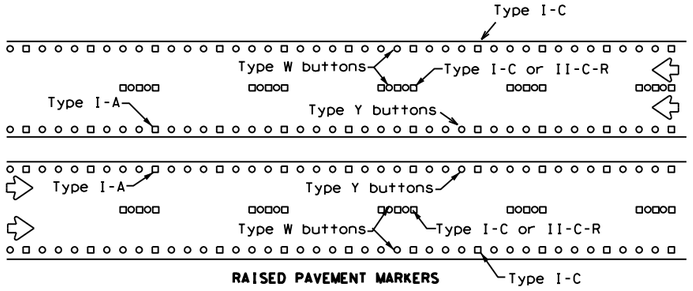
RAISED PAVEMENT MARKERS - PATTERN B

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



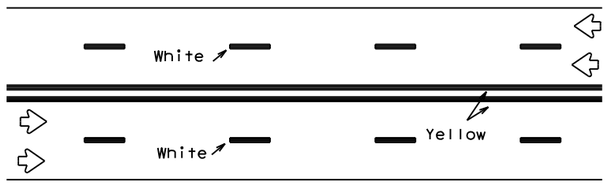
REFLECTORIZED PAVEMENT MARKINGS



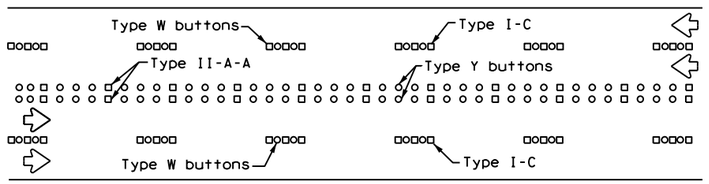
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



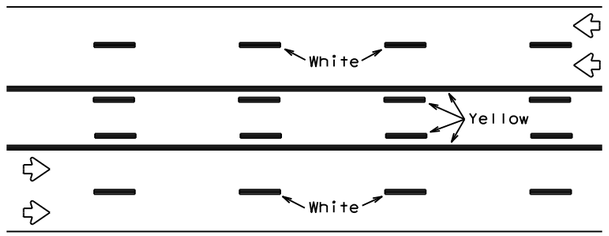
REFLECTORIZED PAVEMENT MARKINGS



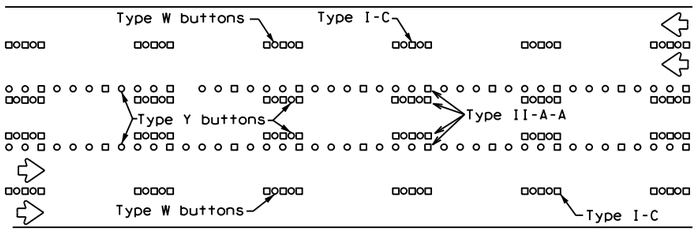
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

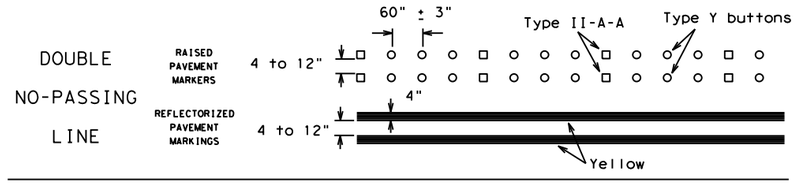
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

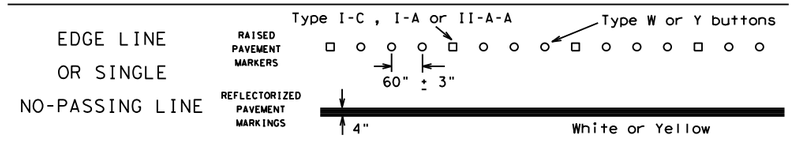
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

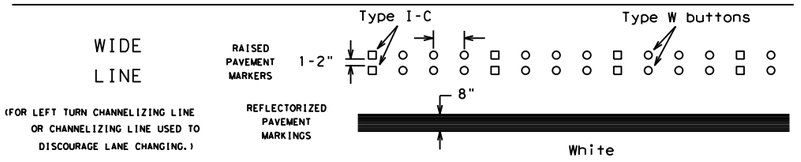


EDGE LINE OR SINGLE NO-PASSING LINE



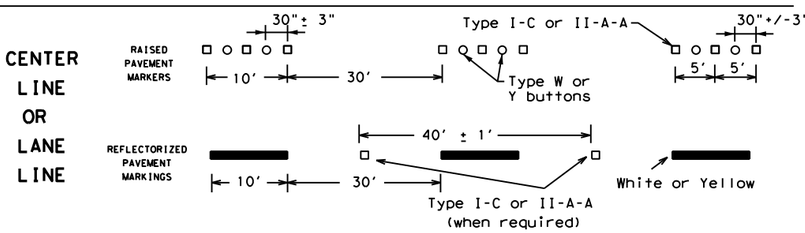
WIDE LINE

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

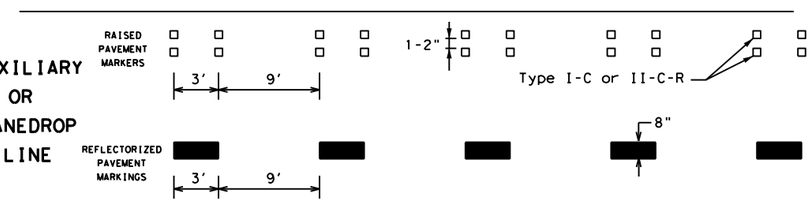


BROKEN LINES

CENTER LINE OR LANE LINE

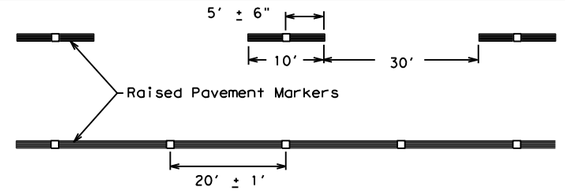


AUXILIARY OR LANEDROP LINE



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

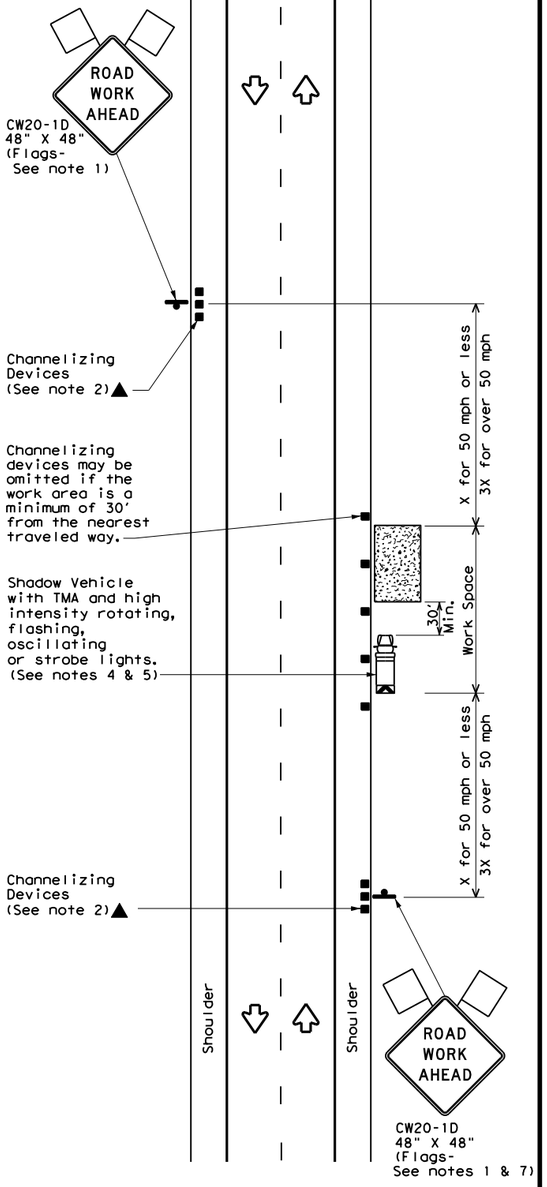
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	08	088	US287
1-97 9-07 5-21	DIST	COUNTY		SHEET NO.
2-98 7-13	WFS	WICHITA		39
11-02 8-14				

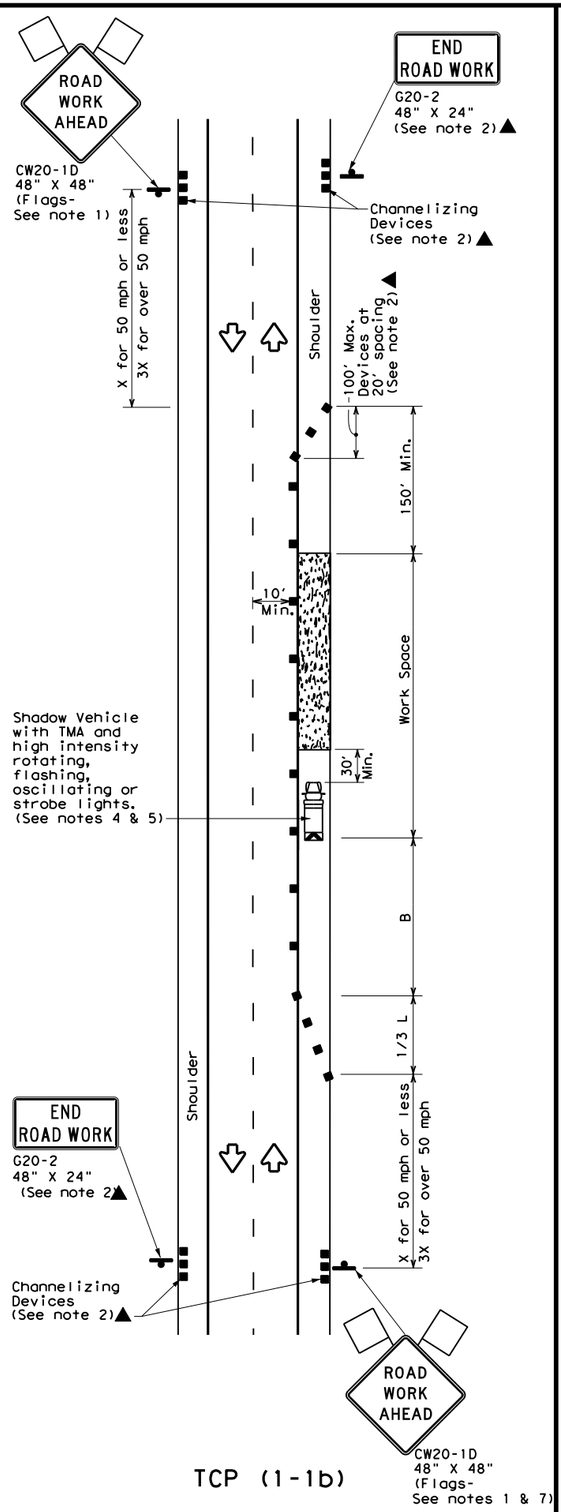
106

DATE:
FILE:



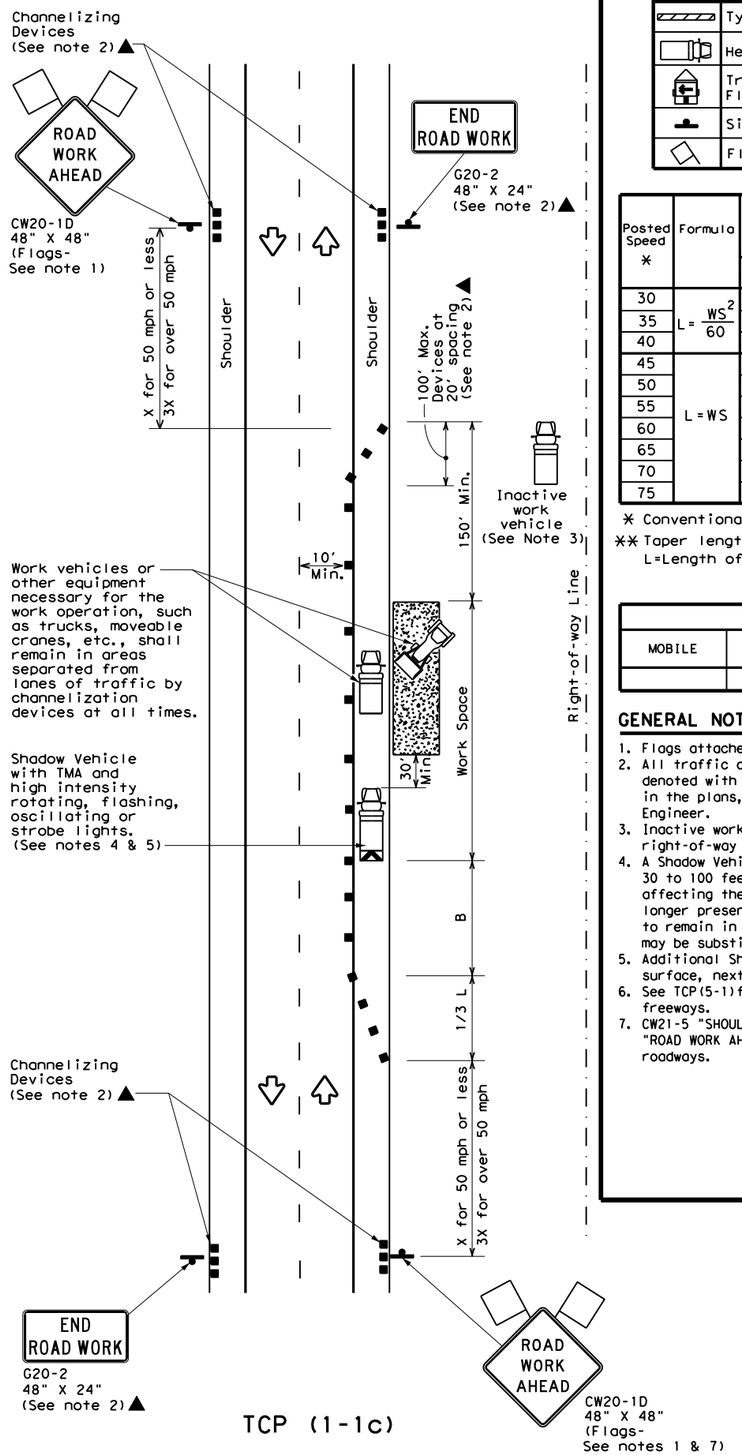
TCP (1-1a)

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

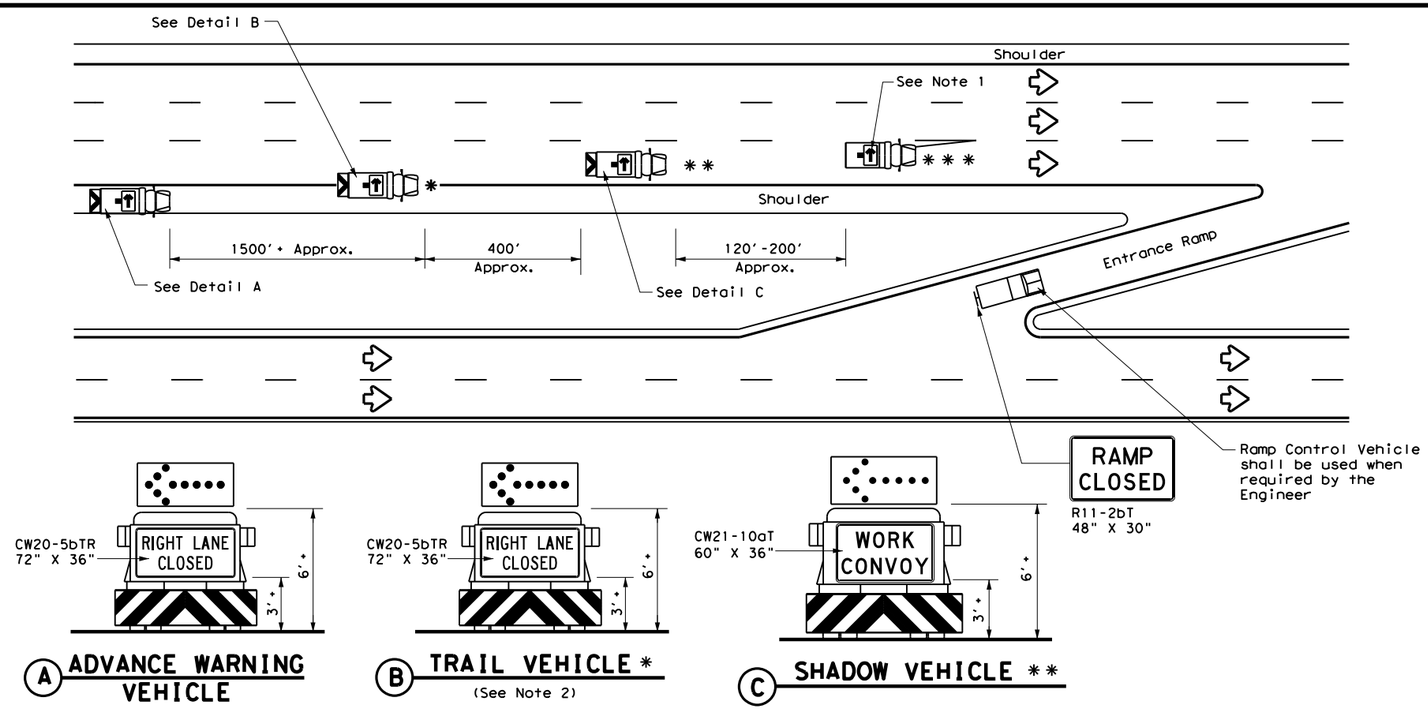
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

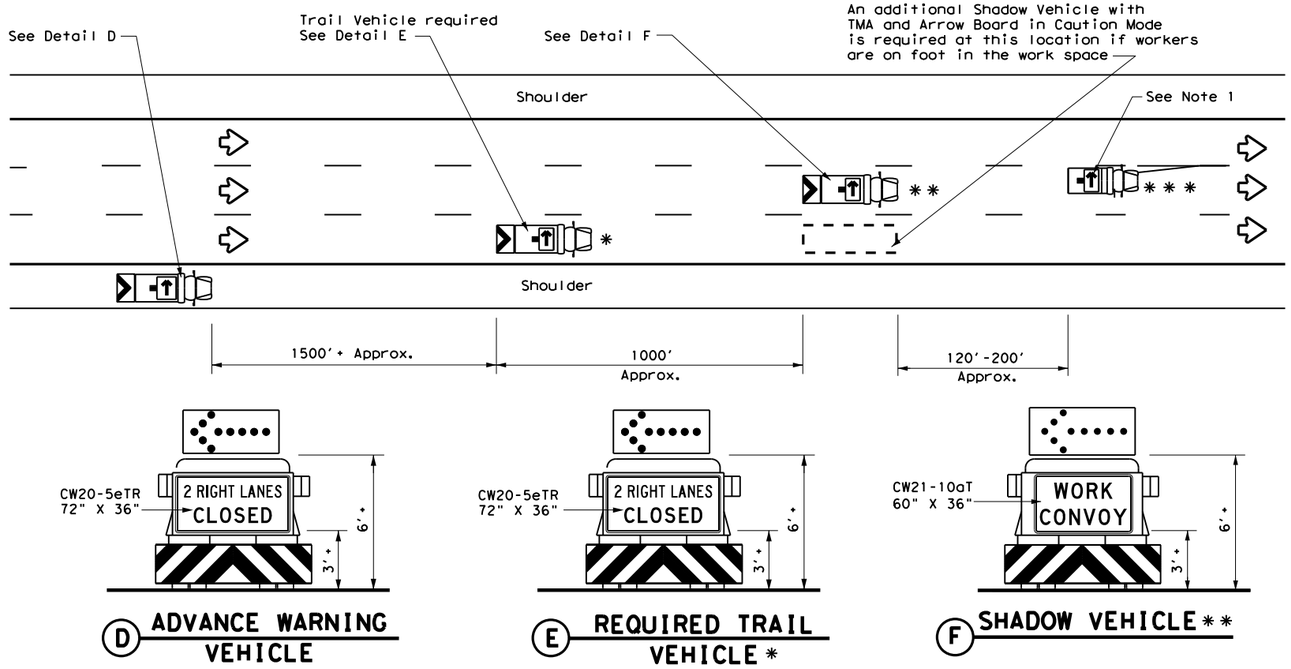
TCP(1-1)-18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	08	088	US287
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	WFS	WICHITA		40
1-97 2-18				

DATE:
FILE:



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



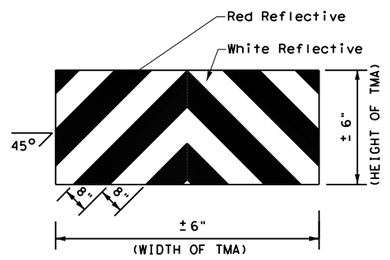
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

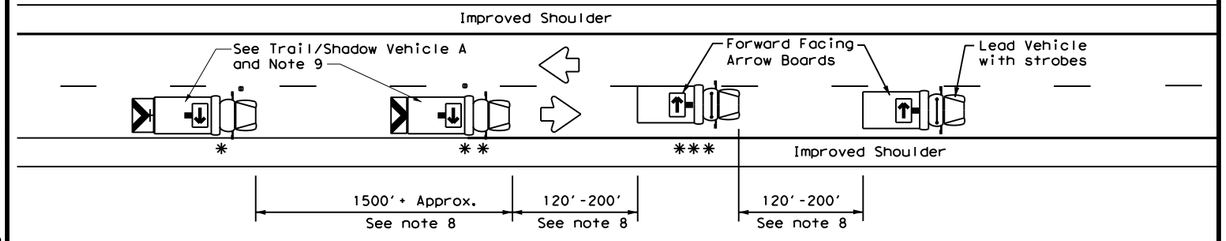
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

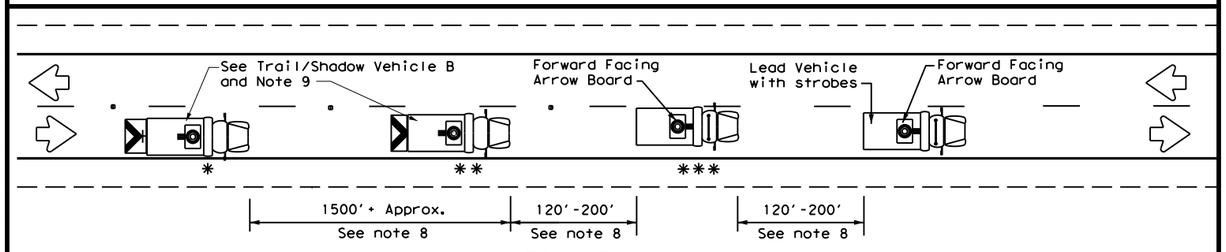
FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	004308		088	US287
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	WFS	WICHITA		41
1-97				

176



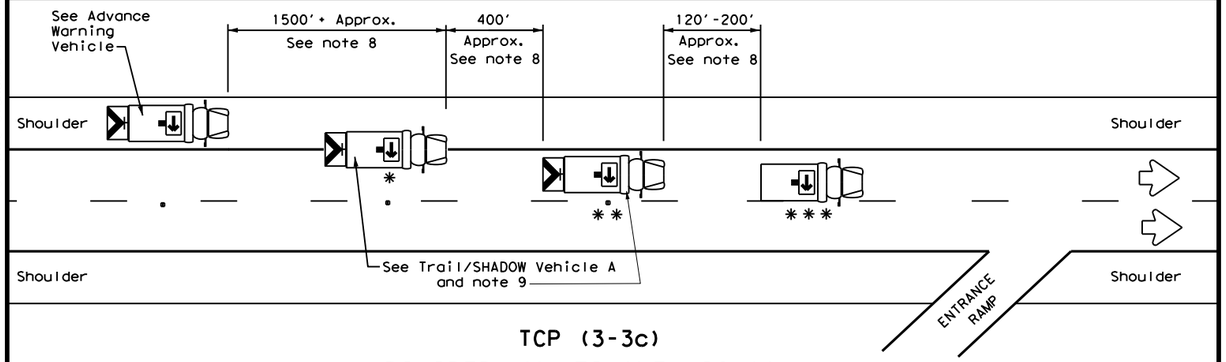
TCP (3-3a)

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



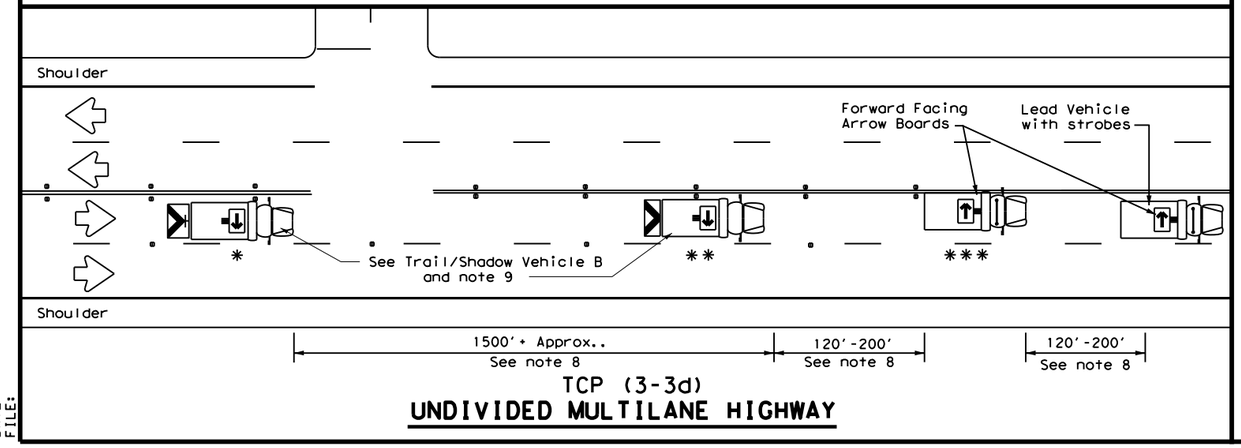
TCP (3-3b)

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



TCP (3-3c)

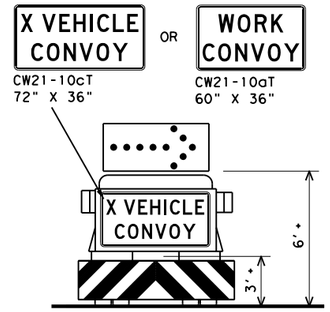
DIVIDED MULTILANE HIGHWAY



TCP (3-3d)

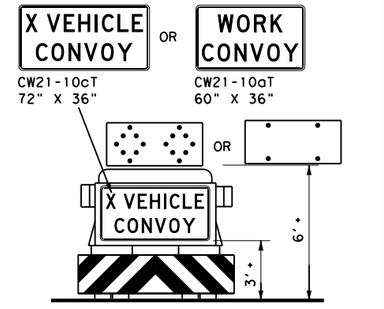
UNDIVIDED MULTILANE HIGHWAY

DATE:
FILE:



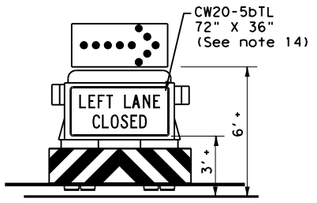
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

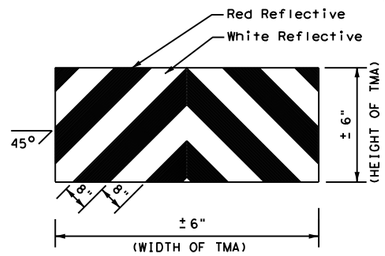


TRAIL/SHADOW VEHICLE B

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	004	308	088	US287
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	WFS	WICHITA		42
1-97 7-14				

DATE:
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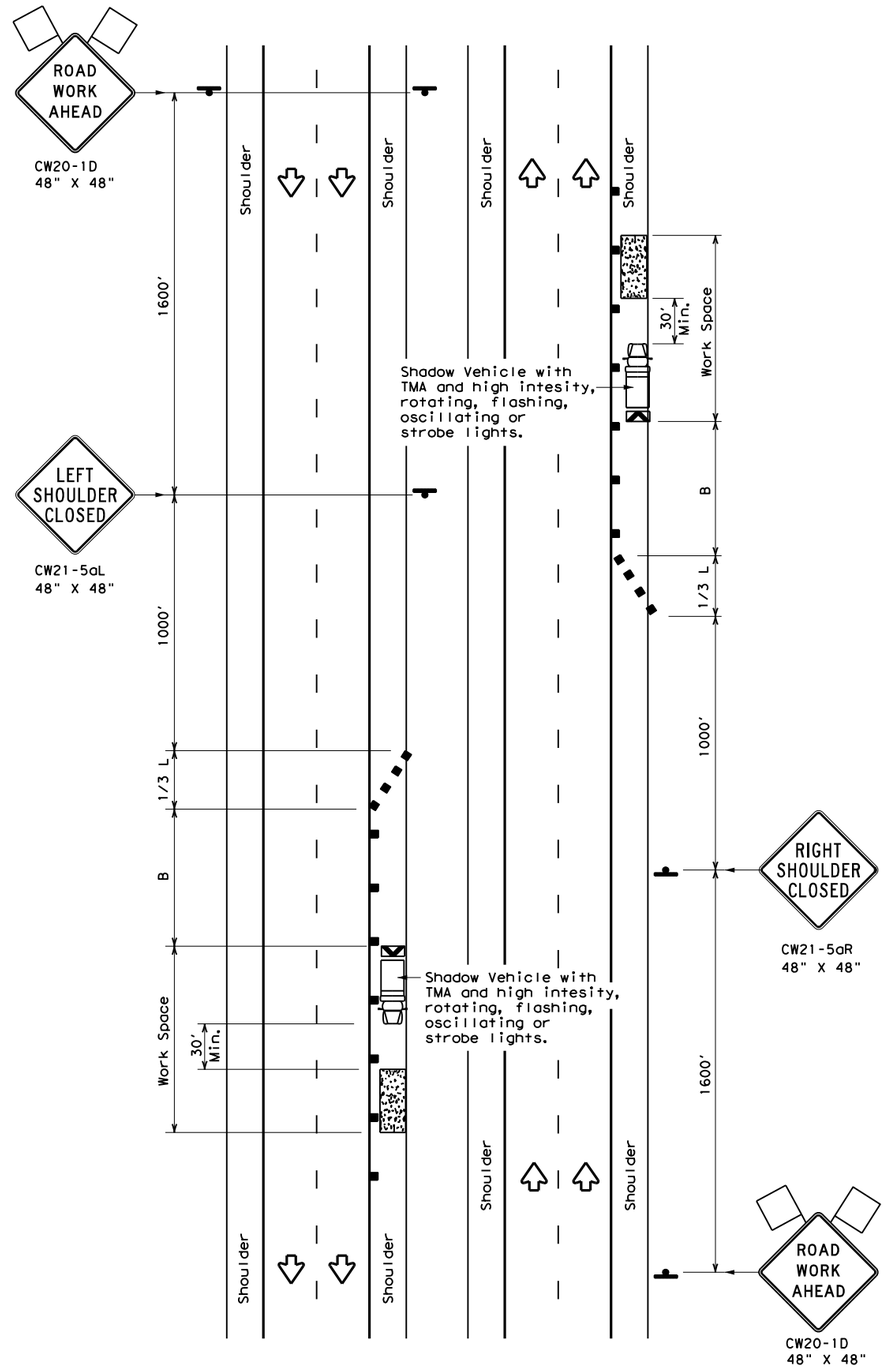
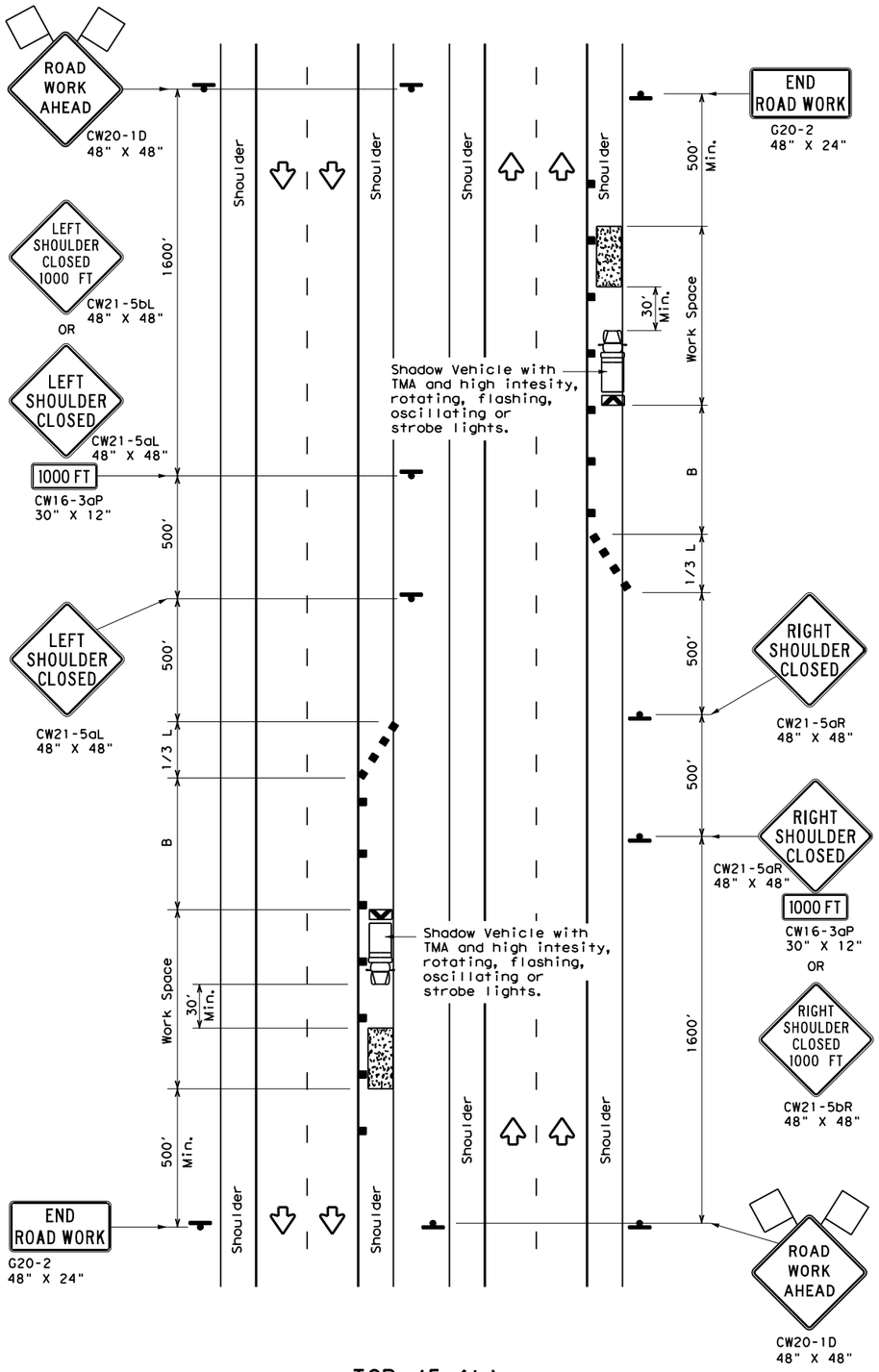


TCP (5-1a)

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.

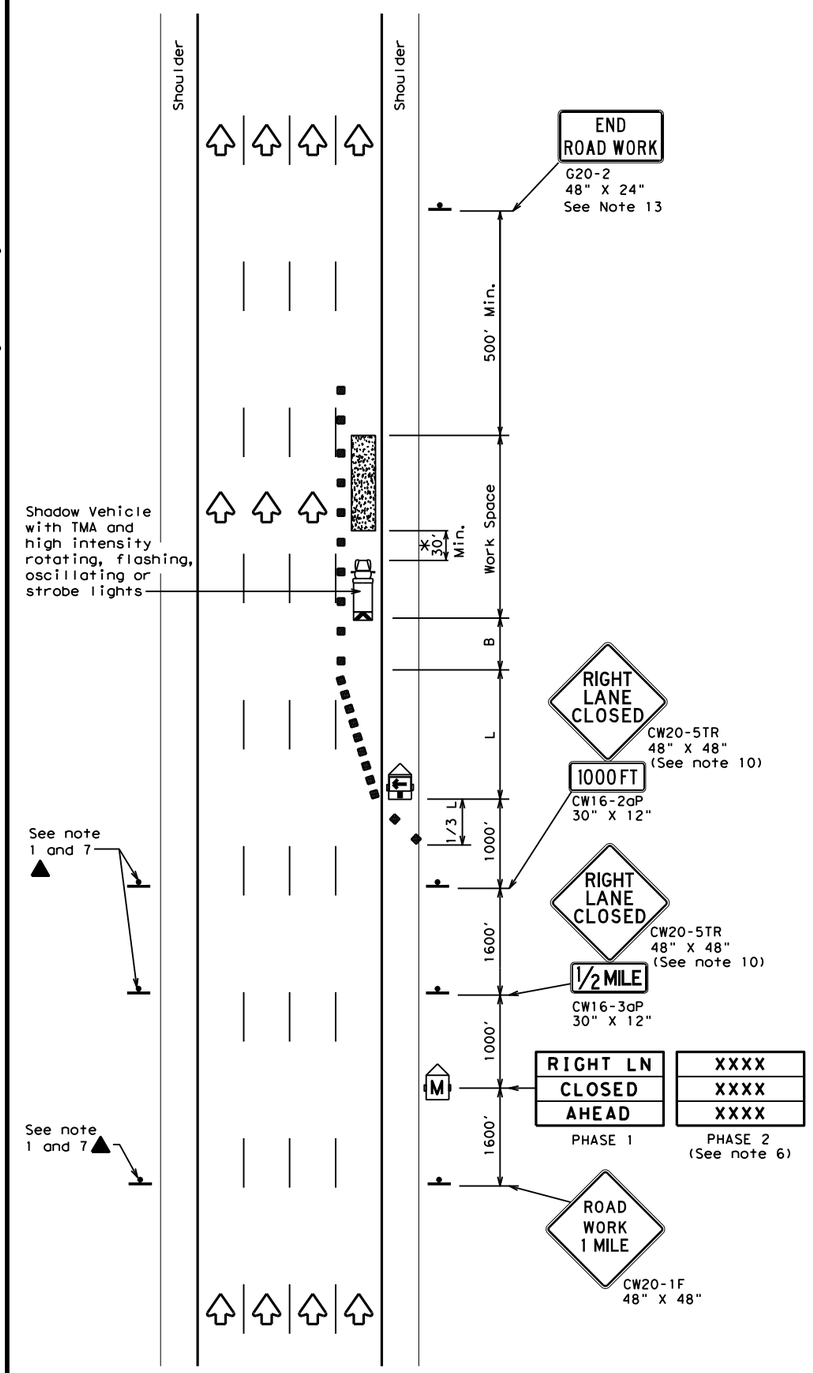
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

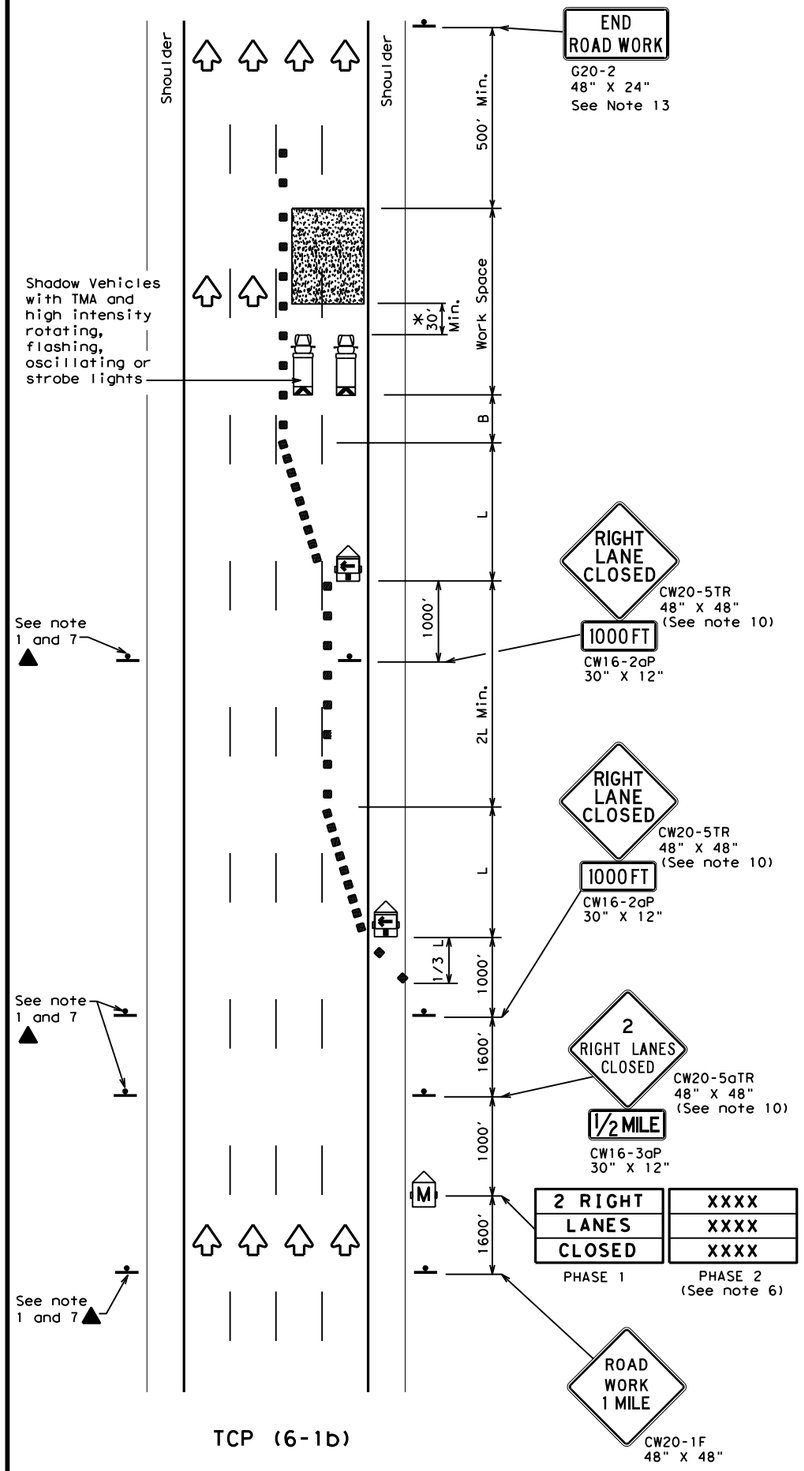
TCP(5-1)-18

FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	08	088	US287
2-18	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		43



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

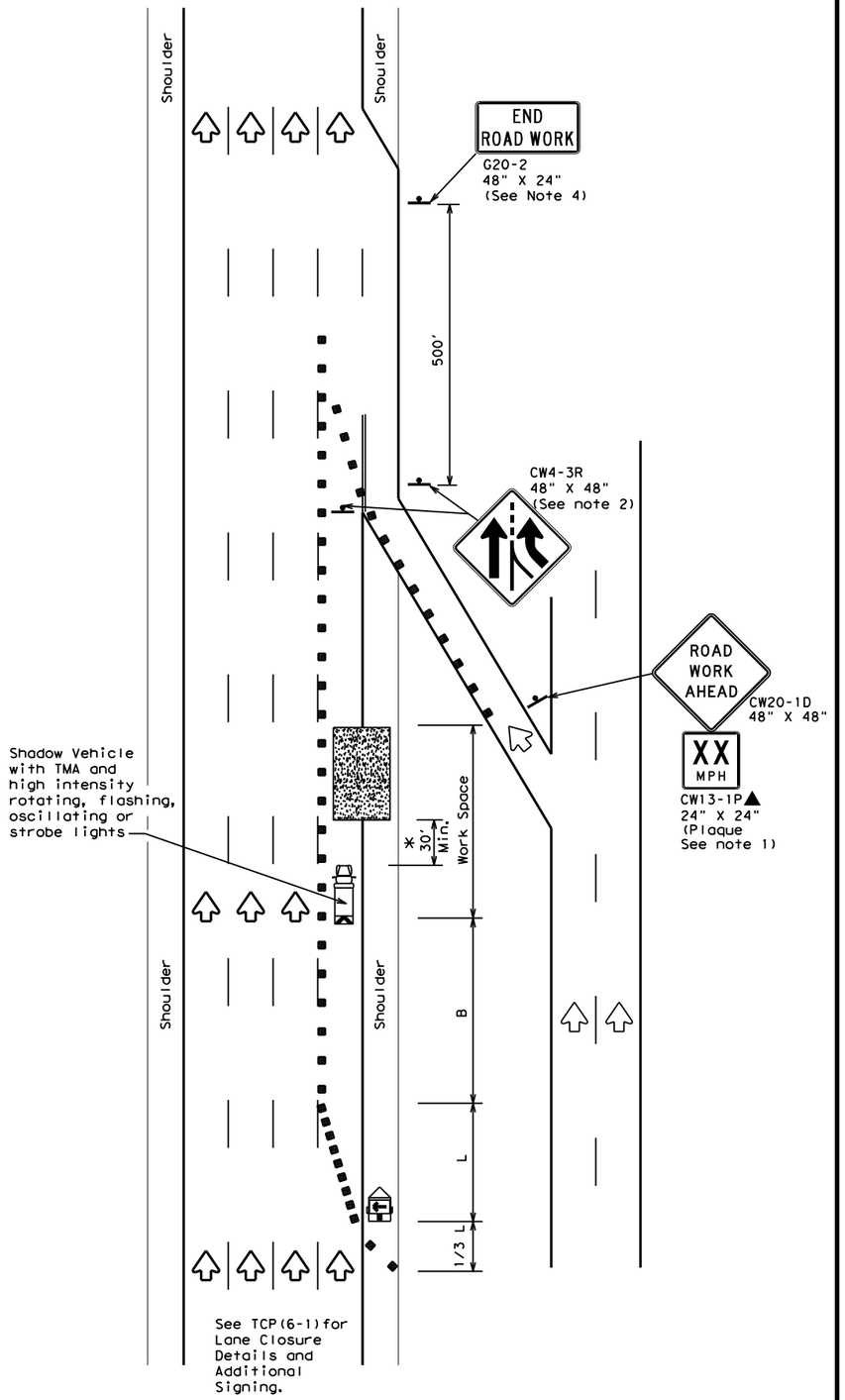
TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

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	08	088	US287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		44

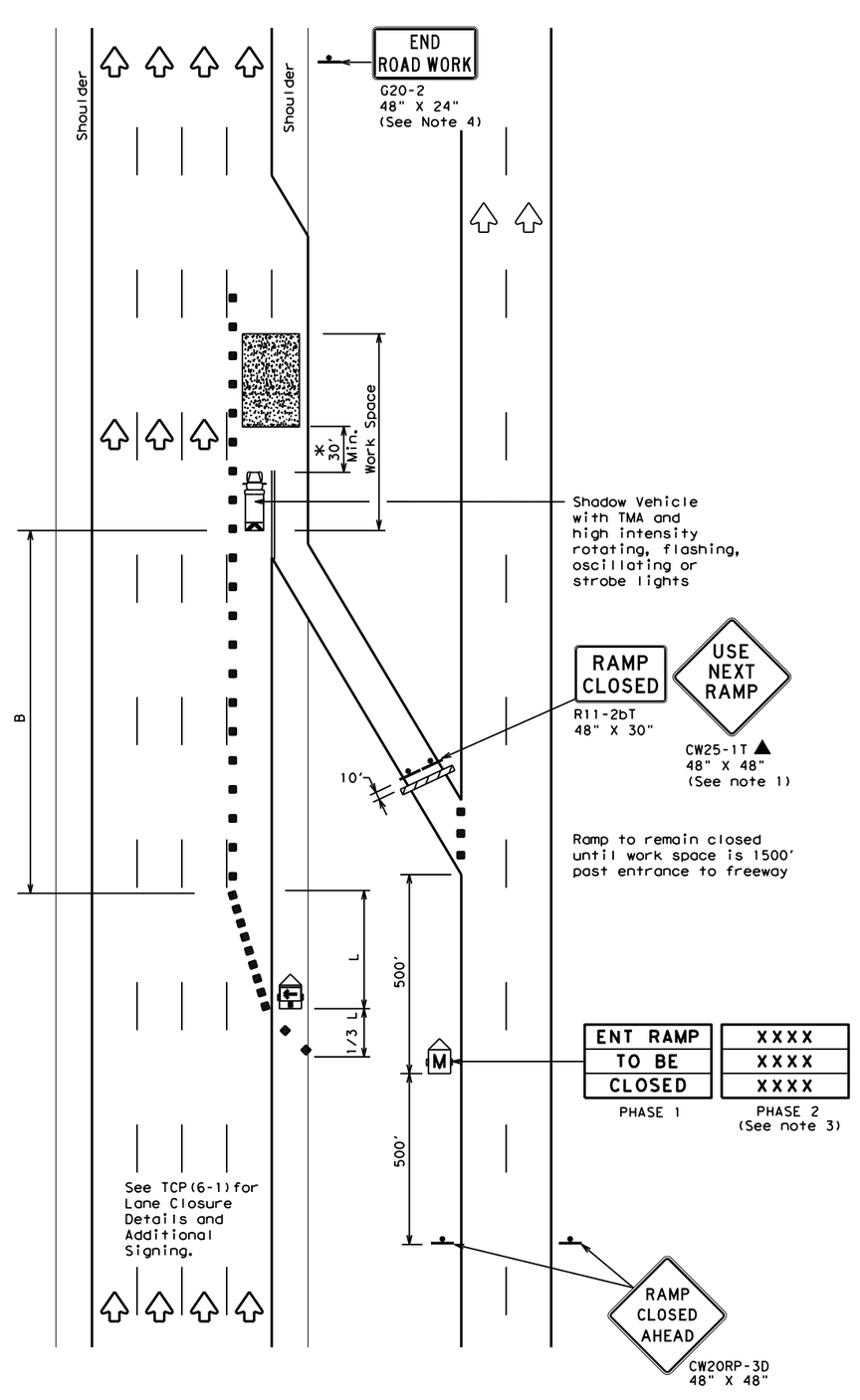
DATE:
FILE:

DATE:
FILE:



TCP (6-2a)

ENTRANCE RAMP OPEN
WORK WITHIN 500' OF RAMP



TCP (6-2b)

ENTRANCE RAMP CLOSED

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

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

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

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. ADDED LANE Symbol (CW4-3) sign may be omitted when sign between ramp and mainlane can be seen from both roadways.
3. See "Advance Notice List" on BC(6) for recommended date and time formatting options for PCMS Phase 2 message.
4. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA NEAR RAMP

TCP(6-2)-12

FILE: tcp6-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
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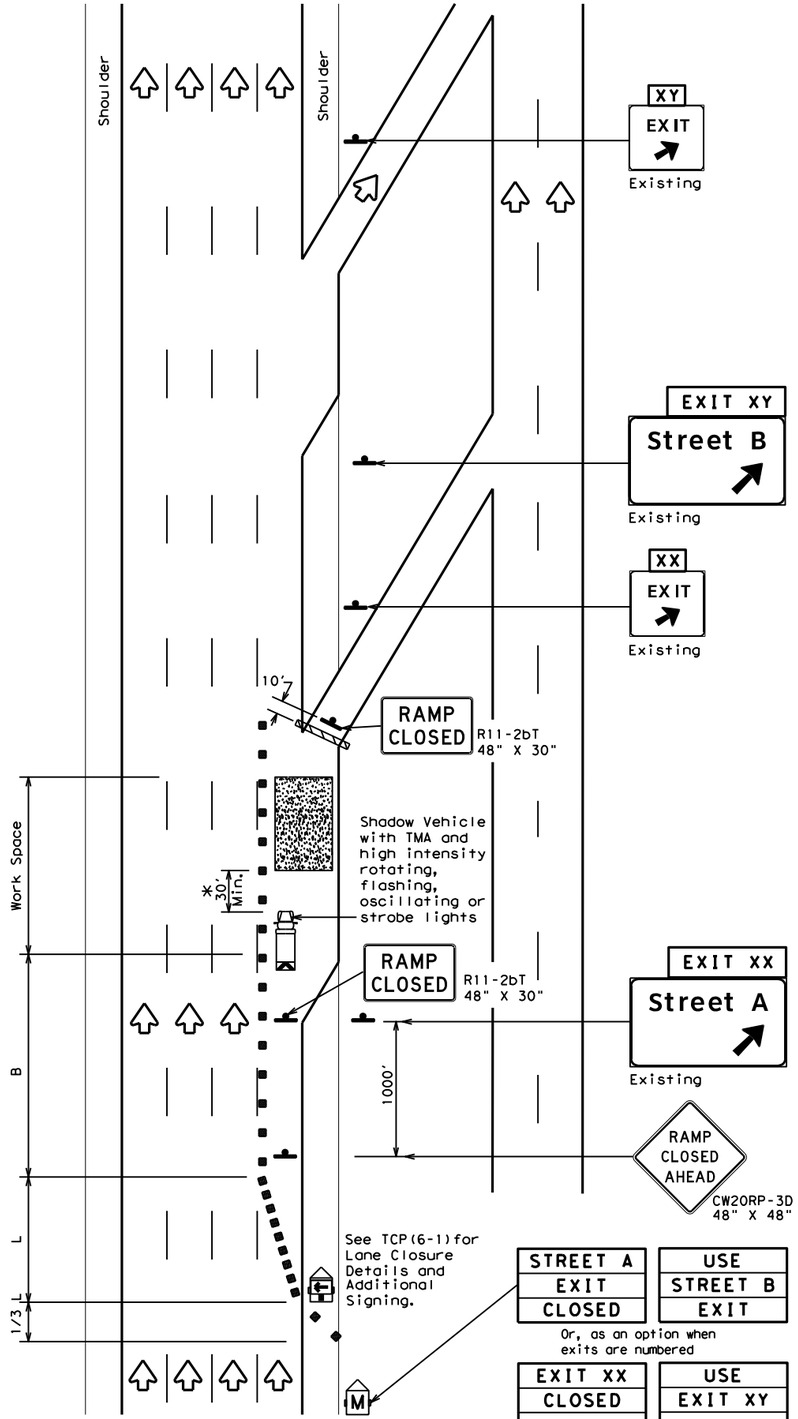
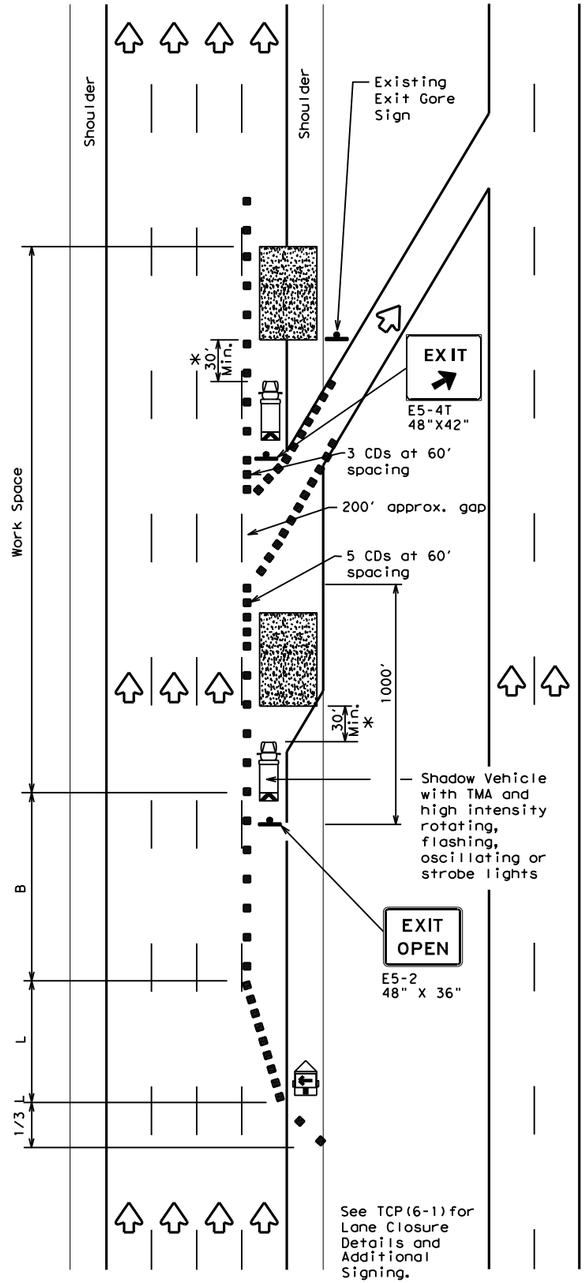
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	WFS	WICHITA		45

202



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

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©TxDOT Feburary 1994	CONT	SECT	JOB	HIGHWAY
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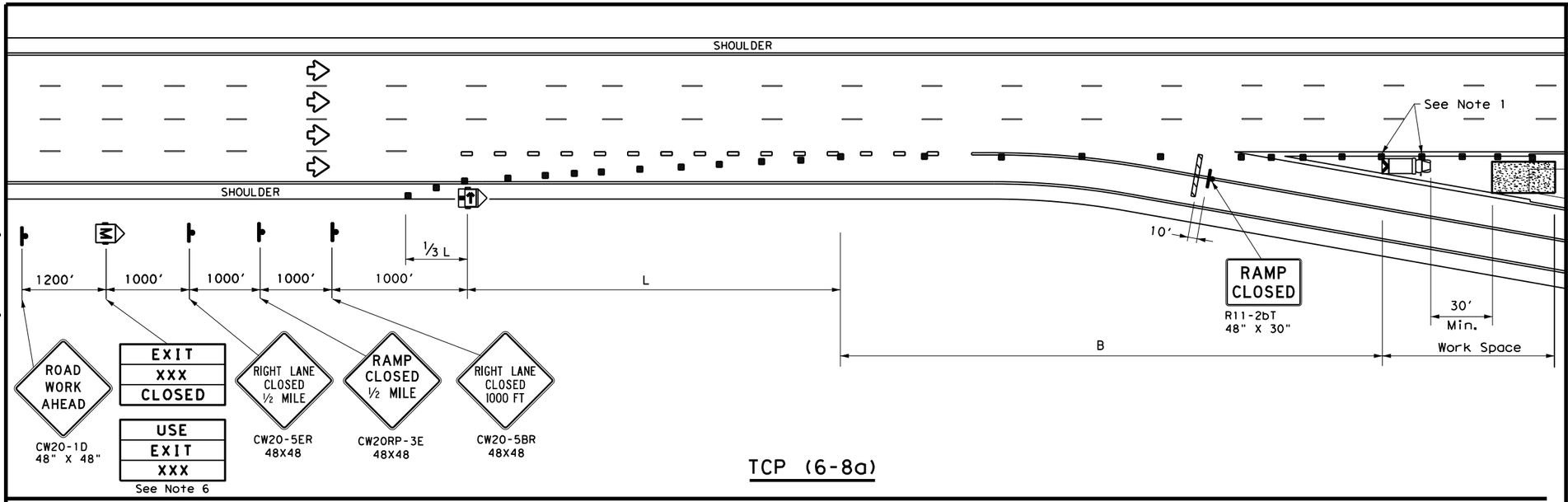
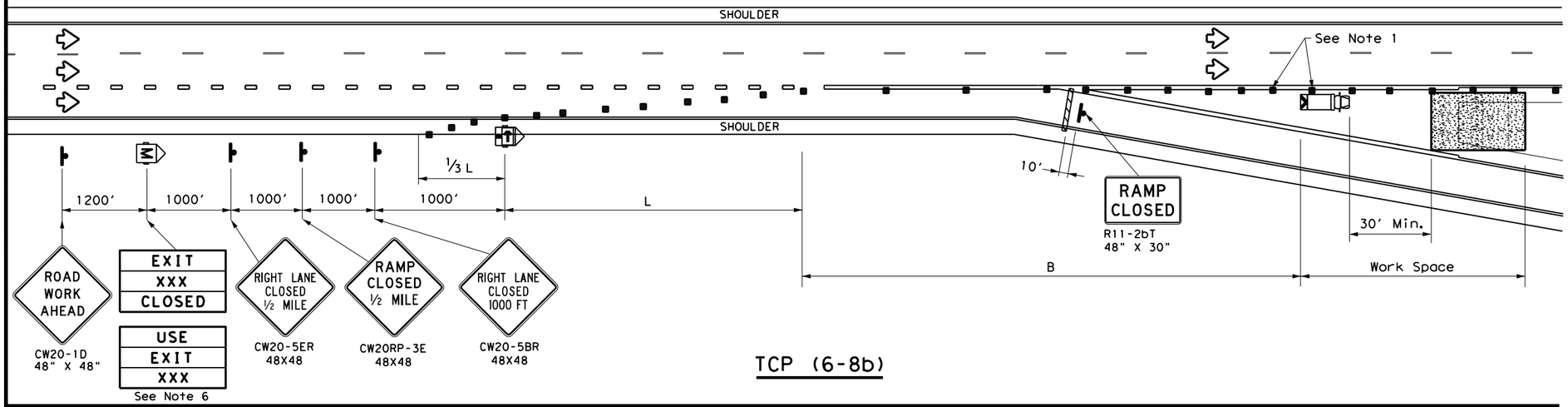
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	WES	WICHITA		46

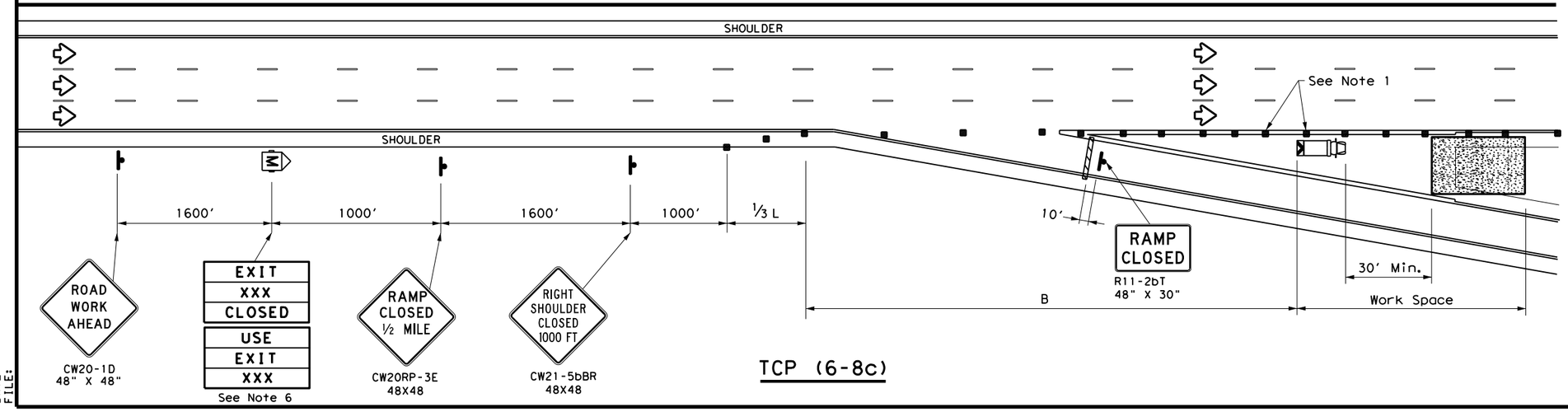
DATE:
FILE:



TCP (6-8a)



TCP (6-8b)



TCP (6-8c)

DATE:
FILE:

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

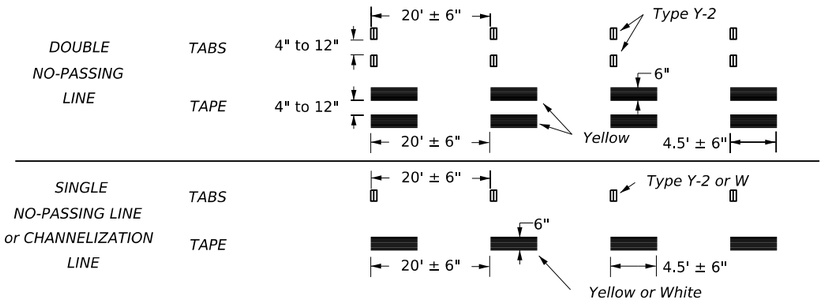
Traffic Operations Division Standard

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
REVISIONS	0043	08	088	US287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		47

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



NOTES:

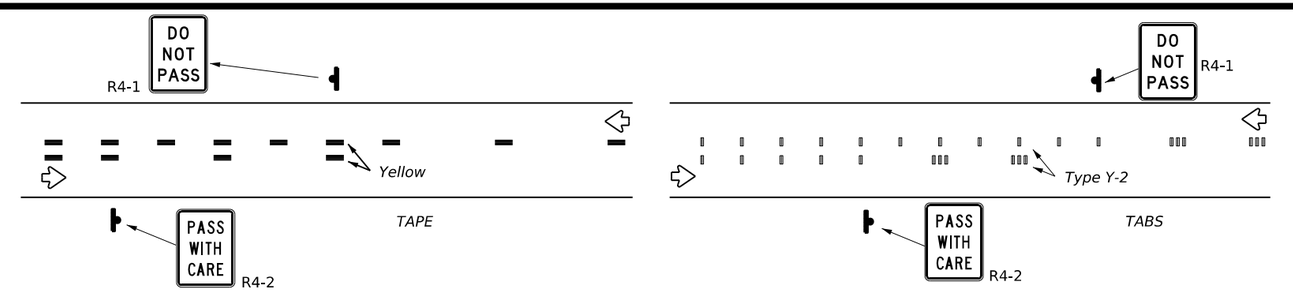
1. Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible reflective roadway marker tabs unless otherwise specified elsewhere in plans.
2. Short term pavement markings shall NOT be used to simulate edge lines.
3. Dimensions indicated on this sheet are typical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

TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

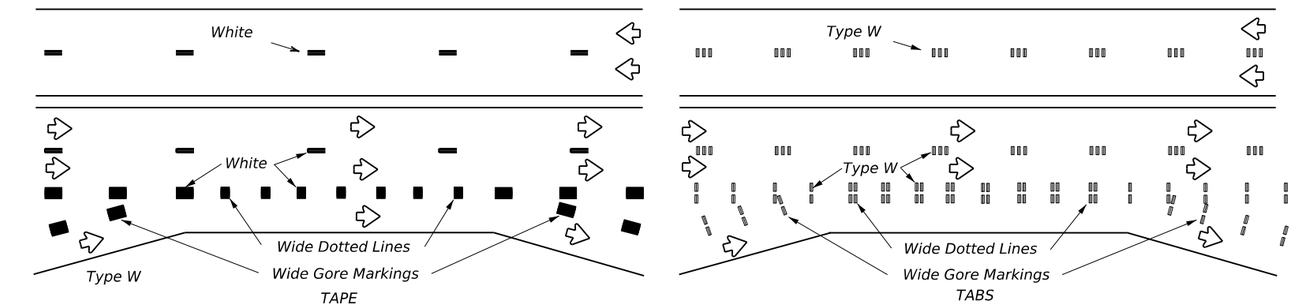
1. Temporary flexible-reflective roadway marker tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with yellow body); Type Y (one amber reflective surface with yellow body); and Type W (one white or silver reflective surface with white body). Additional details may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

DATE:
FILE:

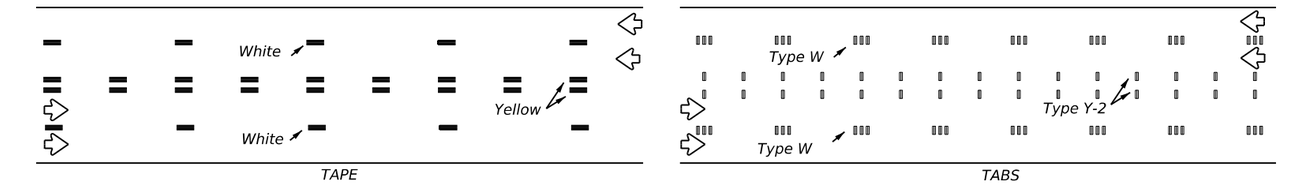
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



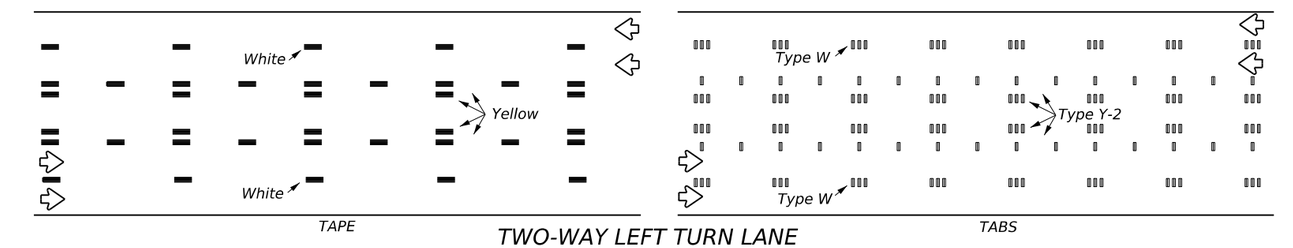
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



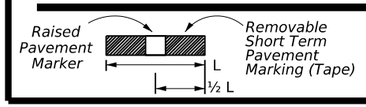
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

FILE: wzstpm-23.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
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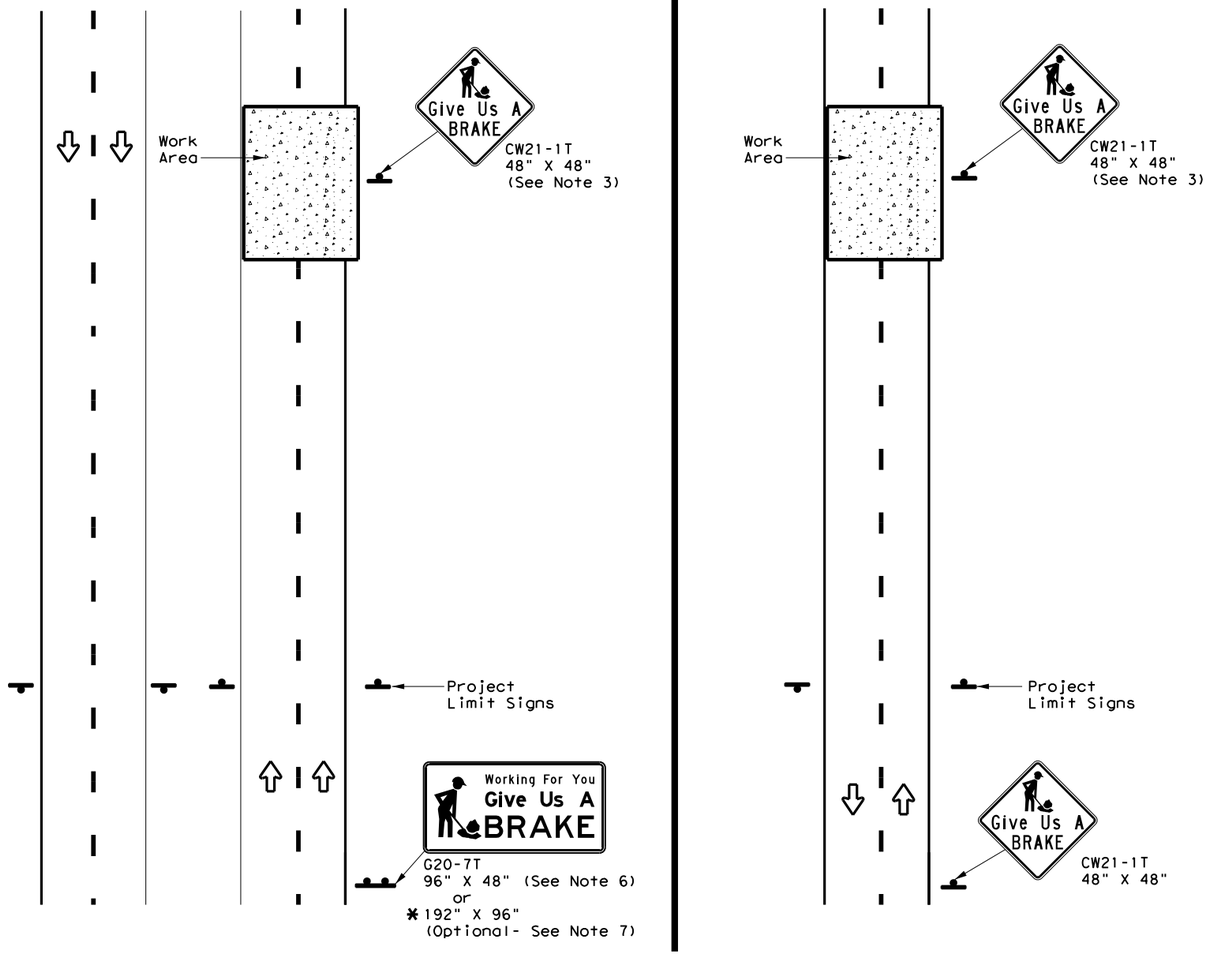
1-97 2-23	WFS	WICHITA		48
3-03				

111



DIVIDED HIGHWAY

UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

DATE:
FILE:

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	
REVISIONS	0043	08	088	US287
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	WFS	WICHITA		49

116

DATE:
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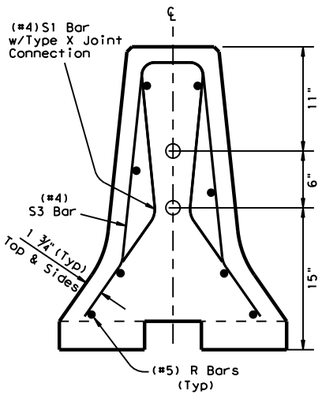
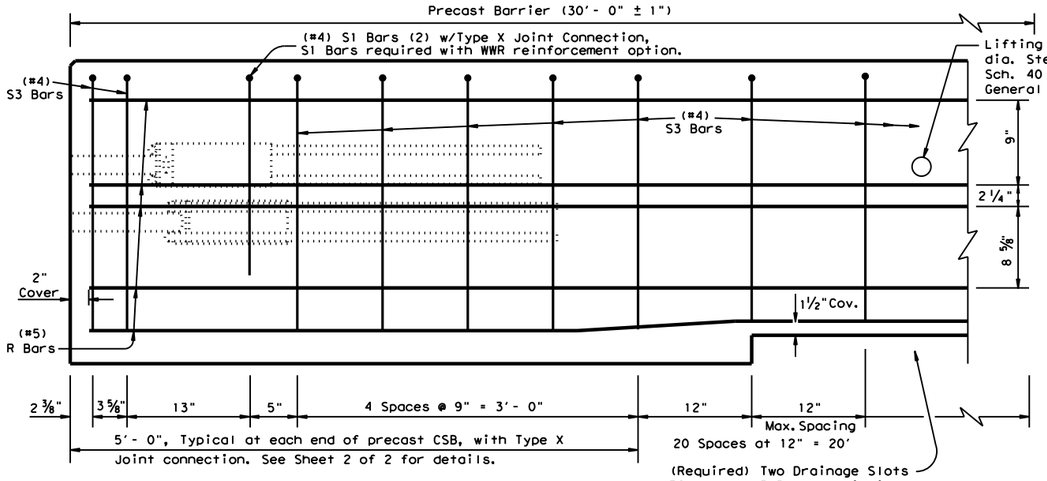


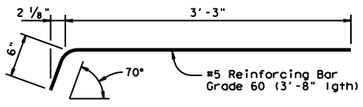
End View Precast Barrier

See sheet 2 of 3 for Joint connection Type X



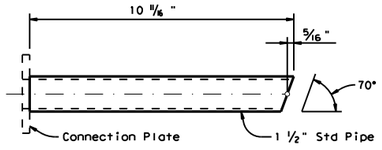
Reinforcement for Precast (CSB) Concrete Safety Barrier (Type 1)

Showing reinforcement for Joint Type X



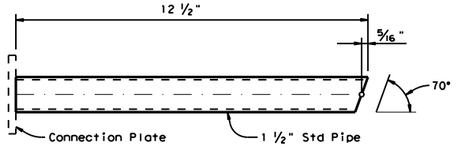
DEFORMED BAR ANCHOR DETAILS

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



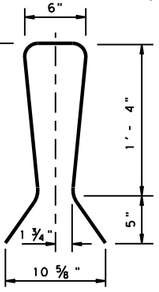
UPPER CONNECTION PIPE DETAILS

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



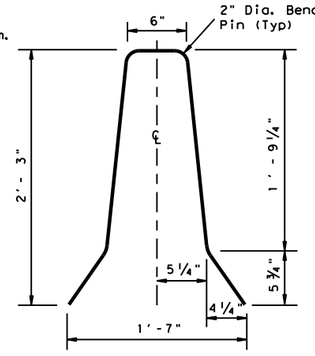
LOWER CONNECTION PIPE DETAILS

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



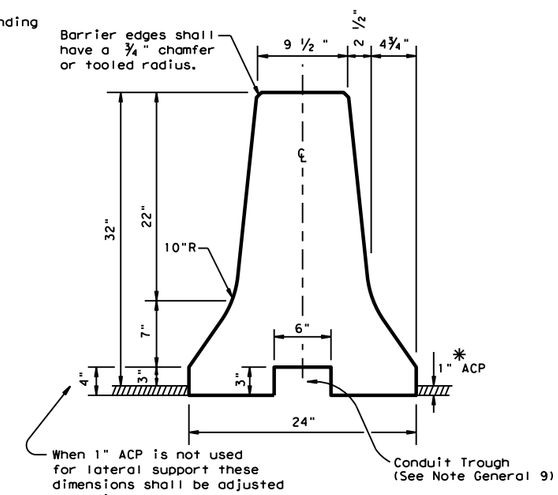
S1 Bar

#4 Bar (2)
(Joint Type X)



S3 Bar

#4 Bar

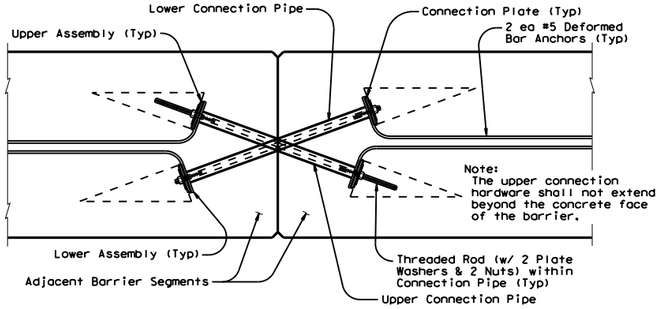


Concrete Safety Barrier

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

GENERAL NOTES

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



TYPE X JOINT INSTALLATION DETAIL

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

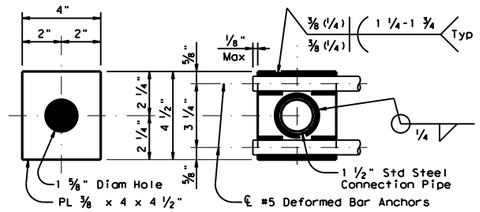
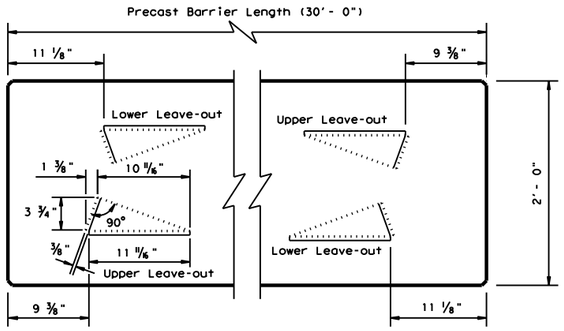


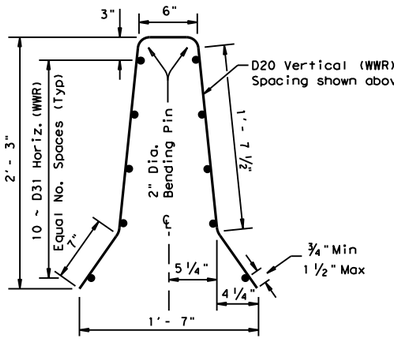
PLATE DIMENSIONS WELDING DETAILS

CONNECTION PLATE DETAILS

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



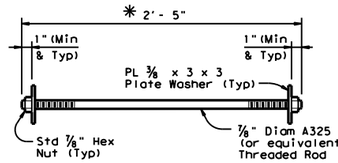
BARRIER PLAN AT END JOINTS



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

(WWR) General Notes

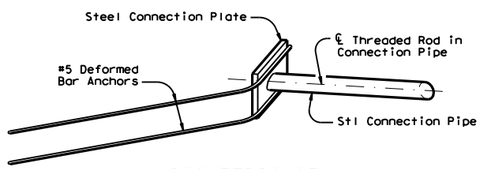
1. Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
2. Welded wire cage may be cut or bent to accommodate the Type X joint connection and drainage slots, as directed by the Engineer.
3. All reinforcement shall comply with Item 440, "Reinforcing Steel."
4. Combinations of reinforcing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



CONNECTION BOLT OR THREADED ROD DETAIL

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

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



ISOMETRIC OF TYPICAL WELDED ASSEMBLY

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

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

SHEET 1 OF 2

Texas Department of Transportation

Design Division Standard

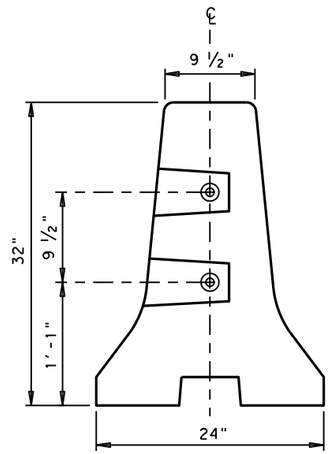
CONCRETE SAFETY BARRIER (F-SHAPE)

PRECAST BARRIER (TYPE 1)

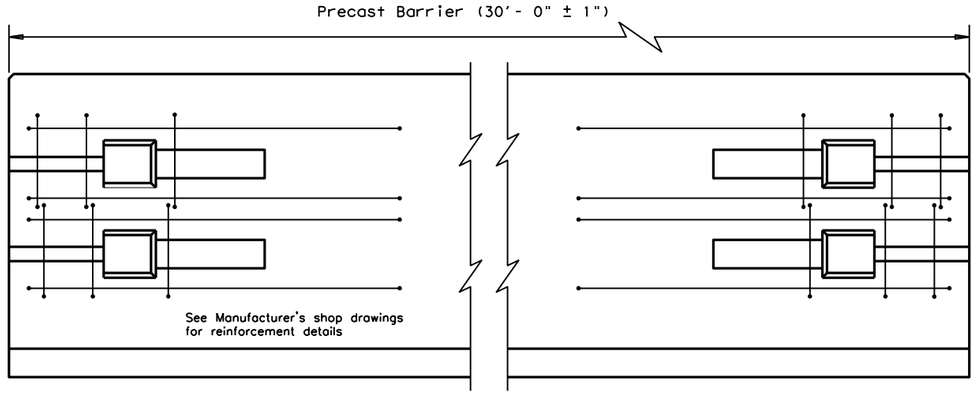
CSB(1)-10

FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD	CK: VP
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	08	088	US287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		50

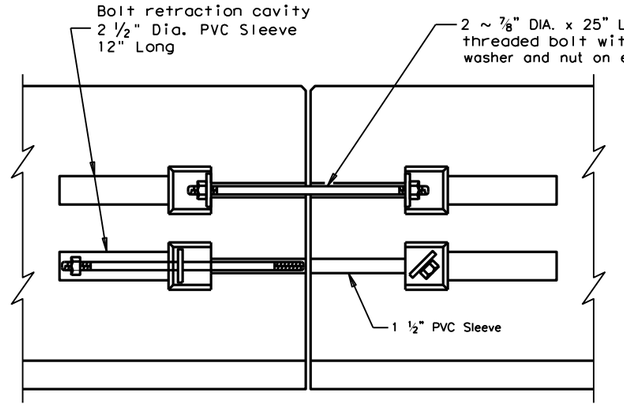
DATE:
FILE:



END VIEW (CSB) QUICK-BOLT
QUICK-BOLT POCKET LOCATIONS

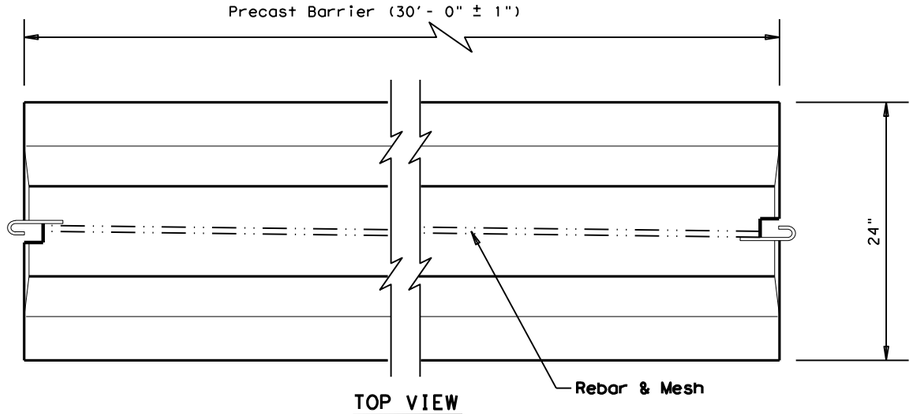


ELEVATION (CSB) QUICK-BOLT
See Manufacturer's shop drawing for additional details

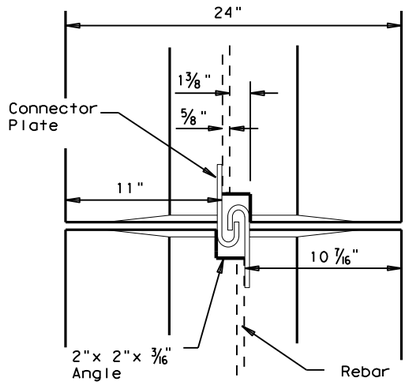


ELEVATION VIEW SHOWING JOINT CONNECTION
"QUICK-BOLT"

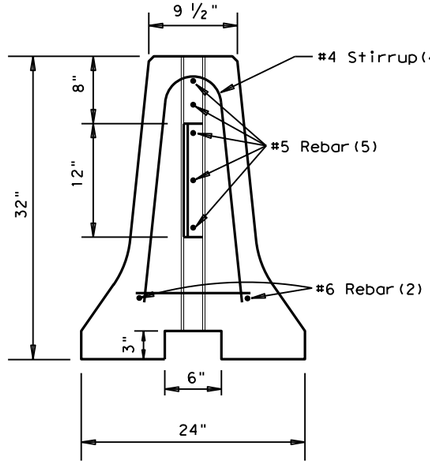
Joint Connection (Type Q)



TOP VIEW
PRECAST (CSB) WITH J-J HOOKS
See Manufacturer's shop drawing for additional details



VIEW FROM ABOVE
J-J HOOK CONNECTION



END VIEW
J-J HOOK CONNECTION

Joint Connection (Type J)

Proprietary Joint Connections (CSB)

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

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

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

Texas Department of Transportation
Design Division Standard

CONCRETE SAFETY BARRIER (F-SHAPE)

PRECAST BARRIER
(TYPE 1)

CSB(1)-10

FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD	CK: VP
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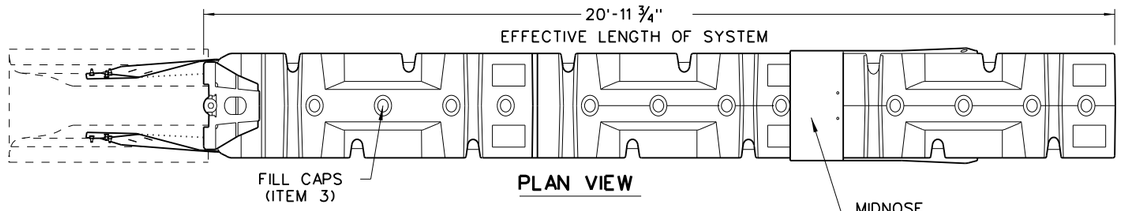
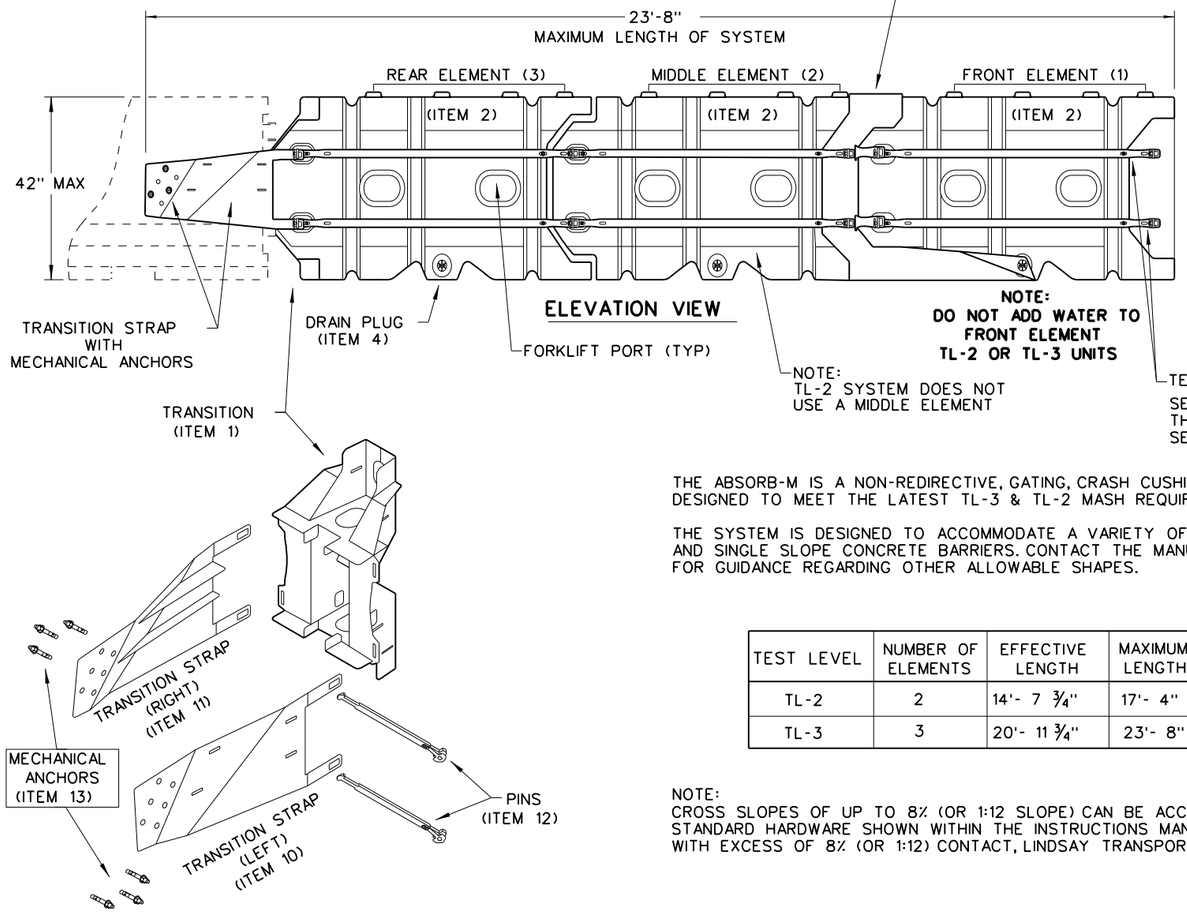
REVISIONS	0043	08	088	US287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		51

DATE:
FILE:

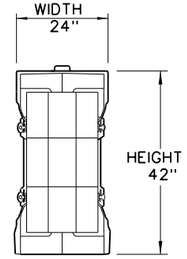
SYSTEM SHOWN - ABSORB-M TL-3



PLAN VIEW



ELEVATION VIEW



SECTION A-A

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

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

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

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

GENERAL NOTES

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

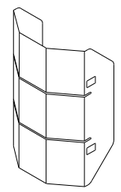
BILL OF MATERIALS (BOM) ABSORB-M TL-3 & TL-2 SYSTEMS			QTY	QTY
ITEM #	PART NUMBER	PART DESCRIPTION	TL-2 SYSTEM	TL-3 SYSTEM
1	BSI-1809036-00	TRANSITION-(GALV)	1	1
[2] *	BSI-1808002-00	PRE-ASSEMBLED ABSORBING (ELEMENTS)	2	3
[3] *	BSI-4004598	FILL CAPS	8	12
[4] *	BSI-4004599	DRAIN PLUGS	2	3
[5] *	BSI-1809053-00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

* COMPONENTS PRE-ASSEMBLED WITH ELEMENT ASSEMBLY

DELINEATION DECAL PLACEMENT GUIDE

TRAFFIC FLOW LEFT-SIDE BARRIER | TRAFFIC FLOW BOTH-SIDE BARRIER | TRAFFIC FLOW RIGHT-SIDE BARRIER

** APPLY DECAL



NOSE PLATE

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

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

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

SACRIFICIAL

Texas Department of Transportation

Design Division Standard

LINDSAY TRANSPORTATION SOLUTIONS

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

FILE: absorbm19	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT: JULY 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	08	088	US287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		52

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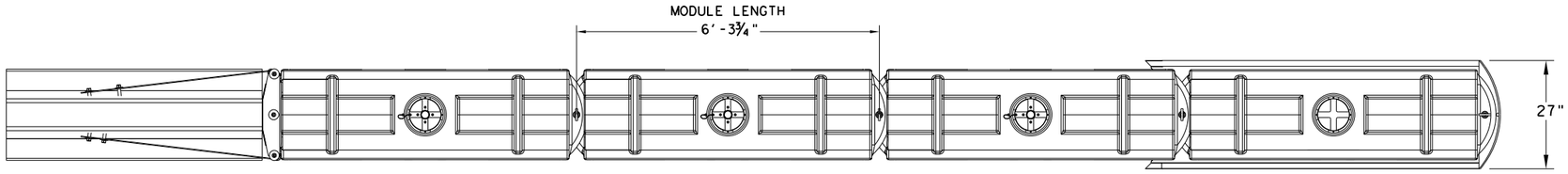
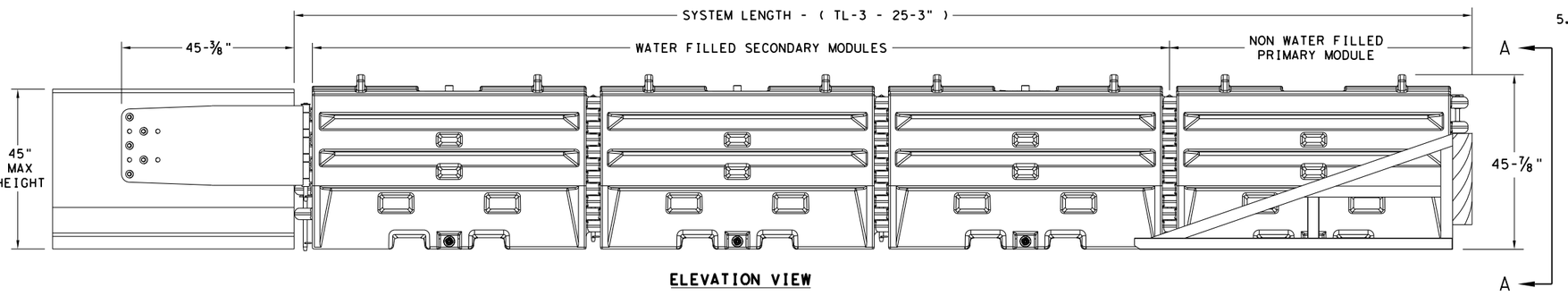
FILE:



PLAN VIEW



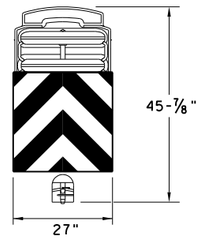
ELEVATION VIEW

GENERAL NOTES

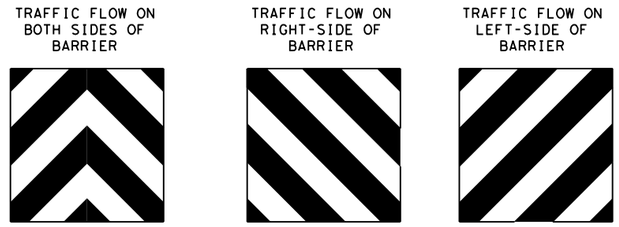
1. REFER TO THE INSTALLATION MANUAL FOR SPECIFIC SYSTEM ASSEMBLY AND MODULE ORIENTATION. FOR ADDITIONAL INFORMATION, CONTACT TRAFFIX, INC. AT (949) 361-5663.
2. THE SLED SYSTEM IS A MASH APPROVED TEST LEVEL 3 (TL-3) CRASH CUSHION APPROVED FOR USE IN TEMPORARY WORK ZONES. THE SLED SYSTEM IS A NON-REDIRECTIVE,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

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

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



SECTION A-A

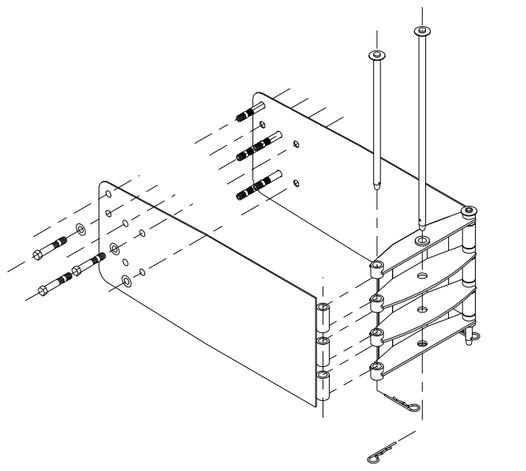


NOSE SHEETING PANEL DELINEATION

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

BILL OF MATERIAL

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



SLED TRANSITION COMPONENTS FOR ATTACHMENT TO CMB

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

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

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

SACRIFICIAL

Texas Department of Transportation

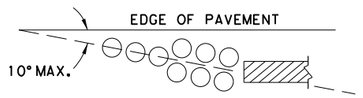
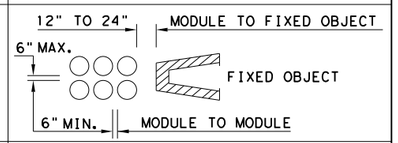
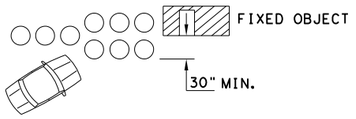
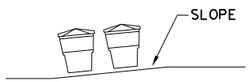
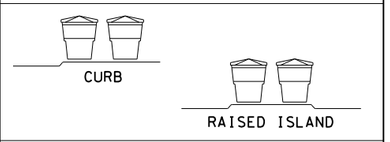
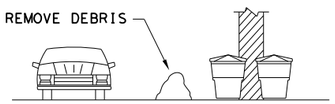
Design Division Standard

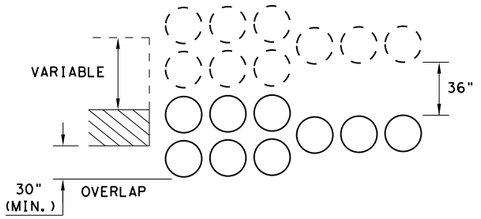
SLED
CRASH CUSHION
TL-3 MASH COMPLIANT
(TEMPORARY, WORK ZONE)
SLED-19

FILE: sled19.dgn	DN: TxDOT	CK: KM	DW: VP	CK:
©TxDOT: DECEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	08	088	US287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		53

DATE:
FILE:

SITE CONDITIONS AND PLACEMENT GUIDELINES

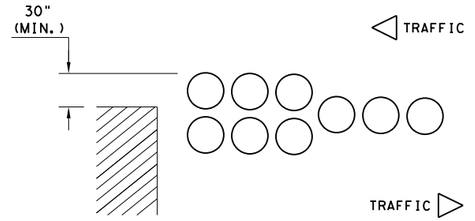
CONDITION	RECOMMENDATION	ILLUSTRATION
1. ANGLE OF ARRAY IN RELATION TO CENTER LINE OF OBSTACLE	NOT RECOMMENDED FOR MORE THAN 10°	
2. MODULE SPACING: MODULE TO FIXED OBJECT MODULE TO MODULE	 12" TO 24" SEE DIAGRAM	
3. BI-DIRECTIONAL TRAFFIC	OFFSET ARRAY TO AVOID REAR CORNER MODULE SNAGGING, POTENTIAL BY TRAFFIC IN THE UPSTREAM DIRECTION OF FLOW.	SEE (DETAIL B) SHOWING BI-DIRECTIONAL TRAFFIC
4. "COFFIN" CORNER	SHIELD 30" MINIMUM OUTSIDE OF FIXED OBJECT	
5. SLOPING SITES: LATERAL AND LONGITUDINAL FOR MORE INFORMATION READ GENERAL NOTE: 7	1:10 MAXIMUM (V: H:)	
6. CURB: RAISED ISLAND:	NO MORE THAN 4" HIGH (REMOVE IF POSSIBLE)	
7. FOUNDATION PADS:	FLAT SURFACE: CONCRETE OR ASPHALT	
8. MAINTENANCE:	KEEP SITE CLEAR OF TRASH, ROAD DEBRIS, ETC	
9. SAND DENSITIES	100 LBS / CF	
10. VANDALISM	CHECK PERIODICALLY FOR DAMAGES, GRAFFITI.	



MODULE PLACEMENT FOR FIXED OBJECT OF VARIABLE WIDTH

DETAIL A

SEE GENERAL NOTE 2



MODULE PLACEMENT FOR BI-DIRECTIONAL TRAFFIC

DETAIL B

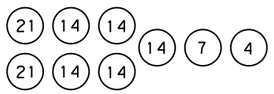
SEE GENERAL NOTE 2

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE AVAILABLE MASH COMPLIANT SYSTEMS, CONTACT: TrafFix DEVICES, INC. AT (949) 361-5663 OR PSS INNOVATIONS, INC. AT (800) 662-6338.
2. REAR MODULES SHOULD OVERLAP THE HAZARDOUS FIXED OBJECT IN WIDTH ON EACH SIDE BY A MINIMUM OF 30 INCHES. SEE DETAILS A, B.
3. BARRIERS CAN BE INSTALLED AT ANY DISTANCE FROM THE SHOULDER, AT ROADSIDE AND MEDIAN LOCATIONS FROM ZERO FT UP TO 30 FT, DEPENDING UPON THE LOCATION OF THE HAZARDOUS FIXED OBJECT.
4. ANGLING THE BARRIER TOWARDS ON-COMING TRAFFIC IS SUGGESTED, 3-DEGREES UP TO 10-DEGREES DEPENDING ON SPACE AVAILABLE.
5. WHENEVER POSSIBLE, CURBS 4 INCHES AND HIGHER SHOULD BE REMOVED FROM THE HAZARDOUS SITES. HOWEVER, WHEN REMOVAL IS NOT POSSIBLE, MODULES CAN BE SEPARATED ALONG THE BARRIER AXIS TO FIT THE SITUATION.
6. LONGITUDINAL SPACING OF MODULES MAY BE INCREASED WHERE SPACE PERMITS, E.G., 2 FT UP TO 3 FT SPACING OF SELECTED MODULES MAY PERMIT THE DESIGNER TO USE ALL THE SPACE ALLOCATED FOR AN ENERGY-ABSORBING BARRIER.
7. THE ENTIRE AREA OF THE CRASH CUSHION INSTALLATION AND APPROACHES SHALL BE GRADED SO THAT THE MAXIMUM SLOPE DOES NOT EXCEED 1V:10H VERTICALLY OR HORIZONTALLY IN ANY DIRECTION.
8. WHERE REQUIRED, SUPPORT PADS, CONCRETE, ASPHALT, ETC, WILL BE MEASURED AND PAID FOR IN ACCORDANCE WITH PERTINENT BID ITEMS.
9. TrafFIX DEVICES AND PSS INNOVATIONS SAND BARREL SYSTEMS HAVE BEEN ASSESSED AS MASH COMPLIANT.

TYPICAL MODULE ARRAYS WITH CORRESPONDING DESIGN SPEED AND SAND WEIGHT (X 100 LB) SHOWN IN CIRCLES.

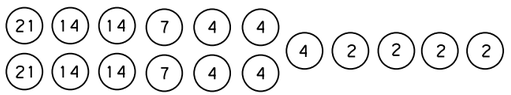
CONFIGURATION = 12,300 LB



TL-2

TL-2 = 45 MPH OR LOWER

CONFIGURATION = 14,000 LB



TL-3

TL-3 = 50 MPH OR GREATER

TYPICAL MODULE ARRAY

NOTE: MODULE ARRAYS SHOWN ARE THE MINIMUM DESIGNS REQUIRED. SITE SPECIFIC VARIATIONS OF THESE DESIGNS WILL REQUIRE ADDITIONAL DETAILS WITH AN ENGINEER'S SEAL.

SACRIFICIAL

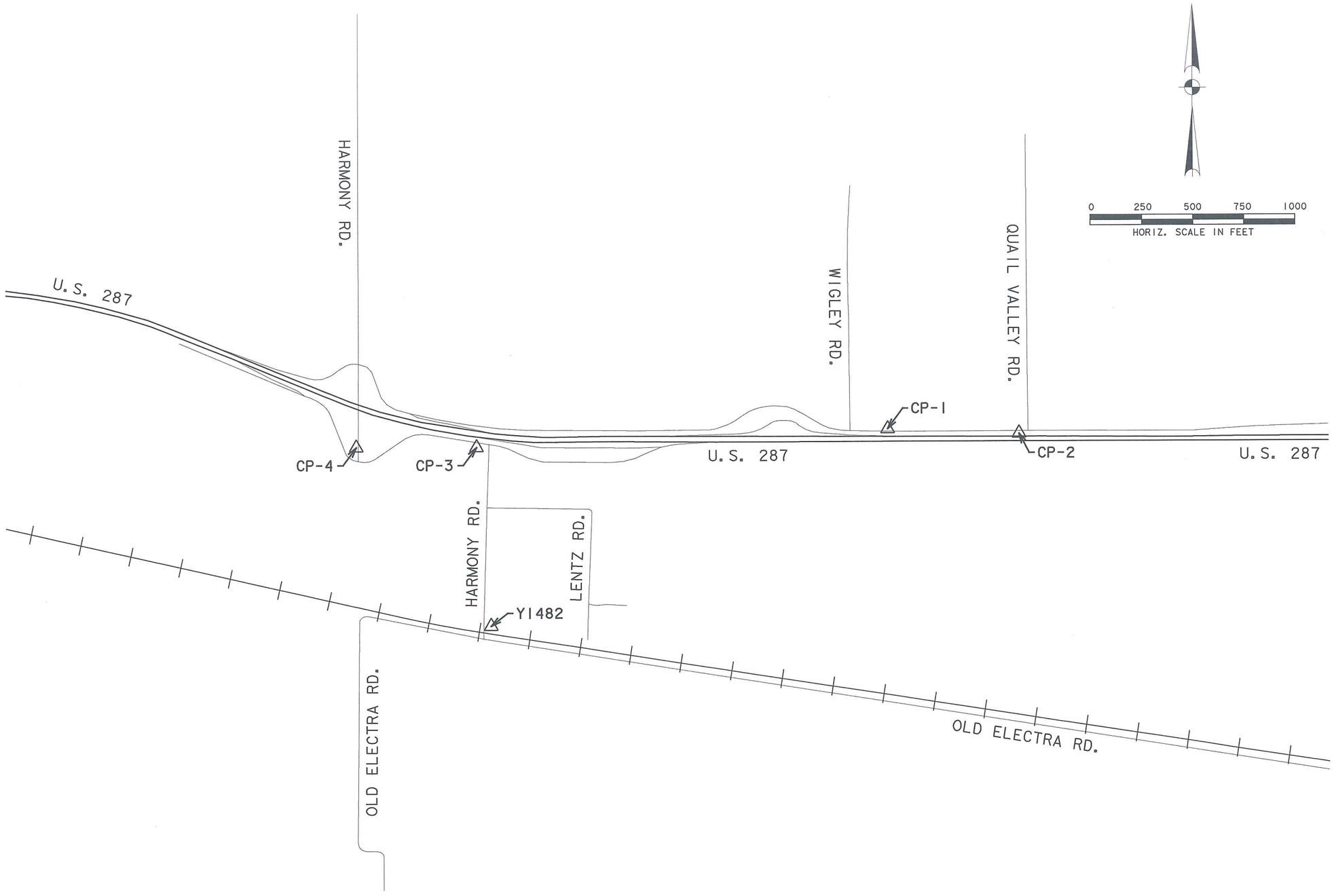
Texas Department of Transportation

Design Division Standard

VEHICLE IMPACT ATTENUATOR SAND FILLED PLASTIC MODULES MASH TL-3 & TL-2

VIA(SFPM)-19

FILE: vigsfpm19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CL		
©TxDOT: DECEMBER 2019	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0043	08	088		US287	
	DIST	COUNTY			SHEET NO.	
	WFS	WICHITA			54	



POINT	GRID COORDINATES NORTHING	GRID COORDINATES EASTING	SURFACE COORDINATES NORTHING	SURFACE COORDINATES EASTING	ELEVATION	DESCRIPTION
PRIMARY CONTROL ESTABLISHED NOVEMBER 16, 2022						
CP-1	7,398,361.206	1,905,745.858	7,398,805.108	1,905,860.203	1,019.21	3-1/2" TXDOT ALUMINUM DISK SET IN CONCRETE (TYPE II) (PRIMARY)
CP-2	7,398,299.060	1,907,238.613	7,398,742.958	1,907,353.047	1,037.28	3-1/2" TXDOT ALUMINUM DISK SET IN CONCRETE (TYPE II) (PRIMARY)
CP-3	7,398,146.114	1,901,367.835	7,398,590.003	1,901,481.917	1,031.66	3-1/2" TXDOT ALUMINUM DISK SET IN CONCRETE (TYPE II) (PRIMARY)
CP-4	7,398,212.813	1,900,078.311	7,398,656.706	1,900,192.316	1,033.28	3-1/2" TXDOT ALUMINUM DISK SET IN CONCRETE (TYPE II) (PRIMARY)
EXISTING CONTROL (NGS BENCHMARK) RECOVERED NOVEMBER 16, 2022						
Y1482	7,395,831.270	1,901,485.320	7,396,275.020	1,901,599.409	1,015.81	FOUND STAINLESS STEEL ROD W/O SLEEVE STAMPED "Y1482 1984"

NOTES:

HORIZONTAL COORDINATES ARE IN U.S. SURVEY FEET BASED ON THE TEXAS COORDINATE SYSTEM OF 1983, NORTH CENTRAL ZONE 4202, NORTH AMERICAN DATUM OF 1983 (NAD83) (2011 ADJ.), EPOCH 2010.00, GEOID 12B MODEL, WITH A GRID TO SURFACE ADJUSTMENT FACTOR OF 1.00006 (WICHITA COUNTY). ELEVATIONS ARE IN U.S. SURVEY FEET BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). HORIZONTAL AND VERTICAL PRIMARY CONTROL VALUES ARE DERIVED FROM RTK BASE GPS OBSERVATIONS (LEVEL 3 TxDOT GPS POSITIONING SPECIFICATIONS) HOLDING THE EXISTING NGS BENCHMARK DESIGNATION Y 1482 (PID DO0649).

THE SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

I, THE UNDERSIGNED, A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF TEXAS, DO HEREBY CERTIFY THAT THE COORDINATE AND ELEVATION INFORMATION SHOWN WERE DERIVED FROM A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

STATE OF TEXAS REGISTERED HEATH W. BROWN 6189 PROFESSIONAL LAND SURVEYOR

Heath W 12-14-2022

HEATH W. BROWN DATE
RPLS NO. 6189

NO.	REVISIONS	BY	DATE

ARREDONDO, ZEPEDA & BRUNZ, LLC
11355 McCree Road - Dallas, Texas 75238
(214) 341-9900
FIRM REGISTRATION No. F-10098
TBPLS REGISTRATION No. 10088700

Texas Department of Transportation

SURVEY CONTROL INDEX SHEET

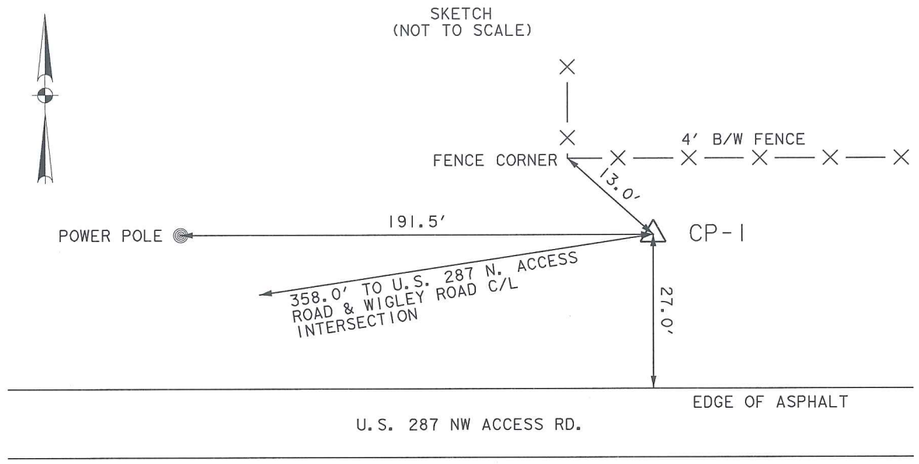
SHEET 1 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 2024(778)TP		55
STATE	DISTRICT	COUNTY	
TEXAS	WICHITA FALLS	WICHITA	
CONTROL	SECTION	JOB	HIGHWAY NO.
0043	08	088	US 287

CONTROL POINT CP-1

APPROXIMATE LOCATION:

A 3-1/2" TXDOT ALUMINUM DISK SET IN CONCRETE (TYPE II) LOCATED APPROXIMATELY 358.0' NORTHEAST OF THE CENTERLINE INTERSECTION OF THE NORTHWEST ACCESS ROAD OF U.S. 287 AND WIGLEY ROAD, 13.0' SOUTHEAST OF A 4' BARBED WIRE FENCE CORNER POST, 27.0' NORTH OF THE EDGE OF ASPHALT AND 191.5' EAST OF A POWER POLE.

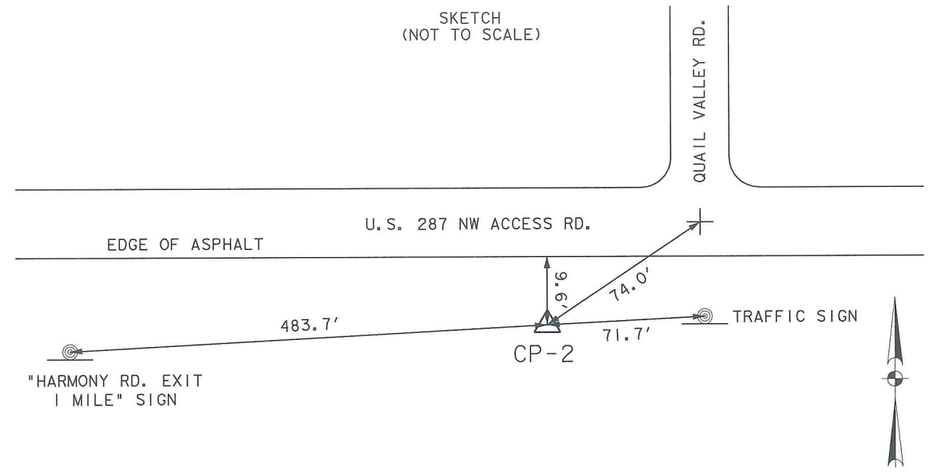


GRID NORTHING:	7,398,361.206'	SURFACE NORTHING:	7,398,805.108'
GRID EASTING:	1,905,745.858'	SURFACE EASTING:	1,905,860.203'
NAVD88 ELEVATION:	1,019.21'	NAVD88 ELEVATION:	1,019.21'

CONTROL POINT CP-2

APPROXIMATE LOCATION:

A 3-1/2" TXDOT ALUMINUM DISK SET IN CONCRETE (TYPE II) LOCATED APPROXIMATELY 74.0' SOUTHWEST OF THE CENTERLINE INTERSECTION OF THE NORTHWEST ACCESS ROAD OF U.S. 287 AND QUAIL VALLEY RD., 9.6' SOUTH OF THE EDGE OF ASPHALT, 71.7' WEST OF A TRAFFIC SIGN AND 483.7' EAST OF THE "HARMONY RD. EXIT 1 MILE" SIGN.



GRID NORTHING:	7,398,299.060'	SURFACE NORTHING:	7,398,742.958'
GRID EASTING:	1,907,238.613'	SURFACE EASTING:	1,907,353.047'
NAVD88 ELEVATION:	1,037.28'	NAVD88 ELEVATION:	1,037.28'

NOTES:

HORIZONTAL COORDINATES ARE IN U.S. SURVEY FEET BASED ON THE TEXAS COORDINATE SYSTEM OF 1983, NORTH CENTRAL ZONE 4202, NORTH AMERICAN DATUM OF 1983 (NAD83) (2011 ADJ.), EPOCH 2010.00, GEOID 12B MODEL, WITH A GRID TO SURFACE ADJUSTMENT FACTOR OF 1.00006 (WICHITA COUNTY). ELEVATIONS ARE IN U.S. SURVEY FEET BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). HORIZONTAL AND VERTICAL PRIMARY CONTROL VALUES ARE DERIVED FROM RTK BASE GPS OBSERVATIONS (LEVEL 3 TxDOT GPS POSITIONING SPECIFICATIONS) HOLDING THE EXISTING NGS BENCHMARK DESIGNATION Y 1482 (PID DO0649).

THE SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

I, THE UNDERSIGNED, A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF TEXAS, DO HEREBY CERTIFY THAT THE COORDINATE AND ELEVATION INFORMATION SHOWN WERE DERIVED FROM A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

STATE OF TEXAS REGISTERED HEATH W. BROWN 6189 PROFESSIONAL LAND SURVEYOR

Heath W. Brown 12-14-2022

HEATH W. BROWN DATE
RPLS NO. 6189

NO.	REVISIONS	BY	DATE

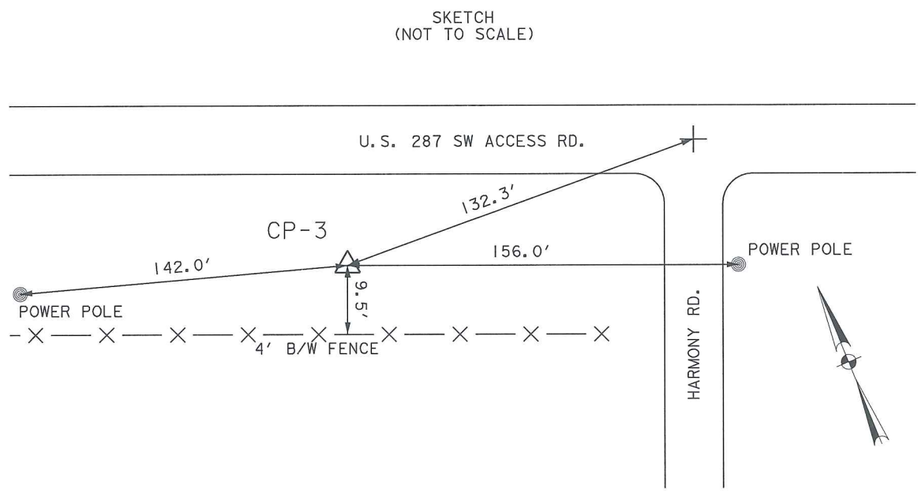
ARREDONDO, ZEPEDA & BRUNZ, LLC
11355 McCree Road - Dallas, Texas 75238
(214) 341-9900
FIRM REGISTRATION No. F-10098
TBPLS REGISTRATION No. 10088700

Texas Department of Transportation

CONTROL POINT CP-3

APPROXIMATE LOCATION:

A 3-1/2" TXDOT ALUMINUM DISK SET IN CONCRETE (TYPE II) LOCATED APPROXIMATELY 132.3' SOUTHWEST OF THE CENTERLINE INTERSECTION OF THE SOUTHWEST ACCESS ROAD OF U.S. 287 AND HARMONY RD., 9.5' NORTHEAST OF A 4' BARBED WIRE FENCE, 142.0' EAST OF A POWER POLE AND 156.0' WEST OF ANOTHER POWER POLE.

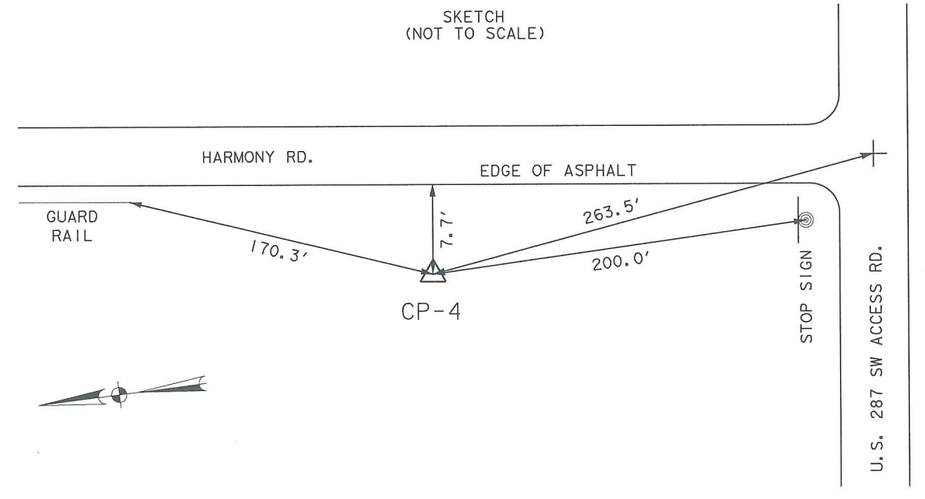


GRID NORTHING:	7,398,146.114'	SURFACE NORTHING:	7,398,590.003'
GRID EASTING:	1,901,367.835'	SURFACE EASTING:	1,901,481.917'
NAVD88 ELEVATION:	1,031.66'	NAVD88 ELEVATION:	1,031.66'

CONTROL POINT CP-4

APPROXIMATE LOCATION:

A 3-1/2" TXDOT ALUMINUM DISK SET IN CONCRETE (TYPE II) LOCATED APPROXIMATELY 263.5' NORTHWEST OF THE CENTERLINE INTERSECTION OF THE SOUTHWEST ACCESS ROAD OF U.S. 287 AND HARMONY RD., 7.7' WEST OF THE EDGE OF ASPHALT, 170.3' SOUTH OF THE END OF A GUARDRAIL AND 200.0' NORTH OF A STOP SIGN.



GRID NORTHING:	7,398,212.813'	SURFACE NORTHING:	7,398,656.706'
GRID EASTING:	1,900,078.311'	SURFACE EASTING:	1,900,192.316'
NAVD88 ELEVATION:	1,033.28'	NAVD88 ELEVATION:	1,033.28'

HORIZONTAL AND VERTICAL CONTROL SHEET

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 2024(778)TP		56
STATE	DISTRICT	COUNTY	
TEXAS	WICHITA FALLS	WICHITA	
CONTROL	SECTION	JOB	HIGHWAY NO.
0043	08	088	US 287

100% SUBMITTAL
DATE: 12/11/2023 TIME: 11:37:54 AM

Alignment Name: RAMP CL-9
Alignment Description:
Alignment Style: Alignment\Ramp

		Station	Northing	Easting
Element: Linear				
POT	( )	1924+00.00 R1	7398718.471	1902060.445
PC	( )	1924+36.13 R1	7398716.627	1902096.531
Tangential Direction:		S87°04'30.10"E		
Tangential Length:		36.133		
Element: Circular				
PC	(RAMP CL-)	1924+36.13 R1	7398716.627	1902096.531
PI	( )	1925+64.29 R1	7398710.087	1902224.517
CC	( )		7403984.755	1902365.704
PT	(RAMP CL-1)	1926+92.39 R1	7398709.771	1902352.670
Radius:		5275.000		
Delta:		02°47'00.21" Left		
Degree of Curvature (Arc):		01°05'10.23"		
Length:		256.256		
Tangent:		128.153		
Chord:		256.231		
Middle Ordinate:		1.556		
External:		1.556		
Back Tangent Direction:		S87°04'30.10"E		
Back Radial Direction:		S02°55'29.90"W		
Chord Direction:		S88°28'00.21"E		
Ahead Radial Direction:		S00°08'29.68"W		
Ahead Tangent Direction:		S89°51'30.32"E		
Element: Linear				
PT	( )	1926+92.39 R1	7398709.771	1902352.670
PC	( )	1940+84.45 R1	7398706.331	1903744.722
Tangential Direction:		S89°51'30.32"E		
Tangential Length:		1392.057		
Element: Circular				
PC	(RAMP CL-1)	1940+84.45 R1	7398706.331	1903744.722
PI	( )	1941+80.52 R1	7398706.093	1903840.796
CC	( )		7399806.327	1903747.440
PT	(RAMP CL-2)	1942+76.11 R1	7398722.515	1903935.455
Radius:		1100.000		
Delta:		09°58'59.01" Left		
Degree of Curvature (Arc):		05°12'31.35"		
Length:		191.661		
Tangent:		96.074		
Chord:		191.419		
Middle Ordinate:		4.172		
External:		4.188		
Back Tangent Direction:		S89°51'30.32"E		
Back Radial Direction:		S00°08'29.68"W		
Chord Direction:		N85°09'00.18"E		
Ahead Radial Direction:		S09°50'29.33"E		
Ahead Tangent Direction:		N80°09'30.67"E		
Element: Linear				
PT	( )	1942+76.11 R1	7398722.515	1903935.455
PC	( )	1943+37.20 R1	7398732.956	1903995.646
Tangential Direction:		N80°09'30.67"E		
Tangential Length:		61.089		
Element: Circular				
PC	( )	1943+37.20 R1	7398732.956	1903995.646
PI	( )	1943+74.88 R1	7398739.398	1904032.778
CC	( )		7398314.210	1904068.288
PT	(RAMP CL-3)	1944+12.37 R1	7398739.205	1904070.465
Radius:		425.000		
Delta:		10°08'06.06" Right		
Degree of Curvature (Arc):		13°28'52.90"		
Length:		75.178		
Tangent:		37.687		
Chord:		75.080		
Middle Ordinate:		1.661		
External:		1.668		
Back Tangent Direction:		N80°09'30.67"E		
Back Radial Direction:		S09°50'29.33"E		
Chord Direction:		N85°13'33.70"E		
Ahead Radial Direction:		S00°17'36.73"W		
Ahead Tangent Direction:		S89°42'23.27"E		

Element: Linear				
PT	( )	1944+12.37 R1	7398739.205	1904070.465
PC	( )	1947+59.50 R1	7398737.426	1904417.587
Tangential Direction:		S89°42'23.27"E		
Tangential Length:		347.127		
Element: Circular				
PC	(RAMP CL-3)	1947+59.50 R1	7398737.426	1904417.587
PI	( )	1947+85.14 R1	7398737.295	1904443.231
CC	( )		7398836.925	1904418.097
PT	(RAMP CL-4)	1948+09.70 R1	7398749.575	1904465.744
Radius:		99.500		
Delta:		28°54'17.44" Left		
Degree of Curvature (Arc):		57°35'01.31"		
Length:		50.196		
Tangent:		25.644		
Chord:		49.666		
Middle Ordinate:		3.149		
External:		3.252		
Back Tangent Direction:		S89°42'23.27"E		
Back Radial Direction:		S00°17'36.73"W		
Chord Direction:		N75°50'28.01"E		
Ahead Radial Direction:		S28°36'40.71"E		
Ahead Tangent Direction:		N61°23'19.29"E		
Element: Linear				
PT	( )	1948+09.70 R1	7398749.575	1904465.744
PC	( )	1949+08.82 R1	7398797.041	1904552.763
Tangential Direction:		N61°23'19.29"E		
Tangential Length:		99.122		
Element: Circular				
PC	(RAMP CL-4)	1949+08.82 R1	7398797.041	1904552.763
PI	( )	1949+58.93 R1	7398821.038	1904596.755
CC	( )		7399102.206	1904386.303
PT	(RAMP CL-5)	1950+08.36 R1	7398856.484	1904632.179
Radius:		347.612		
Delta:		16°24'23.77" Left		
Degree of Curvature (Arc):		16°28'57.67"		
Length:		99.538		
Tangent:		50.112		
Chord:		99.199		
Middle Ordinate:		3.557		
External:		3.594		
Back Tangent Direction:		N61°23'19.29"E		
Back Radial Direction:		S28°36'40.71"E		
Chord Direction:		N53°11'07.41"E		
Ahead Radial Direction:		S45°01'04.47"E		
Ahead Tangent Direction:		N44°58'55.53"E		
Element: Linear				
PT	( )	1950+08.36 R1	7398856.484	1904632.179
PC	( )	1950+44.22 R1	7398881.849	1904657.528
Tangential Direction:		N44°58'55.53"E		
Tangential Length:		35.861		
Element: Circular				
PC	(RAMP CL-5)	1950+44.22 R1	7398881.849	1904657.528
PI	( )	1950+93.00 R1	7398916.353	1904692.011
CC	( )		7398792.724	1904746.710
PT	(RAMP CL-6)	1951+37.31 R1	7398918.664	1904740.737
Radius:		126.082		
Delta:		42°18'09.84" Right		
Degree of Curvature (Arc):		45°26'35.96"		
Length:		93.089		
Tangent:		48.781		
Chord:		90.989		
Middle Ordinate:		8.494		
External:		9.108		
Back Tangent Direction:		N44°58'55.53"E		
Back Radial Direction:		S45°01'04.47"E		
Chord Direction:		N66°08'00.45"E		
Ahead Radial Direction:		S02°42'54.63"E		
Ahead Tangent Direction:		N87°17'05.37"E		
Element: Linear				
PT	( )	1951+37.31 R1	7398918.664	1904740.737
PC	( )	1952+44.50 R1	7398923.742	1904847.808
Tangential Direction:		N87°17'05.37"E		
Tangential Length:		107.192		

Alignment Name: RAMP CL-2
Alignment Description:
Alignment Style: Alignment\Ramp

		Station	Northing	Easting
Element: Linear				
POT	( )	2922+00.00 R1	7398632.456	1901853.249
PC	( )	2924+27.69 R1	7398588.049	1902076.572
Tangential Direction:		S78°45'13.13"E		
Tangential Length:		227.694		
Element: Circular				
PC	( )	2924+27.69 R1	7398588.049	1902076.572
PI	( )	2925+27.87 R1	7398568.513	1902174.823
CC	( )		7399600.698	1902277.933
PT	( )	2926+27.42 R1	7398568.228	1902274.998
Radius:		1032.474		
Delta:		11°05'00.55" Left		
Degree of Curvature (Arc):		05°32'57.72"		
Length:		199.725		
Tangent:		100.175		
Chord:		199.414		
Middle Ordinate:		4.826		
External:		4.848		
Back Tangent Direction:		S78°45'13.13"E		
Back Radial Direction:		S11°14'46.87"W		
Chord Direction:		S84°17'43.41"E		
Ahead Radial Direction:		S00°09'46.31"W		
Ahead Tangent Direction:		S89°50'13.69"E		
Element: Linear				
PT	( )	2926+27.42 R1	7398568.228	1902274.998
PI	( )	2928+73.12 R1	7398567.529	1902520.694
Tangential Direction:		S89°50'13.69"E		
Tangential Length:		245.697		
Element: Linear				
PI	( )	2928+73.12 R1	7398567.529	1902520.694
PC	( )	2937+84.38 R1	7398564.465	1903431.955
Tangential Direction:		S89°48'26.46"E		
Tangential Length:		911.267		
Element: Circular				
PC	( )	2937+84.38 R1	7398564.465	1903431.955
PI	( )	2938+28.33 R1	7398564.318	1903475.903
CC	( )		7398850.756	1903432.918
PT	( )	2938+71.60 R1	7398577.358	1903517.871
Radius:		286.292		
Delta:		17°27'15.30" Left		
Degree of Curvature (Arc):		20°00'46.93"		
Length:		87.214		
Tangent:		43.948		
Chord:		86.878		
Middle Ordinate:		3.315		
External:		3.353		
Back Tangent Direction:		S89°48'26.46"E		
Back Radial Direction:		S00°11'33.54"W		
Chord Direction:		N81°27'55.89"E		
Ahead Radial Direction:		S17°15'41.76"E		
Ahead Tangent Direction:		N72°44'18.24"E		
Element: Linear				
PT	( )	2938+71.60 R1	7398577.358	1903517.871
PC	( )	2938+90.38 R1	7398582.931	1903535.804
Tangential Direction:		N72°44'18.24"E		
Tangential Length:		18.779		

Element: Circular				
PC	( )	2938+90.38 R1	7398582.931	1903535.804
PI	( )	2939+52.13 R1	7398601.255	1903594.777
CC	( )		7398179.440	1903661.181
PT	( )	2940+13.02 R1	7398601.936	1903656.528
Radius:		422.522		
Delta:		16°37'50.22" Right		
Degree of Curvature (Arc):		13°33'37.58"		
Length:		122.641		
Tangent:		61.755		
Chord:		122.211		
Middle Ordinate:		4.442		
External:		4.489		
Back Tangent Direction:		N72°44'18.24"E		
Back Radial Direction:		S17°15'41.76"E		
Chord Direction:		N81°03'13.35"E		
Ahead Radial Direction:		S00°37'51.54"E		
Ahead Tangent Direction:		N89°22'08.46"E		
Element: Linear				
PT	( )	2940+13.02 R1	7398601.936	1903656.528
POT	( )	2940+87.25 R1	7398602.753	1903730.756
Tangential Direction:		N89°22'08.46"E		
Tangential Length:		74.232		

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 Texas Department of Transportation

US 287 REST AREAS

ALIGNMENT DATA

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	57
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_Alignment Data.dgn

100% SUBMITTAL

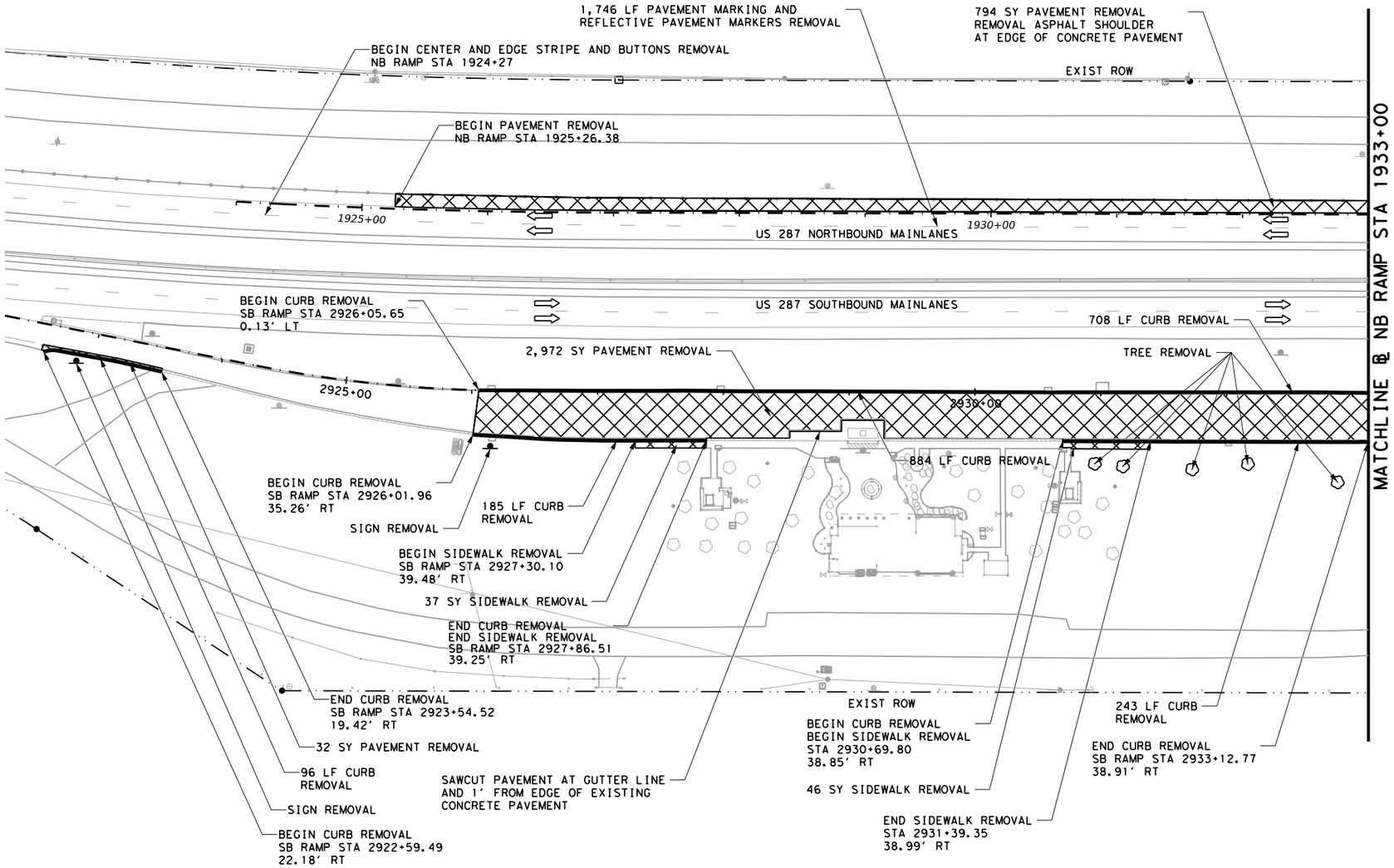
DATE: 12/11/2023 TIME: 11:38:16 AM

SCALE = 1"=100' H

N

LEGEND

- EXISTING TRAFFIC DIRECTION
- PAVEMENT REMOVAL
- CURB REMOVAL
- SIGN REMOVAL
- TREE REMOVAL
- LIGHT POLE REMOVAL



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US 287 REST AREAS

REMOVAL LAYOUT
BEGIN TO STA 1933+00

SCALE: 1"=100' SHEET 1 OF 3

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS SD	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK RAW	TEXAS	WFS	WICHITA	58
CHECK JNR	CONTROL 0043	SECTION 08	JOB 088	

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_Removal Sheet 1.dgn

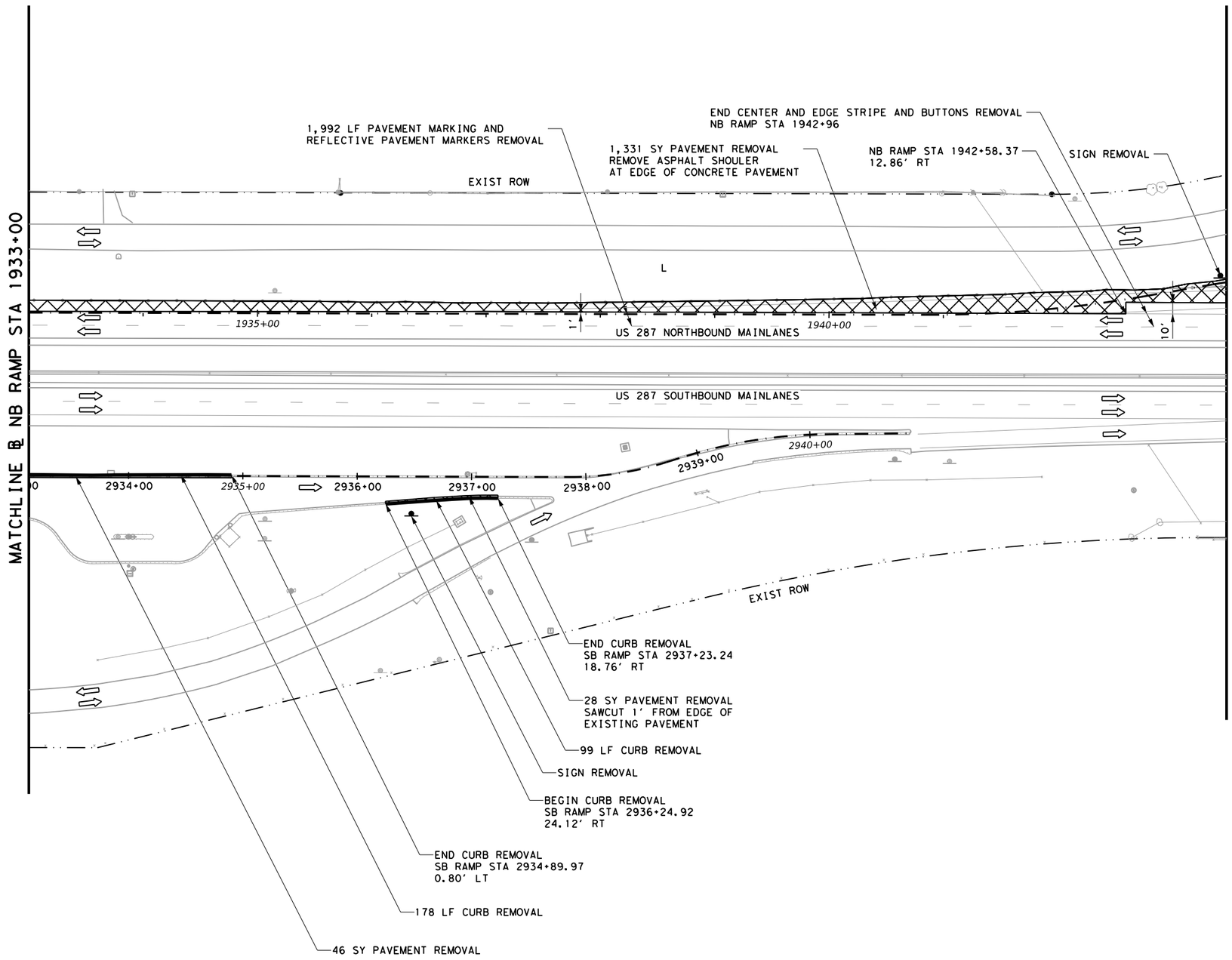
100% SUBMITTAL

DATE: 12/11/2023 TIME: 11:38:36 AM

SCALE = 1"=100' H

LEGEND

- EXISTING TRAFFIC DIRECTION
- PAVEMENT REMOVAL
- CURB REMOVAL
- SIGN REMOVAL
- TREE REMOVAL
- LIGHT POLE REMOVAL



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US 287 REST AREAS

REMOVAL LAYOUT
STA 1933+00 TO STA 1943+50

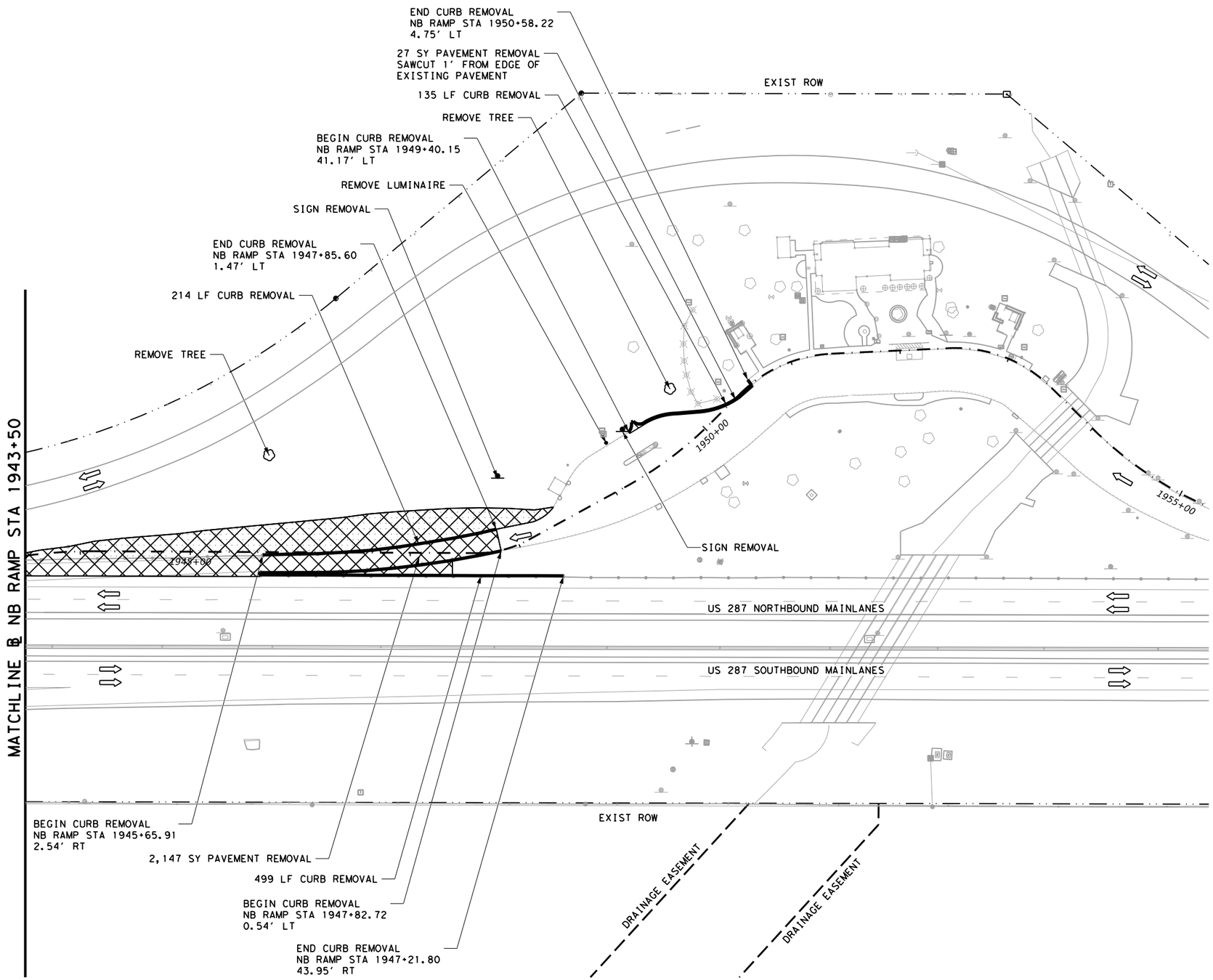
SCALE: 1"=100' SHEET 2 OF 3

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	59
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_Removal Sheet 2.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 11:38:57 AM



SCALE = 1"=100' H

N

LEGEND

- EXISTING TRAFFIC DIRECTION
- PAVEMENT REMOVAL
- CURB REMOVAL
- SIGN REMOVAL
- TREE REMOVAL
- LIGHT POLE REMOVAL

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US 287 REST AREAS

REMOVAL LAYOUT
STA 1943+50 TO END

SCALE: 1"=100' SHEET 3 OF 3

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	60
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_..pentable.tbl
FILE: US 287_Removal Sheet 3.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 11:39:33 AM

SCALE = 1"=60' H

LEGEND

- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- DITCH FLOW LINE
- FLOW DIRECTION

STA 1946+91.50
1' CURB CUT

GUTTER LINE
STA 1946+83.98
OFF 159.54' LT
ELEV 1009.39

PROPOSED DITCH

INSTALL GRATE AND FRAME; SEE MISC DRAINAGE DETAILS SHEET

1.5% SIDEWALK CROSS SLOPE

GUTTER LINE
STA 194528.86
OFF 63.35' LT
ELEV 1011.06

GUTTER LINE
STA 1943+75.07
OFF 15.75' LT
ELEV 1011.86

EXIST ROW

MATCH EXIST ELEV

MATCH EXIST ELEV

GUTTER LINE
STA 1949+15.53
OFF 46.74' LT
ELEV 1009.17

℄ NB RAMP

MATCH EXIST ELEV

GUTTER LINE
STA 1945+81.29
OFF 20.00' LT
ELEV 1011.32

GUTTER LINE
STA 1947+59.50
OFF 35.50' LT
ELEV 1010.00

GUTTER LINE
STA 1945+04.43
OFF 0.50 RT
ELEV 1012.20

GUTTER LINE
STA 1945+51.68
OFF 35.50' LT
ELEV 1011.26

GUTTER LINE
STA 1946+89.39
OFF 0.50' RT
ELEV 1011.28

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US 287 REST AREAS

NORTHBOUND PARKING LOT GRADING PLAN

SCALE: 1"=60'

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	61
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_NB Parking lot Grading Sheet 1.dgn

100% SUBMITTAL

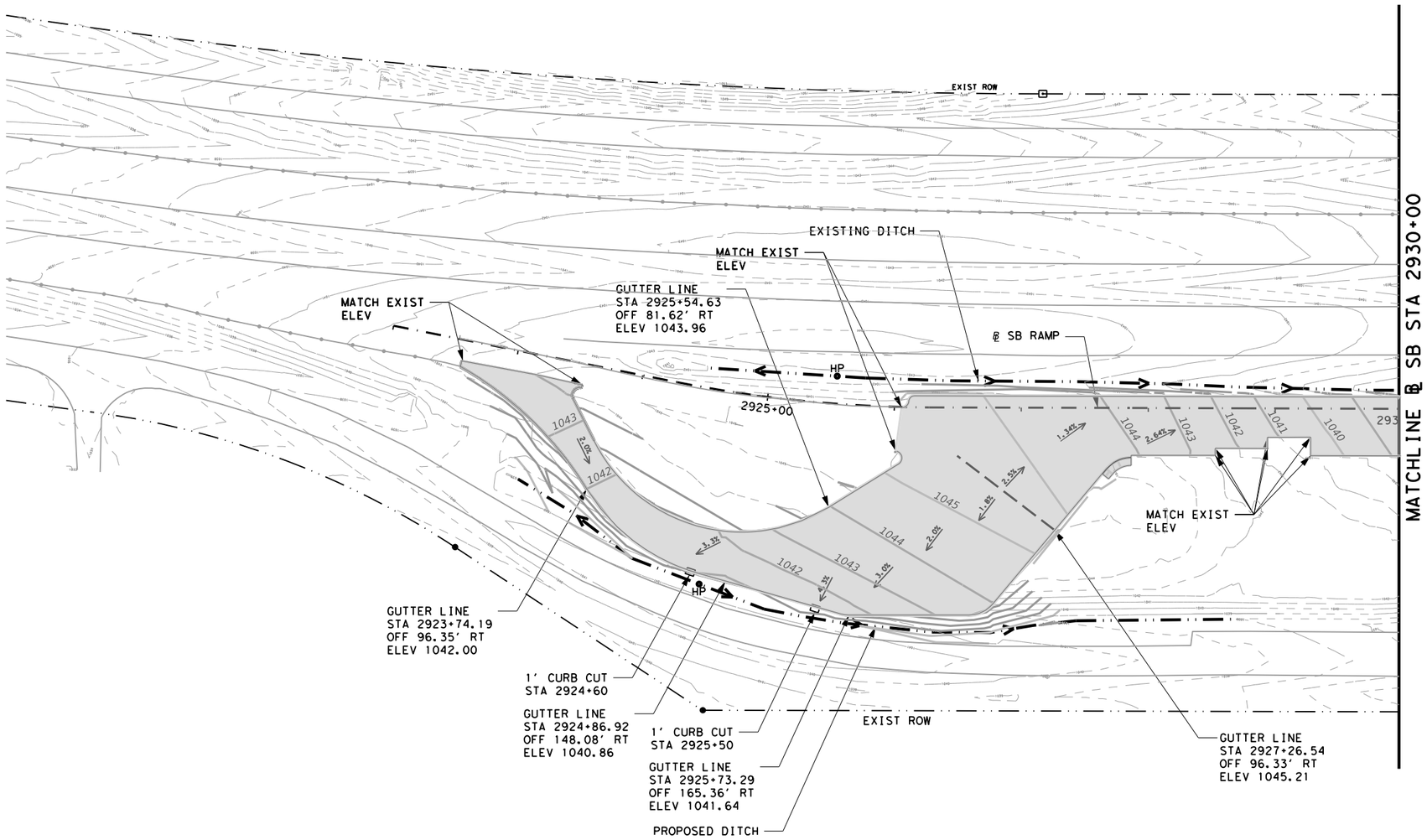
DATE: 12/11/2023 TIME: 11:39:56 AM

SCALE = 1"=100' H

N

LEGEND

- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- DITCH FLOW LINE
- FLOW DIRECTION



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US 287 REST AREAS

SOUTHBOUND PARKING LOT GRADING PLAN

SCALE: 1"=100' SHEET 1 OF 2

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	62
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287-SB Grading Sheet 1.dgn

100% SUBMITTAL

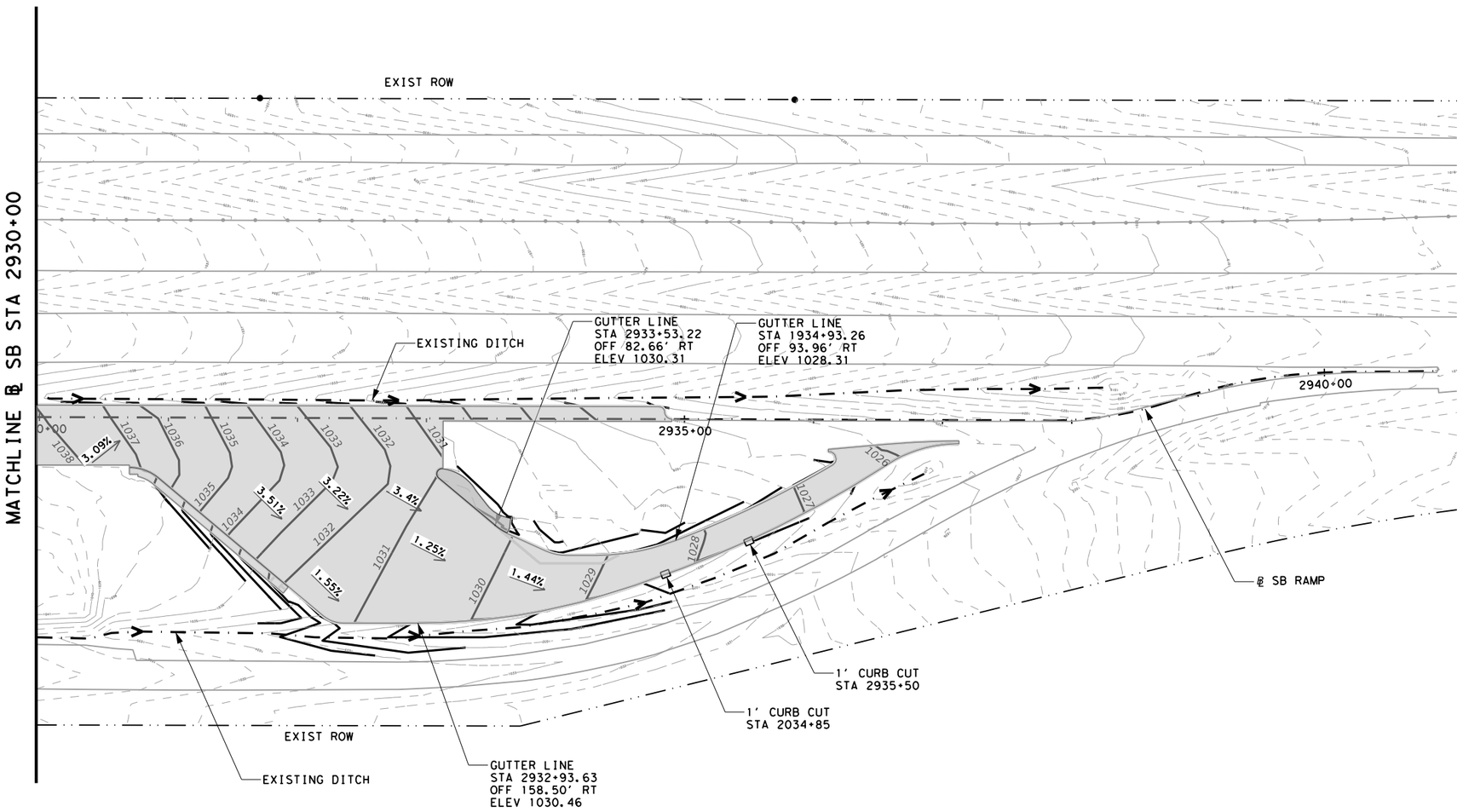
DATE: 12/11/2023 TIME: 12:30:47 PM

SCALE = 1"=100' H

N

LEGEND

- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- DITCH FLOW LINE
- FLOW DIRECTION



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US 287 REST AREAS

SOUTHBOUND PARKING LOT GRADING PLAN

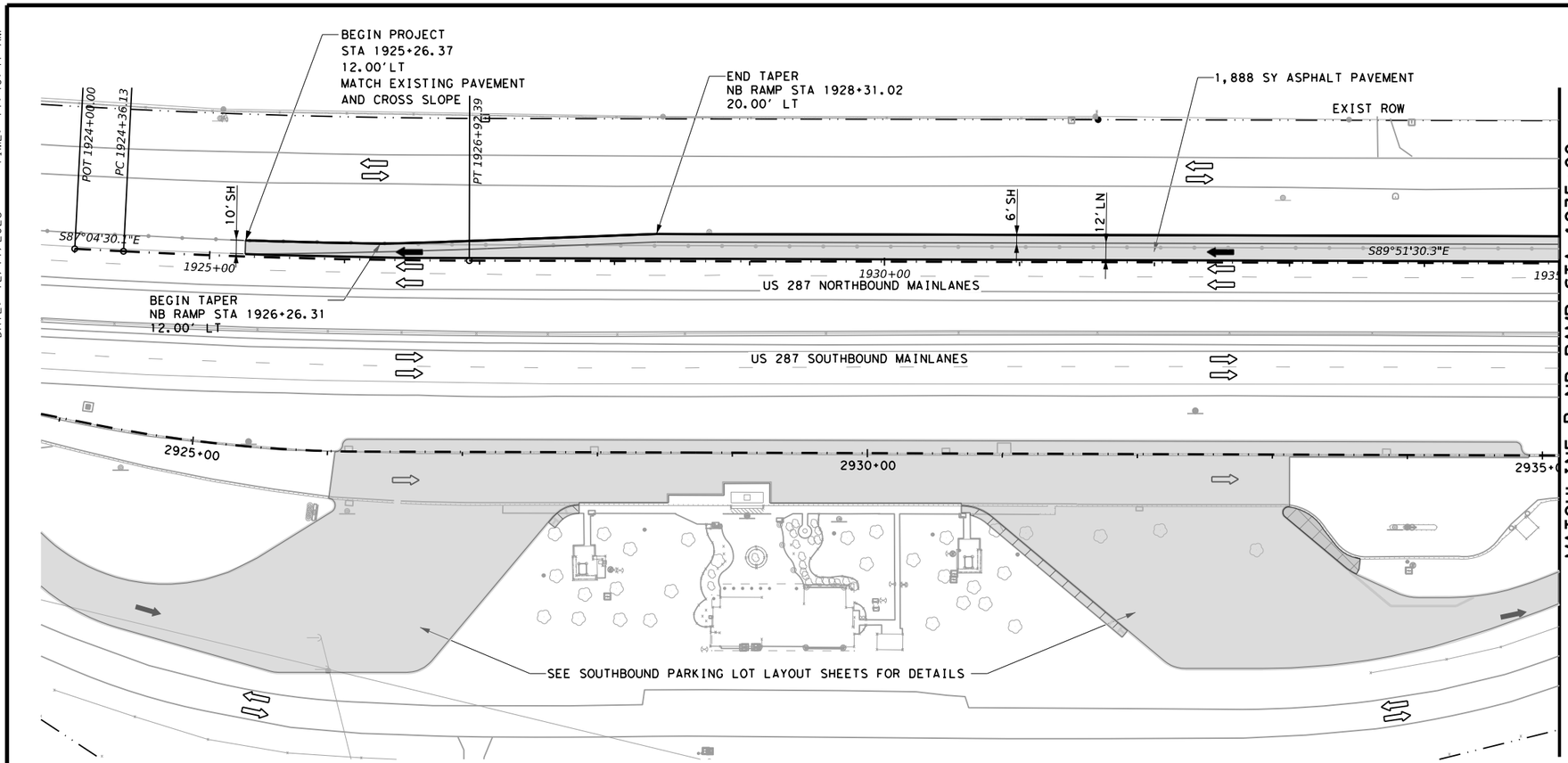
SCALE: 1"=100' SHEET 2 OF 2

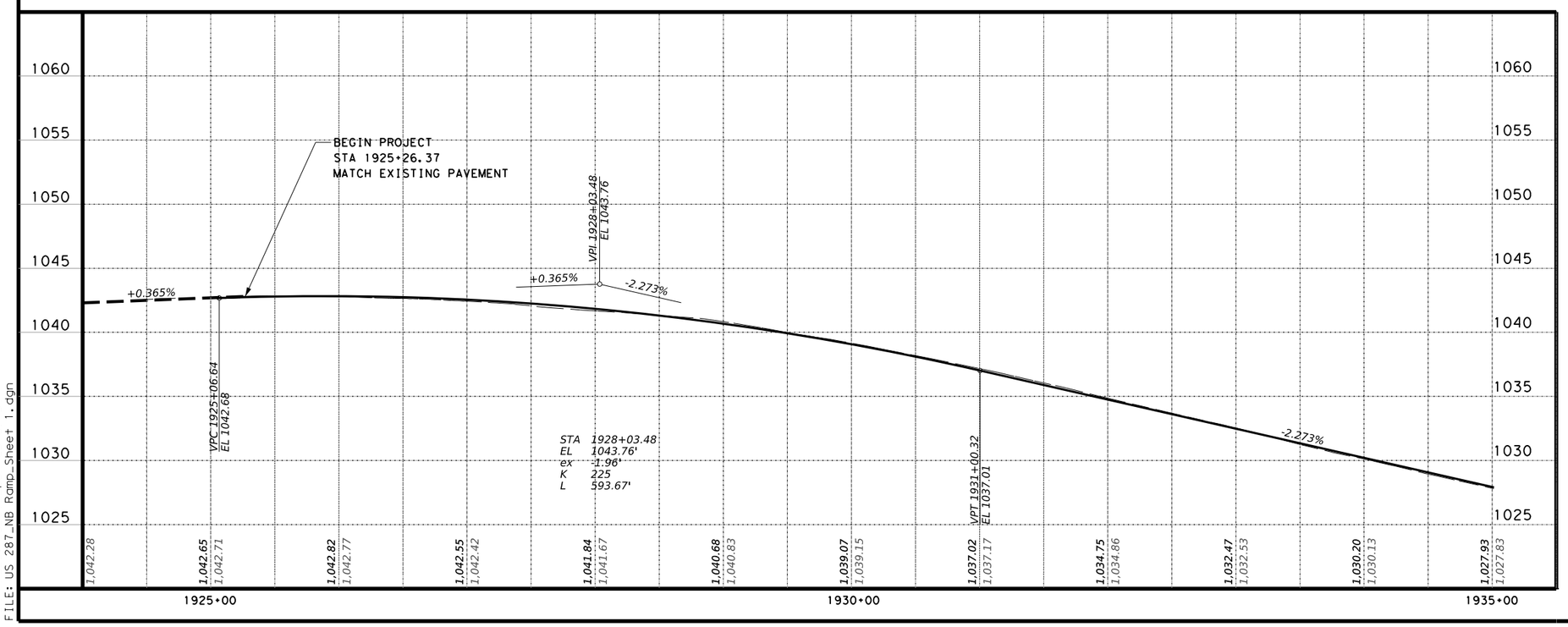
DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	63
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_SB Grading Sheet 2.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 11:40:47 AM





SCALE = 1"=100' H

LEGEND

- EXISTING TRAFFIC DIRECTION
- PROPOSED TRAFFIC DIRECTION
- PROPOSED PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED RAISED MEDIAN

NOTES

1. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR DETAILED ALIGNMENT DATA.
2. ALL DIMENSIONS SHALL BE MEASURED FROM BACK OF CURB UNLESS SHOWN OTHERWISE.
3. SEE SIGNING AND PAVEMENT MARKING SHEETS FOR SIGNING AND PAVEMENT MARKING DETAILS.

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US 287 REST AREAS
NORTHBOUND
RAMP RECONSTRUCTION

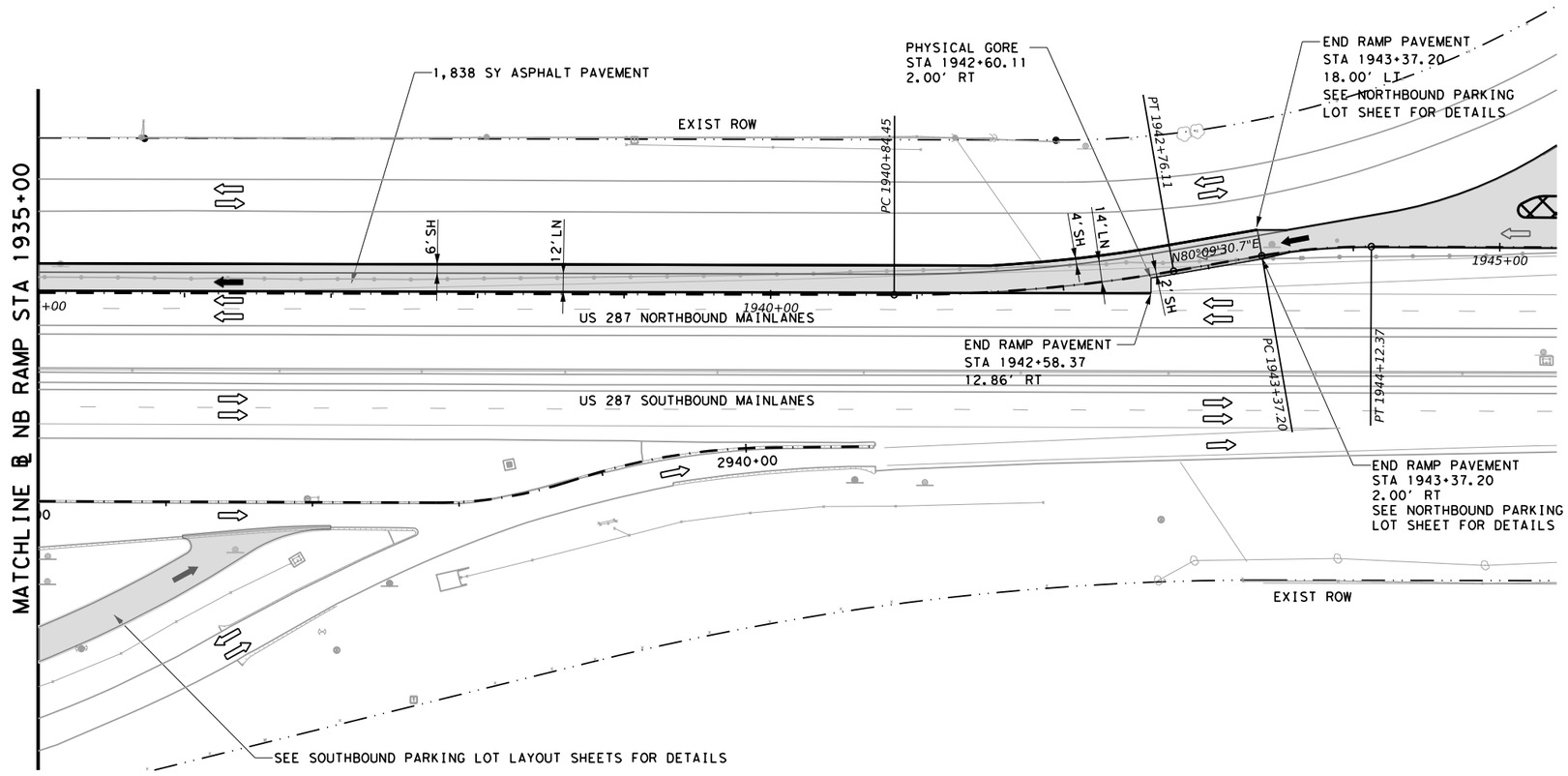
SCALE: 1"=100' SHEET 1 OF 2

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	64
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_NB Ramp_Sheet 1.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 11:41:09 AM



SCALE = 1"=100' H

LEGEND

- EXISTING TRAFFIC DIRECTION
- PROPOSED TRAFFIC DIRECTION
- PROPOSED PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED RAISED MEDIAN

NOTES

1. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR DETAILED ALIGNMENT DATA.
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3. SEE SIGNING AND PAVEMENT MARKING SHEETS FOR SIGNING AND PAVEMENT MARKING DETAILS.

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 Texas Department of Transportation

US 287 REST AREAS
NORTHBOUND
RAMP RECONSTRUCTION

SCALE: 1"=100' SHEET 2 OF 2

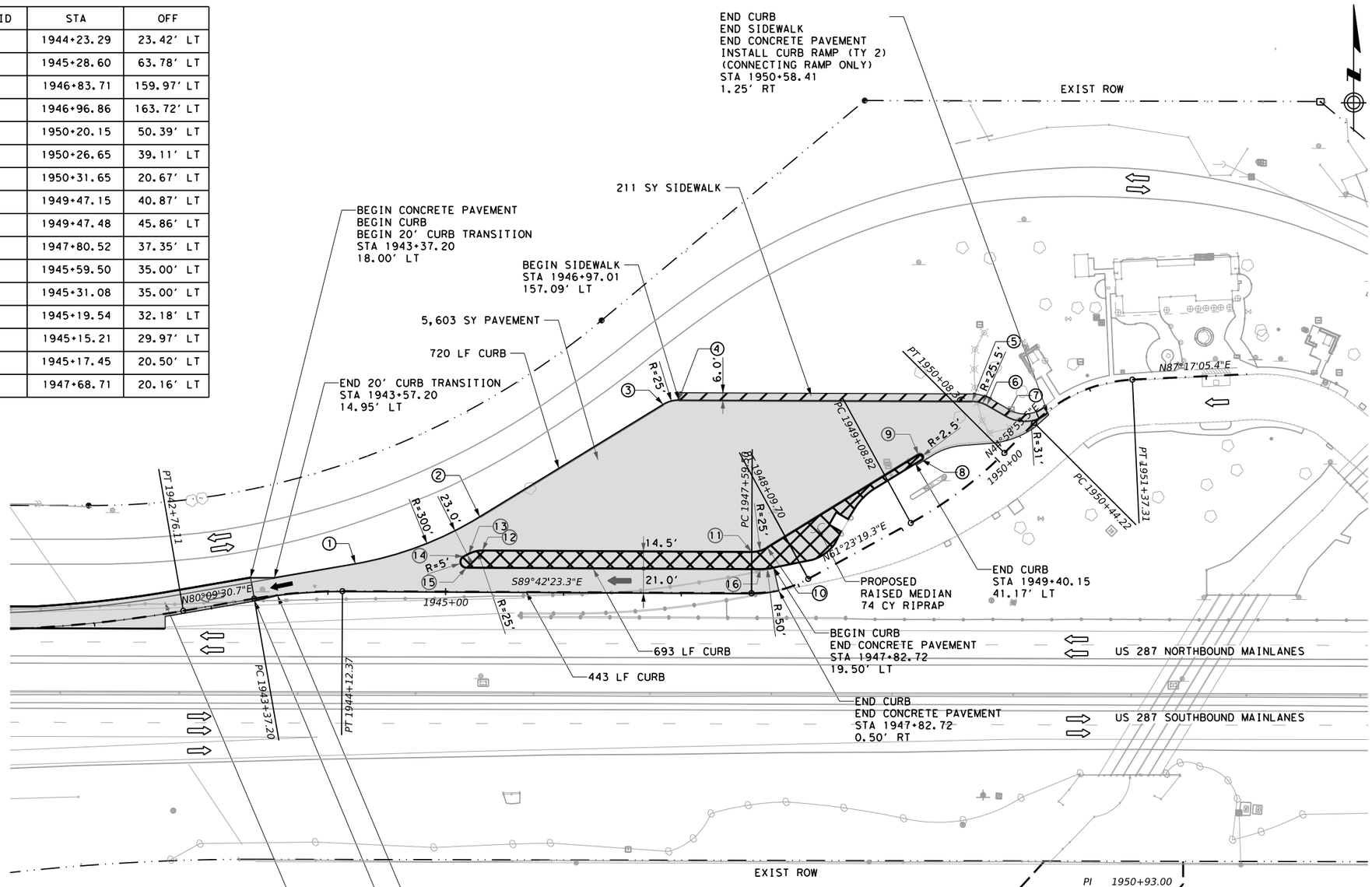
DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	65
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_NB Ramp_Sheet 2.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 11:41:31 AM

PT ID	STA	OFF
1	1944+23.29	23.42' LT
2	1945+28.60	63.78' LT
3	1946+83.71	159.97' LT
4	1946+96.86	163.72' LT
5	1950+20.15	50.39' LT
6	1950+26.65	39.11' LT
7	1950+31.65	20.67' LT
8	1949+47.15	40.87' LT
9	1949+47.48	45.86' LT
10	1947+80.52	37.35' LT
11	1945+59.50	35.00' LT
12	1945+31.08	35.00' LT
13	1945+19.54	32.18' LT
14	1945+15.21	29.97' LT
15	1945+17.45	20.50' LT
16	1947+68.71	20.16' LT



SCALE = 1"=100' H

LEGEND

- EXISTING TRAFFIC DIRECTION
- PROPOSED TRAFFIC DIRECTION
- PROPOSED PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED RAISED MEDIAN

NOTES

1. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR DETAILED ALIGNMENT DATA.
2. ALL DIMENSIONS SHALL BE MEASURED FROM BACK OF CURB UNLESS SHOWN OTHERWISE.
3. SEE SIGNING AND PAVEMENT MARKING SHEETS FOR SIGNING AND PAVEMENT MARKING DETAILS.

PI 1941+80.52
Δ 09°58'59.0" (LT)
D 05°12'31.3"
T 96.07'
L 191.66'
R 1100.00'
PC 1940+84.45
PT 1942+76.11

PI 1943+74.88
Δ 10°08'06.1" (RT)
D 13°28'52.9"
T 37.69'
L 75.18'
R 425.00'
PC 1943+37.20
PT 1944+12.37

PI 1947+85.14
Δ 28°54'17.4" (LT)
D 57°35'01.3"
T 25.64'
L 50.20'
R 99.50'
PC 1947+59.50
PT 1948+09.70

PI 1949+58.93
Δ 16°24'23.8" (LT)
D 16°28'57.7"
T 50.11'
L 99.54'
R 347.61'
PC 1949+08.82
PT 1950+08.36

PI 1950+93.00
Δ 42°18'09.8" (RT)
D 45°26'36.0"
T 48.78'
L 93.09'
R 126.08'
PC 1950+44.22
PT 1951+37.31

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US 287 REST AREAS
NORTHBOUND
PARKING LOT LAYOUT

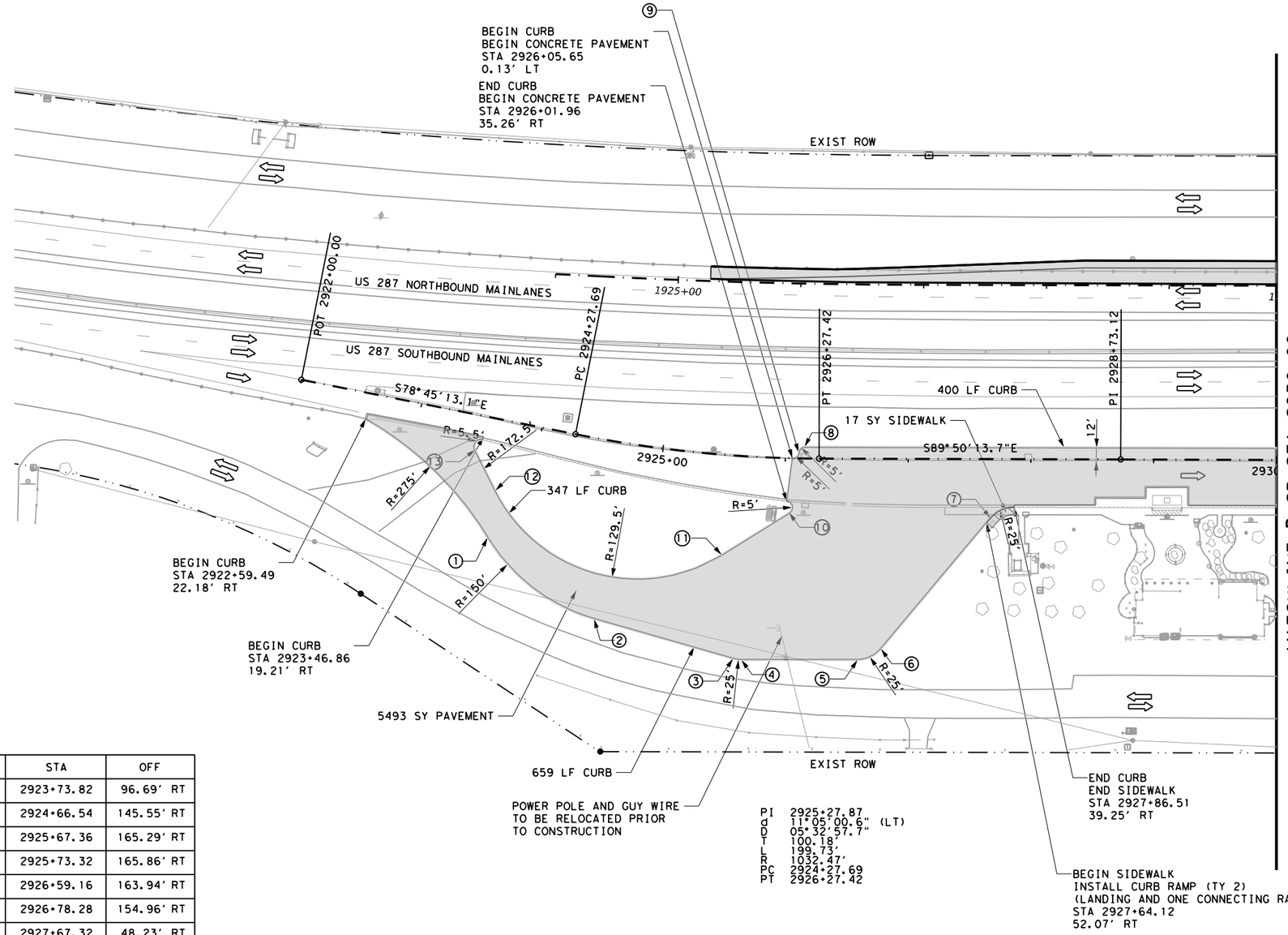
SCALE: 1"=100' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	66
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_NB Parking_Sheet 1.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 11:41:51 AM



SCALE = 1"=100' H

LEGEND

- EXISTING TRAFFIC DIRECTION
- PROPOSED TRAFFIC DIRECTION
- PROPOSED PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED RAISED MEDIAN

NOTES

1. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR DETAILED ALIGNMENT DATA.
2. ALL DIMENSIONS SHALL BE MEASURED FROM BACK OF CURB UNLESS SHOWN OTHERWISE.
3. SEE SIGNING AND PAVEMENT MARKING SHEETS FOR SIGNING AND PAVEMENT MARKING DETAILS.

PT ID	STA	OFF
1	2923+73.82	96.69' RT
2	2924+66.54	145.55' RT
3	2925+67.36	165.29' RT
4	2925+73.32	165.86' RT
5	2926+59.16	163.94' RT
6	2926+78.28	154.96' RT
7	2927+67.32	48.23' RT
8	2926+15.66	9.58' LT
9	2926+10.70	4.87' LT
10	2926+04.10	44.41' RT
11	2925+53.92	81.22' RT
12	2923+72.73	57.59' RT
13	2923+50.03	28.29' RT

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US 287 REST AREAS
SOUTHBOUND
PARKING LOT LAYOUT

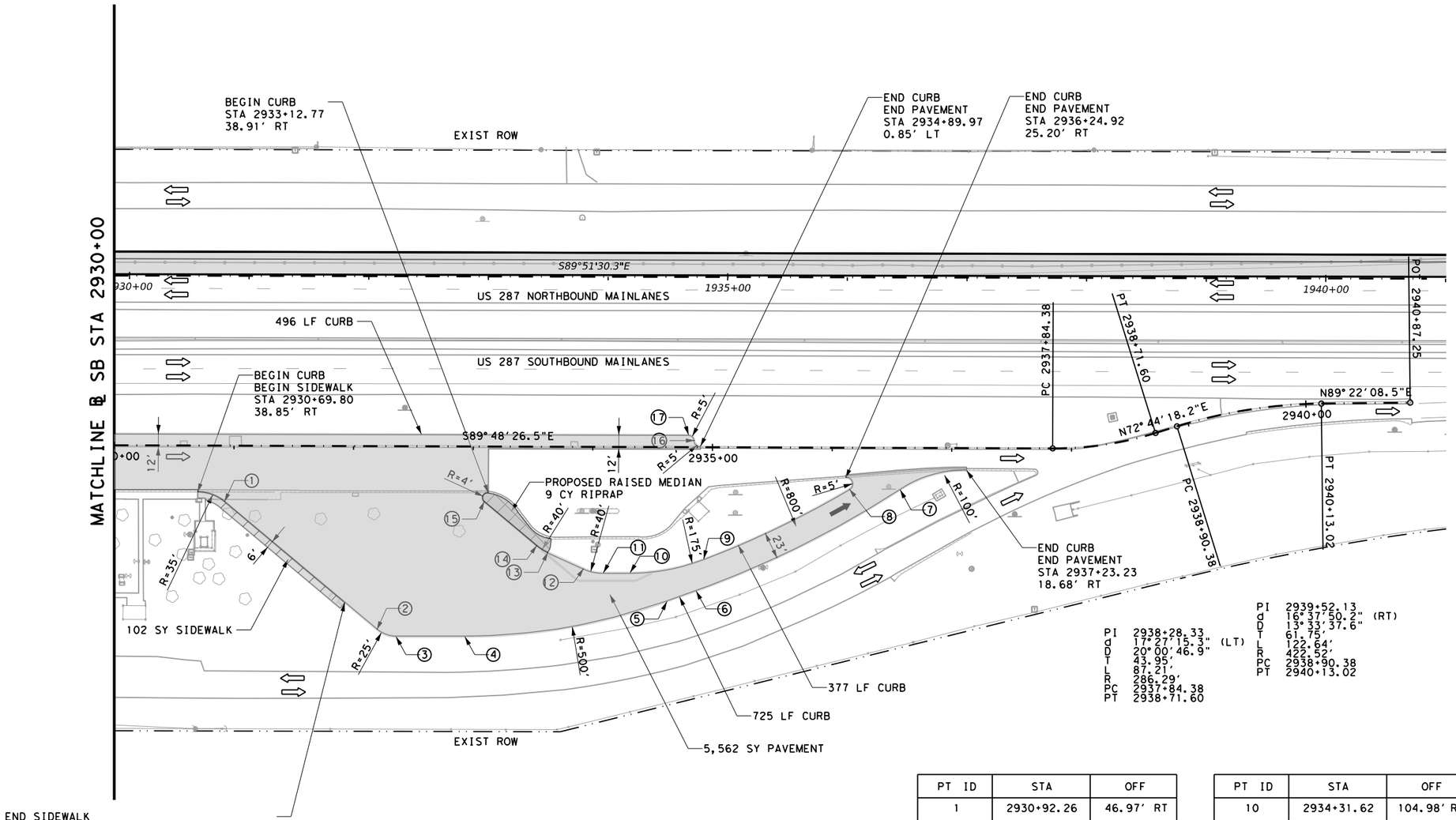
SCALE: 1"=100' SHEET 1 OF 2

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	67
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_SB Parking_Sheet 1.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 11:42:12 AM



END SIDEWALK
INSTALL CURB RAMP (TY 2)
(LANDING AND ONE CONNECTING RAMP ONLY)
STA 2927+64.12
STA 2931+93.08
130.98' RT

PT ID	STA	OFF
1	2930+92.26	46.97' RT
2	2932+20.02	153.43' RT
3	2932+36.10	159.23' RT
4	2932+93.63	159.03' RT
5	2934+62.29	129.13' RT
6	2934+86.77	120.25' RT
7	2936+56.96	35.06' RT
8	2936+14.49	34.48' RT
9	2934+93.09	93.35' RT

PT ID	STA	OFF
10	2934+31.62	104.98' RT
11	2934+09.16	105.14' RT
12	2933+92.69	101.67' RT
13	2933+62.64	88.18' RT
14	2933+53.53	82.49' RT
15	2933+09.44	45.71' RT
16	2934+85.00	5.63' LT
17	2934+80.00	10.42' LT

SCALE = 1"=100' H

LEGEND

- EXISTING TRAFFIC DIRECTION
- PROPOSED TRAFFIC DIRECTION
- PROPOSED PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED RAISED MEDIAN

NOTES

1. SEE HORIZONTAL ALIGNMENT DATA SHEET FOR DETAILED ALIGNMENT DATA.
2. ALL DIMENSIONS SHALL BE MEASURED FROM BACK OF CURB UNLESS SHOWN OTHERWISE.
3. SEE SIGNING AND PAVEMENT MARKING SHEETS FOR SIGNING AND PAVEMENT MARKING DETAILS.

STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER
12/11/2023

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11801 DOMAIN BLVD STE 500
AUSTIN, TEXAS 78758
PH (512) 327-6840
TBPE REG: NO. F-474

 Texas Department of Transportation

US 287 REST AREAS
SOUTHBOUND
PARKING LOT LAYOUT

SCALE: 1"=100' SHEET 2 OF 2

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	68
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

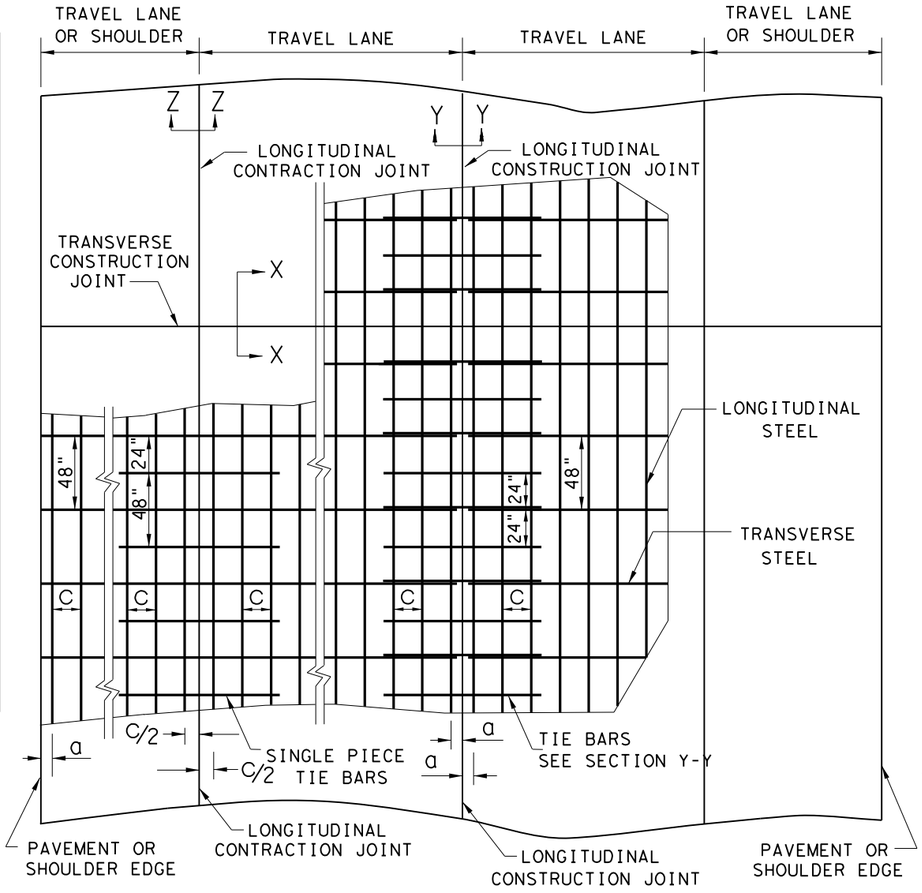
PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_SB Parking_Sheet 2.dgn

DATE:
FILE:

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

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

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

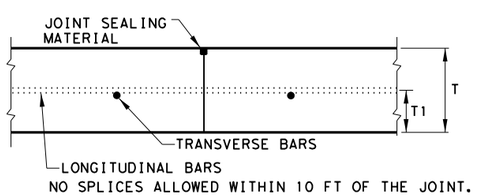


TYPICAL PAVEMENT LAYOUT

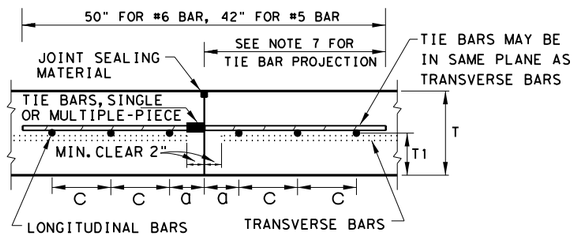
PLAN VIEW (NOT TO SCALE)

GENERAL NOTES

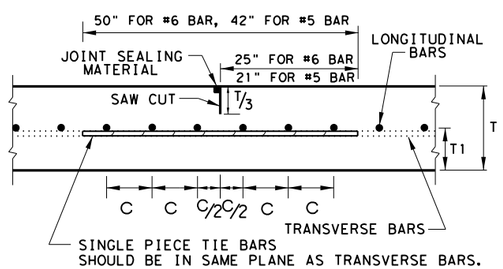
1. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. FOR PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT, ADDITIONAL DETAIL MAY BE SHOWN ELSEWHERE IN THE PLANS.
2. USE COARSE AGGREGATES WITH A RATED COEFFICIENT OF THERMAL EXPANSION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



TRANSVERSE CONSTRUCTION JOINT
SECTION X - X



LONGITUDINAL CONSTRUCTION JOINT
SECTION Y - Y



LONGITUDINAL CONTRACTION JOINT
SECTION Z - Z

SHEET 1 OF 2

Texas Department of Transportation

Design Division Standard

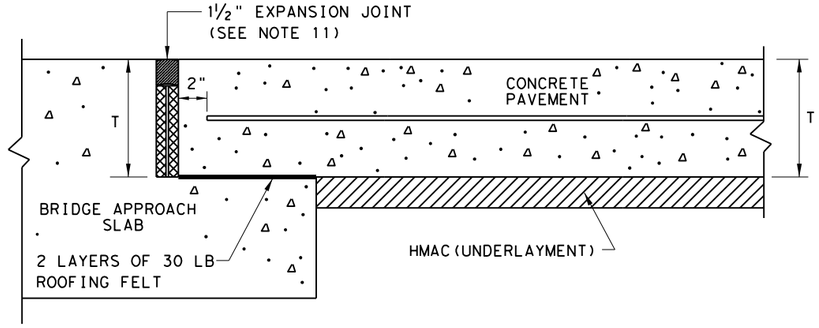
CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

ONE LAYER STEEL BAR PLACEMENT
T - 7 to 13 INCHES

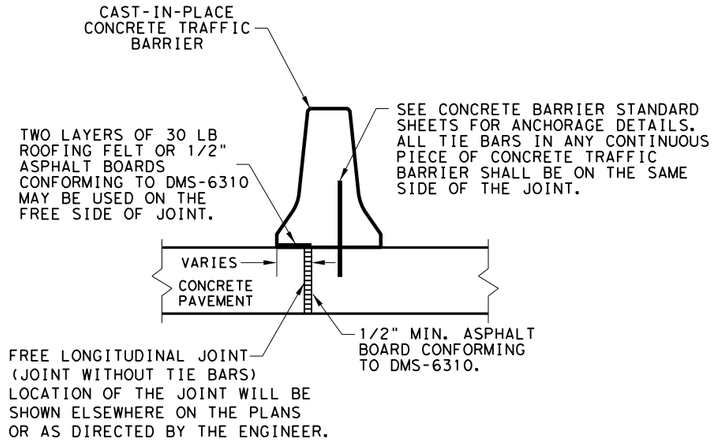
CRCP(1)-23

FILE: crcp123.dgn	DN: TxDOT	CK: KM	DW: CES	CK:
© TxDOT: APRIL 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	08	088	US287
APRIL 2023: REVISED LONG. STEEL VERTICAL LOCATION. REMOVED ADDITIONAL TIEBAR AT TRANSVERSE CONSTRUCTION JOINTS	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		69

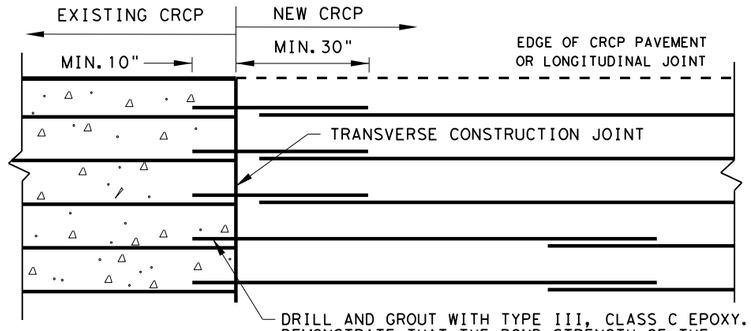
DATE:
FILE:



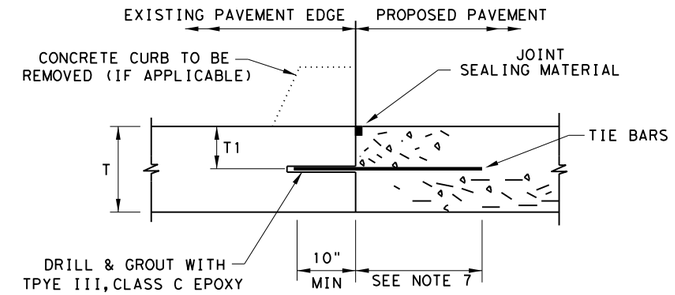
TRANSVERSE EXPANSION JOINT DETAIL
AT BRIDGE APPROACH



CENTERLINE FREE LONGITUDINAL JOINT DETAIL

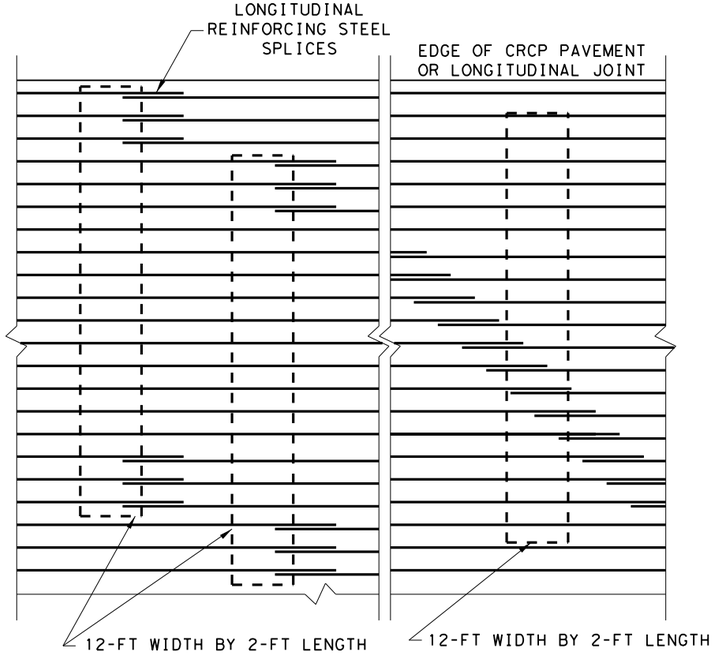


OPTION A: DRILL AND EPOXY
PLAN VIEW (NOT TO SCALE)



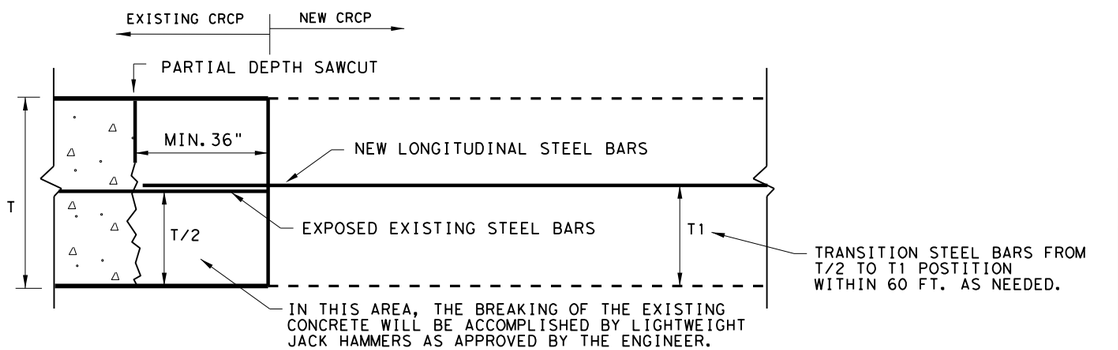
1. BEFORE CONCRETE PLACEMENT, PERFORM PULL-OUT TESTS ON EPOXY-GROUTED TIE BARS IN ACCORDANCE WITH ITEM 360.
2. SPACE TIE BARS AT 24" SPACING. USE #6 TIE BARS FOR 8" AND THICKER PAVEMENTS, USE #5 TIE BARS FOR LESS THAN 8" THICK PAVEMENTS.

LONGITUDINAL WIDENING JOINT DETAIL



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

EXAMPLES OF LAP CONFIGURATION
PLAN VIEW (NOT TO SCALE)



OPTION B: BREAKBACK AND LAP

TRANSVERSE TIE JOINT DETAIL
NEW CRCP TO EXISTING CRCP

SHEET 2 OF 2

Texas Department of Transportation | Design Division Standard

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

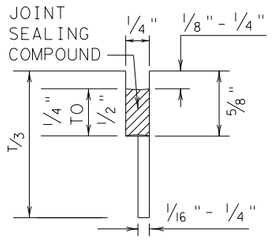
ONE LAYER STEEL BAR PLACEMENT
T - 7 to 13 INCHES

CRCP(1)-23

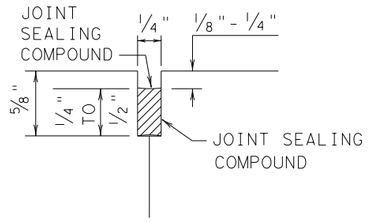
FILE: crcp123.dgn	DN: TxDOT	CK: KM	DW: CES	CK:
©TxDOT: APRIL 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	08	088	US287
APRIL 2023: MODIFIED EXPANSION JOINT DETAIL AT BRIDGE APPROACH SLAB	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		70

DATE:
FILE:

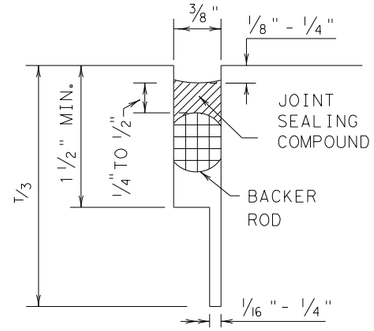
METHOD B: JOINT SEALING COMPOUND



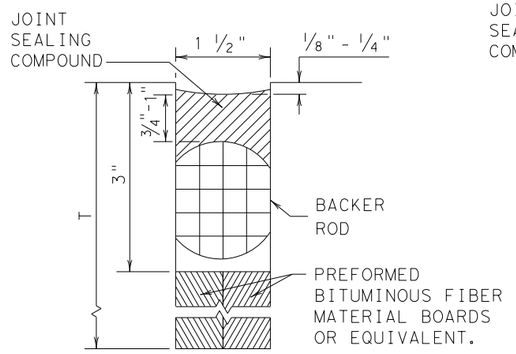
LONGITUDINAL SAWED CONTRACTION JOINT



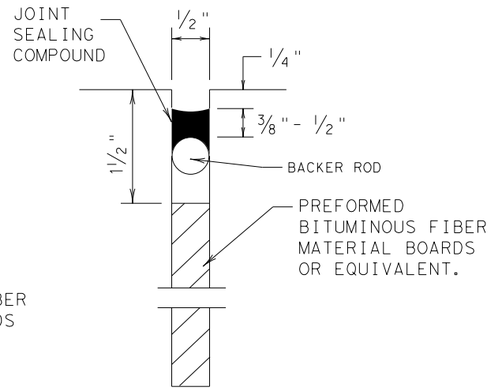
LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINT



TRANSVERSE SAWED CONTRACTION JOINT

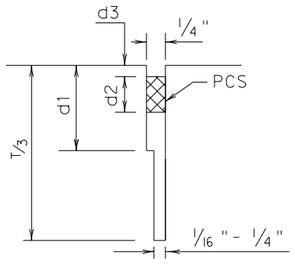


TRANSVERSE FORMED EXPANSION JOINT

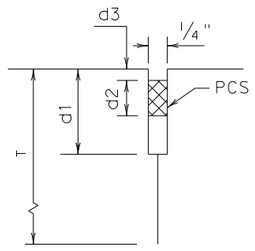


FORMED ISOLATION JOINT

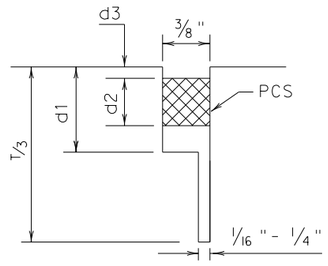
METHOD A: PREFORMED COMPRESSION SEALS (PCS)(DMS-6310 CLASS 6)



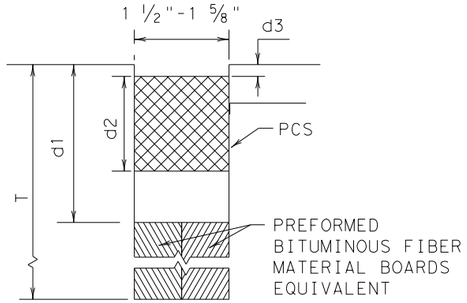
LONGITUDINAL SAWED CONTRACTION JOINT



LONGITUDINAL CONSTRUCTION JOINT



TRANSVERSE SAWED CONTRACTION JOINT



TRANSVERSE FORMED EXPANSION JOINT

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, EITHER METHOD "A" OR METHOD "B" MAY BE USED.
2. THE LOCATION OF JOINTS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.
3. THE JOINT RESERVOIR FOR SEALANT OR PCS SHALL BE SAWED UNLESS OTHERWISE SHOWN ON THE PLANS FOR THE LONGITUDINAL AND TRANSVERSE CONSTRUCTION JOINTS AND THE SAWED JOINTS.
4. DIMENSIONS d1, d2, AND d3 SHOWN IN METHOD A SHALL BE IN ACCORDANCE WITH THE PREFORMED COMPRESSION SEAL MANUFACTURER'S RECOMMENDATION.
5. REFER TO DMS-6310 "JOINT SEALANTS AND FILLERS" FOR THE CLASSIFICATIONS.
6. FOR SAWED LONGITUDINAL JOINT, LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINT, USE JOINT SEALANT CLASS 5 OR 8 UNLESS OTHERWISE SHOWN ON THE PLAN OR APPROVED.
7. FOR TRANSVERSE SAWED CONTRACTION, TRANSVERSE FORMED EXPANSION JOINT, AND ISOLATION JOINT USE JOINT SEALANT CLASS 5 OR 8 AT NEW JOINTS. USE JOINT SEALANT CLASS 4,5,7,OR 8 FOR MAINTAINING EXISTING JOINTS.
8. THE JOINTS SHALL BE CLEANED IN ACCORDANCE WITH THE ITEM 438 "CLEANING AND SEALING JOINTS" OR ITEM 713 "CLEANING AND SEALING JOINTS AND CRACKS (CONCRETE PAVEMENT)".
9. ISOLATION JOINTS ACCOMMODATE HORIZONTAL AND VERTICAL MOVEMENTS THAT OCCUR BETWEEN A PAVEMENT AND A STRUCTURE. ISOLATION JOINTS MAY BE USED FOR BRIDGE ABUTMENTS, INTERSECTIONS, CURB AND GUTTER, OLD AND NEW PAVEMENTS, OR AROUND DRAINAGE INLETS, MANHOLES, FOOTINGS AND LIGHTING STRUCTURES.

Texas Department of Transportation

Design Division Standard

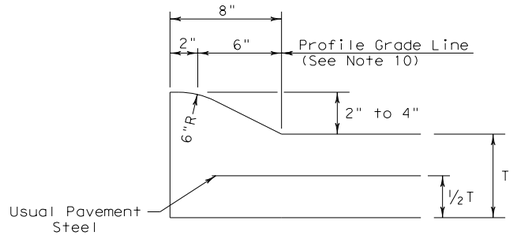
CONCRETE PAVING DETAILS

JOINT SEALS

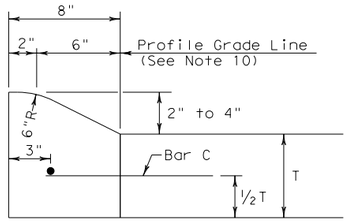
JS-14

FILE: js14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
©TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	08	088	US287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		71

DATE:
FILE:



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



TYPE I CURB
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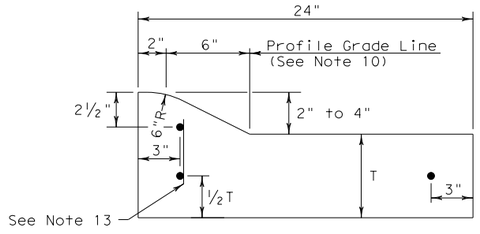
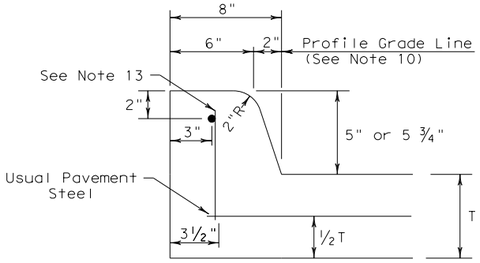
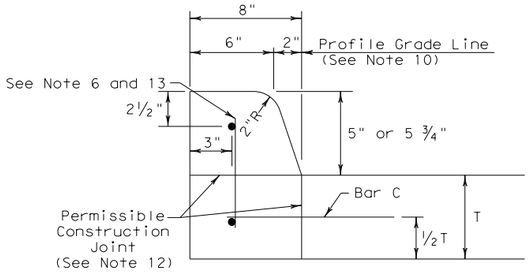


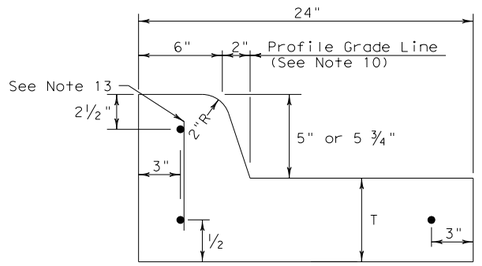
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



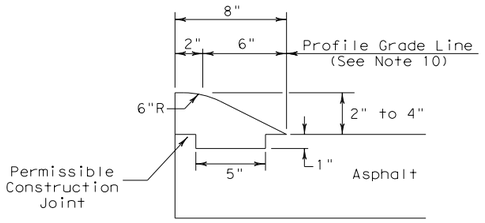
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



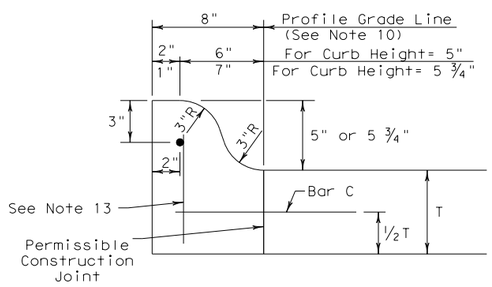
TYPE II CURB
5" - 5 ¾" HEIGHT



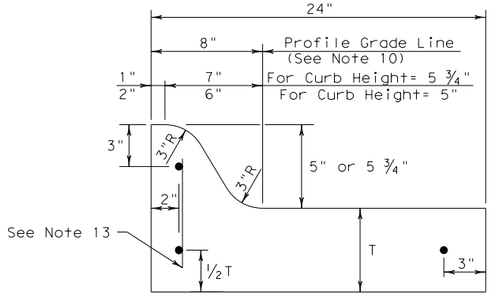
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



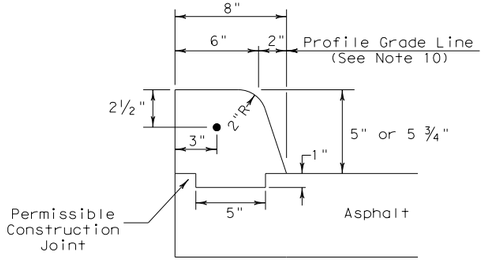
TYPE III CURB (KEYED)
2" - 4" HEIGHT



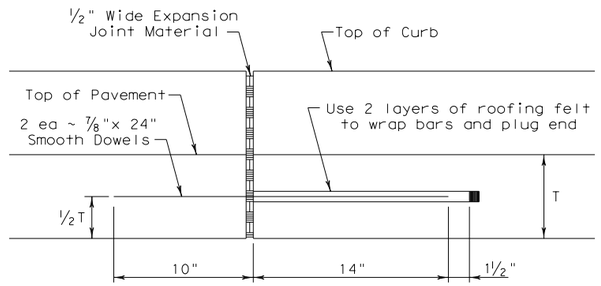
TYPE IIa CURB
5" - 5 ¾" HEIGHT



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

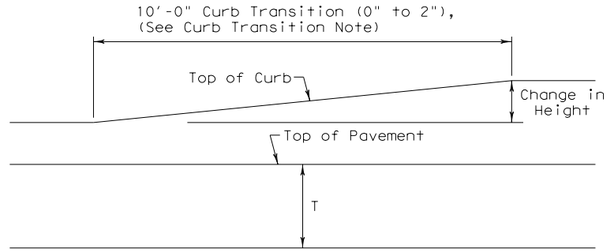


TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

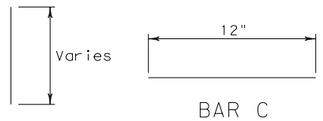
CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



CURB TRANSITION
Note: To be paid for as Highest Curb

GENERAL NOTES

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



BAR B

BAR C

Texas Department of Transportation

Design Division Standard

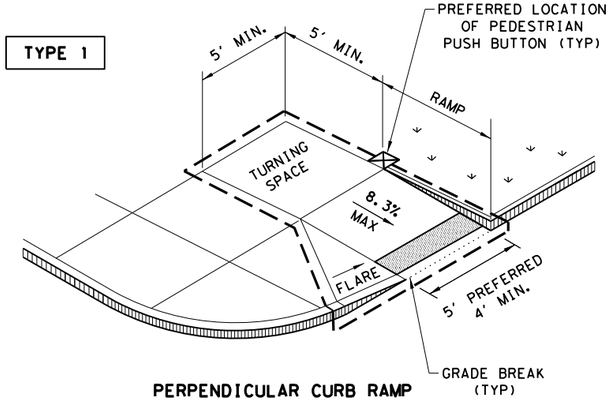
CONCRETE CURB AND CURB AND GUTTER

CCCG-22

FILE: cccg21.dgn	DN: TXDOT	CK: AN	DW: CS	CK: KM
© TxDOT: JUNE 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	004308		088	US287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		72

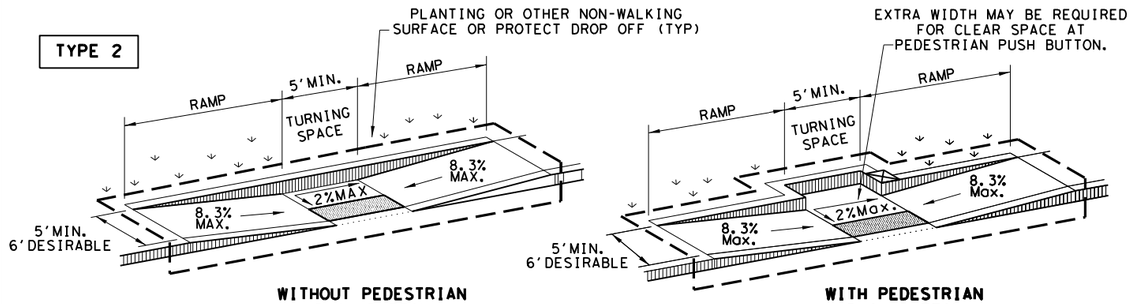
DATE:
FILE:

TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

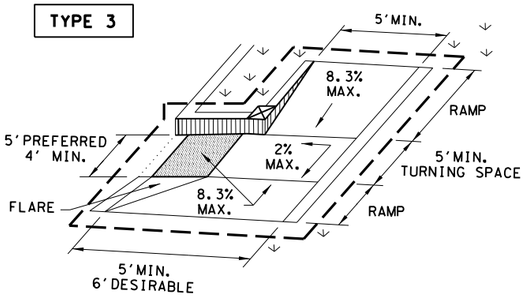


WITHOUT PEDESTRIAN PUSH BUTTON

WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3



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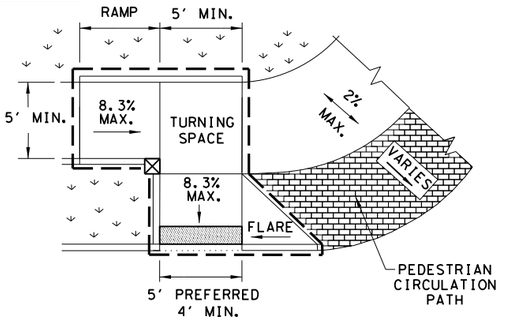
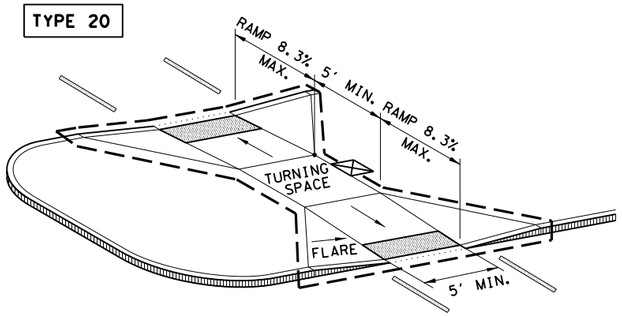


COMBINATION CURB RAMPS

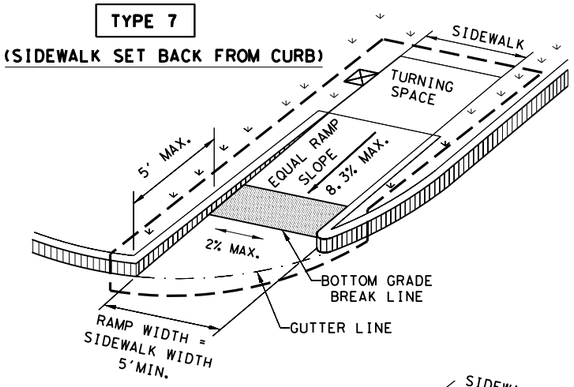
TYPE 20



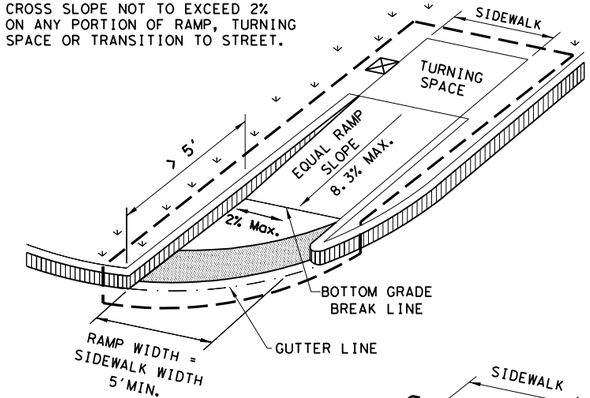
CURB RAMPS AT MEDIAN ISLANDS

TYPE 7

(SIDEWALK SET BACK FROM CURB)

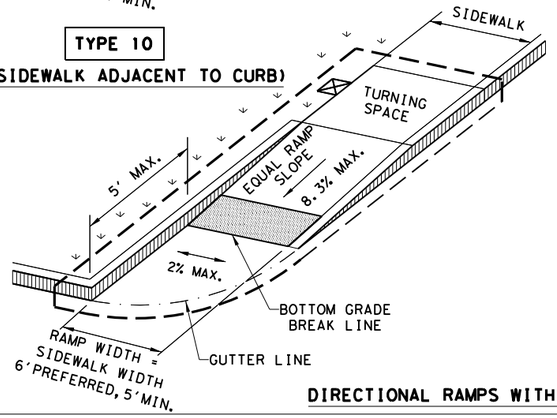


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.

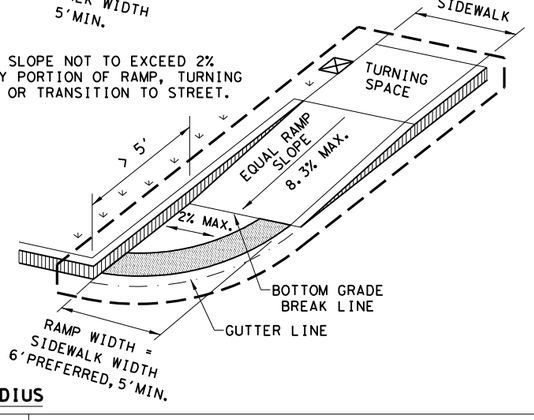


TYPE 10

(SIDEWALK ADJACENT TO CURB)

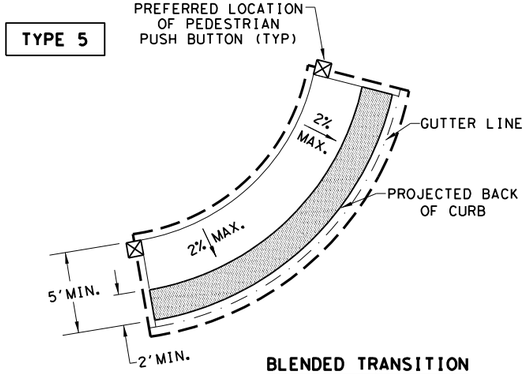


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

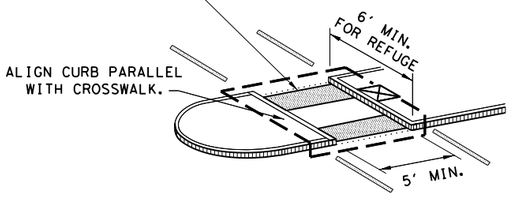
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

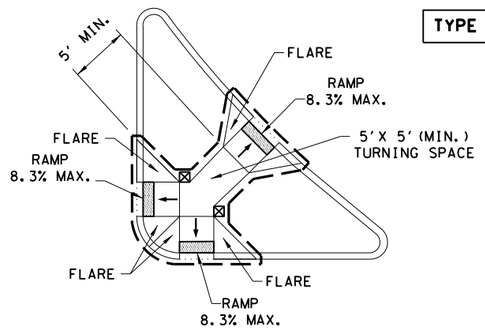
TYPE 21

INSTALL DETECTABLE WARNING SURFACE AT EACH END OF THE CUT-THROUGH RAMP WITH A MINIMUM 2' USUAL SIDEWALK SURFACE BETWEEN. IF MEDIAN IS LESS THAN 6' WIDE, ELIMINATE DETECTABLE WARNING SURFACES.



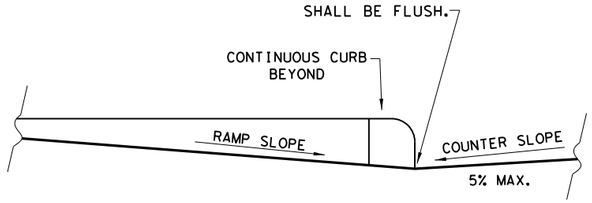
NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS

BOTTOM GRADE BREAK OF CURB RAMP WILL NORMALLY BE AT GUTTER LINE. SURFACE SLOPES AT GRADE BREAKS SHALL BE FLUSH.



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

SEE GENERAL NOTES ON SHEET 2 OF 4 FOR MORE INFORMATION.

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK .....

RAMP LIMITS OF PAYMENT

SHEET 1 OF 4

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	08	088	US287
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		73

DATE:
FILE:

GENERAL NOTES

CURB RAMPS

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
4. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5'x 5' passing areas at intervals not to exceed 200' are required.
5. Turning Spaces shall be 5'x 5' minimum. Cross slope shall be maximum 2%.
6. Clear space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
16. Provide a smooth transition where the curb ramps connect to the street.
17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
18. Existing features that comply with applicalble standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

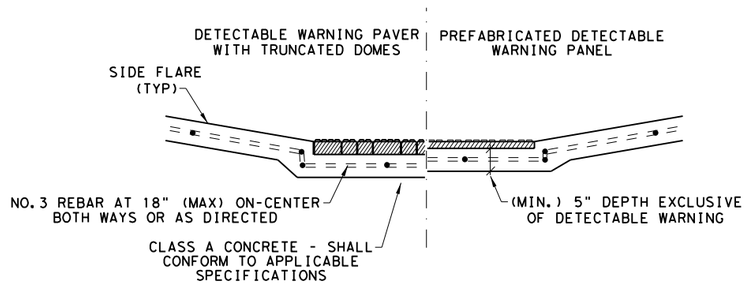
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
21. Detectable warning surfaces must be firm, stable and slip resistant.
22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.
24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

DETECTABLE WARNING PAVERS (IF USED)

25. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
26. Lay full-size units first followed by closure units consisting of at least 25 percent (25%) of a full unit. Cut detectable warning paver units using a power saw.

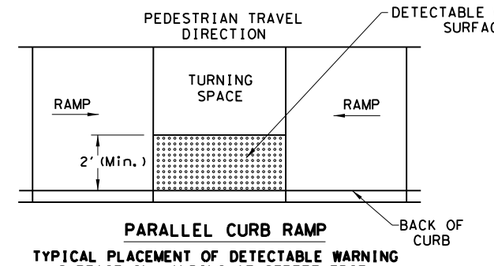
SIDEWALKS

27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
29. Street grades and cross slopes shall be as shown elsewhere in the plans.
30. Changes in level greater than 1/4 inch are not permitted.
31. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than five percent (5%) must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with PROWAG R409.
32. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
33. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
34. Sidewalk details are shown elsewhere in the plans.

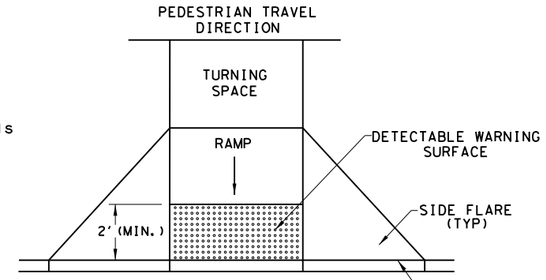


SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

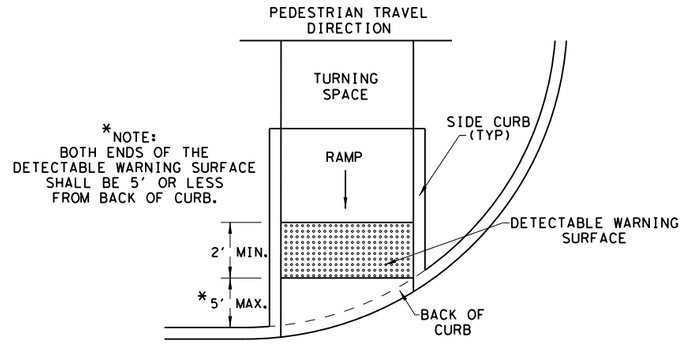
DETECTABLE WARNING SURFACE DETAILS



PARALLEL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.



PERPENDICULAR CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



DIRECTIONAL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

SHEET 2 OF 4

Texas Department of Transportation | Design Division Standard

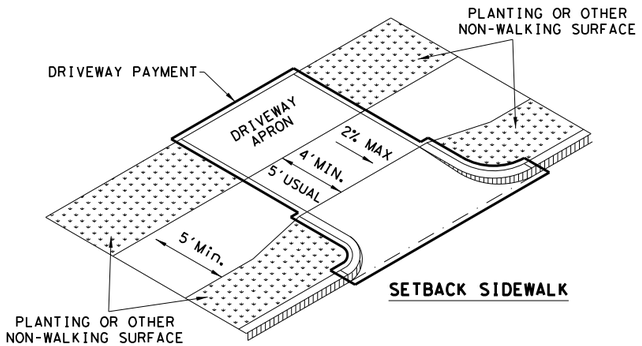
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

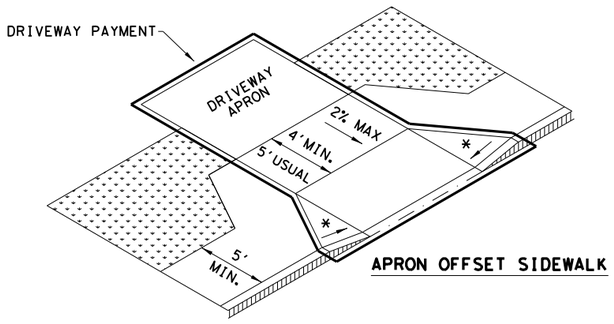
FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0043	08	088		US287
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY			SHEET NO.
	WFS	WICHITA			74

DATE:
FILE:

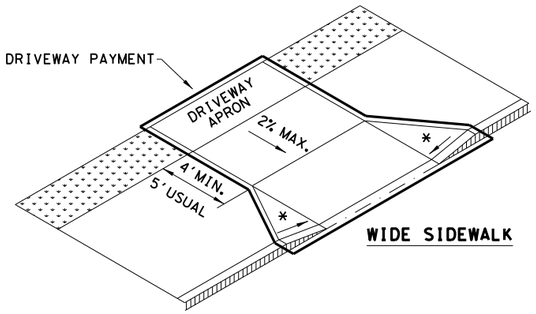
SIDEWALK TREATMENT AT DRIVEWAYS



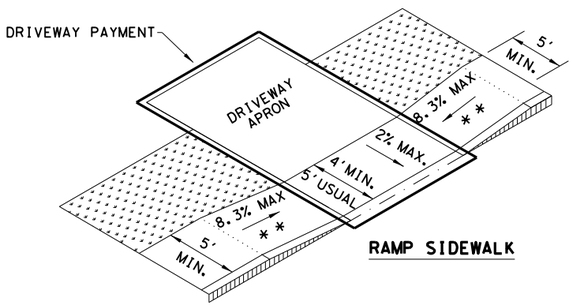
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

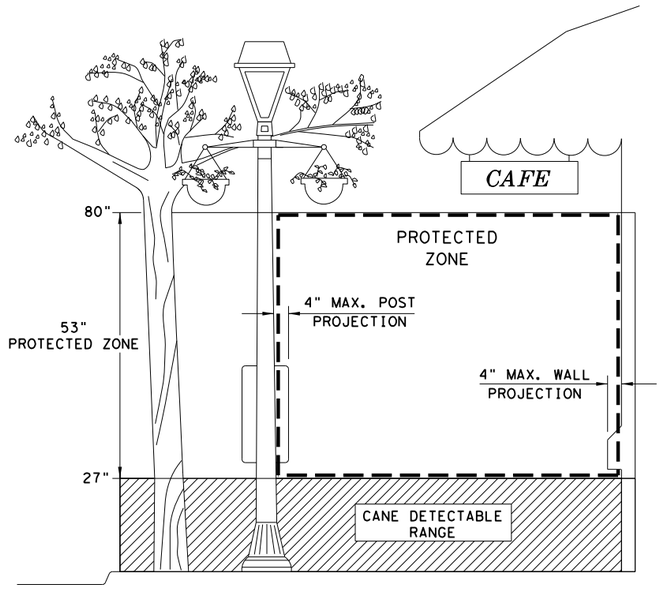


RAMP SIDEWALK

NOTES:

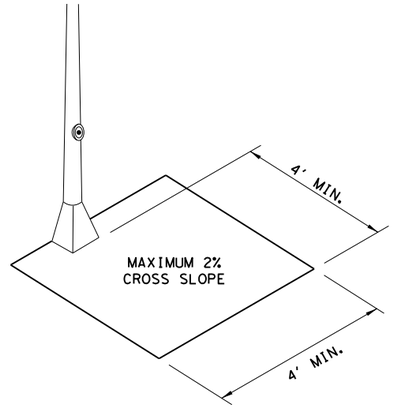
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

* * IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.

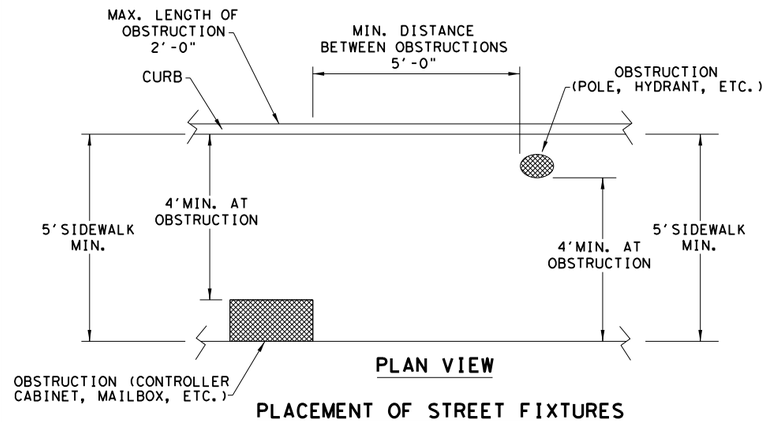


PROTECTED ZONE

NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



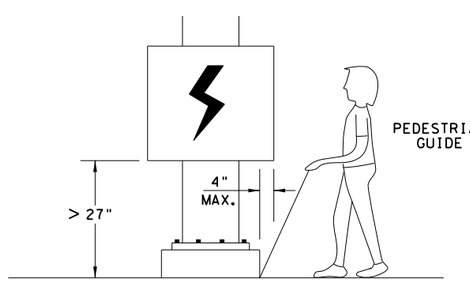
CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



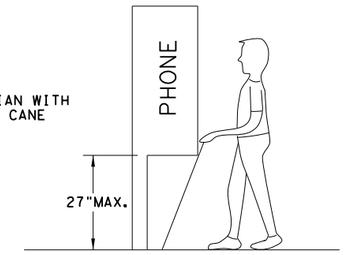
PLAN VIEW

PLACEMENT OF STREET FIXTURES

NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



WHEN AN OBSTRUCTION OF A HEIGHT GREATER THAN 27" FROM THE SURFACE WOULD CREATE A PROTRUSION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.



PROTRUDING OBJECTS OF A HEIGHT ≤ 27" ARE DETECTABLE BY CANE AND DO NOT REQUIRE ADDITIONAL TREATMENT.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

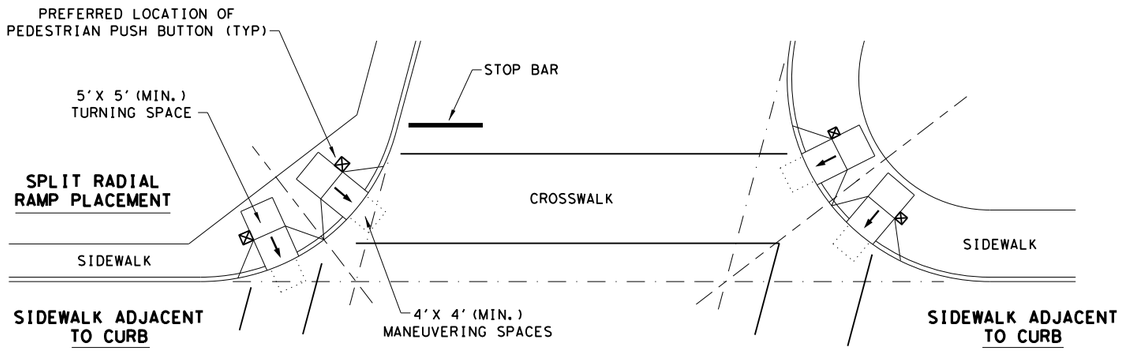
PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG	
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0043	08	088	US287	
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY		SHEET NO.	
	WFS	WICHITA		75	

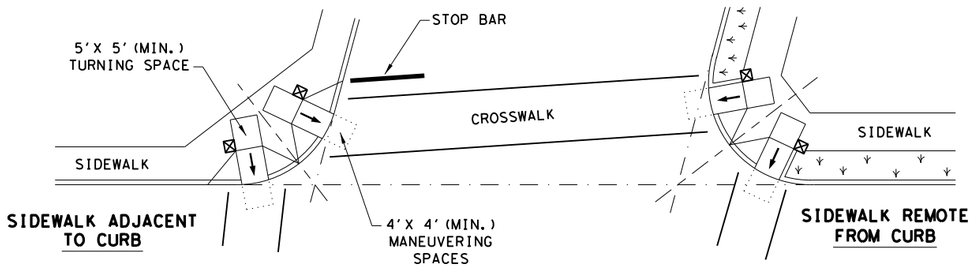
DATE:
FILE:

TYPICAL CROSSING LAYOUTS

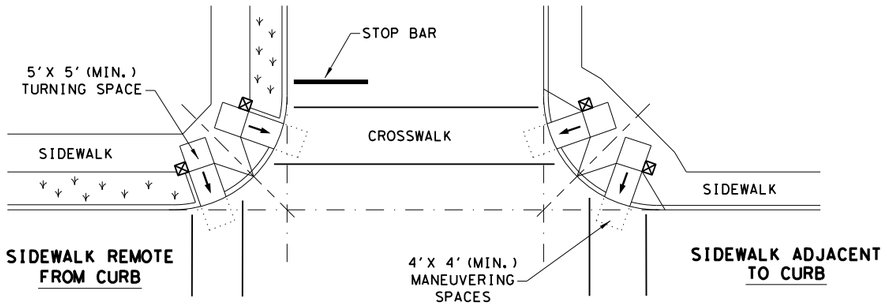
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



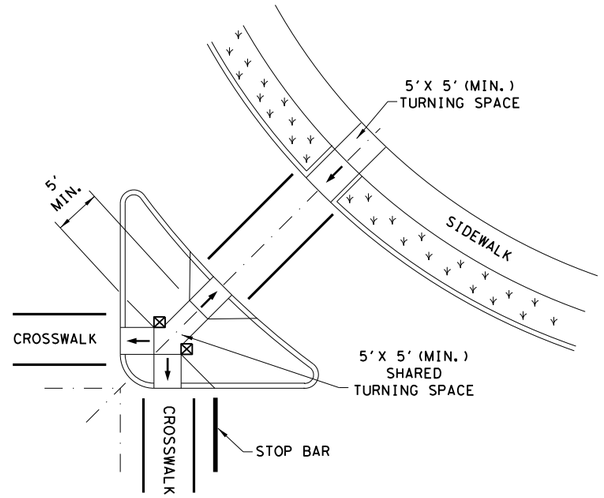
SKEWED INTERSECTION WITH "LARGE" RADIUS



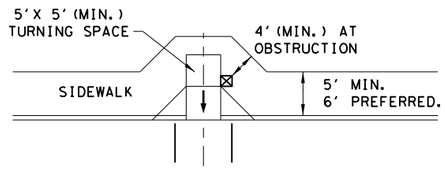
SKEWED INTERSECTION WITH "SMALL" RADIUS

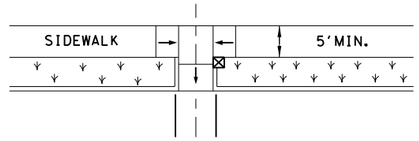


NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND





MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

LEGEND:

SHOWS DOWNWARD SLOPE. →

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE). ☒

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

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PEDESTRIAN FACILITIES CURB RAMPS

PED-18

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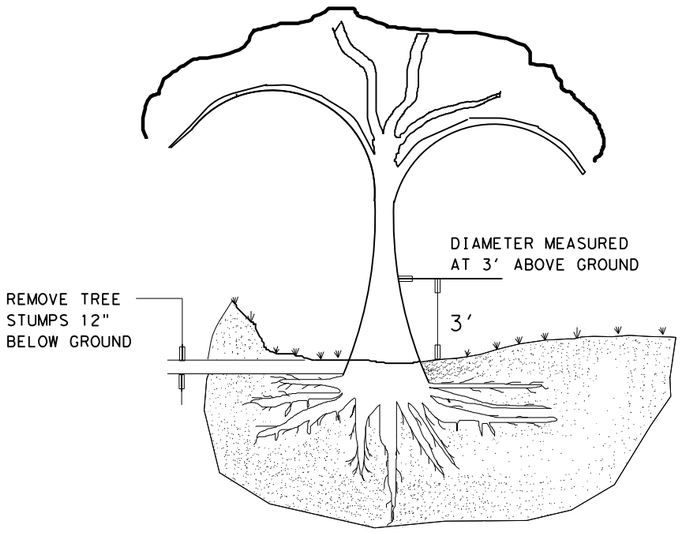
REVISIONS	0043	08	088	US287	
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY		SHEET NO.	
	WFS	WICHITA		76	

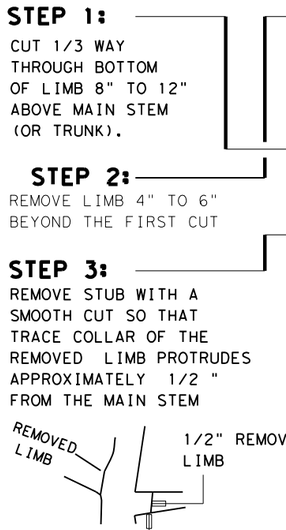


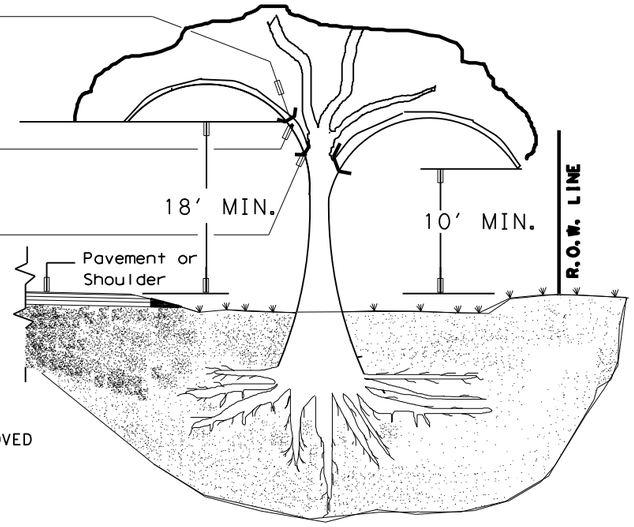
TREE REMOVAL

STEP 1:
CUT 1/3 WAY THROUGH BOTTOM OF LIMB 8" TO 12" ABOVE MAIN STEM (OR TRUNK).

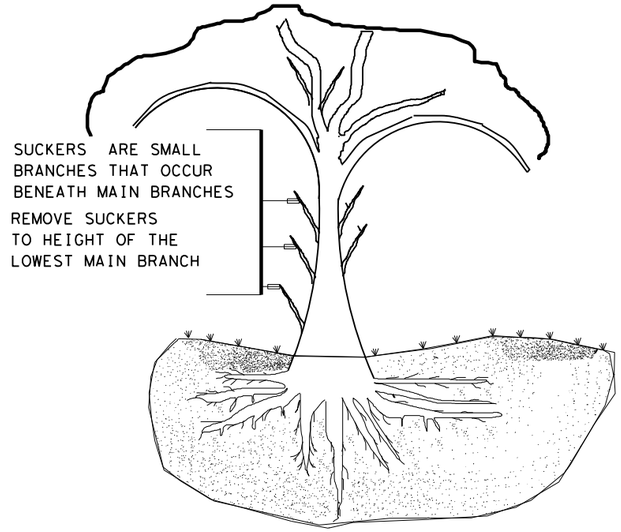
STEP 2:
REMOVE LIMB 4" TO 6" BEYOND THE FIRST CUT

STEP 3:
REMOVE STUB WITH A SMOOTH CUT SO THAT TRACE COLLAR OF THE REMOVED LIMB PROTRUDES APPROXIMATELY 1/2 " FROM THE MAIN STEM

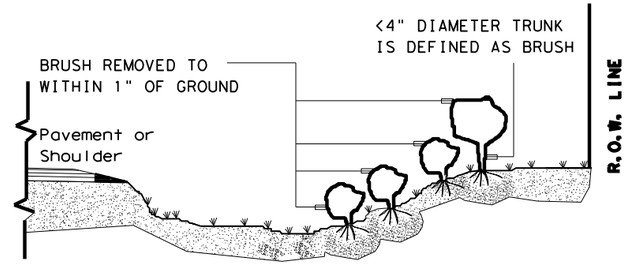




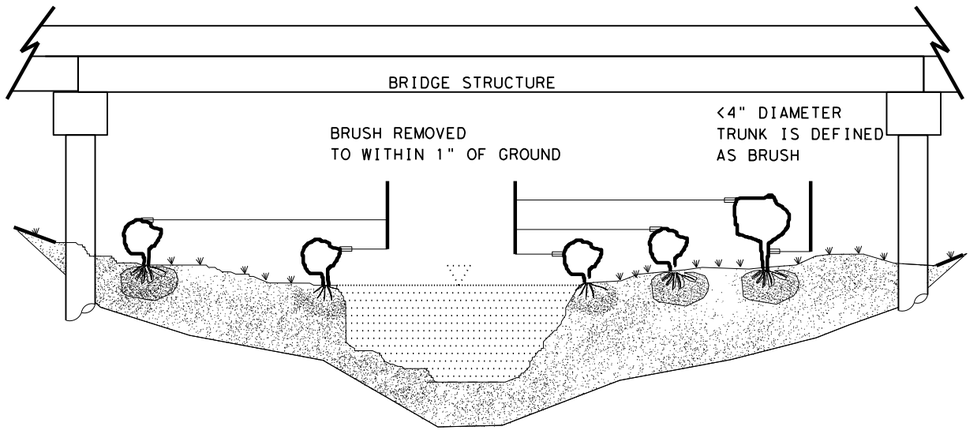
TREE TRIMMING



STEPS 1, 2 AND 3 APPLY WHEN REMOVING LIMBS 2" IN DIAMETER OR LARGER.



BRUSH REMOVAL



BRUSH REMOVAL UNDER BRIDGE AND IN CHANNEL

GENERAL NOTES:

TREE TRIMMING

1. TRIM AND REMOVE ALL TREE LIMBS ON THE PAVEMENT SIDE OF THE TRUNK 18' ABOVE THE PAVEMENT OR BRIDGE DECK ELEVATION, UNLESS OTHERWISE SHOWN ON THE PLANS.

2. TRIM AND REMOVE ALL TREE LIMBS BETWEEN THE TRUNK AND R.O.W. LINE 10' ABOVE NATURAL GROUND, TERRAIN OR OTHER STRUCTURE ELEVATION, UNLESS OTHERWISE SHOWN ON THE PLANS.

TREE REMOVAL

3. FOR TREES MARKED FOR REMOVAL, THE DIAMETER OF TREES ARE DETERMINED BY MEASUREMENT OF THE TRUNK CIRCUMFERENCE 3' ABOVE THE GROUND. TREES WITH TRUNKS OF LESS THAN 4" DIAMETER ARE CONSIDERED TO BE BRUSH. TREES WITH MULTIPLE TRUNKS AT THE POINT OF MEASUREMENT ARE MEASURED AND PAID FOR SEPARATELY.

4. MEASUREMENTS FOR PAYMENT OF TREE DIAMETERS ARE DIVIDED INTO THE RANGES SHOWN IN TABLE 1.

TABLE 1
TREE TRUNK SIZE FOR TREE REMOVAL PAYMENT

	RANGE FOR PAY ITEMS			
	TRUNK DIAMETER *		TRUNK CIRCUMFERENCE	
PAY ITEM	LOWER LIMIT IS GREATER THAN	UPPER LIMIT IS LESS THAN OR EQUAL TO	LOWER LIMIT IS GREATER THAN	UPPER LIMIT IS LESS THAN OR EQUAL TO
752 6005	4	12	12 1/2	37 1/2
752 6006	12	18	37 1/2	56 1/2
752 6007	18	24	56 1/2	75 1/2
752 6008	24	30	75 1/2	94
752 6009	30	36	94	113
752 6010	36	42	113	132
752 6011	42	48	132	151
752 6012	48	60	151	188 1/2
752 6013	60	72	188 1/2	226
752 6019	72	84	226	264
	84	GREATER THAN 84	264	NOT APPLICABLE

*SEE GENERAL NOTE #3.

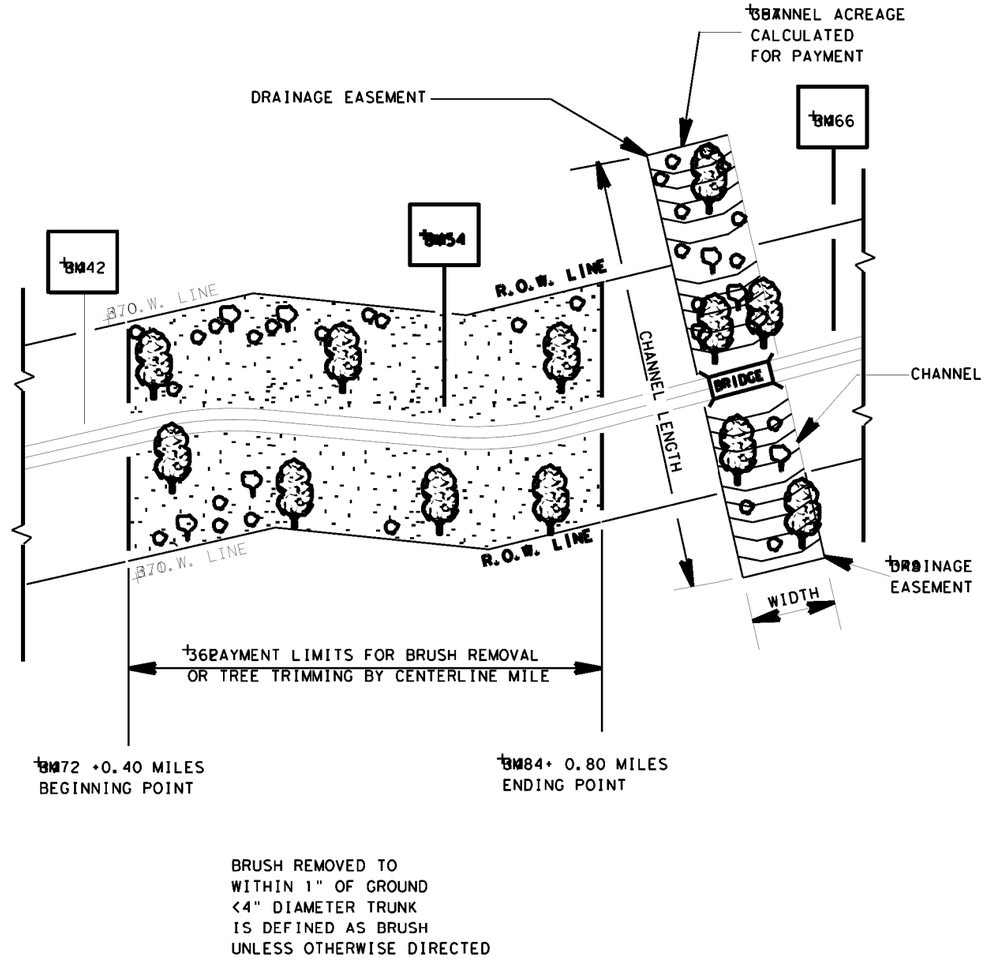
Texas Department of Transportation — Maintenance Division Standard

TREE AND BRUSH REMOVAL

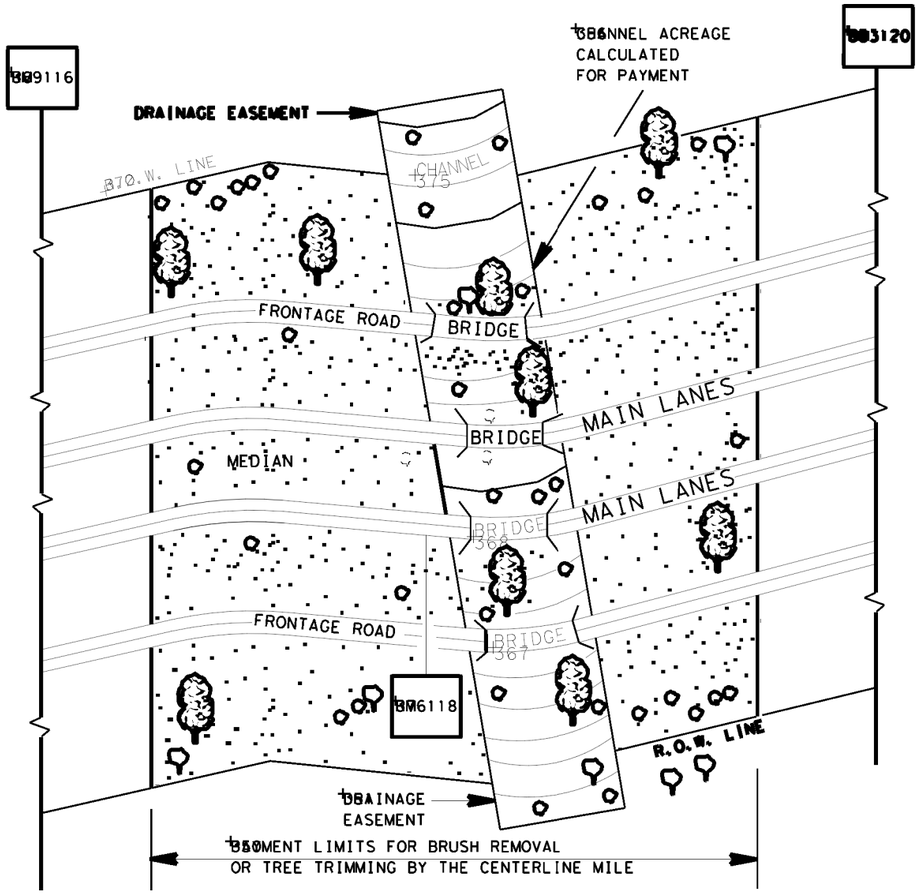
TRB-15(1)

FILE:	DN: JEO	CK: LJB	DW: JEO	CK:
©TxDOT MARCH 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	004308		088	US287
Revised table 1 to 2014 Specification	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		77

12/7/2023 3:51:46 PM
...\3. Roadway\Standards\trb15.dgn



EXAMPLE: UNDIVIDED HIGHWAY



EXAMPLE: DIVIDED HIGHWAY WITH FRONTAGE ROADS

GENERAL NOTES:

TREE TRIMMING AND BRUSH REMOVAL

1. PAYMENT BY THE CENTERLINE MILE IS MADE TO THE NEAREST 1/100 (0.01) MILE.
2. LIMITS OF WORK ARE SHOWN AS DISTANCES FROM REFERENCE MARKERS (RM).
3. PAY ITEMS BY THE CENTERLINE MILE INCLUDE ALL TREE TRIMMING OR BRUSH REMOVAL IN THE RIGHT OF WAY ON BOTH SIDES OF THE HIGHWAY. FOR DIVIDED HIGHWAYS, THE MEDIAN IS INCLUDED. FOR HIGHWAYS WITH FRONTAGE ROADS, THE AREAS BETWEEN THE FRONTAGE ROADS AND MAIN LANES, AND THE AREAS OUTSIDE OF THE FRONTAGE ROADS ARE INCLUDED.
4. BRUSH REMOVAL AND TREE TRIMMING UNDER BRIDGES, IN AND ALONG CHANNELS AND EASEMENTS ARE PAID FOR BY THE ACRE FOR AREAS DESIGNATED ON THE PLANS.

LEVELS DISPLAYED
1

Texas Department of Transportation
Maintenance Division
Standard Plans

TREE AND BRUSH REMOVAL

TRB-15(2)

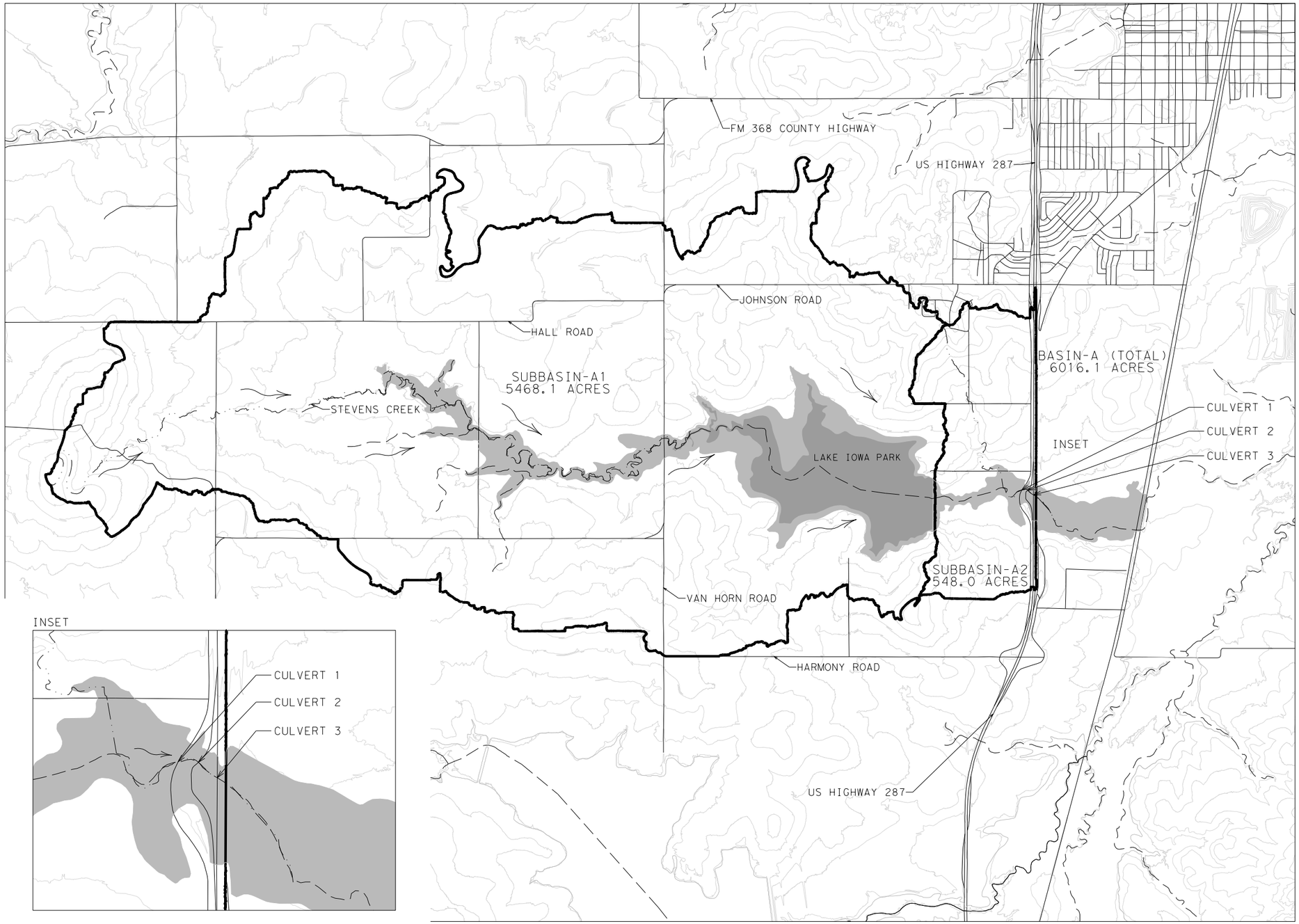
NOT TO SCALE — SHEET 2 OF 2

FILE: TRB-15(2).DGN	DRAWN: JEO	CHECKED: DW/LJB	DW: -	CK: -	MEG NO.:
	MODIFIED:				

© TxDOT APRIL 2015		STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT #		SHEET
REVISED: 5/13/2004	LJB	WFS		STP 2024(778)TP		78
REVISED: 9/24/2004	LJB	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
REVISED: APRIL 2015	JEO	WICHITA		004308	088	US287

100% SUBMITTAL

DATE: 12/11/2023 TIME: 3:33:42 PM



INSET

LEGEND

- BASIN BOUNDARY
- STREAM
- 10 FT ELEVATION CONTOUR
- LAKE
- FEMA FLOOD ZONE A
- FLOW DIRECTION
- TIME OF CONCENTRATION FLOWPATH
- STREET

0 1500 FT 3000 FT

NOTES:
1. FLOWS ESTIMATED USING THE HEC-HMS PROGRAM VERSION 4.9 AND PRECIPITATION ESTIMATED USING EBDLKUP-2019.
2. FEMA NFHL 48485C WAS USED FOR FLOOD ZONE.
3. FLOW ATTENUATED BY LAKE IOWA PARK USING LEVEL POOL ROUTING.

HYDROLOGIC DATA

DRAINAGE AREA ID	DRAINAGE AREA (SQ. MI.)	DRAINAGE AREA (ACRES)	COMPUTATION METHOD	CN	LAG TIME (MIN)	EXISTING Q (CFS) 10-YR	EXISTING Q (CFS) 25-YR	EXISTING Q (CFS) 50-YR	EXISTING Q (CFS) 100-YR	PROPOSED Q (CFS) 10-YR	PROPOSED Q (CFS) 25-YR	PROPOSED Q (CFS) 50-YR	PROPOSED Q (CFS) 100-YR
SUBBASIN-A1	8.5439	5468.1	HYDROGRAPH	70	114	2715	4009	4955	6126	2715	4009	4955	6126
SUBBASIN-A2	0.8562	548.0	HYDROGRAPH	61	26	488	773	987	1260	493	780	994	1267
BASIN-A	9.4001	6016.1	HYDROGRAPH			600	1065	1466	1997	600	1065	1466	1997

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TBPE REG: NO. F-474

US 287 REST AREAS

DRAINAGE AREA MAP AND HYDROLOGIC DATA

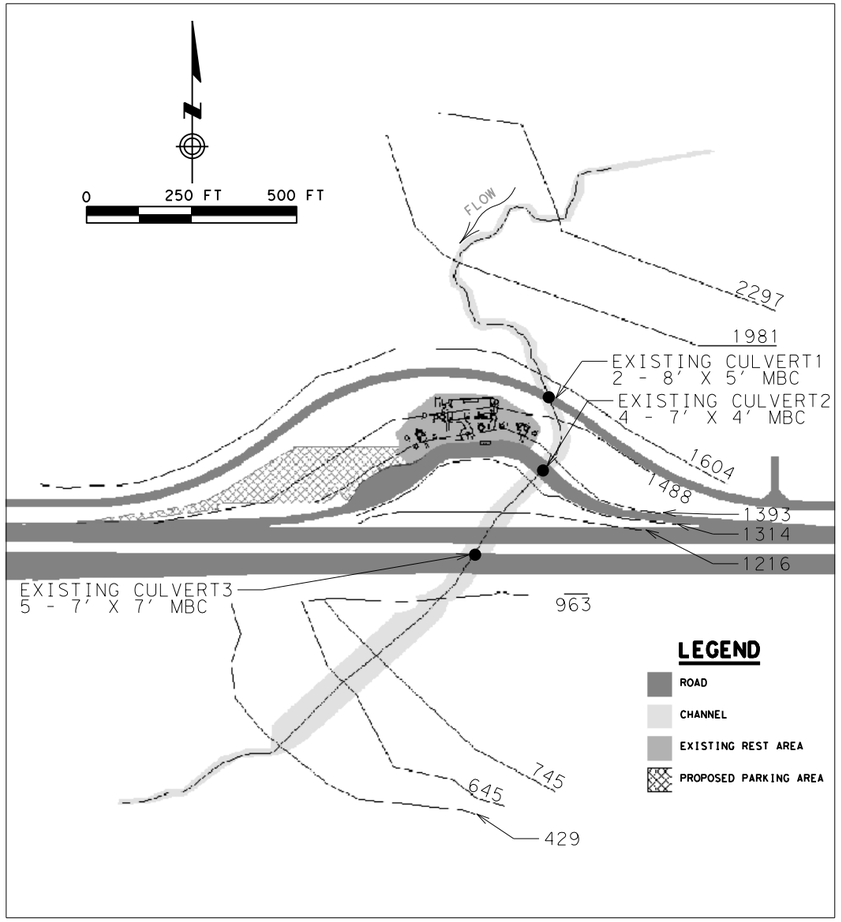
SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
WRY	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
DP	TEXAS	WFS	WICHITA	79
CHECK	CONTROL	SECTION	JOB	
CHECK	0043	08	088	

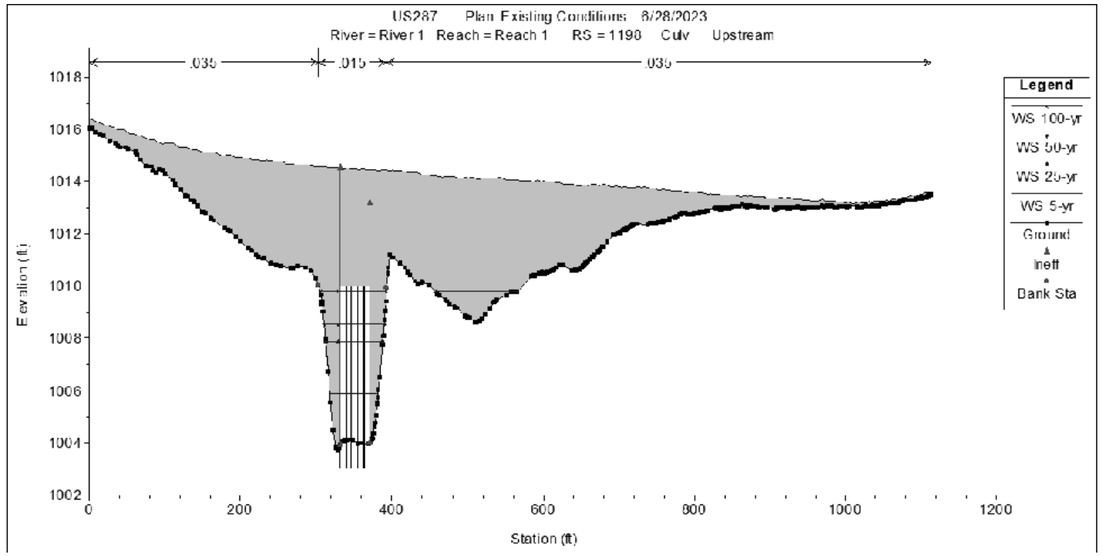
PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US287 Drainage Area Map.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 3:34:01 PM



NORTHBOUND REST AREA HEC-RAS CROSS SECTION LOCATIONS



HEC-RAS UPSTREAM CULVERT3 FACE

NOTES:
1. HEC-RAS VERSION 6.3.1 WAS USED FOR THE HYDRAULIC ANALYSIS OF THE CULVERTS.
2. NORMAL DEPTH COMPUTATION WAS USED FOR THE DOWNSTREAM BOUNDARY CONDITION. SLOPE = 0.0016 FT/FT WAS USED FOR EXISTING CONDITION.
3. DISCHARGES WERE DETERMINED BY USING THE NRCS HYDROGRAPH METHOD ACCORDING TO CHAPTER 4, SECTION 13 OF THE TXDOT HYDRAULIC DESIGN MANUAL (2019).
4. DRAINAGE AREA DELINEATION WAS BASED ON THE 2018 TNRIS LIDAR DATASET "TEXAS WEST CENTRAL LIDAR".
5. FEMA NFHL 48485C WAS USED FOR FLOOD ZONE.
6. COORDINATION WITH CITY OF IOWA PARK FPA OCCURRED ON 06/29/2023.

100-YR CONDITION					
RAS STATION	FLOW (CFS)	WSEL (FT) EXISTING	WSEL (FT) PROPOSED	V (FT/S) EXISTING	V (FT/S) PROPOSED
2297	1065	1013.83	1013.83	2.3	2.3
1981	1065	1013.75	1013.75	1.7	1.7
1604	1065	1012.88	1012.88	7.6	7.6
1577	EXISTING 2 - 8' X 5' MBC				
1488	1065	1012.84	1012.84	6.8	6.8
1393	1065	1012.01	1012.01	4.4	4.4
1386	EXISTING 4 - 7' X 4' MBC				
1314	1065	1009.58	1009.58	13.0	13.0
1216	1065	1009.81	1009.81	9.0	9.0
1198	EXISTING 5 - 7' X 7' MBC				
963	1065	1008.46	1008.46	10.3	10.3
745	1065	1008.34	1008.34	4.0	4.0
645	1065	1008.20	1008.20	3.6	3.6
429	1065	1007.94	1007.94	3.1	3.1

5-YR CONDITION					
RAS STATION	FLOW (CFS)	WSEL (FT) EXISTING	WSEL (FT) PROPOSED	V (FT/S) EXISTING	V (FT/S) PROPOSED
2297	326	1010.52	1010.52	4.1	4.1
1981	326	1008.45	1008.45	5.2	5.2
1604	326	1007.39	1007.39	6.4	6.4
1577	EXISTING 2 - 8' X 5' MBC				
1488	326	1006.35	1006.35	8.6	8.6
1393	326	1006.58	1006.58	4.2	4.2
1386	EXISTING 4 - 7' X 4' MBC				
1314	326	1005.92	1005.92	7.1	7.1
1216	326	1005.70	1005.70	5.1	5.1
1198	EXISTING 5 - 7' X 7' MBC				
963	326	1005.77	1005.77	3.6	3.6
745	326	1005.62	1005.62	1.5	1.5
645	326	1005.57	1005.57	1.5	1.5
429	326	1005.36	1005.36	2.1	2.1

25-YR CONDITION					
RAS STATION	FLOW (CFS)	WSEL (FT) EXISTING	WSEL (FT) PROPOSED	V (FT/S) EXISTING	V (FT/S) PROPOSED
2297	1065	1012.91	1012.91	2.4	2.4
1981	1065	1012.81	1008.45	1.6	1.6
1604	1065	1011.21	1007.39	9.3	9.3
1577	EXISTING 2 - 8' X 5' MBC				
1488	1065	1009.08	1006.35	12.8	12.8
1393	1065	1009.76	1006.58	6.2	6.2
1386	EXISTING 4 - 7' X 4' MBC				
1314	1065	1007.79	1005.92	10.6	10.6
1216	1065	1007.92	1005.70	7.2	7.2
1198	EXISTING 5 - 7' X 7' MBC				
963	1065	1007.59	1005.77	6.6	6.6
745	1065	1007.42	1005.62	2.7	2.7
645	1065	1007.29	1005.57	2.8	2.8
429	1065	1007.04	1005.36	2.7	2.7

50-YR CONDITION					
RAS STATION	FLOW (CFS)	WSEL (FT) EXISTING	WSEL (FT) PROPOSED	V (FT/S) EXISTING	V (FT/S) PROPOSED
2297	1065	1014.08	1014.08	1.5	1.5
1981	1065	1014.05	1014.05	1.1	1.1
1604	1065	1010.54	1010.54	14.2	14.2
1577	EXISTING 2 - 8' X 5' MBC				
1488	1065	1010.29	1010.29	14.2	14.2
1393	1065	1009.93	1009.93	8.3	8.3
1386	EXISTING 4 - 7' X 4' MBC				
1314	1065	1008.60	1008.60	11.7	11.7
1216	1065	1008.73	1008.73	8.2	8.2
1198	EXISTING 5 - 7' X 7' MBC				
963	1065	1008.06	1008.06	8.2	8.2
745	1065	1007.91	1007.91	3.2	3.2
645	1065	1007.77	1007.77	3.2	3.2
429	1065	1007.51	1007.51	2.8	2.8

STATE OF TEXAS
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12/11/2023

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TBPE REG NO. F-474

 Texas Department of Transportation

US 287 REST AREAS
HYDRAULIC DATA SHEET

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
WRY	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
DP	TEXAS	WFS	WICHITA	80
CHECK	CONTROL	SECTION	JOB	
CHECK	0043	08	088	

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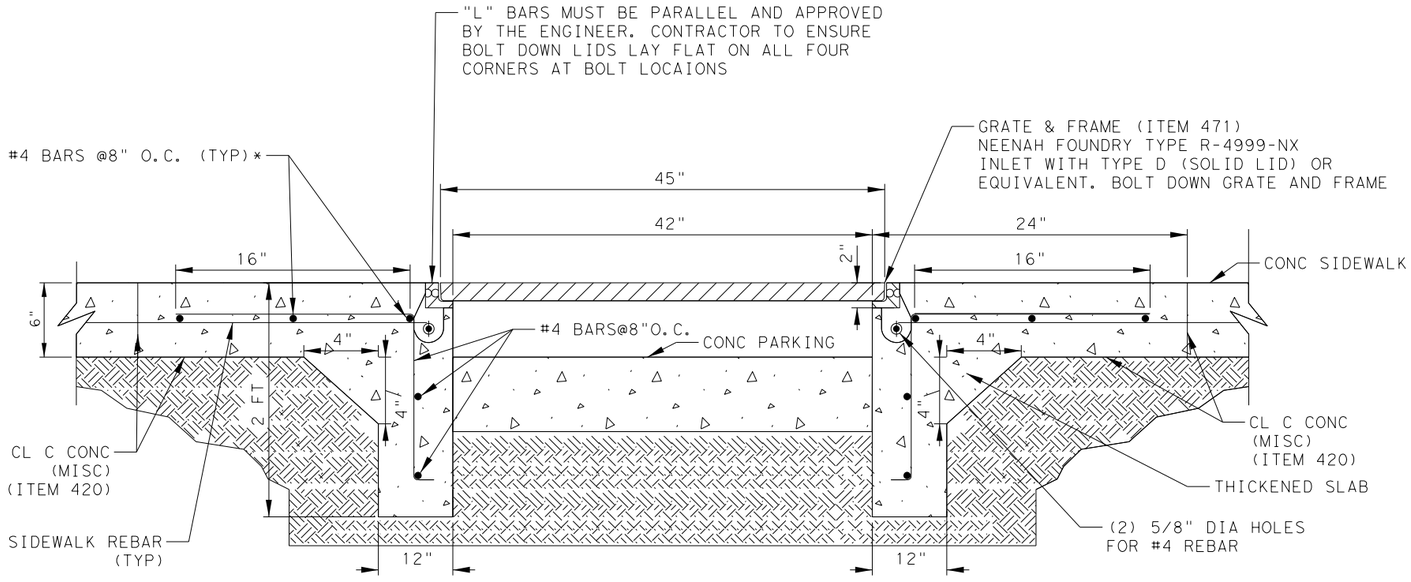
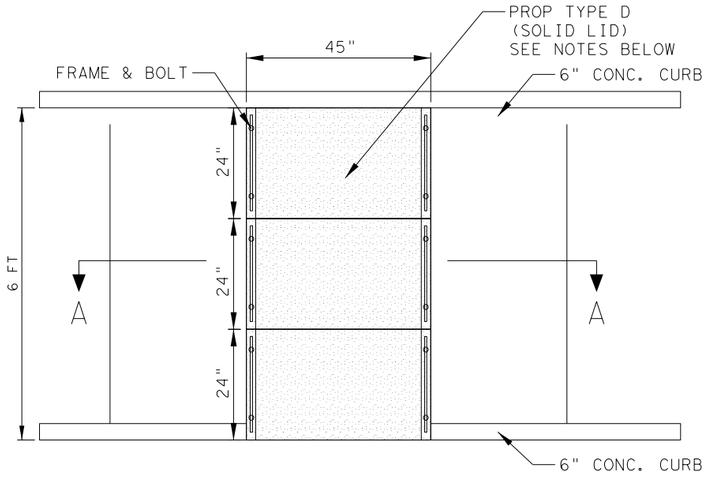


SECTION A-A

GRATE AND FRAME DETAIL

NTS



PLAN VIEW

NTS

* REINFORCEMENT IS SUBSIDIARY TO ITEM 420. CONTRACTOR TO FIELD VERIFY GRATE DIMENSIONS PRIOR TO ORDERING GRATE & FRAME.

NOTES:

1. USE R-4999-NX SOLID LID (45"x24").
2. THE WIDTH REQUIRES 3 x (45"x24") DIAMOND SOLID PLATES. THE PLATES SHALL BE INCIDENTAL TO ITEM 471.

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US 287 REST AREAS

DRAINAGE DETAIL

SIDEWALK

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

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SD	TEXAS	WFS	WICHITA	81
CHECK	CONTROL	SECTION	JOB	
RAW	0043	08	088	
CHECK				
JNR				

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: Drainage Details.dgn

LEGEND

OH ELECTRIC	OE1	ONCOR
UG ELECTRIC	E1	TXDOT
UG FIBER OPTIC	FOC1	AT&T TEXAS
UG FIBER OPTIC	FOC2	TXDOT FIBER
UG FIBER OPTIC	FOC3	FIBERLIGHT
UG TELEPHONE	T1	AT&T TEXAS
WATER	W1	CITY OF IOWA PARK
WATER	W2	TXDOT
WASTEWATER	WW1	CITY OF IOWA PARK

QUALITY LEVEL LEGEND

WW1 QUALITY LEVEL "B"
WW1(C) QUALITY LEVEL "C"
WW1(D) QUALITY LEVEL "D"
TYPICAL FOR ALL UTILITIES

Quality Level "D": Information derived from existing records and/or oral recollections,

Quality Level "C": Information obtained by surveying and plotting visible above-ground utility features and by using professional judgment in correlating this information to quality level D information.

Quality Level "B": Information obtained through the application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utilities (aka Designating).

Quality Level "A": Precise horizontal and vertical location of utilities obtained by the actual exposure and subsequent measurement of subsurface utilities, usually at a specific point (aka Locating).

OHFOC1 OHFOC2 — OVERHEAD COMMUNICATION CALLOUT
APPARENT EXISTING ROW
ROADWAY CENTERLINE OR BASELINE
UTILITY EASEMENT
3FT 1IN — GEOPHYSICAL (ELECTRONIC) DEPTH *
QLA SUE (TESTHOLE)

* GEOPHYSICAL DEPTHS WERE RECORDED AT THE TIME OF DESIGNATION USING A PIPE AND CABLE LOCATOR (PCL). PCL'S DEPTHS FUNCTIONS MEASURE TO THE MIDDLE OF THE FIELD UNLESS OTHERWISE NOTED. FOR EXACT DEPTHS, QLA SUE IS RECOMMENDED AT HIGH PRIORITY LOCATIONS.

- POWER POLE
- POWER POLE WITH RISER
- ELECTRIC SERVICE POLE
- UTILITY POLE
- LIGHT POLE
- LIGHT POLE WITH CAMERA
- GUY ANCHOR
- TRAFFIC SIGNAL LIGHT POLE
- ELECTRIC POWER BOX
- TRAFFIC SIGNAL POWER BOX
- ELECTRIC METER
- TRANSMISSION TOWER
- TELEPHONE POLE
- TELEPHONE MARKER
- TELEPHONE MANHOLE
- TELEPHONE HANDHOLE
- TELEPHONE PEDESTAL
- TELEPHONE CABINET
- FIBER OPTIC CABLE MARKER
- FIBER OPTIC HANDHOLE
- FIBER MANHOLE
- GAS PIPELINE MARKER
- CATHODIC PROTECTION STATION
- GAS VENT
- GAS VALVE
- GAS CAP
- GAS METER
- REGULATING STATION
- PETROLEUM WELL
- WATER METER
- WATER VALVE
- FIRE HYDRANT
- WATER STUBOUT
- WATER MARKER
- WATER VENT
- WATER WELL/PUMP
- WATER TEST STATION
- BACK FLOW PREVENTER
- WASTEWATER MANHOLE
- SANITARY CLEANOUT
- GENERIC VENT POLE
- CONTINUATION OF UTILITY
- END OF UTILITY

ABBREVIATIONS

AC	ASBESTOS CEMENT	PROP	PROPOSED
ABAN	ABANDONED	PVC	POLYVINYL CHLORIDE
BL	BASE LINE	OH	OVERHEAD
CI	CAST IRON	QLA	QUALITY LEVEL A
CL	CENTER LINE	QLB	QUALITY LEVEL B
CSC	CONCRETE STEEL CYLINDER	QLC	QUALITY LEVEL C
DI	DUCTILE IRON	QLD	QUALITY LEVEL D
DBC	DIRECT BURIED CABLE	RCP	REINFORCED CONCRETE PIPE
ESMT	EASEMENT	ROW	RIGHT OF WAY
EXIST	EXISTING	SAN	SANITARY
FM	FORCE MAIN	SSI	STORM SEWER INLET
FOC	FIBER OPTIC CABLE	STL	STEEL
HP	HIGH PRESSURE (> OR = 60 PSI)	SVC LN	SERVICE LINE
IP	INTERMEDIATE PRESSURE	SWR	SEWER
INV	INVERT	UG	UNDERGROUND
LP	LOW PRESSURE (<60 PSI)	VC	VITRIFIED CLAY
PL	PIPELINE	WL	WATER LINE
PLA	PLASTIC	W/	WITH

STATE OF TEXAS
JULIAN S. VALENCIA
142004
LICENSED
PROFESSIONAL ENGINEER
12/13/2023

COMPANY	NAME	ADDRESS	PHONE	EMAIL
ONCOR	JUSTIN STANLEY	115 WEST 7TH STREET, STE 625, FORT WORTH, TX 76102	817-215-5016	JUSTIN.STANLEY@ONCOR.COM
AT&T TEXAS	JAMES DORGAN	117 W COLUMBIA ST., WEATHERFORD, TX 76068	817-598-2025	JD2697@ATT.COM
FIBERLIGHT	ADAM NICKERSON	3000 SUMMIT PLACE, STE. 200, ALPHARETTA, GA 30009	682-321-8437	MAINTENANCE@FIBERLIGHT.COM
CITY OF IOWA PARK	MIKE McCARTY	P.O. BOX 190, IOWA PARK, TX 76367	940-592-2131	MMCCARTY@IOWAPARK.COM

Texas Department of Transportation

ATKINS
MEMBER OF THE SNC-LAVALIN GROUP
11801 DOMAIN BLVD
SUITE 500
AUSTIN, TEXAS 78758
TBPE REG. NO. F-474

US 287
EXISTING UTILITY LAYOUTS
LEGEND

SCALE: NTS SHEET 1 OF 8

CONT	SECT	JOB	HIGHWAY
0043	08	088	US287
DIST	COUNTY		SHEET NO.
WFC	WICHITA		82

DATE: 12/8/2023 7:49:39 AM
FILE: 01 US287 SUE LEG.dgn

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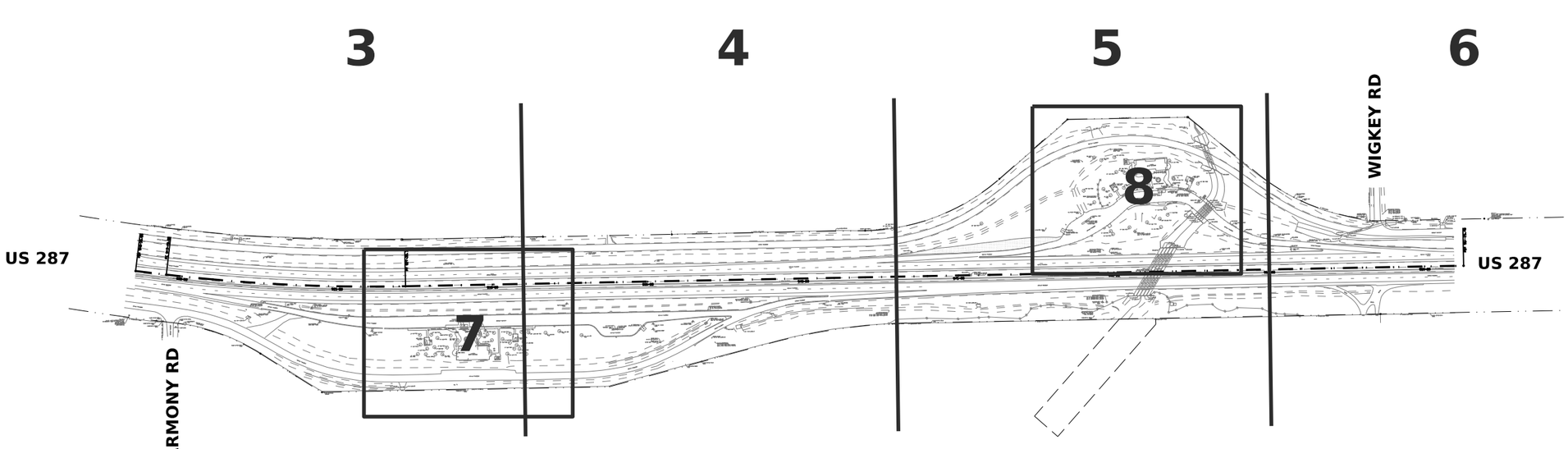
SCALE: 1" = 400' (H)



STATE OF TEXAS
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AUSTIN, TEXAS 78758
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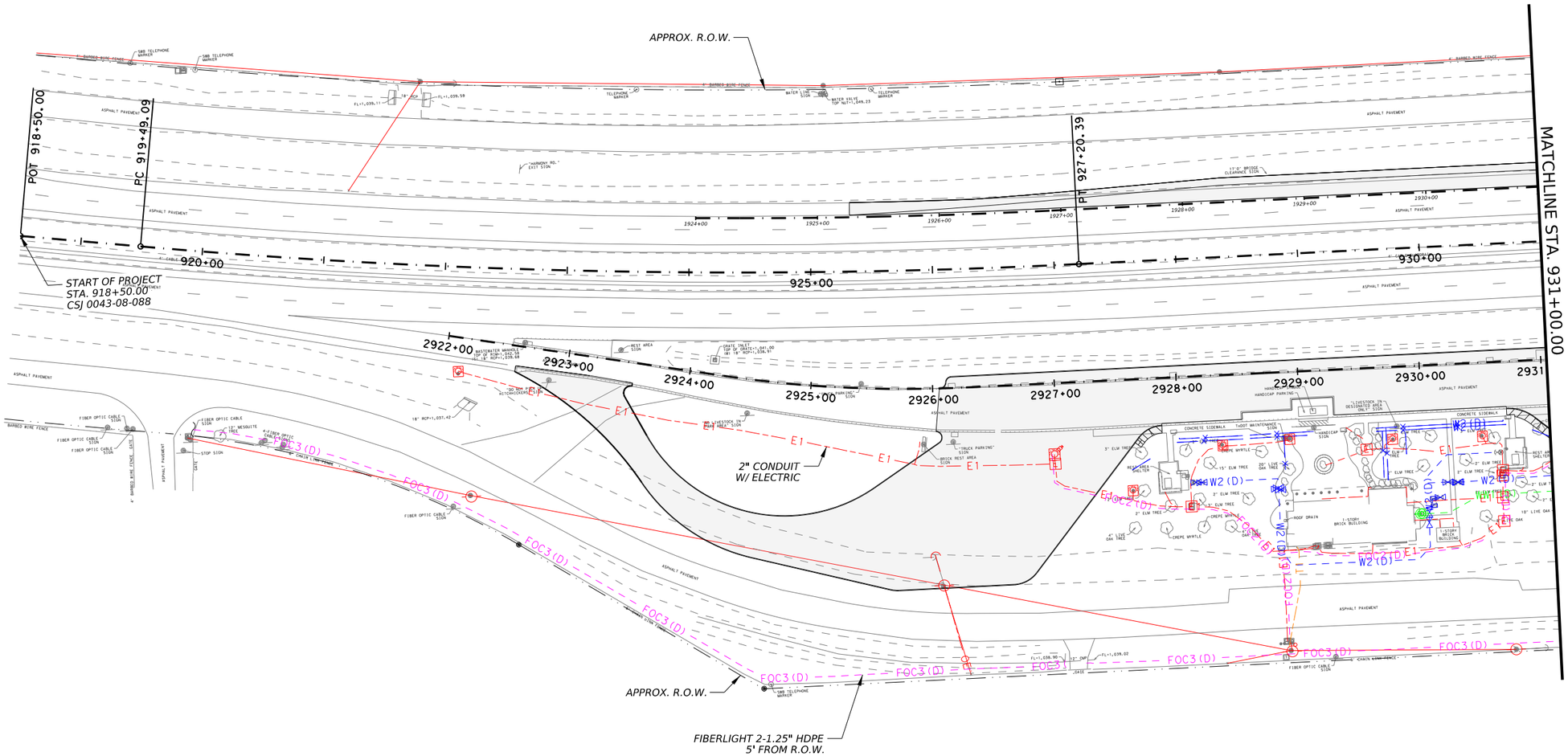
US 287
EXISTING UTILITY LAYOUTS
OVERALL LAYOUT

SCALE: 1"=400' SHEET 2 OF 8

CONT	SECT	JOB	HIGHWAY
0043	08	088	US287
DIST	COUNTY		SHEET NO.
WFC	WICHITA		83

DATE: 12/8/2023 7:49:53 AM
FILE: 02 US287 SUE LAYOUT.dgn

DW: JV CK: DW: MA CK: JV CK: WA



0 50 100 FT
SCALE: 1" = 100' (H)

STATE OF TEXAS
JULIAN S. VALENCIA
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12/13/2023

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AUSTIN, TEXAS 78758
TBPE REG. NO. F-474

US 287
EXISTING UTILITY LAYOUTS
START TO STA. 931+00

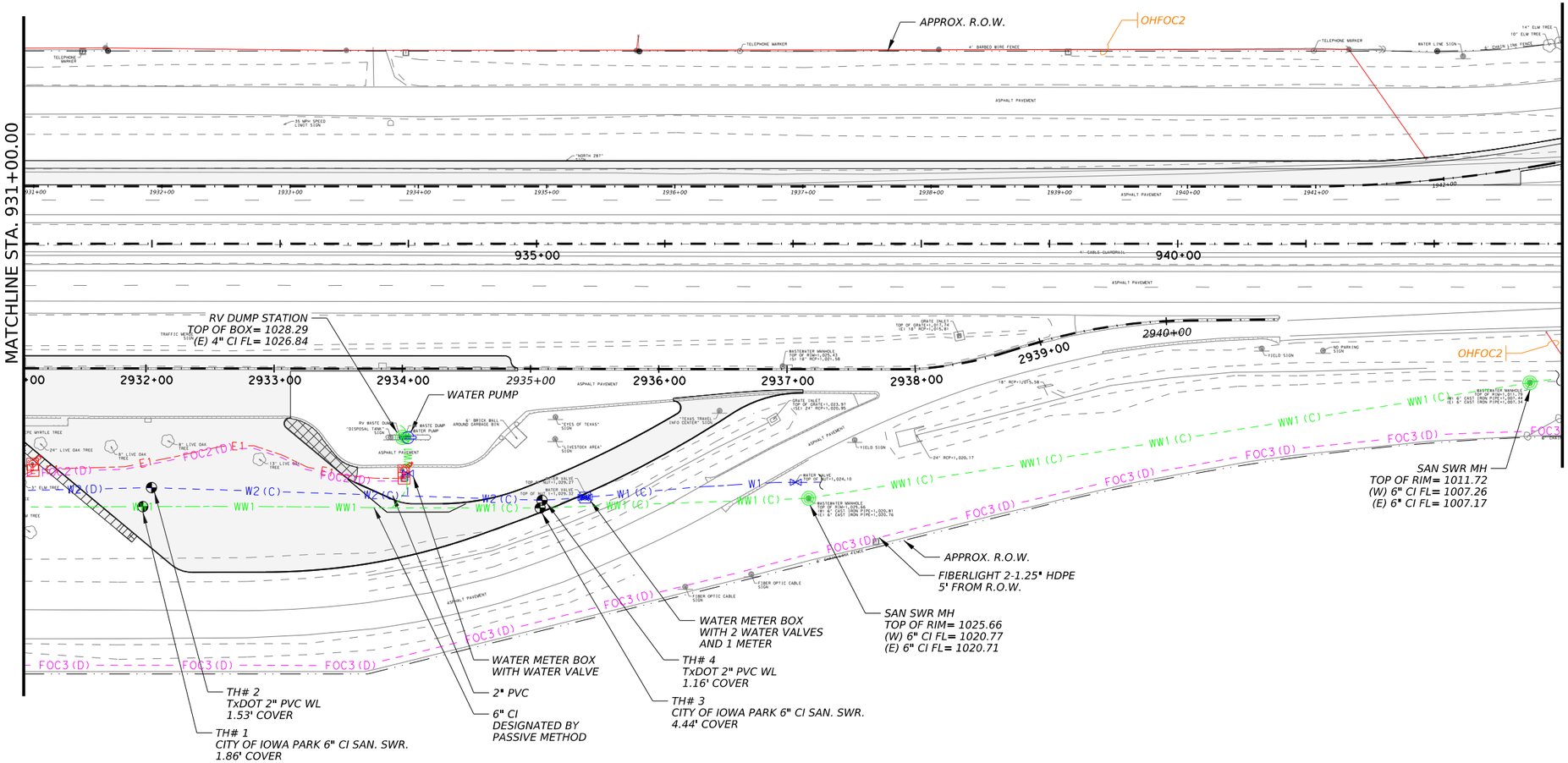
SCALE: 1"=100' SHEET 3 OF 8

CONT	SECT	JOB	HIGHWAY
0043	08	088	US287
DIST	COUNTY		SHEET NO.
WFC	WICHITA		84

DATE: 12/8/2023 7:50:09 AM
FILE: 03 US287 SUE SHEET 01.dgn

DN: JV: CK: MA| DW: JV CK: WA

0 50 100 FT
SCALE: 1" = 100' (H)



STATE OF TEXAS
JULIAN S. VALENCIA
142004
LICENSED
PROFESSIONAL ENGINEER
12/13/2023

Texas Department of Transportation

ATKINS
MEMBER OF THE SNC-LAVALIN GROUP
11801 DOMAIN BLVD
SUITE 500
AUSTIN, TEXAS 78758
TBPE REG: NO. F-474

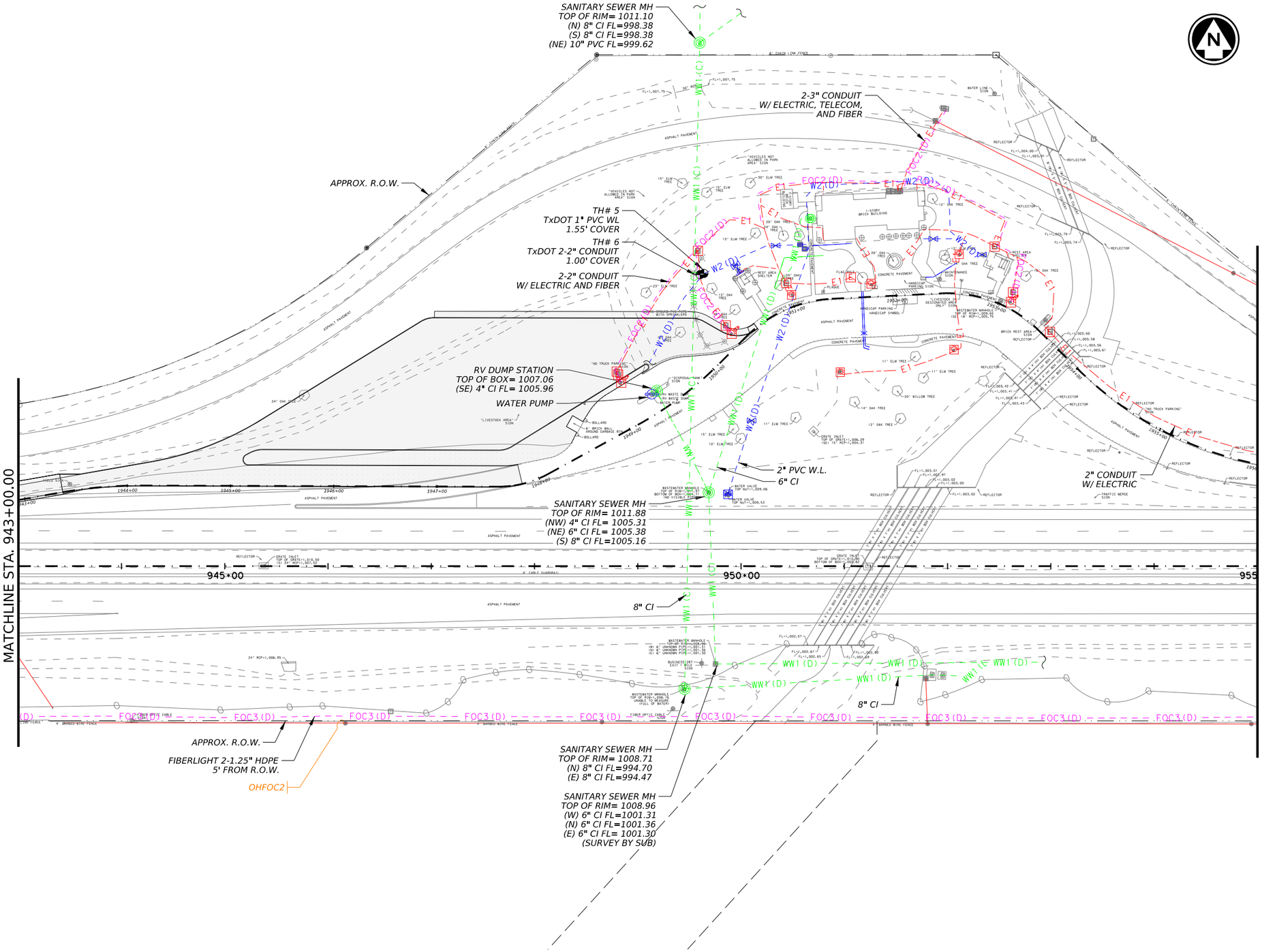
US 287
EXISTING UTILITY LAYOUTS
STA. 931+00 TO STA. 943+00

SCALE: 1"=100' SHEET 4 OF 8

CONT	SECT	JOB	HIGHWAY
0043	08	088	US287
DIST	COUNTY		SHEET NO.
WFC	WICHITA		85

DATE: 12/8/2023 7:50:23 AM
FILE: 04 US287 SUE SHEET 02.dgn

DW: JV CK: JV DW: MA CK: JV PV CK: WA



DATE: 12/8/2023 7:50:36 AM
FILE: 05 US287 SUE SHEET 03.dgn

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SUITE 500
AUSTIN, TEXAS 78758
TBPE REG: NO. F-474

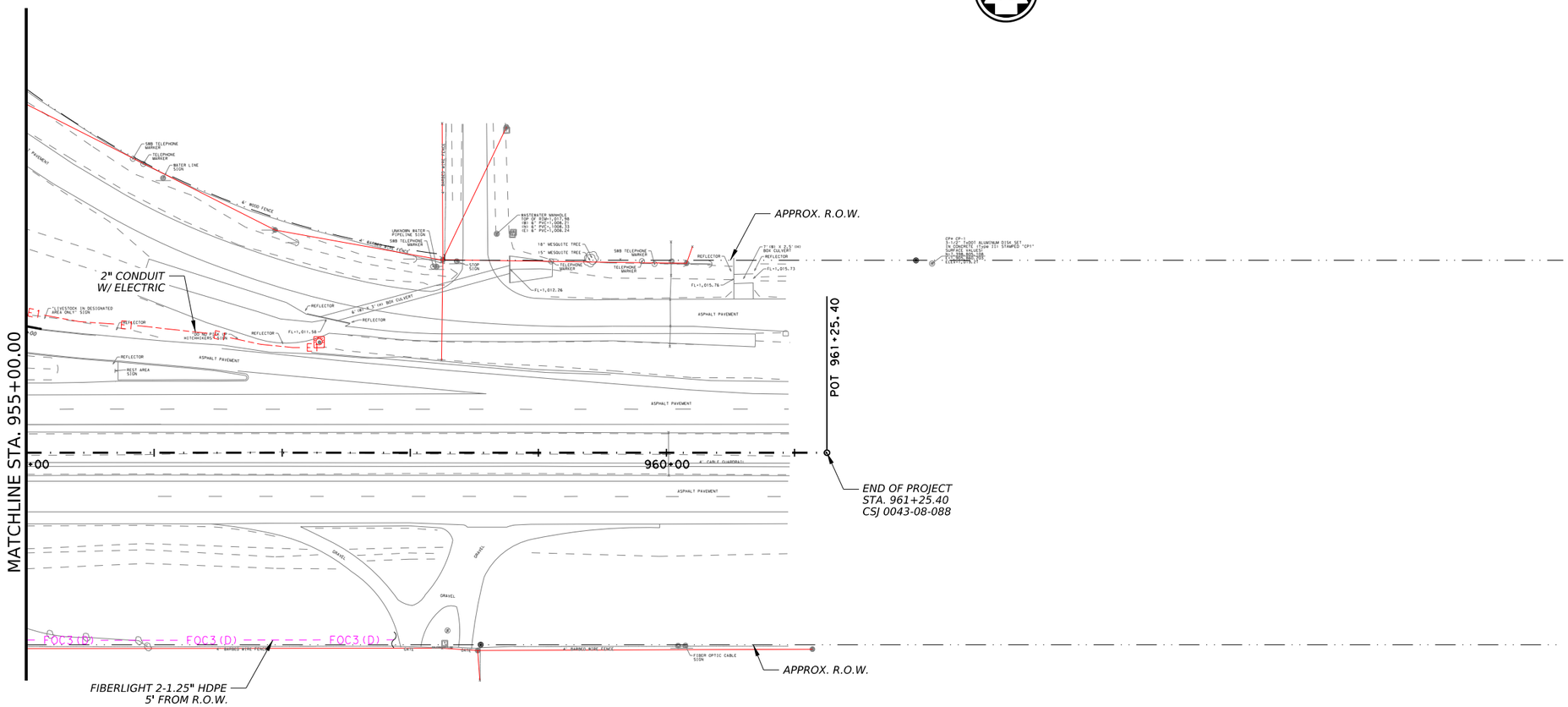
US 287
EXISTING UTILITY LAYOUTS
STA. 943+00 TO STA. 955+00

SCALE: 1"=100' SHEET 5 OF 8

CONT	SECT	JOB	HIGHWAY
0043	08	088	US287
DIST	COUNTY		SHEET NO.
WFC	WICHITA		86

DW: | JV | CK: | AM | DW: | JV | CK: | WA

0 50 100 FT
SCALE: 1" = 100' (H)



STATE OF TEXAS
JULIAN S. VALENCIA
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12/13/2023

Texas Department of Transportation

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SUITE 500
AUSTIN, TEXAS 78758
TBPE REG. NO. F-474

US 287
EXISTING UTILITY LAYOUTS
STA. 955+00 TO END

SCALE: 1"=100' SHEET 6 OF 8

CONT	SECT	JOB	HIGHWAY
0043	08	088	US287
DIST	COUNTY		SHEET NO.
WFC	WICHITA		87

DATE: 12/8/2023 7:50:48 AM
FILE: 06 US287 SUE SHEET 04.dgn

WA | CK | DW | CK | DW

PT 927+20.39

1927+00 1928+00 1929+00 1930+00 1931+00 1932+00

930+00

2927+00 2928+00 2929+00 2930+00 2931+00 2932+00

LIGHT POLE WITH CAMERA
ABAN WL PER RECORDS
ABAN WL PER RECORDS
ABAN WL PER RECORDS
2" PVC ENDS AT VALVE BOX
LIGHT POLE WITH CAMERA
2-2" CONDUIT W/ ELECTRIC AND FIBER
ABAN WL PER RECORDS
2" PVC
E1 ENDS AT SHELTER
2-2" CONDUIT W/ ELECTRIC AND FIBER
E1 ENDS AT SHELTER
2" PVC
6" CI DESIGNATED BY PASSIVE METHOD
2" PVC ENDS AT VALVE BOX
4" PVC CONNECTS TO 6" CI
CONNECTS TO SPRINKERS PER RECORDS
TH# 1 CITY OF IOWA PARK 6" CI SAN. SWR. 1.86' COVER
SAN. SWR. ENTERS BUILDING PER RECORDS
TH# 2 TxDOT 2" PVC WL 1.53' COVER
E1 ENTERS ELECTRICAL PANEL
T1 ENTERS BUILDING
E1 CONNECTS GROUND LIGHT
E1 CONNECTS TO PANEL
T1 CONTINUES TO PEDESTAL
APPROX. R.O.W.
FIBERLIGHT 2-1.25" HDPE 5' FROM R.O.W.

0 25 50 FT
SCALE: 1" = 50' (H)

STATE OF TEXAS
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SUITE 500
AUSTIN, TEXAS 78758
TBPE REG: NO. F-474

US 287
EXISTING UTILITY LAYOUTS
SB REST AREA

SCALE: 1"=50' SHEET 7 OF 8

CONT	SECT	JOB	HIGHWAY
0043	08	088	US287
DIST	COUNTY		SHEET NO.
WFC	WICHITA		88

DATE: 12/8/2023 7:51:01 AM
FILE: 07 US287 SUE SHEET 05.dgn

DN: JV: DW: CK:

E1 CONNECTS TO PANEL

2-3" CONDUIT
W/ ELECTRIC, TELECOM,
AND FIBER

4" PVC SAN SWR LN
CONNECTS TO BUILDING
PER RECORDS

E1 ENTERS
ELECTRICAL PANEL

2" PVC W.L.

E1 CONNECTS
GROUND LIGHT

8' PVC SANITARY SEWER

E1 ENDS AT SHELTER

2" PVC W.L.
ENDS AT VALVE BOX

TH# 5
TxDOT 1" PVC WL
1.55' COVER

TH# 6
TxDOT 2-2" CONDUIT
1.00' COVER

4" PVC

1" PVC

ABAN WL
PER RECORDS

2-2" CONDUIT
W/ ELECTRIC AND FIBER

ABAN 6" SAN SWR
PER RECORDS

2" PVC W.L.

6" PVC SAN SWR LN

LIGTH POLE
WITH CAMERA

1" & 3/4" W.L.
ABANDONED IN PLACE

WL ENDS PER RECORDS
AT METER BOX
NOT FIELD VERIFY

LIGTH POLE
WITH CAMERA

RV DUMP STATION
TOP OF BOX= 1007.06
(SE) 4" CI FL= 1005.96

WATER PUMP

SANITARY SEWER MH
TOP OF RIM= 1011.88
(NW) 4" CI FL= 1005.31
(NE) 6" CI FL= 1005.38
(S) 8" CI FL=1005.16

2" W.L. CONNECTS TO METER
PER RECORDS

8" CI

948+00
1949+00
1950+00
1951+00
1952+00
1953+00
1954+00
950+00

2" PVC W.L.
ENDS AT VALVE BOX

E1 ENDS AT SHELTER

2-2" CONDUIT
W/ ELECTRIC AND FIBER

LIGTH POLE
WITH CAMERA

0 25 50 FT
SCALE: 1" = 50' (H)

STATE OF TEXAS
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SUITE 500
AUSTIN, TEXAS 78758
TBPE REG. NO. F-474

US 287
EXISTING UTILITY LAYOUTS
NB REST AREA

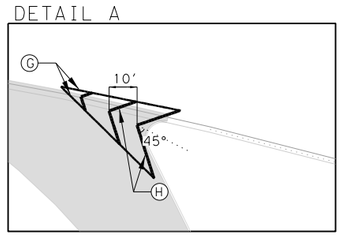
SCALE: 1"=50' SHEET 8 OF 8

CONT	SECT	JOB	HIGHWAY
0043	08	088	US287
DIST	COUNTY		SHEET NO.
WFC	WICHITA		89

DATE: 12/8/2023 7:51:13 AM
FILE: 08 US287 SUE SHEET 06.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 3:08:15 PM



SCALE = 1"=100' H

LEGEND

- (A) 4" SOLID WHITE
- (B) 6" SOLID WHITE
- (C) 6" SOLID YELLOW
- (D) 6" DOT WHITE (3' LONG & 12' C-C)
- (F) 6" DOT WHITE (2' LONG & 8' C-C)
- (G) 8" SOLID WHITE
- (H) 12" SOLID WHITE
- (I) 6" BROKEN WHITE
- (J) REFL PAV MRK TY II-C-R
- (K) REF PAV MRK TY I(W)36" (YLD TRI)
- (E) EXISTING SIGN TO REMAIN
- (R) SIGN TO BE REMOVED
- (#) PROPOSED SIGN
- EXISTING SIGN
- PROPOSED SIGN
- TRAFFIC DIRECTION
- INST DEL ASSM (D-DW)SZ 1(WFLX)GND INSTALL @ 100 FT C-C

NOTES:

1. ALL ACCESSIBLE PARKING SPACE PAVEMENT MARKINGS TO REMAIN.
2. ALL EXISTING DELINEATORS FOR NORTHBOUND ACCELERATION RAMP TO BE REMOVED.
3. *SURFACE PREP REQUIRED TO BE PAID BY ITEM 678.

STATE OF TEXAS
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134840
LICENSED
PROFESSIONAL ENGINEER
12/11/2023
Lacey L Hebert, PE

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AUSTIN, TEXAS 78758
PH (512) 327-6840
TBPE REG: NO. F-474

US 287 REST AREAS

SIGNING AND PAVEMENT MARKING PLAN

SCALE: 1"=100' SHEET 1 OF 3

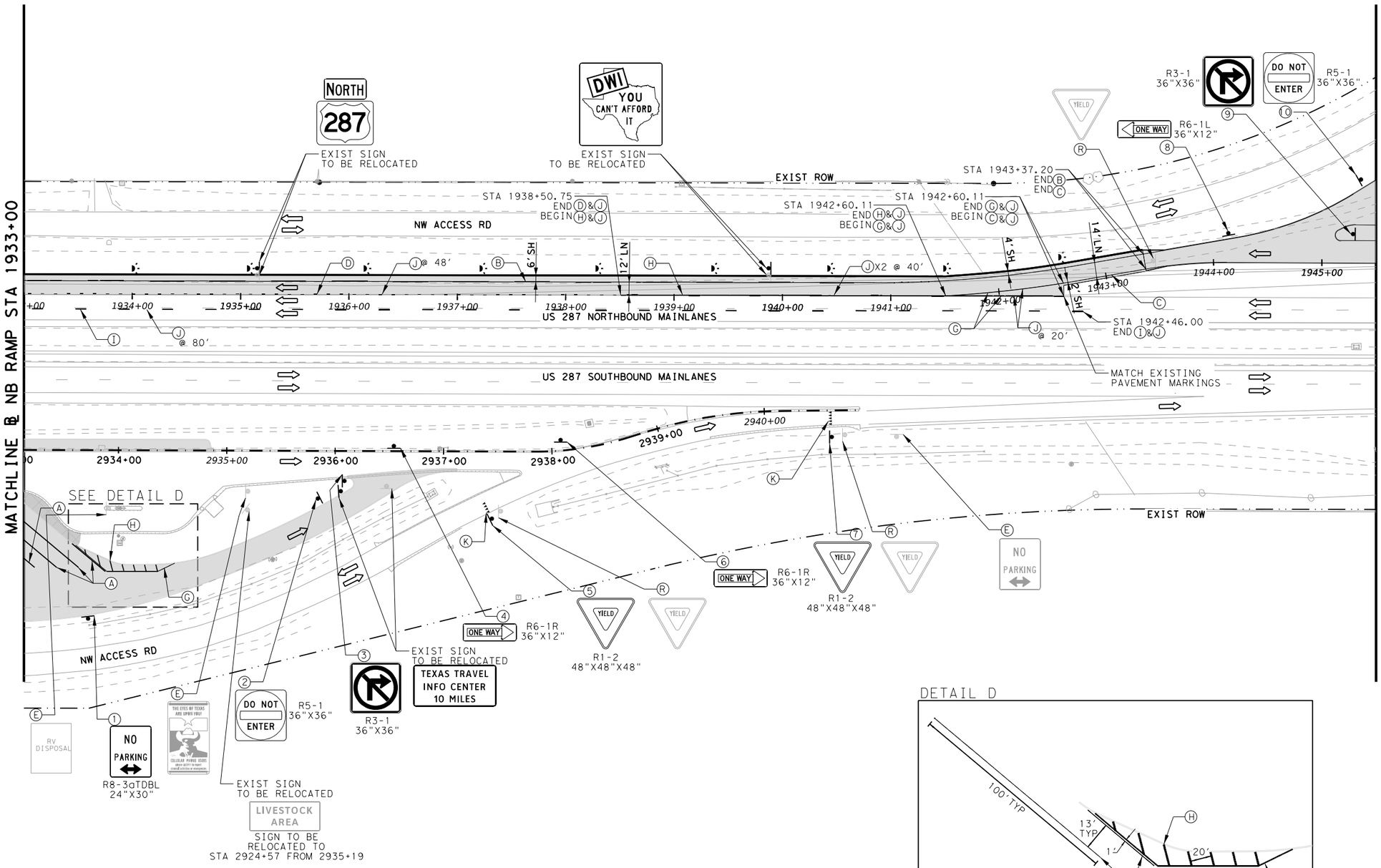
DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2024(778)TP		US287
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	WFS	WICHITA	
CHECK	CONTROL	SECTION	JOB	90
	0043	08	088	

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_SPM Sheet 1.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 3:08:35 PM

SCALE = 1"=100' H



LEGEND

- (A) 4" SOLID WHITE
- (B) 6" SOLID WHITE
- (C) 6" SOLID YELLOW
- (D) 6" DOT WHITE (3' LONG & 12' C-C)
- (F) 6" DOT WHITE (2' LONG & 8' C-C)
- (G) 8" SOLID WHITE
- (H) 12" SOLID WHITE
- (I) 6" BROKEN WHITE
- (J) REFL PAV MRK TY II-C-R
- (K) REF PAV MRK TY I(W)36" (YLD TRI)
- (E) EXISTING SIGN TO REMAIN
- (R) SIGN TO BE REMOVED
- (#) PROPOSED SIGN
- EXISTING SIGN
- PROPOSED SIGN
- TRAFFIC DIRECTION
- INST DEL ASSM (D-DW)SZ 1(WFLX)GND INSTALL @ 100 FT C-C

NOTES:

1. ALL ACCESSIBLE PARKING SPACE PAVEMENT MARKINGS TO REMAIN.
2. ALL EXISTING DELINEATORS FOR NORTHBOUND ACCELERATION RAMP TO BE REMOVED.
3. *SURFACE PREP REQUIRED TO BE PAID BY ITEM 678.

DETAIL D

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Texas Department of Transportation

US 287 REST AREAS

SIGNING AND PAVEMENT MARKING PLAN

SHEET 2 OF 3

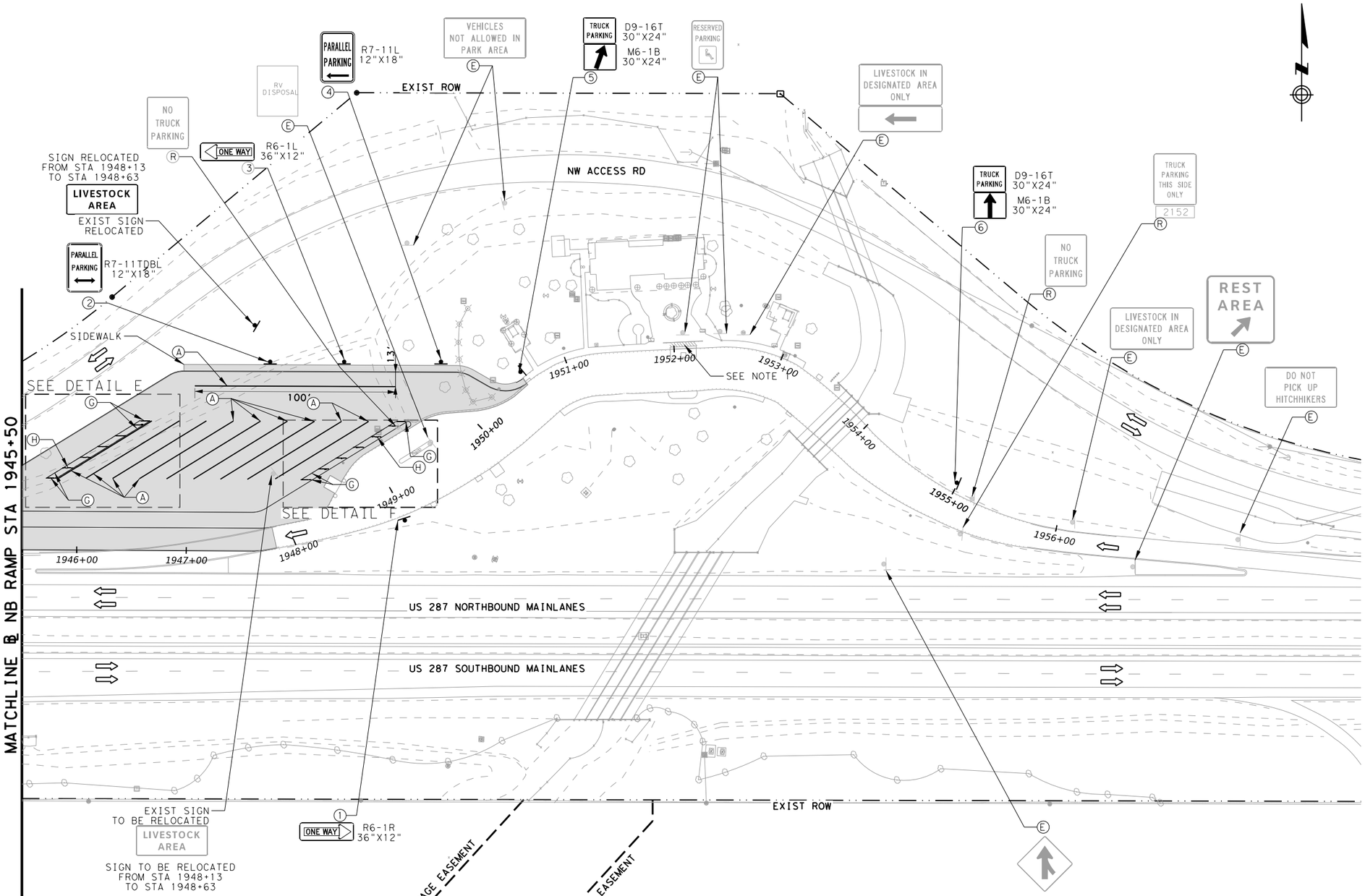
DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2024(778)TP		US287
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	WFS	WICHITA	91
CHECK	CONTROL	SECTION	JOB	
	0043	08	088	

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287__pentable.tbl
FILE: US 287 SPM Sheet 2.dgn

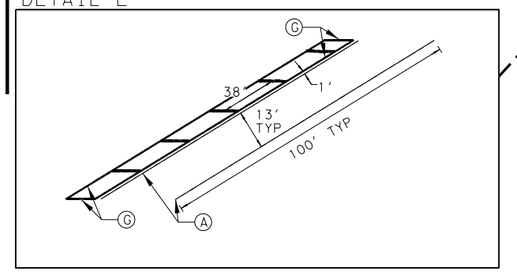
100% SUBMITTAL

DATE: 12/11/2023 TIME: 3:08:57 PM

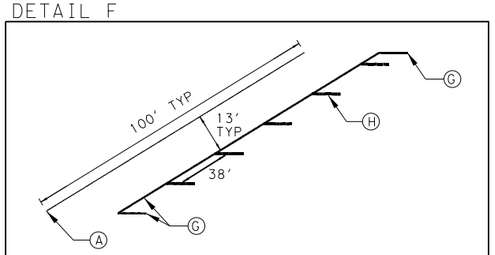
SCALE = 1"=100' H



DETAIL E



DETAIL F



LEGEND

- (A) 4" SOLID WHITE
- (B) 6" SOLID WHITE
- (C) 6" SOLID YELLOW
- (D) 6" DOT WHITE (3' LONG & 12' C-C)
- (F) 6" DOT WHITE (2' LONG & 8' C-C)
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- (J) REFL PAV MRK TY II-C-R
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- (E) EXISTING SIGN TO REMAIN
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- (#) PROPOSED SIGN
- EXISTING SIGN
- PROPOSED SIGN
- TRAFFIC DIRECTION
- INST DEL ASSM (D-DW)SZ 1(WFLX)GND INSTALL @ 100 FT C-C

NOTES:

1. ALL ACCESSIBLE PARKING SPACE PAVEMENT MARKINGS TO REMAIN.
2. ALL EXISTING DELINEATORS FOR NORTHBOUND ACCELERATION RAMP TO BE REMOVED.
3. *SURFACE PREP REQUIRED TO BE PAID BY ITEM 678.

STATE OF TEXAS
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TBPE REG. NO. F-474

US 287 REST AREAS

SIGNING AND PAVEMENT MARKING PLAN

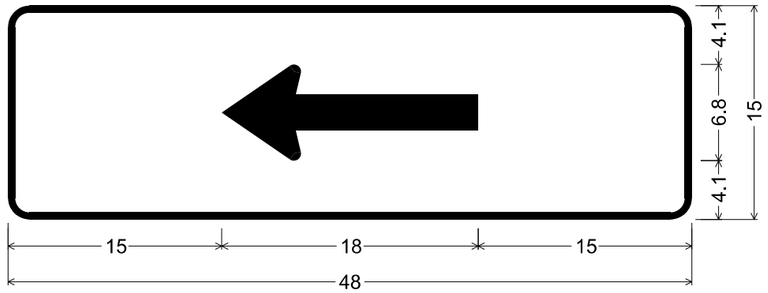
SHEET 3 OF 3

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2024(778)TP		US287
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	WFS	WICHITA	
CHECK	CONTROL	SECTION	JOB	92
	0043	08	088	

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_SPM Sheet 3.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 3:09:18 PM



SHEET 1
SIGN NO. 14

1.5" Radius, 0.5" Border, White on Blue;
Standard Arrow Custom 18.0" X 6.8" 180°;

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Texas Department of Transportation

US 287 REST AREAS

SIGN DETAILS

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2024(778)TP		US287
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	WFS	WICHITA	
CHECK	CONTROL	SECTION	JOB	93
	0043	08	088	

PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_SIGN DETAILS.dgn

100% SUBMITTAL

DATE: 12/11/2023 TIME: 3:36:40 PM

SUMMARY OF SMALL SIGNS

SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
1	1	D9-16T	TRUCK PARKING	30X24	X		TWT	1	WS	P		
		M6-7R	PLAQUE - DIRECTIONAL ARROW	30X24	X							
	2	R5-1a	WRONG WAY	42X30	X		TWT	1	WS	T		
	3	R5-1a	WRONG WAY	42X30	X		TWT	1	WS	T		
	4	R5-1a	WRONG WAY	42X30	X		TWT	1	WS	T		
	5	R5-1a	WRONG WAY	42X30	X		TWT	1	WS	T		
	6	R8-3aTDBL	NO PARKING (ARROW)	24X30	X		TWT	1	WS	P		
	7	R8-3a	NO PARKING	18X24	X		TWT	1	WS	P		
	8	R5-1	DO NOT ENTER	36X36	X		TWT	1	WS	P		
	9	R8-3a	NO PARKING	18X24	X		TWT	1	WS	P		
	10	R3-1	MOVEMENT PROHIBITION (RIGHT)	36X36	X		TWT	1	WS	P		
	11	R6-1L	ONE WAY	36X12	X		TWT	1	WS	T		
	12	R6-1R	ONE WAY	36X12	X		TWT	1	WS	T		
	13	R8-3a	NO PARKING	18X24	X		TWT	1	WS	P		
	14	SPECIAL	PLAQUE - DIRECTIONAL ARROW	48X15	X		MOUNT TO EXISTING POST					
	15	D9-16T	TRUCK PARKING	30X24	X		TWT	1	WS	P		
		M6-1B	PLAQUE - DIRECTIONAL ARROW	30X24	X							
	16	R6-1R	ONE WAY	36X12	X		TWT	1	WS	T		
	17	R8-3aTDBL	NO PARKING (ARROW)	24X30	X		TWT	1	WS	P		
	18	R6-1L	ONE WAY	36X12	X		TWT	1	WS	T		
2	1	R8-3aTDBL	NO PARKING (ARROW)	24X30	X		TWT	1	WS	P		
	2	R5-1	DO NOT ENTER	36X36	X		TWT	1	WS	P		
	3	R3-1	MOVEMENT PROHIBITION (RIGHT)	36X36	X		TWT	1	WS	P		
	4	R6-1R	ONE WAY	36X12	X		TWT	1	WS	T		
	5	R1-2	YIELD	48X48X48	X		10BWG	1	SA	T		
	6	R6-1R	ONE WAY	36X12	X		TWT	1	WS	T		
	7	R1-2	YIELD	48X48X48	X		10BWG	1	SA	T		
	8	R6-1L	ONE WAY	36X12	X		TWT	1	WS	T		
	9	R3-1	MOVEMENT PROHIBITION (RIGHT)	36X36	X		TWT	1	WS	P		
	10	R5-1	DO NOT ENTER	36X36	X		TWT	1	WS	P		
3	1	R6-1R	ONE WAY	36X12	X		TWT	1	WS	T		
	2	R7-11TDBL	PARALLEL PARKING	12X18	X		TWT	1	WS	P		
	3	R6-1L	ONE WAY	36X12	X		TWT	1	WS	T		
	4	R7-11L	PARALLEL PARKING	12X18	X		TWT	1	WS	P		
	5	D9-16T	TRUCK PARKING	30X24	X		TWT	1	WS	P		
		M6-1B	PLAQUE - DIRECTIONAL ARROW	30X24	X							
	6	D9-16T	TRUCK PARKING	30X24	X		TWT	1	WS	P		
		M6-1B	PLAQUE - DIRECTIONAL ARROW	30X24	X							

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

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 Texas Department of Transportation

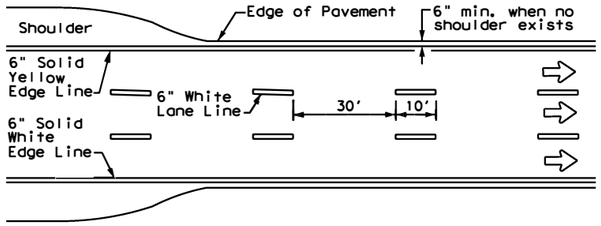
US 287 REST AREAS

SUMMARY OF SMALL SIGNS

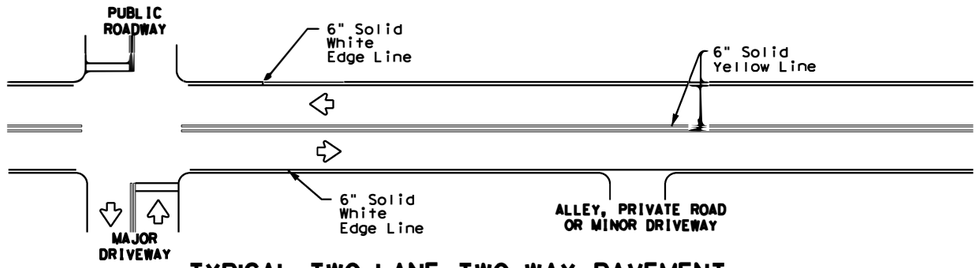
SCALE: 1"=100' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2024(778)TP		US287
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	WFS	WICHITA	94
CHECK	CONTROL	SECTION	JOB	
	0043	08	088	

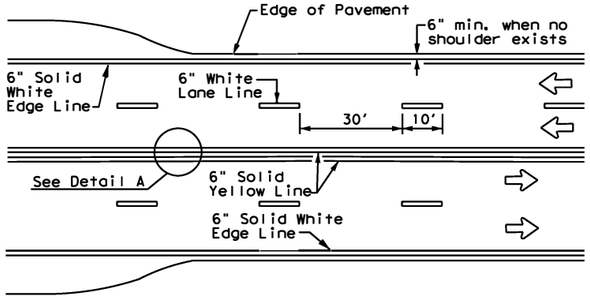
PLOT DRIVER: pdf-c.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_SOSS.dgn

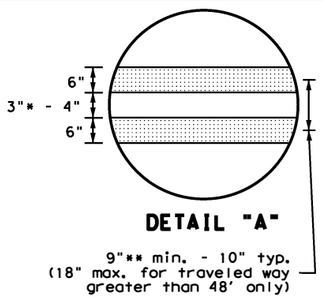


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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

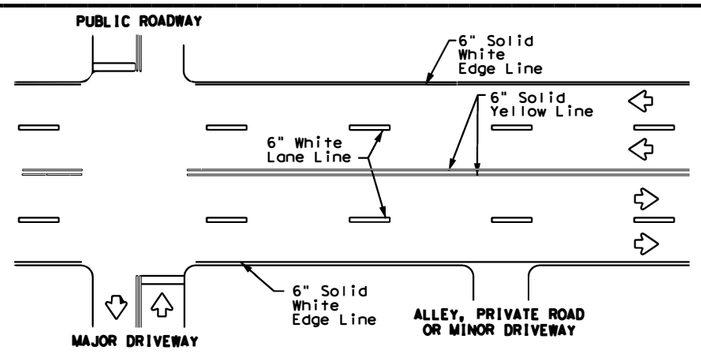




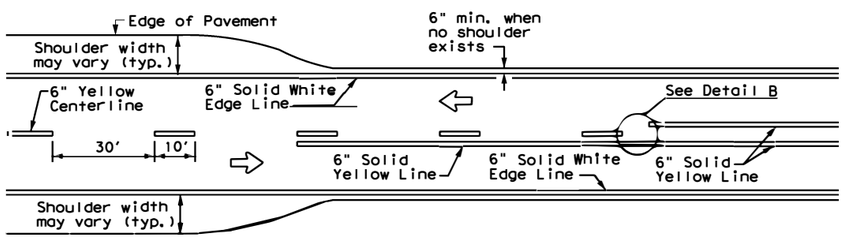
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

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

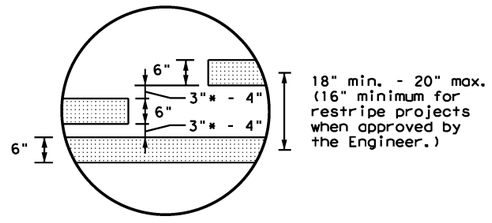
** 8" minimum for restripe projects when approved by the Engineer.



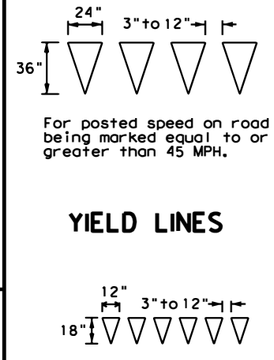
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

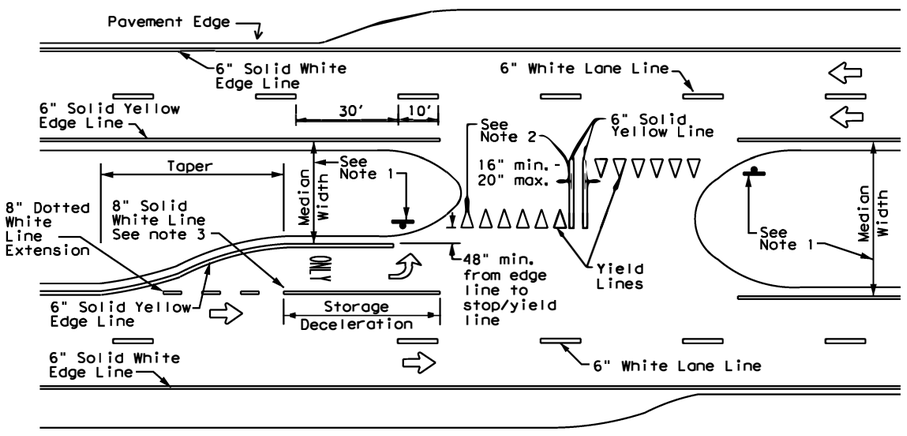


TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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





FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

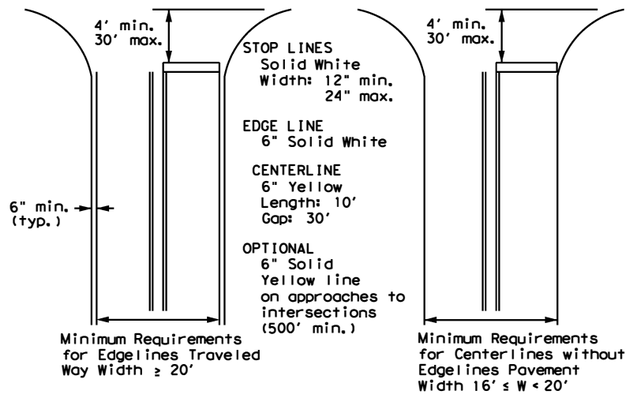
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

GENERAL NOTES

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

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

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



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

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

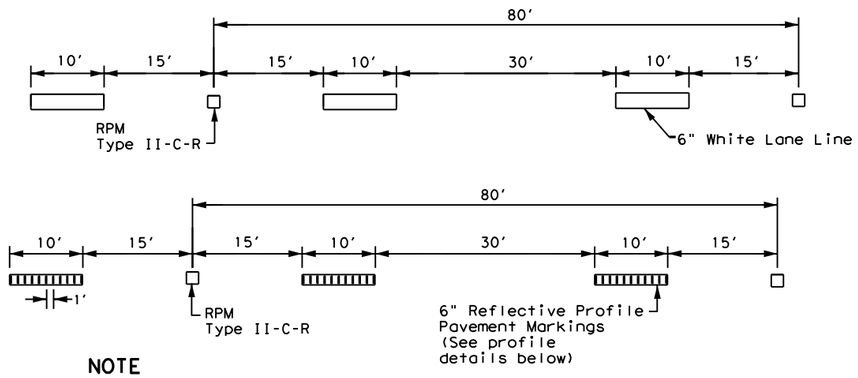
PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20 8-95 3-03 12-22 5-00 2-12	0043	08	088	US287
	DIST	COUNTY		SHEET NO.
	6	WICHITA		95

22A

DATE:
FILE:

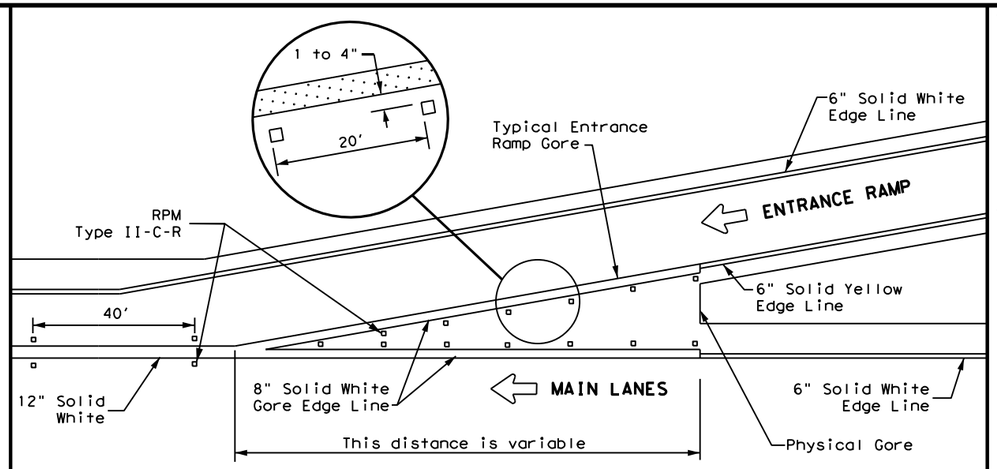
DATE:
FILE:



NOTE

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

TRAFFIC LANE LINES PAVEMENT MARKING



TYPICAL ENTRANCE RAMP GORE MARKING

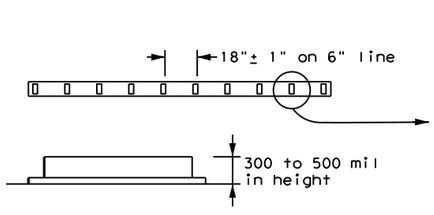
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

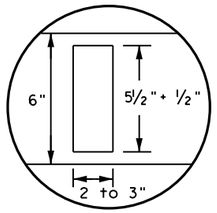
LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R

GENERAL NOTE

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



Reflective Profile Pavement Markings

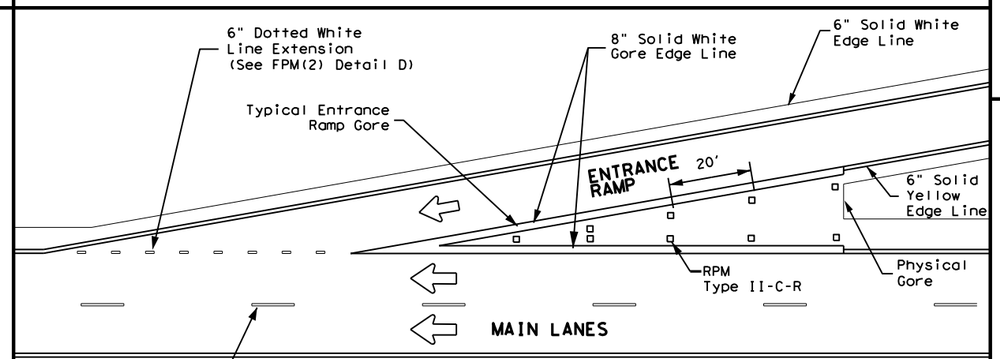


Standard 6" Profile Detail

NOTE

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

EDGE LINE PAVEMENT MARKINGS



NOTE

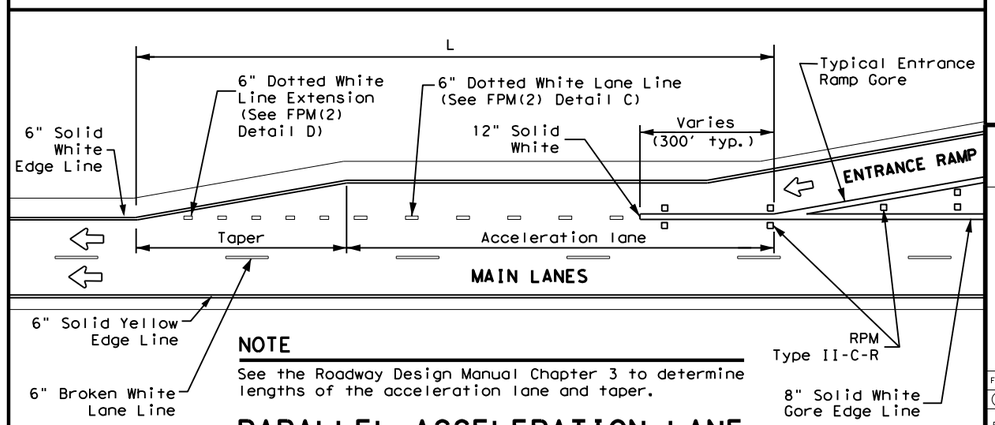
See the Roadway Design Manual Chapter 3 to determine if a tapered acceleration lane may be used.

TAPERED ACCELERATION LANE

NOTES

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

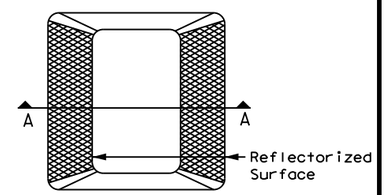
WRONG WAY ARROW



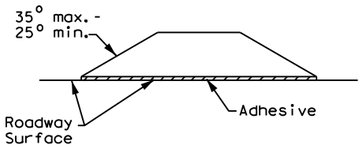
NOTE

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

PARALLEL ACCELERATION LANE



Type II (Top View)



SECTION A

REFLECTORIZED RAISED PAVEMENT MARKER (RPM)

Texas Department of Transportation

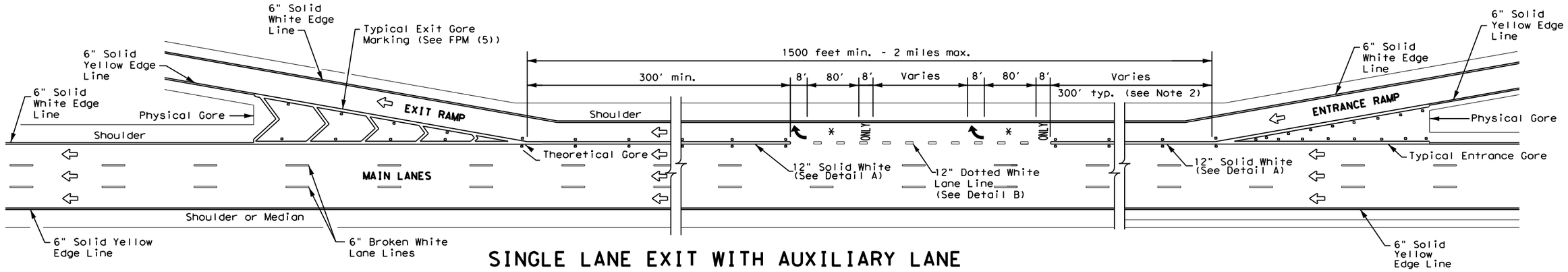
Traffic Safety Division Standard

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS WITH RAISED PAVEMENT MARKERS

FPM(1)-22

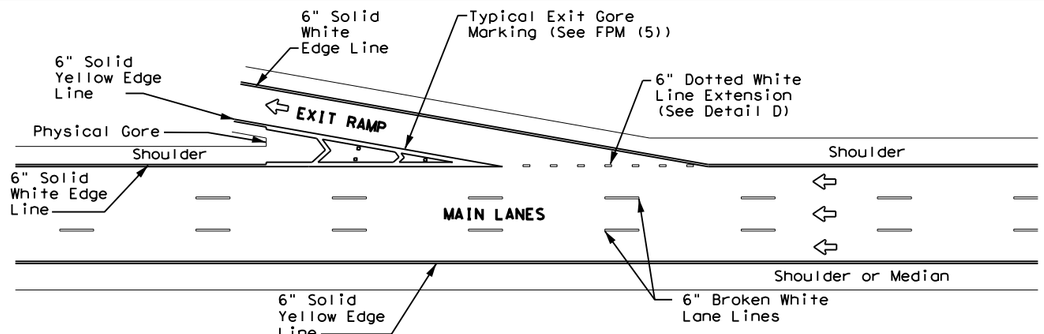
FILE: fpm(1)-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	08	088	US287
5-74 8-00 2-12	DIST	COUNTY		SHEET NO.
4-92 2-08 10-22	6	WICHITA		96
5-00 2-10				

23A



SINGLE LANE EXIT WITH AUXILIARY LANE

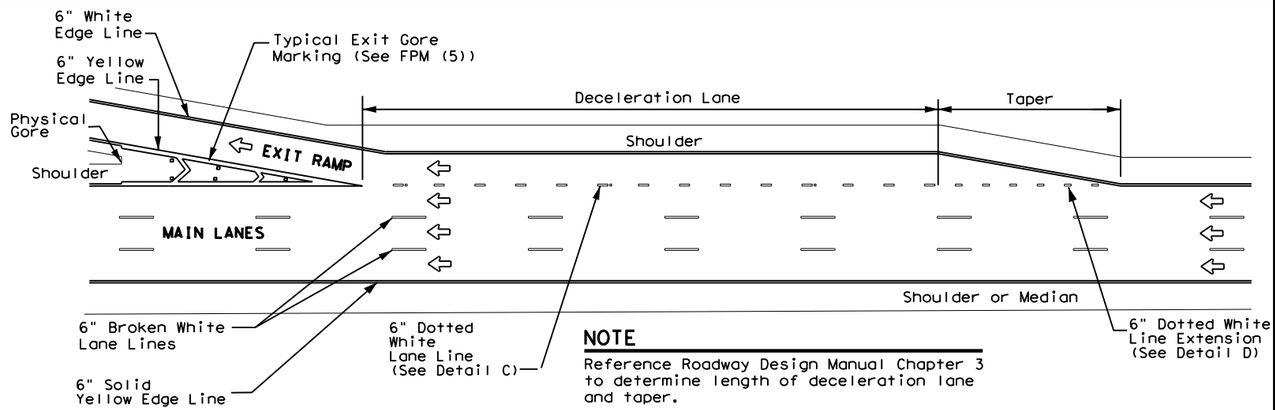
(See Note 2)



NOTE

Reference Roadway Design Manual Chapter 3 to determine if tapered deceleration lane may be used.

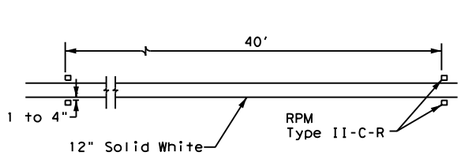
TAPERED DECELERATION LANE



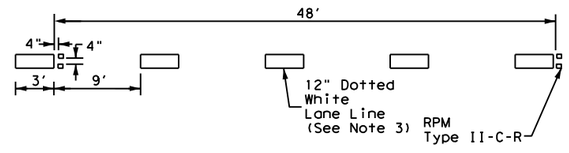
NOTE

Reference Roadway Design Manual Chapter 3 to determine length of deceleration lane and taper.

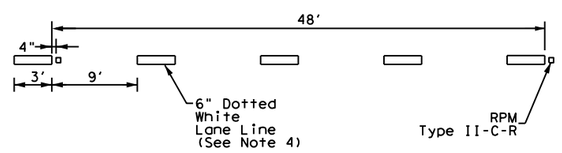
PARALLEL DECELERATION LANE



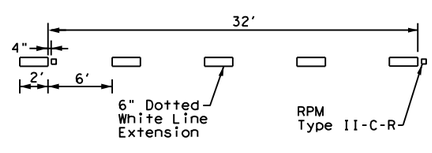
DETAIL A



DETAIL B



DETAIL C



DETAIL D

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 that continues beyond the interchange from an adjacent mandatory exit lane.
4. Normal (6") dotted lane line (see Detail C) is used at parallel acceleration and deceleration lanes.
5. See FPM(1) for traffic lane line pavement marking details.

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

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 Safety Division Standard

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS ENTRANCE AND EXIT RAMPS

FPM(2)-22

FILE: fpm(2)-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	08	088	US287
2-77 5-00 2-12	DIST	COUNTY		SHEET NO.
4-92 8-00 10-22	6	WICHITA		97
8-95 2-10				

23B

DATE:
FILE:

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

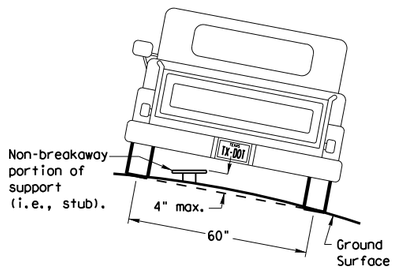
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-1) to (SLIP-3))

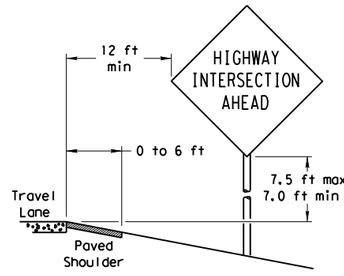
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

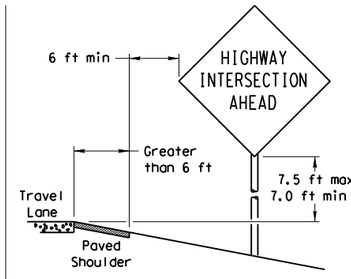
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

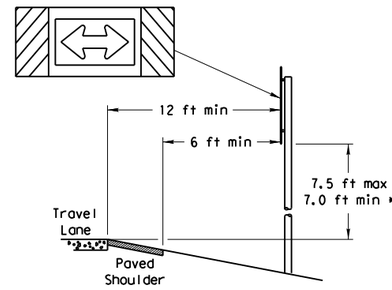
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



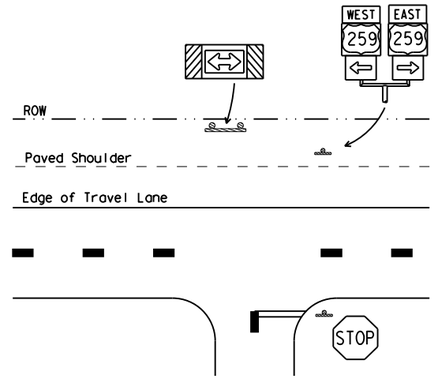
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

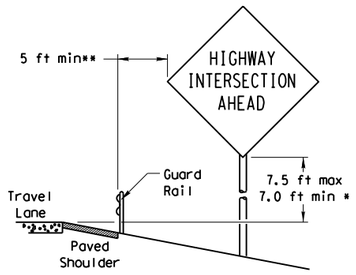
T-INTERSECTION



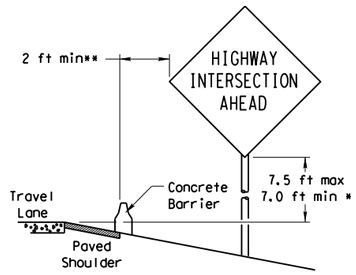
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

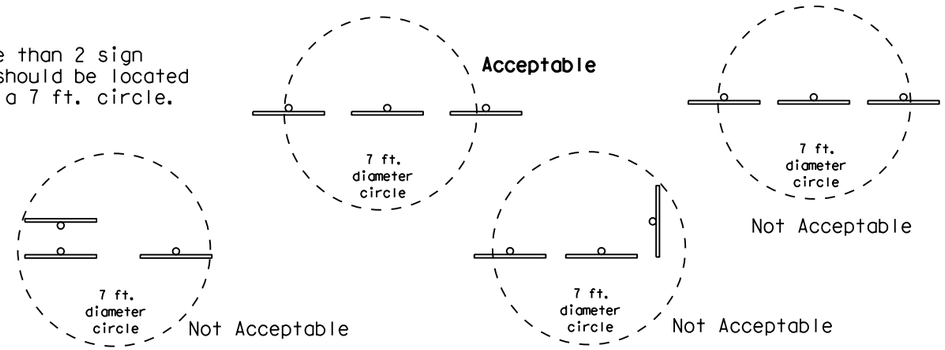
(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

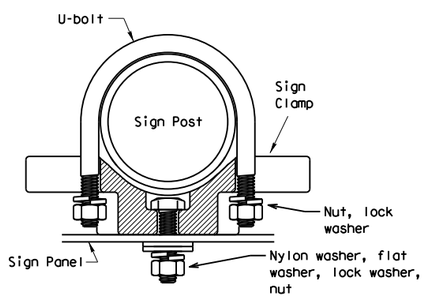
The website address is:
http://www.txdot.gov/publications/traffic.htm

No more than 2 sign posts should be located within a 7 ft. circle.



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

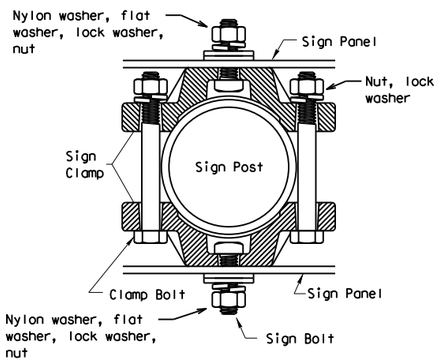


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

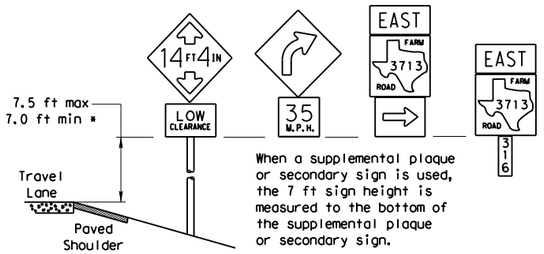
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



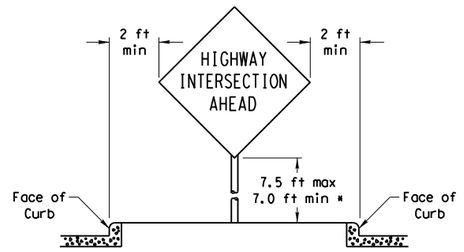
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



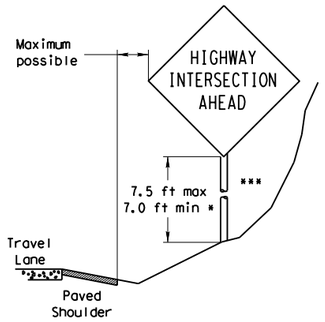
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

Texas Department of Transportation
Traffic Operations Division

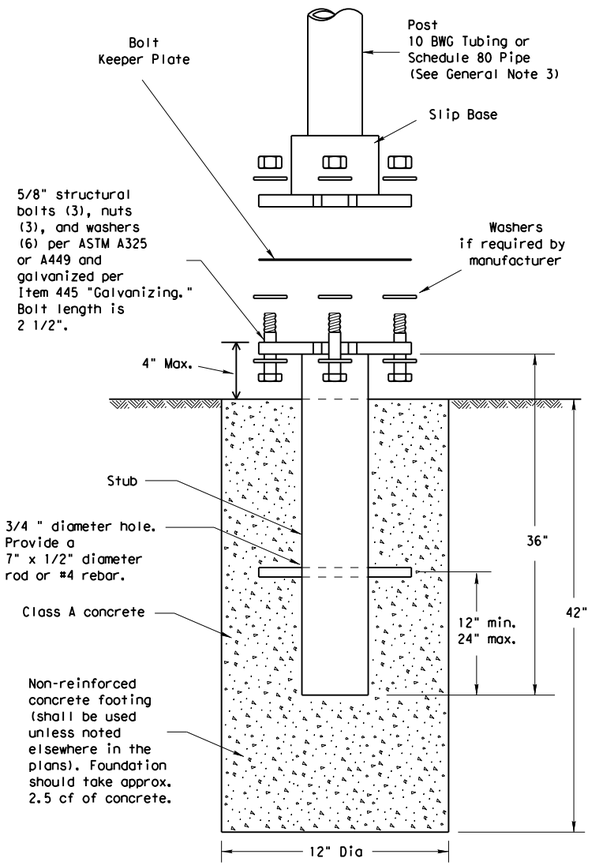
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0043	08	088	US287
	DIST	COUNTY		SHEET NO.
	6	WICHITA		98

DATE: 12/7/2023 2:12:32 PM
FILE: ...\SPM\STANDARDS\smdgen08.dgn

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

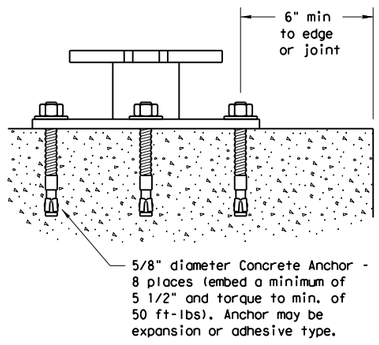
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



SM RD SGN ASSM TY XXXXX(X)SB(X-XXXX)

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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

REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	0043	08	088	US287
	DIST	COUNTY		SHEET NO.
	6	WICHITA		99

DATE: 12/7/2023 2:12:51 PM
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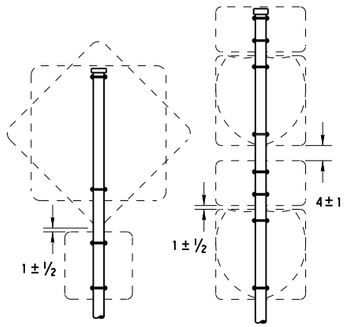
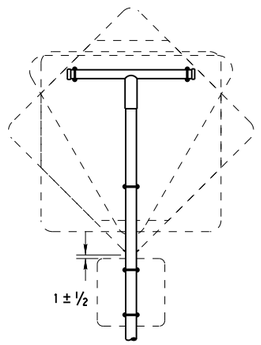
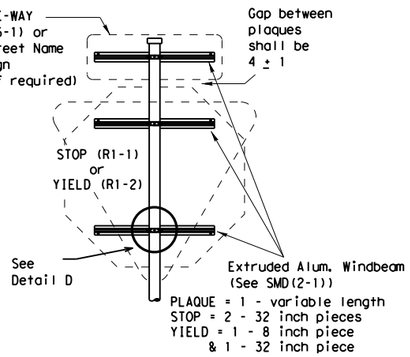


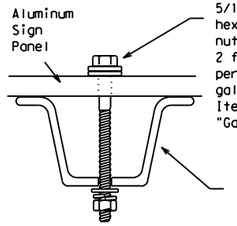
SM RD SGN ASSM TY XXXXX(1)XX(P)



SM RD SGN ASSM TY XXXXX(1)XX(T)

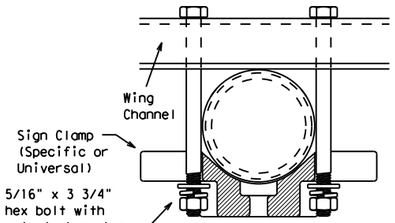


SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



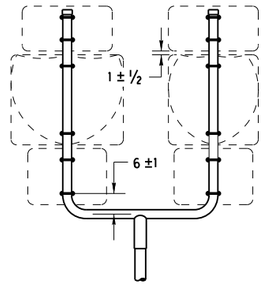
Top View

Detail A

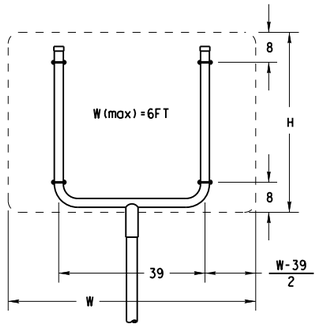


Top View

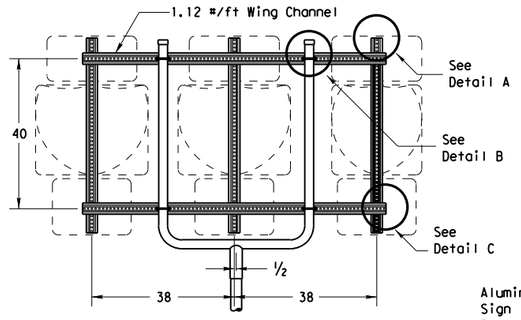
Detail B



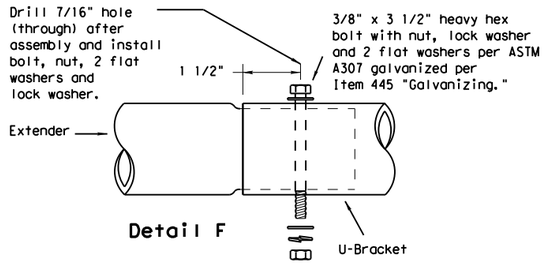
SM RD SGN ASSM TY XXXXX(1)XX(U)



SM RD SGN ASSM TY XXXXX(1)XX(U)

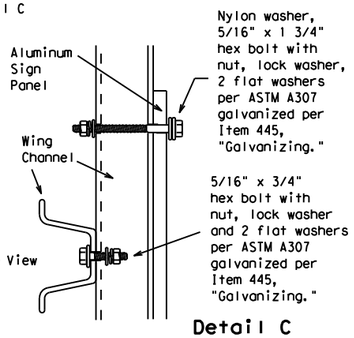


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

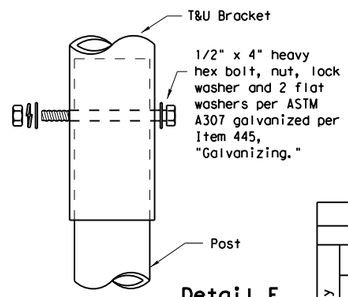


Detail F

Splices shall only be allowed behind the sign substrate.



Detail C



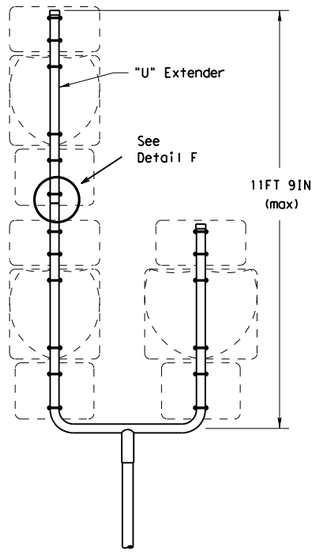
Detail E

GENERAL NOTES:

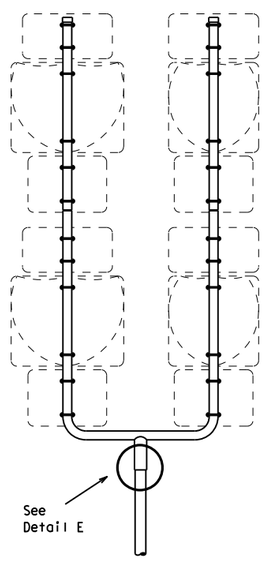
1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

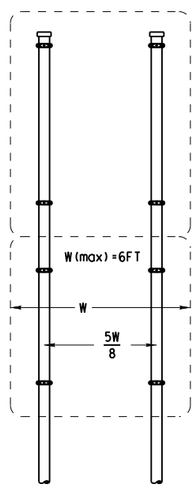
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.



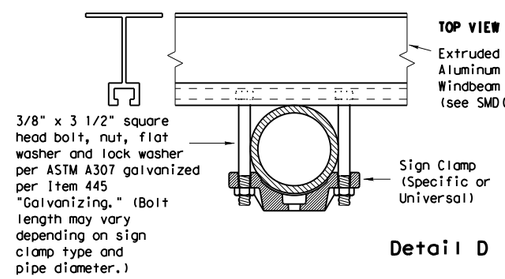
SM RD SGN ASSM TY S80(1)XX(U-1EXT)



SM RD SGN ASSM TY S80(1)XX(U-2EXT)

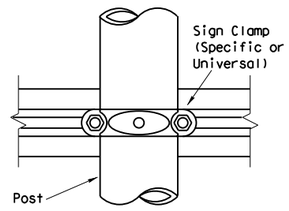


SM RD SGN ASSYM TY XXXXX(2)XX(P)

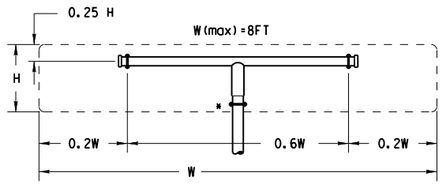


SIDE VIEW

Detail D



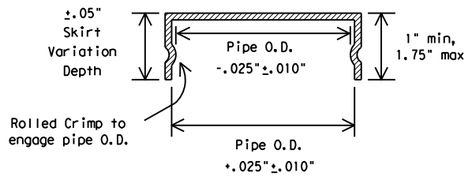
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)



All dimensions are in english unless detailed otherwise.

SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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

REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	0043	08	088	US287

DIST	COUNTY	SHEET NO.
6	WICHITA	100

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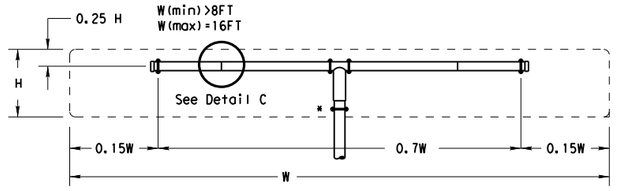
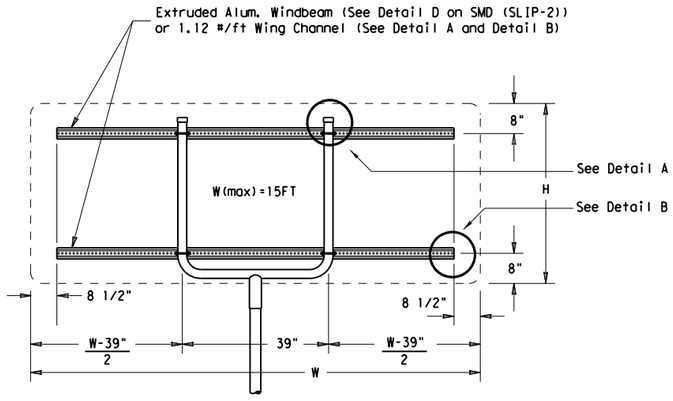
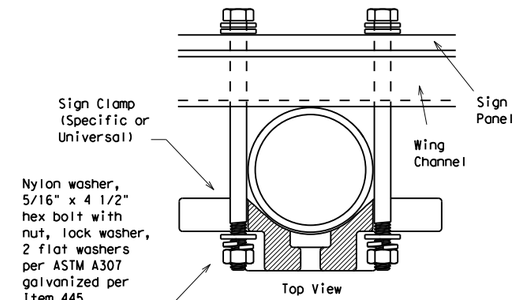


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)

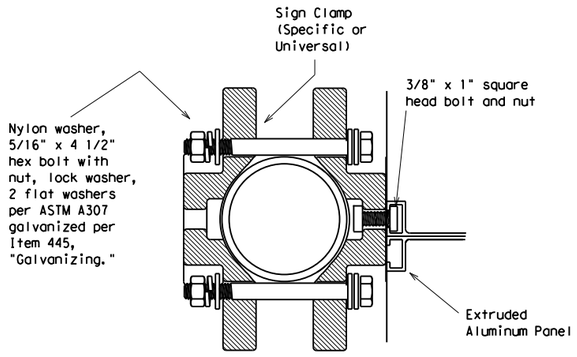


SM RD SGN ASSM TY XXXXX(1)XX(U-XX)

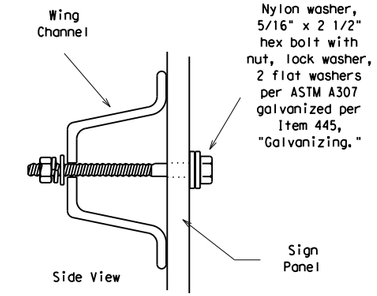


Top View

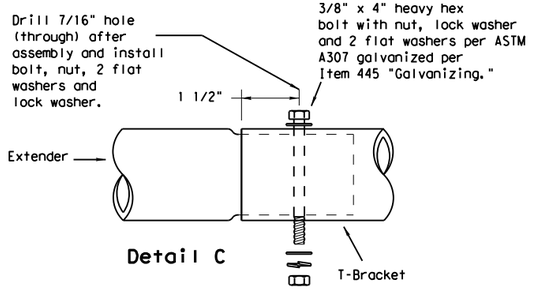
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

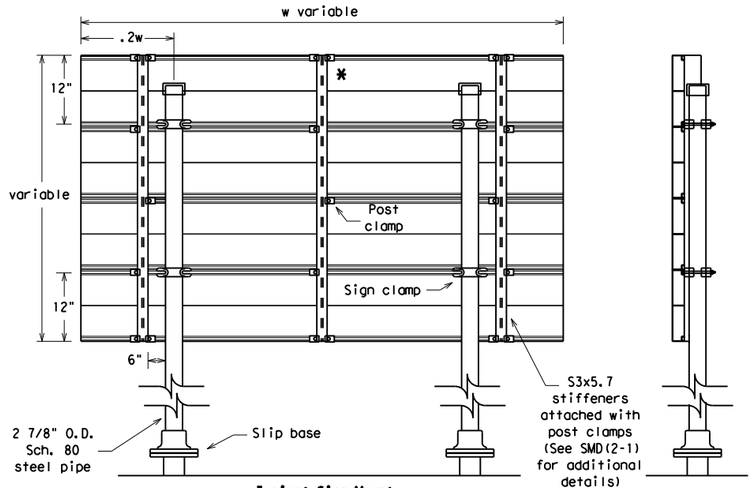


Detail B



Detail C

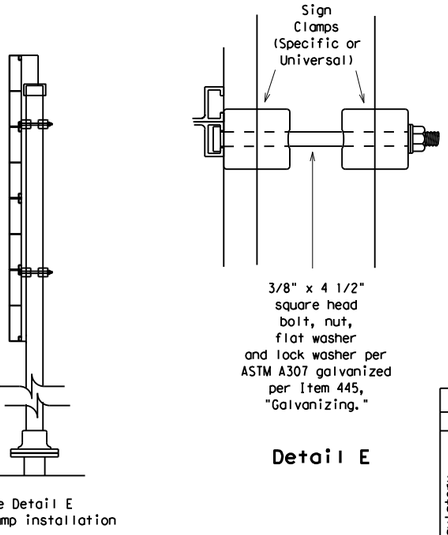
Splices shall only be allowed behind the sign substrate.



Typical Sign Mount

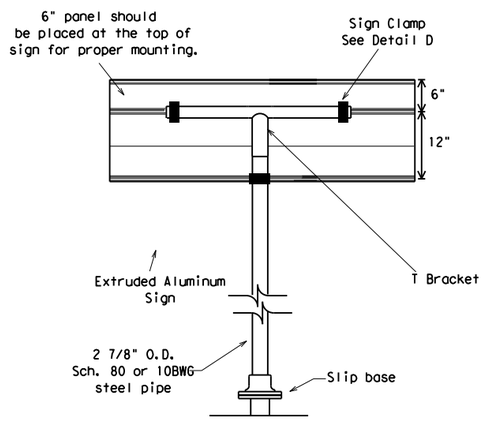
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

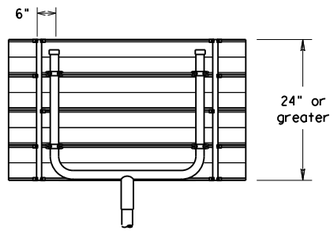


Detail E

See Detail E
for clamp installation



Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

1. See table above.
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Sign blanks shall be the sizes and shapes shown on the plans.
11. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

REVISIONS
9-08

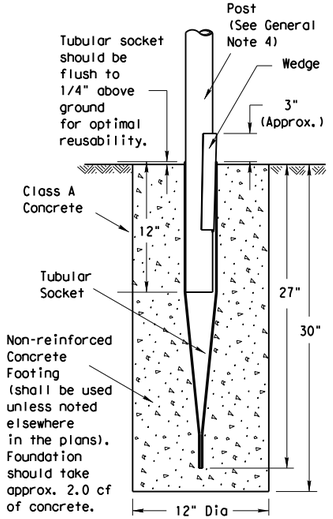
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0043	08	088	US287

DIST	COUNTY	SHEET NO.
6	WICHITA	101

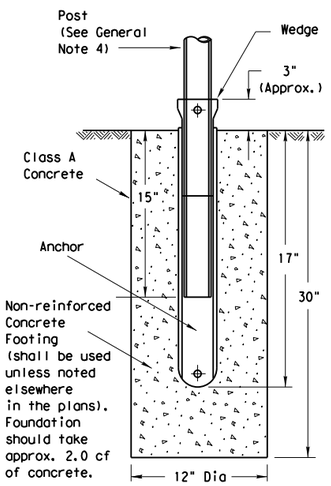
DATE: 12/7/2023 2:13:34 PM
FILE: ...\SPM\STANDARDS\smds3.dgn

Wedge Anchor Steel System



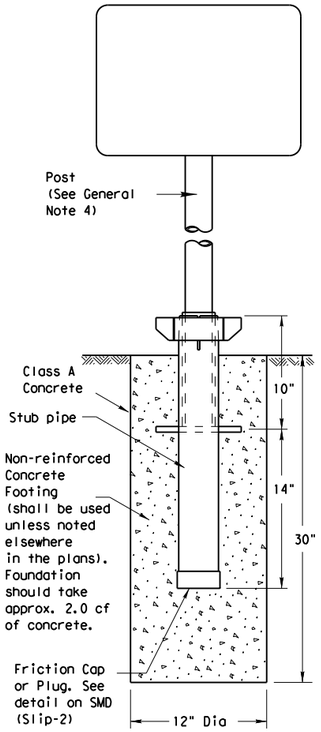
SM RD SGN ASSM TY TWT(X)WS(X)

Wedge Anchor High Density Polyethylene (HDPE) System

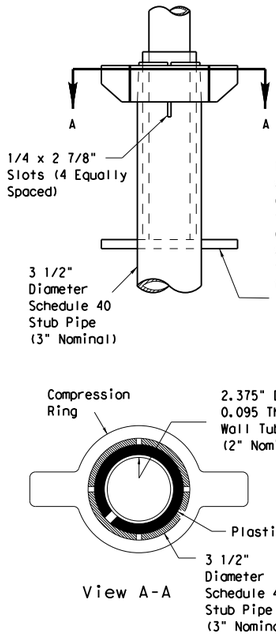


SMD RD SGN ASSM TY TWT(X)WP(X)

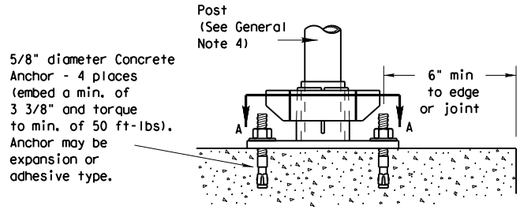
Universal Anchor System with Thin-Walled Tubing Post



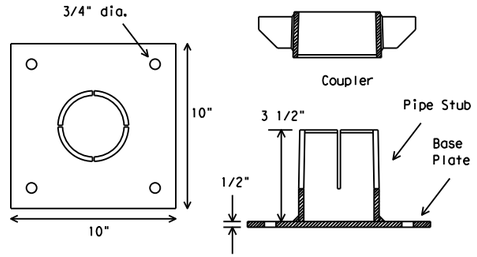
SM RD SGN ASSM TY TWT(X)UA(P)



Plastic insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The insert should be approx. 10" long and cover the tubing from just above the top of the stub pipe to the bottom of the sign post when using the Universal Anchor System. The insert should be cut to approx. 4 1/2" when used with the Bolt Down Universal Anchor System.

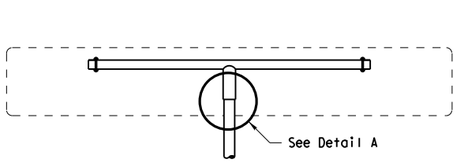


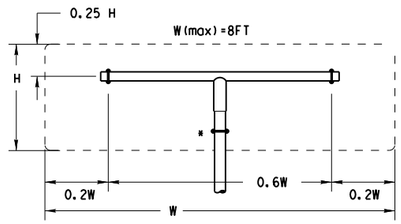
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.



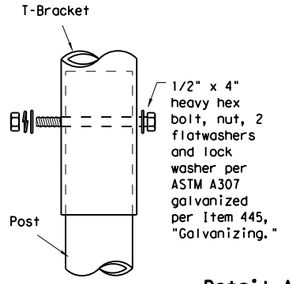
SM RD SGN ASSM TY TWT(X)UB(P)

Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post





SM RD SGN ASSM TY TWT(X)XX(T)
(* - See General Note 6)



Detail A

9/16" hole may need to be drilled through post to accommodate bolt.

NOTE

The devices shall be installed per manufacturer's recommendations.
Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
2. The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
3. Except for posts (13 BWG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is: http://www.txdot.gov/business/producer list.htm
4. Material used as post with this system shall conform to the following specifications:
   13 BWG Tubing (2.375" outside diameter) (TWT)
   0.095" nominal wall thickness
   Seamless or electric-resistance welded steel tubing
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   18% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of .083" to .099"
   Outside diameter (uncoated) shall be within the range of 2.369" to 2.381"
   Galvanization per ASTM 123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
5. Sign blanks shall be the sizes and shapes shown on the plans.
6. Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
7. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
8. See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: http://www.txdot.gov/publications/traffic.htm

WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
3. Insert tubular socket into concrete until top of socket is approximaely 1/4 " above the concrete footing.
4. Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer..
5. Attach the sign to the sign post.
6. Insert the sign post into socket and align sign face with roadway.
7. Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. Insert base post in hole to depths shown and backfill hole with concrete.
3. Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
4. Attach the sign to the sign post.
5. Install plastic insert around bottom of post.
6. Insert sign post into base post. Lower until the post comes to rest on steel rod.
7. Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
8. Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST

SMD(TWT)-08

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

9-08 REVISIONS

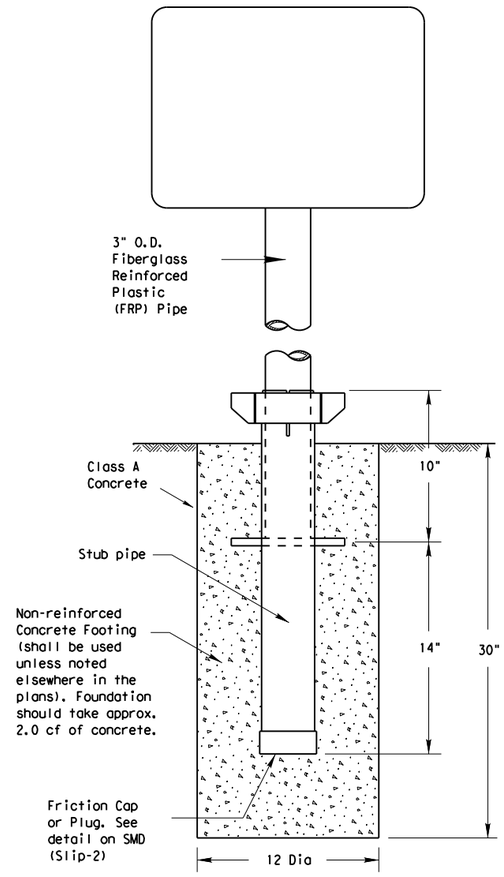
CONT	SECT	JOB	HIGHWAY
0043	08	088	US287

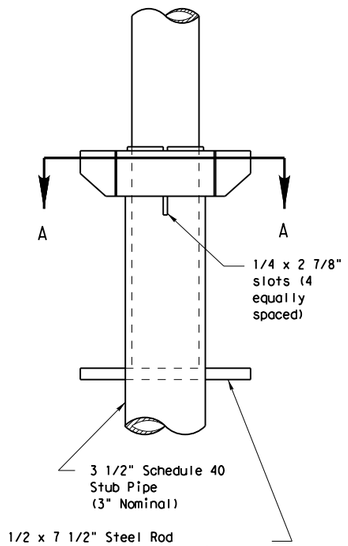
DIST	COUNTY	SHEET NO.
6	WICHITA	102

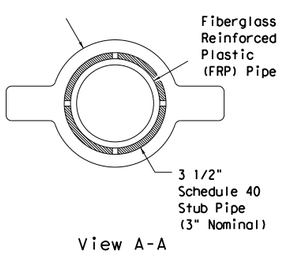
26E

DATE:
FILE:

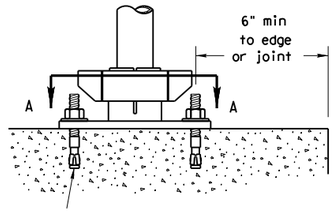
Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post





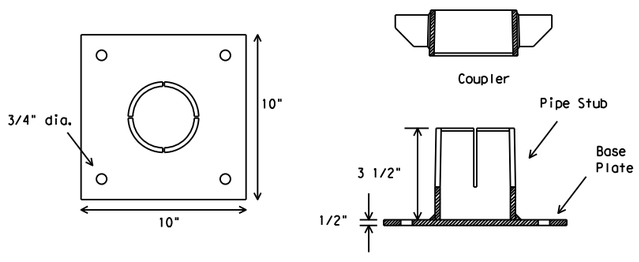


SM RD SGN ASSM TY FRP(X)UA(P)



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.

BOLT-DOWN DETAILS



SM RD SGN ASSM TY FRP(X)UB(P)

GENERAL NOTES:

1. FRP sign supports for a single type sign support may be used for signs up to and including 16 square feet. Dual post installation may be used for signs up to and including 32 square feet.
2. All nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing."
3. See the Traffic Operations Division website for detailed drawings of sign clamps. The website address is: http://www.txdot.gov/publications/traffic.htm

FRP POST REQUIREMENTS

1. Materials shall conform to the requirements of Departmental Material Specification DMS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
2. Thickness of FRP sign support is 0.125" + 0.031", - 0.0".
3. FRP sign supports are prequalified by the Traffic Operations Division. Prequalification procedures are obtained by writing:
   Texas Department of Transportation
   Traffic Operations Division
   125 East 11th Street
   Austin, Texas 78701-2483

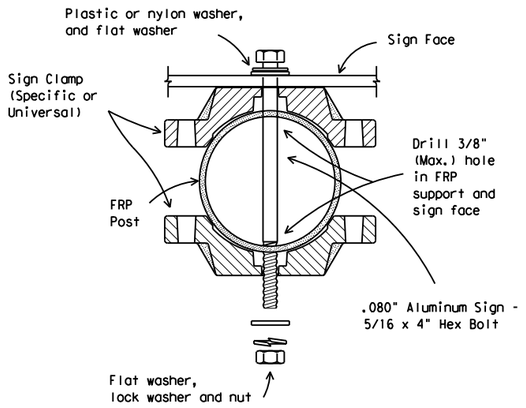
UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Insert base post in foundation hole to depths shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
4. Level and plumb the base post with coupler using a torpedo level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer. Bottom of base post slots shall be above the concrete footing.
5. Attach sign to FRP post.
6. Insert sign post into base post. Lower until the post comes to rest on the steel rod.
7. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
8. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

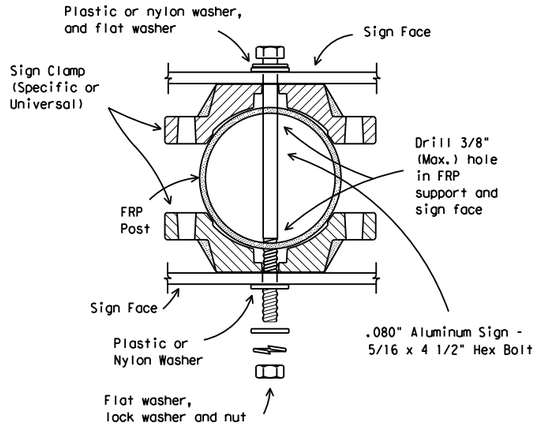
BOLT DOWN SIGN SUPPORT

1. Position base plate with coupler on existing concrete.
2. Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
3. Attach sign to FRP post.
4. Insert bottom of sign post into pipe stub.
5. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
6. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

Typical Sign Mounting Detail for FRP Support with Single Sign



Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs



Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS UNIVERSAL ANCHOR SYSTEM WITH FRP POST

SMD(FRP)-08

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

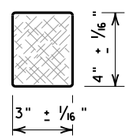
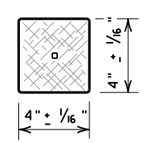
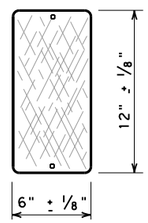
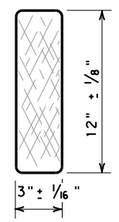
CONT	SECT	JOB	HIGHWAY
0043	08	088	US287

DIST	COUNTY	SHEET NO.
6	WICHITA	103

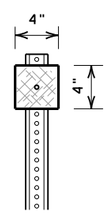
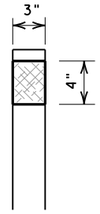
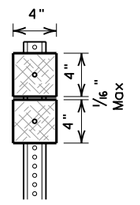
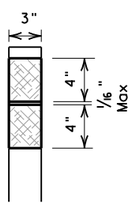
REVISIONS
9-08

DATE:
FILE:

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

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

DELINEATORS

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

D & OM DESCRIPTIVE CODES

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

NUMBER OF REFLECTORS
S = Single
D = Double

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

REFLECTOR UNIT SIZE
1 or 2

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

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

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

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

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

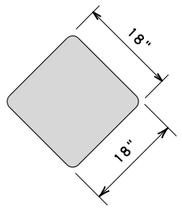
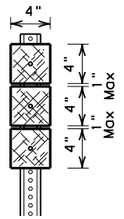
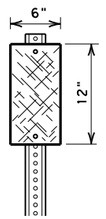
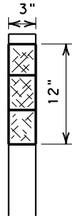
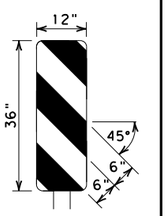
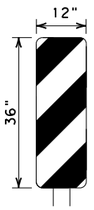
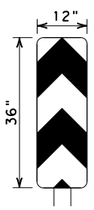
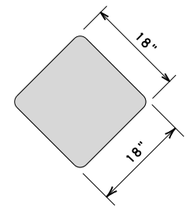
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s) (Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

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

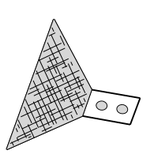
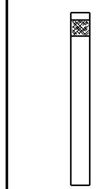
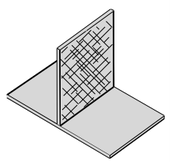
TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

DIRECTION
If Required
BI = Bi-Directional

OBJECT MARKERS

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

BARRIER REFLECTORS (BRF)

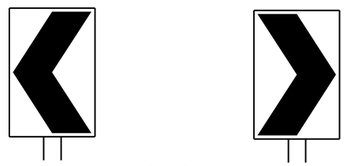
	GF1	GF2	CTB
DEVICE			

1. Barrier reflectors shall meet the requirements of DMS 8600.
2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.

SHEETING: Yellow, White, Red

NOTE: 1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.

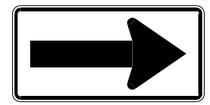
CHEVRONS

DEVICE:  W1-8

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

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

ONE DIRECTION LARGE ARROW

DEVICE:  W1-6

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

NOTE:

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

DEPARTMENTAL MATERIAL SPECIFICATIONS

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

DATE:
FILE: dom1-20.dgn

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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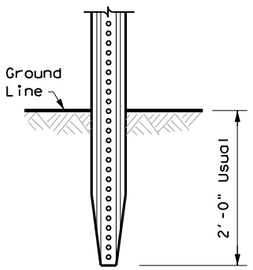
REVISIONS	0043	08	088	US287
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	6	WICHITA		104

20A

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

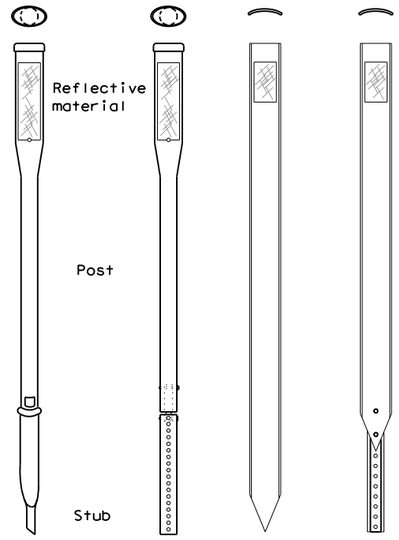


NOTES

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

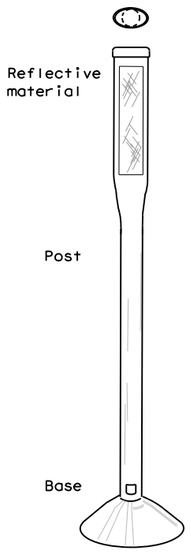
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



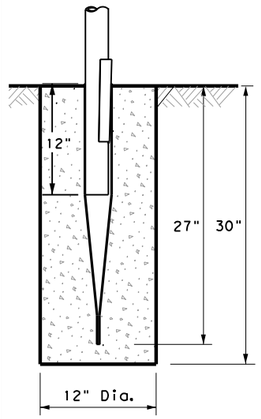
SURFACE MOUNT

NOTES

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

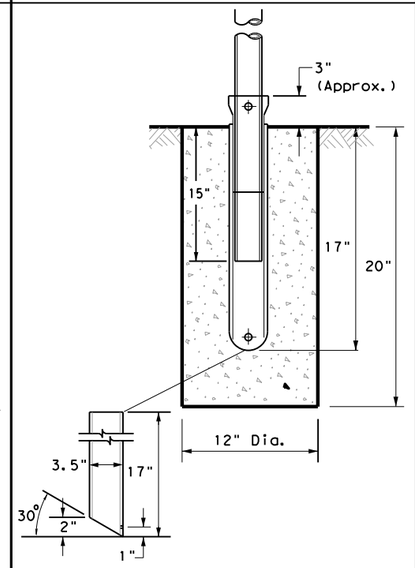
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

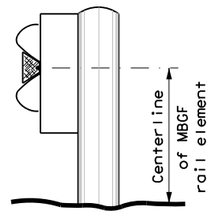
NOTE

1. Install per manufacturer's recommendations.

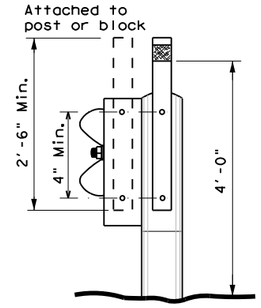
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

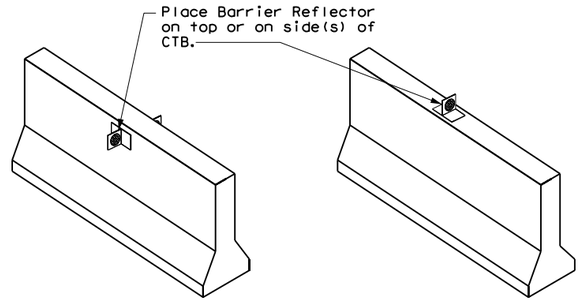
GF1



GF2



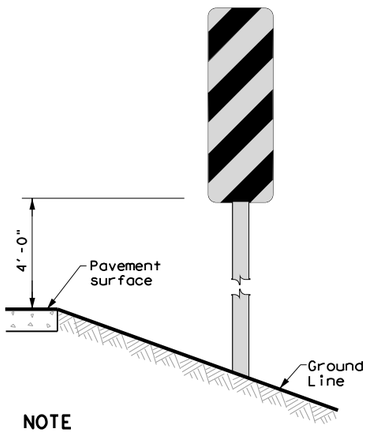
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

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

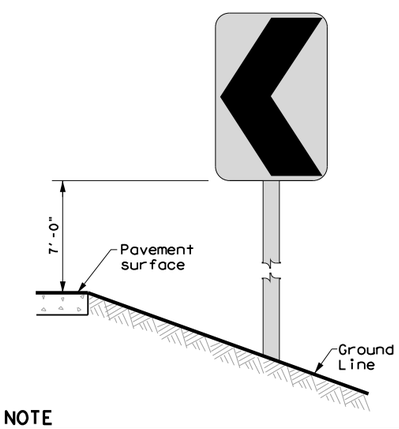
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

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

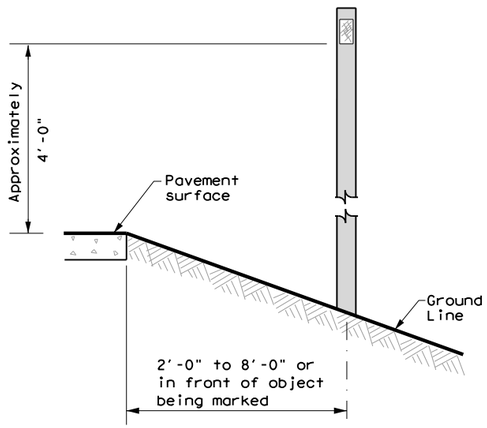
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

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

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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REVISIONS	0043	08	088	US287
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4-10 7-20	6	WICHITA		105

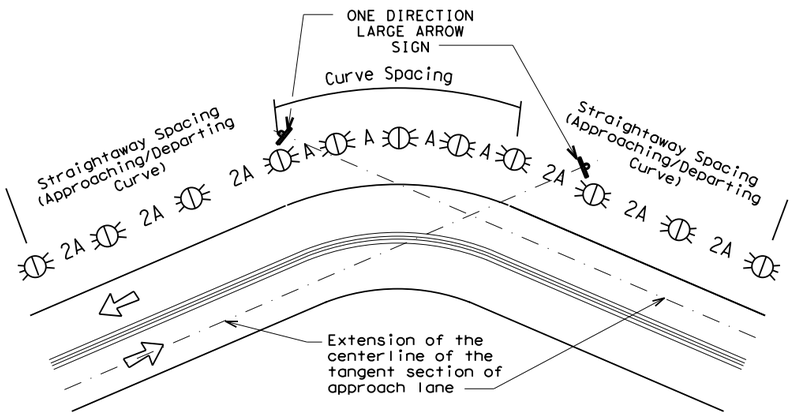
20B

DATE:
FILE:

MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

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

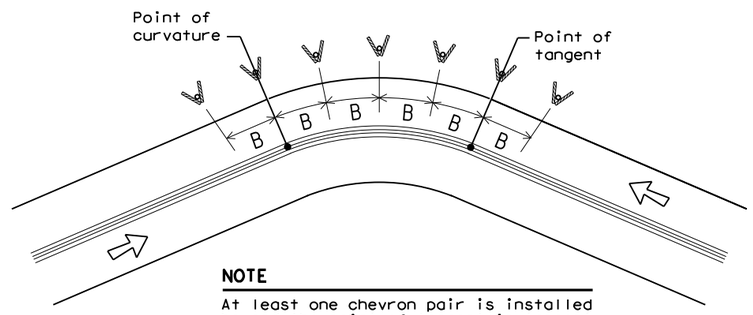
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

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

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

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

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

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

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

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

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

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

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

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

NOTES

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

LEGEND

	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

FILE: dom3-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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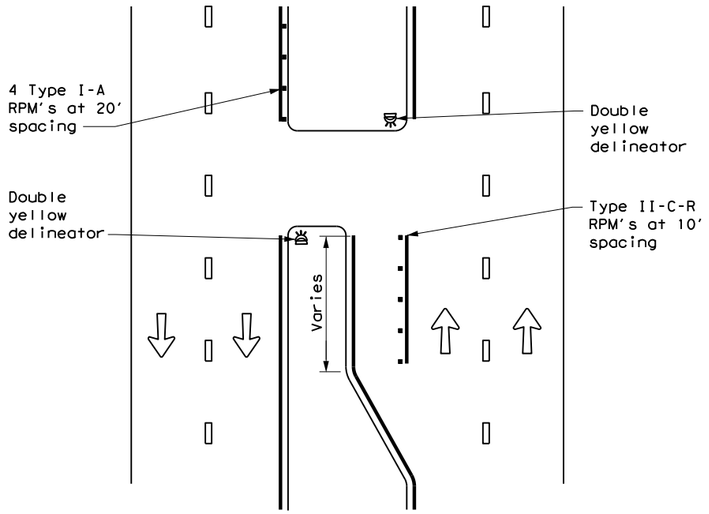
REVISIONS	0043	08	088	US287
3-15 8-15	DIST	COUNTY		SHEET NO.
8-15 7-20	6	WICHITA		106

20C

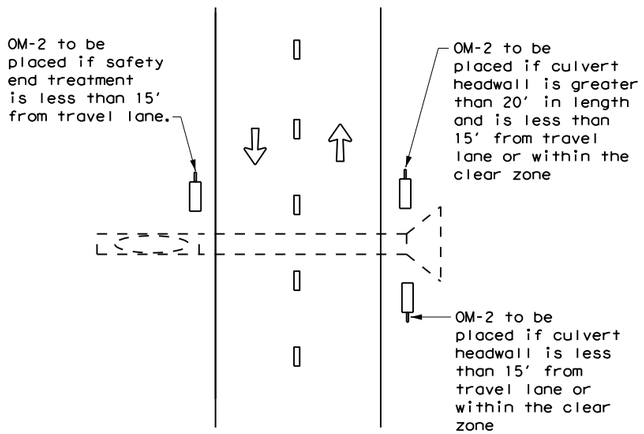
DATE:
FILE:

CROSSOVERS



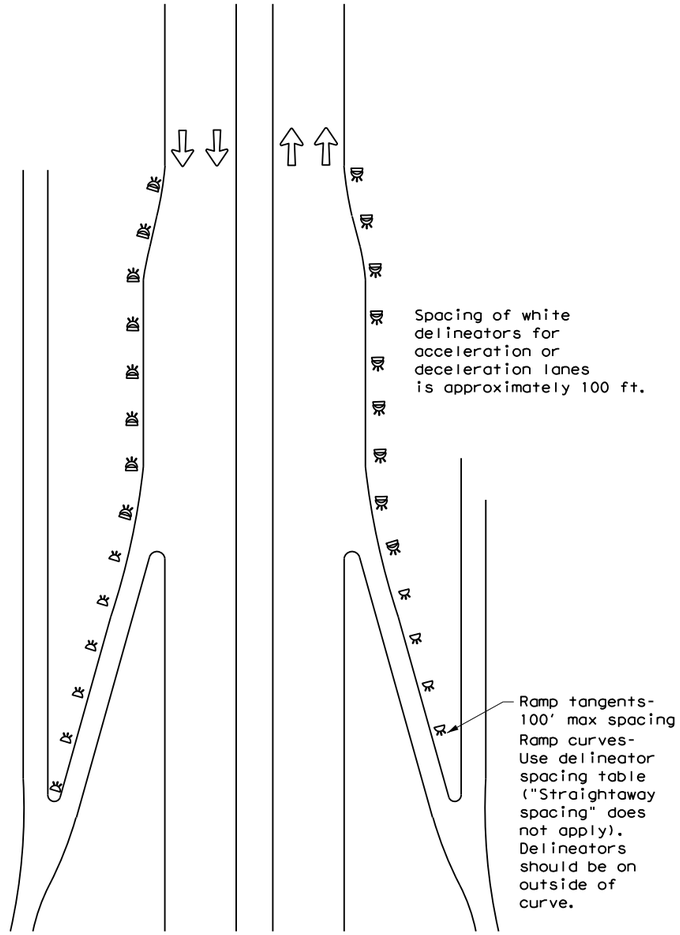
DETAIL 1

FOR CULVERTS WITHOUT MBGF



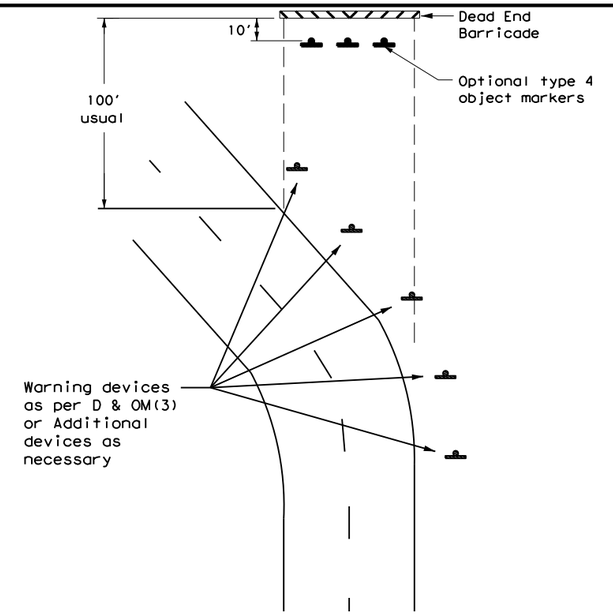
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



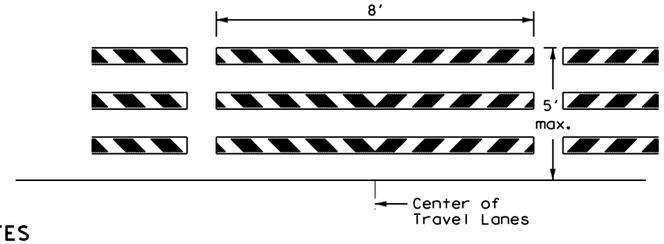
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

1. Barricade striping shall be red and white reflective sheeting for all permanent road closures.
2. Barricade striping is red and white sloping toward the center of the roadway.
3. Type 3 Barricade Supports should be anchored to soil or pavement as described in compliant Work Zone Traffic Control Devices List, section D.2.f and D.2.g.

DETAIL 5

LEGEND

	Bidirectional Delineator
	Delineator
	OM-3
	Barricade
	Sign
	OM-2
	Double Delineator

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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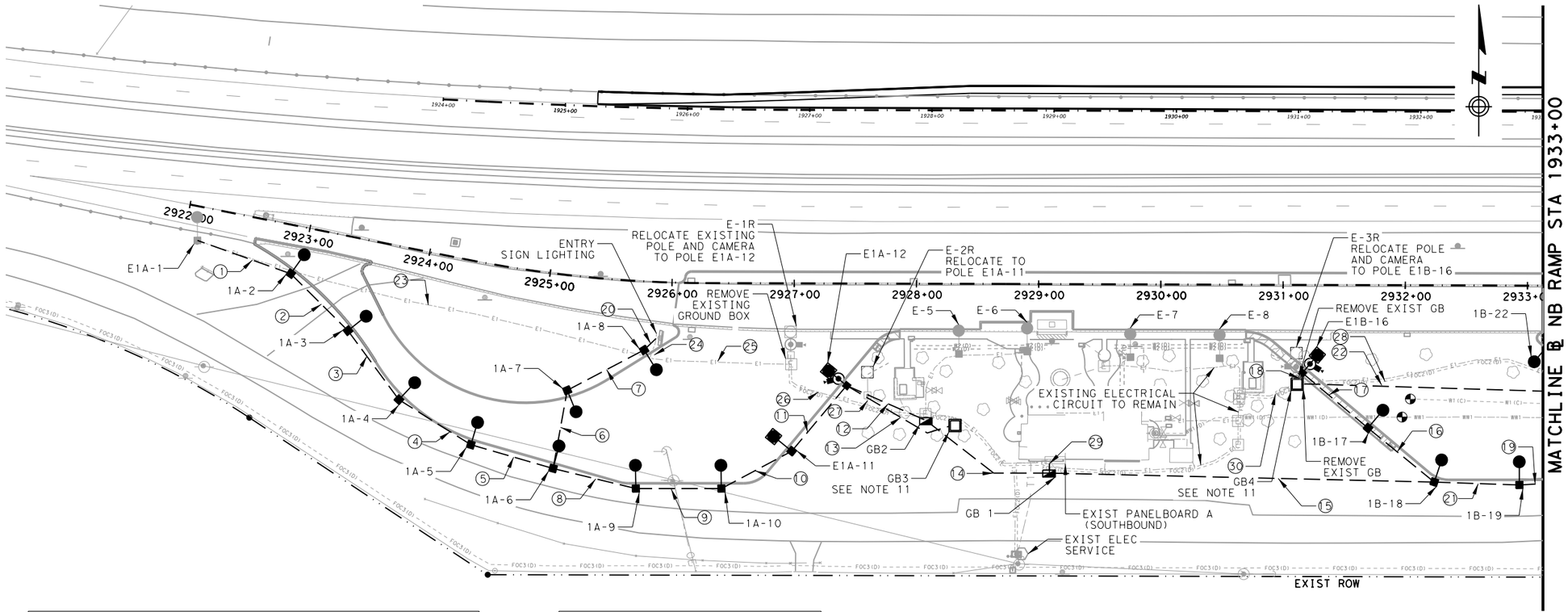
REVISIONS	0043	08	088	US287
3-15	DIST	COUNTY		SHEET NO.
7-20	6	WICHITA		107

DATE:
FILE:

20D

100% SUBMITTAL

DATE: 12/12/2023 TIME: 4:05:46 PM



LEGEND

- EXIST ILL ASSEMBLY TO REMAIN
- PROPOSED AESTHETIC SITE LIGHTING FIXTURE AND POLE
- EXIST ILL ASSM TO BE RELOCATED
- RELOCATED ILL ASSMEMBLY
- EXIST ELECTRICAL SERVICE
- EXIST ELECTRICAL PANEL
- EXIST GROUND BOX
- PROPOSED ILLUM GROUND BOX (TY A)
- PROPOSED ITS GROUND BOX (TY 1)
- PROPOSED ITS GROUND BOX (TY 2)
- EXISTING CCTV
- RELOCATED CCTV
- FOC — EXISTING FIBER CONDUIT
- E1 — EXISTING ELEC CONDUIT
- PROPOSED CONDUIT
- CONDUIT RUN NUMBER
- EXIST ROW

POLE DESIGNATION

EXISTING E1B-2R

- RELOCATE
- POLE OR LUMINAIRE NO.
- CIRCUIT NO.
- SERVICE NO.

CONDUIT, CONDUCTOR & CABLE SCHEDULE

RUN NO.	CONDUIT STATUS	CONDUIT: ITEM 618 SIZE / TYPE CONDUIT: TRENCH: PVC SCHD 40 (2")	CABLE STATUS	NUMBER OF CONDUCTORS: ITEM 620 ELECTRICAL CONDUCTORS: *NO. 6 XHHW (INSULATED) (GROUND)	NUMBER OF CONDUCTORS: ITEM 620 ELECTRICAL CONDUCTORS: *NO. 6 XHHW (INSULATED) (POWER)	CABLES: ITEM 6007: FIBER OPTIC CBL (MLTI-MODE) (6 FIBER)	LENGTH OF RUN	RUN NO.
1	I	1	I	1	2		85	1
2	I	1	I	1	2		70	2
3	I	1	I	1	2		75	3
4	I	1	I	1	2		70	4
5	I	1	I	1	2		75	5
6	I	1	I	1	2		70	6
7	I	1	I	1	2		75	7
8	I	1	I	1	2		75	8
9	I	1	I	1	2		75	9
10	I	1	I	1	2		70	10
11	I	1	I	1	2		75	11
12	I	1	I	1	2		70	12
13	I	1	E			SEE NOTE 9	30	13
14	I	1	I	1	2		125	14
15	I	1	I	1	2		320	15
16	I	1	I	1	2		75	16
17	I	1	I	1	2		70	17
18	I	1	I	1	2		15	18
19	I	1	I	1	2		20	19
20	I	1	I	1	2		20	20
21	I	1	I	1	2		70	21
22	I	1	I			SEE NOTE 10	205	22
29	I	1	I	1	4		5	29
TOTAL		1840		1710	3430			TOTAL

STATUS: E=EXISTING, I=INSTALL

* INCLUDES 5 FT SLACK PER CABLE

CONDUIT, CONDUCTOR & CABLE SCHEDULE

RUN NO.	CONDUIT STATUS	CONDUIT: ITEM 6163: **REMOVE EXISTING CABLES (POWER)	CONDUIT: ITEM 6163: ***REMOVE EXISTING CABLES (FIBER)	LENGTH OF RUN	RUN NO.
23	E	3		390	23
24	E	3		20	24
25	E	3		115	25
26	E	3	1	130	26
27	E	3		10	27
28	E	3	1	205	28
TOTAL		2610	335		TOTAL

STATUS: E=EXISTING, I=INSTALL

** SEE NOTE 8

*** SEE NOTES 9 & 10

NOTES:

1. THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
2. THE LOCATIONS OF ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMATIC ONLY AND MAY BE SHIFTED TO ACCOMODATE LOCAL CONDITIONS. EXACT LOCATION OF ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
3. THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
4. ROW IS SHOWN FOR INFORMATION ONLY.
5. CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION AND ELECTRICAL INFRASTRUCTURE PRIOR TO CONSTRUCTION.
6. CONTRACTOR SHALL CONNECT NEW LIGHTING CIRCUITS "A" AND "B" TO EXISTING PANEL. CONTRACTOR SHALL FIELD VERIFY AND ENSURE INSTALLATION OF PROPOSED CABLES DO NOT EXCEED THE ALLOWABLE CONDUIT FILL OF EXISTING CONDUIT AND STUB UP TO PANEL, PER NEC REQUIREMENTS.
7. REFER TO ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
8. QUANTITIES FOR REMOVAL OF POWER CABLES ARE APPROXIMATE. CONTRACTOR SHALL ONLY REMOVE ELECTRICAL CABLES THAT ARE NOT IN USE BY EXISTING CIRCUITS TO REMAIN IN PLACE. EXISTING CIRCUITS AND GROUND WIRES STILL IN USE SHALL REMAIN INTACT. WHERE NO OTHER CABLES ARE PRESENT IN THE EXISTING CONDUIT, CONDUIT SHALL BE ABANDONED.
9. CONTRACTOR SHALL PULL EXISTING FIBER OPTIC CABLE FROM RUN 24 AND INSTALL IN RUN 13. THIS WORK WILL BE PAID FOR WITH ITEM 6163.
10. CONTRACTOR SHALL PULL EXISTING FIBER OPTIC CABLE FROM RUN 28 AND INSTALL IN RUN 22. IN THIS WORK WILL BE PAID FOR WITH ITEM 6163.
11. GB3 AND GB4 SHALL INTERCEPT EXISTING FIBER OPTIC CABLE CONDUIT.

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TBPE REG: NO. F-474

US 287 REST AREAS

ITS-ILLUMINATION PLAN

SCALE: 1"=100' SHEET 1 OF 3

DESIGN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
JNR	6	STP 2024(778)TP	US287
GRAPHICS: SD	STATE	DISTRICT / COUNTY	SHEET NO.
CHECK: RAW	TEXAS	WFS / WICHITA	108
CHECK: JNR	CONTROL	SECTION / JOB	
	0043	08 / 088	

PLOT DRIVER: pdf-bw.pltcfg
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FILE: US 287_ILL Sheet 1.dgn

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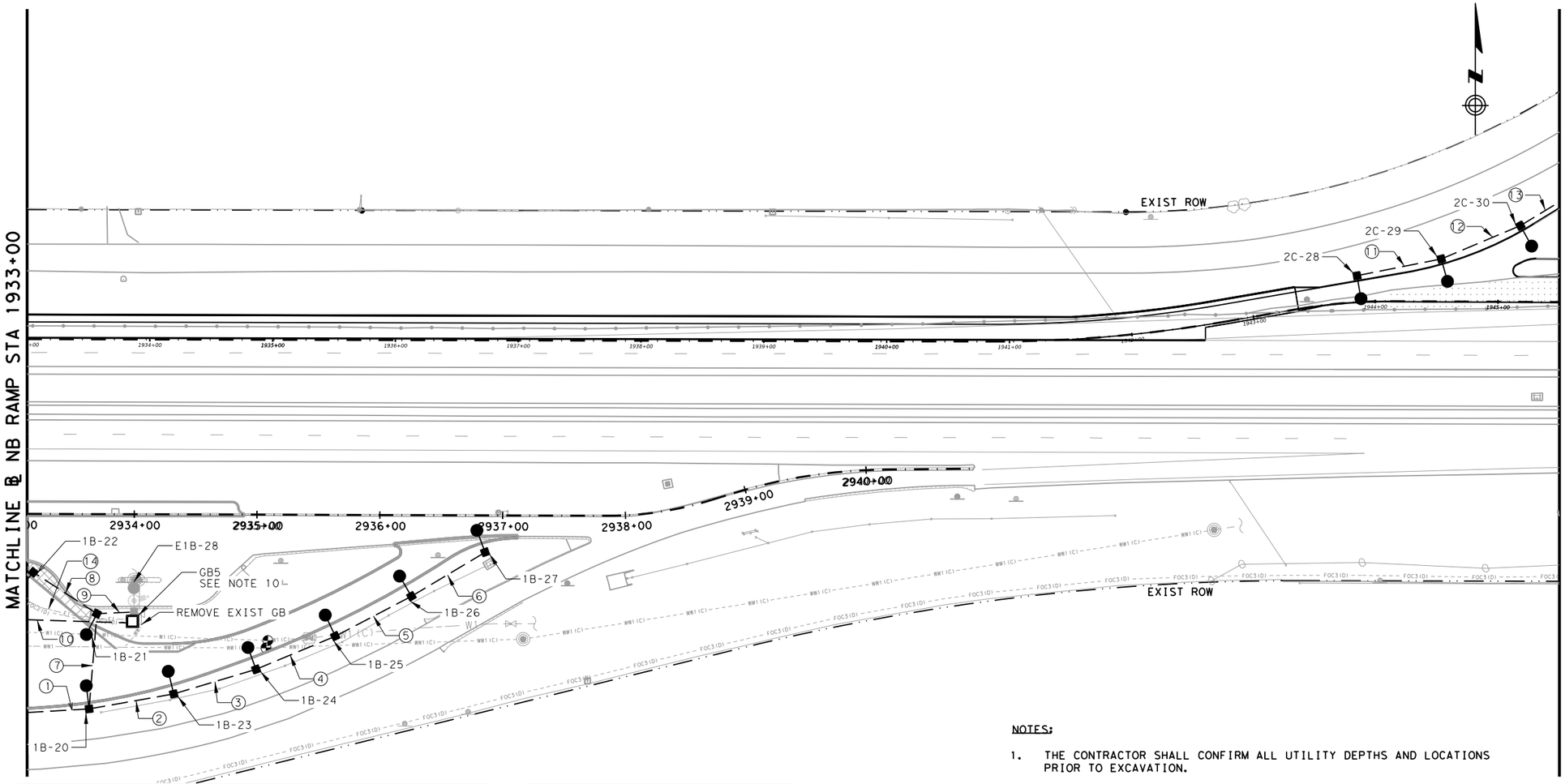

SCALE = 1"=100' H

LEGEND

- EXIST ILL ASSEMBLY TO REMAIN
- PROPOSED AESTHETIC SITE LIGHTING FIXTURE AND POLE
- EXIST ILL ASSM TO BE RELOCATED
- RELOCATED ILL ASSMEMBLY
- EXIST ELECTRICAL SERVICE
- EXIST ELECTRICAL PANEL
- EXIST GROUND BOX
- PROPOSED ILLUM GROUND BOX (TY A)
- PROPOSED ITS GROUND BOX (TY 1)
- PROPOSED ITS GROUND BOX (TY 2)
- EXISTING CCTV
- RELOCATED CCTV
- FOC — EXISTING FIBER CONDUIT
- E1 — EXISTING ELEC CONDUIT
- PROPOSED CONDUIT
- CONDUIT RUN NUMBER
- EXIST ROW

POLE DESIGNATION

EXISTING E1B-28 — RELOCATE; POLE OR LUMINAIRE NO.; CIRCUIT NO.; SERVICE NO.

CONDUIT, CONDUCTOR & CABLE SCHEDULE

RUN NO.	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS		CABLES	LENGTH OF RUN	RUN NO.
	CONDUIT STATUS	ITEM 618 SIZE / TYPE CONDUIT TRENCH PVC SCHD 40 (2")		ITEM 620 ELECTRICAL CONDUCTORS **NO. 6 XHHW (INSULATED) (GROUND)	ITEM 620 ELECTRICAL CONDUCTORS **NO. 6 XHHW (INSULATED) (POWER)	ITEM 6007 FIBER OPTIC CBL (MULTI-MODE) (6 FIBER)		
1	I	1	I	1	2		55	1
2	I	1	I	1	2		75	2
3	I	1	I	1	2		75	3
4	I	1	I	1	2		75	4
5	I	1	I	1	2		75	5
6	I	1	I	1	2		75	6
7	I	1	I	1	2		80	7
8	I	1	I	1	2		65	8
9	I	1	I	1	2		35	9
10	I	1	I			SEE NOTE 9	90	10
11	I	1	I	1	2		75	11
12	I	1	I	1	2		75	12
13	I	1	I	1	2		40	13
TOTAL		890		860	1720			TOTAL

STATUS: E=EXISTING, I=INSTALL

* INCLUDES 5 FT SLACK PER CABLE

CONDUIT, CONDUCTOR & CABLE SCHEDULE

RUN NO.	CONDUIT			LENGTH OF RUN	RUN NO.
	CONDUIT STATUS	ITEM 6163 **REMOVE EXISTING CABLES (POWER)	ITEM 6163 ***REMOVE EXISTING CABLES (FIBER)		
14	E	3	1	90	14
TOTAL		270	90		TOTAL

STATUS: E=EXISTING, I=INSTALL

** SEE NOTE 8

*** SEE NOTE 9

NOTES:

1. THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
2. THE LOCATIONS OF ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMATIC ONLY AND MAY BE SHIFTED TO ACCOMODATE LOCAL CONDITIONS. EXACT LOCATION OF ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
3. THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
4. ROW IS SHOWN FOR INFORMATION ONLY.
5. CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION AND ELECTRICAL INFRASTRUCTURE PRIOR TO CONSTRUCTION.
6. CONTRACTOR SHALL CONNECT NEW LIGHTING CIRCUITS "A" AND "B" TO EXISTING PANEL. CONTRACTOR SHALL FIELD VERIFY AND ENSURE INSTALLATION OF PROPOSED CABLES DO NOT EXCEED THE ALLOWABLE CONDUIT FILL OF EXISTING CONDUIT AND STUB UP TO PANEL, PER NEC REQUIREMENTS.
7. REFER TO ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
8. QUANTITIES FOR REMOVAL OF POWER CABLES ARE APPROXIMATE. CONTRACTOR SHALL ONLY REMOVE ELECTRICAL CABLES THAT ARE NOT IN USE BY EXISTING CIRCUITS TO REMAIN IN PLACE. EXISTING CIRCUITS AND GROUND WIRES STILL IN USE SHALL REMAIN INTACT. WHERE NO OTHER CABLES ARE PRESENT IN THE EXISTING CONDUIT, CONDUIT SHALL BE ABANDONED.
9. CONTRACTOR SHALL PULL EXISTING FIBER OPTIC CABLE FROM RUN 14 AND INSTALL IN RUN 10. THIS WORK WILL BE PAID FOR WITH ITEM 6163.
10. GB5 SHALL INTERCEPT EXISTING FIBER OPTIC CABLE CONDUIT FROM POLE E1B-28.

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US 287 REST AREAS

ITS-ILLUMINATION PLAN

SHEET 2 OF 3

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2024(778)TP		US287
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	WFS	WICHITA	
CHECK	CONTROL	SECTION	JOB	109
	0043	08	088	

PLOT DRIVER: pdf-bw.pltcfg
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FILE: US 287_ILL Sheet 2.dgn

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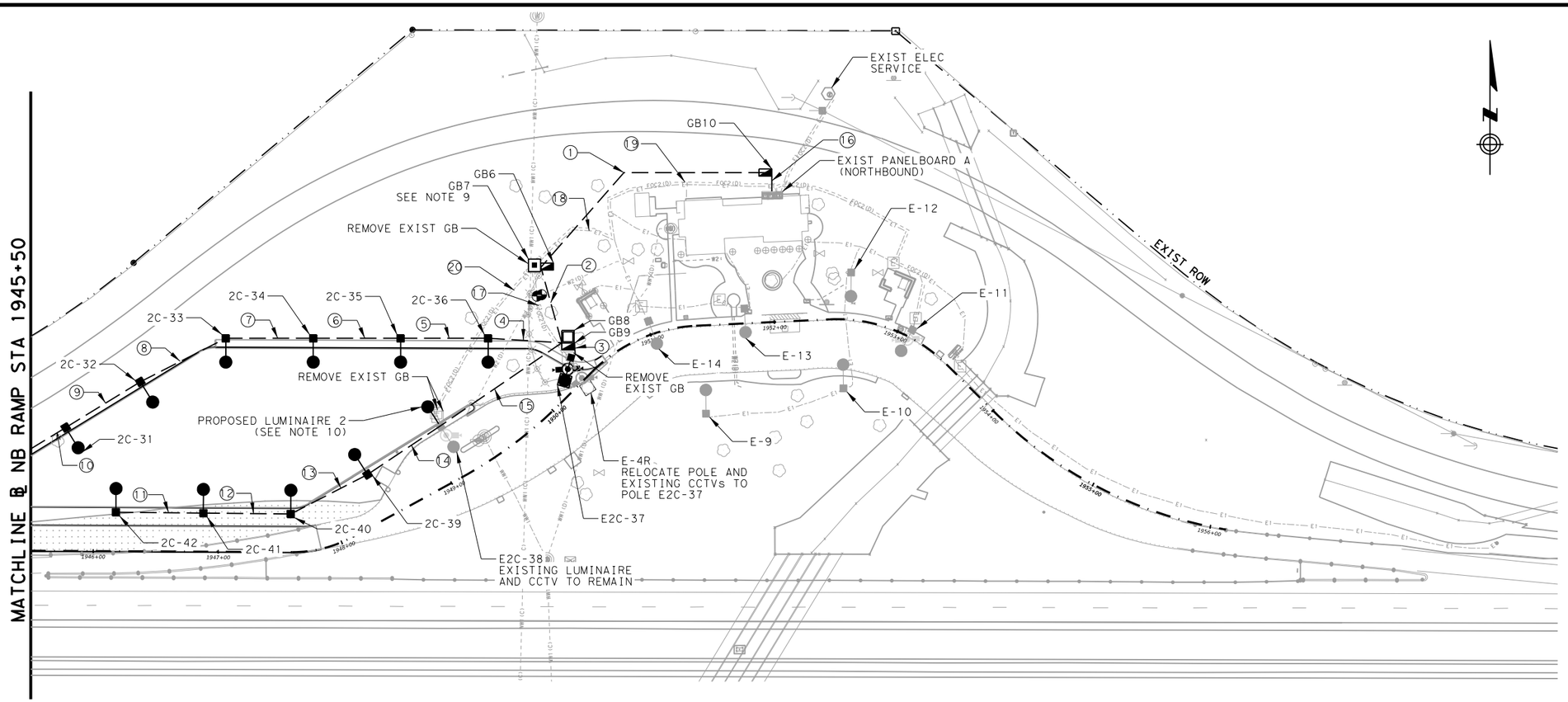

SCALE = 1"=100' H

LEGEND

- EXIST ILL ASSEMBLY TO REMAIN
- PROPOSED AESTHETIC SITE LIGHTING FIXTURE AND POLE
- EXIST ILL ASSM TO BE RELOCATED
- RELOCATED ILL ASSMEMBLY
- EXIST ELECTRICAL SERVICE
- EXIST ELECTRICAL PANEL
- [E] EXIST GROUND BOX
- PROPOSED ILLUM GROUND BOX (TY A)
- PROPOSED ITS GROUND BOX (TY 1)
- PROPOSED ITS GROUND BOX (TY 2)
- EXISTING CCTV
- RELOCATED CCTV
- —FOC— EXISTING FIBER CONDUIT
- —E1— EXISTING ELEC CONDUIT
- — — PROPOSED CONDUIT
- (#) CONDUIT RUN NUMBER
- —— EXIST ROW

POLE DESIGNATION

EXISTING E1B-2R

- RELOCATE
- POLE OR LUMINAIRE NO.
- CIRCUIT NO.
- SERVICE NO.

CONDUIT, CONDUCTOR & CABLE SCHEDULE

RUN NO.	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS		CABLES	LENGTH OF RUN	RUN NO.
	CONDUIT STATUS	ITEM 618 SIZE / TYPE CONDUIT TRENCH PVC SCHD 40 (2")		ITEM 620 ELECTRICAL CONDUCTORS **NO. 6 XHHW (INSULATED) (GROUND)	ITEM 620 ELECTRICAL CONDUCTORS **NO. 6 XHHW (INSULATED) (POWER)	ITEM 6007 FIBER OPTIC CBL (MLTI-MODE) (6 FIBER)		
1	I	1	I	1	2		220	1
2	I	2	I	1	2	2	75	2
3	I	2	I	1	2	1	15	3
4	I	1	I	1	2		70	4
5	I	1	I	1	2		75	5
6	I	1	I	1	2		75	6
7	I	1	I	1	2		75	7
8	I	1	I	1	2		80	8
9	I	1	I	1	2		75	9
10	I	1	I	1	2		35	10
11	I	1	I	1	2		75	11
12	I	1	I	1	2		75	12
13	I	1	I	1	2		70	13
14	I	1	I	1	2		75	14
15	I	2	I	1	2	1	125	15
16	I	1	I	1	2		20	16
TOTAL		1450		1315	2630	290		TOTAL

STATUS: E=EXISTING, I=INSTALL

* INCLUDES 5 FT SLACK PER CABLE

CONDUIT, CONDUCTOR & CABLE SCHEDULE

RUN NO.	CONDUIT			LENGTH OF RUN	RUN NO.
	CONDUIT STATUS	ITEM 6163 **REMOVE EXISTING CABLES (POWER)	ITEM 6163 REMOVE EXISTING CABLES (FIBER)		
17	E	3	1	155	17
18	E	3		75	18
19	E	3		80	19
20	E	3	1	175	20
TOTAL		1455	330		TOTAL

STATUS: E=EXISTING, I=INSTALL

** SEE NOTE 8

NOTES:

1. THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
2. THE LOCATIONS OF ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMATIC ONLY AND MAY BE SHIFTED TO ACCOMODATE LOCAL CONDITIONS. EXACT LOCATION OF ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
3. THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
4. ROW IS SHOWN FOR INFORMATION ONLY.
5. CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION AND ELECTRICAL INFRASTRUCTURE PRIOR TO CONSTRUCTION.
6. CONTRACTOR SHALL CONNECT NEW LIGHTING CIRCUIT "C" TO EXISTING PANEL. CONTRACTOR SHALL FIELD VERIFY AND ENSURE INSTALLATION OF PROPOSED CABLES DO NOT EXCEED THE ALLOWABLE CONDUIT FILL OF EXISTING CONDUIT AND STUB UP TO PANEL, PER NEC REQUIREMENTS.
7. REFER TO ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
8. QUANTITIES FOR REMOVAL OF POWER CABLES ARE APPROXIMATE. CONTRACTOR SHALL ONLY REMOVE ELECTRICAL CABLES THAT ARE NOT IN USE BY EXISTING CIRCUITS TO REMAIN IN PLACE. EXISTING CIRCUITS AND GROUND WIRES STILL IN USE SHALL REMAIN INTACT. WHERE NO OTHER CABLES ARE PRESENT IN THE EXISTING CONDUIT, CONDUIT SHALL BE ABANDONED.
9. GB7 SHALL INTERCEPT EXISTING FIBER OPTIC CABLE CONDUIT FROM RUN 18. CONTRACTOR SHALL SPLICE FIBER OPTIC CABLE FROM RUN 2 TO RUN 18.
10. CONTRACTOR SHALL COORDINATE WITH POLE MANUFACTUER TO OBTAIN DRILL HOLE TEMPLATE AND INSTALL NEW LUMINAIRE ON EXISTING POLE.

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US 287 REST AREAS

ITS-ILLUMINATION PLAN

SHEET 3 OF 3

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2024(778)TP		US287
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	WFS	WICHITA	110
CHECK	CONTROL	SECTION	JOB	
	0043	08	088	

PLOT DRIVER: pdf-bw.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_ILL Sheet 3.dgn

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POLE SCHEDULE			
ID	STA	OFF	TYPE
E1A-1	2922+11.60	27.64' RT	EXISTING LUMINAIRE AND POLE
1A-2	2923+08.19	39.44' RT	SEE NOTE 1
1A-3	2923+46.76	76.01' RT	SEE NOTE 1
1A-4	2924+01.30	123.24' RT	SEE NOTE 1
1A-5	2924+59.10	148.41' RT	SEE NOTE 1
1A-6	2925+19.42	158.50' RT	SEE NOTE 1
1A-7	2925+23.66	93.72' RT	SEE NOTE 1
1A-8	2925+79.91	56.00' RT	SEE NOTE 1
1A-9	2925+78.83	169.55' RT	SEE NOTE 1
1A-10	2926+40.87	168.02' RT	SEE NOTE 1
E1A-11	2926+98.30	137.25' RT	RELOCATED LUMINAIRE AND POLE
E1A-12	2927+43.14	83.50' RT	RELOCATED LUMINAIRE AND POLE
E1B-16	2931+16.09	72.03' RT	RELOCATED LUMINAIRE AND POLE
1B-17	2931+69.86	117.02' RT	SEE NOTE 1
1B-18	2932+24.24	160.84' RT	SEE NOTE 1
1B-19	2932+93.93	163.04' RT	SEE NOTE 1
1B-20	2933+63.76	158.71' RT	SEE NOTE 1
1B-21	2933+64.78	84.84' RT	SEE NOTE 1
1B-22	2933+17.91	47.59' RT	SEE NOTE 1
1B-23	2934+32.62	146.34' RT	SEE NOTE 1
1B-24	2934+99.59	126.11' RT	SEE NOTE 1
1B-25	2935+64.02	98.81' RT	SEE NOTE 1
1B-26	2936+25.89	66.09' RT	SEE NOTE 1
1B-27	2936+85.80	30.02' RT	SEE NOTE 1
E1B-28	2934+00.10	79.17' RT	EXISTING LUMINAIRE AND POLE
2C-28	1943+86.40	21.49' LT	SEE NOTE 1
2C-29	1944+53.66	36.64' LT	SEE NOTE 1
2C-30	1945+17.90	62.04' LT	SEE NOTE 1
2C-31	1945+77.47	98.79' LT	SEE NOTE 1
2C-32	1946+36.96	135.68' LT	SEE NOTE 1
2C-33	1947+05.23	170.87' LT	SEE NOTE 1
2C-34	1948+58.14	154.69' LT	SEE NOTE 1
2C-35	1949+25.34	120.91' LT	SEE NOTE 1
2C-36	1950+03.02	77.80' LT	SEE NOTE 1
E2C-37	1950+40.14	19.95' LT	RELOCATED LUMINAIRE AND POLE
E2C-38 PROPOSED LUMINAIRE	1949+14.52	43.59' LT	LUMINAIRE 1: EXISTING LUMINAIRE 2: SEE NOTE 2(LUMINAIRE ONLY)
2C-39	1948+44.12	38.15' LT	SEE NOTE 1
2C-40	1947+57.97	30.50' LT	SEE NOTE 1
2C-41	1946+87.97	30.83' LT	SEE NOTE 1
2C-42	1946+17.97	31.17' LT	SEE NOTE 1
E-5			EXISTING POLE AND CIRCUITRY TO REMAIN INTACT.
E-6			EXISTING POLE AND CIRCUITRY TO REMAIN INTACT.
E-7			EXISTING POLE AND CIRCUITRY TO REMAIN INTACT.
E-8			EXISTING POLE AND CIRCUITRY TO REMAIN INTACT.
E-9			EXISTING POLE AND CIRCUITRY TO REMAIN INTACT.
E-10			EXISTING POLE AND CIRCUITRY TO REMAIN INTACT.
E-11			EXISTING POLE AND CIRCUITRY TO REMAIN INTACT.
E-12			EXISTING POLE AND CIRCUITRY TO REMAIN INTACT.
E-13			EXISTING POLE AND CIRCUITRY TO REMAIN INTACT.
E-14			EXISTING POLE AND CIRCUITRY TO REMAIN INTACT.

GROUND BOX SCHEDULE	
ID	TYPE
GB1	TYPE A W/APRON
GB2	TYPE A W/APRON
GB3	ITS TYPE 1 W/APRON
GB4	ITS TYPE 1 W/APRON
GB5	ITS TYPE 1 W/APRON
GB6	TYPE A W/APRON
GB7	ITS TYPE 2 W/APRON W/SPLICE ENCLOSURE
GB8	ITS TYPE 1
GB9	TYPE A W/APRON
GB10	TYPE A W/APRON

NOTES:

1. LUMINAIRE SHALL BE GARDCO ECF-S-32L-NW-G2-AR-3-UNV-RPA-BK OR APPROVED EQUAL. POLE SHALL BE GARDCO SRS-CB-4-11-D1-DT5-BK (25FT POLE) OR APPROVED EQUAL.
2. LUMINAIRE SHALL BE GARDCO ECF-S-32L-NW-G2-AR-3-UNV-RPA-BK OR APPROVED EQUAL. CONTRACTOR SHALL COORDINATE WITH POLE MANUFACTURER TO OBTAIN APPROPRIATE DRILL HOLE TEMPLATE AND INSTALL NEW LUMINAIRE ON EXISTING POLE.

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US 287 REST AREAS

ITS-ILLUMINATION SCHEDULES

SCALE: 1"=100' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2024(778)TP		US287
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	WFS	WICHITA	111
CHECK	CONTROL	SECTION	JOB	
	0043	08	088	

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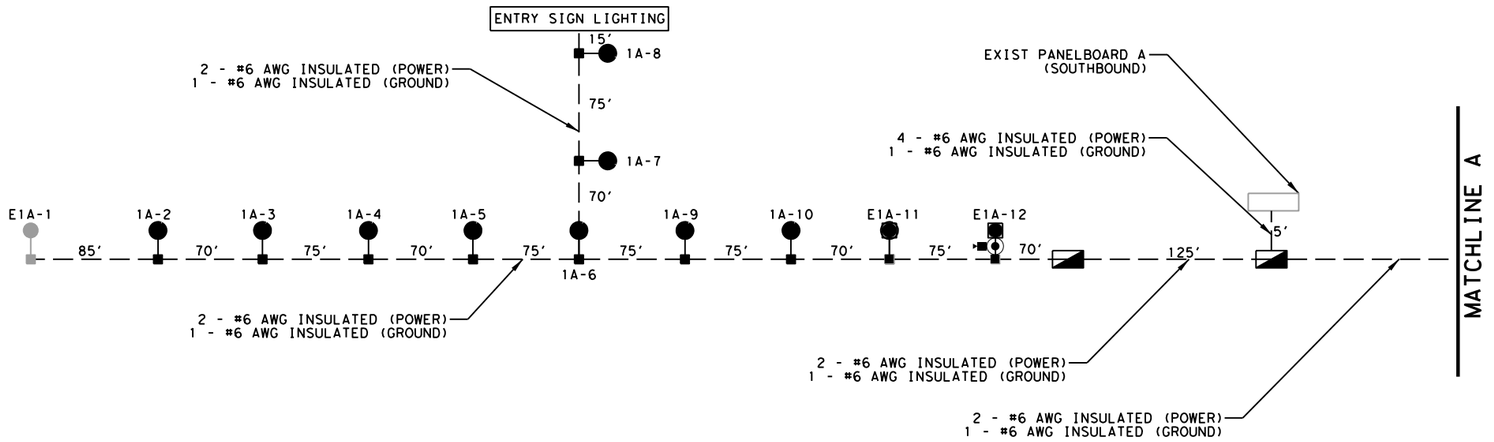
CIRCUIT A

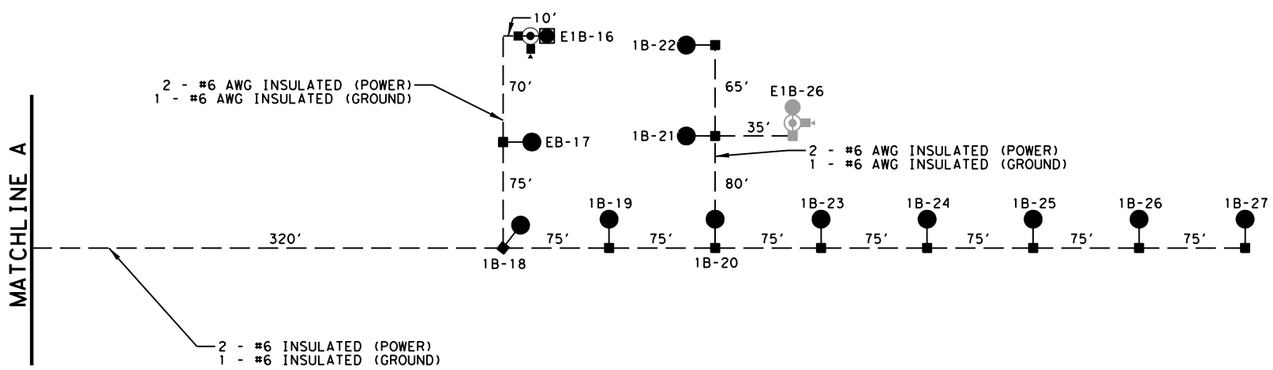


- EXIST ILL ASSEMBLY TO REMAIN
- PROPOSED AESTHETIC SITE LIGHTING FIXTURE AND POLE
- EXIST ILL ASSM TO BE RELOCATED
- RELOCATED ILL ASSMEMBLY
- EXIST ELECTRICAL SERVICE
- EXIST ELECTRICAL PANEL
- EXIST GROUND BOX
- PROPOSED ILLUM GROUND BOX (TY A)
- PROPOSED ITS GROUND BOX (TY 1)
- PROPOSED ITS GROUND BOX (TY 2)
- EXISTING CCTV
- RELOCATED CCTV
- —FOC— EXISTING FIBER CONDUIT
- —E1— EXISTING ELEC CONDUIT
- PROPOSED CONDUIT
- CONDUIT RUN NUMBER
- EXIST ROW

POLE DESIGNATION

EXISTING — E1B-2R
- RELOCATE
- POLE OR LUMINAIRE NO.
- CIRCUIT NO.
- SERVICE NO.

CIRCUIT B



DRAWING NOT TO SCALE

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 Texas Department of Transportation

US 287 REST AREAS
SOUTHBOUND
ILLUMINATION
CIRCUIT DIAGRAM

SCALE: 1"=100′ SHEET 1 OF 2

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2024(778)TP		US287
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	WFS	WICHITA	112
CHECK	CONTROL	SECTION	JOB	
	0043	08	088	

PLOT DRIVER: pdf-bw.pltcfg
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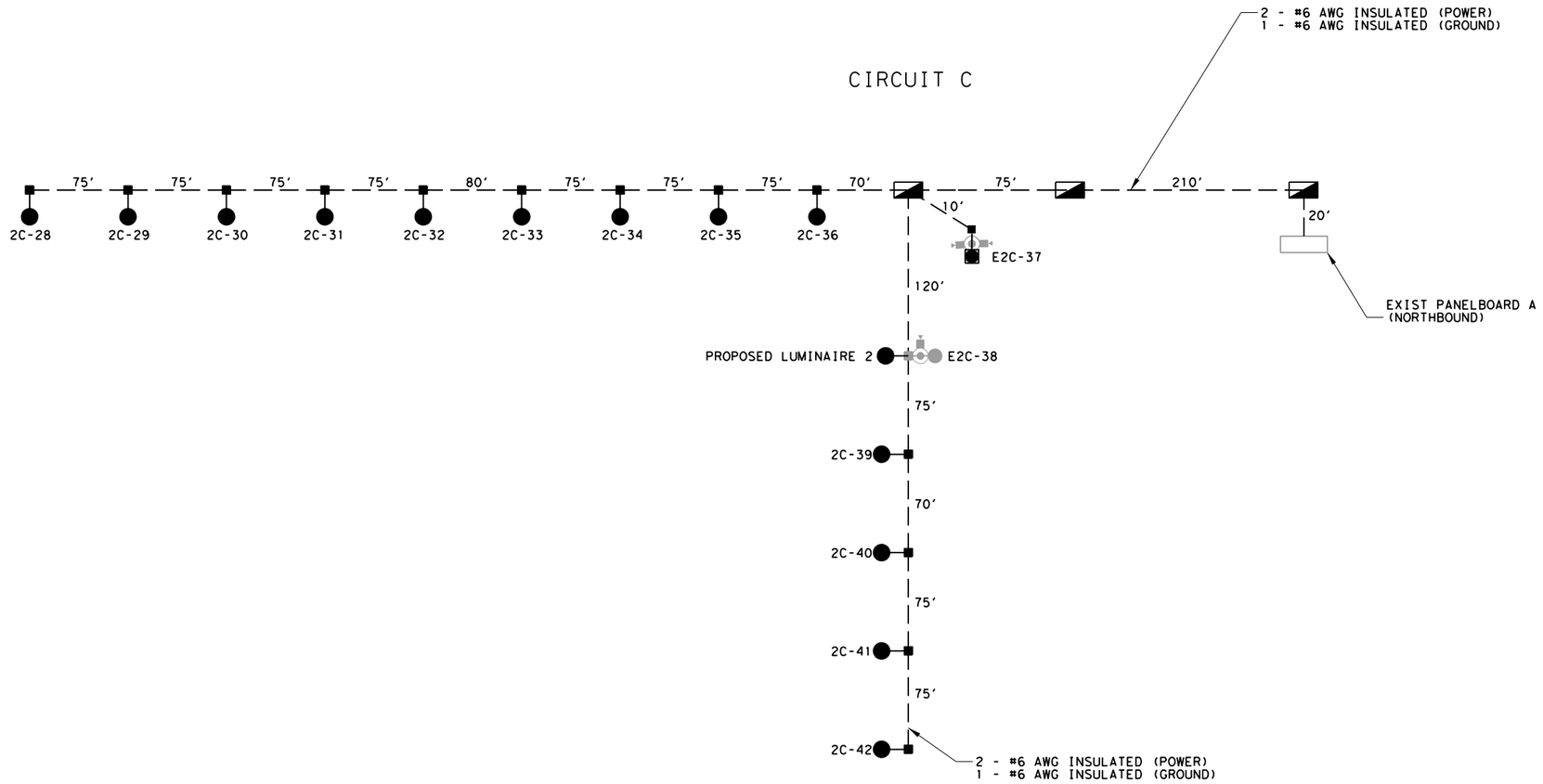

LEGEND

- EXIST ILL ASSEMBLY TO REMAIN
- PROPOSED AESTHETIC SITE LIGHTING FIXTURE AND POLE
- EXIST ILL ASSM TO BE RELOCATED
- RELOCATED ILL ASSMEMBLY
- EXIST ELECTRICAL SERVICE
- EXIST ELECTRICAL PANEL
- EXIST GROUND BOX
- PROPOSED ILLUM GROUND BOX (TY A)
- PROPOSED ITS GROUND BOX (TY 1)
- PROPOSED ITS GROUND BOX (TY 2)
- EXISTING CCTV
- RELOCATED CCTV
- FOC — EXISTING FIBER CONDUIT
- E1 — EXISTING ELEC CONDUIT
- PROPOSED CONDUIT
- CONDUIT RUN NUMBER
- EXIST ROW

POLE DESIGNATION

EXISTING E1B-2R
- RELOCATE
- POLE OR LUMINAIRE NO.
- CIRCUIT NO.
- SERVICE NO.

DRAWING NOT TO SCALE

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US 287 REST AREAS
NORTHBOUND
ILLUMINATION
CIRCUIT DIAGRAM

SCALE: 1"=100′ SHEET 2 OF 2

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
	6	STP 2024(778)TP		US287
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	WFS	WICHITA	113
CHECK	CONTROL	SECTION	JOB	
	0043	08	088	

PLOT DRIVER: pdf-bw.pltcfg
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FILE: US 287_CD 02.dgn

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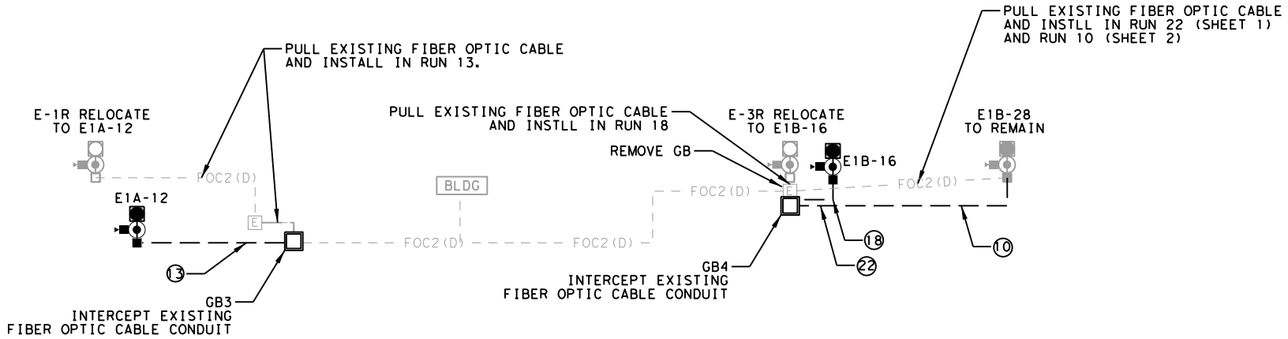
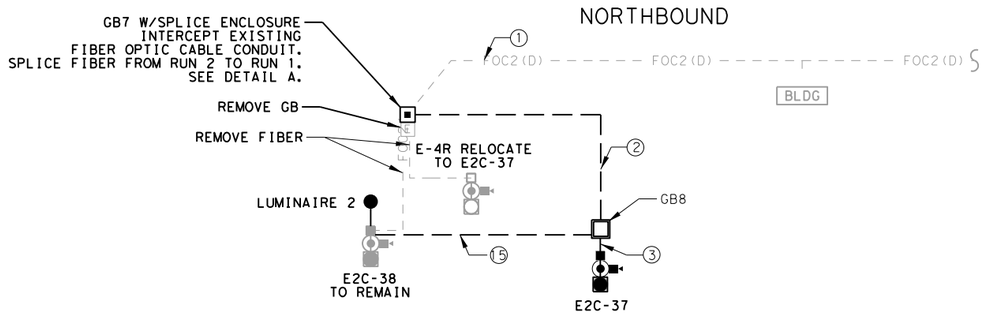
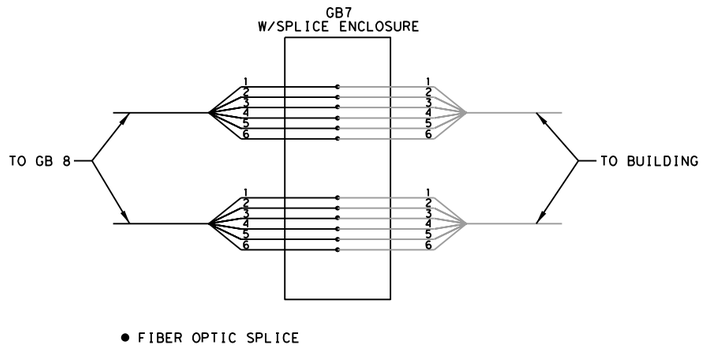
SOUTHBOUND



NORTHBOUND





● FIBER OPTIC SPLICE

DETAIL A

LEGEND

- EXIST ILL ASSEMBLY TO REMAIN
- PROPOSED AESTHETIC SITE LIGHTING FIXTURE AND POLE
- EXIST ILL ASSM TO BE RELOCATED
- RELOCATED ILL ASSMEMBLY
- EXIST ELECTRICAL SERVICE
- EXIST ELECTRICAL PANEL
- E EXIST GROUND BOX
- PROPOSED ILLUM GROUND BOX (TY A)
- PROPOSED ITS GROUND BOX (TY 1)
- PROPOSED ITS GROUND BOX (TY 2)
- EXISTING CCTV
- RELOCATED CCTV
- FOC EXISTING FIBER CONDUIT
- E1 EXISTING ELEC CONDUIT
- PROPOSED CONDUIT
- (#) CONDUIT RUN NUMBER
- EXIST ROW

POLE DESIGNATION
EXISTING E1B-2R
RELOCATE
POLE OR LUMINAIRE NO.
CIRCUIT NO.
SERVICE NO.

DRAWING NOT TO SCALE

STATE OF TEXAS
LACEY L. HEBERT
134840
LICENSED
PROFESSIONAL ENGINEER
12/12/2023
Lacey L Hebert, PE

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11801 DOMAIN BLVD STE 500
AUSTIN, TEXAS 78758
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TBPE REG: NO. F-474

US 287 REST AREAS
ITS
COMMUNICATION DIAGRAMS

SCALE: 1"=100' SHEET 1 OF 2

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2024(778)TP		US287
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	WFS	WICHITA	
CHECK	CONTROL	SECTION	JOB	114
	0043	08	088	

PLOT DRIVER: pdf-bw.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_COMM 01.dgn

100% SUBMITTAL
DATE: 12/12/2023 TIME: 4:08:43 PM

Panelboard A (SOUTHBOUND)

42000 AIC Rating
X New
Existing

120/240 Volt, 1 Phase, 3 Wire 1 Section Type 1 - Nema Rating			Mains Type: MCB	300 A MCB 400 A BUS (Copper)					Lugs: -		Mounting X Surface Flush	
Note	Load (VA)	Type	Description	WIRE	CB	CKT	CB	WIRE	Description	Type	Load (VA)	Note
	670 VA	M	FCU-2S	12	20 A	1 2	20 A	12	RCPT - EXTERIOR	R	720 VA	
	600 VA	M	FCU-1S	12	20 A	3 4 5 6	35 A	8	HP-1S	M	4560 VA	
	5784 VA	M	EUH-1S	10	30 A	7 8 9 10 11 12	35 A 20 A	8 12	HP-3S EF-2S	M R	5520 VA 100 VA	
	2000 VA	M	EWH-2S	10	25 A	13 14 15 16	35 A	8	HP-2S	M	5520 VA	
	225 VA	M	EF-1S	12	20 A	17 18	20 A	12	RCPT - RECEPTION / LOBBY 118	R	360 VA	
	100 VA	L	VALVE SENSORS - RESTROOM 114	12	20 A	19 20	20 A	12	RCPT - PICNIC ARBOR	R	180 VA	
	1500 VA	R	RCPT - VENDING 117	12	20 A	21 22	20 A	12	RCPT - PICNIC ARBOR	R	180 VA	
	1500 VA	R	RCPT - VENDING 117	12	20 A	23 24	20 A	12	LTS - RESTROOMS	Lighting; L	882 VA	
	1941 VA	Lighting; L	LTS - EXTERIOR	12	20 A	25 26	20 A	12	LTS - LOBBY / VENDING	Lighting	1271 VA	
	318 VA	L	LTS - RESTSTOP EAST	12	20 A	27 28	20 A	12	LTS - PAVILION	Lighting	24 VA	
	100 VA	L	LTS - SITE	12	20 A	29 30	20 A	12	LTS - MAINTENANCE 200	Other; L	114 VA	
	180 VA	R	RCPT - SECURITY 112	12	20 A	31 32	20 A	12	RCPT - SHELTER 114	R	360 VA	
	180 VA	R	RCPT - SECURITY 112	12	20 A	33 34	20 A	12	RCPT - VENDING 117	R	1500 VA	
	180 VA	R	RCPT - SECURITY 112	12	20 A	35 36	20 A	12	RCPT - VENDING 117	R	1500 VA	
	180 VA	R	RCPT - SECURITY 112	12	20 A	37 38	20 A	12	DUMP STATION	L	1000 VA	
	100 VA	L	HAND DRYER - RESTROOM 114	12	20 A	39 40	20 A	12	RCPT - MAINTENANCE 113	R	540 VA	
	-	-	SPARE	-	20 A	41 42	20 A	12	RCPT - YARD 200	R	180 VA	
	-	-	SPARE	-	20 A	43 44	20 A	-	LTS - PAVILION	-	-	
	1246 VA	**Lighting; L**	**LTS - Proposed Circuit "A"**	**6**	**60 A**	45 46	20 A	-	SPARE	-	-	
	1389 VA	**Lighting; L**	**LTS - Proposed Circuit "B"**	**6**	**60 A**	47 48	20 A	-	SPARE	-	-	
	-	-	SPARE	-	20 A	49 50	20 A	-	SPARE	-	-	
	-	-	SPARE	-	20 A	51 52	100 A	3	PANEL A2	R; M	13330 VA	
	-	-	SPARE	-	20 A	53 54						

N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity	N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity
220.44	(R) Receptable	14060 VA	85.56%	12030 VA	210.20(a)	(L) Lighting	1839 VA	125.00%	2299 VA
220.56	(K) Kitchen					(EL) Ext. Ltg.			
220.60	(C) Cooling			0 VA	620.14	(E) Elevators			
220.60	(H) Heating			0 VA		(WH) Wat. Htr.			
220.60	(F) Fans				220.5	(MT) Lrg. Motor			
	(M) Misc.	33789 VA	100.00%	33789 VA		(SP) Sub Pnl.			

Total Connected Load: 53399 VA VA = 222 A
Total Load (Diversified): 52756 VA VA = 220 A

Location of Panel: SECURITY STORAGE 112

NOTES:

1. EXISTING PANELBOARD AS SHOWN IN GRAY WAS OBTAINED FROM THE WICHITA COUNTY SAFETY REST AREA AS-BUILTS DATED 2019 AND HAS BEEN PROVIDED FOR INFORMATION ONLY. CONTRACTOR SHALL FIELD VERIFY EXISTING PANELBOARD USE AND CAPCITY PRIOR TO CONSTRUCTION.
2. ONLY ITEMS SHOWN IN BLACK ARE PROPOSED.
3. CONTRACTOR SHALL REPLACE EXISTING 20A BREAKERS FOR PROPOSED CIRCUITS "A" AND "B" WITH 60A BREAKERS. THIS WORK WILL BE PAID FOR WITH ITEM 6084 6001 "MODIFY EXISTING ELECTRICAL SERVICE."
4. CONTRACTOR IS RESPONSIBLE FOR ENSURING ONLY PROPOSED CIRCUITS ON PANELBOARD ARE DISTURBED AND EXISTING CIRCUITS REMAIN OPERATIONAL.

STATE OF TEXAS
LACEY L. HEBERT
134840
LICENSED
PROFESSIONAL ENGINEER

Lacey L Hebert, PE 12/12/2023

ONLY THE ADDITION OF PROPOSED CIRCUITS HAS BEEN REVIEWED AND APPROVED BY ME.

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TBPE REG: NO. F-474

US 287 REST AREAS

SOUTHBOUND PANEL SCHEDULE

SCALE: 1"=100' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2024(778)TP		US287
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	WFS	WICHITA	115
CHECK	CONTROL	SECTION	JOB	
	0043	08	088	

PLOT DRIVER: pdf-bw.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287-SB PANEL SCHEDULE.dgn

100% SUBMITTAL
DATE: 12/12/2023 TIME: 4:08:58 PM

Panelboard A (NORTHBOUND)

42000 AIC Rating
X New
Existing

120/240 Volt, 1 Phase, 3 Wire
1 Section
Type 1 - Nema Rating

Mains Type:
MCB

300 A MCB
400 A BUS (Copper)

Lugs:
-

Mounting
X Surface
Flush

Note	Load (VA)	Type	Description	WIRE	CB	CKT		CB	WIRE	Description	Type	Load (VA)	Note
	670 VA	M	FCU-2	12	20 A	1	2	20 A	12	RCPT - EXTERIOR	R	720 VA	
						3	4	35 A	8	HP-1	M	4560 VA	
	600 VA	M	FCU-1	12	20 A	5	6						
						7	8	35 A	8	HP-3	M	5520 VA	
	5784 VA	M	EUH-1	10	30 A	9	10						
						11	12	20 A	12	EF-2	M	225 VA	
	2000 VA	M	EWH-2	10	25 A	13	14	25 A	10	HP-2	R	3600 VA	
						15	16						
	225 VA	M	EF-1	12	20 A	17	18	20 A	12	RCPT - RECEPTION / LOBBY 118	R	360 VA	
	100 VA	L	VALVE SENSORS - RESTROOM 114	12	20 A	19	20	20 A	12	RCPT - PICNIC ARBOR	R	180 VA	
	1500 VA	R	RCPT - VENDING 117	12	20 A	21	22	20 A	12	RCPT - PICNIC ARBOR	R	180 VA	
	1500 VA	R	RCPT - VENDING 117	12	20 A	23	24	20 A	12	LTS - RESTROOMS	Lighting; L	882 VA	
	1941 VA	Lighting; L	LTS - EXTERIOR	12	20 A	25	26	20 A	12	LTS - LOBBY / VENDING	Lighting	1271 VA	
	318 VA	L	LTS - RESTSTOP EAST	12	20 A	27	28	20 A	12	LTS - PAVILION	Lighting	24 VA	
	100 VA	L	LTS - SITE	12	20 A	29	30	20 A	12	LTS - MAINTENANCE 200	Other; L	114 VA	
	180 VA	R	RCPT - SECURITY 112	12	20 A	31	32	20 A	12	RCPT - SHELTER 114	R	360 VA	
	180 VA	R	RCPT - SECURITY 112	12	20 A	33	34	20 A	12	RCPT - VENDING 117	R	1500 VA	
	180 VA	R	RCPT - SECURITY 112	12	20 A	35	36	20 A	12	RCPT - VENDING 117	R	1500 VA	
	180 VA	R	RCPT - SECURITY 112	12	20 A	37	38	20 A	12	DUMP STATION	L	1000 VA	
	100 VA	L	HAND DRYER - RESTROOM 114	12	20 A	39	40	20 A	12	RCPT - MAINTENANCE 113	R	540 VA	
	-	-	SPARE	-	20 A	41	42	20 A	12	RCPT - YARD 200	R	180 VA	
	-	-	SPARE	-	20 A	43	44	20 A	12	LTS - PAVILION	L	100 VA	
	1709 VA	**Lighting; L**	**LTS - Proposed Circuit "C"**	**6**	**60 A**	45	46	20 A	-	SPARE	-	-	
	-	-	SPARE	-	20 A	47	48	20 A	-	SPARE	-	-	
	-	-	SPARE	-	20 A	49	50	20 A	-	SPARE	-	-	
	-	-	SPARE	-	20 A	51	52	100 A	3	PANEL A2	L; R; M	13330 VA	
	-	-	SPARE	-	20 A	53	54						

N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity	N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity
220.44	(R) Receptable	12860 VA	88.88%	11430 VA	210.20(a)	(L) Lighting	3039 VA	125.00%	3799 VA
220.56	(K) Kitchen					(EL) Ext. Ltg.			
220.60	(C) Cooling			0 VA	620.14	(E) Elevators			
220.60	(H) Heating			0 VA		(WH) Wat. Htr.			
220.60	(F) Fans				220.5	(MT) Lrg. Motor			
	(M) Misc.	32094 VA	100.00%	32094 VA		(SP) Sub Pnl.			

Total Connected Load: 51704 VA VA = 215 A
Total Load (Diversified): 51961 VA VA = 217 A

Location of Panel: SECURITY STORAGE 112

NOTES:

1. EXISTING PANELBOARD AS SHOWN IN GRAY WAS OBTAINED FROM THE WICHITA COUNTY SAFETY REST AREA AS-BUILTS DATED 2019 AND HAS BEEN PROVIDED FOR INFORMATION ONLY. CONTRACTOR SHALL FIELD VERIFY EXISTING PANELBOARD USE AND CAPCITY PRIOR TO CONSTRUCTION.
2. ONLY ITEMS SHOWN IN BLACK ARE PROPOSED.
3. CONTRACTOR SHALL REPLACE EXISTING 20A BREAKER FOR PROPOSED CIRCUIT "C" WITH A 60A BREAKER. THIS WORK WILL BE PAID FOR WITH ITEM 6084 6001 "MODIFY EXISTING ELECTRICAL SERVICE."
4. CONTRACTOR IS RESPONSIBLE FOR ENSURING ONLY PROPOSED CIRCUITS ON PANELBOARD ARE DISTRUBED AND EXISTING CIRCUITS REMAIN OPERATIONAL.

STATE OF TEXAS
LACEY L. HEBERT
134840
LICENSED
PROFESSIONAL ENGINEER

Lacey L Hebert, PE 12/12/2023

ONLY THE ADDITION OF PROPOSED CIRCUITS HAS BEEN REVIEWED AND APPROVED BY ME.

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TBPE REG: NO. F-474

US 287 REST AREAS

NORTHBOUND PANEL SCHEDULE

SCALE: 1"=100' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	STP 2024(778)TP		US287
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	WFS	WICHITA	
CHECK	CONTROL	SECTION	JOB	116
	0043	08	088	

PLOT DRIVER: pdf-bw.pltcfg
PEN TABLE: US287_pentable.tbl
FILE: US 287_NB PANEL SCHEDULE.dgn

DATE:
FILE:

GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.

2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.

3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is ½ in. or less in diameter.

4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.

5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.

6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.

2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.

3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.

5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.

6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.

7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.

9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.

10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.

3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.

4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.

5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."

6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.

7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.

8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.

9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.

10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.

11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.

12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).

13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.

14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

FILE: ed1-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	08	088	US287
	DIST	COUNTY		SHEET NO.
	WFS	WICHITA		117

71A

ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS)11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.

2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.

3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.

4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.

2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.

3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.

4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.

5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.

6. Support conductors in illumination poles with a J-hook at the top of the pole.

7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.

8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.

9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.

10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.

11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.

12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.

2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.

3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.

4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.

5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.

2. Do not place ground rods in the same drilled hole as a timber pole.

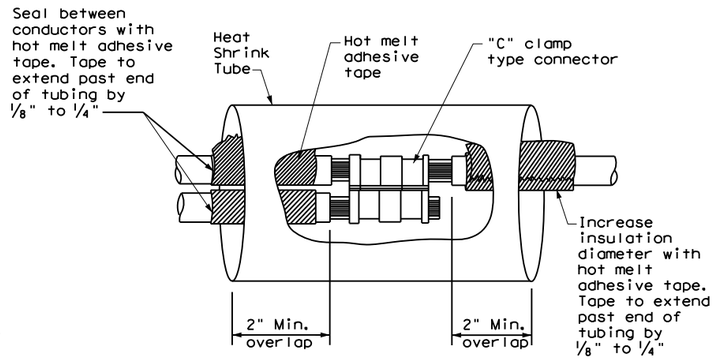
3. Install ground rods so the imprinted part number is at the upper end of the rod.

4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.

5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.

7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
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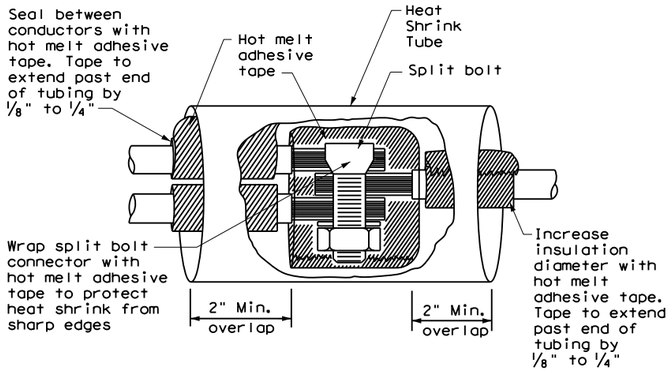
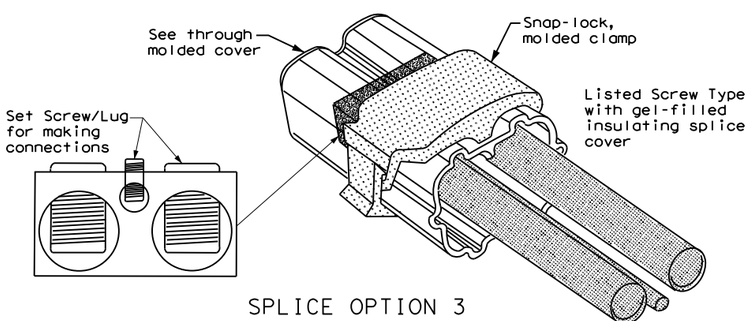


SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

FILE: ed3-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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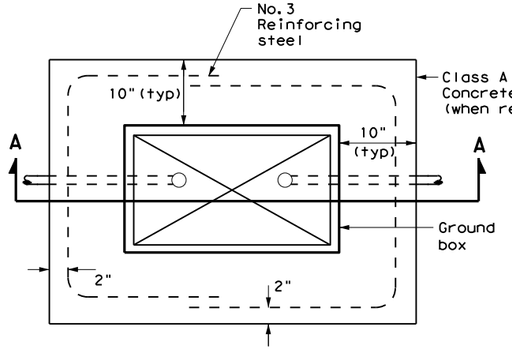
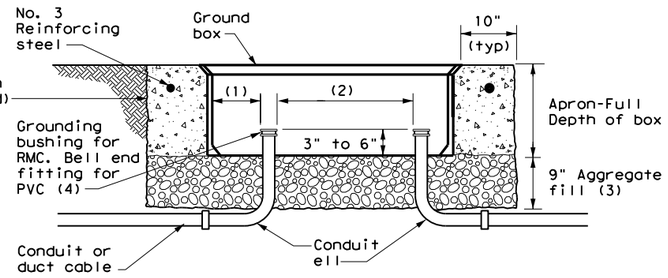


PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

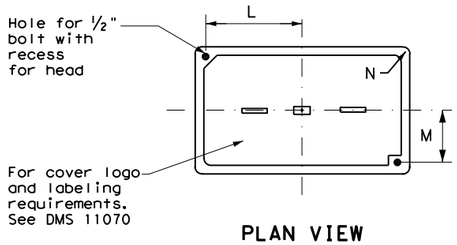
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

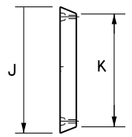
(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

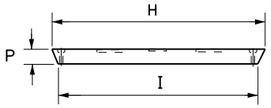
GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



PLAN VIEW



END



SIDE

GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."

2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.

3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.

4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.

2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.

3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.

4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.

5. Temporarily seal all conduits in the ground box until conductors are installed.

6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.

7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.

8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.

9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.

10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.

11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
GROUND BOXES

ED(4)-14

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DUCT CABLE & HDPE CONDUIT NOTES

1. Provide duct cable in accordance with Departmental Material Specification (DMS) 11060 "Duct Cable" and Item 622 "Duct Cable." Provide duct cable as listed on the Material Producer List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 622.

2. Provide High-Density Polyethylene (HDPE) conduit in accordance with DMS 11060 and Item 618, "Conduit." Provide HDPE as listed on the MPL on the Department web site under "Roadway Illumination and Electrical Supplies," Item 618.

3. Supply duct cable with a minimum 2 in. diameter, unless otherwise shown in the plans. Provide duct cable and HDPE conduit as shown by descriptive code or on the plans. Bend duct cable and HDPE conduit as recommended by the manufacturer, with a minimum bending radius of 26 in. for 2 in. duct. Follow manufacturers' recommendations when handling duct cable and HDPE conduit reels and during installation of duct cable and HDPE conduit.

4. Do not splice conductors within duct cable or HDPE conduit. Couple duct cable and HDPE entering a ground box or foundation to a PVC elbow. When galvanized steel RMC elbows are called for in the plans and any portion of the RMC elbow is buried less than 18" from possible contact, ground the RMC elbow.

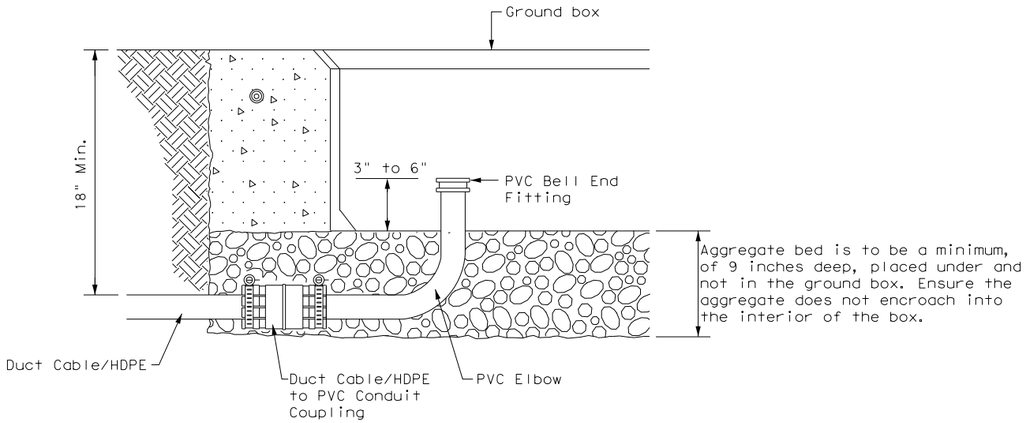
5. Furnish and install duct cable with factory installed conductors, sized as shown in the plans and as required by the National Electrical Code (NEC). The NEC contains specific requirements for duct cable in Article, "Nonmetallic Underground Conduit with Conductors: Type NUCC."

6. When conduit casing is called for in the plans, extend duct cable or HDPE conduit through the conduit casing in one continuous length without connection to the casing.

7. Seal the ends of duct cable or HDPE conduit with duct seal, expandable foam, or other approved method after completing the pull tests required by Item 622.

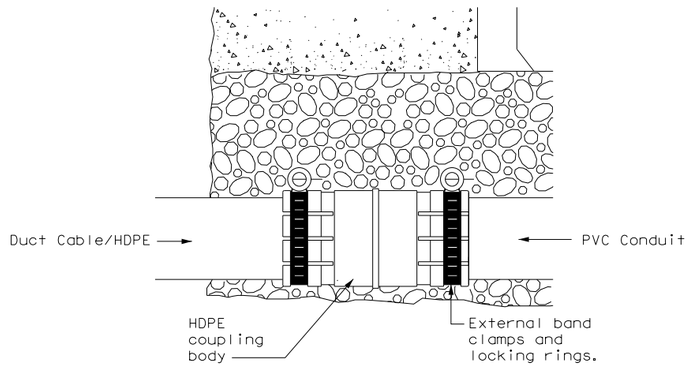
8. Provide minimum cover of 24 in. under roadways, 18 in. in other locations, or as shown on the plans.

9. Furnish and install listed fittings to couple duct cable or HDPE conduit to other types of conduit. Duct cable and HDPE conduit may be field-threaded and spliced with PVC or RMC threaded couplings; connected with listed tie-wrap fittings; connected using listed coupling made of HDPE with stainless steel external banding clamps and locking rings; connected with approved electrofusion conduit couplings; or connected using an approved chemical fusion method using an epoxy or adhesive specifically designed for HDPE couplings and connectors all installed in accordance with their manufacturer's instructions. Do not use PVC glue on HDPE. Do not use water pipe fittings, or connect conduit with heat shrink tubing.

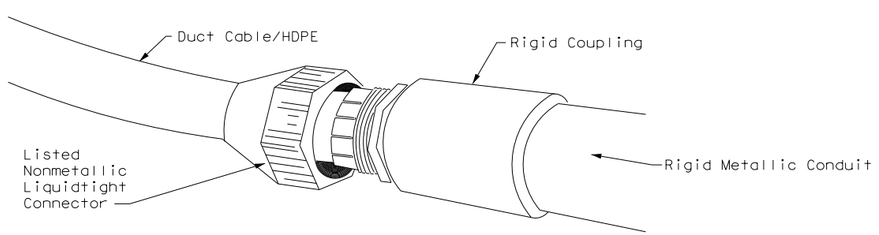


DUCT CABLE/HDPE AT GROUND BOX

When the upper end of an RMC Ell does not enter the ground box, it may be extended with a SCH-40 PVC conduit nipple and bell end, provided there is a minimum of 18" of cover over all parts of the elbow. If not, a rigid extension and ground bushing is required.

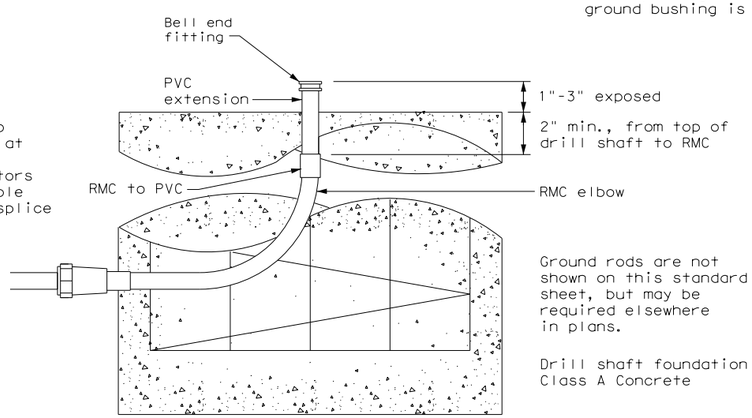


DUCT CABLE/HDPE TO PVC



DUCT CABLE/HDPE TO RMC

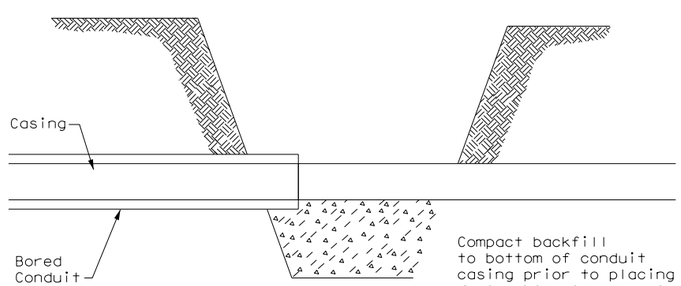
Couple duct to conduit elbow at foundations. Ensure conductors extend into pole base. Do not splice conductors in conduit.



Ground rods are not shown on this standard sheet, but may be required elsewhere in plans.

Drill shaft foundation Class A Concrete

DUCT CABLE / HDPE AT FOUNDATION



Compact backfill to bottom of conduit casing prior to placing duct cable, to prevent kinking.

BORE PIT DETAIL

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS DUCT CABLE/ HDPE CONDUIT

ED(11)-14

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	WFS	WICHITA		120

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ROADWAY ILLUMINATION ASSEMBLY NOTES

1. Details apply to roadway lighting installations bid or referenced under Item 610, "Roadway Illumination Assemblies." Provide, furnish, and install all other materials not shown on the plans which may be necessary for complete and proper construction. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the State such warranties or guarantees.

2. The locations of poles and fixtures may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.

3. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC),TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA),and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association, Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection.

4. Provide Roadway Illumination Light Fixtures as per TxDOT Departmental Material Specification (DMS) 11010, Item 610, and as shown on the Material Producers List (MPL) for Roadway Illumination and Electrical Supplies.

5. Fabricate steel roadway illumination poles in accordance with Roadway Illumination Poles (RIP) standards and Item 610. Poles fabricated according to RIP standards do not require shop drawing submittals.

   a. Alternate designs to RIP standards or the use of aluminum to fabricate poles will require the submission of shop drawings electronically. For instructions on submitting shop drawings electronically see "Guide to Electronic Shop Drawing Submittal" on the TxDOT web site.

   b. Limitations on use of the RIP standard: The RIP standard details were developed for installations in locations where the 3-second gust basic maximum wind speed is 110 mph, and where the elevation of the base of the pole is less than (i.e. not more than) 25′ above the elevation of the surrounding terrain, in accordance with the "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," 6th Edition (2013) of the AASHTO Design Specifications. For poles to be installed in regions where the maximum basic wind speed exceeds 110 mph or to be mounted more than 25′ above the surrounding terrain, provide poles meeting the following requirements:

      i. Submittals. Following the electronic shop drawing submittal process (see Guide to Electronic Shop Drawing Submittal on the TxDOT web site), submit to the Engineer for approval fabrication drawings and calculations for the poles, sealed by a Texas licensed professional engineer (P.E.).

      ii. Luminaire Structural Support Requirements. Provide light poles, arms, and anchor bolt assemblies with a 25 year design life to safely resist dead loads, ice loads and the required basic wind speeds at the location of installation in accordance with the 6th edition (2013) of the AASHTO Design Specifications. For transformer base poles, include transformer base and connecting hardware in calculations and shop drawing submittals. Structurally test all transformer bases to resist the theoretical plastic moment capacity of the pole. Submit certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished with the shop drawings. Show breakaway base model number, manufacturer's name, and logo on shop drawings. Include on manufacturer's shop drawings the ASTM designations for all materials to be used.

6. For both transformer and shoe-base type illumination poles, provide and install double-pole breakaway fuse holders as specified by DMS-11040. Breakaway fuse holders are listed on the MPL for Roadway Illumination and Electrical Supplies under Items 610 & 620. Provide 10 amp time delay fuses for breakaway connectors in light poles, or inside the light fixture for underpass luminaires. In each pole, connect luminaires to the breakaway connector with continuous stranded 12 AWG copper conductors as listed on the MPL. Bond all equipment grounding conductors together and to the ground lug in the transformer base or hand hole.

7. Tighten anchor bolts for shoe base, concrete traffic barrier base, and bridge mount roadway illumination poles, in accordance with Item 449.

8. Install T-Base with following procedure:

   a. Anchor Bolt Tightening.

      i. Coat the threads of the anchor bolts with electrically conductive lubricant.

      ii. Place the T-base over the anchor bolts. Foundation must be level and flat. The maximum permissible gap under any one corner of the t-base is 1/8" before nuts are tightened.

      iii. Coat the bearing surfaces of the nuts and washers with electrically conductive lubricant. Install (1) 1/2" hold down washer, (1) lock washer, and (1) nut on each anchor bolt. Turn the nuts onto the bolts so that each is hand-tight against the washer.

      iv. Using a torque wrench, tighten each nut to 150 ft-lb. Uniform contact is required between the foundation and the T-base in the corner regions of the T-base, and all corner gaps must be closed after applying torque. If a gap still exists after torquing to 150 ft-lbs, continue torquing each bolt incrementally until gap is closed or maximum allowable torque of 250 ft. pound is reached, whichever comes first. If 250 ft-lbs is not enough to close the gap the foundation must be leveled. Gaps along the straight sides of the T-bases and the foundation are permissible. Ensure that no high point of contact occurs between the straight sides of the T-base and the foundation.

      v. Check top of T-base for level. If not level then foundation must be leveled.

   b. Top Bolt Procedure

      i. Erect pole over T-base with crane. Coat bolts, nuts, washers, and lock washers with electrically conductive lubricant.

      ii. Install bolts and 1/2" connecting washers from the inside of the T-base, thread up through the pole base. Install flat washers, lock washers and nuts snug tight according to Item 447, "Structural Bolting."

      iii. Tighten each nut to 150 ft-lb. using a torque wrench.

   c. Level and Plumb

      i. Ensure pole is plumb and mast arm is perpendicular to the roadway according to plans to within 5 degrees.

9. Construct luminaire pole foundations in accordance with Item 416, "Drilled Shaft Foundations," and TxDOT standard sheet RID(2).

10. Provide and install underpass luminaires in accordance with Item 610, DMS-11010, and TxDOT standard sheet RID(3). Typical luminaire size for underpass luminaires is 150W HPS or 150W EQ LED.

11. Mount luminaires on arms level as shown by the luminaire level indicator.

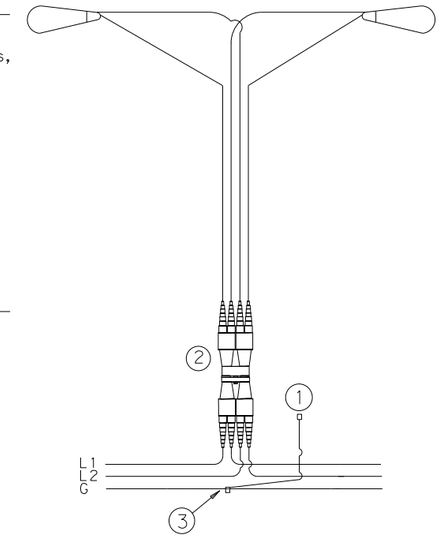
12. Orient luminaires perpendicular to the roadway intended to be lit unless otherwise shown on the plans.

Wiring Diagram Notes:

(1) Use 1/2 in.-13 UNC threaded, copper or tin-plated copper, pole bonding connector, sized appropriately for conductors, bonded to T-base, or use ground lug in handhole as available.

(2) Use pre-qualified two-pole breakaway connectors for all luminaire pole installations. For luminaires fed by a circuit with a neutral conductor, use double pole breakaway connectors with the neutral side unfused and marked white.

(3) Split Bolt or other connector.



L1,L2 = Hot Conductors
G = Grounding Conductor

TYPICAL WIRING DIAGRAM

LUMINAIRES SERVED AT 480V ON 240/480 VOLT SERVICE OR LUMINAIRES SERVED AT 240V FOR 120/240 VOLT SERVICE.

Decorative LED Lighting Notes:

1. LED Drivers in Remote Outdoor enclosures (for drivers that do not include an enclosure as part of a factory assembly):

   a. Provide NEMA 3R outdoor enclosure or as approved.

   b. Install enclosure at least 12" above ground or other horizontal surface. Mount vertically or on ceiling, and avoid direct sun where possible.

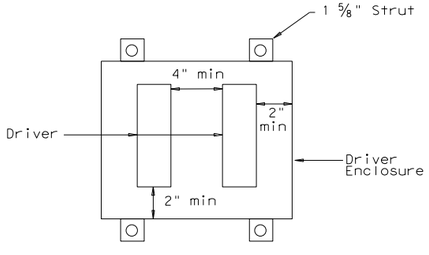
   c. Install drivers with at least 2 inches of space from enclosure walls.

   d. For multiple drivers in an enclosure, provide at least 4 inches side to side and 1 inch end to end from other drivers or electronic equipment

   e. For drivers mounted on back wall of enclosure, mount enclosure on 1 5/8" strut or other standoff to dissipate heat, or mount driver to side of the enclosure or to the metal cover.

   f. Provide remote drivers with a maximum of 100 watts

   g. Provide drivers with documentation of 100,000 hr lifetime at Tcase of 65C or higher.



Driver Spacing In Remote Enclosure

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS

RID(1)-20

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12-20	WFS	WICHITA		121

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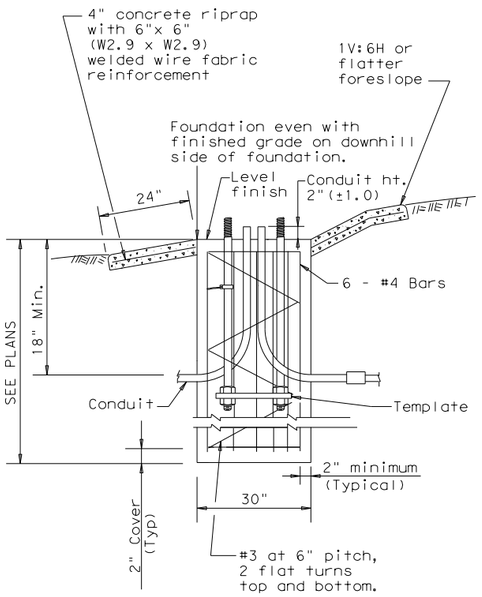
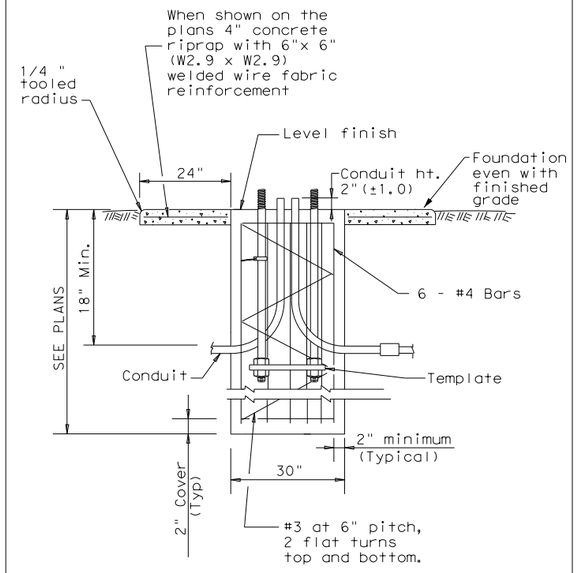


SECTION A-A
SHOWING SLOPED GRADE



SECTION A-A
SHOWING CONSTANT GRADE

TABLE 1

ANCHOR BOLTS

POLE MOUNTING HEIGHT	BOLT CIRCLE		ANCHOR BOLT SIZE
	Shoe Base	T-Base	
<40 ft.	13 in.	14 in.	1in. x 30in.
40-50 ft.	15 in.	17 ¼in.	1 ¼in. x 30in.

TABLE 2

RECOMMENDED FOUNDATION LENGTHS (See note 1)

MOUNTING HEIGHT	TEXAS CONE PENETROMETER N Blows/ft		
	10	15	40
≤20 ft.	6′	6′	6′
>20 ft. to 30 ft.	8′	6′	6′
>30 ft. to 40 ft.	8′	8′	6′
>40 ft. to 50 ft.	10′	8′	6′

TABLE 3

PAY QUANTITY OF RIPRAP PER FOUNDATION (Install only when shown on the plans)

Foundation Diameter	RIPRAP DIAMETER	RIPRAP (CONC) (CL B)
30 in.	78 in.	0.35 CY

GENERAL NOTES:

1. "Recommended Foundation Lengths" table is for information purposes only. Foundation lengths shall be as shown on the plans, or as directed by the Engineer. Foundations will be paid for under Item 416, "Drilled Shaft Foundations," unless otherwise shown on the plans.
2. Erect roadway illumination assembly poles plumb and true. Form and level the top 6" of the foundation so the pole will be plumb. Use leveling nuts to plumb shoe base poles. Do not use shims or leveling nuts under transformer bases. Do not grout between baseplate and the foundation.
3. Ensure Class 2A and 2B fit for anchor bolts and nuts. Tap and chase nuts after galvanizing. Anchor bolt body with rolled threads need not be full size.
4. Use appropriate class of concrete as specified in Items 416 and 432. Concrete for riprap may be upgraded to Class C at no extra cost to the Department.
5. Place riprap around the foundation when called for elsewhere in the plans. Riprap will be paid for under Item 432.
6. Locate breakaway roadway illumination assemblies as shown in the placement table, unless otherwise dimensioned on the plans. Protect non-breakaway illumination assemblies from vehicular impact (i.e. 2.5 ft. behind guard rail or mounted on traffic barrier), or located outside the clear zone, except that 2.5 ft. from curb face is minimum desired for light poles on city streets, 45 mph or less. See Roadway Design Manual for further information.
7. Use 4 hold down and 4 connecting washers on transformer base poles as recommended by the manufacturer and supplied with base.
8. Install a minimum of 2 conduits in each foundation. See lighting layout sheets for locations of foundations with more than 2 conduits. Cap unused conduits in foundations on both ends.
9. Conduit location in foundations is critical for breakaway devices. Place conduits 2 in. apart on centerline as shown.
10. Bond anchor bolt to rebar cage with #6 bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. The bonded steel in the foundation creates a concrete encased grounding electrode which replaces the ground rod.
11. Grade earthwork around T-base foundations even with the finished grade as shown in Section A-A to ensure proper function of the breakaway device. Use riprap on T-base foundations that are located on sloped grades, and as shown on the plans for level grades.

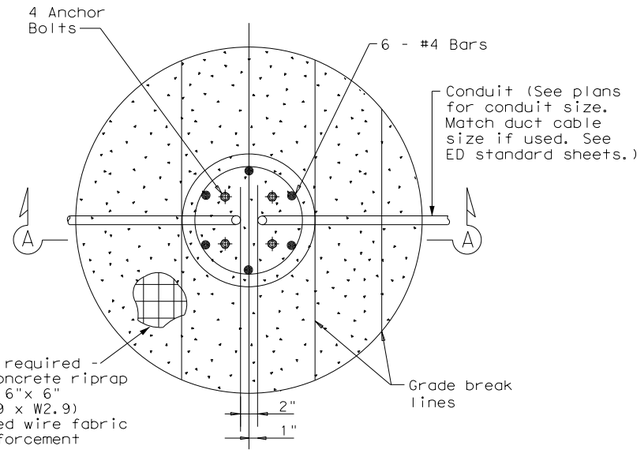
TABLE 4

BREAKAWAY POLE PLACEMENT (See note 6)

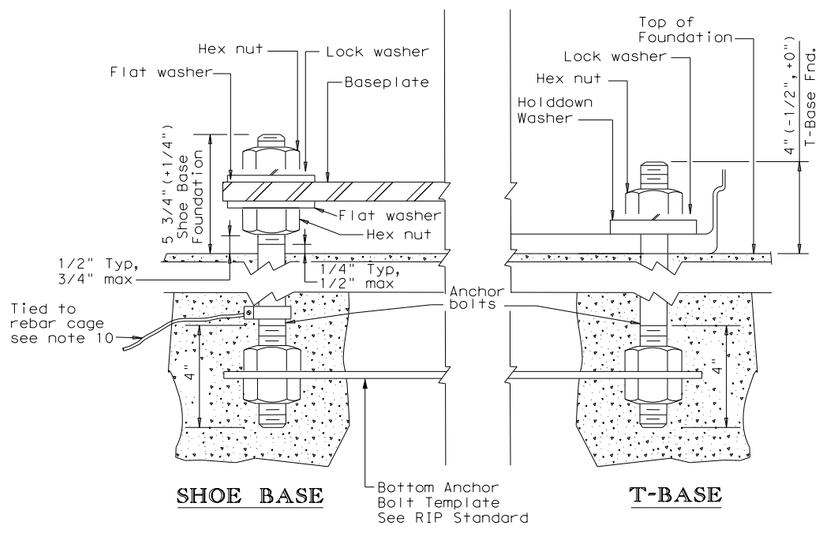
ROADWAY FUNCTIONAL CLASSIFICATION	** POLE OFFSET (DISTANCE TO FACE OF TRANSFORMER BASE)
Freeway Mainlanes (roadway with full control of access)	15 ft. (minimum and typical) from lane edge
All curbed, 45 mph or less design speed	2.5 ft. minimum (15 ft. desirable) from curb face
All others	10 ft. minimum*(15 ft. desirable) from lane edge

* or as close to ROW line as is practical

** provide 2/5 of the luminaire mounting height behind the pole for "falling area" to prevent encroachment on the other travel lanes. See design guidelines.



FOUNDATION DETAIL



ANCHOR BOLT DETAIL

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS
(RDWY ILLUM FOUNDATIONS)
RID(2)-20

FILE: rid2-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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1-11	DIST	COUNTY		SHEET NO.
7-17	WFS	WICHITA		122
12-20				

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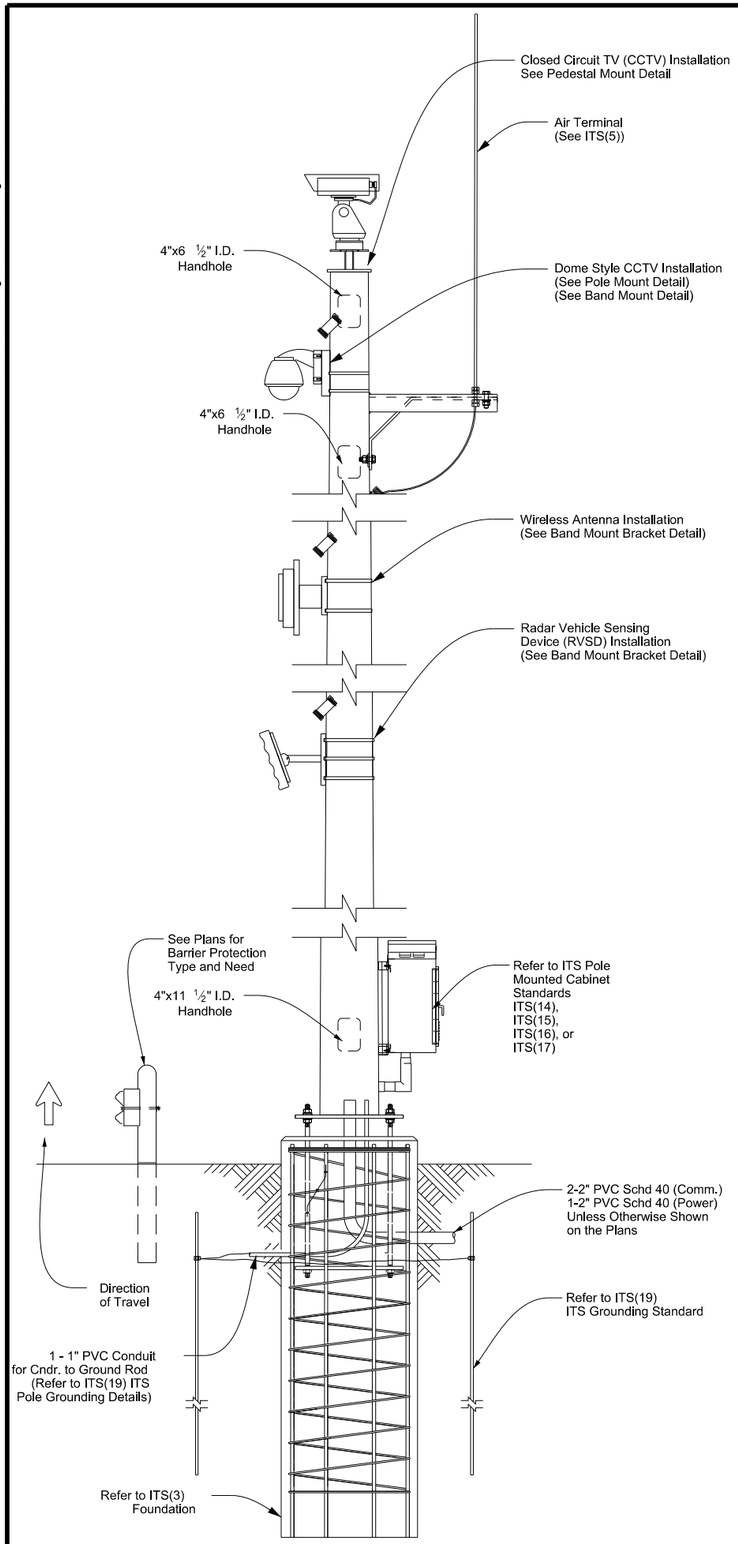
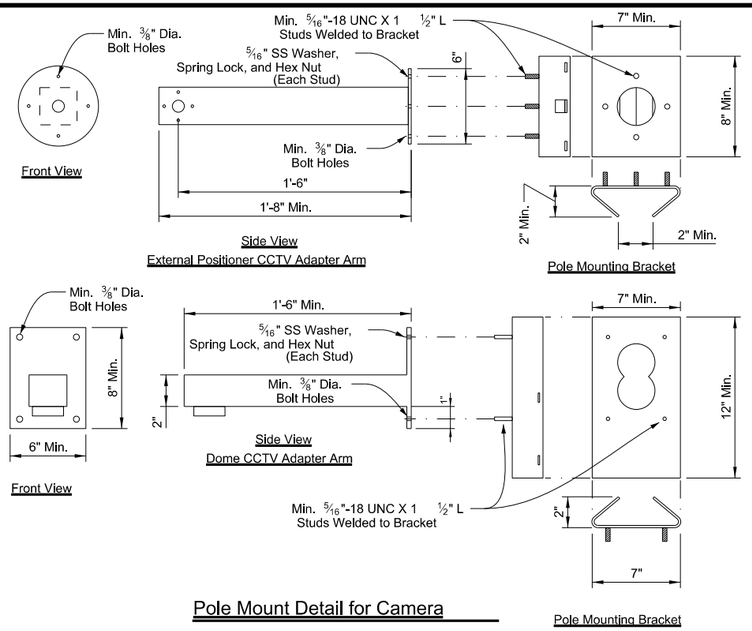
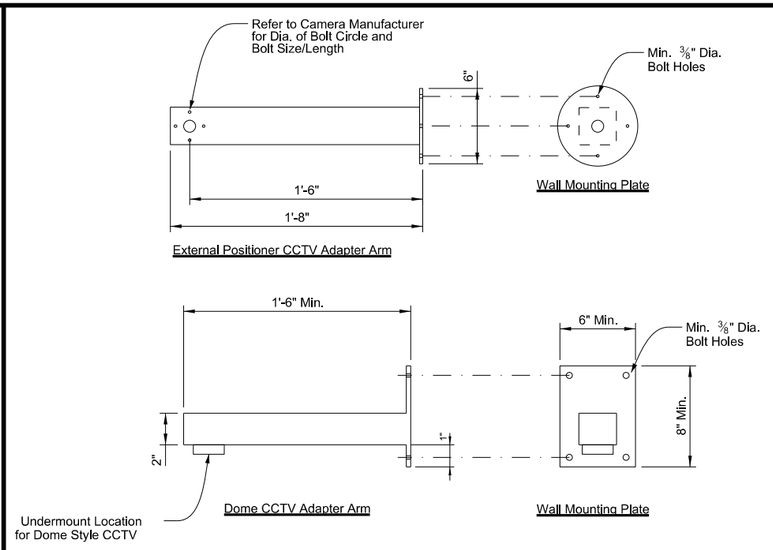


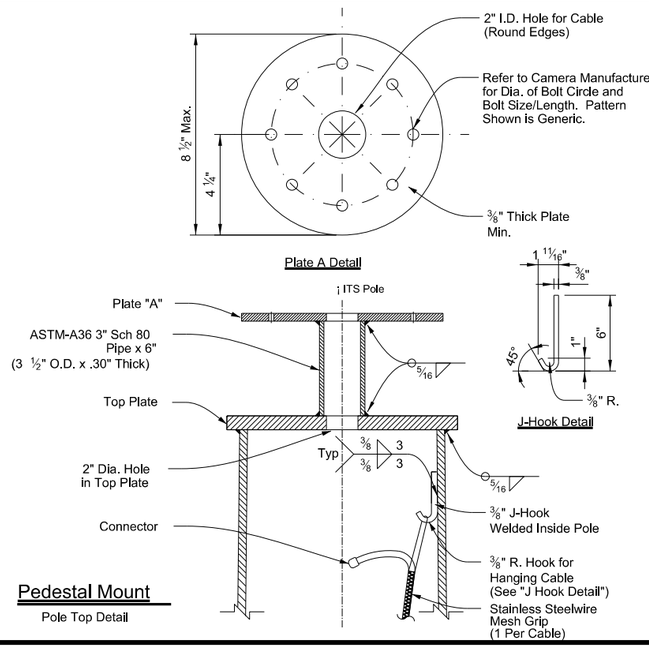
ITS Pole with Cabinet



Pole Mount Detail for Camera

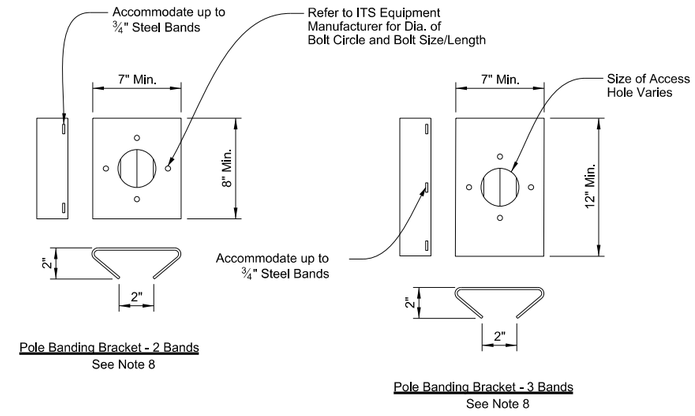


Wall Mount Detail



Pedestal Mount

Pole Top Detail



Band Mount Bracket Details

General Notes:

1. Designed according to Sixth Edition AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications.
2. Hang all cabling inside ITS pole structure with stainless steel wire mesh grips.
3. Bolt positioning in the pedestal top plate (Plate "A") for the pan/tilt base must be determined in the field per camera manufacturers recommendations. This will allow positioning of the camera to maximize coverage area. The Engineer will determine the camera's blind zone at each location.
4. Provide pedestal top plate and Plate "A" that conform to ASTM A36.
5. Make all welds conform to Item 441 and AWSD 1.1 (Structural Welding). Repair damaged galvanized coating per Item 445, "Galvanizing."
6. Galvanize parts in accordance with Item 445, "Galvanizing" unless otherwise noted.
7. The type of ITS equipment shown to be mounted to the ITS pole is intended to represent the most common ITS equipment applications and should not be treated as all inclusive. Other ITS equipment applications may exist that are project specific.
8. Mounting brackets are intended to be diagrammatic and for information only, and are not all inclusive. Contractor responsible for submitting mounting bracket design for approval by the Engineer prior to fabrication. Mounting bracket designed to support a maximum 35 Lbs. Off-the-shelf mounting brackets are acceptable and shall be submitted by shop drawing for approval.
9. Mounting heights to be determined in the field based on manufacturer recommendations.

Texas Department of Transportation

Traffic Operations Division Standard

ITS POLE EQUIPMENT MOUNTING DETAILS

ITS(6)-15

FILE: its(6)-15.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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	WFS	WICHITA		123

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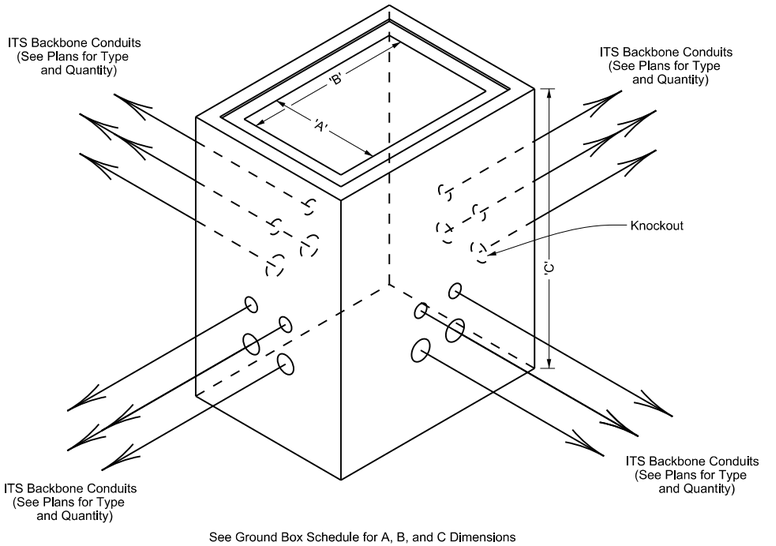
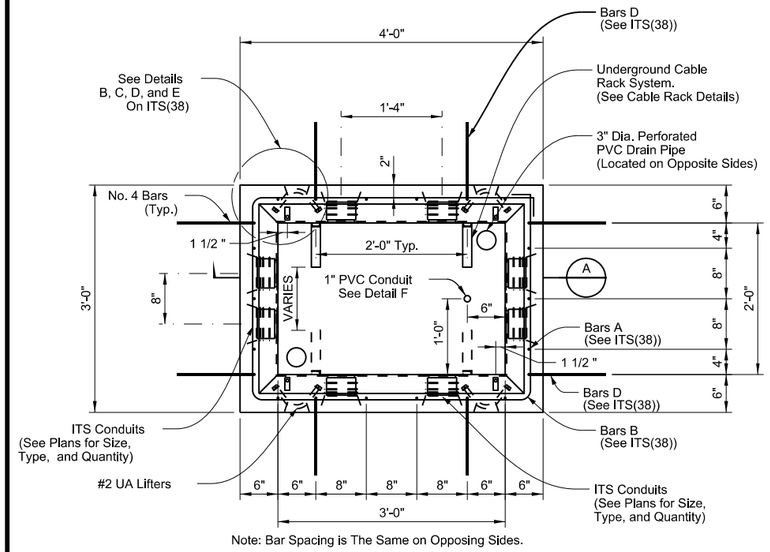


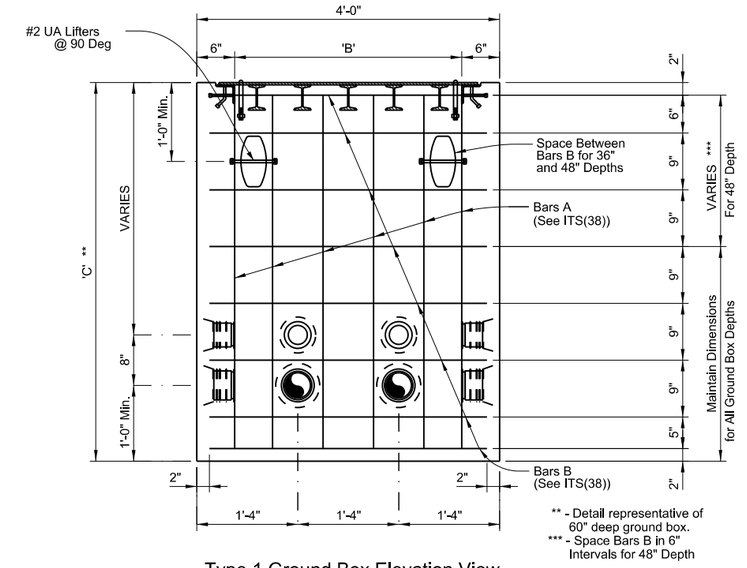
See Ground Box Schedule for A, B, and C Dimensions

Type 1 Ground Box Isometric View



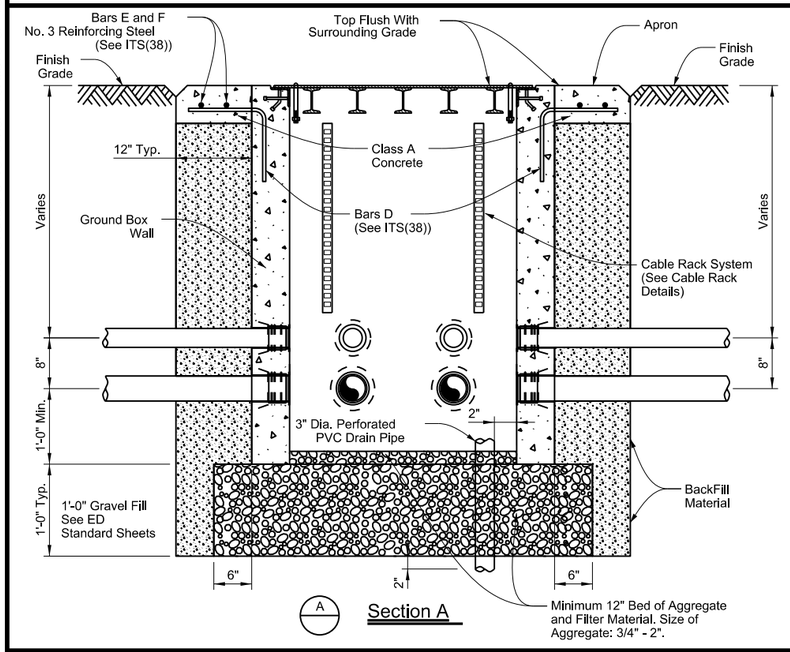
Note: Bar Spacing is The Same on Opposing Sides.

Type 1 Ground Box Plan View

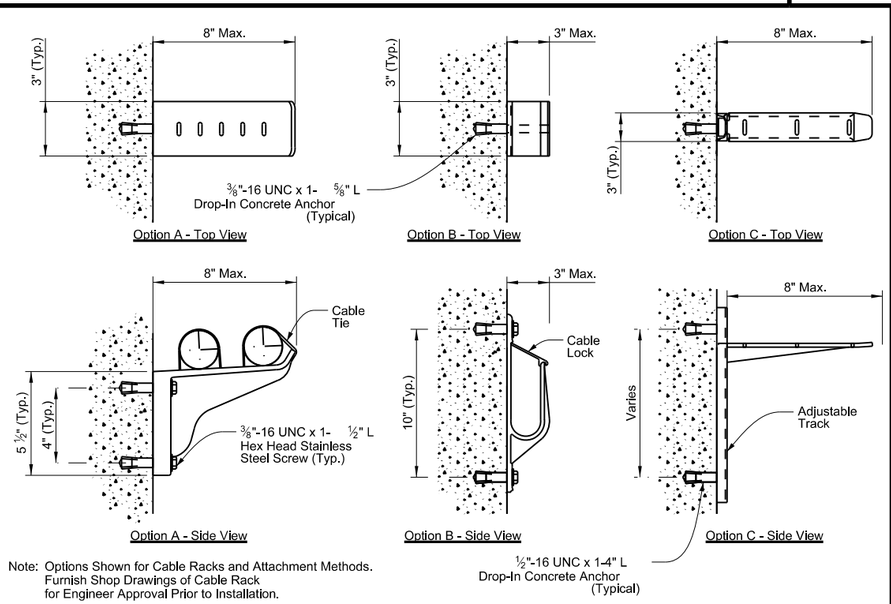


** - Detail representative of 60" deep ground box.
*** - Space Bars B in 6" Intervals for 48" Depth

Type 1 Ground Box Elevation View

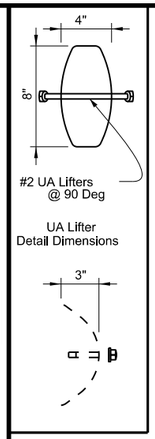


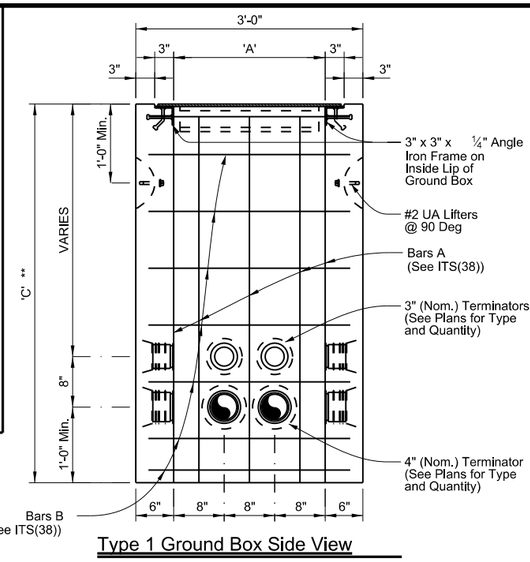
Section A



Note: Options Shown for Cable Racks and Attachment Methods. Furnish Shop Drawings of Cable Rack for Engineer Approval Prior to Installation.

Type 1 Cable Rack Details





Type 1 Ground Box Side View

** - Detail representative of 60" deep ground box.

SHEET 1 OF 2

General Notes:

1. Conduit entry points shown represent the standard configuration for backbone conduit as detailed on ITS(27). Additional conduits may be required as shown on the plans.
2. Provide Class A concrete for Type "1" ground boxes.
3. Provide terminators for the PVC conduit cast in the walls and placed symmetrically about the centerline of the box at the depths shown, unless otherwise noted, for the number of conduits identified on the plans to enter the box.
4. Provide terminators appropriately sized for the conduits indicated on the plans. Provide terminators with an air tight and water tight connection.
5. Closed bottom Type "1" ground boxes are acceptable in lieu of open bottom boxes. Provide two 3" Dia. perforated PVC drain pipes on opposite corners to optimize water drainage. Provide 12-inch bed of aggregate that extends 6 inches in all directions from the perimeter of the box for closed bottom boxes. Aggregate bed will be subsidiary to Special Specification, "ITS Ground Box."
6. Install all open bottom Type "1" ground boxes on a 12-inch bed of aggregate that extends 6 inches in all directions from the perimeter of the box. Aggregate bed will be subsidiary to Special Specification, "ITS Ground Box."
7. Cap and seal terminators that do not have conduits attached.
8. When additional conduit entry points are needed to accommodate existing conduit, core drill conduit knockouts in the field of the appropriate number and size of conduit at each location, as directed by the Engineer.
9. Provide a bell fitting on the end of each conduit to ensure a flush fit inside the ground box.
10. Concrete grout around the knockout (inside and out) and around the conduit and bell fitting to ensure a neat watertight fit after the conduit and bell fitting have been placed in a knockout. Ensure all openings in the ground box are sealed prior to grouting operations.
11. Install a nylon string and plug all unused conduits with tug-plugs sized for the particular conduits. Provide split innerduct plugs in conduits or innerducts with cables to seal the innerduct around the cables to prevent water and dirt from entering.
12. Provide steel (ASTM A-153), glass reinforced nylon, or equivalent cable rack assemblies designed to support the amount of cable storage slack identified in the plans. Locate cable rack system on one side only (longer length side) to allow access to the inside of the ground box. Cable racks may be installed at the factory or in the field. When mounting cable racks in the field, seal all penetrations to the concrete side wall to prevent moisture penetration. Ground metallic cable rack systems to grounding system inside ground box in accordance with the National Electrical Code.

Ground Box Schedule			
Ground Box Type	'A' Width Inside (Inches)	'B' Length Inside (Inches)	'C' Depth Inside (Inches)
Type 1	24	36	36, 48, 60

Sheet Details
Not to Scale

Texas Department of Transportation

Traffic Safety Division Standard

ITS GROUND BOX DETAILS TYPE "1" WITH STEEL COVER

ITS(37)-22

FILE: its(37)-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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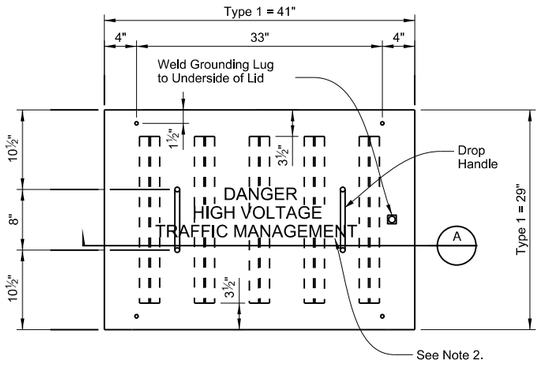
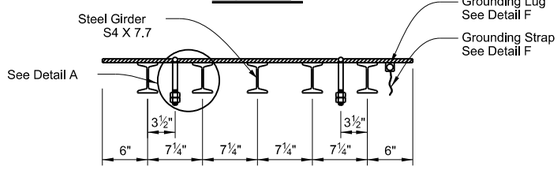
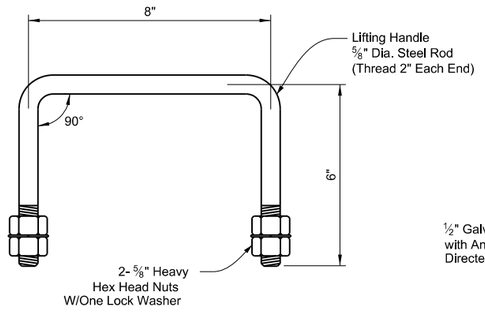


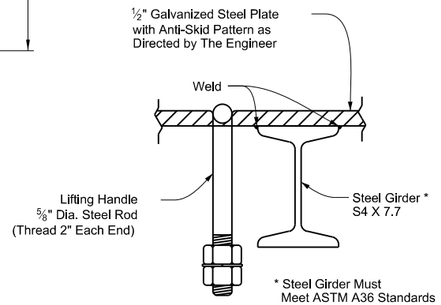
Type 1 Steel Cover Details
Top View



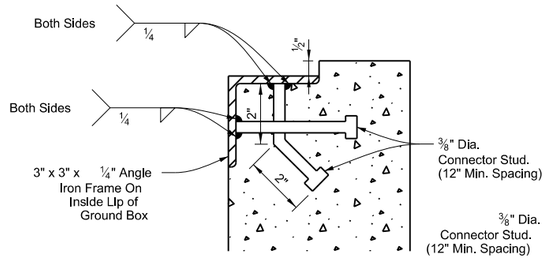
A Section A



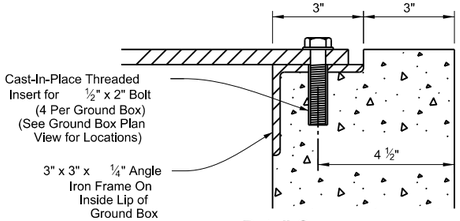
Drop Handle Detail



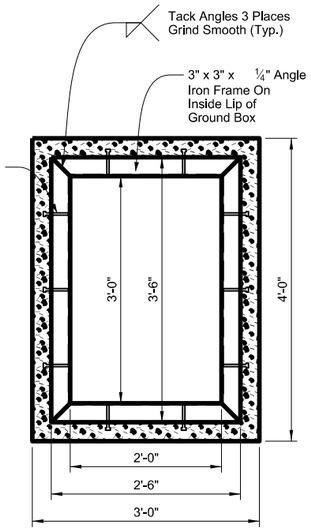
Detail A



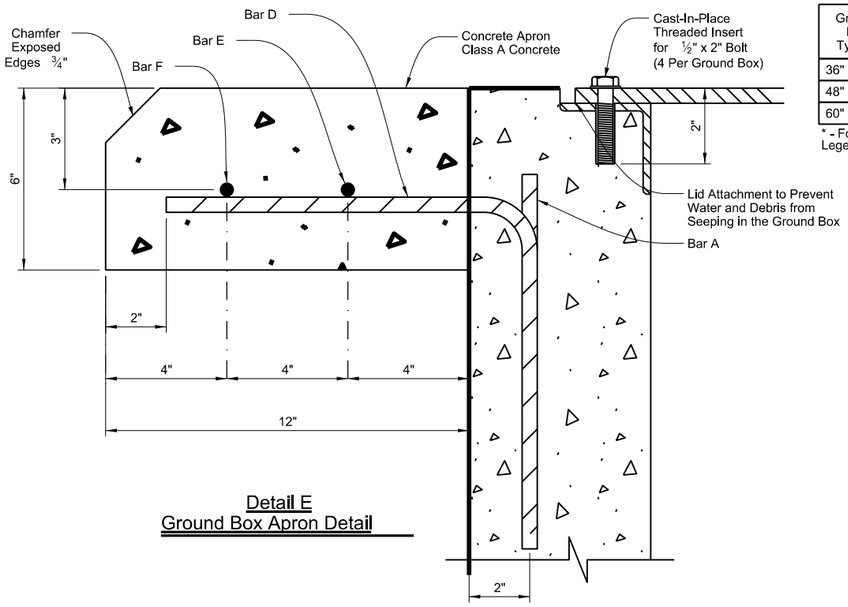
Detail B



Detail C
Lid Attachment Detail



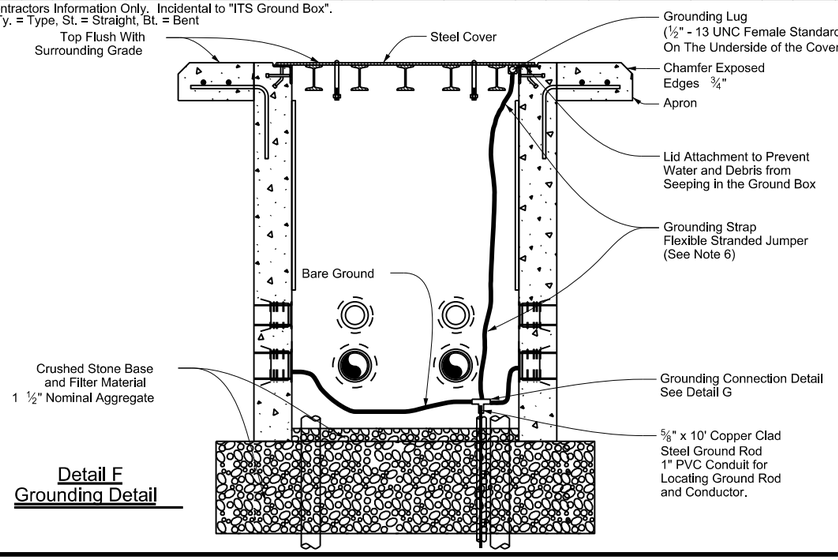
Detail D



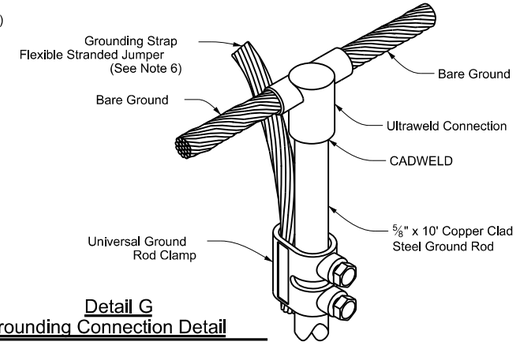
Detail E
Ground Box Apron Detail

Ground Box Type 1	BAR A					BAR B					BAR D					BAR E					BAR F					TOTALS	
	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	Steel * LBS.	Conc. * CY
36" Depth	22	#4	St.	2'-8"	39.3	5	#4	Bt.	13'-2"	44.1	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	17'-2"	6.5	1	#3	Bt.	19'-10"	7.5	108.1	.67
48" Depth	22	#4	St.	3'-8"	54.0	7	#4	Bt.	13'-2"	61.8	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	17'-2"	6.5	1	#3	Bt.	19'-10"	7.5	140.5	.89
60" Depth	22	#4	St.	4'-8"	68.8	8	#4	Bt.	13'-2"	70.6	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	17'-2"	6.5	1	#3	Bt.	19'-10"	7.5	164.1	1.11

* - For Contractors Information Only. Incidental to "ITS Ground Box".
Legend: Ty. = Type, St. = Straight, Bt. = Bent



Detail F
Grounding Detail



Detail G
Grounding Connection Detail

Note - All grounding connections to be CADWELD or approved equal. This work will not be paid for directly, but is considered incidental to ITS ground box.

General Notes:

1. See ITS(37) for additional Type "1" ground box details.
2. Hot-dip galvanized steel covers after all welds are made.
3. Label top of cover with the words "DANGER HIGH VOLTAGE TRAFFIC MANAGEMENT" using template-guided, hand-welded lettering at a height of 2 inches to ensure neatness.
4. Provide all Type "1" ground boxes with a securable, tamper-proof cover equipped with a bolting system that positively secures the cover in place.
5. Ground steel covers in accordance with the National Electrical Code.
6. Ground covers to the grounding cable using a split-bolt kearney clamp, and a minimum 8-foot long flexible stranded jumper the same size as the grounding conductor. Terminate to metal ground box cover with a tank ground type lug as approved and directed by the Engineer.
7. Provide Type "1" ground box and cover designed for heavy duty loading in accordance with AASHTO H20 loading when located where the box may experience deliberate, continuous vehicular traffic, such as near the shoulder or an auxiliary lane, or immediately adjacent to the unprotected edge of pavement.
8. Provide a Type "1" ground box and cover tested by a laboratory independent of the manufacturer certifying loading requirements are met. Provide certification of such tests to the Engineer for approval.
9. Provide a steel or cast iron cover in accordance with Item 471, Article 471.2, "Frames, Grates, Rings, and Covers." Provide covers with the number of drop handles shown. Provide Class "A" concrete for ground box construction and aprons.
10. Fabricate cover so to fits properly on the ground box, and no undue noise results when traffic contacts the cover.

Sheet Details
Not to Scale

SHEET 2 OF 2

Texas Department of Transportation

Traffic Operations Division Standard

ITS GROUND BOX DETAILS TYPE "1" WITH STEEL COVER

ITS(38)-17

FILE: its(38)-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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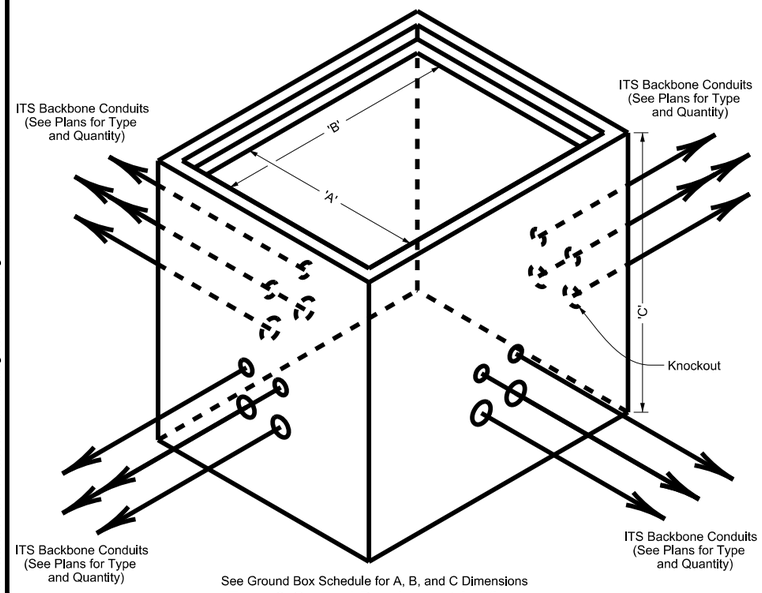
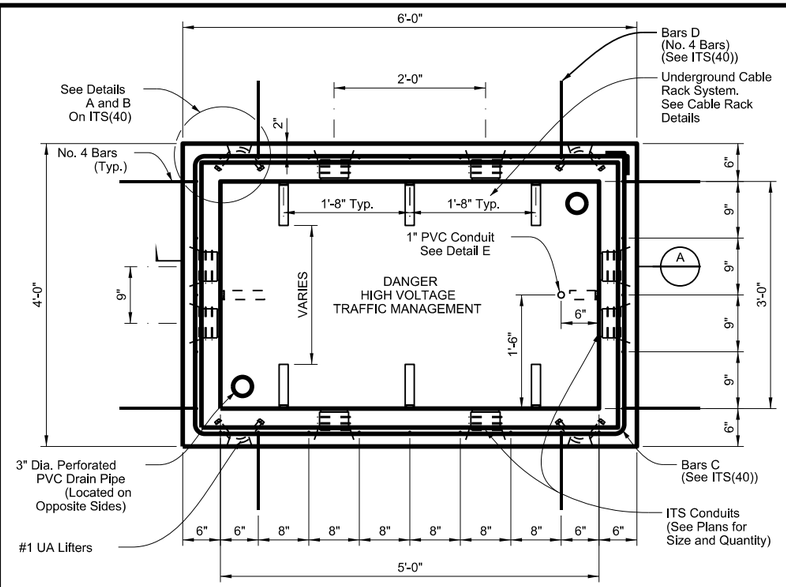


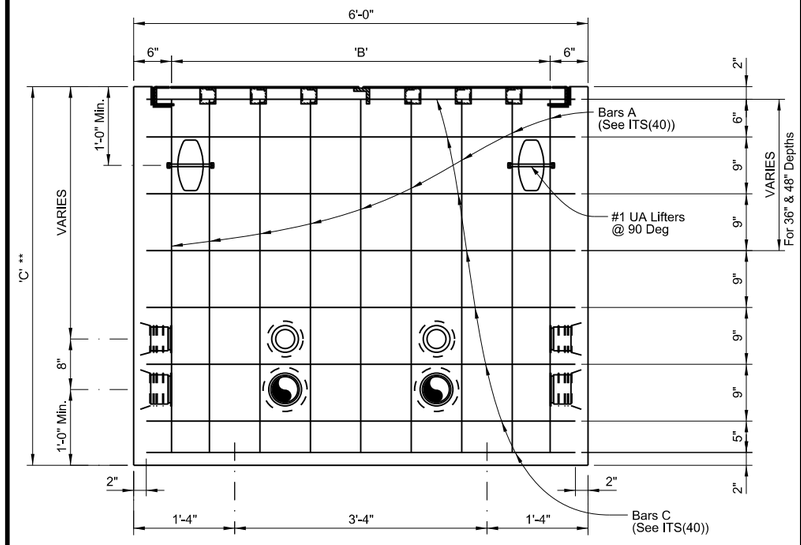
See Ground Box Schedule for A, B, and C Dimensions

Type 2 Ground Box Isometric View



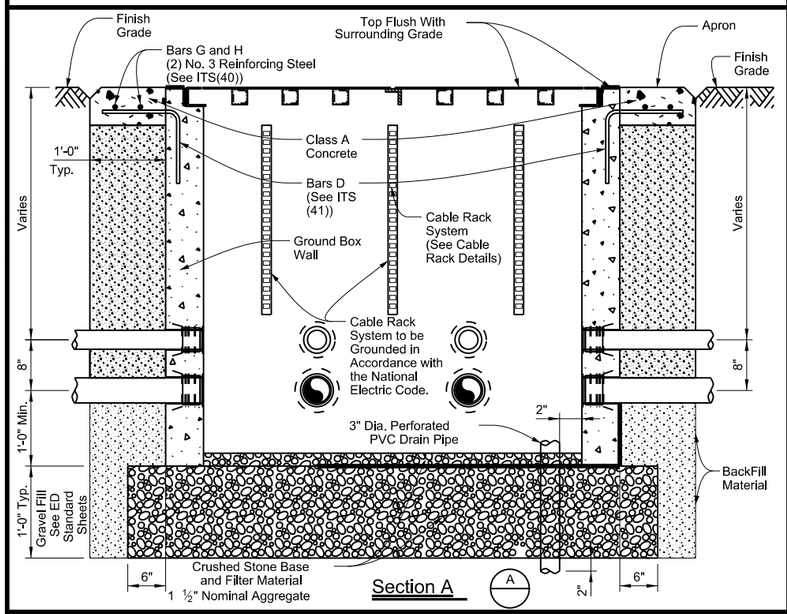
Note: Bar Spacing is The Same on Opposing Sides.

Type 2 Ground Box Plan View

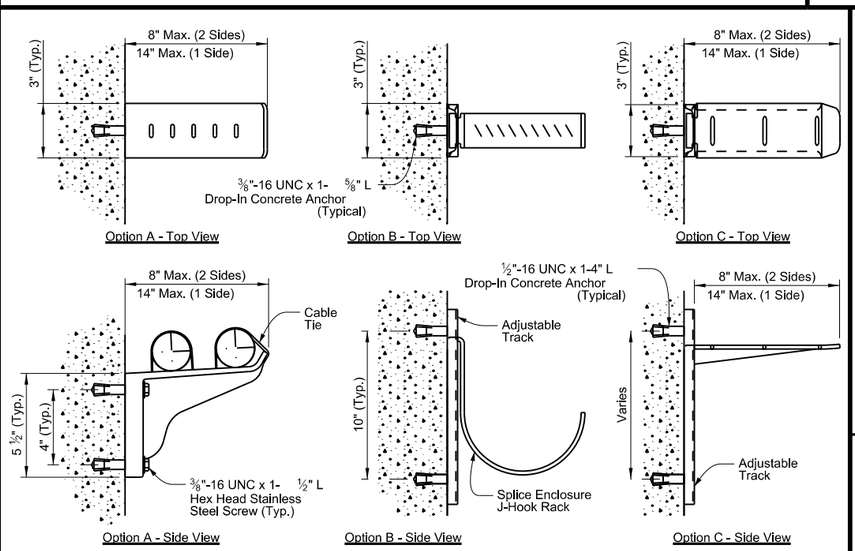


** - Detail representative of 60" deep ground box.

Type 2 Ground Box Elevation View

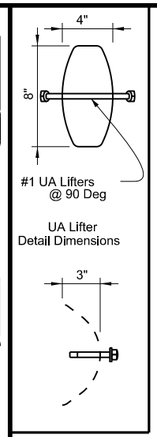


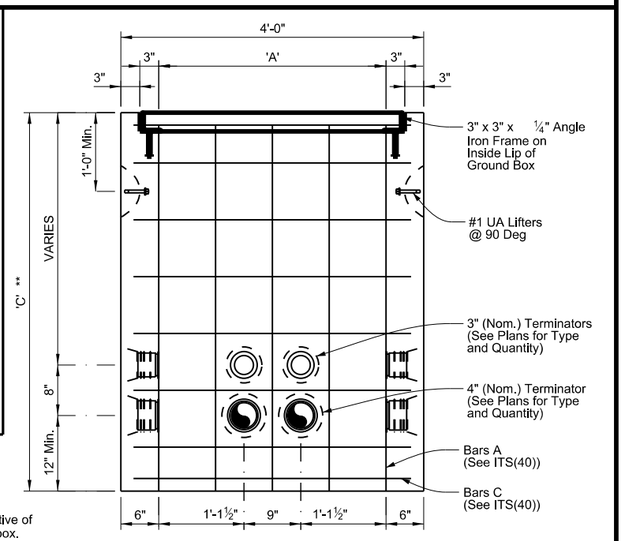
Section A



Note: Options Shown for Cable Racks and Attachment Methods Contractor to Supply Shop Drawings of Cable Rack and Cable Rack Grounding System (If Applicable) for Engineer Approval Prior to Installation.

Type 2 Cable Rack Details





** - Detail representative of 60" deep ground box.

Type 2 Ground Box Side View

SHEET 1 OF 2

General Notes:

1. Conduit entry points shown represent the standard configuration for backbone conduit as detailed on ITS(27). Additional conduits may be required as shown on the plans.
2. Provide Class "A" concrete for Type "2" ground boxes.
3. Provide terminators for the PVC conduit cast in the walls and placed symmetrically about the centerline of the box at the depths shown, unless otherwise noted, for the number of conduits identified on the plans to enter the box.
4. Provide terminators appropriately sized for the conduits indicated on the plans. Provide terminators with an air tight and water tight connection.
5. Closed bottom Type "2" ground boxes are acceptable in lieu of open bottom boxes. Provide two 3" Dia. perforated PVC drain pipes on opposite corners to optimize water drainage. Provide closed bottom boxes with a 12-inch base of crushed stone which extends 6 inches in all directions from the perimeter of the box. Crushed stone will be subsidiary to Special Specification, "ITS Ground Box."
6. When additional conduit entry points are needed to accommodate existing conduit, core drill conduit knockouts in the field of the appropriate number and size of conduit at each location, as directed by the Engineer.
7. Provide a bell fitting on the end of each conduit to ensure a flush fit inside the ground box.
8. Concrete grout around the knockout (inside and out) and around the conduit and bell fitting to ensure a neat watertight fit after the conduit and bell fitting have been placed in a knockout. Ensure all openings in the ground box are sealed prior to grouting operations.
9. Install a nylon string and plug all unused conduits with tug-plugs sized for the particular conduits. Provide split innerduct plugs in conduits or innerducts with cables to seal the innerduct around the cables to prevent water and dirt from entering.
10. Install all open bottom Type "2" ground boxes on a 12-inch base of crushed stone which extends 6 inches in all directions from the perimeter of the box. Crushed stone will be subsidiary to special specification, "ITS Ground Box."
11. Cap and seal terminators that do not have conduits attached.
12. Backfill in accordance with Item 400, "Excavation and Backfill for Structures."
13. Provide steel (ASTM A-153), glass reinforced nylon, or equivalent cable rack assemblies designed to support the amount of cable storage slack and splice enclosures identified in the plans. Locate cable rack system on any side but allow for sufficient access to the inside of the ground box. Cable racks may be installed at the factory or in the field. When mounting cable racks in the field, seal all penetrations to the concrete side wall to prevent moisture penetration. Ground metallic cable rack systems to grounding system inside ground box in accordance with the National Electrical Code.

Ground Box Schedule			
Ground Box Type	'A' Width Inside (Inches)	'B' Length Inside (Inches)	'C' Depth Inside (Inches)
Type 2	36	60	36, 48, 60

Sheet Details
Not to Scale

Texas Department of Transportation

Traffic Operations Division Standard

ITS GROUND BOX DETAILS TYPE "2" WITH STEEL COVER

ITS(39)-16

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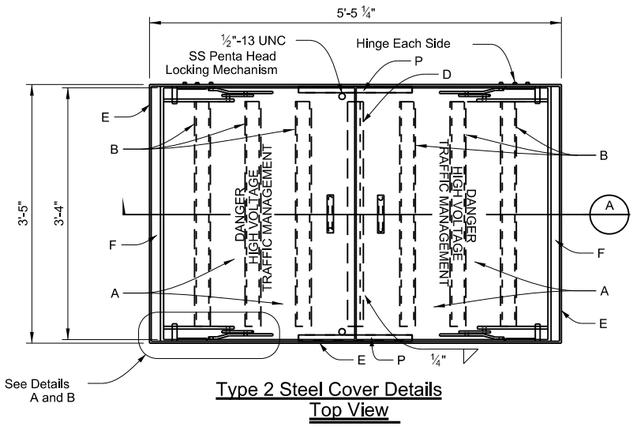
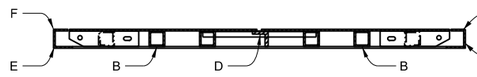
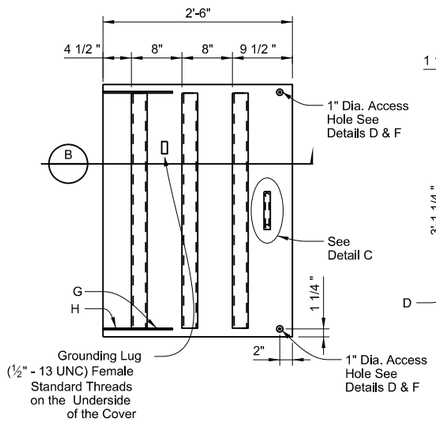


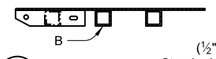
Type 2 Steel Cover Details
Top View



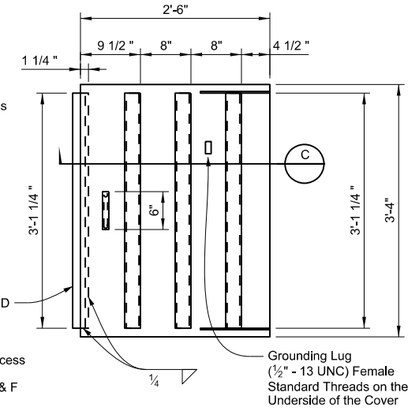
A Section A



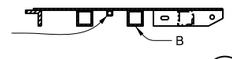
Type 2 Steel Cover Details
Bottom View (Left)



B Section B

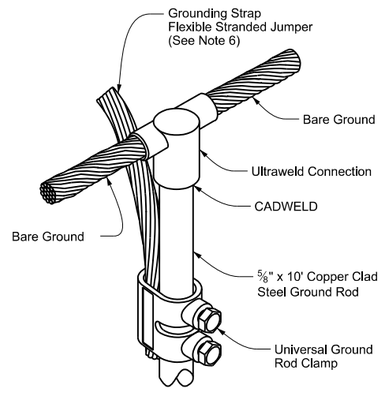


Type 2 Steel Cover Details
Bottom View (Right)



Grounding Lug
(½" - 13 UNC) Female
Standard Threads On The
Underside of the Cover

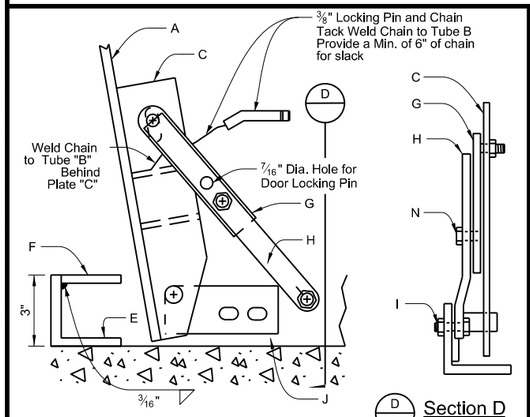
C Section C



Detail G
Grounding Connection Detail

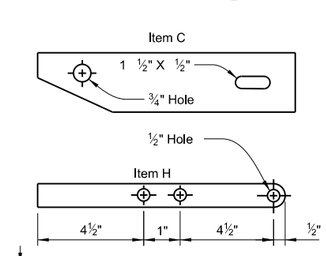
Note - All grounding connections to be CADWELD or approved equal. This work will not be paid for directly, but is considered incidental to ITS ground box.

Item	Qty	Incidental "ITS Ground Box" Material
A	2	¼" Floor Plate 40" x 30"
B	6	2 ½" x 2 ½" x 37 ¼" Tube
C	4	11" x 2 ½" x ¼" Plate
D	1	2 ½" x 2 ½" x ½" x 37" ¼ Angle
E	4	3" x 3" x ¼" Angle
F	2	40 ½" x 2" x ¼" Plate
G	4	6 ½" x 1 ¼" x ¼" Plate
H	4	10 ½" x 1 ¼" x ¼" Plate
I	12	½" Bolt/Nut
J	4	4 ¾ x 2" x ¾" Plate
K	2	⅝" Drop Handle
L	2	1 ½" x ⅝" x 3/16" Channel x 7"
M	4	1 ½" x ⅛" P Disk
N	8	½" x ⅝" Bolt
P	2	1" x 1" x ⅛" Angle x 18"

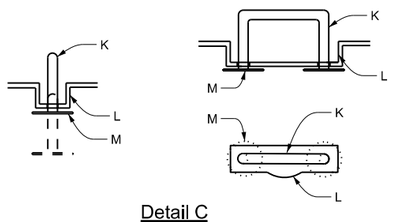


D Section D

Detail A
Type 2 Cover Side View Detail



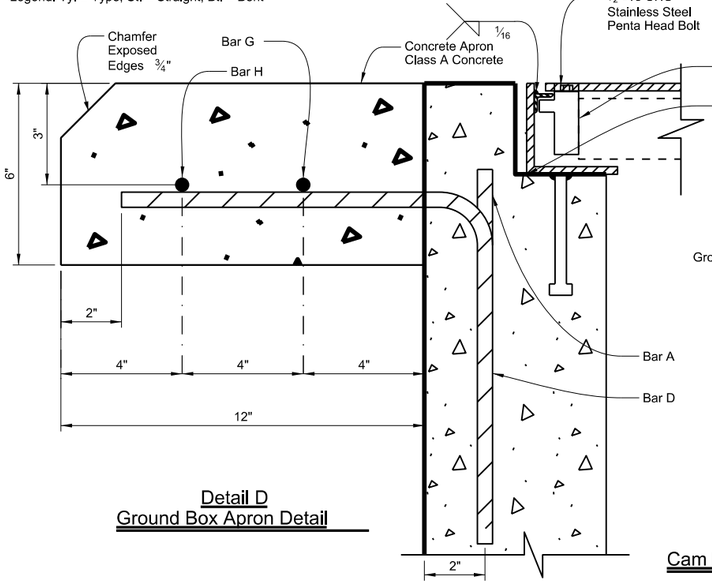
Detail B
Type 2 Hinge Details



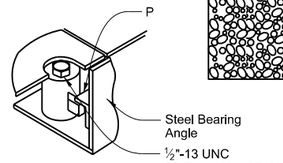
Detail C
Type 2 Drop Handle Details

Ground Box Type 2	BAR A					BAR C					BAR D					BAR G					BAR H					TOTALS	
	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	Steel * LBS.	Conc. * CY
36" Depth	28	#4	St.	2'-8"	50.0	5	#4	Bt.	19'-1"	63.9	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	23'-3"	8.8	1	#3	Bt.	25'-11"	9.8	143.2	1.00
48" Depth	28	#4	St.	3'-8"	68.8	7	#4	Bt.	19'-1"	89.5	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	23'-3"	8.8	1	#3	Bt.	25'-11"	9.8	187.6	1.33
60" Depth	28	#4	St.	4'-8"	87.5	8	#4	Bt.	19'-1"	102.3	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	23'-3"	8.8	1	#3	Bt.	25'-11"	9.8	219.1	1.67

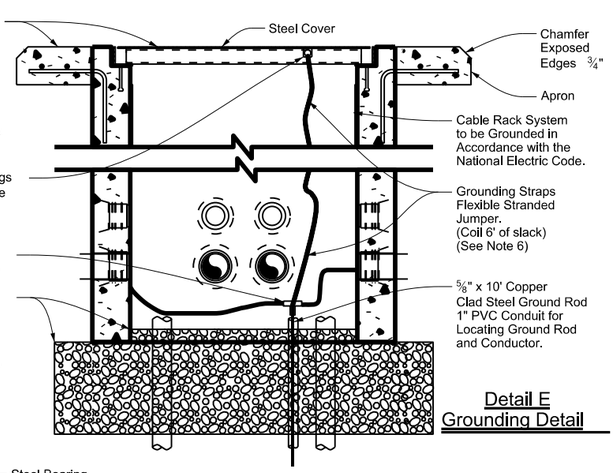
* - For Contractors Information Only. Incidental to "ITS Ground Box".
Legend: Ty. = Type, St. = Straight, Bt. = Bent



Detail D
Ground Box Apron Detail



Detail F
Cam Locking Mechanism



Detail E
Grounding Detail

SHEET 2 OF 2

General Notes:

1. See ITS(39) for additional Type "2" ground box details.
2. Hot-dip galvanized steel covers after all welds are made.
3. Label top of cover with the words "DANGER HIGH VOLTAGE TRAFFIC MANAGEMENT" using template-guided, hand-welded lettering at a height of 2 inches to ensure neatness.
4. Provide all Type "2" ground boxes with a securable, tamper-proof cover equipped with a bolting system that positively secures the cover in place.
5. Ground steel covers in accordance with the National Electrical Code.
6. Ground covers to the grounding cable using a split-bolt kearney clamp, and a minimum 8-foot long flexible stranded jumper the same size as the grounding conductor. Terminate to metal ground box cover with a tank ground type lug as approved and directed by the Engineer.
7. Provide Type "2" ground box and cover designed for heavy duty loading in accordance with AASHTO H20 loading when located where the box may experience deliberate, continuous vehicular traffic, such as near the shoulder or an auxiliary lane, or immediately adjacent to the unprotected edge of pavement.
8. Provide a Type "2" ground box and cover tested by a laboratory independent of the manufacturer certifying loading requirements are met. Provide certification of such tests to the Engineer for approval.
9. Provide a steel or cast iron cover in accordance with Item 471, Article 471.2, "Frames, Grates, Rings, and Covers." Provide covers with the number of drop handles shown. Provide Class "A" concrete for ground box construction and aprons.
10. Fabricate cover so to fits properly on the ground box, and no undue noise results when traffic contacts the cover.

Texas Department of Transportation — Traffic Operations Division Standard

ITS GROUND BOX DETAILS TYPE "2" WITH STEEL COVER

ITS(40)-17

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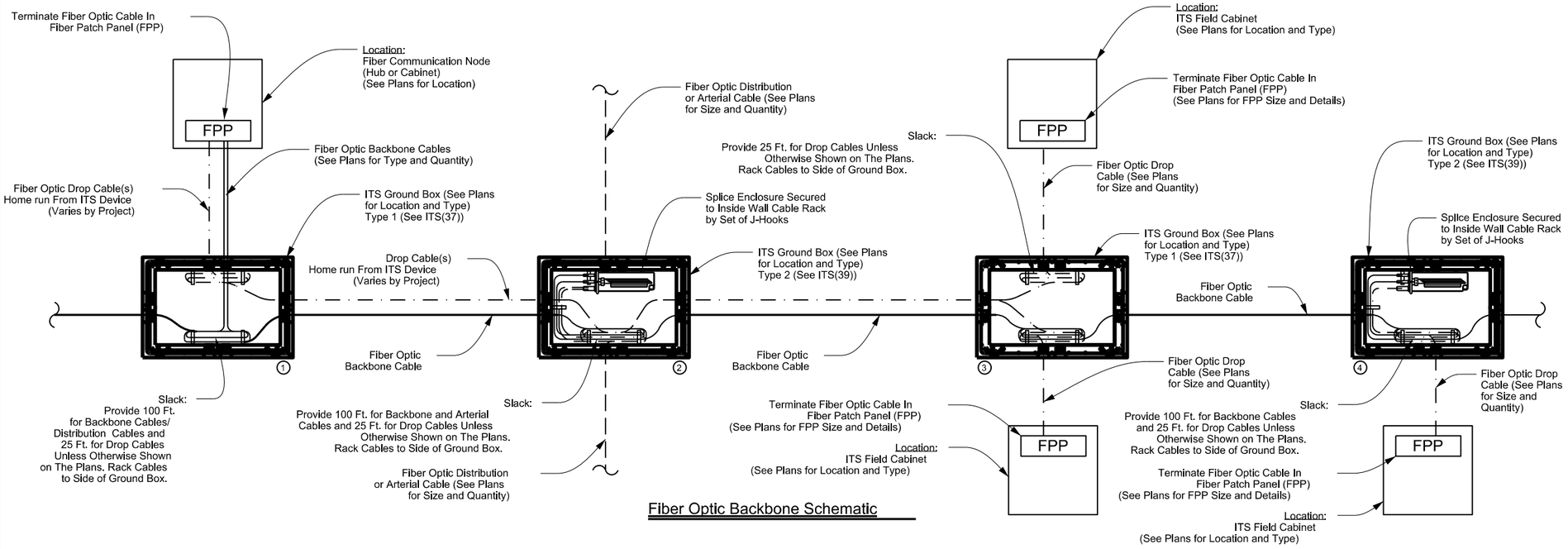
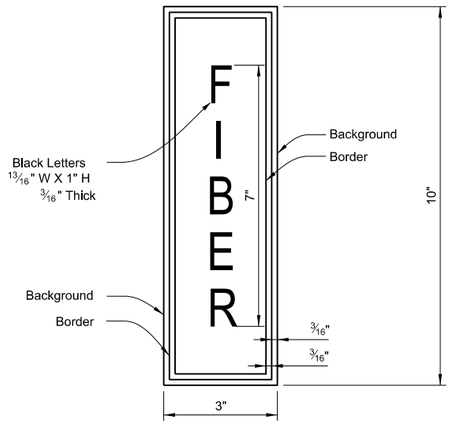
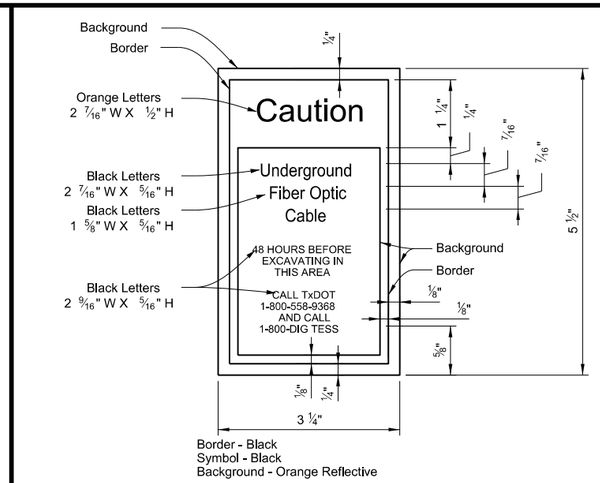


Fiber Optic Backbone Schematic



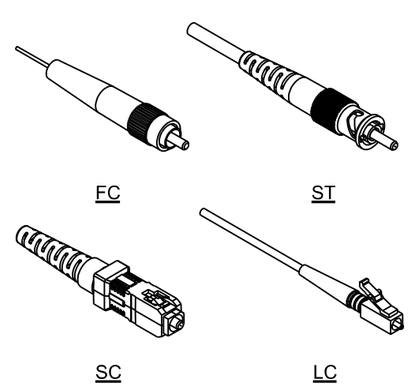
Border - Black
Background - Orange Reflective

Fiber Decal Details



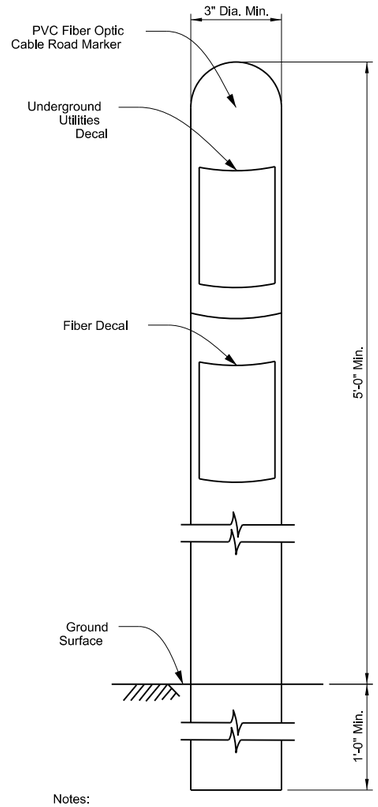
Border - Black
Symbol - Black
Background - Orange Reflective

Underground Utilities Decal Details



Fiber Optic Connectors

Note - Details are diagrammatic and may vary by manufacturer.



Notes:
1. Space fiber optic cable road markers at maximum 1000' intervals or at significant changes in direction such as a 90 degree turn.
2. Provide all orange fiber optic cable road markers for non-splice locations.
3. Provide orange fiber optic cable road markers with white dome for splice locations.
4. Locate marker within concrete apron of fiber ground box.

Fiber Optic Cable Road Markers

Reference Notes:

1. Fiber architecture at communication node.
2. Fiber architecture for splicing arterial distribution cables.
3. Fiber architecture for home run of drop cables from ITS field equipment cabinets to communication node.
4. Fiber architecture for splicing drop cable from ITS field equipment cabinet.

General Notes:

1. The fiber optic backbone schematic shown is diagrammatic only and intended to represent the various fiber optic communication architectures seen across the state and may not show all configurations seen. Connection of ITS field equipment to ITS communication nodes or hubs is achieved through home run drop cables or spliced to the backbone in a splice enclosure. Refer to fiber communication schematic details and fiber termination information shown on the plans for further information.
2. Install a flat pull cord in all empty conduits and inner-ducts identified for communication use. The pull cord must have a tensile strength of 1,250 lbs minimum and have foot markings to determine length installed. Furnish and installation of pull cord will be subsidiary to special specification "ITS Fiber Optic Cable".
3. Color code each type of fiber optic cable to identify the cable as a "backbone" (green or blue), "distribution" (red), or "drop" (orange or yellow).
4. Terminate fibers at fiber patch panel (FPP), also referred to as patch panel, with SC connectors for new installations. When connecting to existing FPP, terminate with FC or ST connectors as shown on the plans. Provide connector adaptors as required to accommodate existing equipment if information is not provided in the plans.
5. Provide a list showing cable number assignments and highway or facility that the cable services.
6. Provide a single 1/C #14 insulated wire in conduit runs which have been identified in the plans to carry fiber optic cable. Provide UL listed solid copper wire with orange color low density polyethylene insulation suitable for conduit installation rated for temperature range -20 C to 60 C and a voltage rating of 600V. This wire will serve as a tracer, or locate, wire for locating underground conduit containing fiber optic cabling and will be paid for under Item 620, "Electrical Conductors."
7. Ensure each cable is marked on the outer jacket with a label detailing the manufacturer's name, the date of manufacturer (month/year), the fiber count (Example: 48F SM or 48 SMF), and sequential length markings at maximum 3 FT increments.

Sheet Details
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SHEET 1 OF 2

Texas Department of Transportation

Traffic Operations Division Standard

ITS FIBER OPTIC CABLE MISCELLANEOUS DETAILS

ITS(42)-16

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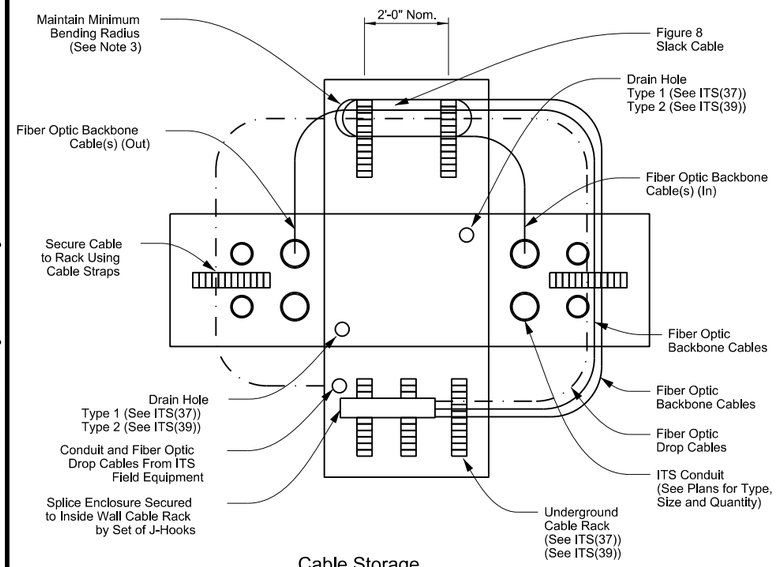
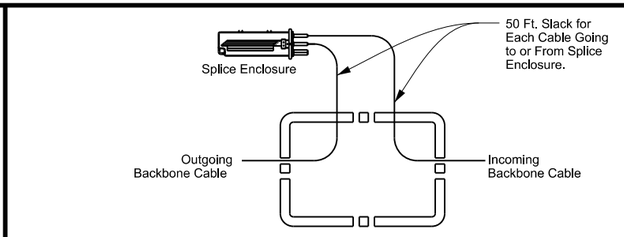
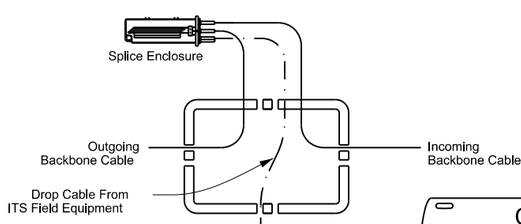


Cable Storage

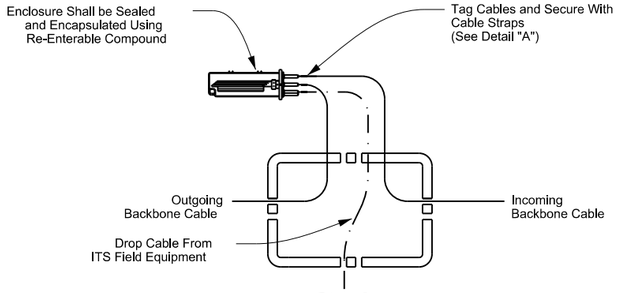
Top View - Ground Box Walls Folded Down for Clarity



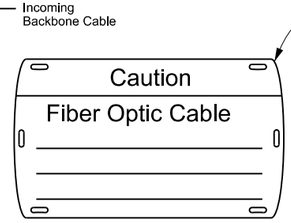
Step 1



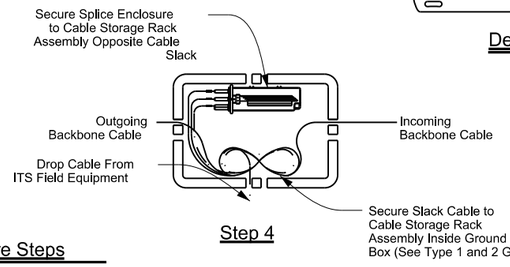
Step 2



Step 3

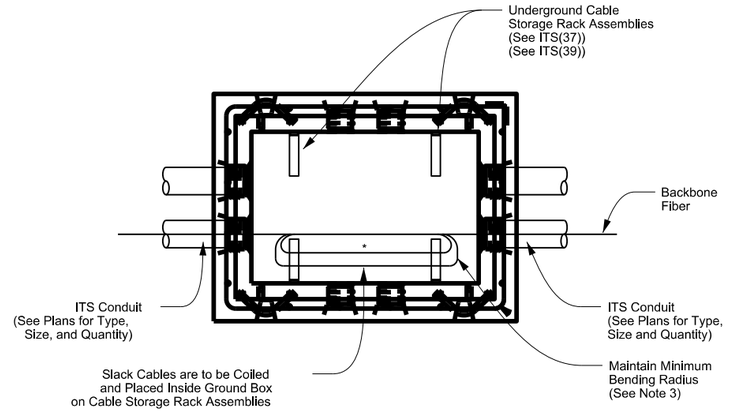


Detail "A"



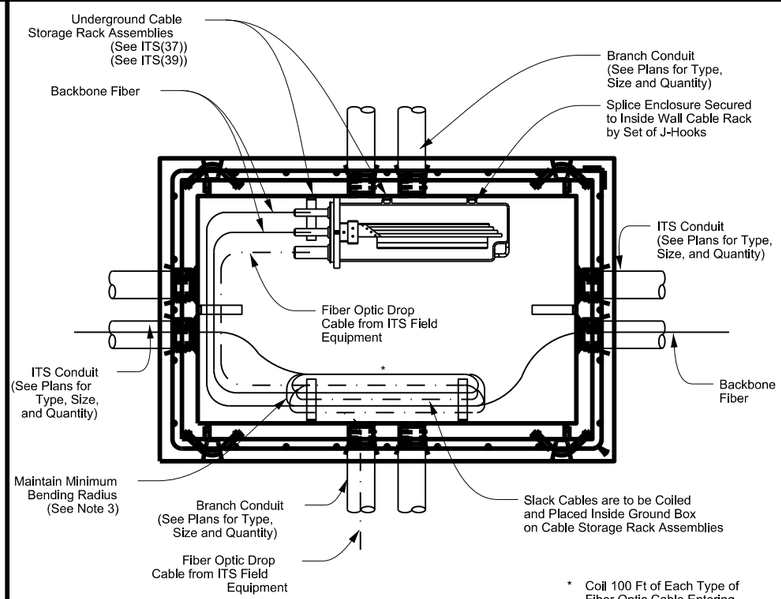
Step 4

Splice Procedure Steps



Type "1" Ground Box

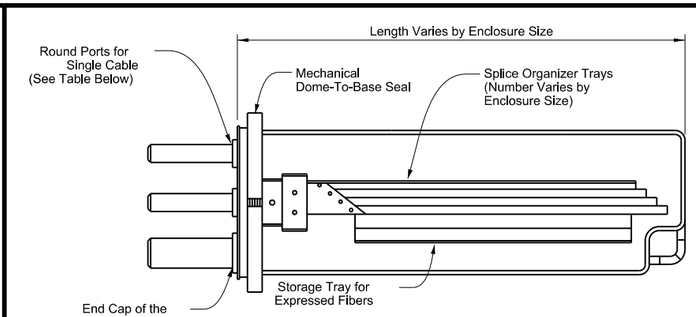
* Coil 25 Ft of Fiber Optic Cable for Slack



Type "2" Ground Box

with Splice

* Coil 100 Ft of Each Type of Fiber Optic Cable Entering the Ground Box



Splice Enclosure Sizes			
Type	No. of Ports	Port Capacity	Fiber Use
1	4	2 - Up to 144 Sm	Backbone
		2 - Up to 48 Sm	Drop
2	6	4 - Up to 144 Sm	Backbone/Arterial
		2 - Up to 48 Sm	Drop
3	8	4 - Up to 144 Sm	Backbone/Arterial
		4 - Up to 48 Sm	Drop

Splice Enclosure Fiber Accommodations

General Notes:

1. Conduit entry points to the Type 1 and Type 2 ground boxes are diagrammatic. Refer to ITS ground box standards, ITS(37) and ITS(39), for more information. Additional conduits may be required as shown on the plans.
2. Type 2 ground boxes are to be used, as shown on the plans, when splice enclosures are required.
3. Maintain a minimum bend radius of 20 times the fiber optic cable diameter during installation, relocation, and removal and a minimum of 10 times the fiber optic cable diameter when in operation.
4. Caulk all conduit around the top of the cable ducts with an engineer approved caulking compound to seal clearance between the cables and ducts. Place conduit plugs in all vacant conduits or inner-ducts.
5. Provide cable straps that will withstand ultra-violet exposure and do not damage cables when tightening.
6. All incidental equipment necessary for the cable installation and mounting of splice enclosure within the ground box will be incidental to Special Specification, "ITS Fiber Optic Cable."
7. Submit all splice locations to the field engineer for approval before beginning work.
8. Provide splice enclosures designed to seal, bond, anchor, and protect fiber optic cable splices. Provide splice enclosures designed to handle mechanical and fusion type splices. Provide splice enclosures with port configurations for the sizes detailed above.
9. Provide splice enclosures designed for underground placement with a sealing system preventing water penetration when submerged under 10 ft. of water.
10. Furnish, install, and secure fiber optic cable tags for each fiber optic cable entering a ground box, ITS field equipment cabinet (ground and pole), and hub building or communication node as detailed above. Provide information including fiber optic type, count, origin, and destination on the cable tag. Use UV resistant tie-wraps for securing the tag to the cable. Provide tie-wraps that do not damage fiber when securing to cable.

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Sheet Details
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Texas Department of Transportation

Traffic Operations Division Standard

ITS FIBER OPTIC CABLE MISCELLANEOUS DETAILS

ITS(43)-16

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	WFS	WICHITA		129

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TxDOT policy for projects disturbing less than 1 acre of soil, and not part of a larger common plan of development.

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0043-08-088

1.2 PROJECT LIMITS:
From: NB US 287 Rest Area west of Iowa Park

To: SB US 287 Rest Area west of Iowa Park

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 33° 57' 56.18" N ,(Long) 98° 43' 12.01" W

END: (Lat) 33° 57' 59.14" N ,(Long) 98° 42' 39.30" W

1.4 TOTAL PROJECT AREA (Acres): 28.35

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.95

1.6 NATURE OF CONSTRUCTION ACTIVITY:
Add truck parking lots to existing rest areas

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Clay	Sandy, Lean, hard, dry to moist
Clay	Fat with Sand, stiff to hard, moist
Clay	Fat, hard, moist

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):
PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

☐ PSLs determined during preconstruction meeting
☐ PSLs determined during construction
☒ No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:
(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.3.)

☒ Mobilization
☒ Install sediment and erosion controls
☒ Blade existing topsoil into windrows, prep ROW, clear and grub
☒ Remove existing pavement
☒ Grading operations, excavation, and embankment
☒ Excavate and prepare subgrade for proposed pavement widening
☐ Remove existing culverts, safety end treatments (SETs)
☐ Remove existing metal beam guard fence (MBGF), bridge rail
☒ Install proposed pavement per plans
☐ Install culverts, culvert extensions, SETs
☐ Install mow strip, MBGF, bridge rail
☒ Place flex base
☒ Rework slopes, grade ditches
☐ Blade windrowed material back across slopes
☒ Revegetation of unpaved areas
☒ Achieve site stabilization and remove sediment and erosion control measures
☐ Other: _____
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

☒ Sediment laden stormwater from stormwater conveyance over disturbed area
☒ Fuels, oils, and lubricants from construction vehicles, equipment, and storage
☐ Solvents, paints, adhesives, etc. from various construction activities
☒ Transported soils from offsite vehicle tracking
☒ Construction debris and waste from various construction activities
☐ Contaminated water from excavation or dewatering pump-out water
☐ Sanitary waste from onsite restroom facilities
☒ Trash from various construction activities/receptacles
☐ Long-term stockpiles of material and waste
☒
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.11 RECEIVING WATERS:
Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
Stevens Creek	

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

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

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

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

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12/11/2023
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STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

July 2023 Sheet 1 of 2
Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	STP 2024(778)TP		130
STATE	STATE DIST.	COUNTY	
TEXAS	WFS	WICHITA	
CONT.	SECT.	JOB	HIGHWAY NO.
0043	08	088	US287

DATE: 12/11/2023
FILE: swp3g23_2.dgn

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- [X] [ ] Protection of Existing Vegetation
- [ ] [X] Vegetated Buffer Zones
- [ ] [ ] Soil Retention Blankets
- [ ] [ ] Geotextiles
- [ ] [ ] Mulching/ Hydromulching
- [ ] [ ] Soil Surface Treatments
- [ ] [ ] Temporary Seeding
- [ ] [X] Permanent Planting, Sodding or Seeding
- [ ] [ ] Biodegradable Erosion Control Logs
- [X] [ ] Rock Filter Dams/ Rock Check Dams
- [ ] [ ] Vertical Tracking
- [ ] [ ] Interceptor Swale
- [ ] [X] Riprap
- [ ] [ ] Diversion Dike
- [ ] [ ] Temporary Pipe Slope Drain
- [ ] [ ] Embankment for Erosion Control
- [ ] [ ] Paved Flumes
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- [X] [ ] Biodegradable Erosion Control Logs
- [ ] [ ] Dewatering Controls
- [X] [ ] Inlet Protection
- [X] [ ] Rock Filter Dams/ Rock Check Dams
- [ ] [ ] Sandbag Berms
- [X] [ ] Sediment Control Fence
- [X] [ ] Stabilized Construction Exit
- [ ] [ ] Floating Turbidity Barrier
- [ ] [X] Vegetated Buffer Zones
- [ ] [ ] Vegetated Filter Strips
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
None		

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

- [ ] Chemical Management
- [X] Concrete and Materials Waste Management
- [X] Debris and Trash Management
- [X] Dust Control
- [ ] Sanitary Facilities
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- [X] Fire hydrant flushings
- [X] Irrigation drainage
- [X] Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- [X] Potable water sources
- [X] Springs
- [X] Uncontaminated groundwater
- [X] Water used to wash vehicles or control dust
- [X] Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 DEWATERING:

2.9 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3 .

2.10 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3.

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STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

July 2023 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	STP 2024(778)TP		131
STATE	STATE DIST.	COUNTY	
TEXAS	WFS	WICHITA	
CONT.	SECT.	JOB	HIGHWAY NO.
0043	08	088	US287

DATE: 12/11/2023
FILE: swp3d23_2.dgn

DATE:
FILE:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1.

2.

☒ No Action Required ☐ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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

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

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

☒ No Permit Required

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

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: 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.

1.

2.

3.

4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

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

☐ Yes ☒ No

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

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

☐ Yes ☐ No

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

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

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

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

☐ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Texas Department of Transportation — Design Division Standard

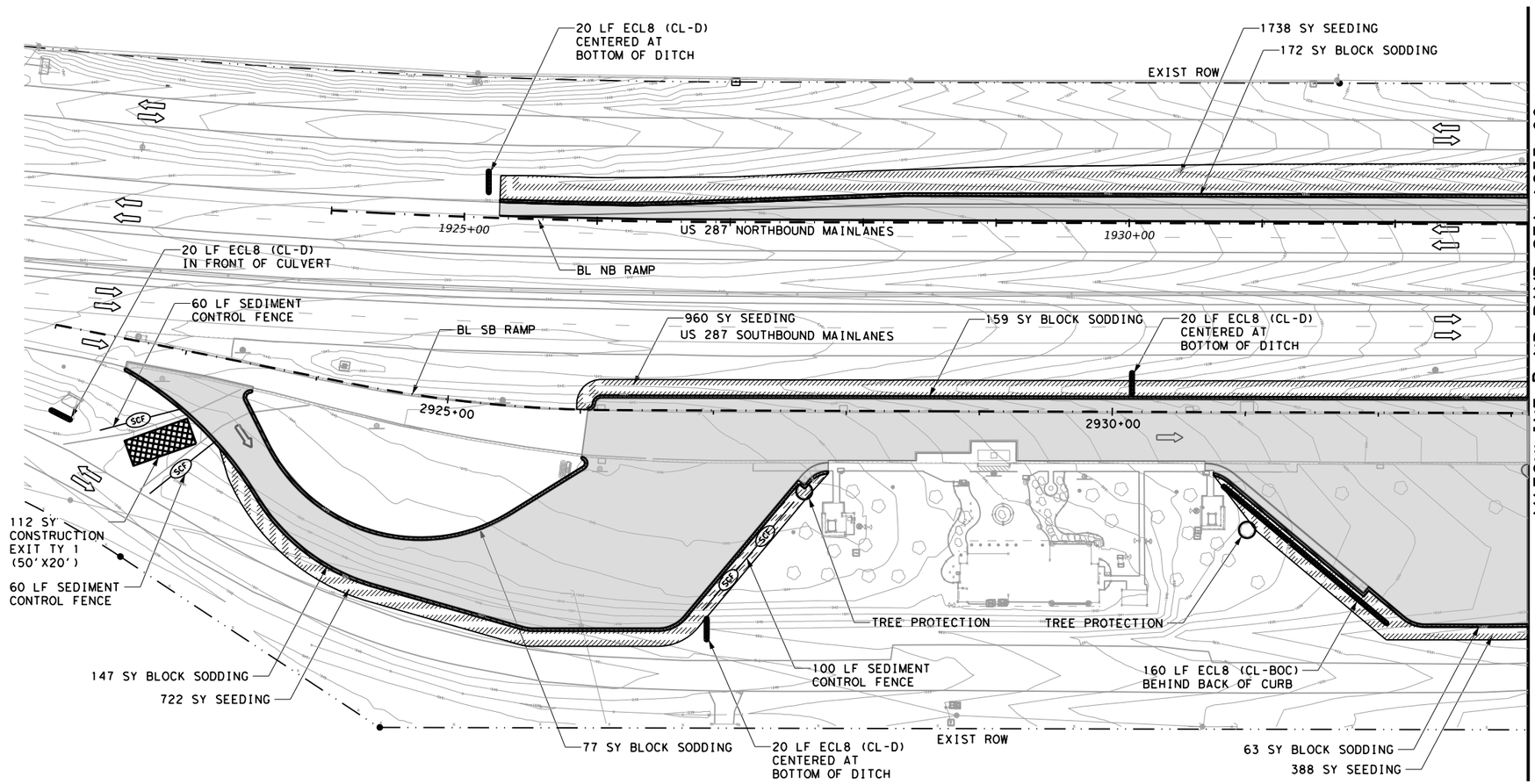
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR	
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0043	08	088	US287	
12-12-2011 (DS)	DIST	COUNTY		SHEET NO.	
05-07-14 ADDED NOTE SECTION IV.	WFS	WICHITA		132	
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.					

100% SUBMITTAL

DATE: 12/11/2023 TIME: 12:00:41 PM



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LEGEND

- CONSTRUCTION EXIT TY 1
- BLOCK SODDING
- SEEDING
- SCF — SEDIMENT CONTROL FENCE
- RFD2 — ROCK FILTER DAM TY 2
- EROSION CONTROL LOG (12")
- EROSION CONTROL LOG (8")
- TREE PROTECTION
- DIRECTION OF TRAFFIC

NOTES:

1. STORMWATER POLLUTION PREVENTION PLAN (SW3P) SHALL BE IN PLACE PRIOR TO COMMENCING ANY SOIL DISTURBING ACTIVITIES. THE CONTRACTOR SHALL FOLLOW STANDARD EC(1)-16, EC(2)-16, EC(3)-16, EC(6)-16 AND EC(9)-16 EXCEPT AS DIRECTED BY THE ENGINEER.
2. ALL ROCK FILTER DAMS AND SEDIMENT CONTROL FENCE TO REMAIN UNTIL END OF CONSTRUCTION.
3. CONSTRUCTION EXITS SHOWN IN DRAWINGS ARE APPROXIMATE. CONSTRUCTION EXITS AND CONCRETE WASHOUT AREAS WILL BE DETERMINED DURING THE TIME OF CONSTRUCTION AS DIRECTED BY ENGINEER. REFER TO STANDARD EC(3)-16 FOR DETAILS.
4. QUANTITIES SHOWN ARE APPROXIMATE AND MAY BE ADJUSTED TO MEET FIELD CONDITIONS.
5. PLACE 2' WIDTH OF BLOCK SODDING BEHIND PROPOSED SHOULDER, CURB, AND/OR SIDEWALK IN LOCATIONS INDICATED.
6. PROTECT TREES AS SHOWN AND AS DIRECTED BY THE ENGINEER.
7. PLACE TREES AT THE DISCRETION OF THE ENGINEER.

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TBPE REG. NO. F-474

 Texas Department of Transportation

US 287 REST AREAS

EROSION CONTROL PLAN

SCALE: 1"=100' SHEET 1 OF 3

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS SD	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK RAW	TEXAS	WFS	WICHITA	133
CHECK JNR	CONTROL 0043	SECTION 08	JOB 088	

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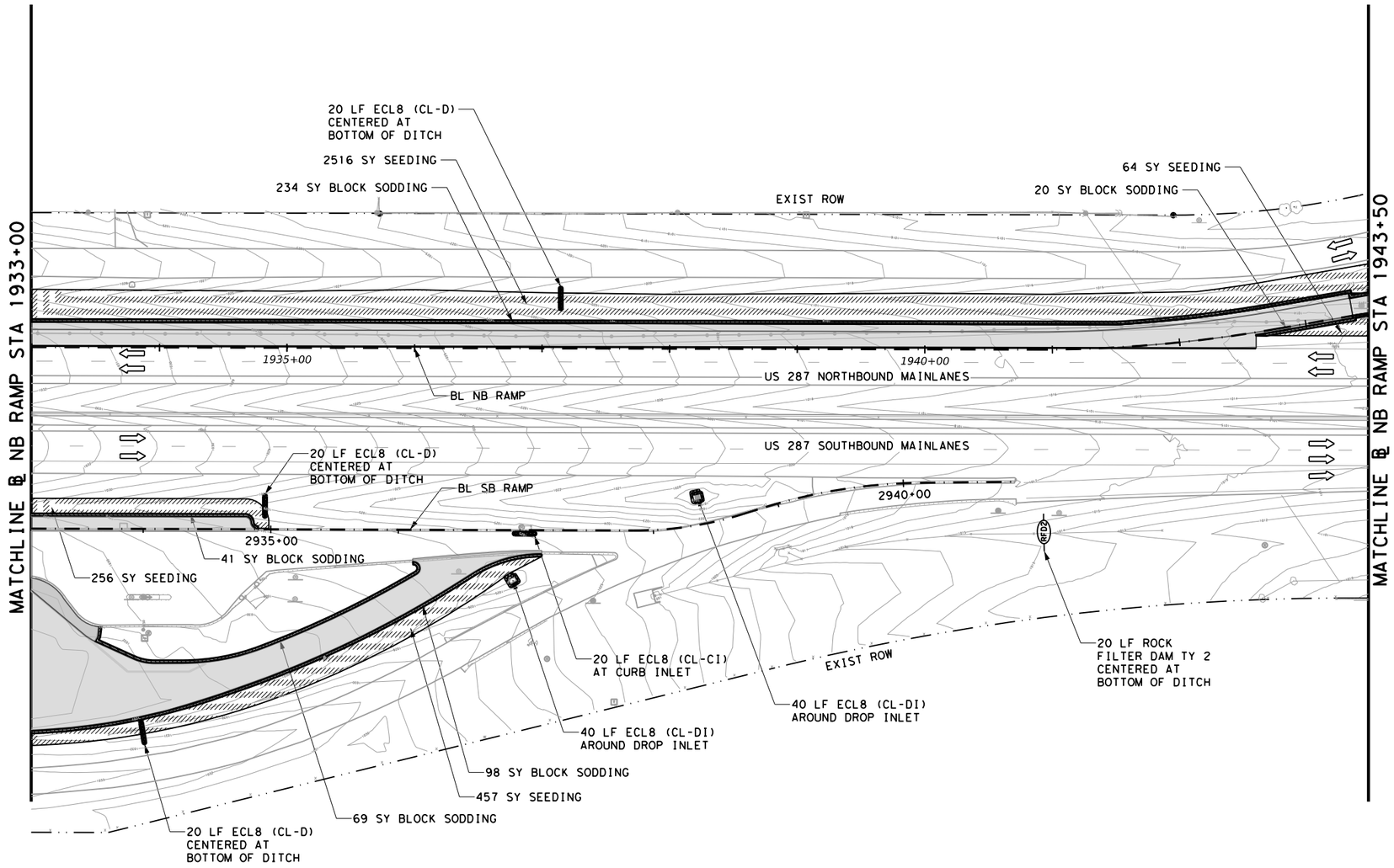

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SCALE = 1"=100' H

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LEGEND

- CONSTRUCTION EXIT TY 1
- BLOCK SODDING
- SEEDING
- SCF — SEDIMENT CONTROL FENCE
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US 287 REST AREAS

EROSION CONTROL PLAN

SCALE: 1"=100' SHEET 2 OF 3

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS SD	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK RAW	TEXAS	WFS	WICHITA	134
CHECK JNR	CONTROL 0043	SECTION 08	JOB 088	

PLOT DRIVER: pdf-c.pltcfg
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100% SUBMITTAL

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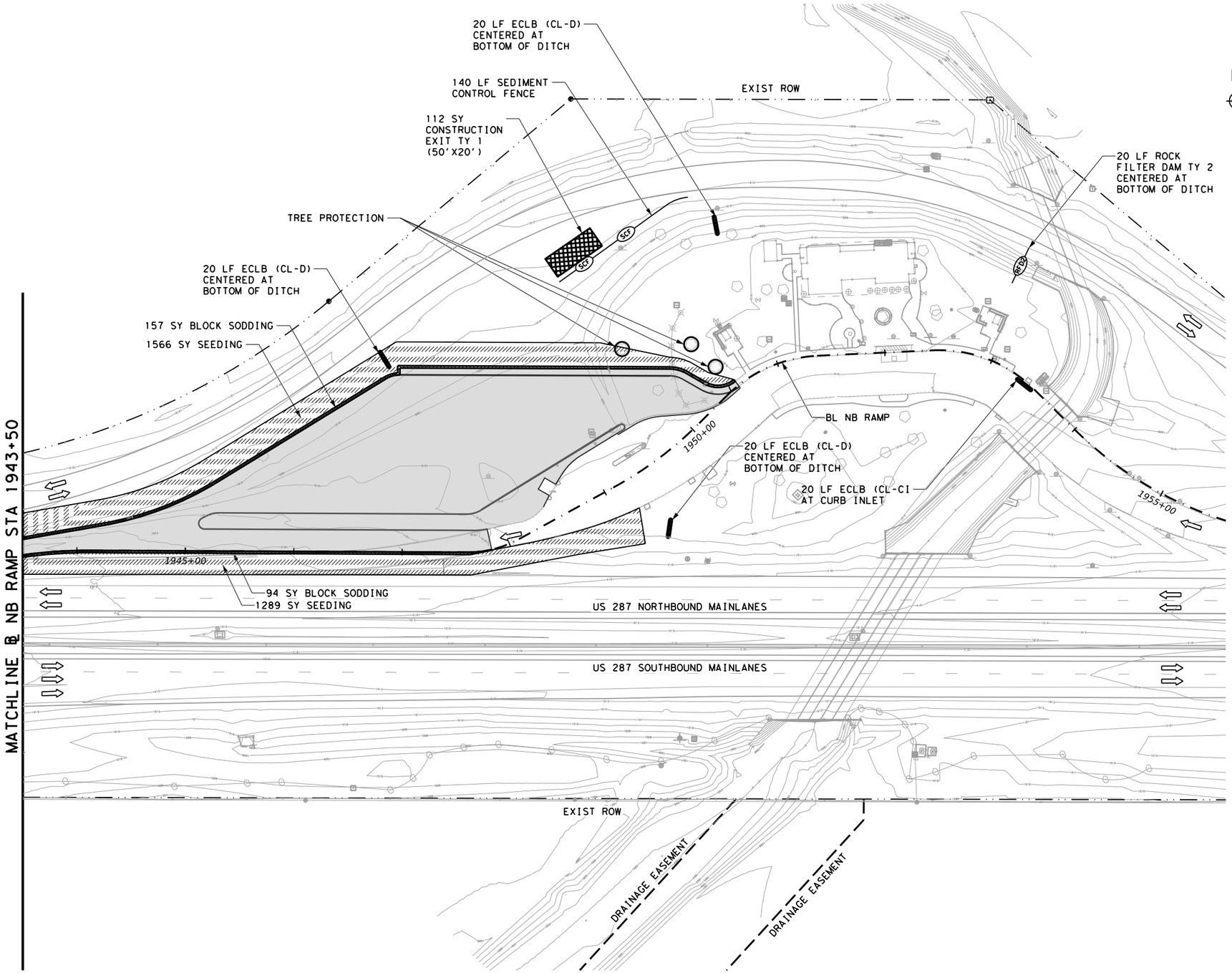

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SCALE = 1"=100' H

LEGEND

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 Texas Department of Transportation

US 287 REST AREAS

EROSION CONTROL PLAN

SCALE: 1"=100' SHEET 3 OF 3

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
JNR	6	STP 2024(778)TP		US287
GRAPHICS SD	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK RAW	TEXAS	WFS	WICHITA	135
CHECK JNR	CONTROL	SECTION	JOB	
	0043	08	088	

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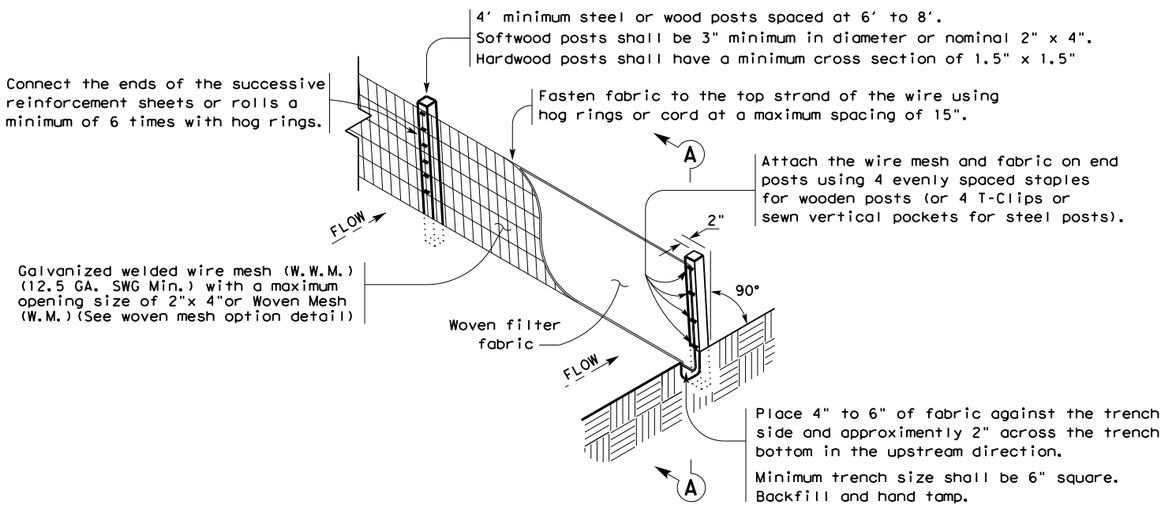
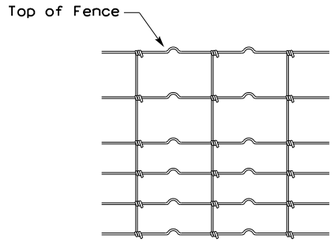
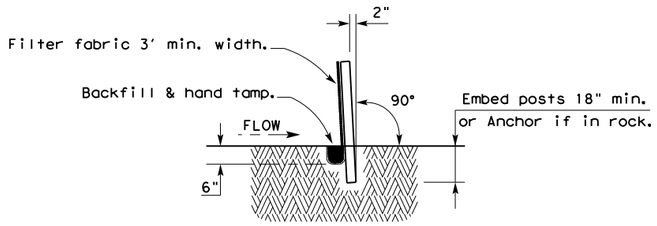


TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

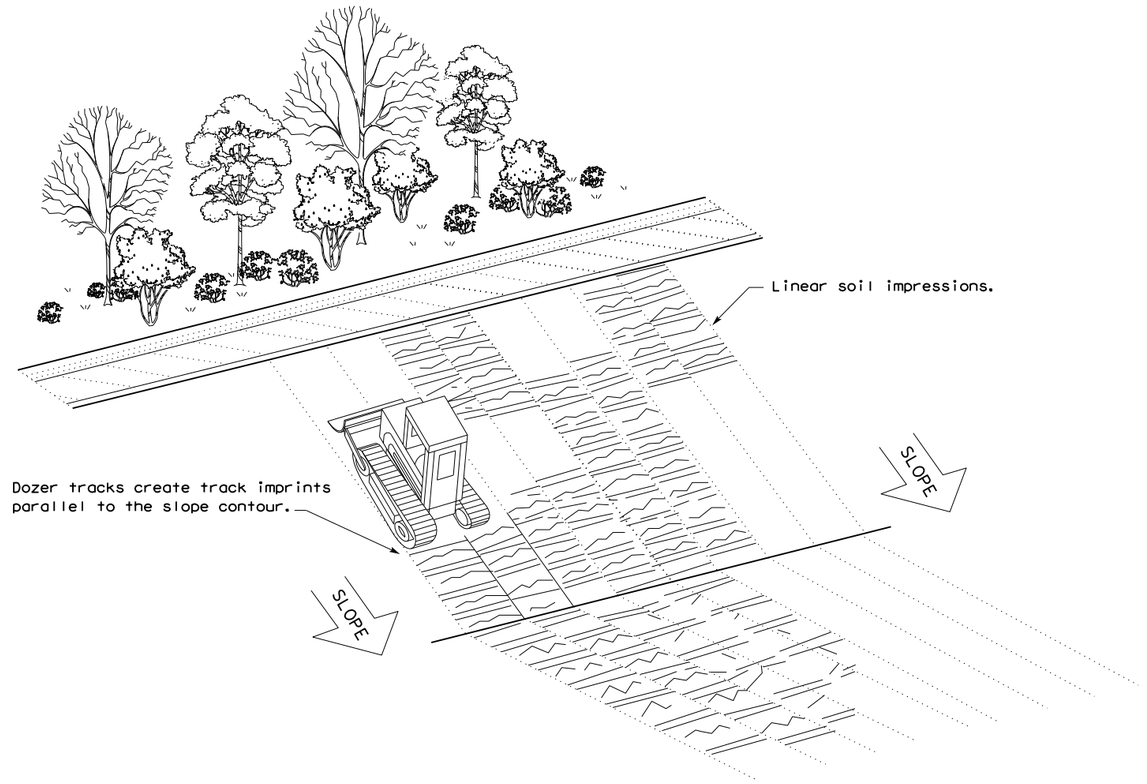
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0043	08	088		US287	
	DIST	COUNTY			SHEET NO.	
	WFS	WICHITA			136	

DATE
FILE

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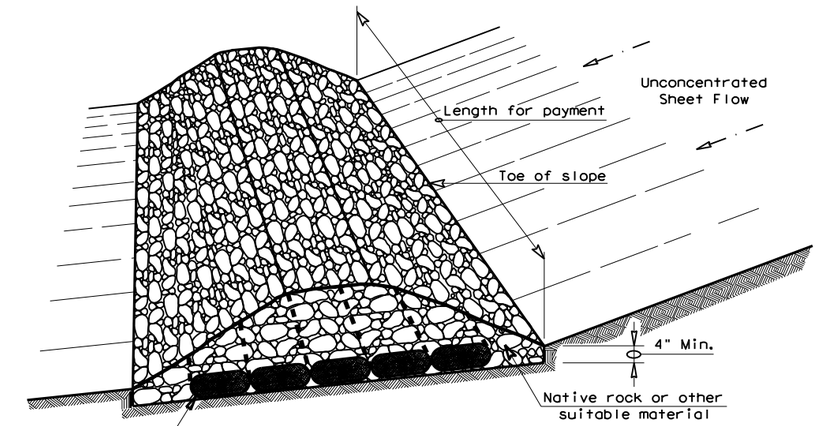
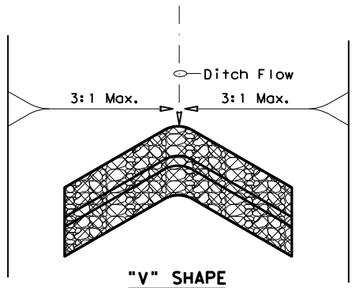
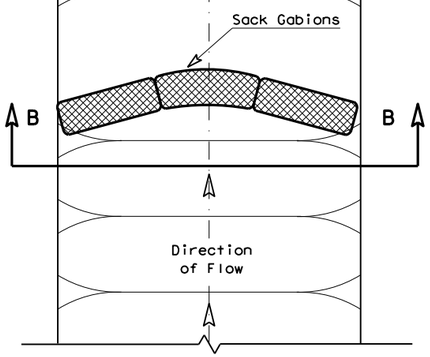


FILTER DAM AT TOE OF SLOPE

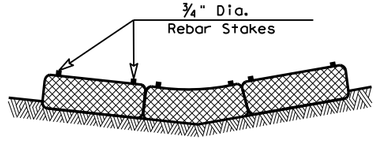
RFD1



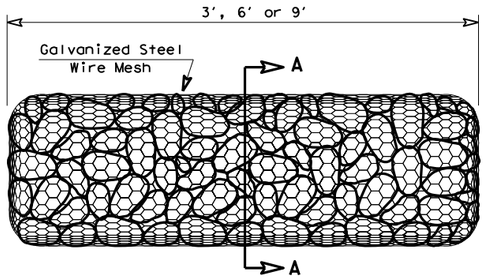
"V" SHAPE PLAN VIEW



PLAN VIEW

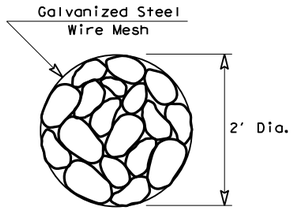


SECTION B-B

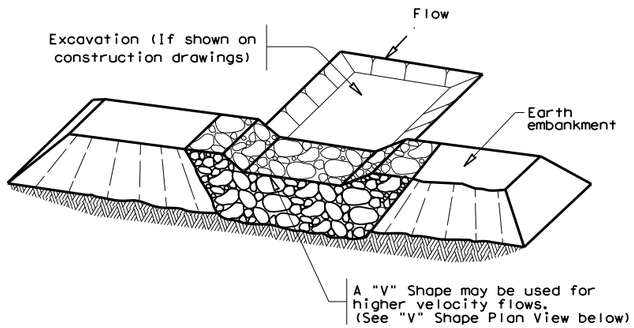


TYPE 4 (SACK GABIONS)

RFD4

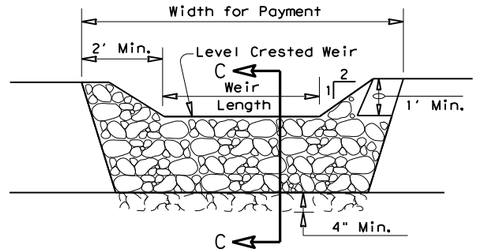


SECTION A-A

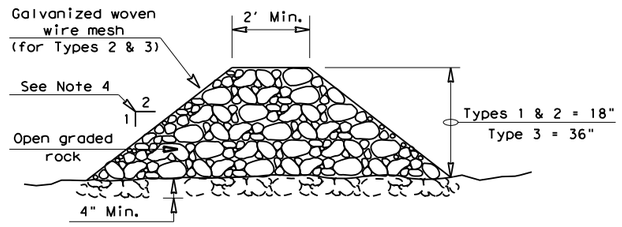


FILTER DAM AT SEDIMENT TRAP

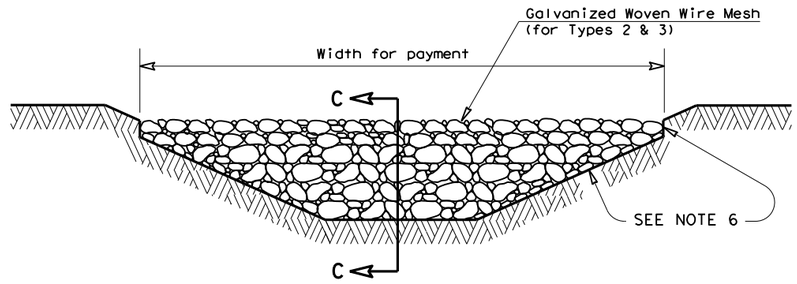
RFD1 — OR — RFD2



PROFILE



SECTION C-C



FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximently 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam	RFD1
Type 2 Rock Filter Dam	RFD2
Type 3 Rock Filter Dam	RFD3
Type 4 Rock Filter Dam	RFD4

Texas Department of Transportation

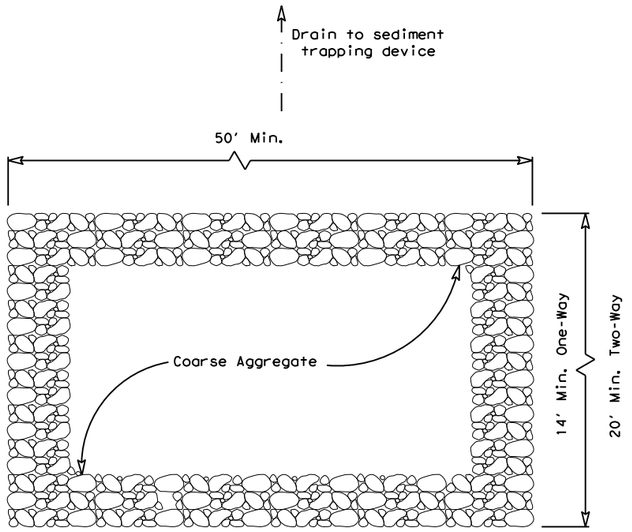
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

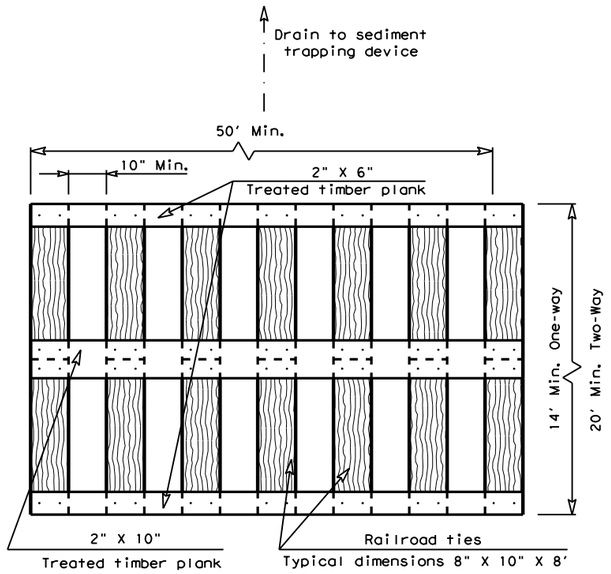
ROCK FILTER DAMS

EC(2)-16

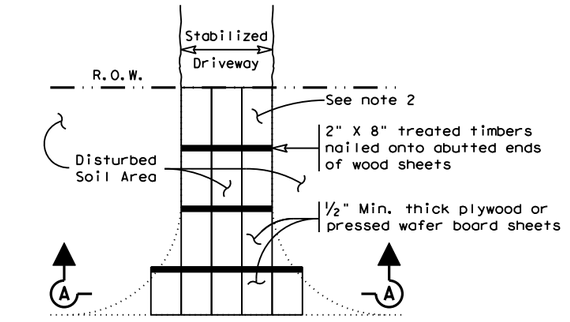
FILE: ec216	DN: TxDOT		CK: KM	DW: VP		DN/CK: LS
	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0043	08	088		US287	
	DIST	COUNTY			SHEET NO.	
	WFS	WICHITA			137	



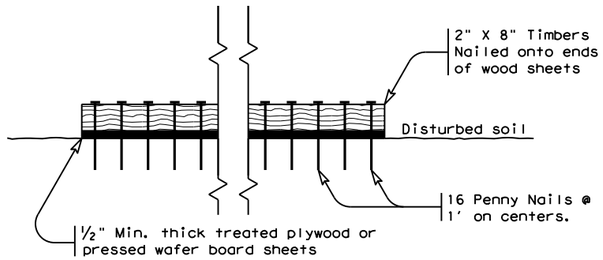
PLAN VIEW



PLAN VIEW



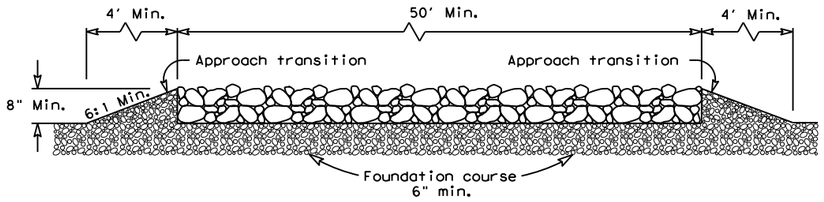
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

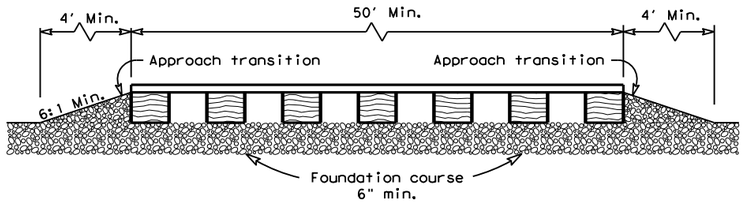
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materialas approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0043	08	088	US287
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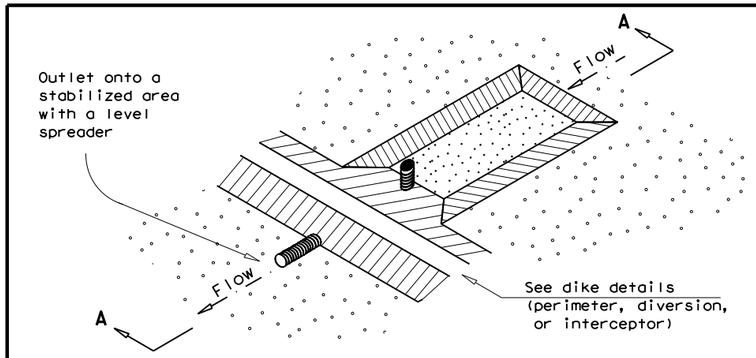
	WFS	WICHITA		138

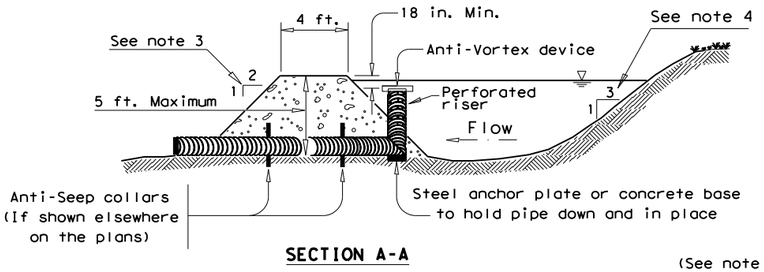
DATE: 12/7/2023
FILE: ...\Standards\ec316.dgn

DATE:
FILE:

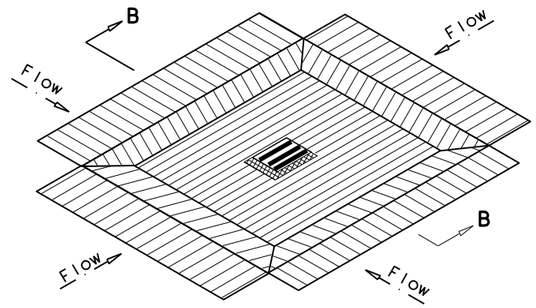


SEDIMENT BASIN AND/OR TRAP WITH PIPE OUTLET

ST/PO

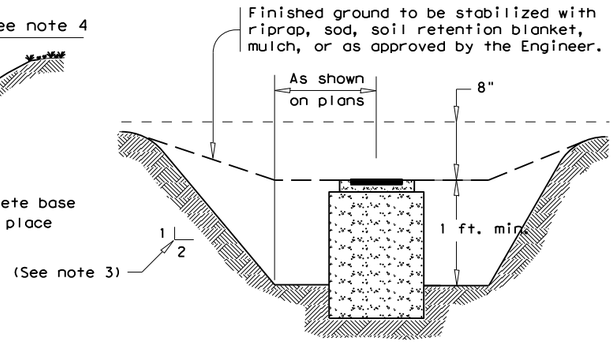


SECTION A-A

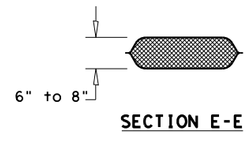


DROP INLET SEDIMENT TRAP

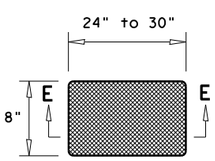
ST-DI



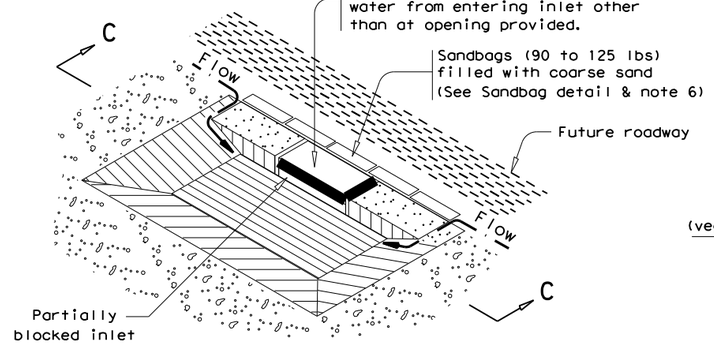
SECTION B-B



SECTION E-E

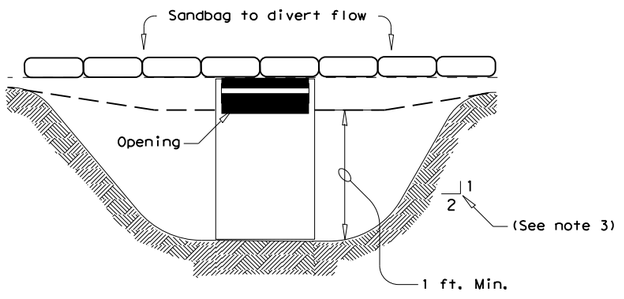


SANDBAG DETAIL

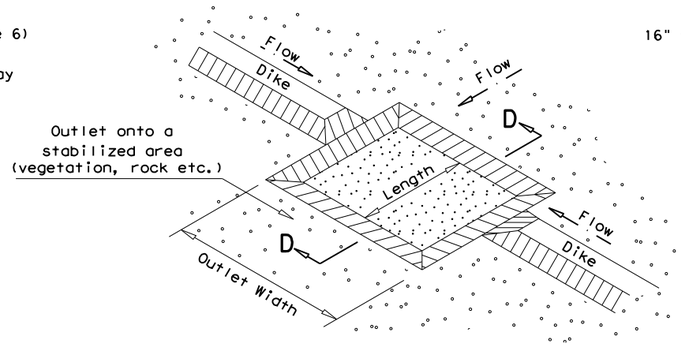


CURB INLET SEDIMENT TRAP

ST-CI

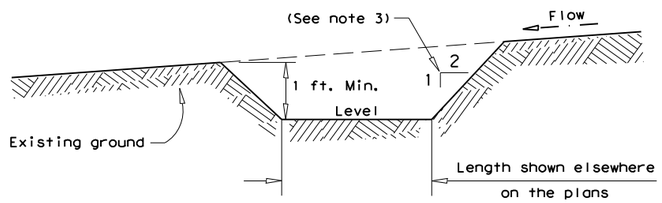


SECTION C-C



SEDIMENT TRAP WITH LEVEL STABILIZED OUTLET

ST



SECTION D-D

GENERAL NOTES

1. Pipe outlet material shall conform to the Item "Pipe Underdrains" or as accepted by the Engineer.
2. All pipe connections shall be watertight.
3. Side slopes within the safety clear zone of a roadway shall be 6:1 or flatter. Protect the traveling public from inlet stacks within the clear zone.
4. Sediment basins shall have side slopes of 3:1 or flatter.
5. The dimensions and limits of excavation for sediment basins and traps will be as shown elsewhere on the plans.
6. The sandbag material shall be made of polypropylene, polyethylene or polyamide woven fabric, min. unit weight 4 ounces /SY, Mullen burst strength exeeding 300 psi and ultraviolet stability exeeding 70%.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

SEDIMENT BASIN & TRAP USAGE GUIDELINES

A sediment basin and/or trap may be used to precipitate sediment out of runoff draining from an unstabilized area.

Basins: The drainage area for a sediment basin should not exceed 100 acres. The basin capacity shall be at least 1800 CF/Acre of drainage area (0.5" over the drainage area). If the disturbed area draining to the basin is larger than 10 acres, the basin capacity should be 3600 CF/Acre (1.0" over the drainage area).

The basin should have a 40 hour draw-down time with an emergency spillway. The spillway may be designed to pass the peak rate of runoff from a 25 year frequency storm. The 100 year storm should be investigated to consider possible flooding impacts.

The entrance into the basin should be protected from erosion. The basin should be cleaned when the capacity has been reduced by 1/3.

Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Sediment traps should be placed in the following locations:
1. Within drainage ditches spaced @ 500'± on center
2. Immediately preceding ditch inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way

The trap outlet may either be through a perforated riser and pipe assembly designed to achieve a 40 hour draw-down time or over a level stabilized area (vegetation, rock, etc.).

The trap should be cleaned when the capacity has been reduced by ½ or the sediment has accumulated to a depth of 1', whichever is less.

PLANS SHEET LEGEND

ST/PO — Sediment Basin and / or Trap with Pipe Outlet

ST-DI — Drop Inlet Sediment Trap

ST-CI — Curb Inlet Sediment Trap

ST — Sediment Trap with Level Stabilized Outlet

Texas Department of Transportation

Design Division Standard

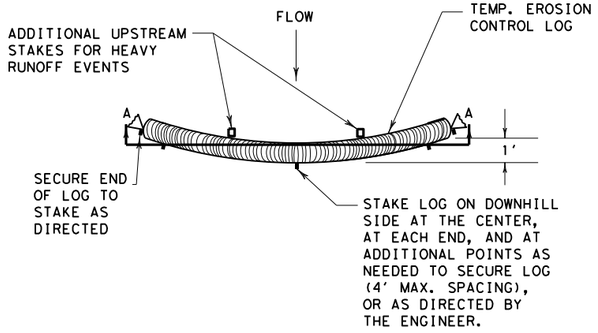
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

SEDIMENT BASINS AND TRAPS (EARTHWORK FOR EROSION CONTROL)

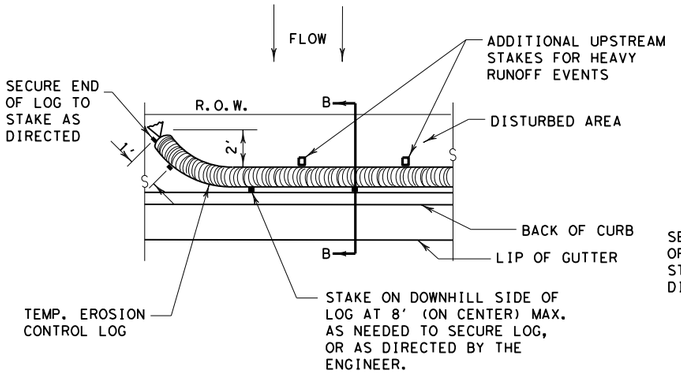
EC(6)-16

FILE: ec616	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS		
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0043	08	088		US287	
	DIST	COUNTY			SHEET NO.	
	WFS	WICHITA			139	

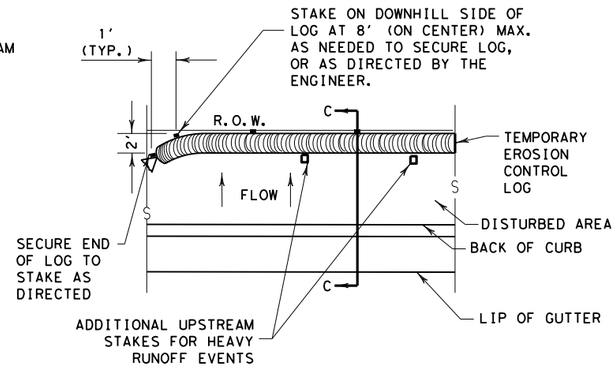
DATE:
FILE:



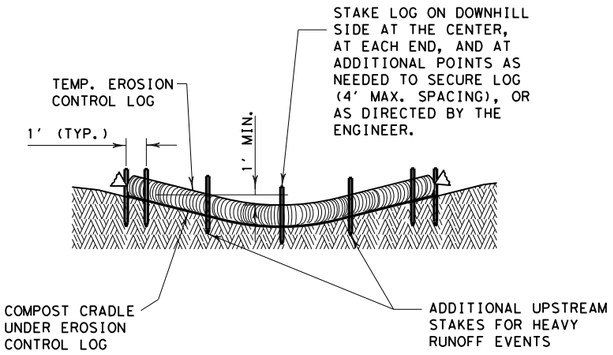
PLAN VIEW



PLAN VIEW



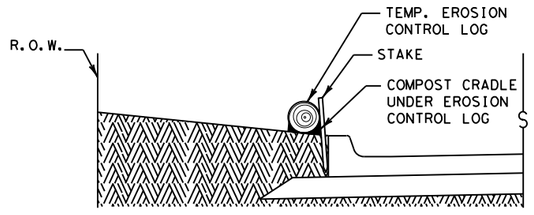
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

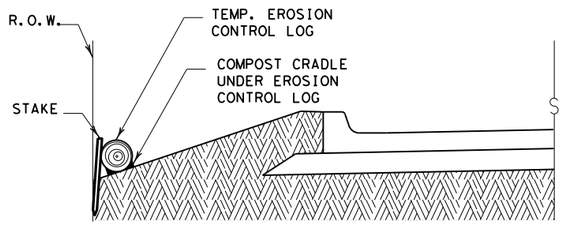
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

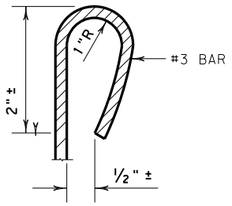
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

LEGEND

CL-D	EROSION CONTROL LOG DAM
CL-BOC	EROSION CONTROL LOG AT BACK OF CURB
CL-ROW	EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
CL-SST	EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
CL-SSL	EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
CL-DI	EROSION CONTROL LOG AT DROP INLET
CL-CI	EROSION CONTROL LOG AT CURB INLET
CL-GI	EROSION CONTROL LOG AT CURB & GRATE INLET

SEDIMENT BASIN & TRAP USAGE GUIDELINES

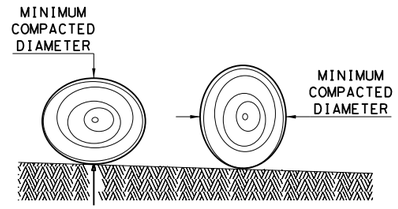
An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:
1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916		DN: TxDOT		CK: KM	DW: LS/PT		CK: LS
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REVISIONS		0043	08	088		US287	
		DIST		COUNTY			SHEET NO.
		WFS		WICHITA			140

DATE:
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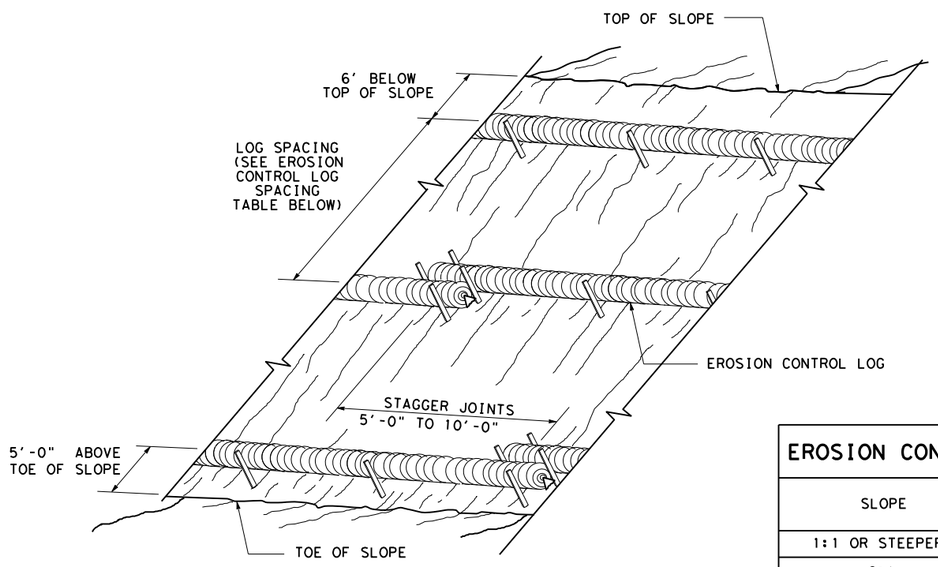
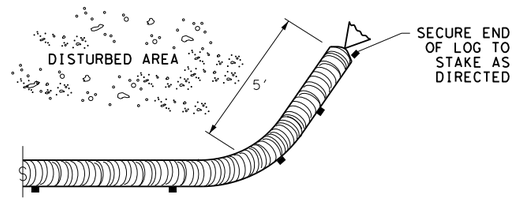


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

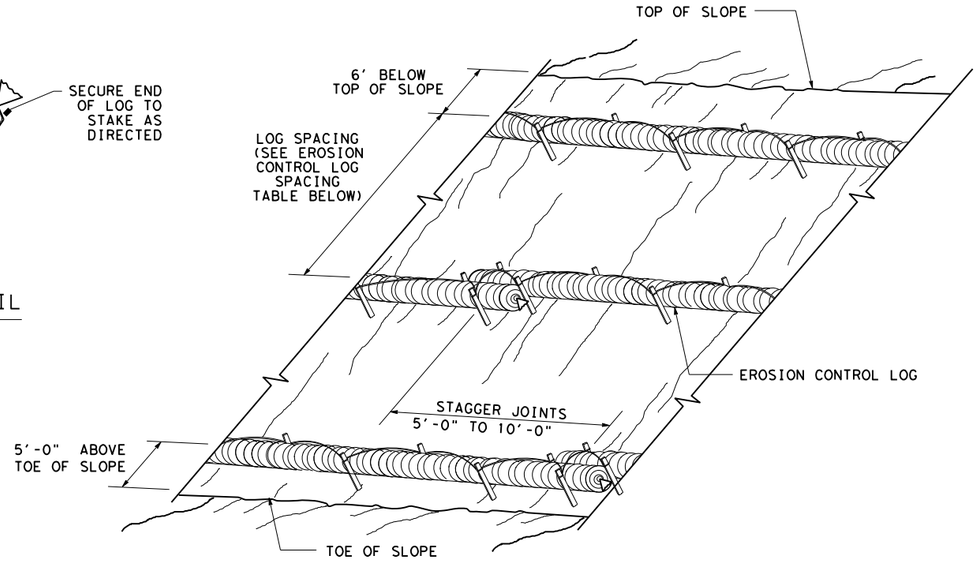
CL-SST



END SECTION RAP DETAIL

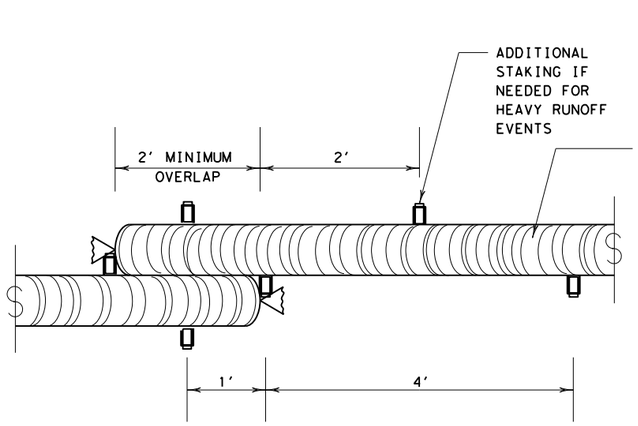
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

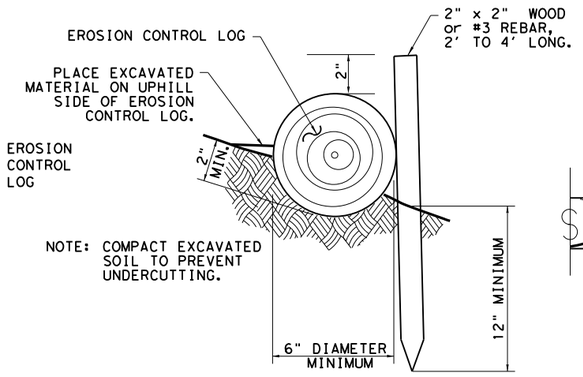
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

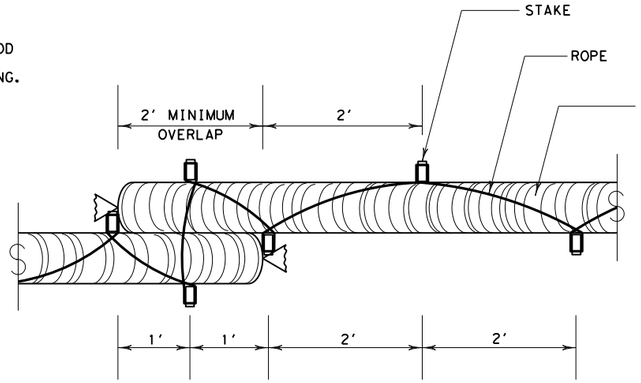


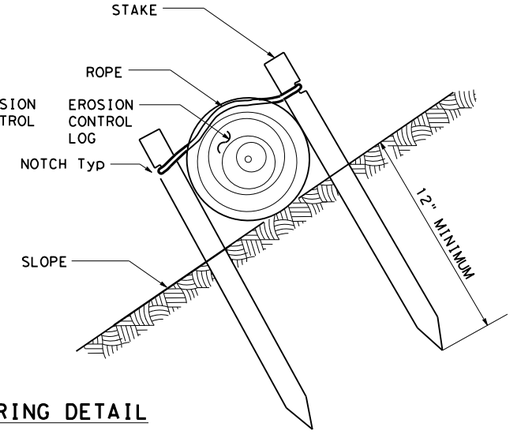


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

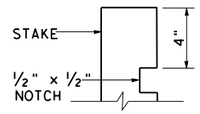
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

SHEET 2 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
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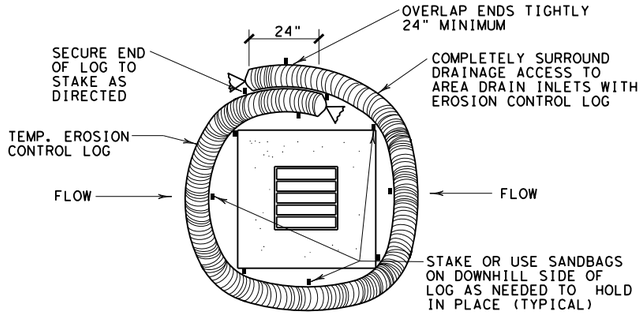
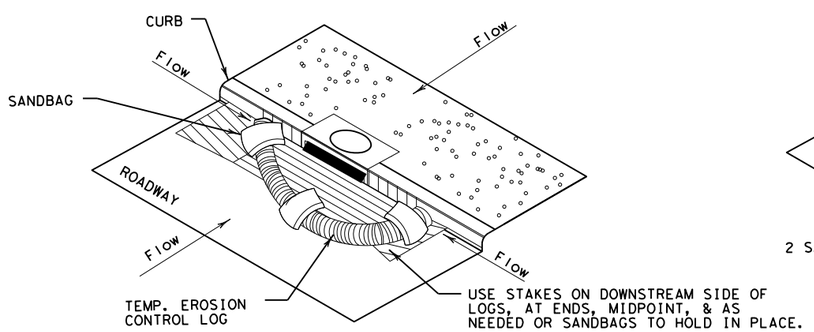
REVISIONS	0043	08	088		US287	
	DIST	COUNTY			SHEET NO.	
	WFS	WICHITA			141	

DATE:
FILE:



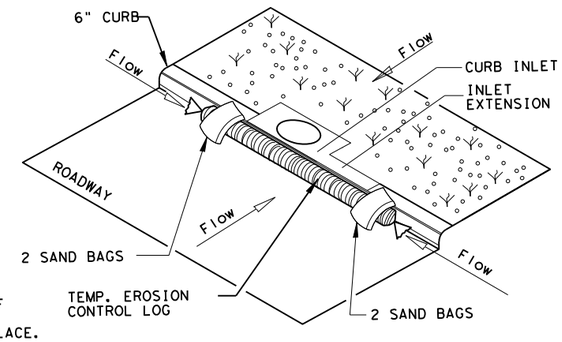
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

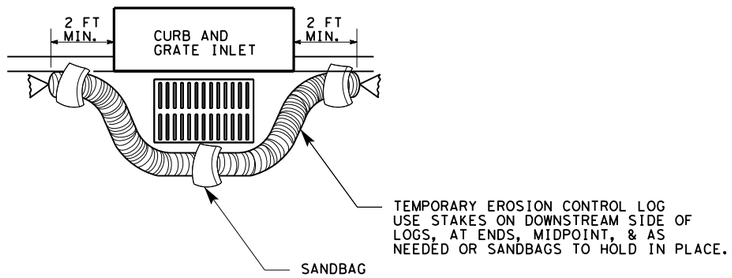
CL-CI



EROSION CONTROL LOG AT CURB INLET

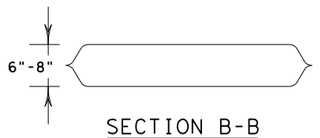
CL-CI

NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.

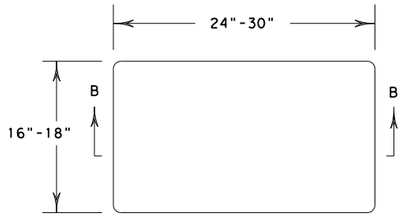


EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI



SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

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	WFS	WICHITA			142	