

SEE SHEET 2 FOR INDEX OF SHEETS

# STATE OF TEXAS DEPARTMENT OF TRANSPORTATION

## PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NO. STP 2024(670)HES

### US 59, ETC. PANOLA COUNTY

FOR THE CONSTRUCTION OF SAFETY IMPROVEMENTS  
CONSISTING OF INSTALLING MEDIAN BARRIER

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	STP 2024(670)HES		1
STATE	DIST.	COUNTY	
TEXAS	ATL	PANOLA	
CONT.	SECT.	JOB	HIGHWAY NO.
0063	04, ETC.	068, ETC.	US 59, ETC.

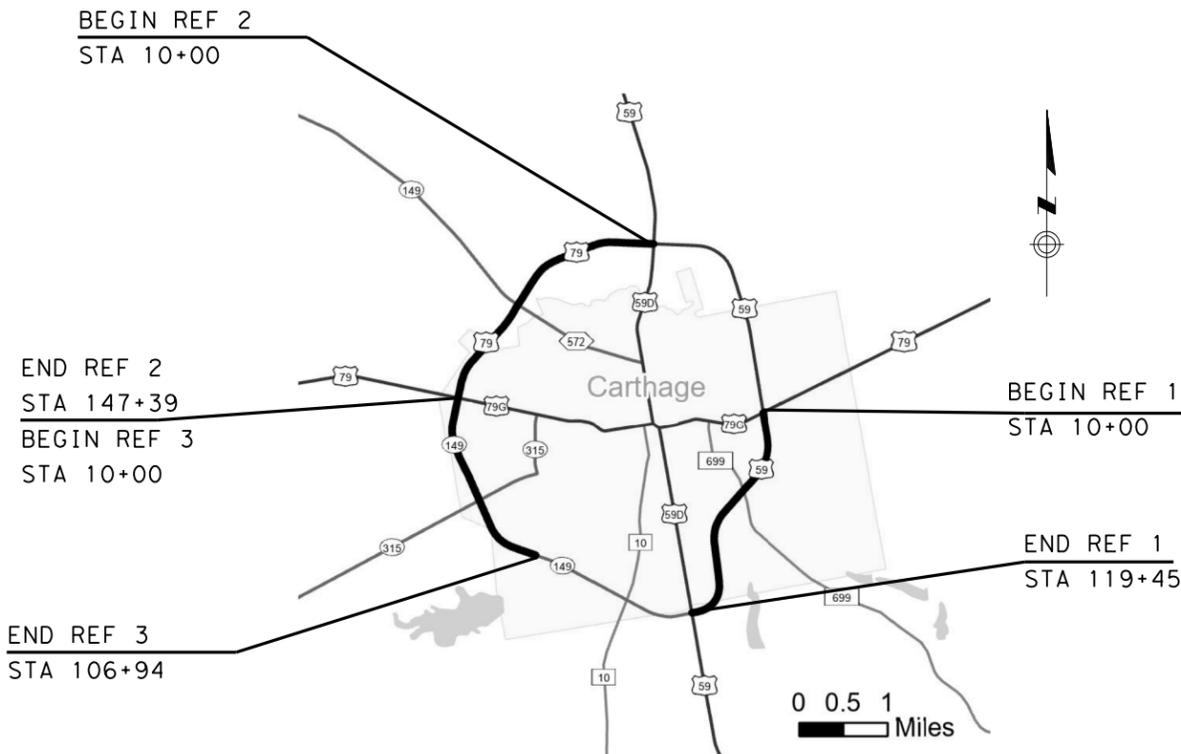
DESIGN SPEED = N/A

THE CONTRACTOR SHALL MAKE HIS OWN INVESTIGATIONS AND ARRANGEMENTS FOR DELIVERY OF MATERIALS.

REQUIRED SIGNS SHALL BE IN ACCORDANCE WITH THE CURRENT BARRICADE AND CONSTRUCTION OR BC SHEETS AND THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

FINAL PLANS

LETTING DATE: \_\_\_\_\_  
 DATE CONTRACTOR BEGAN WORK: \_\_\_\_\_  
 DATE WORK WAS COMPLETED & ACCEPTED: \_\_\_\_\_  
 FINAL CONTRACT COST: \$ \_\_\_\_\_  
 CONTRACTOR: \_\_\_\_\_  
 CONTRACTOR ADDRESS: \_\_\_\_\_  
 LIST OF APPROVED FIELD CHANGES: \_\_\_\_\_



REF	CSJ	COUNTY	HIGHWAY	LIMITS	BEGIN STATION	END STATION	BEGIN REF MRK	END REF MRK	LENGTH FEET	LENGTH MILES	AADT (2022)
1	0063-04-068	PANOLA	US 59	FR: US 79 N TO: US 59 S	10+00	119+45	312+0.852	314+0.957	10,945	2.073	11,695
2	0063-11-061	PANOLA	US 79	FR: US 59 N TO: US 79 S	10+00	147+39	312+0.808	312+1.794	13,739	2.602	16,408
3	0063-11-062	PANOLA	SH 149	FR: US 79 S TO: 0.8 MILES OF SH 315	10+00	106+94	312+1.794	316+0.754	9,694	1.836	9,891
<b>PROJECT TOTALS</b>									<b>34,378</b>	<b>6.511</b>	

NOTE: STATIONING IS FOR CONSTRUCTION PURPOSES ONLY.

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 FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, OCTOBER 23, 2023)

EXCEPTIONS: NONE  
 EQUATIONS: NONE  
 RAILROAD CROSSINGS: ONE

1) BNSF, RR MP = 173.70 (US 79 STA 55+90) (LAT: 32.1801771°, LONG: -94.3533379°)

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

P. E. \_\_\_\_\_  
DATE



RECOMMENDED FOR LETTING: 12/1/2023

DocuSigned by:  
  
 DISTRICT DIRECTOR OF TRANSPORTATION  
 PLANNING AND DEVELOPMENT

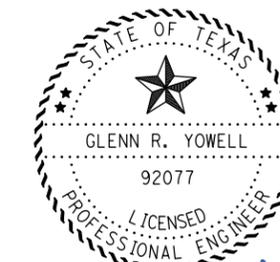
APPROVED FOR LETTING: 12/1/2023

DocuSigned by:  
  
 DISTRICT ENGINEER  
 22686C08B28E4A0

DATE: 11/30/2023 11:48:22 AM  
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COUNTY: HARRISON  
 PROJ. NO.: STP 2024(670)HES  
 HWY. NO.: US 59, ETC.  
 DATE ACCEPTED: FEBRUARY 2024

	<u>GENERAL</u>
1	TITLE SHEET
2	INDEX OF SHEETS
3, 3A-3B	GENERAL NOTES
4	ESTIMATE & QUANTITY
5	MISCELLANEOUS SUMMARIES
6-7	RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS
8	RAILROAD SCOPE OF WORK
9	LOCATION MAP BNSF RAILROAD CROSSING
	<u>TRAFFIC CONTROL PLAN STANDARDS</u>
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# 22	TCP(ATL-10) -14
# 23	TCP(ATL-18) -15
# 24	WZ(RS) -22
	<u>ROADWAY DETAILS &amp; STANDARDS</u>
25-26	ROADWAY DETAILS
# 27-29	BRIFEN(TL4) -14
# 30	CASS(TL4) -14
# 31	GBRLTR(TL4) -14
# 32-33	NU-CABLE(TL4) -14
	<u>ENVIRONMENTAL ISSUES</u>
34	EPIC



*Glenn R. Yowell, P.E.*  
 11-7-23

**INDEX  
 OF  
 SHEETS**

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE BY A '#'  
 HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.



CONT	SECT	JOB	HIGHWAY
0063	04	068	US 59
DIST	COUNTY	SHEET NO.	
ATL	PANOLA	2	

Control: 0063-04-068, ETC.  
County: PANOLA  
Highway: US 59, ETC

Control: 0063-04-068, ETC.  
County: PANOLA  
Highway: US 59, ETC

**GENERAL NOTES:**

**General Requirements and Covenants:**

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

Jacob Vise – Area Engineer  
[Jacob.Vise@txdot.gov](mailto:Jacob.Vise@txdot.gov)  
Ryan Griffin – Assistant Area Engineer  
[Ryan.Griffin@txdot.gov](mailto:Ryan.Griffin@txdot.gov)

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

[https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors?%](https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors?%25)

All contractor questions will be reviewed by the Engineer. All questions and any corresponding responses that are generated will be posted through the same Letting Pre-Bid Q&A web page. The Letting Pre-Bid Q&A web page for each project can be accessed by using the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

**ITEM 5 – Control of the Work:**

Contact all utility companies for the exact location of underground utilities before boring, trenching or any other work that might interfere with or damage existing utilities. The Contractor will be responsible for adjustments in project construction which may be needed because of conflicts with utilities. In addition to calling for dig tests at all locations shown on the plans, contact the Atlanta TXDOT signal shop at least 2 weeks in advance of work at the proposed locations. A representative from the signal shop will verify that no existing TXDOT electrical systems will interfere with the proposed work.

Repair any damage caused to utilities by Contractor operations at own expense and restore service in a timely manner.

Place construction points, stakes, and marks at intervals of no more than 100 ft., or as directed. Place stakes and marks so as not to interfere with normal maintenance operations.

**ITEM 6 - Control of Material:**

To comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law, the contractor must submit 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:**

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

Transmit copies of correspondence between Contractor and resource agencies as listed in Article 7.7 “ Preservation of Cultural and Natural Resources and the Environment”

No significant traffic generator events.

**ITEM 8 – Prosecution and Progress:**

Working days will be charged in accordance with Section 8.3.1.4 “Standard Workweek”.

**ITEM 164 – Seeding for Erosion Control:**

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

(Season: February 1 to May 15)	
Green Sprangletop	0.4
Bermudagrass	2.4
Sand Lovegrass	1.0
Lance-Leaf Coreopsis	1.25

(Season: September 1 to November 30)	
Bermuda (Unhulled)	12
Crimson Clover	10

**Control: 0063-04-068, ETC.**  
**County: PANOLA**  
**Highway: US 59, ETC**

**Control: 0063-04-068, ETC.**  
**County: PANOLA**  
**Highway: US 59, ETC**

**TEMPORARY SEEDING FOR EROSION CONTROL**

Warm Season  
 (Season: May 15 to August 31)

Bermudagrass	6
Foxtail Millet	34

Cool Season  
 (Season: September 1 to November 30)

Tall Fescue	4.5
Oats	24
Wheat	34

Adjust the seeding mixture and rates if directed.

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

Do not use Bahiagrass.

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

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

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

Mow tall growing vegetation as directed, to provide optimum growing conditions for temporary or permanent seeded areas in accordance with Item 730 "Roadside Mowing" except for measurement and payment. This work will be subsidiary to pertinent bid item.

Repair mulch sod, damaged by causes other than the Contractor's operations, as directed using mulch sod, seeding, and fertilizer. This work will be measured and paid for in accordance with the applicable bid items of the contract.

**ITEM 166 - Fertilizer:**

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

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

**ITEM 421 – Hydraulic Cement Concrete:**

The Department will furnish and maintain concrete compressive strength testing equipment. (For projects with small placements of structural concrete including multiple small placements on the same project.)

Elevate beam tanks as directed.

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

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

**ITEM 432 - Riprap:**

Provide 1/2" expansion joint material with an area equal to the area of contact between the two concrete surfaces. The joint material will be visually inspected for approval.

Mow strip can be placed monolithically with the appropriate foundation. If placed monolithically, then leave outs are not required, otherwise, see applicable standards.

Meet concrete class requirements of the foundations as approved by the engineer.

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

**ITEM 502 – Barricades, Signs, and Traffic Handling:**

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

**Control: 0063-04-068, ETC.**

**County: PANOLA**

**Highway: US 59, ETC**

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

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

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

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

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

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

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

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

Place erosion or pollution control measures deemed necessary by the Engineer. Work performed for which there is no applicable pay items in the contract will be reimbursed in accordance with Article 9.7, "Payment for Extra Work and Force Account Method".

The project is exempt from the Texas Pollutant Discharge Elimination System (TPDES) General Permit (TXR15000). Exempt projects are those that disturb less than one acre or routine maintenance activities that maintain the original line and grade, hydraulic capacity, or original purposes of the site. No temporary erosion control measures or Storm Water Pollution Prevention Plan (SWP3) have been included in the plans.

**ITEM 6185–Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA):**

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

A total of two (2) shadow vehicles with TMA will be required for work. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMA's needed for the project.



# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0063-04-068

DISTRICT Atlanta  
HIGHWAY SH 149, US 59, US 79

COUNTY Panola

CONTROL SECTION JOB				0063-04-068		0063-11-061		0063-11-062		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00192943		A00192944		A00192955			
COUNTY				Panola		Panola		Panola			
HIGHWAY				US 59		US 79		SH 149			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	164-6054	BOND FBR MTRX SEED (PERM)(RURAL)(SAND)	SY	13,323.000		26,289.000		16,288.000		55,900.000	
	164-6071	BROADCAST SEED (TEMP)(WARM OR COOL)	SY	13,323.000		26,289.000		16,288.000		55,900.000	
	168-6001	VEGETATIVE WATERING	MG	426.300		841.300		521.300		1,788.900	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	223.000		440.000		272.000		935.000	
	500-6001	MOBILIZATION	LS	1.000						1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	4.000						4.000	
	543-6002	CABLE BARRIER SYSTEM (TL-4)	LF	5,555.000		11,555.000		7,165.000		24,275.000	
	543-6020	CABLE BARRIER TERMINAL SECTION (TL-4)	EA	16.000		10.000		6.000		32.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000		2.000		2.000		6.000	
	6185-6002	TMA (STATIONARY)	DAY	18.000		30.000		21.000		69.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000						1.000	
		RAILROAD FLAGGING: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000						1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000						1.000	

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STATION			ROADWAY			SWP3			TCP		
			432 6045	543 6002	543 6020	164 6071 6054		166 6001	168 6001	6001 6002	6185 6002
FROM	-	TO	RIPRAP (MOW STRIP) (4 IN)	CABLE BARRIER SYSTEM (TL-4)	<sup>3</sup> CABLE BARRIER TERMINAL SECTION (TL-4)	BROADCAST SEED (TEMP) (WARM OR COOL)	BOND FIBER MTRX SEED(PERM) (RURAL)	<sup>1</sup> FERTILIZER (300 LBS/ 5000 SY)	VEGETATIVE WATERING (80 MG/ 5000 SY)	<sup>4</sup> PORTABLE CHANGEABLE MESSAGE SIGN	<sup>5</sup> TMA (STATIONARY)
			CY	LF	EA	SY	SY	TON	MG	EA	DAY
<b>CSJ 0063-04-068</b>											
10+00	-	10+50									
10+50	-	13+50	11	245	2	667	667	0.04	21.3	2	18
24+00	-	32+00	30	745	2	1,778	1,778	0.11	56.9		
37+40	-	40+50	11	255	2	689	689	0.04	22.0		
61+50	-	71+70	38	965	2	2,267	2,267	0.14	72.5		
77+30	-	90+50	49	1,265	2	2,933	2,933	0.18	93.9		
96+00	-	101+00	19	445	2	1,111	1,111	0.07	35.6		
106+30	-	120+50	53	1,365	2	3,156	3,156	0.19	101.0		
121+00	-	124+25	12	270	2	722	722	0.04	23.1		
<b>CSJ 0063-04-068 TOTALS</b>			<b>223</b>	<b>5,555</b>	<b>16</b>	<b>13,323</b>	<b>13,323</b>	<b>1</b>	<b>426.3</b>		
<b>CSJ 0063-11-061</b>											
10+00	-	10+50								2	30
10+50	-	38+20	103	2,715	2	6,156	6,156	0.37	197.0		
43+60	-	55+40	44	1,125	2	2,622	2,622	0.16	83.9		
56+40	-	61+40	19	445	2	1,111	1,111	0.07	35.6		
68+20	-	87+80	73	1,905	2	4,356	4,356	0.26	139.4		
90+60	-	144+80	201	5,365	2	12,044	12,044	0.72	385.4		
<b>CSJ 0063-11-061 TOTALS</b>			<b>440</b>	<b>11,555</b>	<b>10</b>	<b>26,289</b>	<b>26,289</b>	<b>2</b>	<b>841.3</b>		
<b>CSJ 0063-11-062</b>											
10+00	-	10+50								2	21
10+50	-	62+40	192	5,135	2	11,533	11,533	0.69	369.1		
66+00	-	83+70	66	1,715	2	3,933	3,933	0.24	125.9		
97+60	-	101+30	14	315	2	822	822	0.05	26.3		
<b>CSJ 0063-11-062 TOTALS</b>			<b>272</b>	<b>7,165</b>	<b>6</b>	<b>16,288</b>	<b>16,288</b>	<b>1</b>	<b>521.3</b>	<b>2</b>	<b>21</b>
<b>PROJECT TOTALS</b>			<b>935</b>	<b>24,275</b>	<b>32</b>	<b>55,900</b>	<b>55,900</b>	<b>4.00</b>	<b>1,788.9</b>	<b>6</b>	<b>69</b>

- <sup>1</sup> FOR CONTRACTOR INFORMATION ONLY
- <sup>2</sup> STATIONS ARE TO END OF PROPOSED TERMINAL
- <sup>3</sup> LENGTH OF PROPOSED TERMINAL ESTIMATED AT 27'-6"
- <sup>4</sup> TO BE PLACED AS DIRECTED
- <sup>5</sup> QUANTITY IS FOR 2 TMAs

**MISCELLANEOUS SUMMARIES**

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CONT	SECT	JOB	HIGHWAY
0063	04	068	US 59
DISTRICT	COUNTY	SHEET	
ATL	PANOLA	5	

DATE: 11/6/2023 3:57:56 PM  
 FILE: p:\t\tdot\projectwiseonline.com\TXDOT15\Documents\19 - ATL\Design Projects\006304068\4 - Design\Master Design Files\01 PLANSHEETS\000 RAILROAD REQUIREMENTS FOR NON-BRIDGE CON

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

**1.02 REQUEST FOR INFORMATION / CLARIFICATION**

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

**1.03 PLANS / SPECIFICATIONS**

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

**PART 2 - UTILITIES AND FIBER OPTIC**

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

**PART 3 - CONSTRUCTION**

**3.01 GENERAL**

- A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.
- B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.
- C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.
- D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.
- E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.
- F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.
- G. All permanent clearances shall be verified before project closing.

**3.02 RAILROAD OPERATIONS**

- A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.
- B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.
- C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:
  - 1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.
  - 2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

**3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES**

- A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.
- B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.
- C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.
- D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
  - 1. Exactly what the work entails.
  - 2. The days and hours that work will be performed.
  - 3. The exact location of work, and proximity to the tracks.
  - 4. The type of window requested and the amount of time requested.
  - 5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.
- E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

**3.04 INSURANCE**

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

**3.05 RAILROAD SAFETY ORIENTATION**

- A. Complete the railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.
 

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."
- B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

**3.06 COOPERATION**

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

**3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES**

Abide by the following minimum temporary clearances during the course of construction:

- A. 15' - 0" (BNSF) (UPRR) and 14' - 0" (KCS) horizontal from centerline of track
- B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

**3.08 APPROVAL OF REDUCED CLEARANCES**

- A. Maintain minimum track clearances during construction as specified in Section 3.07.
- B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.
- C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

SHEET 1 OF 2

 Texas Department of Transportation				Rail Division	
<b>RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS</b>					
FILE:	DW: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY	
REVISIONS March 2020	0063	04	068	US	59
	DIST		COUNTY		SHEET NO.
	ATL		PANOLA		6

**3.09 MAINTENANCE OF RAILROAD FACILITIES**

- A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.
- B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.
- C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

**3.10 SITE INSPECTIONS BY RAILROAD'S DESIGNATED REPRESENTATIVE**

- A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
  - 1. Pre-construction meetings.
  - 2. Pile driving/drilling of caissons or drilled shafts.
  - 3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
  - 4. Erection of precast concrete or steel bridge superstructure.
  - 5. Placement of waterproofing (prior to placing ballast on bridge deck).
  - 6. Completion of the bridge structure.
- B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.
- C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

**3.11 RAILROAD REPRESENTATIVES**

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

- A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.
- B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.
- C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.
- D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.
- E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

**3.12 COMMUNICATIONS AND SIGNAL LINES**

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

**3.13 TRAFFIC CONTROL**

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

**3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK**

- A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".
- B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

UPRR 1-800-336-9193  
 7:00 AM to 9:00 PM CST Monday-Friday except holidays,  
 staffed 24 hrs/day for emergencies  
 48 hrs notice required

BNSF 1-800-533-2891  
 24 hour number  
 5 working days notice required

KCS 1-800-344-8377  
 Texas One Call, a 24 hour number  
 48 hrs notice required, excluding weekends and holidays

If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

- C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of 1/4 inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

**3.15 RAILROAD FLAGGING**

Per the Right of Entry Agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

**3.16 CLEANING OF RIGHT-OF-WAY**

When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the right of Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.

 Texas Department of Transportation		Rail Division	
RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS			
FILE: © TxDOT October 2018	DWS: TxDOT CONT: 0063 SECT: 04	CKS: TxDOT JOB: 068	DWS: TxDOT HIGHWAY: US 59
REVISIONS March 2020		DIST: ATL	COUNTY: PANOLA SHEET NO.: 7

**DISCLAIMER:** The use of this standard is governed by the "Texas Engineering Practice Act." No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

**I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)**

This project is adjacent or parallel work, not within RR ROW:  
 DOT No.: 024072W  
 Crossing Type: At Grade  
 RR Company Operating Track at Crossing: BNSF Railway Company  
 RR Company Owning Track at Crossing: BNSF Railway Company  
 RR MP: 173.70  
 RR Subdivision: Longview  
 City: Carthage  
 County: Panola  
 CSJ at this Crossing: 0063-11-061  
 Latitude: 32.1801771  
 Longitude: -94.3533379

Scope of Work, including any TCP, to be performed by State Contractor:

Install cable barrier in the median on both sides of the crossing. Cable barrier will stop before BNSF right-of-way. Traffic control will be setup thru the crossing to install the cable barrier. If contractor performs operations outside of RXR right-of-way, but creates a contra-flow condition that causes vehicles to cross the railroad tracks in an opposing lane. A railroad flagger is also required to be on-site for the duration of the contra-flow traffic control plan with the BNSF railroad.

Scope of Work to be performed by Railroad Company:

Railroad Protective Flagging while TXDOT Contractor has traffic control set up to work on the section near the crossing.

**II. FLAGGING & INSPECTION**

No. of Days of Railroad Flagging Expected: 6  
 On this project, night or weekend flagging is:  
 Expected  
 Not Expected

Flagging services will be provided by:

Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.  
 Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

**UPRR** UP.info@railpros.com  
 Call Center 877-315-0513, Select #1 for flagging  
 UP.request@nrssinc.net  
 Call Center 877-984-6777  
 **BNSF** BNSFinfo@railprofs.com  
 Call Center 877-315-0513, Select #1 for flagging  
 **CPKCR** KCS.info@railpros.com  
 Call Center 877-315-0513, Select #1 for flagging  
 Bottom Line On-Track Safety Services  
 bottomline076@aol.com, 903-767-7630

OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

Not Required  
 Required. Contact Information for Construction Inspection:

**III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD**

Required.  
 Not Required  
 Railroad Point of Contact: \_\_\_\_\_

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

**IV. RAILROAD INSURANCE REQUIREMENTS**

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Escalated Limits	
Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	\$500,000 / \$500,000 / \$500,000
Commercial General Liability	\$2,000,000 / \$4,000,000
Business Automobile	\$2,000,000

Railroad Protective Liability Limits	
<input type="checkbox"/> Not Required	
<input checked="" type="checkbox"/> Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	\$2,000,000 / \$6,000,000
<input type="checkbox"/> Bridge Structure Projects. Includes new construction or replacement of overpass/underpass structures	\$5,000,000 / \$10,000,000
<input type="checkbox"/> Other:	_____

**V. CONTRACTOR'S RIGHT OF ENTRY (CROE)**

Not Required  
 Required: UPRR Maintenance Consent Letter. TxDOT to assist  
 Required: TxDOT to assist in obtaining the UPRR CROE  
 Required: Contractor to obtain  
 BNSF: \_\_\_\_\_  
 https://bnsf.railpermitting.com  
 CPKCR  
 https://jllrpg.360works.com/fmi/webd/rpo\_web\_kcs.fmp12  
 Other Railroads: \_\_\_\_\_

To view previously approved CROE templates agreed upon between the State and Railroad, see: <https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html>

Approved CROE templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed CROE between the Contractor and the Railroad if required on project.

**VI. RAILROAD COORDINATION MEETING**

A Railroad Coordination Meeting is required. See item 5, Article 8.1, of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges Manual for more details.

**VII. RAILROAD SAFETY ORIENTATION**

A. Complete the Railroad's course "Orientation for Contractor's Safety," and maintain registration prior to working on the Railroad's property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

UPRR, BNSF, CPKCR will not accept on-track safety training certificates from other Railroads. Refer to each Railroad's specific contractor right of entry for training information.

Know and follow the Contractor's Right of Entry Agreement EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

**VIII. SUBCONTRACTORS**

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

**IX. EMERGENCY NOTIFICATION**

**In Case of Railroad Emergency**  
 Call: (800) -832-5452  
 Railroad Emergency Line at: (800) -832-5452  
 Location: DOT 024072W  
 RR Milepost: 173.70  
 Subdivision: Longview

**RRD Review Only**  
 Initials: [Signature]  
 Date: 8/30/23

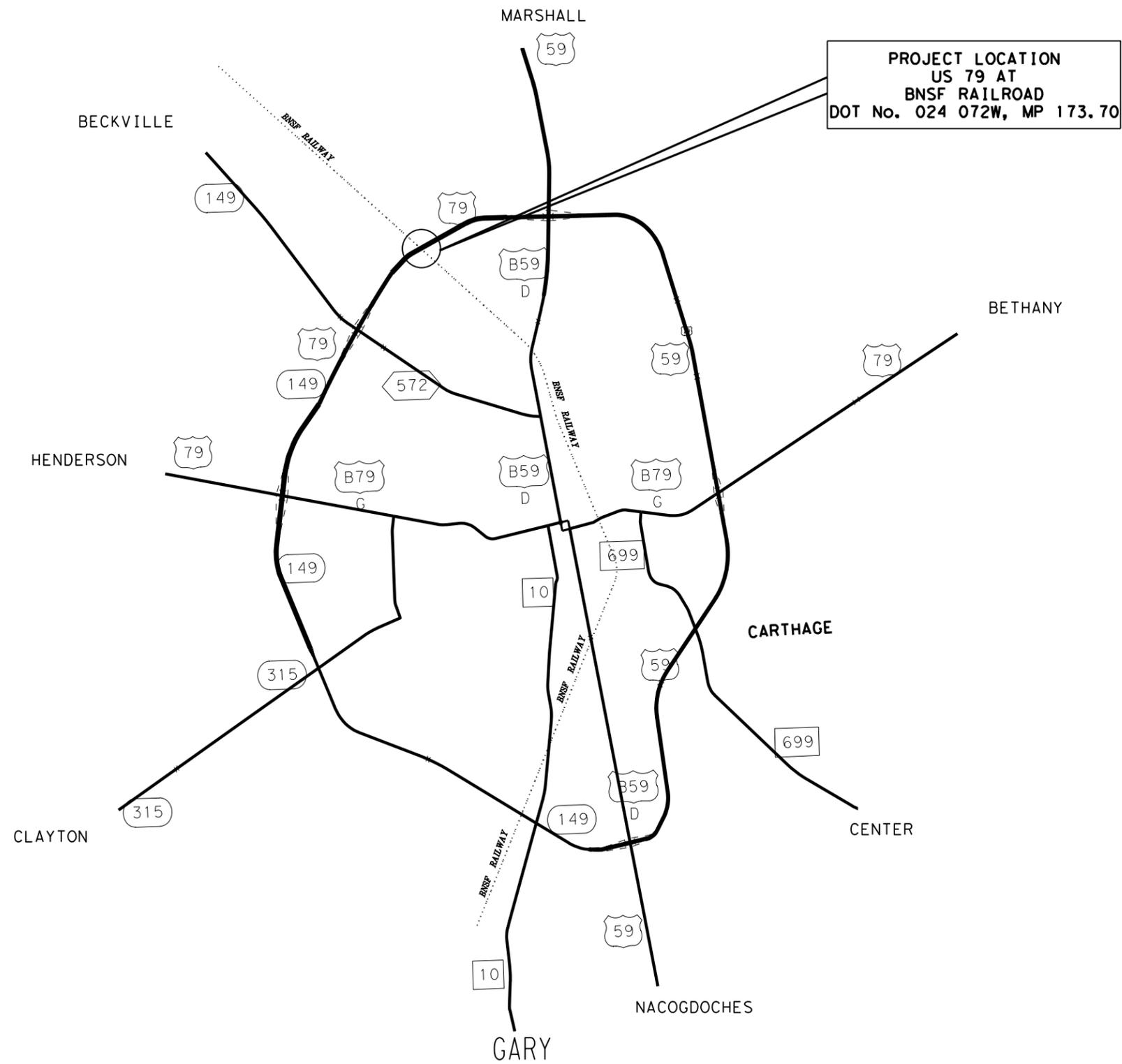
**Rail Division**

## RAILROAD SCOPE OF WORK

### PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf	DN: TxDOT	CK:	DW:	CK:
© TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
6/2023	0063	04	068	US 59
REVISIONS		COUNTY		SHEET NO.
		19	Panola	8

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**LOCATION  
 MAP  
 BNSF  
 RAILROAD CROSSING**

NOT TO SCALE

CONT	SECT	JOB	HIGHWAY
0063	04	068	US 59
DIST	COUNTY		SHEET NO.
ATL	PANOLA		9

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**BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:**

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
10. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.
11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.
12. The Engineer has the final decision on the location of all traffic control devices.
13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

**WORKER SAFETY NOTES:**

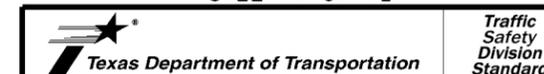
1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance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

**COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES**

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

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

SHEET 1 OF 12



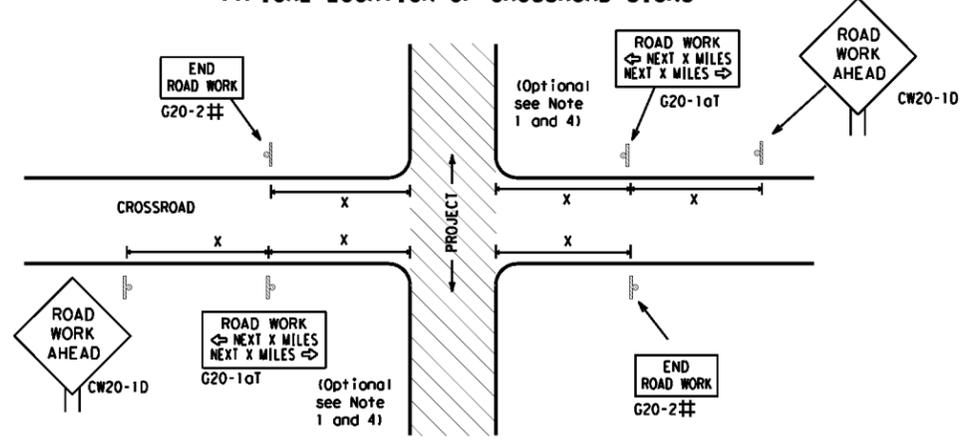
**BARRICADE AND CONSTRUCTION  
GENERAL NOTES  
AND REQUIREMENTS**

**BC (1) - 21**

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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5-10 5-21				

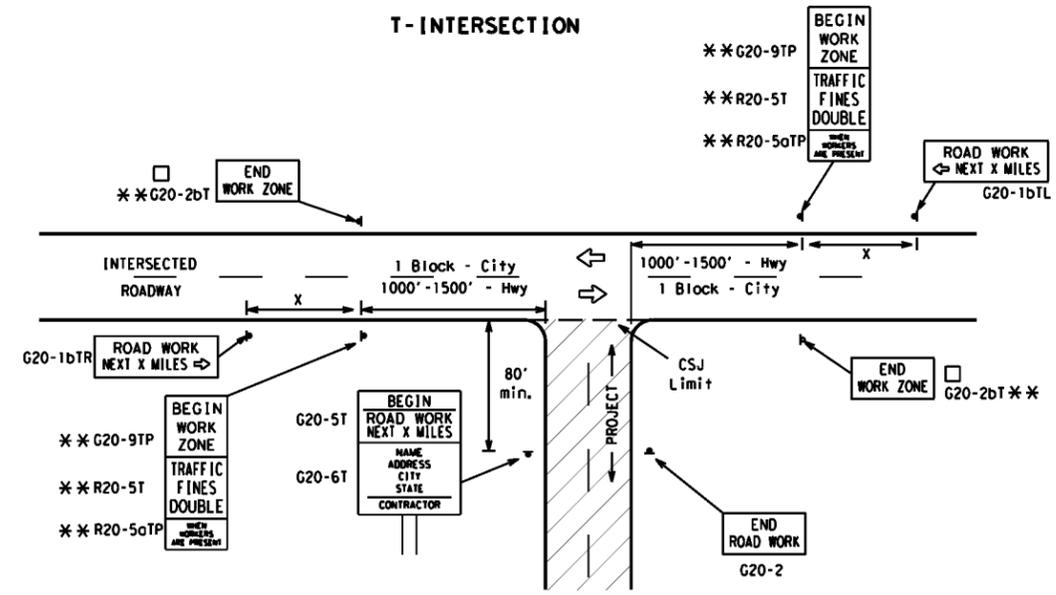
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**TYPICAL LOCATION OF CROSSROAD SIGNS**



- ## May be mounted on back of "ROAD WORK AHEAD" (CW20-1D) sign with approval of Engineer. (See note 2 below)
- 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.
  - 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.
  - 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.
  - 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.
  - Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
  - 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**

- 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.
- 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<sup>1,5,6</sup>**

Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed MPH	Sign Δ Spacing "x" Feet (Apprx.)
CW20 <sup>4</sup>	48" x 48"	48" x 48"	30	120
CW21			35	160
CW22			40	240
CW23			45	320
CW25			50	400
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	60	600 <sup>2</sup>
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"	65	700 <sup>2</sup>
			70	800 <sup>2</sup>
			75	900 <sup>2</sup>
			80	1000 <sup>2</sup>
			*	* <sup>3</sup>

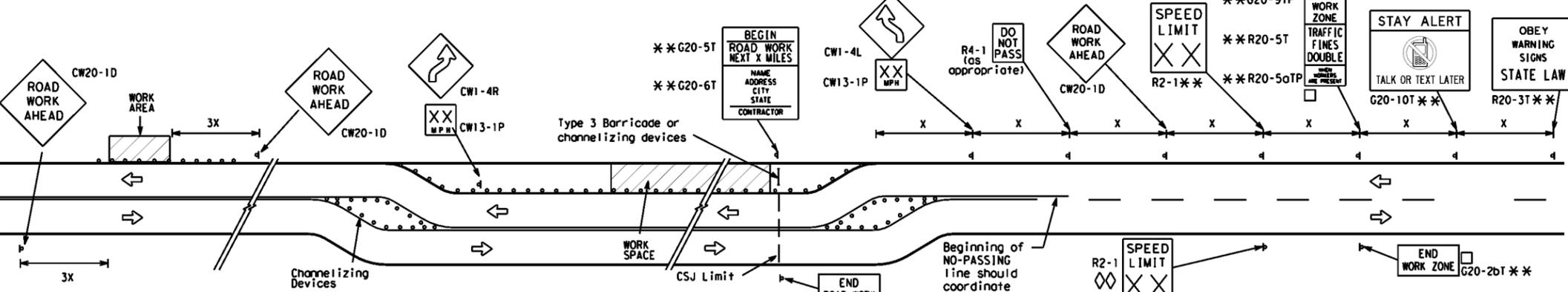
\* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

**GENERAL NOTES**

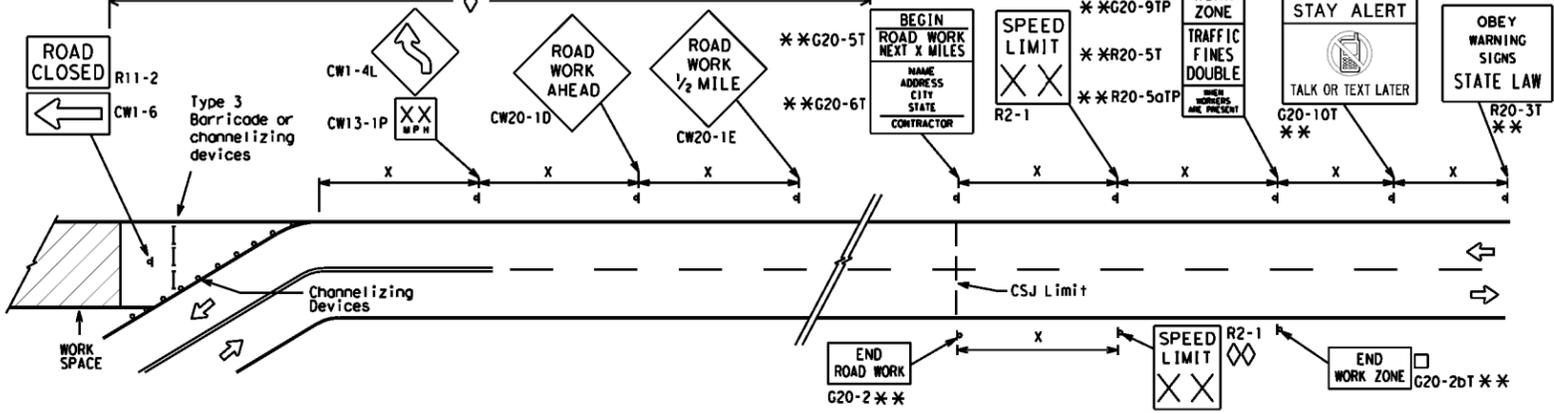
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be 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".
- Only diamond shaped warning sign sizes are indicated.
- 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



**BARRICADE AND CONSTRUCTION PROJECT LIMIT**

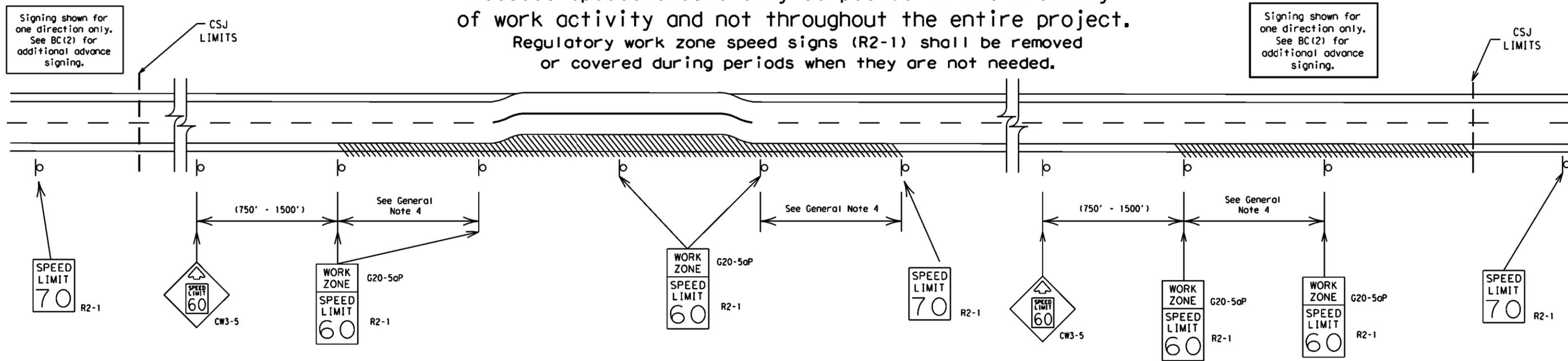
**BC(2)-21**

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9-07 8-14	DIST: ATL	COUNTY: PANOLA	SHEET NO. 11	
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# 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:

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- 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

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- 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
- Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
- 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.
- Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
- Techniques that may help reduce traffic speeds include but are not limited to:
  - Law enforcement.
  - Flagger stationed next to sign.
  - Portable changeable message sign (PCMS).
  - Low-power (drone) radar transmitter.
  - Speed monitor trailers or signs.
- Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
- 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.

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SHEET 3 OF 12

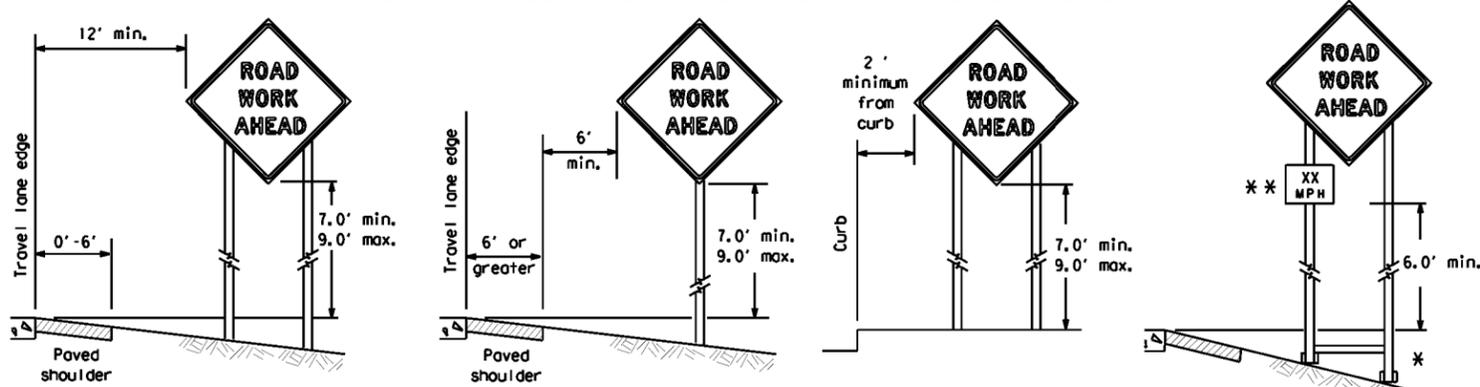


## BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC (3) - 21

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7-13	5-21	ATL	PANOLA	12	

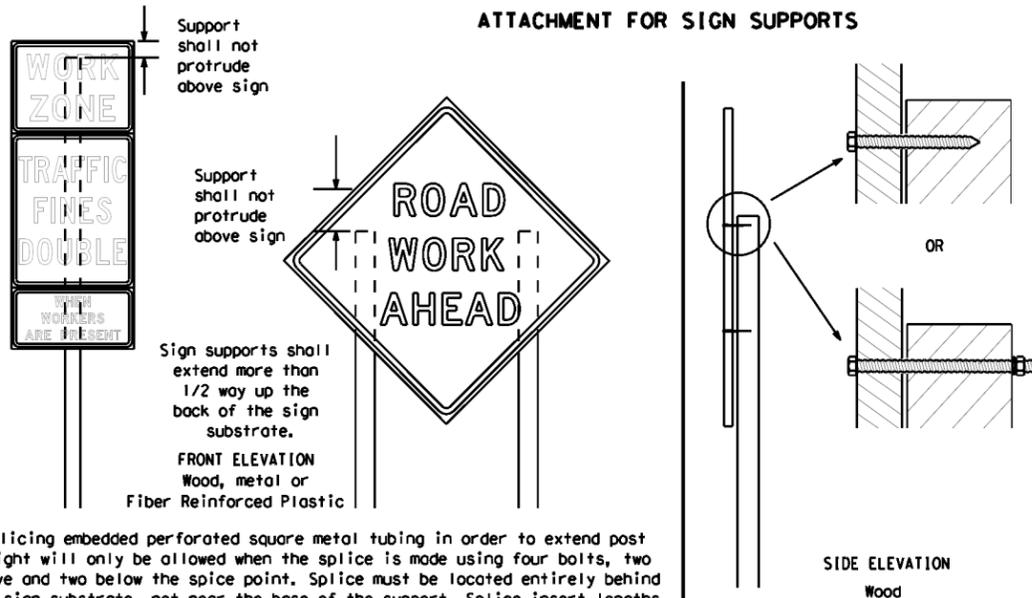
**TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS**



\* 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**



**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 splice 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.

**GENERAL NOTES FOR WORK ZONE SIGNS**

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
- Wooden sign posts shall be painted white.
- Barricades shall NOT be used as sign supports.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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)**

- 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.
  - Long-term stationary - work that occupies a location more than 3 days.
  - 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.
  - Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
  - Short, duration - work that occupies a location up to 1 hour.
  - Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

**SIGN MOUNTING HEIGHT**

- 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.
- 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.
- Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
- 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.
- 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**

- 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**

- 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.
- "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
- 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**

- 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).
- White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
- Orange sheeting, meeting the requirements of DMS-8300 Type B<sub>FL</sub> or Type C<sub>FL</sub>, shall be used for rigid signs with orange backgrounds.

**SIGN LETTERS**

- 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**

- When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
- 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.
- 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.
- 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.
- Burlap shall NOT be used to cover signs.
- Duct tape or other adhesive material shall NOT be affixed to a sign face.
- Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

**SIGN SUPPORT WEIGHTS**

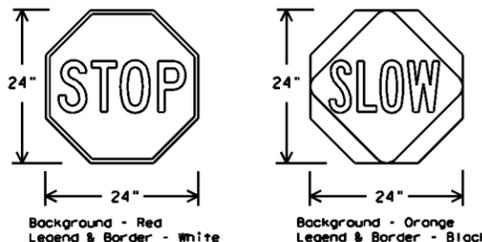
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
- 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.
- 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.
- 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.
- Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

**FLAGS ON SIGNS**

- 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.

**STOP/SLOW PADDLES**

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



SHEETING REQUIREMENTS (WHEN USED AT NIGHT)		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	ORANGE	TYPE B <sub>FL</sub> OR C <sub>FL</sub> 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**

- 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.
- 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.
- When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
- 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.
- 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.
- 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.

Texas Department of Transportation  
Traffic Safety Division Standard

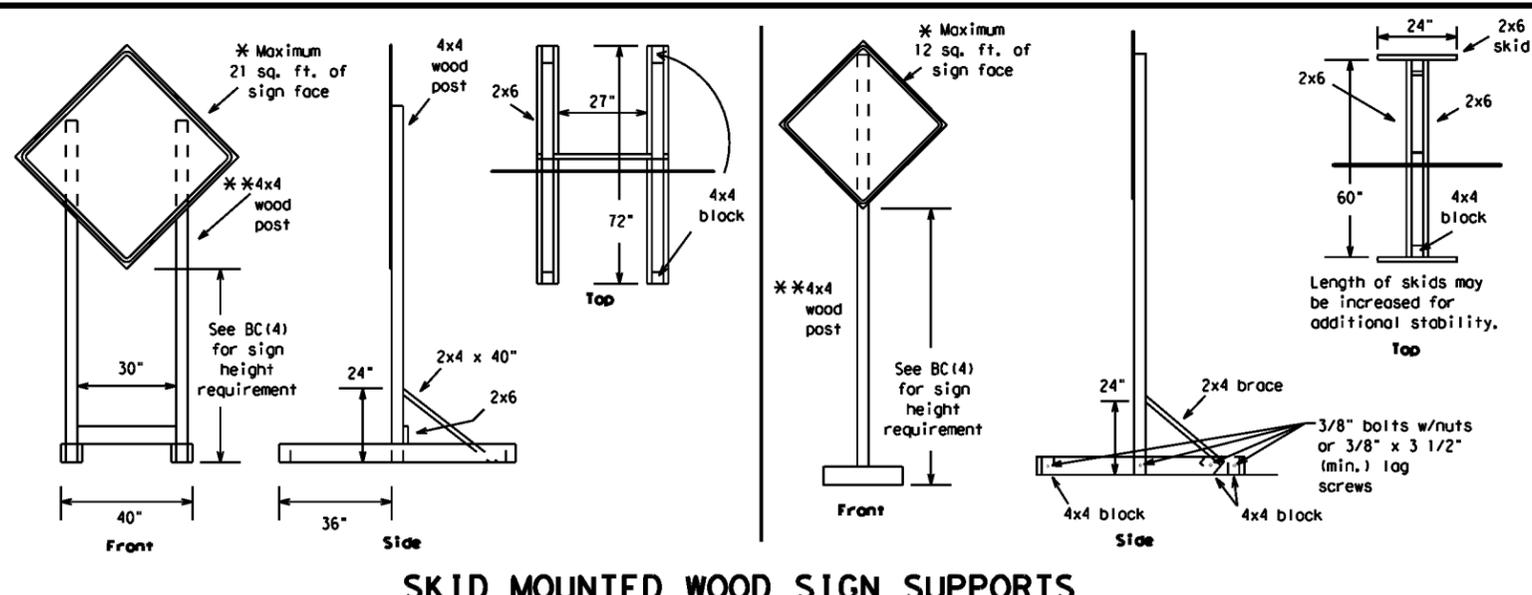
**BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES**

**BC (4) - 21**

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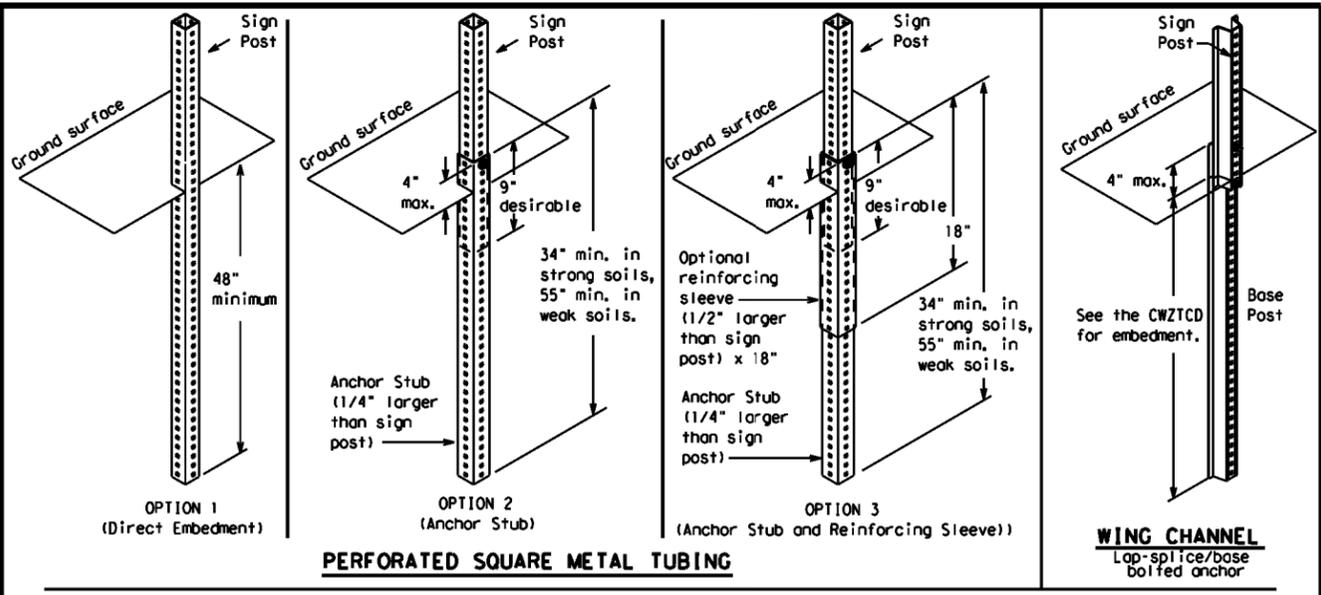
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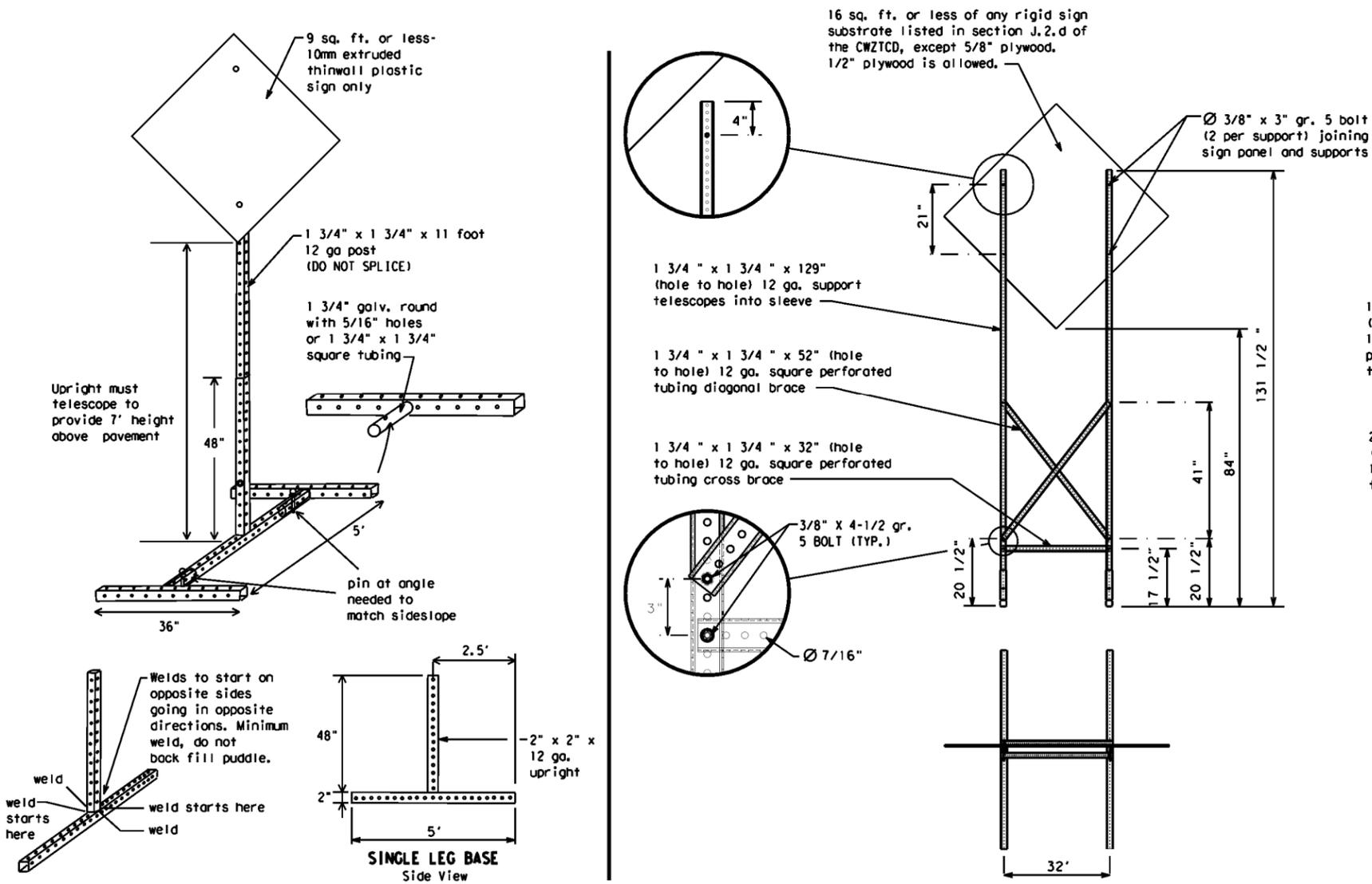
**SKID MOUNTED WOOD SIGN SUPPORTS**

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



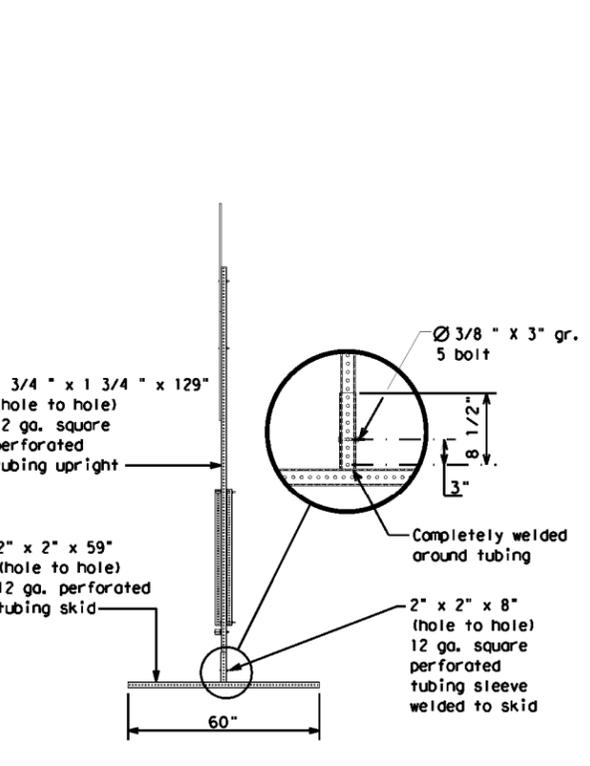
**GROUND MOUNTED SIGN SUPPORTS**

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



**SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS**

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



**WEDGE ANCHORS**

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

**OTHER DESIGNS**

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

**GENERAL NOTES**

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

- \* See BC(4) for definition of "Work Duration."
- \*\* Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
- ☐ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

SHEET 5 OF 12



**BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT**

**BC(5) - 21**

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7-13 5-21	ATL	PANOLA	14	

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

# RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

## PORTABLE CHANGEABLE MESSAGE SIGNS

- The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
- 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.
- 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.
- Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
- Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
- When in use, the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
- 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.
- 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.
- Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
- 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.
- Do not use the word "Danger" in message.
- Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
- Do not display messages that scroll horizontally or vertically across the face of the sign.
- 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.
- 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.
- Each line of text should be centered on the message board rather than left or right justified.
- 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.

## Phase 1: Condition Lists

### Road/Lane/Ramp Closure List

FREEWAY CLOSED X MILE
ROAD CLOSED AT SH XXX
ROAD CLSD AT FM XXXX
RIGHT X LANES CLOSED
CENTER LANE CLOSED
NIGHT LANE CLOSURES
VARIOUS LANES CLOSED
EXIT CLOSED
MALL DRIVEWAY CLOSED
XXXXXXXX BLVD CLOSED

### Other Condition List

FRONTAGE ROAD CLOSED
SHOULDER CLOSED XXX FT
RIGHT LN CLOSED XXX FT
RIGHT X LANES OPEN
DAYTIME LANE CLOSURES
I-XX SOUTH EXIT CLOSED
EXIT XXX CLOSED X MILE
RIGHT LN TO BE CLOSED
X LANES CLOSED TUE - FRI
ROADWORK XXX FT
FLAGGER XXXX FT
RIGHT LN NARROWS XXXX FT
MERGING TRAFFIC XXXX FT
LOOSE GRAVEL XXXX FT
DETOUR X MILE
ROADWORK PAST SH XXXX
BUMP XXXX FT
TRAFFIC SIGNAL XXXX FT
ROAD REPAIRS XXXX FT
LANE NARROWS XXXX FT
TWO-WAY TRAFFIC XX MILE
CONST TRAFFIC XXX FT
UNEVEN LANES XXXX FT
ROUGH ROAD XXXX FT
ROADWORK NEXT FRI-SUN
US XXX EXIT X MILES
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
DETOUR NEXT X EXITS
USE EXIT XXX
STAY ON US XXX SOUTH
TRUCKS USE US XXX N
WATCH FOR TRUCKS
EXPECT DELAYS
REDUCE SPEED XXX FT
USE OTHER ROUTES
STAY IN LANE *
FORM X LINES RIGHT
USE XXXXX RD EXIT
USE EXIT I-XX NORTH
USE I-XX E TO I-XX N
WATCH FOR TRUCKS
EXPECT DELAYS
END SHOULDER USE
WATCH FOR WORKERS

### Location List

AT FM XXXX
BEFORE RAILROAD CROSSING
NEXT X MILES
PAST US XXX EXIT
XXXXXXXX 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

- Only 1 or 2 phases are to be used on a PCMS.
- The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
- A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
- A Location Phase is necessary only if a distance or location is not included in the first phase selected.
- 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.
- 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

- The words RIGHT, LEFT and ALL can be interchanged as appropriate.
- Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
- EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
- Highway names and numbers replaced as appropriate.
- ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
- AHEAD may be used instead of distances if necessary.
- FT and MI, MILE and MILES interchanged as appropriate.
- AT, BEFORE and PAST interchanged as needed.
- 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

- 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.
- 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.
- 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.
- 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.

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

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



## BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) - 21

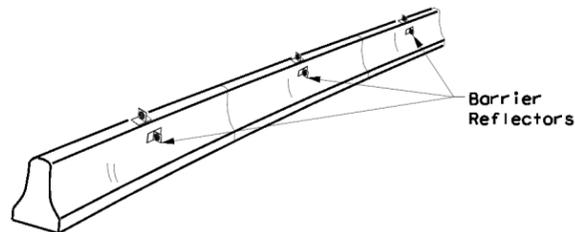
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© TxDOT November 2002	CONT: 0063	SECT: 04	JOB: 068	HIGHWAY: US 59
REVISIONS	0063	04	068	US 59
9-07 8-14	DIST: ATL	COUNTY: PANOLA	SHEET NO.: 15	
7-13 5-21				

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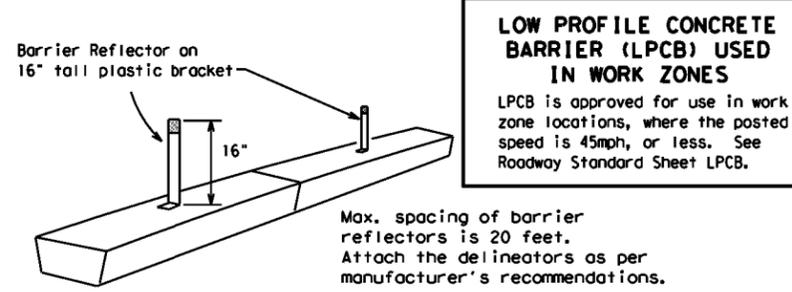
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



**CONCRETE TRAFFIC BARRIER (CTB)**

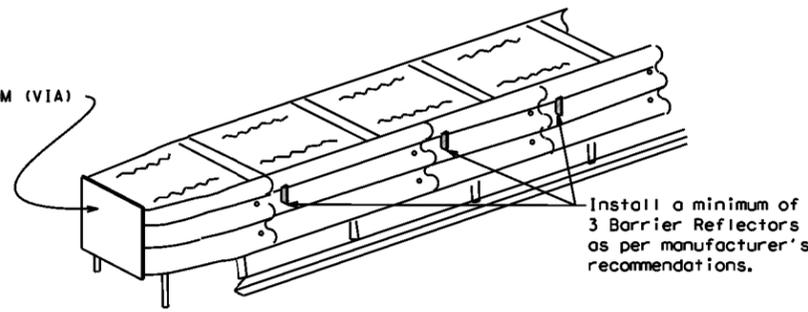
- Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector.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



**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 appropriate 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**

**WARNING LIGHTS**

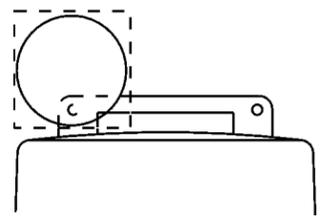
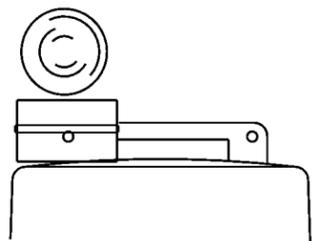
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet 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<sub>PL</sub> or C<sub>FL</sub> Sheeting meeting the requirements of Departmental Material Specification DMS-8300.
- 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".
- The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
- 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.
- 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.
- The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

**WARNING LIGHTS MOUNTED ON PLASTIC DRUMS**

- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- 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.
- 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.
- Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
- Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
- The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

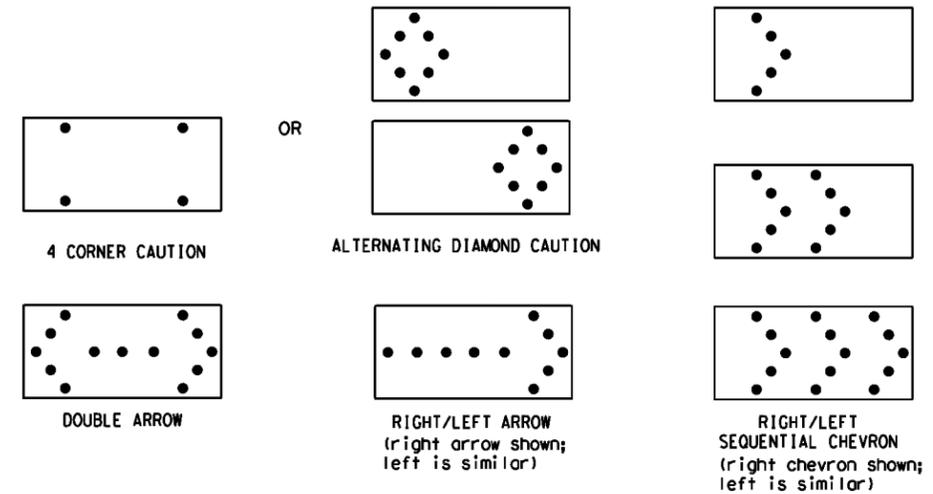
**WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C (STEADY BURN) WARNING LIGHTS**

- 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.
- 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.
- The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
- Round reflectors shall be fully reflectorized, including the area where attached to the drum.
- 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.
- 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.
- When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
- The warning reflector should be mounted on the side of the handle nearest approaching traffic.
- 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.

- 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.
- 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.
- 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.
- The Flashing Arrow Board should be able to display the following symbols:



- The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
- The straight line caution display is NOT ALLOWED.
- 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.
- 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.
- The sequential arrow display is NOT ALLOWED.
- The flashing arrow display is the TxDOT standard; however, the sequential chevron display may be used during daylight operations.
- The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
- A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
- 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.
- Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

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

**ATTENTION**

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

**FLASHING ARROW BOARDS**

SHEET 7 OF 12

**TRUCK-MOUNTED ATTENUATORS**

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
- Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
- Refer to the CWZTCD for a list of approved TMAs.
- TMAs are required on freeways unless otherwise noted in the plans.
- 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.
- The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

Texas Department of Transportation  
Traffic Safety Division Standard

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

**BC (7) - 21**

FILE: bc-21.dgn	DWG: TxDOT	CR: TxDOT	DWG: TxDOT	CR: TxDOT
© TxDOT November 2002		CONT: 0063 04	JOB: 068	HIGHWAY: US 59
REVISIONS		DATE	COUNTY	SHEET NO.
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				16

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**GENERAL NOTES**

- For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
- 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.
- 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.
- 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).
- 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.
- 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**

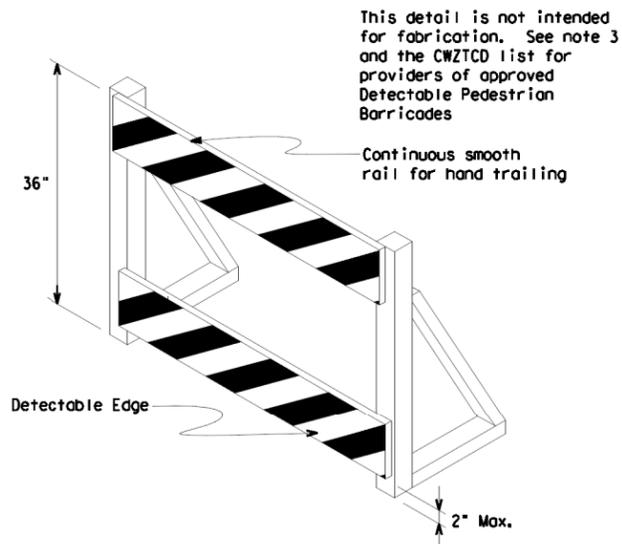
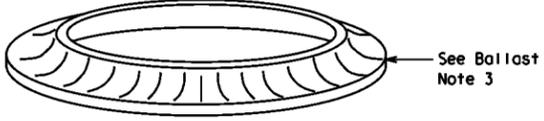
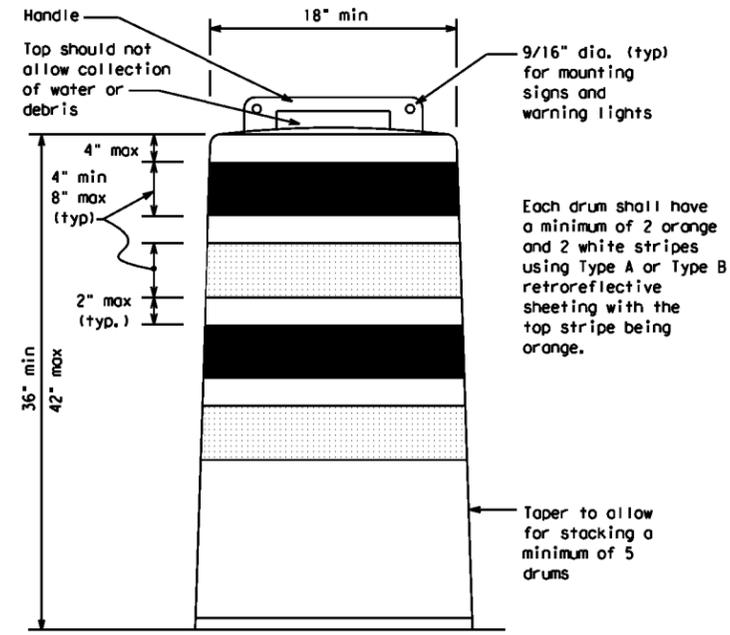
- Pre-qualified plastic drums shall meet the following requirements:
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
  - The body and base shall lock together in such a manner that the body separates from the base when impacted 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.
  - 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.
  - 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.
  - 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.
  - 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.
  - 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.
  - Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
  - Drum body shall have a maximum unballasted weight of 11 lbs.
  - Drum and base shall be marked with manufacturer's name and model number.

**RETROREFLECTIVE SHEETING**

- 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.
- 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.

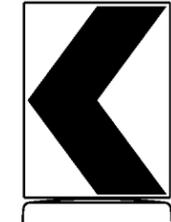
**BALLAST**

- 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.
- 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.
- Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
- 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.
- 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.
- Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.

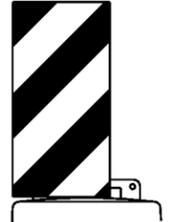


**DETECTABLE PEDESTRIAN BARRICADES**

- 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.
- 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.
- 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.
- 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.
- Warning lights shall not be attached to detectable pedestrian barricades.
- 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 CWI-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**

- Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
- Chevrons and other work zone signs with an orange background shall be manufactured with Type B<sub>FL</sub> or Type C<sub>FL</sub> Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
- 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.
- 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.
- Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
- Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
- 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.
- 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.

SHEET 8 OF 12



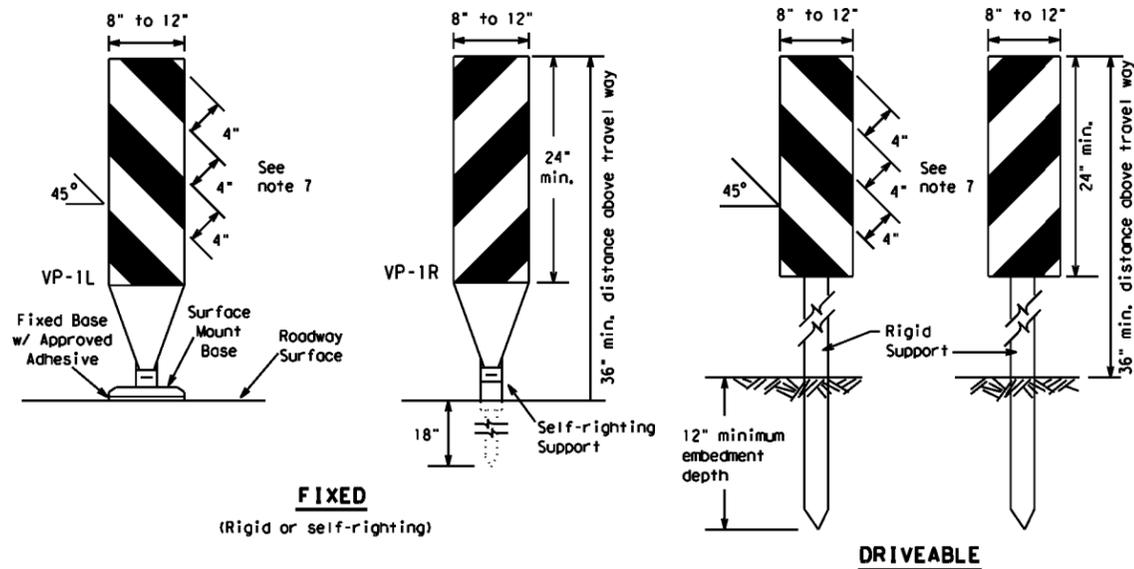
**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC(8)-21**

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© TxDOT November 2002	CONT: 0063	SECT: 04	JOB: 068	HIGHWAY: US 59
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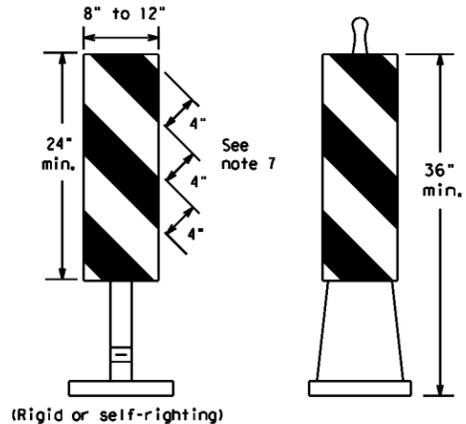
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**FIXED**  
(Rigid or self-righting)

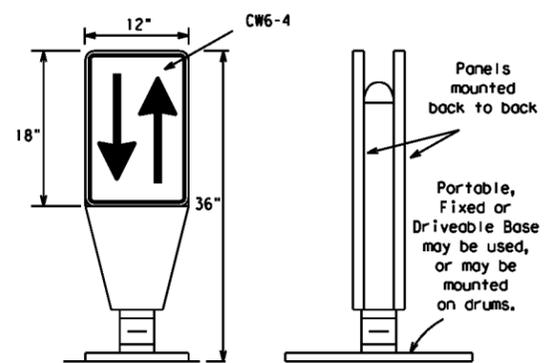
**DRIVEABLE**



**PORTABLE**

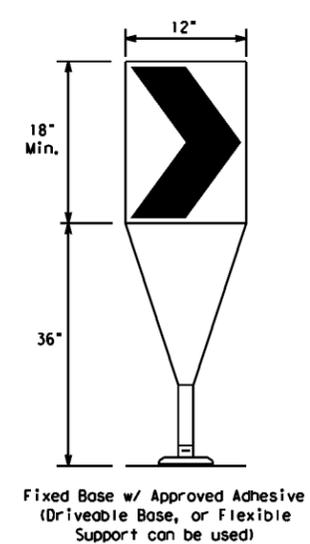
**VERTICAL PANELS (VPs)**

- Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
- 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.
- 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.
- VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
- Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- Sheeting for the VP's shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
- Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.



**OPPOSING TRAFFIC LANE DIVIDERS (OTLD)**

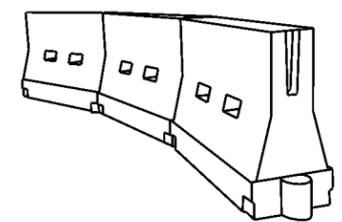
- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base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



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

- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- 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.
- 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.
- To be effective, the chevron should be visible for at least 500 feet.
- Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B<sub>FL</sub> or Type C<sub>FL</sub> conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
- For Long Term Stationary use on tapers or transitions on freeways and divided highways, self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

**CHEVRONS**



**LONGITUDINAL CHANNELIZING DEVICES (LCD)**

- 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.
- LCDs may be used instead of a line of cones or drums.
- LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
- LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
- 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**

- 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.
- 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.
- 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.
- 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.
- When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

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

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

**GENERAL NOTES**

- 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).
- 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.
- 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).
- 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.
- Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
- 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.
- The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.

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

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

**SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS**

SHEET 9 OF 12



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

BC (9) - 21

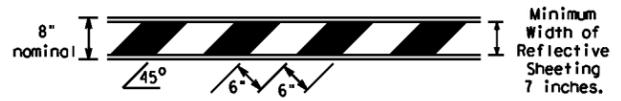
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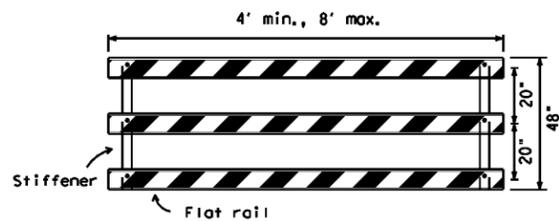
**TYPE 3 BARRICADES**

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.

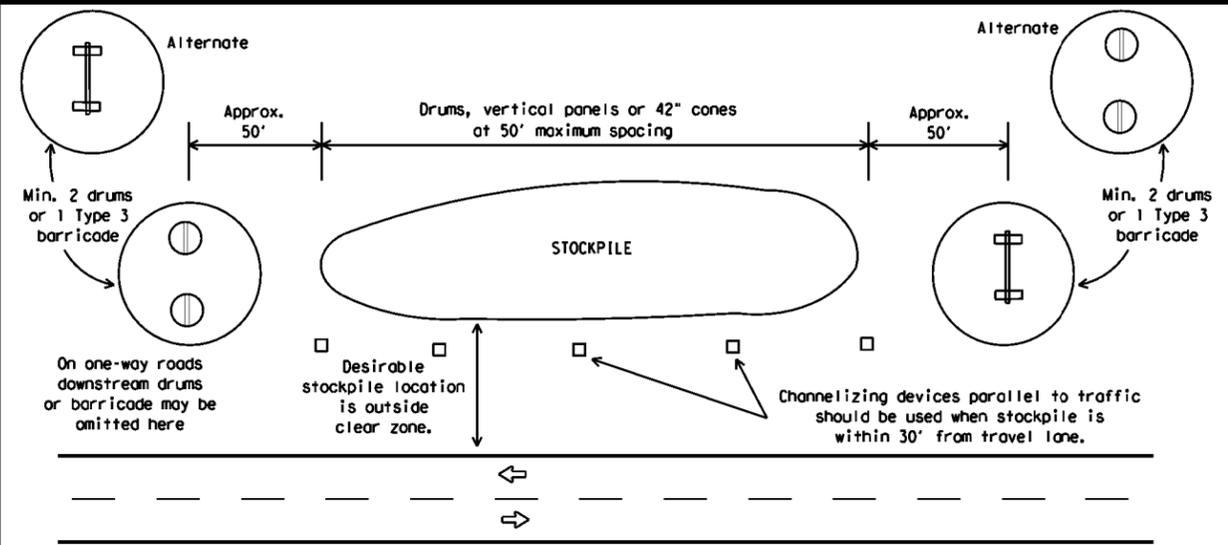


**TYPICAL STRIPING DETAIL FOR BARRICADE RAIL**



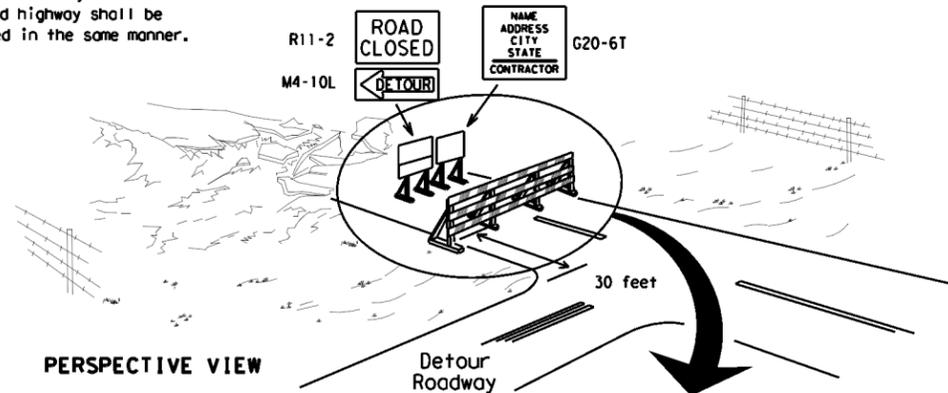
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

**TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES**



**TRAFFIC CONTROL FOR MATERIAL STOCKPILES**

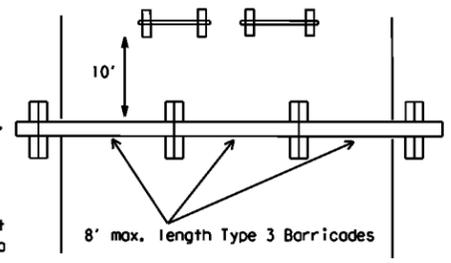
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

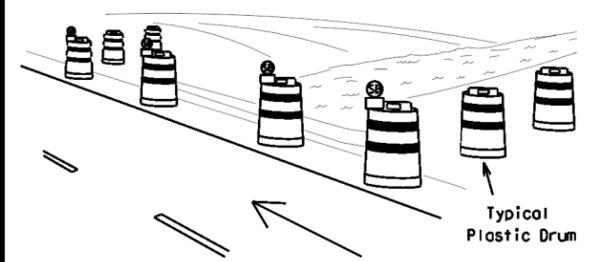
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.

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.

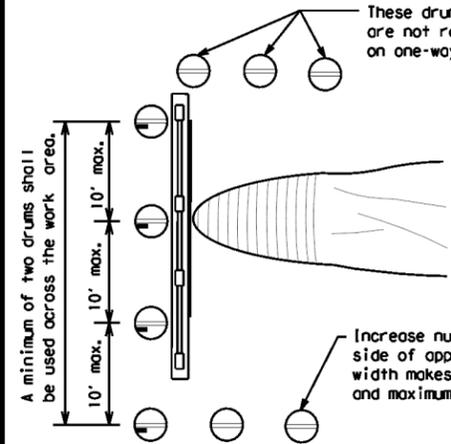


PLAN VIEW

**TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION**



PERSPECTIVE VIEW

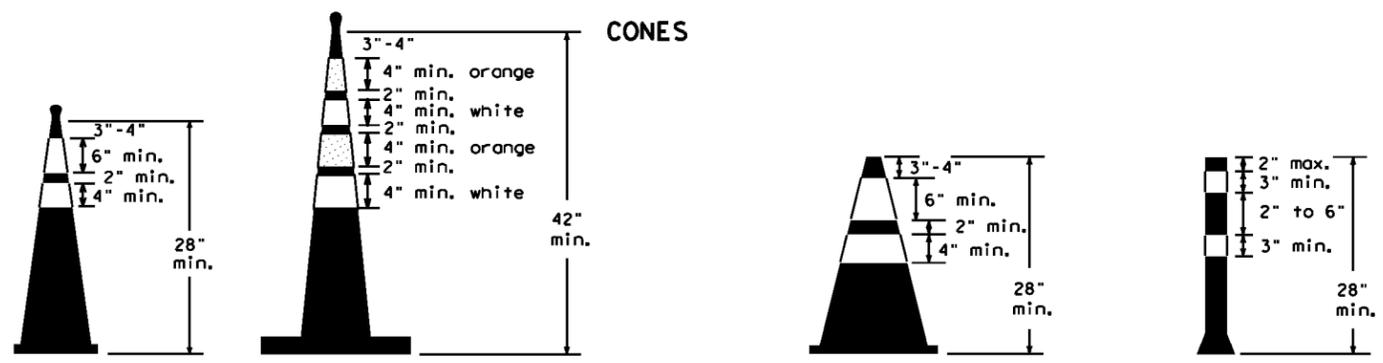


PLAN VIEW

**CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS**

1. Where positive redirection 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
	Steady burn warning light or yellow warning reflector



Two-Piece cones

One-Piece cones

Tubular Marker

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

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



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (10) - 21**

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## WORK ZONE PAVEMENT MARKINGS

### GENERAL

- 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.
- Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- Additional supplemental pavement marking details may be found in the plans or specifications.
- Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
- 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).
- 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.
- All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

### RAISED PAVEMENT MARKERS

- Raised pavement markers are to be placed according to the patterns on BC(12).
- 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

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

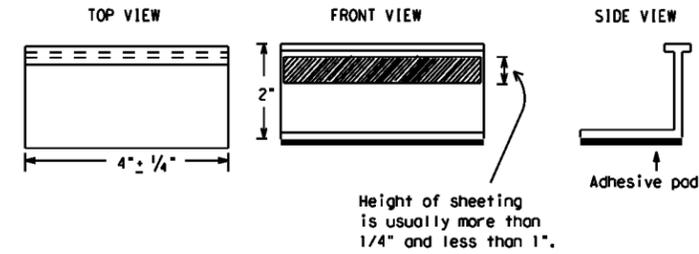
### MAINTAINING WORK ZONE PAVEMENT MARKINGS

- The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
- 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.
- 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.
- 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

- 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.
- 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.
- 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".
- The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
- Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
- Blast cleaning may be used but will not be required unless specifically shown in the plans.
- Over-painting of the markings SHALL NOT BE permitted.
- Removal of raised pavement markers shall be as directed by the Engineer.
- 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.
- 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**

- Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
- 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.
  - 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.
  - 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.
- Small design variances may be noted between tab manufacturers.
- 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

- Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
- All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
- 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).

SHEET 11 OF 12



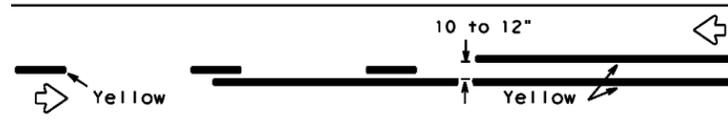
## BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

**BC(11)-21**

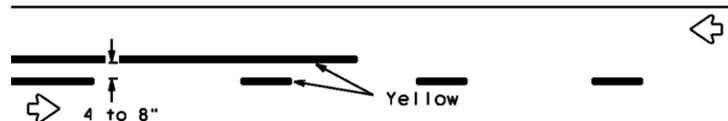
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## PAVEMENT MARKING PATTERNS

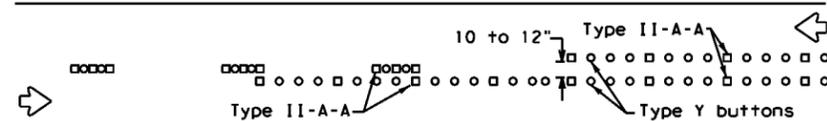


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

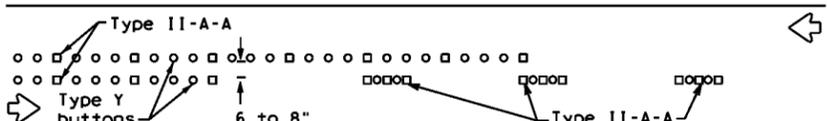


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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.

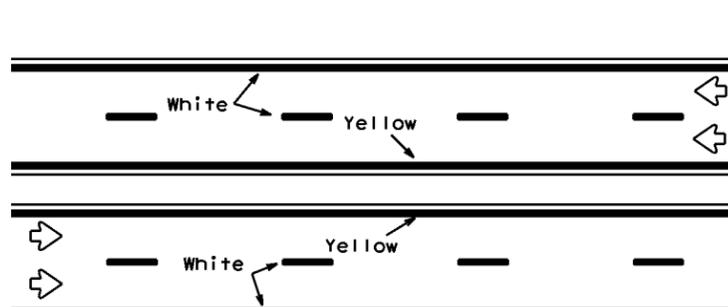


RAISED PAVEMENT MARKERS - PATTERN A



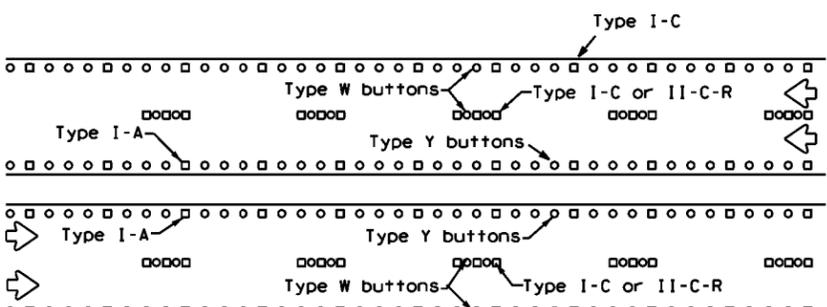
RAISED PAVEMENT MARKERS - PATTERN B

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



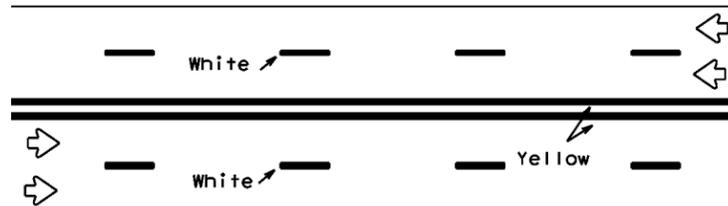
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



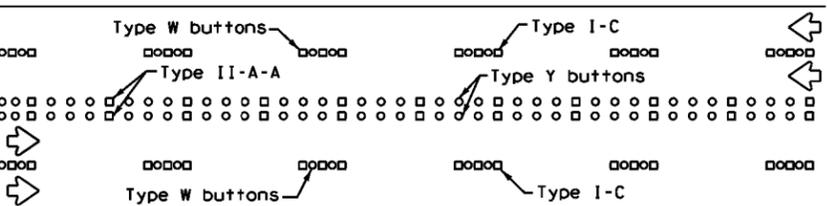
RAISED PAVEMENT MARKERS

## EDGE & LANE LINES FOR DIVIDED HIGHWAY



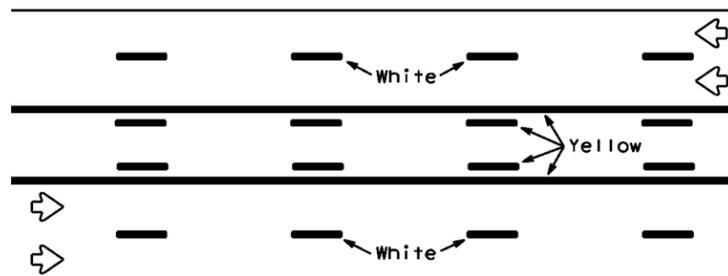
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



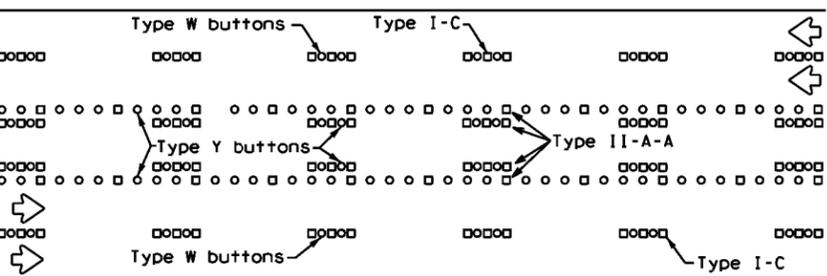
RAISED PAVEMENT MARKERS

## LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

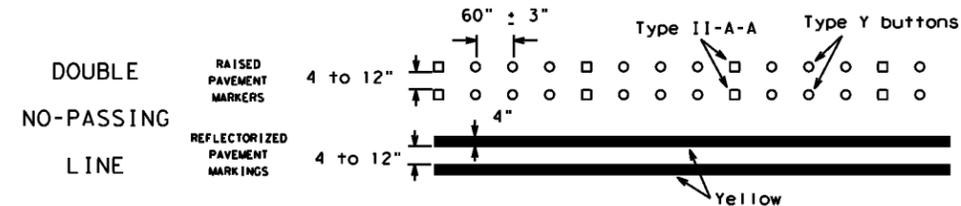
Prefabricated markings may be substituted for reflectORIZED pavement markings.



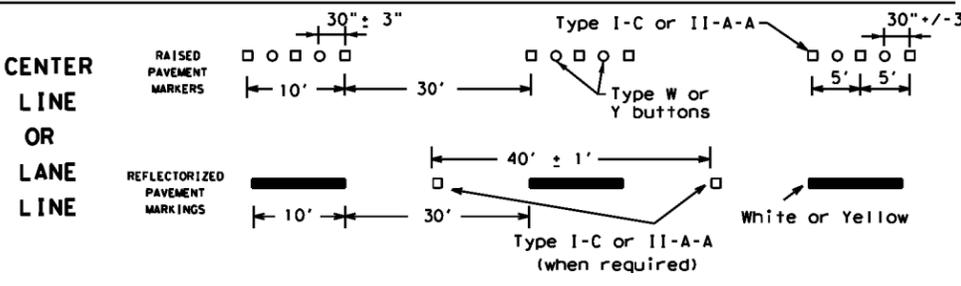
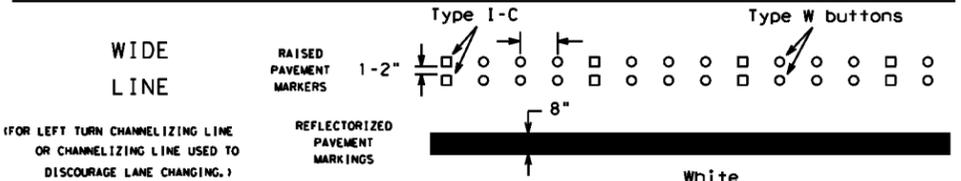
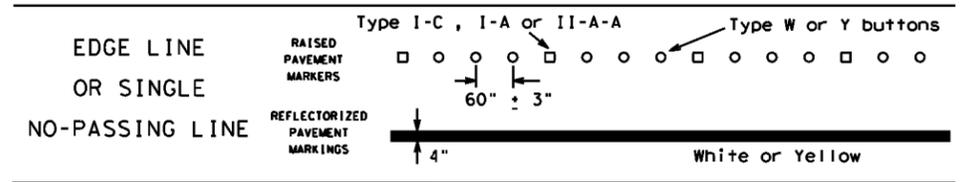
RAISED PAVEMENT MARKERS

## TWO-WAY LEFT TURN LANE

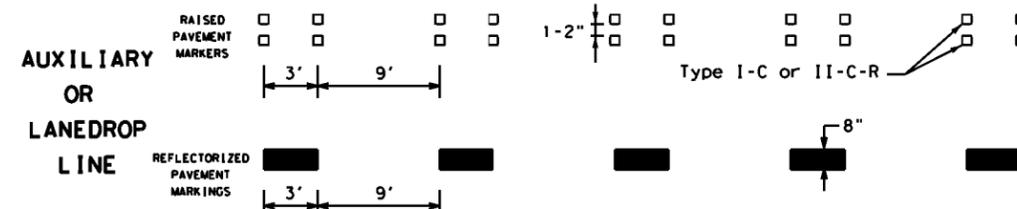
## STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



### SOLID LINES

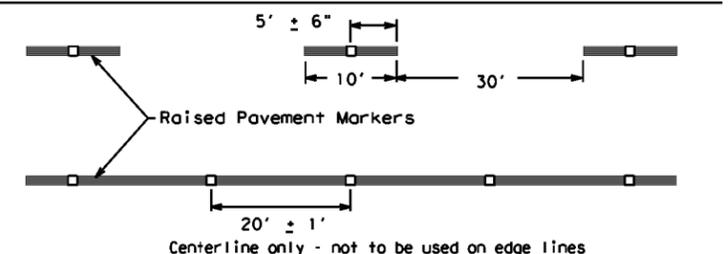


### BROKEN LINES



### 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.



SHEET 12 OF 12



## BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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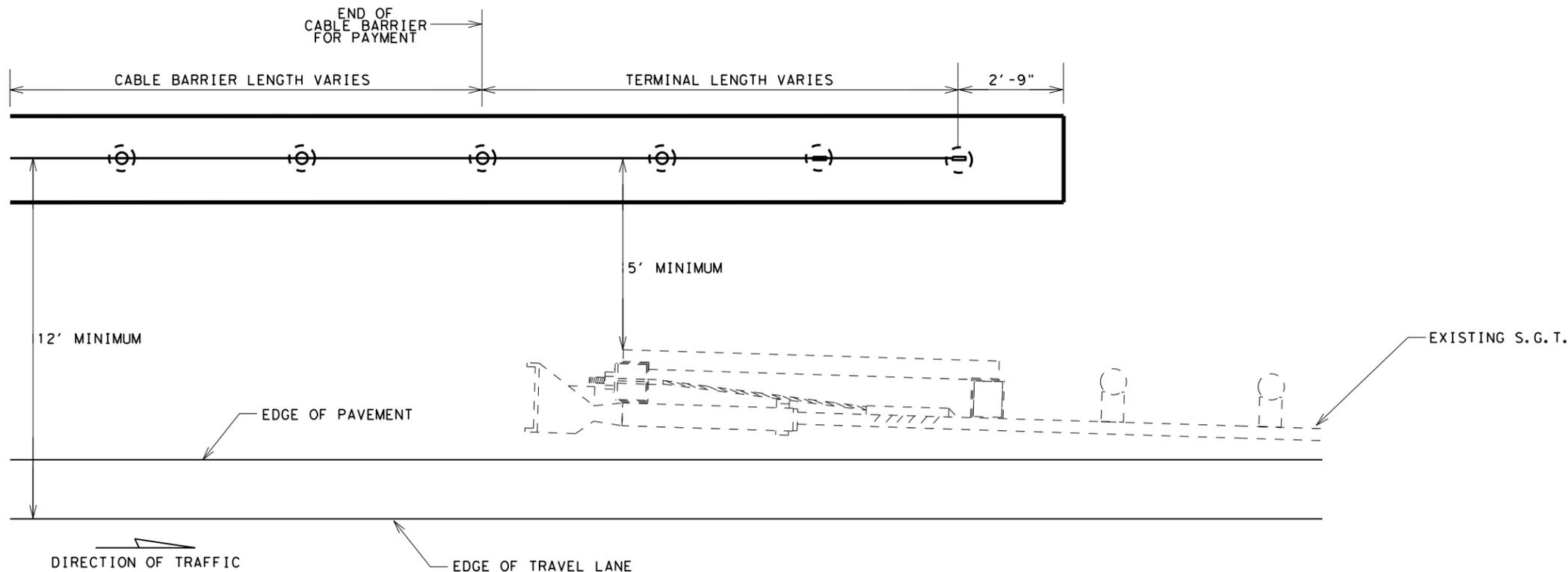
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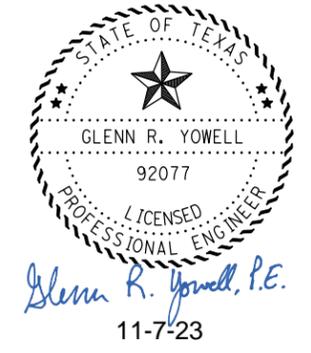


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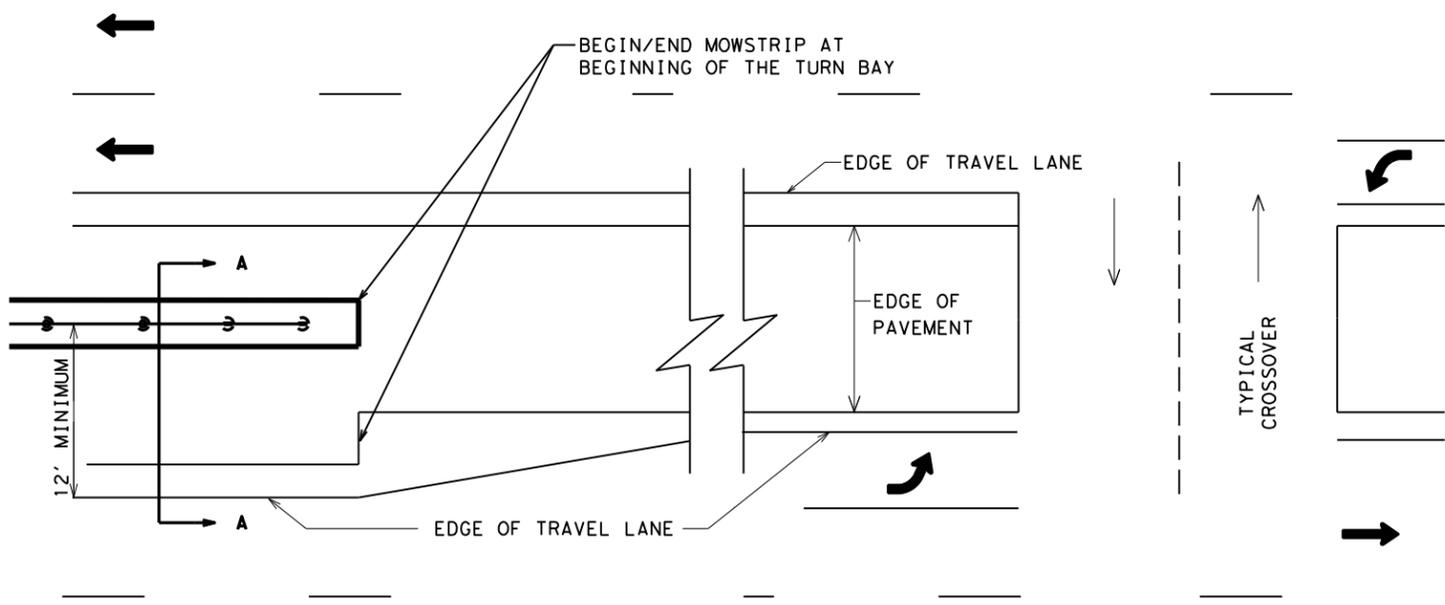


TYPICAL PLAN VIEW  
 WHEN SGT IS ENCOUNTERED

NOTES: EXACT LOCATION OF CABLE BARRIER PLACEMENT  
 TO BE APPROVED BY THE ENGINEER.  
 MINIMUM WIDTH OF MEDIAN FOR CABLE BARRIER  
 PLACEMENT IS 25'



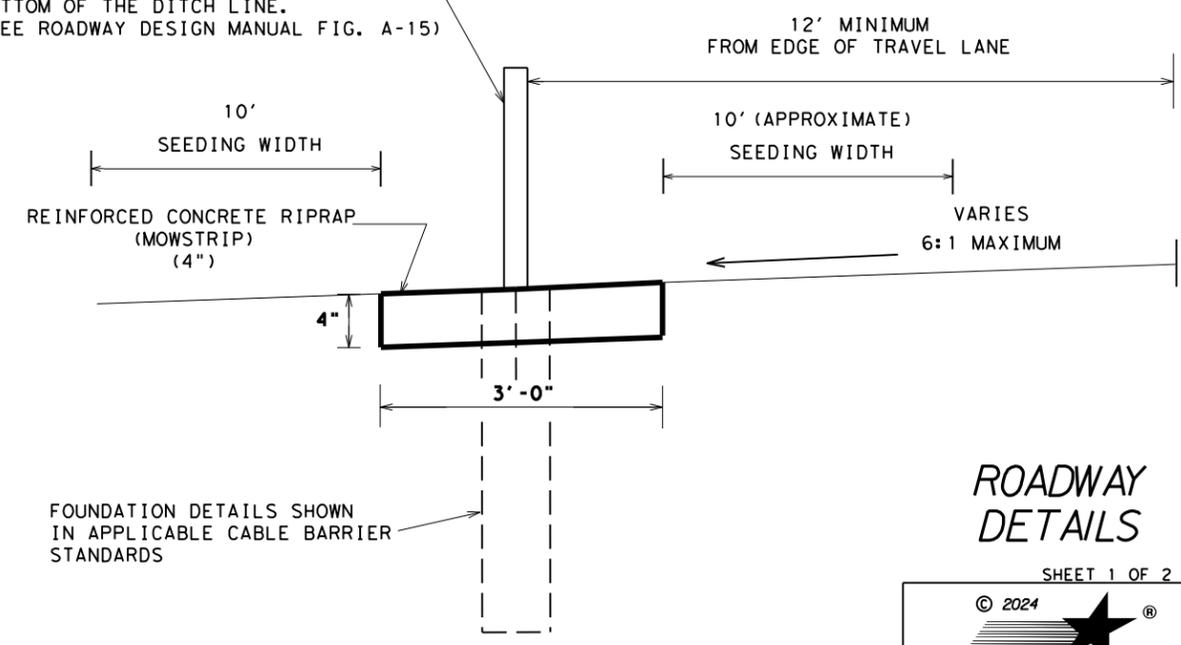
NOT TO SCALE



TYPICAL PLAN VIEW  
 AT CROSSOVERS

NOT TO SCALE

CABLE BARRIER SHOULD NOT BE PLACED  
 IN THE RANGE OF 1-8 FEET FROM THE  
 BOTTOM OF THE DITCH LINE.  
 (SEE ROADWAY DESIGN MANUAL FIG. A-15)



SECTION A-A

FOUNDATION DETAILS SHOWN  
 IN APPLICABLE CABLE BARRIER  
 STANDARDS

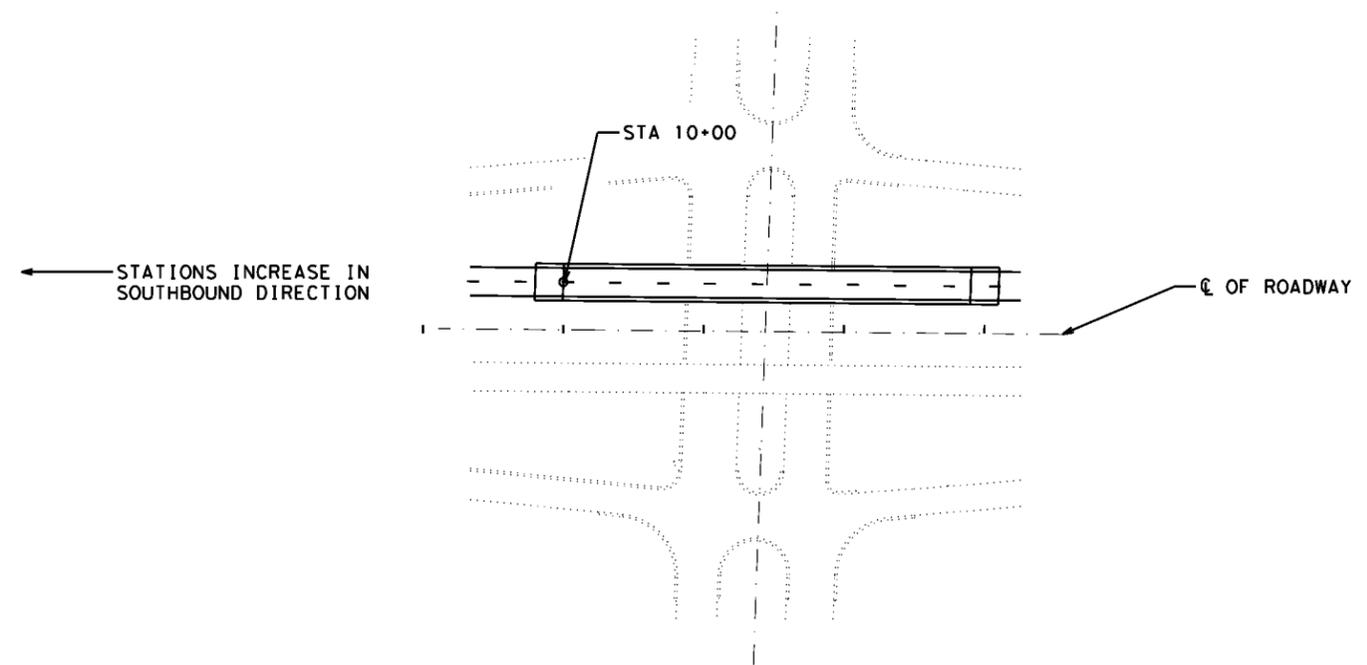
NOT TO SCALE

ROADWAY  
 DETAILS

SHEET 1 OF 2

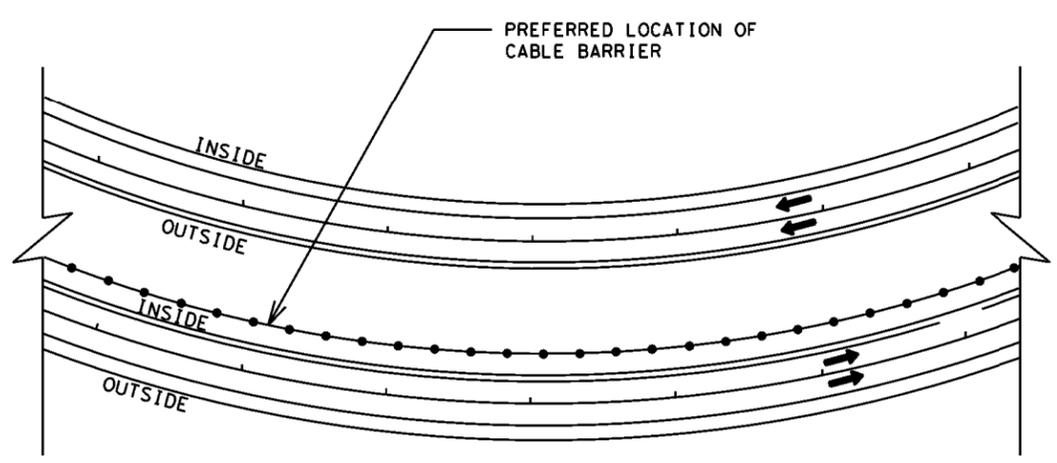
© 2024			
CONT	SECT	JOB	HIGHWAY
0063	04	068	US 59
DIST	COUNTY	SHEET NO.	
ATL	PANOLA	25	

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TYPICAL BEGINNING OF EACH PROJECT  
 (BEGIN STATIONING AT END OF BRIDGE ON THE ARMOR JOINT)

NOT TO SCALE



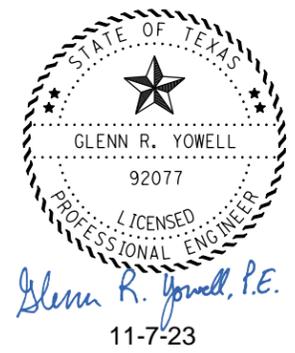
CABLE BARRIER PLACEMENT IN A CURVE

RADIUS (FT)	POST SPACING
650-2500	6'8"
2501-5500	10'
>5500	STANDARD RECOMMENDATION

RECOMMENDED POST SPACING IN A CURVE

LOCATION	STATIONS		RADIUS (C/L)
	FROM	TO	FT
0063-04-068 US 59	25+06	42+01	2,291.83
	70+55	84+58	1,909.86
	107+87	121+91	1,273.24
0063-11-061 US 79	29+80	39+40	2,291.83
	62+86	73+68	2,291.83
	129+14	138+11	2,291.83
0063-11-062 SH 149	25+19	35+84	2,291.83
	68+60	79+10	1,909.86
	101+52	113+91	2,291.83

NOTE: STATIONING IS FOR CONSTRUCTION PURPOSES ONLY



ROADWAY  
 DETAILS

SHEET 2 OF 2

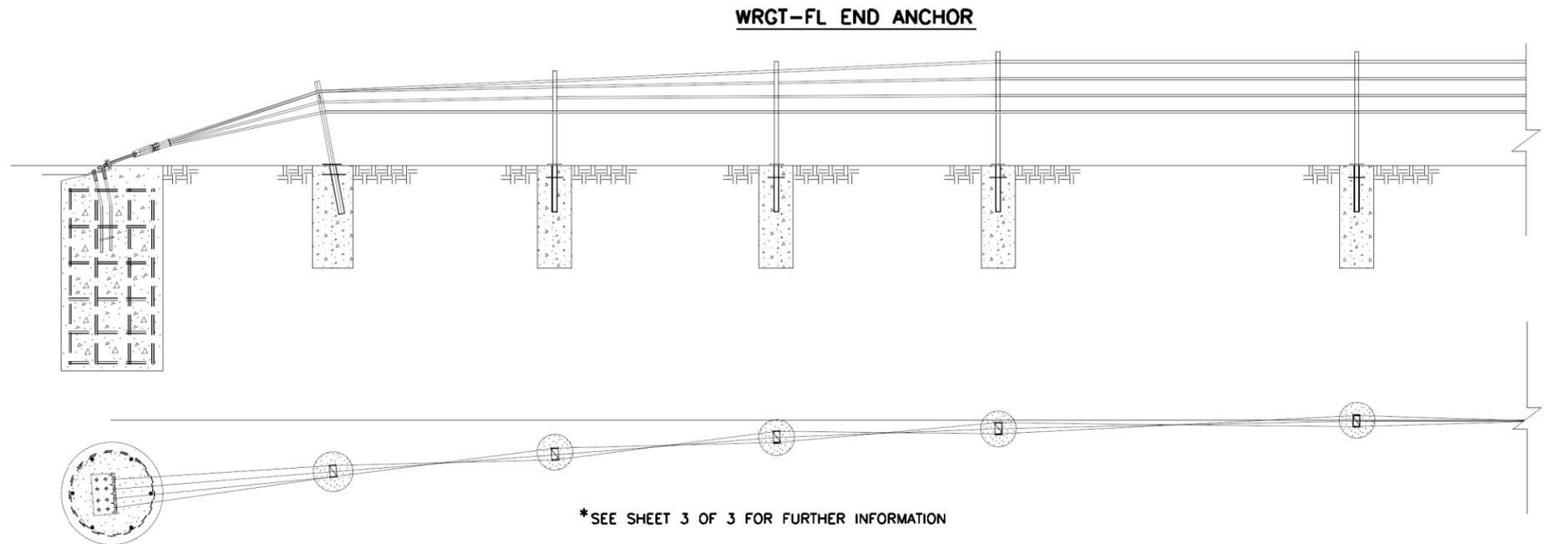
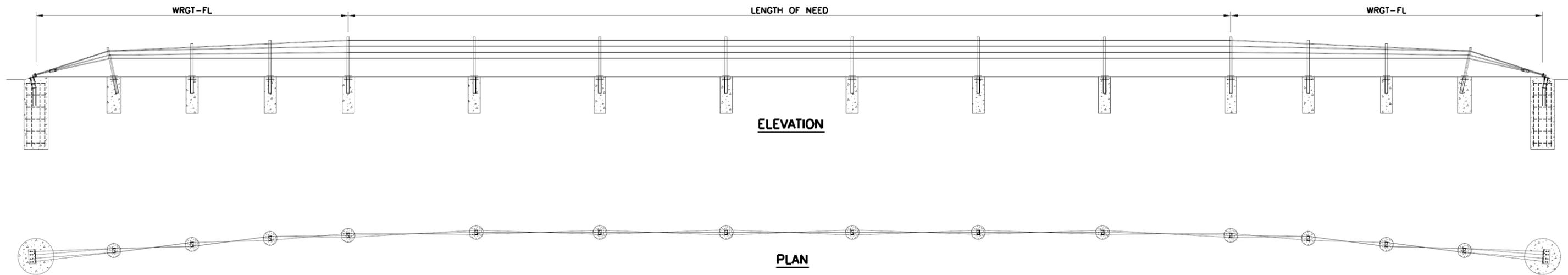


CONT	SECT	JOB	HIGHWAY
0063	04	068	US 59
DIST	COUNTY	SHEET NO.	
ATL	PANOLA	26	

NOT TO SCALE

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 FILE: D:\txdot\projectwiseonline.com\TXDOT15\Documents\19 - ATL\Design Projects\006304068\4 - Design\Master Design Files\04 STANDARDS\002 BRIFEN(TL4)-14.dgn



ROPE TENSION TABLE		
ROPE TEMP (°F)	TENSION (LBS)	TENSION (kN)
0	5700	25.4
5	5550	24.7
10	5400	24.0
15	5250	23.4
20	5100	22.7
25	4950	22.0
30	4800	21.4
35	4650	20.74
40	4500	20.0
45	4350	19.3
50	4200	18.7
55	4050	18.0
60	3900	17.3
65	3750	16.7
70	3600	16.0
75	3450	15.3
80	3300	14.7
85	3150	14.0
90	3000	13.3
95	2850	12.7
100	2700	12.0
105	2550	11.3
110	2400	10.7
115	2250	10.0
120	2100	9.3
125	1950	8.7
130	1800	8.0
135	1650	7.3
140	1500	6.7

GENERAL NOTES:

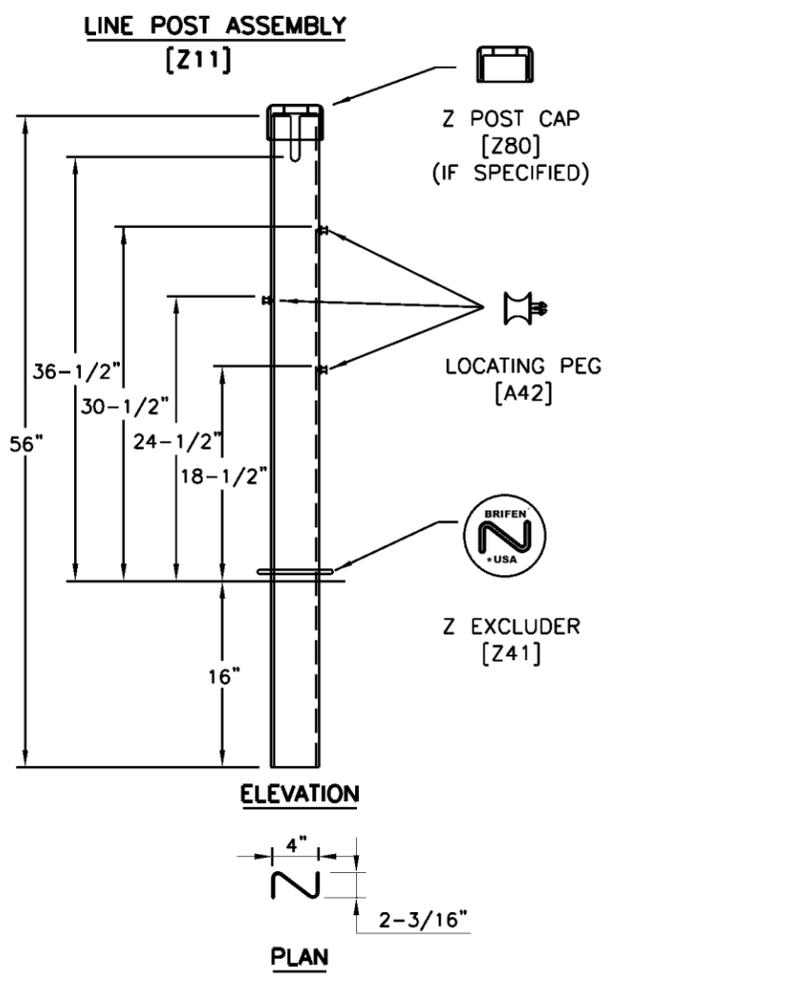
- BRIFEN DRAWINGS, SPECIFICATIONS, AND PRODUCT MANUAL SHOULD BE REVIEWED PRIOR TO STARTING AN INSTALLATION. FOR ADDITIONAL INFORMATION OR QUESTIONS, CONTACT BRIFEN USA, INC. AT 1-866-427-4336.
- THE BRIFEN WRSF HAS BEEN SUCCESSFULLY TESTED TO NCHRP 350 TL-4 CONDITIONS ON SLOPES 6:1 OR FLATTER AND NCHRP 350 TL-3 CONDITIONS ON SLOPES 4:1 TO 6:1.
- THE POST SPACING SHALL BE DETERMINED BY THE SPECIFYING AGENCY. POST SPACING MAY BE DECREASED TO AVOID OBSTRUCTIONS OR UTILITIES. IN NO EVENT SHALL THE POST SPACING EXCEED 21'-0".
- BRIFEN WRSF SHALL BE PLACED ON A SMOOTH SURFACE, WITHOUT HUMPS, DROP-OFFS, HOLES, ETC THAT WOULD INTERFERE WITH THE STABILITY OF THE ERRANT VEHICLE. GRADING, FILL AND COMPACT MAY BE REQUIRED TO ASSURE THAT ROPES ARE INSTALLED AT THE DESIGN HEIGHT.
- THE WRGT-FL END ANCHOR HAS BEEN SUCCESSFULLY TESTED TO NCHRP 350 TL-3 CONDITIONS. THE LENGTH OF NEED BEGINS 31'-0" FROM THE END ANCHOR. POSTS A THROUGH POST B3, SPACED 6'-6" APART, HAVE WEAKENED CUTS AT THE GROUND THAT SHALL FACE THE ANCHOR.
- ANCHOR AND LINE POST DIMENSIONS AND STEEL REINFORCEMENT WILL BE DETERMINED ON PROJECT SPECIFIC SOIL CLASSIFICATION, PROPERTIES AND TEMPERATURE EXTREMES. CONTACT BRIFEN USA, INC. FOR ADDITIONAL INFORMATION.
- ALL REINFORCEMENT AND CONCRETE FOR THE ANCHORS AND LINE POSTS PROVIDED BY OTHERS.
- REINFORCEMENT AND CONCRETE PROPERTIES SHALL MEET AGENCY SPECIFICATIONS.
- FOR PLACEMENT NEAR GUARDRAIL OR OTHER OBSTACLES CONTACT BRIFEN USA, INC. FOR ADDITIONAL DRAWINGS AND SUPPORT.
- TAPER RATES FOR THE BRIFEN WRSF ARE AS FOLLOWS:  
 HORIZONTAL: 25:1 MAXIMUM, 50:1 PREFERABLE  
 VERTICAL: 25:1 MAXIMUM, 50:1 PREFERABLE

\*ROPE TENSION: ± 20% AFTER 2-WEEK INTERVAL

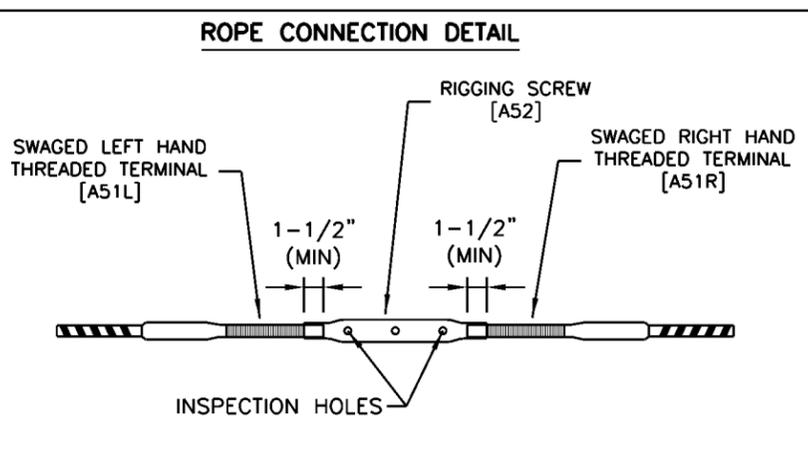
SHEET 1 OF 3

		<i>Design Division Standard</i>	
<b>BRIFEN          WIRE ROPE SAFETY FENCE          (TL-4)</b>			
<b>BRIFEN(TL4) - 14</b>			
FILE: brifent1414.dgn	DNR TxDOT	CR: RM	DWR: VP
© TxDOT: MARCH 2014	CONT: 0063	SECT: 04	JOB: 068
REVISIONS	DIST: ATL		COUNTY: PANOLA
			SHEET NO.: 27

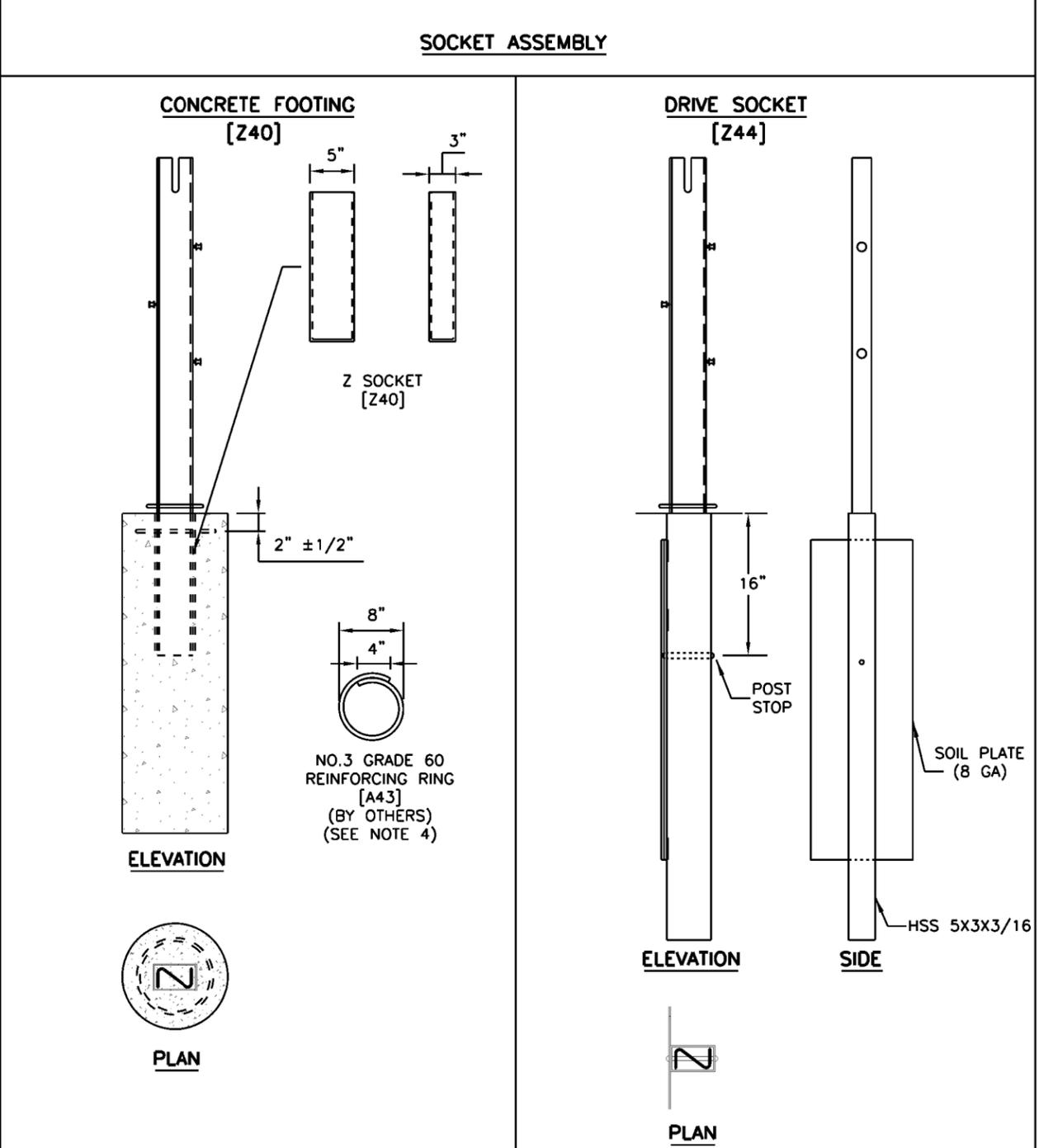
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- NOTES SPECIFIC TO LINE POST ASSEMBLY**
1. ROPE HEIGHTS SHALL BE  $\pm 1"$  TO GROUND LINE.
  2. POST SHALL BE  $\pm 4"$  FROM VERTICAL PLUMB.
  3. POST CAPS SHALL BE USED IF SPECIFIED.
  4. REFLECTORS SHALL BE SPACED ACCORDING TO AGENCY SPECIFICATIONS.
  5. REFLECTORS CAN BE PLACED ON THE POST CAP OR POST.



- NOTES SPECIFIC TO ROPE CONNECTION DETAIL**
1. THE WIRE ROPE TERMINALS SHALL BE THREADED A MINIMUM OF 1-1/2" INTO RIGGING SCREW.
  2. AFTER FINAL TENSIONING, THE TERMINALS SHALL BE VISIBLE IN THE INSPECTION HOLES.



- NOTES SPECIFIC TO CONCRETE FOOTING**
1. SIZE OF FOOTING WILL BE DETERMINED BY SOIL CONDITIONS, FOUNDATION TYPE AND PROJECT CONDITIONS.
  2. CONCRETE BASED ON AGENCY SPECIFICATIONS.
  3. CONCRETE BY OTHERS.
  4. REINFORCING RING (BY OTHERS) WILL BE USED ACCORDING TO FOUNDATION SIZE AND TYPE. THE REINFORCING RING MAY BE OMITTED IF THE FOOTING IS PLACED IN A CONTINUOUS CONCRETE MOW STRIP.
  5. FOOTING SHALL BE FLUSH WITH THE GROUND LINE, TO A MAXIMUM OF 1 INCH BELOW OR ABOVE GROUND LINE.
  6. SOCKET SHALL BE  $\pm 2^\circ$  OF VERTICAL PLUMB.

- NOTES SPECIFIC TO DRIVE SOCKETS**
1. SIZE OF SOIL PLATE WILL BE DETERMINED BY SOIL CONDITIONS AND PROJECT CONDITIONS.
  2. THE SOIL PLATE SHALL BE PARALLEL TO ROADWAY AND CAN FACE TOWARD OR AWAY FROM THE TRAVEL LANE.
  3. FOOTING SHALL BE FLUSH WITH THE GROUND LINE, TO A MAXIMUM OF 1 INCH BELOW OR ABOVE GROUND LINE.
  4. SOCKET SHALL BE  $\pm 2^\circ$  OF VERTICAL PLUMB.
  5. SOCKETS SHALL BE DRIVEN IN A MANNER TO NOT DISTORT OR DESTROY THE TOP OF SOCKET TO A DEGREE THAT PLACES THE SOCKET OR LINE POST OUT OF CONSTRUCTION TOLERANCES.

- GENERAL NOTES:**
1. BRIFEN DRAWINGS, SPECIFICATIONS, AND PRODUCT MANUAL SHOULD BE REVIEWED PRIOR TO STARTING AN INSTALLATION. FOR ADDITIONAL INFORMATION OR QUESTIONS, CONTACT BRIFEN USA, INC. 1-866-427-4336.
  2. THE BRIFEN WRSF HAS BEEN SUCCESSFULLY TESTED TO NCHRP 350 TL-4 CONDITIONS ON SLOPES 6:1 OR FLATTER AND NCHRP 350 TL-3 CONDITIONS ON SLOPES 4:1 TO 6:1.
  3. THE POST SPACING SHALL BE DETERMINED BY THE SPECIFYING AGENCY. POST SPACING MAY BE DECREASED TO AVOID OBSTRUCTIONS OR UTILITIES. IN NO EVENT SHALL THE POST SPACING EXCEED 21'-0".
  4. BRIFEN WRSF SHALL BE PLACED ON A SMOOTH SURFACE, WITHOUT HUMPS, DROP-OFFS, HOLES, ETC THAT WOULD INTERFERE WITH THE STABILITY OF THE ERRANT VEHICLE. GRADING, FILL AND COMPACTION MAY BE REQUIRED TO ASSURE THAT ROPES ARE INSTALLED AT THE DESIGN HEIGHT.

SHEET 2 OF 3

Design Division Standard

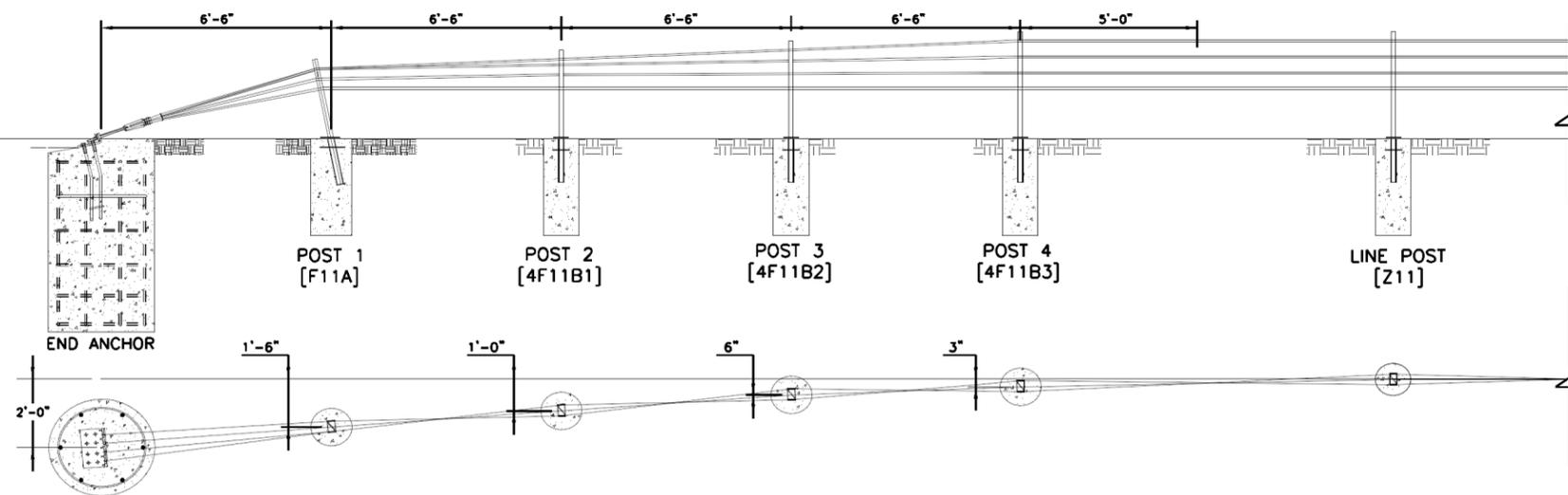
## BRIFEN WIRE ROPE SAFETY FENCE (TL-4)

### BRIFEN(TL4)-14

FILE: brifentl414.dgn	DNR TxDOT	CHK: RM	DWG: VP	CR:
© TxDOT: MARCH 2014	CONT: 0063	SECT: 04	JOB: 068	HIGHWAY: US 59
REVISIONS	DIST: ATL	COUNTY: PANOLA	SHEET NO.: 28	

DATE: 11/6/2023  
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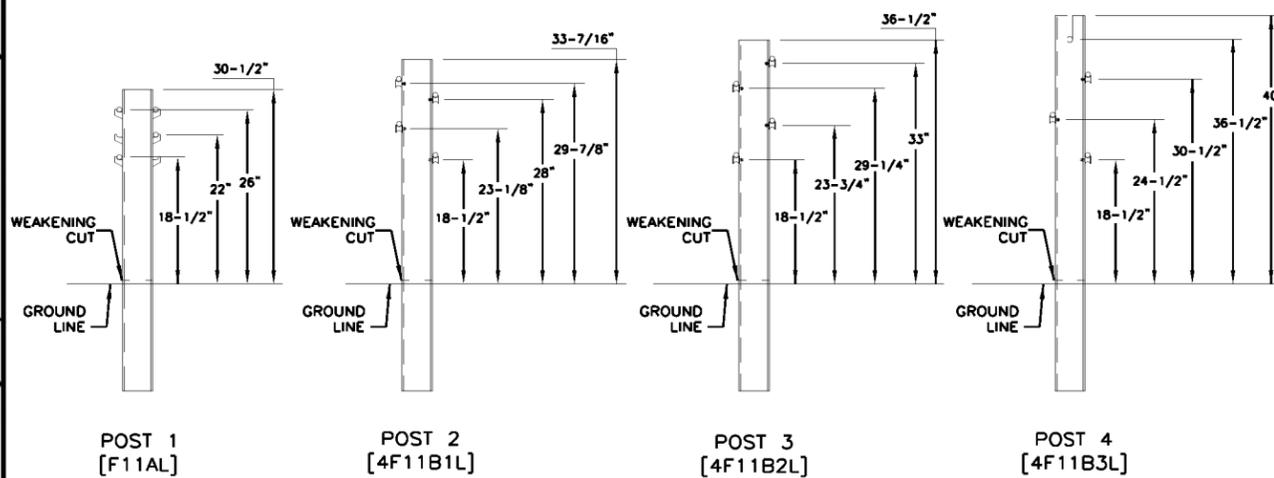
### WRGT-FL END ANCHOR LAYOUT



#### GENERAL NOTES:

- BRIFEN DRAWINGS, SPECIFICATIONS, AND PRODUCT MANUAL SHOULD BE REVIEWED PRIOR TO STARTING AN INSTALLATION. FOR ADDITIONAL INFORMATION OR QUESTIONS, CONTACT BRIFEN USA, INC. AT 1-866-427-4336.
- THE WRGT-FL END ANCHOR HAS BEEN SUCCESSFULLY TESTED TO NCHRP 350 TL-3 CONDITIONS. THE LENGTH OF NEED BEGINS 31'-0" FROM THE END ANCHOR. POSTS A THROUGH POST B3, SPACED 6'-6" APART, HAVE WEAKENED CUTS AT THE GROUND THAT SHALL FACE THE ANCHOR.
- ANCHOR AND LINE POST DIMENSIONS AND STEEL REINFORCEMENT WILL BE DETERMINED ON PROJECT SPECIFIC SOIL CLASSIFICATION, PROPERTIES AND TEMPERATURE EXTREMES. CONTACT BRIFEN USA, INC. FOR ADDITIONAL INFORMATION.
- ALL REINFORCEMENT AND CONCRETE FOR THE ANCHORS AND LINE POSTS PROVIDED BY OTHERS.
- REINFORCEMENT AND CONCRETE PROPERTIES SHALL MEET AGENCY SPECIFICATIONS.
- FOR PLACEMENT NEAR GUARDRAIL OR OTHER OBSTACLES CONTACT BRIFEN USA, INC. FOR ADDITIONAL DRAWINGS AND SUPPORT.

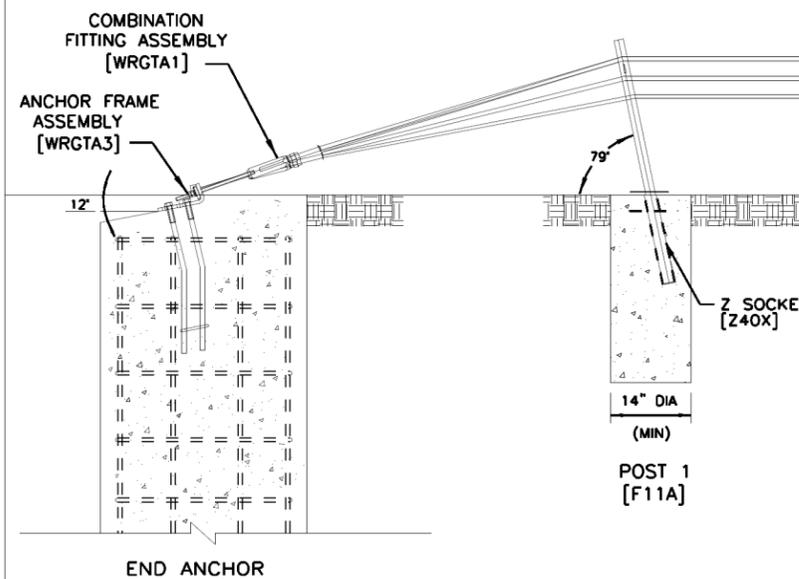
### WRGT-FL POST DETAILS



#### NOTES SPECIFIC TO WRGT-FL POST DETAIL

- ROPE HEIGHTS SHALL BE  $\pm 1"$  TO GROUND LINE.
- POST SHALL BE  $\pm 4"$  FROM VERTICAL PLUMB.
- POST CAPS SHALL BE USED IF SPECIFIED.
- REFLECTORS SHALL BE SPACED ACCORDING TO AGENCY SPECIFICATIONS.
- REFLECTORS CAN BE PLACED ON THE POST CAP OR POST.
- Z EXCLUDER (Z41) SHALL BE USED.
- POST A & SOCKET SHALL BE PLACED  $79^\circ (\pm 4^\circ)$  TOWARD END ANCHOR FROM THE HORIZONTAL PLANE.
- POST A SOCKET SHALL BE PLACED IN 14" (MIN) CONCRETE FOUNDATION. DEPTH TO BE DETERMINED FROM SOIL CONDITIONS AND PROJECT CONDITIONS.
- FOUNDATIONS FOR POST 2 THRU 4 SHALL BE THE SAME AS THE LINE POST ASSEMBLY'S FOR THE PROJECT.
- WEAKENED CUTS SHALL FACE END ANCHOR.

### END ANCHOR DETAILS

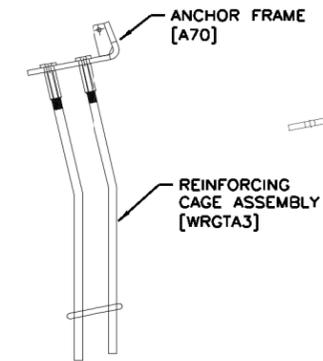


#### NOTES SPECIFIC TO END ANCHOR DETAIL

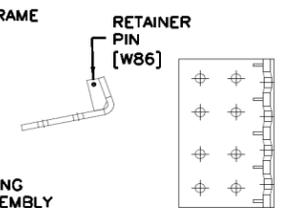
- THE END ANCHOR ASSEMBLY SHALL BE PLACED 12" (+3", -1") BELOW HORIZONTAL PLANE.
- POST 1 & SOCKET SHALL BE PLACED  $79^\circ (\pm 4^\circ)$  TOWARD END ANCHOR FROM THE HORIZONTAL PLANE.
- POST 1 SOCKET SHALL BE PLACED IN 14" (MIN) CONCRETE FOUNDATION. DEPTH TO BE DETERMINED FROM SOIL CONDITIONS AND PROJECT CONDITIONS.

### END ANCHOR COMPONENTS

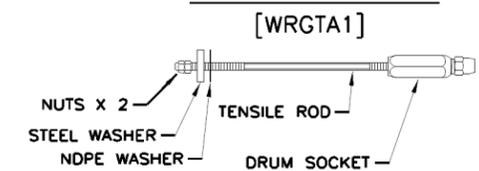
#### ANCHOR FRAME ASSEMBLY



#### ANCHOR FRAME [A70]



#### COMBINATION FITTING [WRGTA1]



SHEET 3 OF 3



## BRIFEN WIRE ROPE SAFETY FENCE (TL-4)

### BRIFEN(TL4)-14

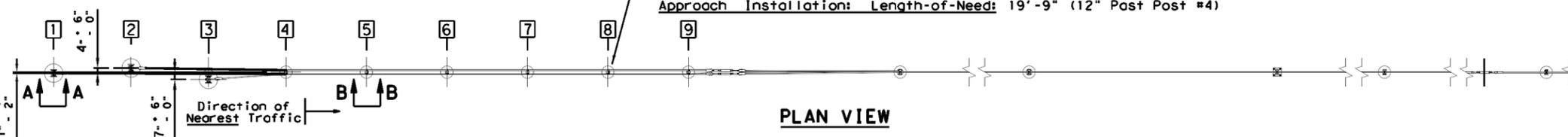
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© TxDOT: MARCH 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0063	04	068	US 59
DIST	COUNTY		SHEET NO.	
ATL	PANOLA		29	

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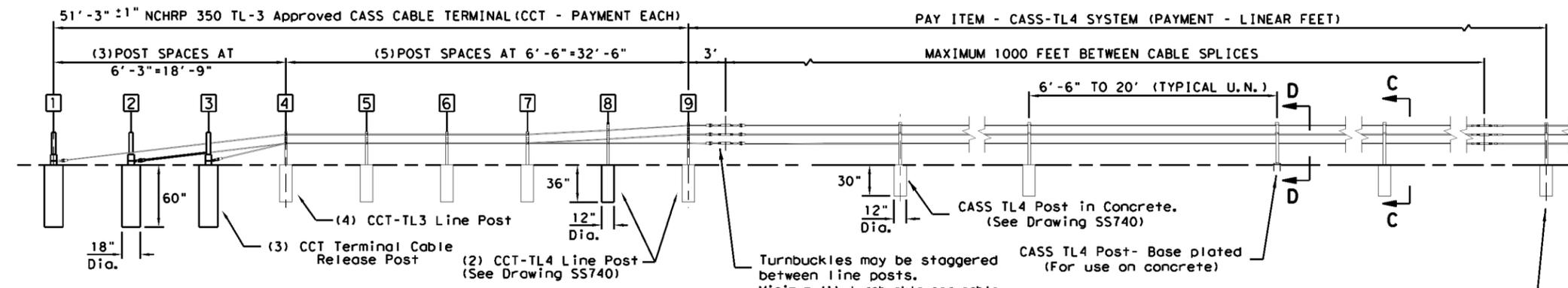
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**Preferred Installation:** Locate post #2 away from nearest traffic. System has been successfully tested with opposite installation.

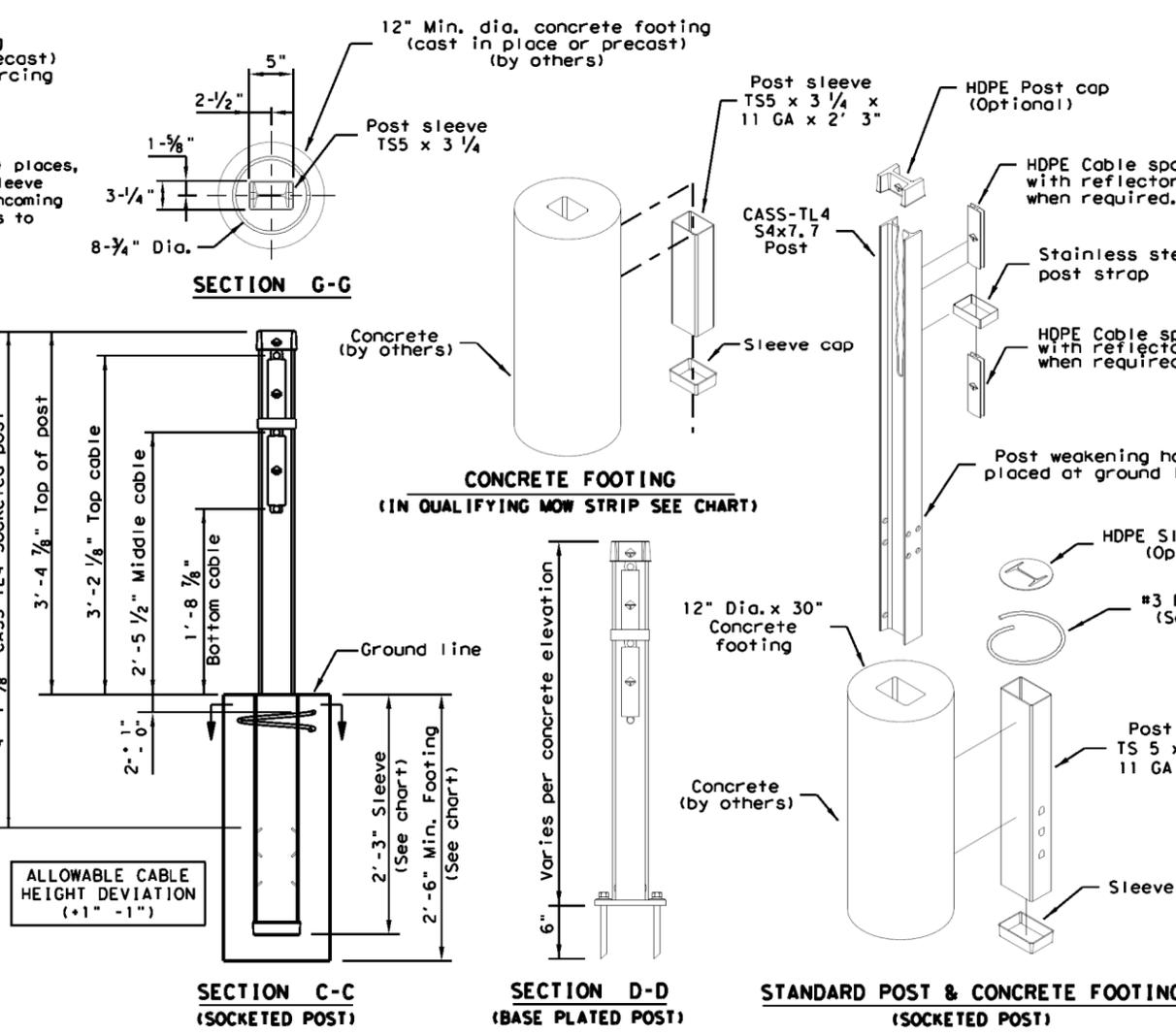
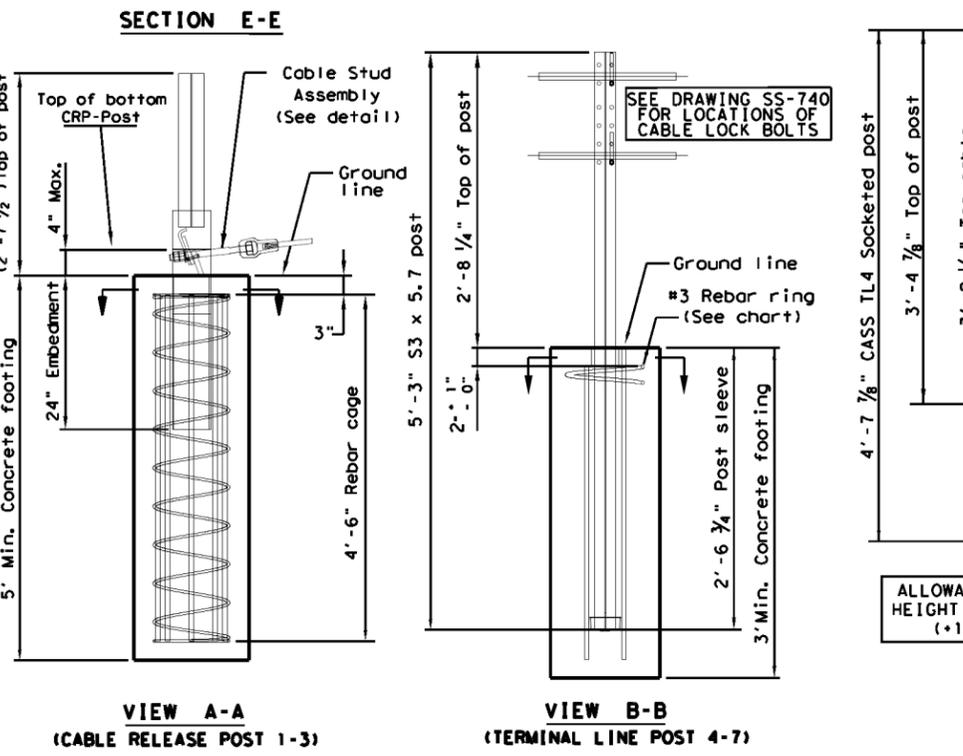
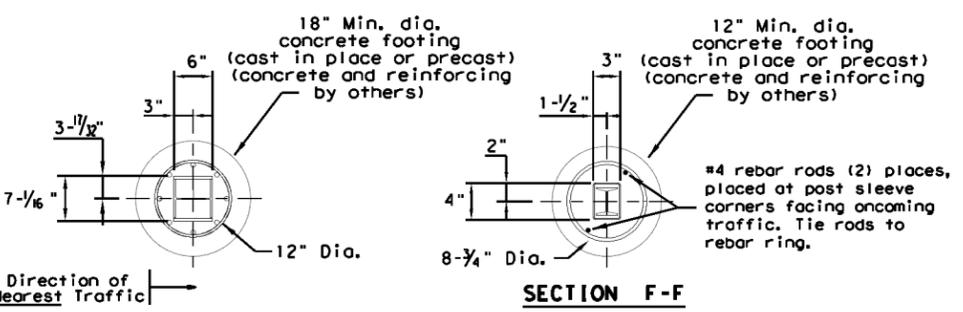
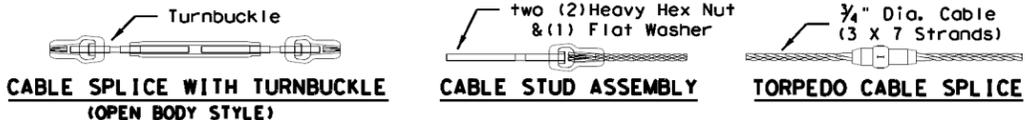
**Length-of-Need Cass Cable Terminal (CCT):**  
**Departure Installation:** Length-of-Need: 44'-9" (At Post #8)  
**Approach Installation:** Length-of-Need: 19'-9" (12" Post Post #4)



**PLAN VIEW**



**ELEVATION VIEW (TYPICAL LAY-OUT)**



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

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

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

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

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

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

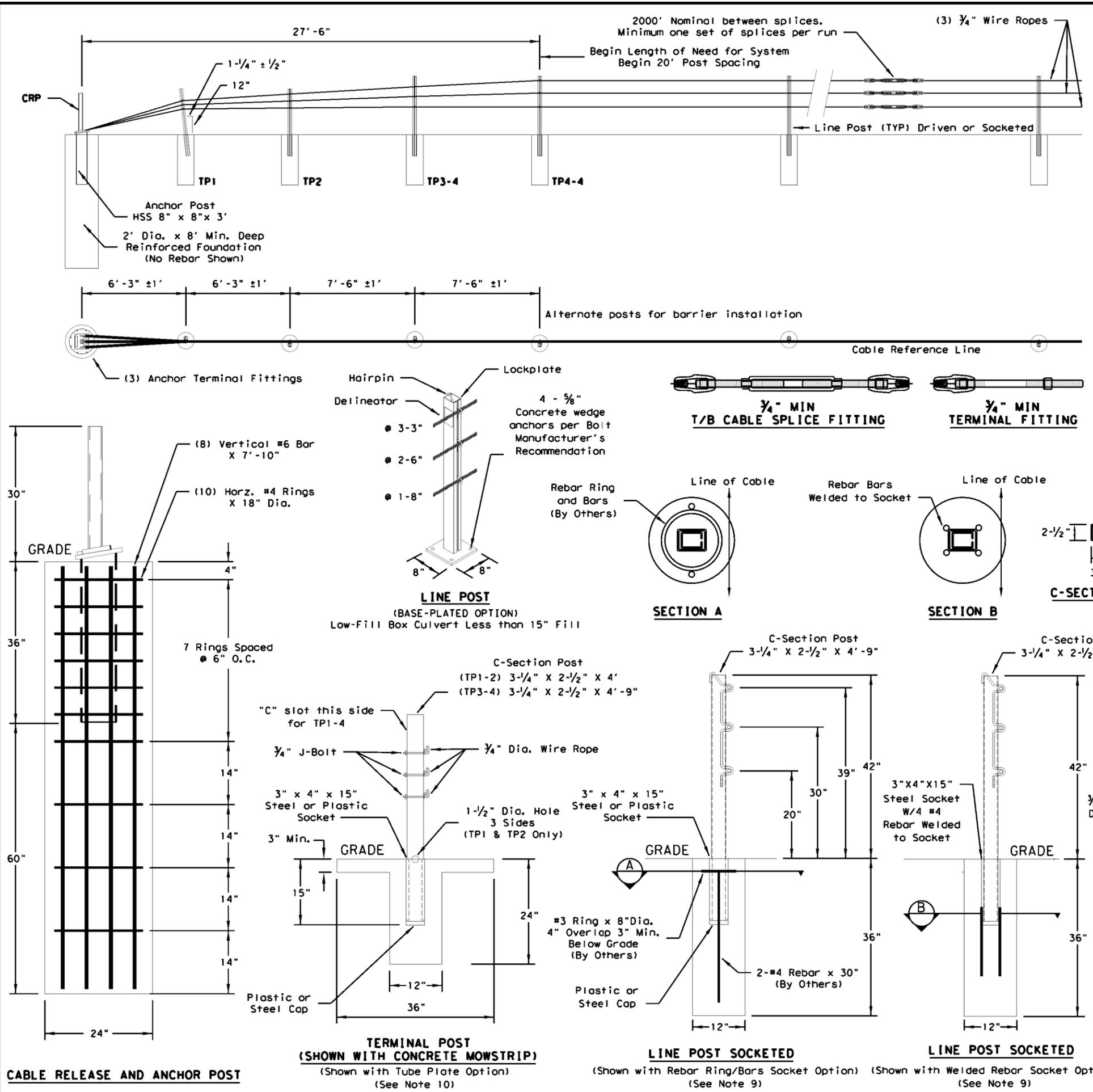
Texas Department of Transportation  
 Design Division Standard

**TRINITY CABLE SAFETY SYSTEM (TL-4)**

**CASS (TL4) - 14**

FILE: casst1414.dgn	DNR TxDOT	CR: RM	DNR VP	CR:
©TxDOT: March 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0063	04	068	US 59
	DIST	COUNTY		SHEET NO.
	ATL	PANOLA		30

DATE: 11/6/2023  
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**GENERAL NOTES**

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

**CABLE TENSION CHART\***

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

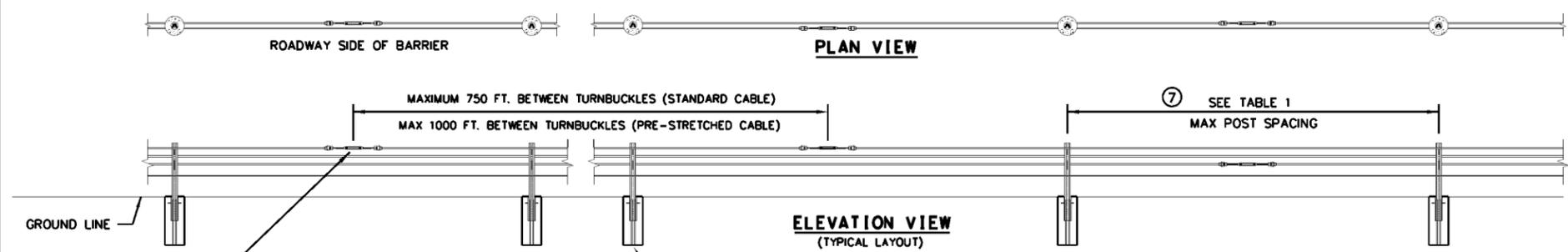
**DEFLECTION**

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

\* Allowable Deviation from Chart +/- 10%

Design Division Standard  
**GIBRALTAR CABLE BARRIER SYSTEM (TL-4)**  
**GBRLTR(TL4)-14**  
 FILE: gbrltrtl414.dgn DNR:TXDOT CK:RM DW:VP CK:  
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 REVISIONS: 0063 04 068 US 59  
 DIST: COUNTY: SHEET NO.:  
 ATL PANOLA 31

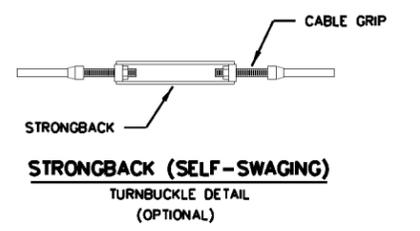
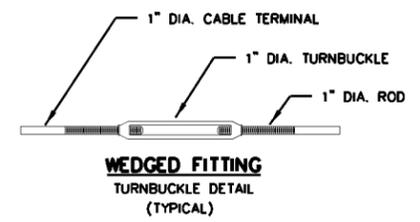
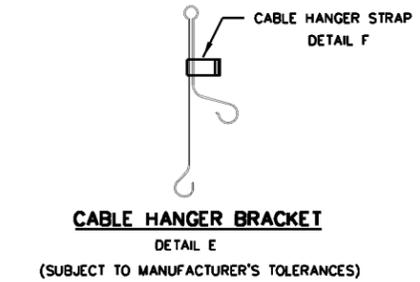
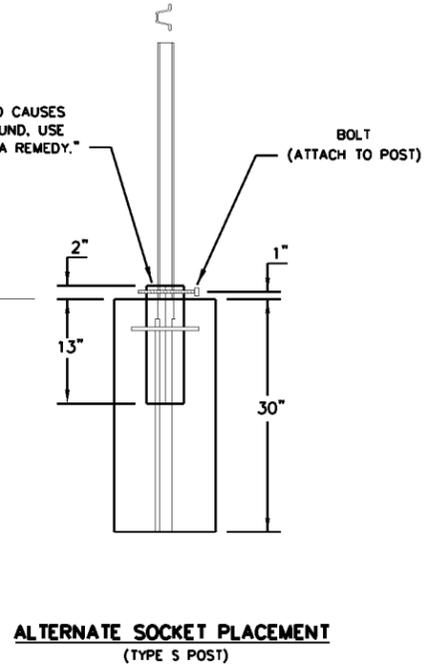
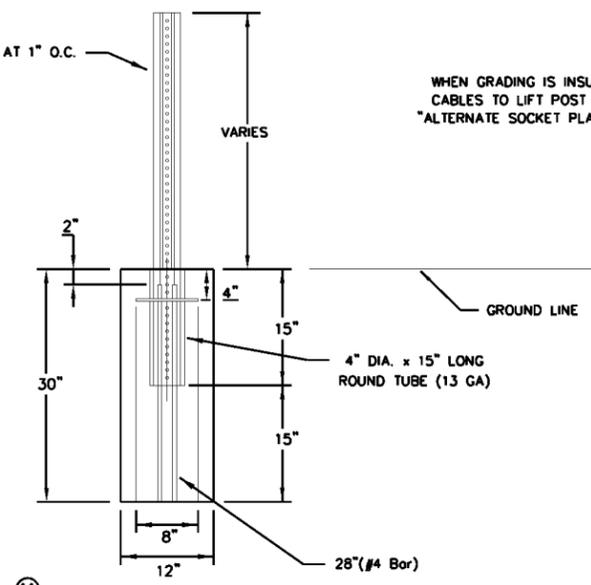
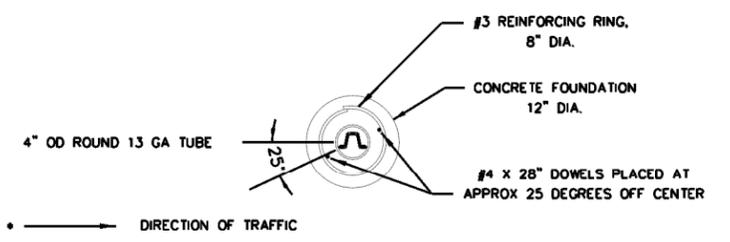
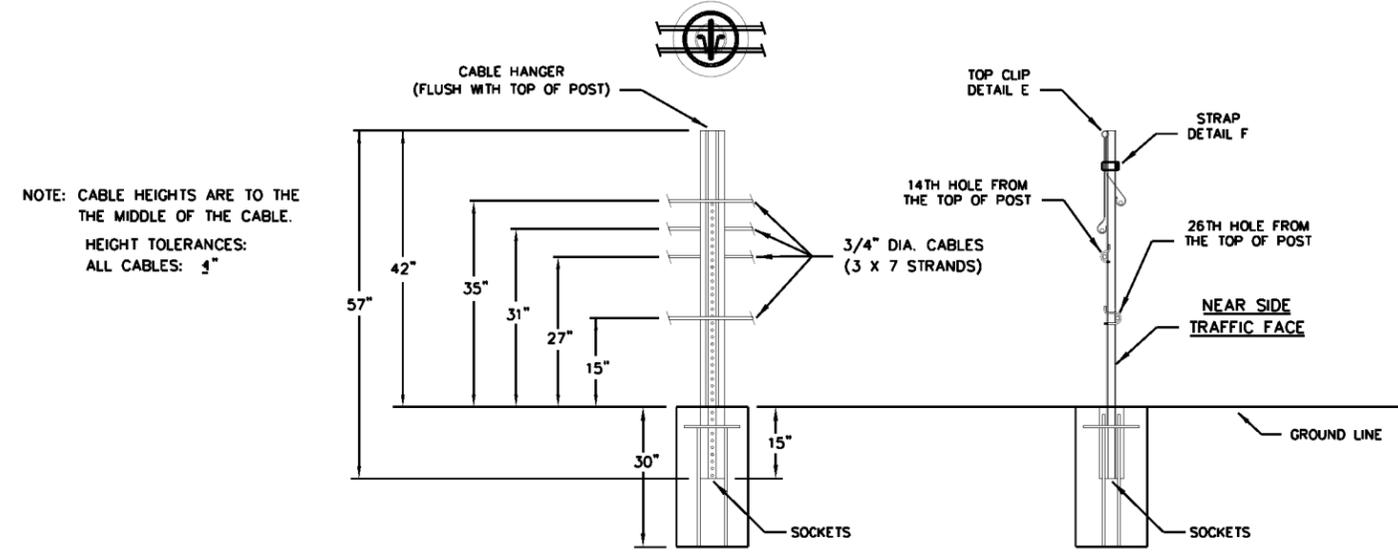
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STAGGER PLACEMENT OF TURNBUCKLES LINE TO LINE BETWEEN POSTS.

NOTE: TURNBUCKLES MAY BE SWAGED OR WEDGE FITTINGS.

Rib-Bok™ CABLE LINE POST (SOCKET OPTION)  
30" DEEP X 12" DIA. CONCRETE FOOTING



**GENERAL NOTES**

- FOR ADDITIONAL INFORMATION CONTACT YOUR DISTRIBUTOR OR NUCOR STEEL MARION, INC. AT (740) 383-4011.
- FOR PAYMENT SEE SPECIAL SPECIFICATION "CABLE BARRIER SYSTEM".
- FOR ADDITIONAL INFORMATION SEE THE MANUFACTURER'S PRODUCT MANUAL.
- THE NU-CABLE SYSTEM IS DESIGNED FOR BI-DIRECTIONAL TRAFFIC FLOWS. SEE THE MANUFACTURER'S PRODUCT MANUAL FOR PLACEMENT ADJACENT TO GUARDRAIL END TREATMENTS.
- THE NU-CABLE SYSTEM SHALL BE INSTALLED ON MEDIANS WITH SLOPES OF 6:1 OR FLATTER WITHOUT OBSTRUCTIONS, DEPRESSIONS, ETC; THAT MAY SIGNIFICANTLY AFFECT THE STABILITY OF AN ERRANT VEHICLE.
- THE NU-CABLE SYSTEM MAY BE INSTALLED ON EITHER SIDE OF THE ROADWAY. Rib-Bok™ CABLE LINE POSTS MAY BE SOCKETED OR DRIVEN DESIGN.
- THE TL-4 FOR 6:1 SLOPES CAN USE 4# / LF POST. SEE TABLE #1 FOR POST SIZE PER SPACING.
- SEE (TABLE 2) FOR TENSION AMOUNT AT SPECIFIC CABLE TEMPERATURE FOR INITIAL INSTALLATION.
- SEE (TABLE 3) FOR TENSION AMOUNT AT SPECIFIC CABLE TEMPERATURE FOR MAINTENANCE.
- FOURTH (LOWEST) CABLE IS NOT OPTIONAL ON THE TL-4 SYSTEM.
- CONSULT YOUR PROJECT PLAN SHEETS AND CABLE BARRIER SPECIFICATIONS FOR DESIRED SOCKET MATERIAL.
- ALL FOUNDATION DESIGNS ARE BASED ON NCHRP 350 STRONG (S1) SOIL. CONSULT THE MANUFACTURER FOR SPECIFIC FOUNDATION DESIGN IF SOIL TYPES DIFFER.

**7) TABLE 1**

POST SIZE TABLE	
POST SPACING	POST SIZE
0' - 17'-6"	4# / LF X 4' OR 6' POST
17'-6" - 20'	5# / LF X 4' POST

POST SPACING IS PER 8 FOOT DEFLECTION REQUIREMENTS. CONSULT PRODUCT MANUAL IF GREATER DEFLECTION IS PERMISSIBLE.

**8) TABLE 2**

CABLE TENSION CHART	
INITIAL INSTALL	
F	LBF
120	4624
110	4986
100	5350
90	5713
80	6077
70	6440
60	7167
50	7894
40	8619
30	9346
20	10073
10	10800
0	11525
-10	12252
-20	12979
-30	13706

**9) TABLE 3**

CABLE TENSION CHART	
MAINTENANCE	
F	LBF
120	4021
110	4336
100	4652
90	4968
80	5284
70	5600
60	6232
50	6864
40	7495
30	8127
20	8759
10	9391
0	10022
-10	10654
-20	11286
-30	11918

SHEET 1 OF 2

Texas Department of Transportation  
Design Division Standard

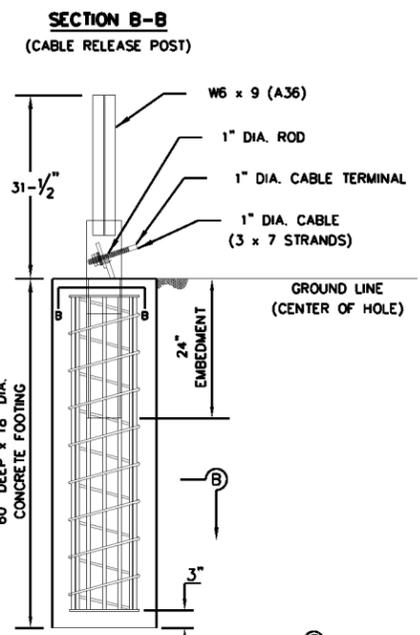
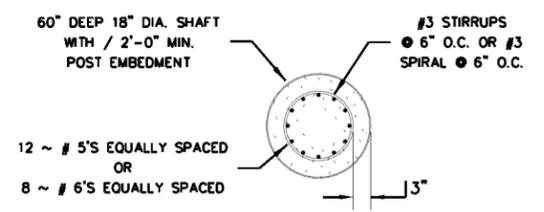
**NU-CABLE BARRIER SYSTEM (TL-4) (4 CABLE)**

**NU-CABLE (TL4) - 14**

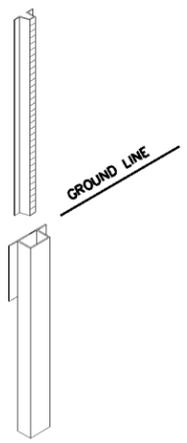
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REVISIONS	0063	04	068	US 59
	DIST	COUNTY	SHEET NO.	
	ATL	PANOLA	32	

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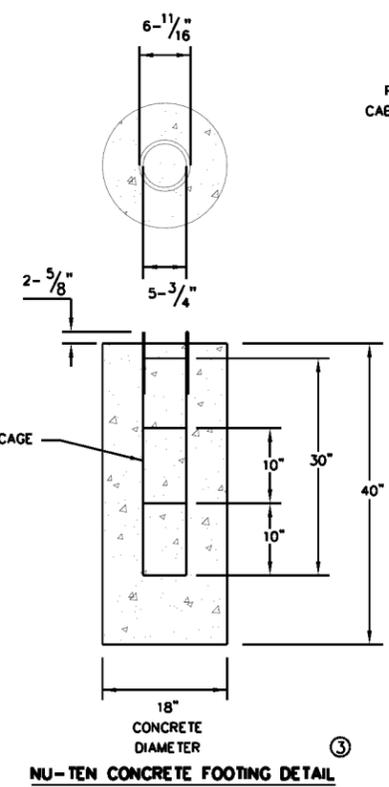
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**DETAIL A - CRP IN CONCRETE FOOTING**  
(3000 PSI MIN CONCRETE)



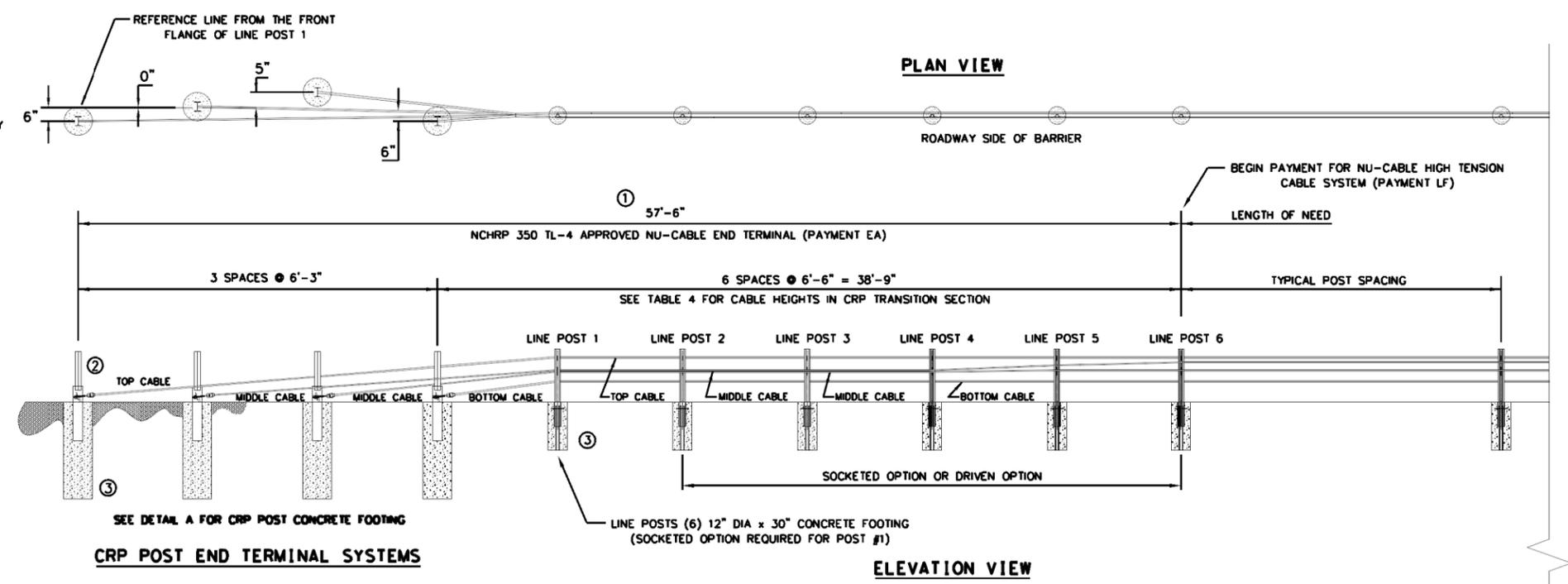
**DRIVEN SOCKET OPTION**



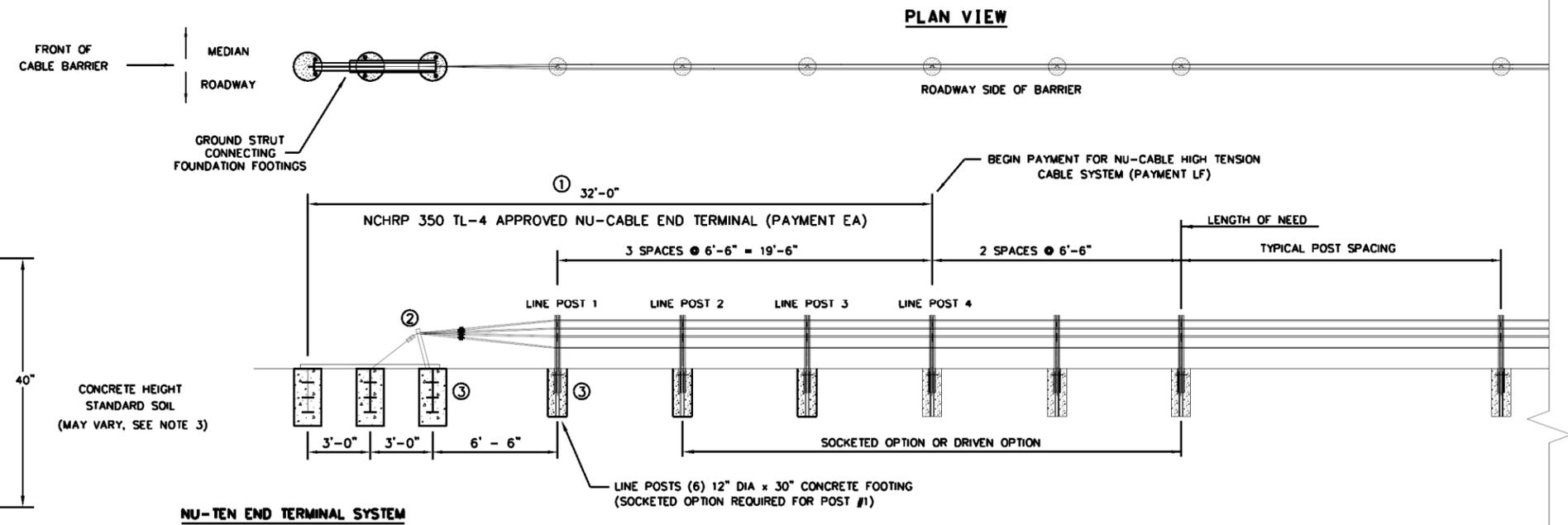
**NU-TEN CONCRETE FOOTING DETAIL**

**TABLE 4**  
CRP END TERMINAL CABLE HEIGHTS - TL-4

	LP 1	LP 2	LP 3	LP 4	LP 5	LP 6
TOP CABLE	34"	34"	34"	34"	34"	34"
UPPER-MIDDLE CABLE	27"	27"	27"	27"	28"	31"
BOTTOM-MIDDLE CABLE	24"	24"	24"	24"	24"	24"
BOTTOM CABLE	15"	15"	15"	15"	15"	15"



① THE OPPOSING END TREATMENTS ON A PARTICULAR RUN ARE MIRRORED IN THEIR LAYOUT.



**NOTES**

1. THE OPPOSING END TREATMENTS ON A PARTICULAR RUN ARE MIRRORED IN THEIR LAYOUT. SYSTEM PAYMENT IS PER EACH (EA). REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL PAYMENT INFORMATION
2. REFER TO INSTALLATION MANUAL FOR CABLE END ASSEMBLY DETAIL.
3. ALL FOUNDATION DESIGNS ARE BASED ON NCHRP 350 STRONG (S1) SOIL. CONSULT THE MANUFACTURER FOR SPECIFIC FOUNDATION DESIGNS IF SOIL TYPES DIFFER.
4. SEE TABLE 4 CABLE HEIGHTS IN CRP TRANSITION SECTION.

SHEET 2 OF 2

Design Division Standard

**NU-CABLE BARRIER SYSTEM (TL-4) (4 CABLE)**

**NU-CABLE (TL4) - 14**

FILE:	DNR:	CK#:	DW#:	CK#:
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REVISIONS:	0063	04	068	US 59
	DIST:	COUNTY:	SHEET NO.	
	ATL	PANOLA	33	

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 FILE: D:\t\tdot\projectwiseonline.com\TXDOTS\Documents\19 - ATL\Design Projects\006304068\4 - Design\Master Design Files\01 PLANSHEETS\058 EPIC.dgn

**I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402**

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

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

1. N/A

No Action Required     Required Action

Action No.

1. This project is considered a maintenance activity and is exempt from the requirements of TPDES TX 150000.

Commitment No.

**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
<input type="checkbox"/> Temporary Vegetation	<input type="checkbox"/> Silt Fence	<input type="checkbox"/> Vegetative Filter Strips
<input type="checkbox"/> Blankets/Matting	<input type="checkbox"/> Rock Berm	<input type="checkbox"/> Retention/Irrigation Systems
<input type="checkbox"/> Mulch	<input type="checkbox"/> Triangular Filter Dike	<input type="checkbox"/> Extended Detention Basin
<input type="checkbox"/> Sodding	<input type="checkbox"/> Sand Bag Berm	<input type="checkbox"/> Constructed Wetlands
<input type="checkbox"/> Interceptor Swale	<input type="checkbox"/> Straw Bale Dike	<input type="checkbox"/> Wet Basin
<input type="checkbox"/> Diversion Dike	<input type="checkbox"/> Brush Berms	<input type="checkbox"/> Erosion Control Compost
<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Mulch Filter Berm and Socks
<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks
<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Vegetation Lined Ditches
	<input type="checkbox"/> Stone Outlet Sediment Traps	<input type="checkbox"/> Sand Filter Systems
	<input type="checkbox"/> Sediment Basins	<input type="checkbox"/> 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	SWSP: Storm Water Pollution Prevention Plan
DSHS: Texas Department of State Health Services	PCN: Pre-Construction Notification
FHWA: Federal Highway Administration	PSL: Project Specific Location
MOA: Memorandum of Agreement	TCEQ: Texas Commission on Environmental Quality
MOU: Memorandum of Understanding	TPDES: Texas Pollutant Discharge Elimination System
MS4: Municipal Separate Stormwater Sewer System	TPWD: Texas Parks and Wildlife Department
MBTA: Migratory Bird Treaty Act	TxDOT: Texas Department of Transportation
NOT: Notice of Termination	T&E: Threatened and Endangered Species
NWP: Nationwide Permit	USACE: U.S. Army Corps of Engineers
NOI: Notice of Intent	USFWS: U.S. Fish and Wildlife Service

**VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES**

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used. Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: 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	DNR TxDOT	CR: RG	DNR VP	CR: AR
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12-12-2011 (DS) REVISIONS	0063 04	068	US 59	
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY	SHEET NO.	
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	ATL	PANOLA	34	