

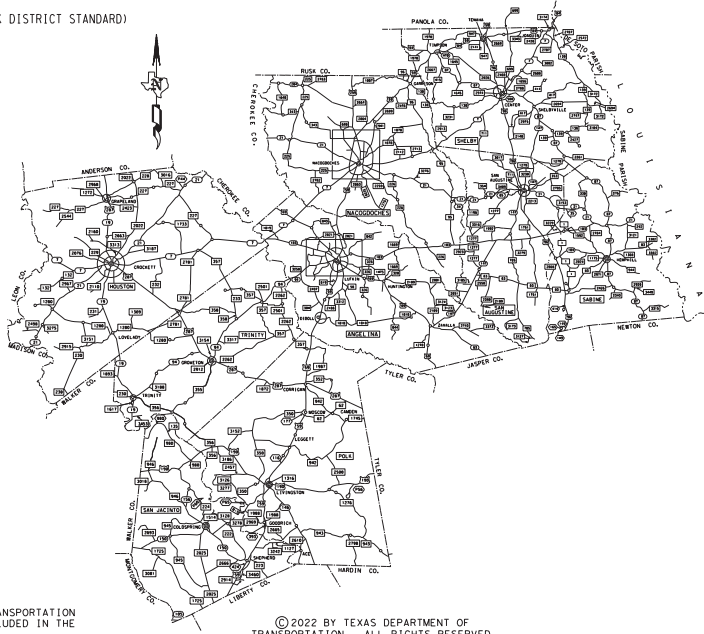
**STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION**

FWA DIVISION	PROJECT NO.	SHEET NO.
TEXAS	RMC 6428-21-001	1
STATE DISTRICT	COUNTY	
TEXAS	ANGELINA, ETC.	
CONTROL SECTION	JOB	HIGHWAY NO.
6428	21	001 US 59, ETC.

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**PLANS OF PROPOSED
STATE HIGHWAY ROUTINE MAINTENANCE CONTRACT
TYPE OF WORK:
INSTALLATION OF SPECIALTY PAVEMENT MARKINGS
RMC 6428-21-001
US 59, ETC.
ANGELINA COUNTY, ETC.
LIMITS: VARIOUS LOCATIONS DISTRICTWIDE**



Seth D. Franks, P.E.
P. E. 11/29/2022
DATE

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

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION NOVEMBER 1, 2014 AND SPECIAL SPECIFICATION ITEMS INCLUDED IN THE CONTRACT SHALL GOVERN ON THIS PROJECT.

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BARRICADES AND WARNING SIGNS
PROJECT LIMIT BARRICADES WILL NOT BE REQUIRED. THE CONTRACTOR SHALL PROVIDE AND ERECT WARNING SIGNS IN ACCORDANCE WITH THE BARRICADE & CONSTRUCTION STANDARDS, TCP STANDARDS, THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND AS DIRECTED.



SUBMITTED FOR LETTING: DocuSigned by: <i>Seth D. Franks, P.E.</i> 1-591-224411-643448	INGINEER DATE	12/1/2022
RECOMMENDED FOR LETTING: DocuSigned by: <i>Jeremy King, P.E.</i> 5135292FE4184A4	NEER DATE	12/1/2022
DocuSigned by: <i>Z. Boyer, P.E.</i> 1A86E6C298C5C492	TTING: ATIONS DATE	12/1/2022

11/28/2022 8:25:14 AM T:\LFX\TRG\5\m\Performance_Contracts\PLANS\2022_Jobs\RMC_6428-21-001_Speciality_Pavement_Markings\1. Plan Set Pages\Title Sheet.dgn

Project Number: RMC 6428-21-001

County: Angelina, etc

Highway: US 59, etc

Control: 6428-21-001

GENERAL NOTES:

This Maintenance Contract is to provide for restoration of pavement markings throughout the Lufkin District, which consists of the following nine counties: Angelina, Houston, Nacogdoches, Polk, Sabine, San Augustine, San Jacinto, Shelby and Trinity.

Commence work within 7 days of receiving a work order unless otherwise approved. Failure to commence work within the specified time period or to work continuously until the work order has been completed will be cause to declare the Contract in default. Exception from declaring default will be if the Contractor has obtained written permission from the Engineer prior to leaving the project. In the event that all Contract funds or 365 calendar days have been expended, the Contract will be considered complete.

All work must meet the minimum requirements of this Contract for a day and night inspection.

Use approved safety and personal protection equipment (PPE) as directed. Non-compliance with the Safety, Qualification and Certification requirements will be grounds for suspension of work.

Provide proper equipment and labor to complete the initial list prior to leaving.

Prior to beginning work, submit a schedule based on the list of highways so that inspection arrangements can be made. The Contractor will be provided an initial list of highways at the pre-construction meeting, indicating where pavement markings are to be placed.

Work will be performed on weekdays, Monday thru Friday. No work will be performed on weekends unless otherwise approved.

In high traffic volume areas, work will not be allowed to begin before 9 A.M. and continued after 4 P.M., unless otherwise approved. In other areas, beginning and ending work times will be as directed or approved.

No lane closures will be allowed on US 59 after 12:00 PM (Noon) on Fridays or on days preceding Major Holidays, unless otherwise approved.

Furnish materials and make repairs to the existing roadway at any location that might be damaged by construction operations. Perform this work in a manner satisfactory to the Engineer. This work will be considered subsidiary to various bid items.

For questions concerning the plans contact Don Maddux at (936) 633-4353.

Item 4: Scope of Work

The Contract may be extended if in the judgment of the Engineer, the Contractor has satisfactorily fulfilled the terms and conditions of the Contract. The extension must be agreed upon in writing by both parties to the Contract and may be extended for an additional period of time not to exceed the original Contract time period. The extended Contract may be for

Project Number: RMC 6428-21-001

County: Angelina, etc

Highway: US 59, etc

Sheet 2

Control: 6428-21-001

additional quantities up to the original bid quantities plus any quantities added by an approved change order. The extensions must meet the terms and conditions of the original Contract or any mutually agreed modifications to the said terms and conditions by one or more cumulative change orders. The Engineer will set a deadline for completing the agreements. This deadline will be based on the time needed to re-let and award a new Contract if no extension is agreed upon.

Item 7: Legal Relations and Responsibilities

The proposed work of this project is to Install Specialty Pavement Markings at various locations throughout the Lufkin District. This activity maintains the original line and grade, hydraulic capacity and original purpose of the site. Therefore, this project meets the definition of a routine maintenance activity as defined in the TPDES General Permit No. TXR150000 issued March 5, 2018 and TCEQ's TPDES CGP does not apply.

Contractor to repair or replace in kind, at their own expense, any historic materials damaged (buildings, historical markers, etc) in the course of executing work. Contractor is responsible for locating replacement source for historical materials damaged in the course of the work. TxDOT-Environmental Affairs Division is to be informed of proposed repairs to facilitate consultation with Texas Historical Commission prior to the execution of repairs.

There is critical habitat and/or populations of the following federally listed threatened and endangered species within the Lufkin District: Texas golden gladecress, White bladder pod, Neches River Rose-mallow, Texas Prairie Dawn, Texas Trailing Phlox, Red-cockaded woodpecker and Louisiana Pinesnake. Consultation with the United States Fish and Wildlife Service has not been conducted with regard to these species.

1. NO EQUIPMENT or VEHICLES shall leave the pavement and NO STOCKPILING or EQUIPMENT STORAGE shall be allowed along the following roadways without prior approval from the Area Engineer: Angelina County- SH 63 Houston County- SH 7, FM 227, FM 1733, FM 2781, FM 230; Nacogdoches County- SH 21 Polk County- FM 1276 Sabine County- SH 87, SH 21, FM 2343, FM 2426 San Augustine County- SH 21, SH 103, SH 147, FM 1992, FM 3483, FM 353 San Jacinto County - FM 2693, FM 1725, FM 945, FM 2025, FM 2666 Shelby County- FM 2261, FM 3184 Trinity County - SH 94, FM 2262, FM 357.

Item 9: Measurement and Payment

This Contract includes callout work. In accordance with Article 9.2., "Plans Quantity Measurement", plans quantity measurement requirements are not applicable. The quantities shown are for estimates only and payment will be based on the actual quantities placed.

Project Number: RMC 6428-21-001

County: Angelina, etc

Highway: US 59, etc

Control: 6428-21-001

Item 502: Barricades, Signs And Traffic Handling

Traffic Control Plan (TCP):

Furnish and maintain all warning signs, flaggers, channelizing devices, etc., required for Traffic Control on this project in accordance with Item 502, except for measurement and payment. This work will not be paid for directly but will be subsidiary to pertinent items.

Provide Traffic Control in accordance with TCP (2-2)-18, TCP (2-4)-18 and TCP (3-4)-13. An arrow panel will be required.

Use additional flaggers at roadway intersections to direct traffic entering the work area, when deemed necessary by the Engineer. All flaggers shall wear approved hardhats and reflective clothing.

All workers on TxDOT right-of-way shall wear reflective clothing meeting ANSI Class II requirements during the day and ANSI Class III requirements during the night.

Provide temporary Rumble Strips as shown on WZ(RS)-22 when lane closures are necessary.

Blue warning lights should only be used while performing work on or near the travel lanes or shoulder where the traveling public may encounter workers that are not protected by a standard work zone set up such as a lane closure, shoulder closure, or one-way traffic control.

Item 506: Temporary Erosion, Sedimentation, and Environmental Controls

Due to the limited soil disturbing nature of this project, temporary erosion control work has not been included. However, the SWP3 for this project shall consist of any erosion control or pollution control items deemed necessary by the Engineer. Should this work become necessary, it will be paid for in accordance with Article 4.4, "Changes in the Work".

Item 668: Prefabricated Pavement Markings

Furnish all materials for this Contract in accordance with this Item.

Perform all work during daylight hours and when weather conditions are suitable for the work.

Item 6056: Preformed In-Lane (Transverse)/Centerline Rumble Strips

Preformed In-Lane (Transverse) Rumble Strips shall be black.

Item 6185: Truck Mounted Attenuator (TMA)

One (1) TMA (Mobile Operation) will be required for this project. The contractor will be responsible for determining if multiple operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

General Notes

Project Number: RMC 6428-21-001

County: Angelina, etc

Highway: US 59, etc

Sheet 2A

Control: 6428-21-001

Truck Mounted Attenuators (TMA's) shall meet the requirements of this item and the Department's Compliant Work Zone Traffic Control Device List.

Truck Mounted Attenuators (TMA's) as shown on the TCP's shall be used. Whether shown on the TCP's or added by the Department, TMA's shall be paid for under Item 6185, "Truck Mounted Attenuator (Mobile Operation)".

General Notes



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 6428-21-001

DISTRICT Lufkin
HIGHWAY US0059

COUNTY Angelina

CONTROL SECTION JOB				6428-21-001		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00192277			
COUNTY				Angelina			
HIGHWAY				US0059			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	500-6033	MOBILIZATION (CALLOUT)	EA	6,000		6,000	
	668-6075	PREFAB PAV MRK TY C (W) (18") (SLD)	LF	1,000.000		1,000.000	
	668-6076	PREFAB PAV MRK TY C (W) (24") (SLD)	LF	7,000.000		7,000.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	50.000		50.000	
	668-6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	20.000		20.000	
	668-6079	PREFAB PAV MRK TY C (W) (TPL ARROW)	EA	5.000		5.000	
	668-6080	PREFAB PAV MRK TY C (W) (UTURN ARROW)	EA	10.000		10.000	
	668-6083	PREFAB PAV MRK TY C (W) (LNDP ARROW)	EA	6.000		6.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	30.000		30.000	
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)	EA	10.000		10.000	
	677-6006	ELIM EXT PAV MRK & MRKS (18")	LF	700.000		700.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	4,000.000		4,000.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	35.000		35.000	
	677-6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	20.000		20.000	
	677-6010	ELIM EXT PAV MRK & MRKS (TPL ARROW)	EA	5.000		5.000	
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	20.000		20.000	
	677-6016	ELIM EXT PAV MRK & MRKS (RR XING)	EA	8.000		8.000	
	677-6036	ELIM EXT PAV MRK & MRKS (UTURN ARROW)	EA	5.000		5.000	
	6056-6001	PREFORMED IN-LANE(TRANS) RUMBLE STRIP	LF	2,000.000		2,000.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	80.000		80.000	



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DISTRICT	COUNTY	CCSJ	SHEET
Lufkin	Angelina, Etc	6428-21-001	3

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

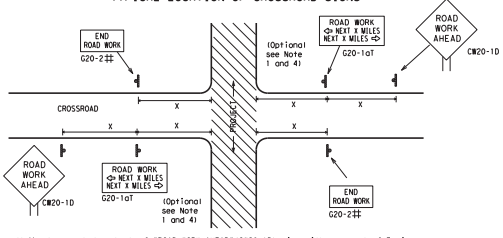
1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

<p>THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov</p>
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

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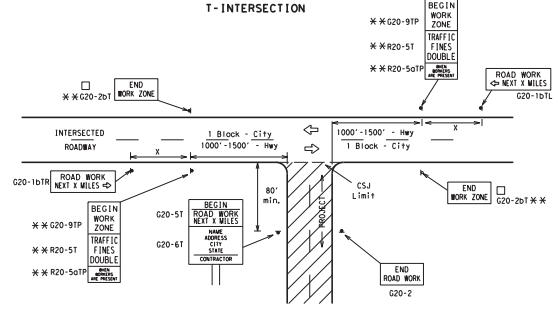
		Traffic Safety Division Standard
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS		
BC(1)-21		
Title: BC(1)-21 Date: November 2002	Job No: 6428 21 Section: 001	Project: US 59, ETC. County: LFK City: ANGELINA, ETC.
Revision: 4-01 1-13 9-07 8-14 5-10 5-21	Job No: 6428 21 Section: 001	Project: US 59, ETC. County: LFK City: ANGELINA, ETC.
		SHEET NO. 4

TYPICAL LOCATION OF CROSSROAD SIGNS



1. The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-10) sign and a (G20-21) "END ROAD WORK" sign, unless noted otherwise in plans.
2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-10) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK" (G20-21) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume as per TMUTCD Part 5. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The "ROAD WORK NEXT X MILES" (G20-101) sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



- CSJ LIMITS AT T-INTERSECTION**
- 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" (G20-61) sign behind the Type 3 Barricades for the road closure (see BC110) also. The "ROAD WORK NEXT X MILES" (left arrow-G20-101L) and "ROAD WORK NEXT X MILES" (right arrow-G20-101R) signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING^{1,5,6}

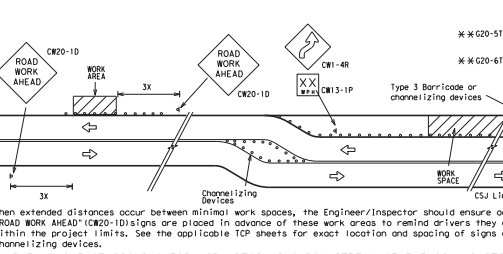
Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed MPH	Sign Spacing "x"
CW20 ⁴	48" x 48"	48" x 48"	30	120
CW21			35	160
CW22			40	240
CW23			45	320
CW25	50	400		
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	55	500 ²
			60	600 ²
			65	700 ²
CW3, CW4, CW5, CW6, CW8-5, CW10, CW12	48" x 48"	48" x 48"	70	800 ²
			75	900 ²
			80	1000 ²
			*	* ³

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

¹ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

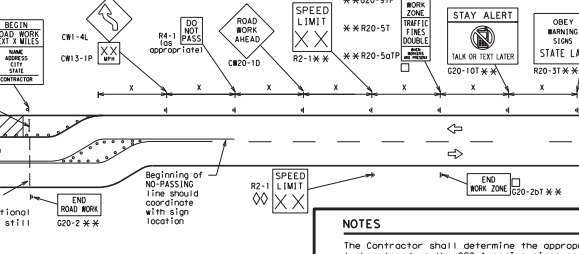
- GENERAL NOTES**
- Special or larger size signs may be used as necessary.
 - Distance between signs should be increased as required to have 1500 feet advance warning.
 - Distance between signs should be increased as required to have 1/2 mile or more advance warning.
 - 36" x 36" "ROAD WORK AHEAD" (CW20-10) 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



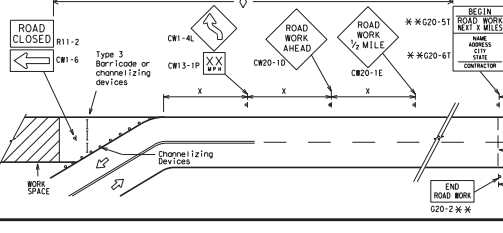
When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-10) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TOP sheets for exact location and spacing of signs and channelizing devices.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-61) 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.

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" (G20-61) 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" (G20-91P) and "END WORK ZONE" (G20-201) 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" (CW20-10) sign and other signs or devices as called for on the Traffic Control Plan.
 - Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND

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

SHEET 2 OF 12
Texas Department of Transportation
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC (2) - 21

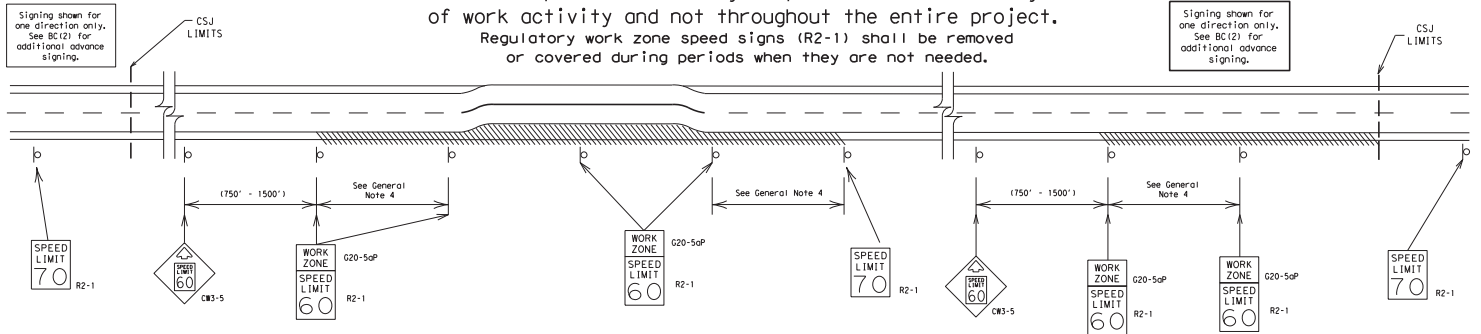
FILED: BC-21.001	REVISED: 11/13/2002	DATE: 11/13/2002	BY: 11/13/2002	JOB: 11/13/2002	PROJECT: 11/13/2002
REVISIONS	6428	21	001	US 59, ETC.	
9-07	8-14	9-07	9-07	LFK	ANGELINA, ETC.
1-13	5-21				

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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:

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

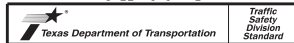
Short Term Work Zone Speed Limit signs should be posted and visible to the motorists only when work activity is present. When work activity is not present, signs shall be removed or covered. (See Removing or Covering on BC(4)).

GENERAL NOTES

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

DISCLAIMER: The use of this program is governed by the Texas Engineering Practice Act. No warranty of any kind is made by the State of Texas or any of its agencies, departments, or employees for any damages resulting from its use.

SHEET 3 OF 12



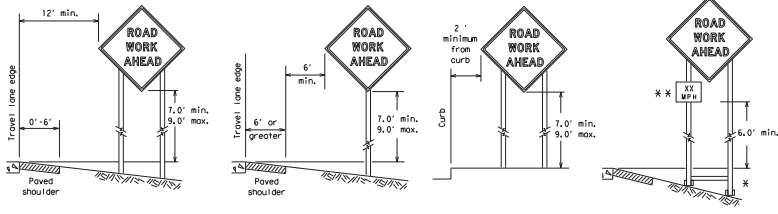
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC (3) - 21

File#	BC-21-091	Rev	1/001	Rev	1/001	Rev	1/001	Rev	1/001
Rev	1/001	Rev	1/001	Rev	1/001	Rev	1/001	Rev	1/001
REVISED	6/28/01	REVISED	2/1/01	REVISED	001	REVISED	US 59, ETC.	REVISED	
DATE	9-07	DATE	8-14	DATE	7-13	DATE	5-21	DATE	
BY	LFK	BY	ANGELINA, ETC.	BY		BY		BY	
SHEET NO.	6	SHEET NO.		SHEET NO.		SHEET NO.		SHEET NO.	

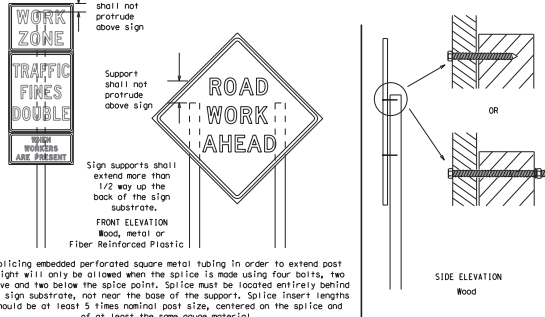
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



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

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

ATTACHMENT FOR SIGN SUPPORTS



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

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

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" (CWZTD) 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)

- Types of sign supports, sign mounting height, the size of signs, and the type of sign substrate 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-term 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 paved surface but no more than 2 feet above the shoulder.
- 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 roadway 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.

SIZES 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 CWZTD lists sign 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 SMS-8300 for rigid signs or SMS-8310 for roll-up signs. The web address for SMS specifications is shown on BC(1).
- White sheeting, meeting the requirements of SMS-8300 type A, shall be used for signs with a white background.
- Orange sheeting, meeting the requirements of SMS-8300 type B₁ or type C₁, 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.
- Burial shall NOT be used to cover signs.
- Duct tape or other adhesive material shall NOT be affixed to a sign face.
- Signs and anchor studs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT HEIGHTS

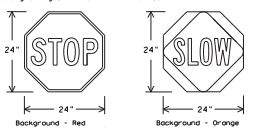
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be filled with sand to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall 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 channeled signs 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 CWZTD 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 rights 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 ₁ OR C ₁ 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 (LOCO), 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 to 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 Standard sheets. 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 CWZTD 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.

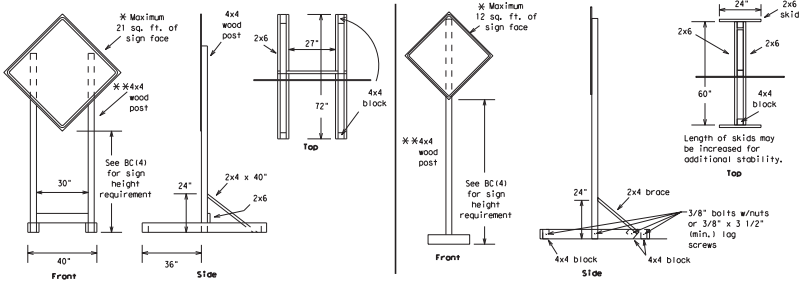


BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 21

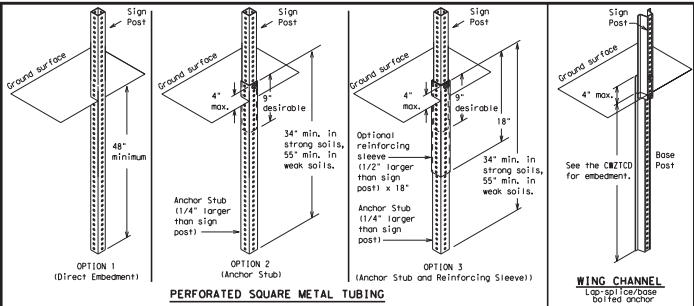
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REVISED	November 2002	DATE	11/01	JOB		BY		CHKD	
REVISED	6/28/21	DATE	001	JOB	US 59, ETC.	BY		CHKD	
REVISED	9-07 8-14	DATE	0151	JOB	US 59, ETC.	BY		CHKD	
REVISED	7-13 5-21	DATE	0151	JOB	ANGELINA, ETC.	BY		CHKD	

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SKID MOUNTED WOOD SIGN SUPPORTS

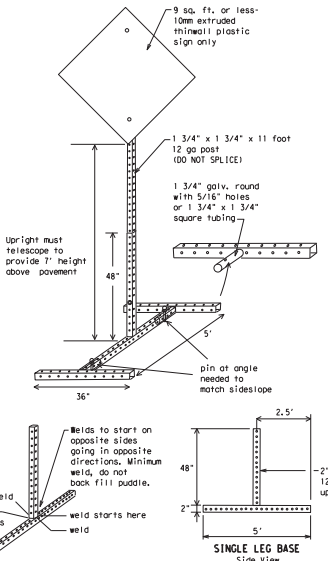
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS



GROUND MOUNTED SIGN SUPPORTS

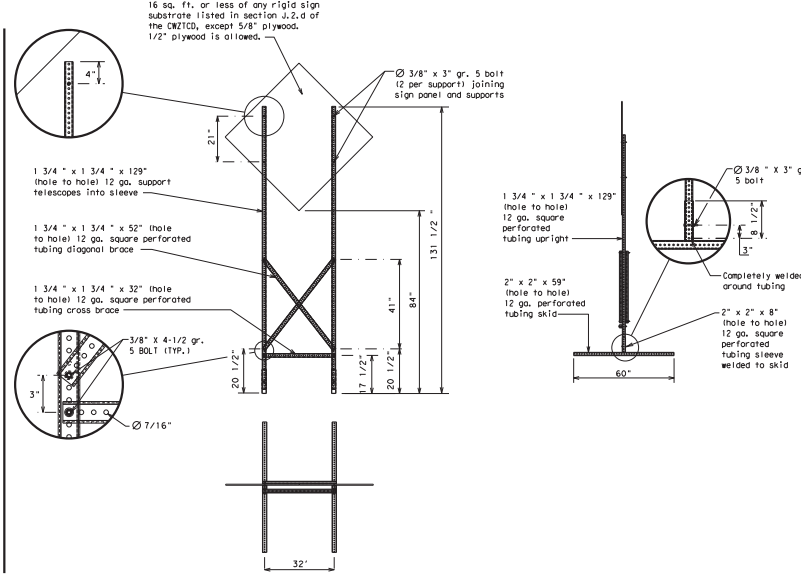
Refer to the CRZTCO and the manufacturer's installation procedure for each type sign support. The maximum sign square footage shall adhere to the manufacturer's recommendation. Two post installations can be used for larger signs.

DISCLAIMER: Plans prepared by the Texas Department of Transportation. The user assumes all responsibility for the accuracy of the information provided herein. The user shall be responsible for any and all consequences resulting from the use of these plans. DATE: 11/16/2022 10:46:10 AM FILE: H:\EXTRAS\INTRODUCER\CONTRACTS\PLANS\2022\JUBA\INC\6428-21-001\ISSUES\0113\PROVISIONS\WARRANTY\5\CONTRACT\BC(5)-21



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 STD 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 BC111).

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

- GENERAL NOTES**
- 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.
 - No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CRZTCO List.
 - When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered satisfactory to Item 505.
- See BC(14) for definition of "Work Duration."
 - Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
 - See the CRZTCO for the type of sign substrate that can be used for each approved sign support.

SHEET 5 OF 12
 Texas Department of Transportation
 Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC (5) - 21

FILED: BC(5)-001	REV: T2007	REV: T4007	REV: T4007	REV: T4007
NOVEMBER 2002	CONTRACT	JOB	SECTION	
REVISIONS	6428 21	001	US 59, ETC.	
9-07 8-14	9151	COUNTY	SHEET NO.	
2-13 5-21	LFK	ANGELINA, ETC.	8	

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

- PORTABLE CHANGEABLE MESSAGE SIGNS**
- 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, if 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 TMC/CO.
 - PCMS character height should be at least 18 inches for trailer mounted units. 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 displayed, 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.

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List		Other Condition List	
FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED	ROADWORK XXX FT	ROAD REPAIRS XXXX FT
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT	FLAGGER XXXX FT	LANE NARROWS XXXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT	RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
RIGHT X LANES CLOSED	RIGHT X LANES OPEN	MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
CENTER LANE CLOSED	DAYTIME LANE CLOSURES	LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
NIGHT LANE CLOSURES	I-XX SOUTH LANE CLOSED	DETOUR X MILE	ROUGH ROAD XXXX FT
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE	ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
EXIT CLOSED	RIGHT LN TO BE CLOSED	BUMP XXXX FT	US XXX EXIT X MILES
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI	TRAFFIC SIGNAL XXXX FT	LANES SHIFT
XXXXXXXX BLVD CLOSED			*

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel	Location List	Warning List	** Advance Notice List
MERGE CLOSED	FORM X LINES RIGHT	AT FM XXXX	SPEED LIMIT XX MPH
DETOUR NEXT X EXITS	USE XXXXX RD EXIT	BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH
USE EXIT XXX	USE EXIT I-XX NORTH	NEXT X MILES	MINIMUM SPEED XX MPH
STAY ON US XXX SOUTH	USE I-XX E TO I-XX N	PAST US XXX EXIT	ADVISORY SPEED XX MPH
TRUCKS USE US XXX N	WATCH FOR TRUCKS	XXXXXXXX TO XXXXXXXX	RIGHT LANE EXIT
WATCH FOR TRUCKS	EXPECT DELAYS	US XXX TO FM XXXX	USE CAUTION
EXPECT DELAYS	PREPARE TO STOP		DRIVE SAFELY
REDUCE SPEED XXX FT	END SHOULDER USE		DRIVE WITH CARE
USE OTHER ROUTES	WATCH FOR WORKERS		TONIGHT XX PM - XX AM
STAY IN LANE	*		** See Application Guidelines Note 6.

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

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

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

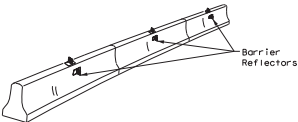
- When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
- When symbol signs, such as the "Flagger Symbol" (CW20-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirements 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.

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

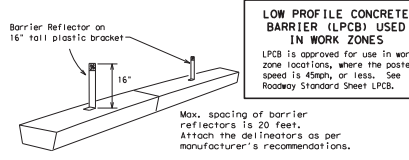
BC (6) - 21

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1-13 9-21	0151	COUNTY:	SHEET NO.
	LFK	ANGELINA, ETC.	9

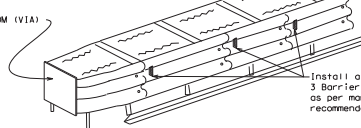
- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DM-8500. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC11.
- Color of Barrier Reflectors shall be as specified in the MUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



CONCRETE TRAFFIC BARRIER (CTB)



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 CRWCD List for approved end treatments and manufacturers.

- 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 on one end of each CTB. This will allow for attachment of a barrier grade 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 units 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 edge line 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.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

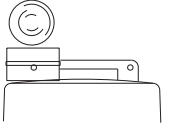
- Warning lights shall meet the requirements of the MUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet 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 B₁ or G₁ sheeting meeting the requirements of Departmental Material Specification DM-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

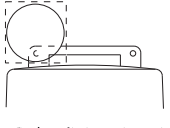
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing 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 or 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 CRWCD.
- 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 MMS 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.



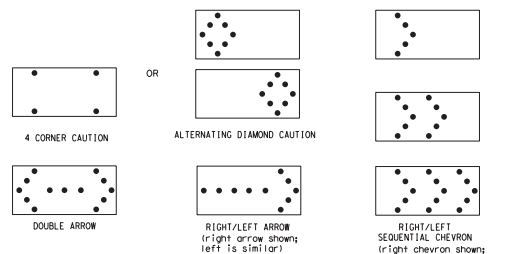
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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 Board shall be 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 POMS 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

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 CRWCD for the requirements of Level 2 or Level 3 TMAs.
- Refer to the CRWCD 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 on 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-21-099	REV	TxDOT	DATE	BY	CHKD	DATE
REVISED	6428	21	001	US 59, ETC.	9-07	8-14	1-13
REVISED	9131	21	001	US 59, ETC.	1-13	8-21	1-13
REVISED	9131	21	001	US 59, ETC.	1-13	8-21	1-13

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" (CWZCD).
- 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

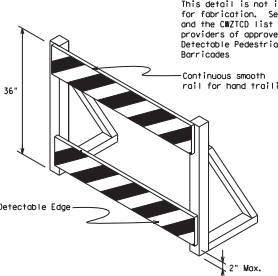
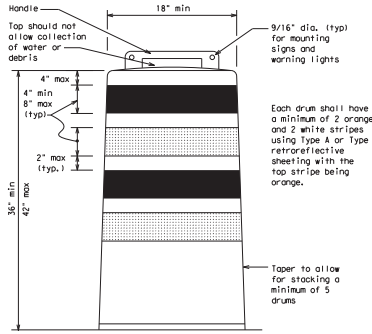
- Pre-qualified plastic drums shall meet the following requirements:
- Plastic drum shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
 - The body and base shall lock together in such a manner that the body separates from the base when impacted 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 channelizing 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 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 footpads of sufficient size to allow base to be held down while separating the drum body from the base.
 - Plastic drums shall be constructed of ultraviolet 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.

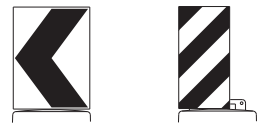
BALLAST

- 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 CWZCD 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 ballasts 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 M2(B5-2) 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 B 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.
- Table, 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 rolls as shown on BC110) 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 (M-8, Obposing Traffic Lane Divider, Driveway Sign D100, Keep Right R4 series or other signs as approved by Engineer

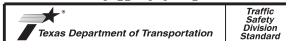
12" x 24" Vertical Panel
mount with diagonals sloping down toward travel way

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 CWZCD.
- Chevrons and other work zone signs with an orange background shall be manufactured with Type B₂ or Type G₂ 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 an every third drum. A minimum of three (3) should be used of 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

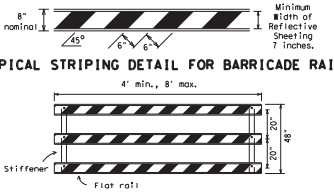
Rev:	01-21-001	Rev:	10/01	Rev:	10/01	Rev:	10/01	Rev:	10/01
01-001	November 2002	01-001	June 2001	01-001	June 2001	01-001	June 2001	01-001	June 2001
REVISED		REVISED		REVISED		REVISED		REVISED	
4-03	8-14	6428	21	001	US 59, ETC.	COUNTY		SHEET NO.	
01-03	8-14	0101			LFK ANGELINA, ETC.			11	
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TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZCD) 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, consistency 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.

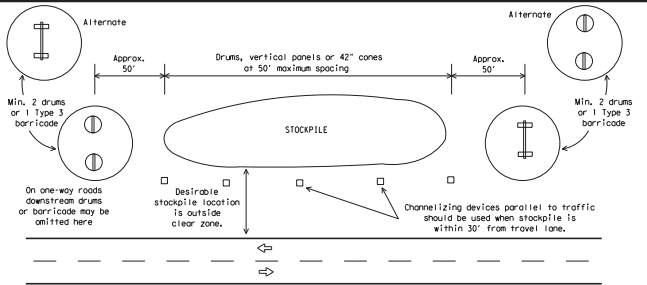
Barricades shall NOT be used as a sign support.



TYPICAL STRIPING DETAIL FOR BARRICADE RAIL

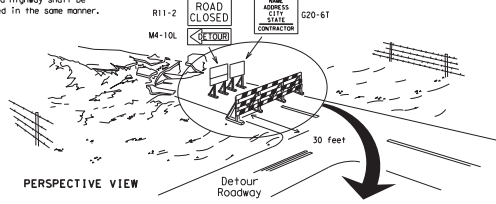
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



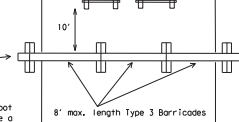
TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



PERSPECTIVE VIEW

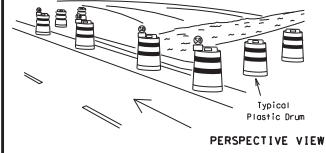
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



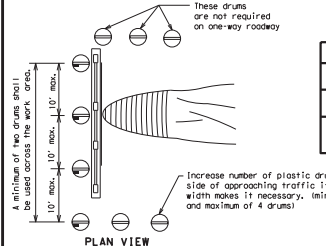
PLAN VIEW

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

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW



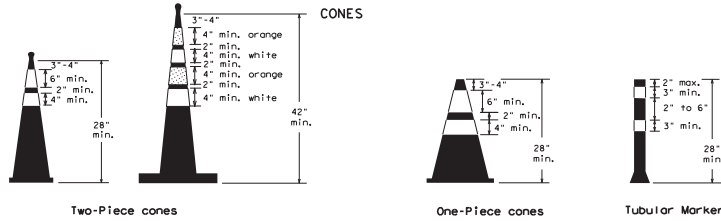
PLAN VIEW

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



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 BC141. 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

File#	BC-21-090	Rev	1/007	On 1/007	Rev	1/001	On 1/001
Rev	1/007	Nov 2002	Rev	1/001	Rev	1/001	Rev
REVISED	6428	21	001	US 59,	ETC.		
9-07	8-14	9151	COUNTY				
7-13	5-21	LFK	ANGELINA, ETC.				13

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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(S15PM).
- 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(11).
- 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 (fall back) shall meet the requirements of DMS-8240.

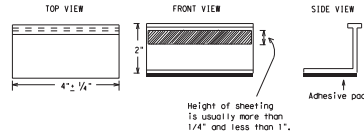
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- 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 500 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 discernible 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.
- Block-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(S15PM) for tab placement on new pavements. See Standard Sheet TOP(T-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



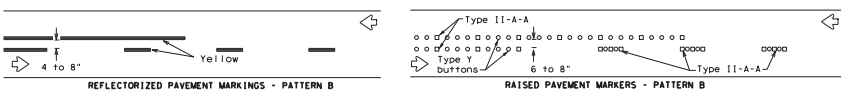
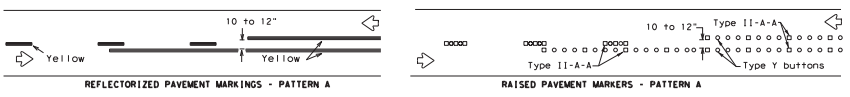
BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11) - 21

File#	BC-21-001	Rev	1/001	Chg	1/001	Rev	1/001	Chg	1/001
Date	02/01/1998	Drawn	10/01	Checked	10/01	Checked	10/01	Checked	10/01
Revisions		6428	21	001	US 59, ETC.				
2-98	9-07	9-21	9131	COUNTY					
1-02	7-13			LFK	ANGELINA, ETC.				14
11-07	8-14								

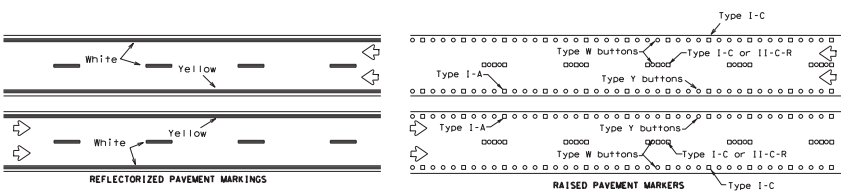
DISCLAIMER: This drawing is prepared by the Texas Department of Transportation. The user of this drawing is advised that the Department of Transportation does not assume any responsibility for the consequences of any errors or omissions resulting from the use of this drawing.

PAVEMENT MARKING PATTERNS



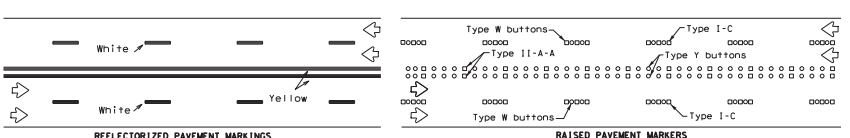
Pattern A is the TxDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectORIZED pavement markings.

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



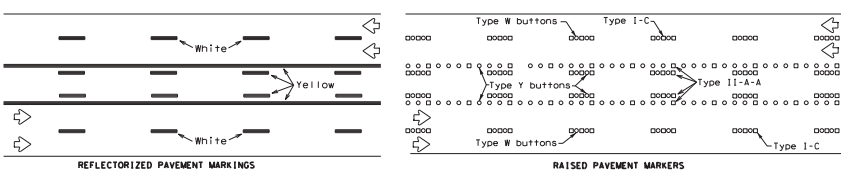
Prefabricated markings may be substituted for reflectORIZED pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



Prefabricated markings may be substituted for reflectORIZED pavement markings.

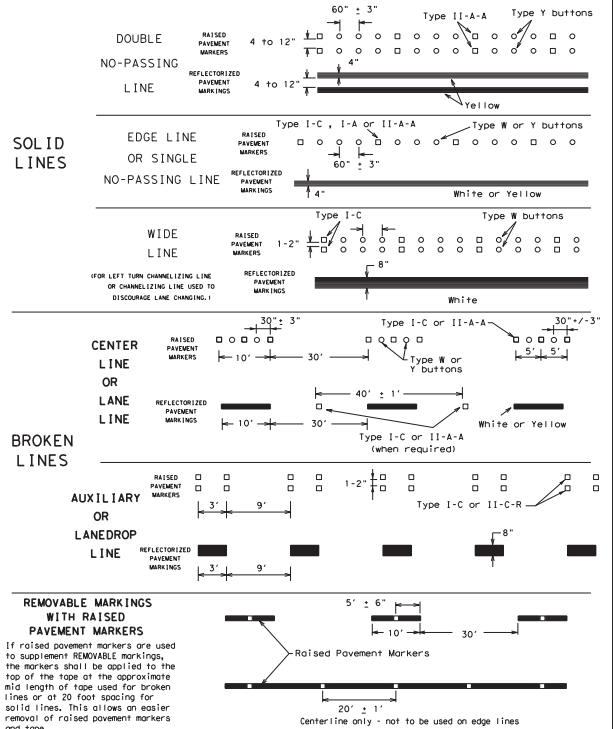
LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



Prefabricated markings may be substituted for reflectORIZED pavement markings.

TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



SHEET 12 OF 12

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

Texas Department of Transportation Traffic Safety Division Standard

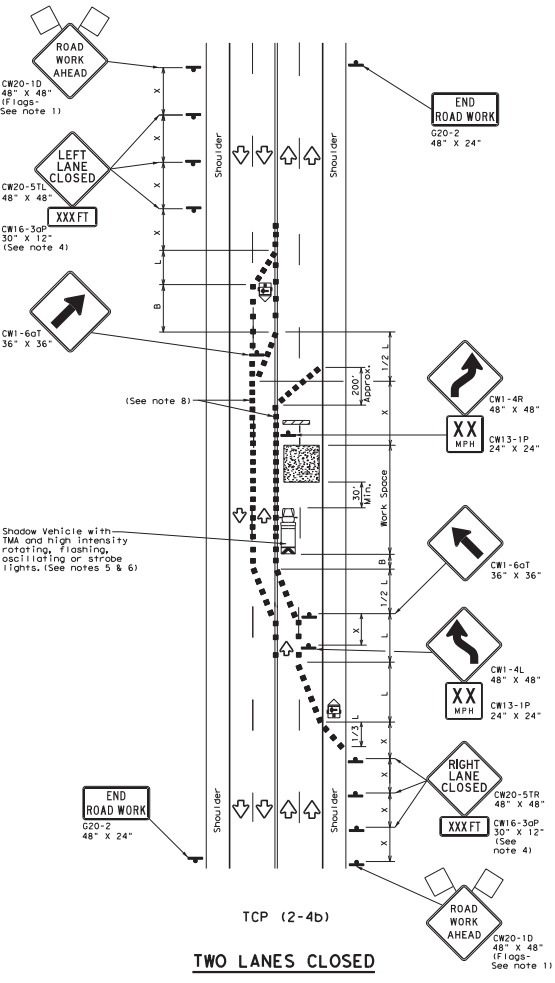
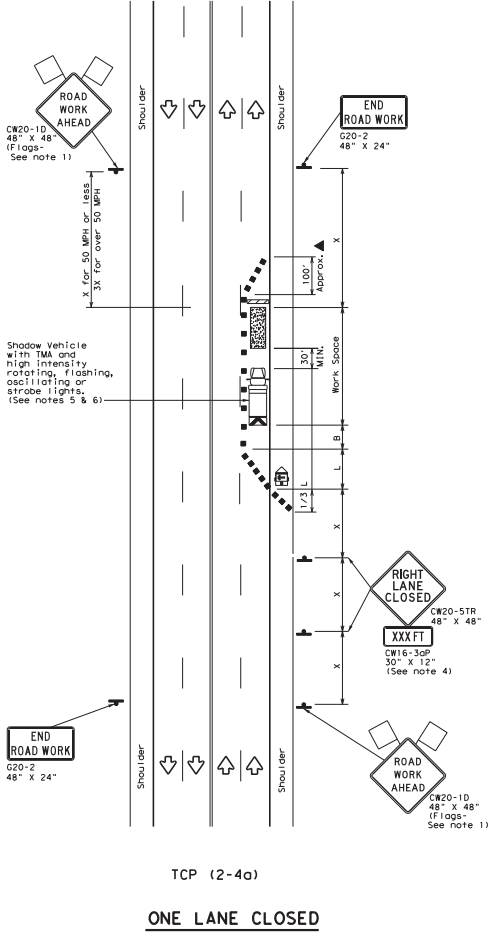
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC (12) - 21

Plan: BC-21-000	Rev: 1/001	On: 1/001	Rev: 1/001	On: 1/001
1/001 February 1998	CON: 1001	JOB: 6428 21	COUNTY: 001	US 59, ETC.
1-97 9-07 5-21	REVISIONS	0151	DATE	
2-98 7-13				
11-97 8-14				
		LFK	ANGELINA, ETC.	15

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DATE: 11/16/2022 10:46:15 AM
 FILE: \\S:\L\T\TSPS\MO\INT\MOUSE\CONTR\GAS\PLANS\2022\JUBA\INC\6428-21-001\SPEC\T\11\TRAFFIC CONTROL PLAN\18-550000001.DWG
 DSC: LMK:R
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LEGEND

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

Posted Speed	Formula	Minimum Desirable Taper Lengths	Suggested Spacing of Channelizing Devices	Minimum Sign Spacing	Suggested Longitudinal Buffer Space
30	L	10' 11' 12'	On a Taper	60'	90'
35	L + WS	150' 165' 180'	On a Tangent	120'	120'
40	L	205' 225' 245'	On a Tangent	160'	155'
45	L + WS	265' 295' 320'	On a Tangent	240'	195'
50	L	450' 495' 540'	On a Tangent	320'	240'
55	L + WS	500' 550' 600'	On a Tangent	400'	295'
60	L	550' 605' 660'	On a Tangent	500'	350'
65	L + WS	600' 660' 720'	On a Tangent	600'	410'
70	L	650' 715' 780'	On a Tangent	700'	475'
75	L + WS	700' 770' 840'	On a Tangent	800'	540'
80	L	750' 825' 900'	On a Tangent	900'	600'

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

TYPICAL USAGE

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

GENERAL NOTES

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

TCP (2-4a)

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

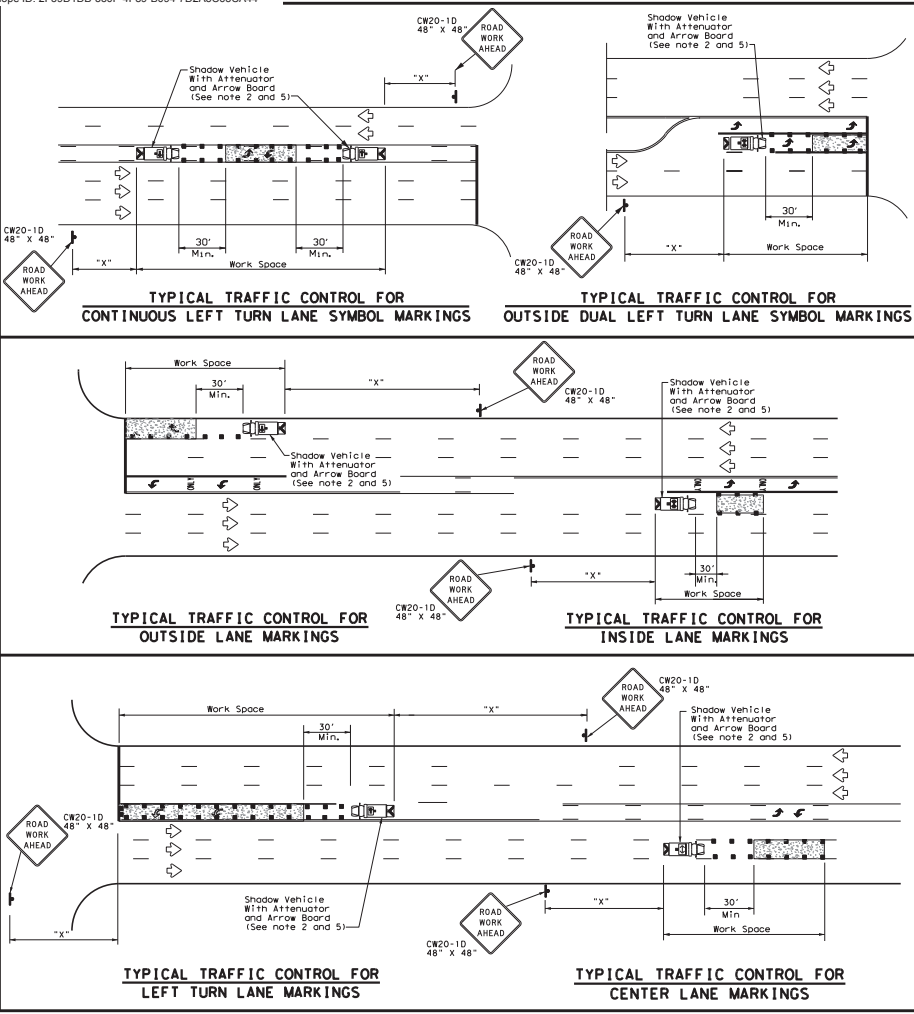
TCP (2-4b)

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

TRAFFIC CONTROL PLAN
LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS
TCP (2-4) - 18

FILE: 1022-4-18.dwg	DATE: 11/16/2022	BY: LMK	CHK: JUBA
REV: 001	REVISIONS: December 1985	CON: 6428	JOB: 21
REV: 001	REVISIONS: 1-97	DIST: 001	COUNTY: 001
REV: 002	REVISIONS: 2-18	DIST: LFK	COUNTY: ANGELINA, ETC.
REV: 003	REVISIONS: 2-18	DIST: LFK	COUNTY: ANGELINA, ETC.

DATE: 11/16/2022 10:46:15 AM
 FILE: H:\EX1805\MOBILE\PLANS\2022\JDDA\TMC 6428-21-001
 DISCUSS: 0154
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LEGEND	
* Trail Vehicle	ARROW BOARD DISPLAY
** Shadow Vehicle	
*** Work Vehicle	RIGHT Directional
**** Heavy Work Vehicle	LEFT Directional
Truck Mounted Attenuator (TMA)	Double Arrow
Traffic Flow	Channelizing Devices

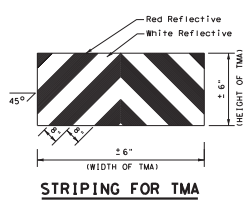
Posted Speed (K)	Formula	Minimum Desirable Taper Lengths (ft)			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing (ft)	Suggested Longitudinal Buffer Space (ft)
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	WS-2	150'	165'	180'	30'	60'	120'	90'
35	L+WS	205'	225'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

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

TYPICAL USAGE			
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	LONG TERM STATIONARY

GENERAL NOTES

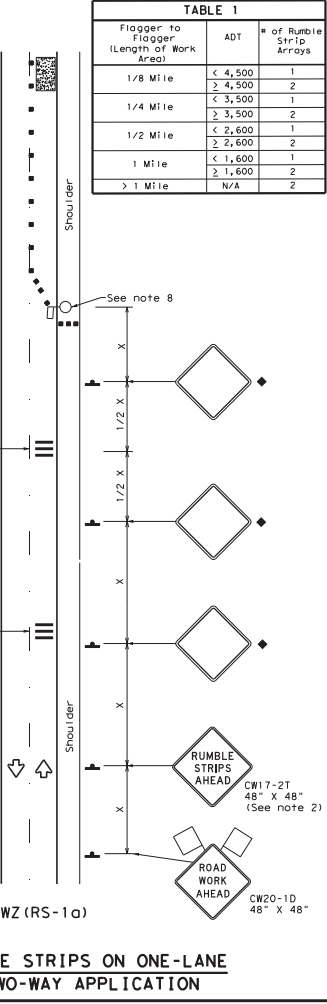
- This traffic control plan is for use on conventional roads posted at 45 mph or less and is intended for mobile operations that move continuously or intermittently (stopping up to approximately 15 minutes) such as short-line striping and in-lane rumble strips. When activities are anticipated to take longer amounts of time or traffic conditions warrant, a short duration or short-term stationary traffic control plan should be used.
- A Truck Mounted Attenuator shall be used on Shadow Vehicle. Striping on the back panel of all truck mounted attenuators shall be 4" red and white reflective sheeting placed in an inverted "V" design. Reflective sheeting shall meet or exceed the reflectivity and color requirements of departmental material specification DMS-8300, Type A.
- All traffic control devices shall be in accordance with the Texas Manual on Uniform Traffic Control Devices (TMUTCD), latest edition.
- The use of yellow rotating beacons or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
- Flashing arrow board shall be used on Shadow Vehicle. Flashing arrow board shall be Type B or Type C as per BC Standards. The arrow board operation shall be controlled from inside the truck.



Texas Department of Transportation		Traffic Operations Division Standard	
TRAFFIC CONTROL PLAN MOBILE OPERATIONS FOR ISOLATED WORK AREAS UNDIVIDED HIGHWAYS			
TCP (3-4) - 13			
FILE#	6428-21-001	REVISED	01/16/2013
DATE	11/16/2022	BY	LFK
PROJECT	6428-21	COUNTY	US 59, ETC.
SHEET NO.	18	ANGELINA, ETC.	

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

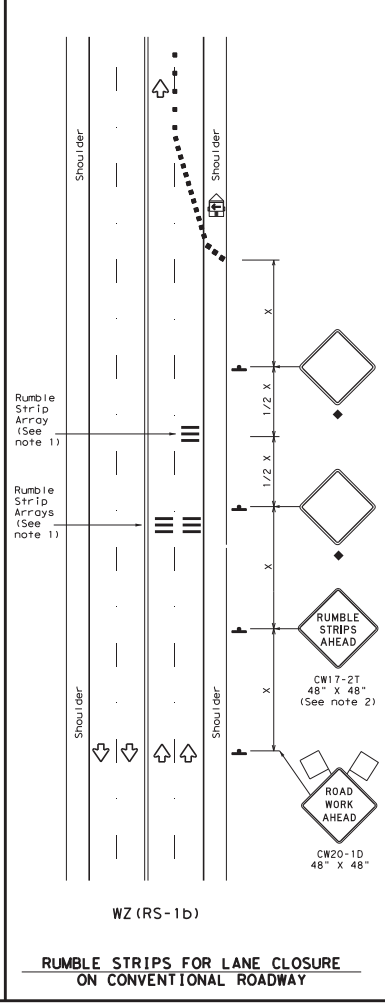
DATE: 11/19/2022 10:46:16 AM
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 D:\C:\Users\jdd\OneDrive\Documents\2022\JDDA\WZ (RS)-22.dwg
 The second Rumble Strip Array is required when the ADT thresholds in Table 1 indicate the need for 2 Arrays.



RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION

TABLE 1

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



RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

TABLE 2

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

LEGEND

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

Posted Speed (MPH)	Formula	Minimum Desirable Taper Lengths (ft)			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing (ft)	Suggested Longitudinal Buffer Space (ft)
		On a Taper	On a Tangent	On a Taper	On a Tangent			
30	L = WS/60	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40	L = WS	265'	295'	320'	40'	80'	240'	155'
45		450'	495'	540'	45'	90'	320'	195'
50	L = WS	500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60	L = WS	600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70	L = WS	700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

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

TYPICAL USAGE

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

◆ Signs are for illustrative purposes only. Signs required may vary depending on the TCP, MUTCD Typical Application, or project specific details for the project.
 * For posted speeds in excess of 65 MPH, it is recommended that spacing is increased as speed limits increase. Increasing space between rumble strips will improve effectiveness.

Texas Department of Transportation
 Traffic Safety Division Standard

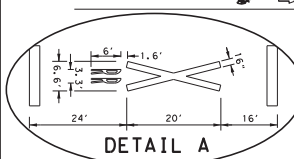
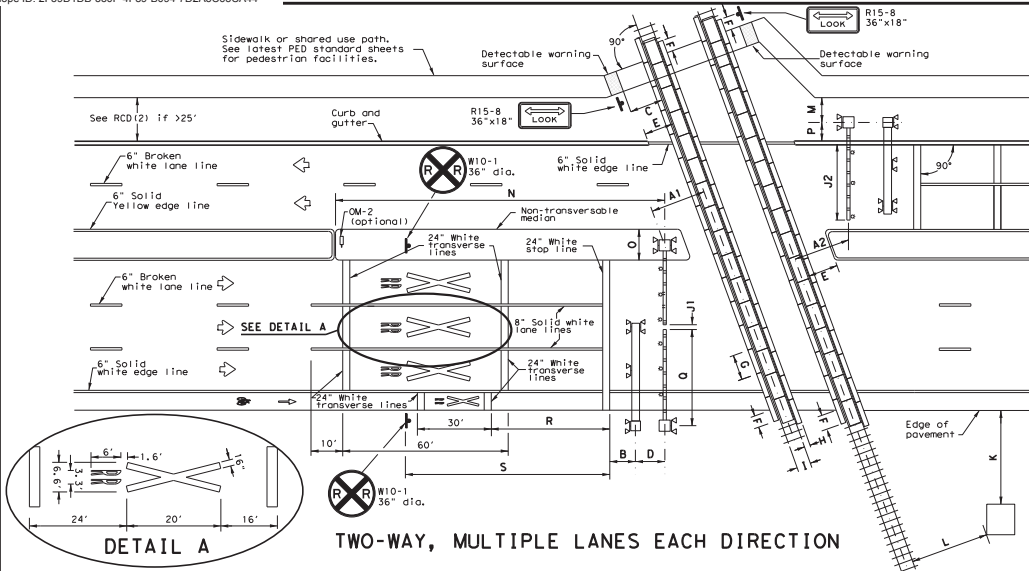
TEMPORARY RUMBLE STRIPS

WZ (RS) - 22

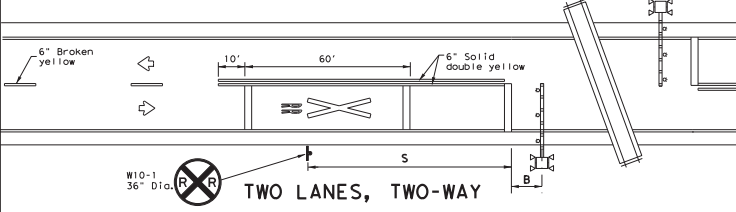
File#	WZ (RS)-22.dwg	Rev	1/001	On	1/001	By	1/001	On	1/001
Project	11-001	Revision	2012	Cont	1/001	Job		Sheet	
Revisions	2-14	1-22	6428	21	001	US	59	ETC.	
Dist	4-16		LFK	ANGELINA, ETC.				SHEET NO.	19

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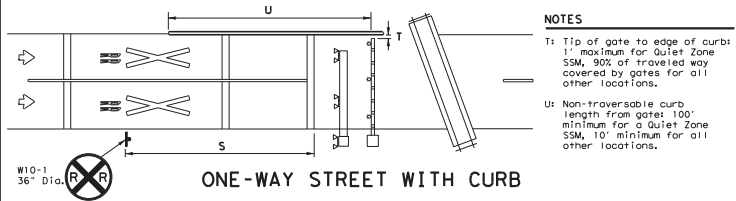
DATE: 11/28/2022 8:21:14 AM
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TWO-WAY, MULTIPLE LANES EACH DIRECTION



TWO LANES, TWO-WAY



ONE-WAY STREET WITH CURB

NOTES

- T1: Tip of gate to edge of curb: 1' maximum for Quiet Zone SSM, 90% of traveled way covered by gates for all other locations.
- U: Non-traversable curb length from gate: 100' minimum for a Quiet Zone SSM, 10' minimum for all other locations.

TABLE 1

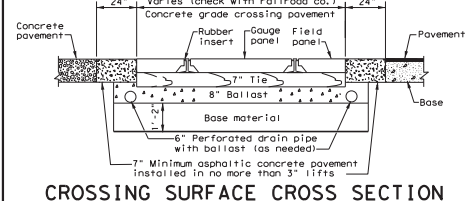
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

LEGEND

	Sign
	Object Marker
	Traffic Flow
	Cantilever
	Gate Assembly
	Mast Flasher Pair

GENERAL NOTES

- Medians and curbs must be non-traversable to qualify as a Quiet Zone Supplementary Safety Measure (SSM). Non-traversable curbs in Quiet Zones are 6' tall minimum and used on roadways where speed does not exceed 40 mph.
- Raised pavement markers may be used to supplement striping. See PM(2) and PM(3) standard sheets.
- Medians preferred whenever possible to prevent vehicles from driving around gates.
- Longitudinal edge striping may be continued thru crossing as needed. Illumination may also be considered for nighttime visibility.
- See SMD standard sheets for sign mounting details.
- See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.



CROSSING SURFACE CROSS SECTION

Texas Department of Transportation Traffic Safety Division Standard

RAILROAD CROSSING SIGNING, STRIPING, AND DEVICE PLACEMENT RCD(1)-22

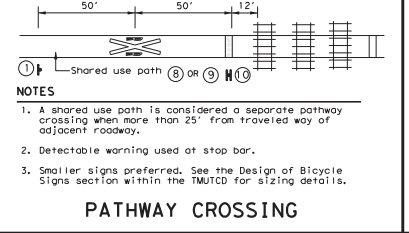
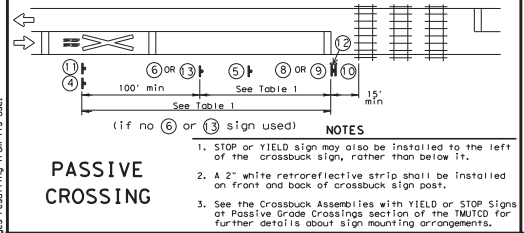
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REV: 11/2007	REV: 11/2007	REV: 11/2007	REV: 11/2007	REV: 11/2007
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2-16
11-22

6428 21 001 US 59, ETC.

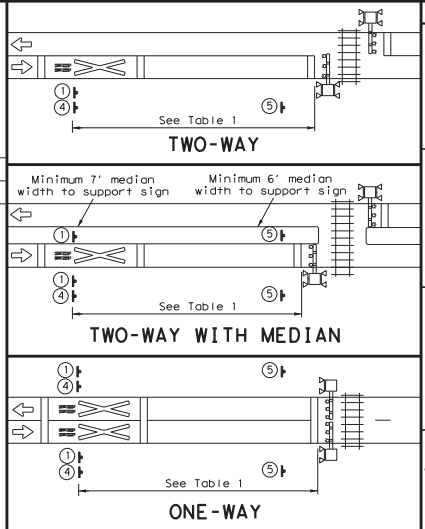
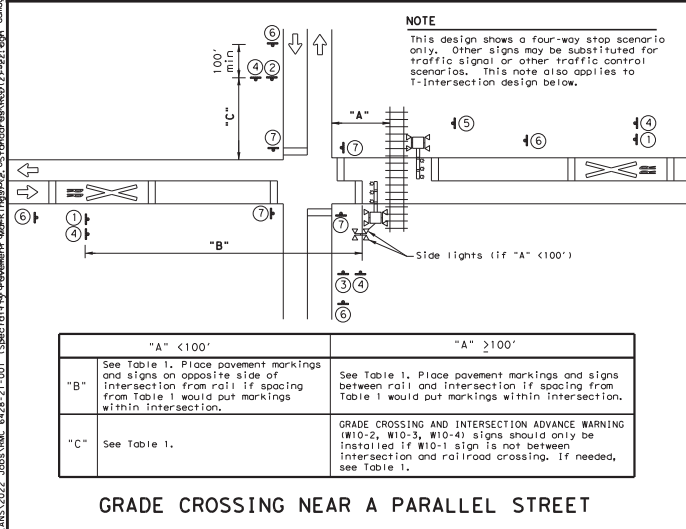
DIST COUNTY SHEET NO.
LFX ANGELINA, ETC. 20

DISCLAIMER: This standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by the Texas Department of Transportation, or its employees, agents, or subcontractors, for any consequences resulting from its use. DATE: 11/28/2022 8:26:15 AM FILE: T:\LFX\TDS\INT\TEMPLATE\PLANS\2022\JADA\TMC_6428-21-001



Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

- GENERAL NOTES**
- Railroad company to provide active traffic control devices, CROSSBUCK (W10-1), NUMBER OF TRACKS (R15-2P) plaque (if more than 1 track), and EMERGENCY NOTIFICATION (I-13) signs.
 - LOW GROUND CLEARANCE (W10-5) signs may be relocated further upstream of crossing to provide advance warning of alternate route.
 - GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2) signs may be modified as needed to fit roadway geometry.
 - Table 1 placement distances may vary per the Placement of Warning Signs section of the TMUTCD.
 - See Table 1 to determine placement of STOP AHEAD (W3-1) and YIELD AHEAD (W3-2) signs unless shown otherwise.
 - DO NOT STOP ON TRACKS (R8-8) signs installed when potential for vehicles stopping on tracks is significant as determined by seating engineer. Install so sign does not block view of RR mast.
 - See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.

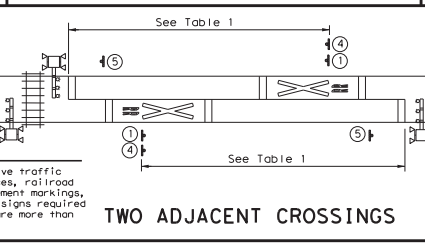
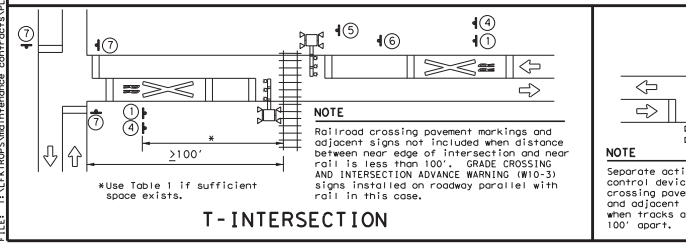


SIGNS

RAILROAD CROSSING DETAILS SIGNING & STRIPING

RCD (2) - 22

FILE: rcd-22.dgn	REV: 1001	DATE: 11/28/2022	BY: JADA	CHECKED: JADA	DATE: 11/28/2022
11/28/2022 8:26:15 AM	NOVEMBER 2022	6428	21	001	US 59, ETC.
2-16	11-22	DIST	COUNTY	SHEET NO.	
		LFK	ANGELINA, ETC.	21	

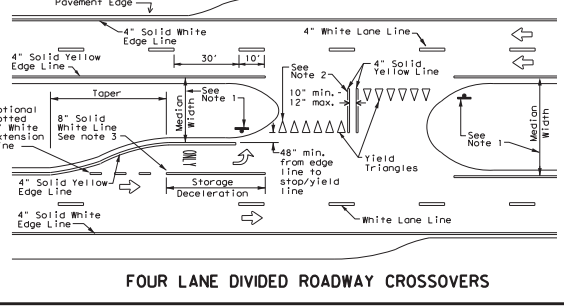
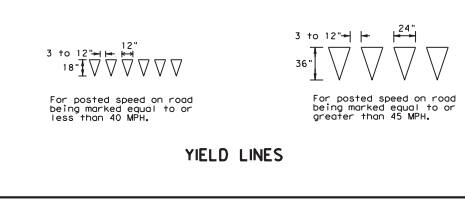
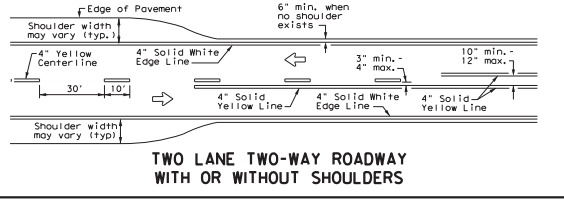
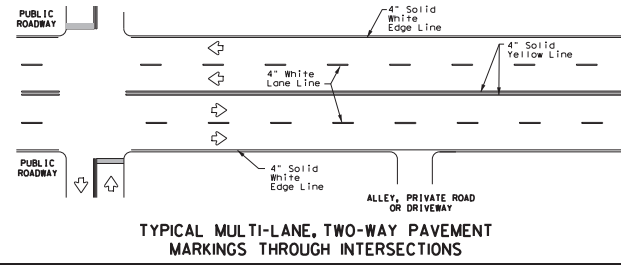
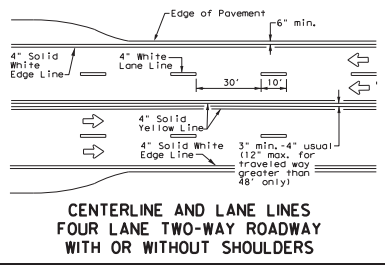
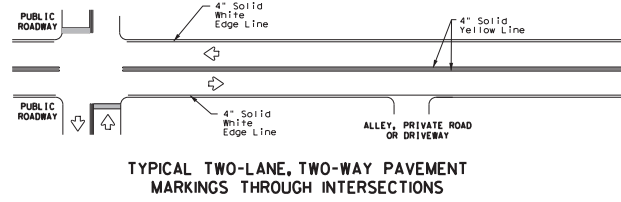
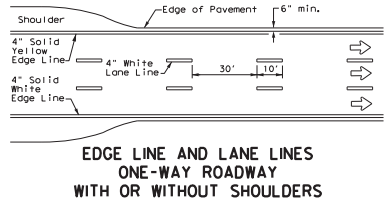


RAILROAD CROSSING DETAILS SIGNING & STRIPING

RCD (2) - 22

FILE: rcd-22.dgn	REV: 1001	DATE: 11/28/2022	BY: JADA	CHECKED: JADA	DATE: 11/28/2022
11/28/2022 8:26:15 AM	NOVEMBER 2022	6428	21	001	US 59, ETC.
2-16	11-22	DIST	COUNTY	SHEET NO.	
		LFK	ANGELINA, ETC.	21	

DISCUSS: In the case of this standard, it is governed by the Texas Engineering Practice Act. No warranty of any kind is made by the State of Texas or the Department of Transportation. The user of this standard shall assume all responsibility for damages resulting from its use.



NOTES

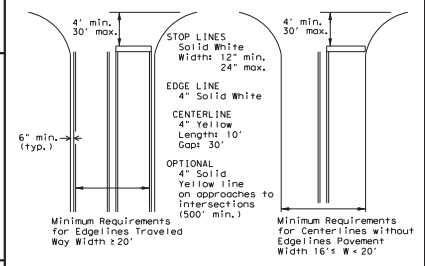
- Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

GENERAL NOTES

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

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

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



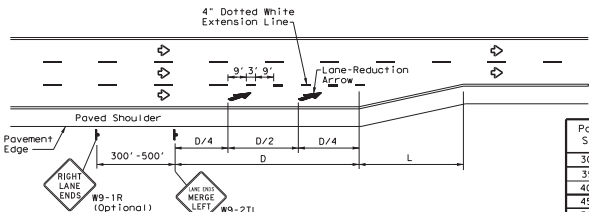
Texas Department of Transportation
Traffic Safety Division Standard

**TYPICAL STANDARD
PAVEMENT MARKINGS**

PM (1) - 20

FILED: 08/11/2022	REV: 08/11/2022	DATE: 08/11/2022	BY: [Signature]	CHK: [Signature]
01001	NOVEMBER 1978	REVISED	6428 21	001
8-95	3-03	REVISED	001	US 59, ETC.
5-00	2-12	REVISED	DIS1	COUNTY
8-00	6-20	REVISED	DIS1	ANGELINA, ETC.
2211				22

DATE: 11/16/2022 10:46:18 AM FILE: \\S:\L\T\2023\INT\TSP\CONTRACTS\PLANS\2022\JADA\TMC_6428-21-001 (SPEC TO HIS STATEMENTS, ADMIN, PROJECTS, OS, SIGNED\TSP\2023\2022\21-001.dwg)



LANE REDUCTION

NOTES

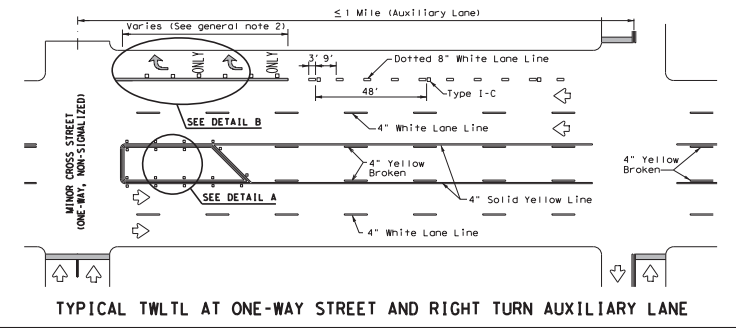
- Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TSP (PL) standard sheets.
- On divided highways, an additional W9-1R "RIGHT LANE ENDS" sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
- Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
- For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

GENERAL NOTES

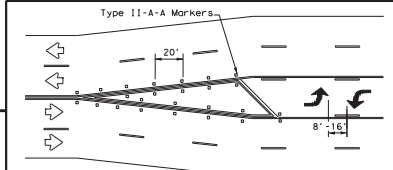
- Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
- When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
- Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
- Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

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

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

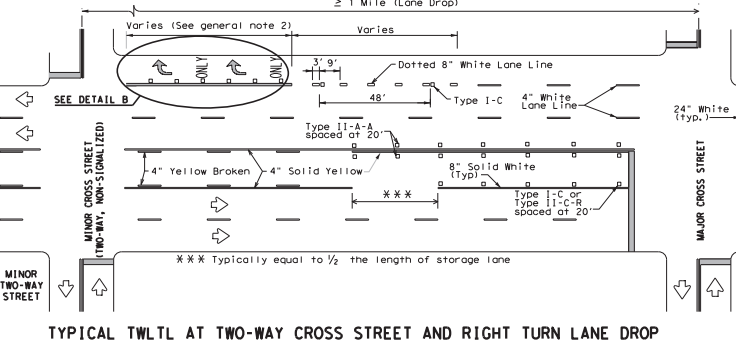


TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE

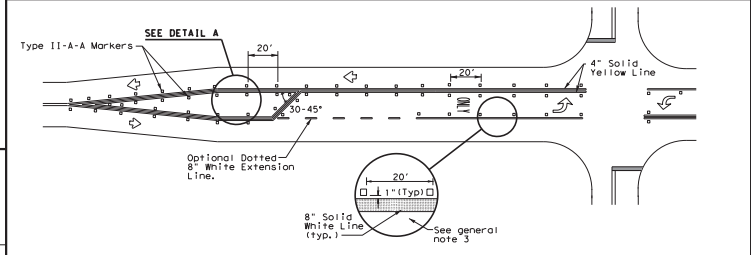


TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

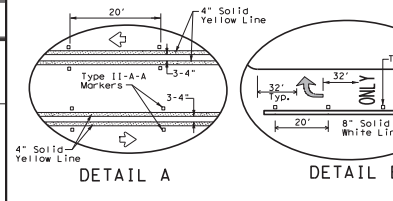
A two-way left-turn (TWLTL) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or designated turn bay is not required unless stated elsewhere in the plans.



TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS

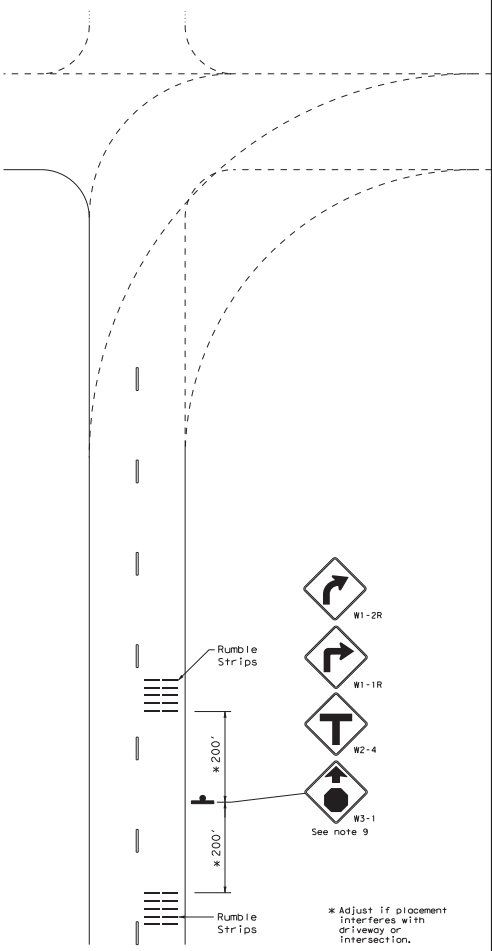


Texas Department of Transportation Traffic Safety Division Standard

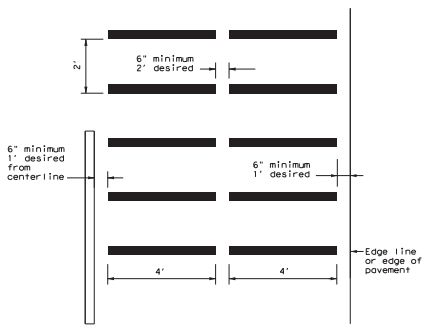
TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM (3) - 20

FILE#	DATE	BY	CHK	APP	REV
1001	08-11-1998	CON	SECT	JOB	ISSUED
5-00	2-10	REVISIONS	6428	21	001
8-00	2-12	DIST	COUNTY	US 59, ETC.	SHEET NO.
3-00	8-20	LFK	ANGELINA, ETC.		23

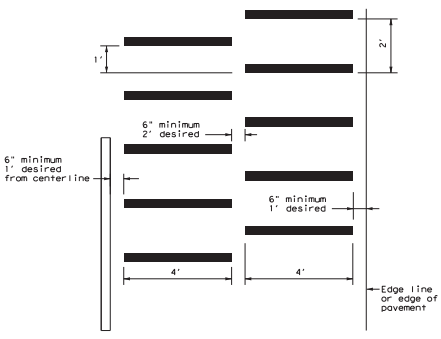
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by the Texas Department of Transportation for any damages resulting from its use.



STANDARD PATTERN



ALTERNATIVE PATTERN



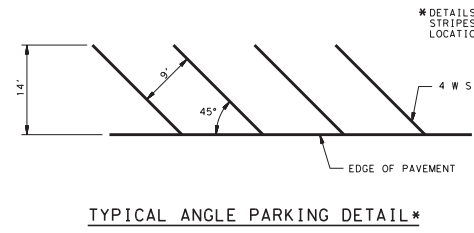
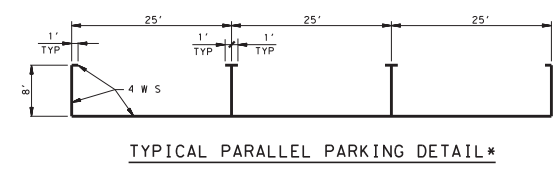
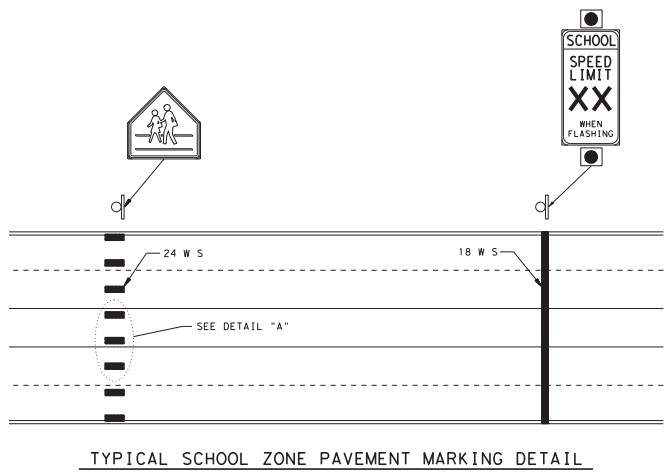
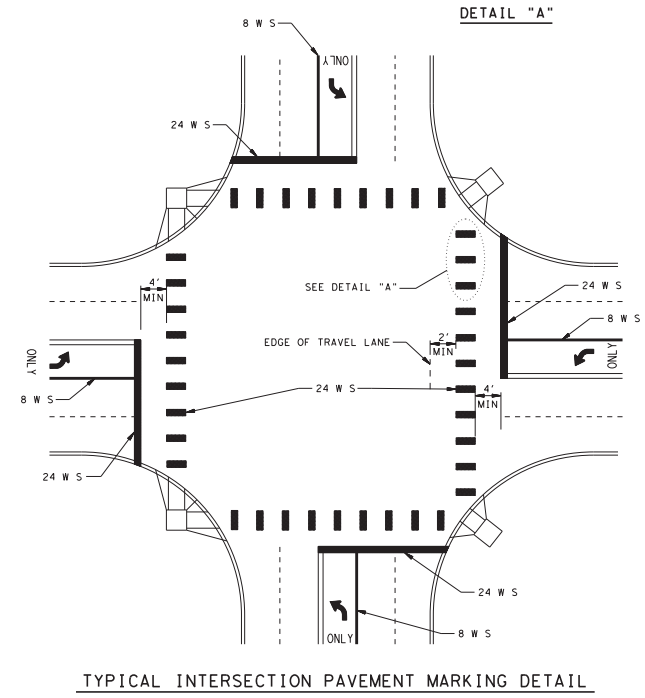
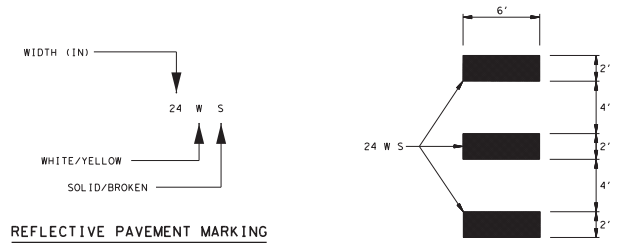
GENERAL NOTES

1. Transverse or in-lane rumble strips should only be used at high incident and special geometric locations. These special geometric locations may include: approaches to rural, high speed signalized or Stop-controlled intersections with sight restrictions and/or high crash rates, approaches to unexpected urban intersections, approaches to newly installed Stop or signalized controlled intersections, approaches to toll plazas, approaches to hazardous horizontal curves, and approaches to railroad grade crossings.
2. When used, the rumble strips shall be placed 200 feet prior to and after the placement of the warning device.
3. The use of rumble strips should not be widespread or used indiscriminately.
4. Prefabricated black raised rumble strips should be used. They should be installed in accordance with the manufacturer's recommendations.
5. A list of approved, prefabricated raised rumble strips can be obtained from the Traffic Operations Division.
6. Consideration should be given to noise levels when in-lane or transverse rumble strips are installed near residential areas, schools, churches, etc.
7. The use of the "Rumble Strips Ahead" sign may be used in advance of in-lane or transverse rumble strips, based on engineering judgement. This sign is typically not necessary for rumble strip installations built to the guidelines on this standard sheet. When used, this sign should be spaced in advance of the rumble strips based on the guidelines for advance placement of warning sign included in the "Texas Manual on Uniform Traffic Control Devices".
8. Consideration should be given to bicyclists. A 12 inch gap from the edge line may be used to accommodate bicyclists when a usable shoulder is not available. Additional gaps in the in-lane or transverse rumble strips are not recommended since they could cause motorists to swerve to avoid the rumble strips.
9. Other signs can be used as conditions warrant.



		Traffic Operations Division Standard	
TRANSVERSE OR IN-LANE RUMBLE STRIPS			
RS (5) - 13			
Title: RS(5)-13, sign Date: 10-13-2006 Revisions: 10-13	Rev: 1000 Date: 04/11/2006 Rev: 1001 Date: 06/11/2006 Rev: 1002 Date: 06/11/2006	Job: 6428 21 Dist: LFK	Job: 001 County: ANGELINA, ETC. Sheet No: 24

DISCLAIMER
 THE USE OF THIS DETAIL IS COVERED BY THE TEXAS ENGINEERING PRACTICE ACT. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE CONSTRUCTION OF THIS DETAIL TO THE USER. THE USER ASSUMES ALL LIABILITY FOR ANY DAMAGES RESULTING FROM ITS USE.



*DETAILS SHOWN FOR ILLUSTRATION ONLY.
 STRIPES MAY BE PLACED AT EXISTING LOCATIONS AS DIRECTED BY THE ENGINEER.

NOT TO SCALE

LUFKIN DISTRICT STANDARD

TYPICAL PAVEMENT MARKING DETAILS

TEXAS DEPARTMENT OF TRANSPORTATION

CONTRACT NO.	SECTION	JOB	ROADWAY
6428	21	001	US 59, ETC.
DIST.	COUNTY	SHEET NO.	
LFK	ANGELINA, ETC.	25	

ISSUED 03-08
 REVISED 10-20-2016: MODIFIED TITLE BLOCK

DISCLAIMER: This document is governed by the Texas Engineering Practice Act. No warranty of any kind is made by the State of Texas or any of its agencies, departments, divisions, or offices, or any of its employees, for the accuracy, completeness, or timeliness of the information contained herein.

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 USA 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 Action Required

Action No.

1. The proposed work of this project is to install Specialty Pavement Markings at various locations throughout the Lufkin District. This activity maintains the original line and grade, hydraulic capacity and original purpose of the site. Therefore, this project meets the definition of a routine maintenance activity as defined in the TPDES General Permit No. TXR150000 issued March 5, 2018 and TCEQ's TPDES CGP does not apply.

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: NWPA

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. N/A

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 archaeological artifacts are found during construction. Upon discovery of archaeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

No Action Required Action Required

Action No.

1. Contractor to repair or replace in kind, at their own expense, any historic materials damaged (buildings, historical markers, etc.) in the course of executing work. Contractor is responsible for locating replacement source for historic materials damaged in the course of the work. TxDOT-Environmental Affairs Division is to be informed of proposed repairs to facilitate consultation with Texas Historical Commission prior to the execution of repairs.

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 Action Required

Action No.

1. N/A

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

There is critical habitat and/or populations of the following federally listed threatened and endangered species within the Lufkin District:

Texas golden gladiolus, white bladder pod, Neches River Rose-mallow, Texas Prairie Dawn, Texas Trilling Phlox, Red-cockaded woodpecker and Louisiana Pinesnake. Consultation with the United States Fish and Wildlife Service has not been conducted with regard to these species.

No Action Required Action Required

Action No.

1. NO EQUIPMENT or VEHICLES shall leave the pavement and NO STOCKPILING or EQUIPMENT STORAGE shall be allowed along the following roadways without prior approval from the Area Engineer:

Angelina County- SH 63
 Houston County- SH 7, FM 227, FM 1733, FM 2781, FM 230;
 Nacogdoches County- SH 21
 Polk County- FM 1276
 Sabine County- SH 87, SH 21, FM 2343, FM 2426
 San Augustine County- SH 21, SH 103, SH 147, FM 1992, FM 3483, FM 353
 San Jacinto County - FM 2693, FM 1725, FM 945, FM 2025, FM 2666
 Shelby County- FM 2261, FM 3184
 Trinity County - SH 94, FM 2262, FM 357.

LIST OF ABBREVIATIONS

BMP: Best Management Practice	SPCC: Spill Prevention Control and Countermeasure
CGP: Construction General Permit	SWP3: Storm Water Pollution Prevention Plan
DSHS: Texas Department of State Health Services	PN: Pre-Construction Notification
FHWA: Federal Highway Administration	PSL: Project Specific Location
MOA: Memorandum of Agreement	TPDES: 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
NETA: Migratory Bird Treaty Act	TxDOT: Texas Department of Transportation
NOI: Notice of Intent	TLE: Threatened and Endangered Species
NWPA: 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 bore 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, containers, 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 details 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 Action Required

Action No.

1. N/A


VII. OTHER ENVIRONMENTAL ISSUES

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

No Action Required Action Required

Action No.

1. N/A

		Design Division Standard
<h2 style="margin: 0;">EPIC</h2> <h3 style="margin: 0;">(ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS)</h3>		
FILE# 4070-021 01/02/2015 02-12-2015 05-27-14 4000 NORTH SECTION 16, 00-00-00 SECTION 11, CORNER 11W 112E 10 110W 06E, 4000 04007 SHALES	REVISED 6428 21 0151 LFK	001 US 59, ETC. COUNTY ANGELINA, ETC.
04/01/2015 02/01/2015 02/01/2015 02/01/2015 02/01/2015	04/01/2015 02/01/2015 02/01/2015 02/01/2015 02/01/2015	04/01/2015 02/01/2015 02/01/2015 02/01/2015 02/01/2015
04/01/2015 02/01/2015 02/01/2015 02/01/2015 02/01/2015	04/01/2015 02/01/2015 02/01/2015 02/01/2015 02/01/2015	04/01/2015 02/01/2015 02/01/2015 02/01/2015 02/01/2015