

Project Number: RMC 6409-29-001

County: Angelina, etc.

Highway: US 59, etc.

Control: 6409-29-001

GENERAL NOTES:

This Contract is to provide callout work for Maintenance of Large Signs 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 72 hours 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.

Existing regulatory, warning and guide signs within project worksites are to remain visible to the traveling public at all times. If a sign must be repositioned during construction operations, move and install the sign to an approved location. Use care when working near existing signs and repair or replace signs damaged by work operations. All work involved repositioning existing signs will be considered subsidiary to various bid items.

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

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.

Maintain adequate surface drainage throughout the limits of the project during all phases of construction.

Remove dirt, silt, rocks, debris and other foreign matter that accumulates in structures due to the Contractor's operations as directed. Keep stream channels open at all times. This work will not be paid for directly, but will be subsidiary to pertinent items.

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

Seth Franks Seth.Franks@txdot.gov
Don Maddux Donald.Maddux@txdot.gov

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

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

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

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

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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 additional quantities up to the original bid quantities plus any quantities added by an approved change order. The extensions shall 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 in the time needed to re-let and award a new contract if no extension is agreed upon.

Item 5: Control of the Work

Contact appropriate utility companies to locate underground utilities prior to drilling foundations, installing or removing underground conduits, or any other excavating. Use care when working near utilities or existing storm sewers to prevent damage. Use One-Call for locates.

If unforeseen utility adjustments are encountered during construction operations, alter operations and continue to prosecute the contract in such a manner that will allow utility adjustments to be made by others. An extension of working time may be granted for any delays caused by the utility adjustments, if deemed necessary.

Remove all debris that may be deposited by construction operations within each worksite, and properly dispose of at the end of each workday. Do not dump or stockpile collected litter on State property. Litter removal will not be measured or paid for directly, but will be subsidiary to various bid items.

Item 7: Legal Relations and Responsibilities

The proposed work of this project is for Maintenance of Large Signs. This activity maintains the original line and grade, hydraulic capacity and original purpose to 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.

No significant traffic generator events identified.

Item 8: Prosecution and Progress

For this project, working days will be computed and charged in accordance with Section 8.3.1.5, "Calendar Day".

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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.

Item 416: Drilled Shaft Foundations

Note and heed all utility warnings before digging in the vicinity of underground utilities.

Locate existing utilities before excavating for foundations. Take adequate precautions to prevent damage to existing storm sewers and public or private utilities.

Item 421: Hydraulic Cement Concrete

Curing facilities and strength testing equipment, for acceptance testing, will be provided at the District's Signal Shop located in Lufkin at 1805 N. Timberland Drive.

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.

Restrict construction work to single lane widths with only minor disruptions in traffic flow. Lane closures shall conform to the Traffic Control Plan for lane closures as shown in the plans. No overnight closures will be permitted.

Plan the sequence of work to minimize the time lane closures are in place. Install lane closures only where construction operations are anticipated to start within 1 hr. and limited to the amount of lane that can be reached by the construction activity within 2 hr., unless otherwise approved.

Provide temporary rumble strips as shown on WZ(RS)-22.

Provide adequate flaggers to protect the traveling public when working on or near a roadway carrying traffic. All flaggers shall wear hardhats and reflective vests.

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

Install "Be Prepared to Stop" (CW3-4) and "Flagger Ahead" (CW20-7aD) signs when flaggers are present. Position the signs where good visibility and traffic control can be maintained.

When directed, use a flashing arrow board in addition to the required signs to warn motorists of flaggers.

General Notes

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Sheet 2A

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Open all traffic lanes to traffic at the close of work each day.

Notify the Engineer prior to placing any materials or equipment on the right of way. Locate equipment, stockpiles or other materials not in use as far as possible from the driving lanes and in no case closer than 30 ft. unless otherwise authorized. Any equipment, stockpiles, or materials placed within 30 ft. of the driving lane must have adequate signs, barricades or other warning devices as approved. As a minimum place an 8 ft. wide TY III Barricade or barrels on the approach side of each site that is within 30 ft. of the driving lane. Use TY III Barricade or barrels for the site similarly on the departure side if the location is within 30 ft. of the opposing traffic lane.

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

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 SW3P 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".

General Notes



Estimate & Quantity Sheet

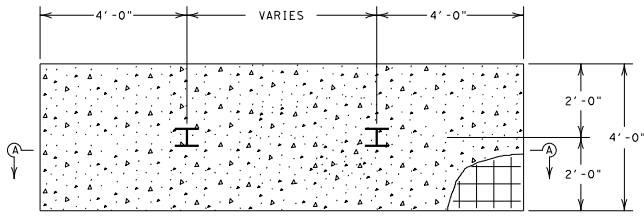
CONTROLLING PROJECT ID 6409-29-001

DISTRICT Lufkin
HIGHWAY US0059

COUNTY Angelina

CONTROL SECTION JOB				6409-29-001		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00188598			
COUNTY				Angelina			
HIGHWAY				US0059			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	104-6009	REMOVING CONC (RIPRAP)	SY	60,000		60,000	
	416-6015	DRILL SHAFT (NON - REINFORCED) (12 IN)	LF	20,000		20,000	
	416-6018	DRILL SHAFT (SIGN MTS) (24 IN)	LF	140,000		140,000	
	420-6012	CL B CONC (MISC)	CY	15,000		15,000	
	500-6033	MOBILIZATION (CALLOUT)	EA	4,000		4,000	
	636-6001	ALUMINUM SIGNS (TY A)	SF	500,000		500,000	
	636-6002	ALUMINUM SIGNS (TY G)	SF	2,000,000		2,000,000	
	636-6003	ALUMINUM SIGNS (TY O)	SF	1,000,000		1,000,000	
	647-6001	INSTALL LRSS (STRUCT STEEL)	LB	5,000,000		5,000,000	
	647-6003	REMOVE LRSA	EA	10,000		10,000	
	6185-6002	TMA (STATIONARY)	DAY	40,000		40,000	
	7052-6057	LANE CLOSURE (SETUP AND REMOV)(TY 16)	EA	10,000		10,000	

DISTRICT	COUNTY	CCSJ	SHEET
Lufkin	Angelina	6409-29-001	3



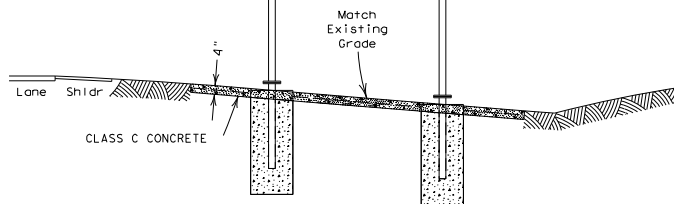
PLAN VIEW

RIPRAP SHALL BE REINFORCED WITH NUMBER 3 OR 4 BARS @ 12" CC BOTH DIRECTIONS.

NOT TO SCALE



NOTE: EXISTING DRAINAGE SHALL BE MAINTAINED.



**ELEVATION
SECT A-A**

TYPICAL RIPRAP DETAIL

NOT TO SCALE



**ROADSIDE
SIGN ANCHOR
PAD DETAILS**

TEXAS DEPARTMENT OF TRANSPORTATION ©2002			
CONTRACT	JOB	HIGHWAY	
6409 29	001	US 59, ETC.	
DIST.	COUNTY	SHEET NO.	
LFK	ANGELINA, ETC.	4	

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

WORKER SAFETY NOTES:

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES


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

<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

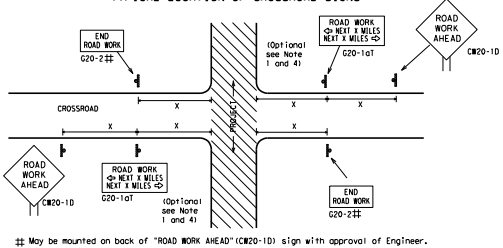
DISCLAIMER: THIS MANUAL IS PROVIDED AS A SERVICE TO THE PUBLIC. IT IS NOT TO BE USED FOR ANY OTHER PURPOSE. THE TEXAS DEPARTMENT OF TRANSPORTATION ASSUMES NO LIABILITY FOR THE CONSTRUCTION OF ANY PROJECTS BASED ON THE INFORMATION CONTAINED HEREIN. THE USER ASSUMES ALL LIABILITY FOR ANY DAMAGE, LOSS, OR INJURY RESULTING FROM THE USE OF THIS MANUAL.

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SHEET 1 OF 12

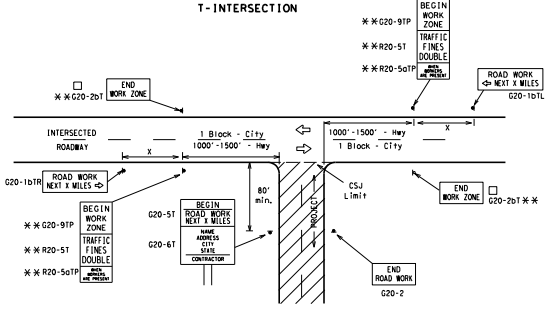
		Traffic Safety Division Standard
<p>BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS</p>		
<p>BC (1) - 21</p>		
Title: 6409-29-001 11/001 November 2002	Job No: 6409-29-001 DIST: LFK COUNTY: ANGELINA, ETC.	SHEET NO.: 5

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 (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-10) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK" (G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume as per TMUTCD Part 5. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The "ROAD WORK NEXT X MILES" (G20-101) 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

1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
2. If construction closes the road at a T-Intersection, the Contractor shall place the "CONTRACTOR NAME" (G20-61) 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 Δ Spacing "x"
CW20 ¹	48" x 48"	48" x 48"	30	120
CW22			35	160
CW23			40	240
CW25			45	320
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	50	400
			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 TDP Standard Sheets.

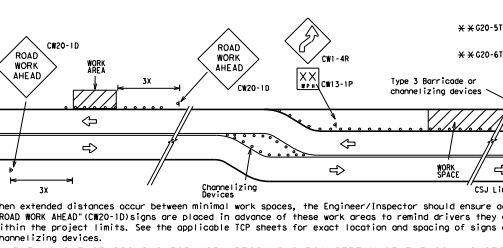
Δ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

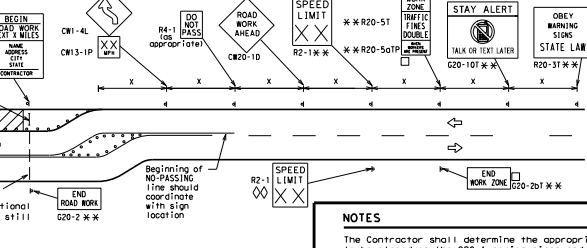
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-10) signs may be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

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WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

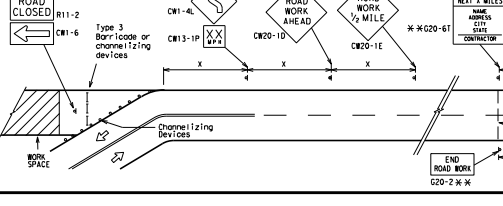


SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF 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.

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

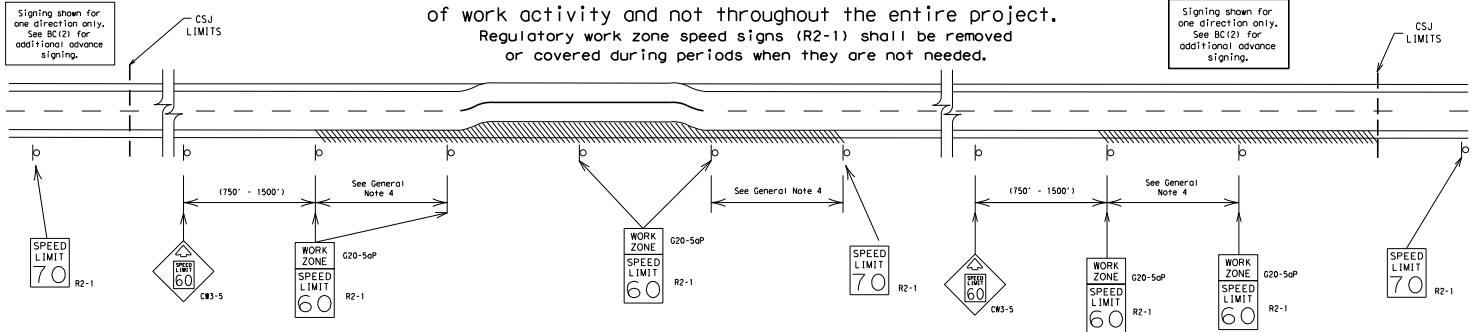
BC (2) - 21

Plan:	BC-21, 091	Rev:	T001	En:	T001	Iss:	T001	En:	T001
Revisions:	6409 29	001	US 59, ETC.	9-07	8-14	1-13	5-21	LFK	ANGELINA, ETC.

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) rough road or damaged pavement surface
 - b) substantial alteration of roadway geometrics (diversions)
 - c) construction detours
 - d) grade
 - e) width
 - f) other conditions readily apparent to the driver
- As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

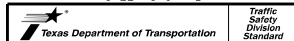
This type of work zone speed limit may be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 10 feet of the traveled way or actually in the traveled way.

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

GENERAL NOTES

1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
4. Frequency of work zone speed limit signs should be:
 - 40 mph and greater 0.2 to 2 miles
 - 35 mph and less 0.2 to 1 mile
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
6. Fabrication, erection and maintenance of the "ADVANCE SPEED LIMIT" (CW3-5) sign, "WORK ZONE" (G20-5aP) plaque and the "SPEED LIMIT" (R2-1) signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
7. Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
8. Techniques that may help reduce traffic speeds include but are not limited to:
 - A. Law enforcement.
 - B. Flagger stationed next to sign.
 - C. Portable changeable message sign (PCMS).
 - D. Low power (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.

SHEET 3 OF 12



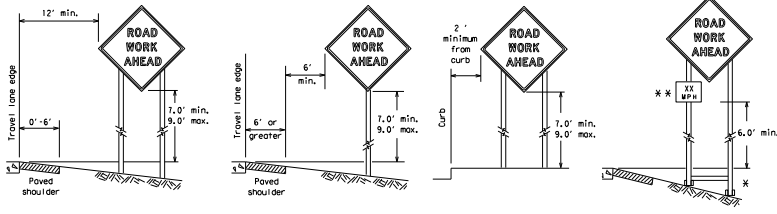
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC (3) - 21

Field	BC-21.dgn	Rev	1/00	Rev	1/00	Rev	1/00	Rev	1/00
©	TxDOT	November	2002	CONT	SHEET				
REVISIONS	6409	29	001	US	59, ETC.				
9-07	8-14			DIST	COUNTY			SHEET NO.	
7-13	5-21			LFK	ANGELINA, ETC.			7	

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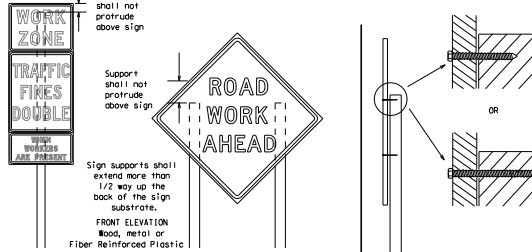
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* 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.

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

GENERAL NOTES FOR WORK ZONE SIGNS

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
- Wooden sign posts shall be painted white.
- Barricades shall NOT be used as sign supports.
- All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
- The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
- The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (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 when damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
- Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
- The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

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

- The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
 - Long-term stationary - work that occupies a location more than 3 days.
 - Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
 - Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
 - Short-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 pavement surface but no more than 2 feet above the ground.
- Long-term/Intermediate-term signs may be used in lieu of Short-term/Short Duration signing.
- Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
- Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

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

SIGN SUPPORT WEIGHTS

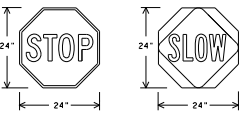
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be filled shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
- Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
- Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
- Rubber ballasts designed for chromelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the 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

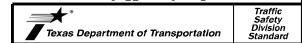
- STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24".
- STOP/SLOW paddles shall be retroreflective when used at night.
- STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
- Any lights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



SHEETING REQUIREMENTS (WHEN USED AT NIGHT)		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	ORANGE	TYPE B 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 on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
- If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC standard sheets, TLRS standard sheets or the 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

Revised	06-21-09	by	TxDOT	on	11/02/07	for	TxDOT	on	11/02/07
Revised	11-07-02	by	TLR	on	11/02/02	for	TLR	on	11/02/02
Revised	04-09-29	by	001	on	US 59	for	ETC.	on	ETC.
Revised	07-01-14	by	9151	on	COUNTY	for	SHEET NO.	on	8
Revised	1-13-07	by	LFK	on	ANGELINA, ETC.	for		on	

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 "REOPEN" 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.
- 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/COD.
- PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 to 1.5 mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
- Each line of text should be centered on the message board rather than left or right justified.
- If 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

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel

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

Location List

AT FM XXXX	BEFORE RAILROAD CROSSING	NEXT X MILES	PAST US XXX EXIT	US XXX TO FM XXXX
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Warning List

SPEED LIMIT XX MPH	MAXIMUM SPEED XX MPH	MINIMUM SPEED XX MPH	ADVISORY SPEED XX MPH	RIGHT LANE EXIT	DRIVE SAFELY	DRIVE WITH CARE
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**** Advance Notice List**

TUE-FRI XX AM-X PM	APR XX-XX X PM-X AM	BEGINS MONDAY	BEGINS MAY XX	MAY X-X XX PM - XX AM	NEXT FRI-SUN	XX AM TO XX PM	NEXT TUE AUG XX	TONIGHT XX PM-XX AM
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** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

- The words RIGHT, LEFT and ALL can be interchanged as appropriate.
- Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
- EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
- Highway names and numbers replaced as appropriate.
- ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
- AHEAD may be used instead of distances if necessary.
- FT and 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" (CR20-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above.
- When symbol signs are represented graphically on the full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
- A full matrix PCMS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(7), for the same size arrow.

SHEET 6 OF 12

Texas Department of Transportation
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) - 21

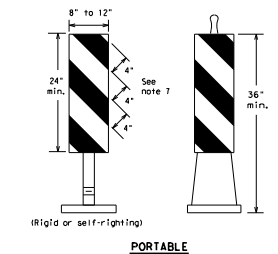
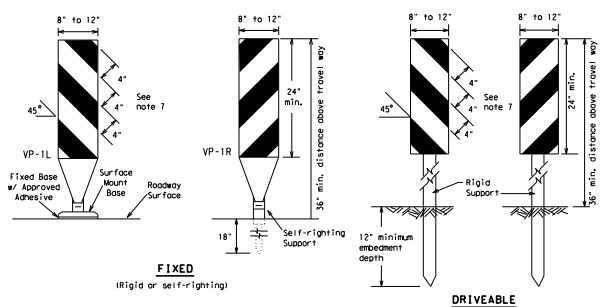
Revised: 6/09/29 001 US 59, ETC.
9-07 8-14
1-13 9-21
LFLK ANGELINA, ETC. 10

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WORD OR PHRASE	ABBREVIATION	WORD OR PHRASE	ABBREVIATION
Access Road	ACCESS 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
Center	CENT	North	N
Center	CTR	Northbound	Troute1 N
Construction Ahead	CONST AHD	Parking	PKING
CROSSING	XING	Road	RD
Detour Route	DETOUR RTE	Right Lane	RT LN
Do Not	DN	Saturday	SAT
East	E	Service Road	SERV RD
Eastbound	Troute1 E	Shoulder	SLDR
Emergency	EMR	Slippery	SLIP
Emergency Vehicle	EMR VEH	South	S
Entrance	ENT	Southbound	Troute1 S
Express Lane	EXP LN	Speed	SPD
Expressway	EXPWY	Street	ST
XXXX Feet	XXXX FT	Sunday	SUN
Fog Ahead	FOG AHD	Telephone	PHONE
Freeway	FRWY, FWY	Temporary	TEMP
Freeway Blocked	FRWY BLKD	Thursday	THURS
Friday	FRI	To Downtown	TO DWTN
Hazardous Driving	HAZ DRIVING	Traffic	TRAF
Hazardous Meter (id)	HAZMET	Travelers	TRVLRS
High Occupancy	HOV	Tuesday	TUES
Vehicle	VEH	Time Minutes	TIME MIN
Highway	HWY	Upper Level	UPR LEVEL
Hour(s)	HR, HRS	Vehicles (pl)	VEH, VEHs
Information	INFO	Warning	WARN
It Is	ITS	Wednesday	WED
Junction	JCT	Weight Limit	WT LIMIT
Left	L	West	W
Left Lane	LFT LN	Westbound	Troute1 W
Lane Closed	LN CLSD	West Pointment	WT PWTM
Lower Level	LWR LEVEL	WILL Not	WONT
Maintenance	MAINT		

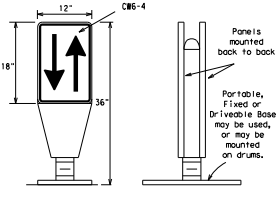
Roadway designation # IH-number, US-number, SH-number, FM-number

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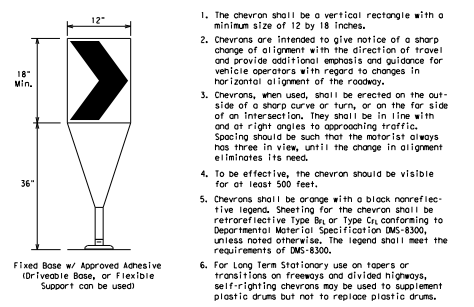
VERTICAL PANELS (VPs)

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



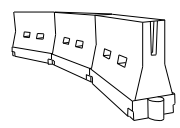
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
- The OTLD may be used in combination with 42" cones or VPS.
- Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPS placed between the OTLD's should not exceed 100 foot spacing.
- The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B₂ or Type C₂ conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.



CHEVRONS

- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
- Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
- To be effective, the chevron should be visible for at least 500 feet.
- Chevrons shall be orange with a black non-reflective legend. Sheeting for the chevron shall be retroreflective Type B₂ or Type C₂ conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
- For Long Term Stationary use on tapers or transitions on freeways and divided highways, self-lighting chevrons may be used to supplement plastic drums but not to replace plastic drums.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

- LCDs are crossworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
- LCDs may be used instead of a line of cones or drums.
- LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
- LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(17) when placed roughly parallel to the travel lanes.
- LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rolls as shown on BC(10). Place reflective sheeting near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

GENERAL NOTES

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

Posted Speed	Formula	Minimum Desirable Taper Lengths (ft.)			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' Offset	On a Taper	On a Target
30	L + WS	150	165	180	30'	60'
40	L + WS	205	225	245	35'	70'
45	L + WS	265	285	320	40'	80'
50	L + WS	450	495	540	45'	90'
55	L + WS	500	550	600	50'	100'
60	L + WS	550	605	660	55'	110'
65	L + WS	600	660	720	60'	120'
70	L + WS	650	715	780	65'	130'
75	L + WS	700	770	840	70'	140'
80	L + WS	750	825	900	75'	150'
85	L + WS	800	880	960	80'	160'

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

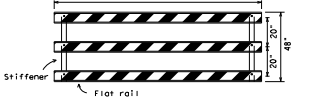
BC (9) - 21

Plan: BC-21.dgn	Rev: 1/2007	Drawn: [blank]	Check: [blank]	Date: 1/2007	Drawn: [blank]
Project: 11007	Revision: 2002	Scale: [blank]	Job: [blank]	Sheet: [blank]	Total: [blank]
Revisions:	6/4/09	2/9	001	US 59, ETC.	
9-01	8-14	9/17			
11-13	5/21		LFK	ANGELINA, ETC.	13

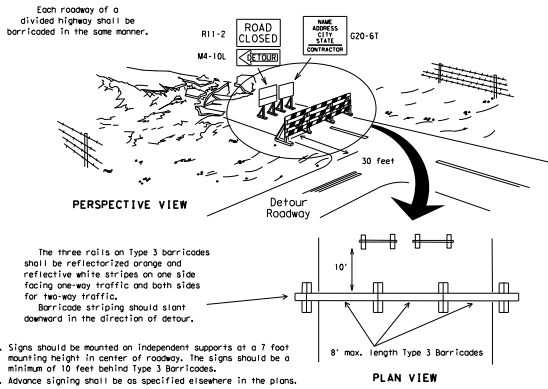
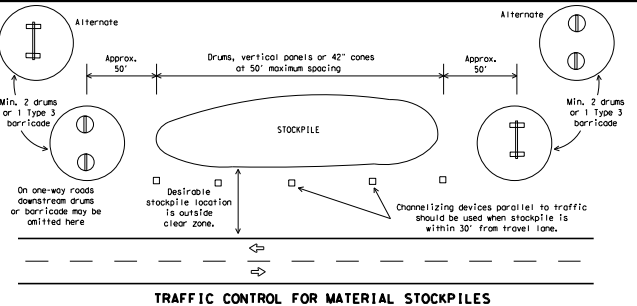
TYPE 3 BARRICADES

1. Refer to the Compliant Mark Zone Traffic Control Devices List (CMZCD) 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 rolls, 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 rolls. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rolls 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 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.

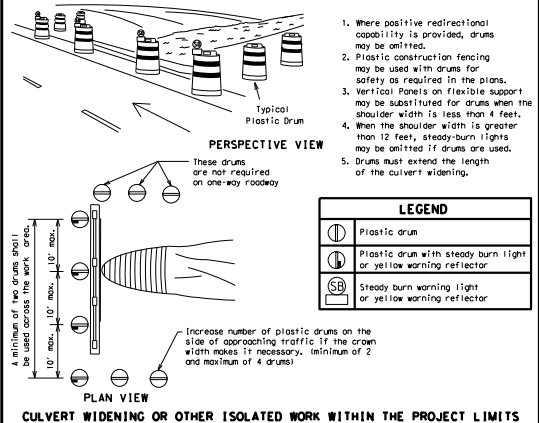
Barricades shall NOT be used as a sign support.



TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

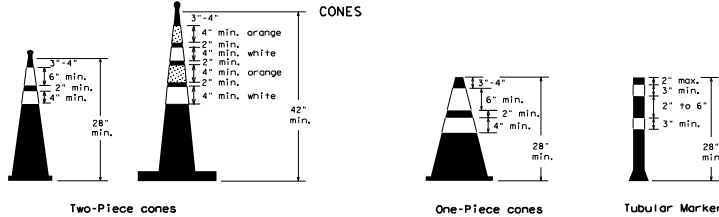


TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



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.

SHEET 10 OF 12

Texas Department of Transportation
Traffic Safety Division Standard

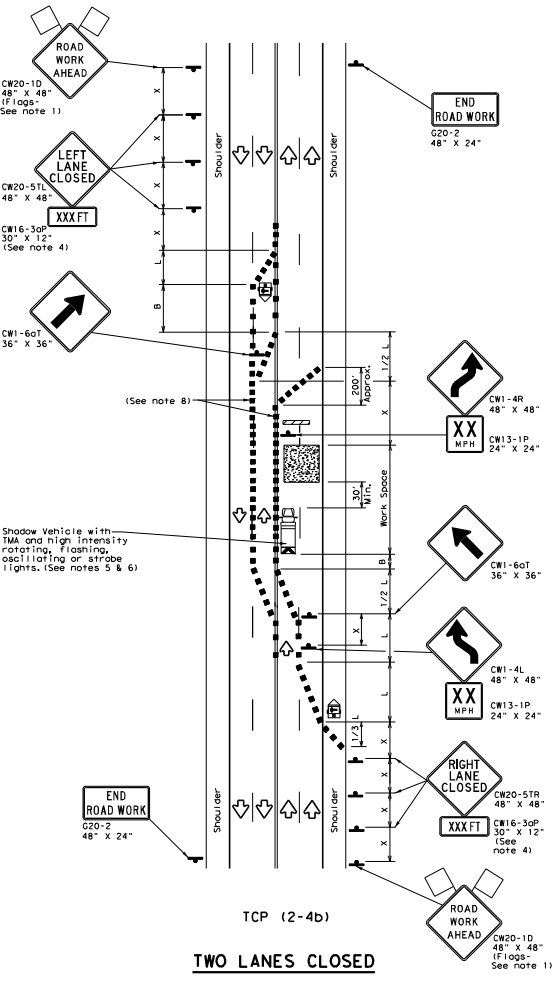
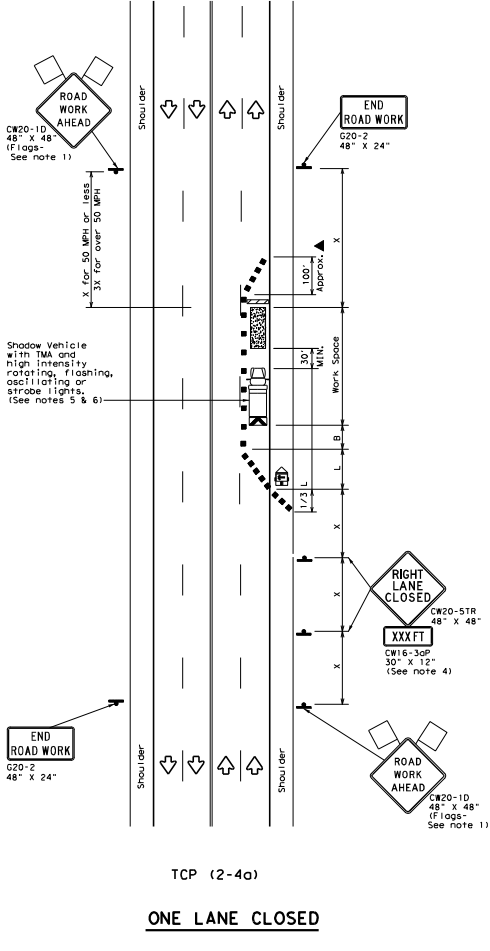
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (10) - 21

Plan: BC-21-091	Rev: T1007	Rev: T1007	Rev: T1007	Rev: T1007
01/007	November 2002	04/09	2/9	001
9-07	8-14	7-13	8-21	14
01ST	01ST	01ST	01ST	01ST
LFK	ANGELINA, ETC.			

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DATE: 6/24/2022 3:27:45 PM
 FILE: T:\L\K\TSPS\WSP\LANC\LANC2022\JOB\LANC 6409-29-001 (L) 48" X 48" SIGN\LANC2022\LANC2022-113E02.dwg
 DISCUSSION: This drawing is governed by the Texas Engineering Practice Act. No warranty of any kind is made by the author or publisher of this drawing. The user of this drawing shall be responsible for its use.



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

Posted Speed * X	Formula	Minimum Desirable Taper Lengths **	Suggested Spacing of Channelizing Devices	Minimum Sign Spacing Distance	Suggested Longitudinal Buffer Space "B"
30	L	150' 115' 180'	30'	60'	120'
35	L	205' 225' 245'	35'	70'	160'
40	L	265' 295' 320'	40'	80'	240'
45	L	450' 495' 540'	45'	90'	320'
50	L	500' 550' 600'	50'	100'	400'
55	L	550' 605' 660'	55'	110'	500'
60	L	600' 660' 720'	60'	120'	600'
65	L	650' 715' 780'	65'	130'	700'
70	L	700' 770' 840'	70'	140'	800'
75	L	750' 825' 900'	75'	150'	900'

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

TYPICAL USAGE			
MOBILE	SHORT DURATION	SHORT 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 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)

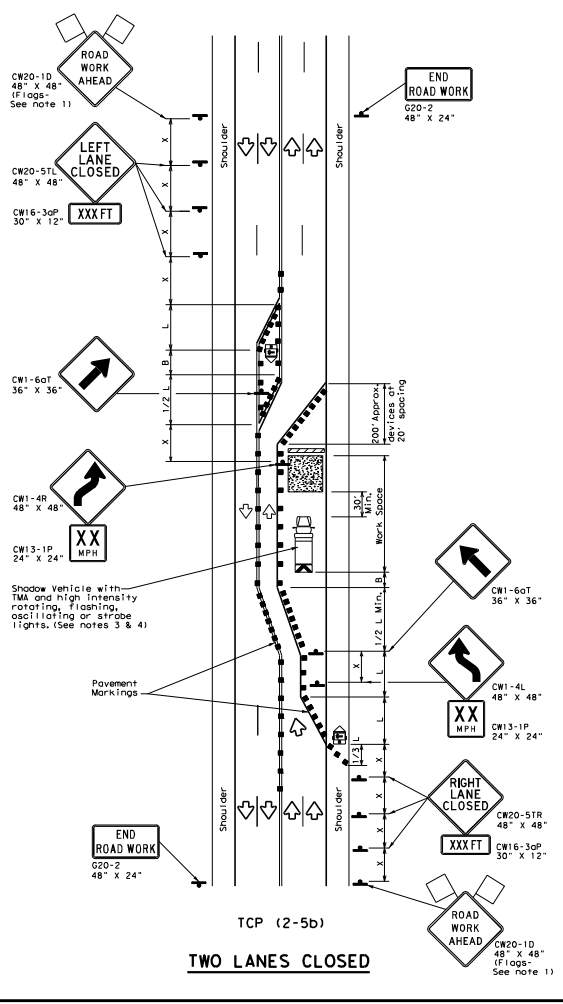
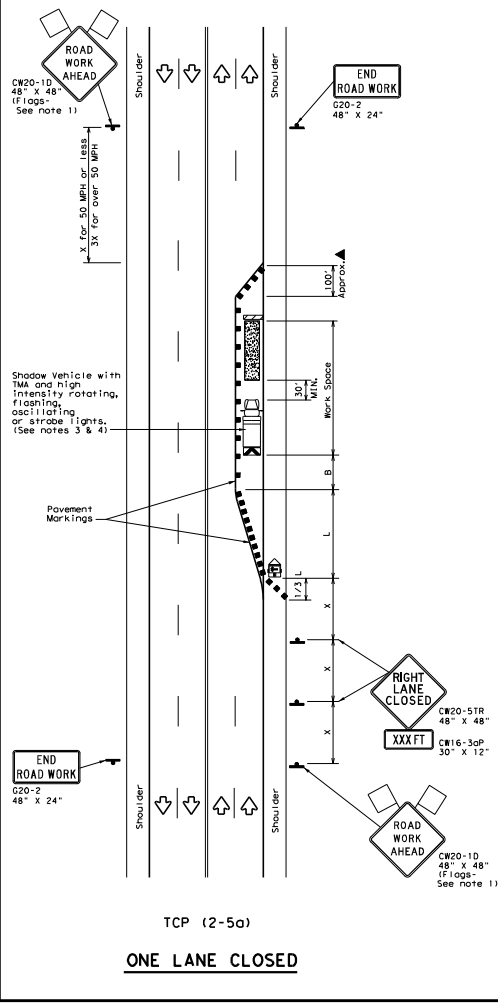
- For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is 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

Plan: 1002-4-18.dgn	DATE: 10/20/18	BY: JEM	CHK: JEM
10/01	December 1985	CONT: 001	SHEET: 19
6-95	3-01	6409/29	001
1-91	2-12	DIST:	COUNTY:
4-99	2-18	LFK	ANGELINA, ETC.

DISCUSSION: This standard is governed by the Texas Engineering Practice Act. No warranty of any kind is made by the State of Texas for the use of this standard. The user assumes all liability for any damages resulting from its use.



LEGEND

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

Posted Speed	Formula	Minimum Desirable Taper Lengths	Suggested Maximum Spacing of Channelizing Devices	Minimum Sign Spacing	Suggested Longitudinal Buffer Space
X	L = W/S	10' Offset	On a Taper	"X"	"B"
30		150'	30'	60'	90'
35		205'	35'	70'	120'
40		265'	40'	80'	155'
45		450'	45'	90'	195'
50		500'	50'	100'	240'
55	L = W/S	550'	55'	110'	295'
60		600'	60'	120'	350'
65		650'	65'	130'	410'
70		700'	70'	140'	475'
75		750'	75'	150'	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	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.
- 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.
- The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

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

TCP (2-5b)

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

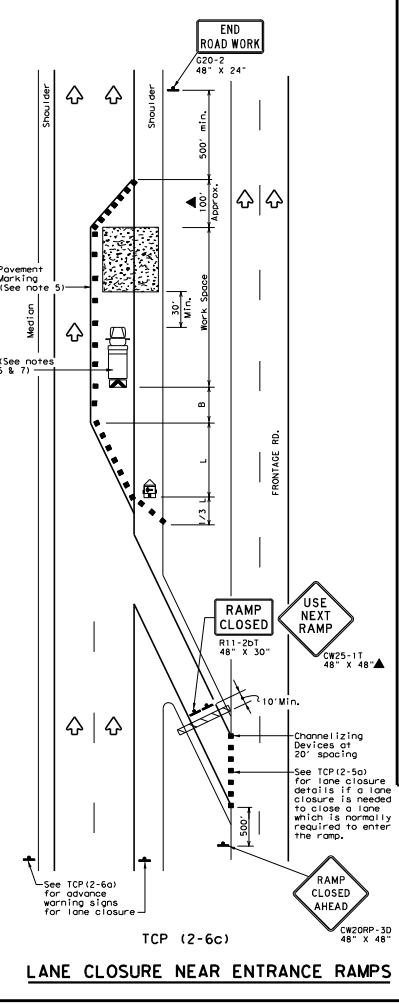
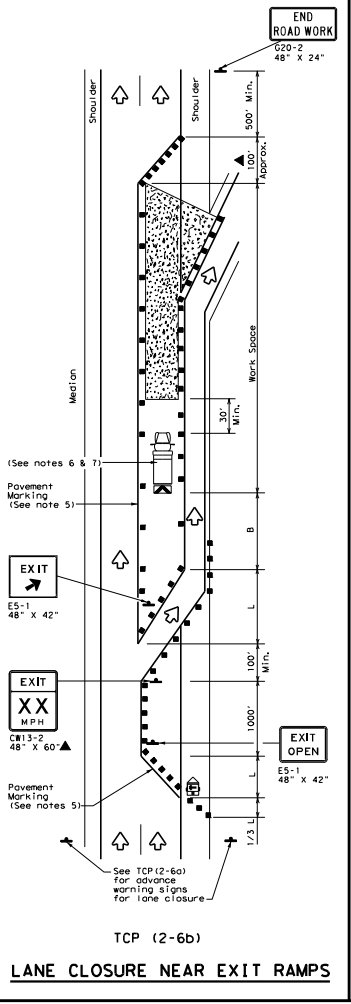
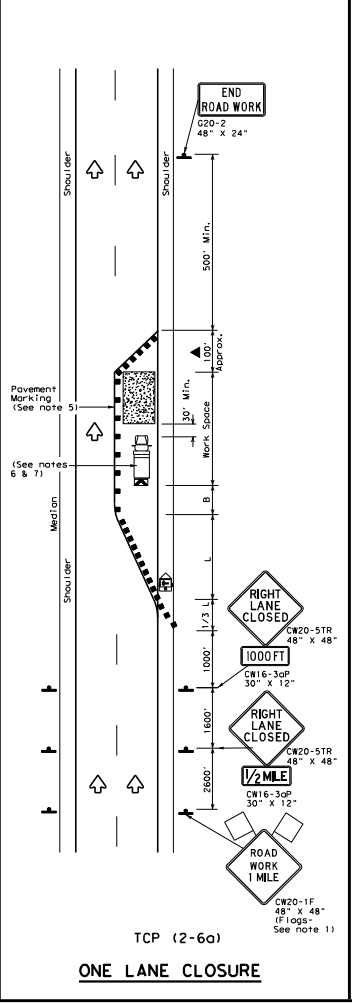
Texas Department of Transportation Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
LONG TERM LANE CLOSURES
MULTILANE CONVENTIONAL RDS.

TCP (2-5) - 18

FILED: 1002-20-18.dgn	DATE: 10/20/18	BY: [Signature]	CHK: [Signature]
PROJECT: 6409/29	CONTRACT: 001	SHEET: 59	TOTAL SHEETS: ETC.
DATE: 1-97	BY: [Signature]	COUNTY: [Signature]	SHEET NO. 20
DATE: 2-18	BY: [Signature]	COUNTY: [Signature]	SHEET NO. 20

DISCUSS: This standard is governed by the Texas Engineering Practice Act. No warranty of any kind is made by the State of Texas for the use of this standard. The user assumes all liability for any damages resulting from its use.



LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

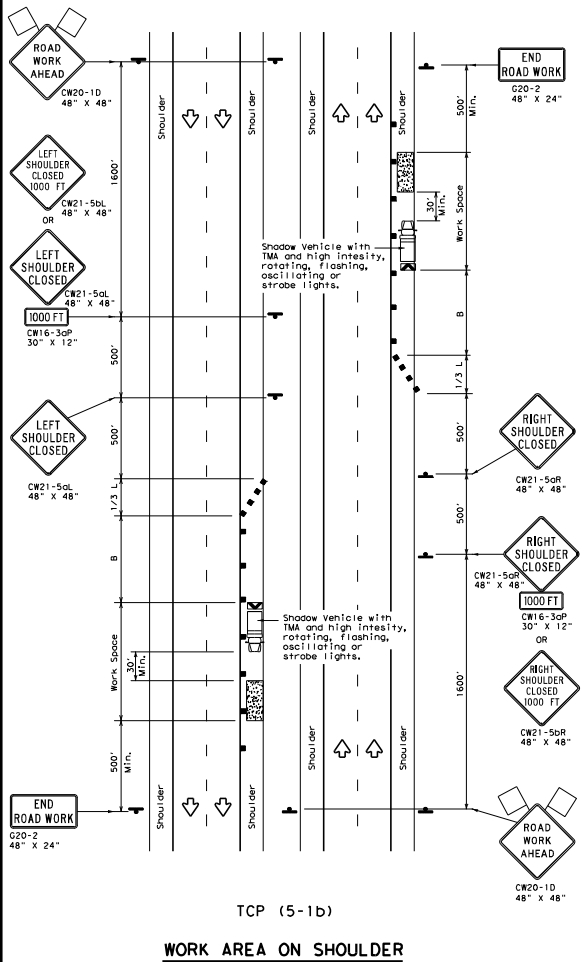
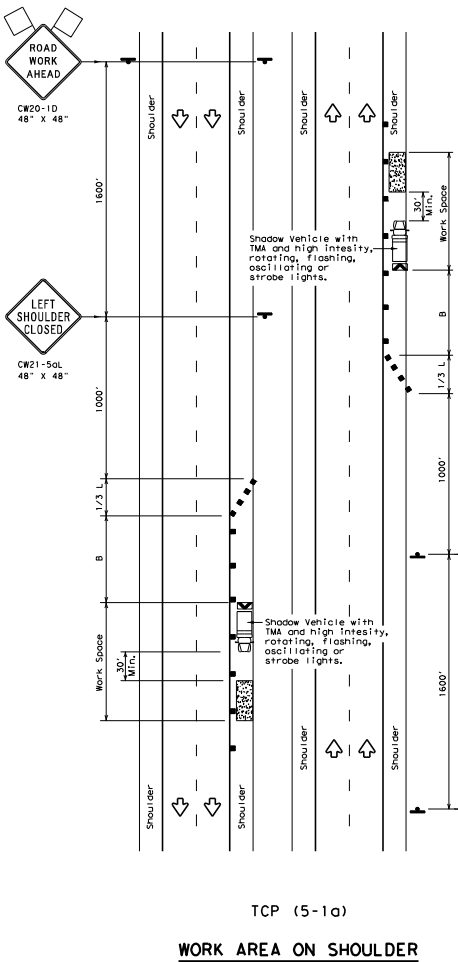
1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Channelizing devices used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

TRAFFIC CONTROL PLAN
LANE CLOSURES ON
DIVIDED HIGHWAYS

TCP (2-6) - 18

Plan:	1020-6-18-09	Rev:	01
Project:	December 1985	Cont. Sheet:	001
Revision:	6/09/29	Job:	US 59, ETC.
Date:	2-94	Dist:	001
File:	LFK_ANGELINA, ETC.	Sheet No.:	21

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LEGEND

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

Posted Speed #	Formula	Minimum Desirable Taper Lengths # x #		Suggested Maximum Spacing of Channelizing Devices		Suggested Longitudinal Buffer Space "B"
		On a Taper	On a Tangent	On a Taper	On a Tangent	
30	L = $\frac{WS^2}{60}$	10'	11'	12'	30'	90'
35		15'	16'	18'	30'	120'
40	L = WS	20'	22'	24'	35'	155'
45		25'	29'	32'	40'	195'
50	L = WS	30'	33'	36'	40'	240'
55		35'	40'	44'	45'	295'
60	L = WS	40'	45'	50'	50'	350'
65		45'	50'	55'	55'	410'
70	L = WS	50'	55'	60'	60'	475'
75		55'	60'	66'	75'	540'
80	L = WS	60'	66'	72'	80'	615'
85		65'	71'	78'	85'	690'

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

TYPICAL USAGE

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

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

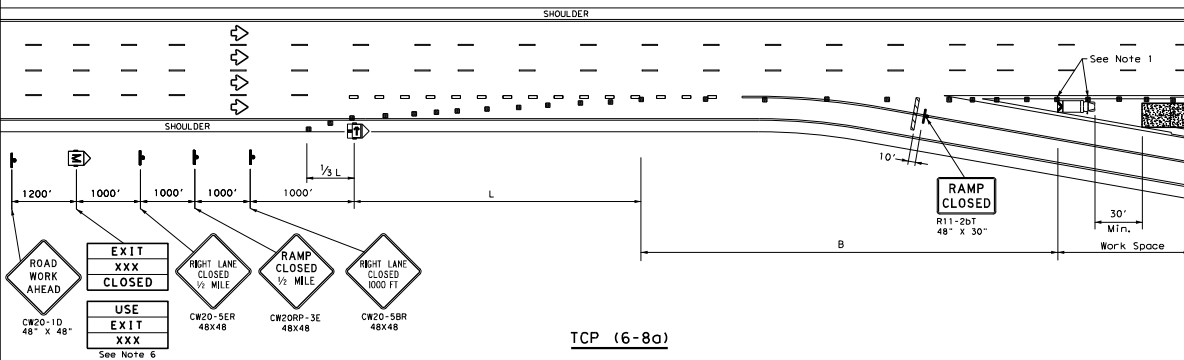
Texas Department of Transportation
 Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
SHOULDER WORK FOR
FREeways / EXPRESSWAYS

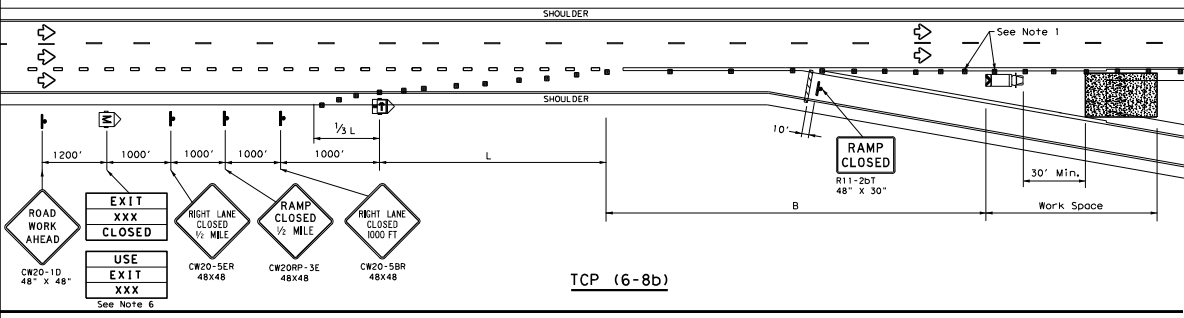
TCP (5-1) - 18

File No:	1005-1-18.dgn	Rev:	01	Rev:	01
Date:	February 2012	Cont:	SECT	Des:	JM
Revisions:	6409/29	001	US 59, ETC.		
Dist:		County:		Sheet No.:	
Dist:	LFK	County:	ANGELINA, ETC.	Sheet No.:	22

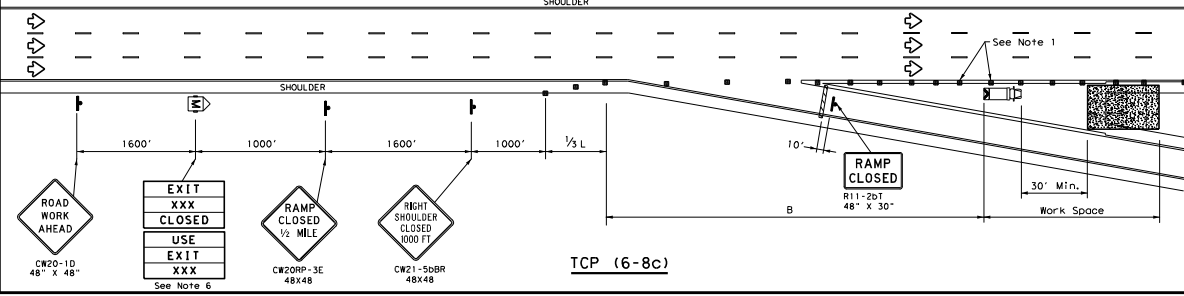
DISCUSS WITH THE USER OF THIS STANDARD IS GOVERNED BY THE TEXAS ENGINEERING PRACTICE ACT. NO WARRANTY OF ANY KIND IS MADE BY THE BOARD OF TEXAS ENGINEERS AND SURVEYORS FOR DAMAGES RESULTING FROM THIS USE.



TCP (6-8a)



TCP (6-8b)



TCP (6-8c)

LEGEND

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

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

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

TYPICAL USAGE

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

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

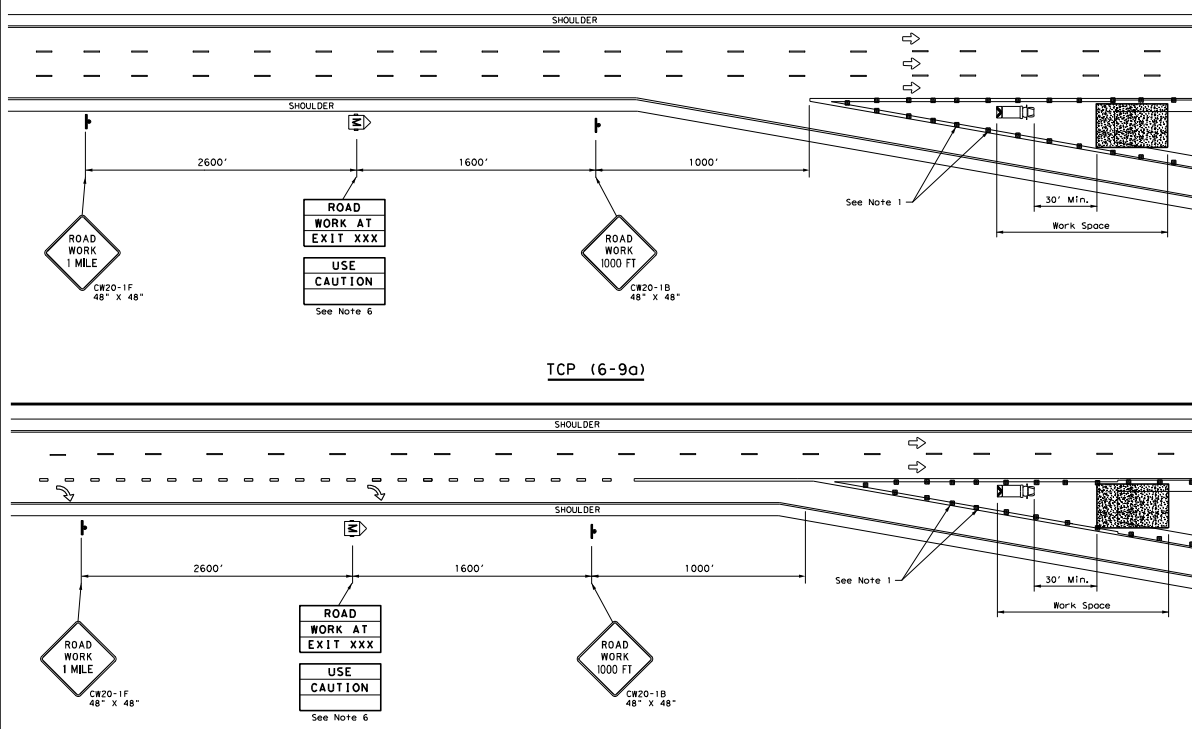
Texas Department of Transportation Traffic Operations Division Standard

WORK IN EXIT GORE FOR ADT GREATER THAN 10,000

TCP (6-8) - 14

FILED: 6/24/2022 1:27:57 PM	DATE: 6/24/2022 1:27:57 PM	FILED: 6/24/2022 1:27:57 PM	DATE: 6/24/2022 1:27:57 PM	FILED: 6/24/2022 1:27:57 PM	DATE: 6/24/2022 1:27:57 PM
REVISED	DATE	BY	REASON	DATE	BY
6409/29	001	US 59, ETC.			
LFK	ANGELINA, ETC.				

DISCUSSION: This standard 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 for damages resulting from its use.



TCP (6-9a)

TCP (6-9b)

LEGEND

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

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

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

TYPICAL USAGE

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

- GENERAL NOTES**
- Place channelizing devices in the gore at 20' spacing.
 - See the Standard Highway Sign Design for Texas (SHSD) for sign details.
 - The PCMS may be omitted when a permanent DMS sign is available in an appropriate location to display a similar message as called for on the PCMS.
 - When it is determined that a through lane should be closed in addition to the exit ramp, refer to TCP (6-4) and TCP (6-8) for traffic control details.
 - Truck mounted attenuators are required.
 - The PCMS may be omitted if replaced with a "ROAD WORK 1/2 MILE" (CW20-1E).
 - Roadway ADT should be less than 10,000.

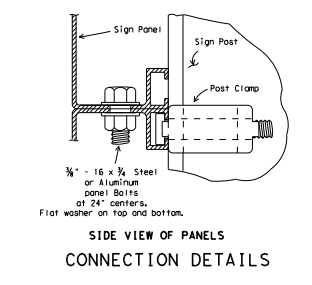
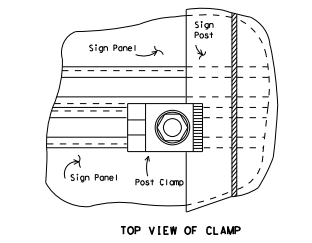
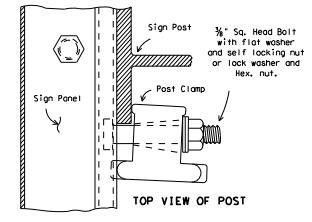
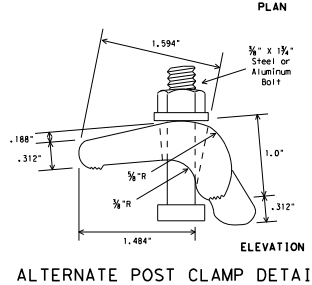
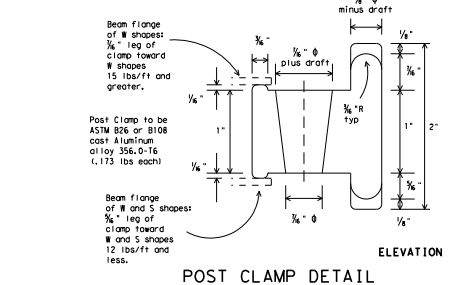
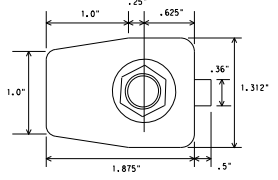
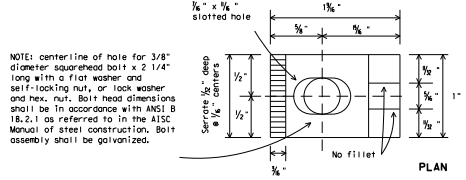


WORK IN EXIT GORE FOR ADT LESS THAN 10,000

TCP (6-9) - 14

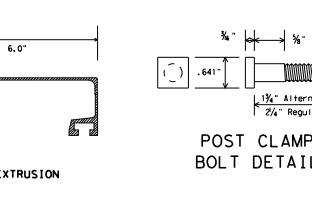
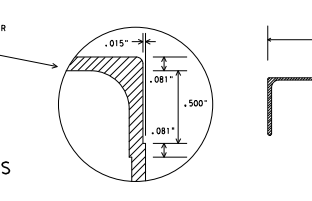
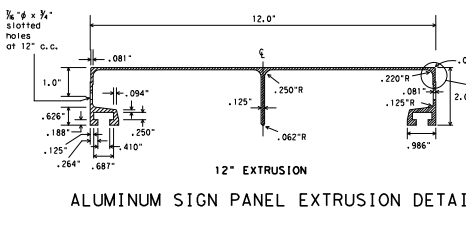
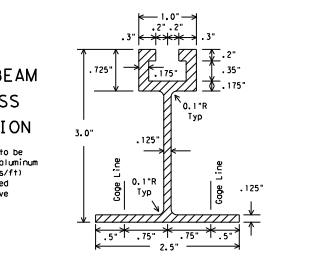
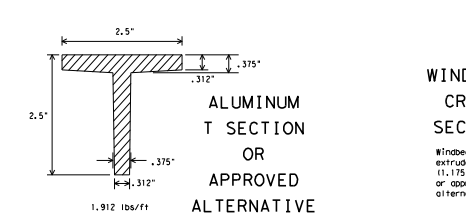
FILED: 1006-9.dgn	REV: 1007	REV: 1007	REV: 1007	REV: 1007
© 1007 February 2014	CONT: 1007	JOB: 1007	US: 59	ETC: 24
REVISIONS	6409/29	001	US 59, ETC.	
DIST: LFK	COUNTY: ANGELINA, ETC.	SHEET NO.: 24		

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DEPARTMENTAL MATERIAL SPECIFICATIONS
 SIGN HARDWARE DNS-7120

GENERAL NOTES:
 1. Design conforms with AASHTO Specifications for the design and construction of structural supports for highway signs.
 2. Materials and fabrication shall conform to the requirements of the Department material specifications.
 3. Structural steel shall be "low-alloy steel" for non-bridge structures per Item 442, "Metal for Structures."
 4. For fiberglass substrate connection details, see manufacturer's recommendations.



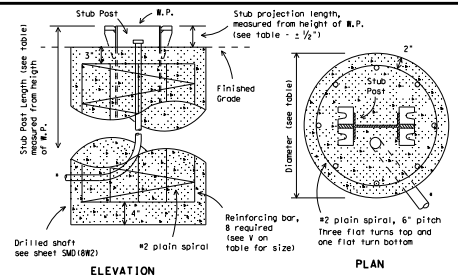
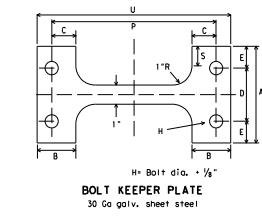
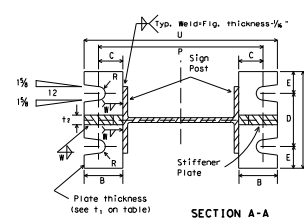
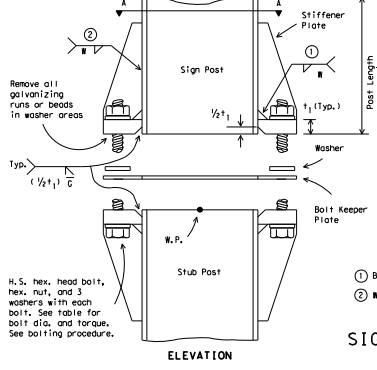
Texas Department of Transportation
Traffic Operations Division

**SIGN MOUNTING DETAILS-
 EXTRUDED ALUMINUM
 SIGN PANELS & HARDWARE**
SMD (2-1) -08

9-08	REVISED	DATE	BY	CHK	APP	DATE	BY	CHK	APP
640929	001					US 59, ETC.			
9357		COUNTY				SHEET NO.			
LFK	ANGELINA, ETC.					26			

27A

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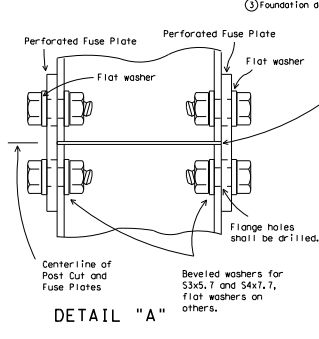
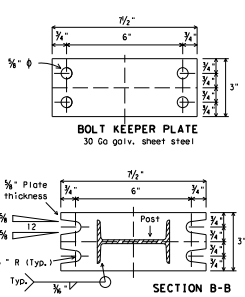
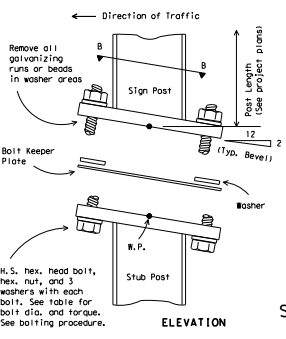
SIGN POST AND STUB POST
(For W Shapes)

FOUNDATION DETAIL

SHIM DETAIL

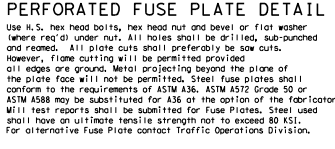
- BOLTING PROCEDURE FOR ASSEMBLY OF BASE CONNECTION:**
1. Assemble sign post, BOLT KEEPER PLATE and stub post with bolts and three flat washers per bolt as shown.
 2. Shim as required to plumb post.
 3. Tighten all bolts to the maximum possible with a 12 to 15 inch wrench to clean bolt threads and to bed washers and shims.
 4. Loosen each bolt in sequence and retighten bolts in a systematic order to the prescribed torque. Do not over-tighten.
 5. To prevent nut loosening, burr threads of bolt at junction with nut using a center punch.

Dimensions Post Size	Bolt Size & Torque	Base Connection Data Table										Perforated Fuse Plate Data Table										Bolt Keeper Data			Foundation Data				
		A	B	C	D	E	t ₁	t ₂	W	R	F	G	J	K	M	d ₁	d ₂	t ₃	Bolt Dia. (req. (typ.))	Bolt length	P	S	U	Stub length	Stub projection	Dr. Shaft diameter	Bar V Size		
W6x9	5/8" φ x 2 3/4"																											#5	
W6x12	440-450 1 inch pounds	5"	2"	1 1/4"	2 3/4"	1 1/8"	3/4"	1 1/2"	1/4"	1 1/2"	2"	4"	2 1/4"	1"	3/8"	3/4"	1/4"	1/2"	1.01	1 1/2"	8 3/8"	9 7/8"	10"	2'-0"	3"		#5		
W6x15	38-38 foot pounds																										#6		
W8x18																											#7		
W8x21	3/4" φ x 3 1/2"																										#8		
W10x22	740-750 1 inch pounds	6"	2 1/4"	1 3/8"	3 1/2"	1 1/4"	1"	3/4"	3/8"	1 1/2"	2 1/2"	1 1/4"	1 1/8"	1 1/8"	1/8"	1/2"	3/4"	4.03	2 1/4"	12 7/8"	1 1/2"	14 1/8"	3'-0"	2 1/2"	24"	#9			
W10x26	62-63 foot pounds																										#10		
W12x26																											#11		
S3x5.7	1/2" φ x 2 1/2"	See Detail Below										3 3/4"	1 1/2"	2 3/8"	1 1/2"	3/8"	3/8"	3/8"	1/4"	1/2"	0.60	1 1/2"	See Detail Below			3'-3 1/2"	3 1/2"	12"	Wp reinforced
S4x7.7		See Detail Below																											



SIGN POST AND STUB POST
(For S4x7.7 and S3x5.7)

DETAIL "A"



PERFORATED FUSE PLATE DETAIL

**SIGN MOUNTING DETAILS-
LARGE ROADSIDE SIGNS
FOUNDATION & STUB**

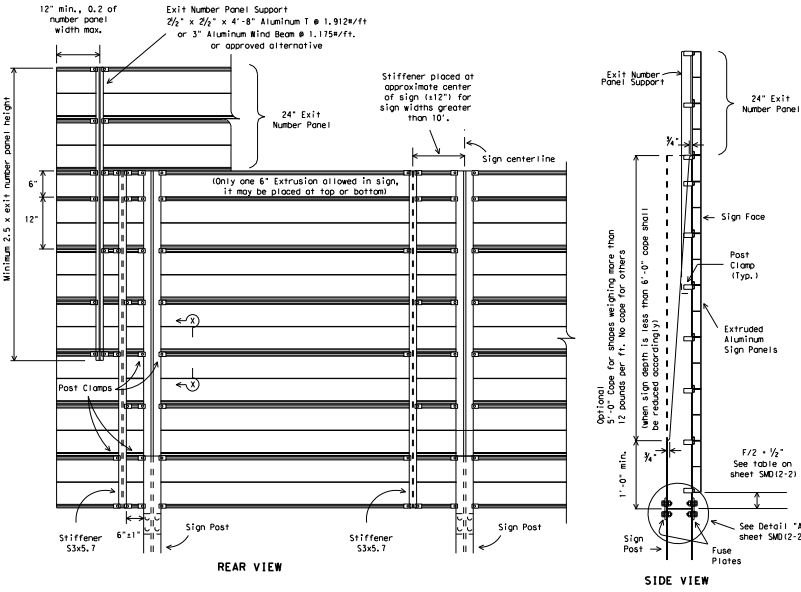
SMD (2-2) -08

4-08 9-08	0107 REVISED	08/01 August 1995	001 JOB	001 US 59, ETC.	27 SHEET NO.
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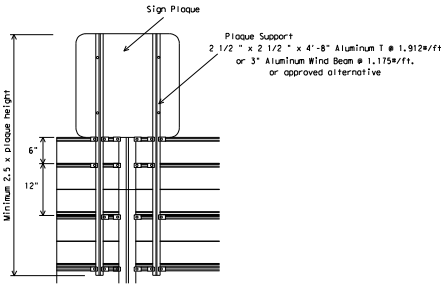
27B

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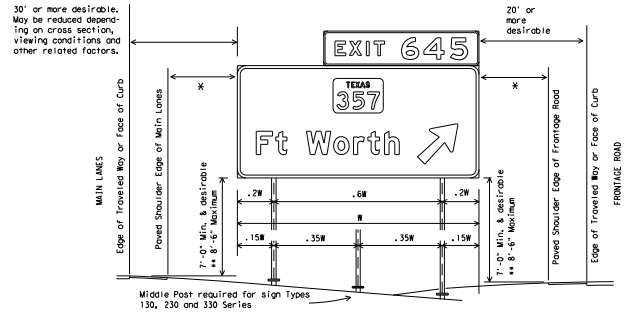
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ALUMINUM PARENT SIGN & EXIT NUMBER PANEL MOUNTING DETAILS



SIGN PLAQUE MOUNTING DETAIL TO ALUMINUM PARENT SIGN



TYPICAL SIGN INSTALLATION AND LOCATION

LATERAL CLEARANCE NOTES:
 Lateral clearances of signs mounted on median side of main lanes are the same as shown above where space will permit.
 Where a sign is to be located behind guardrail, an allowable minimum clearance of five feet may be used, measured from the face of the guardrail to the near edge of sign.

POST SPACING NOTES:
 Post spacing on a two post sign may vary a maximum of plus or minus 10% of total sign width to fit field conditions.
 Post spacing on a three post sign may vary a maximum of plus or minus 5% of total sign width to fit field conditions.

SIGN HEIGHT NOTES:
 ** The 8' 6" maximum may be exceeded when placing signs on extreme slopes. In these conditions, a 7' minimum from natural ground to bottom of sign must be maintained.

GENERAL NOTES:
 1. Exit number panel shall be mounted to the right hand side of the parent sign for right exits and to the left hand side for left exits. The number panel shall be mounted with two uprights so its right edge is even with the right edge of the parent sign or vice-versa for left hand exits.
 2. Exit number panel support shall be symmetrical about number panel centerline.
 3. Exit number panel support shall be ASTM A36 structural steel galvanized after fabrication, or ASTM B221 aluminum alloy 6061-T6 or approved alternative.
 4. All bolts, nuts and washers shall be galvanized per ASTM Designation B695 Class 50, or A153 Class C or D.
 5. Posts, parent sign panels, and exit number panels shall comply with notes on sheets SMD(2-1) and SMD(2-2).
 6. Signs (such as exit number panels) attached above a parent sign, General Service and Routing signs may be fabricated from flat sheet aluminum.
 7. Exit number panel support and other connection hardware required to fasten exit number panel to parent sign shall be subsidiary to Aluminum Signs or Fiberglass Signs.
 8. For fiberglass sign installation details, see manufacturer's recommendations.

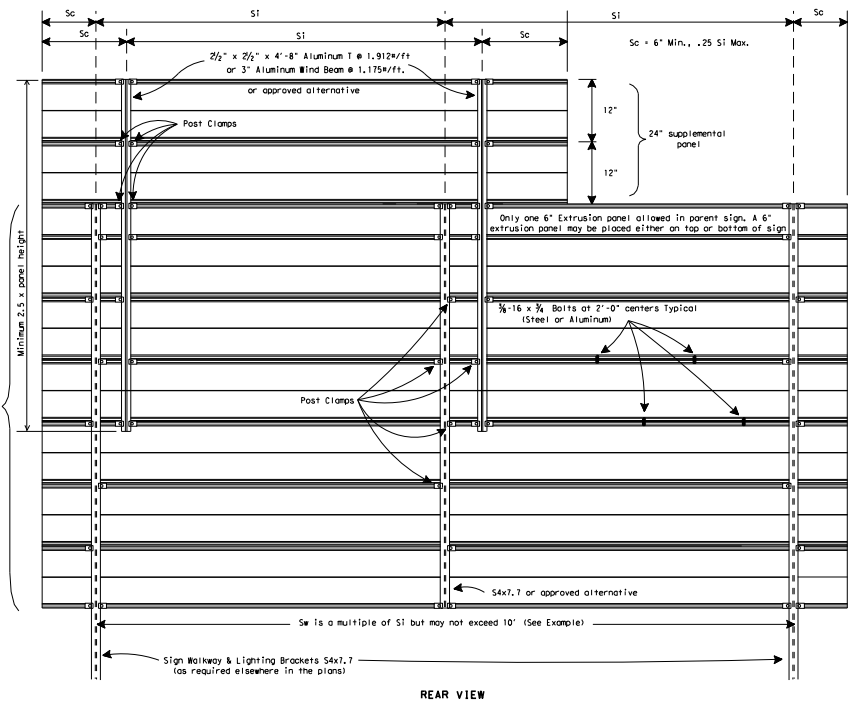
DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN HARDWARE	DMS-7120



**SIGN MOUNTING DETAILS-
 LARGE ROADSIDE SIGNS
 SMD (2-3) - 08**

REV	DATE	BY	CHK	APP	DESCRIPTION
01	08/01/1995				
9-08	REVISED				
	6409-29	001			US 59, ETC.
					LFK ANGELENA, ETC.
					SHEET NO. 28

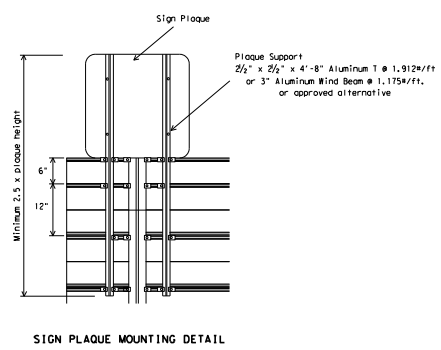
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EXAMPLES (FOR DETERMINING S1 and Sw)

NO.	ZONE	"d"	EXIT PANEL	WALKWAY	S1	Sw	COMMENT
1	1	15.0	YES	YES	4.5	9.0	Sw=2x(S1)
2	2	14.0	YES	NO	7.5	7.5	Sw = S1
3	1	15.0	NO	NO	8.5	8.5	Sw = S1
4	3	14.0	NO	YES	10.0	10.0	Sw = S1

Values shown for S1 are maximum values. S1 may be varied for different sign lengths and truss mounting conditions. Sw should not exceed two times S1 Max. or 10 feet.



MAXIMUM SIGN SUPPORT SPACING "S1" (FEET)

"d"	EXTRUDED ALUMINUM SIGN PANELS							
	WITH EXIT NUMBER PANELS				WITHOUT EXIT NUMBER PANELS			
	WITH WALKWAYS		WITHOUT WALKWAYS		WITH WALKWAYS		WITHOUT WALKWAYS	
WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	WIND ZONE	
15	1	2	3	4	1	2	3	4
14	4.5	7	8	10	5	7	8	10
13	6	7.5	9.5	10	6	7.5	9.5	10
12	7.5	9	10	10	7.5	9	10	10
11 or less	8.5	10	10	10	8.5	10	10	10

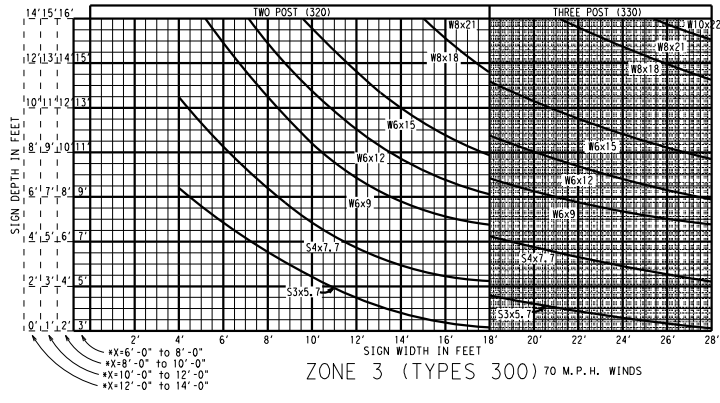
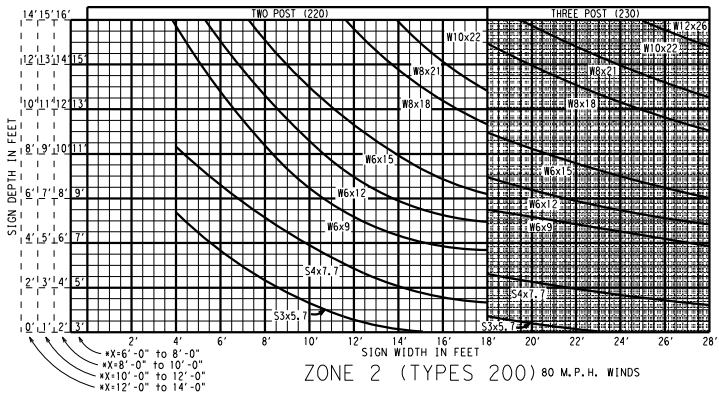
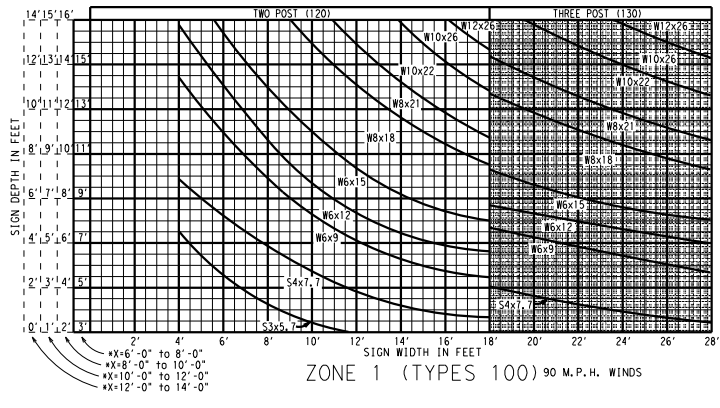
For fiberglass sign installations, see manufacturer's recommendations.

Texas Department of Transportation
Traffic Operations Division

**SIGN MOUNTING DETAILS-
OVERHEAD SIGNS
EXTRUDED ALUMINUM**
SMD (2-4) -08

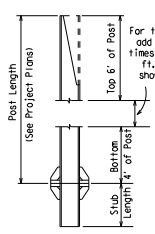
9-08	REVISED	DATE	BY	CHK	APP	DATE	BY	CHK	APP
9-08	4/11/09	6/4/09	29	001				US 59, ETC.	
		DIST	COUNTY					SHEET NO.	
		LFK	ANGELINA, ETC.					29	

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* NOTE: "X" EQUALS THE AVERAGE HEIGHT FROM THE GROUND LINE TO THE BOTTOM EDGE OF THE SIGN.

SHADED AREA DENOTES 3 POST SUPPORTS



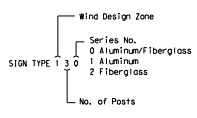
For total post wt. add this length times post wt. per ft. to weight shown in table

POST SIZE	Weight of one post (lb)	Weight of two posts (lb)	Weight of three posts (lb)
W6x9*	123.2	246.4	369.6
W6x12*	160.3	320.6	480.9
W6x15*	167.8	335.6	503.4
W8x18*	201.8	403.6	605.4
W8x21*	254.7	509.4	764.1
W10x22*	266.0	532.0	798.0
W10x26*	308.0	616.0	924.0
W12x26*	308.6	617.2	925.8
S3x5.7*	85.9	171.8	257.7
S4x7.7*	112.2	224.4	336.6

*LAST FIGURES=POST WT. PER FT.

Weight Data is the weight of items shown for one, two or three posts - includes top 6" of post, bottom 4" of post, post foundation stub, related base connection plates and stiffeners, friction fuse plate and all high strength bolts, nuts and washers).

SIGN TYPE



Note: Footings for S3x5.7 and S4x7.7 post sizes shall be non-reinforced with Class A concrete, while footing for all other post sizes shall be reinforced with Class C concrete.

Texas Department of Transportation
Traffic Operations Division

LARGE ROADSIDE SIGN SUPPORTS
POST SELECTION
WORKSHEET

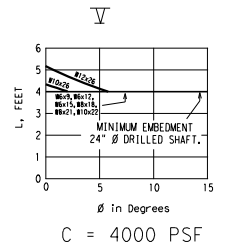
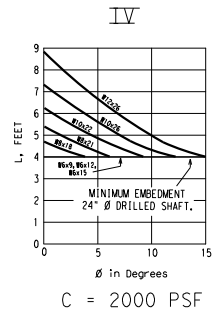
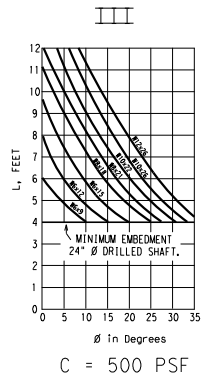
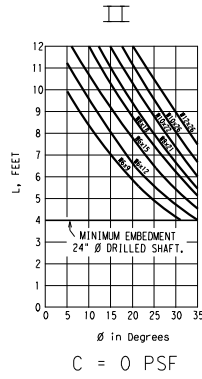
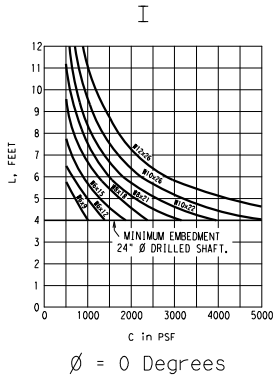
SMD (8W1) - 08

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REVISED	DATE
1-02	6/4/09
5-01	2/9/09
9-08	1/2/08

29A

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DATE: 6/24/2022 1:28:03 PM
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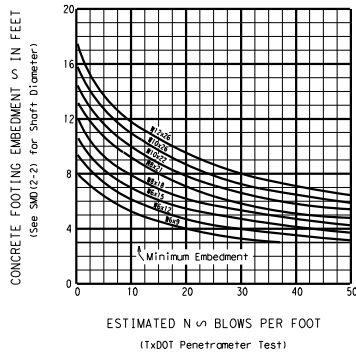


DRILLED CONCRETE FOOTING DEPTH CHART
(COHFRIC DESIGN)

NOTE: THESE CHARTS MAY BE USED AS AN ALTERNATE TO THE CHART BELOW, PROVIDED THAT SOIL COHESION AND INTERNAL FRICTION (COHFRIC) DATA ARE AVAILABLE.

LEGEND:

L = Required embedment of concrete drilled shaft, in feet
 C = Cohesive shear strength of soil, in psf
 ϕ = Angle of internal friction of soil, in degrees
 For values of C and ϕ which are intermediate to those on the charts, embedments may be determined by straight-line interpolation.



DRILLED CONCRETE FOOTING DEPTH CHART
(TxDOT PENETROMETER DESIGN)

NOTE: ESTIMATED N SHOULD BE BASED ON APPROXIMATELY THE UPPER ONE-THIRD POINT OF THE DRILLED CONCRETE FOOTING BELOW THE GROUND LINE

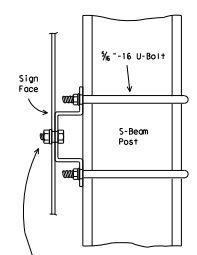
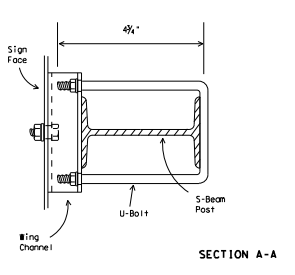
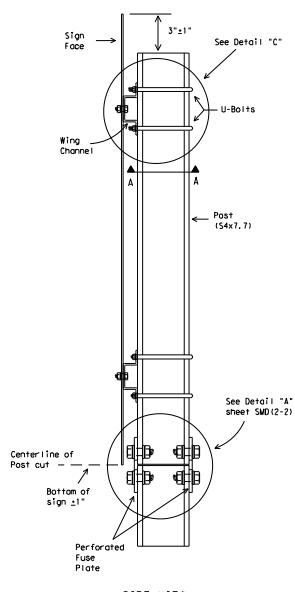
Note:
 1. Curves shown on this sheet are applicable for reinforced concrete footings only.

Texas Department of Transportation
 Traffic Operations Division
LARGE ROADSIDE SIGN SUPPORTS
FOUNDATION
WORKSHEET
SMD (8W2) - 08

© TxDOT July 1972 5-74 4-78 9-08	REVISONS 6409 29 01ST	DATE 08/10/07 001	JOB US 59, ETC.	SHEET NO. 31
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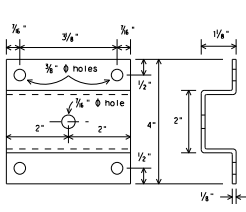
298

WING CHANNEL CLAMP DETAIL FOR TYPE G MOUNT



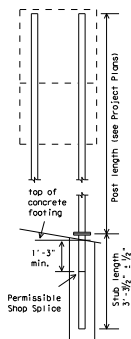
Galvanized steel or aluminum self-locking hex. head nut, 3/8" - 16 x 3/4" hex. head bolt for sheet metal, 3/8" - 16 x 1 1/4" hex. head bolt for plywood, 3/8" galvanized medium washer.

DETAIL "C"



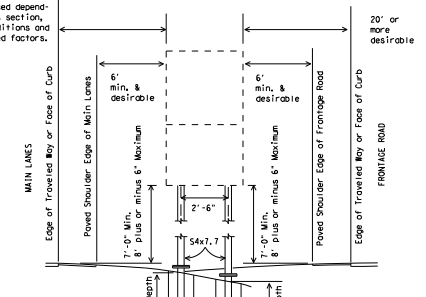
WING CHANNEL

Wing channel, 4" width x 1/8" depth x 1/8" thickness, shall be aluminum (ASTM B221 6061-T6 or B209 6061-T6), galvanized steel (ASTM A36) or stainless steel (ASTM A167 type 304, No. 2B finish).



The weight of one S4x7.7 post is equal to 112.2 lbs. plus 7.7 lbs./ft x post length in feet minus 10 ft. The weight of 112.2 lbs. includes 10 feet of post length, post foundation stub, related connection plates, friction fuse plate, nuts and washers.

30' or more desirable. May be reduced depending on cross section, viewing conditions and other related factors.



This type mount to be used:
 (1) For SPEED LIMIT sign (R2-1) when used in combination with R2-2 and R2-4 or for R2-2A.
 (2) For DO NOT ENTER sign (R5-1) when used with WRONG WAY sign (R5-1a), R5-1a is mounted above R5-1.

DEPARTMENTAL MATERIAL SPECIFICATIONS	DMS-7120
SIGN HARDWARE	

- GENERAL NOTES:
- Design conforms with AASHTO Specifications for the design and construction of structural supports for highway signs.
 - Materials and fabrication shall conform to the requirements of the Department material specifications.
 - Structural steel shall be "Low-Alloy Steel" for non-bridge structures per Item 442, "Metal For Structures."
 - Parts shall be saw cut either before galvanizing and the galvanized cut cleaned of zinc dust, or saw cut after galvanizing and the cut surface repaired per Item 445, "Galvanizing." (Cut surface will not be treated until plate is installed and all bolts fully tightened.)



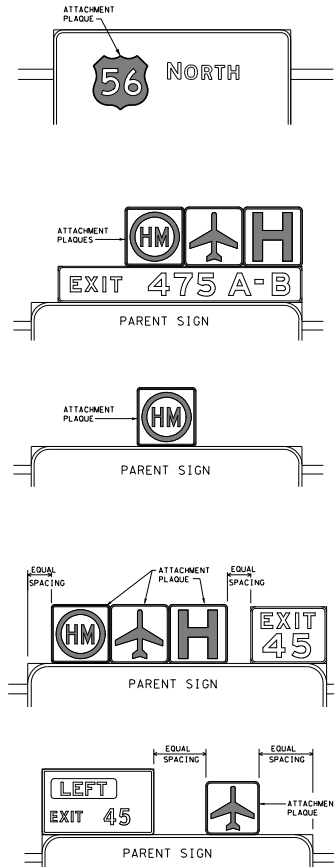
SIGN MOUNTING DETAILS, TYPE G SUPPORT

SMD (TY G) -08

DATE: 6/24/2022 1:28:03 PM	FILE: \\S:\L\TRIPS\WAS\INT\EMBARC.CONTR\0815\PLANS\2022\JOB\A\INC.6409-29-001\LARGE SIGN CLAMP\A\SMD(TY G)-08.dgn				
REV	DATE	BY	CHK	APP	DESCRIPTION
1	6/29/2022	001			US 59, ETC.
2	8/15/2022	LFK			ANGELINA, ETC.

REQUIREMENTS FOR ATTACHMENTS TO OVERHEAD AND LARGE GROUND MOUNTED SIGNS

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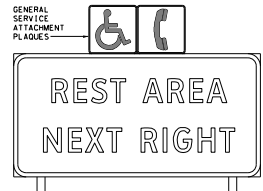
TYPICAL EXAMPLES

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

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B OR C SHEETING

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Route Marker legends (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emad, or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to white background sheeting, or combination thereof.
7. Route markers and other attachments within the parent sign face shall be direct applied unless otherwise specified in the plans. Attachments not direct applied shall use 0.063 inch thick one piece sheet aluminum signs (Type A).
8. General Service Plaques shall be 0.080 inch thick and Routing Plaques shall be 0.100 inch thick.
9. The priority for Routing Plaques shall be (left to right) Hazardous Material, Airport then Hospital. See examples for mounting location.
10. Mounting details of attachments to parent signs face are shown on Standard Plan Sheet TSR(5). Mounting details of sign plaque attachments above and below parent sign are shown in the "SMD series" Standard Plan Sheets.
11. Plaques shall be horizontally centered at the top of the parent sign. If an exit number panel exists, the plaque shall be centered between the edge of the parent sign and the edge of the exit number panel. The plaque may be placed above the exit number panel if there is insufficient space.



REQUIREMENTS FOR EXIT ONLY AND LEFT EXIT PANELS

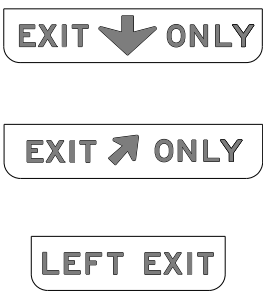
DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

SHEETING REQUIREMENTS FOR OVERHEAD EXIT PANELS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLUORESCENT YELLOW	TYPE B _L OR C _L SHEETING
LEGEND	BLACK	ACRYLIC NON-REFLECTIVE FILM

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD). Individual panel sizes shown in the plans may be adjusted to fit actual parent sign sizes if necessary.
2. Exit Panel legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets E Series.
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend shall be applied by screening process or cut-out acrylic non-reflective black film to yellow background sheeting, or combination thereof.
5. Exit Only and Left Exit panels within the parent sign face shall be direct applied unless otherwise specified in the plans. Panels not direct applied shall use 0.063 inch thick one piece sheet aluminum signs (Type A).
6. Mounting details of Exit Only and Left Exit panel attachments to parent signs face are shown on Standard Plan Sheet TSR(5).

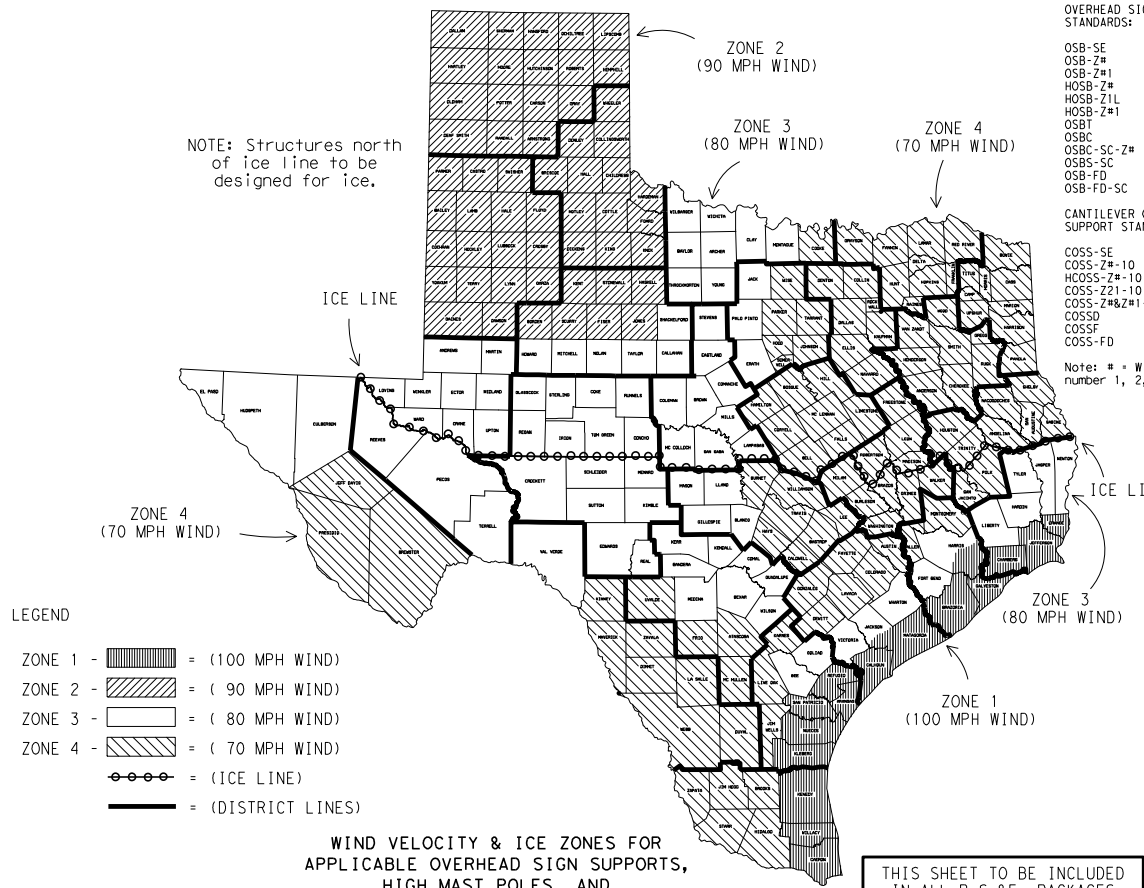
The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:
<http://www.txdot.gov/>



TYPICAL EXAMPLES

Texas Department of Transportation		Traffic Operations Division Standard
<h3>TYPICAL SIGN REQUIREMENTS</h3>		
<h4>TSR(2) - 13</h4>		
Title: TSR(2) - 13 Date: 10/01/00	Rev: 10/01/00 Cont: 10/01/00	Job: 10/01/00 Station: 10/01/00
Revision: 001 Date: 12-03-7-13	District: 10/01/00 County: 10/01/00	Sheet No.: 34

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NOTE: Structures north of ice line to be designed for ice.

- LEGEND**
- ZONE 1 - [diagonal lines] = (100 MPH WIND)
 - ZONE 2 - [cross-hatch] = (90 MPH WIND)
 - ZONE 3 - [horizontal lines] = (80 MPH WIND)
 - ZONE 4 - [vertical lines] = (70 MPH WIND)
 - [line of circles] = (ICE LINE)
 - [solid line] = (DISTRICT LINES)

WIND VELOCITY & ICE ZONES FOR APPLICABLE OVERHEAD SIGN SUPPORTS, HIGH MAST POLES, AND TRAFFIC SIGNAL POLES
 Based on 50 Year Mean Recurrence Interval of Fastest Mile Wind Velocity at 33 feet height.

THIS SHEET TO BE INCLUDED IN ALL P.S.&E. PACKAGES CONTAINING ONE OR MORE OF THE APPLICABLE STANDARD SHEETS LISTED HEREON

APPLICABLE STANDARDS SHEETS

- | | |
|--|---|
| OVERHEAD SIGN BRIDGE STANDARDS: | HIGH MAST ILLUMINATION POLE STANDARDS: |
| OSB-SE | HMIP-98 |
| OSB-Z# | HMIF-98 |
| OSB-Z#1 | |
| HOSB-Z# | WALKWAYS AND BRACKETS STANDARDS: |
| HOSB-Z1L | SWW |
| HOSB-Z#1 | SB (SWL-1) |
| OSBT | |
| OSBC | TRAFFIC SIGNAL POLE STANDARDS: |
| OSBC-SC-Z# | SP-80 |
| OSBS-SC | SP-100 |
| OSB-FD | SMA-80 |
| OSB-FD-SC | SMA-100 |
| | DMA-80 |
| CANTILEVER OVERHEAD SIGN SUPPORT STANDARDS: | DMA-100 |
| COSS-SE | MA-C |
| COSS-Z#-10 | MAC(L)LSN) |
| HCOSS-Z#-10 | MAD-D |
| COSS-Z21-10 | TS-FD |
| COSS-Z#&Z#1-10 | LUM-A |
| COSSD | CFA |
| COSSF | LMA |
| COSS-FD | TS-C |
| | MA-DPD |
- Note: # = Wind Zone number 1, 2, 3 or 4

FOR HARRIS CO. ONLY
 Zone line is just North of US 90, ground on the North, West and South sides of IH 610 and down the West side of SH 288.

FOR JACKSON CO. ONLY
 Zone line is just North of SH 616.

Texas Department of Transportation		Traffic Operations Division Standard	
WIND VELOCITY AND ICE ZONES			
WV & IZ-14			
File#	windvel.dgn	Rev	1x001
Project	APR11 1996	Cont	1x001
Revisions	6409/29	Dist	001
*14 - based on 50 year recurrence interval, 33 ft. wind speed		County	US 59, ETC.
		Dist	LFK ANGELINA, ETC.
		Sheet No.	36

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I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

- 1.
2. No Action Required Required Action

1. 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: NWP# _____

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

- 1.
- 2.
- 3.
- 4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

- No Action Required Required Action

Action No. 1.

IV. VEGETATION RESOURCES

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

- No Action Required Required Action

Action No. 1.

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

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately.

- No Action Required Required Action

Action No.

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	TCEQ: Texas Commission on Environmental Quality
MOU: Memorandum of Understanding	TPDES: Texas Pollutant Discharge Elimination System
MS4: Municipal Separate Stormwater Sewer System	TPWD: Texas Parks and Wildlife Department
NETA: Migratory Bird Treaty Act	TxDOT: Texas Department of Transportation
NOI: Notice of Intent	TLE: Threatened and Endangered Species
NWP: Nationwide Permit	USACE: U.S. Army Corps of Engineers
NOI: Notice of Intent	USFWS: U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

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

Contact the Engineer if any of the following are detected:

- Dead or distressed vegetation (not identified as normal)
- Trash piles, drums, canister, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of substances

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

- Yes No

If "No", then no further action is required. If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection. Are the results of the asbestos inspection positive (is asbestos present)?

- Yes No

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

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

In either case, the Contractor is responsible for providing the 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 Required Action

Action No.

- 1.
- 2.
- 3.

VII. OTHER ENVIRONMENTAL ISSUES

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

- No Action Required Required Action

Action No.

1. If work is located within the National Forest, notify the National Forest prior to starting work.

		Design Division Standard	
EPIC			
(ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS)			
FILES: 4010.dgn	Rev TxDOT	Chg No	Rev VP
01/20/11 February 2015	cont	sheet	job
12-12-2011 1001	REVISED	6409 29	001 US 59, ETC.
04-21-14 4000 1001 section 1v	915T	COUNTY	SHEET NO.
01-23-2016 SECTION 11 CHANGE 114 1182	LFK	ANGELINA, ETC.	37