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TRAFFIC CONTROL PLAN

STATE OF TEXAS DEPARTMENT OF TRANSPORTATION

RMC 6437-00-001 STATE DISTRICT TEXAS LFK CONTROL SECTION JOB HIGHWAY NO. 6437 00 001 FM 357, ETC.

PLANS OF PROPOSED STATE HIGHWAY ROUTINE MAINTENANCE CONTRACT TYPE OF WORK:

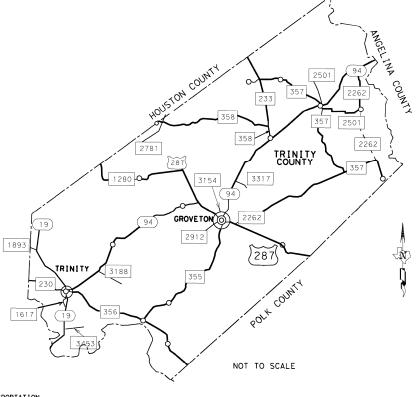
TREE & BRUSH REMOVAL AND TREE TRIMMING

RMC 6437-00-001

FM 357, ETC.

TRINITY COUNTY

LIMITS: VARIOUS LOCATIONS WITHIN THE TRINITY COUNTY MAINTENANCE SECTION



BARRICADES AND WARNING SIGNS

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

Texas Department of Transportation`

RECOMMENDED FOR LETTING:

-DocuSigned by: Jeremy King, P.E. DISTRICT MAYNTENANCE ENGINEER

3/24/2023 DATE

APPROVIES 298 RE44 84 AG:

DIRECTOR SEPTEMBERATIONS

3/24/2023 DATE

DocuSigned by:

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE

SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

3/24/2023

SPECIF1352PRONSINGENED BY THE TEXAS DEPARTMENT OF TRANSPORTATION NOVEMBER 1, 2014 AND SPECIAL SPECIFICATION ITEMS INCLUDED IN THE CONTRACT SHALL GOVERN ON THIS PROJECT.

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County: Trinity Highway: FM 357, ETC.

GENERAL NOTES:

Project Description: This project consists of performing tree trimming and brush removal on various roads and channels in the Trinity County Maintenance Section. This project also consists of removing trees as directed.

TXDOT PROJECT SUPERVISOR: All work on this contract will be scheduled and directed by the Maintenance Section Supervisor(s) listed below. Payment will be made on a monthly basis for work completed and accepted according to specifications. All payment requests should be directed to the Maintenance Section Supervisor(s) listed below.

CONTRACT PROSECUTION:

Each contract awarded by the Department stands on its own and, as such, is separate from other contracts. A Contractor awarded multiple contracts must be capable and sufficiently staffed to concurrently process any or all contracts at the same time.

Existing regulatory, warning and guide signs within project limits are to always remain visible to the traveling public. 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 subsidiary to various bid items.

Furnish materials and make repairs to the existing roadway and right-of-way at any location damaged by construction operations. This work shall be done in an approved manner and will be subsidiary to various bid items.

Minimize vehicles and equipment in construction areas to lessen the impact on existing vegetation. The intent of the plans is to prepare only that portion of the right-of-way necessary for construction.

Provide suitable access at all times to adjacent businesses, private property, and side roads.

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.

All workers on TxDOT right-of-way shall wear reflective clothing meeting ANSI Class II requirements during the day and ANSI Class III requirements during the night. Non-compliance with any of these requirements shall be grounds for suspension of work.

Project Number: RMC 6437-00-001 **Control:** 6437-00-001

County: Trinity Highway: FM 357, ETC.

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

Jeremy King Jeremy.King@TxDOT.gov Tamara Gibson Tamara.Gibson@TxDOT.gov

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

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

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

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

Item 2: Instructions to Bidders

View plans on-line or download from the web at:

http://www.txdot.gov/business/contractors consultants/plans online.htm

Order plans from any of the plan reproduction companies shown on the web at:

http://www.txdot.gov/business/contractors consultants/repro companies.htm

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.

General Notes Sheet 2 General Notes Sheet 2

County: Trinity Highway: FM 357, ETC.

Item 7: Legal Relations and Responsibilities

The proposed work of this project is the removal and trimming of trees and brush at various roadways within the Trinity County Maintenance Section that are hazardous, dying, or protruding into State right-of-way. 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, 2023 and TCEQ's TPDES CGP does not apply. Dispose of all vegetative matter and any other materials removed from State Right of Way in accordance with applicable environmental laws, rules, regulations, and requirements.

In order to maintain compliance with Chapter 64 of the Texas Parks and Wildlife Code and Migratory Bird Treaty Act (MBTA), construction activities that may affect nests (i.e. tree removal, tree limbing, bridge work) shall be conducted outside of the nesting season (March 15 to September 15). In the event birds or active nests (eggs and/or nestlings present) are encountered, contact the engineer prior to conducting work

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

Portions of roadways within the Trinity County Maintenance Section occurs within compartments of the Davy Crockett National Forest (DCNF). Refer to the EPIC sheet for more information regarding locations and restrictions within the DCNF. Red-cockaded woodpecker (federally listed endangered species) habitat is present adjacent to the ROW along FM 357 from Carlton Road to FM 2262. NO trees along this roadway are to be cut or otherwise damaged without prior approval from the Area Engineer. Critical Habitat for the Neches River Rose-Mallow (federally threatened species) is present within the ROW along FM 230 from 2.25 miles West of SH 19 and along SH 94 between the Neches River and FM 2262. Contact District Environmental Staff prior to working in these areas.

Item 8: Prosecution and Progress

Contract Time – The number of working days for this project shall be 365 days or until contract funds are expended.

For this project, working days will be computed and charged in accordance with Item 8, Section 3.1.5, "Calendar Days".

Project Number: RMC 6437-00-001 **Control:** 6437-00-001

County: Trinity Highway: FM 357, ETC.

A work order will be issued via email that details the type, amount, and the time frame (begin and end) the work is to be completed. The time frame will include the working days and will be based on typical production rates. For emergency work, the contractor shall be on site within 48 hours. For non-emergency work, the contractor will have 5 business days to begin work unless otherwise approved. Once time has started, the contractor shall work continuously toward completion of the work order unless otherwise approved.

If the contractor does not complete the work within the specified time frame, "Work Order Liquidated Damages" in the amount of \$100/Day will be charged until the work is completed.

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.

NONCOMPLIANCE PENALTY – A penalty will be assessed for each instance the contractor is in noncompliance. A noncompliance instance is defined by the following:

- The contractor fails to begin work at the specified time and/or location(s).
- The contractor does not have all the personnel and pieces of equipment necessary to fulfill the requirement of the item(s) called out at the specified time and/or location(s).
- The contractor does not complete the work continuously, unless approved by the Engineer.

The Noncompliance Penalty will be deducted from any money due or to become due for any completed item(s) or work. The Noncompliance Penalty will be assessed as follows: \$250 per instance, per location, and per day until the contractor returns to a state of compliance.

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 contract in accordance with Item 502.1 & 502.2. This work will not be paid for directly but will be considered subsidiary to the various bid items.

General Notes Sheet 2A General Notes Sheet 2A

County: Trinity Highway: FM 357, ETC.

For protection of the traveling public, direct traffic through the work area using signs, flaggers, and other devices. Required signs are shown in the plans on the Barricade and Construction Standards and Traffic Control Plan Sheets. The latest edition of the "Texas Manual on Uniform Traffic Control Devices" shall also be used as a guide for handling traffic on this project.

Texas Transportation Code 547.105 authorizes the use of warning lights to promote safety and provides an effective means of gaining the travelling public's attention as they drive in areas where construction crews are present. In order to influence the public to move over when high risk construction activities are taking place, minimize the utilization of blue warning lights. These lights must be used only while performing work on or near the travel lanes or shoulder where the travelling public encounters construction crews that are not protected by a standard work zone set up such as a lane closure, shoulder closure, or one-way traffic control. Refrain from leaving the warning lights engaged while travelling from one work location to another or while parked on the right-of-way away from the pavement or a work zone.

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.

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

Provide a flashing arrow panel and a truck-mounted attenuator to supplement required signs and devices for each lane closure.

Provide adequate flaggers to protect the traveling public when working on or near a roadway carrying traffic. All flaggers shall wear hardhats and ANSI approved reflective safety vests. Vests shall be clean and worn fully fastened.

Install "Be Prepared to Stop" (CW20-7B) and "Flagger Ahead" (CW22-7D) signs when flaggers are present. Position the signs where good visibility and traffic control can be maintained. Provide one high-intensity yellow, rotating dome-light on all equipment such as distributors, spreader boxes, lay-down machines, rollers, backhoes, road graders, loaders, etc. Mount lights high enough to be visible from all directions and operating when the equipment is within 30 feet of the travel way. On all other equipment, such as trucks, trailers, automobiles, etc., use emergency flashers while within the work zone.

Item 752: Tree and Brush Removal

All work, except emergency work, is to be completed between September 15th and March 15th to ensure compliance with the Migratory Bird Treaty Act (MBTA). Emergency work is any work required to eliminate a potential hazard(s) to the traveling public or from causing property damage.

Project Number: RMC 6437-00-001 **Control:** 6437-00-001

County: Trinity Highway: FM 357, ETC.

The Contractor shall become knowledgeable of the location of utilities within the rightof-way and shall use care when working near them.

The Contractor shall be responsible for contacting all utility companies and locating all underground utilities prior to stump grinding and/or other excavating. The Contractor shall use care when working near these utilities so as not to damage them.

Complete at least ½ of a centerline mile of tree trimming, brush, and tree removal per day.

Trim branches, limbs, and brush to a distance of 30 feet from the edge of pavement and a height of 18 feet above the white line unless otherwise directed. Trimming shall be performed so as to leave a neat and uniform appearance. Quantities shown are for both sides of the roadway. The equipment used to trim limbs and remove brush shall be approved by the maintenance supervisor. A boom axe will not be allowed when trimming limbs. The Contractor shall remove all existing limbs and small trees on the ground within the limits of brush removal. Trees to be removed shall be marked by the State with a red, white, or orange "X", painted on the trunk.

For trimming/ brush removal (channels) clear 50 feet either side of culvert center line and from right-of-way line to right-of-way line. If Waters of the US location, no work shall be performed within the channel and debris, or discharge/fill material shall not enter the channel. Equipment used at Waters of the US locations shall not enter the channel under any circumstance.

Remove trees as designated. After the removal of the designated trees, the Contractor may move out, and the remaining tree removal for this contract will be used on an as needed basis. The Engineer will send the Contractor written notification requiring him to move in and begin tree removal each time there are a minimum of 10 trees to be removed and mobilization will be paid for on a callout basis. After completion of the required tree removal, the Contractor may again move out, and this procedure will continue for the duration of the contract.

Pick up and remove all trees and limbs felled from right-of-way on the same day, unless otherwise approved.

Remove trees that are already down in the right-of-way. Cut and measure trees that have fallen from private property at the right-of-way line. These trees will be paid for in the same manner as trees that are to be felled and removed.

Grind all limbs and protruding roots. Grind all stumps to a depth of 12 inches below the ground level. Backfill any resulting holes to the level of the surrounding ground. If, in the opinion of the Engineer, stumps on back slope cannot be ground, trees shall be cut flush with surrounding ground line.

General Notes Sheet 2B General Notes Sheet 2B

County: Trinity Highway: FM 357, ETC.

Dispose of all vegetative matter and any other materials removed from State right-of-way in accordance with applicable environmental laws, rules, regulations, and requirements in the contract.

The Contractor will be required to furnish materials and make repairs to the existing roadway and right-of-way, including rutting, at any location damaged by the Contractor's operations. This work shall be done in a manner satisfactory to the Engineer and will be considered subsidiary to various bid items.

Remove a tree in increments when cutting the trees at ground level may endanger overhead utility lines or damage private property.

Removal of brush, limbs, debris, and trees less than 4 inches in diameter are considered brush and will be subsidiary to Item 752.

Trees that have fallen onto the right-of-way from private property will be cut and measured at the right-of-way line.

Item 6185: Truck Mounted Attenuator (TMA)

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

Truck Mounted Attenuators TMA's as shown on the TCP's shall be used. Whether shown on the TCP's or added by the Department, TMA's shall be paid for under Item 6185, "Truck Mounted Attenuator" for the type of operation being performed.

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Estimate & Quantity Sheet

CONTROLLING PROJECT ID 6437-00-001

DISTRICT Lufkin **HIGHWAY** FM0357

COUNTY Trinity

		CONTROL	SECTION JOB	6437-0	0-001		
			PROJECT ID	A0019	4765		
			COUNTY	Trini	ity	TOTAL EST.	TOTAL FINAL
			HIGHWAY	FM03	357		1110/12
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	500-6033	MOBILIZATION (CALLOUT)	EA	6.000		6.000	
	752-6003	TREE TRIMMING / BRUSH REMOVAL	MI	10.000		10.000	
	752-6005	TREE REMOVAL (4" - 12" DIA)	EA	500.000		500.000	
	752-6006	TREE REMOVAL (12" - 18" DIA)	EA	300.000		300.000	
	752-6007	TREE REMOVAL (18" - 24" DIA)	EA	200.000		200.000	
	752-6008	TREE REMOVAL (24" - 30" DIA)	EA	200.000		200,000	
	752-6009	TREE REMOVAL (30" - 36" DIA)	EA	100.000		100.000	
	752-6010	TREE REMOVAL (36" - 42" DIA)	EA	20.000		20.000	
	752-6011	TREE REMOVAL (42" - 48" DIA)	EA	10.000		10.000	
	752-6012	TREE REMOVAL (48" - 60" DIA)	EA	5.000		5.000	
	6185-6002	TMA (STATIONARY)	DAY	20.000		20.000	



DISTRICT	COUNTY	CCSJ	SHEET
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	SUMMARY OF TREE REMOVAL ITEMS							
ITEM NO.	752 6005	752 6006	752 6007	752 6008	752 6009	752 6010	752 6011	752 6012
LOCATION	TREE REMOVAL (4"-12" DIA)	TREE REMOVAL (12"-18" DIA)	TREE REMOVAL (18"-24" DIA)	TREE REMOVAL (24"-30" DIA)	TREE REMOVAL (30"-36" DIA)	TREE REMOVAL (36"-42" DIA)	TREE REMOVAL (42"-48" DIA)	TREE REMOVAL (42" - 48" DIA)
	EA							
VARIOUS	500	300	200	200	100	20	10	5

SUMMARY	OF TREE T	RIMMING/BRUSH	REMOVAL	ITEMS
				ITEM 0752 6003
HIGHWAY		LIMITS		TREE TRIMMING/BRUSH REMOVAL
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SUMMARY	OF	TRAFFIC	C	ONTR	ROL	ITEMS
				* I T E	M 61	85 6002
LC	CATI	ON		TMA	(STA	T [ONARY)
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^{*} USE TMA WHEN REQUIRED TO DO SO AS OUTLINED BY TCP STANDARDS.

QUANTITY SUMMARIES



CONT	SECT	JOB		H I GHW	ΑY
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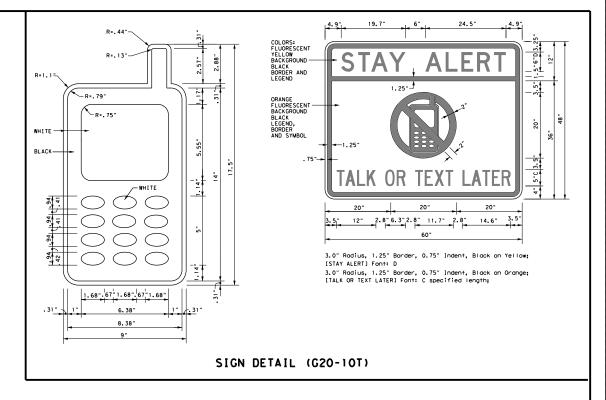
NOTE: ALL QUANTITIES ARE AN ESTIMATE AND SHALL BE VERIFIED IN THE FIELD PRIOR TO BEGINNING OF WORK. NO GUARANTEES ARE MADE AS TO THE AMOUNT OF WORK WHICH WILL BE PERFORMED AT EACH LOCATION.

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

- The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction povement 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.
- 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.
- 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. As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER (see Sign Detail G20-10T) and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. However, the TRAFFIC FINES DOUBLE sign will not be required on projects consisting solely of mobile operation work, such as striping or milling edgeline rumble strips. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.
- Except for devices required by Note 10, 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 APPAREL 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.



Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation Traffic Operations Division - TE Phone (512) 416-3118

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

TRAFFIC ENGINEERING STANDARD SHEETS

SHEET 1 OF 12

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

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REVISION

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Contractor will install a regulatory speed limit sign at

the end of the work zone.

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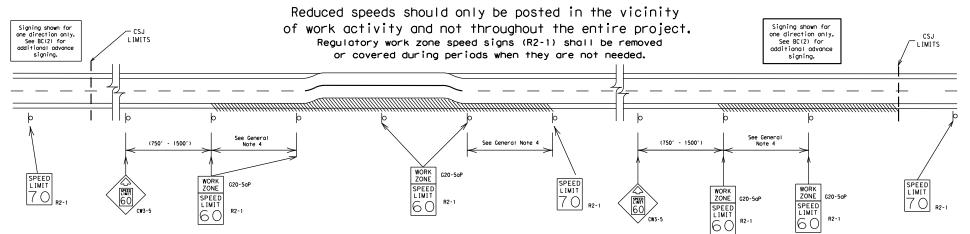
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ROAD WORK

WORK SPACE

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.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

- 0.2 to 1 mile 35 mph and less
- 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.
- Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
- 8. Techniques that may help reduce traffic speeds include but are not limited to: A. Low enforcement.
 - B. Flagger stationed next to sign.
 - C. Portable changeable message sign (PCMS).
 - D. Low-power (drone) radar transmitter.
- E. Speed monitor trailers or signs.
- 9. Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
- 10. For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

SHEET 3 OF 12

Texas Department of Transportation

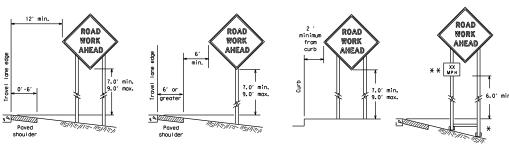
Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

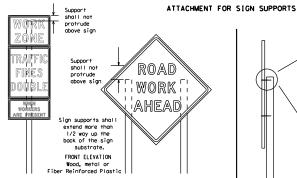
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TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



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



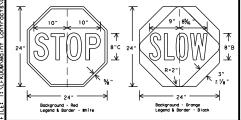
Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the spice point. Splice must be located entirely bel the sign substrate, not near the base of the support. Splice insert lengths should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

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 sian 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.

STOP/SLOW PADDLES

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



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

SIDE ELEVATION

Wood

- 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 interest, and other geographical, recreational, 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.
- 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 relocatina existina sians.
- If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards 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 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

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, worn, 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 rom 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 IXOD diary and howing both the Inspector and Contractor initial and date the agreed upon changes. The Contractor shall furnish sign supports listed in the "Compliant Nork Zone Traffic Contract Device List" (OWITCD). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can
- verify the correct procedures are being followed. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
- Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used 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 61

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

Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

- SIGN MOUNTING HEIGHT

 I. 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 an led of short-term/Short Duration signs shall be used any during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
- Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration. SIZE OF SIGNS

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

SIGN SUBSTRATES

- The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CMZTCD lists each substrate that can be used on the different types and models of sign supports.

 "Mesh" type materials are NOI on approved sign substrate, regardless of the tightness of the weave.
 - west hyperillular rules are not or approved signs substitute, regardless or in iterations of the Neover.

 All wooden individual sign ponels fobricated from 2 or more pieces shall have one or more piywood 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" enters. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

- All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
 White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
- Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL} , 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 he sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any ntersections 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 block plastic, or other materials which will cover the face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
- Burlop shall NOT be used to cover signs.
- Duct tape or other adhesive material shall NOT be affixed to a sign face.

 Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

- Where sign supports require the use of weights to keep from turning over.
- the use of sandbags with dry, cohesionless sand should be used.

 The sandbags will be tied shut to keep the sand from spilling and to
- maintain a constant weight. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
- Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs
- Sandbags shall be made of a durable material that tears upon vehicular
- impact. Rubber (such as tire inner tubes) shall NOT be used. Rubber hallasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured
- with rubber bases may be used when shown on the CWZTCD list. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
- Sandbaas 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 of fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

SHEET 4 OF 12

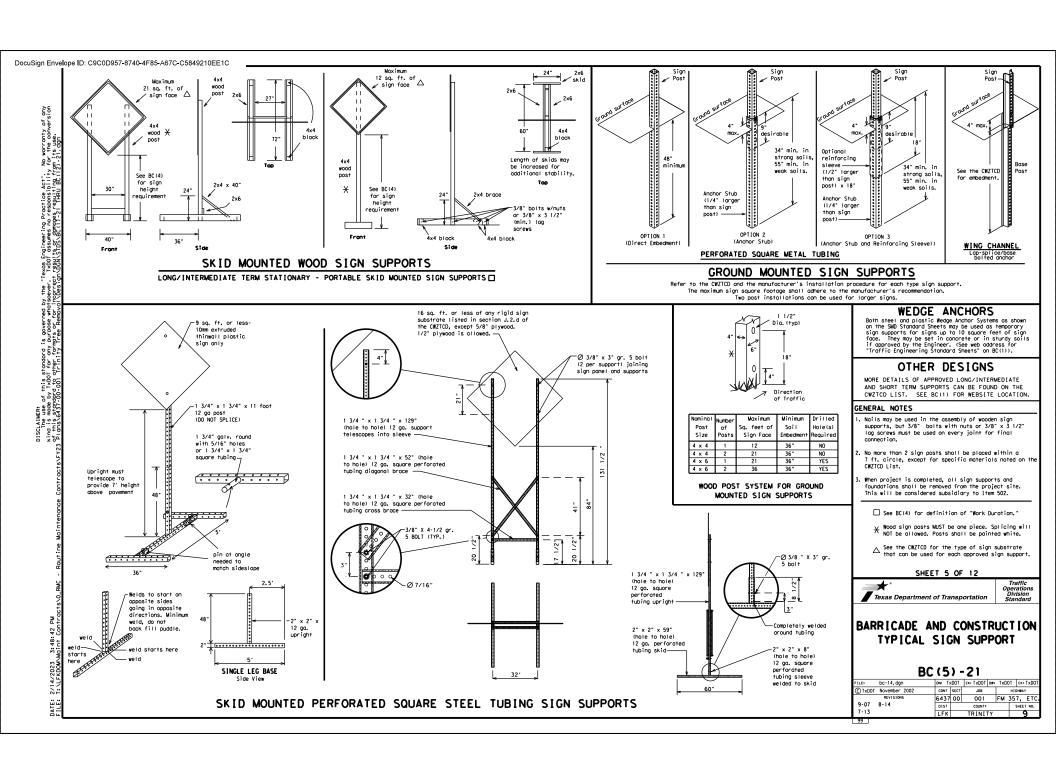


BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

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

PORTABLE CHANGEABLE MESSAGE SIGNS

- 1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
- Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO,"
- 3. Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by
- 4. Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."

 5. Always use the route or interstate designation (IH, US, SH, FM)
- along with the number when referring to a roadway.

 When in use the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.

 7. The message term "WEEKEND" should be used only if the work is to
- start on Saturday morning and end by Sunday evening at midnight.
 Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.

 8. The Engineer/Inspector may select one of two options which are avail-
- able for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
- Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
- 10. Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
- Do not use the word "Danger" in message.
 Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
- 13. Do not display messages that scroll horizontally or vertically across the face of the sian.
- 14. The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated, unless shown in the TMUTCD.
- 15. PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
- 16. Each line of text should be centered on the message board rather than left or right justified.

 17. If disabled, the PCMS should default to an illegible display that will
- not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

WORD OR PHRASE	ABBREV1ATION	WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD	Major	MAJ
Alternate	ALT	Miles	MI
Avenue	AVE	Miles Per Hour	MPH
Best Route	BEST RTE	Minor	MNR
Boulevard	BLVD	Monday	MON
Bridge	BRDG	Normal	NORM
Cannot	CANT	North	N
Center	CTR	Northbound	(route) N
Construction Ahead	CONST AHD	Parking Road	PK ING
CROSSING	XING	Right Lane	RT LN
Detour Route	DETOUR RTE	Saturday	SAT
Do Not	DONT	Service Road	SERV RD
East	F	Shoulder	SHLDR
Eastbound	(route) E		SLIP
Emergency	EMER	Slippery South	SLIP
Emergency Vehicle		Southbound	(route) S
Entrance, Enter	ENT	Speed	SPD SPD
Express Lane	EXP LN	Street	ST
Expressway	EXPWY	Sunday	SUN
XXXX Feet	XXXX FT	Telephone	PHONE
Fog Ahead	FOG AHD	Temporary	TEMP
Freeway	FRWY, FWY	Thursday	THURS
Freeway Blocked	FWY BLKD	To Downtown	TO DWNTN
Friday	FRI	Traffic	TRAF
Hazardous Drivina			
Hazardous Material		Travelers	TRVLRS
High-Occupancy	HOV	Tuesday	TUES
Vehicle		Time Minutes	TIME MIN
Highway	HWY	Upper Level	UPR LEVEL
Hour (s)	HR, HRS	Vehicles (s)	VEH, VEHS
Information	INFO	Warning	WARN
It Is	ITS	Wednesday	WED
Junction	JCT	Weight Limit	WT LIMIT
Left	IFT	West	W
Left Lane	LFT LN	Westbound	(route) W
Lane Closed	LN CLOSED	Wet Pavement	WET PVMT
Lower Level	LWR LEVEL	Will Not	WONT
Maintenance	MAINT		

22.

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

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

APPLICATION GUIDELINES

- 1. 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".

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

- 3, A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Natice Phose Lists".
- 4. 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.
- 6. For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week prior to the work.

Phase 2: Possible Component Lists

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

WORDING ALTERNATIVES

- 1. The words RIGHT, LEFT and ALL can be interchanged as appropriate. 2. Roadway designations IH, US, SH, FM and LP can be interchanged as
- oppropriate. 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.
- 7. FT and MI, MILE and MILES interchanged as appropriate. 8. AT, BEFORE and PAST interchanged as needed.
- 9. Distances or AHEAD can be eliminated from the message if a

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

BLVD

- 1. When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.

 2. When symbol signs, such as the "Flagger Symbol" (CMZO-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it
- shall maintain the legibility/visibility requirement listed above.

 3. When symbol signs are represented graphically on the Full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute
- for, or replace that sign.

 4. A full matrix PCMS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(7), for the

SHEET 6 OF 12



BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

Traffic Operations Division Standard

BC(6)-21

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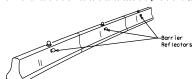
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Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

Type C Warning Light or approved substitute mounted on a

drum adjacent to the travel way.

- 1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of pregualified Barrier Reflectors can be found at the Material Producer List web address
- 2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The



CONCRETE TRAFFIC BARRIER (CTB)

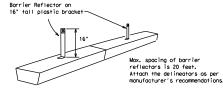
- 3. Where traffic is on one side of the CTB. two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB.

 An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of
- the barrier, as shown in the detail above.

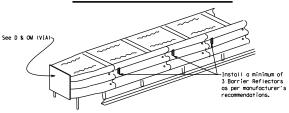
 4. Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional) while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in
- The vertiff above.

 Simen CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.

 Barrier Reflector units shall be yellow or white in color to match
- the edgeline being supplemented.
- Maximum spacing of Barrier Reflectors is forty (40) feet.
- Pavement morkers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
- 9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's
- recommendations. 10. Missing or damaged Barrier Reflectors shall be replaced as directed
- by the Engineer.
 11. Single slope barriers shall be delineated as shown on the above detail.



LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350, Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

- 1. Warning lights shall meet the requirements of the TMUTCD.
- 2. Warning lights shall NOI be installed on barricades.
 3. Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous orea. Their use and I be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Worning Lights shall not be used with signs manufactured with Type B_{FL} or C_{FL} Sheeting meeting the requirements of Departmental Material Specification DMS-8300.

 4. Type-C and Type D 360 degree Steady Burn Lights are intended to be used in a series for delineation to supplement other traffic control
- devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "SB".
- 5. The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.

 6. When required by the Engineer, the Contractor shall furnish a copy of the warning lights certification. The warning light manufacturer will
- certify the warning lights meet the requirements of the latest LTE Purchase Specifications for Flashing and Steady-Burn Warning Lights.

 7. When used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on the outside of the curve, not the inside.
- 8. The location of warning light's and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- 2. Type a following worming lights a form interface to define on the disease in the disease of sequential flashing worning lights placed on channelizing devices to form a merging toper may be used for delineation. If used, the successive flashing of the sequential worning lights should occur from the beginning of the taper to the end of the merging taper in
- order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.

 4. Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
- 5. Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
- 6. Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
- 7. The maximum spacing for warning lights on drums should be identical to the channelizing device spacing

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

- A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the
 discretion of the Contractor unless otherwise noted in the plans.
- 2. The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed
- 3. The worning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
- 4. Round reflectors shall be fully reflectorized, including the area where attached to the drum.

 5. Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it
- The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type B or Type C.

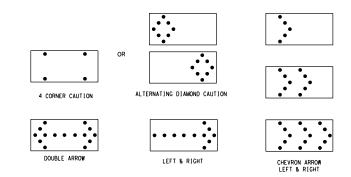
 7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.

- The warning reflector should be mounted on the side of the handle nearest approaching traffic.
 The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.

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

- The Floshing Arrow Board should be used for all lone closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lones.
 Floshing Arrow Boards should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
 The Engineer/Inspector shall choose all appropriate signs, borricades and/or other traffic control devices that should be used in conjunction with the Floshing Arrow Board.
 The Electric Arrow Board should be used in conjunction with the Floshing Arrow Board.

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



- The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating
- Ine "CAUTION" also you consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
 The straight line court on display is NOT ALLOWED.
 The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
 Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.

- 9. The sequential arrow display is NOT ALLOWED.

 10. The floshing arrow display is NOT ALLOWED.

 11. The floshing arrow display is the TXDOT standard; however, the sequential Chevron display may be used during daylight operations.

 11. The Floshing Arrow Board shall Not But Use to laterally shift traffic.

 12. A Floshing Arrow Board SHALL NOT BE USED to laterally shift traffic.

 13. A full matrix POMS may be used to simulate a Floshing Arrow Board provided it meets visibility, flosh catched disminate requirements and this TXDOT.
- flash rate and dimming requirements on this sheet for the same size arrow.
- Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

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

ATTENTION
Flashing Arrow Boards shall be equipped with
automatic dimming devices

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No, 350 (NCHRP 350) or the Manual for Assessing Safety Hardware (MASH).
 Refer to the CMZTCD for the requirements of Level 2 or
- Level 3 TMAs.
- 3. Refer to the CMZTCD for a list of approved TMAs.
 4. TMAs are required on freeways unless otherwise noted
- in the plans. 5. A TMA should be used anytime that it can be positioned
- 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.

 6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

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Texas Department of Transportation	n

Traffic Operations Division Standard

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

BC(7)-21

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- 2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
- Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or
- single piece plastic drums as channelization devices or sign supports.

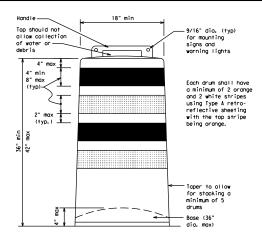
 4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
- 5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
- 6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in
- 7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
- Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
- 9. Drum body shall have a maximum unballasted weight of 11 lbs. 10. Drum and base shall be marked with manufacturer's name and model number.

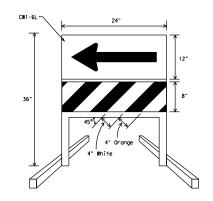
RETROREFLECTIVE SHEETING

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

- 1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above payement surface may not exceed 12 inches.

 2. Bases with built-in ballast shall weigh between 40 lbs, and 50 lbs.
- Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
- Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
- 4. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
- When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
- 6. Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.

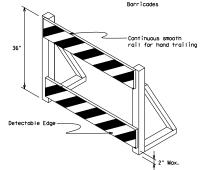




DIRECTION INDICATOR BARRICADE

- The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
 If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into
- In series to direct the driver through the transition and into the intended frovel lone. The Direction Indicator Barricade shall consist of One-Direction Lorge Arrow (GNI-6) sign in the size shown with a black arrow on a background of Type $B_{\rm L}$ or Type $C_{\rm R}$ dronge retroreflective sheeting above a roll with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheeting types shall be as per DMS 8300. Double arrows on the Direction Indicator Barricade will not be
- Approved manufacturers are shown on the CWZTCD List.
 Ballast shall be as approved by the manufacturers instructions.

This detail is not intended for fabrication. See note 3 and the CWZTCD list for providers of approved Detectable Pedestrian Barricades



DETECTABLE PEDESTRIAN BARRICADES

- When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be mene existing pecestrian racilities are disrupted, closed, or relocated in ofTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.
 Where pedestrians with visual disabilities normally use the
- closed sidewalk, a device that is detectable by a person with a visual disability travelling with the aid of a long cane shall be placed across the full width of the closed sidewalk.
- 3. Detectable pedestrian parricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian
- Tape, rone, or plastic chain strung between devices are not tope, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" and should not be used as a control for pedestrian movements.
- Warning lights shall not be attached to detectable pedestrian
- 6. Detectable pedestrian barricades may use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

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Texas Department of Transportation

Traffic Operations Division Standard

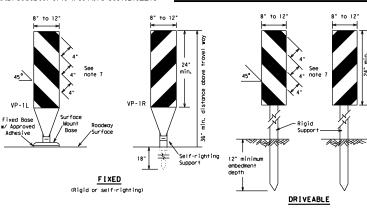
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

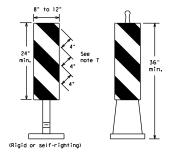
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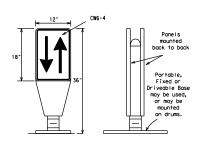


PORTABLE

 Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.

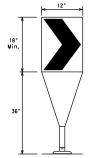
- 2. YP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual Appendix B "Treatment of Powement Drop-offs in Nork Zones" for additional guidelines on the use of YP's for drop-offs.
- 3. VP's should be mounted back to back if used at the edge of cuts adjacent to two way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
- YP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
- Self-righting supports are available with portable base.
 See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- Sheeting for the VP's shall be retroreflective Type A conforming to Deportmental 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.

VERTICAL PANELS (VPs)



- 1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OILD's are used on temporary center lines. 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 povement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
- 2. The OTLD may be used in combination with 42"
- Spacing between the OTLD shall not exceed 500 feet, 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
- 4. The OTLD shall be orange with a black nonreflective legend. Sheeting for the OTLD shall be retroreflective Type Br, or Type Crt, conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



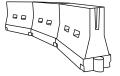
Fixed Base w/ Approved Adhesive (Driveoble Base, or Flexible Support can be used)

- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
- 3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist allways has three in view, until the change in alignment eliminates its need.
- 4. To be effective, the chevron should be visible for at least 500 feet.
- Chevrons shall be aronge with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B₁, or Type C₁, conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8301.
- For Long Term Stationary use on tapers or transitions on freeways and divided highways self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS

GENERAL NOTES

- Work Zone channel izing devices illustrated an 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 Cantral Devices" (TMUICD).
- Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
- 3. Channelizing devices on self-righting supports should be used in work zone cress where channelizing devices ore frequently impacted by errort 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 "Compilant Work Zone Traffic Control Devices List" (CMZTOD.)
- 4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, foded, 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 powerent surfaces, including powerent surfaces including powerent surface discoloration or surface integrity. Driveoble bases shall not be permitted on final powerent surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

- LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
- CCDs may be used instead of a line of cones or drums.
 CCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CMZTCD list;
- 4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.

 5. LCDs shall be supplemented with retroreflective deligation as required for temporary barriers.
- 5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
- 6. LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10) placed near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

- 1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the
- work space per the appropriate NCHRP 350 croshworthiness requirements based on roadway speed and barrier application.

 2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation
- or channelizing devices to improve deytime/nighttime visibility. They may also be supplemented with povement markings.

 3. Nater 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 CMXICO list.
- 4. Water boll asted systems used as borriers 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 avoil table geometric conditions.
- 5. When water bollasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

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

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

Speed	Formula	D	Minimur esirob er Len **	le	Suggested Maximum Spacing of Channelizing Devices				
*		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	<u>ws²</u>	150'	1651	180′	30′	60′			
35	L = WS-	2051	2251	245'	35′	701			
40	1 80	2651	295'	3201	40'	80'			
45		450'	4951	540'	45′	90′			
50		5001	5501	6001	50′	1001			
55	L=WS	5501	6051	660'	55′	110'			
60] - ""	600'	660'	7201	60′	120'			
65		650'	715′	780′	651	130′			
70		700′	770'	840'	70′	140'			
75		750′	825'	900'	75′	150′			
80		8001	880'	9601	80′	160'			

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

SUGGESTED MAXIMUM SPACING OF
CHANNELIZING DEVICES AND
MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Traffic Operations

Texas Department of Transportation

Tansportation

Traffic Operation
Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

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TYPE 3 BARRICADES

- . Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials
- used in the construction of Type 3 Barricades.

 2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
- Borricodes 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.

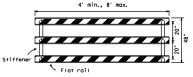
 Striping of rails, for the right side of the roadway, should slope
- downward to the left. For the left side of the roadway, striping should slope downward to the right.
- 5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
- 6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.

 Warning lights shall NOT be installed on barricades.
- Morning Trights shall have be installed on burnicables.

 Where borricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. that covers any portion or a particable rails fertective sneering. 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 duroble material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
- 9. Sheeting for barricades shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

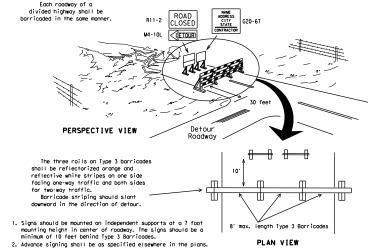


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL

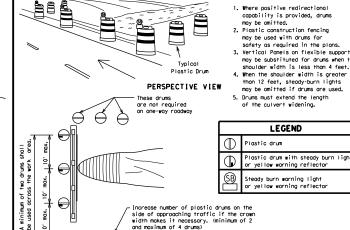


Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

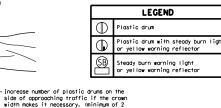


TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



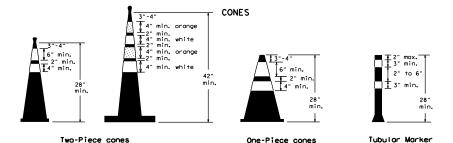
may be substituted for drums when the shoulder width is less than 4 feet.

than 12 feet, steady-burn lights may be omitted if drums are used.



PLAN VIEW CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

and maximum of 4 drums)



Alternate \bigcirc Alternate ф Drums, vertical panels or 42" cones Approx. \bigcirc Approx. 501 at 50' maximum spacina 50' Min. 2 drums Min. 2 drums or 1 Type 3 Type : barricade barricade STOCKPILE On one-way roads Desirable downstream drums stockpile location Channelizing devices parallel to traffic or barricade may be should be used when stockpile is omitted here clear zone. within 30' from trovel lone. ✧

TRAFFIC CONTROL FOR MATERIAL STOCKPILES

➾

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

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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 unright and in place.
- 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 used at night 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.
- 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
- 6. 42" two-piece cones, vertical panels or drums are suitable for all work zone
- 7. Cones or tubular markers used on each project should be of the same size

THIS DEVICE SHALL NOT BE USED ON PROJECTS LET AFTER MARCH 2014. EDGEL INE CHANNEL IZER

- 1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in transitions or topers.
- 2. This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
- 3. This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
- The base must weigh a minimum of 30 lbs.

SHEET 10 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

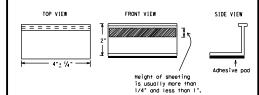
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

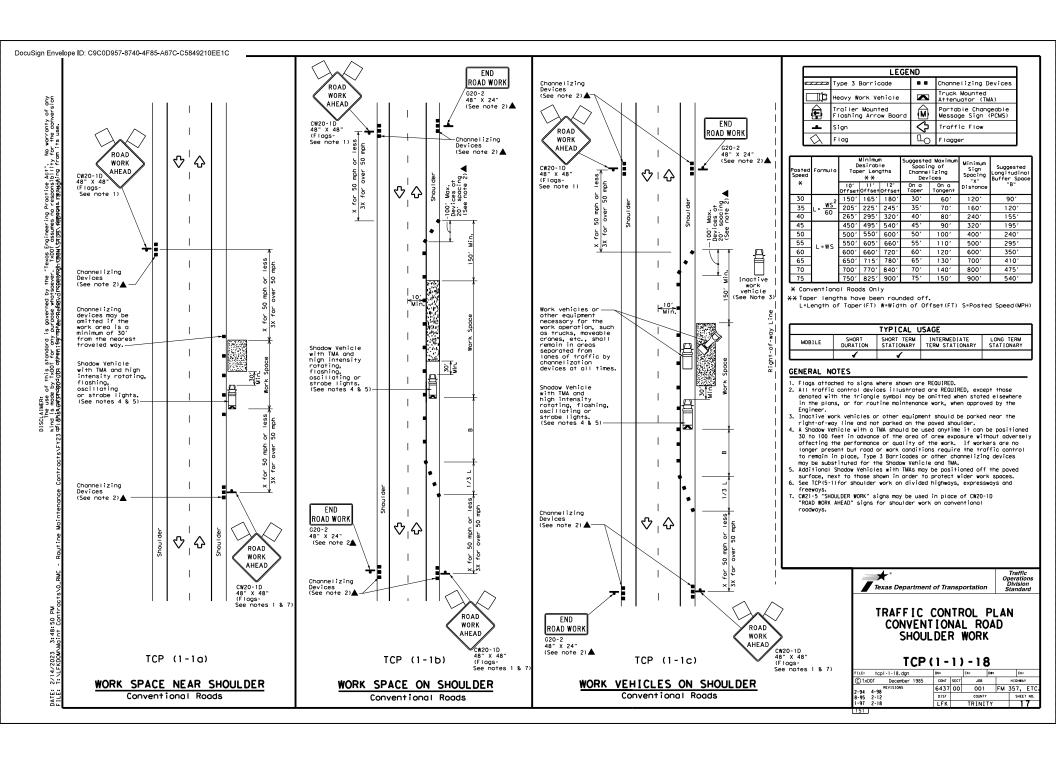


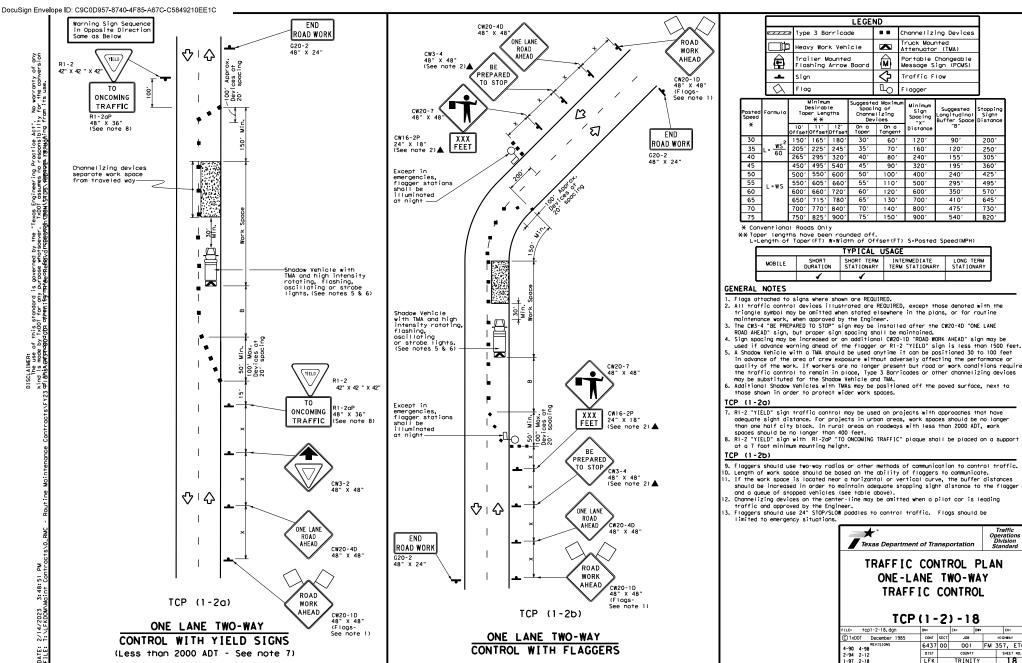
BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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SHEET 11 OF 12





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

Speed	Formula	Minimum Desirable Taper Lengths **		le	Suggested Maximum Spacing of Channelizing Devices		Spacing of Channelizing Devices		Minimum Sign Spacing "x"	Suggested Longitudinal Buffer Space	Stopping Sight Distance
*		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent	Distance	"В"			
30	ws²	1501	165'	180'	30'	60'	120'	90′	200'		
35	L = WS	2051	2251	245'	35′	70'	160'	120'	250'		
40	80	2651	2951	320'	40'	80'	240'	155'	305′		
45		450'	4951	5401	45′	90'	320'	195'	360'		
50		500'	5501	600'	50′	100'	4001	240'	425'		
55	L=WS	5501	6051	660'	55′	110'	500'	295'	4951		
60	L - #13	600'	660'	720'	60′	120'	600'	350′	570′		
65		650'	715′	7801	65′	1301	7001	410'	645'		
70		700′	770′	8401	70'	140'	800'	475′	730′		
75		7501	8251	900'	751	150'	900'	540'	820'		

TYPICAL USAGE							
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY			
		1					

- 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

- in advance of the area of crew exposure without adversely affecting the performance or in dovance or the dred of crew exposure without doversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.

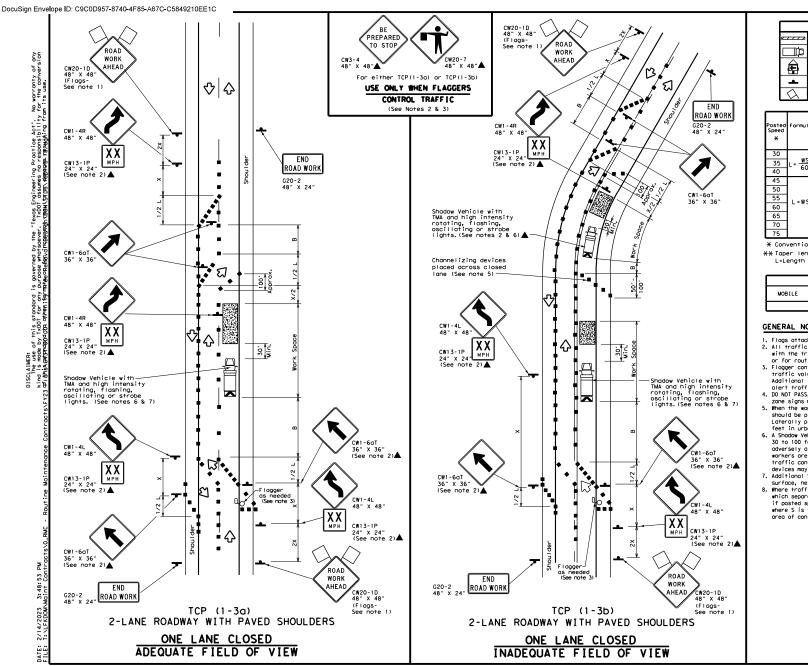
 6. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to
- those shown in order to protect wider work spaces.
- 7. R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban greas, work spaces should be no longer than one half city block. In rural areas on roadways with less than 2000 ADT, work
- spaces should be no longer than 400 feet.
 R1-2 "YIELD" sign with R1-2aP "TO ONCOMING TRAFFIC" plaque shall be placed on a support
- Flaggers should use two-way radios or other methods of communication to control traffic.
 Length of work space should be based on the ability of flaggers to communicate.
- and a queue of stopped vehicles (see table above).
- Channelizing devices on the center-line may be amitted when a pilot car is leading traffic and approved by the Engineer.



TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

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	LEGEND							
~~~	Type 3 Barricade	88	Channelizing Devices					
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)					
Ê	Trailer Mounted Flashing Arrow Board	(X	Portable Changeable Message Sign (PCMS)					
4	Sign	∿	Traffic Flow					
$\Diamond$	Flag	3	Flagger					

Speed	Formula	Minimum Desirable Taper Lengths **			Spacin		Minimum Sign Spacing "x"	Suggested Longitudinal Buffer Space
*		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent	Distance	"B"
30		150′	165'	180'	301	60'	120'	90'
35	L = WS	2051	225'	245'	35′	70′	160′	120′
40	80	2651	295′	3201	401	801	240'	1551
45		450'	4951	540'	45′	90′	320′	195′
50		500'	550′	6001	50′	1001	400'	240′
55	L=WS	5501	6051	660'	55′	110′	500′	295′
60	L-#3	6001	660′	7201	60′	1201	600'	350′
65		650′	715′	780′	65′	130'	7001	410′
70		7001	770′	8401	70′	140′	8001	475′
75		750′	8251	900'	75′	150′	900'	540′

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

TYPICAL USAGE							
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY			
	1	1					

#### GENERAL NOTES

- 1. Flags attached to signs where shown are REQUIRED.
- 2. All traffic control devices illustrated are REQUIRED, except those denoted 2. All trattic control devices illustrated are koulkey, except mose denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.

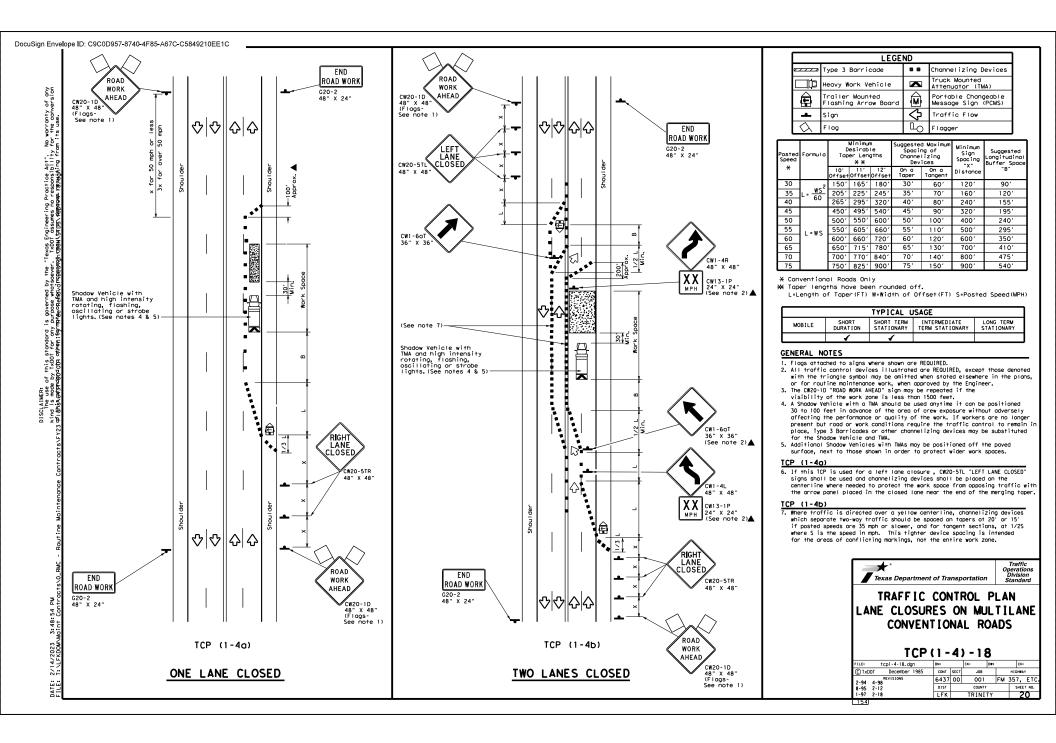
  3. Flagger control should NOT be used unless roadway conditions or heavy traffic valume require additional emphasis to safely control traffic.
- Additional flaggers may be positioned in advance of traffic queues to alert traffic to reduce speed.
- DO NOT PASS, PASS WITH CARE and construction regulatory speed zone signs may be installed downstream of the ROAD WORK AHEAD signs.
- When the work zone is made up of several work spaces, channelizing devices should be placed laterally across the closed lane to re-emphasize closure.
- should be placed interally across the closed later to re-emphasize closure. Laterally placed channelizing devices should be repeated every 500 to 1000 feet in urban areas and every 1/4 to 1/2 mile in rural areas. 6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
- Additional Shodow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
- 8. 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 speed are 35 mph or slower, and for tangent sections, at 1/25 where S is the speed in mph. This tighter device spacing is intended for the area of conflicting markings not the entire work zone.

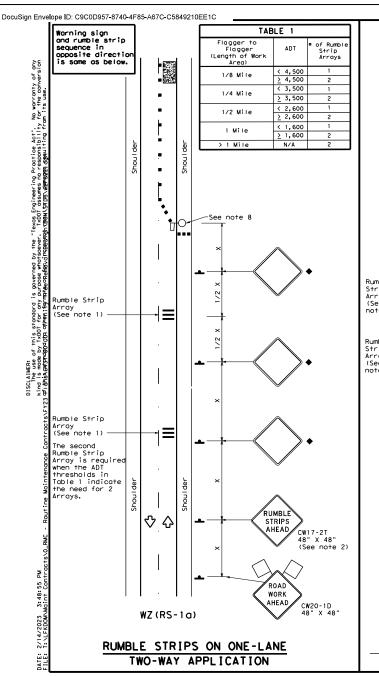


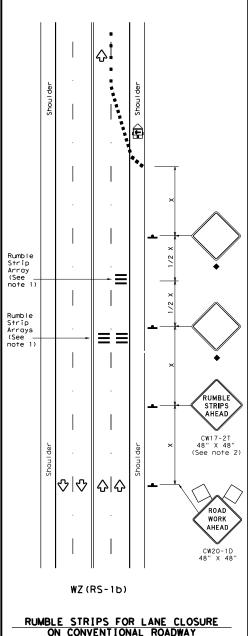
TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

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#### GENERAL NOTES

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

	LEGEND								
	Type 3 Barricade	8 8	Channelizing Devices						
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)						
Ê	Trailer Mounted Flashing Arrow Panel	(M)	Portable Changeable Message Sign (PCMS)						
-	Sign	Ŷ	Traffic Flow						
$\Diamond$	Flag	4	Flagger						

Posted Speed *	Formula	Minimum Desirable Taper Lengths **		Spacin Channe Dev	lizing ices	Minimum Sign Spacing "X"	Suggested Longitudinal Buffer Space "B"	
*		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent	Distance	-8-
30	. WS ²	1501	1651	1801	30′	60′	1201	90'
35	L = WS	2051	2251	2451	35′	70′	160'	120'
40	60	265′	2951	3201	40'	801	240'	155′
45		450'	4951	5401	45′	90'	3201	1951
50		500'	550′	600'	50′	1001	4001	240′
55	L=WS	550'	6051	6601	55′	110'	5001	295′
60	L ,, J	600'	660'	7201	60'	1201	600'	350′
65		650'	7151	7801	65′	130'	7001	410′
70		700′	770′	840'	701	140'	8001	475′
75		7501	8251	9001	75′	150′	900'	540′

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

		TYPICAL U	ISAGE	
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	1	1		

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

TABLE 2							
Speed	Approximate distance between strips in an array						
≤ 40 MPH	10′						
> 40 MPH & <u>&lt;</u> 55 MPH	15'						
= 60 MPH	20′						
≥ 65 MPH	* 35'+						

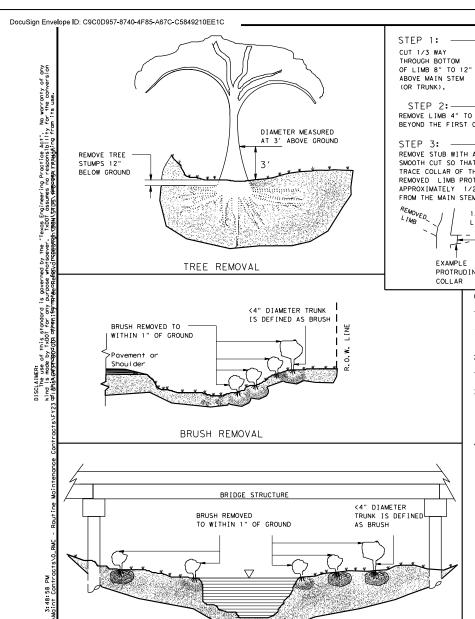
Texas Department of Transportation

TEMPORARY RUMBLE STRIPS

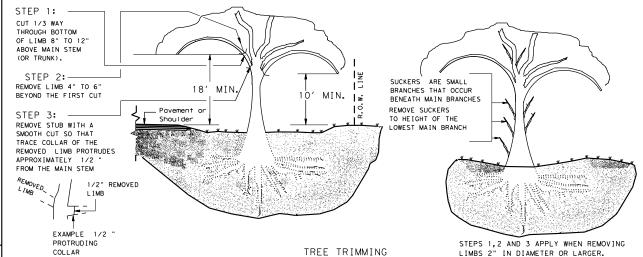
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4-10		LFK	TRINITY			21		

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BRUSH REMOVAL UNDER BRIDGE AND IN CHANNEL



#### GENERAL NOTES:

#### TREE TRIMMING

- TRIM AND REMOVE ALL TREE LIMBS ON THE PAVEMENT SIDE OF THE TRUNK 18' ABOVE THE PAVEMENT OR BRIDGE DECK ELEVATION, UNLESS OTHERWISE SHOWN ON THE PLANS.
- TRIM AND REMOVE ALL TREE LIMBS BETWEEN THE TRUNK AND R.O.W. LINE 10' ABOVE NATURAL GROUND, TERRAIN OR OTHER STRUCTURE ELEVATION, UNLESS OTHERWISE SHOWN ON THE PLANS.
   TREE REMOVAL
- 3. FOR TREES MARKED FOR REMOVAL, THE DIAMETER OF TREES ARE DETERMINED BY MEASUREMENT OF THE TRUNK CIRCUMFERENCE
  - 3' ABOVE THE GROUND, TREES WITH TRUNKS OF LESS THAN 4" DIAMETER ARE CONSIDERED TO BE BRUSH. TREES WITH MULTIPLE TRUNKS AT THE POINT OF MEASUREMENT ARE MEASURED AND PAID FOR SEPARATELY.
- 4. MEASUREMENTS FOR PAYMENT OF TREE DIAMETERS ARE DIVIDED INTO THE RANGES SHOWN IN TABLE 1.

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

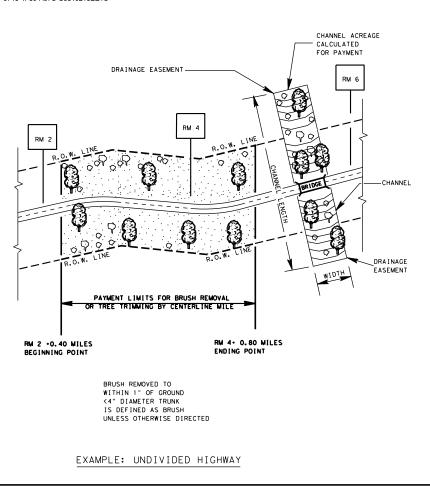
*SEE GENERAL NOTE #3.

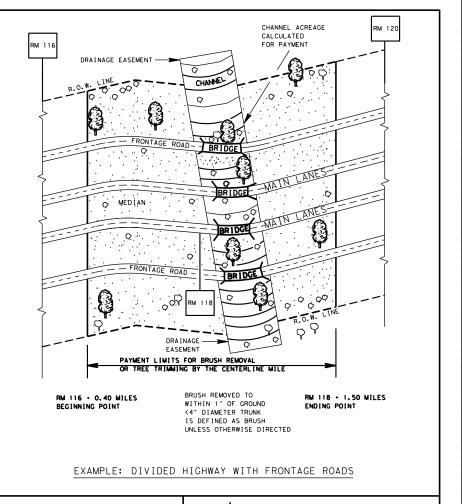
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GENERAL NOTES:

TREE TRIMMING AND BRUSH REMOVAL

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



NOT TO SCALE

▼ Texas Department of Transportation

Maintenance Division Standard Plans

SHEET 2 OF 2

TREE AND BRUSH REMOVAL

TRB-15(2)

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REVISED:	9/24/2004	LJB		COUNTY		CONTROL	SECTION	J08		H1CH#	VY.
REVISED:	APRIL 2015	JE0	TR	INITY		6437	00	001	FМ	357,	ETC
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STORMWATER POLLUTION	PREVENTION-CLEAN WATER	R ACT SECTION 402	III. CULTURAL RESOURCES	VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES				
TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more ocres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with 1 tem 506.			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.) case work in the immediate area and contact the Engineer immediately.	General (applies to all projects):  Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting sofety 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.				
List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.  1. N/A  No Action Required Required Action  Action No.			☐ No Action Required	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:				
			Contractor to repair or replace in kind, at their own expense, any historic materials damaged (buildings, historical markers, etc.) in the course of	Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curin 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.				
			executing the work. Contractor is responsible for locating replacement source for historical materials admoged in the course of the work. TXDOT-Environmental Affairs Division is to be informed of proposed repairs to facilitate consultation with Texas Historical Commission prior to the execution of repairs.	Maintain an adequate supply of an-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				
	project is the removal and trim			of all product spills.				
dying, or protruding into Sto	inity County Maintenance Section te right-of-way. This activity and original purpose of the site.	maintains the original line and Therefore, this project meets	IV. VEGETATION RESOURCES	Contact the Engineer if any of the following are detected:  Dead or distressed vegetation (not identified as normal)  Trosh piles, drums, conister, borrels, etc.				
	intenance activity as defined i 2023 and TCEQ's TPDES CGP does		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	and the project that the cry of regularity and the contract of				
			Portions of roadways within the Trinity County Maintenance Section occurs	replacements (bridge class structures not including box culverts)?				
WORK IN OR NEAR STRE	AMS, WATERBODIES AND W	VETLANDS CLEAN WATER	within compartments of the Davy Crockett National Forest (DCNF). Below are following roadways and actions required:	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				
ACT SECTIONS 401 AND	404		FM 357: From SH 21 to FM 2262					
USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.			FM 2262: From SH 94 to FM 357 and FM 357 to US 287 SH 94: From Angelina County Line to FM 2262 and Apple Springs to US 287 US 287: From FM 2262 to FM 1280	If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist w the notification, develop obatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at lea 15 working days prior to scheduled demolition.				
The Contractor must adhere to all of the terms and conditions associated with the following permit(s):  [X] No Permit Required			FM 1280: From US 281 to 1 mile West of US 287 FM 358: From FM 3154 to 3. 42 miles East of FM 3154 FM 3154: From FM 358 to US 287					
			FM 2781: From Kennord, TX to CR 4545	If "No", then TxDOT is still required to notify DSHS 15 working days prior to an scheduled demolition.				
Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)		an 1/10th acre waters or	a) Area Engineer shall notify the USFS (DCNF) prior to commencing work on the above roadways.     b) NO trees along these roadways are to be cut or otherwise damaged without it.	In either case, the Contractor is responsible for providing the date(s) for abdr				
Nationwide Permit 14 -		2 acre, 1/3 in tidal waters)	approval from the Area Engineer and USFS (DCNF).	Any other evidence indicating possible hazardous materials or contamination disc				
Other Nationwide Permi			V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES	on site. Hazardous Materials or Contamination Issues Specific to this Project:  \[ \infty \text{No Action Required}   \text{Required Action} \]				
	ters of the US permit appli Practices planned to contr		AND MIGRATORY BIRDS.  □ No Action Required	1. N/A				
1. N/A			No Action Required X Required Action  1. In order to maintain compliance with Chapter 64 of the Texas Parks and Wildlife	VII. OTHER ENVIRONMENTAL ISSUES				
			Code and Migratory Bird Treaty Act (MBTA), construction activities that may affect nests (i.e. tree removal, tree limbing, bridge work) shall be conducted outside of the					
			nesting season (March 15 to September 15). In the event birds or active nests (eggs and/or nestlings present) are encountered, contact the engineer prior to conducting work					
			Red-cockaded woodpecker (federally listed endangered species) habitat	Action No.				
The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.  Best Management Practices:			is present adjacent to the ROW along FM 357 from Carlton Road to FM 2562. No trees along this roadway are to be out or otherwise damaged without prior approval from the Area Engineer.	Area Engineer shall notify USFS prior to working on locations provided in Section V.     Limbing IS allowed within the US Forest Service (DCNF) boundary.				
			Critical Habitat for the Neches River Rose-Mallow (federally threatened species) is present within the ROW along FM 230 from 2.25 miles West	2. Do not fell trees within the US Forest Service (DONF) boundary without prior approval. Timber cut within US Forest  One of the US Forest  One of the US Forest  One of the US Forest				
Erosion	Sedimentation	Post-Construction TSS	of SH 19 to 2.90 miles West of SH 19 and along SH 94 between the Neches Riverand FM 2262. Contact District Environmental Staff prior to working in these	Service (DCNF) boudnary remains the property of US Forest Service (DCNF)				
Temporary Vegetation	Silt Fence	Vegetative Filter Strips	areas.	and may require measured lengthsto be cut or for trees to be felled entirely  Tayor Department of Transportation				
☐ Blankets/Matting ☐ Mulch	☐ Rock Berm ☐ Triangular Filter Dike	Retention/Irrigation Systems Extended Detention Basin		onto US Forest Serivce (DCNF) Land.				
Sodding	Sand Bag Berm	Constructed Wetlands	LIST OF ABBREVIATIONS	ENVIRONMENTAL PERMIT				
Interceptor Swale	Straw Bale Dike	Wet Basin	BMP: Best Management Practice SPCC: Spill Prevention Control and Countermeasure	ISSUES AND COMMITMEN				
Diversion Dike Erosion Control Compost	☐ Brush Berms ☐ Erosion Control Compost	☐ Erosion Control Compost ☐ Mulch Filter Berm and Socks	COP: Construction General Permit DSMS: Texas Department of State Health Services FHMA: Federal Highway Administration PDN: Pre-Construction Notification PSL: Prolect Sectific Location	EPIC				
_	<del>-</del>	s Compost Filter Berm and Socks	MOA: Memorandum of Agreement TCEQ: Texas Commission on Environmental Quality MOU: Memorandum of Understanding TONES: Texas Pollutant Discharge Elimination System					
Compost Filter Berm and Soc	ks Compost Filter Berm and So	_	MS4: Municipal Separate Stormwater Sewer System TPMD: Texas Parks and Wildlife Department MBTA: Migratory Bird Treaty Act TYDD: Texas Department of Transportation	©TxDOT: February 2015 cont sect Job High				
	Stone Outlet Sediment Traps	s Sand Filter Systems Grassy Swales	NOT: Notice of Termination T&E: Threatened and Endangered Species NMP: Noticnwide Permit USACE: U.S. Army Corps of Engineers	12-12-2011 (DS) PEVISIONS 64-37 0.0 0.01 FM 357 05-07-14 ADDID NOTE SECTION IV. DIST COUNTY S				