

FHWA TEXAS DIVISION		PROJECT NO. RMC 6469-05-001		SHEET NO. 1
STATE	DISTRICT	COUNTY		
TEXAS	LFK	HOUSTON, ETC.		
CONTROL SECTION	JOB	HIGHWAY NO.		
6469	05	001	US 287, ETC.	

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STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY ROUTINE MAINTENANCE CONTRACT

TYPE OF WORK:

CLEANING AND SEALING CRACKS (SOUTH)

RMC 6469-05-001

US 287, ETC.

HOUSTON, ETC.

LIMITS: VARIOUS LOCATIONS WITHIN THE HOUSTON, TRINITY, POLK, AND SAN JACINTO COUNTY MAINTENANCE SECTIONS

SEE SHEETS 2 AND 3
FOR LOCATION MAPS

BARRICADES AND WARNING SIGNS

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

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RECOMMENDED FOR LETTING:



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

DocuSigned by:
Jeremy King, P.E. 6/4/2024
5135292FE4184A4... DATE

DISTRICT MAINTENANCE ENGINEER
APPROVED FOR LETTING:

DocuSigned by:
Kevin Buranakitipinyo 6/4/2024
DABECD29BC5C492... DATE

DIRECTOR OF MAINTENANCE

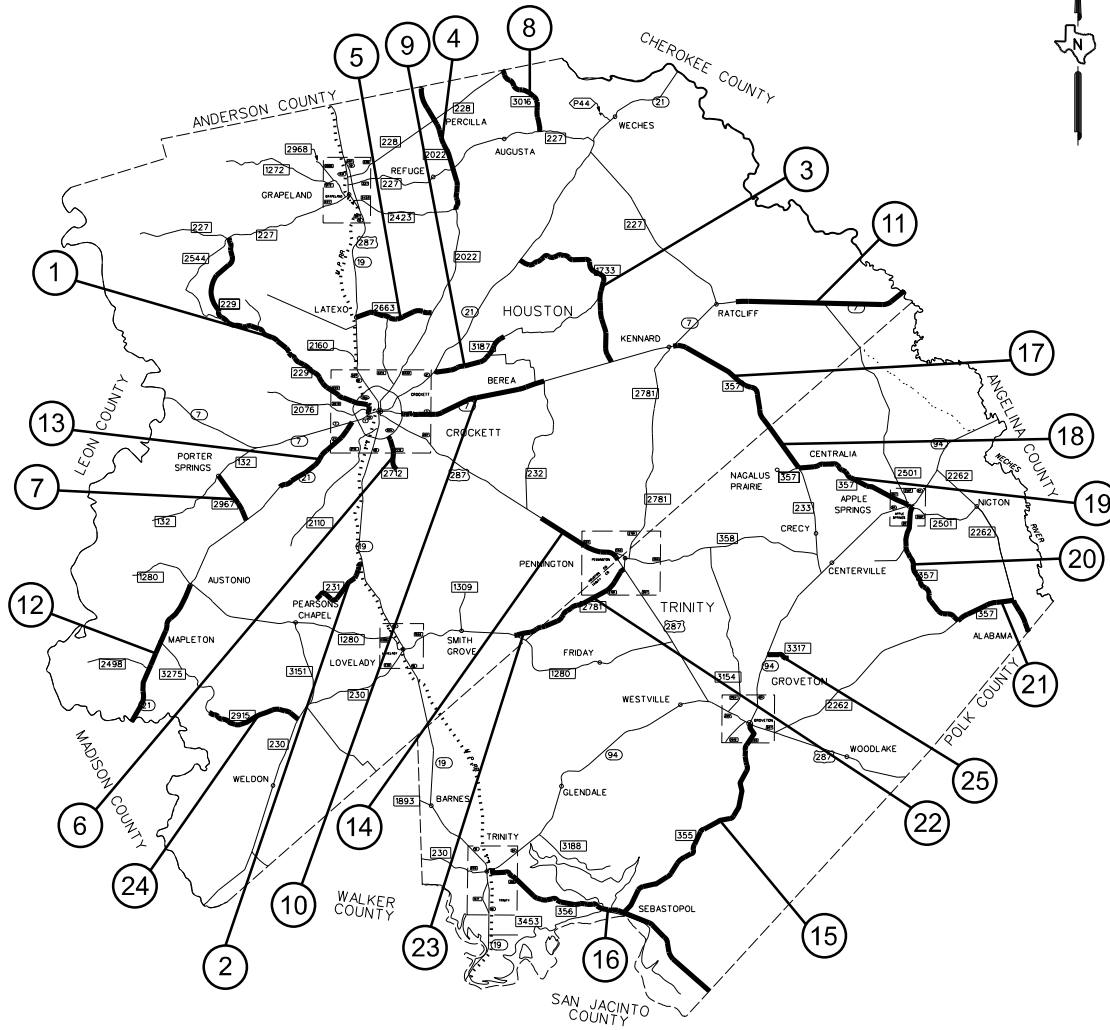
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Jeremy King, P.E. 6/4/2024
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SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION NOVEMBER 1, 2014 AND SPECIAL SPECIFICATION ITEMS INCLUDED IN THE CONTRACT SHALL GOVERN ON THIS PROJECT.

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PROJECT REFERENCE	MAINTENANCE SECTION	HIGHWAY NUMBER	ROADWAY	
			LIMITS	
			FROM	TO
1	HOUSTON	FM 229	FM 2544 RM 656+0.041	SH 7 RM 670+1.177
2	HOUSTON	FM 231	BEG. OF PAVEMENT RM 666+0.000	SH 19 RM 668+1.809
3	HOUSTON	FM 1733	SH 21 RM 354+0.049	SH 7 RM 364+0.371
4	HOUSTON	FM 2022	ANDERSON CO. LINE RM 344+1.862	FM 2423 RM 352+1.299
5	HOUSTON	FM 2663	US 287 RM 688+0.021	FM 2022 RM 672+0.433
6	HOUSTON	FM 2712	SL 304 RM 364+0.031	END OF PAVEMENT RM 364+1.784
7	HOUSTON	FM 2967	FM 132 RM 366+0.063	SH 21 RM 368+0.826
8	HOUSTON	FM 3016	FM 228 RM 344+0.042	FM 227 RM 348+0.418
9	HOUSTON	FM 3187	SH 21 RM 674+0.031	END OF PAVEMENT RM 678+0.382
10	HOUSTON	SH 7	SL 304 RM 676+0.320	FM 232 RM 684+0.446
11	HOUSTON	SH 7	0.312 MI. EAST OF FM 227 RM 694+1.171	ANGELINA CO. LINE RM 704+1.483
12	HOUSTON	SH 21	MADISON CO. LINE RM 694+0.558	FM 1280 WEST RM 704+0.392
13	HOUSTON	SH 21	2.48 MI. EAST OF FM 2967 RM 710+1.748	SH 7 RM 716+1.506
14	HOUSTON	US 287	1.2 MI SE OF FM 232 RM 646+1.078	TRINITY CO. LINE RM 650+1.761
15	TRINITY	FM 355	INT. FM 356 RM 380+0.059	INT. US 287 RM 394+0.032
16	TRINITY	FM 356	SH 94 RM 686+0.049	POLK CO. LINE RM 702+0.047
17	TRINITY	FM 357	SH 7 RM 686+0.04	TRINITY CO. LINE RM 694+0.000
18	TRINITY	FM 357	HOUSTON CO. LINE RM 694+0.000	FM 233 RM 696+0.717
19	TRINITY	FM 357	FM 233 696+0.717	SH 94 RM 702+1.437
20	TRINITY	FM 357	SH 94 RM 702+1.635	FM 2262 RM 710+1.327
21	TRINITY	FM 357	FM 2262 RM 710+1.327	POLK CO. LINE RM 716+0.447
22	TRINITY	FM 2781	US 287 RM 370+1.350	HOUSTON COUNTY LINE RM 376+0.796
23	TRINITY	FM 2781	TRINITY CO. LINE RM 376+0.796	FM 1280 RM 380+0.081
24	TRINITY	FM 2915	END OF PAVEMENT RM 680+0.059	FM 230 RM 684+1.283
25	TRINITY	FM 3317	END OF PAVEMENT RM 692+0.033	INT. SH 94 RM 694+0.067

N.T.S.

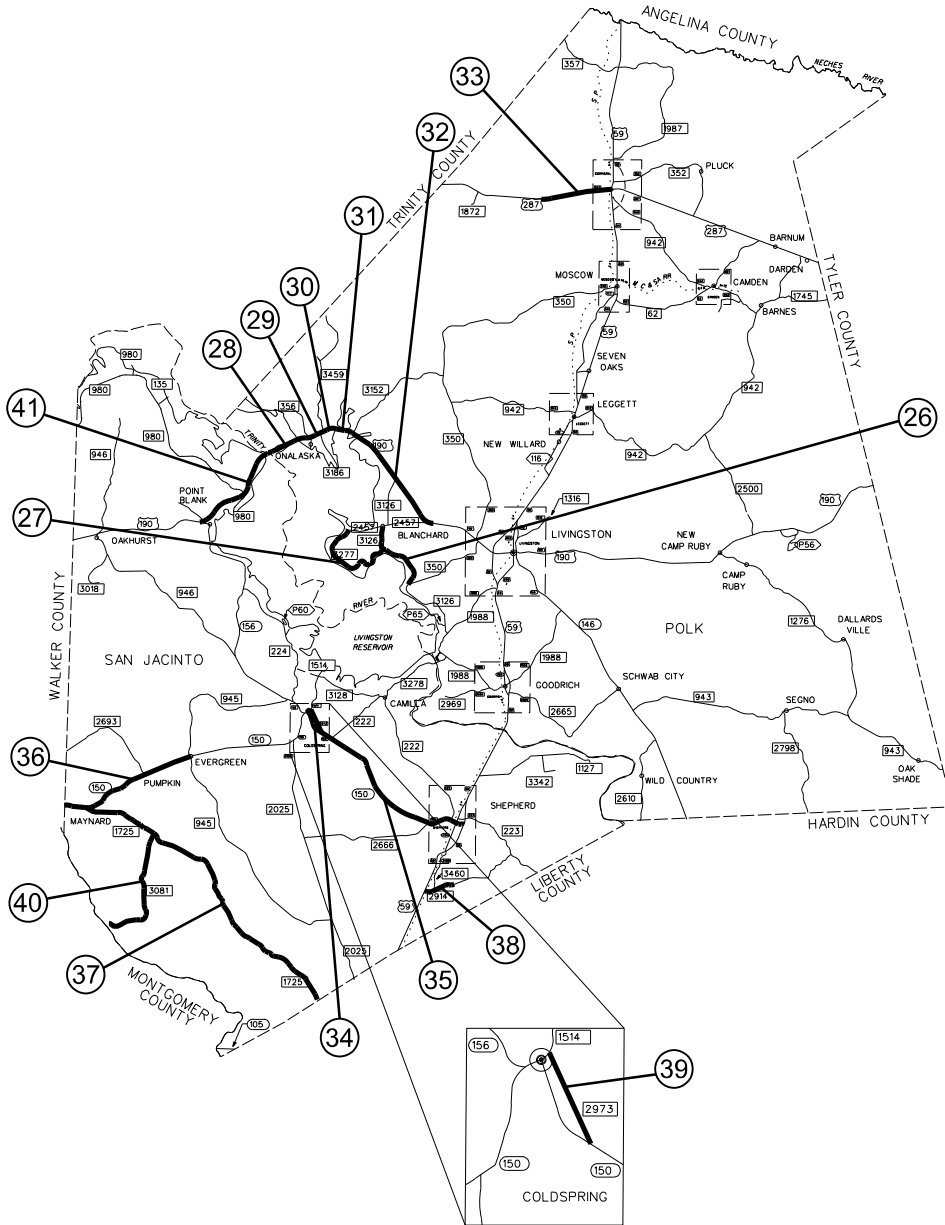
LOCATION MAPS

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 Texas Department of Transportation
 SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
6469	05	001	US 287, ETC.
DIST		COUNTY	SHEET NO.
LFK		HOUSTON, ETC.	2

5/30/2024 8:12:08 AM T:\LFLK\DDA\Maint Contracts\0.RMC - Routine Maintenance Contracts\F25 Plans\6969-05-08 Houston Creek Seal (South)\DCN\LOCATION MAP 2.dgn



PROJECT REFERENCE	MAINTENACE SECTION	HIGHWAY NUMBER	ROADWAY	
			LIMITS	
			FROM	TO
26	POLK	FM 3126	FM 2457 RM 400+0.980	FM 350 404+1.010
27	POLK	FM 3277	FM 2457 RM 694+0.020	FM 3126 RM 698+1.510
28	POLK	US 190	SAN JACINTO CO. LINE RM 770+0.02	OLD TRINITY ROAD RM 772+0.580
29	POLK	US 190	OLD TRINITY ROAD RM 772+0.580	FM 3459 RM 772+1.610
30	POLK	US 190	FM 3459 RM 772+1.610	KICKAPOO CREEK RD RM 774+0.150
31	POLK	US 190	KICKAPOO CREEK RD RM 774+0.150	SANDY RIDGE DR RM 774+1.150
32	POLK	US 190	SANDY RIDGE DR RM 774+1.150	FM 2457 RM 774+1.510
33	POLK	US 287	PACES CREEK RM 678+1.85	US 59 RM 692+1.571
34	SAN JACINTO	SH 150	SH 156 RM 694+1.043	FM 222 RM 696+1.216
35	SAN JACINTO	SH 150	FM 222 RM 696+1.216	US 58 RM 706+0.719
36	SAN JACINTO	SH 150	WALKER CO. LINE RM 678+1.365	FM 945 RM 696+1.543
37	SAN JACINTO	FM 1725	SH 150 RM 416+0.047	LIBERTY CO. LINE RM 434+0.000
38	SAN JACINTO	FM 2914	US 59 RM 698+0.078	END OF STATE MAINTENANCE RM 698+1.530
39	SAN JACINTO	FM 2973	FM 1514 RM 412+0.025	SH 150 RM 414+0.014
40	SAN JACINTO	FM 3081	FM 1725 RM 418+0.250	MONTGOMERY CO. LINE RM 426+0.217
41	SAN JACINTO	US 190	SH 156 RM 762+1.277	POLK CO. LINE RM 770+0.021

N.T.S.

LOCATION MAPS

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SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
6469	05	001	US 287, ETC.
DIST	COUNTY		SHEET NO.
LFLK	HOUSTON, ETC.		3

Project Number: RMC 6469-05-001**Control:** 6469-05-001**County:** HOUSTON, ETC.**Highway:** US 287, ETC.**GENERAL NOTES:**

Project Description: This project consists of cleaning and sealing joints and cracks at various locations within the Houston, Trinity, Polk, and San Jacinto County Maintenance Sections.

TxDOT Project Supervisors: All work on this contract will be scheduled and directed by the Maintenance Section Supervisors 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 following Maintenance Section Supervisors listed below.

<u>COUNTY</u>	<u>SUPERVISOR</u>	<u>ADDRESS</u>	<u>CONTACT #</u>
Houston	Danny Luna	1123 East Loop 304 Crockett, TX 75835	(936)544-2264
Trinity	David Wars	728 W First St. Groveton, TX 75845	(936)642-1132
Polk	James Henagan	3161 US Highway 59 Livingston, TX 77351	(936)327-8914
San Jacinto	Chester Dixon	8066 SH 150 West Shepherd, TX 77371	(936)628-3328

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

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

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

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.

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.

General Notes**Project Number:** RMC 6469-05-001**Control:** 6469-05-001**County:** HOUSTON, ETC.**Highway:** US 287, 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.

The contractor's attention is directed to the EPIC sheet(s) included in this plan set for additional information regarding environmental permits, issues, and commitments.

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.dot.state.tx.us/business/contractors_consultants/repro_companies.htm

Item 5: Control of the Work

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

Item 7: Legal Relations and Responsibilities

The proposed work of this project consists of the cleaning and sealing of cracks on existing roadway pavement at various locations shown in the plans within Houston, Trinity, Polk, and San Jacinto County Maintenance Sections. 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.

General Notes**Sheet 4**

Project Number: RMC 6469-05-001

Control: 6469-05-001

County: HOUSTON, ETC.

Highway: US 287, ETC.

- Portion of Site 15: FM 355 is within the Trinity County Courthouse Historic District in Groveton. Portion of Site 34 is within the San Jacinto County Courthouse Historic District in Coldspring. The following actions are required.
1. Equipment storage and stockpiling of materials is NOT permitted in ANY pull-off or parking area labelled as historical markers, buildings, or property.
- Portions of the following roadways occur within the boundaries of the U.S. Forest Service Property and require the following actions:
 Site 3: FM 1733 Davy Crockett National Forest
 Site 11: SH 7 Davy Crockett National Forest
 Site 17: FM 357 Davy Crockett National Forest
 Site 19: FM 357 Davy Crockett National Forest
 Site 20: FM 357 Davy Crockett National Forest
 Site 21: FM 357 Davy Crockett National Forest
 Site 25: FM 3317 Davy Crockett National Forest
 Site 35: SH 150 Sam Houston National Forest
 Site 37: FM 1725 Sam Houston National Forest
 Site 40: FM 3081 Sam Houston National Forest
1. Area Engineer shall notify the Davy Crockett National Forest and Sam Houston National Forest prior to commencing work on the above roadways.
 2. NO stockpiling or storage of materials and equipment within the boundaries of the Davy Crockett National Forest and Sam Houston National Forest.
- Red-cockaded Woodpecker (federally listed endangered species) cluster is present adjacent to the ROW along the following roadways below. Conservation measures have been agreed upon by the USFWS and TxDOT to ensure that the proposed action will not adversely affect the red-cockaded woodpecker. The conservation measures below must be followed in order to be in compliance with the ESA:
 Site 3: FM 1733 from 0.20 mile north of SH 7 to 0.70 mile north of SH 7.
 Site 11: SH 7 from 1.25 mile west of CR 1160 to 2.75 mile west of CR 1160 and from 0.90 mile east of CR 1160 to 1.25 mile east of CR 1160.
 Site 21: FM 357 from 0.34 mile east of the West intersection of FM 357/2262 to 1.75 mile east of the West intersection of FM 357/2262.
1. NO WORK shall be performed on (highway) from April 1 to July 31.
 2. WORK shall begin one hour after sunrise and cease one hour before sunset.
 3. NO STOCKPILES or EQUIPMENT STORAGE shall be allowed along or within the ROW along (highway or location).

General Notes

Project Number: RMC 6469-05-001

Control: 6469-05-001

County: HOUSTON, ETC.

Highway: US 287, ETC.

Item 8: Prosecution and Progress

Contract Time – The number of working days shall be 35 days or until contract funds are expended.

For this project, working days will be computed and charged in accordance with Item 8, Section 3.1.4, “Standard Workweek”.

It is the intent of this contract to finish before March 31st, 2025.

Provide the sequence of work with an estimated project schedule to the Engineer for approval prior to commencing any work on this contract.

If the Contract is not completed in the allotted days provided, liquidated damages will be charged in accordance with SP 000-1243 for each day until the work is accepted by the Engineer as completed.

No lane closures will be allowed after Noon on Fridays or on days preceding National Holidays unless otherwise approved.

Unless otherwise approved, work shall not begin before daylight and all operations shall stop in sufficient time to have signs removed from the road before dark.

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:

1. The contractor fails to begin work at the specified time and/or location(s).
2. The contractor does not have all the personnel and pieces of equipment necessary to fulfill of the item(s) called out at the specified time and/or location(s).
3. The contractor does not complete the work continuously, unless approved by the Engineer.
4. The contractor fails to complete any requirements as stated in the general notes.

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

General Notes

Sheet 4A

Project Number: RMC 6469-05-001**Control:** 6469-05-001**County:** HOUSTON, ETC.**Highway:** US 287, ETC.**Item 502: Barricades, Signs, and Traffic Handling****Traffic Control Plan (TCP):**

Provide all traffic control for this project. The traffic control plan (TCP) will be governed by PART VI of the TMUTCD, TxDOT standard sheets, TCP standard sheets and as directed by the Engineer. Additional signing and/or barricades shown in the TMUTCD, BC, and TCP standards may be required by the Engineer to insure the safety of the traveling public.

Ensure the Contractor's Responsible Person (CRP) or their alternate for Barricades, Signs and Traffic Handling is available at all times and able to receive instructions from the Engineer or authorized Department representative. The CRP shall be a person that is usually at the project site during normal working hours.

In lieu of placing channeling devices on centerline for one-lane, two-way traffic control, the Contractor may provide the Pilot Car Method. Operate the pilot vehicle in coordination with the flagging operations and other controls at the end of one-lane sections in accordance with appropriate TCP. Mount a G20-4 (Pilot Car Follow Me) sign at a conspicuous location on the rear of the vehicle. Traffic delays caused by one-lane, two-way traffic control, will not be allowed to exceed 5 minutes unless approved by the Engineer. Centerline channelizing devices may be omitted with approval of the Area Engineer.

The Engineer has authority to direct the Contractor to revise TCP limits and/or operations if traffic delays consistently exceed 5 minutes in duration.

Lane Closures are Required on all Roadways.

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.

Limit lane closures for multilane roads (4 or more lanes) to 2 mi. in length, unless otherwise approved.

Limit lane closures for 2 lane roads to 1 mi. in length, unless otherwise approved.

Lane closure lengths can exclude the end tapers.

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

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

General Notes**Project Number:** RMC 6469-05-001**Control:** 6469-05-001**County:** HOUSTON, ETC.**Highway:** US 287, ETC.

Provide temporary rumble strips as shown on work zone rumble strip standards. Temporary rumble strips shall be a product listed on the Compliant Work Zone Traffic Control Devices and shall be a two-piece rumble strip that hinges in the middle.

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.

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.

Use additional flaggers at roadway intersections to direct traffic entering the work area when deemed necessary by the Engineer.

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

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.

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.

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

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.

All bi-directional machines such as rollers, compactors, front-end loaders, bulldozers and similar equipment shall be equipped with a horn, distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction. The horn shall be maintained in an operative condition.

General Notes**Sheet 4B**

Project Number: RMC 6469-05-001

Control: 6469-05-001

County: HOUSTON, ETC.

Highway: US 287, ETC.

The contractor shall not use any vehicle or equipment having an obstructed view to the rear unless the vehicle or equipment has a reverse signal alarm audible above the surrounding noise level. The alarm shall be maintained in an operative condition.

Item 712: Cleaning and Sealing Joints and Cracks (Asphalt Concrete)

All sealable cracks shall be filled according to specifications. This includes, but is not limited to, sealing over pavement markings and rumble strips.

Equipment used in cleaning cracks shall be capable of delivering a minimum of 125 PSI of air pressure with orifice of at least 0.5 inches in size.

Use of turbine blowers of any type for cleaning debris from cracks shall not be allowed.

Clean joints and cracks to the satisfaction of the Engineer with air blast cleaning to a depth at least twice the width of the joint or crack prior to sealing.

Seal cracks completely with crack sealer from edge of pavement to edge of pavement.

Use a hot applied rubber-asphalt crack sealer (Class B).

Hot poured rubber-asphalt (Class B) is NOT to be applied if the air temperature is below 50° F and falling, but may be applied when the temperature is above 40° F and rising; the air temperature being taken in the shade and away from artificial heat.

Joints and cracks must be free of moisture prior to sealing.

The sealant is not to be applied when, in the opinion of the Engineer, the weather conditions are not suitable.

Protect raised pavement markers from damage.

Complete all crack sealing at each location before beginning operations at subsequent locations, unless otherwise approved.

Dispose of solvents or other materials in a timely manner in accordance with local, state and federal regulations. Provide written documentation showing proof of compliance when required.

This item will be measured by the lane mile. Shoulders wider than 6 ft. are considered additional lanes.

Shoulders 6 feet wide and less are considered subsidiary to the travel lane.

Apply fine aggregate as needed to prevent tracking. Clean road of debris from cracks and open to traffic as soon as possible, but no later than the end of the workday. This work is subsidiary to Item 712.

General Notes

Project Number: RMC 6469-05-001

Control: 6469-05-001

County: HOUSTON, ETC.

Highway: US 287, ETC.

Item 6185: Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

All crash attenuators shall meet current NCHRP-350 standards, the requirements of this item, and the Department's Compliant Work Zone Traffic Control Device List.

<https://ftp.txdot.gov/pub/txdot-info/cmd/mpl/cwztcd.pdf>

Truck Mounted Attenuators (TMAs) as shown on the TCPs are not optional and shall be used. Whether shown on the TCPs or added by the Department, TMAs shall be paid for under Item 6185, "Truck Mounted Attenuator" for the type of operation being performed.

TMAs will be paid under Item 6185-6002 "TMA (STATIONARY)".

The TMA used for set-up and removal of the Traffic Control Plan is deemed to be the one and the same TMA used during maintenance of the Traffic Control Plan.

Submit to the Engineer on or before the pre-construction meeting a letter certifying all TMA devices used on the project meet NCHRP 350 or AASHTO Manual for assessing Safety Hardware (MASH) requirements.

Signs and arrow boards required on truck-mounted attenuators and pilot vehicles are subsidiary to Item 6185.

General Notes

Sheet 4C



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 6469-05-001

DISTRICT Lufkin
HIGHWAY US0287

COUNTY Houston

CONTROL SECTION JOB				6469-05-001		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00210411			
COUNTY				Houston			
HIGHWAY				US0287			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	4.000		4.000	
	712-6008	JT / CRCK SEAL (RUBBER - ASPHALT)	LMI	685.460		685.460	
	6185-6002	TMA (STATIONARY)	DAY	34.000		34.000	

HOT-POUR CRACK SEAL ASPHALT CONCRETE PROJECT SUMMARY (HOUSTON COUNTY)														ITEM CODE 0712 6008		
PROJECT REFERENCE	MAINTENANCE SECTION	HIGHWAY NUMBER	CONTROL	SECTION	ROADWAY							AVG. CRACKS/ 100 FT	CONTRACTOR'S INFO ONLY		JT / CRCK SEAL (RUBBER- ASPHALT)	
					LIMITS		LENGTH MI	NO OF LANES	LANE WIDTH	NO OF SHLDRS	SHLDR WIDTH		CRACKS/ MILE	ESTIMATE @ 1LB/4 LF		LMI
					FROM	TO										
1	HOUSTON	FM 229	0340	04	FM 2544 RM 656-0.041	SH 7 RM 670+1.177	14,140	2	11	2	1	46	4,857.60	8.59	28.28	
2	HOUSTON	FM 231	0938	01	BEG. OF PAVEMENT RM 666+0.000	SH 19 RM 668+1.809	3,810	2	11	2	1	58	6,124.80	2.92	7.62	
3	HOUSTON	FM 1733	1677	01	SH 21 RM 354-0.049	SH 7 RM 364+0.371	10,330	2	10.5	2	0.5	146	15,417.60	19.91	20.66	
4	HOUSTON	FM 2022	1875	02	ANDERSON CO. LINE RM 344+1.862	FM 2423 RM 352+1.299	7,940	2	11	2	1	6	633.60	0.63	15.88	
5	HOUSTON	FM 2663	2663	01	US 287 RM 668-0.021	FM 2022 RM 672+0.433	4,410	2	10.5			27	2,851.20	1.57	8.82	
6	HOUSTON	FM 2712	2324	01	SL 304 RM 364-0.031	END OF PAVEMENT RM 364+1.784	1,820	2	10.5			60	6,336.00	1.44	3.64	
7	HOUSTON	FM 2967	3034	01	FM 132 RM 366-0.063	SH 21 RM 368+0.826	2,820	2	11	2	1	192	20,275.20	7.15	5.64	
8	HOUSTON	FM 3016	3110	01	FM 228 RM 344-0.042	FM 227 RM 348+0.418	4,400	2	10			43	4,540.80	2.50	8.80	
9	HOUSTON	FM 3187	3265	01	SH 21 RM 674-0.031	END OF PAVEMENT RM 678+0.382	4,380	2	12			26	2,745.60	1.50	8.76	
10	HOUSTON	SH 7	0336	01	SL 304 RM 676+0.320	FM 232 RM 684+0.446	8,010	2	12	2	10	72	15,206.40	15.23	32.04	
					EXTRA 3RD PASSING LANE		3,000	1	12			72	3,801.60	1.43	3.00	
11	HOUSTON	SH 7	0336	02	0.312 MI. EAST OF FM 227 RM 694+1.171	ANGELINA CO. LINE RM 704+1.483	10,030	2	12	2	10	68	14,361.60	18.01	40.12	
					EXTRA PASSING LANES MAKING UP A 4 LANE		1,500	2	12			68	7,180.80	1.35	3.00	
12*	HOUSTON	SH 21	0117	06	MADISON CO. LINE RM 694+0.568	FM 1280 WEST RM 704+0.392	9,980	2	12	2	11	71	14,995.20	18.71	39.92	
					EXTRA 3RD PASSING LANE, PLUS TURN LANES @ FM 1280		5,000	1	12			71	3,748.80	2.34	5.00	
13	HOUSTON	SH 21	0117	07	2.48 MI. EAST OF FM 2967 RM 710+1.748	SH 7 RM 716+1.506	5,980	2	12	2	10	58	12,249.60	9.16	23.92	
					EXTRA 3RD PASSING LANE		4,250	1	12			58	3,062.40	1.63	4.25	
14	HOUSTON	US 287	0340	01	1.2 MI SE OF FM 232 RM 646+1.078	TRINITY CO. LINE RM 650+1.761	4,070	2	12	2	1	127	13,411.20	6.82	8.14	
					EXTRA PASSING LANES MAKING UP A 4 LANE		1,400	2	12			127	13,411.20	2.35	2.80	
HOUSTON MAINTENANCE SECTION SUBTOTALS													123.24	270.29		

*INCLUDES TURN LANES

**THE CONTRACTOR MUST CONTACT THE MAINTENANCE OFFICE PRIOR BEGINNING OF WORK IN EACH MAINTENANCE SECTION.

QUANTITY SUMMARIES

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SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
6469	05	001	US 287, ETC.
DIST	COUNTY	SHEET NO.	
LFK	HOUSTON, ETC.	6	

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HOT-POUR CRACK SEAL ASPHALT CONCRETE PROJECT SUMMARY (TRINITY COUNTY)														ITEM CODE 0712 6008	
PROJECT REFERENCE	MAINTENANCE SECTION	HIGHWAY NUMBER	CONTROL	SECTION	ROADWAY						AVG. CRACKS/100 FT	CONTRACTOR'S INFO ONLY		JT / CRCK SEAL (RUBBER- ASPHALT)	
					LIMITS		LENGTH MI	NO OF LANES	LANE WIDTH	NO OF SHLDRS		SHLDR WIDTH	CRACKS/ MILE		ESTIMATE @ 1LB/4 LF
					FROM	TO									
15	TRINITY	FM 355	0930	01	INT. FM 356 RM 380-0.059	INT. US 287 RM 394+0.032	14,091	2	12		50	5,280.00	9.30	28.18	
16	TRINITY	FM 356	0475	09	SH 94 RM 686-0.049	POLK CO. LINE RM 702+0.047	16,096	2	13		50	5,280.00	10.62	32.19	
17	TRINITY	FM 357	0940	01	SH 7 RM 686-0.04	TRINITY CO. LINE RM 694+0.000	8,040	2	13		50	5,280.00	5.31	16.08	
18	TRINITY	FM 357	0940	02	HOUSTON CO. LINE RM 694+0.000	FM 233 RM 696+0.717	2,717	2	13		50	5,280.00	1.79	5.43	
19	TRINITY	FM 357	0931	04	FM 233 696+0.717	SH 94 RM 702+1.437	6,720	2	13		50	5,280.00	4.44	13.44	
20	TRINITY	FM 357	2071	03	SH 94 RM 702+1.635	FM 2262 RM 710+1.327	7,692	2	13		50	5,280.00	5.08	15.38	
21	TRINITY	FM 357	2117	02	FM 2262 RM 710+1.327	POLK CO. LINE RM 716+0.447	5,120	2	12		50	5,280.00	3.38	10.24	
22	TRINITY	FM 2781	2913	02	US 287 RM 376+1.350	HOUSTON COUNTY LINE RM 376+0.796	5,446	2	13		50	5,280.00	3.59	10.89	
23	TRINITY	FM 2781	2813	01	TRINITY CO. LINE RM 376+0.796	FM 1280 RM 380+0.081	3,285	2	13		50	5,280.00	2.17	6.57	
24	TRINITY	FM 2915	2448	02	END OF PAVEMENT RM 660-0.059	FM 230 RM 664+1.283	5,342	2	13		50	5,280.00	3.53	10.68	
25	TRINITY	FM 3317	3493	01	END OF PAVEMENT RM 692-0.033	INT. SH 94 RM 694+0.067	2,100	2	11		50	5,280.00	1.39	4.20	
TRINITY COUNTY MAINTENANCE SECTION SUBTOTALS													50.60	153.28	

HOT-POUR CRACK SEAL ASPHALT CONCRETE PROJECT SUMMARY (POLK COUNTY)														ITEM CODE 0712 6008	
PROJECT REFERENCE	MAINTENANCE SECTION	HIGHWAY NUMBER	CONTROL	SECTION	ROADWAY						AVG. CRACKS/100 FT	CONTRACTOR'S INFO ONLY		JT / CRCK SEAL (RUBBER- ASPHALT)	
					LIMITS		LENGTH MI	NO OF LANES	LANE WIDTH	NO OF SHLDRS		SHLDR WIDTH	CRACKS/ MILE		ESTIMATE @ 1LB/4 LF
					FROM	TO									
26	POLK	FM 3126	3160	01	FM 2457 RM 400+0.980	FM 350 404+1.010	4,030	2	12		110	11,616.00	5.85	8.06	
27	POLK	FM 3277	3471	01	FM 2457 RM 694-0.020	FM 3126 RM 698+1.510	5,530	2	12		60	6,336.00	4.38	11.06	
28*	POLK	US 190	0213	03	SAN JACINTO CO. LINE RM 770+0.02	OLD TRINITY ROAD RM 772+0.580	2,560	2	12	2	10	25,344.00	8.11	10.24	
29*	POLK	US 190	0213	03	OLD TRINITY ROAD RM 772+0.580	FM 3459 RM 772+1.610	1,030	3	12	2	4	19,008.00	2.45	3.09	
30*	POLK	US 190	0213	03	FM 3459 RM 772+1.610	KICKAPOO CREEK RD RM 774+0.150	0,540	3	12	2	10	31,680.00	2.14	2.70	
31*	POLK	US 190	0213	03	KICKAPOO CREEK RD RM 774+0.150	SANDY RIDGE DR RM 774+1.150	1,000	2	12	2	10	25,344.00	3.17	4.00	
32*	POLK	US 190	0213	03	SANDY RIDGE DR RM 774+1.150	FM 2457 RM 780+1.610	6,460	3	12	2	10	31,680.00	25.58	32.30	
33*	POLK	US 287	0341	02	PACES CREEK RM 678+1.85	US 59 RM 682+1.571	3,721	2	12	2	10	33,792.00	15.72	14.88	
POLK COUNTY MAINTENANCE SECTION SUBTOTALS													67.40	86.33	

*INCLUDES TURN LANES

**THE CONTRACTOR MUST CONTACT THE MAINTENANCE OFFICE PRIOR BEGINNING OF WORK IN EACH MAINTENANCE SECTION.

QUANTITY SUMMARIES

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 Texas Department of Transportation
 SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
6469	05	001	US 287, ETC.
DIST	COUNTY	SHEET NO.	
LFK	HOUSTON, ETC.	7	

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HOT-POUR CRACK SEAL ASPHALT CONCRETE PROJECT SUMMARY (SAN JACINTO COUNTY)														ITEM CODE 0712 6008	
PROJECT REFERENCE	MAINTENANCE SECTION	HIGHWAY NUMBER	CONTROL	SECTION	ROADWAY							AVG. CRACKS/ 100 FT	CONTRACTOR'S INFO ONLY		JT / CRCK SEAL (RUBBER- ASPHALT)
					LIMITS		LENGTH MI	NO OF LANES	LANE WIDTH	NO OF SHLDRS	SHLDR WIDTH		CRACKS/ MILE	ESTIMATE @ 1LB/4 LF	
					FROM	TO							FT	TON	
34	SAN JACINTO	SH 150	0395	03	SH 156 RM 694+1.043	FM 222 RM 696+1.216	4,346	2	13	2	9	415	87,648.00	47.61	17.38
35	SAN JACINTO	SH 150	0395	03	FM 222 RM 696+1.216	US 59 RM 706+0.719	9,503	2	13	2	9	210	44,352.00	52.68	38.01
36	SAN JACINTO	SH 150	0395	02	WALKER CO. LINE RM 878+1.365	FM 945 RM 686+1.643	8,278	2	13	2	9	400	84,480.00	87.42	33.11
37	SAN JACINTO	FM 1725	1582	01	SH 150 RM 416+0.047	LIBERTY CO. LINE RM 434+0.000	18,047	2	12			350	36,960.00	83.38	36.09
38	SAN JACINTO	FM 2914	2962	01	US 59 RM 698+0.078	END OF STATE MAINTENANCE RM 698+1.630	1,708	2	12			200	21,120.00	4.51	3.42
39	SAN JACINTO	FM 2973	3037	01	FM 1514 RM 412+0.025	SH 150 RM 414+0.014	2,043	2	12			200	21,120.00	5.39	4.09
40	SAN JACINTO	FM 3081	2594	02	FM 1725 RM 418+0.250	MONTGOMERY CO. LINE RM 426+0.217	8,242	2	12			213	22,492.80	23.17	16.48
41	SAN JACINTO	US 190	0213	02	SH 156 RM 762+1.277	POLK CO. LINE RM 770+0.021	6,744	2	13	2	8	307	64,838.40	54.66	26.98
SAN JACINTO COUNTY MAINTENANCE SECTION SUBTOTALS													358.82	175.56	
PROJECT TOTALS													600.06	685.46	


*INCLUDES TURN LANES

**THE CONTRACTOR MUST CONTACT THE MAINTENANCE OFFICE PRIOR BEGINNING OF WORK IN EACH MAINTENANCE SECTION.

SUMMARY OF TRUCK MOUNTED ATTENUATORS (TMAs)	
COUNTY	ITEM 6185-6002
	TMA (STATIONARY)
	DAY
VARIOUS	34
PROJECT TOTALS FOR ALL COUNTIES	34

USE ACCORDING TO APPROPRIATE TCP STANDARDS.

QUANTITY SUMMARIES

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SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
6469	05	001	US 287, ETC.
DIST	COUNTY		SHEET NO.
LFK	HOUSTON, ETC.		8

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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 pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.
- Traffic control devices should be in place only while work is actually in progress or a definite need exists.
- The Engineer has the final decision on the location of all traffic control devices.
- Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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SHEET 1 OF 12

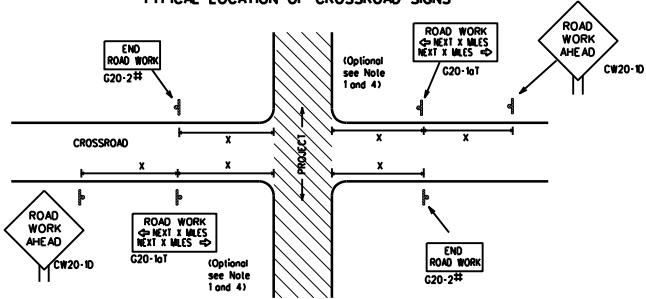


**BARRICADE AND CONSTRUCTION
 GENERAL NOTES
 AND REQUIREMENTS**

BC(1)-21

FILE:	bc-21.dgn	DN:	TxDOT	CK:	TxDOT	DN:	TxDOT	CK:	TxDOT
CONT:	November 2002	SECT:		JOB:		HIGHWAY:			
REVISIONS:		6469	05	001	US 287, ETC.				
4-03	7-13	DIST:		COUNTY:		SHEET NO.:			
9-07	8-14	LFK		HOUSTON, ETC.		9			
5-10	5-21								

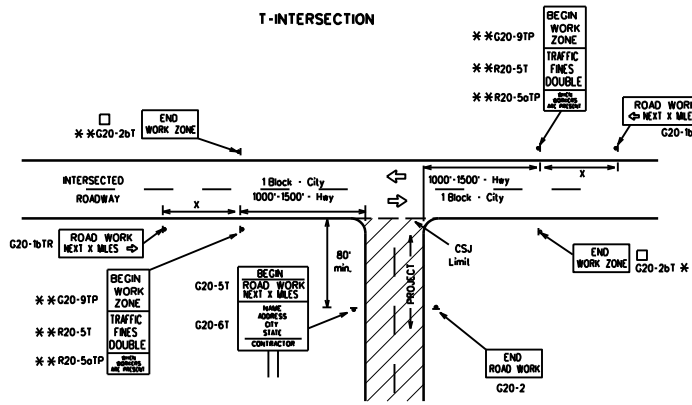
TYPICAL LOCATION OF CROSSROAD SIGNS



May be mounted on back of "ROAD WORK AHEAD" (CW20-10) sign with approval of Engineer. (See note 2 below)

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING

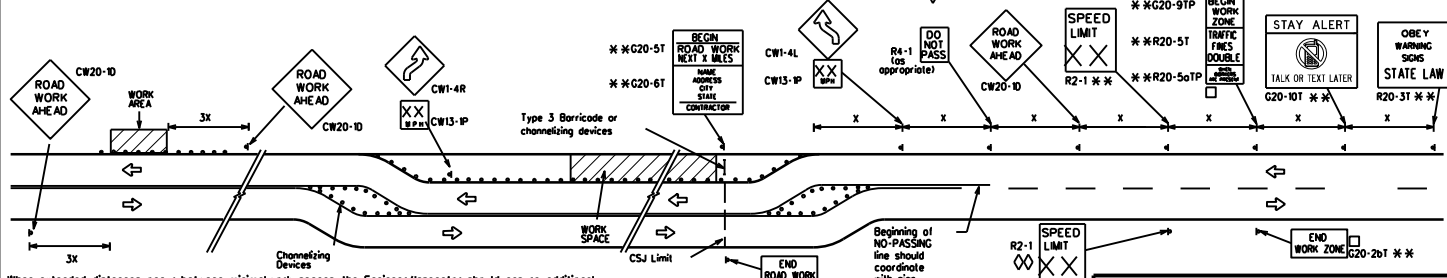
Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed MPH	Sign Spacing "X" Feet (Approx.)
CW20 ⁴	48" x 48"	48" x 48"	30	120
CW21			35	160
CW22			40	240
CW23	36" x 36"	48" x 48"	45	320
CW1, CW2, CW7, CW8, CW9, CW11, CW14			50	400
			55	500 ²
CW3, CW4, CW5, CW6, CW8-3,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

- For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.
- Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

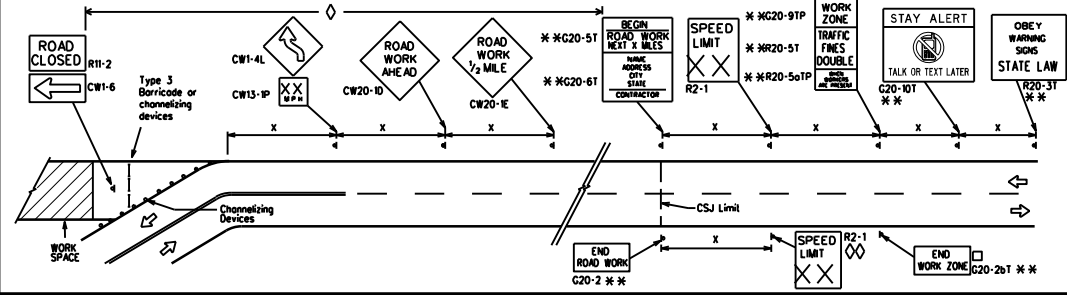
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-10) signs may be used on low volume crossroads at the discretion of the Engineer as per TMUTCD Part 5. See Note 2 under "Typical Location of Crossroad Signs".
- Only diamond shaped warning sign sizes are indicated.
- See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

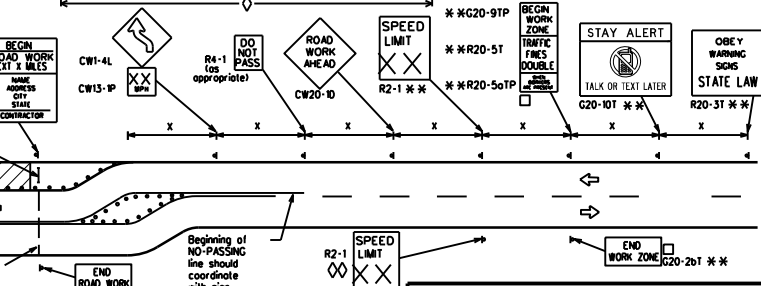


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-10) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



LEGEND

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

NOTES

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-5T) sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.

The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.

CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.

Area for placement of "ROAD WORK AHEAD" (CW20-10) and other signs or devices as called for on the Traffic Control Plan.

Contractor will install a regulatory speed limit sign at the end of the work zone.

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CR: TxDOT	DR: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6469	05	001	US 287, ETC.
9-07	8-14			
7-13	5-21			
	DIST	COUNTY		SHEET NO.
	LFK	HOUSTON, ETC.		10

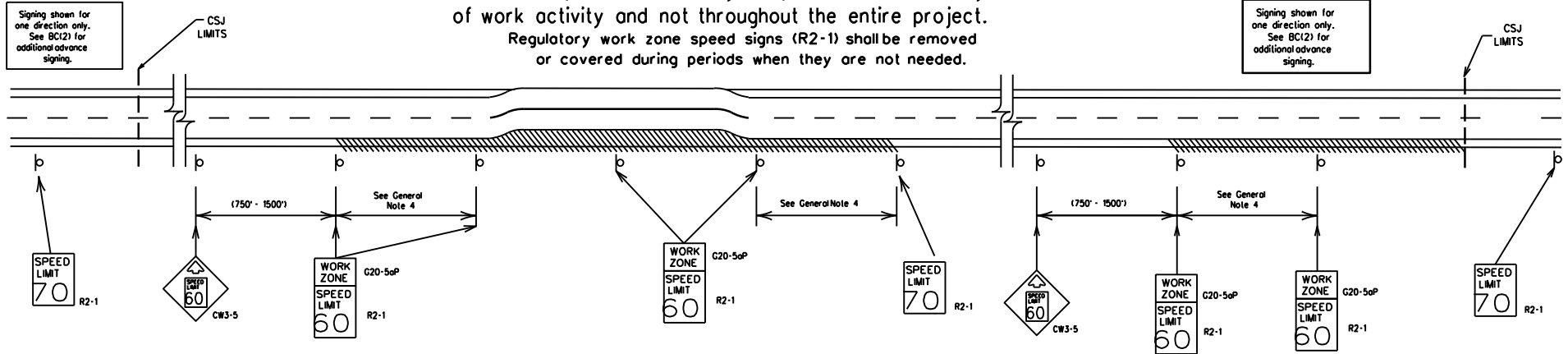
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Work zone speed limits shall be regulatory, established in accordance with the "Procedures for Establishing Speed Zones," and approved by the Texas Transportation Commission, or by City Ordinance when within incorporated City Limits.

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project. Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present.

Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

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

f) other conditions readily apparent to the driver

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

SHEET 3 OF 12



Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

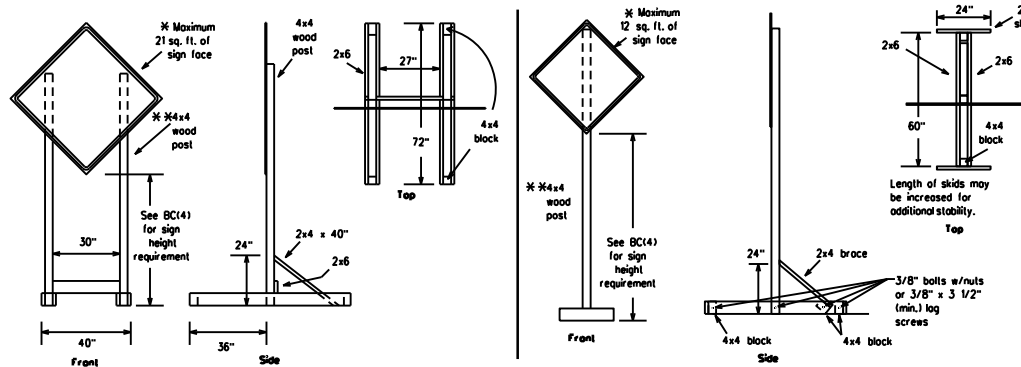
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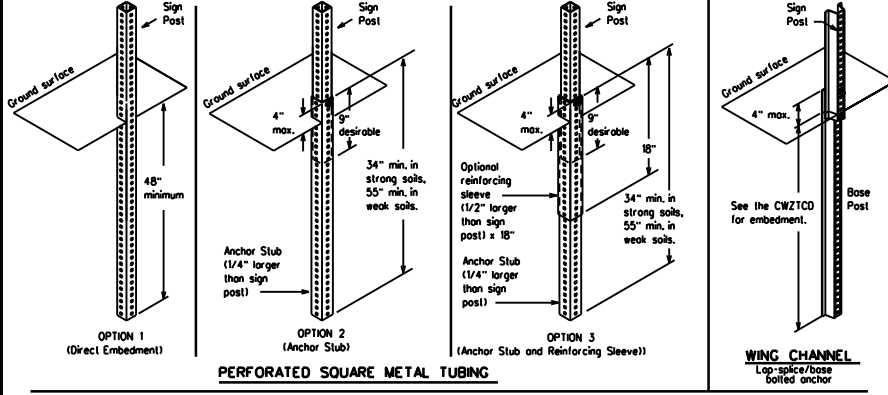
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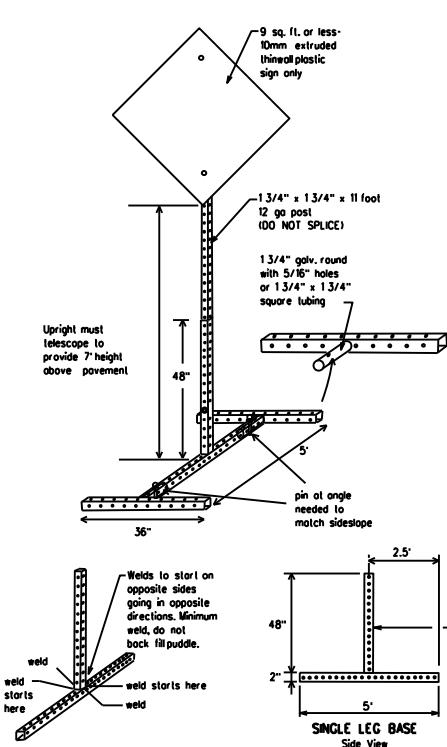
SKID MOUNTED WOOD SIGN SUPPORTS

LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS



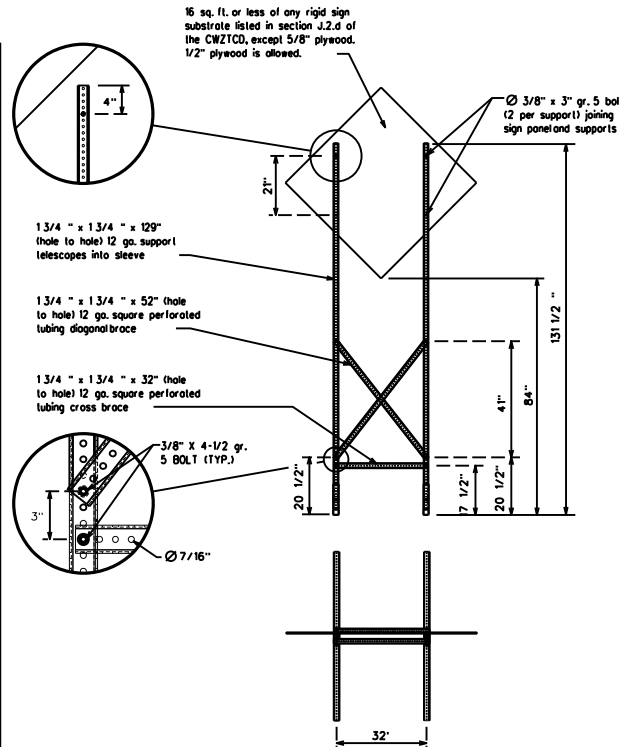
GROUND MOUNTED SIGN SUPPORTS

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



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS



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

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

- GENERAL NOTES**
- Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
 - No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCO List.
 - When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.
- See BC(4) for definition of "Work Duration."
 Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be pointed white.
 See the CWZTCO for the type of sign substrate that can be used for each approved sign support.

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

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

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

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

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

roadway designation = H=number, US=number, SH=number, FM=number

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

- When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
- When symbol signs, such as the "Flagger Symbol" (CW20-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above.
- When symbol signs are represented graphically on the Full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
- A Full Matrix PCMS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(17), for the same size arrow.



Texas Department of Transportation
Traffic Safety Division
Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

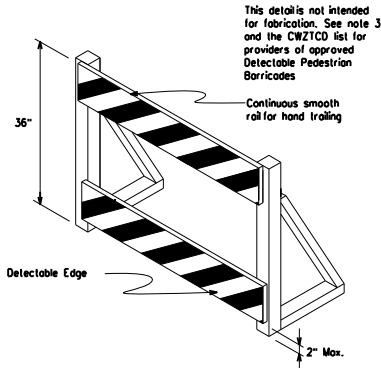
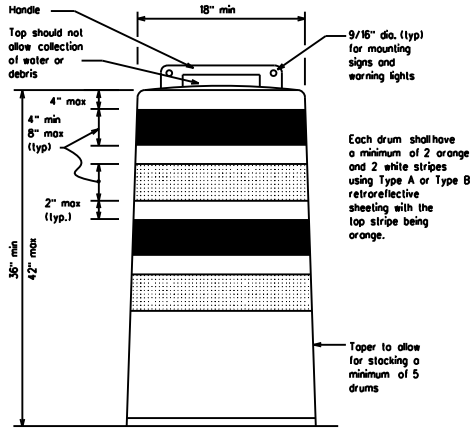
- Pre-qualified plastic drums shall meet the following requirements:
- Plastic drums shall be a two-piece design: the "body" of the drum shall be the top portion and the "base" shall be the bottom.
 - The body and base shall lock together in such a manner that the body separates from the base when impacted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

RETROREFLECTIVE SHEETING

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

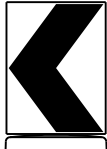
BALLAST

- Unboltsed bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, shall 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. Slacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
- Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
- Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
- The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
- When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
- Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.

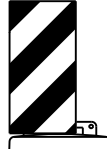


DETECTABLE PEDESTRIAN BARRICADES

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



18" x 24" Sign
(Maximum Sign Dimension)
Chevron CW1-8, Opposing Traffic Lane Divider, Driveaway sign D700, Keep Right R4 series or other signs as approved by Engineer




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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

SHEET 8 OF 12



Texas Department of Transportation
Traffic Safety Division
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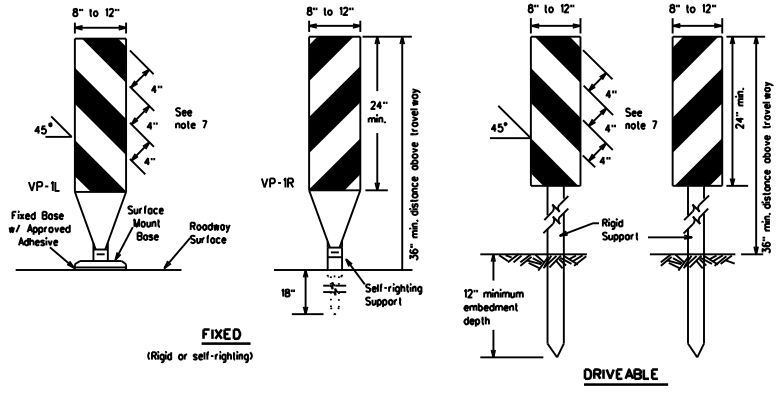
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

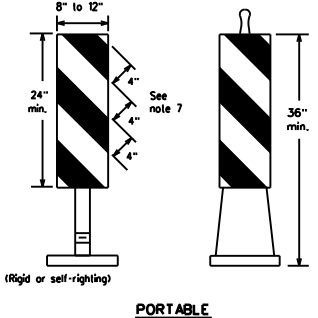
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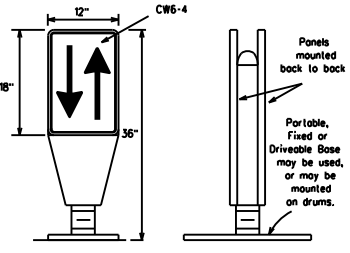
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- Vertical Panels (VPs) are normally used to channelize traffic or divide opposing lanes of traffic.
- VPs may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual for additional requirements on the use VP's for drop-offs.
- VPs 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 travelway.
- VPs 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 bases. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- Sheeting for the VP's shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
- Where the height of reflective material on the vertical panels is 36 inches or greater, a panel stripe of 6 inches shall be used.

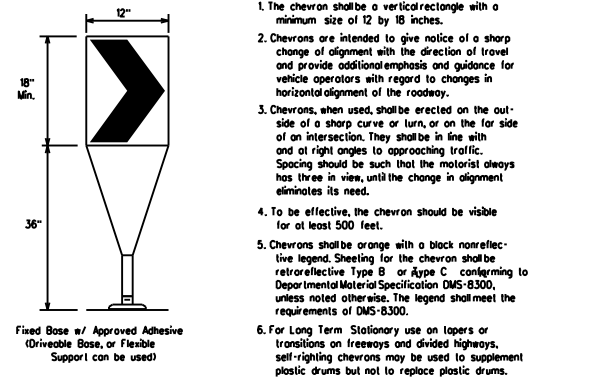


VERTICAL PANELS (VPs)



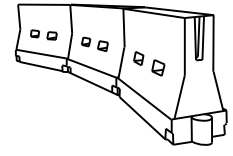
- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLDs are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



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

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

GENERAL NOTES

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

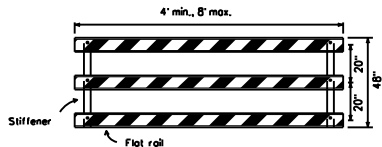
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7-13	5-21	LFK	HOUSTON, ETC.	17					

TYPE 3 BARRICADES

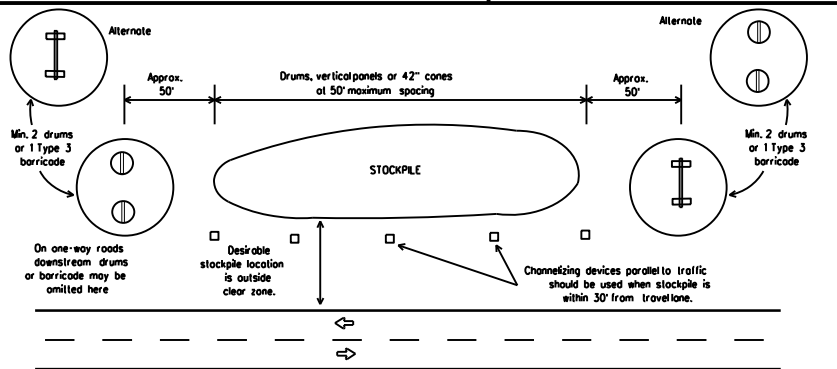
1. Refer to the *Compliant Work Zone Traffic Control Devices List (CWZTCD)* for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending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

Barricades shall NOT be used as a sign support.

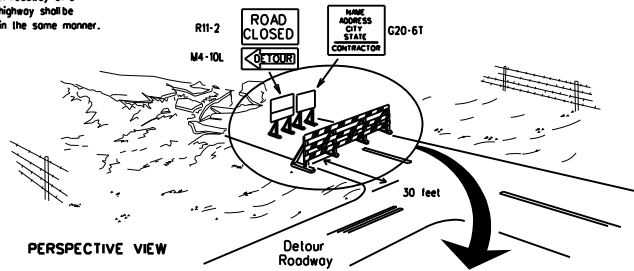


Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

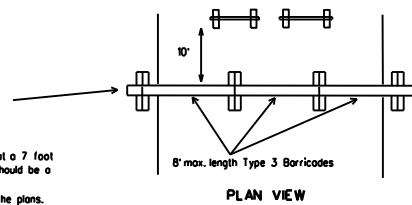


Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

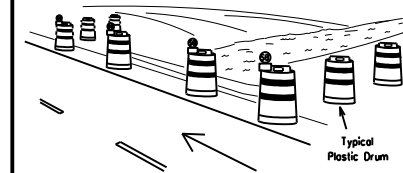
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



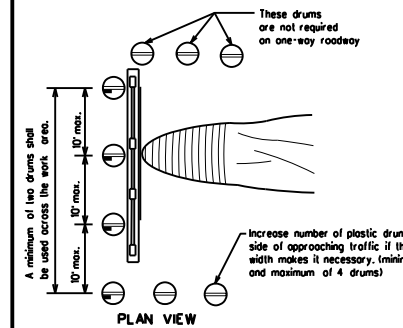
PLAN VIEW

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

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

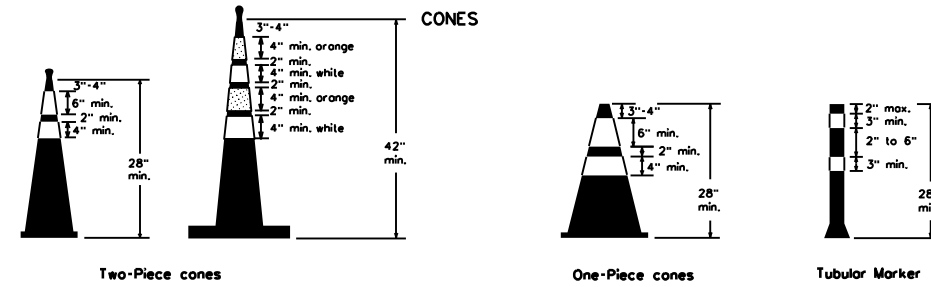


PLAN VIEW

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

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

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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

Texas Department of Transportation
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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© TxDOT November 2002	CONT: 6469	SECT: 05	JOB: 001	HS-WAY: US 287, ETC.
9-07 8-14	DIST: LFK	COUNTY: HOUSTON, ETC.	SHEET NO. 18	
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WORK ZONE PAVEMENT MARKINGS

GENERAL

- The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
- Color, patterns and dimensions shall be in conformance with the "Texas Manual Uniform Traffic Control Devices" (TMUTCD).
- Additional supplemental pavement marking details may be found in the plans or specifications.
- Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
- When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(S17PM).
- When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PASS signs shall be erected to mark the beginning of the sections where passing is prohibited and PASS WITH CARE signs at the beginning of sections where passing is permitted.
- All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

- Raised pavement markers are to be placed according to the patterns on BC(11).
- All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

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

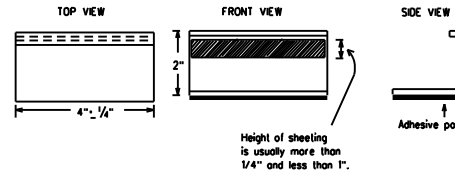
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

- Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
- Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
 - Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
- Small design variances may be noted between lab manufacturers.
- See Standard Sheet WZ(S17PM) for tab placement on new pavements. See Standard Sheet TC(P17-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(11).

SHEET 11 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

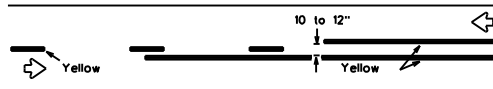
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1-02 7-15	DIST	COUNTY	SHEET NO.	
11-02 8-14	LFK	HOUSTON, ETC.	19	

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PAVEMENT MARKING PATTERNS

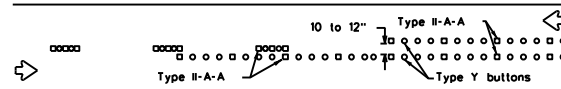


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

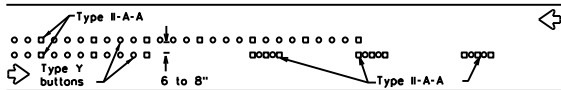


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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

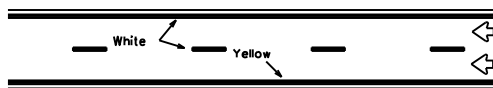


RAISED PAVEMENT MARKERS - PATTERN A



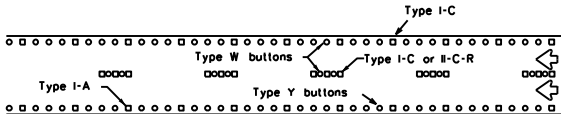
RAISED PAVEMENT MARKERS - PATTERN B

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



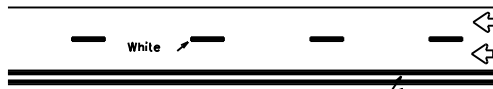
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



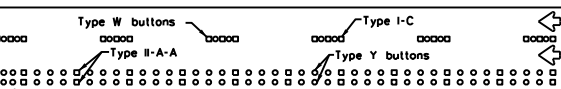
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



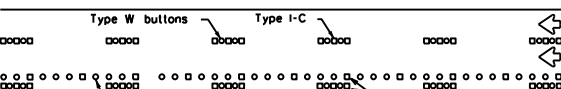
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

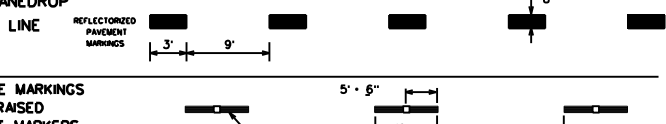
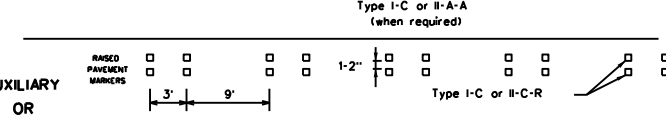
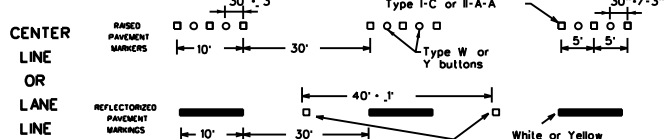
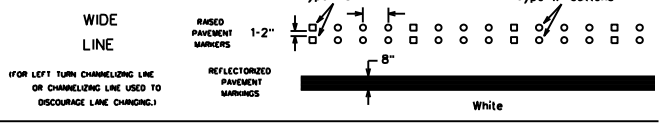
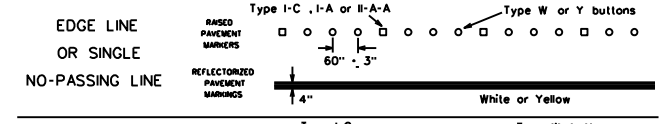
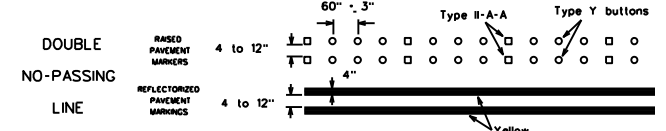
Prefabricated markings may be substituted for reflectORIZED pavement markings.



RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



SOLID LINES

BROKEN LINES

REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.

SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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

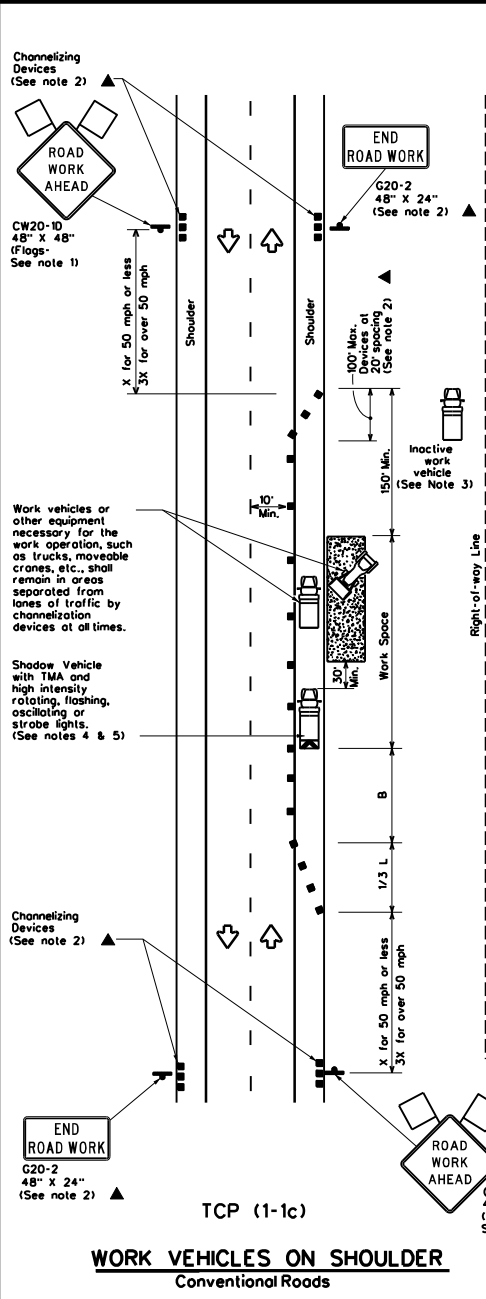
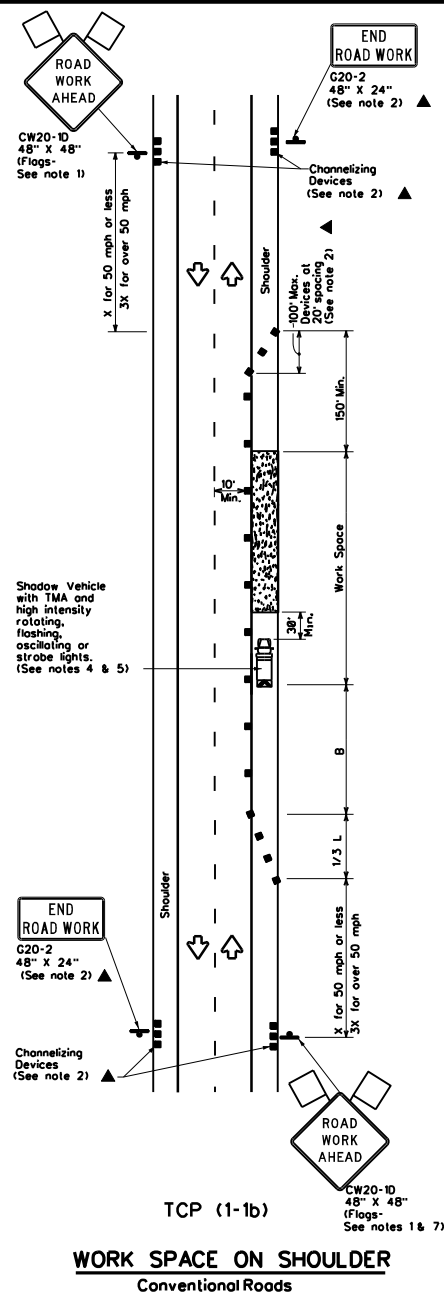
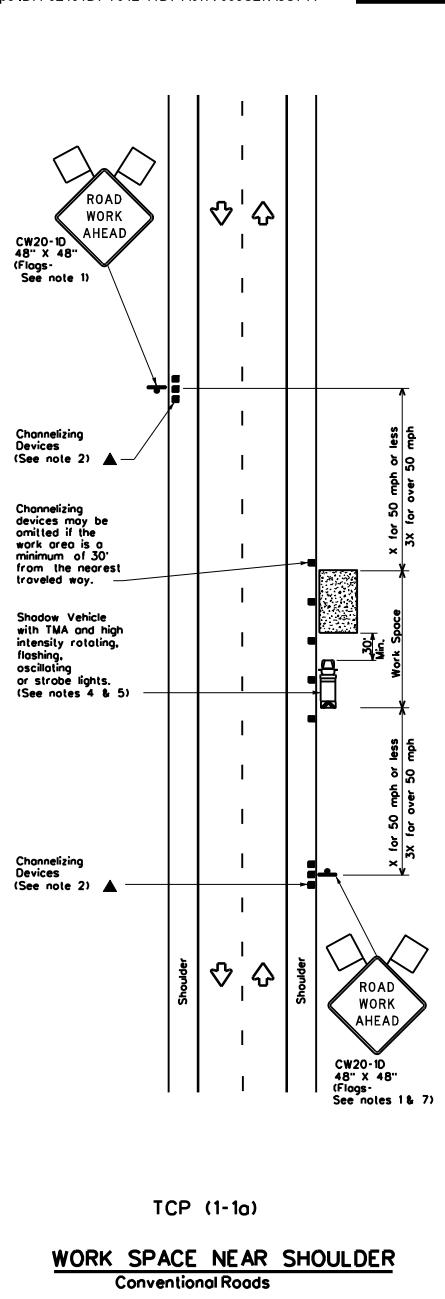
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© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
1-97 9-07 5-21	6469	05	001	US 287, ETC.
2-98 7-13	DIST	COUNTY	SHEET NO.	
11-02 8-14	LFK	HOUSTON, ETC.	20	

DISCLAIMER: This standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by the use of this standard or for incorrect results or damages resulting from its use.

DATE: 5/22/2024 7:39:59 AM
FILE: T:\LFD\DM\Tent Contracts\B_RMC - Routine Maintenance Contracts\FY25 Plans\B99-95-001 Houston Creek Seal (South)\DDN\STANDARD\BC-21.dgn

DSC# 4469.
 The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units.

DATE: 5/22/2024 7:39:59 AM
 FILE: T:\LFD004\Hent Contracts\B.RMC - Routine Maintenance Contracts\FY25 Plans\Highway\Traffic Control Plans\1809-18.dwg



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

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

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

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

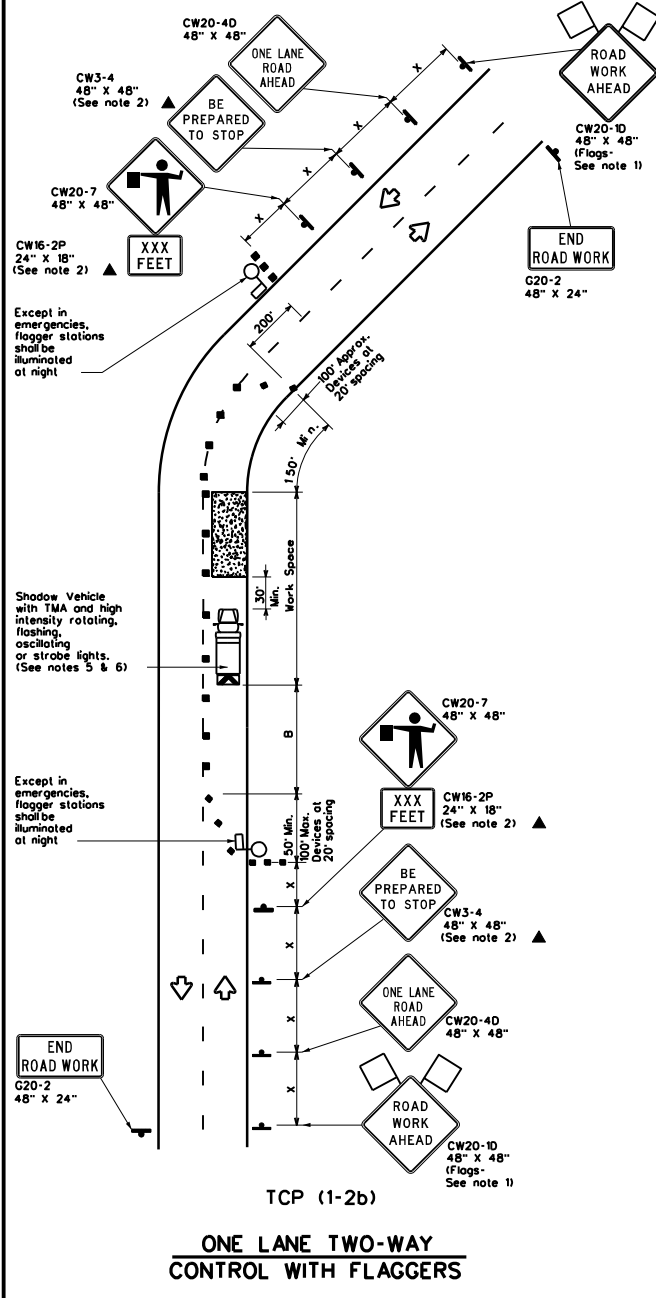
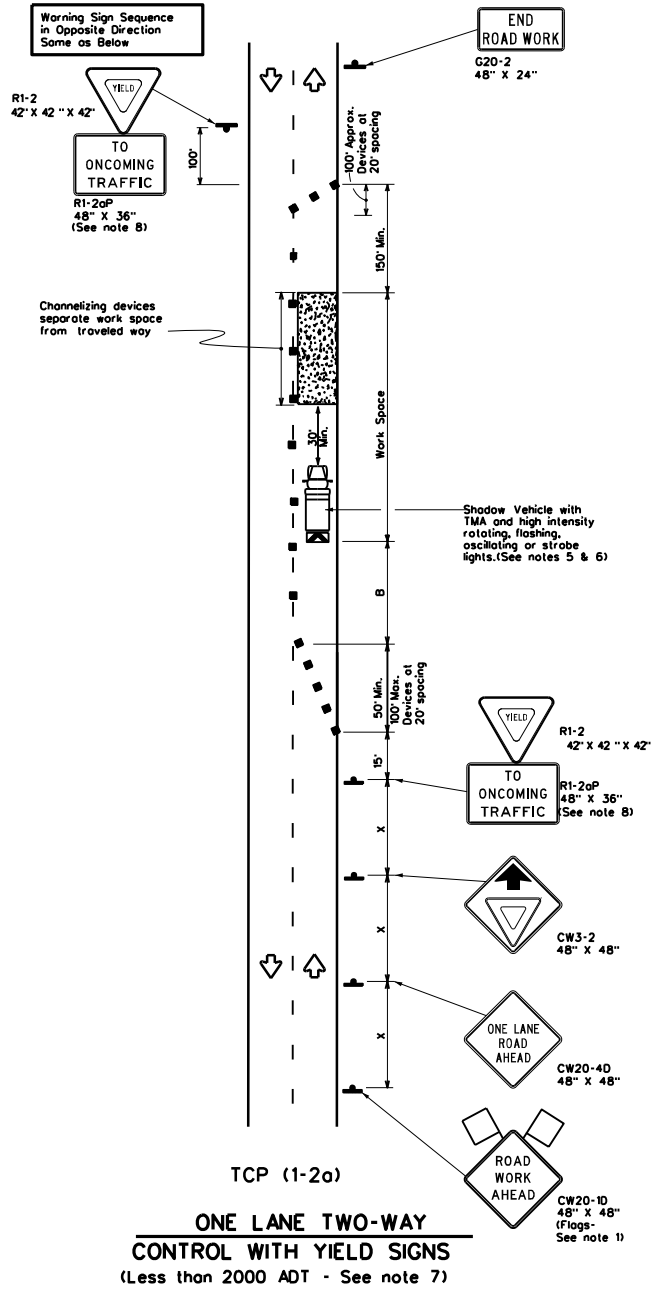
- GENERAL NOTES**
- Flags attached to signs where shown are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
 - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
 - See TCP15-11 for shoulder work on divided highways, expressways and freeways.
 - CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

TRAFFIC CONTROL PLAN
CONVENTIONAL ROAD
SHOULDER WORK
TCP(1-1)-18

FILE: tcpl-1-18.dgn	DATE: 05/22/2024	BY: 6469	CHK: 05	DATE: 05/22/2024	BY: 001	DATE: 05/22/2024	BY: 287, ETC.
REVISIONS		6469 05		001		US 287, ETC.	
2-94	4-98						
8-95	2-12						
1-97	2-18						
DIST: LFK				COUNTY: HOUSTON, ETC.		SHEET NO.: 21	

DSC# 4469.
 The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units.

DATE: 5/22/2024 7:48:00 AM
 FILE: T:\LFKDDM\Hent Contracts\B.RMC - Routine Maintenance Contracts\FY25 Plans\Signage\Standard Plans\TCPS\TCP(1-2).dgn



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

Posted Speed =	Formula	Minimum Desirable Taper Lengths = x			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X"	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	L - WS 60	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L + WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

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

- GENERAL NOTES**
- Flags attached to signs where shown are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
 - Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
 - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

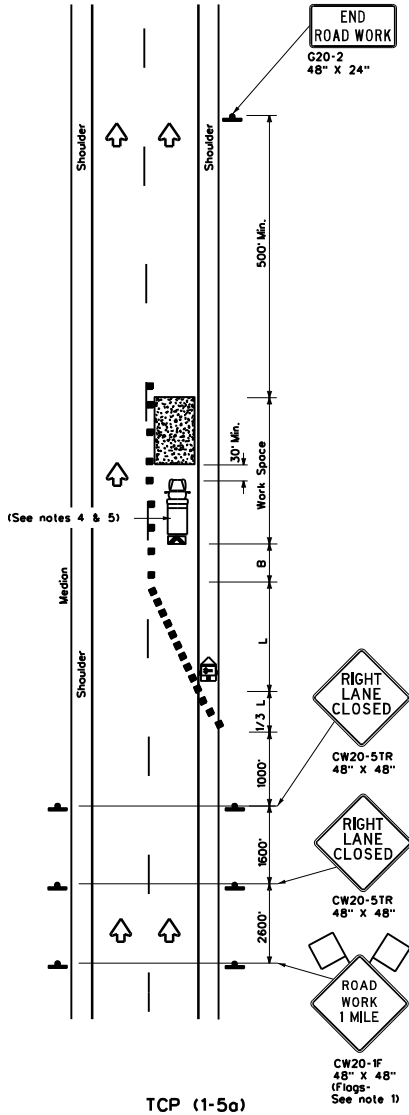
- TCP (1-2a)**
- R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work spaces should be no longer than one half city block. In rural areas on roadways with less than 2000 ADT, work spaces should be no longer than 400 feet.
 - R1-2 "YIELD" sign with R1-2aP "TO ONCOMING TRAFFIC" plaque shall be placed on a support at a 7 foot minimum mounting height.

- TCP (1-2b)**
- 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.
 - If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
 - Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
 - Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

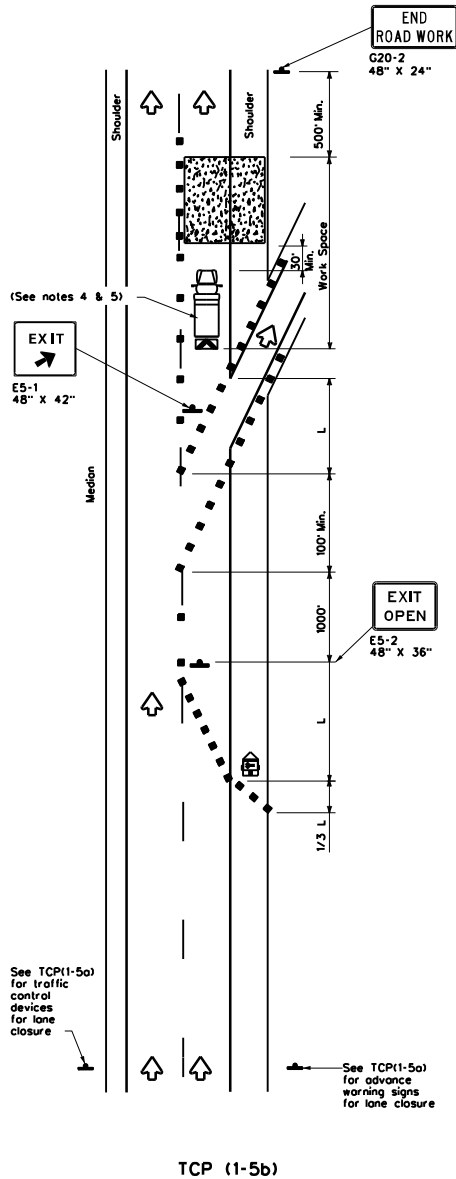
Texas Department of Transportation		Traffic Operations Division Standard	
TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL			
TCP(1-2)-18			
FILE: tcp1-2-18.dgn	DATE: December 1985	CONT SECT: 05	JOB: 001
4-90 4-98 REVISIONS	6469	05	001
2-94 2-12	DIST	COUNTY	US 287, ETC.
1-97 2-18	LFK	HOUSTON, ETC.	SHEET NO. 22

DSC# 446P: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units.

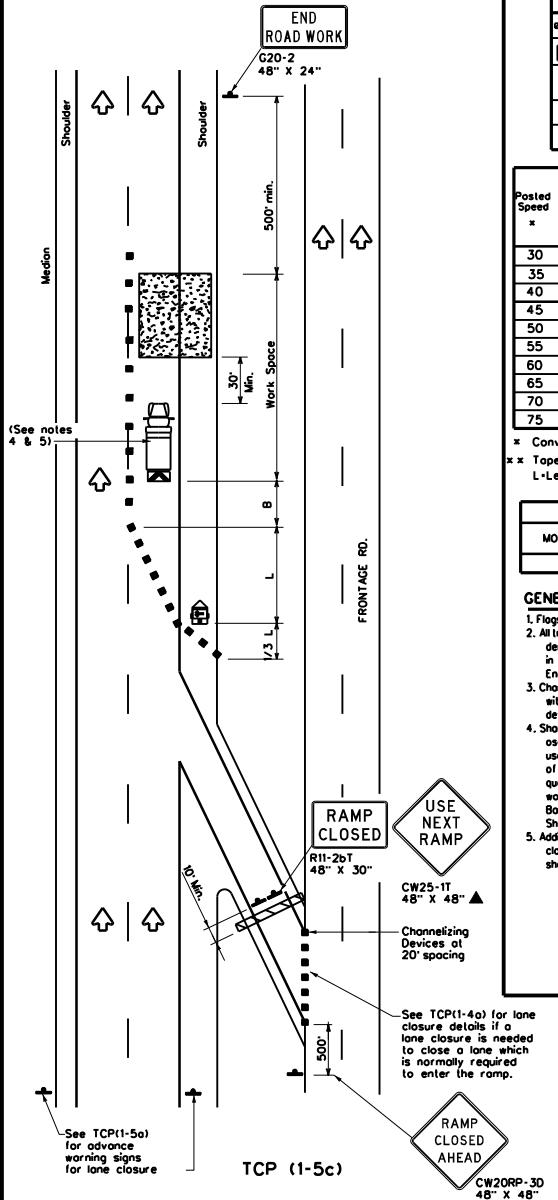
DATE: 5/22/2024 7:48:01 AM
 FILE: T:\LFK\DDA\Main\Contract\1725 Pl\18\Routine Maintenance Contracts\1725 Pl\18\Traffic Control Plans\1725 Pl\18\18-18.dwg



ONE LANE CLOSURE



LANE CLOSURE NEAR EXIT RAMP



LANE CLOSURE NEAR ENTRANCE RAMP

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

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

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

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

GENERAL NOTES

- Flags attached to signs where shown, are REQUIRED.
- All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
- Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
- Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
- Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.



**TRAFFIC CONTROL PLAN
LANE CLOSURES FOR
DIVIDED HIGHWAYS**

TCP(1-5)-18

FILE: tcp1-5-18.dgn	DATE: February 2012	CONT: 6469	SECT: 05	JOB: 001	US 287, ETC.
2-18	REVISIONS	DIST: LFK	COUNTY: HOUSTON, ETC.	SHEET NO.: 25	

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

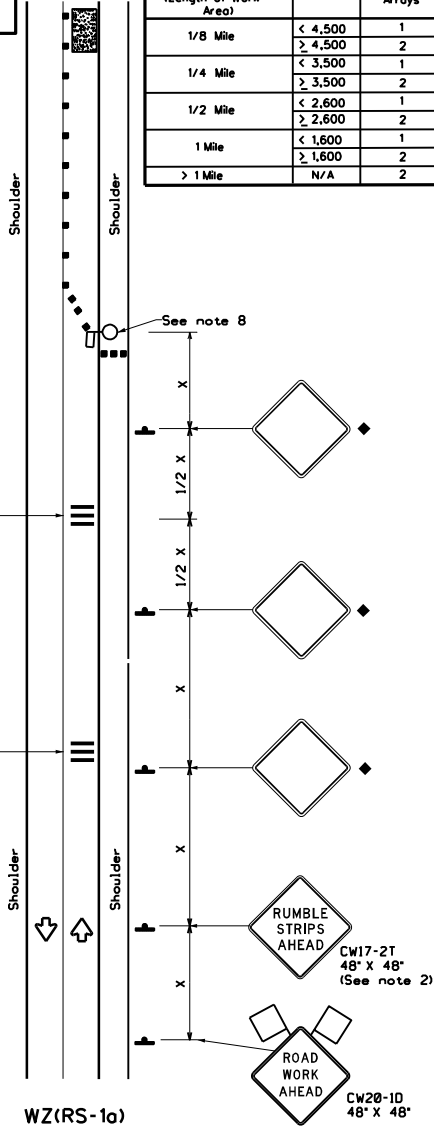
Flagger to Flagger (Length of Work Area)	ADT	# of Rumble Strip Arrays
1/8 Mile	< 4,500	1
	> 4,500	2
1/4 Mile	< 3,500	1
	> 3,500	2
1/2 Mile	< 2,600	1
	> 2,600	2
1 Mile	< 1,600	1
	> 1,600	2
> 1 Mile	N/A	2

DSC# 4465. The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units.

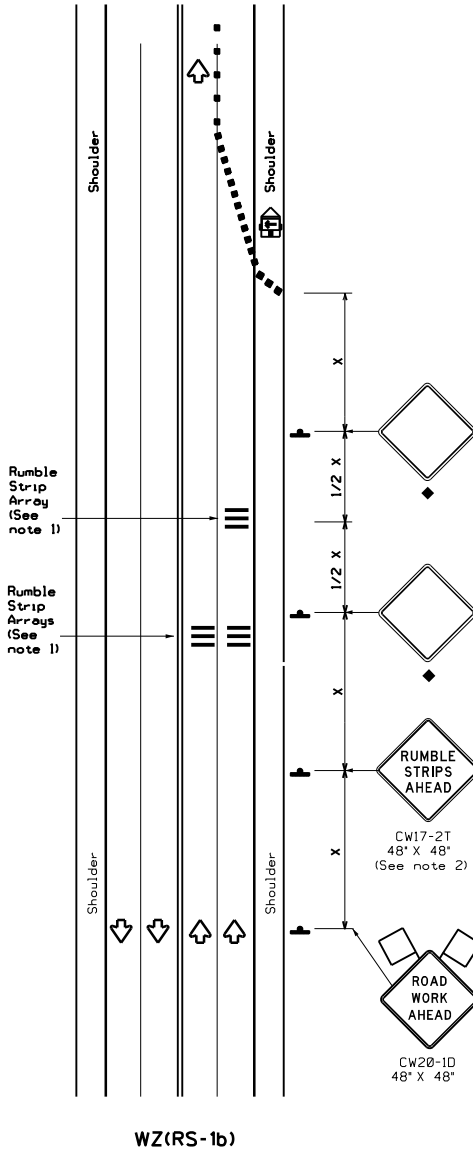
Rumble Strip Array (See note 1)

Rumble Strip Array (See note 1)

The second Rumble Strip Array is required when the ADT thresholds in Table 1 indicate the need for 2 Arrays.



RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

Posted Speed x	Formula	Minimum Desirable Taper Lengths s = x			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x"	Suggested Longitudinal Buffer Space "s"
		10' Offset	15' Offset	20' Offset	On a Taper	On a Tangent		
30	L = WS ² / 60	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40	L = WS	265'	295'	320'	40'	80'	240'	155'
45		450'	495'	540'	45'	90'	320'	195'
50	L = WS	500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60	L = WS	600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70	L = WS	700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

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

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

◆ Signs are for illustrative purposes only. Signs required may vary depending on the TCP, 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.

Texas Department of Transportation
 Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzs22.dgn	DATE: 11/01/2012	BY: TxDOT	CHK: TxDOT	DATE: 11/01/2012	CHK: TxDOT
© TxDOT November 2012	COM: 6469	SECT: 05	JOB: 001	US 287, ETC.	HSW-WAY
REVISIONS: 2-14 4-16	1-22	DIST: LFK	COUNTY: HOUSTON, ETC.	SHEET NO. 26	

DATE: 6/3/2024 11:08:38 PM
 FILE: T:\AFRODIA\Hment Contracts\AB-RMC - Routine Maintenance Contracts\FY25 Plans\1181838\1181838.dgn
 DSC: MAFB: This use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of any information into digital form.

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1. N/A

No Action Required Action Required

Action No.

1. The proposed work of this project consists of the cleaning and sealing of cracks on existing roadway pavement at various locations shown in the plans within Houston, Trinity, Polk, and San Jacinto County Maintenance Sections. 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.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

- No Permit Required
- Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
- Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
- Individual 404 Permit Required
- Other Nationwide Permit Required: NWP# _____

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

1. N/A

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

No Action Required Action Required

Portion of Site 15: FM 355 is within the Trinity County Courthouse Historic District in Groveton. Portion of Site 34 is within the San Jacinto County Courthouse Historic District in Goldspring. The following actions are required.

Action No.

1. Equipment storage and stockpiling of materials is NOT permitted in ANY pull-off or parking area labelled as historical markers, buildings, or property.

IV. VEGETATION RESOURCES

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

No Action Required Action Required

Action No.

1. N/A

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

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

No Action Required Action Required

Action No.

Red-cockaded Woodpecker (federally listed endangered species) cluster is present adjacent to the ROW along the following roadways below. Conservation measures have been agreed upon by the USFWS and TxDOT to ensure that the proposed action will not adversely affect the red-cockaded woodpecker. The conservation measures below must be followed in order to be in compliance with the ESA:

- Site 3: FM 1733 from 0.20 mile north of SH 7 to 0.70 mile north of SH 7.
- Site 11: SH 7 from 1.25 mile west of CR 1160 to 2.75 mile west of CR 1160 and from 0.90 mile east of CR 1160 to 1.25 mile east of CR 1160.
- Site 21: FM 357 from 0.34 mile east of the West intersection of FM 357/2262 to 1.75 mile east of the West intersection of FM 357/2262.

1. NO WORK shall be performed on (highway) from April to July 31.
2. WORK shall begin one hour after sunrise and cease one hour before sunset.
3. NO STOCKPILES or EQUIPMENT STORAGE shall be allowed along or within the ROW along (highway or location).

LIST OF ABBREVIATIONS

BMP: Best Management Practice	SPCC: Spill Prevention Control and Countermeasure
CCP: Construction General Permit	SWP3: Storm Water Pollution Prevention Plan
DSHS: Texas Department of State Health Services	PON: Pre-Construction Notification
FHWA: Federal Highway Administration	PSL: Project Specific Location
MOA: Memorandum of Agreement	TCEQ: Texas Commission on Environmental Quality
MOU: Memorandum of Understanding	TPDES: Texas Pollution Discharge Elimination System
MS4: Municipal Separate Stormwater Sewer System	TPWD: Texas Parks and Wildlife Department
MBTA: Migratory Bird Treaty Act	TxDOT: Texas Department of Transportation
NOT: Notice of Termination	T&E: Threatened and Endangered Species
NWP: Nationwide Permit	USACE: U.S. Army Corps of Engineers
NOI: Notice of Intent	USFWS: U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects): Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bore ground and covered, for products which may be hazardous. Maintain product labeling as required by the Act. Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spills as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

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

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

Yes No

If "No", then no further action is required. If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

Yes No

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

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

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

No Action Required Action Required

Action No.

1. N/A

VII. OTHER ENVIRONMENTAL ISSUES

Portions of the following roadways occur within the boundaries of the U.S. Forest Service Property and require the following actions:


- Site 3: FM 1733 Davy Crockett National Forest
- Site 11: SH 7 Davy Crockett National Forest
- Site 17: FM 357 Davy Crockett National Forest
- Site 19: FM 357 Davy Crockett National Forest
- Site 20: FM 357 Davy Crockett National Forest
- Site 21: FM 357 Davy Crockett National Forest
- Site 25: FM 357 Davy Crockett National Forest
- Site 35: SH 150 Sam Houston National Forest
- Site 37: FM 1725 Sam Houston National Forest
- Site 40: FM 3081 Sam Houston National Forest

No Action Required Action Required

Action No.

1. Area Engineer shall notify the Davy Crockett National Forest and Sam Houston National Forest prior to commencing work on the above roadways.

2. NO stockpiling or storage of materials and equipment within the boundaries of the Davy Crockett National Forest and Sam Houston National Forest.

		Design Division Standard		
<h2 style="margin: 0;">EPIC</h2> <p style="margin: 0;">(ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS)</p>				
FILE: epic.dgn	DN: TxDOT	CR: RC	DN: VP	CR: AR
© TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
02-12-2011 1051	6469	051	001	US 287, ETC.
05-07-14: ADOBE NOTE: SECTION IV, 02-23-2015: SECTION I (HAWKED ITEM 102 TO ITEM 506, ADOBE GRASSY SWALES.	DIST	COUNTY	SHEET NO.	
	LFK	HOUSTON, ETC.	27	