DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
DJH	6	C 81 5 53, ETC		FM 428,Etc
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
DJH	TEXAS	DALLAS	DENTON,Etc.	1
CHECK	CONTROL	SECTION	JOB	
DJH	0081	05	053,Etc.	
CHECK				
DM				

FINAL PLANS

NAME OF CONTRACTOR: ____________

DATE OF LETTING: ____________

DATE WORK BEGAN: ____________

DATE WORK COMPLETED: ____________

DATE WORK ACCEPTED: ____________

SUMMARY OF CHANGE ORDERS:

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

STATE PROJECT NUMBER

C 81-5-53, ETC.
CCSJ: 0081-05-053, ETC.

FM 428,ETC.
DENTON COUNTY,ETC.

LIMITS: FROM VARIOUS LOCATIONS IN
COLLIN, DALLAS, DENTON, ELLIS, KAUFMAN, NAVARRO
AND ROCKWALL COUNTIES

TOTAL LENGTH OF PROJECT =

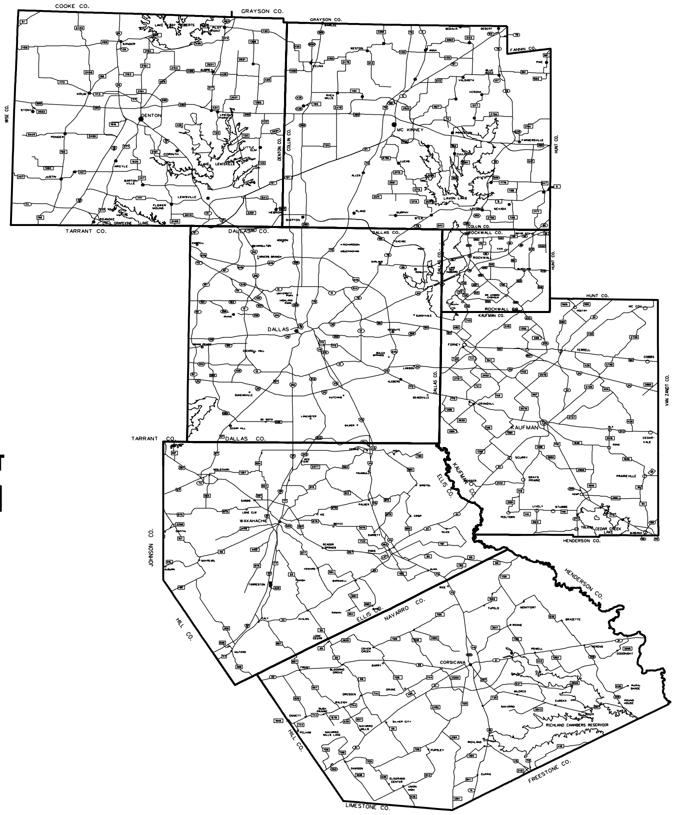
ROADWAY	=	926,666.40 FT.	= 175.505 MI.
BRIDGE	=	2,848.00 FT.	= 0.540 MI.
TOTAL	=	929,514.40 FT.	= 176.045 MI.

FOR THE CONSTRUCTION OF SEAL COAT
CONSISTING OF SEAL COAT,PAVEMENT MARKINGS,
AND MILL & INLAY HMAC

DESIGN SPEEDS = N/A MPH
ADT = SEE QUANTITY SUMMARY SHEETS

NOTE:

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, SEPTEMBER 1, 2024, AND THE CONTRACT PROVISIONS LISTED AND DATED AS FOLLOWS SHALL GOVERN ON THIS PROJECT: SPECIAL LABOR PROVISIONS FOR STATE PROJECTS (000-005)



N

DALLAS DISTRICT

NOT TO SCALE

EQUATIONS: NONE
EXCEPTIONS: NONE
RAILROAD CROSSINGS: BNSF & UPRR

TEXAS DEPARTMENT OF TRANSPORTATION

SUBMITTED FOR LETTING: 8/1/2024
Darius Haggard, P.E.
DESIGN ENGINEER

RECOMMENDED FOR LETTING: 8/2/2024
David Morren, P.E.
DISTRICT MAINTENANCE ENGINEER

RECOMMENDED FOR LETTING: 8/2/2024
James P. Campbell, P.E.
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

RECOMMENDED FOR LETTING: 8/2/2024
JEFFREY BUSH, P.E.
DIRECTOR OF OPERATIONS

APPROVED FOR LETTING: 8/2/2024
Ceason Clemens, P.E.
DISTRICT ENGINEER

WORK WAS COMPLETED ACCORDING TO THE PLANS AND CONTRACT.

____________, P.E.
Signature of Registrant & Date

DATE:

INDEX OF SHEETS

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2	INDEX OF SHEETS
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4, 4A - 4K	ESTIMATE AND QUANTITY SHEET
5	RETRACE QUANTITY SUMMARY
6 - 7	RETRACE LOCATION MAPS
8	COLLIN CO. PROJECT SUMMARY AND LOCATION MAP
9	DENTON CO. PROJECT SUMMARY AND LOCATION MAP
10	ELLIS CO. PROJECT SUMMARY AND LOCATION MAP
11	KAUFMAN CO. PROJECT SUMMARY AND LOCATION MAP
12	NAVARRO CO. PROJECT SUMMARY AND LOCATION MAP
13	ROCKWALL CO. PROJECT SUMMARY AND LOCATION MAP
14	QUANTITY SUMMARY
15	WORKZONE AND STRIPING QUANTITY
16	HARD CURVE MILL & INLAY QUANTITY
17	COLLIN CO. INTERSECTION, WIDENING, RAMPS & GORES QUANTITY
18	DENTON CO. INTERSECTION, WIDENING, RAMPS & GORES QUANTITY
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20	KAUFMAN CO. INTERSECTION, WIDENING, RAMPS & GORES QUANTITY
21	NAVARRO CO. INTERSECTION, WIDENING, RAMPS & GORES QUANTITY
22	ROCKWALL CO. INTERSECTION, WIDENING, RAMPS & GORES QUANTITY
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	ROADWAY AND TRAFFIC STANDARDS
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STATE OF TEXAS
DARIUS JAMAL HAGGARD
145313
LICENSED
PROFESSIONAL ENGINEER

Darius Haggard, PE , P.E. 8/2/2024

Signature of Registrant Date

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

DALLAS DISTRICT./2025 SEAL COAT

INDEX OF SHEETS

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
DH	6	SEE TITLE SHEET		FM 428, ETC.
GRAPHICS DH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK AZ	TEXAS	DAL	DENTON, ETC.	2
CHECK DM	CONTROL	SECTION	JOB	
	0081	05	053, ETC.	

CSJ: 0081-05-053, ETC.

County: DENTON, ETC.

Highway: FM 428, ETC.

SPECIFICATION DATA

Table 1: Basis of Estimate for Permanent Construction					
Item	Description	Thickness	Rate		Quantity
344	SP-C PG 64-22 MIX	2 Inches	110	Lbs./SY/In	3916 Tons
344	Tack Coat (Undiluted Application/Spray Rate)	Milled HMA 0.06		Gal/SY	2134 Gal
Note: (1) Asphalt weight based on 110 Lbs./SY/In					

GENERAL

Project Description – This project consists of performing “Retrace Operations”, “Seal Coat Operations”, “Permanent Striping Operations”, and “HMAC Operations” on various roadways in the Dallas District including Collin, Denton, Ellis, Kaufman, Navarro, and Rockwall Counties.

The construction, operation and maintenance of the proposed project will be consistent with the state implementation plan as prepared by the Texas Commission on Environmental Quality.

The disturbed area for this project, as shown on the plans is 0 acres. However, the Total Disturbed Area (TDA) will establish the required authorization for storm water discharges. The TDA of this project will be determined by the sum of the disturbed area in all project locations in the contract, and all disturbed area on all Project-Specific Locations (PSL) located in the project limits and/or within 1 mile of the project limits. The department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction site as shown on the plans, according to the TDA of the project. The contractor will obtain any required authorization from the TCEQ for the discharge of storm water from any PSL for construction support activities on or off of the project row according to the TDA of the project. When the TDA for the project exceeds 1 acre, provide a copy of the appropriate application of permit (NOI, or Construction Site Notice) to the engineer, for any PSL located in the project limits or within 1 mile of the project limits. Follow the directives and adhere to all requirements set forth in the TCEQ, Texas Pollution Discharge Elimination System, Construction General Permit (TPDES, CGP).

This project required no formal consultation or permits with environmental resources agencies. There is a high probability that an environmentally sensitive area could be encountered on the contractor designated Project-Specific Locations (PSL) for this project (haul roads, equipment staging areas, borrow pits, disposal sites, field offices, storage areas, parking areas, etc.). Item 7.6 “Project-Specific Locations”, provides a listing of regulatory agencies that may need to be contacted regarding this project.

Contact the Dallas District Maintenance Department for approval of all stockpile locations and prior to beginning any stockpile activity. Only material delivered to approved stockpile locations will be paid as Material on Hand (MOH). When material is delivered to roadway, Contractor shall label each ticket to match the roadway material was delivered to.

Place barricades on the project no more than 5 days prior to beginning work on the reference location.

Clean staging area and stockpile sites and associated roadway sections of construction debris and excess gravel prior to moving from one stockpile to the next. Restore all sites to an acceptable condition. The final estimate will not be released until this is accomplished.

Contractor is responsible to locate and protect all objects located within the seal coat area. Upon completion of all work provided for in the contract for any individual roadway, an inspection will be conducted, and if the work is found to be satisfactory, the Contractor will be released from further maintenance on that portion of the work. Do not remove construction signs from an accepted highway until the stockpile(s) and staging areas for that roadway have been returned to their pre-existing condition. All staging areas and aggregate stockpile sites will be returned to their pre-existing condition following seal coat operations prior to moving work to another county.

Quantities shown in the plans are subject to change due to field conditions encountered prior to and during construction. TxDOT personnel will be available to assist with verifying project limits and associated quantities. Provide written confirmation to the Engineer that quantities have been verified. This written confirmation shall include a detailed listing of any suspected discrepancies in the quantities shown in the plans. Upon receipt, the Engineer will investigate all alleged discrepancies and develop a plan to address any necessary quantity adjustments. The plan for such adjustments will be finalized and agreed to no later than the completion of the pre-construction conference.

Clean the roadway of dirt, grass and any debris prior to sealing. This work will not be paid for directly but will be subsidiary to the various bid items in this contract.

Perform work in such a way as to avoid damage to vehicles resulting from asphalt and loose aggregate. Conformance with the specifications, standards, and traffic control is considered a minimum effort and is not intended to absolve any liability for damage to vehicles as a result of construction operations.

Install traffic marking signs prior to sealcoat application and remove within three days after placement of traffic markings.

CSJ: 0081-05-053, ETC.

County: DENTON, ETC.

Highway: FM 428, ETC.

Leave all right of way areas undisturbed until actual construction is to be performed in said areas.

Coordinate work though:

Darius Haggard, P.E.
4777 E. Hwy. 80
Mesquite, Texas 75150
214-320-6657 / 945-275-3198

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

David Morren, P.E. David.Morren@txdot.gov
Darius Haggard, P.E. Darius.Haggard@txdot.gov

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

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

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

Item 1:
This is a Non-Site-Specific Contract as defined in Item 1.3.95.

Item 7:
Repair or replace any structures and utilities that might have been damaged by negligence or a failure to have utility locates performed.

Patrol vehicles must be clearly marked to correspond with the officer's agency and equipped with appropriate lights to identify them as law enforcement. For patrol vehicles not owned by a law enforcement agency, markings will be retroreflective and legible from 100 ft. from both sides and the rear of the vehicle. Lights will be high intensity and visible from all angles.

Holiday restrictions – The Engineer may decide that no lane closures or construction operations shall be allowed during the restricted periods listed in the following holiday schedule. TxDOT has the right to lengthen, shorten, or otherwise modify these restricted periods as actual, or expected, traffic conditions may warrant. Working days will not be charged for these restricted periods. No additional compensation will be allowed for these closures (i.e., overhead, delays, stand-by, barricades or any other associated cost impacts).

- New Year's Eve and Day (5 am on December 31 thru 10:00 pm January 1)
- Easter Holiday weekend (5 am on Friday thru 10:00 pm Sunday)
- Memorial Day weekend (5 am on Friday thru 10:00pm Monday)
- Independence Day (5 am on July 3 thru 10:00 pm on July 5)
- Labor Day weekend (5 am on Friday thru 10:00 pm Monday)
- Thanksgiving Holiday (5 am on Wednesday thru 10:00 pm Sunday)
- Christmas Holiday (5 am on December 23 thru 10:00 pm December 26)

Designate a responsible person for receiving and resolving damage claims from the public. This person will be available to receive calls during normal business hours, 8:00 A.M. – 5:00 P.M., Monday through Saturday, during the course of this project. Prior to beginning work, furnish this person's name, mailing address, and a telephone number and make it available to individuals contacting the Department with claims.

No significant traffic generator events identified.

Item 8:
This Project will be Calendar Day in accordance with Article 8.3.1.5.

Nighttime work is allowed in accordance with Article 8.3.3.

This project contains an asphalt season delay SP 008-002, since retrace will begin in February.

Notify and obtain permission from the Project Engineer a minimum of 24 hours before beginning striping operations each week during the operation. Provide proposed work location and schedule for the week. Do not place any contract stripe unless the designated TxDOT Representative is present. Leaving a recorded message does not meet the aforementioned requirements. Failure

to have the required weekly permission and designated TxDOT Representative present will result in forfeiture of payment for each day these conditions are not met. Project Engineer hours are 8 A.M. to 5 P.M., Monday through Friday. The time of day allowed to work will be as directed.

Before starting work, provide a sequence of work and estimated progress schedule meeting the requirements of Section 8.2.1., “Construction Contracts”.

Time charges for Retrace Operations will begin February 1, 2025. Delay start for asphalt season. Time charges for Seal Coat Operations & associated Permanent Striping Operations will begin May 1, 2025. Once work has started, proceed in a continuous manner until all work is complete.

Item 301:

Provide liquid antistripping agents unless otherwise directed. Add the minimum dosage determined by the manufacturer or higher dosage determined by design requirement and try subsequent trials at 0.25% increments.

Item 302: Aggregates for Surface Treatments

Use unmodified AC, PG, or emulsion for pre coating aggregate. Use AC-10, PG64-22, SS-1, SS-1H, CSS-1, or CSS-1H.

Item 316:

The Engineer will retrieve a minimum of one asphalt sample from the job site for each type of asphalt used for each particular reference for quality control purposes.

Utilize an asphalt distributor capable of providing a transversely varied asphalt rate. The Engineer will select the pavements where the transversely varied asphalt rate is required.

When a transversely varied rate is required, the asphalt rate outside of the wheel paths will be between 22 and 32% higher than the asphalt rate applied in the wheel paths.
Provide calibration documents to the Engineer that include a description of the spray bar(s) and nozzles that will be used and the percentage difference in asphalt rate achieved by each tested spray bar and nozzle arrangement. The nozzles proposed for use shall be clearly stamped or marked from the factory identifying the manufacturer.

That Certifications are required for this project, refer to SP 316-001 for more information.

Table 1: Season Requirements	
	AC20-5TR, AC20-XP AC15-P
MAY	
JUNE	REFER TO STANDARD SPECIFICATIONS ITEM 316 FOR TEMPERATURE REQUIREMENTS
JULY	
AUGUST	
SEPTEMBER	
OCTOBER	

Table 2: Rates for District Seal Coat Projects			
Item	Application (GR 3)		Application (GR 4)
Asphalt Type	AC		AC
*Asph. Rate (Gal/SY)	0.42 AC	OR	0.33 AC
*Asph. Rate On Unsealed HMAC	0.52 AC		0.42 AC
Aggregate Type	PB or PL		PB or PL
Aggregate Grade	3		4
*Aggr. Rate (CY/SY)	1:110		1:125

* The information above is intended to provide general guidance and as a basis of estimate. Based on the season and weather conditions at the time, the engineer will determine the asphalt type and rates to be used at the time of application.

In addition to the temperature requirements of this Item, AC Asphalts used in Surface Treatments and Sealcoats must be placed between May 1 and August 31. Emulsions may be substituted for AC Asphalts outside this timeframe only with the approval of the Engineer.

At all joints where the newly installed HMAC meets the seal coat, over-lap the seal coat 2ft past the joint, on top of the HMAC, so the joint between the existing roadway and new HMAC is sealed and protected.

Item 320:
Use a self-propelled wheel mounted MTV capable of receiving mix from the haul trucks, separate from the paver. It shall have a minimum storage capacity of approximately 25 tons. It shall be equipped with a pivoting discharge conveyor and shall completely and thoroughly remix the material prior to placement. The effectiveness of the MTV's remixing ability is subject to the approval of the Engineer. In addition, the paver shall have a surge storage insert with a minimum capacity of 20 tons.

Item 344:

Provide PG binder 64-22 in Type SP-C mixture. An approved anti-stripping agent will be required.

Tack coat is required. Dilution of tack is not allowed.

Asphalt edges will be beveled to eliminate pavement drop offs.

When work is being performed for Planing and Inlaying HMAC, the use of the Temporary Work Zone Rumble Strips shall be required, in accordance with WZ(RS)-22 and in conjunction with all other applicable TCP standards.

All mixing, placing, and compacting will be completed during daylight hours only. Unless otherwise approved, dumping of the asphalt mixture in a windrow and then placing the mixture in the finishing machine will not be permitted.

Storing the completed mix on the ground will not be permitted at the mixing plant or the job site. Any mix that comes in contact with the earth or other objectionable foreign matter will be rejected.

Provide Short Term Work Zone Pavement Markings where striping is eliminated.

Item 354:
Remove the loose material from the roadway before opening to traffic.

Patch pavement cut to excessive depth by equipment failure with an approved epoxy material. Re-plane patched area to an acceptable approved ride quality. Payment for these corrections is subsidiary to this item.

All reclaimed asphaltic material will become property of the Contractor to be removed and recycled properly.

During the planing operation, maintain the existing centerline stripe for overnight traffic operations unless full width planing is accomplished in one day. Plane all vertical longitudinal faces with a 3:1 slope to meet Edge Condition I as shown on sheet "Treatment for Various Edge Conditions".

If unstable material is observed after initial milling, plane additional material to a depth that will support traffic.

Use a minimum 30 ft. ski on the planing machine.

Maintain the surface of planed surfaces prior to HMAC operations.

The planing operation will be followed closely by the hot-mix asphalt (HMA) overlay operation. Vacuum loose fines immediately after the milling operation and prior to overlaying with HMA. If inclement weather or other unexpected factors do not allow planed areas to be overlaid as described above, warning signs per Standard Sheet "Signing for Uneven Lanes" will be maintained until the hot-mix asphalt overlay operation is completed.

Item 500: Mobilization
Material On Hand (MOH) will not be used in calculating partial payments for Mobilization.

Item 502:
The Contractor Force Account "Safety Contingency", Law Enforcement Personnel" and "Rail Road Flagging" that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

Correct all deficiencies noted on the Traffic Control Device Inspection Form 599 as soon as possible, but no later than 5 days after notification. Failure to make corrections within 5 days will result in no payment for this Item for the month of the noted deficiency.

Particular attention is directed to the requirements of Item 7, "Legal Relations and Responsibilities" in the Standard Specifications. The Contractor's Responsible Person (CRP) will be responsible for ensuring that all signs and traffic control devices are in place and functioning properly in accordance with article 502.2 of the Standard Specifications. The CRP will inspect and ensure any deficiencies are corrected every day throughout the duration of this contract.

The pavement will be entirely open to traffic at the end of each day. All material stockpiles, equipment left overnight or any obstruction within thirty feet of a travel way will be removed or clearly marked by warning lights and barricades as approved.

Use Type III barricades at stockpile sites. Obtain approval before placing stockpiles closer than 30 feet from the edge of the travel lane. In no case may a stockpile be closer than 16 feet to the edge of the pavement or within an intersection clear sight zone.

CSJ: 0081-05-053, ETC.

County: DENTON, ETC.

Highway: FM 428, ETC.

The traffic control plan for this project will consist of the barricades and signing arrangement shown on the plans, the Barricade and Construction Standards and the Traffic Control Plans Sheets and Standards.

Provide traffic control in compliance with the latest edition of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD), the "Traffic Control Standard Sheets" (TCSS), and as directed.

Place barricades and signs in locations that do not obstruct the sight distance of drivers entering the highway from driveways or side streets.

Review traffic control details described on TCP (SC-8)-22. This sheet includes provisions for certain signs to be installed, which are to remain in place until standard pavement markings are in place. These signs are in addition to the signs and barricades that may be required on the Barricade and Construction Standards. Erect R4-1 (Do Not Pass) and R4-2 (Pass with Care) signs to mark no-passing zones as directed.

Provide flaggers as directed. Wear an orange reflectorized safety vest and a white safety helmet/hardhat when performing flagging duties or working within the highway right of way. The Contractor will be responsible for maintaining a safety program that includes furnishing and maintaining all necessary safety equipment as required.

Display "FLAGGER AHEAD" and "BE PREPARED TO STOP" signs only when flaggers are working. Furnish all flaggers with long handled stop-slow paddles and operational two-way radios.

Regulate all construction activities and equipment to cause a minimum of inconvenience to the traveling public. Provide warning signs and flaggers where it is necessary for trucks to stop, load or unload at stockpile locations.

Provide and use a pilot car, according to Item 510, "One-Way Traffic Control", whenever one lane of traffic exists. Do not exceed cycle duration of 10 minutes. This work will not be paid for separately but will be considered subsidiary to Item 502.

Traffic Control Plans with a lane closure causing backups of 10 minutes or greater in duration will be modified by the Engineer.

Do not begin Item 502, "Barricades, Signs and Traffic Handling", on any individual roadway until both of the following conditions are met:

1. The work schedule is approved.
2. No more than 5 work days will pass between the beginning of Item 502 and the Actual commencement of the roadway work bid items, for the particular roadway receiving barricades and construction signing.

Access will be provided to all business and residences at all times. Where turning radii are limited during phased construction at intersections, provide all weather surfaces such as RAP or base in turning movements to accommodate and to protect the traffic from edge drop-offs.

Materials, labor, maintenance and removal for these temporary accesses and radii will not be paid for directly but will be considered subsidiary to the various bid items.

Close no more than one lane at a time, unless otherwise approved. Provide written proposed lane closure information by 1:00 pm on the business day prior to the proposed closures. Do not close lanes when this requirement is not met. Furnish information for Monday closures or closures following a national or state holiday on the last office workday prior to the closures. Do not close lanes if the above reporting requirements have not been met.

Maximum length of lane closure will be 2 miles.

Provide sufficient and qualified staff and equipment to revise the traffic control as directed.

Do not operate or park any equipment/machinery closer than 30 feet from the traveled roadway after sunset unless authorized by the engineer.

Nighttime and weekend work will be allowed with prior approval, except for emergency work.

Place barricades and signs in locations that do not obstruct the sight distance of drivers entering the highway from driveways or side streets.

Do not commence work on the road before sunrise. Do not operate or park any equipment/machinery closer than 30 feet from the traveled roadway after sunset unless authorized by the engineer.

When moving unlicensed equipment on or across any pavement or public highways, protect the pavement from all damage using an acceptable method.

As approved by the Engineer, provide uniformed off duty police officers that are licensed peace officers in the State of Texas during lane or ramp closures, night time work or other situations that indicate a need for additional traffic control to protect the traveling public or the construction workforce. Provide documentation such as payroll, log sheets with signatures and badge number, or invoices from the government entity providing the officers for reimbursement. Complete the weekly tracking form provided by the department and submit invoices that agree with the tracking form for payment at the end of each month approved services were provided. Reimbursement will not be made for coordination fees charged by any party.

Patrol vehicles must be clearly marked to correspond with the officer's agency and equipped with appropriate permanently affixed red and blue flashing lights to identify them as law enforcement. For patrol vehicles not owned by a law enforcement agency, markings will be retroreflective and legible from 100 ft. from both sides and the rear of the vehicle. Red and Blue flashing lights will be high intensity and visible from all angles.

Item 505:
The total number of truck mounted attenuators (TMAs) or trailer attenuators (TAs) required when utilizing the traffic control standards are shown in the tables below.

TCP 1 Series	Scenario		Required TMA/TA	
(1-1)-18 / (1-2)-18			1	
(1-3)-18	A	B	1	2
(1-4)-18 / (1-5)-18			1	

TCP 2 Series	Scenario		Required TMA/TA	
(2-1)-18 / (2-2)-18 / (2-4)-18 / (2-5)-18 / (2-6)-18	All		1	
(2-3)-23	A	B	1	2

TCP 3 Series	Scenario			Required TMA/TA
(3-1)-13	All			2
(3-2)-13	A	B		3
(3-3)-14	A	B	D	2
	C			3

TCP 6 Series	Scenario	Required TMA/TA
(6-8)-14 / (6-9)-14	All	1

TCP SC Series	Scenario			Recommended TMA(s)		
(SC-1)-22	All			1		
(SC-2)-22	A	B	C	1	2	2
(SC-3)-22	A	B	C	2	2	4
(SC-4)-22	All			1		
(SC-5)-22	All			1		
TCP SC Series	Scenario			Required TMA(s)		
(SC-6)-22	A	B	C	2	1	1

The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs/TAs needed for the project.

Additional TMAs/TAs used that are not specified in the plans in which the contractor expects compensation will require prior approval from the Engineer.

Stationary TMA's/TA's will be only paid for by the operations classified in theTCP sheets as short term, short term stationary, intermediate term stationary and long term stationary. Mobile TMA's/TA's will only be paid for by the operations classified in the TCP standards as mobile operations. TMA's/TA's used for installation/removal of traffic control for a work area will be subsidiary to the TMA/TA used to perform the work.

Item 506:
It is not anticipated that any erosion, sedimentation, or environmental control devices will be needed on this project. However, in the event that such controls are necessary, the SW3P for this project shall consist of the use of any temporary erosion control measures deemed necessary by the Engineer and as provided under this item. If physical conditions encountered at the job site require any of the deemed necessary controls, BMP installation, maintenance, and removal will be paid as extra work on a force account basis per Articles 4.4, "Changes in the Work" and Article 9.7.

Take all practicable precautions to prevent debris from being discharged into the Waters of Texas or a designated wetland. Install Best Management Practices before demolition begins and maintain them during the demolition. Remove any debris or construction material that escapes containment devices and are discharged into the restricted areas, before the next rain event or within 24 hours of the discharge.

Item 585:
This note is applicable to the HMAC work only: Provide a 10-ft. straightedge at all times. Measure and evaluate ride quality of repairs as directed by using Surface Test Type A. Correct surface areas as required.

Item 662: Work Zone Pavement Markings
Place flexible reflective roadway tabs in accordance with TCP (SC-7)-22. Place tabs to indicate the beginning and ending of no passing zones.

Place work zone tabs before sundown on all roadway surfaces sealed during a workday.

Cut, remove and properly dispose of the upright portions of all work zone tabs prior to acceptance of any roadway.

No section of highway included in this contract will be without standard pavement markings for a period longer than 14 calendar days.

Items 666 and 668: Retroreflectorized and Prefabricated Pavement Markings
Verify and document the widths of travel lanes. Immediately notify the Engineer of any discrepancies.

Use a crew experienced in the application of Type II Reflective Pavement Markings, capable of placing the markings in neat straight lines and in a safe and timely manner. Place all pavement markings according to the Texas Manual on Uniform Traffic Control Devices and PM/FPM Standards.

Place pavement markings as directed by the Engineer. Do not use existing pavement markings as a guide for new pavement markings.

Use a pilot line to re-establish the center of the roadway and obtain approval before applying any pavement markings. The requirements for the pilot line may be waived if it is determined that the tabs placed at the existing centerline of the roadway will be sufficient for this purpose and if the contractor demonstrates the ability to consistently place centerline markings using alternative techniques. The work will not be paid for directly but will be considered subsidiary to Items 666 and 668.

Maintain and reestablish all passing and no passing zones throughout the project, as outlined in the 2011 Edition of the Texas Manual of Uniform Traffic Control Devices. All passing and no passing zones will be verified prior to placement of permanent pavement markings.

All centerline striping on main lanes will be continuously striped through County Road intersections. All centerline and edge line markings will be continuously striped across concrete sections, bridges, etc.… All concrete and Asphalt intersections, except for private roads, will receive a stop bar.

TY II Centerline and edgeline striping will be placed on all HMAC work locations included in this contract no later than 14 calendar days from the date of work completed per each location.

Begin striping operations within 7 days of milled rumble strip placement.

Pavement marking words and arrows details are contained in the Standard Highway Sign Designs for Texas (SHSD).

A gravity flow applicator will be used to funnel the beads onto the stripe. Truck speed will be slow enough to ensure that the beads drop onto the stripe and do not roll in the paint film.

All stripes will be applied in 1 coat.

Layout work will be required where markings have been obliterated, sealed, or overlaid.

All equipment will be capable of maintaining a continuous work schedule to the satisfactory completion of the project. Equipment used for the contract will be equipped with footage counters capable of measuring the linear footage placed. Counters must be calibrated prior to the beginning of striping operations.

Item 677:
A water blasting method approved by the Engineer will be the only method allowed for the removal of permanent and temporary pavement markings except on a sealcoat surface. A 2 foot wide sealcoat will be required on sealcoat surfaces to eliminate permanent and temporary pavement markings.

Remove all existing crosswalk striping at intersections, school crossings, pedestrian/bike path crossings, etc., bumps prior to seal coat operations. Grinding is an acceptable removal method on HMAC.

Payment for removal will be made under this item, and will be per LF of existing striping, not by the length of crosswalk span.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0081-05-053

DISTRICT Dallas

COUNTY Collin, Dallas, Denton, Ellis, Kaufman, Navarro, Rockwall

HIGHWAY BI 45H, FM 1384, FM 157, FM 1827, FM 2194, FM 2860, FM 2862, FM 3039, FM 416, FM 428, FM 550, FM 552, FM 635, FM 637, FM 66, FM 661, FM 664, FM 667, FM 780, FM 813, IH 20, SH 22, SH 243, SH 274, SS 469, US 175, US 287, US 67, Various

			CONTROL SECTION JOB		**0081-05-053**		**0092-12-006**		**0092-15-003**		**0121-05-052**		**0122-01-048**		**0122-02-032**	
			PROJECT ID		**A00191612**		**A00198931**		**A00198933**		**A00191689**		**A00198934**		**A00191672**	
			COUNTY		**Denton**		**Ellis**		**Ellis**		**Navarro**		**Navarro**		**Navarro**	
			HIGHWAY		**FM 428**		**BI 45H**		**SS 469**		**SH 22**		**US 287**		**US 287**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-7087	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	TON	320.000		68.000		53.000		251.000		36.000		435.000	
	316-7236	AGGR (TY-PL, GR-3 LTWT)(SAC-B)	CY			351.000		277.000						1,897.000	
	316-7245	AGGR (TY-PB OR PL, GR-4)(SAC-B)	CY	1,860.000						1,174.000		166.000			
	344-7009	SP MIXES SP-C PG64-22	TON												
	344-7077	TACK COAT	GAL												
	354-7051	PLANE ASPH CONC PAV(2")	SY												
	500-7001	MOBILIZATION	LS	1.000											
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	8.000											
	505-7003	TMA (MOBILE OPERATION)	DAY	240.000											
	533-7002	MILL RUMBLE STRIPS (ASPH) (CENTERLINE)	LF												
	662-7112	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	204.000											
	662-7114	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	4,041.000		555.000		972.000		3,064.000		449.000		5,386.000	
	666-7024	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF												
	666-7030	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF												
	666-7036	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF												
	666-7117	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF												
	666-7172	RE PM TY II (W) 6" (BRK)	LF												
	666-7175	RE PM TY II (W) 6" (SLD)	LF	91,186.000		22,440.000		42,934.000		65,905.000		13,580.000		92,400.000	
	666-7179	RE PM TY II (W) 8" (SLD)	LF											159.000	
	666-7182	RE PM TY II (W) 12" (SLD)	LF	4,089.000											
	666-7184	RE PM TY II (W) 24" (SLD)	LF	210.000		182.000		48.000							
	666-7211	RE PM TY II (Y) 6" (BRK)	LF	5,474.000		2,060.000				5,471.000				8,634.000	
	666-7212	RE PM TY II (Y) 6" (DOT)	LF												
	666-7213	RE PM TY II (Y) 6" (SLD)	LF	67,017.000		9,091.000		19,450.000		39,748.000		13,580.000		42,779.000	
	666-7214	RE PM TY II (Y) 8" (SLD)	LF												
	666-7215	RE PM TY II (Y) 12" (SLD)	LF	1,179.000						50.000				990.000	
	666-7279	RE PROF PM (W)6"(SLD) RAISD PROF ONLY	LF												
	666-7280	RE PROF PM (Y)6"(SLD) RAISD PROF ONLY	LF												
	666-7281	RE PROF PM (Y)6"(BRK) RAISD PROF ONLY	LF												
	666-7408	REFL PAV MRK TY I (W)6"(BRK)(100MIL)	LF												
	666-7411	REFL PAV MRK TY I (W)6"(SLD)(100MIL)	LF												
	666-7420	REFL PAV MRK TY I (Y)6"(BRK)(100MIL)	LF												
	666-7423	REFL PAV MRK TY I (Y)6"(SLD)(100MIL)	LF												
	668-7091	PREFAB PM TY C (W)(ARROW)	EA	26.000								2.000		8.000	
	668-7103	PREFAB PM TY C (W)(WORD)	EA	22.000								2.000		2.000	
	668-7108	PREFAB PM TY C (W)(RR XING)	EA												
	668-7110	PREFAB PM TY C (W)(18")(YLD TRI)	EA												

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0081-05-053

DISTRICT Dallas

COUNTY Collin, Dallas, Denton, Ellis, Kaufman, Navarro, Rockwall

HIGHWAY BI 45H, FM 1384, FM 157, FM 1827, FM 2194, FM 2860, FM 2862, FM 3039, FM 416, FM 428, FM 550, FM 552, FM 635, FM 637, FM 66, FM 661, FM 664, FM 667, FM 780, FM 813, IH 20, SH 22, SH 243, SH 274, SS 469, US 175, US 287, US 67, Various

				CONTROL SECTION JOB		**0092-12-006**		**0092-15-003**		**0121-05-052**		**0122-01-048**		**0122-02-032**	
				PROJECT ID		**A00198931**		**A00198933**		**A00191689**		**A00198934**		**A00191672**	
				COUNTY		**Ellis**		**Ellis**		**Navarro**		**Navarro**		**Navarro**	
				HIGHWAY		**BI 45H**		**SS 469**		**SH 22**		**US 287**		**US 287**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	668-7111	PREFAB PM TY C (W)(36")(YLD TRI)	EA												
	672-7002	REFL PAV MRKR TY I-C	EA	204.000											
	672-7004	REFL PAV MRKR TY II-A-A	EA	1,529.000		277.000		486.000		871.000		131.000		1,285.000	
	672-7006	REFL PAV MRKR TY II-C-R	EA												
	677-7001	ELIM EXT PM & MRKS (4")	LF	4,000.000										11,168.000	
	677-7008	ELIM EXT PM & MRKS (24")	LF	210.000											
	677-7009	ELIM EXT PM & MRKS (ARROW)	EA	26.000											
	677-7015	ELIM EXT PM & MRKS (WORD)	EA	22.000											
	677-7019	ELIM EXT PM & MRKS (RR XING)	EA												
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK (NON-PART)	LS	1.000											
	18	LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000											
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000											
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000											

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0081-05-053

DISTRICT Dallas

COUNTY Collin, Dallas, Denton, Ellis, Kaufman, Navarro, Rockwall

HIGHWAY BI 45H, FM 1384, FM 157, FM 1827, FM 2194, FM 2860, FM 2862, FM 3039, FM 416, FM 428, FM 550, FM 552, FM 635, FM 637, FM 66, FM 661, FM 664, FM 667, FM 780, FM 813, IH 20, SH 22, SH 243, SH 274, SS 469, US 175, US 287, US 67, Various

			CONTROL SECTION JOB	**0197-03-081**		**0197-04-085**		**0197-05-064**		**0197-08-009**		**0260-02-053**		**0261-01-051**	
			PROJECT ID	**A00199743**		**A00191642**		**A00191644**		**A00191640**		**A00191628**		**A00191627**	
			COUNTY	**Kaufman**		**Kaufman**		**Kaufman**		**Kaufman**		**Ellis**		**Ellis**	
			HIGHWAY	**US 175**		**US 175**		**US 175**		**SH 243**		**US 67**		**US 67**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-7087	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	TON	101.000		266.000		145.000		57.000		67.000		161.000	
	316-7236	AGGR (TY-PL, GR-3 LTWT)(SAC-B)	CY									291.000		703.000	
	316-7245	AGGR (TY-PB OR PL, GR-4)(SAC-B)	CY	472.000		1,244.000		845.000		266.000					
	344-7009	SP MIXES SP-C PG64-22	TON												
	344-7077	TACK COAT	GAL												
	354-7051	PLANE ASPH CONC PAV(2")	SY												
	500-7001	MOBILIZATION	LS												
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	505-7003	TMA (MOBILE OPERATION)	DAY												
	533-7002	MILL RUMBLE STRIPS (ASPH) (CENTERLINE)	LF												
	662-7112	WK ZN PAV MRK SHT TERM (TAB)TY W	EA							127.000		554.000		668.000	
	662-7114	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	1,380.000		1,543.000		2,006.000		315.000					
	666-7024	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF												
	666-7030	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF												
	666-7036	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF												
	666-7117	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF												
	666-7172	RE PM TY II (W) 6" (BRK)	LF					8,850.000		1,703.000				6,687.000	
	666-7175	RE PM TY II (W) 6" (SLD)	LF	37,548.000		87,172.000		41,659.000		4,209.000		11,088.000		26,750.000	
	666-7179	RE PM TY II (W) 8" (SLD)	LF			1,777.000		2,998.000							
	666-7182	RE PM TY II (W) 12" (SLD)	LF			392.000									
	666-7184	RE PM TY II (W) 24" (SLD)	LF			106.000		338.000							
	666-7211	RE PM TY II (Y) 6" (BRK)	LF	909.000		2,043.000				1,558.000		2,772.000			
	666-7212	RE PM TY II (Y) 6" (DOT)	LF												
	666-7213	RE PM TY II (Y) 6" (SLD)	LF	15,610.000		30,164.000		41,569.000		8,158.000				26,750.000	
	666-7214	RE PM TY II (Y) 8" (SLD)	LF									11,088.000			
	666-7215	RE PM TY II (Y) 12" (SLD)	LF												
	666-7279	RE PROF PM (W)6"(SLD) RAISD PROF ONLY	LF												
	666-7280	RE PROF PM (Y)6"(SLD) RAISD PROF ONLY	LF												
	666-7281	RE PROF PM (Y)6"(BRK) RAISD PROF ONLY	LF												
	666-7408	REFL PAV MRK TY I (W)6"(BRK)(100MIL)	LF												
	666-7411	REFL PAV MRK TY I (W)6"(SLD)(100MIL)	LF												
	666-7420	REFL PAV MRK TY I (Y)6"(BRK)(100MIL)	LF												
	666-7423	REFL PAV MRK TY I (Y)6"(SLD)(100MIL)	LF												
	668-7091	PREFAB PM TY C (W)(ARROW)	EA			11.000		8.000							
	668-7103	PREFAB PM TY C (W)(WORD)	EA			11.000		8.000							
	668-7108	PREFAB PM TY C (W)(RR XING)	EA												
	668-7110	PREFAB PM TY C (W)(18")(YLD TRI)	EA	24.000		59.000									

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0081-05-053

DISTRICT Dallas

COUNTY Collin, Dallas, Denton, Ellis, Kaufman, Navarro, Rockwall

HIGHWAY BI 45H, FM 1384, FM 157, FM 1827, FM 2194, FM 2860, FM 2862, FM 3039, FM 416, FM 428, FM 550, FM 552, FM 635, FM 637, FM 66, FM 661, FM 664, FM 667, FM 780, FM 813, IH 20, SH 22, SH 243, SH 274, SS 469, US 175, US 287, US 67, Various

			CONTROL SECTION JOB	**0197-03-081**		**0197-04-085**		**0197-05-064**		**0197-08-009**		**0260-02-053**		**0261-01-051**	
			PROJECT ID	**A00199743**		**A00191642**		**A00191644**		**A00191640**		**A00191628**		**A00191627**	
			COUNTY	**Kaufman**		**Kaufman**		**Kaufman**		**Kaufman**		**Ellis**		**Ellis**	
			HIGHWAY	**US 175**		**US 175**		**US 175**		**SH 243**		**US 67**		**US 67**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	668-7111	PREFAB PM TY C (W)(36")(YLD TRI)	EA												
	672-7002	REFL PAV MRKR TY I-C	EA							22.000					
	672-7004	REFL PAV MRKR TY II-A-A	EA	482.000		452.000		2,200.000		119.000					
	672-7006	REFL PAV MRKR TY II-C-R	EA									139.000		334.000	
	677-7001	ELIM EXT PM & MRKS (4")	LF												
	677-7008	ELIM EXT PM & MRKS (24")	LF												
	677-7009	ELIM EXT PM & MRKS (ARROW)	EA												
	677-7015	ELIM EXT PM & MRKS (WORD)	EA												
	677-7019	ELIM EXT PM & MRKS (RR XING)	EA												
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK (NON-PART)	LS												
	18	LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS												
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS												
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS												

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0081-05-053

DISTRICT Dallas

COUNTY Collin, Dallas, Denton, Ellis, Kaufman, Navarro, Rockwall

HIGHWAY BI 45H, FM 1384, FM 157, FM 1827, FM 2194, FM 2860, FM 2862, FM 3039, FM 416, FM 428, FM 550, FM 552, FM 635, FM 637, FM 66, FM 661, FM 664, FM 667, FM 780, FM 813, IH 20, SH 22, SH 243, SH 274, SS 469, US 175, US 287, US 67, Various

			CONTROL SECTION JOB		**0495-01-084**		**0561-01-026**		**0596-02-055**		**0596-02-056**		**0747-02-020**		**0747-06-015**	
			PROJECT ID		**A00191643**		**A00191641**		**A00191621**		**A00191622**		**A00191668**		**A00139537**	
			COUNTY		**Kaufman**		**Kaufman**		**Ellis**		**Ellis**		**Navarro**		**Ellis**	
			HIGHWAY		**IH 20**		**SH 274**		**FM 66**		**FM 66**		**FM 667**		**FM 157**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-7087	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	TON	193.000		254.000		80.000		238.000		376.000		267.000	
	316-7236	AGGR (TY-PL, GR-3 LTWT)(SAC-B)	CY					413.000				1,640.000		1,388.000	
	316-7245	AGGR (TY-PB OR PL, GR-4)(SAC-B)	CY	903.000		1,189.000				1,383.000					
	344-7009	SP MIXES SP-C PG64-22	TON											1,640.000	
	344-7077	TACK COAT	GAL											894.000	
	354-7051	PLANE ASPH CONC PAV(2")	SY											14,899.000	
	500-7001	MOBILIZATION	LS												
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	505-7003	TMA (MOBILE OPERATION)	DAY												
	533-7002	MILL RUMBLE STRIPS (ASPH) (CENTERLINE)	LF											4,789.000	
	662-7112	WK ZN PAV MRK SHT TERM (TAB)TY W	EA							7.000				69.000	
	662-7114	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	1,000.000		2,608.000		1,578.000		3,149.000		5,128.000		1,571.000	
	666-7024	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF												
	666-7030	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF												
	666-7036	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF												
	666-7117	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF												
	666-7172	RE PM TY II (W) 6" (BRK)	LF	50.000		1,165.000				146.000					
	666-7175	RE PM TY II (W) 6" (SLD)	LF	30,000.000		64,385.000		36,960.000		110,742.000		107,163.000		87,914.000	
	666-7179	RE PM TY II (W) 8" (SLD)	LF			2,561.000				1,224.000				1,374.000	
	666-7182	RE PM TY II (W) 12" (SLD)	LF												
	666-7184	RE PM TY II (W) 24" (SLD)	LF	252.000		180.000				574.000				336.000	
	666-7211	RE PM TY II (Y) 6" (BRK)	LF	524.000		4,845.000		2,667.000		7,462.000		4,982.000		6,368.000	
	666-7212	RE PM TY II (Y) 6" (DOT)	LF												
	666-7213	RE PM TY II (Y) 6" (SLD)	LF	31,000.000		58,291.000		20,901.000		70,416.000		30,233.000		42,406.000	
	666-7214	RE PM TY II (Y) 8" (SLD)	LF												
	666-7215	RE PM TY II (Y) 12" (SLD)	LF												
	666-7279	RE PROF PM (W)6"(SLD) RAISD PROF ONLY	LF					25,872.000		77,519.000		75,329.000		87,914.000	
	666-7280	RE PROF PM (Y)6"(SLD) RAISD PROF ONLY	LF									55,725.000			
	666-7281	RE PROF PM (Y)6"(BRK) RAISD PROF ONLY	LF									3,487.000			
	666-7408	REFL PAV MRK TY I (W)6"(BRK)(100MIL)	LF												
	666-7411	REFL PAV MRK TY I (W)6"(SLD)(100MIL)	LF												
	666-7420	REFL PAV MRK TY I (Y)6"(BRK)(100MIL)	LF												
	666-7423	REFL PAV MRK TY I (Y)6"(SLD)(100MIL)	LF												
	668-7091	PREFAB PM TY C (W)(ARROW)	EA			12.000				11.000				6.000	
	668-7103	PREFAB PM TY C (W)(WORD)	EA			12.000				7.000				5.000	
	668-7108	PREFAB PM TY C (W)(RR XING)	EA									2.000			
	668-7110	PREFAB PM TY C (W)(18")(YLD TRI)	EA	20.000											

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0081-05-053

DISTRICT Dallas

COUNTY Collin, Dallas, Denton, Ellis, Kaufman, Navarro, Rockwall

HIGHWAY BI 45H, FM 1384, FM 157, FM 1827, FM 2194, FM 2860, FM 2862, FM 3039, FM 416, FM 428, FM 550, FM 552, FM 635, FM 637, FM 66, FM 661, FM 664, FM 667, FM 780, FM 813, IH 20, SH 22, SH 243, SH 274, SS 469, US 175, US 287, US 67, Various

				CONTROL SECTION JOB	**0495-01-084**		**0561-01-026**		**0596-02-055**		**0596-02-056**		**0747-02-020**		**0747-06-015**	
				PROJECT ID	**A00191643**		**A00191641**		**A00191621**		**A00191622**		**A00191668**		**A00139537**	
				COUNTY	**Kaufman**		**Kaufman**		**Ellis**		**Ellis**		**Navarro**		**Ellis**	
				HIGHWAY	**IH 20**		**SH 274**		**FM 66**		**FM 66**		**FM 667**		**FM 157**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**		EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	668-7111	PREFAB PM TY C (W)(36")(YLD TRI)	EA		24.000											
	672-7002	REFL PAV MRKR TY I-C	EA												69.000	
	672-7004	REFL PAV MRKR TY II-A-A	EA		600.000		251.000		656.000		2,031.000		1,244.000		1,160.000	
	672-7006	REFL PAV MRKR TY II-C-R	EA													
	677-7001	ELIM EXT PM & MRKS (4")	LF								3,260.000					
	677-7008	ELIM EXT PM & MRKS (24")	LF													
	677-7009	ELIM EXT PM & MRKS (ARROW)	EA													
	677-7015	ELIM EXT PM & MRKS (WORD)	EA													
	677-7019	ELIM EXT PM & MRKS (RR XING)	EA										2.000			
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK (NON-PART)	LS													
	18	LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS													
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS													
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS													

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0081-05-053

DISTRICT Dallas

COUNTY Collin, Dallas, Denton, Ellis, Kaufman, Navarro, Rockwall

HIGHWAY BI 45H, FM 1384, FM 157, FM 1827, FM 2194, FM 2860, FM 2862, FM 3039, FM 416, FM 428, FM 550, FM 552, FM 635, FM 637, FM 66, FM 661, FM 664, FM 667, FM 780, FM 813, IH 20, SH 22, SH 243, SH 274, SS 469, US 175, US 287, US 67, Various

				0816-05-028		0918-00-420		0995-01-030		0997-03-008		0998-03-027		1014-03-062	
		CONTROL SECTION JOB													
		PROJECT ID		A00191636		A00192084		A00191732		A00191669		A00191665		A00191645	
		COUNTY		Collin		Dallas		Navarro		Navarro		Navarro		Rockwall	
		HIGHWAY		FM 2862		Various		FM 637		FM 667		FM 416		FM 550	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-7087	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	TON	103.000				222.000		212.000		257.000			
	316-7236	AGGR (TY-PL, GR-3 LTWT)(SAC-B)	CY	449.000				969.000		924.000		1,334.000		155.000	
	316-7245	AGGR (TY-PB OR PL, GR-4)(SAC-B)	CY											724.000	
	344-7009	SP MIXES SP-C PG64-22	TON									612.000			
	344-7077	TACK COAT	GAL									333.000			
	354-7051	PLANE ASPH CONC PAV(2")	SY									5,563.000			
	500-7001	MOBILIZATION	LS												
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	505-7003	TMA (MOBILE OPERATION)	DAY												
	533-7002	MILL RUMBLE STRIPS (ASPH) (CENTERLINE)	LF												
	662-7112	WK ZN PAV MRK SHT TERM (TAB)TY W	EA											200.000	
	662-7114	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	1,565.000				87.000		2,930.000		4,694.000		2,311.000	
	666-7024	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF			35,963.000									
	666-7030	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF			1,222.000									
	666-7036	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF			6,232.000									
	666-7117	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF			276.000									
	666-7172	RE PM TY II (W) 6" (BRK)	LF	262.000											
	666-7175	RE PM TY II (W) 6" (SLD)	LF	31,268.000				59,854.000		51,058.000		95,473.000		58,143.000	
	666-7179	RE PM TY II (W) 8" (SLD)	LF	544.000										170.000	
	666-7182	RE PM TY II (W) 12" (SLD)	LF					26.000							
	666-7184	RE PM TY II (W) 24" (SLD)	LF	280.000				30.000				266.000		76.000	
	666-7211	RE PM TY II (Y) 6" (BRK)	LF					2,700.000		4,704.000		5,093.000		2,719.000	
	666-7212	RE PM TY II (Y) 6" (DOT)	LF												
	666-7213	RE PM TY II (Y) 6" (SLD)	LF	31,268.000				34,000.000		20,729.000		66,359.000		42,142.000	
	666-7214	RE PM TY II (Y) 8" (SLD)	LF												
	666-7215	RE PM TY II (Y) 12" (SLD)	LF												
	666-7279	RE PROF PM (W)6"(SLD) RAISD PROF ONLY	LF							35,741.000		66,831.000			
	666-7280	RE PROF PM (Y)6"(SLD) RAISD PROF ONLY	LF							14,510.000		46,451.000			
	666-7281	RE PROF PM (Y)6"(BRK) RAISD PROF ONLY	LF							3,293.000		3,565.000			
	666-7408	REFL PAV MRK TY I (W)6"(BRK)(100MIL)	LF			66,287.000									
	666-7411	REFL PAV MRK TY I (W)6"(SLD)(100MIL)	LF			2,008,317.000									
	666-7420	REFL PAV MRK TY I (Y)6"(BRK)(100MIL)	LF			170,310.000									
	666-7423	REFL PAV MRK TY I (Y)6"(SLD)(100MIL)	LF			1,376,640.000									
	668-7091	PREFAB PM TY C (W)(ARROW)	EA											1.000	
	668-7103	PREFAB PM TY C (W)(WORD)	EA											1.000	
	668-7108	PREFAB PM TY C (W)(RR XING)	EA					2.000							
	668-7110	PREFAB PM TY C (W)(18")(YLD TRI)	EA												

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0081-05-053

DISTRICT Dallas

COUNTY Collin, Dallas, Denton, Ellis, Kaufman, Navarro, Rockwall

HIGHWAY BI 45H, FM 1384, FM 157, FM 1827, FM 2194, FM 2860, FM 2862, FM 3039, FM 416, FM 428, FM 550, FM 552, FM 635, FM 637, FM 66, FM 661, FM 664, FM 667, FM 780, FM 813, IH 20, SH 22, SH 243, SH 274, SS 469, US 175, US 287, US 67, Various

				CONTROL SECTION JOB		**0816-05-028**		**0918-00-420**		**0995-01-030**		**0997-03-008**		**0998-03-027**		**1014-03-062**	
				PROJECT ID		**A00191636**		**A00192084**		**A00191732**		**A00191669**		**A00191665**		**A00191645**	
				COUNTY		**Collin**		**Dallas**		**Navarro**		**Navarro**		**Navarro**		**Rockwall**	
				HIGHWAY		**FM 2862**		**Various**		**FM 637**		**FM 667**		**FM 416**		**FM 550**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	668-7111	PREFAB PM TY C (W)(36")(YLD TRI)	EA														
	672-7002	REFL PAV MRKR TY I-C	EA													22.000	
	672-7004	REFL PAV MRKR TY II-A-A	EA	391.000				1,000.000		495.000		1,084.000		709.000			
	672-7006	REFL PAV MRKR TY II-C-R	EA														
	677-7001	ELIM EXT PM & MRKS (4")	LF														
	677-7008	ELIM EXT PM & MRKS (24")	LF														
	677-7009	ELIM EXT PM & MRKS (ARROW)	EA														
	677-7015	ELIM EXT PM & MRKS (WORD)	EA														
	677-7019	ELIM EXT PM & MRKS (RR XING)	EA							2.000							
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK (NON-PART)	LS														
	18	LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS														
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS														
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS														

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0081-05-053

DISTRICT Dallas

COUNTY Collin, Dallas, Denton, Ellis, Kaufman, Navarro, Rockwall

HIGHWAY BI 45H, FM 1384, FM 157, FM 1827, FM 2194, FM 2860, FM 2862, FM 3039, FM 416, FM 428, FM 550, FM 552, FM 635, FM 637, FM 66, FM 661, FM 664, FM 667, FM 780, FM 813, IH 20, SH 22, SH 243, SH 274, SS 469, US 175, US 287, US 67, Various

				1017-01-018		1048-03-012		1049-01-017		1051-01-062		1139-01-049		1310-02-011	
		CONTROL SECTION JOB													
		PROJECT ID		A00191646		A00191753		A00191623		A00198932		A00191624		A00191616	
		COUNTY		Rockwall		Ellis		Ellis		Ellis		Ellis		Denton	
		HIGHWAY		FM 552		FM 780		FM 661		FM 664		FM 813		FM 1384	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-7087	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	TON	107.000		160.000		69.000		44.000		313.000		145.000	
	316-7236	AGGR (TY-PL, GR-3 LTWT)(SAC-B)	CY			699.000		359.000				1,625.000		751.000	
	316-7245	AGGR (TY-PB OR PL, GR-4)(SAC-B)	CY	621.000						206.000					
	344-7009	SP MIXES SP-C PG64-22	TON							503.000		1,162.000			
	344-7077	TACK COAT	GAL							274.000		633.000			
	354-7051	PLANE ASPH CONC PAV(2")	SY							4,571.000		10,565.000			
	500-7001	MOBILIZATION	LS												
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	505-7003	TMA (MOBILE OPERATION)	DAY												
	533-7002	MILL RUMBLE STRIPS (ASPH) (CENTERLINE)	LF												
	662-7112	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	200.000				26.000		114.000					
	662-7114	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	2,080.000		1,700.000		1,500.000		490.000		5,537.000		2,139.000	
	666-7024	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF												
	666-7030	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF												
	666-7036	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF												
	666-7117	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF												
	666-7172	RE PM TY II (W) 6" (BRK)	LF							216.000					
	666-7175	RE PM TY II (W) 6" (SLD)	LF	47,868.000		42,934.000		28,196.000		9,910.000		138,358.000		52,144.000	
	666-7179	RE PM TY II (W) 8" (SLD)	LF	983.000				522.000		801.000					
	666-7182	RE PM TY II (W) 12" (SLD)	LF												
	666-7184	RE PM TY II (W) 24" (SLD)	LF	290.000		140.000		48.000		160.000		724.000		70.000	
	666-7211	RE PM TY II (Y) 6" (BRK)	LF	2,152.000		2,993.000				749.000		5,099.000		1,993.750	
	666-7212	RE PM TY II (Y) 6" (DOT)	LF	49.000											
	666-7213	RE PM TY II (Y) 6" (SLD)	LF	38,362.000		35,543.000		29,130.000		8,333.000		108,099.000		41,446.000	
	666-7214	RE PM TY II (Y) 8" (SLD)	LF												
	666-7215	RE PM TY II (Y) 12" (SLD)	LF	358.000											
	666-7279	RE PROF PM (W)6"(SLD) RAISD PROF ONLY	LF	33,508.000		36,393.000		19,737.000				96,851.000		36,501.000	
	666-7280	RE PROF PM (Y)6"(SLD) RAISD PROF ONLY	LF	26,853.000				20,391.000						29,012.000	
	666-7281	RE PROF PM (Y)6"(BRK) RAISD PROF ONLY	LF	1,506.000										1,396.000	
	666-7408	REFL PAV MRK TY I (W)6"(BRK)(100MIL)	LF												
	666-7411	REFL PAV MRK TY I (W)6"(SLD)(100MIL)	LF												
	666-7420	REFL PAV MRK TY I (Y)6"(BRK)(100MIL)	LF												
	666-7423	REFL PAV MRK TY I (Y)6"(SLD)(100MIL)	LF												
	668-7091	PREFAB PM TY C (W)(ARROW)	EA	7.000				1.000							
	668-7103	PREFAB PM TY C (W)(WORD)	EA	4.000				1.000							
	668-7108	PREFAB PM TY C (W)(RR XING)	EA												
	668-7110	PREFAB PM TY C (W)(18")(YLD TRI)	EA												

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0081-05-053

DISTRICT Dallas

COUNTY Collin, Dallas, Denton, Ellis, Kaufman, Navarro, Rockwall

HIGHWAY BI 45H, FM 1384, FM 157, FM 1827, FM 2194, FM 2860, FM 2862, FM 3039, FM 416, FM 428, FM 550, FM 552, FM 635, FM 637, FM 66, FM 661, FM 664, FM 667, FM 780, FM 813, IH 20, SH 22, SH 243, SH 274, SS 469, US 175, US 287, US 67, Various

			CONTROL SECTION JOB	**1017-01-018**		**1048-03-012**		**1049-01-017**		**1051-01-062**		**1139-01-049**		**1310-02-011**	
			PROJECT ID	**A00191646**		**A00191753**		**A00191623**		**A00198932**		**A00191624**		**A00191616**	
			COUNTY	**Rockwall**		**Ellis**		**Ellis**		**Ellis**		**Ellis**		**Denton**	
			HIGHWAY	**FM 552**		**FM 780**		**FM 661**		**FM 664**		**FM 813**		**FM 1384**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	668-7111	PREFAB PM TY C (W)(36")(YLD TRI)	EA												
	672-7002	REFL PAV MRKR TY I-C	EA	53.000				26.000		37.000					
	672-7004	REFL PAV MRKR TY II-A-A	EA	823.000		900.000		392.000		250.000		2,596.000		618.000	
	672-7006	REFL PAV MRKR TY II-C-R	EA												
	677-7001	ELIM EXT PM & MRKS (4")	LF									928.000			
	677-7008	ELIM EXT PM & MRKS (24")	LF												
	677-7009	ELIM EXT PM & MRKS (ARROW)	EA												
	677-7015	ELIM EXT PM & MRKS (WORD)	EA												
	677-7019	ELIM EXT PM & MRKS (RR XING)	EA												
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK (NON-PART)	LS												
	18	LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS												
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS												
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS												

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0081-05-053

DISTRICT Dallas

COUNTY Collin, Dallas, Denton, Ellis, Kaufman, Navarro, Rockwall

HIGHWAY BI 45H, FM 1384, FM 157, FM 1827, FM 2194, FM 2860, FM 2862, FM 3039, FM 416, FM 428, FM 550, FM 552, FM 635, FM 637, FM 66, FM 661, FM 664, FM 667, FM 780, FM 813, IH 20, SH 22, SH 243, SH 274, SS 469, US 175, US 287, US 67, Various

				1746-01-030		1847-01-011		2247-01-015		3089-01-012		3190-01-013		TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB													
		PROJECT ID		A00191634		A00191666		A00191635		A00191639		A00191638			
		COUNTY		Collin		Navarro		Collin		Kaufman		Kaufman			
		HIGHWAY		FM 1827		FM 635		FM 2194		FM 3039		FM 2860			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	316-7087	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	TON	162.000		52.000		159.000		90.000		183.000		5,646.000	
	316-7236	AGGR (TY-PL, GR-3 LTWT)(SAC-B)	CY			228.000		824.000				798.000		16,075.000	
	316-7245	AGGR (TY-PB OR PL, GR-4)(SAC-B)	CY	756.000						523.000				12,332.000	
	344-7009	SP MIXES SP-C PG64-22	TON											3,917.000	
	344-7077	TACK COAT	GAL											2,134.000	
	354-7051	PLANE ASPH CONC PAV(2")	SY											35,598.000	
	500-7001	MOBILIZATION	LS											1.000	
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO											8.000	
	505-7003	TMA (MOBILE OPERATION)	DAY											240.000	
	533-7002	MILL RUMBLE STRIPS (ASPH) (CENTERLINE)	LF											4,789.000	
	662-7112	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	19.000						12.000				2,200.000	
	662-7114	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	2,831.000		1,479.000		2,930.000		1,574.000		2,167.000		70,759.000	
	666-7024	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF											35,963.000	
	666-7030	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF											1,222.000	
	666-7036	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF											6,232.000	
	666-7117	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF											276.000	
	666-7172	RE PM TY II (W) 6" (BRK)	LF											19,079.000	
	666-7175	RE PM TY II (W) 6" (SLD)	LF	58,512.000				56,169.000		41,784.000		51,722.000		1,797,428.000	
	666-7179	RE PM TY II (W) 8" (SLD)	LF	377.000						227.000				13,717.000	
	666-7182	RE PM TY II (W) 12" (SLD)	LF											4,507.000	
	666-7184	RE PM TY II (W) 24" (SLD)	LF	240.000				200.000				135.000		4,885.000	
	666-7211	RE PM TY II (Y) 6" (BRK)	LF	610.000		2,441.000		9,693.000		9,693.000		3,003.000		109,411.750	
	666-7212	RE PM TY II (Y) 6" (DOT)	LF											49.000	
	666-7213	RE PM TY II (Y) 6" (SLD)	LF	54,405.000		5,555.000		68,514.000		25,529.000		36,564.000		1,213,141.000	
	666-7214	RE PM TY II (Y) 8" (SLD)	LF											11,088.000	
	666-7215	RE PM TY II (Y) 12" (SLD)	LF											2,577.000	
	666-7279	RE PROF PM (W)6"(SLD) RAISD PROF ONLY	LF	58,512.000		14,111.000		39,318.000		29,249.000				733,386.000	
	666-7280	RE PROF PM (Y)6"(SLD) RAISD PROF ONLY	LF			3,888.000		47,960.000		17,870.000				262,660.000	
	666-7281	RE PROF PM (Y)6"(BRK) RAISD PROF ONLY	LF			1,709.000		1,127.000		6,785.000				22,868.000	
	666-7408	REFL PAV MRK TY I (W)6"(BRK)(100MIL)	LF											66,287.000	
	666-7411	REFL PAV MRK TY I (W)6"(SLD)(100MIL)	LF											2,008,317.000	
	666-7420	REFL PAV MRK TY I (Y)6"(BRK)(100MIL)	LF											170,310.000	
	666-7423	REFL PAV MRK TY I (Y)6"(SLD)(100MIL)	LF											1,376,640.000	
	668-7091	PREFAB PM TY C (W)(ARROW)	EA	2.000				4.000				14.000		113.000	
	668-7103	PREFAB PM TY C (W)(WORD)	EA	2.000										77.000	
	668-7108	PREFAB PM TY C (W)(RR XING)	EA											4.000	
	668-7110	PREFAB PM TY C (W)(18")(YLD TRI)	EA											103.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0081-05-053

DISTRICT Dallas

COUNTY Collin, Dallas, Denton, Ellis, Kaufman, Navarro, Rockwall

HIGHWAY BI 45H, FM 1384, FM 157, FM 1827, FM 2194, FM 2860, FM 2862, FM 3039, FM 416, FM 428, FM 550, FM 552, FM 635, FM 637, FM 66, FM 661, FM 664, FM 667, FM 780, FM 813, IH 20, SH 22, SH 243, SH 274, SS 469, US 175, US 287, US 67, Various

				1746-01-030		1847-01-011		2247-01-015		3089-01-012		3190-01-013		TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB													
		PROJECT ID		A00191634		A00191666		A00191635		A00191639		A00191638			
		COUNTY		Collin		Navarro		Collin		Kaufman		Kaufman			
		HIGHWAY		FM 1827		FM 635		FM 2194		FM 3039		FM 2860			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	668-7111	PREFAB PM TY C (W)(36")(YLD TRI)	EA											24.000	
	672-7002	REFL PAV MRKR TY I-C	EA	19.000						12.000				464.000	
	672-7004	REFL PAV MRKR TY II-A-A	EA	710.000		191.000		888.000		691.000		646.000		26,158.000	
	672-7006	REFL PAV MRKR TY II-C-R	EA											473.000	
	677-7001	ELIM EXT PM & MRKS (4")	LF											19,356.000	
	677-7008	ELIM EXT PM & MRKS (24")	LF											210.000	
	677-7009	ELIM EXT PM & MRKS (ARROW)	EA											26.000	
	677-7015	ELIM EXT PM & MRKS (WORD)	EA											22.000	
	677-7019	ELIM EXT PM & MRKS (RR XING)	EA											4.000	
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK (NON-PART)	LS											1.000	
	18	LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS											1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS											1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS											1.000	

2025 TYPE(1)RETRACE SEAL COAT QUANTITY SUMMARY (0918-00-420)

REFERENCE NUMBER	COUNTY	HIGHWAY	C-S-J	ROADWAY LIMITS		ROADWAY LENGTH	0666-7024 REFL PAV MRK TY I (W)8"(SLD) (100MIL)	0666-7030 REFL PAV MRK TY I (W)12"(SLD) (100MIL)	0666-7036 REFL PAV MRK TY I (W)24"(SLD) (100MIL)	0666-7117 REFL PAV MRK TY I (Y)12"(SLD) (100MIL)	0666-7408 REFL PAV MRK TY I (W)6" (BRK) (100MIL)	0666-7411 REFL PAV MRK TY I (W)6" (SLD) (100MIL)	0666-7420 REFL PAV MRK TY I (Y)6" (BRK) (100MIL)	0666-7423 REFL PAV MRK TY I (Y)6" (SLD) (100MIL)
				FROM	TO									
				DESCRIPTION	DESCRIPTION	(MI)	(LF)	(LF)	(LF)	(LF)	(LF)	(LF)	(LF)	(LF)
R1	COLLIN	SH 66	0009-05-013	ROCKWALL CO. LINE	HUNT CO. LINE	2.175	803		182			22580		22860
R2	COLLIN	SS 195	1012-01-020	US 75	SH 5	0.952	1626	180	111			9268	366	6224
R3	COLLIN	BS 289C	0091-09-018	SH 289N	E. ASH ST.	4.545	150	132	250			46124	1776	38260
R4	COLLIN	FM 546	1013-01-041	W. OF EN LOE RD.	FM 982	8.17	514		334			83276	1448	77560
R5	COLLIN	FM 1138	1016-07-015	FM 1778	FM 6	2.64			206			26534	1528	19720
R6	COLLIN	FM1138	1016-02-020	FM 6	Rockwall CL	4.068	981	48	150			43376	2830	28266
R7	COLLIN	FM 2933	2977-01-010	FM 545	FM 1827	7.517	542		234			70550	3140	58296
R8	DENTON	IH 35W	0081-13-070	NORTH OF SH 114	FM 1515	13.844			45			35563	2399	33164
R9	DENTON	FM 1192	0816-06-006	W. OF CARL GROSS RD	BUS 377E	1.802			45			18762	2075	6581
R10	DENTON	FM 2931	2979-01-014	FRIENDSHIP RD.	N. OF WOODY CREEK TRAIL	5.737	3937		340			60582	5580	25315
R11	DENTON	FM 3524	0081-05-051	US 377	FM 428	1.796			126			18102	925	14002
R11A	DENTON	FM 2449	2352-02-028	JOHN PAINE RD/UNDERWOOD RD	IH 35W	0.836			28			8828		8828
R12	ELLIS	US 77	0048-03-101	FM 66	PARK HILLS DR./IH 35 NBFR	1.113	100		12	72	75	10672	1172	3486
R13	ELLIS	US 77	0048-04-103	0.175 Mi. N. OF SOUTH PRONG CREEK	FM 55	1.689			16	24		17292	1049	12138
R14	ELLIS	BI 45J	0092-10-009	DALLAS CL	IH 45 SOUTH (S. OF S. MAIN ST.)	2.232			206	44		22238	2230	6720
R15	ELLIS	SL 561	0092-11-005	N. OF IH 45	NEWTON RD.	1.037			14	24		10362	954	3452
R16	ELLIS	BU 287Q	0172-04-051	E. OF US 67	W. OF 1ST ST.	0.315	460		64			3056	762	3048
R17	ELLIS	BU 287Q	0172-05-130	FM 663	MIDLOTHIAN PKWY.	1.18	844		210		3538	11968	2538	11036
R18	ELLIS	FM 878	0596-04-046	US 287	FM 813	8.863			234	112	2810	92134	5022	68774
R19	ELLIS	FM 85	1050-01-020	FM 1182	NAVARRO CO. LINE	2.253			44			23722	1996	22288
R20	ELLIS	FM 85	1050-01-019	IH 45 FR	FM 1182	8.378			20			87358	4113	66882
R21	ELLIS	FM 3413	1050-03-002	IH 45	FM 85	0.211			12			2172		2060
R22	ELLIS	FM 329	1051-02-020	IH 35 FR	US 77	0.363			38			3446		3242
R23	ELLIS	US 287 FR	0172-08-104	N. OF SH 34	OLD ALMA RD.	5.315	5282		353		14050	56200		56200
R24	ELLIS	FM 875	1159-01-031	FM 663	BU 287R	7.137			70			74856	1800	66998
R25	ELLIS	FM 984	1211-01-024	SH 34	EOM (CARTWRIGHT RD.)	6.269			12			65932	4145	37554
R26	ELLIS	FM 985	1212-01-017	FM 984	SH 34	7.074			34			77202	5510	38748
R27	KAUFMAN	FM 148	0751-01-051	IH 20	FM 987	3.53	210		156		42	36734	3428	18582
R28	KAUFMAN	FM 598	0751-04-005	FM 1392	SH 205	2.231			106			23176	2503	10460
R29	KAUFMAN	FM 1392	1016-06-012	SH 205	US 80	4.567			20			47388	5092	17060
R30	KAUFMAN	FM 1389	1395-01-017	US 175	FM 3039	4.941			94			52272	2478	41556
R31	KAUFMAN	FM 1389	1395-01-018	FM 3039	EOM	1.618			78			16564	2116	4028
R32	KAUFMAN	FM 740	1091-01-024	FM 460	PATRIOT PKWY.	1.368	820	323	74		20	13920	1522	8068
R33	KAUFMAN	SS 557	0495-01-085	LAS LOMAS PKWY.	FM 148	1.35	2844	403	400		3432	14056		14056
R34	NAVARRO	IH 45 FR	0093-01-105	RICHLAND CREEK	BI 45F	8.006	11050		93		42272	84544	49175	84544
R35	NAVARRO	SH 14	0093-02-022	IH 45	FREESTONE CO. LINE	8.315	182		163		48	86626	7768	45276
R36	NAVARRO	FM 55	0121-08-021	3RD ST. BLOOMING GROVE	SH 31	9.991		26	112			102418	6864	59938
R37	NAVARRO	FM 85	0719-02-032	FM 1129	HENDERSON CL (TRINITY RIVER)	1.345			184			14030	1492	5238
R38	NAVARRO	FM 1129	0719-02-033	FM 85	SH 31	14.881			334			155502	14338	65450
R39	NAVARRO	FM 1578	0997-01-047	FM 744	CO 3360	2.023			82			20822	1954	14754
R40	NAVARRO	FM 1838	0997-02-045	FM 709	FM 638	9.250			66			96318	6878	70880
R41	NAVARRO	FM 85	1050-02-012	ELLIS CO. LINE	FM 1129	3.264		110	14			34302	2072	10168
R42	NAVARRO	FM 1839	1786-01-012	FM 1126	SH 22	5.700			110			60660	3818	37190
R43	ROCKWALL	SH 66	0009-04-075	BEN PAYNE RD	ROCKWALL CO. LINE	6.303	3232		398			58108	642	62772
R44	ROCKWALL	FM 1140	1014-03-061	FM 740 NORTH	OLD RIDGE RD.	0.133	142		28			982		1254
R45	ROCKWALL	FM 1140	1091-03-013	OLD RIDGE RD.	FM 740SOUTH	2.452	280		56			24426		26780
R46	ROCKWALL	FM 549	1091-04-030	FM 550	SH 205	3.652	1602		182			37220	1888	32522
R47	ROCKWALL	FM 2453	2363-01-008	FM 35	END OF MAINTENANCE	2.527	362		92			26094	2924	4362
						204.958	**35963**	**1222**	**6232**	**276**	**66287**	**2008317**	**170310**	**1376640**

NOTE: FOR CONTRACTOR INFORMATION ONLY;

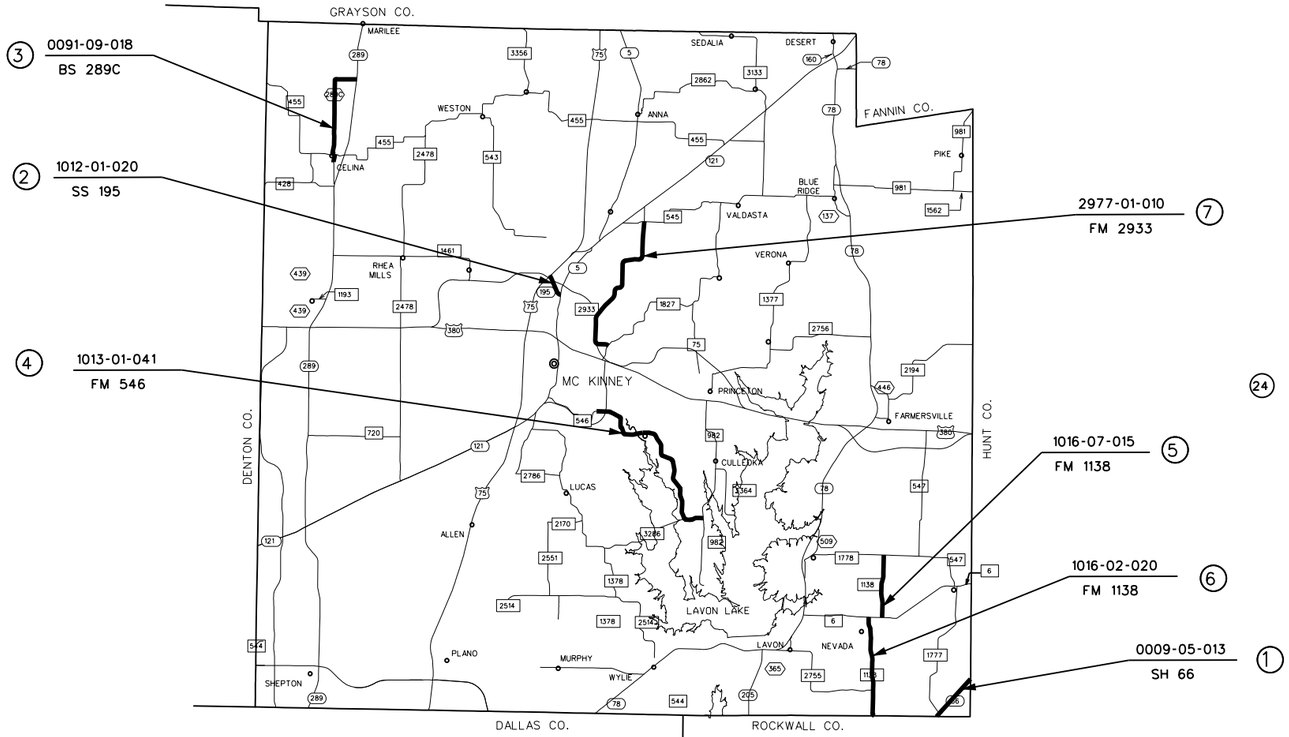
REFERENCE ALL ROADWAYS TO PROJECT CCSJ: 0009-04-075, ETC. [PREVIOUS YEARS SEAL COAT CCSJ]

INDIVIDUAL ROADWAY CSJ'S ARE FOR REFERENCE ONLY

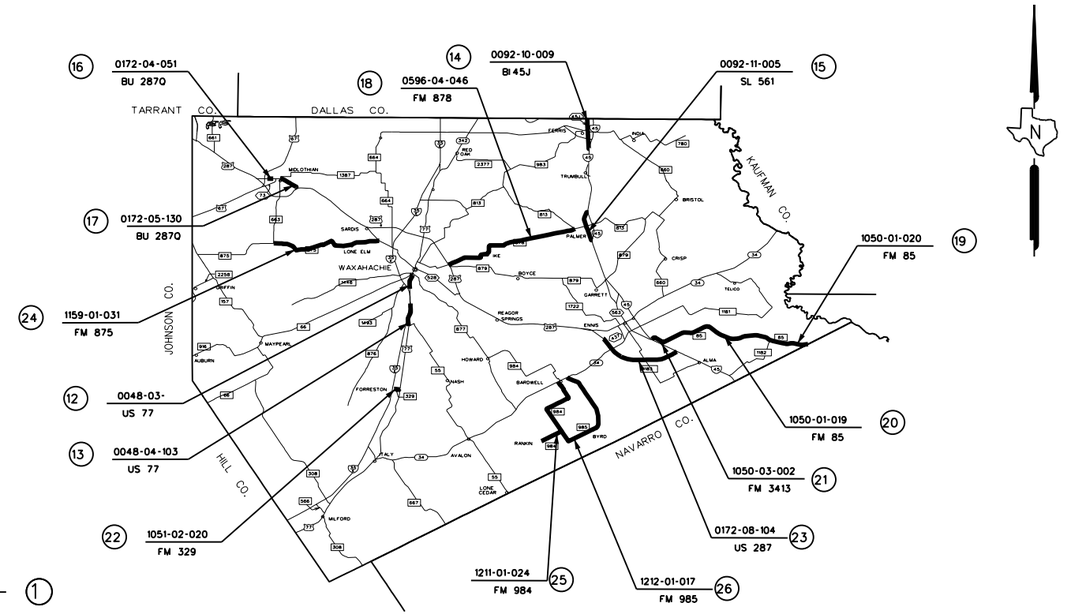
DALLAS DISTRICT /2025 SEAL COAT

RETRACE QUANTITY SUMMARY

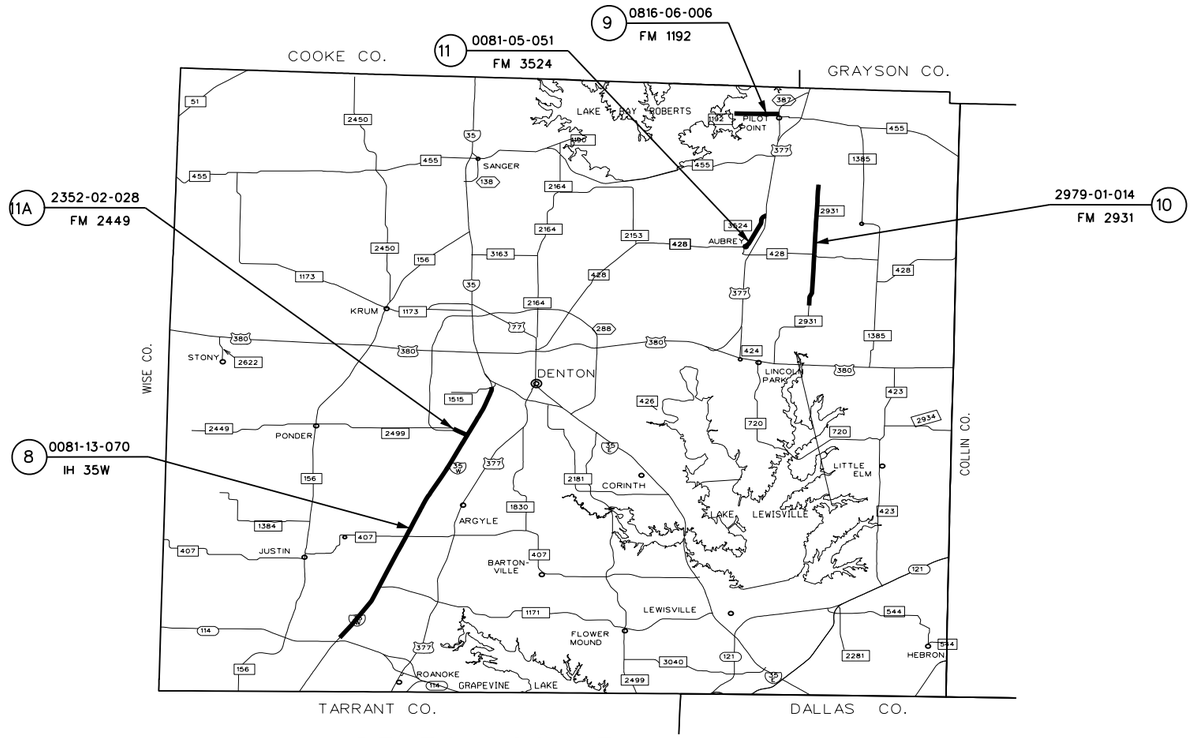
DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
DH	6	SEE TITLE SHEET		FM 428, ETC.
GRAPHICS DH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK AZ	TEXAS	DAL	DENTON, ETC.	5
CHECK DM	CONTROL	SECTION	JOB	
	0081	05	053, ETC.	



COLLIN COUNTY



ELLIS COUNTY



DENTON COUNTY

HOSS Dallas District Maint. 03/20/18

STATE OF TEXAS
DARIUS J. HAGGARD
145313
LICENSED
PROFESSIONAL ENGINEER

Darius Haggard, PE 8/22/2024

DARIUS HAGGARD, P.E. DATE

Texas Department of Transportation

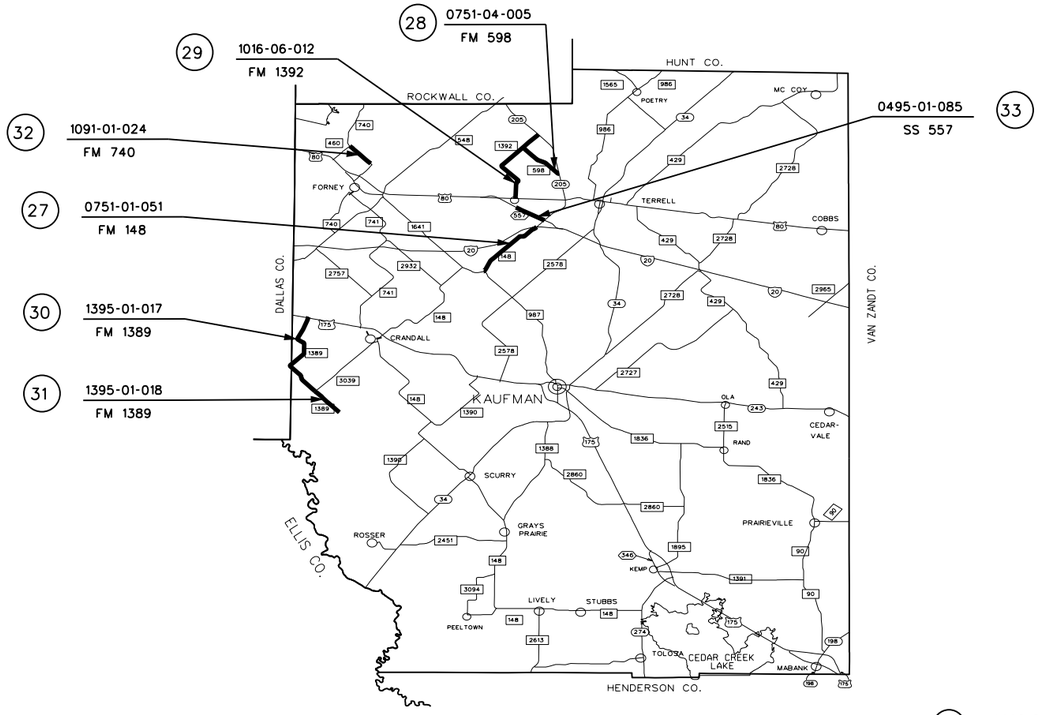
 DALLAS DISTRICT/2025 SEAL COAT

RETRACE LOCATION MAPS

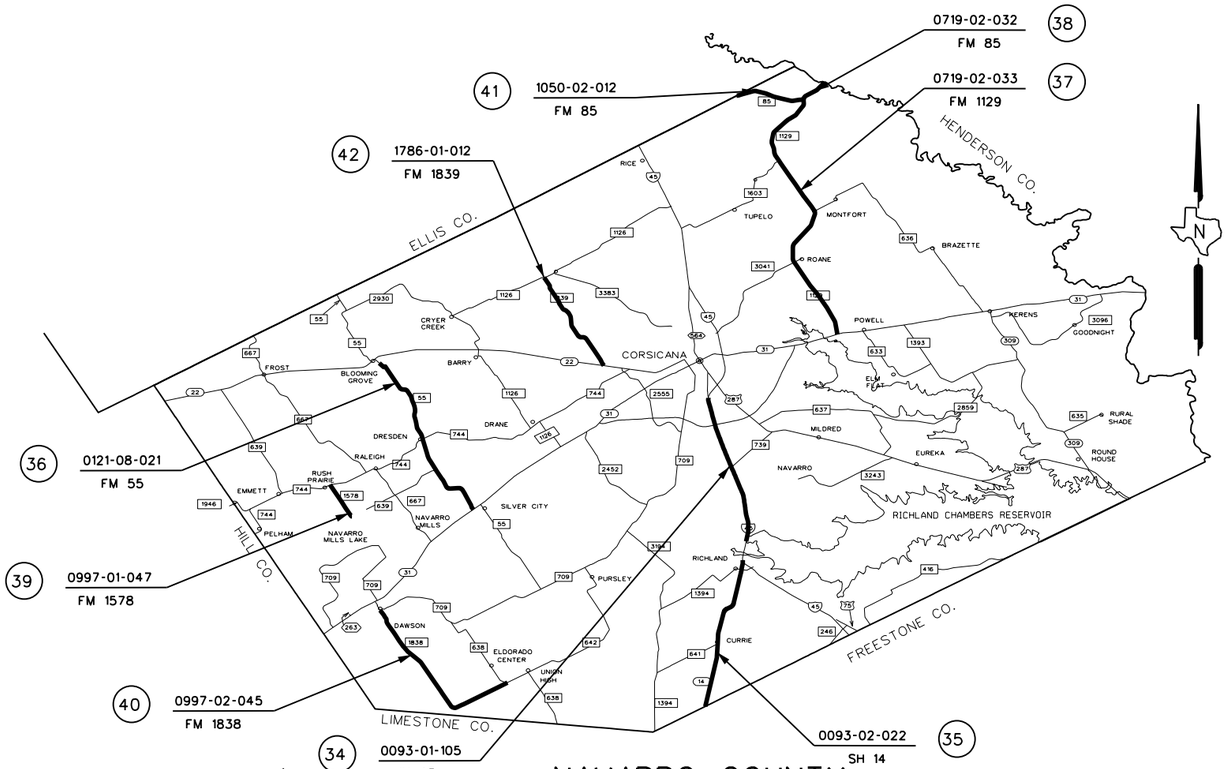
SHEET 1 OF 2

NOT TO SCALE

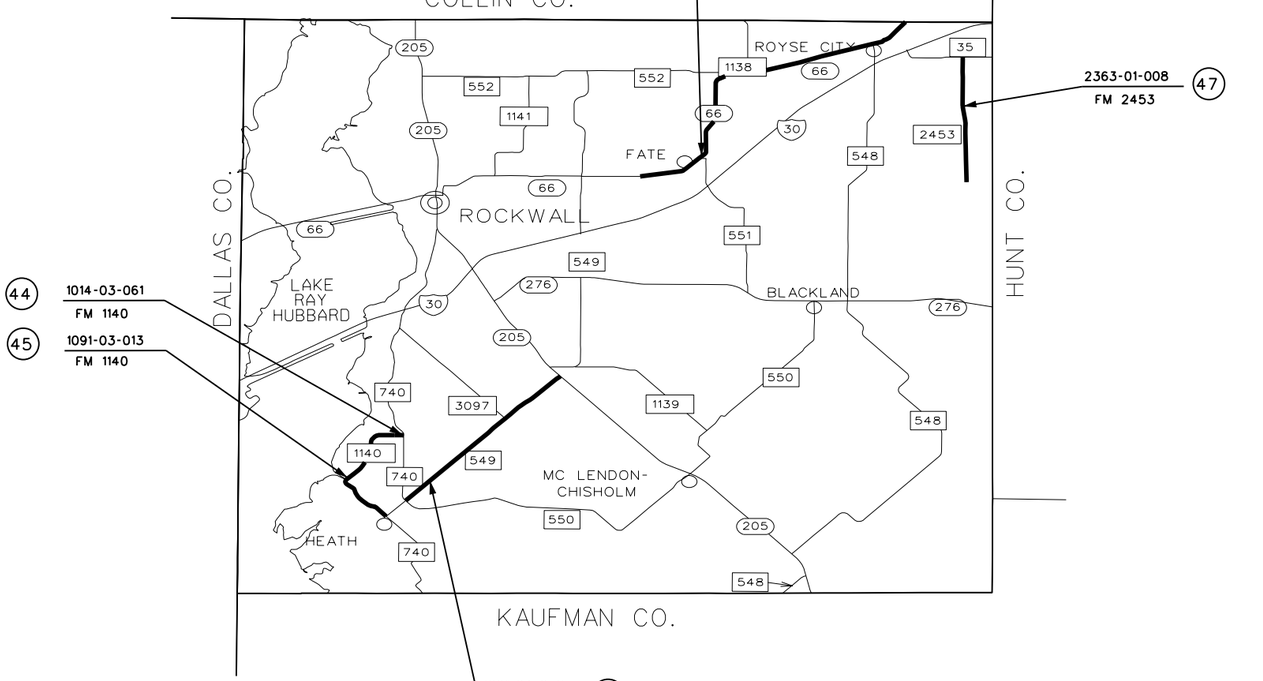
DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
DH	6	SEE TITLE SHEET		FM 428,ETC
GRAPHICS DH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DH	TEXAS	DAL	DENTON,ETC.	6
CHECK DM	CONTROL	SECTION	JOB	
	0081	05	053, ETC.	



KAUFMAN COUNTY



NAVARRO COUNTY



ROCKWALL COUNTY

NOT TO SCALE

STATE OF TEXAS
DARIUS J. HAGGARD
145313
LICENSED
PROFESSIONAL ENGINEER

Darius Haggard, PE 8/22/2024

DARIUS HAGGARD, P.E. DATE

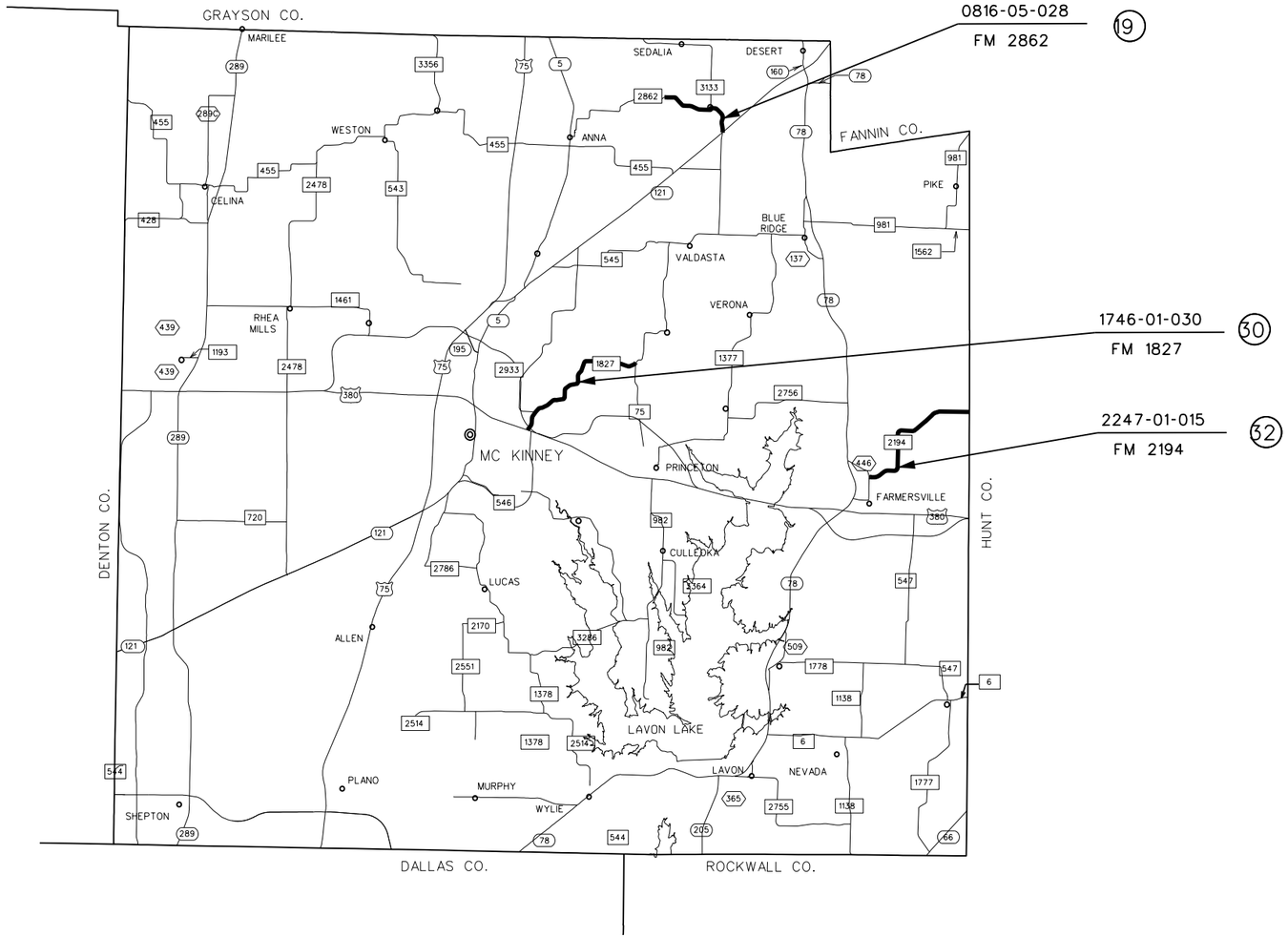
Texas Department of Transportation

 DALLAS DISTRICT/2025 SEAL COAT

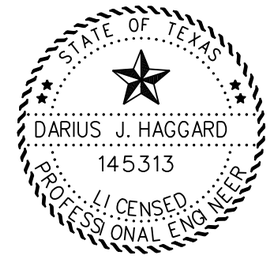
RETRACE LOCATION MAPS

SHEET 2 OF 2

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
DH	6	SEE TITLE SHEET		FM 428,ETC
GRAPHICS DH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DH	TEXAS	DAL	DENTON,ETC.	7
CHECK DM	CONTROL 0081	SECTION 05	JOB 053, ETC.	



REFERENCE NUMBER	HIGHWAY	C-S-J	ROADWAY LIMITS		RDWY. LENGTH (MI)
			FROM	TO	
			DESCRIPTION	DESCRIPTION	
19	FM 2862	0816-05-028	WESTOVER LN.	SH 121	2.961
30	FM 1827	1746-01-030	FM 75	US 380	5.541
32	FM 2194	2247-01-015	BS 78E	COLLIN CL	5.323
				SUBTOTAL	13.825



Darius Haggard, PE 8/2/2024

DARIUS HAGGARD, P.E. DATE

Texas Department of Transportation

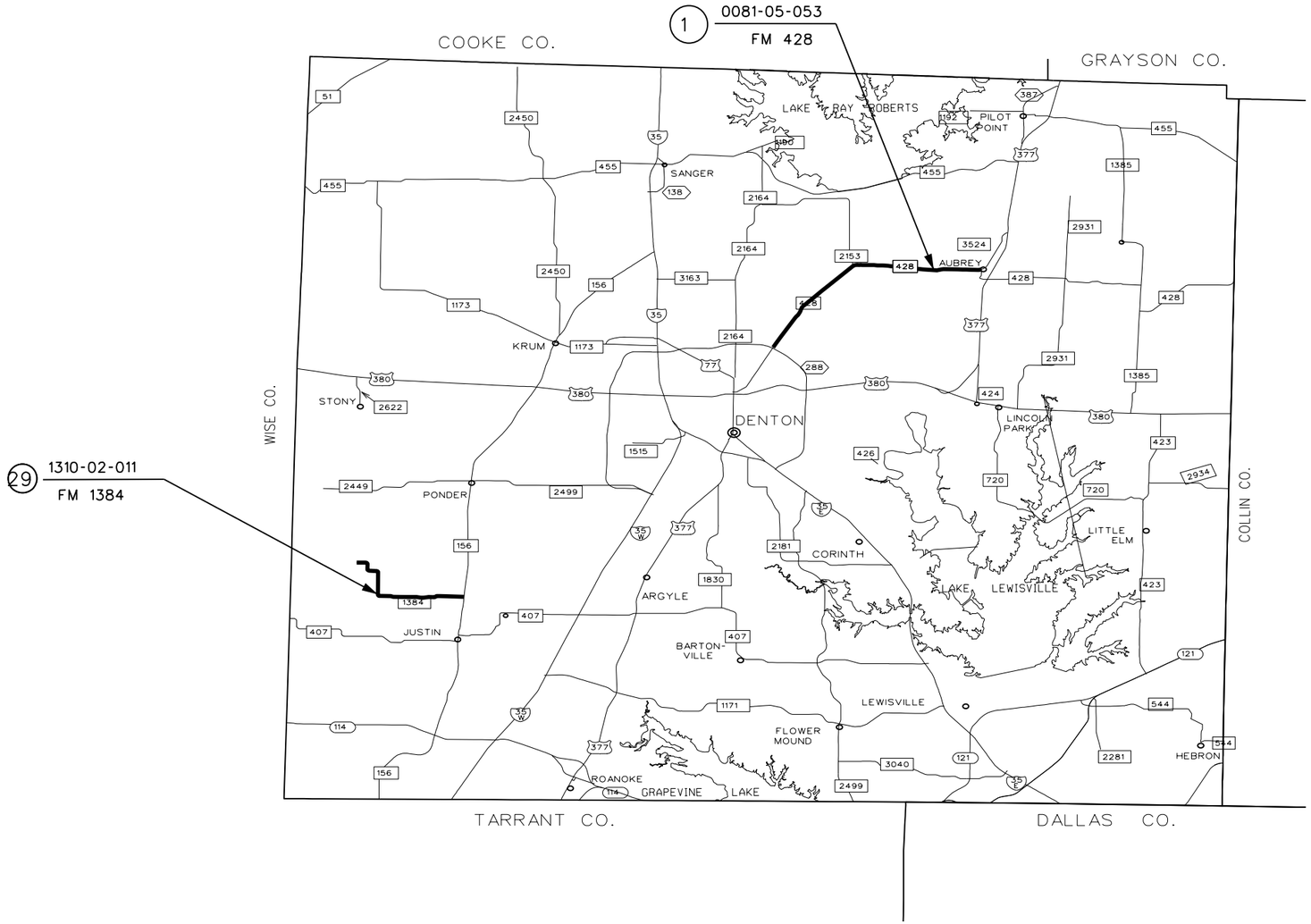
DALLAS DISTRICT/2025 SEAL COAT

COLLIN COUNTY PROJECT SUMMARY AND LOCATION MAP

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
IJ	6	SEE TITLE SHEET		428, ETC.
GRAPHICS IJ	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK JH	TEXAS	DAL	DENTON, ETC.	8
CHECK	CONTROL	SECTION	JOB	
	0081	05	053,ETC.	

NOT TO SCALE

MOSS Dallas District Mshl. 01/15/2020



REFERENCE NUMBER	HIGHWAY	C-S-J	ROADWAY LIMITS		RDWY. LENGTH (MI)
			FROM	TO	
			DESCRIPTION	DESCRIPTION	
1	FM 428	0081-05-053	N of SL 288	FM 3524	8.634
29	FM 1384	1310-02-011	End of Maintenance	FM 156	4.937
				SUBTOTAL	13.571

STATE OF TEXAS
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Darius Haggard, PE 8/2/2024
DARIUS HAGGARD, P.E. DATE

NOT TO SCALE

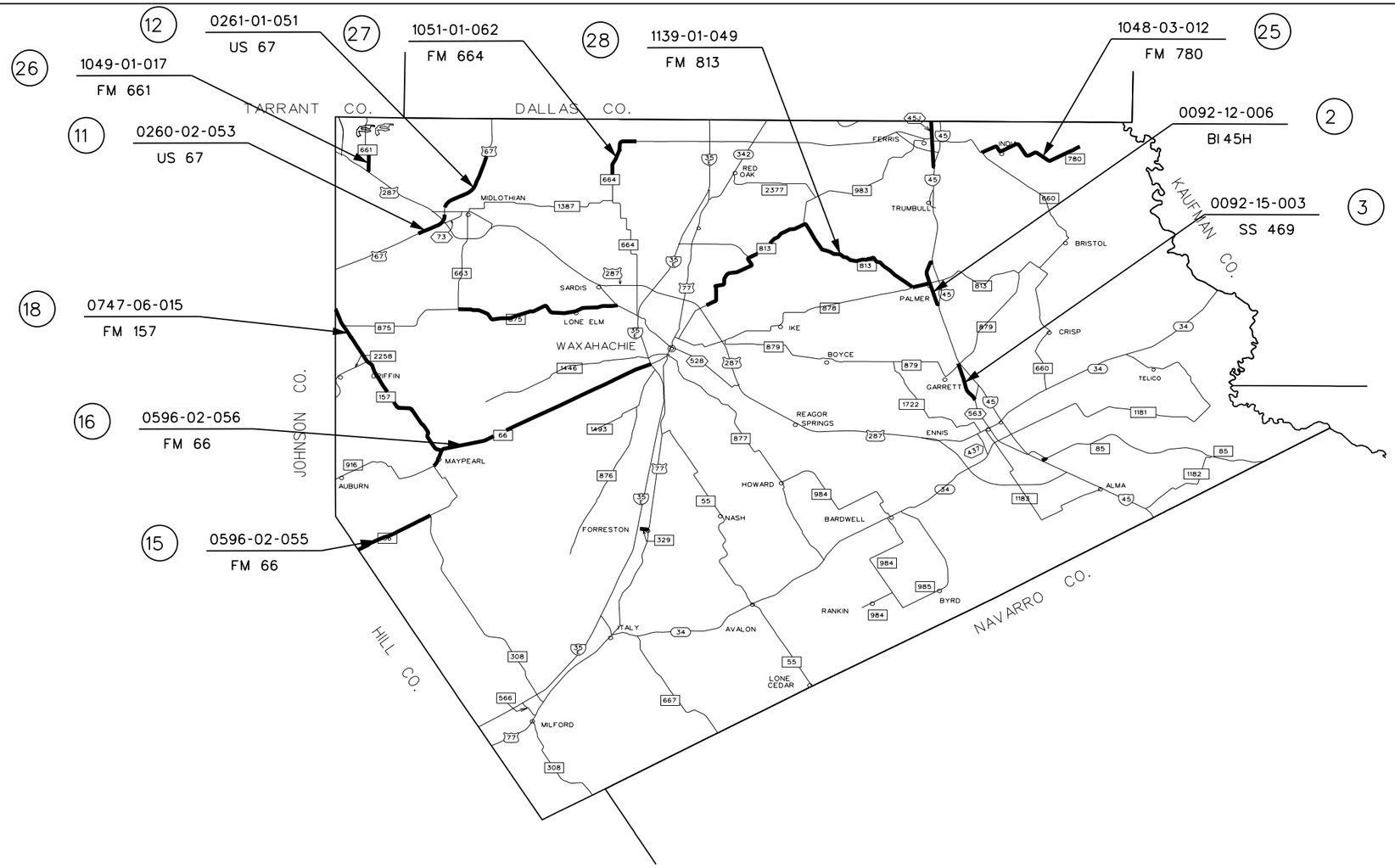
Texas Department of Transportation

DALLAS DISTRICT/2025 SEAL COAT

DENTON COUNTY PROJECT SUMMARY AND LOCATION MAP

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
IJ	6	SEE TITLE SHEET		FM 428, ETC.
GRAPHICS IJ	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK JH	TEXAS	DAL	DENTON, ETC.	9
CHECK	CONTROL	SECTION	JOB	
	0081	05	053, ETC.	

HOSS Dallas District Maint. 01/15/2020



REFERENCE NUMBER	HIGHWAY	C-S-J	ROADWAY LIMITS		RDWY. LENGTH (MI)
			FROM	TO	
			DESCRIPTION	DESCRIPTION	
2	BI 45H	0092-12-006	IH 45 SBFR North	IH 45 SBFR South	2.232
3	SS 469	0092-15-003	BI 45G in Ennis	FM 879	1.929
11	US 67FR	0260-02-053	(0.155 Mi.) South BU 287Q	(0.17 Mi.) North of S Wyatt Rd	2.211
12	US 67FR	0261-01-051	Dallas CL (SB FR Only)	(0.155 Mi.) South of BU 287Q	5.445
15	FM 66	0596-02-055	Hill CL	FM 308	3.41
16	FM 66	0596-02-056	FM 916	IH 35E	10.554
18	FM 157	0747-06-015	Johnson CL	FM 66	8.526
25	FM 780	1048-03-012	FM 660	EOM	4.993
26	FM 661	1049-01-017	From FM 66 Near Tarrant CL	US 287	2.653
27	FM 664	1051-01-062	Red Oak Creek	Westmoreland Rd	1.117
28	FM 813	1139-01-049	N. Grove Blvd.	BI 45H	12.888
				SUBTOTAL	55.958

STATE OF TEXAS
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Darius Haggard, PE 7/24/2024
DARIUS HAGGARD, P.E. DATE

Texas Department of Transportation

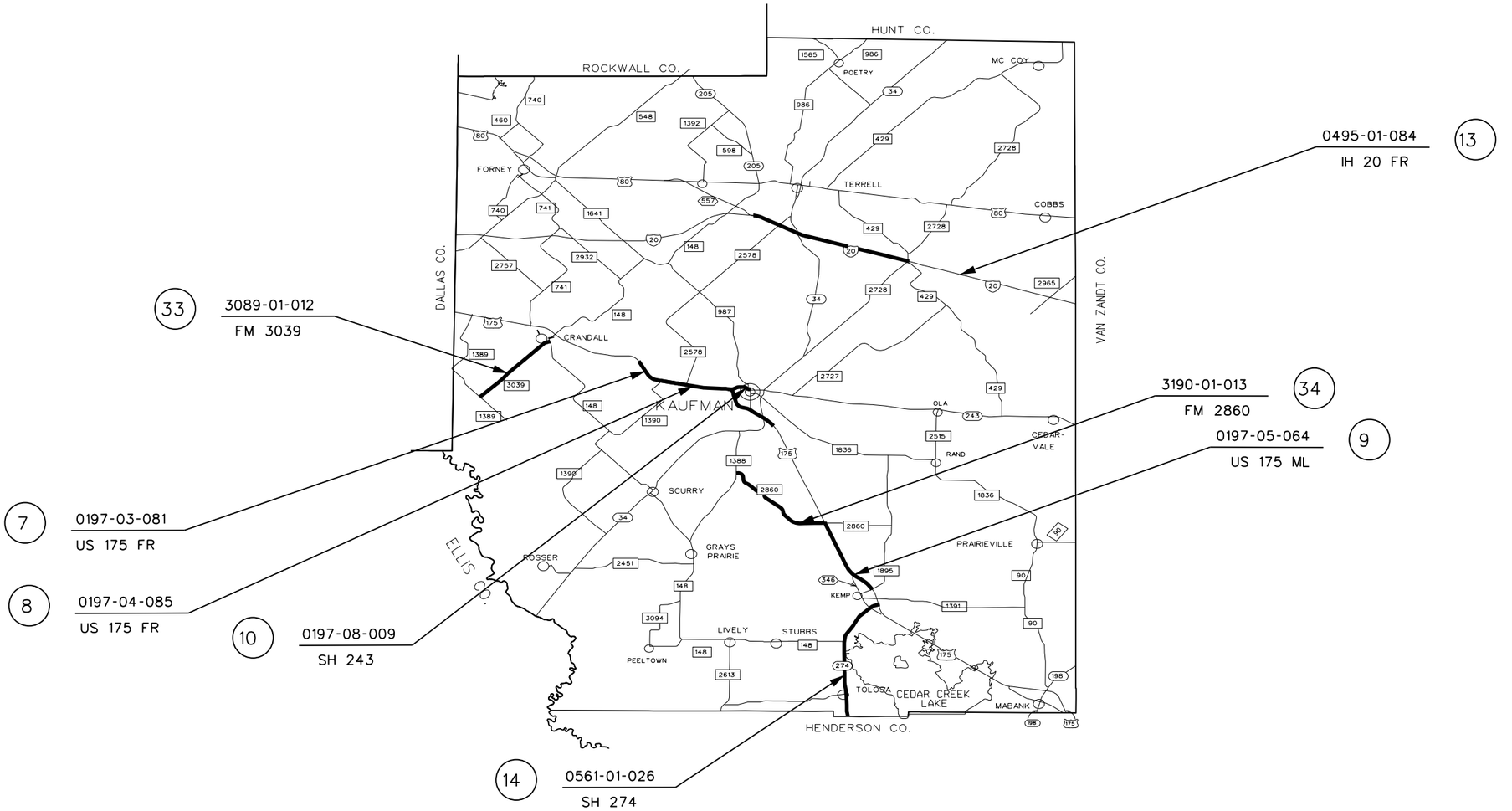
DALLAS DISTRICT/2025 SEAL COAT

ELLIS COUNTY PROJECT SUMMARY AND LOCATION MAP

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
IJ	6	SEE TITLE SHEET		FM 428, ETC.
GRAPHICS IJ	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK JH	TEXAS	DAL	DENTON. ETC.	10
CHECK	CONTROL	SECTION	JOB	
	0081	05	053, ETC.	

NOT TO SCALE

HOSS Dallas District Maint. 03/20/16



REFERENCE NUMBER	HIGHWAY	C-S-J	ROADWAY LIMITS		RDWY. LENGTH (MI)
			FROM	TO	
			DESCRIPTION	DESCRIPTION	
7	US 175 FR	0197-03-081	NW Cedar Ln	Big Brush Crk	1.827
8	US 175 FR	0197-04-085	Big Brush Crk	Praire Branch	5.009
9	US 175 ML	0197-05-064	FM 2860	FM 1895	4.98
10	SH 243	0197-08-009	US 175	FM 987	0.816
13	IH 20 FR	0495-01-084	Rose Hill Rd	FM 429	6.746
14	SH 274	0561-01-026	US 175	HENDERSON CL	6.1
33	FM 3039	3089-01-012	FM 148	FM 1389	4.024
34	FM 2860	3190-01-013	FM 1388	US 175	4.899
				SUBTOTAL	34.401

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Texas Department of Transportation

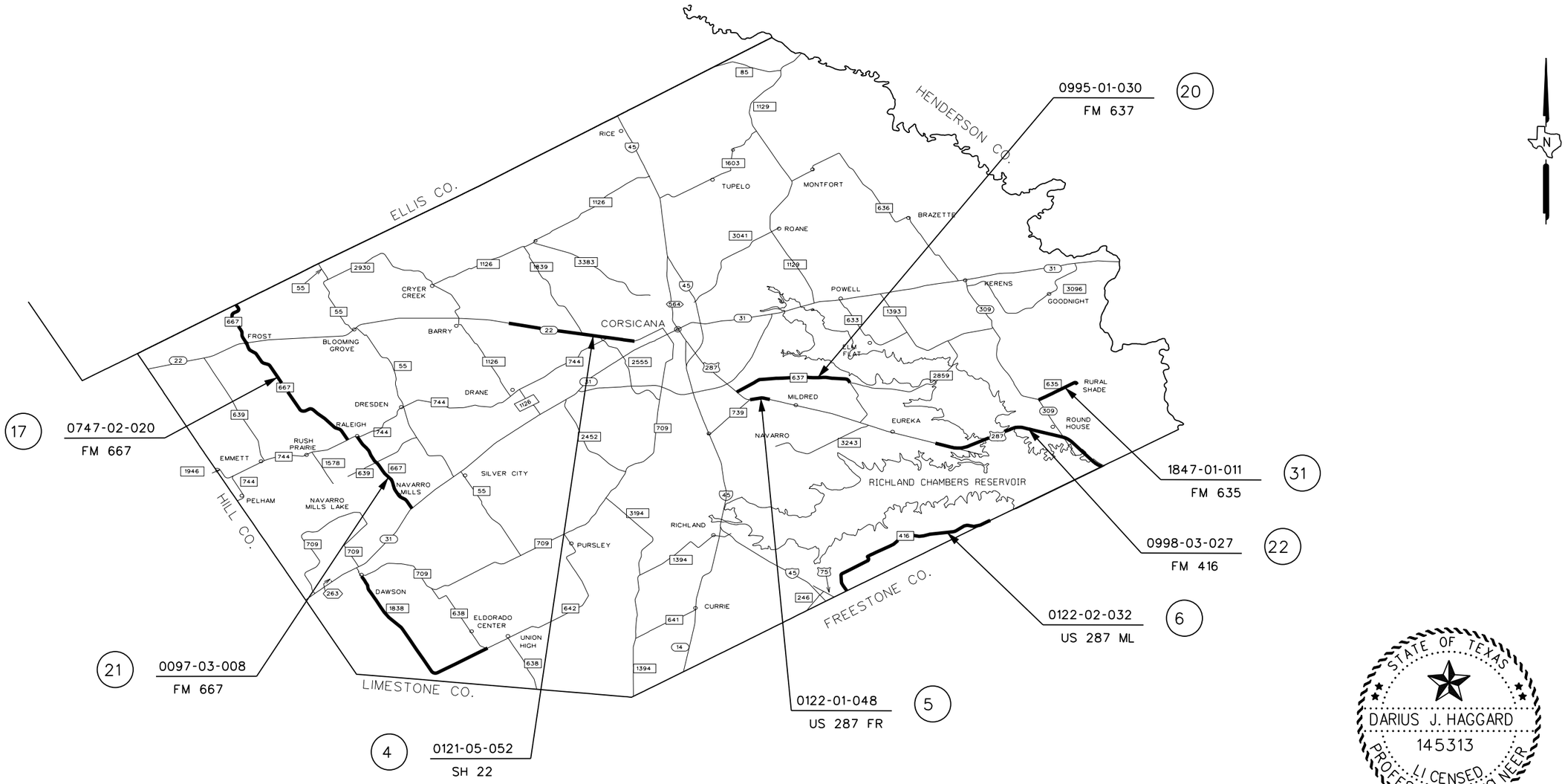
DALLAS DISTRICT/2025 SEAL COAT

KAUFMAN COUNTY PROJECT SUMMARY AND LOCATION MAP

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
DH	6	SEE TITLE SHEET		FM 428, ETC.
GRAPHICS DH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK AZ	TEXAS	DAL	DENTON, ETC.	11
CHECK DM	CONTROL	SECTION	JOB	
	0081	05	053, ETC.	

NOT TO SCALE

HOSS Dallas District Maint. 03/20/18



REFERENCE NUMBER	HIGHWAY	C-S-J	ROADWAY LIMITS		RDWY. LENGTH (MI)
			FROM	TO	
			DESCRIPTION	DESCRIPTION	
4	SH 22	0121-05-052	NW CR 1190	W of 37th St	6.239
5	US 287 FR	0122-01-048	FM 739	W of CR 4901 (End of Jug)	0.841
6	US 287 ML	0122-02-032	1.0 Mi W of SS 294	Freestone Cl	8.75
17	FM 667	0747-02-020	Ellis CL	FM 744	10.149
20	FM 637	0995-01-030	US 287	FM 2859	5.67
21	FM 667	0997-03-008	FM 744	SH 31	4.829
22	FM 416	0998-03-027	W Freestone CL	E Freestone CL	9.099
31	FM 635	1847-01-011	FM 309	END OF STATE MAINT	2.134
				SUBTOTAL	47.711

STATE OF TEXAS
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Darius Haggard, PE 8/2/2024
DARIUS HAGGARD, P.E. DATE

NOT TO SCALE

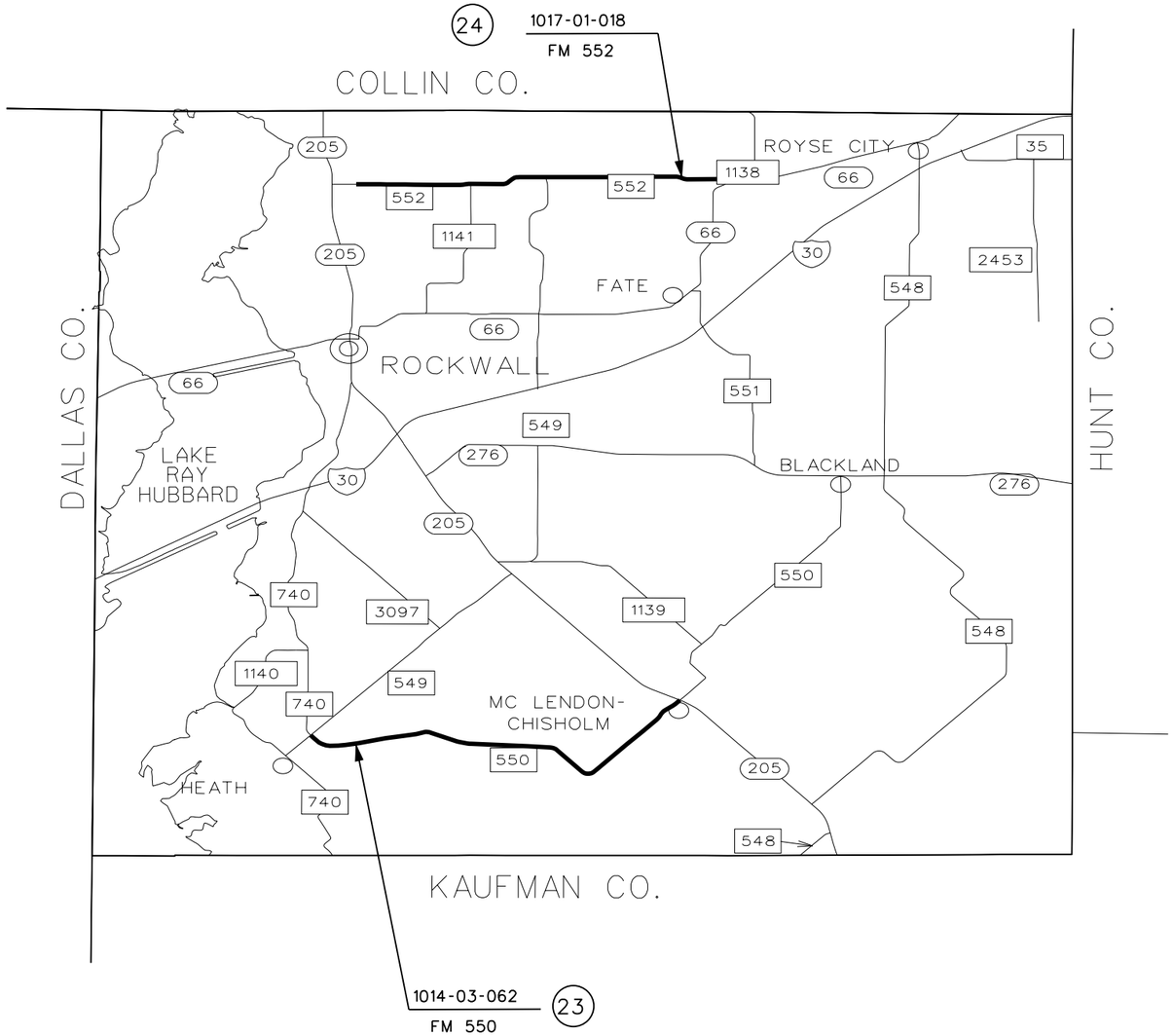
Texas Department of Transportation

DALLAS DISTRICT/2025 SEAL COAT

NAVARRO COUNTY PROJECT SUMMARY AND LOCATION MAP

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
DH	6	SEE TITLE SHEET		FM 428, ETC.
GRAPHICS DH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK AZ	TEXAS	DAL	DENTON, ETC.	12
CHECK DM	CONTROL	SECTION	JOB	
	0081	05	053, ETC.	

Hoss Dallas District Maint. 03/20/18



REFERENCE NUMBER	HIGHWAY	C-S-J	ROADWAY LIMITS		RDWY. LENGTH (MI)
			FROM	TO	
			DESCRIPTION	DESCRIPTION	
23	FM 550	1014-03-062	E of FM 549	SH 205	5.507
24	FM 552	1017-01-018	John King Blvd	SH 66	4.532
				SUBTOTAL	10.039

NOT TO SCALE

STATE OF TEXAS
DARIUS J. HAGGARD
145313
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PROFESSIONAL ENGINEER

Darius Haggard, PE 7/24/2024

DARIUS HAGGARD, P.E. DATE

Texas Department of Transportation

DALLAS DISTRICT/2025 SEAL COAT

ROCKWALL COUNTY PROJECT SUMMARY AND LOCATION MAP

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
DH	6	SEE TITLE SHEET		FM 428, ETC.
GRAPHICS DH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK AZ	TEXAS	DAL	DENTON, ETC.	13
CHECK DM	CONTROL	SECTION	JOB	
	0081	05	053, ETC	

Hoss Dallas District Maint. 02/20/2020

SEAL COAT QUANTITY SUMMARY

PAVEMENT ITEMS

REFERENCE NUMBER	COUNTY	HWY.		C-S-J	FROM	TO	MEASURED ROADWAY LENGTHS (FT)	ROADWAY WIDTHS (FT)	SEAL COAT ROADWAY AREAS (SY)	INT. RAMPS, CROSS OVER AND GORE AREAS (SY)	TOTAL AREA (SY)	ADT	AGG (GR3 OR 4)	ASPHALT RATE (GAL/SY)	AGG RATE (SY/CY)	316-7087 ASPH (AC-15P, AC-20-5TR, OR AC-20XP) (TON)	316-7236 AGGR (TY-PL GR-3LW) SAC-B (CY)	316-7245 AGGR (TY-PB GR-4 OR TY-PL GR-4) SAC-B (CY)
1	DENTON	FM	428	0081-05-053	N OF SL 288	FM 3524	44753	46	228738	3811	232549	7776	4	0.33	125	320	0	1860
2	ELLIS	BI	45H	0092-12-006	IH 45 SBFR North	IH 45 SBFR South	11220	30	37400	1168	38568	3487	3	0.42	110	68	351	0
3	ELLIS	SS	469	0092-15-003	BI 45G in Ennis	FM 879	9526	28	29636	810	30446	2937	3	0.42	110	53	277	0
4	NAVARRO	SH	22	0121-05-052	NW CR 1190	(0.071 Mi) W of 37th St	32947	40	146431	298	146729	6518	4	0.41	125	251	0	1174
5	NAVARRO	US	287 FR	0122-01-048	FM 739	W of CR 4901 (End of Jug)	4451	42	20771	0	20771	6021	4	0.41	125	36	0	166
6	NAVARRO	US	287 ML	0122-02-032	1.0 Mi W of SS 294	Freestone Cl	40616	46	207593	1033	208626	2800	3	0.50	110	435	1897	0
7	KAUFMAN	US	175 FR	0197-03-081	(0.2 Mi) NW of Cedar Ln	Big Brush Crk	18774	28	58408	609	59017	22080	4	0.41	125	101	0	472
8	KAUFMAN	US	175 FR	0197-04-085	Big Brush Crk	(0.25 Mi S of) Praire Branch	43586	30	145287	10242	155529	22080	4	0.41	125	266	0	1244
9	KAUFMAN	US	175 ML	0197-05-064	FM 2860	BUS 175	14571	45	72855	2182	105622	22080	4	0.33	125	145	0	845
					BUS 175	FM 1895	6256	44	30585									
10	KAUFMAN	SH	243	0197-08-009	US 175	FM 987	4303	66	31555	1668	33223	8938	4	0.41	125	57	0	266
11	ELLIS	US	67 FR	0260-02-053	(0.155 Mi) South BU 287Q	(0.17 Mi) North of S Wyatt Rd	11088	26	32032	0	32032	3686	3	0.50	110	67	291	0
12	ELLIS	US	67 FR	0261-01-051	DALLAS CL	(0.155 Mi) South of BU 287Q	26750	26	77278	0	77278	2403	3	0.50	110	161	703	0
13	KAUFMAN	IH	20 FR	0495-01-084	Rose Hill Rd	FM 2965	25200	32	89600	23252	112852	7000	4	0.41	125	193	0	903
14	KAUFMAN	SH	274	0561-01-026	US 175	HENDERSON CL	31319	42	146155	2455	148610	7309	4	0.41	125	254	0	1189
15	ELLIS	FM	66	0596-02-055	Hill CL	FM 308	18480	22	45173	228	45401	582	3	0.42	110	80	413	0
16	ELLIS	FM	66	0596-02-056	FM 916	IH 35E	54556	28	169730	3170	172900	7109	4	0.33	125	238	0	1383
17	NAVARRO	FM	667	0747-02-020	Ellis CL	FM 744	53592	30	178640	1790	180430	1267	3	0.50	110	376	1640	0
18	ELLIS	FM	157	0747-06-015	JOHNSON CL	FM 66	43957	30	146523	6176	152699	2460	3	0.42	110	267	1388	0
19	COLLIN	FM	2862	0816-05-028	Westover Ln	SH 121	15469	28	48126	1262	49388	1537	3	0.50	110	103	449	0
20	NAVARRO	FM	637	0995-01-030	US 287	FM 2859	29927	32	106407	173	106580	1552	3	0.50	110	222	969	0
21	NAVARRO	FM	667	0997-03-008	FM 744	SH 31	25407	35	98805	2852	101657	1024	3	0.50	110	212	924	0
22	NAVARRO	FM	416	0998-03-027	W Freestone CL	E Freestone CL	46458	28	144536	2156	146692	620	3	0.42	110	257	1334	0
23	ROCKWALL	FM	550	1014-03-062	(500') E of FM 549	SH 205	28871	28	89821	692	90513	5978	4	0.41	125	155	0	724
24	ROCKWALL	FM	552	1017-01-018	John King Blvd	SH 66	23934	28	74461	3103	77564	6525	4	0.33	125	107	0	621
25	ELLIS	FM	780	1048-03-012	FM 660	EOM	26352	26	76128	713	76841	1135	3	0.50	110	160	699	0
26	ELLIS	FM	661	1049-01-017	FM 661 NEAR TARRANT CL	US 287	14097	24	37592	1939	39531	1398	3	0.42	110	69	359	0
27	ELLIS	FM	664	1051-01-062	Red Oak Creek	Westmoreland Rd	4955	44	24224	1547	25771	8645	4	0.41	125	44	0	206
28	ELLIS	FM	813	1139-01-049	(0.586 Mi) E of US 287	BI 45H	60175	26	173839	4911	178750	4285	3	0.42	110	313	1625	0
29	DENTON	FM	1384	1310-02-011	END OF MAINTENANCE	FM 156	26072	28	81113	1443	82556	1014	3	0.42	110	145	751	0
30	COLLIN	FM	1827	1746-01-030	FM 75	US 380	29082	28	90477	4032	94509	6746	4	0.41	125	162	0	756
31	NAVARRO	FM	635	1847-01-011	FM 309	END OF STATE MAINT	11304	20	25120	0	25120	206	3	0.50	110	52	228	0
32	COLLIN	FM	2194	2247-01-015	BS 78E	COLLIN CL	28084	28	87373	3319	90692	3095	3	0.42	110	159	824	0
33	KAUFMAN	FM	3039	3089-01-012	FM 148	FM 1389	20892	28	64997	318	65315	5512	4	0.33	125	90	0	523
34	KAUFMAN	FM	2860	3190-01-013	FM 1388	US 175	25861	30	86203	1620	87823	919	3	0.50	110	183	798	0
								SUBTOTAL	**3203615**	**88972**	**3292587**					**5800**	**15920**	**12332**
															AS-BUILT QUANTITY SUBTOTALS			

NOTE: FOR CONTRACTOR INFORMATION ONLY

1- EXCLUSIONS - AREA OF CONCRETE SECTON, BRIDGES, LEAVE-OUTS, OR WIDENINGS:
REF. 1, CONTROL: 0081-05-053, BRIDGE SECT. : L= 840 LF
REF. 6, CONTROL: 0122-02-032, BRIDGE SECT. : L= 5584 LF
REF. 16, CONTROL: 0596-02-056, BRIDGE SECT. : L= 815 LF
REF. 19, CONTROL: 0816-05-028, BRIDGE SECT. : L= 165 LF
REF. 22, CONTROL: 0998-03-027, BRIDGE SECT. : L= 1669 LF
REF. 30, CONTROL: 1746-01-030, BRIDGE SECT. : L= 174 LF

Texas Department of Transportation
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QUANTITY SUMMARY

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
IJ	6	SEE TITLE SHEET		428, ETC.
GRAPHICS IJ	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK JH	TEXAS	DAL	DENTON, ETC.	14
	CONTROL	SECTION	JOB	
CHECK	0081	05	053, ETC.	

HOSS_Dallas District Maint_01/15/2020

WORK ZONE & PERMANENT PAVEMENT MARKINGS

STRIPING & SAFETY ITEMS

REFERENCE NUMBER	COUNTY	HIGHWAY	C-S-J	662-7112 WRK ZN PAV MRK SHT TERM (TAB) TY W (EA)	662-7114 WRK ZN PAV MRK SHT TERM (TAB) TY Y-2 (EA)	666-7172 REF PAV MRK TY II (W) 6" (BRK)	666-7175 REF PAV MRK TY II (W) 6" (SLD) (LF)	666-7179 REF PAV MRK TYII (W) 8" (SLD) (LF)	666-7182 REF PAV MRK TY II (W) 12" (SLD) (LF)	666-7184 REF PAV MRK TY II (W) 24" (SLD) * (LF)	666-7211 REF PAV MRK TY II (Y) 6" (BRK) (LF)	666-7212 REF PAV MRK TY II (Y) 6" (DOT) (LF)	666-7213 REF PAV MRK TY II (Y) 6" (SLD) (LF)	666-7215 REF PAV MRK TY II (Y) 12" (SLD) (LF)	666-7279 RE PROF PM (W)6"(SLD) RAISD PROF ONLY (LF)	666-7280 RE PROF PM (Y)6"(SLD) RAISD PROF ONLY (LF)	666-7281 RE PROF PM (Y)6"(BRK) RAISD PROF ONLY (LF)	677-7001 ELIM EXT PM & MRKS 4" (LF)	677-7006 ELIM EXT PM & MRKS 12" (LF)	677-7008 ELIM EXT PM & MRKS 24" (LF)	677-7009 ELIM EXT PM & MRKS ARROW (EA)	677-7015 ELIM EXT PM & MRKS WORD (EA)	677-7019 ELIM EXT PM & MRKS RR XING (EA)	668-7091 PREFAB PAV MRK TY C (W) (ARROW) (EA)	668-7103 PREFAB PAV MRK TY C (W) (WORD) (EA)	668-7108 PREFAB PAV MRK TY C (W) (RR XING) (EA)	668-7110 PREFAB PAV MRK TY C (W) (18") (YLD TRI) (EA)	668-7111 PREFAB PAV MRK TY C (W) (36") (YLD TRI) (EA)	672-7002 REF PAV MRKR TY I -C (EA)	672-7004 REF PAV MRKR TY II -A-A (EA)	672-7006 REF PAV MRKR TY II -C-R (EA)
1	DENTON	FM 428	0081-05-053	204	4041		91186		4089	210	5474		67017	1179					4000	210	26	22		26	22				204	1529	
2	ELLIS	BI 45H	0092-12-006		555		22440			182	2060		9091																	277	
3	ELLIS	SS 469	0092-15-003		972		42934			48			19450																	486	
4	NAVARRO	SH 22	0121-05-052		3064		65905				5471		39748	50																871	
5	NAVARRO	US 287 FR	0122-01-048		449		13580						13580											2	2					131	
6	NAVARRO	US 287 ML	0122-02-032		5386		92400	159			8634		42779	990				11168						8	2					1285	
7	KAUFMAN	US 175 FR	0197-03-081		1380		37548				909		15610														24			482	
8	KAUFMAN	US 175 FR	0197-04-085		1543		87172	1777	392	106	2043		30164											11	11		59			452	
9	KAUFMAN	US 175 ML	0197-05-064		2006	10392	41659	2998		338			41659											8	8					2200	
10	KAUFMAN	SH 243	0197-08-009	127	315	1703	4209				1558		8158																22	119	
11	ELLIS	US 67 FR	0260-02-053	554			11088				2772		11088																		139
12	ELLIS	US 67 FR	0261-01-051	668		6687	26750						26750																		334
13	KAUFMAN	IH 20 FR	0495-01-084		1000	50	30000			252	524		31000														20	24		600	
14	KAUFMAN	SH 274	0561-01-026		2608	1165	64385	2561		180	4845		58291											12	12					251	
15	ELLIS	FM 66	0596-02-055		1578		36960				2667		20901		25872															656	
16	ELLIS	FM 66	0596-02-056	7	3149	146	110742	1224		574	7462		70416		77519			3260						11	7					2031	
17	NAVARRO	FM 667	0747-02-020		5128		107163				4982		30233		75329	55725	3487									2				1244	
18	ELLIS	FM 157	0747-06-015	69	1571		87914	1374		336	6368		42406		61540									6	5				69	1160	
19	COLLIN	FM 2862	0816-05-028		1565	262	31268	544		280			31268																	391	
20	NAVARRO	FM 637	0995-01-030		87		59854		26	30	2700		34000													2				1000	
21	NAVARRO	FM 667	0997-03-008		2930		51058				4704		20729		35741	14510	3293													495	
22	NAVARRO	FM 416	0998-03-027		4694		95473			266	5093		66359		66831	46451	3565													1084	
23	ROCKWALL	FM 550	1014-03-062	200	2311		58143	170		76	2719		42142											1	1				22	709	
24	ROCKWALL	FM 552	1017-01-018	200	2080		47868	983		290	2152	49	38362	358	33508	26853	1506							7	4				53	823	
25	ELLIS	FM 780	1048-03-012		1700		52705			140	2993		35543		36893															900	
26	ELLIS	FM 661	1049-01-017	26	1500		28196	522		48			29130		19737	20391								1	1				26	392	
27	ELLIS	FM 664	1051-01-062	114	490	216	9910	801		160	749		8333																37	250	
28	ELLIS	FM 813	1139-01-049		5537		138358			724	5099		108099		96851			928												2596	
29	DENTON	FM 1384	1310-02-011		2139		52144			70	1994		41446		36501	29012	1396													618	
30	COLLIN	FM 1827	1746-01-030	19	2831		58512	377		240	610		54405											2	2				19	710	
31	NAVARRO	FM 635	1847-01-011		1479						2441		5555		14111	3888	1709													191	
32	COLLIN	FM 2194	2247-01-015		2930		56169			200	1610		68514		39318	47960	1127							4						888	
33	KAUFMAN	FM 3039	3089-01-012	12	1574		41784	227			9693		25529		29249	17870	6785												12	691	
34	KAUFMAN	FM 2860	3190-01-013		2167		51722			135	3003		36564											14						646	
SUBTOTAL				**2200**	**70759**	**20621**	**1755477**	**13717**	**4507**	**4750**	**98326**	**49**	**1224319**	**2577**	**649000**	**262660**	**22868**	**15356**	**4000**	**210**	**26**	**22**	**4**	**99**	**77**	**4**	**103**	**24**	**464**	**26158**	**473**
AS-BUILT QUANTITY SUBTOTALS																															

DALLAS DISTRICT/2025 SEAL COAT

WORK ZONE AND STRIPING QUANTITY

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
IJ	6	SEE TITLE SHEET		428, ETC.
GRAPHICS IJ	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK JH	TEXAS	DAL	DENTON, ETC.	15
CHECK	CONTROL	SECTION	JOB	
	0081	05	053, ETC.	

HARD CURVE MILL & INLAY

ELLIS COUNTY	REFERENCE NUMBER	HIGHWAY	LATITUDE/LONGITUDE OF CURVE LOCATIONS	FROM TRM	TO TRM	LENGTH (MI)	LENGTH (FT)	WIDTH (FT)	INTERSECTIONS (SY)	TOTAL AREA (SY)	354-7051 PLANE ASPH CONC PAV (2") (SY)	344-7009 SP MIXES SP-C PG64-22 (TON)	344-7077 TACK COAT (GAL)	533-7002 RUMBLE STRIPS (CENTERLINE) ASPHALT (LF)
	18	FM 157	32.344691/-97.043791	306+1.388	306+1.598	0.21	1109	28	0	3450	3450	380	207	1109
	18	FM 157	32.343187/-97.032676	306+1.919	308+0.082	0.241	1272	28	0	3957	3957	435	237	1272
	18	FM 157	32.332712/-97.0264818	308+0.808	308+0.976	0.168	887	28	0	2760	2760	304	166	887
	18	FM 157	32.326936/-97.021822	308+1.294	308+1.582	0.288	1521	28	0	4732	4732	521	284	1521
	27	FM 664	32.530222/-96.885696	590+0.986	590+1.163	0.177	935	44	0	4571	4571	503	274	
	28	FM 813	32.428792/-96.678595	0	0	0	0	0	721	721	721	79	43	
	28	FM 813	32.443865/-96.792933	590+0.966	590+1.089	0.093	491	30	0	1637	1637	180	98	
	28	FM 813	32.442824/-96.794814	590+1.352	590+1.471	0.119	628	30	0	2093	2093	230	126	
	28	FM 813	32.455784/-96.743026	594+1.549	596+1.616	0.067	354	30	0	1180	1180	130	71	
	28	FM 813	32.452112/-96.730317	594+0.357	596+0.416	0.059	312	30	0	1040	1040	114	62	
	28	FM 813	32.449477/-96.707203	596+1.845	596+1.947	0.102	539	30	0	1797	1797	198	108	
	28	FM 813	32.447275/-96.704509	598+0.132	598+0.192	0.06	317	30	0	1057	1057	116	63	
	28	FM 813	32.446352/-96.701152	598+0.296	598+0.355	0.059	312	30	0	1040	1040	114	62	
										SUBTOTAL	**30035**	**3304**	**1801**	**4789**

NAVARRO COUNTY	REFERENCE NUMBER	HIGHWAY	LATITUDE/LONGITUDE OF CURVE LOCATIONS	FROM TRM	TO TRM	LENGTH (MI)	LENGTH (FT)	WIDTH (FT)	INTERSECTIONS (SY)	TOTAL AREA (SY)	354-7051 PLANE ASPH CONC PAV (2") (SY)	344-7009 SP MIXES SP-C PG64-22 (TON)	344- 7077 TACK COAT (GAL)
	22	FM 416	31.906426/-96.306224	618+0.461	618+0.624	0.169	892	30	0	2973	2973	327	178
	22	FM 416	31.909538/-96.305857	618+0.710	618+0.762	0.052	275	30	0	917	917	101	55
	22	FM 416	31.927569/-96.272018	621+1.057	621+1.149	0.095	502	30	0	1673	1673	184	100
										SUBTOTAL	**5563**	**612**	**333**

HARD CURVE
MILL & INLAY QUANTITY

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
DH	6	SEE TITLE SHEET		428, ETC.
GRAPHICS DH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DH	TEXAS	DAL	DENTON, ETC.	16
CHECK DM	CONTROL	SECTION	JOB	
	0081	05	053, ETC.	

COLLIN COUNTY INTERSECTION(I),WIDENING(W),CROSSOVERS(CRO),RAMPS(R)AND GORES(G) QUANTITY

REF. # 19 FM 2862		INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
Westover Ln.	ASPH	0	0	0	0	0
County Rd 480	ASPH	40	25	22	17	130
County Rd 511	ASPH	30	25	20	27	110
Westmoreland Cir	ASPH	32	24	22	20	106
N Bowden Ave (north)	ASPH	14	20	11	11	37
N Bowden Ave (south)	ASPH	10	20	10	13	29
Picadilly Ave	ASPH	11	20	10	16	33
College Ave (north)	ASPH	11	20	10	12	30
College Ave (south)	ASPH	0	0	0	0	0
N Georgia Ave (north)	ASPH	13	20	20	0	38
N Georgia Ave (south)	ASPH	13	20	13	8	34
Church St	ASPH	35	25	30	15	124
FM 3133	ASPH	30	28	25	26	124
Broadway Ave	ASPH	37	29	29	18	147
E Austin St	ASPH	36	30	15	41	165
County Rd 526	ASPH	33	33	34	17	155
					TOTAL	1262

REF. # 30 FM 1827		INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
FM 75	ASPH	73	34	67	75	517
County Rd 409	ASPH	17	37	38	27	122
County Rd 988	ASPH	185	28	124	0	942
Surrey Estates Rd	ASPH	16	28	19	25	73
Bomar Ln	ASPH	31	37	26	14	148
Windmill Dr	ASPH	32	24	27	33	129
Creek View Landing Dr	ASPH	30	71	32	38	296
Meadows Dr	CONC	0	0	0	0	0
County Rd 408	ASPH	42	25	32	44	187
Dale Dr	CONC	0	0	0	0	0
Farms Rd	ASPH	18	20	18	20	57
Buck Board Dr	ASPH	89	17	37	0	201
Peppermint Ln	CONC	0	0	0	0	0
Trail Dr	ASPH	59	23	32	0	175
Rockcrest Rd	ASPH	37	35	57	43	265
FM 2933	ASPH	20	73	55	42	276
Oak Creek Dr	ASPH	29	33	21	28	136
Fisher Rd	ASPH	15	55	26	29	128
Widening @US 380	CONC	300	11.4	0	0	380
US 380	CONC	0	0	0	0	0
					TOTAL	4032

REF. # 32 FM 2194		INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
BS 78E	ASPH	78	28	87	61	512
Merit St	ASPH	147	11	0	0	180
Willow Ln	CONC	0	0	0	0	0
County Rd 657	ASPH	56	22	48	38	226
County Rd 656	ASPH	135	22	0	45	378
County Rd 657	ASPH	47	48	81	48	462
County Rd 657	ASPH	190	21	0	0	443
County Rd 1025	ASPH	27	16	28	24	80
County Rd 1024	ASPH	18	22	22	30	77
County Rd 661	ASPH	41	19	30	19	117
County Rd 658	ASPH	46	24	52	37	220
County Rd 701	ASPH	55	18	45	42	200
County Rd 702	ASPH	73	23	44	32	257
County Rd 701	ASPH	37	21	37	45	167
					TOTAL	3319

DALLAS DISTRICT/2025 SEAL COAT

COLLIN COUNTY INTERSECTION,WIDENING RAMPS & GORES QUANTITY

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
IJ	6	SEE TITLE SHEET		428, ETC.
GRAPHICS IJ	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK JH	TEXAS	DAL	DENTON, ETC.	17
CHECK	CONTROL	SECTION	JOB	
	0081	05	053, ETC.	

DENTON COUNTY INTERSECTION(I),WIDENING(W),CROSSOVERS(CRO),RAMPS(R)AND GORES(G) QUANTITY

REF. # 1 FM 428		INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
HARTLEE FIELD RD	ASPH	32	23	43	28	145
WIDENING	ASPH	1092	10.5	0	0	1274
LONG RD	CONC	0	0	0	0	0
BRIABROOK DR	CONC	0	0	0	0	0
ELM BOTTOM CIR	ASPH	65	23	84	62	426
GREEN VALLEY CIR	ASPH	60	22	0	71	267
WARSCHUN RD EAST	ASPH	39	22	27	0	113
WARSCHUN RD WEST	ASPH	87	25	0	84	410
WARSCHUN RD	CUT	0	0	0	0	0
REINING RD	ASPH	25	25	30	28	110
FM 2153	ASPH	52	41	0	48	292
ZACHARY RD	ASPH	27	23	41	31	132
ELM BOTTOM RD	ASPH	19	25	26	30	90
WILDCAT RD	ASPH	40	26	46	50	226
BLACKJACK RD W	ASPH	17	23	27	23	73
WACHUM RD	ASPH	0	0	0	0	0
BLACKJACK RD	ASPH	27	24	35	26	117
MAPLE ST	GRVL	0	0	0	0	0
S. CHERRY ST	ASPH	33	22	32	36	136
CHERRY ST	CONC	0	0	0	0	0
					TOTAL	3811

REF. # 29 FM 1384		INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
FM 1384 SPUR	ASPH	198.5	24	0	0	529
SHERMAN RD	ASPH	258.5	24	0	0	689
JIM BAKER RD	ASPH	19	42	27	31	129
JIM BAKER RD	GRVL	0	0	0	0	0
LEVY ST	GRVL	0	0	0	0	0
SPUD LUCK LN.	GRVL	0	0	0	0	0
SPUD LUCK LN.	GRVL	0	0	0	0	0
LEUTY ST	GRVL	0	0	0	0	0
V RANCH RD	GRVL	0	0	0	0	0
SPOTTED DOG LN	GRVL	0	0	0	0	0
TIM DONALD RD	ASPH	30	22	30	0	95
					TOTAL	1443

DENTON COUNTY
INTERSECTION,WIDENING
RAMPS & GORES QUANTITY

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
DH	6	SEE TITLE SHEET		FM 428,ETC.
GRAPHICS DH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK AZ	TEXAS	DAL	DENTON, ETC.	18
CHECK DM	CONTROL	SECTION	JOB	
	0081	05	053, ETC.	

ELLIS COUNTY INTERSECTION(I),WIDENING(W),CROSSOVERS(CRO),RAMPS(R)AND GORES(G) QUANTITY

REF. # 2 — BI 45H — INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY

INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
N. Stacks St.	ASPH	53	24	33	30	189
E. Paris St.	ASPH	20	20	16	12	54
E. Paris St.	ASPH	20	20	16	12	54
E. Canton St.	ASPH	20	20	13	12	52
E. Canton St.	ASPH	20	20	13	12	52
E. Denton St.	ASPH	20	20	15	15	55
E. Denton St.	ASPH	20	20	15	15	55
FM 813	ASPH	20	24	21	26	80
FM 813	ASPH	20	24	21	26	80
Marshall St.	ASPH	20	24	20	26	79
Marshall St.	ASPH	20	20	20	20	64
E. Cooper St.	ASPH	20	20	20	19	63
E. Cooper St.	ASPH	20	20	20	19	63
E. Lamar St.	ASPH	20	20	14	20	59
E. Lamar St.	ASPH	20	20	14	20	59
E. Waco	ASPH	20	20	14	16	55
E. Waco	ASPH	20	20	14	16	55
					TOTAL	1168

REF. # 3 — SS 469 — INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY

INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
Widining at BI 45G in Ennis	ASPH	232	18	25	24	493
Brombeck	ASPH	42	28	23	24	157
Cedar	CONC	0	0	0	0	0
Abner Rd.	ASPH	50	24	23	24	160
					TOTAL	810

REF. # 15 — FM 66 — INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY

INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
Weekly Branch Rd	ASPH	32	24	38	18	127
Dollie Rd	ASPH	36	22	17	16	101
					TOTAL	228

REF. # 16 — FM 66 — INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY

INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
Howland Ln.	ASPH	25	24	18	15	80
Technology Way	CONC	0	0	0	0	0
Yukon Blvd.	CONC	0	0	0	0	0
Red River Dr.	CONC	0	0	0	0	0
Waterford Dr.	ASPH	22	24	15	14	69
E. Tumbleweed Rd.	ASPH	48	30	18	14	172
Cunningham-Meadows Rd.	ASPH	57	24	30	17	180
Cunningham-Meadows Rd.	ASPH	57	24	30	17	180
W. Tumbleweed Rd.	ASPH	0	0	0	0	0
Richard Rd.	ASPH	25	24	23	21	90
Lonesome Valley Rd.	CONC	0	0	0	0	0
Evening Fire Dr.	CONC	0	0	0	0	0
Arrowhead Rd.	ASPH	48	37	30	28	237
E. Greathouse Rd.	ASPH	50	50	38	35	341
Alysa Ln.	CONC	0	0	0	0	0
Grand Casa Rd.	ASPH	40	24	22	20	128
Four Trees Crossing	CONC	0	0	0	0	0
Stone Field Ct	CONC	0	0	0	0	0
Cedar Park Ct	CONC	0	0	0	0	0
N. Oak Branch Rd.	ASPH	48	24	50	30	209
S. Oak Branch Rd.	ASPH	40	24	38	20	151
N. Hidden Hills Blvd.	ASPH	48	46	32	20	279
S. Hidden Hills Blvd.	CONC	0	0	0	0	0
Mission Trl.	ASPH	0	0	0	0	0
W. Greathouse Rd.	ASPH	30	24	33	24	120
					TOTAL	2236

REF. # 16 — FM 66 — INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY

INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
Wilemon Rd.	ASPH	42	24	23	18	132
E. Creekview Cir.	ASPH	35	24	26	27	127
W. Creekview Cir.	ASPH	30	24	18	18	95
Chambers Creek Cir.	CONC	0	0	0	0	0
Hillridge Ln.	ASPH	35	24	16	25	114
FM157	ASPH	46	36	54	46	304
E. Fifth St.	ASPH	0	0	0	0	0
W. Fourth St.	ASPH	24	24	20	18	81
E. Fourth St.	ASPH	24	24	20	18	81
W. Third St.	ASPH	0	0	0	0	0
E. Third St.	ASPH	0	0	0	0	0
W. Second St.	ASPH	0	0	0	0	0
E. Second St.	ASPH	0	0	0	0	0
W. First St.	ASPH	0	0	0	0	0
E. First St.	ASPH	0	0	0	0	0
W. MLK Jr St.	ASPH	0	0	0	0	0
E. MLK Jr St.	ASPH	0	0	0	0	0
					TOTAL	934

REF. # 18 — FM 157 — INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY

INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
FM 875	ASPH	42	60	69	65	494
Madison Wilson	ASPH	33	20	15	18	86
FM 2258	ASPH	30	50	56	53	308
Murr	ASPH	41	22	18	21	118
Highgate	CONC	0	0	0	0	0
Marion	ASPH	15	24	11	14	48
Armstrong	ASPH	31	24	20	20	102
Country Acres	ASPH	41	24	22	20	130
Country Acres	ASPH	42	22	23	21	126
Ozro	ASPH	32	22	23	27	108
Campbell	ASPH	38	30	33	33	179
Old Buena Vista	ASPH	32	24	43	39	166
Barton	ASPH	25	24	31	28	108
Phillips	ASPH	27	40	22	22	143
Widening	ASPH	1085	9.5	0	0	1145
Morton	ASPH	25	12	10	10	38
Claunch	ASPH	40	24	47	38	194
Trice	ASPH	30	20	20	17	83
Widening	ASPH	16	1725	0	0	3067
Rangeland	CONC	0	0	0	0	0
Brahman	CONC	0	0	0	0	0
Diamond Crest	CONC	0	0	0	0	0
Widening	ASPH	10	535	0	0	594
Widening	ASPH	9	1055	0	0	1055
					TOTAL	6176

REF. # 25 — FM 780 — INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY

INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
Askew Rd	ASPH	25	24	20	22	88
India Rd	ASPH	0	0	0	0	0
Moyers Rd	ASPH	0	0	0	0	0
Ten Mile Rd	ASPH	30	24	27	29	117
Mohundro Rd	ASPH	33	20	23	21	96
E. India Rd	ASPH	0	0	0	0	0
Hall Rd	ASPH	53	24	30	27	180
Wickliff Rd	ASPH	0	0	0	0	0
Hall Rd	ASPH	43	20	32	24	134
James Rd	ASPH	30	22	14	29	98
					TOTAL	713

REF. # 26 — FM 661 — INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY

INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
Branch Hollow	CONC	0	0	0	0	0
Gifco	ASPH	24	30	32	36	135
Widening	ASPH	1160	14	0	0	1804
Britton (Tarrant County Line)	ASPH	0	0	0	0	0
					TOTAL	1939

REF. # 27 — FM 664 — INTER., WIDING, RAMPS,CROSSOV. & GORES QUANTITY

INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
Main	ASPH	37	24	25	29	134
E. Main	ASPH	36	30	45	24	182
Mallov	ASPH	37	22	18	24	112
Main	ASPH	55	30	27	22	212
Widening	ASPH	480	17	0	0	907
					TOTAL	1547

REF. # 28 — FM 813 — INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY

INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
Widining	ASPH	500	32			1778
N Stacks	ASPH	20	24	20	18	71
S Stacks	ASPH	20	24	20	18	71
N Sherman	ASPH	20	30	20	0	76
S Sherman	ASPH	20	30	20	0	76
Lacellus	ASPH	20	18	15	15	51
Beck	ASPH	27	24	18	23	92
Short	ASPH	15	16	12	13	34
Almand	ASPH	30	20	21	20	87
McKeever	ASPH	45	24	30	24	155
Farrar	ASPH	26	24	28	15	93
Farrar	ASPH	30	30	31	13	127
Clouse	ASPH	28	20	17	16	75
South Wick	ASPH	26	24	16	17	82
Americana	ASPH	25	20	15	19	70
Sutton	ASPH	30	24	22	22	103
John Rocket	CONC	0	0	0	0	0
Kimberly Hill	ASPH	25	22	17	15	73
Sunrise	ASPH	15	22	15	12	45
Scenic	ASPH	25	24	16	16	79
Maple Leaf	ASPH	47	20	24	18	126
Loma Linda	ASPH	37	24	10	28	120
Beus Chapel	ASPH	36	24	38	27	148
Twin Lakes	ASPH	30	24	29	20	110
Falcon Ridge	CONC	0	0	0	0	0
					TOTAL	3742

REF. # 28 — FM 813 — INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY

INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
Eagle Ridge	CONC	0	0	0	0	0
Tree Grit	CONC	0	0	0	0	0
FM 387	ASPH	25	80	42	62	356
Swenson Ranch	CONC	0	0	0	0	0
Gibson Rd	ASPH	71	22	0	0	174
Gibson Rd	ASPH	55	24	0	0	147
Robnett	ASPH	30	24	26	29	116
Grove Creek	ASPH	51	30	30	30	213
Bear Oak	CONC	0	0	0	0	0
Spring Crk	ASPH	27	26	15	16	89
Spapphire	CONC	0	0	0	0	0
Garden Valley	CONC	0	0	0	0	0
Windham	ASPH	24	20	24	17	74
					TOTAL	1169

Texas Department of Transportation

 DALLAS DISTRICT/2025 SEAL COAT

ELLIS COUNTY INTERSECTION,WIDENING RAMPS & GORES QUANTITY

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
DH	6	SEE TITLE SHEET		FM 428,ETC.
GRAPHICS DH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DH	TEXAS	DAL	DENTON, ETC.	19
CHECK DM	CONTROL	SECTION	JOB	
	0081	05	053, ETC.	

KAUFMAN COUNTY INTERSECTION(I),WIDENING(W),CROSSOVERS(CRO),RAMPS(R)AND GORES(G) QUANTITY

REF. # 7	US 175 FR	INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
ENTRANCE RAMP	ASPH	154	30	0	0	513
CEDAR LANE	ASPH	28	24	20	22	96
					TOTAL	609

REF. # 8	US 175 FR	INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
EXIT RAMP FM 2578	ASPH	463	30	0	0	1543
ENTRY RAMP	ASPH	286	29	0	0	922
EXIT RAMP	ASPH	349	32	0	0	1241
ENTRY RAMP	ASPH	107	32	0	0	380
EXIT RAMP/OAK GROVE	ASPH	430	28	0	0	1338
EXIT RAMP/BS 34	ASPH	117	16	0	0	208
ENTRY RAMP	ASPH	183	20	0	0	407
EXIT RAMP	CONC	0	0	0	0	0
ENTRY RAMP	CONC	0	0	0	0	0
ROADWAY WIDEN	ASPH	60	417	0	0	2780
ROADWAY WIDEN	ASPH	258	41	0	0	1175
ENTERPRISE WAY	ASPH	24	74	23	40	248
					TOTAL	10242

REF. # 9	US 175 ML	INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
CROSS/OVER	ASPH	66	60	0	0	440
CROSS/OVER	ASPH	64	51	0	0	363
CROSS/OVER	ASPH	64	53	0	0	377
CROSS/OVER	ASPH	67	50	0	0	372
KC 4037	ASPH	54	29	30	26	212
ASHLEY RD	CONC	0	0	0	0	0
VICTOR	ASPH	41	24	25	20	134
COUGAR	GRVL	0	0	0	0	0
DEER	ASPH	41	24	25	20	134
MISTER B'S	ASPH	45	24	29	20	150
					TOTAL	2182

REF. # 10	SH 243	INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
ED HALL DR	ASPH	32	66	24	33	274
SHANNON ST	ASPH	27	32	30	29	138
GROVE ST	ASPH	121	69	0	0	928
CLAY ST	ASPH	20	30	20	16	82
OAK ST	ASPH	20	40	20	27	116
SHANNON ST	ASPH	13	60	33	27	130
					TOTAL	1668

REF. # 13	IH 20 FR	INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
FM 429 N	ASPH	60	55	0	0	367
FM 429 S	ASPH	65	84	0	0	607
WILSON RD	ASPH	103	142	0	0	1625
SH 34	ASPH	3065	34	0	0	11579
ROSE HILL RD	ASPH	2552	32	0	0	9074

REF. # 14	SH 274	INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
COMMERCE ST	ASPH	40	30	25	29	168
MILLER ST	ASPH	20	20	15	14	54
TOLOSA RD	ASPH	30	40	24	20	157
WIDENING	ASPH	475	16	0	0	844
CR 4045	ASPH	21	20	26	36	94
CR 4023	ASPH	30	274	44	24	973
BS 175	ASPH	32	31	0	0	110
BS 175	ASPH	16	31	0	0	55
					TOTAL	2455

REF. # 33	FM 3039	INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
MAIN ST.	ASPH	30	30	20	16	116
RIVER OAK ST.	CONC	0	0	0	0	0
RUSTIC OAKS	ASPH	37	20	20	20	101
PARADISE	ASPH	37	20	20	20	101

REF. # 34	FM 2860	INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
COTTON CIRLCE	ASPH	40	22	30	22	131
COTTON CIRCLE	ASPH	40	22	30	22	131
FAIR RD	ASPH	32	23	28	44	147
CR 158	ASPH	47	24	25	24	154
WILSON CHAPEL LN	ASPH	17	15	17	18	43
CR 154	ASPH	41	30	28	30	177
WILDFLOWER	ASPH	22	24	22	22	82
CR 155 A	ASPH	37	22	24	31	127
CR 155	ASPH	34	20	21	27	103
CR 155	ASPH	37	22	25	19	114
CR 4040	ASPH	38	24	28	25	135
CR 4031	ASPH	37	24	33	24	138
CR 151	ASPH	36	26	23	30	138

Texas Department of Transportation

DALLAS DISTRICT/2025 SEAL COAT

KAUFMAN COUNTY INTERSECTION,WIDENING RAMPS & GORES QUANTITY

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
DH	6	SEE TITLE SHEET		FM 428,ETC.
GRAPHICS DH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK AZ	TEXAS	DAL	DENTON, ETC.	20
CHECK DM	CONTROL	SECTION	JOB	
	0081	05	053, ETC.	

NAVARRO COUNTY INTERSECTION(I),WIDENING(W),CROSSOVERS(CRO),RAMPS(R)AND GORES(G) QUANTITY

REF. # 4 SH 22		INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
NW 2020	ASPH	42	20	20	25	118
NW 1170	GRVL	0	0	0	0	0
NW 20210	GRVL	0	0	0	0	0
NW 2008	ASPH	32	20	23	28	102
NW 1040	ASPH	25	20	22	21	78
					TOTAL	298

REF. # 6 US 287 ML		INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
SS 294	ASPH	30	27	28	43	153
SE 3190	ASPH	45	24	26	27	154
SE 3290	GRVL	1	0	0	0	0
SE 3300	ASPH	45	24	29	20	150
SE 3320	GRVL	0	0	0	0	0
309	ASPH	31	42	23	26	173
SE 4270	ASPH	42	28	38	25	180
SE 3285	ASPH	35	24	17	24	114
SE 3185	ASPH	27	24	27	29	109
CADDO TRAIL	CONC	0	0	0	0	0
					TOTAL	1033

REF. # 17 FM 667		INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
NW 4071	ASPH	28	20	15	20	77
NW 4070	ASPH	28	20	16	18	76
NW 4051	GRVL	0	0	0	0	0
NW 4050	GRVL	0	0	0	0	0
NW 4110	ASPH	35	20	20	22	99
BECK	ASPH	40	24	34	20	144
NW 4420	ASPH	40	24	21	18	125
NW 4425	ASPH	135	26	40	32	453
NW 4340	ASPH	29	20	21	18	83
WHITESELLE	ASPH	40	41	25	41	237
NW 4108	ASPH	27	20	20	26	268
NW 4130	GRVL	0	0	0	0	0
NW 4160	GRVL	0	0	0	0	0
NW 4180	ASPH	27	24	30	21	104
NW 4200	ASPH	40	20	27	27	124
NW 4200	GRVL	0	0	0	0	0
OMIT GARITTY TO SH 22	ASPH	0	0	0	0	0
					TOTAL	1790

REF. # 20 FM 637		INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
SE 3010	GRVL	0	0	0	0	0
SE 3020	GRVL	0	0	0	0	0
SE 3040	GRVL	0	0	0	0	0
SE 3046	ASPH	27	24	18	25	95
SE 3048	GRVL	0	0	0	0	0
RICHLAND PARK	ASPH	0	0	0	0	0
BLUFFVIEW LN	ASPH	24	22	20	20	78
NAVARRO OIL	GRVL	0	0	0	0	0
SE 3060	GRVL	0	0	0	0	0
					TOTAL	173

REF. # 21 FM 667		INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
NW 3070	ASPH	42	24	26	33	154
NW 3100	ASPH	42	22	20	16	118
NW 3120	ASPH	42	24	20	16	128
OAK PARK	ASPH	42	24	28	25	146
WIDEN AT fm 639	ASPH	315	62	0	0	2170
NW 3060	ASPH	50	22	13	20	136
					TOTAL	2852

REF. # 22 FM 416		INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
Navarro ST	GRVL	0	0	0	0	0
SE 1240	ASPH	34	23	35	30	138
COUNTY ROAD 1260	ASPH	36	26	16	26	126
SE 1280 RD S.	ASPH	55	20	0	0	122
SE 1280 RD N.	ASPH	51	20.5	0	0	116
SE 1270 RD	ASPH	43	26	35	0	153
HOUT BAY RD	ASPH	31	34	30	30	160
CR 2310	ASPH	24	24	19	24	86
SE 2300 RD	ASPH	20	20	18	22	64
R 2355	ASPH	20	14	15	12	40
SE CR 2536	ASPH	30	20	34	30	116
CR 2340	ASPH	27	43	10	15	137
SE COUNTY RD 2350	ASPH	35	34	27	45	198
SE COUNTY RD 2370	ASPH	34	26	29	33	144
CR 2380 S.	ASPH	30	35	28	22	147
CR 2380 N.	ASPH	30	17	28	24	89
CR 2390	ASPH	40	24	39	27	160
CR 185	ASPH	36	18	48	37	160
					TOTAL	2156

REF. # 31 FM 635		INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
SE COUNTY RD 4120	GRVL					0
SE COUNTY RD 4100	GRVL					0
SE COUNTY RD 4150	GRVL					0
SE COUNTY RD 4180	GRVL					0
					TOTAL	0

NAVARRO COUNTY INTERSECTION,WIDENING RAMPS & GORES QUANTITY

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
DH	6	SEE TITLE SHEET		FM 428,ETC.
GRAPHICS DH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK AZ	TEXAS	DAL	DENTON, ETC.	21
CHECK DM	CONTROL	SECTION	JOB	
	0081	05	053, ETC.	

ROCKWALL COUNTY INTERSECTION(I),WIDENING(W),CROSSOVERS(CRO),RAMPS(R)AND GORES(G) QUANTITY

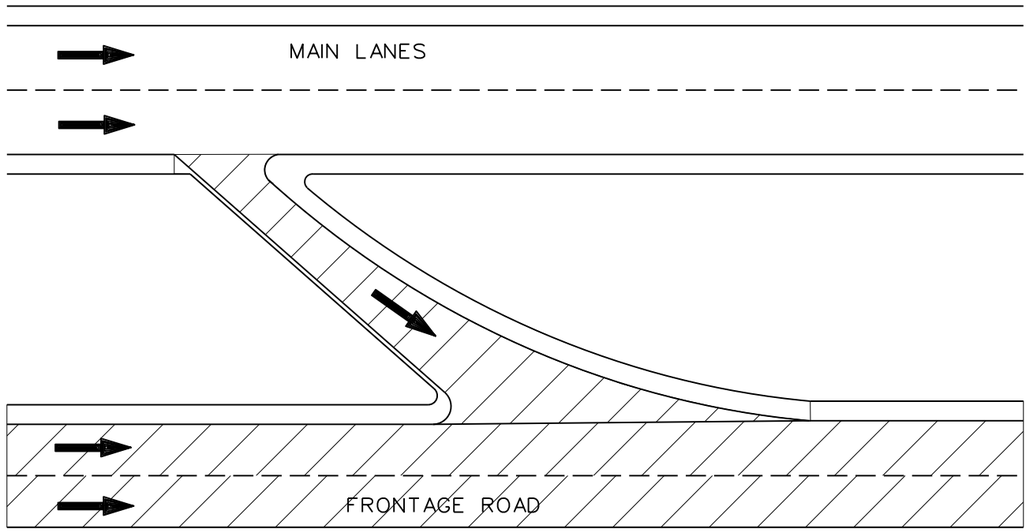
REF. # 23 FM 550		INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
Stoneleigh Dr	CONC	0	0	0	0	0
Berkshire Dr	CONC	0	0	0	0	0
Brentwood Dr	CONC	0	0	0	0	0
McDonald Rd	CONC	0	0	0	0	0
Rabbit Ridge Ct 1	ASPH	31	28	46	48	202
Rabbit Ridge Ct 2	ASPH	22	12	30	27	68
Pullen rd	ASPH	28	36	44	38	193
Stevens Rd	ASPH	22	22	24	28	86
Smith Rd	ASPH	28	26	35	37	143
Chapel Hill Ln	CONC	0	0	0	0	0
Granite Ridge Dr	CONC	0	0	0	0	0
Cattle Barron Dr	CONC	0	0	0	0	0
					TOTAL	692

REF. # 24 FM 552		INTER.,WIDING, RAMPS,CROSSOV. & GORES QUANTITY				
INTERSECTION, WIDING, RAMPS, CROSSOV., GORES	TYP	LENGTH FT	WIDTH FT	R1 FT	R2 FT	AREA SY
Park Central Dr	ASPH	29	20	35	33	120
Clear Bluff Dr	CONC	0	0	0	0	0
Breezy Hill Ln	ASPH	34	24	38	37	158
Windy Ln 1	ASPH	26	20	36	30	110
Windy Ln 2	ASPH	28	20	33	33	114
Stoney Hollow Ln	ASPH	11	50	15	15	72
Cobblestone	ASPH	11	50	15	15	72
Skyview Ln	ASPH	29	13	37	37	107
Saddle Horn Cir	ASPH	35	28	43	43	197
Panhandle Dr	ASPH	32	45	42	42	244
Anna Cade Rd	ASPH	26	22	32	36	119
FM 1141	ASPH	40	30	58	50	273
Red Valley run	ASPH	33	20	32	46	148
Northridge Ln 1	ASPH	28	20	30	30	105
Old Millwood Rd	ASPH	31	25	40	40	162
Cornerstone 1	ASPH	20	10	34	34	77
Northridge Ln 2	ASPH	15	12	27	22	49
N Stodghill Rd	ASPH	40	40	50	60	323
N Smith Rd	ASPH	31	24	41	41	163
Lydia Ln	ASPH	30	23	42	42	161
Phyllis Ln	ASPH	18	21	22	25	68
N King Rd	ASPH	25	20	25	38	105
High Glen Cir	CONC	0	0	0	0	0
Meadow Ridge Cir	CONC	0	0	0	0	0
Dismore Ln	ASPH	28	28	38	38	156
					TOTAL	3103

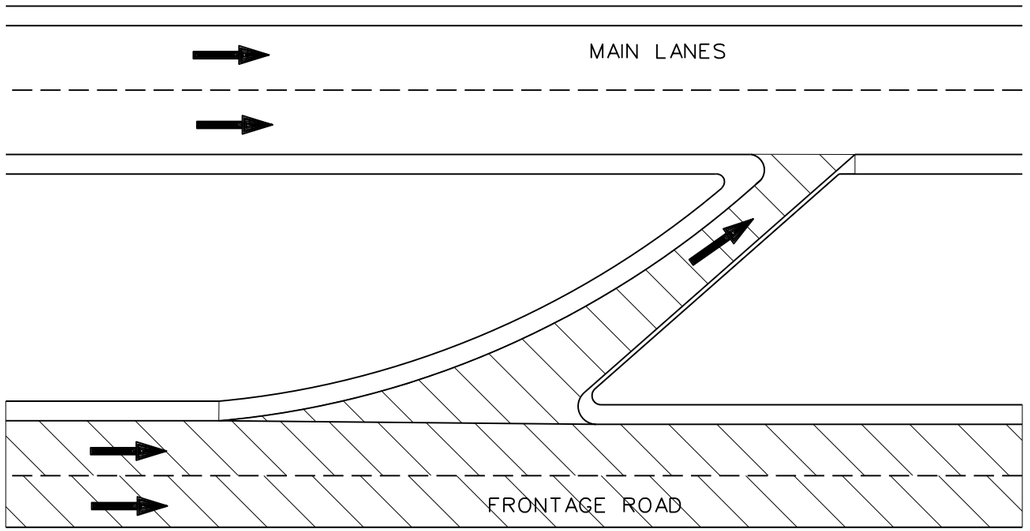
ROCKWALL COUNTY
INTERSECTION,WIDENING
RAMPS & GORES QUANTITY

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
DH	6	SEE TITLE SHEET		FM 428,ETC.
GRAPHICS DH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK AZ	TEXAS	DAL	DENTON, ETC.	22
CHECK DM	CONTROL	SECTION	JOB	
	0081	05	053, ETC.	

CONSTRUCTION DETAILS



EXIT RAMP



ENTRANCE RAMP

NOTE: SEAL COAT LIMITS ON RAMPS SHALL BE TO THE CONCRETE PAVEMENT JOINT OR AS DIRECTED.

STATE OF TEXAS
DARIUS J. HAGGARD
145313
LICENSED PROFESSIONAL ENGINEER

Darius Haggard, PE 8/2/2024

DARIUS HAGGARD, P.E. DATE

NOT TO SCALE

Texas Department of Transportation

 DALLAS DISTRICT MAINTENANCE/2025 SEAL COAT

CONSTRUCTION DETAILS

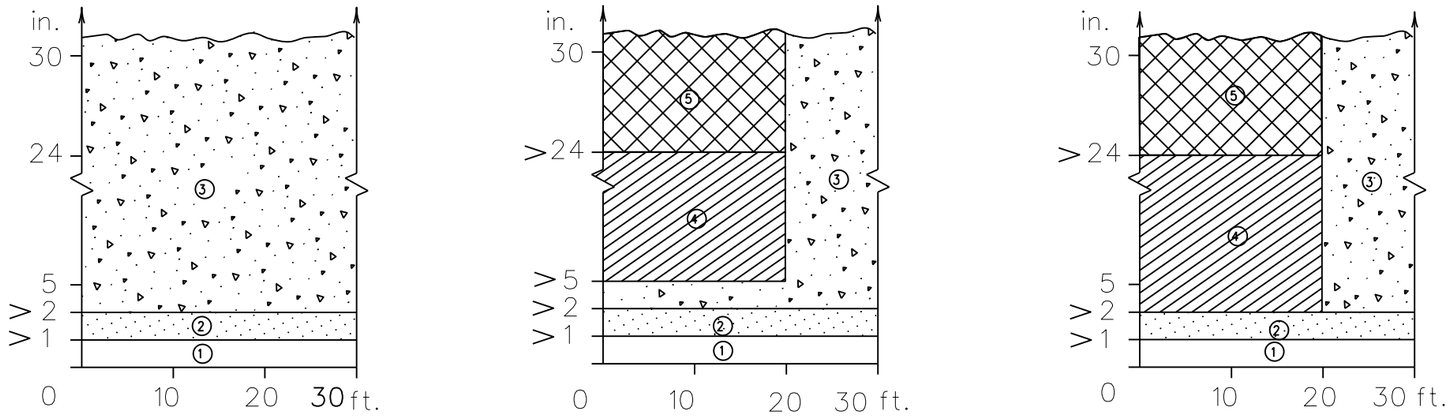
DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
DH	6	SEE TITLE SHEET		FM 428, ETC.
GRAPHICS DH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DH	TEXAS	DAL	DENTON, ETC.	23
CHECK DM	CONTROL	SECTION	JOB	
	0081	05	053, ETC.	

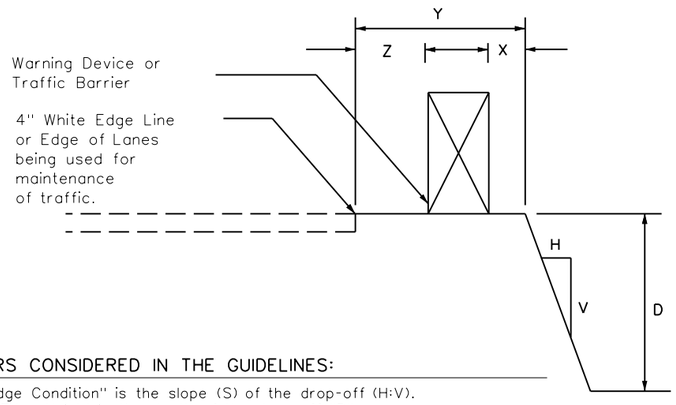
LIMITS OF PROPOSED WORK

MSH Dallas District Mdnl. 07/09/12

DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

Edge Height (D) in Inches versus Lateral Clearance (Y) in Feet





FACTORS CONSIDERED IN THE GUIDELINES:

1. The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height is the depth of the drop-off "D".

2. Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of dropoff. Distance "Z" does not have a minimum.

3. In addition to the factors considered in the guidelines, each construction zone drop-off situation should be analyzed individually, taking into account other variables, such as: traffic mix, posted speed in the construction zone, horizontal curvature, and the practicality of the treatment options.

4. The conditions for indicating the use of positive or protective barriers are given by Zone-5 and Figure-1. Traffic barriers are primarily applicable for high speed conditions. Urban areas with speeds of 30 mph or less may have a lesser need for signing, delineation, and barriers. Right-angled edges, however, with "D" greater than 2 inches and located within a lateral offset of 6 feet, may indicate a higher level of treatment.

5. If the distance "Y" must be less than 3 feet, the use of a positive barrier may not be feasible. In such a case, consider either: 1) narrowing the lanes to a desired 11 to 12 feet or 10 foot minimum (see CW20-8 sign), or 2) provide an edge slope such as Edge Condition I.

Zone	Treatment Types Guidelines:
①	No treatment
②	CW 8-11 "Uneven Lanes" signs.
③	CW 8-9a Shoulder Drop-Off" or CW 8-11 signs plus vertical panels.
④	CW8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge slope to that of the profered Edge Condition I.
⑤	Check indications (Figure-1) for possitive barrier. Where positive barrier is not indicated, the treatment shown above for Zone-4 may be used after consideration of other applicable factors.

Edge Condition Notes:

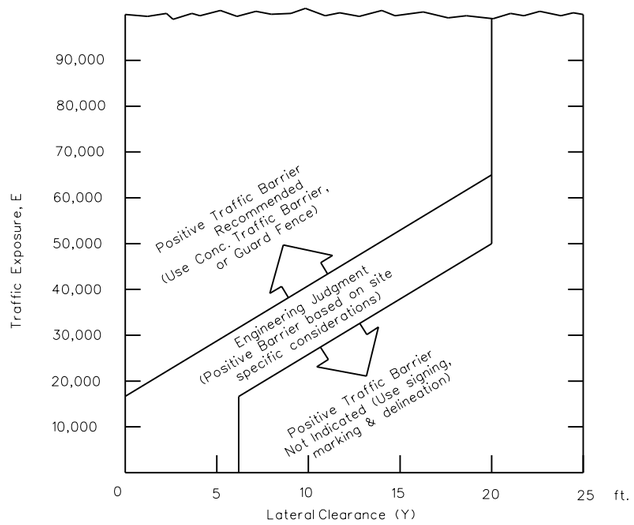
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

2. Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1 to 1) so long as "D" does not exceed 5 inches. Under-carriage drag on most automobiles will occur when "D" exceeds 6 inches. As "D" exeeds 24 inches, the possibility for rollover is greater in most vehicles.

3. Edge Condition III: When slopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles, if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control at different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularly those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.

4. Milling or overlay operations that result in Edge Condition III should not be in place without appropriate warning treatments, and these conditions should not be left in place for extended periods of time.

FIGURE-1: CONDITIONS INDICATING USE OF POSITIVE BARRIER FOR ZONE 5 ( )



1. E = ADT x T
   Where ADT is that portion of the average daily traffic volume traveling within 20 feet (generally two adjacent lanes) of the edge dropoff condition; and, T is the duration time in years of the dropoff condition.

2. Figure-1 provides a practical approach to the use of positive barriers for the protection of vehicles from pavement drop-offs. Other factors, such as the presence of heavy machinery, construction workers, or the mix and volume of traffic may make the use of positive barriers appropriate, even when the edge condition alone may not justify the use of a barrier.

3. An approved end treatment should be provided for any positive barrier end located within the clear zone.

These guidelines apply to temporary traffic control areas or work zones where continuous pavement edges or drop-offs exists parallel and adjacent to a lane used by traffic. The edge conditions may be present between shoulders and travel lanes, between adjacent or opposing travel lanes, or at intermediate points across the width of the paved surface. Due to the variability in construction operations, tolerances in the variables may be allowed by the engineer. These guidelines do not apply to short term operations. These guidelines do not constitute a rigid standard or policy; rather, they are guidance to be used in conjunction with engineering judgement. These guidelines may be updated on the Design Division's on-line manuals.

Engineer's Seal

STATE OF TEXAS
DARIUS J. HAGGARD
145313
LICENSED
PROFESSIONAL ENGINEER

Darius Haggard, PE

Date 8/2/2024

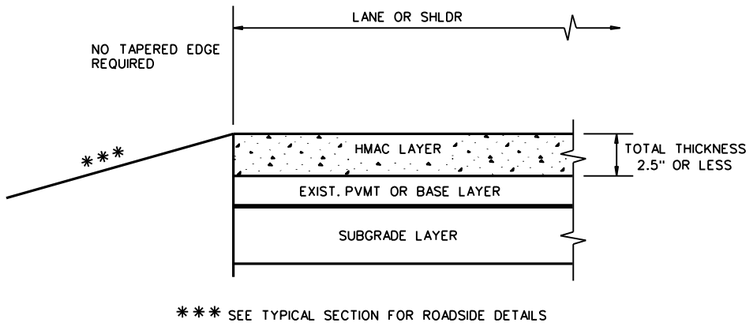
Texas Department of Transportation

Traffic Safety Division Standard

TREATMENT FOR VARIOUS EDGE CONDITIONS

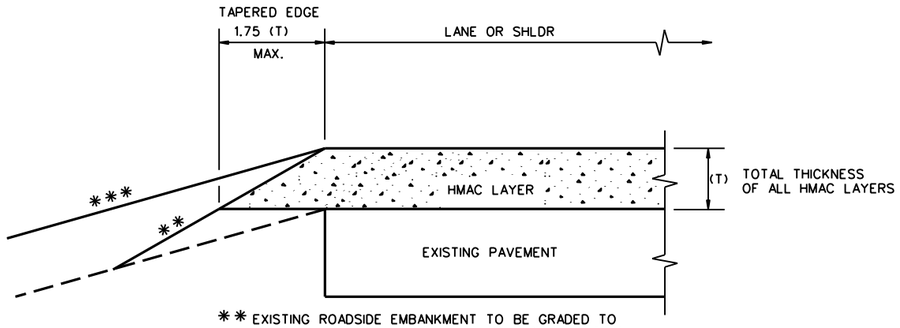
FILE: edgecon.dgn	DN:	CK:	DW:	CK:
© TxDOT August 2000	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428,ETC.
03-01 08-01 9-21	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		24

DATE: $DATE$ $TIME$
FILE: $FILE$



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

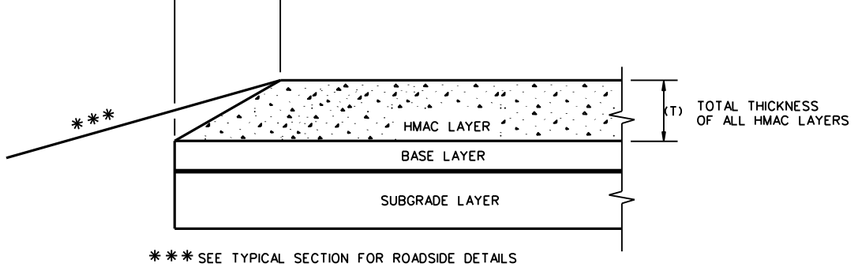
CONDITION - 1
THIN HMAC SURFACES OR HMAC OVERLAY WITH THICKNESS OF 2.5" OR LESS



** EXISTING ROADSIDE EMBANKMENT TO BE GRADED TO PRODUCE A SMOOTH LEVEL SURFACE FOR PLACEMENT OF TAPERED EDGE. THIS WORK IS SUBSIDIARY TO THE VARIOUS BID ITEMS.

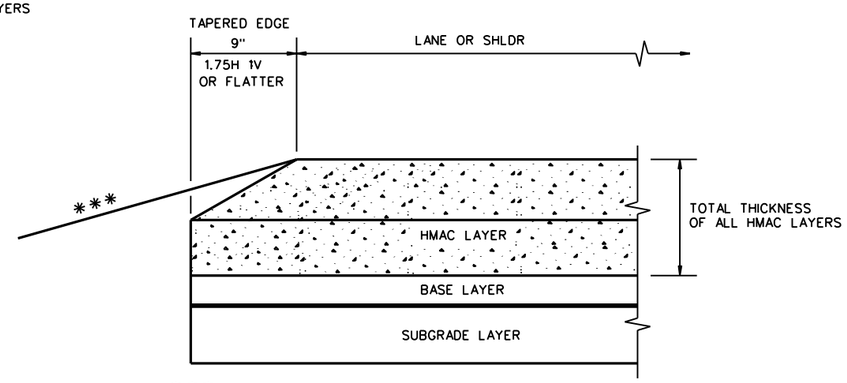
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 2
OVERLAY OF EXISTING PAVEMENT HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 3
NEW OR RECONSTRUCTED PAVEMENT HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 4
NEW OR RECONSTRUCTED PAVEMENT HMAC THICKNESS 5" OR GREATER

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, A VERTICAL EDGE IS PERMISSIBLE FOR HMAC PLACED GREATER THAN 5" BELOW THE EDGE OF PAVEMENT AND FOR THICKNESS OF HMAC LESS THAN 2.5".
2. FOR FURTHER INFORMATION REGARDING THE ROADSIDE AND PAVEMENT DETAILS, SEE TYPICAL SECTIONS.
3. PAYMENT FOR TAPERED EDGE WILL BE IN ACCORDANCE WITH APPLICABLE ITEMS IN THE CONTRACT.
4. THE SLOPE OF THE TAPERED EDGE SHALL BE 1.75H 1V: OR FLATTER.
5. THE TAPERED EDGE SHALL BE PRODUCED BY USE OF A SCREED ATTACHMENT CAPABLE OF PRODUCING A SMOOTH COMPACTED SURFACE. ADDITIONAL COMPACTING EFFORT BEHIND THE SCREED IS NOT REQUIRED.

(NOT TO SCALE)

Texas Department of Transportation

Design Division Standard

TAPERED EDGE DETAILS HMAC PAVEMENT

TE(HMAC)-11

FILE: tehmac11.dgn	DN: TxDOT	CK: RL	DW: KB	CK:
© TxDOT January 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053,ETC.	FM 428,ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON,ETC.		25

DATE: $DATE$
FILE: $FILE$

DATE:
FILE:

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).

2. The development and design of the Traffic Control Plan (TCP)is the responsibility of the Engineer.

3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.

4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.

5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.

6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.

7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.

8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.

10. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.

11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.

12. The Engineer has the final decision on the location of all traffic control devices.

13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.

2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

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

Texas Department of Transportation

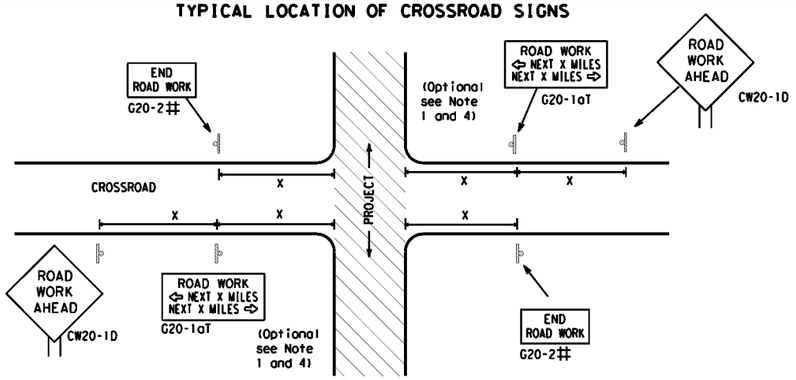
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053,EtC	FM 428,Etc
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	DAL	DENTON,EtC		26
5-10 5-21				

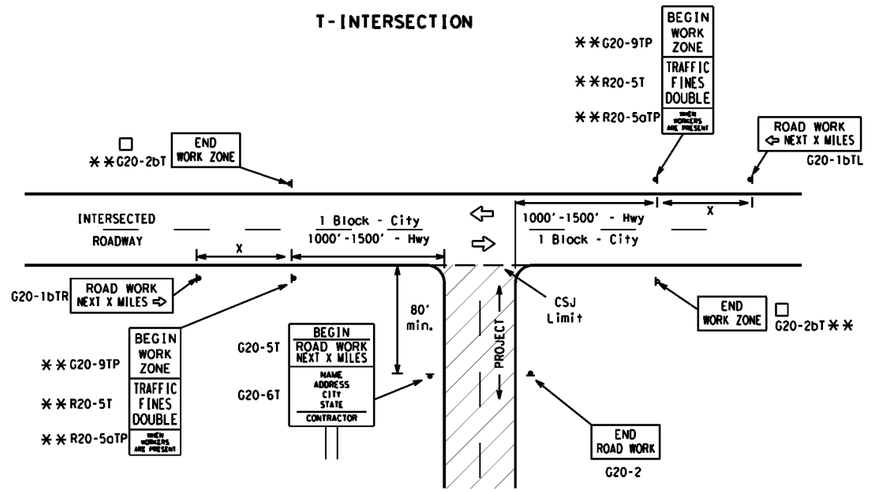
TYPICAL LOCATION OF CROSSROAD SIGNS



May be mounted on back of "ROAD WORK AHEAD"(CW20-1D) sign with approval of Engineer. (See note 2 below)

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING[1,5,6]

SIZE

Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20[4], CW21, CW22, CW23, CW25	48" x 48"	48" x 48"
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"

SPACING

Posted Speed	Sign △ Spacing "X"
MPH	Feet (Apprx.)
30	120
35	160
40	240
45	320
50	400
55	500[2]
60	600[2]
65	700[2]
70	800[2]
75	900[2]
80	1000[2]
*	*[3]

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

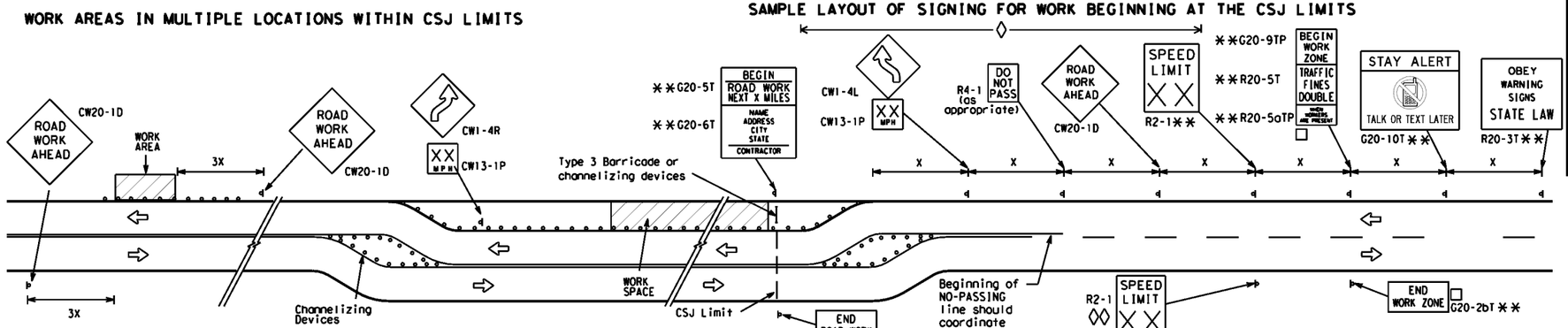
△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may be used on low volume crossroads at the discretion of the Engineer as per TMUTCD Part 5. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. 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.

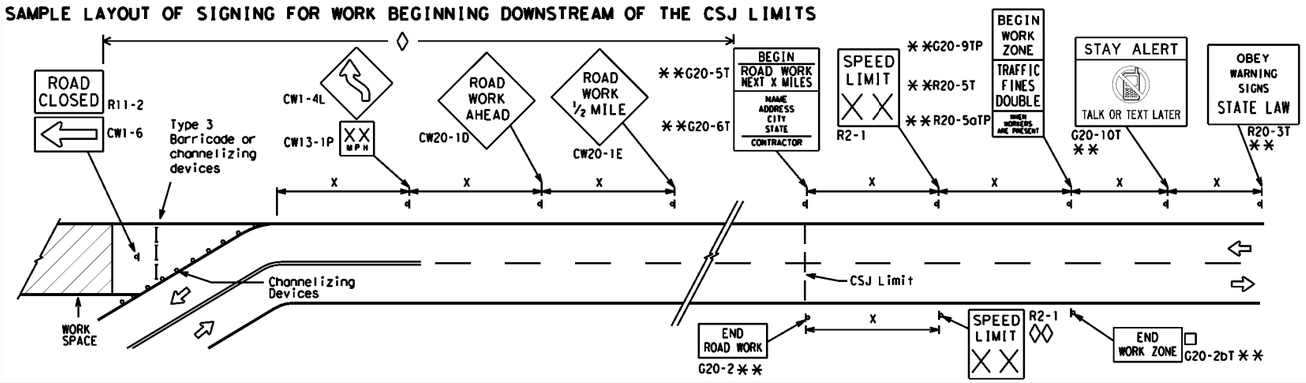
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and channelizing devices.

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



NOTES

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

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

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

◊ Area for placement of "ROAD WORK AHEAD" (CW20-1D)sign and other signs or devices as called for on the Traffic Control Plan.

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

LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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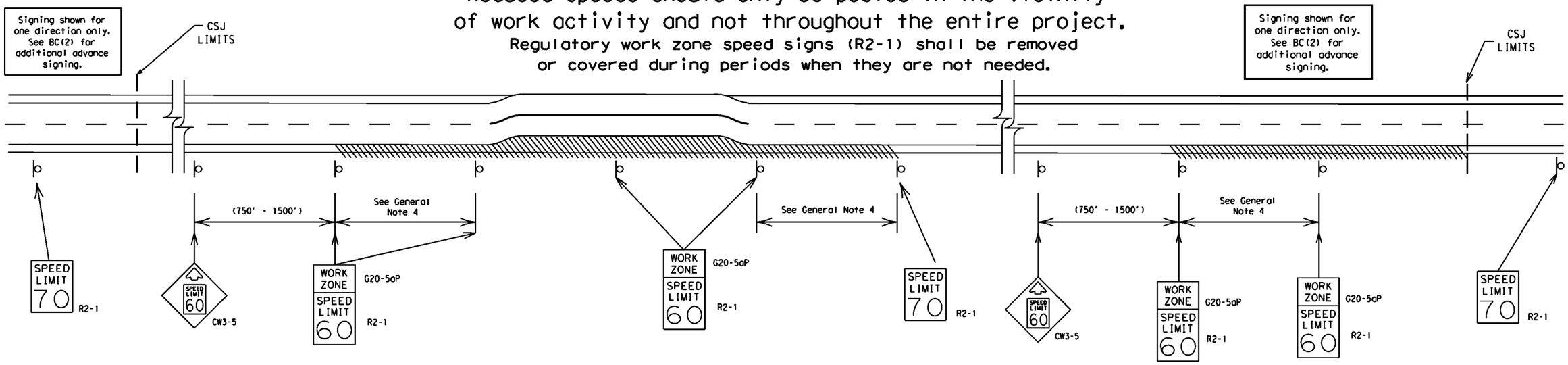
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project.

Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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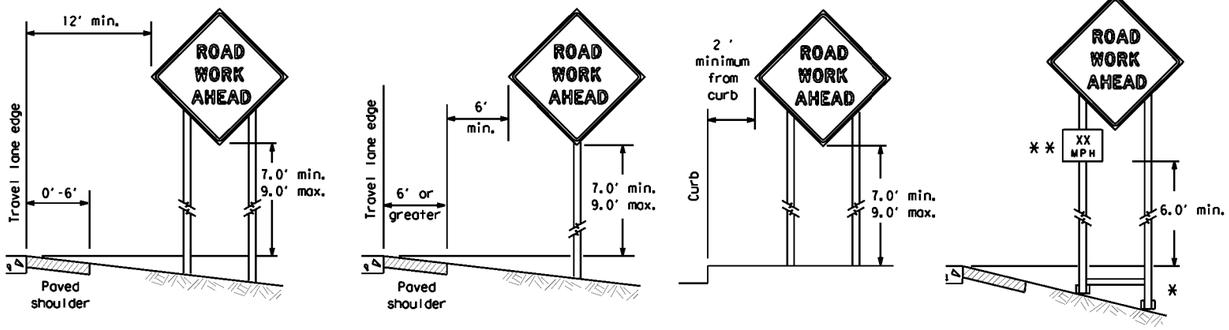
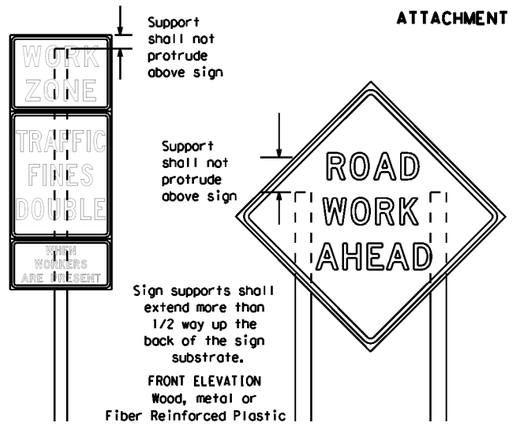
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

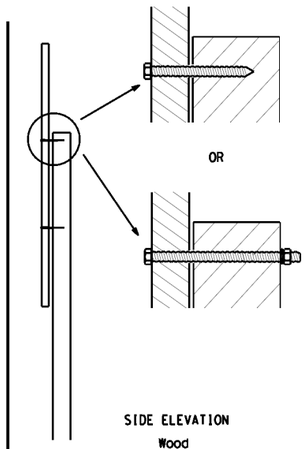


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





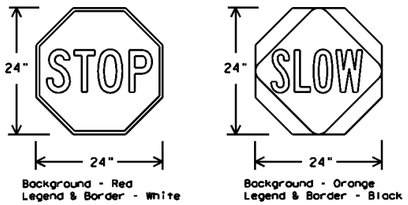
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



SHEETING REQUIREMENTS (WHEN USED AT NIGHT)		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	ORANGE	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDER	WHITE	TYPE B OR C SHEETING
LEGEND & BORDER	BLACK	ACRYLIC NON-REFLECTIVE FILM

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, specific service (LOGO), or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition. For details for covering large guide signs see the TS-CD standard.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC standard sheets, TLRS standard sheets or the CWZTCD list. The signs shall meet the required mounting heights shown on the BC, or the SMD standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
6. Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
5. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
6. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD) for small roadside signs. Supports for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) standard sheets. The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
7. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
8. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
9. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

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

1. The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
   a. Long-term stationary - work that occupies a location more than 3 days.
   b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
   c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
   d. Short, duration - work that occupies a location up to 1 hour.
   e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

1. The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
2. The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
5. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

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

SIGN SUBSTRATES

1. The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
3. All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
2. White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

1. All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
3. Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
4. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
5. Burlap shall NOT be used to cover signs.
6. Duct tape or other adhesive material shall NOT be affixed to a sign face.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

1. Flags may be used to draw attention to warning signs. When used, the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

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BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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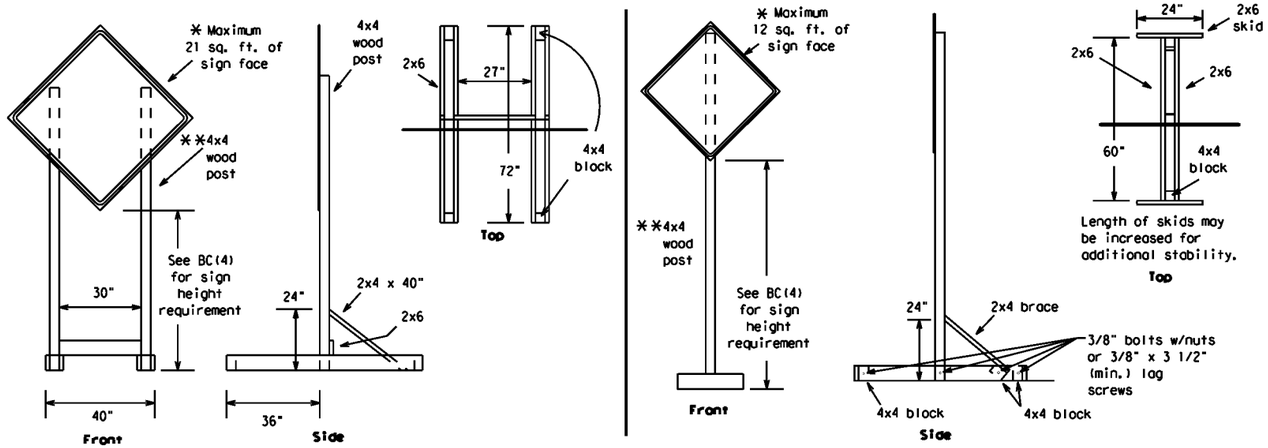
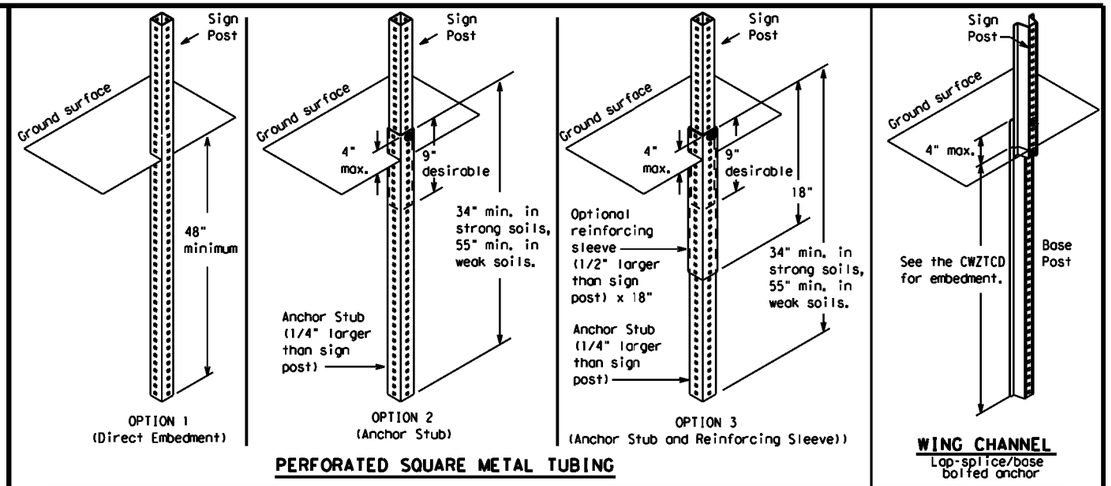


SKID MOUNTED WOOD SIGN SUPPORTS

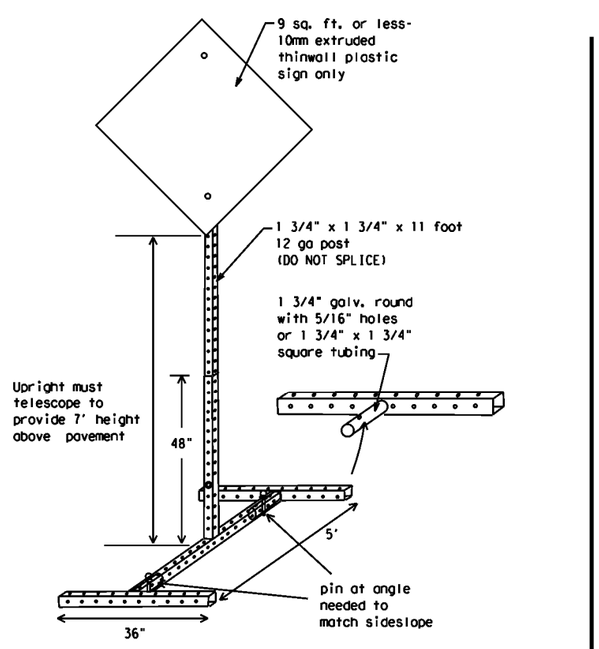
*** LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS**

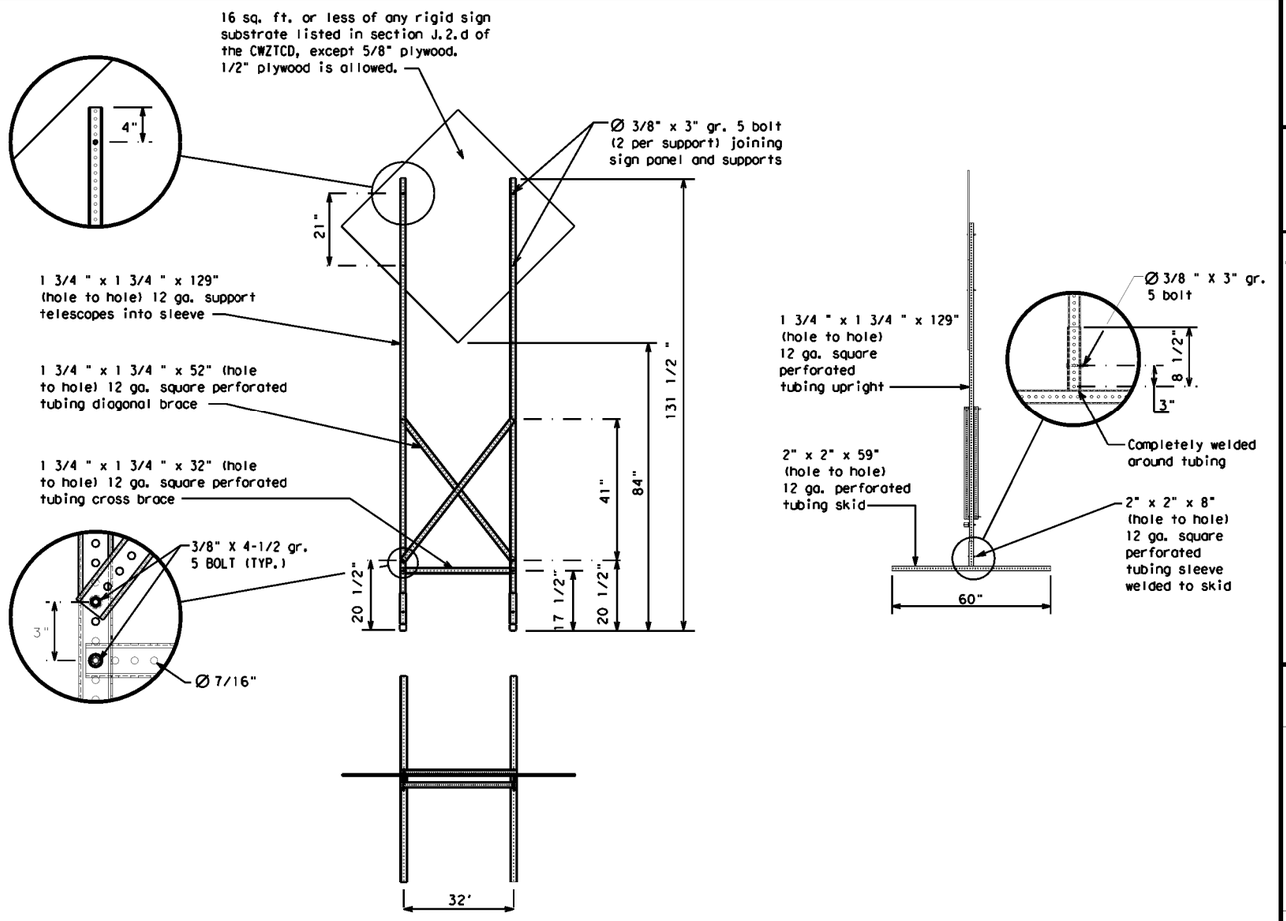


PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

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





SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

* See BC(4) for definition of "Work Duration."

** Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.

☐ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

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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

1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
2. 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.
3. Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
4. Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
5. Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
6. When in use, the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
7. The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
8. The Engineer/Inspector may select one of two options which are 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.
9. Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
10. Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
11. Do not use the word "Danger" in message.
12. Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
13. Do not display messages that scroll horizontally or vertically across the face of the sign.
14. The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated, unless shown in the TMUTCD.
15. PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
16. Each line of text should be centered on the message board rather than left or right justified.
17. If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy	HOV
Vehicle Highway	HWY
Hour(s)	HR, HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	LFT
Left Lane	LFT LN
Lane Closed	LN CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT

WORD OR PHRASE	ABBREVIATION
Major	MAJ
Miles	MI
Miles Per Hour	MPH
Minor	MNR
Monday	MON
Normal	NORM
North	N
Northbound	(route) N
Parking	PKING
Road	RD
Right Lane	RT LN
Saturday	SAT
Service Road	SERV RD
Shoulder	SHLDR
Slippery	SLIP
South	S
Southbound	(route) S
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Thursday	THURS
To Downtown	TO DWNTN
Traffic	TRAF
Travelers	TRVLRS
Tuesday	TUES
Time Minutes	TIME MIN
Upper Level	UPR LEVEL
Vehicles (s)	VEH, VEHS
Warning	WARN
Wednesday	WED
Weight Limit	WT LIMIT
West	W
Westbound	(route) W
Wet Pavement	WET PVMT
Will Not	WONT

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/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
- XXXXXXXX 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 LINES RIGHT
- DETOUR NEXT X EXITS
- USE XXXXX RD EXIT
- USE EXIT XXX
- USE EXIT I-XX NORTH
- STAY ON US XXX SOUTH
- USE I-XX E TO I-XX N
- TRUCKS 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
- XXXXXXX TO XXXXXXX
- US XXX TO FM XXXX

Warning List

- SPEED LIMIT XX MPH
- MAXIMUM SPEED XX MPH
- MINIMUM SPEED XX MPH
- ADVISORY SPEED XX MPH
- RIGHT LANE EXIT
- USE CAUTION
- DRIVE SAFELY
- DRIVE WITH CARE

** Advance Notice List

- TUE-FRI XX AM- X PM
- APR XX-XX X PM-X AM
- BEGINS MONDAY
- BEGINS MAY XX
- MAY X-X XX PM - XX AM
- NEXT FRI-SUN
- XX AM TO XX PM
- NEXT TUE AUG XX
- TONIGHT XX PM- XX AM

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

1. The words RIGHT, LEFT and ALL can be interchanged as appropriate.
2. Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
3. EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
4. Highway names and numbers replaced as appropriate.
5. ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
6. AHEAD may be used instead of distances if necessary.
7. FT and MI, MILE and MILES interchanged as appropriate.
8. AT, BEFORE and PAST interchanged as needed.
9. Distances or AHEAD can be eliminated from the message if a 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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

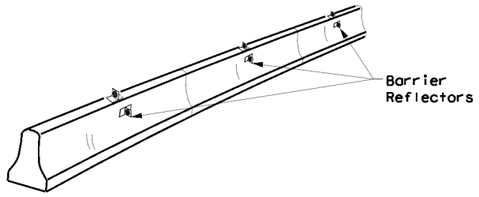
BC(6)-21

FILE:	bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS		0081	05	053,ETC	FM 428,Etc
9-07 8-14		DIST	COUNTY		SHEET NO.
7-13 5-21		DAL	DENTON,ETC		31

100

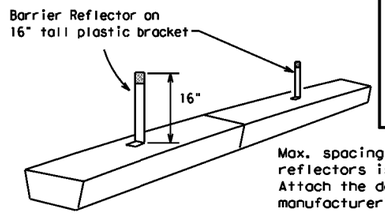
DATE:
FILE:

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



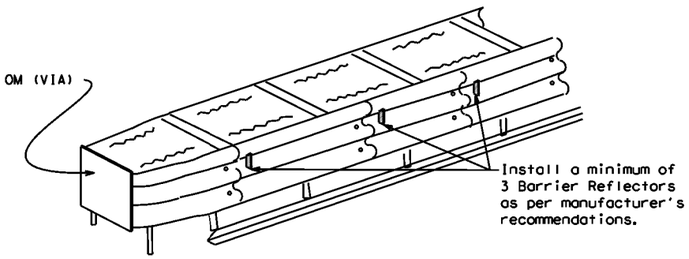
CONCRETE TRAFFIC BARRIER (CTB)

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



Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

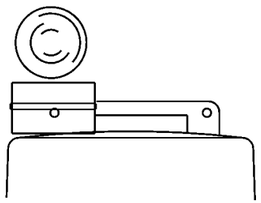
END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet the appropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). Refer to the CWZTCD List for approved end treatments and manufacturers.

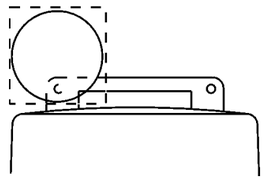
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

1. Warning lights shall meet the requirements of the TMUTCD.
2. Warning lights shall NOT be installed on barricades.
3. Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Warning Lights shall not be used with signs manufactured with Type B_{FL} or C_{FL} Sheeting meeting the requirements of Departmental Material Specification DMS-8300.
4. Type-C and Type D 360 degree Steady Burn Lights are intended to be used in a series for delineation to supplement other traffic control devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "SB".
5. The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
6. When required by the Engineer, the Contractor shall furnish a copy of the warning lights certification. The warning light manufacturer will certify the warning lights meet the requirements of the latest ITE Purchase Specifications for Flashing and Steady-Burn Warning Lights.
7. When used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on the outside of the curve, not the inside.
8. The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

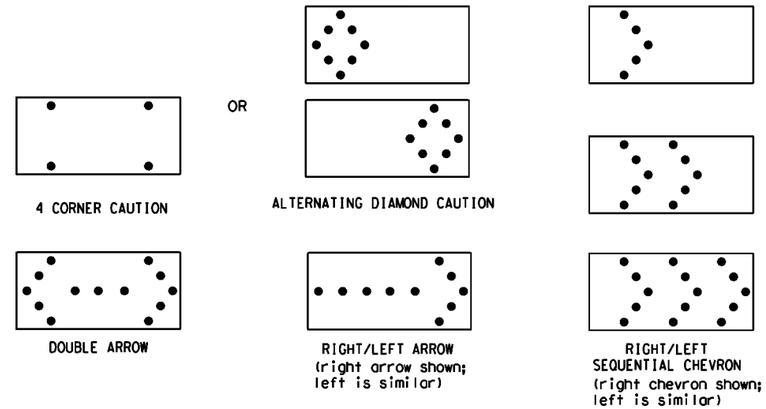
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
4. Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
5. Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
6. Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
7. The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

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

1. A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
2. The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
3. The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
4. Round reflectors shall be fully reflectorized, including the area where attached to the drum.
5. Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it attaches to the drum.
6. The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type B or Type C.
7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
8. The warning reflector should be mounted on the side of the handle nearest approaching traffic.
9. The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.

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

1. The Flashing Arrow Board should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
2. Flashing Arrow Boards should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
3. The Engineer/Inspector shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Board.
4. The Flashing Arrow Board should be able to display the following symbols:



4 CORNER CAUTION

ALTERNATING DIAMOND CAUTION

DOUBLE ARROW

RIGHT/LEFT ARROW (right arrow shown; left is similar)

RIGHT/LEFT SEQUENTIAL CHEVRON (right chevron shown; left is similar)

5. The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
6. The straight line caution display is NOT ALLOWED.
7. The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
8. Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
9. The sequential arrow display is NOT ALLOWED.
10. The flashing arrow display is the TxDOT standard; however, the sequential chevron display may be used during daylight operations.
11. The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
12. A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
13. A full matrix PCMS may be used to simulate a Flashing Arrow Board provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
14. Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is on an extended distance from the TMA.

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053,E+C	FM 428,Etc
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	DAL	DENTON,E+C		32

101

DATE:
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

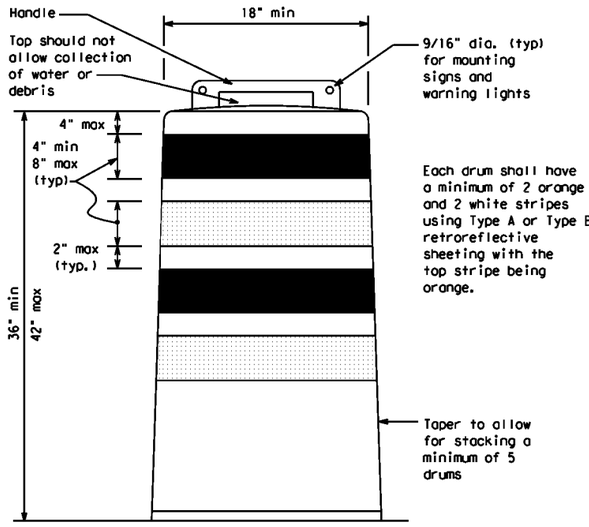
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

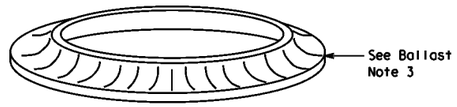
RETROREFLECTIVE SHEETING

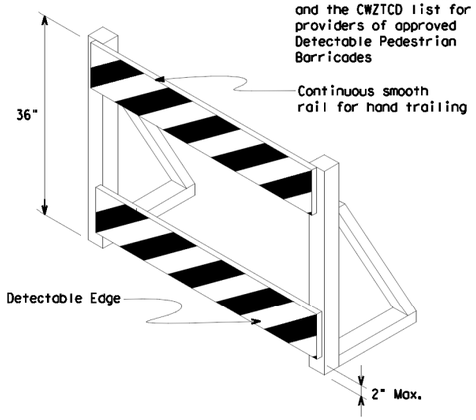
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall 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

1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
4. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
5. When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.

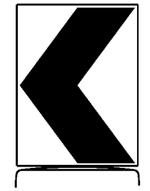




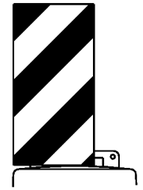


DETECTABLE PEDESTRIAN BARRICADES

1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
2. 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.
3. 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.
4. 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.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades should use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A or Type B. Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. 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.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations, they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053,E+C	FM 428,Etc
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	DAL	DENTON,E+C		33
7-13				

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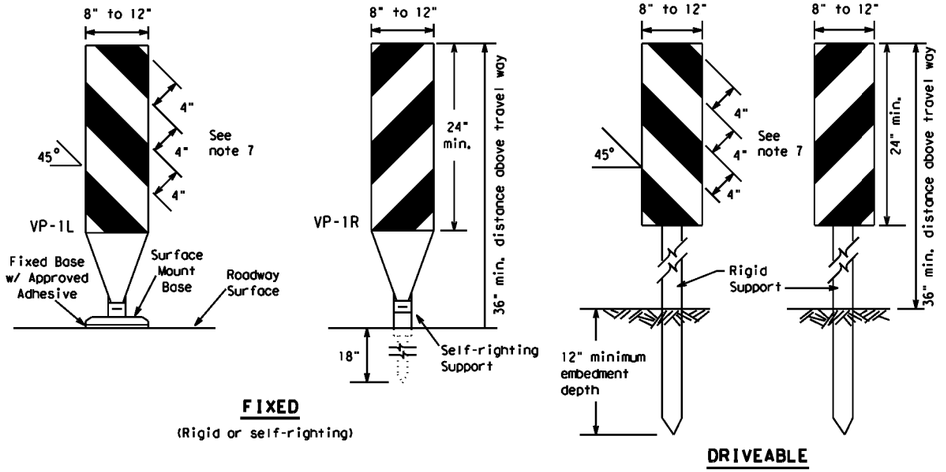
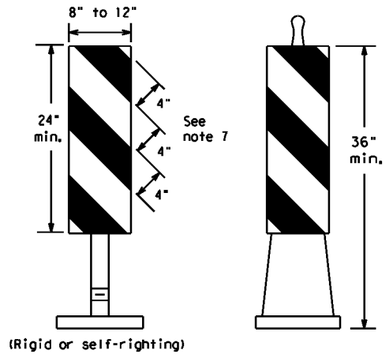


FIXED
(Rigid or self-righting)

DRIVEABLE

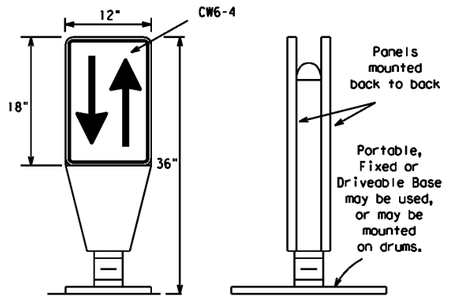


(Rigid or self-righting)

PORTABLE

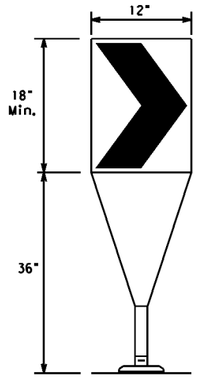
VERTICAL PANELS (VPs)

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



OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

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



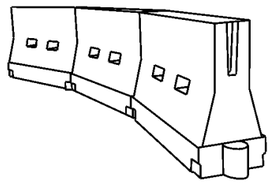
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

1. 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).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone 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).
4. 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.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
6. 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.
7. 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.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

1. 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.
2. LCDs may be used instead of a line of cones or drums.
3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
6. LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10). Place reflective sheeting near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate Manual for Assessing Safety Hardware (MASH) crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. 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.
4. 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.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

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

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

Posted Speed	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent
30	$L = \frac{WS^2}{60}$	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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0081	05	053,EtC	FM 428,Etc
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7-13 5-21	DAL	DENTON,EtC		34

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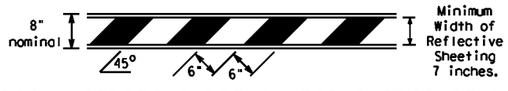
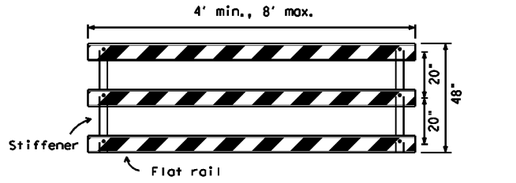
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



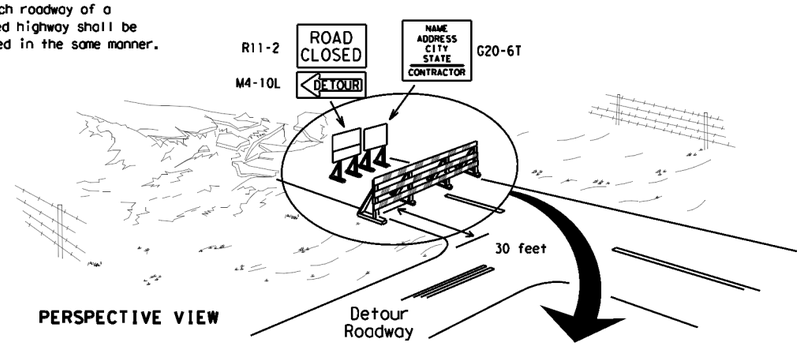
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

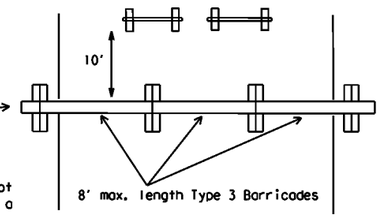
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

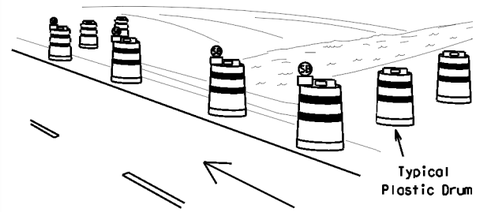
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

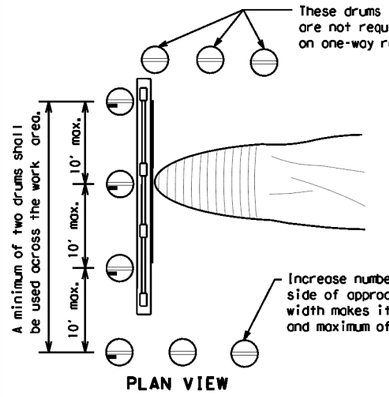
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

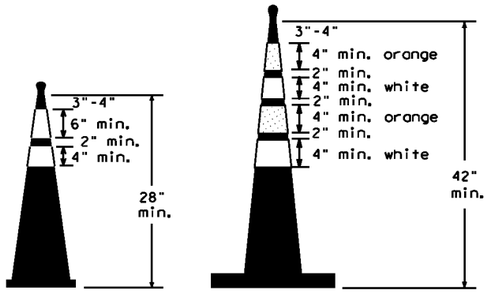
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder 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
SB	Steady burn warning light or yellow warning reflector

PLAN VIEW

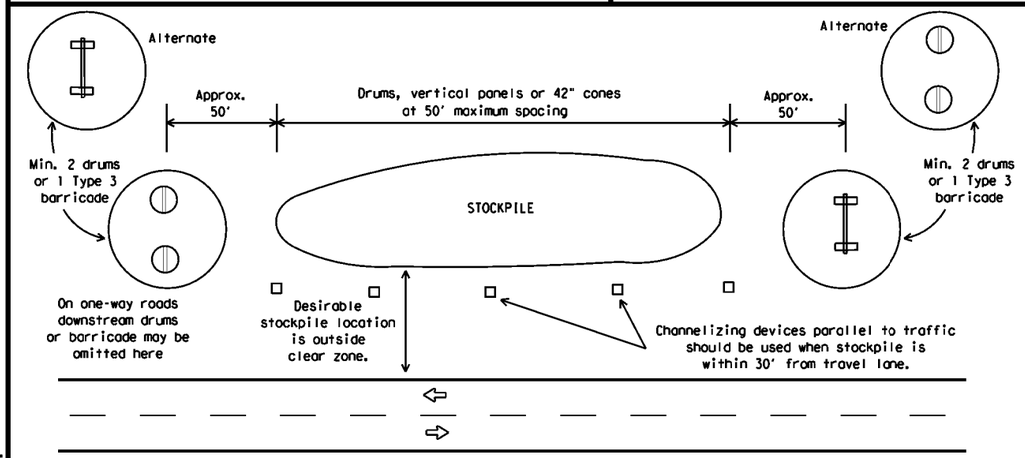
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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WORK ZONE PAVEMENT MARKINGS

GENERAL

1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
2. Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
3. Additional supplemental pavement marking details may be found in the plans or specifications.
4. Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
5. When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(STPM).
6. 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.
7. All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

1. Raised pavement markers are to be placed according to the patterns on BC(12).
2. 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

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

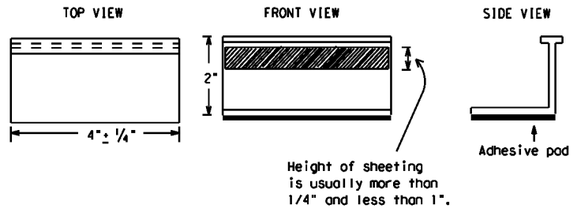
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

1. Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
2. Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
   A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
   B. Select five (5) 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.
3. Small design variances may be noted between tab manufacturers.
4. See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 2-98 9-07 5-21 1-02 7-13 11-02 8-14	0081	05	053,ETC	FM 428,ETC
	DIST	COUNTY		SHEET NO.
	DAL	DENTON,ETC		36

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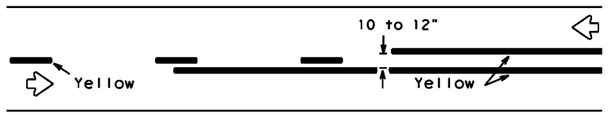
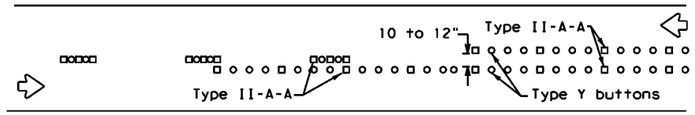
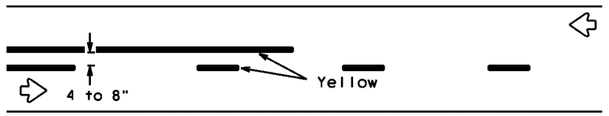
PAVEMENT MARKING PATTERNS



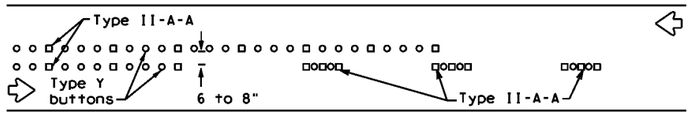
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



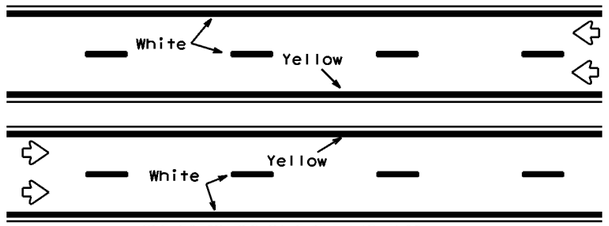
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



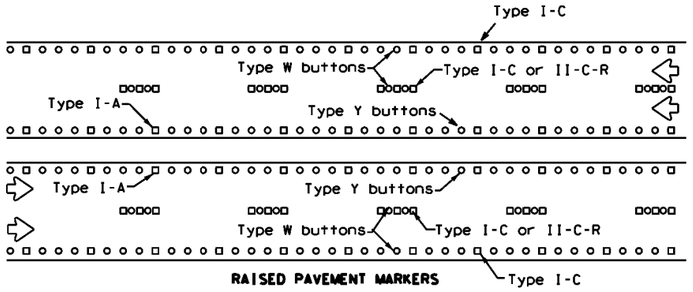
RAISED PAVEMENT MARKERS - PATTERN B

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.

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



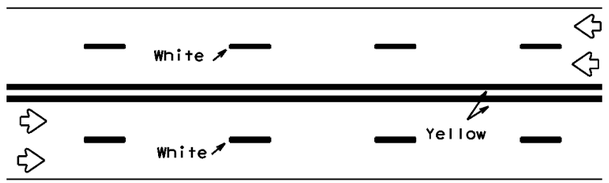
REFLECTORIZED PAVEMENT MARKINGS



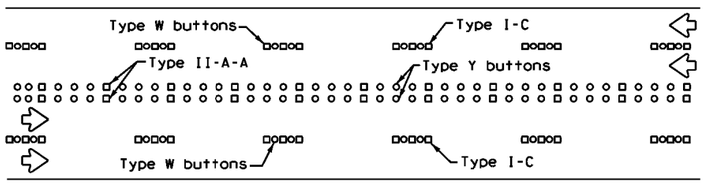
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



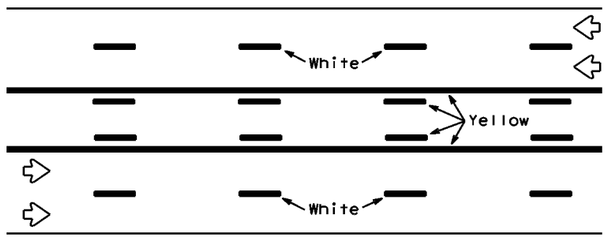
REFLECTORIZED PAVEMENT MARKINGS



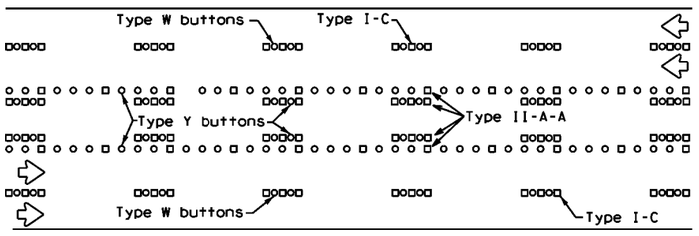
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

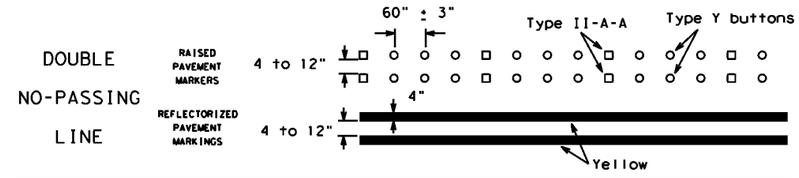
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

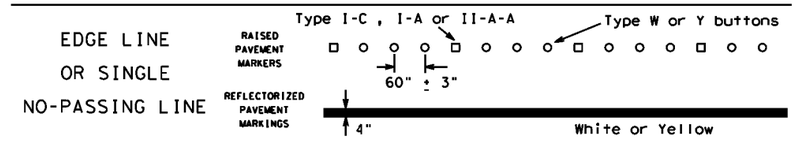
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

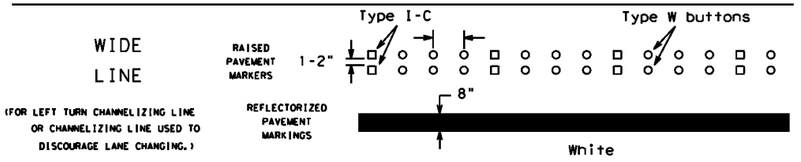


EDGE LINE OR SINGLE NO-PASSING LINE



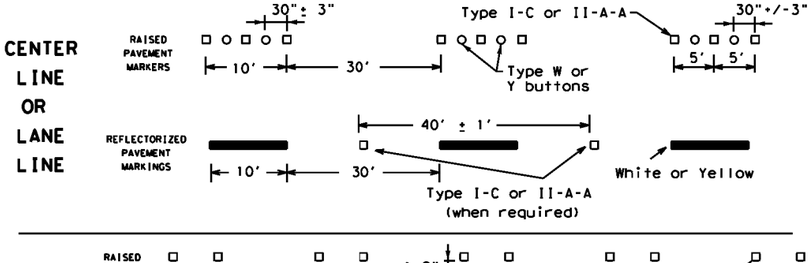
WIDE LINE

(FOR LEFT TURN CHANNELIZING LINE OR CHANNELIZING LINE USED TO DISCOURAGE LANE CHANGING.)

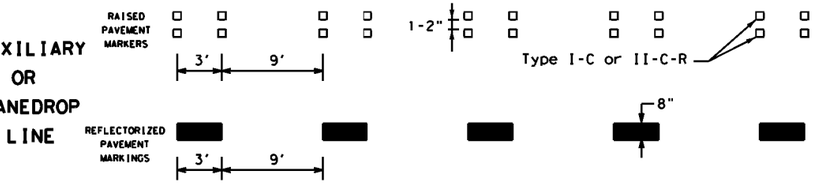


BROKEN LINES

CENTER LINE OR LANE LINE

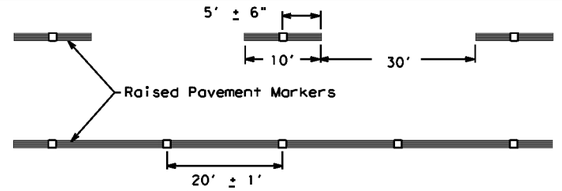


AUXILIARY OR LANEDROP LINE



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.



Centerline only - not to be used on edge lines

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."

SHEET 12 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0081	05	053,EtC	FM 428,Etc
	DIST	COUNTY		SHEET NO.
	DAL	DENTON,EtC		37

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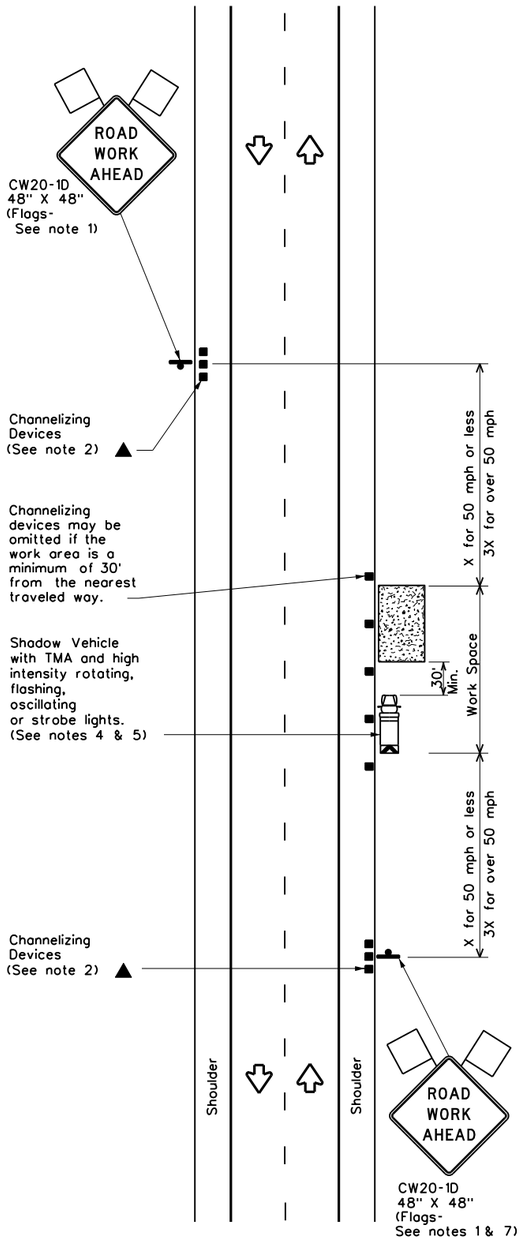
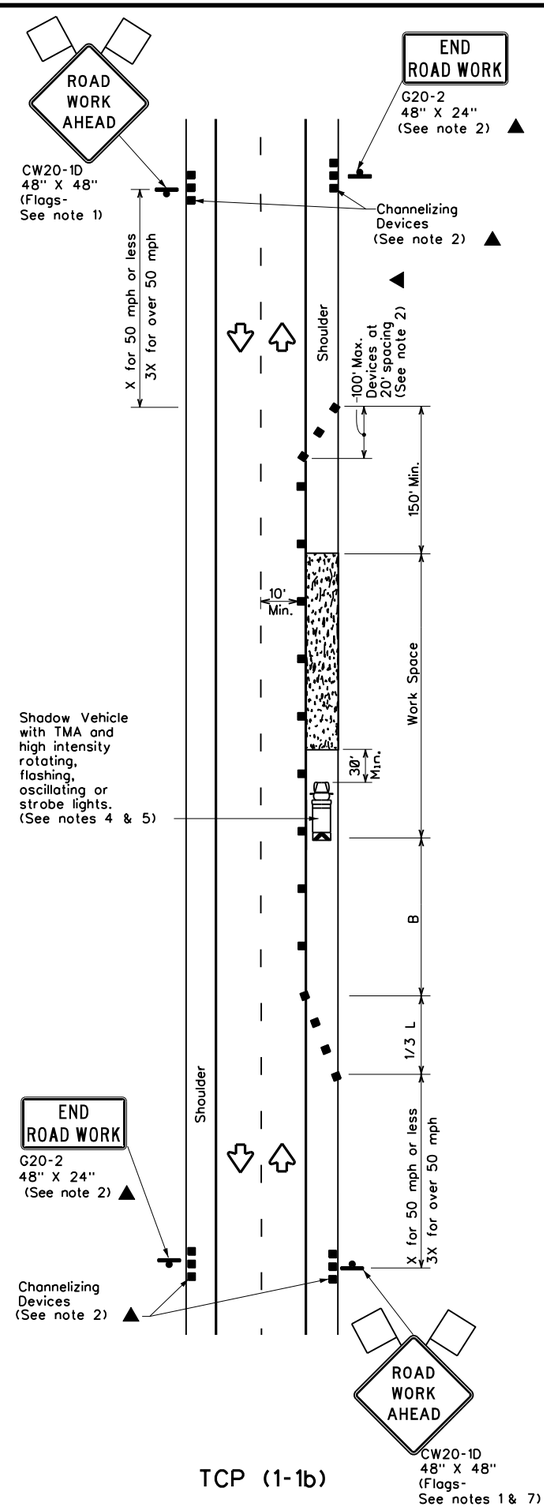
DATE: $DATE$ $TIME$
FILE: $FILE$



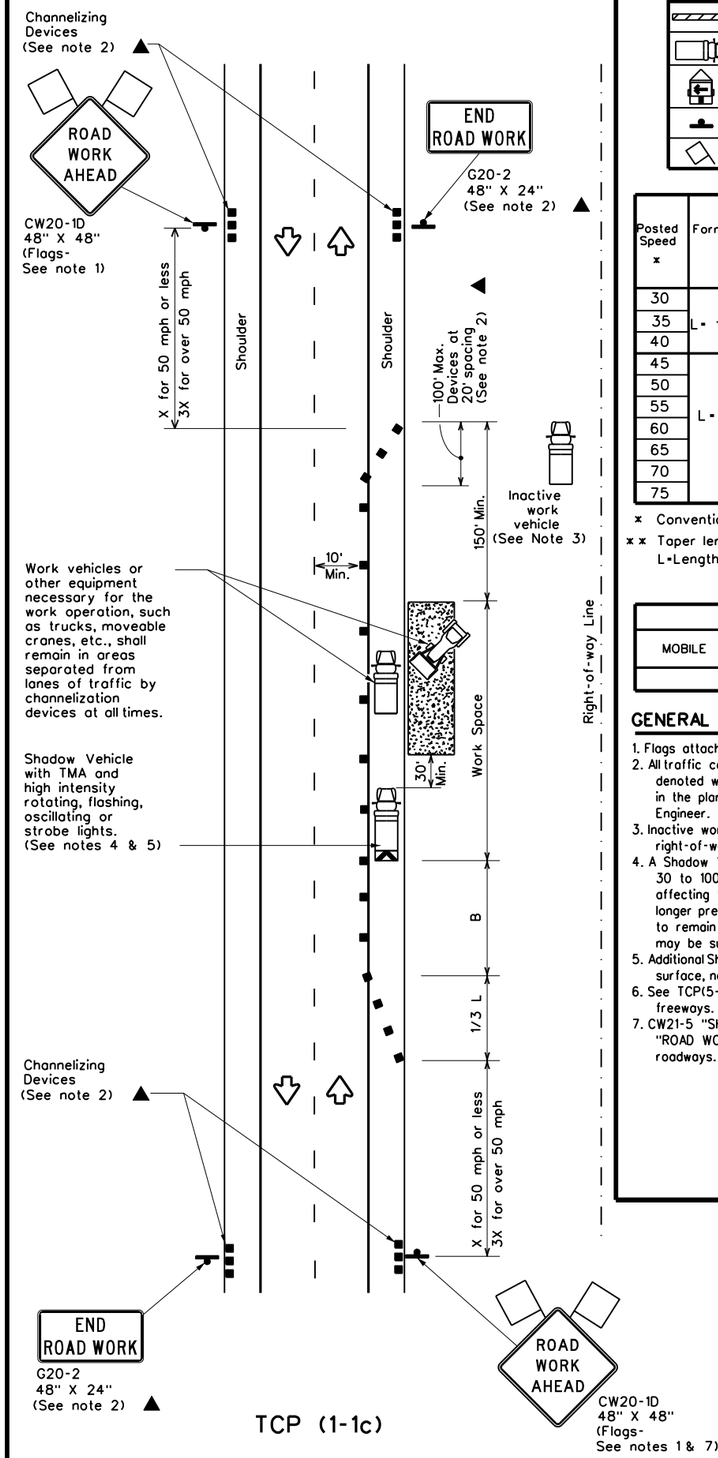
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	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

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. 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.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
6. See TCP(5-1)for shoulder work on divided highways, expressways and freeways.
7. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

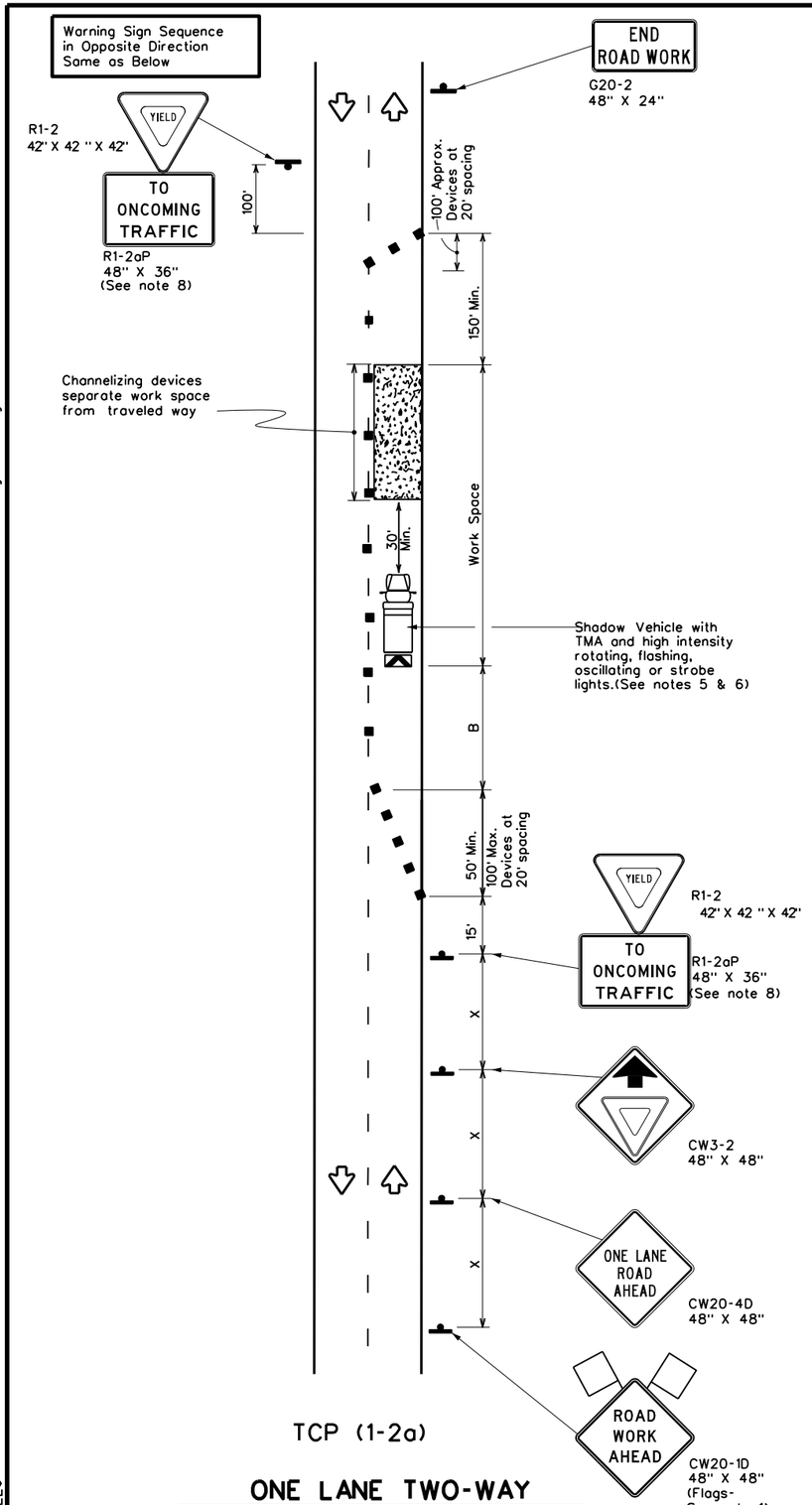
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 / 8-95 2-12 / 1-97 2-18	0081	05	053, ETC.	FM 428, ETC
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC		38

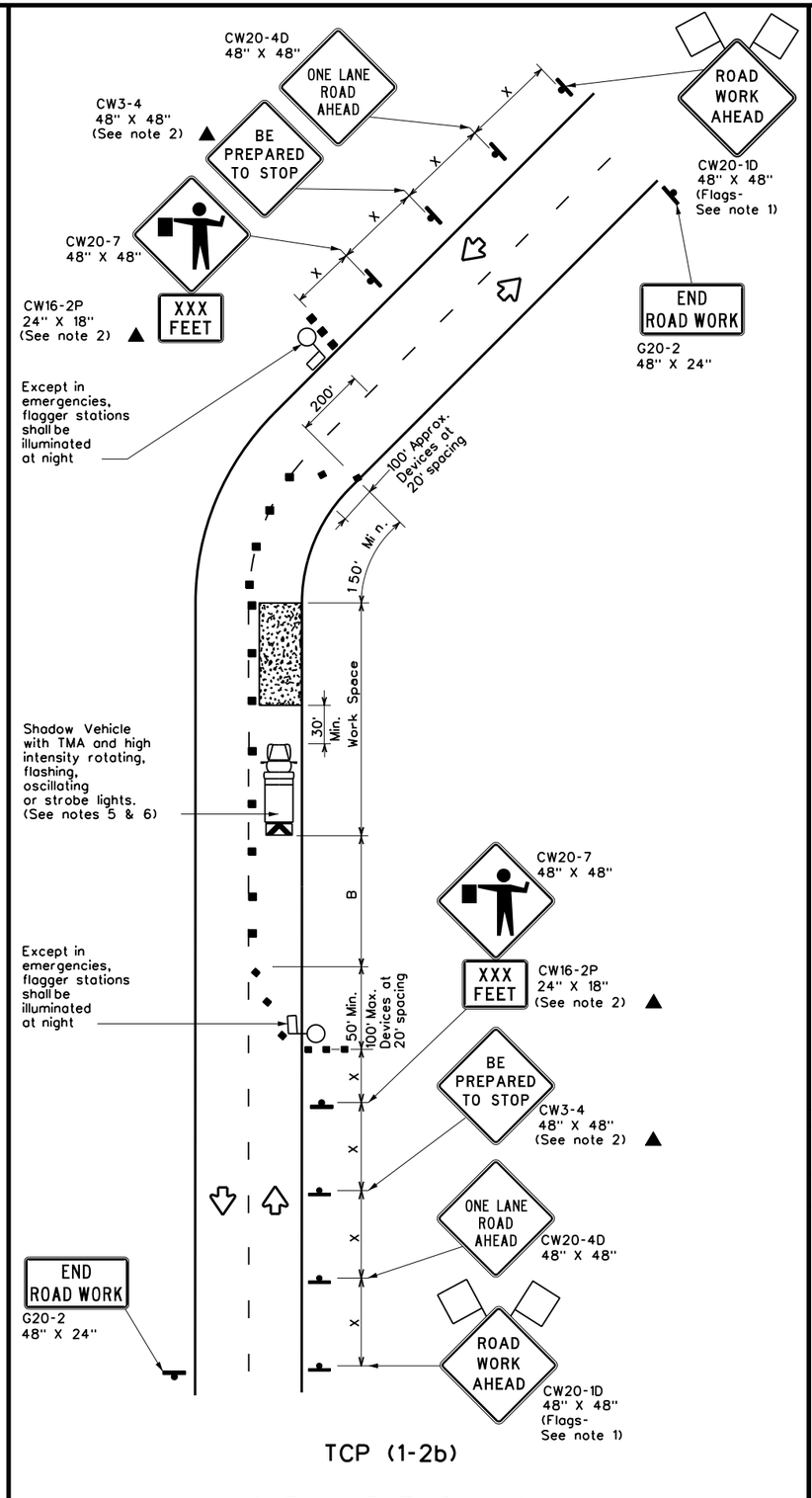
DATE: $DATE$ $TIME$
FILE: $FILE$



TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY CONTROL WITH FLAGGERS

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L = \frac{WS^2}{60}$	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(FT) W = Width of Offset(FT) S = Posted Speed(MPH)

TYPICAL USAGE

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. 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.
4. 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.
5. 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.
6. 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)

7. 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.
8. 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)

9. Flaggers should use two-way radios or other methods of communication to control traffic.
10. Length of work space should be based on the ability of flaggers to communicate.
11. 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).
12. Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
13. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

Texas Department of Transportation

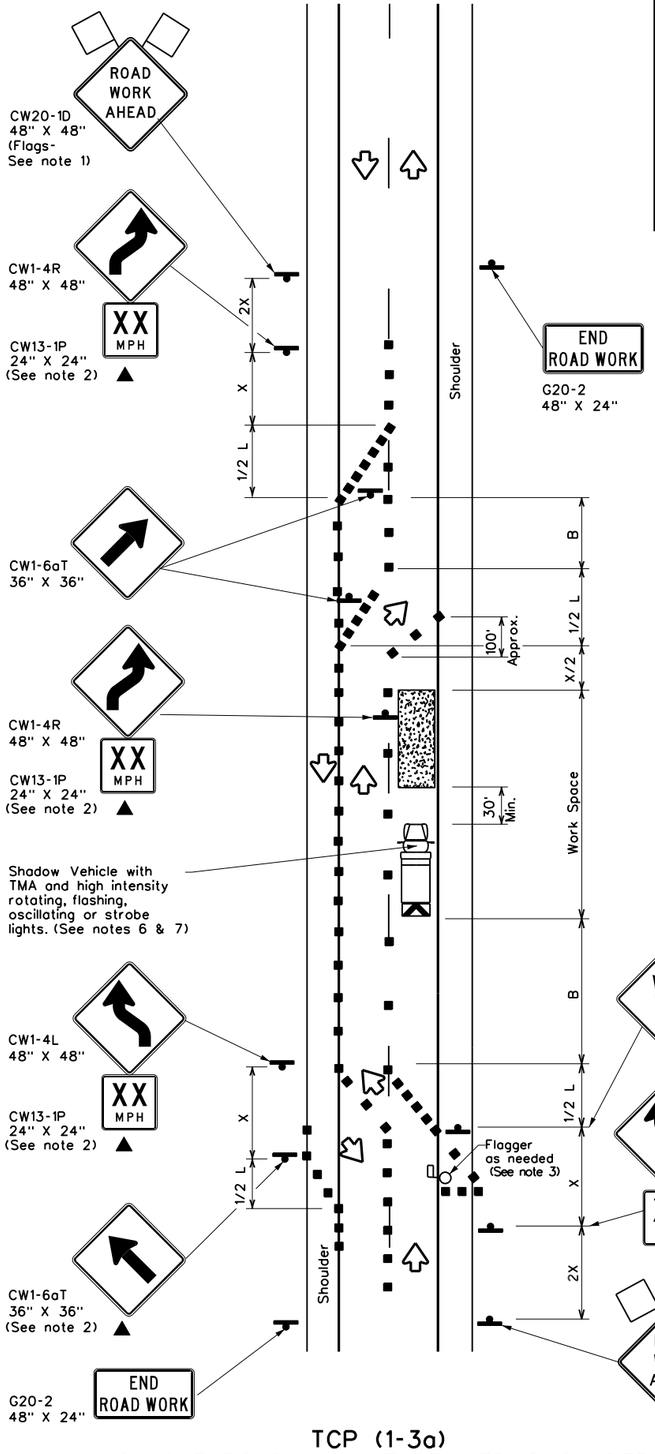
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

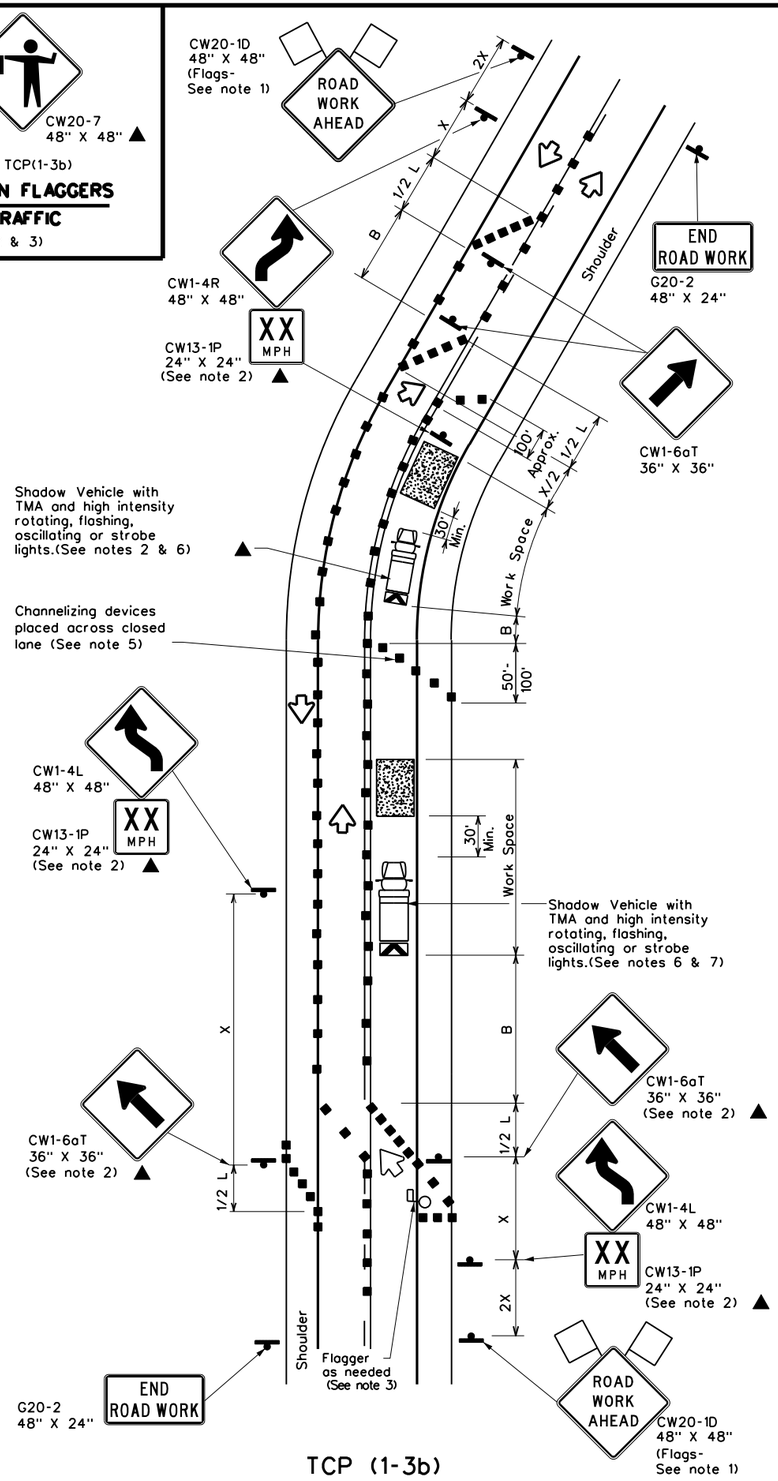
FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-90 4-98 2-94 2-12 1-97 2-18	0081	05	053, ETC.	FM 428, ETC
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC		39

DATE: $DATE$ $TIME$
FILE: $FILE$



TCP (1-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



TCP (1-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L = \frac{WS^2}{60}$	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

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Additional flaggers may be positioned in advance of traffic queues to alert traffic to reduce speed.
4. DO NOT PASS, PASS WITH CARE and construction regulatory speed zone signs may be installed downstream of the ROAD WORK AHEAD signs.
5. When the work zone is made up of several work spaces, channelizing devices should be placed laterally across the closed lane to re-emphasize closure. Laterally placed channelizing devices should be repeated every 500 to 1000 feet in urban areas and every 1/4 to 1/2 mile in rural areas.
6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
8. Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20', or 15' if posted speed are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the area of conflicting markings not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

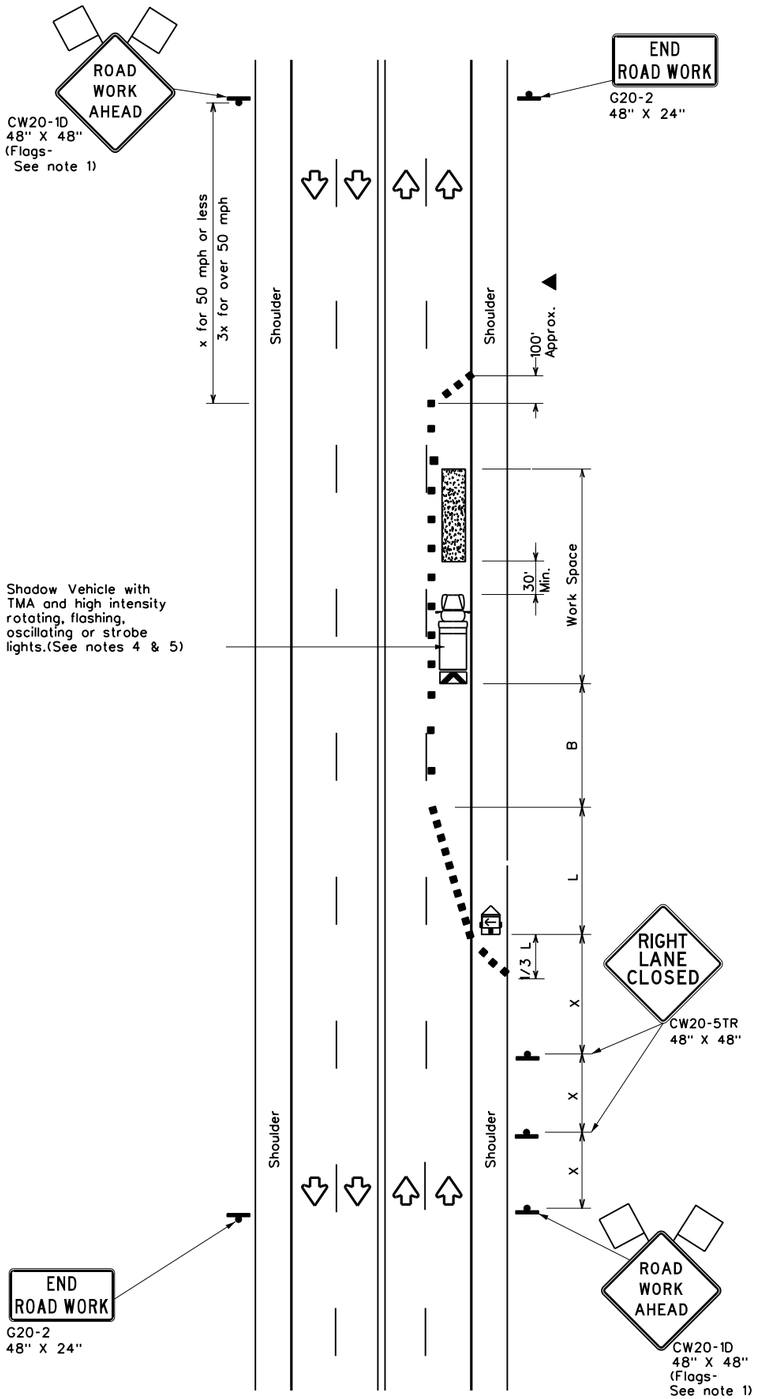
TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

FILE: tcp1-3-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	DAL	DENTON, ETC.		40
1-97 2-18				

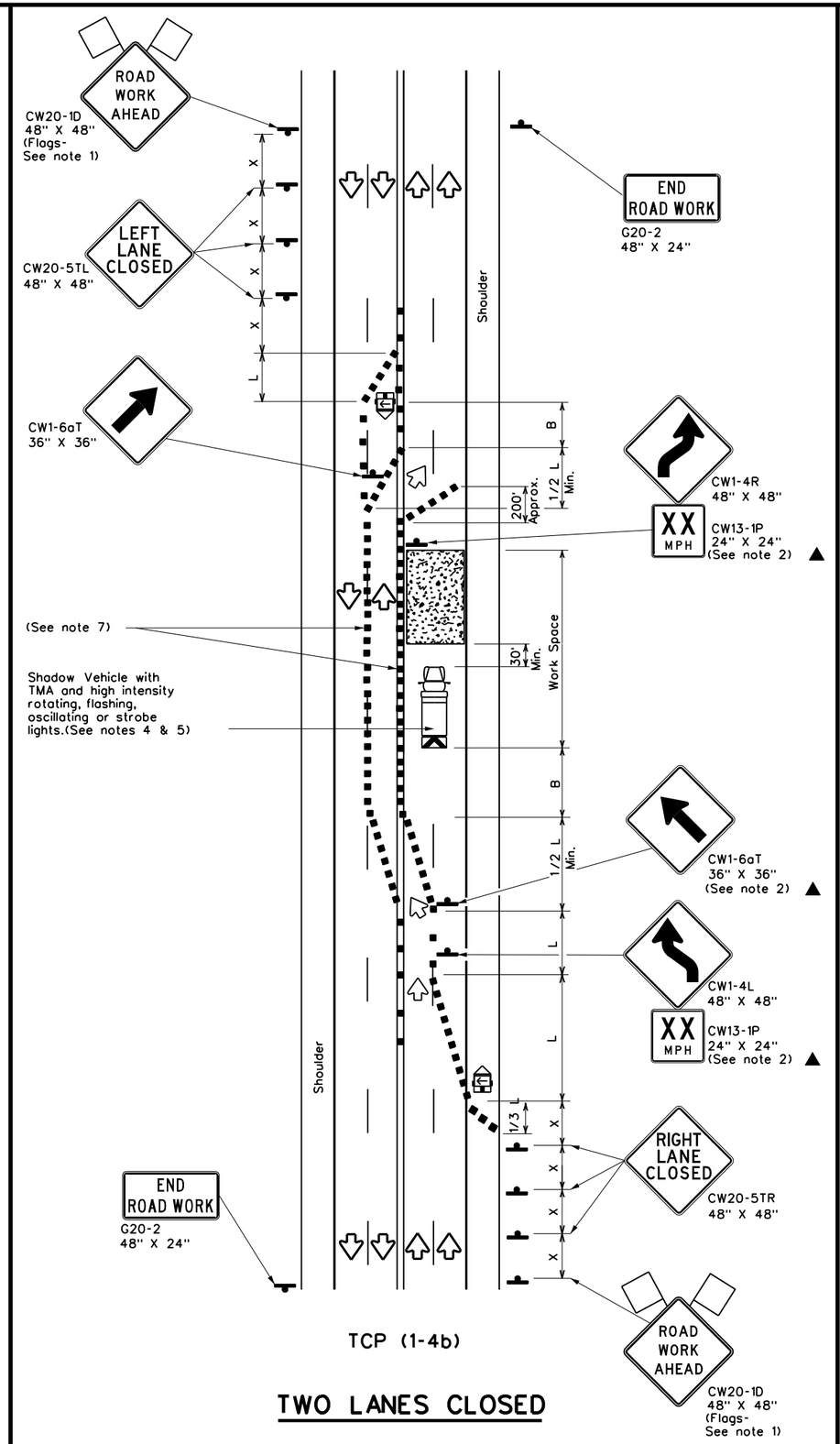
153

DATE: $DATE$ $TIME$
FILE: $FILE$



TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L = \frac{WS^2}{60}$	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

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
4. 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.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-4a)

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

TCP (1-4b)

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

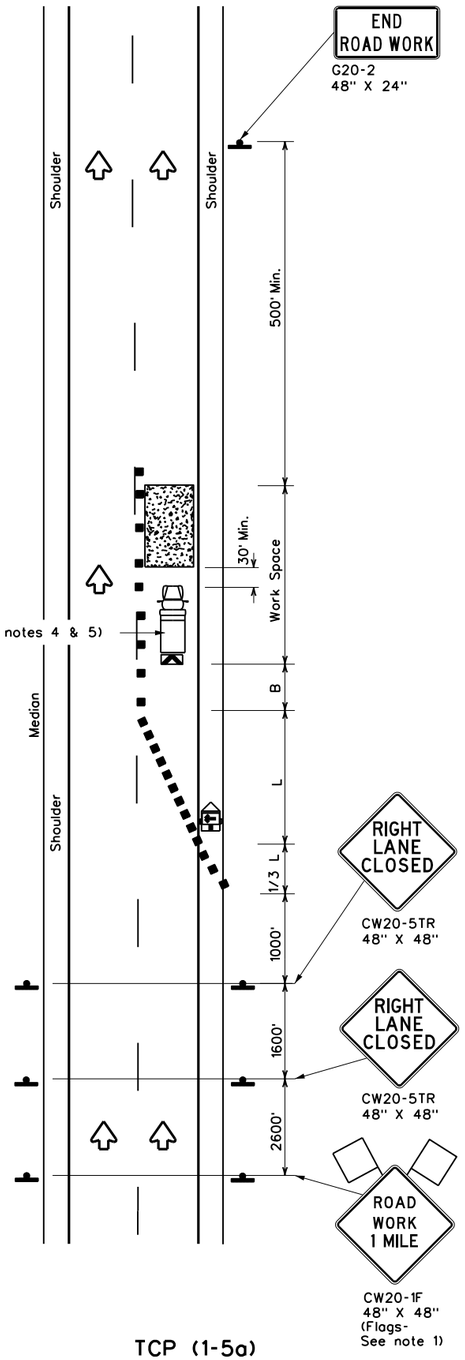
Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-18

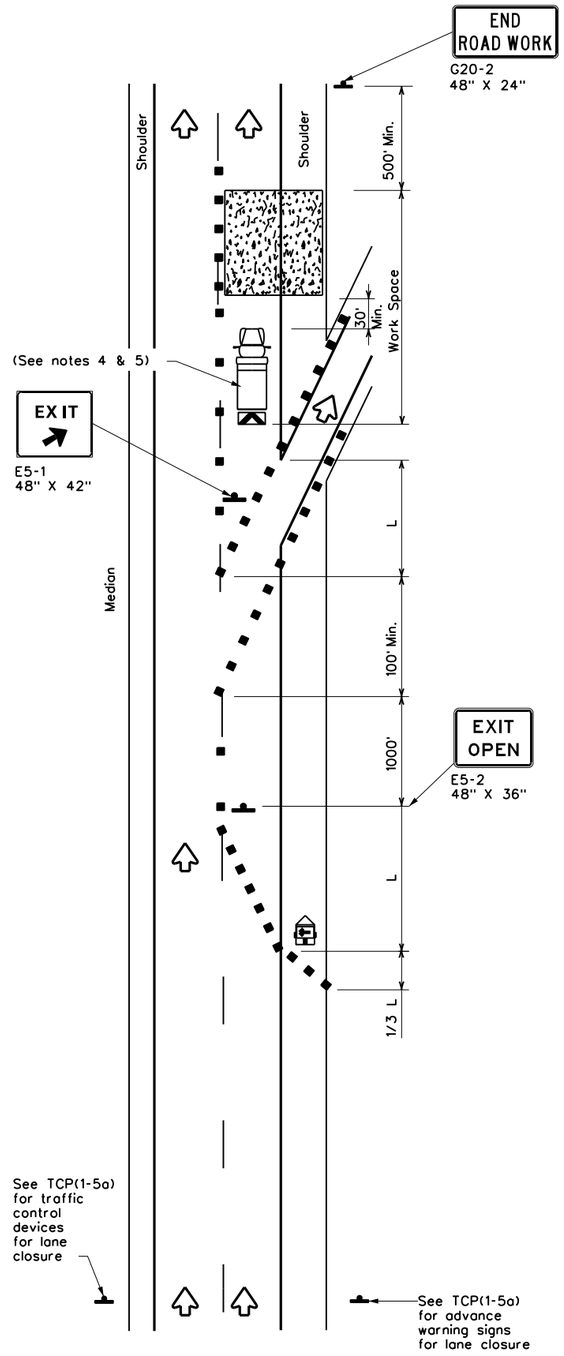
FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	DAL	DENTON, ETC.		41
1-97 2-18				

DATE: $DATE$ $TIME$
FILE: $FILE$



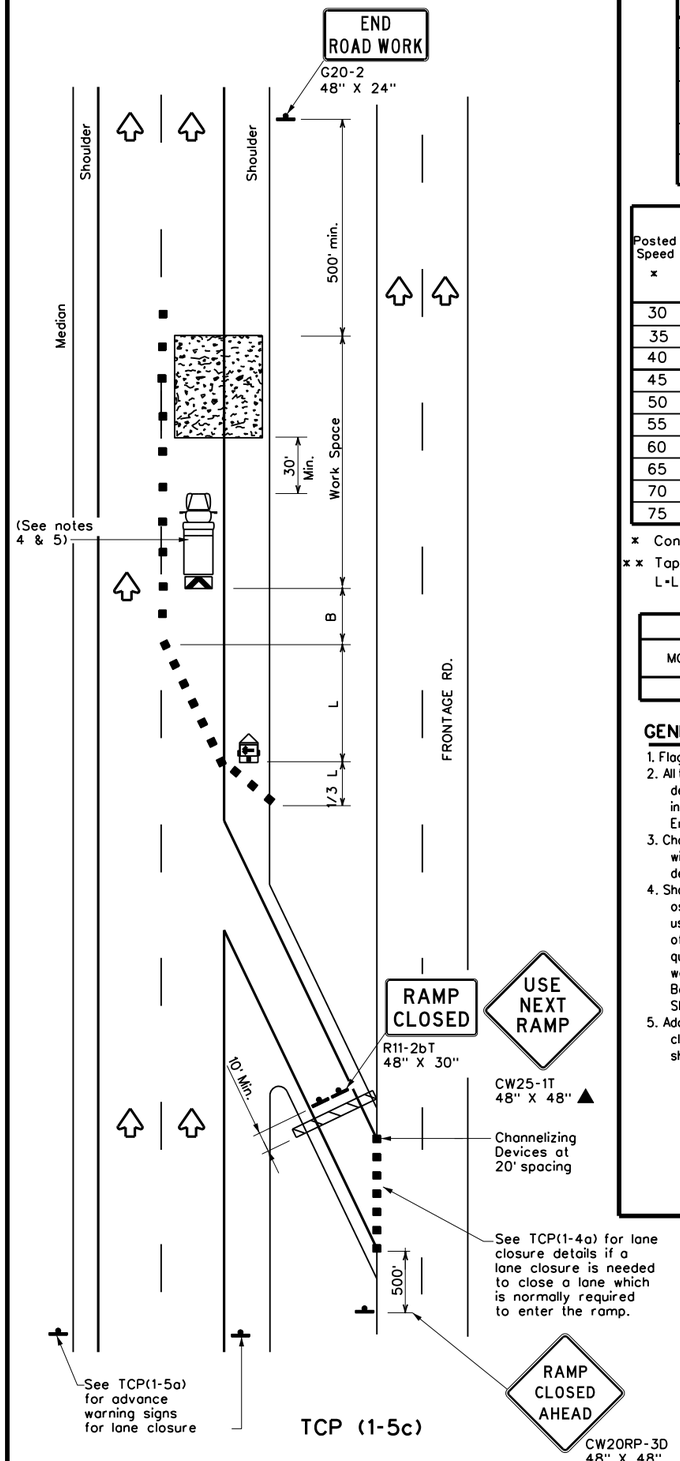
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	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

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Channelizing devices used to close lanes 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.
4. 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.
5. 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.

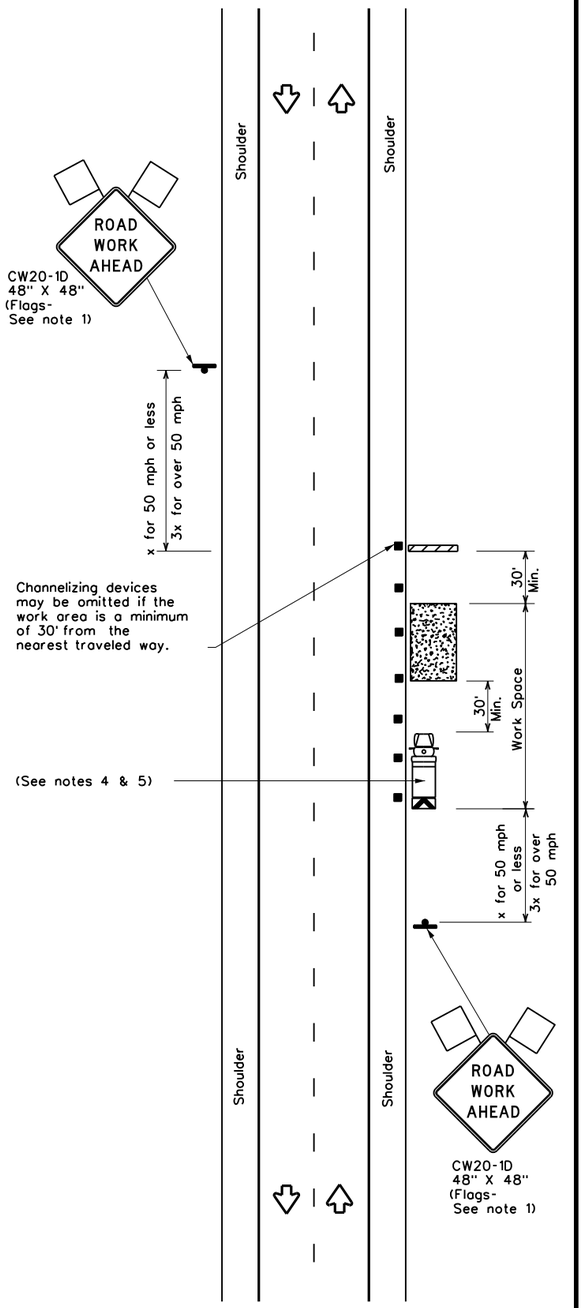
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-18

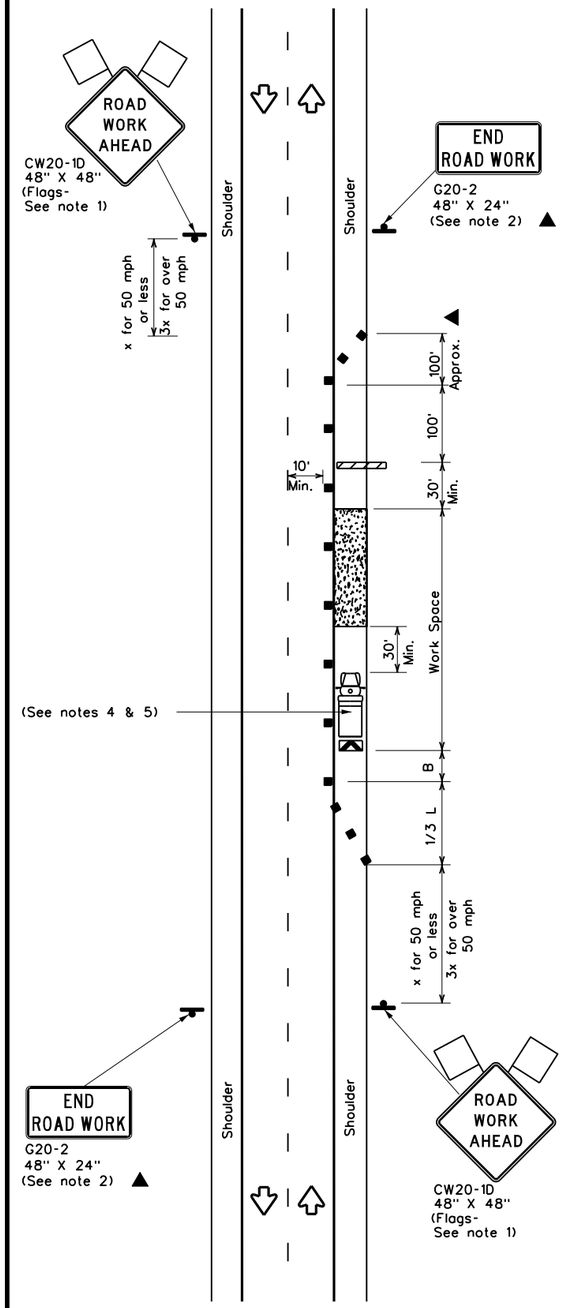
FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	0081	05	053,ETC.	FM 428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		42



TCP (2-1a)

WORK SPACE NEAR SHOULDER

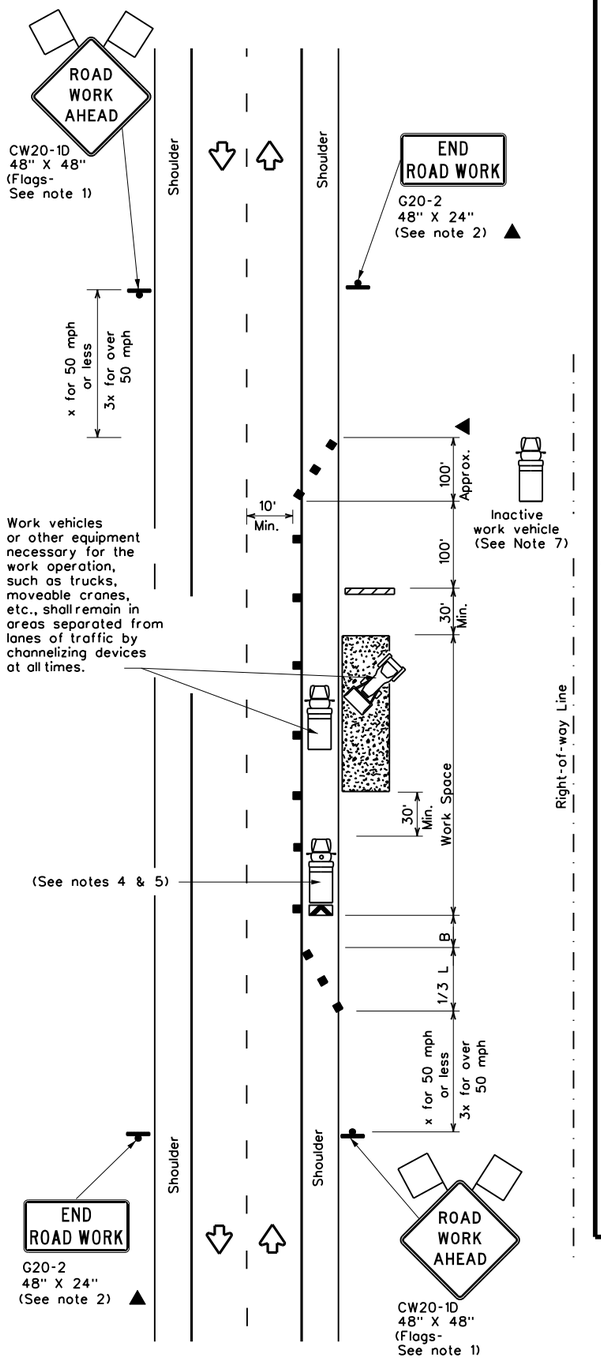
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER

Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER

Conventional Roads

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths * * 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	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

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
3. Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
4. 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.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
8. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

Traffic Operations Division Standard

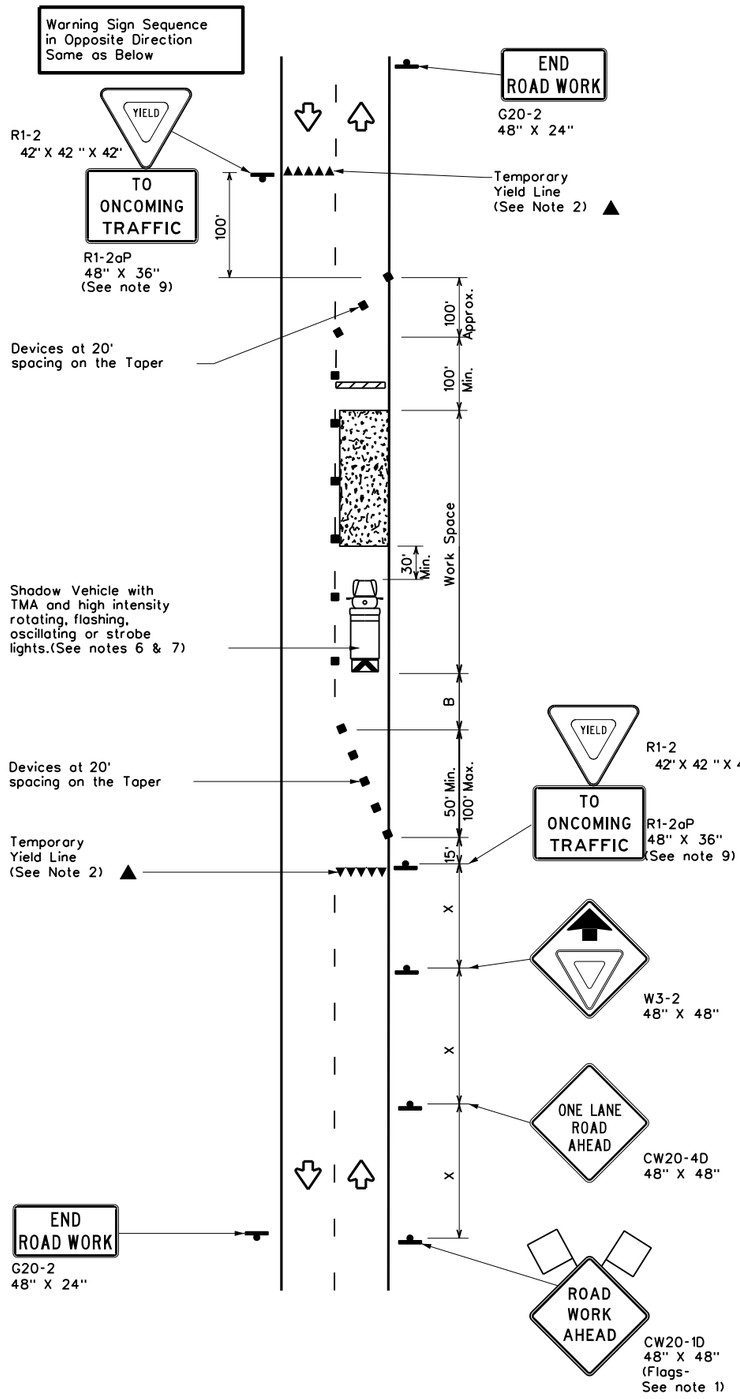
TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	DAL	DENTON, ETC.		43
1-97 2-18				

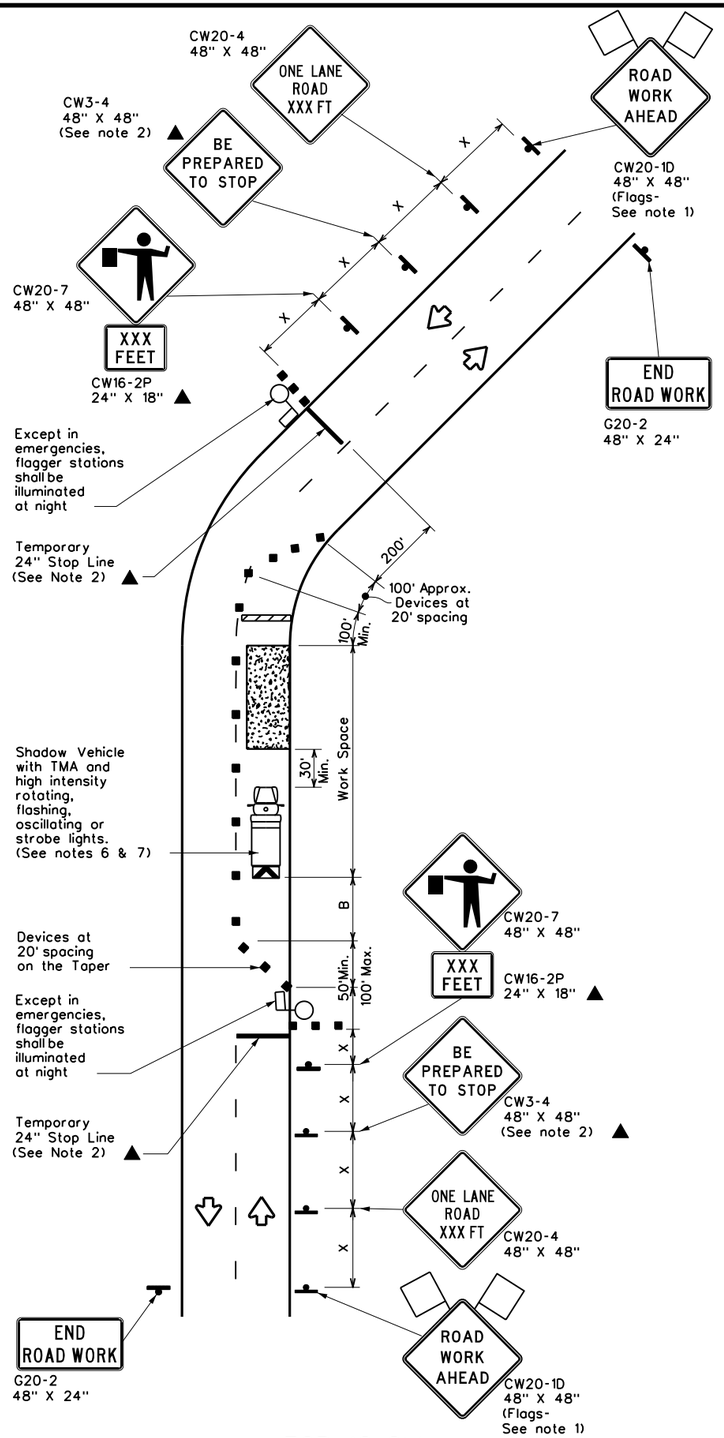
DATE: $DATE$ $TIME$
FILE: $FILE$

DATE: $DATE$ $TIME$
FILE: $FILE$



TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS

ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS

ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	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(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-2a)

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

TCP (2-2b)

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

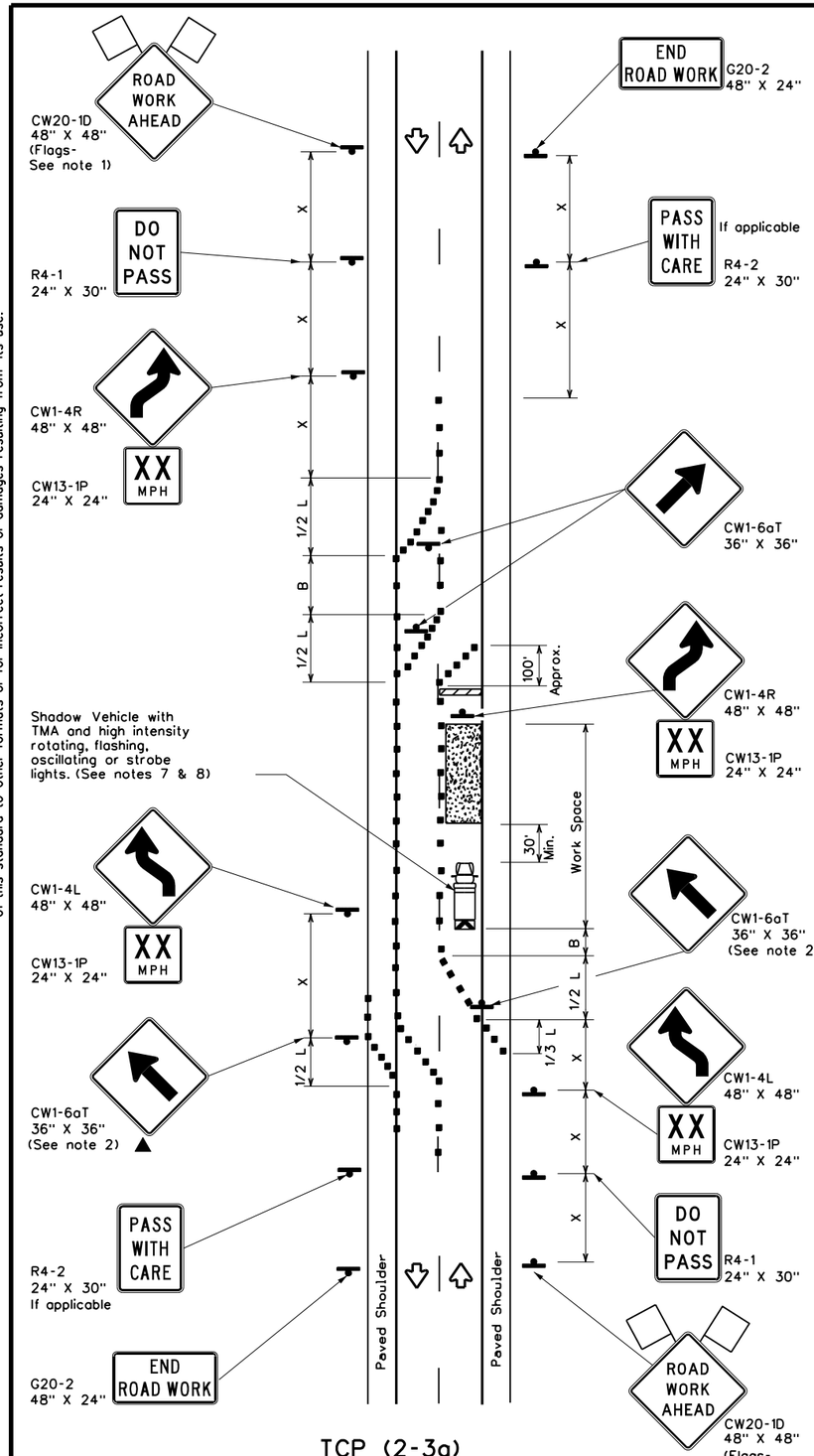
Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(2-2)-18

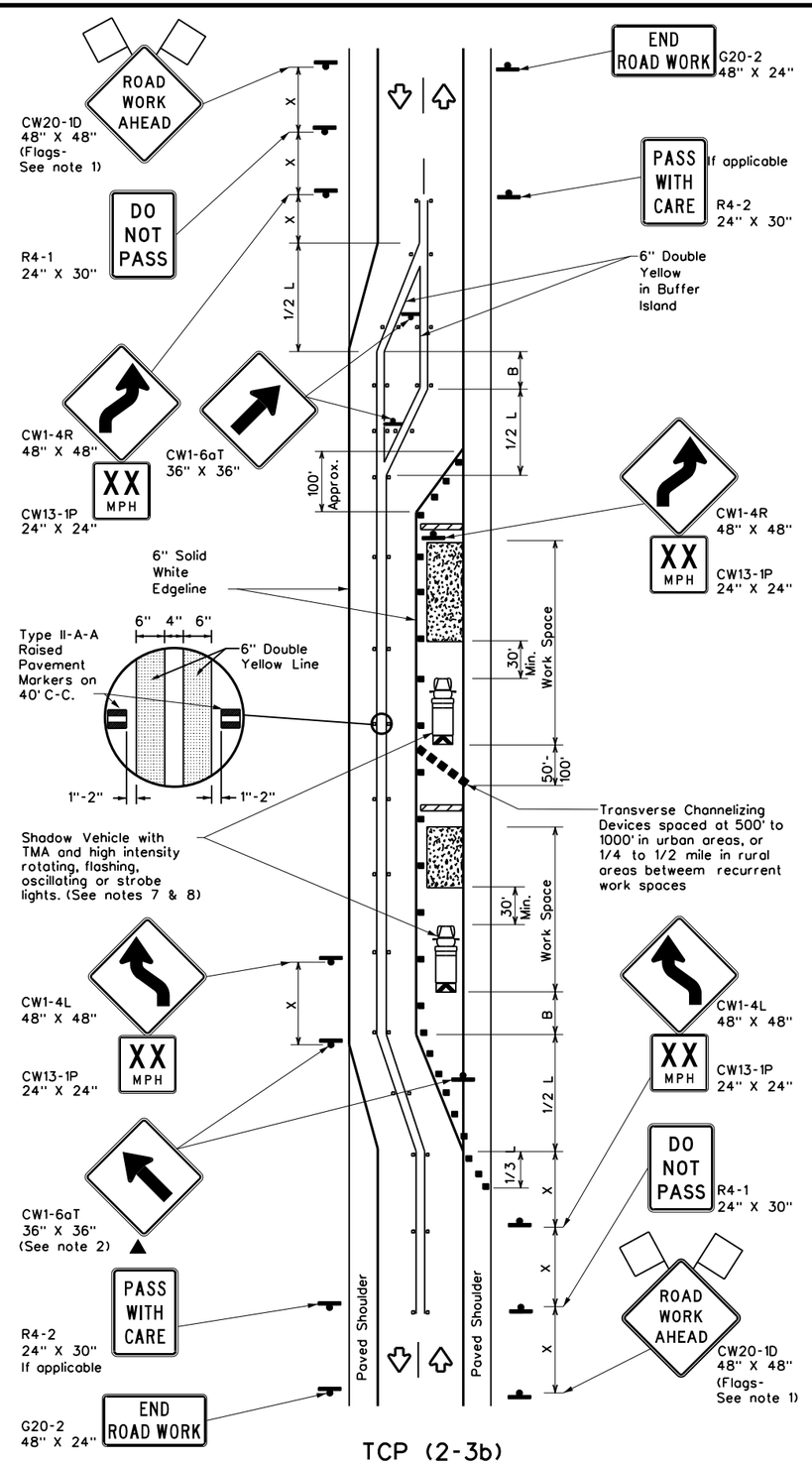
FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0081	05	053, ETC.	FM 428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		44

DATE: $DATE$ $TIME$
FILE: $FILE$



TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



TCP (2-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

LEGEND

	Type 3 Barricade	■ ■	Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	• • • •	Raised Pavement Markers Ty II-AA
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	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
				TCP(2-3b)ONLY
			✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
4. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
5. The R4-1 "DO NOT PASS," R4-2 " PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
6. Conflicting pavement marking shall be removed for long term projects.
7. 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.
8. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-3a)

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

Texas Department of Transportation

Traffic Safety Division Standard

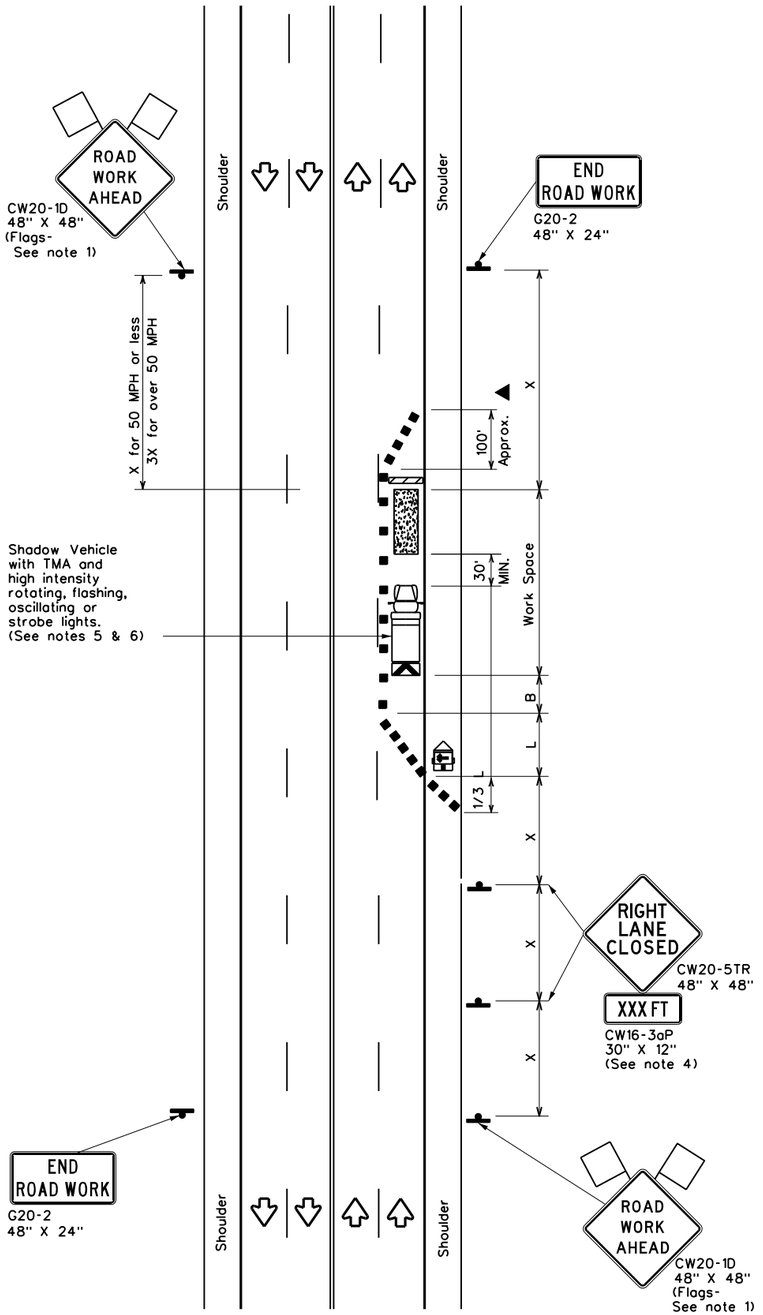
TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-23

FILE: tcp(2-3)-23.dgn	DN:	CK:	DW:	CK:
© TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-85 4-98 2-18	0081	05	053, ETC	FM 428, ETC.
8-95 3-03 4-23	DIST	COUNTY		SHEET NO.
1-97 2-12	DAL	DENTON, ETC		45

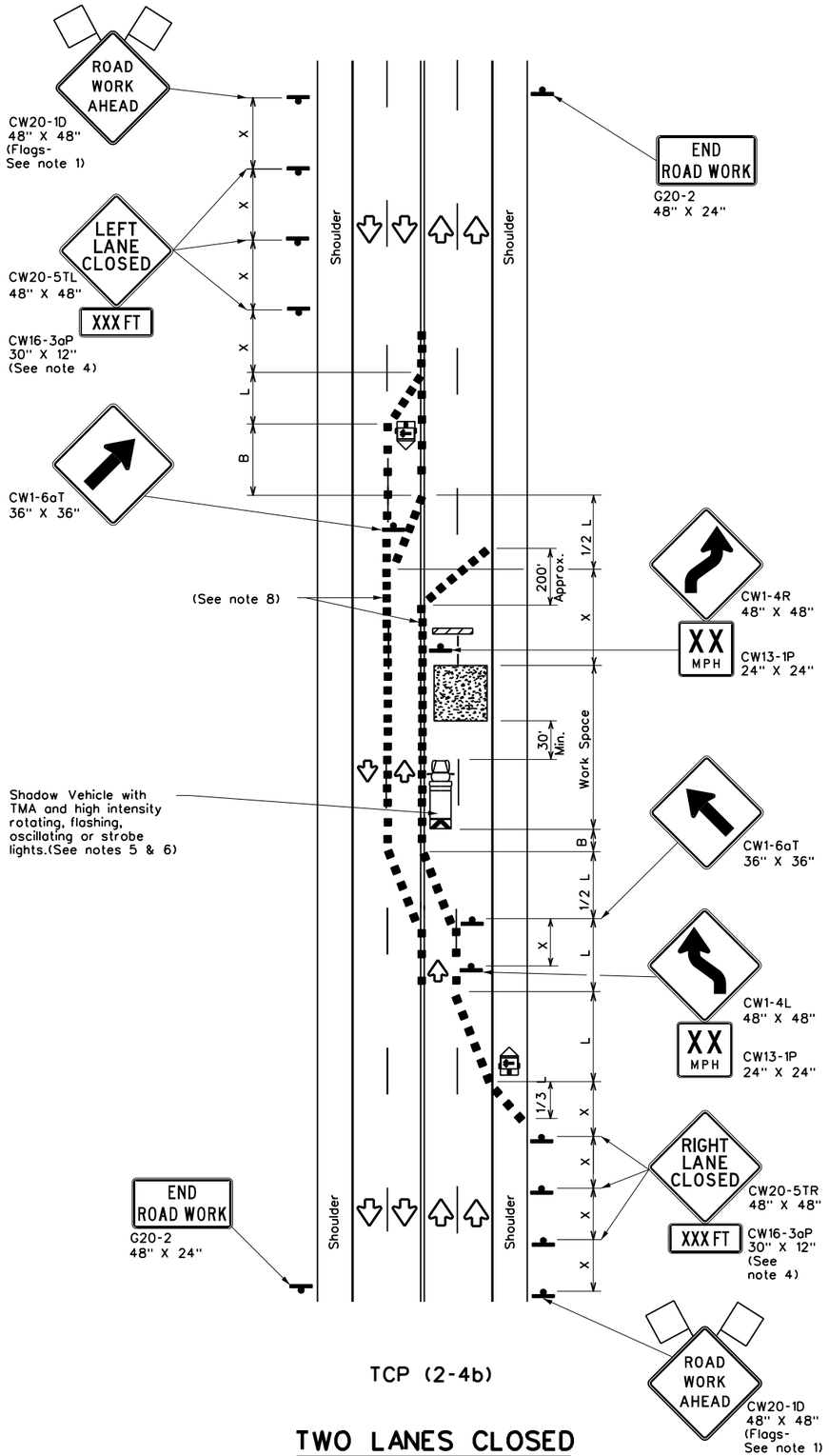
163

DATE: $DATE$ $TIME$
FILE: $FILE$



TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	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

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
5. 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.
6. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-4a)

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

TCP (2-4b)

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

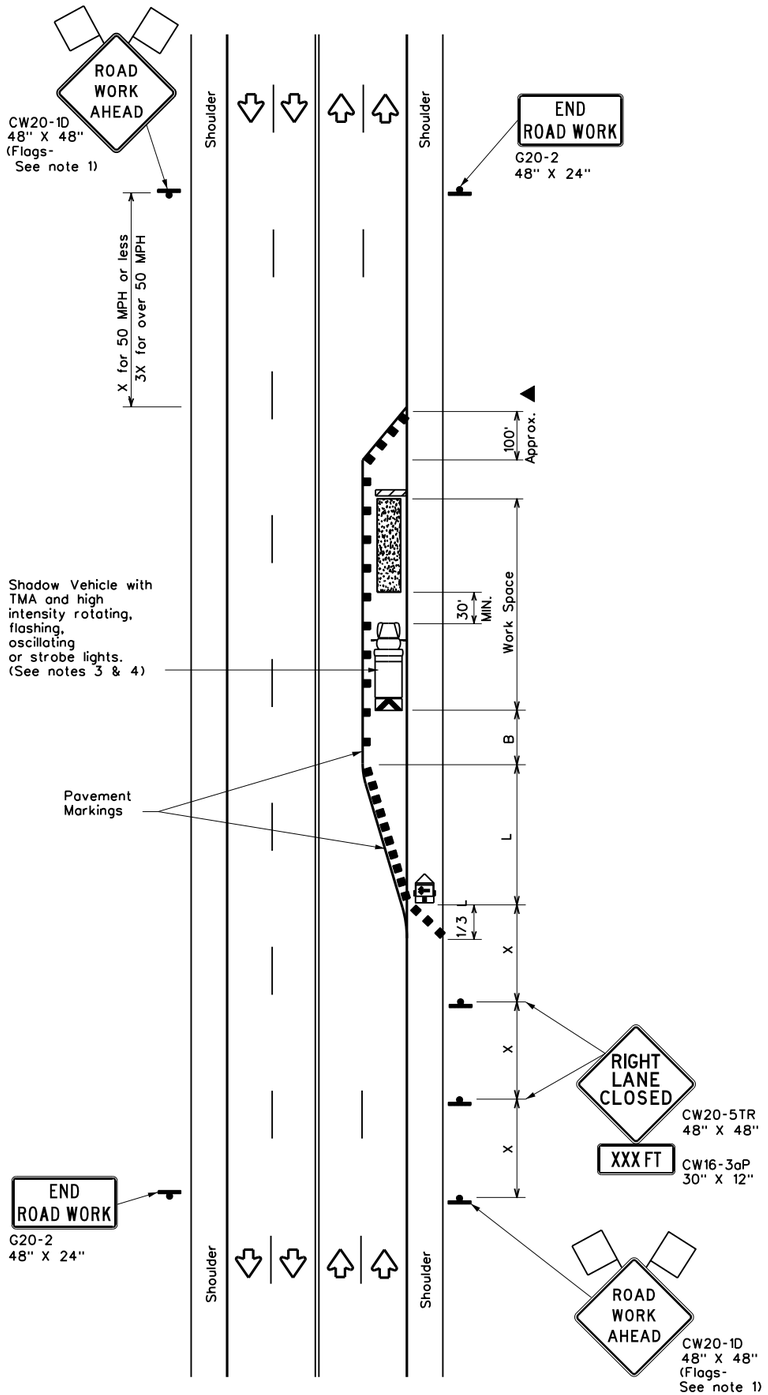
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

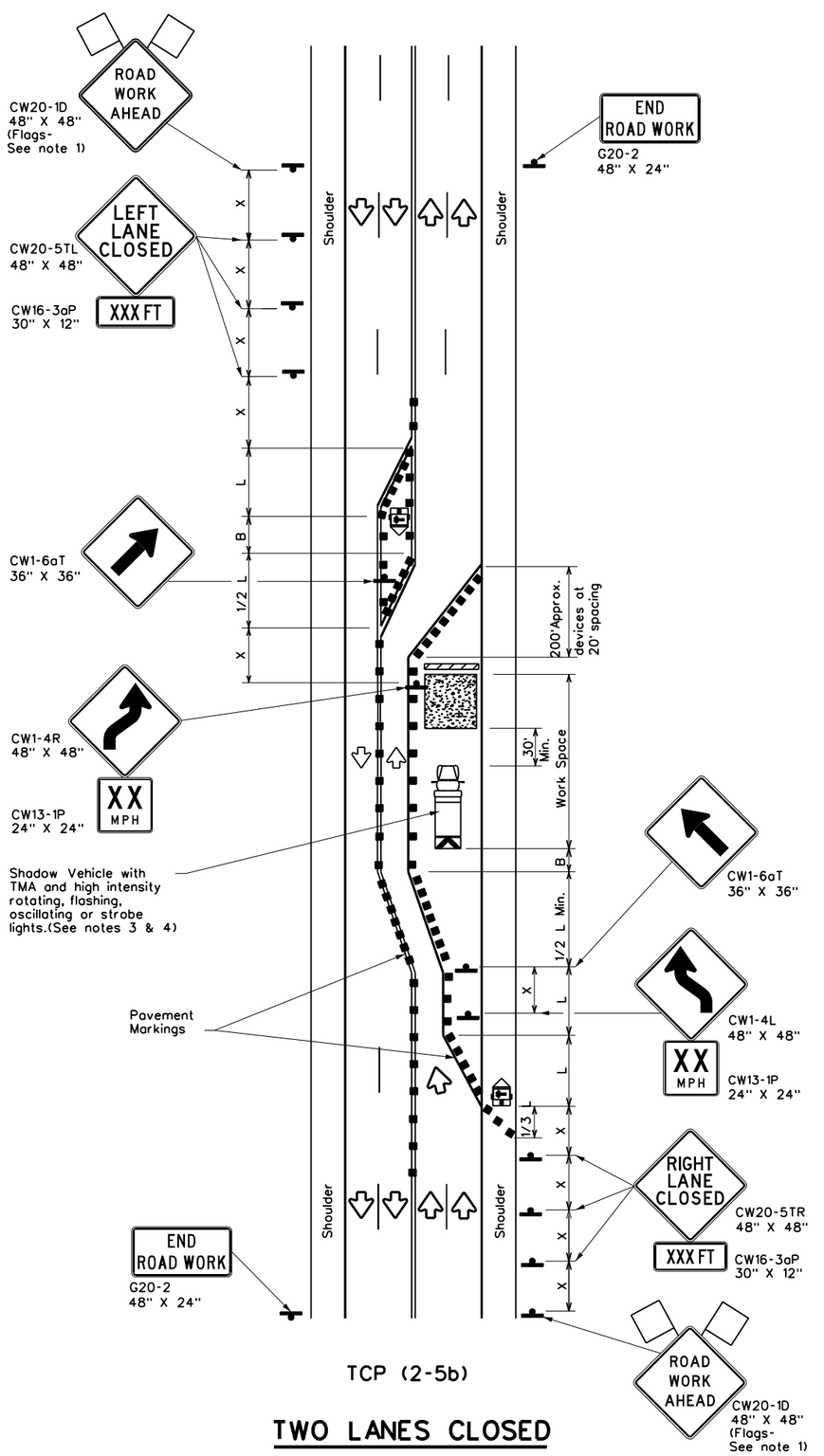
TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0081	05	053, ETC.	FM 428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		46



TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths * * 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L = \frac{WS^2}{60}$	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

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. 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 eposure 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 substitutued for the Shadow Vehicle and TMA.
4. 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.
5. The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

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

TCP (2-5b)

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

Texas Department of Transportation

Traffic Operations Division Standard

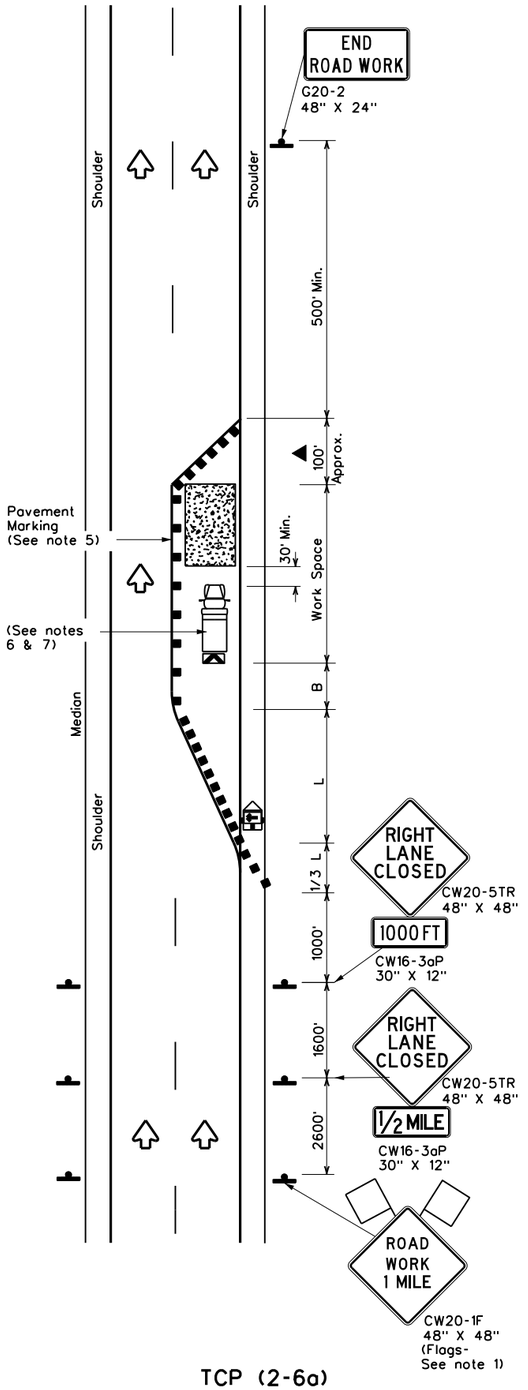
TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

FILE: tcp2-5-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
8-95 2-12	DIST	COUNTY		SHEET NO.
1-97 3-03	DAL	DENTON, ETC.		47
4-98 2-18				

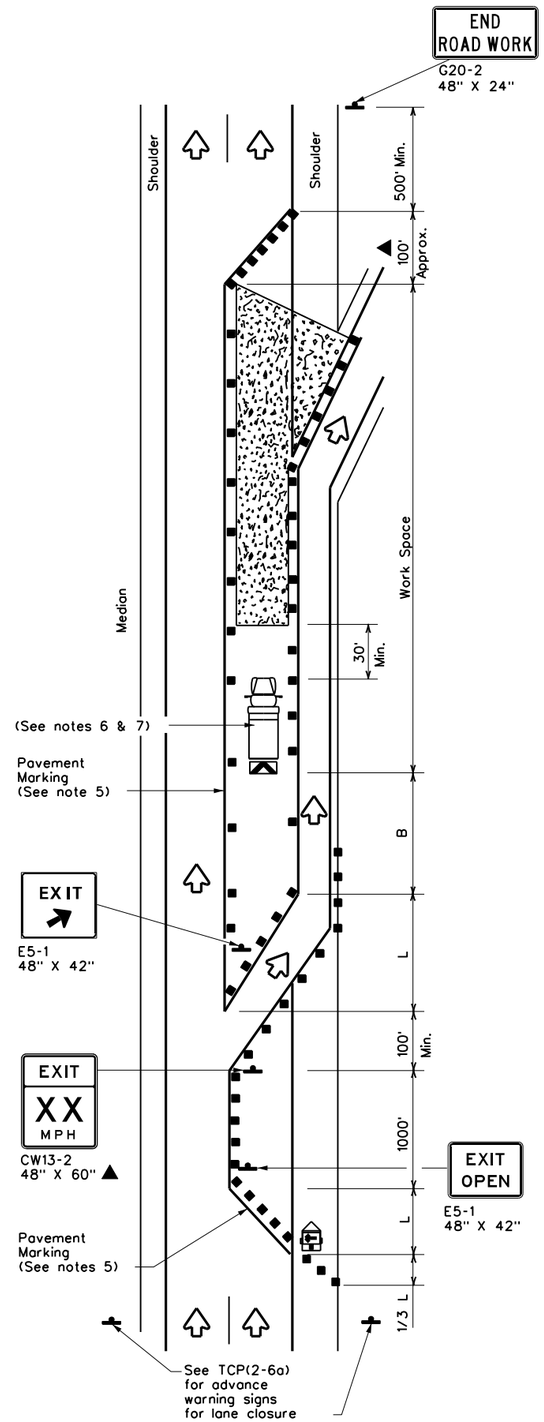
DATE: $DATE$ $TIME$
FILE: $FILE$

DATE: $DATE$ $TIME$
FILE: $FILE$



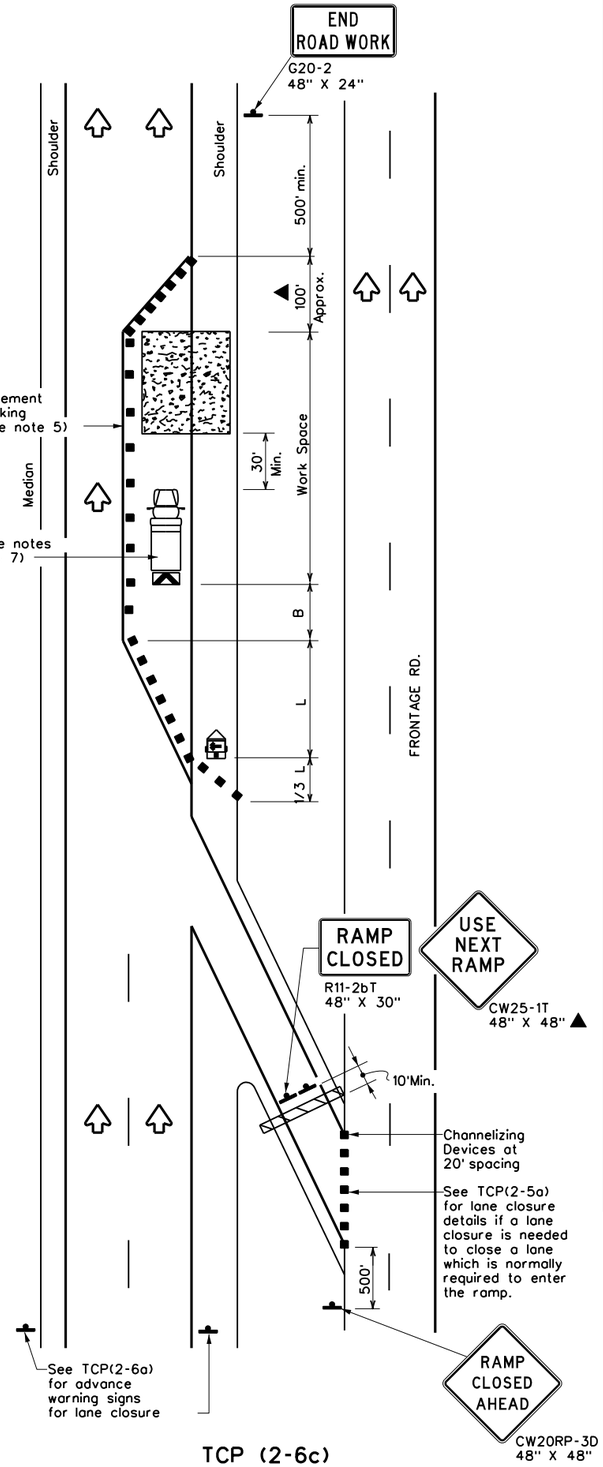
TCP (2-6a)

ONE LANE CLOSURE



TCP (2-6b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (2-6c)

LANE CLOSURE NEAR ENTRANCE RAMPS

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	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

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Channelizing devices used to close lanes 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.
4. Channelizing devices used along the work space or along tangent sections may be supplemented with vertical panels (VP) placed on everyother channelizing device. If night time conditions make it difficult to see at least two VPs, the VPs may be placed on each channelizing device.
5. The placement of pavement markings may be omitted on Intermediate-term stationary work zones with the approval of the Engineer.
6. Shadow Vehicle with TMA and high intensity rotating, flashing,oscillating or strobe lights. Shadow Vehicle with TMA 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.
7. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

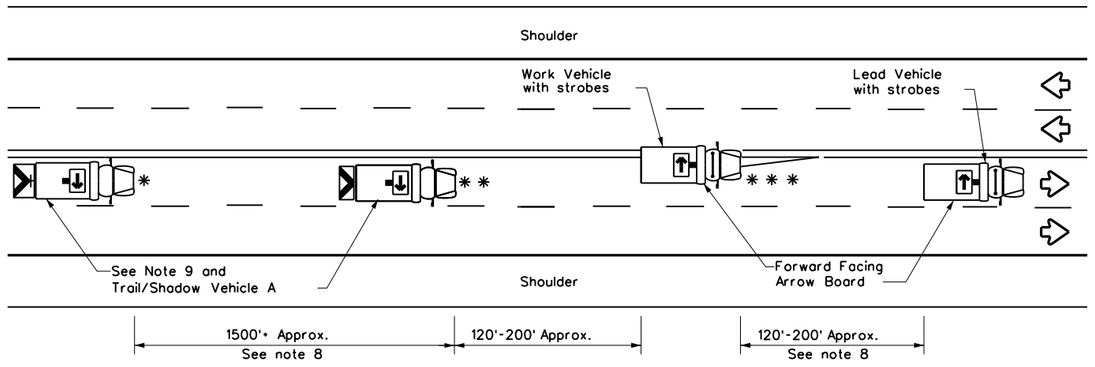
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

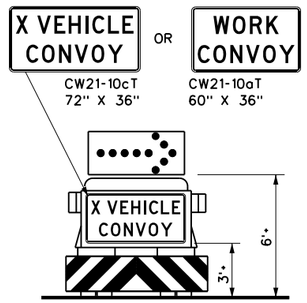
TCP(2-6)-18

FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	DAL	DENTON, ETC.		48
1-97 2-18				



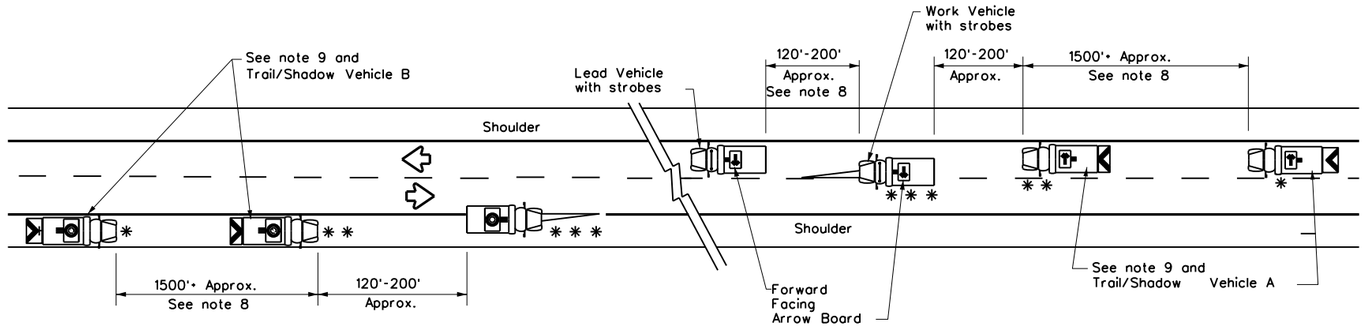
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

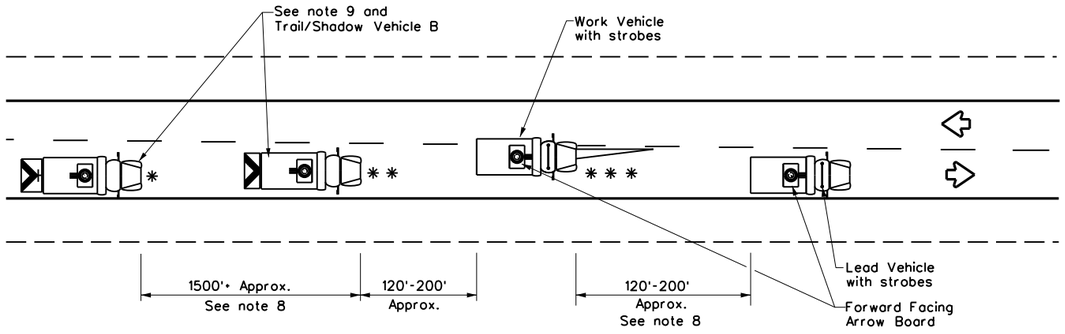


WORK ON SHOULDER

WORK ON TRAVEL LANE

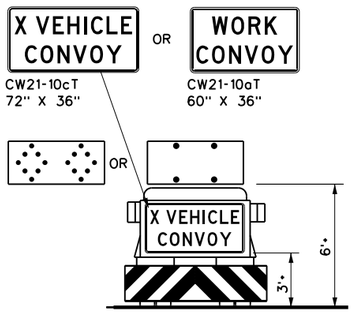
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

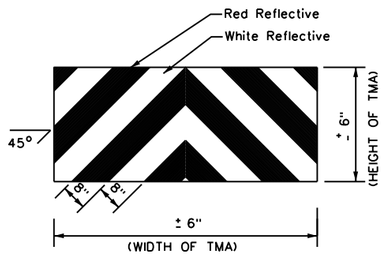
with Flashing Arrow Board in CAUTION display

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
* *	Shadow Vehicle		
* * *	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. "X VEHICLE CONVOY" (CW21-10cT) or "WORK CONVOY" (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped "WORK CONVOY"(CW21-10T) or "X VEHICLE CONVOY" (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

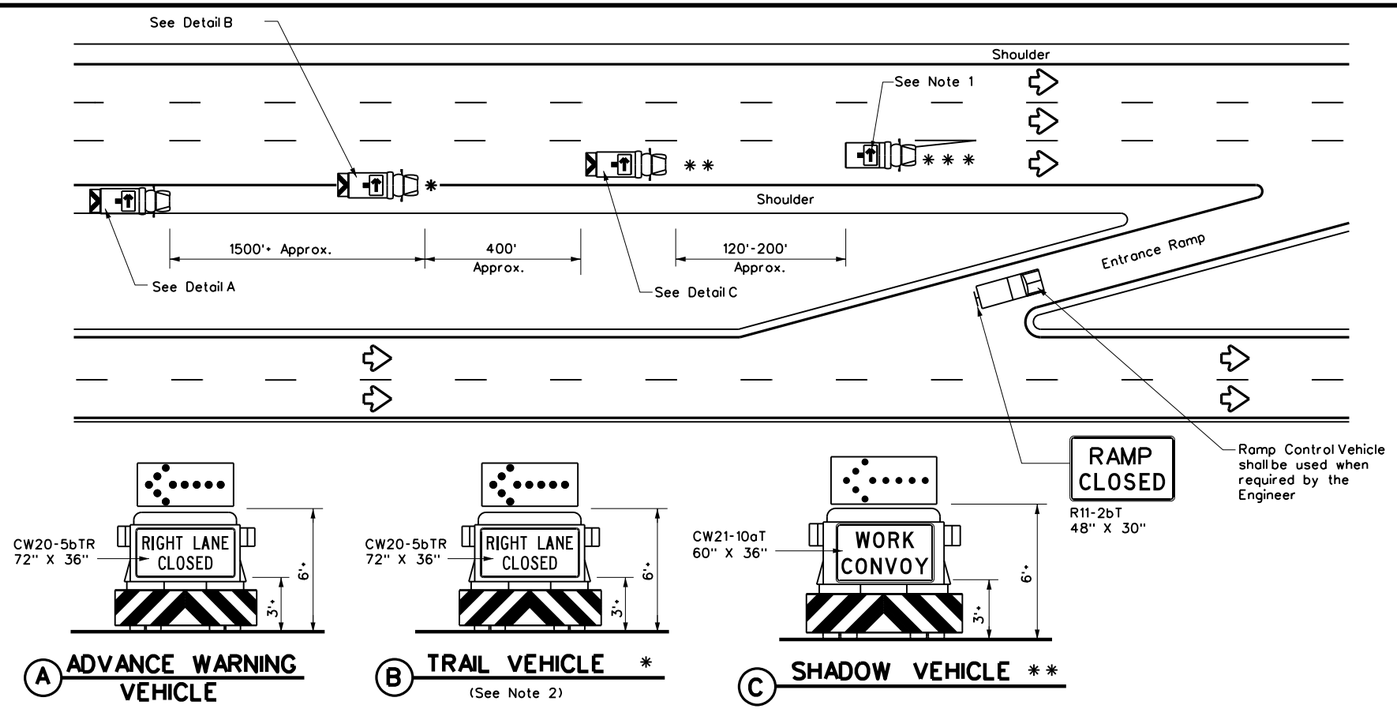
TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

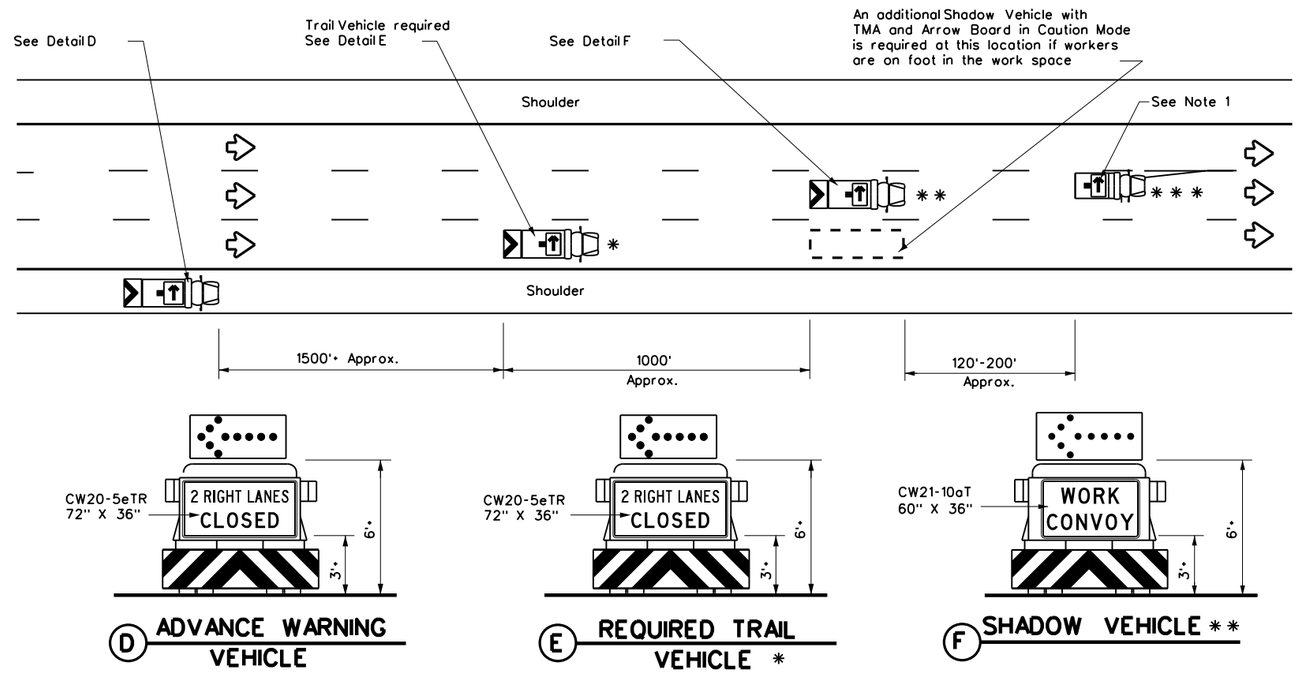
FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
2-94 4-98 8-95 7-13 1-97	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC		49

DATE: $DATE$ $TIME$
FILE: $FILE$

DATE:
FILE:



RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



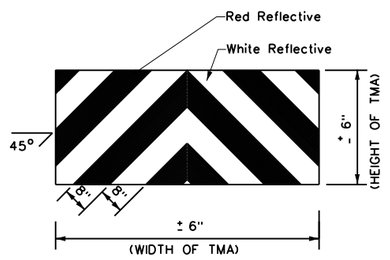
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

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

GENERAL NOTES

1. ADVANCE WARNING, TRAIL and SHADOW vehicles shall be equipped with Type B or Type C flashing arrow boards as per the Barricade and Construction (BC) standards. Arrow boards on WORK vehicles will be optional based on the type of work being performed. The arrow boards shall be operated from inside the vehicle.
2. For TCP(3-2a) the Engineer will determine if the TRAIL VEHICLE is required based on prevailing roadway conditions, traffic volume, and sight distance restrictions. All other vehicles shown for both TCP(3-2a) and TCP(3-2b) are required.
3. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
4. The use of truck mounted attenuators (TMA) on the ADVANCE WARNING, SHADOW, and TRAIL vehicles are required.
5. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DMS 8300, Type A.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE may vary according to terrain, work activity and other factors.
9. Standard 48" X 48" diamond shaped warning signs with the same message as those shown may be used where adequate mounting space exists.
10. The signs shown should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or a truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board, must be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
12. The principles on this sheet may be used to close lanes from the left side of the roadway considering the number of lanes, shoulder width, sight distance, and ramp frequency.
13. Signs and flashing arrow board modes shall be appropriately altered when implementing left lane closures or interior closures which close the left lanes.
14. The Advance Warning Vehicle may straddle the edgeline when shoulder width makes it necessary.



STRIPING FOR TMA

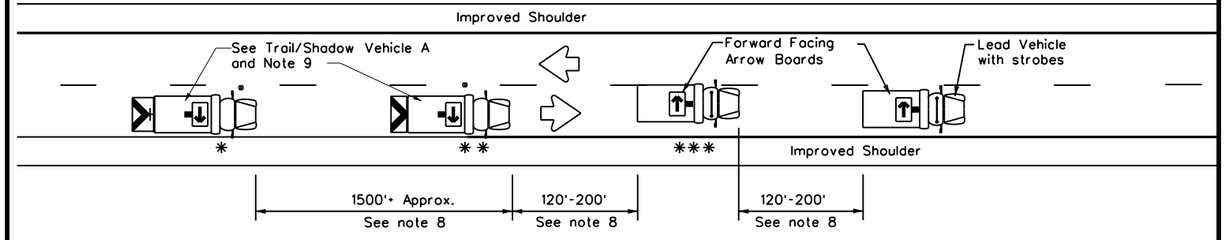
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

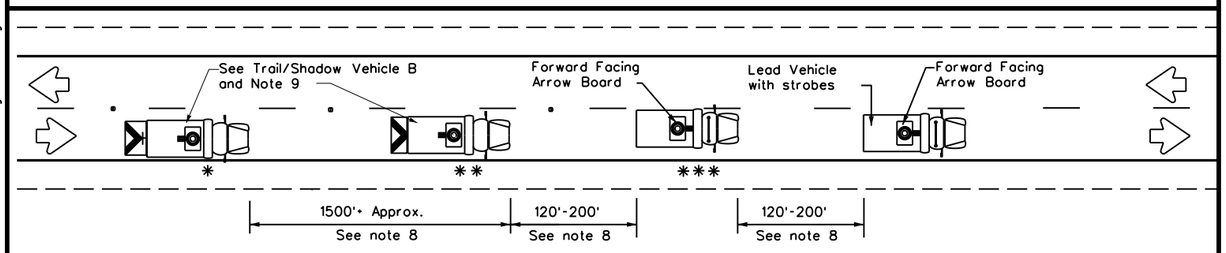
TCP(3-2)-13

FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0081	05	053, ETC.	FM 428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		50



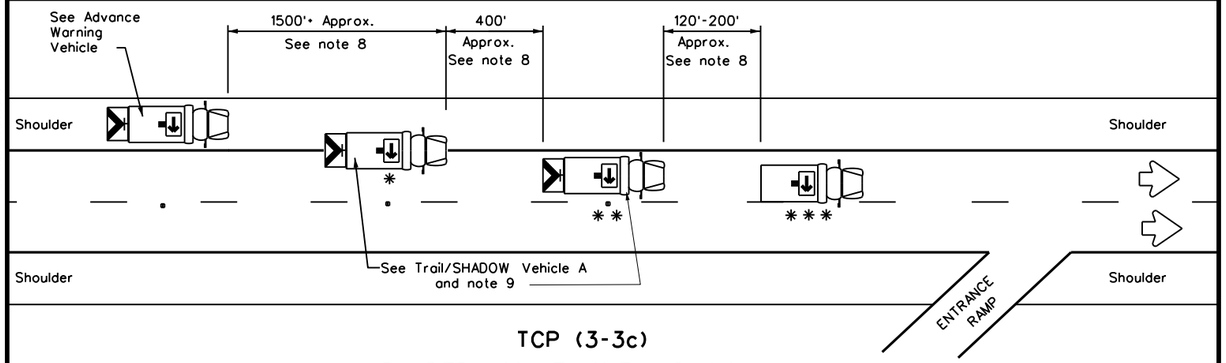
TCP (3-3a)

TWO LANE HIGHWAY WITH PAVED SHOULDERS (WORK ON TRAVEL LANE)



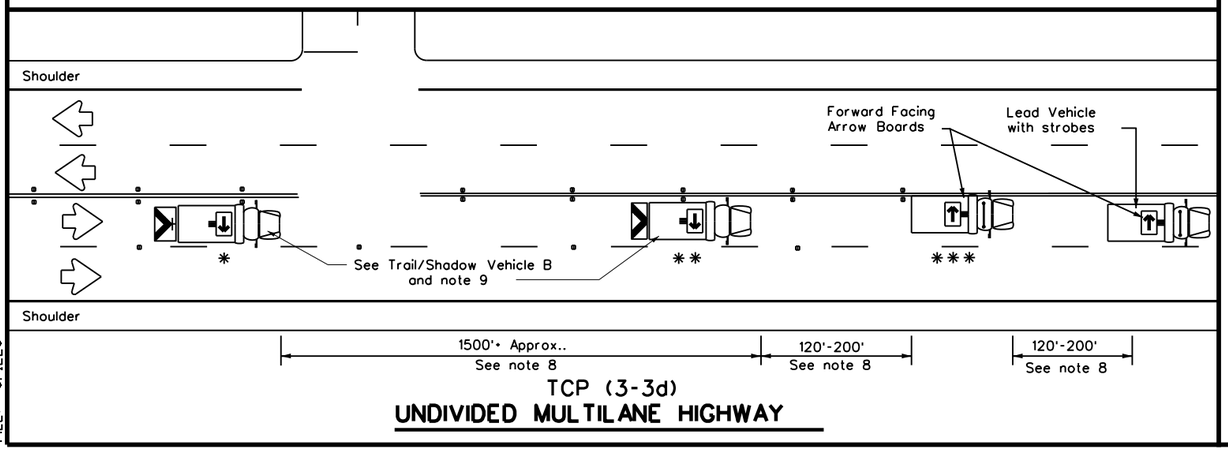
TCP (3-3b)

TWO LANE HIGHWAY WITHOUT PAVED SHOULDERS (WORK ON TRAVEL LANE)



TCP (3-3c)

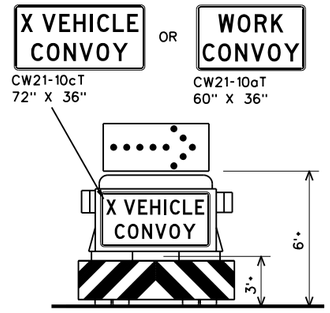
DIVIDED MULTILANE HIGHWAY



TCP (3-3d)

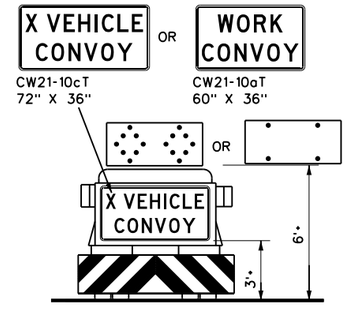
UNDIVIDED MULTILANE HIGHWAY

$TIME$
DATE: $DATE$
FILE: $FILE$



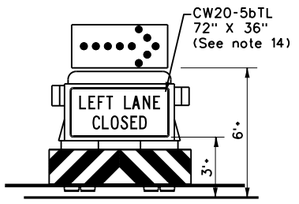
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

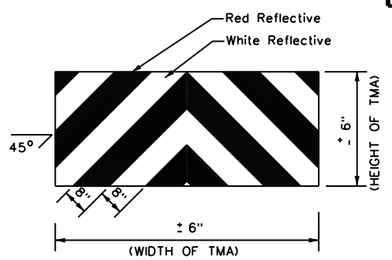


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
* *	Shadow Vehicle		
* * *	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

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

GENERAL NOTES

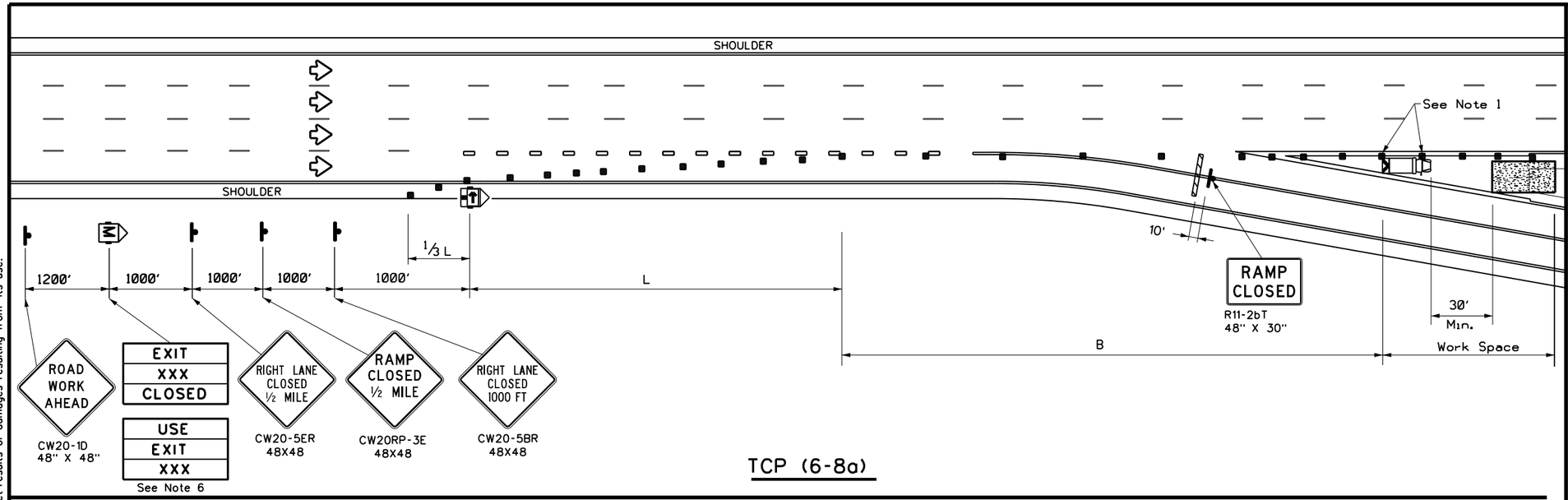
1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer will determine if the LEAD vehicle and/or TRAIL vehicle are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating, or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE, ADVANCE WARNING and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. X VEHICLE CONVOY (CW21-10cT) or WORK CONVOY (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" x 48" diamond shaped WORK CONVOY (CW21-10T) or X VEHICLE CONVOY (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The X VEHICLE CONVOY sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. For divided highways with two or three lanes in one direction, the appropriate LEFT LANE CLOSED (CW20-5bTL), RIGHT LANE CLOSED (CW20-5bTR), or CENTER LANE CLOSED (CW20-5dT) sign should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board may be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. A double arrow shall not be displayed on the arrow board on the Advance Warning Vehicle.
12. For divided highways with three or four lanes in each direction, use TCP(3-2).
13. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
14. The Advance Warning Vehicle may straddle the edgeline when Shoulder width makes it necessary.
15. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a DO NOT PASS (R4-1) sign should be placed on the back of the rearmost protection vehicle.

Texas Department of Transportation

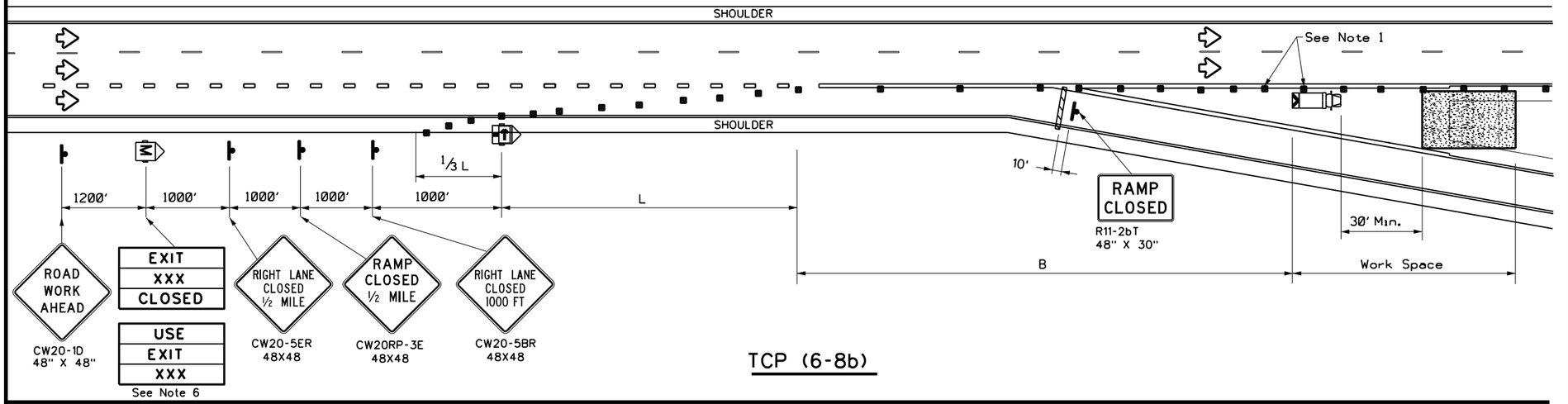
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL TCP(3-3)-14

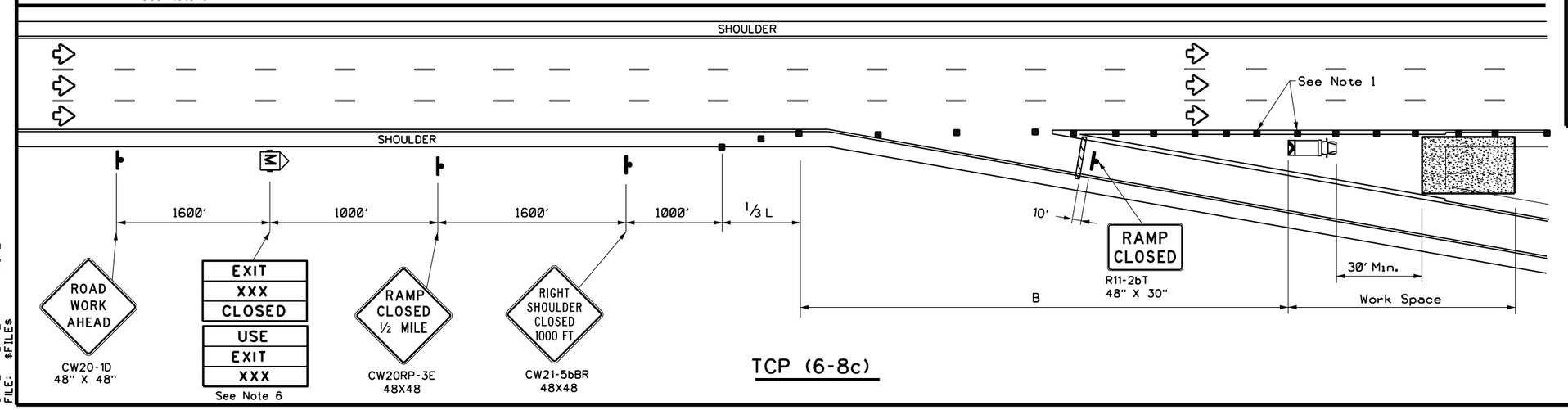
FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	DAL	DENTON, ETC.		51
1-97 7-14				



TCP (6-8a)



TCP (6-8b)



TCP (6-8c)

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK IN EXIT GORE FOR ADT GREATER THAN 10,000

TCP(6-8)-14

FILE: tcp6-8.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		52

DATE: $DATE$ $TIME$
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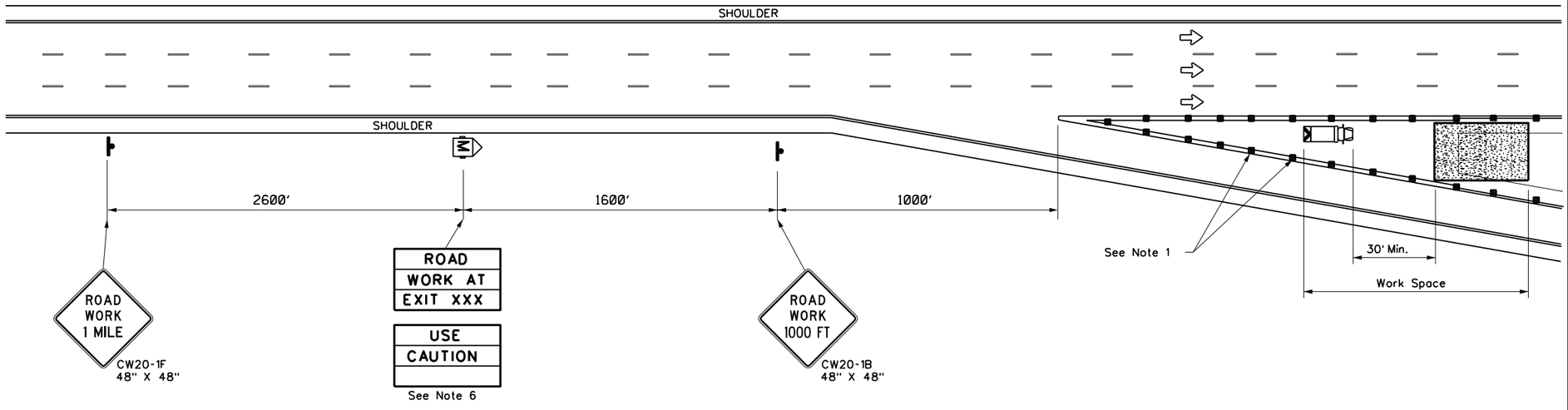
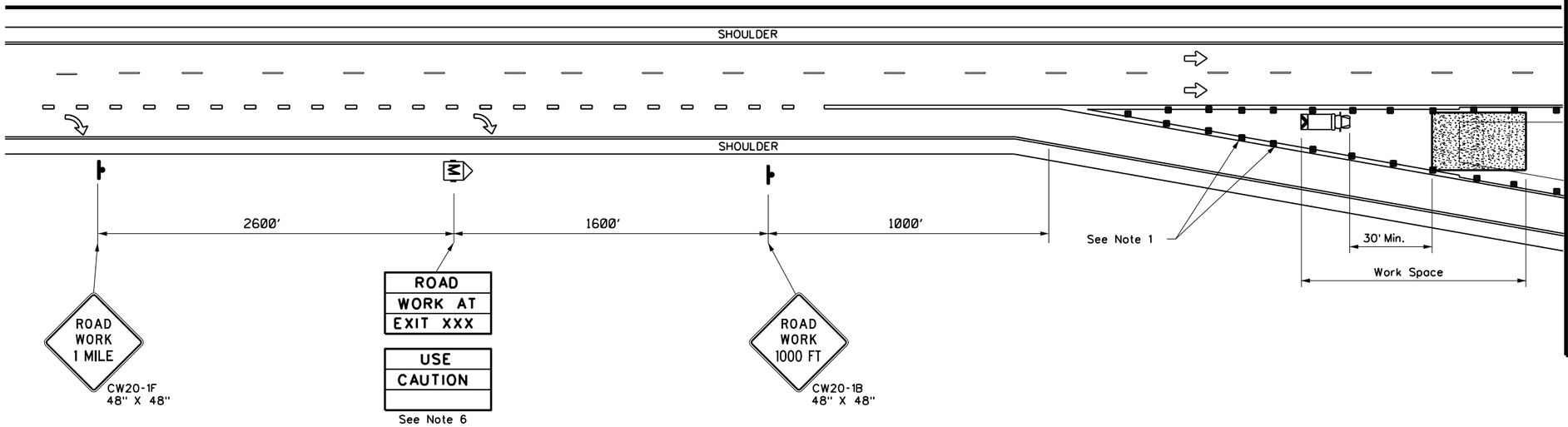


TCP (6-9a)



TCP (6-9b)

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

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

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

GENERAL NOTES

1. Place channelizing devices in the gore at 20' spacing.
2. See the Standard Highway Sign Design for Texas (SHSD) for sign details.
3. The PCMS may be omitted when a permanent DMS sign is available in an appropriate location to display a similar message as called for on the PCMS.
4. When it is determined that a through lane should be closed in addition to the exit ramp, refer to TCP(6-4) and TCP(6-8)for traffic control details.
5. Truck mounted attenuators are required.
6. The PCMS may be omitted if replaced with a "ROAD WORK ½ MILE" (CW20-1E).
7. Roadway ADT should be less than 10,000.

Texas Department of Transportation

Traffic Operations Division Standard

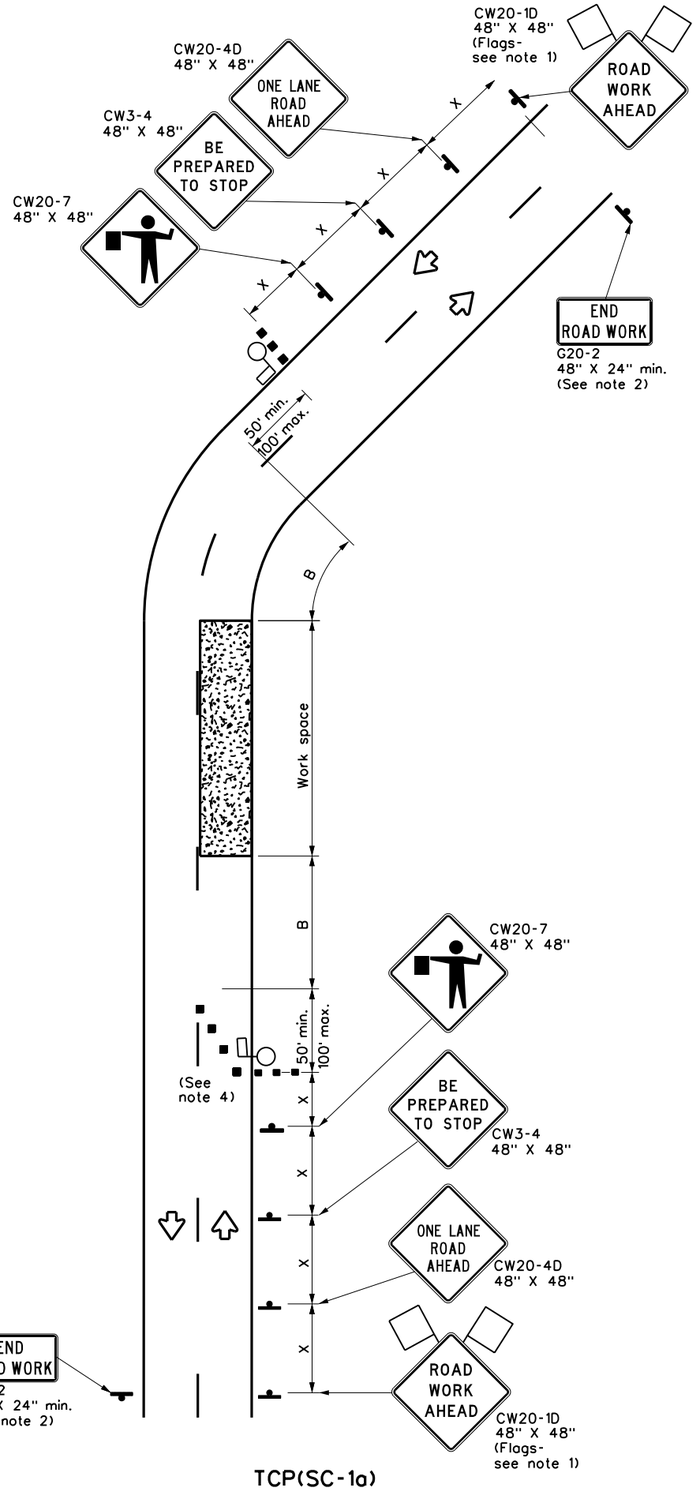
WORK IN EXIT GORE FOR ADT LESS THAN 10,000

TCP(6-9)-14

FILE: tcp6-9.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		53

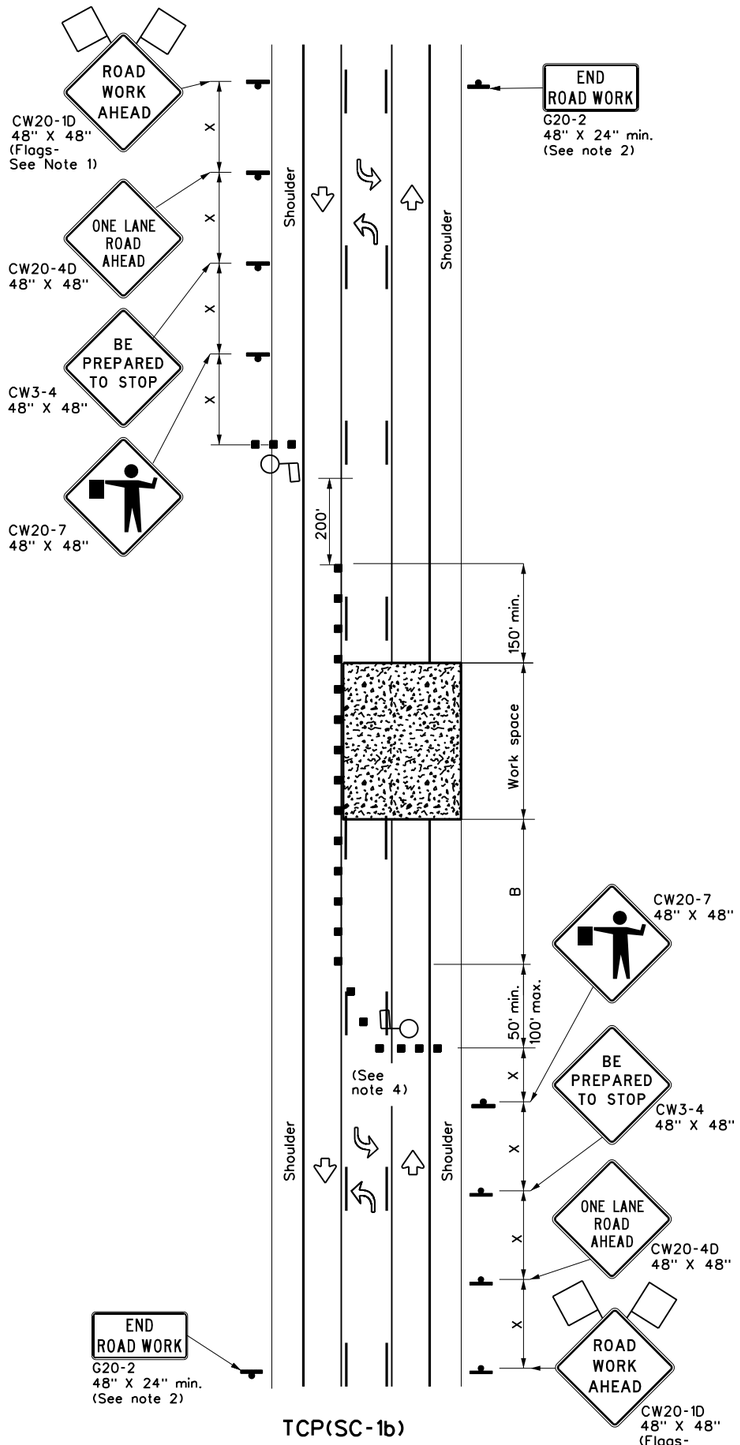
DATE: $DATE$ $TIME$
FILE: $FILE$

DATE: $DATE$ $TIME$
FILE: $FILE$



TCP(SC-1a)

ONE LANE TWO-WAY (TWO LANES) CONTROL WITH PILOT VEHICLE



TCP(SC-1b)

ONE LANE TWO-WAY (THREE LANES) CONTROL WITH PILOT VEHICLE AND CHANNELIZING DEVICES

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths * * 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing Distance "X"	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L = \frac{WS^2}{60}$	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 (FT) W = Width of Offset (FT) S = Posted Speed (MPH)

TYPICAL USAGE

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except: if project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.
3. Sign spacing may be increased or an additional ROAD WORK AHEAD (CW20-1D) sign may be used if advance warning ahead of the flagger sign is less than 1500 feet.
4. Flaggers should use two-way radios or other methods of communication at all times for traffic control coordination.
5. Flaggers should use 24" STOP (CW20-8) / SLOW (CW20-8aT) paddles to control traffic. Flags should be limited to emergency situations.
6. 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).
7. If the seal coat operation crosses intersections, traffic in these areas must be controlled. Care must be taken to prevent vehicles from crossing the asphalt before the aggregate is placed. This may require positioning additional traffic control personnel (flaggers) at the intersection.
8. Temporary rumble strips are not required on seal coat operations.
9. The pilot car is used to guide vehicles through traffic control zone. The pilot car shall have an identification name displayed and PILOT CAR, FOLLOW ME (G20-4) sign or message board mounted in a conspicuous position on rear.

TCP (SC-1a)

1. Channelizing devices on the centerline are not required when a pilot car is leading traffic, unless directed by the Engineer.

Texas Department of Transportation

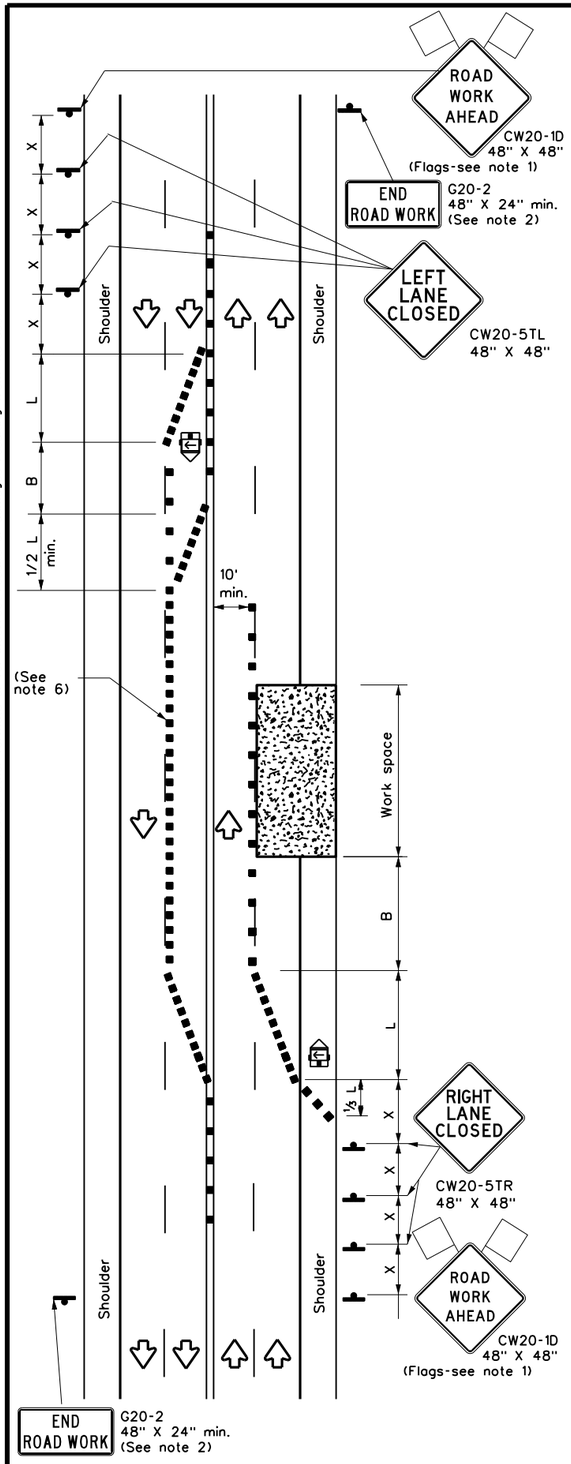
Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS ONE-LANE TWO-WAY

TCP(SC-1)-22

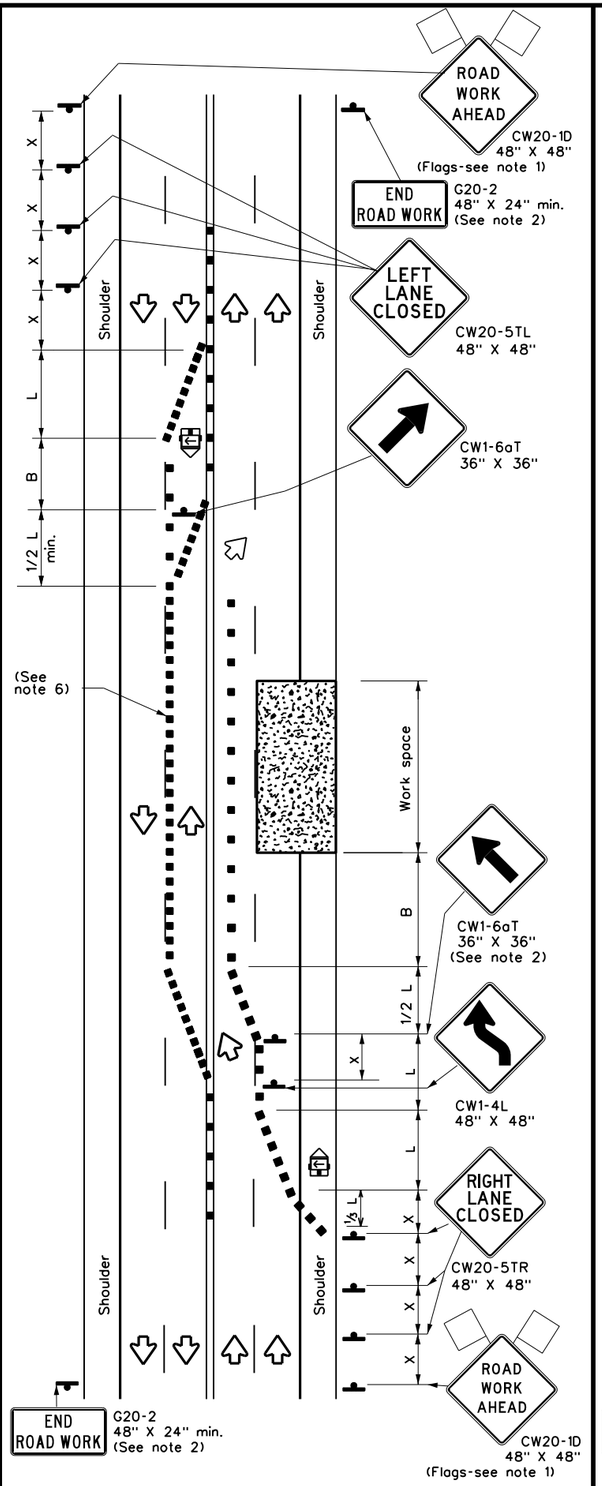
FILE: tcpsc-1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-21 10-22	0081	05	053, ETC.	FM 428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		54

DATE: $DATE$ $TIME$
FILE: $FILE$



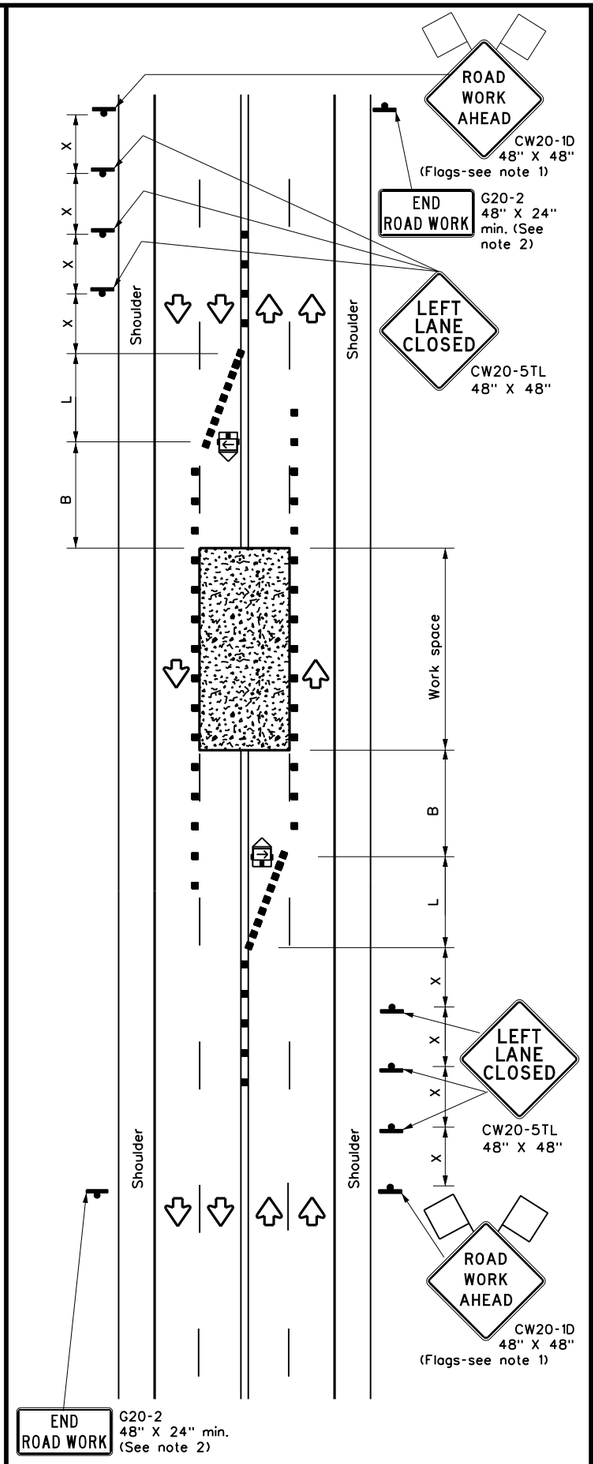
TCP (SC-2a)

ONE LANE CLOSED EACH DIRECTION
CONTROL W/ CHANNELIZING DEVICES



TCP (SC-2b)

ONE LANE CLOSED EACH DIRECTION
CONTROL W/ CHANNELIZING DEVICES



TCP (SC-2c)

CENTER LANES CLOSED
CONTROL W/ CHANNELIZING DEVICES

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing Distance "X"	Suggested Longitudinal Buffer Space "B"
30	$L = \frac{WS^2}{60}$	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

1. Flags attached to signs where shown are REQUIRED.

2. All traffic control devices illustrated are REQUIRED, except: if project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.

3. The ROAD WORK AHEAD (CW20-1D) sign may be repeated if the visibility of the work zone is less than 1500 feet.

4. If the seal coat operation crosses intersections, traffic in these areas must be controlled. Care must be taken to prevent vehicles from crossing the asphalt before the aggregate is placed. This may require positioning additional traffic control personnel (flaggers) at the intersection.

5. Temporary rumble strips are not required on seal coat operations.

TCP (SC-2a) and (SC-2b)

6. Channelizing devices which separate two-way traffic shall be spaced on tapers at:
   a.) 20 feet;
   b.) 15 feet when posted speeds are 35 mph or slower; or
   c.) at 1/2(S) for tangent sections.
   This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

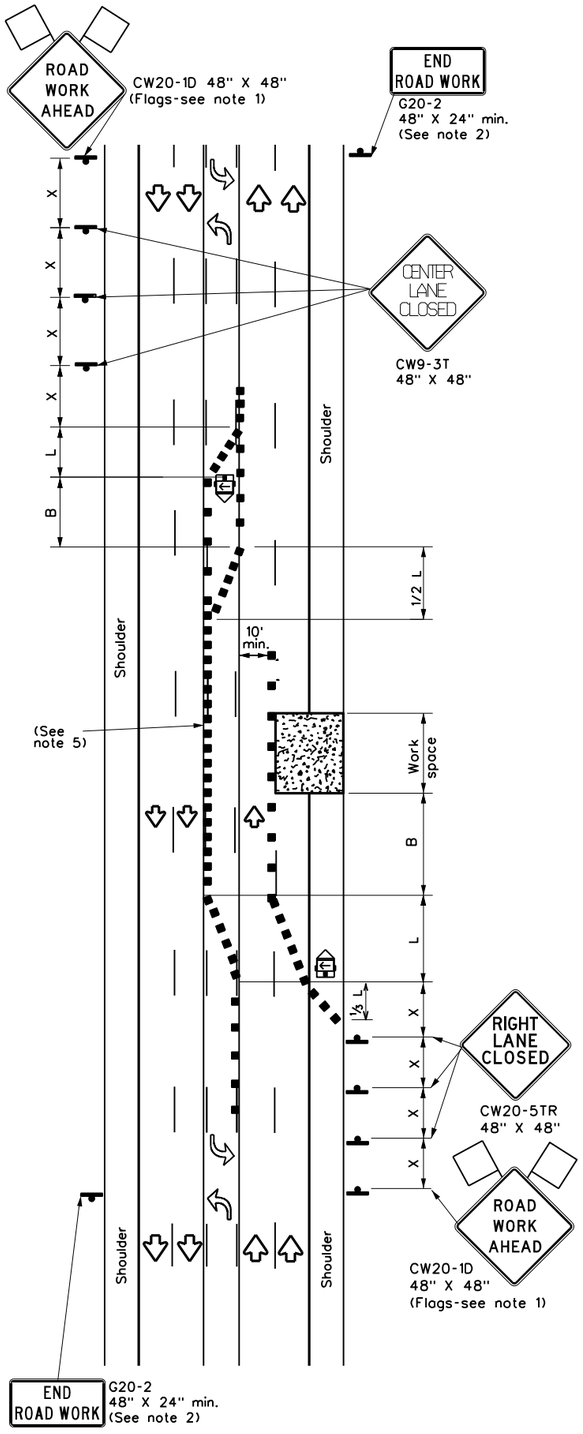
Texas Department of Transportation | Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEALCOAT OPERATIONS MULTILANE ROADS (UNDIVIDED)

TCP(SC-2)-22

FILE: tcpsc-2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-21 10-22	0081	05	053, ETC.	FM 428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		55

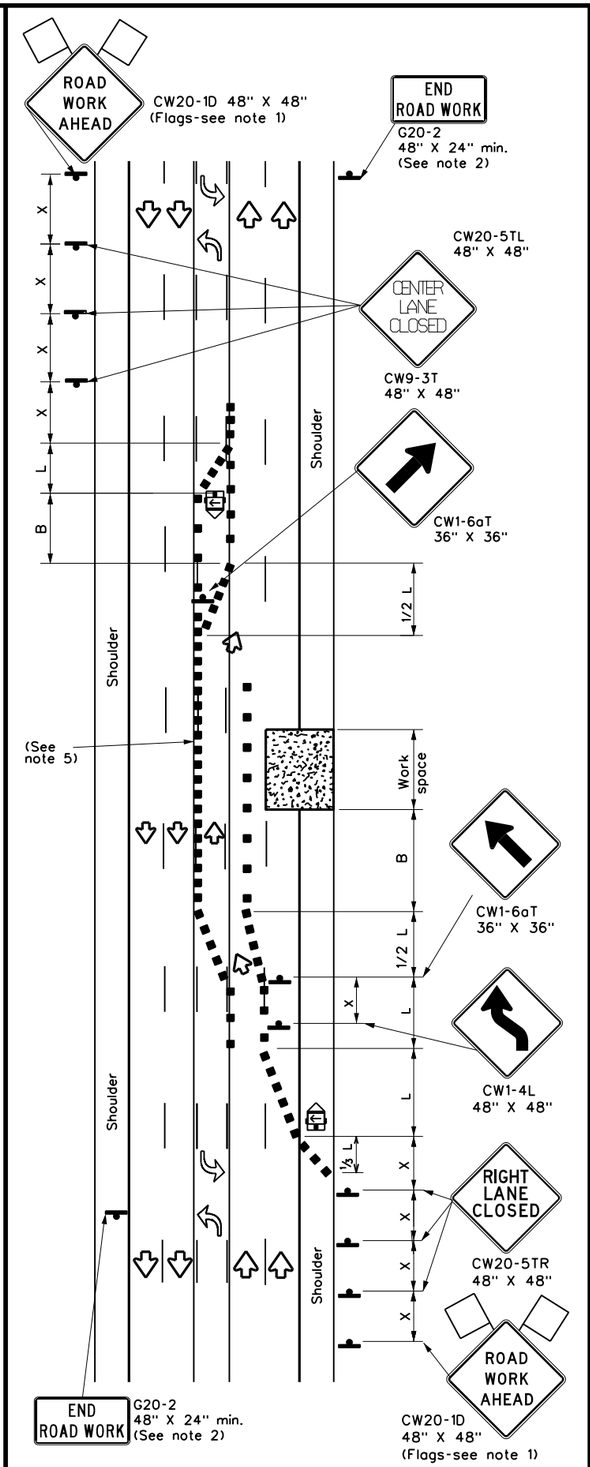
DATE: $DATE$
FILE: $FILE$
$TIME$



TCP(SC-3a)

ONE LANE CLOSED

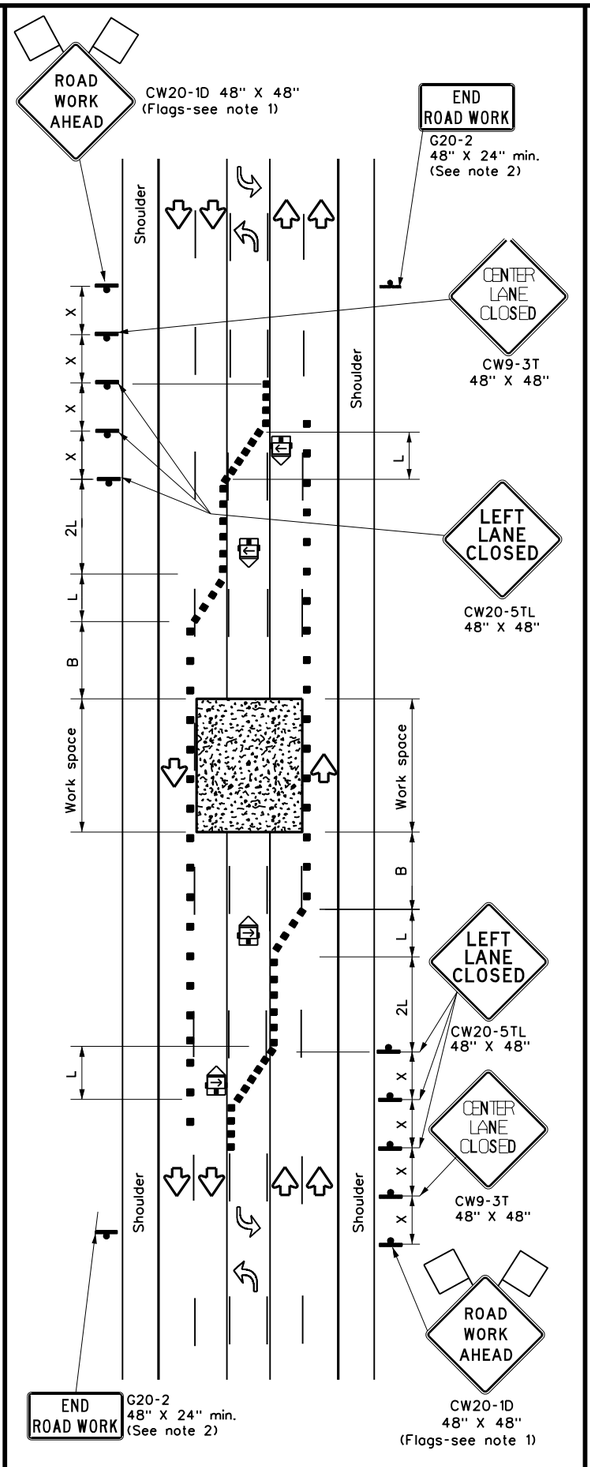
CONTROL W/ CHANNELIZING DEVICES



TCP(SC-3b)

TWO LANES CLOSED

CONTROL W/ CHANNELIZING DEVICES



TCP(SC-3c)

CENTER LANES CLOSED

CONTROL W/ CHANNELIZING DEVICES

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing Distance "X"	Suggested Longitudinal Buffer Space "B"
30	$L = \frac{WS^2}{60}$	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

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except: if project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.
3. If the seal coat operation crosses intersections, traffic in these areas must be controlled. Care must be taken to prevent vehicles from crossing the asphalt before the aggregate is placed. This may require positioning additional traffic control personal (flaggers) at the intersection.
4. Temporary rumble strips are not required on seal coat operations.

TCP (SC-3a) and (SC-3b)

5. Channelizing devices which separate two-way traffic shall be spaced on tapers at:
   a.) 20 feet;
   b.) 15 feet when posted speeds are 35 mph or slower; or
   c.) at 1/2(S) for tangent sections.
   This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

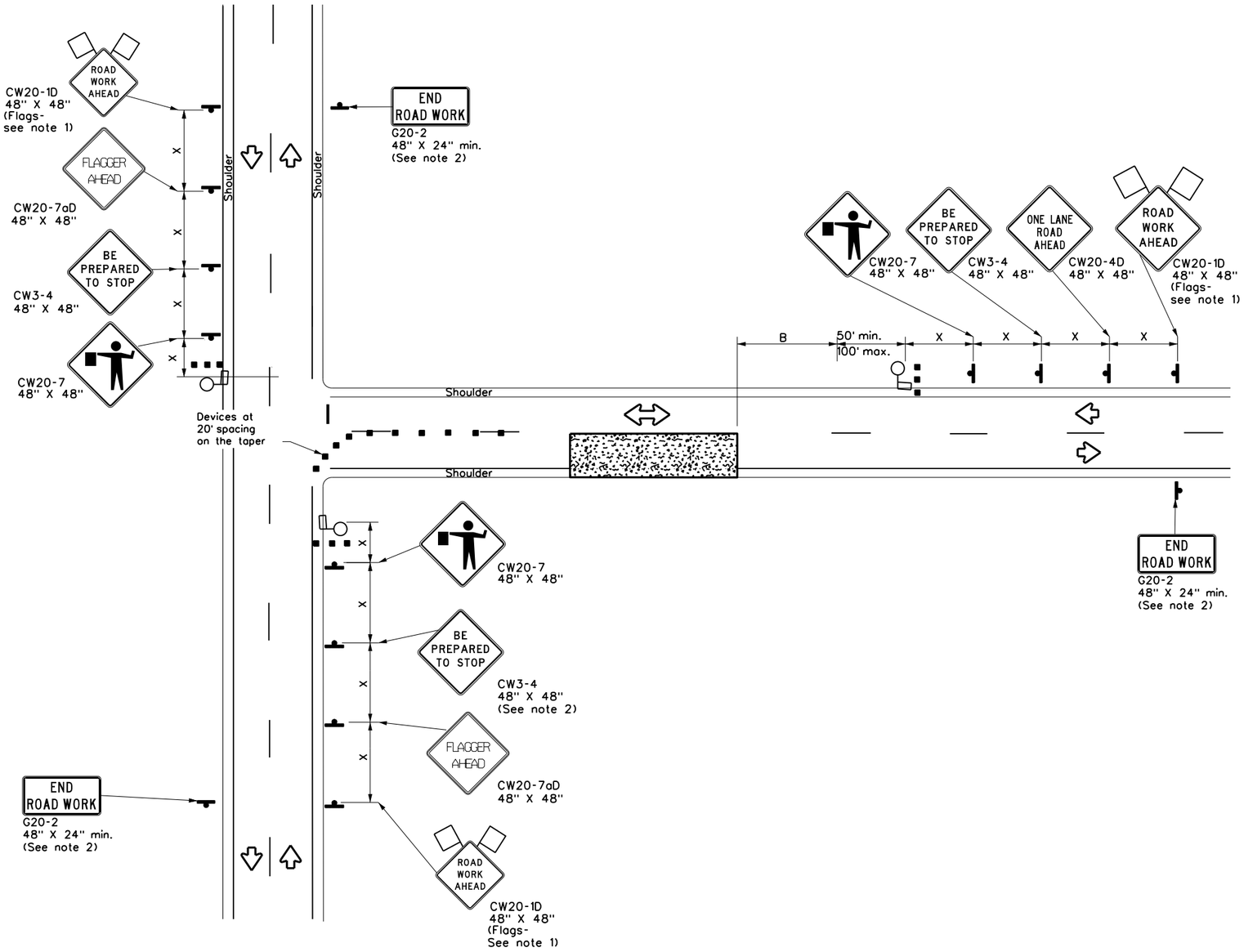
Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS MULTILANE ROADS (W/ CENTER LEFT TURN LANE)

TCP(SC-3)-22

FILE: tcpsc-3-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
4-21	DIST	COUNTY		SHEET NO.
10-22	DAL	DENTON, ETC.		56



ONE LANE TWO-WAY (T-INTERSECTION) CONTROL WITH PILOT VEHICLE

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths * * 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing Distance "X"	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L = \frac{WS^2}{60}$	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 (FT) W = Width of Offset (FT) S = Posted Speed (MPH)

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except: if project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.
3. Flaggers should use two-way radios or other methods of communication at all times for traffic control coordination.
4. Flaggers should use 24" STOP (CW20-8) / SLOW (CW20-8aT) paddles to control traffic. Flags should be limited to emergency situations.
5. 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).
6. Temporary rumble strips are not required on seal coat operations.
7. The pilot car is used to guide vehicles through traffic control zone. The pilot car shall have an identification name displayed and PILOT CAR, FOLLOW ME (G20-4) sign or message board mounted in a conspicuous position on rear.

Texas Department of Transportation | Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS NEAR INTERSECTION

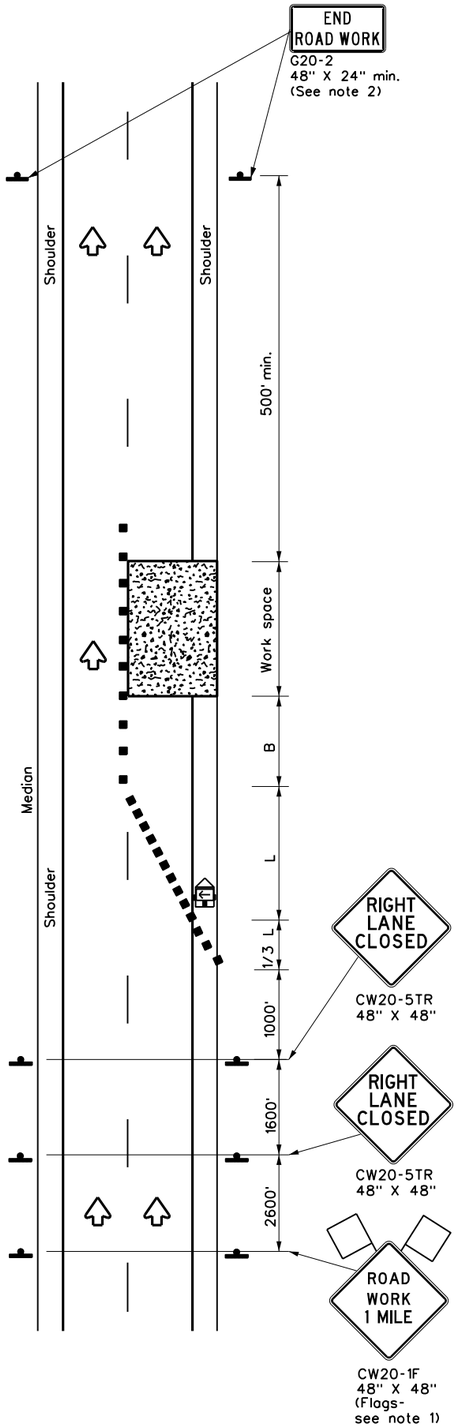
TCP(SC-4)-22

FILE: tcpsc-4-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-21 10-22	0081	05	053, ETC.	FM 428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		57

220

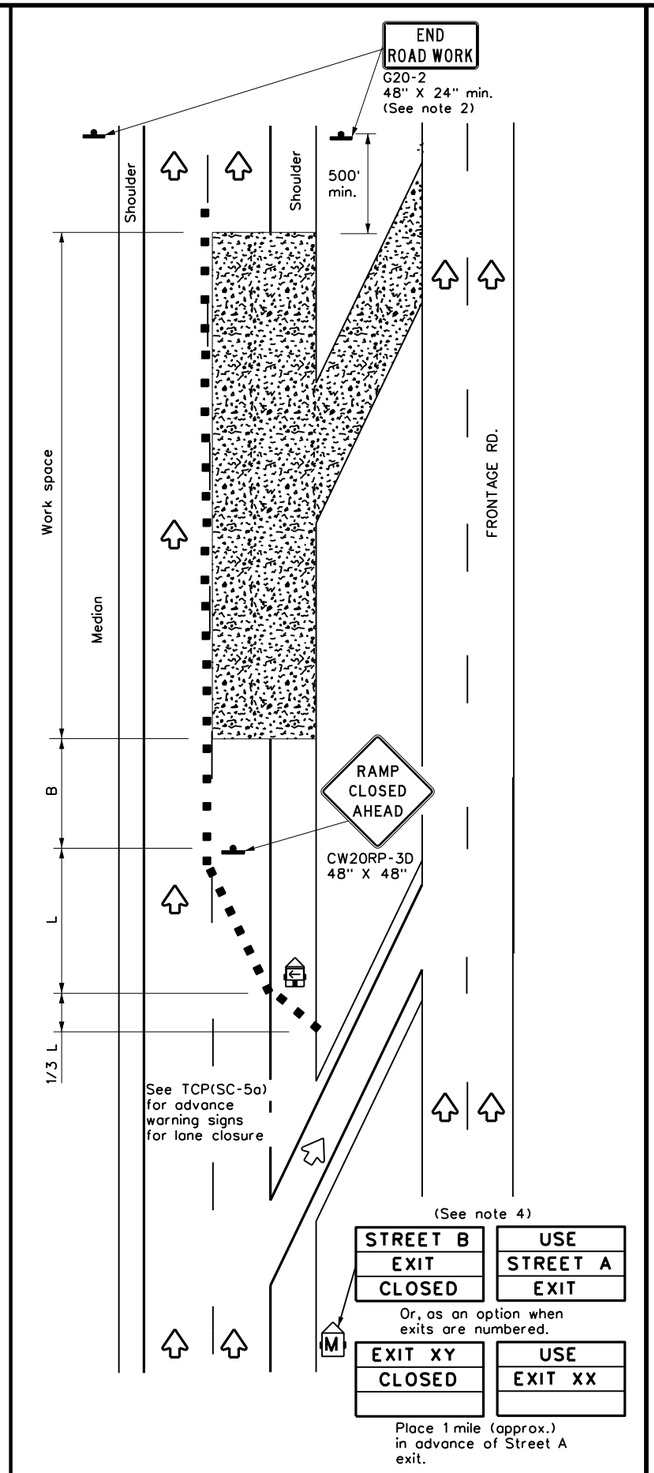
DATE: $DATE$ $TIME$
FILE: $FILE$

DATE: $DATE$ $TIME$
FILE: $FILE$



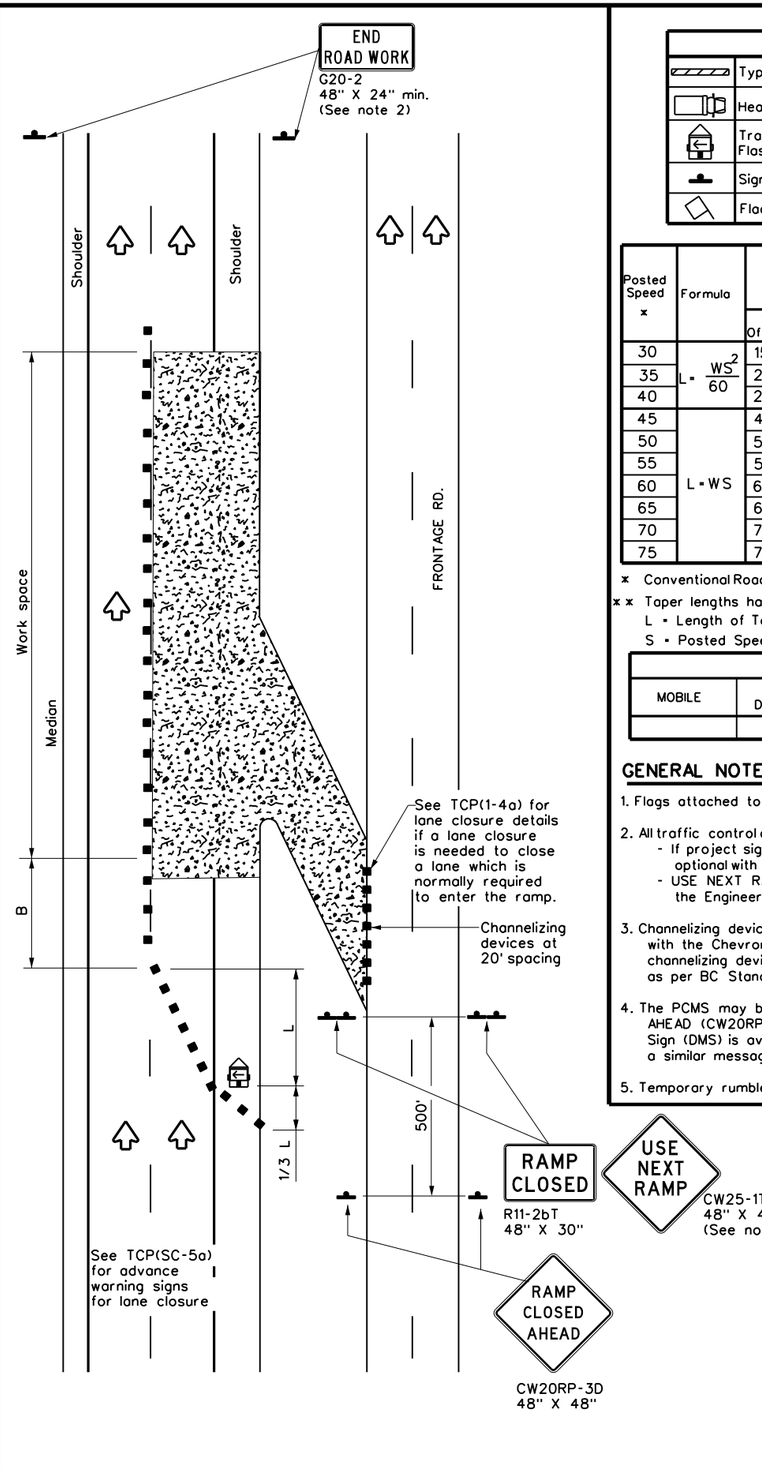
TCP (SC-5a)

ONE LANE CLOSURE



TCP (SC-5b)

LANE AND RAMP CLOSURE AT EXIT RAMPS



TCP (SC-5c)

LANE AND RAMP CLOSURE AT ENTRANCE RAMPS

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing Distance "X"	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	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

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except:
   - If project signing is present, END ROAD WORK (G20-2) sign is optional with approval by the Engineer.
   - USE NEXT RAMP (CW25-1T) sign is optional with approval by the Engineer.
3. 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.
4. The PCMS may be omitted if: it is replaced with a RAMP CLOSED AHEAD (CW20RP-3D) sign or when a permanent Dynamic Message Sign (DMS) is available in the appropriate location to display a similar message as called for on the PCMS.
5. Temporary rumble strips are not required on seal coat operations.

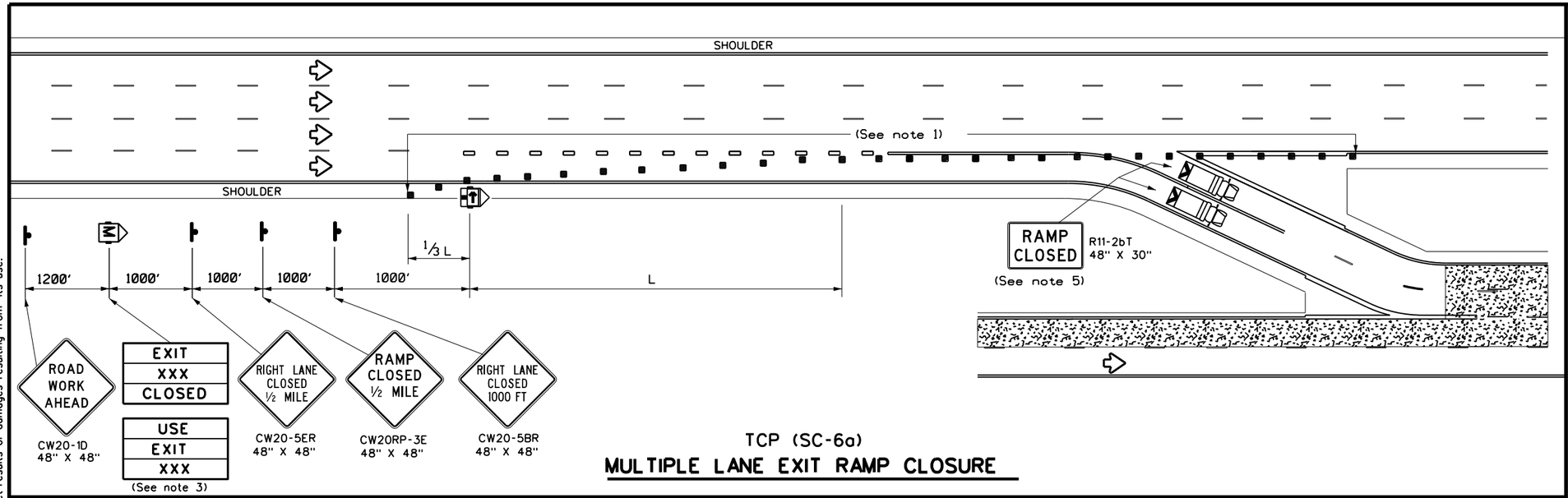
Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS DIVIDED HIGHWAYS

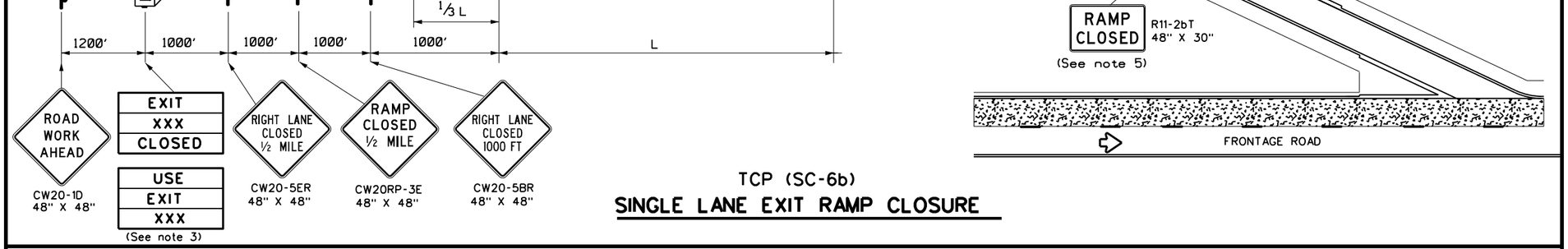
TCP(SC-5)-22

FILE: tcpsc-5-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-21 10-22	0081	05	053, ETC.	FM 428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		58



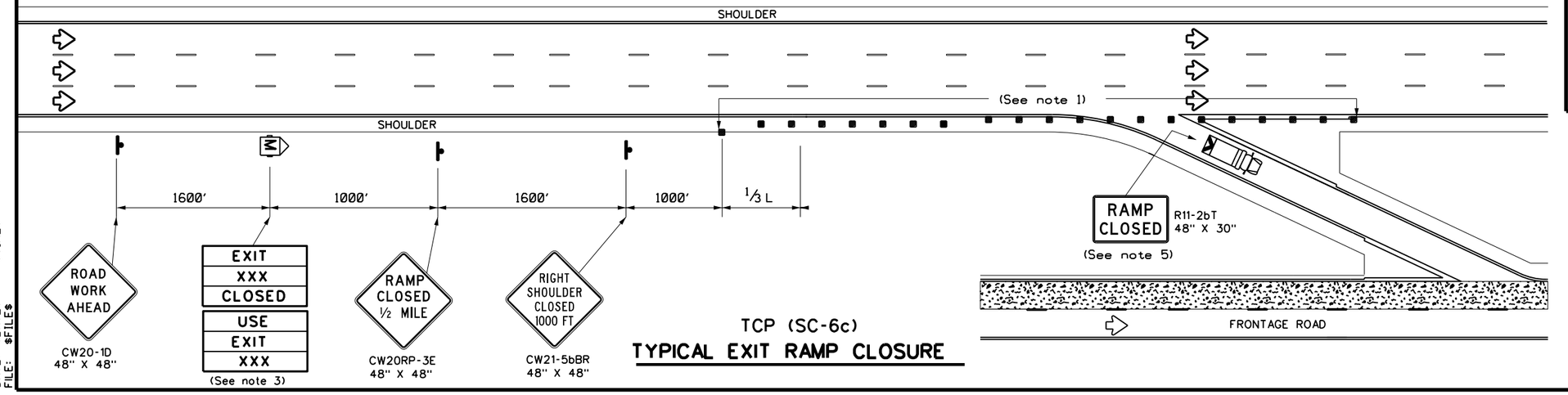
TCP (SC-6a)

MULTIPLE LANE EXIT RAMP CLOSURE



TCP (SC-6b)

SINGLE LANE EXIT RAMP CLOSURE



TCP (SC-6c)

TYPICAL EXIT RAMP CLOSURE

DATE: $DATE$ $TIME$
FILE: $FILE$

LEGEND

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'
85		850'	935'	1020'	85'	170'	695'

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

TYPICAL USAGE

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

GENERAL NOTES

1. Place channelizing devices at 20' spacings. Tighter spacing allowed as necessary to address field conditions or observed driver behavior.
2. See the Standard Highway Sign Design for Texas (SHSD) for sign details.
3. The PCMS may be omitted if replaced with a RAMP CLOSED AHEAD (CW20RP-3D) sign or when a permanent Dynamic Message Sign (DMS) is available in an appropriate location to display a similar message as called for on the PCMS.
4. When it is determined that a through lane should be closed in addition to the exit ramp, refer to TCP(6-4) for traffic control details.
5. A Truck Mounted Attenuator (TMA), where shown, is REQUIRED and shall have a RAMP CLOSED (R11-2bT) sign mounted on the rear of the truck.

Texas Department of Transportation

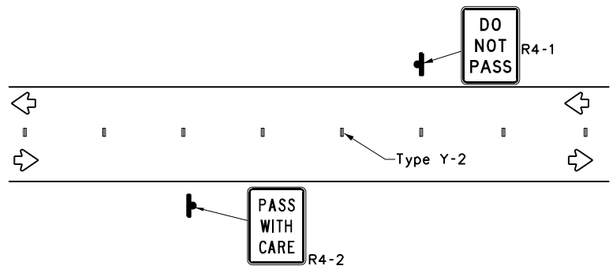
Traffic Safety Division Standard

TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS DIVIDED HIGHWAYS

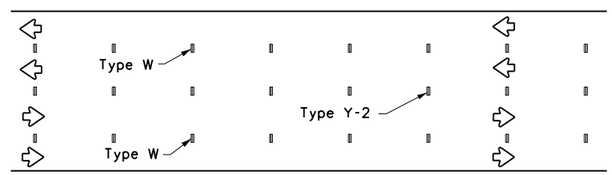
TCP(SC-6)-22

FILE: tcpsc-6-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 10-22	0081	05	053, ETC.	FM 428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		59

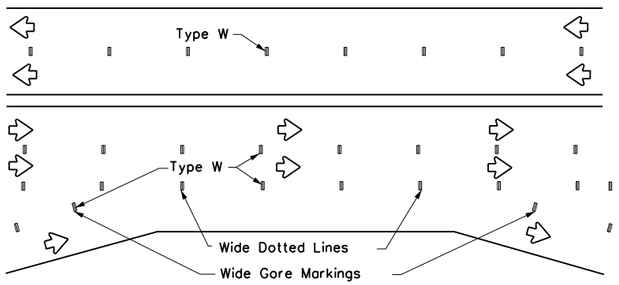
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS (TABS)



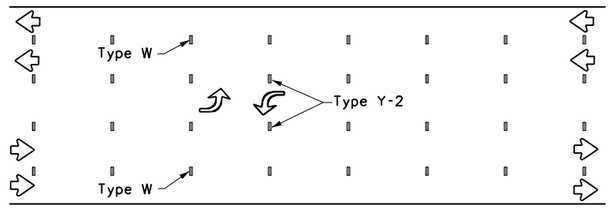
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS

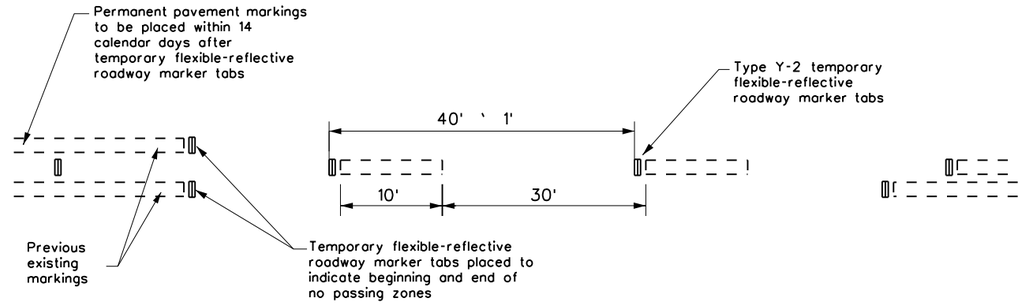


LANE LINES FOR DIVIDED HIGHWAY



TWO-WAY LEFT TURN LANE

TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS



TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS

1. Temporary markings for surfacing projects shall be Temporary Flexible-Reflective Roadway Marker Tabs with protective cover unless otherwise approved by the Engineer. Tabs are to be installed to provide true alignment for striping crews or as directed by the Engineer. Tabs will be placed at the spacing indicated. Tabs should be applied to the pavement no more than two days before the surfacing is applied. After the surfacing is rolled and swept, the protective cover over the reflective strip shall be removed.
2. Temporary Flexible-Reflective Roadway Marker Tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with a yellow body); Type Y (one amber reflective surface with yellow body); and Type W (one white or silver reflective surface with white body). Additional details may be found on BC(11).
3. Temporary Flexible-Reflective Roadway Marker Tabs will require normal maintenance replacement when used on roadways with an Average Daily Traffic (ADT) per lane of up to 7500 vehicles with no more than 10% truck mix. When roadway volumes exceed these values, additional maintenance replacement of these devices should be planned for.
4. When dry, tabs shall be visible for a minimum distance of 200 feet during normal daylight hours and when illuminated by automobile low- beam head light at night, unless sight distance is restricted by roadway geometrics.
5. No two consecutive tabs nor four tabs per 1000 feet of line shall be missing or fail to meet the visual performance requirements of Note 4.
6. Tabs shall meet requirements of Departmental Material Specification DMS-8242.
7. Tabs shall NOT be used to simulate edge lines.

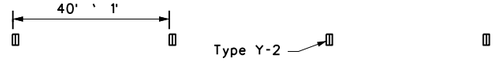
NOTES:

1. The Contractor will be responsible for maintaining short term pavement markings until permanent pavement markings are in place. When the Contractor is responsible for placement of permanent pavement markings, no segment of roadway shall remain without permanent pavement markings for a period greater than 14 calendar days unless weather conditions prohibit placement. Permanent pavement markings shall be placed as soon as weather permits.
2. For exit gores where a lane is being dropped, place wide gore markings or retroreflective channelizing devices to guide motorist through the exit. If channelizing devices are to be used it should be noted elsewhere in the plans. One piece cones are NOT acceptable.
3. Dimensions indicated on this sheet are typical and approximate. Variations in size and height may occur between markers or devices made by manufacturers, by as much as 1/4 inch, unless otherwise noted.

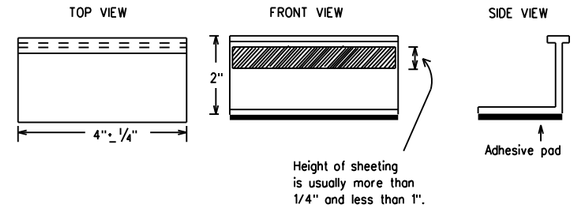
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS) & MATERIAL PRODUCER LISTS (MPL)

1. DMSs referenced above may be found along with embedded links to their respective MPLs at the following website: http://www.txdot.gov

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS (TABS)

SOLID LINES	DOUBLE NO-PASSING LINE	
	SINGLE NO-PASSING LINE or CHANNELIZATION LINE	
	8" WIDE SOLID LINE	
BROKEN LINES (FOR CENTER LINE OR LANE LINE)		
WIDE DOTTED LINES (FOR LANE DROP LINES)		
WIDE GORE MARKINGS		

TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS



Texas Department of Transportation

Traffic Safety Division Standard

TEMPORARY PAVEMENT MARKINGS FOR SEAL COAT OPERATIONS

TCP(SC-7)-22

FILE: tcpsc-7-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0081	05	053, ETC.	FM 428, ETC.
4-21	DIST	COUNTY		SHEET NO.
10-22	DAL	DENTON, ETC.		60

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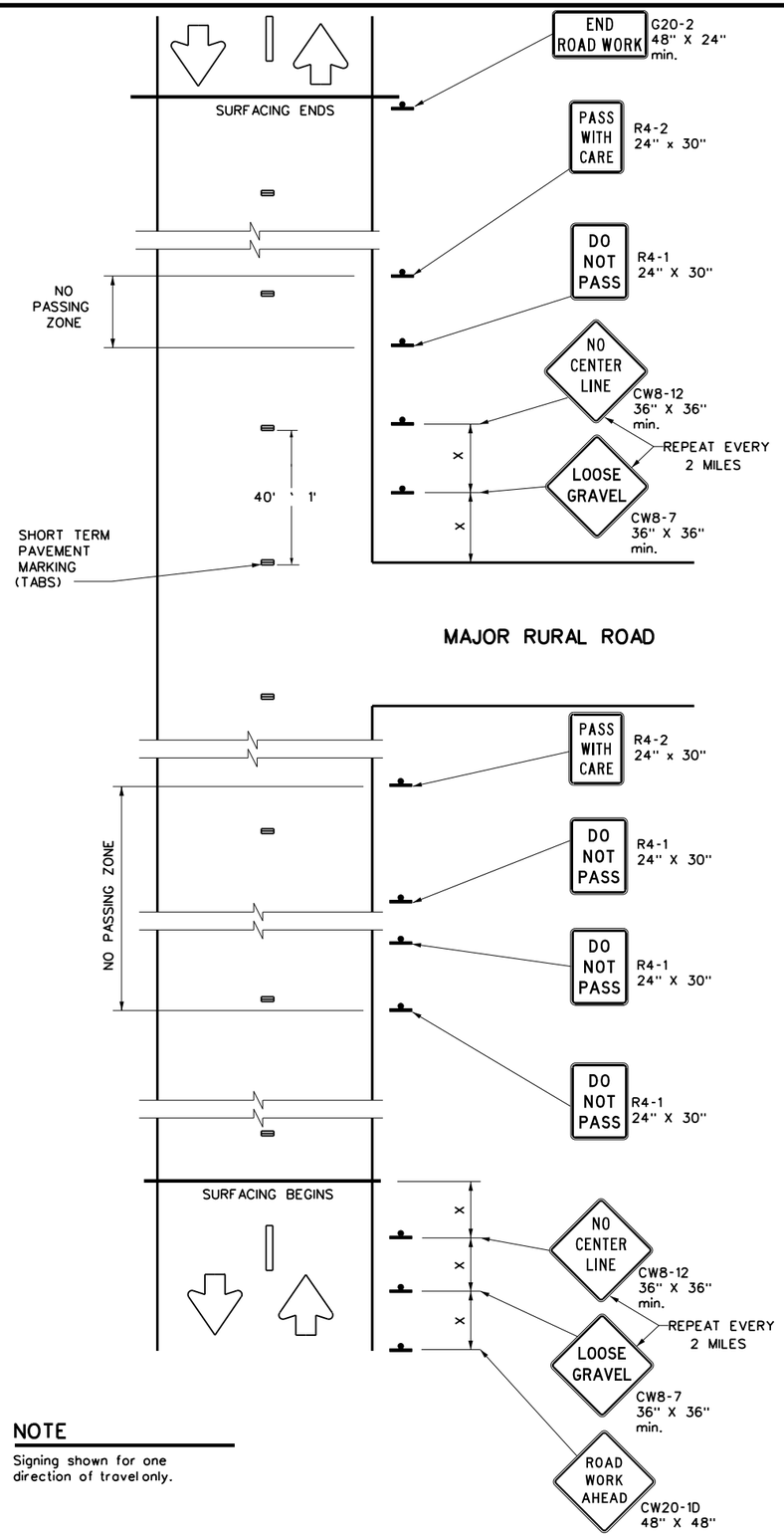


NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS

DO NOT PASS (R4-1) SIGN and NO-PASSING ZONES

A. Prior to the beginning of construction, all currently striped no-passing zones shall be signed with the DO NOT PASS (R4-1) signs and PASS WITH CARE (R4-2) signs placed at the beginning and end of each zone for each direction of travel, except as otherwise provided herein. Signs marking these individual no-passing zones need not be covered prior to construction if the signs supplement the existing pavement markings.

B. At the discretion of the Engineer, in areas of numerous no-passing zones, several zones may be combined as a single zone. If passing is to be prohibitd over one or more lengthy sections, a DO NOT PASS sign and a NEXT XX MILES (R20-1TP) plaque may be used at the beginning of such zones. The DO NOT PASS sign and the NEXT XX MILES plaque should be repeated every mile to the end of the no-passing zone. In areas where there is a considerable distance between no-passing zones, the end of the no-passing zone may be signed with a PASS WITH CARE sign and a NEXT XX MILES plaque.

C. Depending on traffic volumes and length of sections, it may be desirable to prohibit passing throughout the project to prevent damage to windshields and lights. The DO NOT PASS sign and NEXT XX MILES plaque should be used and repeated as often as necessary for this purpose. Where several existing zones are to be combined into one individual no-passing zone, the sign at the beginning of the zone should be covered until the surfacing operation has passed this location so as not to have the DO NOT PASS sign conflict with the existing pavement markings. Also, unless one day of operation completes the entire length of such combined zones, appropriate DO NOT PASS and PASS WITH CARE signs should be placed at the beginning and end of the no-passing zones where the surfacing operation has stopped for the day.

D. DO NOT PASS and PASS WITH CARE signs are to remain in place until permanent pavement markings are installed.

NO CENTER LINE (CW8-12) SIGN

A. Center line markings are yellow pavement markings that delineate the separation between lanes that have opposite directions of travel on a roadway. Divided highways do not typically have center line markings.

B. At the time construction activity obliterates the existing center line markings (low volume roads may not have an existing center line), a NO CENTER LINE (CW8-12) sign should be erected at the beginning of the work area, at approximately two mile intervals within the work area, beyond major intersections, and other locations deemed necessary by the Engineer.

C. The NO CENTER LINE signs are to remain in place until permanent pavement markings are installed.

LOOSE GRAVEL (CW8-7) SIGN

A. When construction begins, a LOOSE GRAVEL (CW8-7) sign should be erected at each end of the work area and repeated at intervals of approximately two miles in rural areas and closer in urban areas.

B. The LOOSE GRAVEL signs are to remain in place until the condition no longer exists.

COORDINATION OF SIGN LOCATIONS

A. The location of warning signs at the beginning and end of a work area are to be coordinated with other signing typically shown on the Barricade and Construction Standards for project limits to ensure adequate sign spacing.

B. Where possible, the ROAD WORK AHEAD (CW20-1D), LOOSE GRAVEL (CW8-7), and NO CENTER LINE (CW8-12) signs should be placed:
   a.) In the sequence shown following the OBEY WARNING SIGNS STATE LAW (R20-3T) sign and the TRAFFIC FINES DOUBLE (R20-5T) sign; and
   b.) One "X" sign spacing prior to the CONTRACTOR (G20-6T) sign typically located at or near the limits of surfacing.

   LOOSE GRAVEL and NO CENTER LINE sign placements will then be repeated as described above.

Posted Speed *	Minimum Sign Spacing Distance "X"
30	120'
35	160'
40	240'
45	320'
50	400'
55	500'
60	600'
65	700'
70	800'
75	900'

* Conventional Roads Only

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

GENERAL NOTES

1. Surfacing operations that cover or obliterate existing pavement markings must first have the passing zones clearly marked with tabs as well as having any of the traffic control devices detailed on this sheet furnished and erected as directed by the Engineer.

2. The devices shown on this sheet are to be used to supplement those required by the BC Standards or others required elsewhere in the plans.

3. Signs shall be erected as detailed on the BC Standards or the Compliant Work Zone Traffic Control Devices List (CWZTCD) on supports approved for Short Duration / Short Term Stationary Work Zone Sign Supports.

4. When surfacing operations take place on divided highways, freeways or expressways, the size of diamond shaped construction warning signs shall be 48" x 48".

5. Signs on divided highways, freeways and expressways should be placed on both right and left sides of the roadway based on roadway conditions as directed by the Engineer.

Texas Department of Transportation

Traffic Safety Division Standard

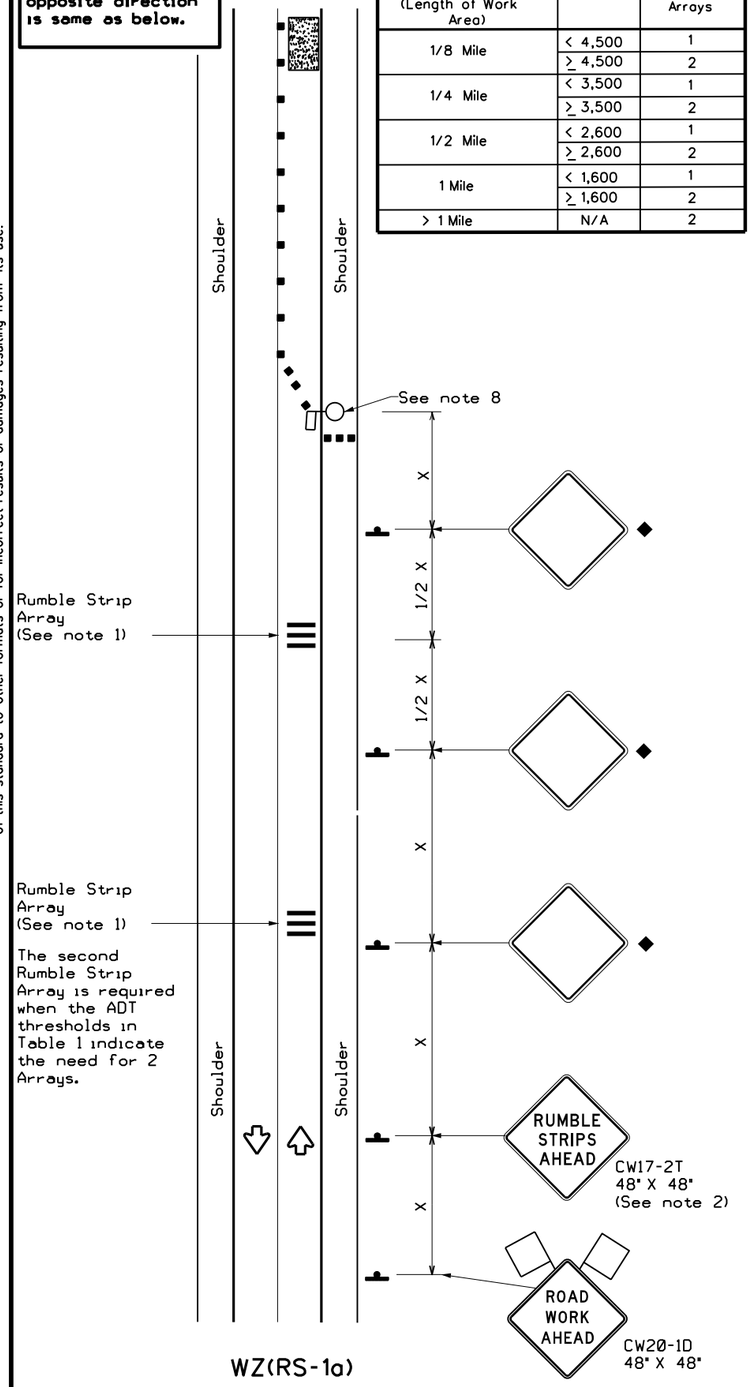
TRAFFIC CONTROL DETAILS FOR SEAL COAT OPERATIONS

TCP(SC-8)-22

FILE: tcpsc-8-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
4-21	DIST	COUNTY		SHEET NO.
10-22	DAL	DENTON, ETC.		61

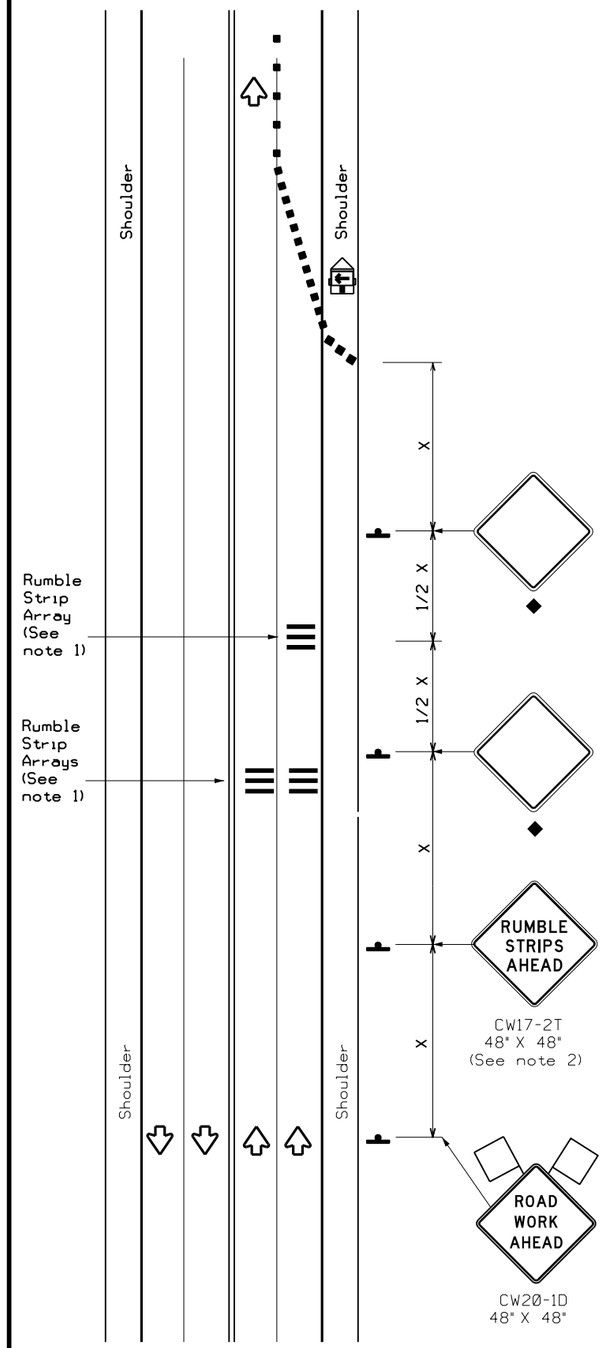
Warning sign and rumble strip sequence in opposite direction is same as below.

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



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

1. Each Rumble Strip Array should consist of three rumble strips spaced center to center at the spacing shown in Table 2, placed transverse across the lane at locations shown.
2. The 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.
3. Temporary Rumble Strips will be considered subsidiary to Item 502, and shall be a product listed on the Compliant Work Zone Traffic Control Devices.
4. Remove Temporary Rumble Strips before removing the advanced warning signs.
5. Temporary Rumble Strips should not be used on horizontal curves, loose gravel,soft or bleeding asphalt, heavily rutted pavements or unpaved surfaces.
6. Temporary Rumble Strips shall be installed and maintained as per manufacturer's recommendations.
7. This standard sheet shall be used in conjunction with other appropriate TCP standard, TMUTCD typical application or project specific detail for the project.
8. The one-lane two-way application may utilize a flagger, an Automated Flagger Assistance Device (AFAD) or a Portable Traffic Signal (PTS).
9. Replace defective Temporary Rumble Strips as directed by the Engineer.
10. Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment and written direction from the Engineer.

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	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
	✓	✓		

◆ Signs are for illustrative purposes only. Signs required may vary depending on the TCP,TMUTCD Typical Application, or project specific details for the project.

* For posted speeds in excess of 65 MPH, it is recommended that spacing is increased as speed limits increase. Increasing space between rumble strips will improve effectiveness.

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

Texas Department of Transportation

Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	0081	05	053, ETC.	428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		62

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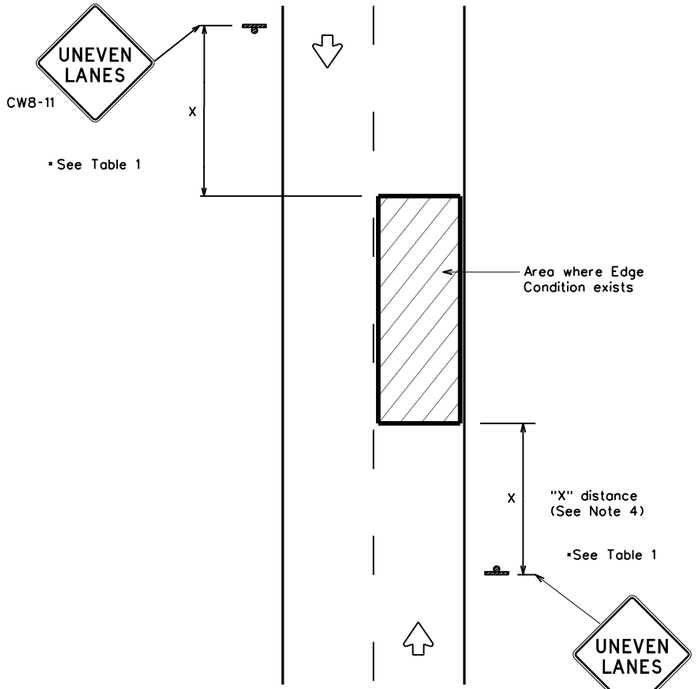
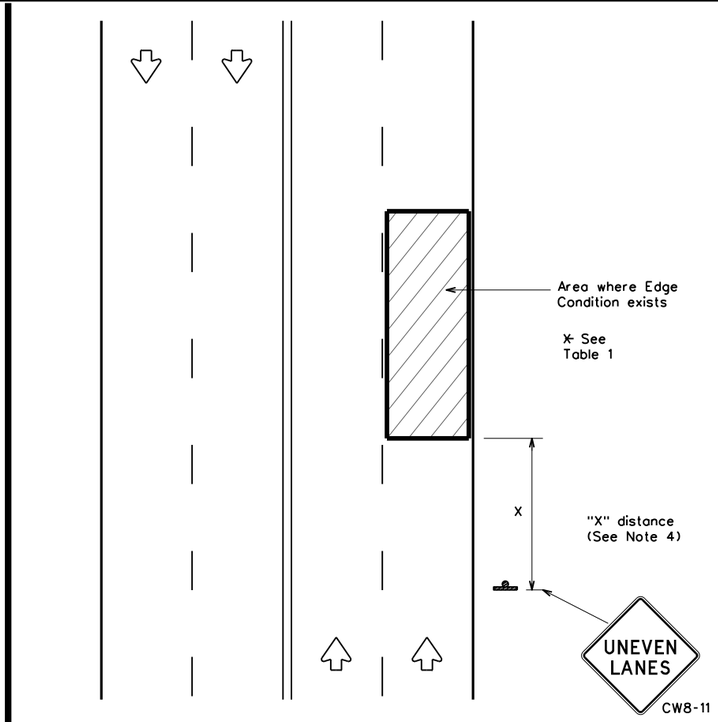
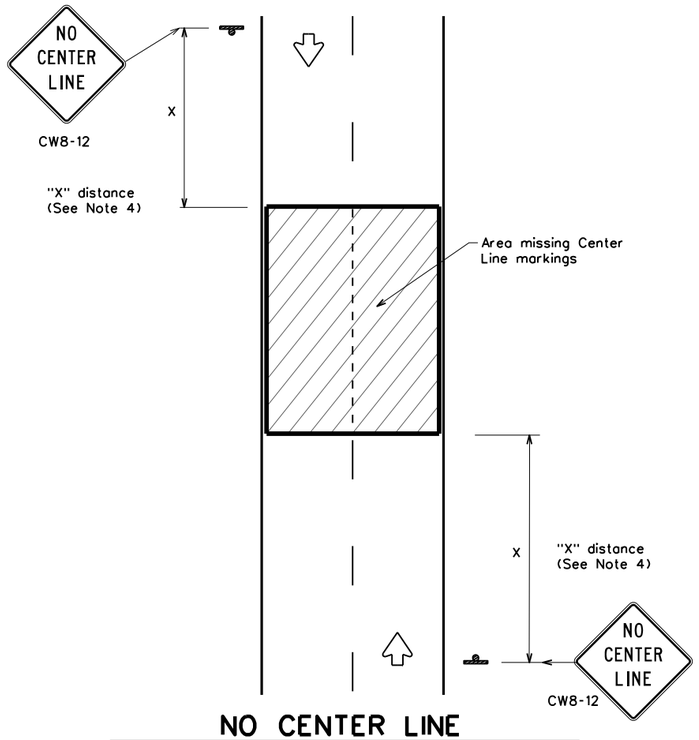


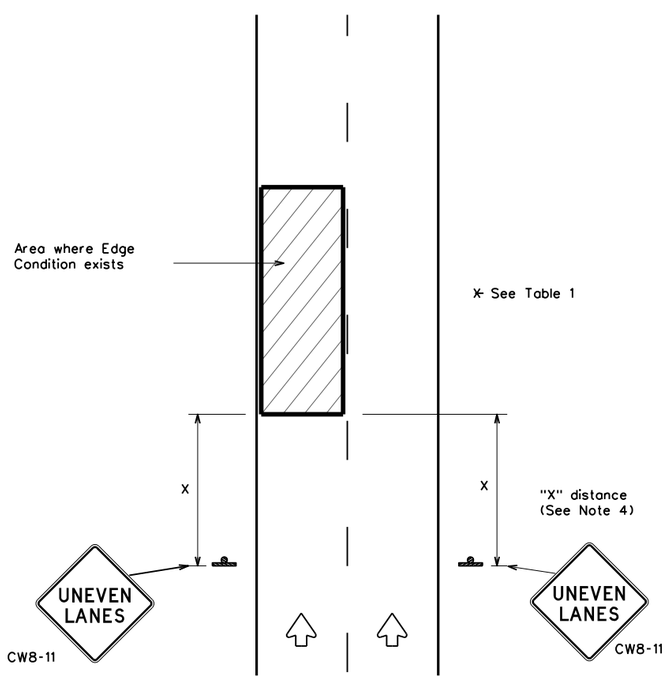
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

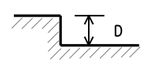
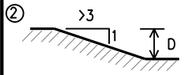
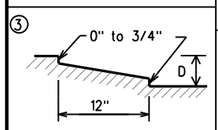
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL} SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

GENERAL NOTES

1. If spalling or holes occur, ROUGH ROAD (CW8-8) signs should be placed in advance of the condition and be repeated every two miles where the condition persists.
2. UNEVEN LANES (CW8-11) signs shall be installed in advance of the condition and repeated every mile. Signs installed along the uneven lane condition may be supplemented with the NEXT XX MILES (CW7-3aP) plaque or Advisory Speed (CW13-1P) plaque.
3. NO CENTER LINE (CW8-12) signs and temporary pavement markings as per the WZ(STPM) standard shall be installed if yellow centerlines separating two way traffic are obscured or obliterated. Repeat NO CENTER LINE signs every two miles where the center line markings are not in place. The signs and markings shall remain in place until permanent pavement markings are installed.
4. Signs shall be spaced at the distances recommended as per BC standards.
5. Additional signs may be required as directed by the Engineer. Signs shall remain in place until final surface is applied. Signs shall be considered subsidiary to Item 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING."
6. Signs shall be fabricated and mounted on supports as shown on the BC standards and/or listed on the "Compliant Work Zone Traffic Control Devices" list.
7. Short term markings shall not be used to simulate edge lines.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition.

TABLE 1

Edge Condition	Edge Height (D)	* Warning Devices
① 	Less than or equal to: 1¼" (maximum-planing) 1½" (typical-overlay)	Sign: CW8-11
	Distance "D" may be a maximum of 1 1/4 " for planing operations and 2" for overlay operations if uneven lanes with edge condition 1 are open to traffic after work operations cease.	
② 	Less than or equal to 3"	Sign: CW8-11
③  Notched Wedge Joint	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

TRAFFIC CONTROL DURING PLANING, OVERLAY AND LEVELING OPERATIONS ARE SHOWN ELSEWHERE IN THE PLANS.

MINIMUM WARNING SIGN SIZE	
Conventional roads	36" x 36"
Freeways/expressways, divided roadways	48" x 48"

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	DAL	DENTON, ETC.		63

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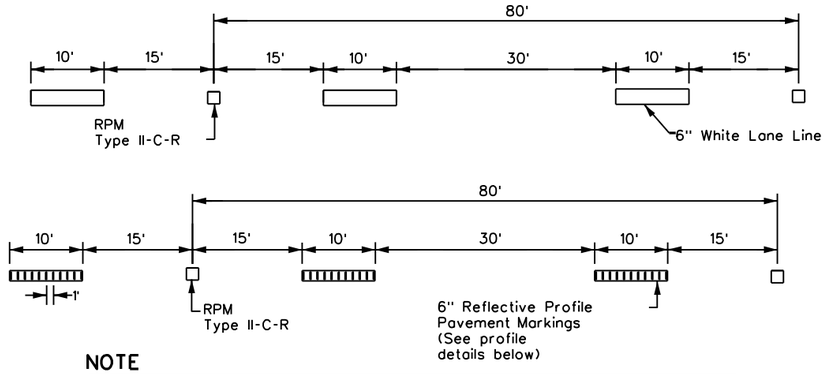
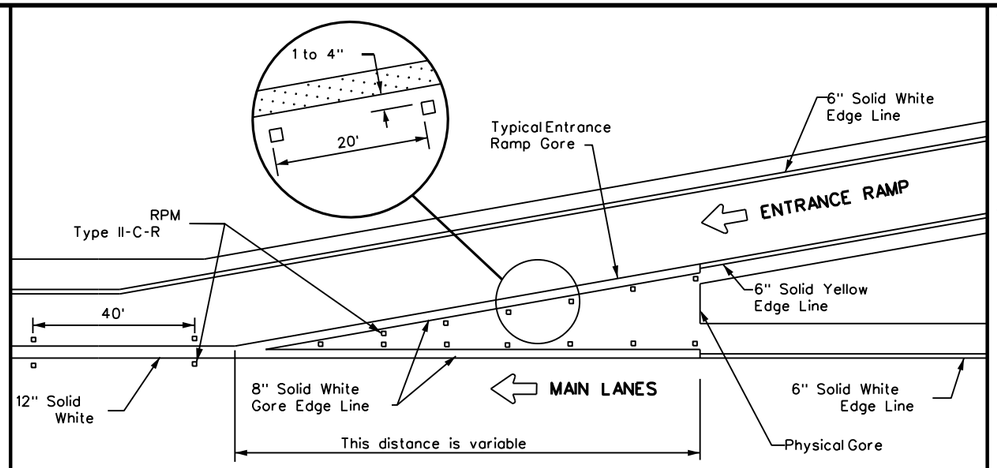


NOTE

Reflectorized raised pavement markers Type II-C-R shall be spaced on 80'centers with the clear face toward normal traffic and the red face toward wrong way traffic. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.

TRAFFIC LANE LINES PAVEMENT MARKING



TYPICAL ENTRANCE RAMP GORE MARKING

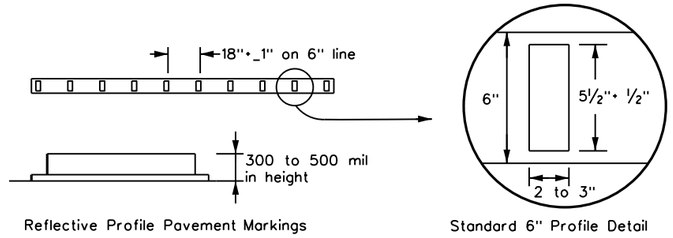
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R

GENERAL NOTE

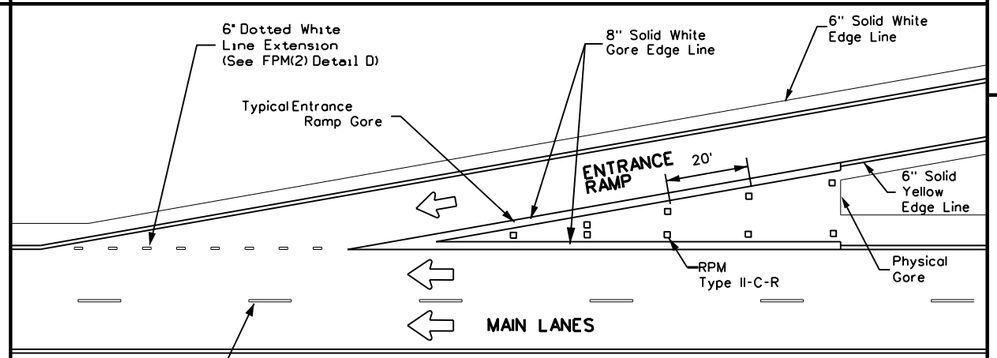
On concrete pavements the raised pavement markers shall be placed to one side of the longitudinal joints.



NOTE

Edge lines should typically be 6" wide and the materials shall be as specified in the plans. See details above if reflective profile pavement markings are to be used.

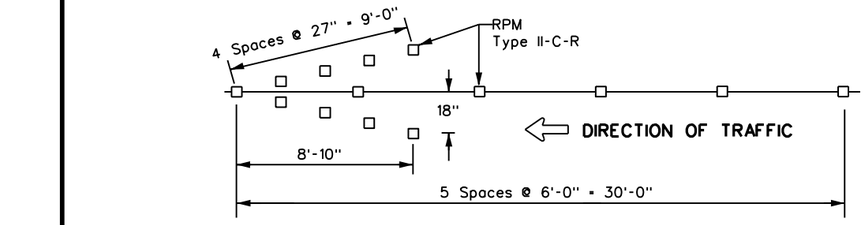
EDGE LINE PAVEMENT MARKINGS



NOTE

See the Roadway Design Manual Chapter 3 to determine if a tapered acceleration lane may be used.

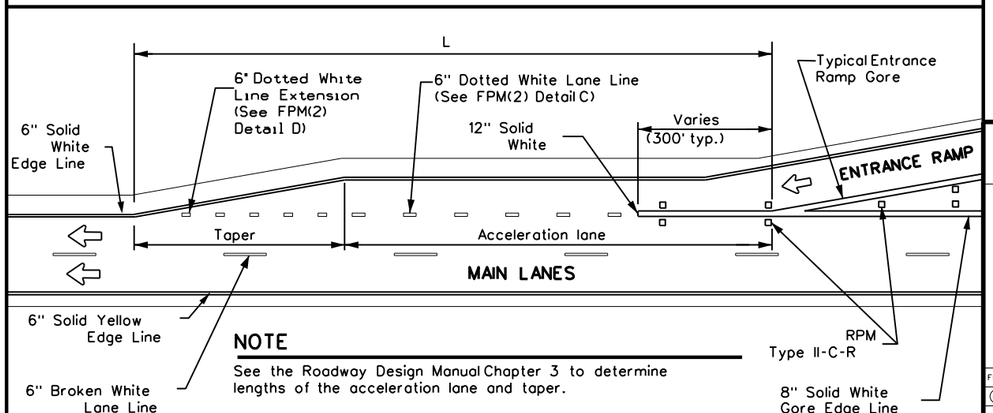
TAPERED ACCELERATION LANE



NOTES

1. Reflectorized raised pavement markers Type-II-C-R in the wrong way arrow shall have the clear face toward normal traffic and the red face toward the wrong way traffic.
2. Red reflectorized wrong way arrows, not to exceed two, may be placed on exit ramps. Locations of the arrows shall be as shown in the plans or as directed by the engineer.

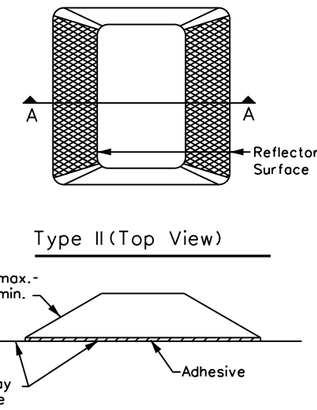
WRONG WAY ARROW



NOTE

See the Roadway Design Manual Chapter 3 to determine lengths of the acceleration lane and taper.

PARALLEL ACCELERATION LANE



SECTION A

REFLECTORIZED RAISED PAVEMENT MARKER (RPM)

Texas Department of Transportation — Traffic Safety Division Standard

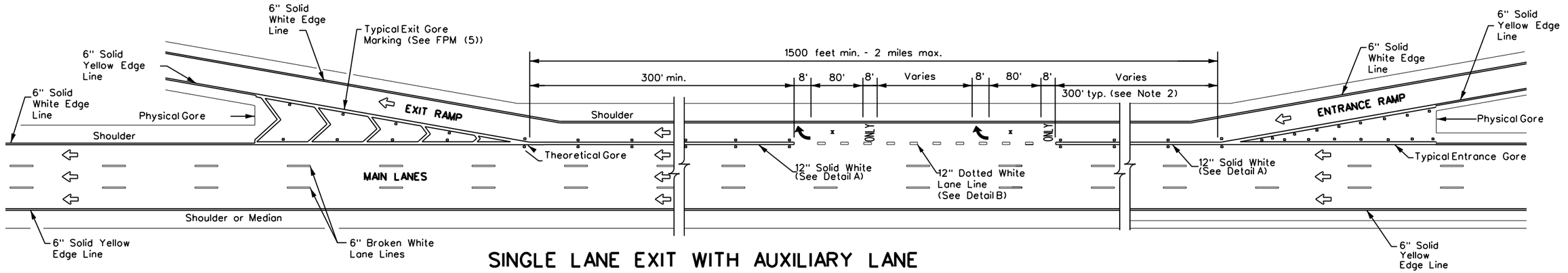
TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS WITH RAISED PAVEMENT MARKERS

FPM(1)-22

FILE: fpm(1)-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 5-74 8-00 2-12	0081	05	053, ETC.	FM 428, ETC.
4-92 2-08 10-22	DIST	COUNTY		SHEET NO.
5-00 2-10	DAL	DENTON, ETC.		64

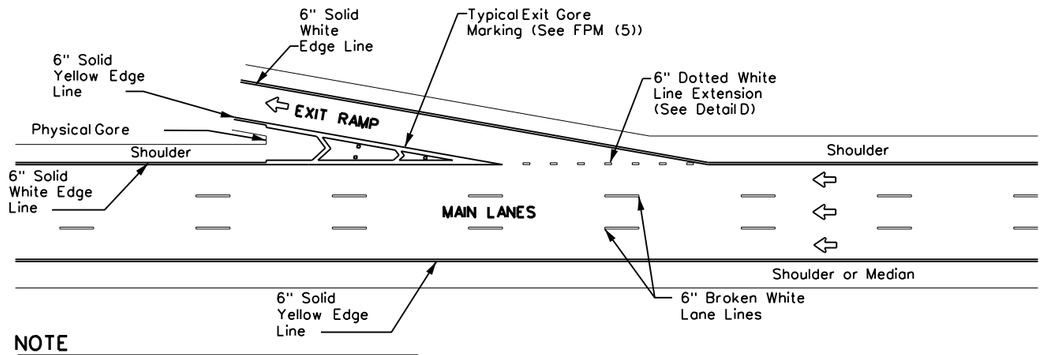
23A

DATE: $DATE$ $TIME$
FILE: $FILE$



SINGLE LANE EXIT WITH AUXILIARY LANE

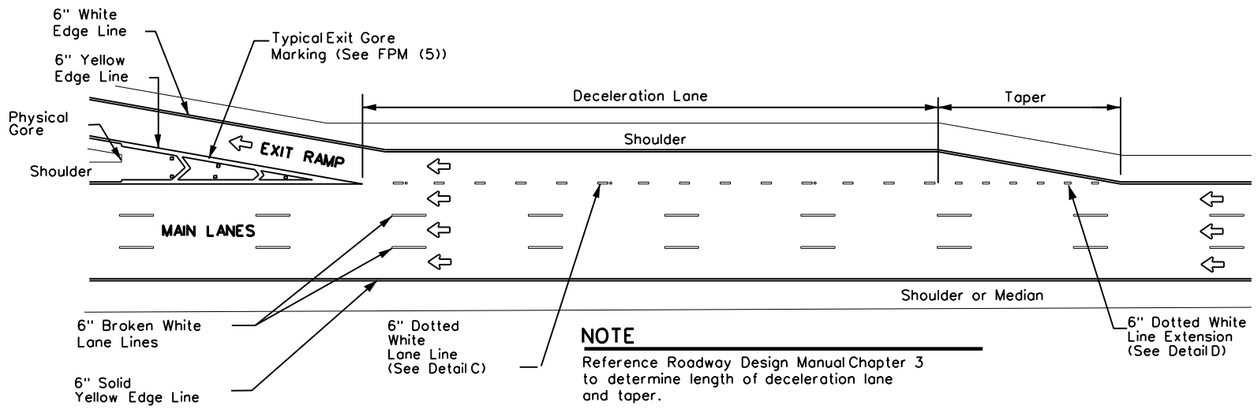
(See Note 2)



NOTE

Reference Roadway Design Manual Chapter 3 to determine if tapered deceleration lane may be used.

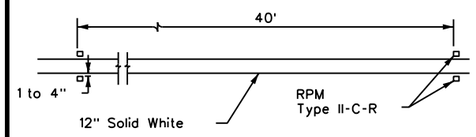
TAPERED DECELERATION LANE



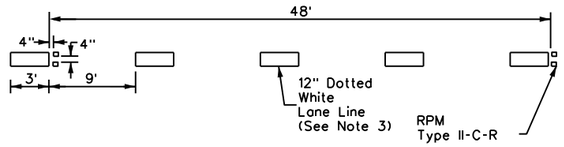
NOTE

Reference Roadway Design Manual Chapter 3 to determine length of deceleration lane and taper.

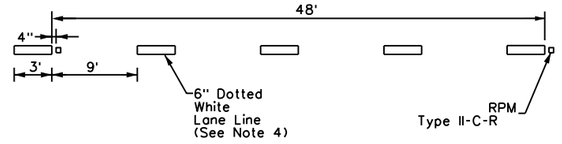
PARALLEL DECELERATION LANE



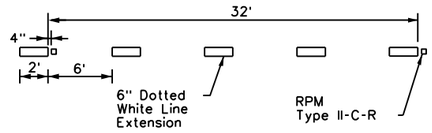
DETAIL A



DETAIL B



DETAIL C



DETAIL D

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") dotted lane line (see Detail B) is used to separate a through lane that continues beyond the interchange from an adjacent mandatory exit lane.
4. Normal (6") dotted lane line (see Detail C) is used at parallel acceleration and deceleration lanes.
5. See FPM(1) for traffic lane line pavement marking details.

LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R
✱	Arrow markings are optional, however "ONLY" is required if arrow is used

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

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

Texas Department of Transportation

Traffic Safety Division Standard

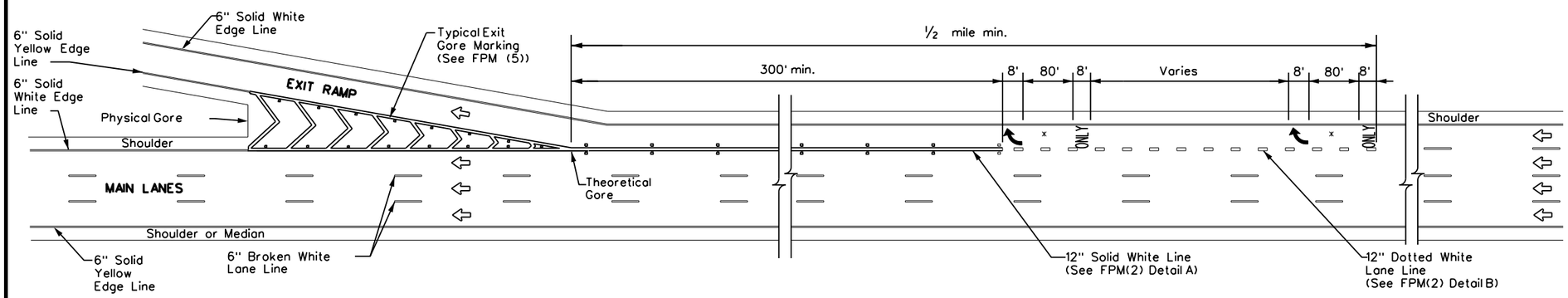
TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS ENTRANCE AND EXIT RAMPS

FPM(2)-22

FILE: fpm(2)-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
2-77 5-00 2-12	DIST	COUNTY		SHEET NO.
4-92 8-00 10-22	DAL	DENTON, ETC.		65
8-95 2-10				

23B

DATE: $DATE$ $TIME$
FILE: $FILE$

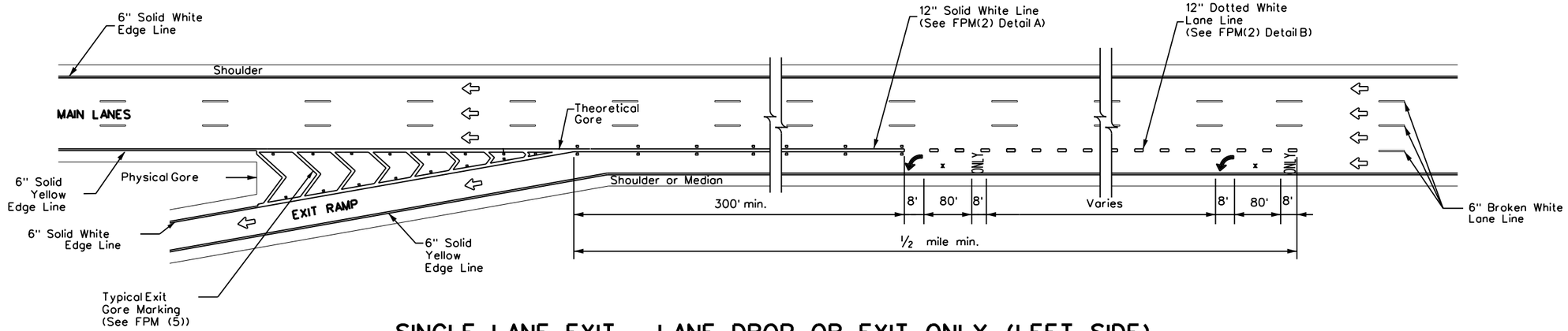


SINGLE LANE EXIT - LANE DROP OR EXIT ONLY

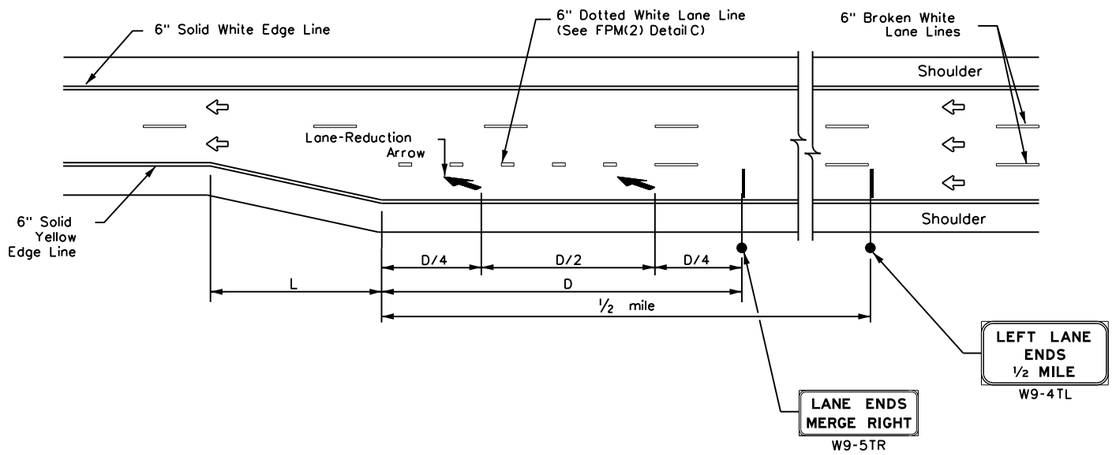
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R
x	Arrow markings are optional, however "ONLY" is required if arrow is used



SINGLE LANE EXIT - LANE DROP OR EXIT ONLY (LEFT SIDE)



FREEWAY LANE REDUCTION

NOTES

1. Large Guide signs shall conform to the TxDOT Freeway Signing Handbook.
2. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
3. Arrows and sign details can be found in the Standard Highway Sign Designs for Texas (SHSD) at http://www.txdot.gov.
4. These guidelines may also be applied to the design of a right side lane reduction. Use LANE ENDS MERGE LEFT (W9-5TL) and RIGHT LANE ENDS 1/2 MILE (W9-4TR) signs in lieu of what is shown on drawing.

ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	
80 MPH	1,500	
85 MPH	1,625	

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") dotted lane line (see FPM(2) Detail B) is used to separate a through lane that continues beyond the interchange from an adjacent mandatory exit lane.
4. Edge lines are not required in curb and gutter sections of frontage roads.
5. See FPM(1) for traffic lane line pavement marking details.

Texas Department of Transportation

Traffic Safety Division Standard

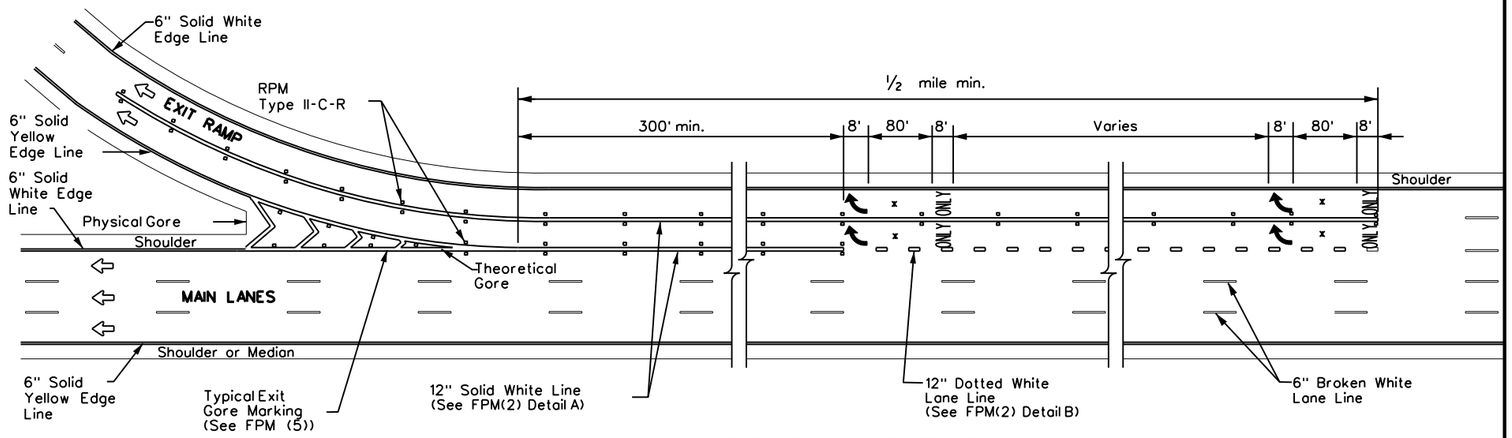
TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS SINGLE LANE DROP(EXIT ONLY) AND LANE REDUCTION DETAILS

FPM(3)-22

FILE: fpm(3)-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
4-92 2-10	DIST	COUNTY		SHEET NO.
5-00 2-12	DAL	DENTON, ETC.		66
8-00 10-22				

23C

DATE: $DATE$ $TIME$
FILE: $FILE$



MULTIPLE LANE EXIT ONLY

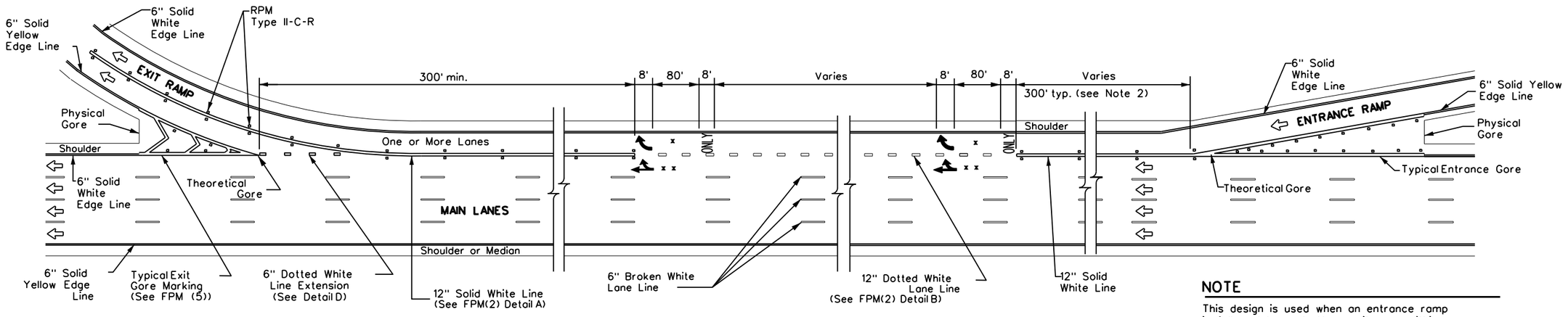
LEGEND	
⇦	Traffic Flow
▫	Reflectorized Raised Markers (RPM) Type II-C-R
↱	Pavement marking arrow (white)
x	Arrow markings are optional, however "ONLY" is required if arrow is used
x x	Arrow markings are optional

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

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

GENERAL NOTES

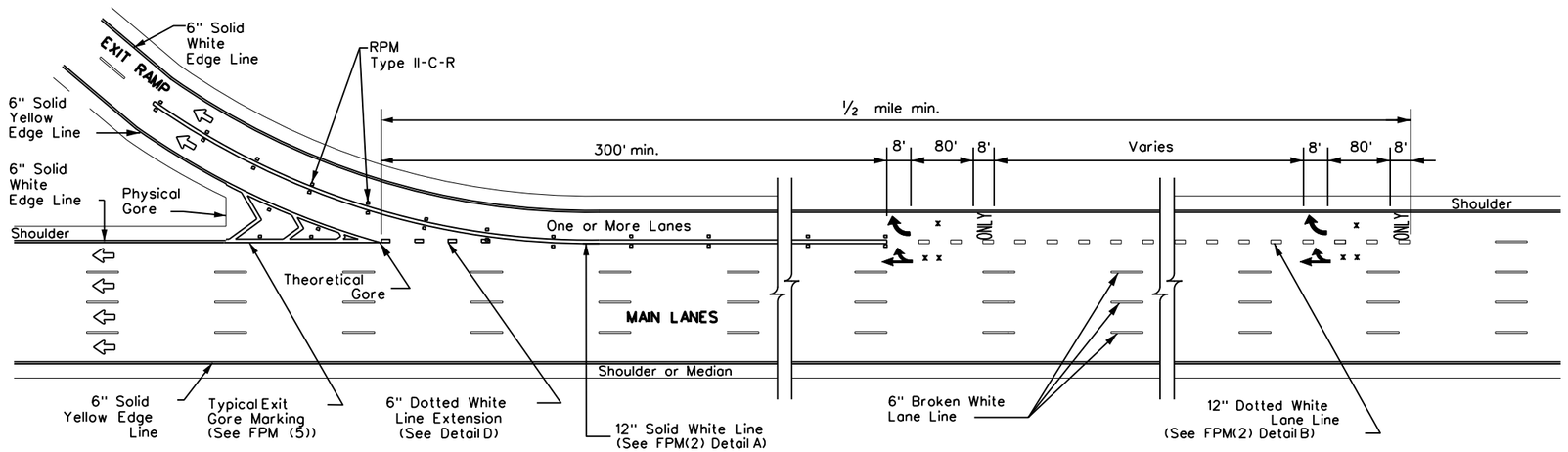
1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") dotted lane line (see FPM(2) Detail B) is used to separate a through lane that continues beyond the interchange from an adjacent mandatory exit lane.
4. Edge lines are not required in curb and gutter sections of frontage roads.
5. See FPM(1) for traffic lane line pavement marking details.



SINGLE LANE ENTRANCE WITH MULTIPLE LANE EXIT - EXIT ONLY WITH OPTION LANE

NOTE

This design is used when an entrance ramp is followed by a dual lane exit ramp within 2400' downstream (theoretical gore to theoretical gore).



MULTIPLE LANE EXIT - EXIT ONLY WITH OPTION LANE

DATE: $DATE$ $TIME$
FILE: $FILE$

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS MULTIPLE LANE DROP (EXIT) DETAILS

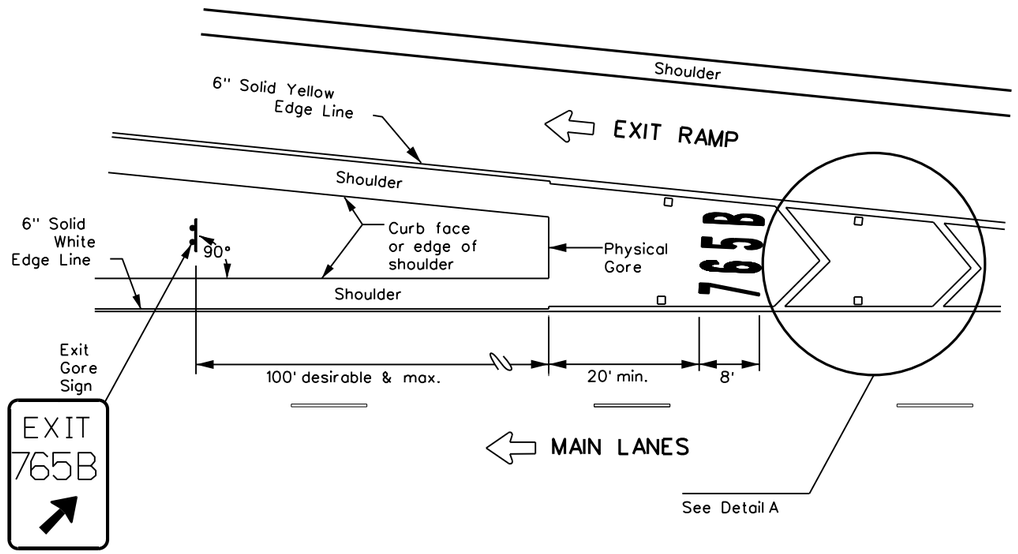
FPM(4)-22

FILE: fpm(4)-22.dgn	DN:	CK:	DW:	CK:
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
2-77 2-10	DIST	COUNTY		SHEET NO.
5-00 2-12	DAL	DENTON, ETC.		67
8-00 10-22				

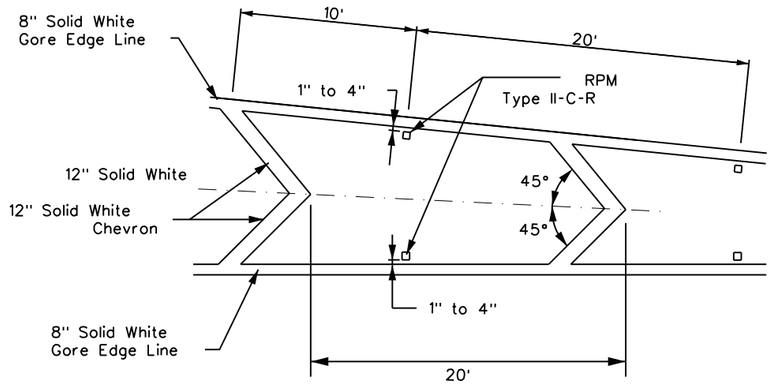
230

EXIT NUMBER PAVEMENT MARKING NOTES

1. Minimum 8 foot white exit number pavement markings should be used, unless otherwise noted.
2. Spacing between letters and numbers should be approximately 4 inches.
3. Pavement markings are to be located as specified elsewhere in the plans.
4. Numbers and Letters details can be found in the Standard Highway Design for Texas (SHSD) Section 12 at http://www.txdot.gov



MARKINGS WITH EXIT NUMBER



NOTES

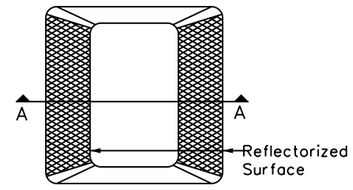
1. Raised pavement markers shall be centered between each chevron or neutral area line.
2. For more information, see Reflectorized Raised Pavement Marker Detail.

DETAIL A

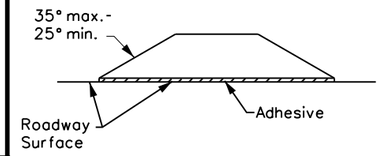
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

LEGEND	
⇦	Traffic flow
▫	Reflectorized Raised Markers (RPM) Type II-C-R

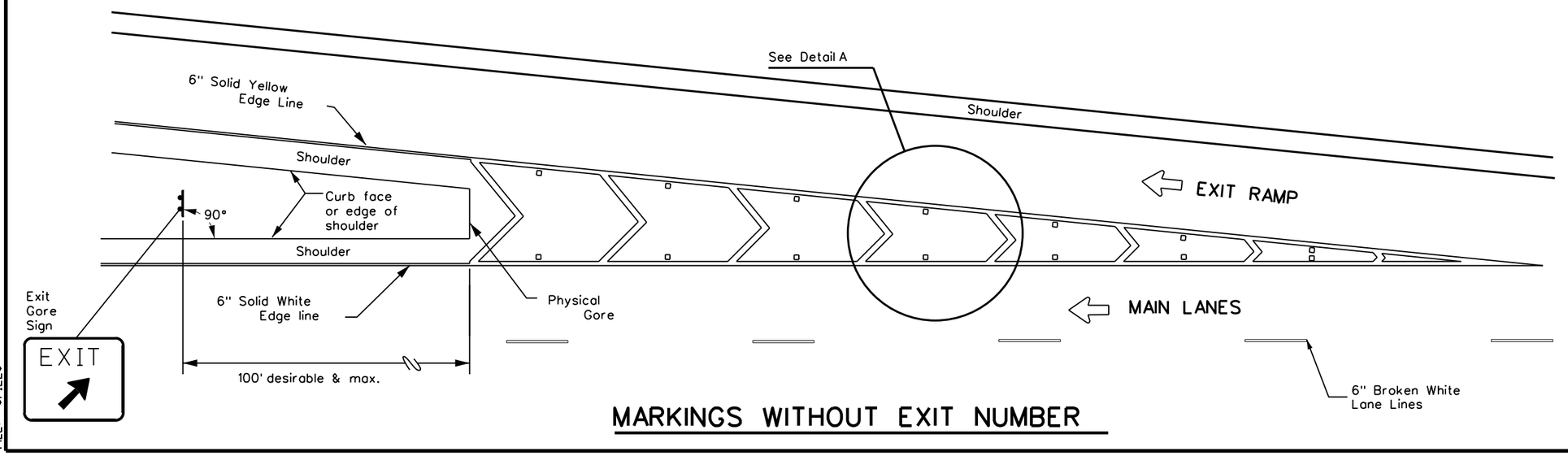


Type II (Top View)



SECTION A

REFLECTORIZED RAISED PAVEMENT MARKER (RPM)



MARKINGS WITHOUT EXIT NUMBER

Texas Department of Transportation

Traffic Safety Division Standard

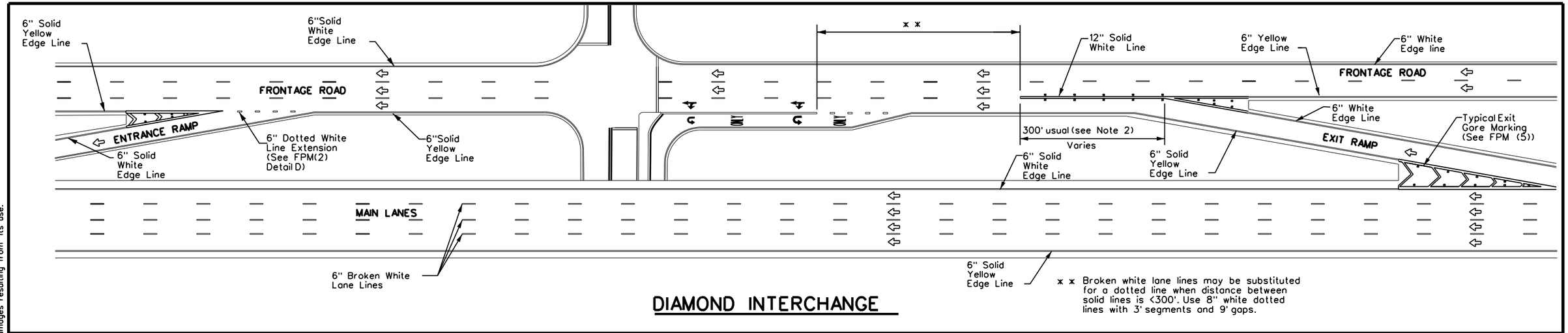
EXIT GORE PAVEMENT MARKINGS

FPM(5)-22

FILE: fpm(5)-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-19 10-22	0081	05	053, ETC.	FM 428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		68

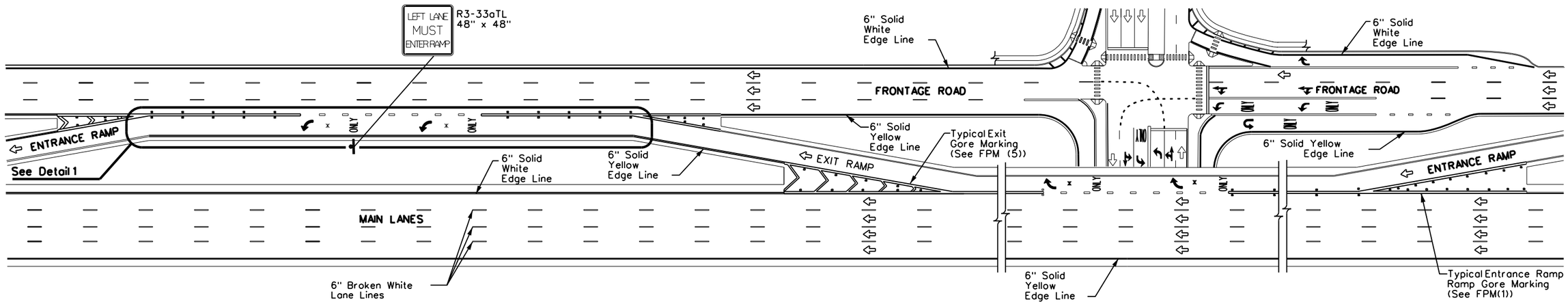
23E

DATE: $DATE$ $TIME$
FILE: $FILE$

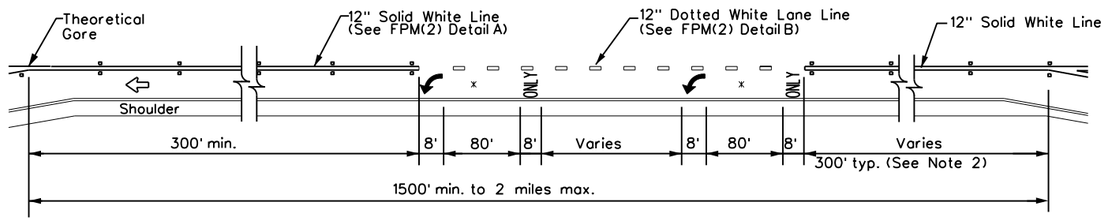


x x Broken white lane lines may be substituted for a dotted line when distance between solid lines is <300'. Use 8" white dotted lines with 3' segments and 9' gaps.

DIAMOND INTERCHANGE



URBAN X-RAMP WITH FRONTAGE ROAD AUXILIARY LANE



DETAIL 1

(Frontage Road Auxiliary Lane for X-Ramps)

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

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

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") dotted lane line (see FPM(2) Detail B) is used to separate a through lane that continues beyond the interchange from an adjacent mandatory exit lane.
4. Edge lines are not required in curb and gutter sections of frontage roads.
5. See FPM(1) for traffic lane line pavement marking details.

LEGEND	
⇦	Traffic flow
↱	Pavement marking arrows (white)
▫	Reflectorized Raised Markers (RPM) Type II-C-R
x	Arrow markings are optional, however "ONLY" is required if arrow is used

Texas Department of Transportation

Traffic Safety Division Standard

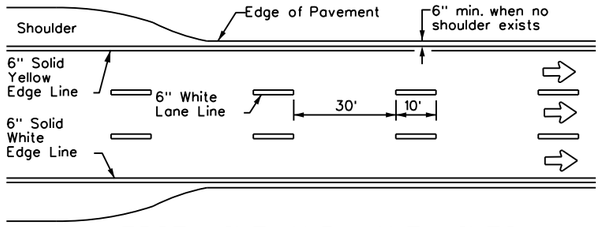
TYPICAL STANDARD FREEWAY AND FRONTAGE ROAD PAVEMENT MARKINGS

FPM(6)-22

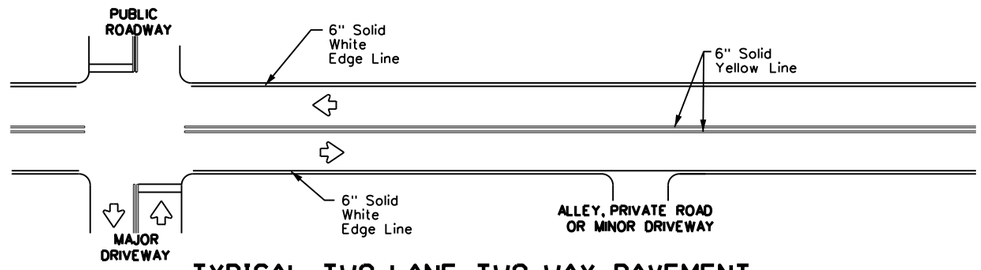
FILE: fpm(6)-22.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 10-22	0081	05	053, ETC.	FM 428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		69

23F

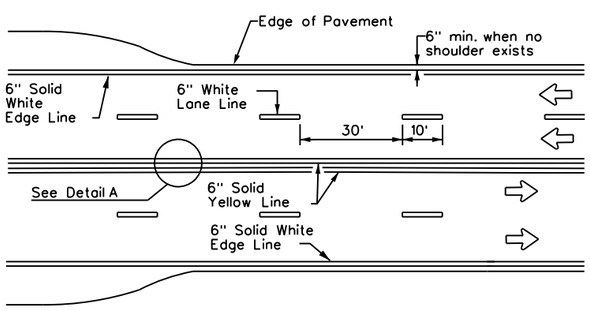
DATE: $DATE$ $TIME$
FILE: $FILE$

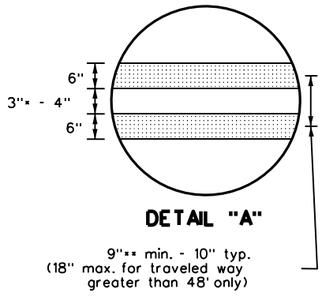


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

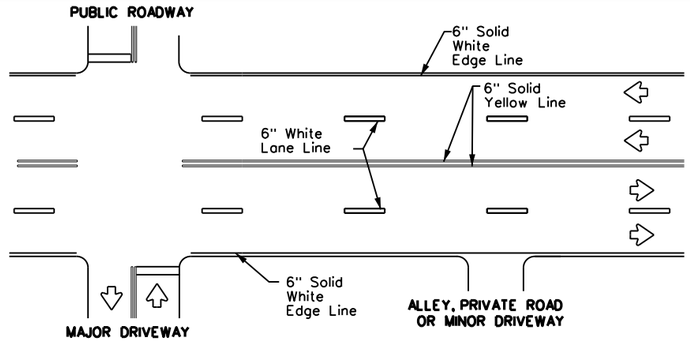




CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

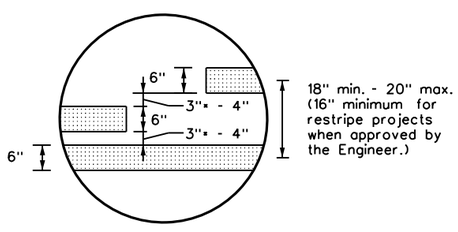
* 2" minimum for restripe projects when approved by the Engineer.

** 8" minimum for restripe projects when approved by the Engineer.



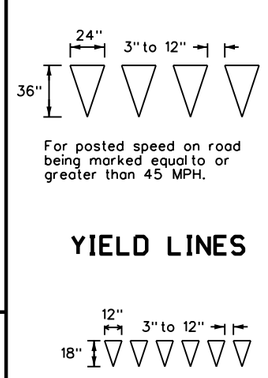
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

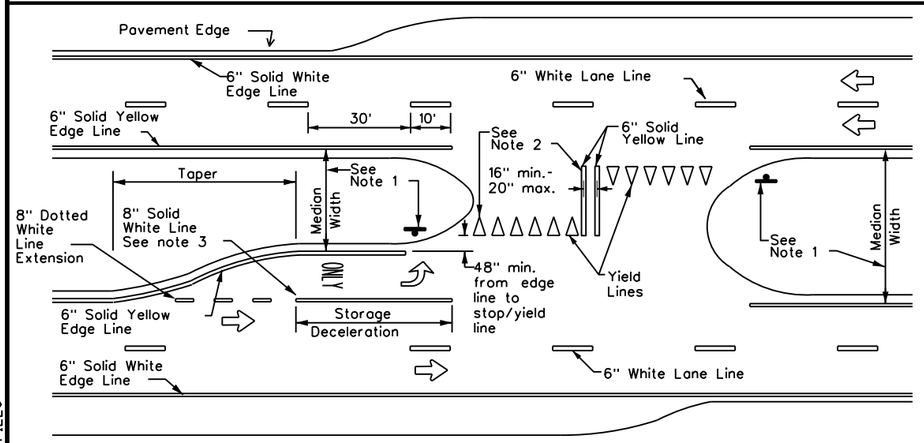
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



DETAIL "B"

* 2" minimum for restripe projects when approved by the Engineer.





FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

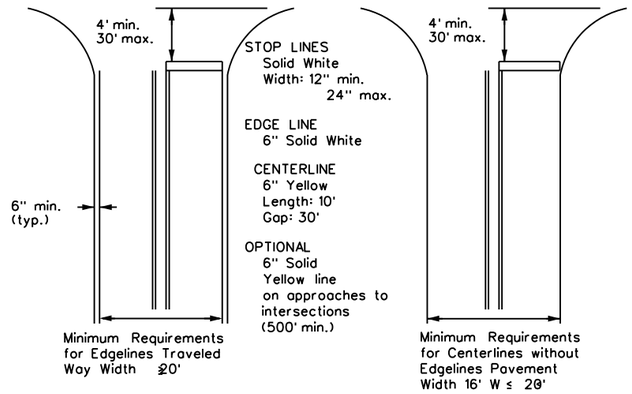
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections.
   Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

GENERAL NOTES

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

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

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



NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

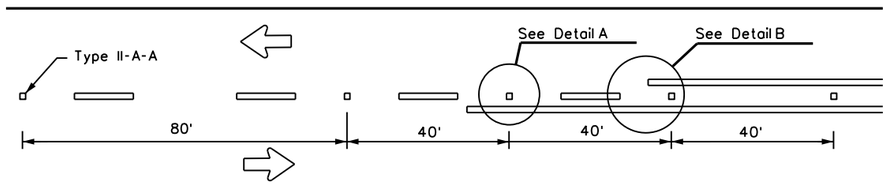
PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20 8-95 3-03 12-22 5-00 2-12	0081	05	053, ETC.	FM 428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		70

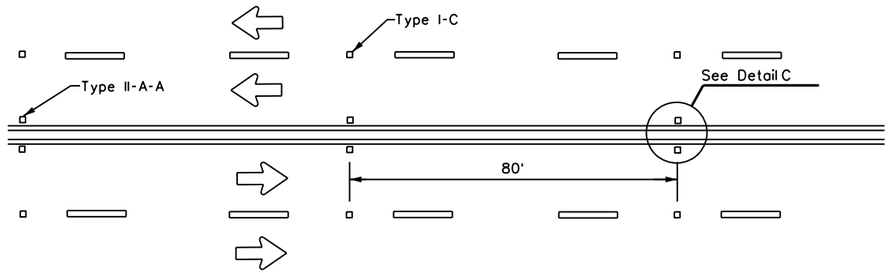
22A

DATE: $DATE$ $TIME$
FILE: $FILE$

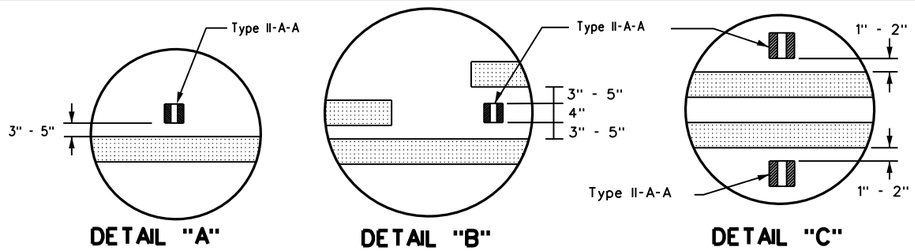
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

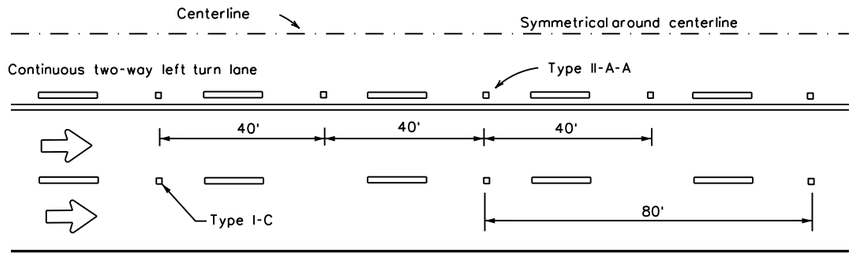


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

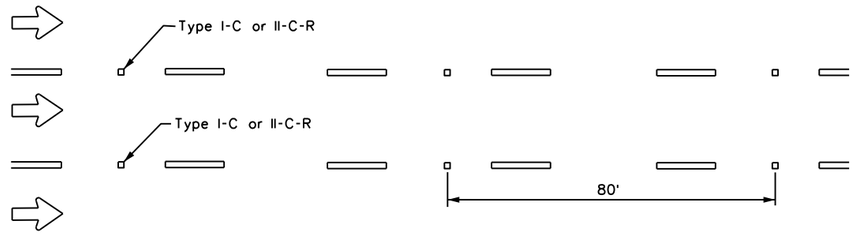


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



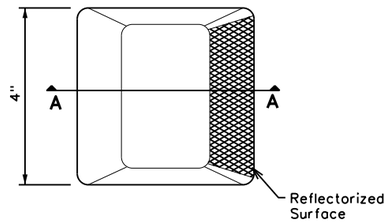
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

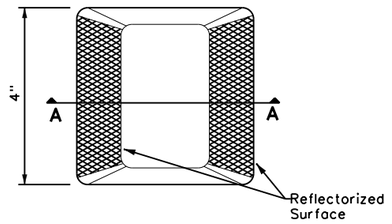
See Note 3.

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

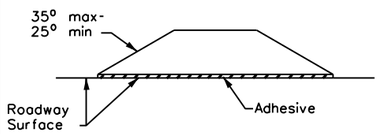
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

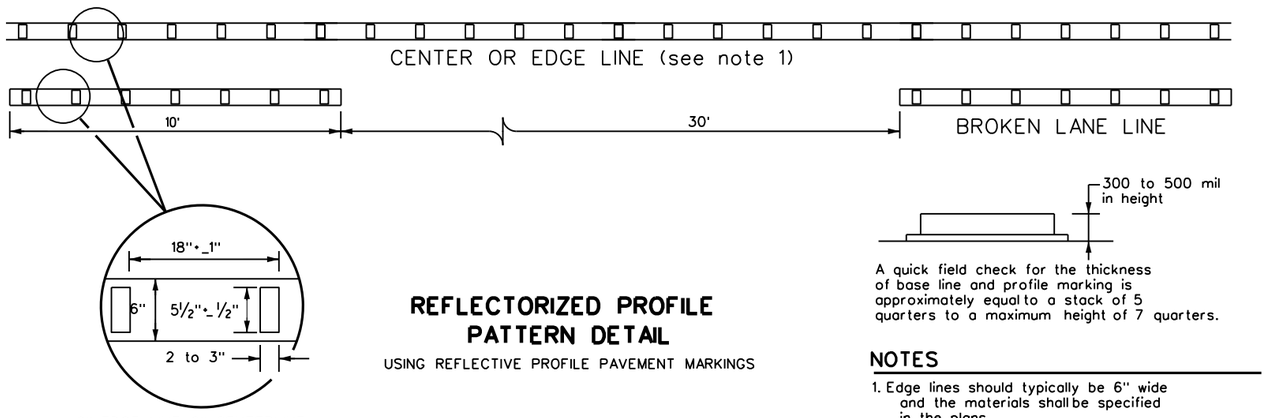


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

NOTES

1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

Texas Department of Transportation

Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
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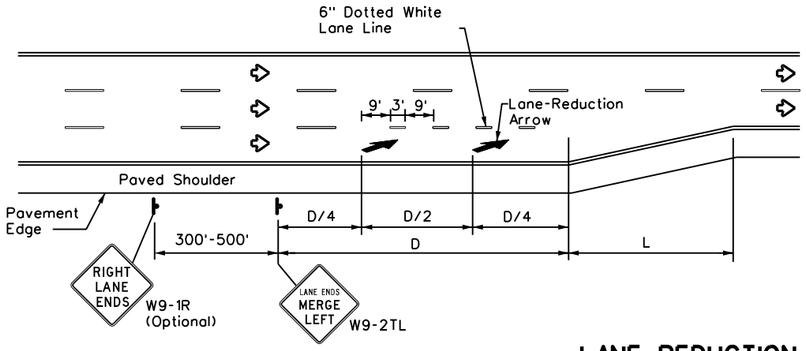
REVISIONS 4-77 8-00 6-20 4-92 2-10 12-22 5-00 2-12	0081	05	053, ETC.	FM 428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		71

22B

DATE: $DATE$ $TIME$
FILE: $FILE$



LANE REDUCTION

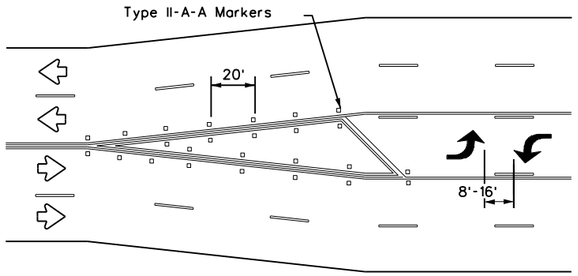
NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional RIGHT LANE ENDS (W9-1R) sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L = \frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

GENERAL NOTES

1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

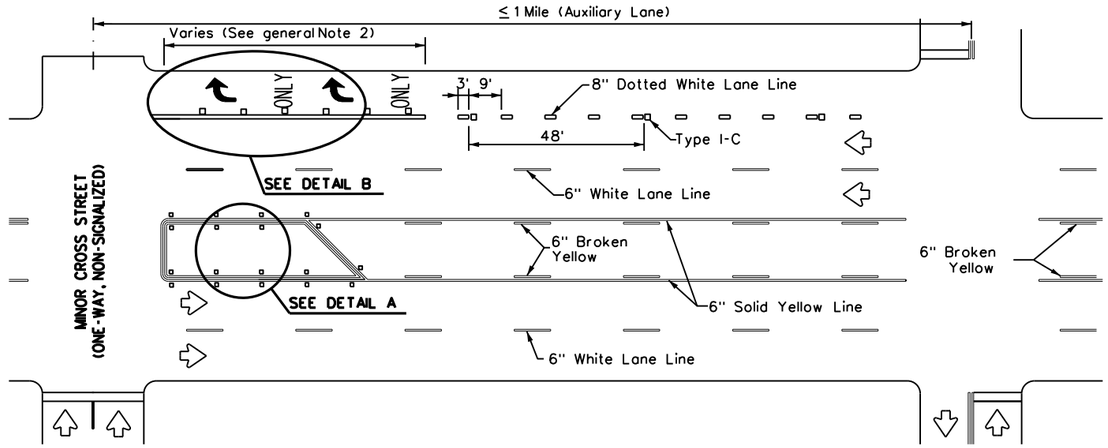


A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

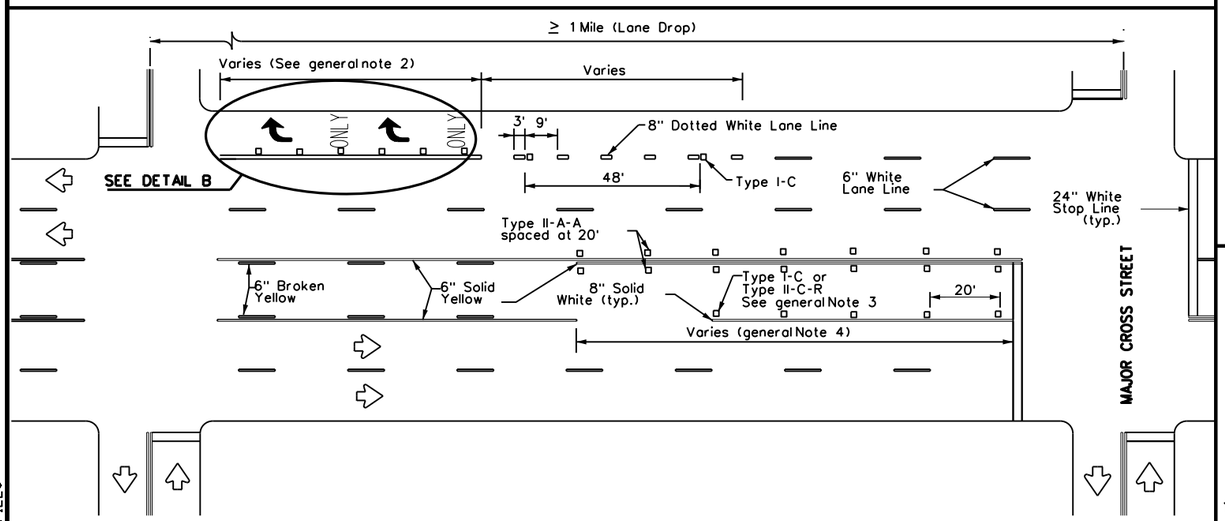
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

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

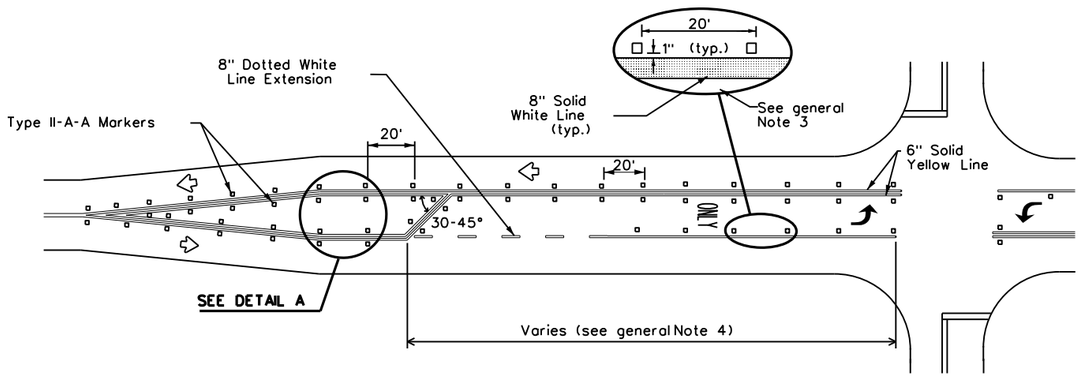
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



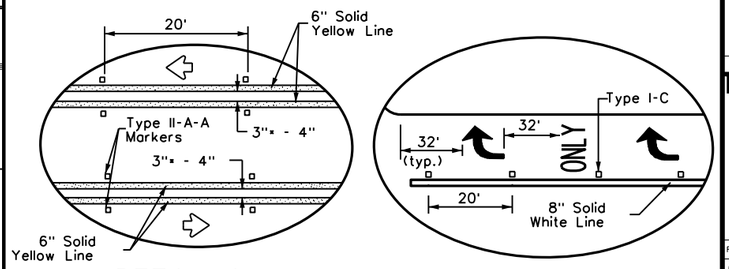
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



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



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A DETAIL B

- 2" minimum allowed for restripe projects when approved by the Engineer.

Texas Department of Transportation

Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

PM(3)-22

FILE:	pm3-22.dgn	DN:	CK:	DW:	CK:
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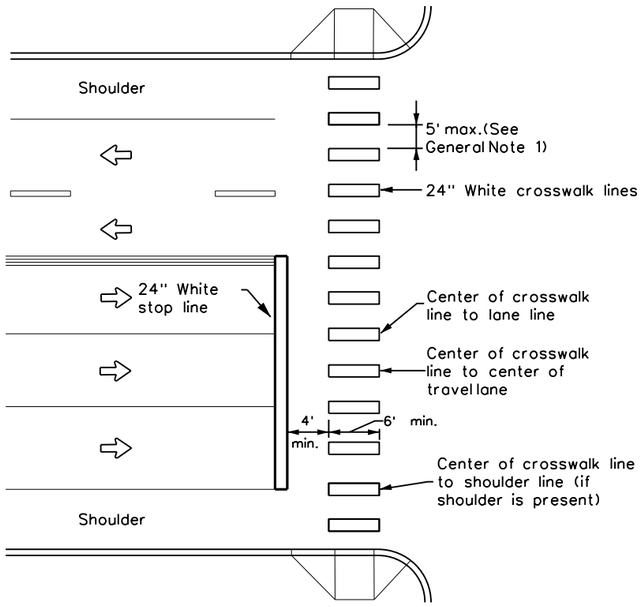
REVISIONS		0081	05	053, ETC.	FM 428, ETC.
4-98 3-03 6-20		DIST	COUNTY		SHEET NO.
5-00 2-10 12-22		DAL	DENTON, ETC.		72
8-00 2-12					

22C

DATE: $DATE$ $TIME$
FILE: $FILE$



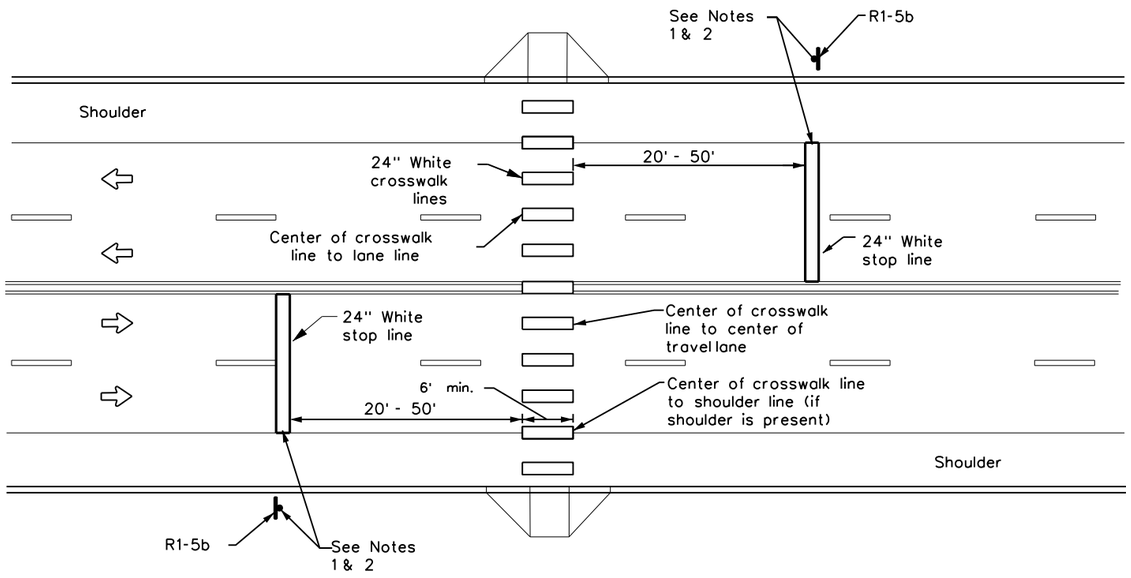
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

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

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



UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with Stop Here For Pedestrians (R1-5b) signs at unsignalized midblock cross walks.
2. Use stop bars with STOP HERE ON RED (R10-6 or R10-6a) signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

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Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-22A

FILE: pm4-22a.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 6-20 6-22 12-22	0081	05	053, ETC.	FM 428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		73

22D

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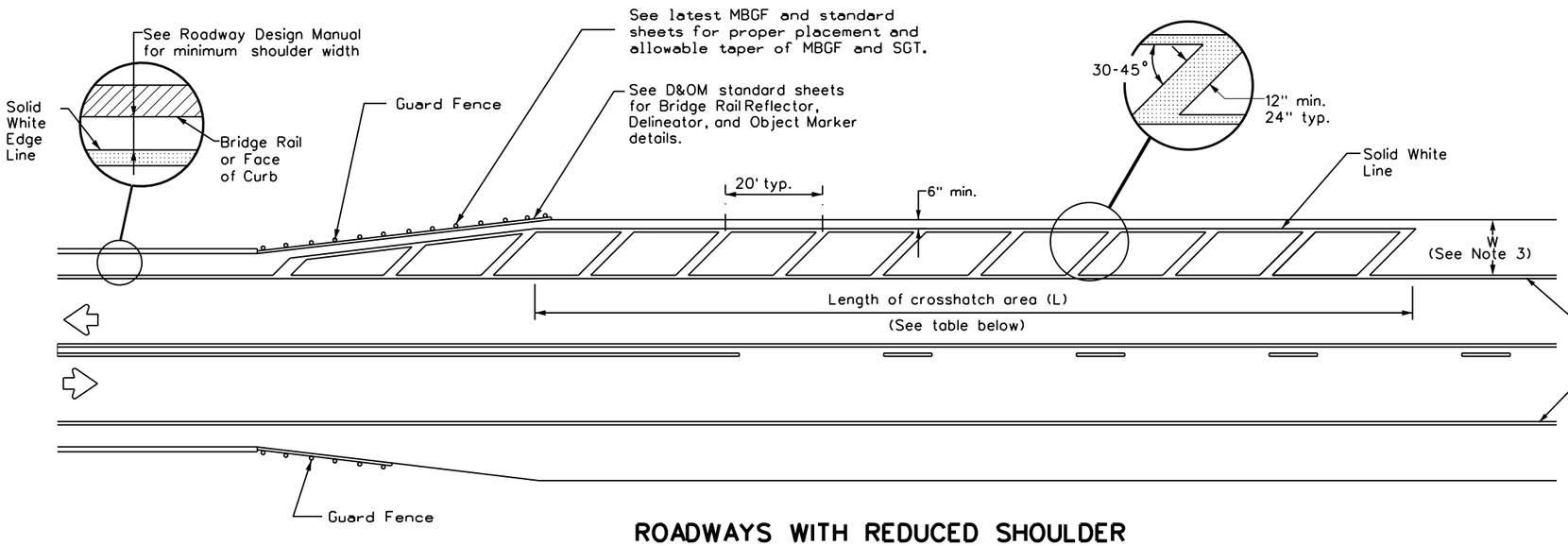

ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT

CROSSHATCH LENGTH (L)	
Posted Speed (MPH)	L (ft)
30	300 ft
35	
40	
45	
50	500 ft
55	
60	
65	
70	
75	

NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 4 inches from the bridge rail or face of curb or 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions.
2. No-passing zone on bridge approach is optional. If used, the no-passing zone shall be a minimum 500 feet long from the beginning of the bridge.
3. The crosshatching should be required if the shoulder width in advance of the bridge is 4 feet or wider and a reduction of at least 3 feet in shoulder width across the bridge occurs.
4. On divided highways, review both the right and left shoulder widths for the need for narrow bridge pavement markings.

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

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

Texas Department of Transportation

Traffic Safety Division Standard

PAVEMENT MARKINGS FOR ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT

PM(5)-22

FILE: pm5-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		74

DATE: $DATE$ $TIME$
FILE: $FILE$

22E

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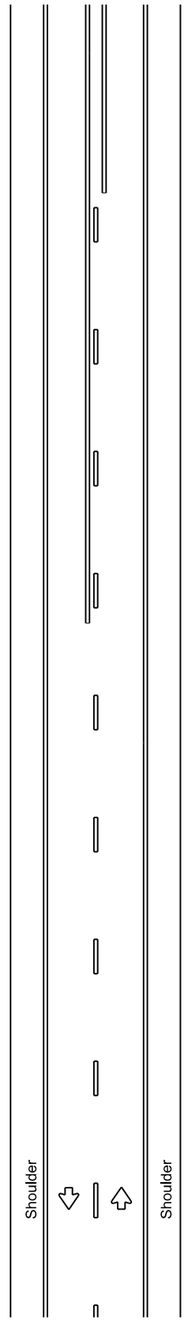
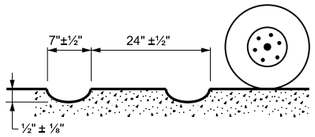
FILE: $FILE$

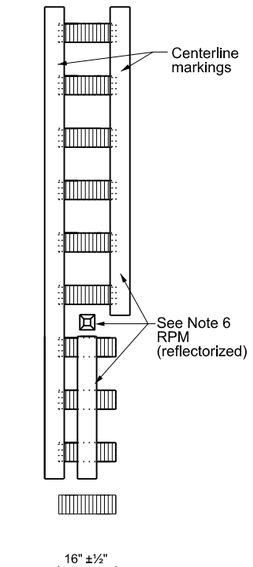
CENTERLINE RUMBLE STRIPS

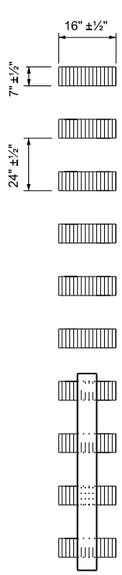


TWO LANE TWO-WAY HIGHWAYS



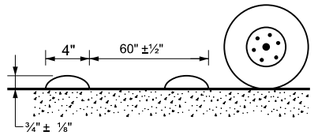
PROFILE VIEW



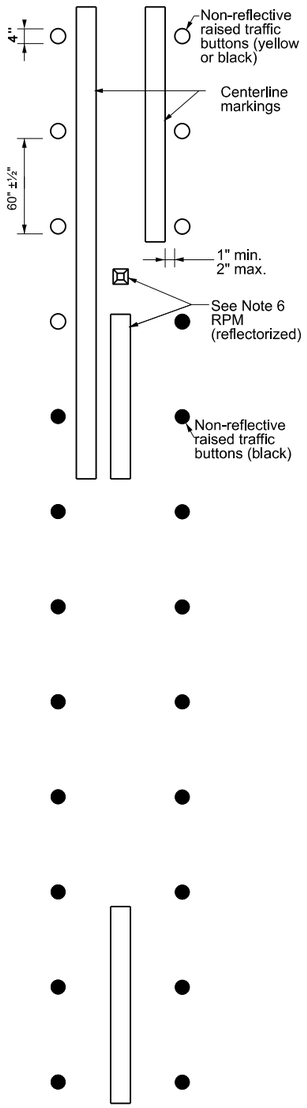


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

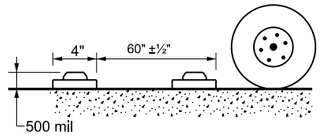


PROFILE VIEW

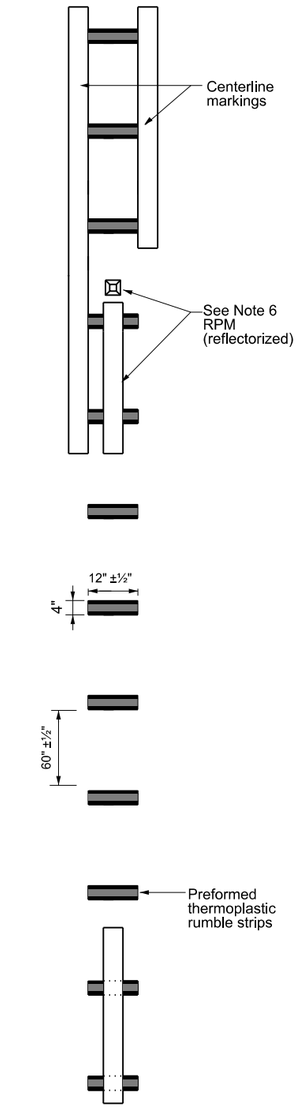


PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS

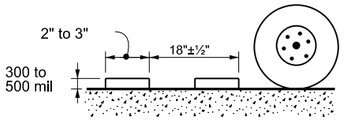


PROFILE VIEW

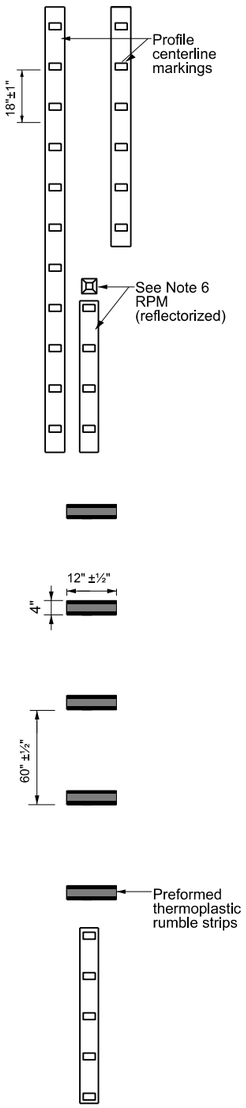


PLAN VIEW
OPTION 3

PREFORMED THERMOPLASTIC RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC RUMBLE STRIPS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on two-lane highways with or without shoulders.
2. Centerline and edge line rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections or driveways with high usage of large trucks.
6. Use standard sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
11. The color of the button should be yellow for a continuous no passing roadway. Black buttons should be used in areas where passing is allowed.
12. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING EDGE LINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

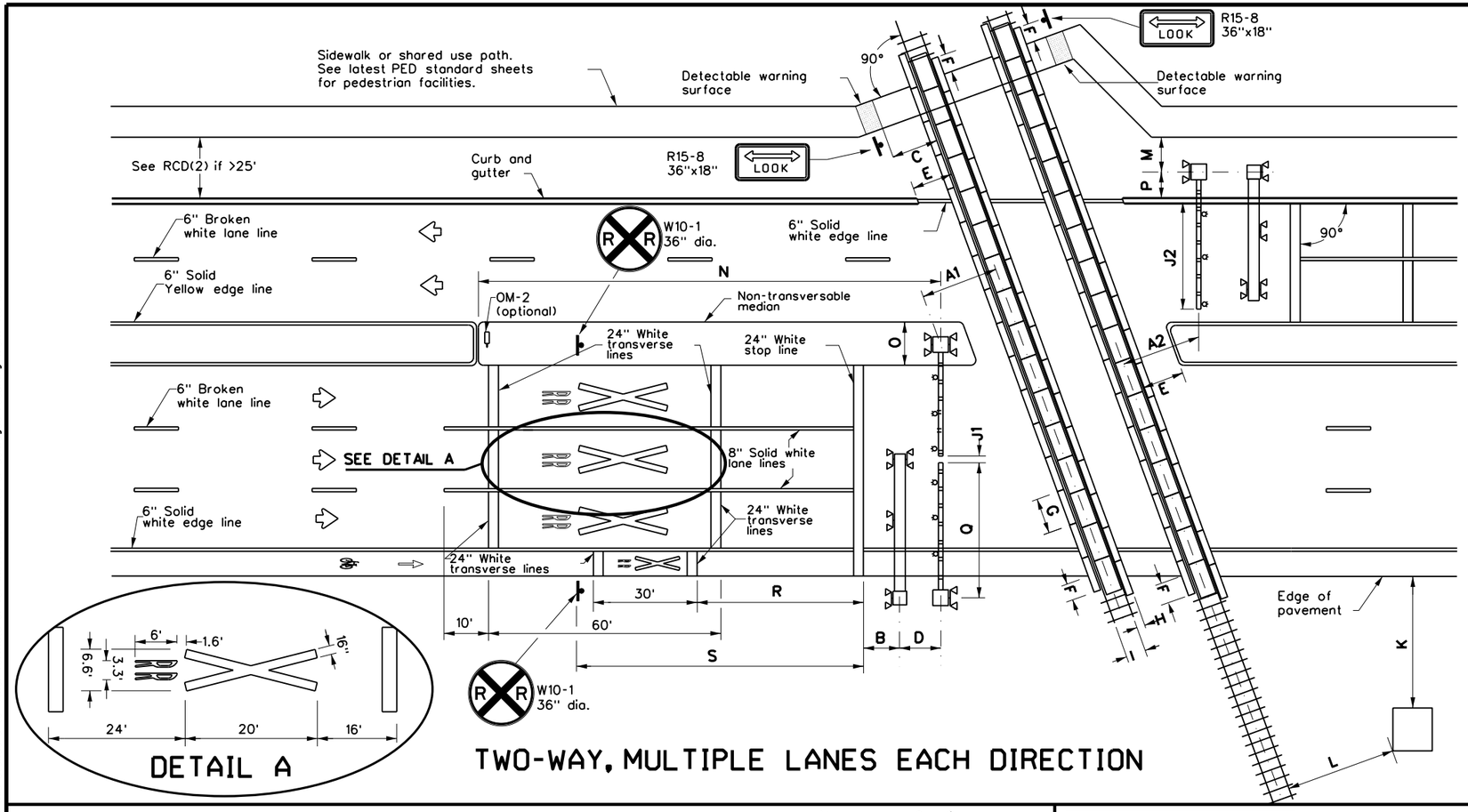
13. See standard sheet RS(2).

Texas Department of Transportation

Traffic Safety Division Standard

CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS RS(4)-23

FILE: rs(4)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
10-13	DIST	COUNTY		SHEET NO.
1-23	DAL	DENTON, ETC.		78



DETAIL A

TWO-WAY, MULTIPLE LANES EACH DIRECTION

NOTES

A1: Center of RR mast to center of rail: 12' minimum, 15' typical.

A2: Tip of gate to center of rail: 12' minimum, 15' typical.

B: Center of mast (cantilever, gate, or mast flasher) of nearest active traffic control device to stop line: 8' (NOTE: Stop line may be moved as needed, but should be at least 8' back from gates, if present).

C: Near edge of detectable warning surface to nearest rail: 12' minimum.

D: Center of gate mast to center of cantilever mast: 6' typical.
NOTE: Cantilever may be located in front or behind gates.

E: Edge of median or curb to nearest rail: 10' typical.
NOTE: Design median edge to be parallel with rail.

F: Edge of planking panel from edge of pavement or sidewalk: 3' minimum.
NOTE: Field panels need not be in line with gauge panels.

G: Length of panels along rail: 8' typical.

H: Width of field panel: 2' typical (check with railroad company).

I: Distance between rails: 4'- 8 1/2".

J1: Tip of gate to tip of gate: 2' maximum.

J2: 90% of traveled roadway to be covered by gate.

K: Nearest edge of RR cabinet from edge of pavement: 30' typical.
NOTE: Cabinet not required to be parallel to edge of pavement.

L: Nearest edge of RR cabinet from nearest rail: 25' typical.

M: Center of RR mast to edge of sidewalk: 6' minimum.

N: Center of gate mast to leading edge of non-traversable median: 100' minimum to qualify as a Quiet Zone SSM. NOTE: 60'will suffice if there is a street intersection within the 100' and all street intersections within 60' are closed.

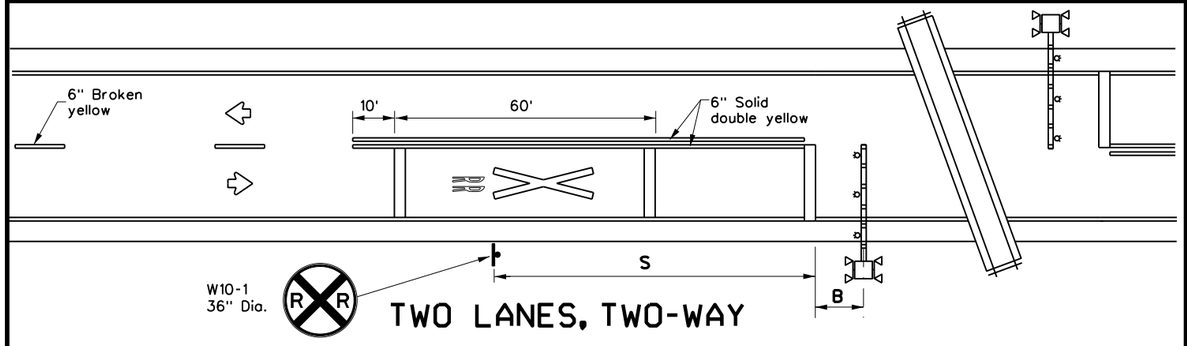
O: Width of median for RR gate assembly: 8'-6" minimum, 10' typical when using median gates. NOTE: Center of gate mast minimum 4'-3" from face of curb.

P: Center of RR mast to face of curb: 5'-3" minimum.
Center of RR mast to edge of pavement (with shoulder): 7' minimum.
Center of RR mast to edge of pavement (no shoulder): 9'-3" minimum.
NOTE: Final location determined by the railroad company.

Q: Gate length: 28' or less typical, but railroad company may allow up to 32' under special circumstances.

R: Stop line to first RR Crossing transverse line (bike lane): 50' typical.

S: Stop line to GRADE CROSSING ADVANCE WARNING (W10-1) sign and adjacent RR Crossing pavement markings. See Table 1. See RCD(2) for other signs.



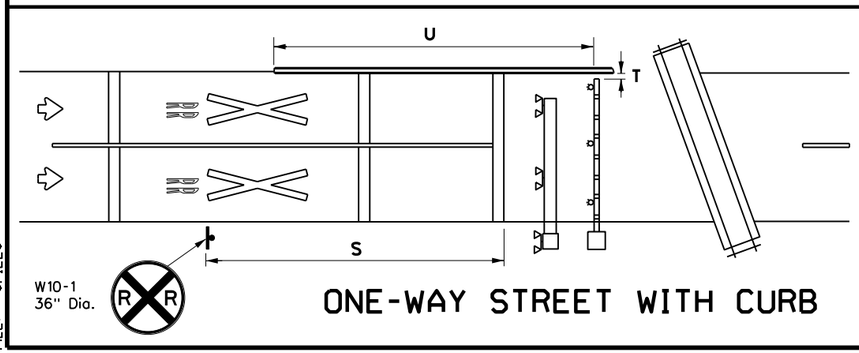
TWO LANES, TWO-WAY

TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

LEGEND	
	Sign
	Object Marker
	Traffic Flow
	Cantilever
	Gate Assembly
	Mast Flasher Pair

GENERAL NOTES

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

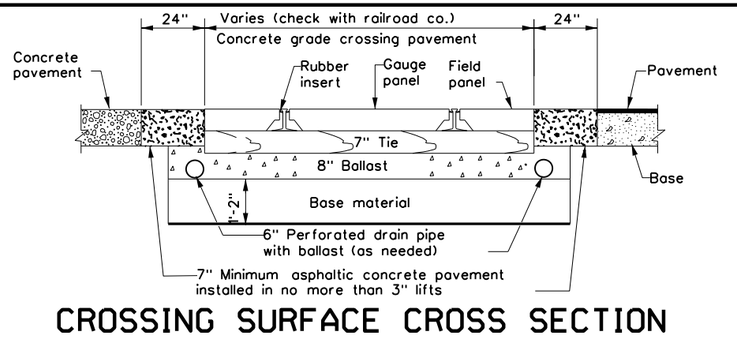


ONE-WAY STREET WITH CURB

NOTES

T: Tip of gate to edge of curb: 1' maximum for Quiet Zone SSM, 90% of traveled way covered by gates for all other locations.

U: Non-traversable curb length from gate: 100' minimum for a Quiet Zone SSM, 10' minimum for all other locations.



CROSSING SURFACE CROSS SECTION

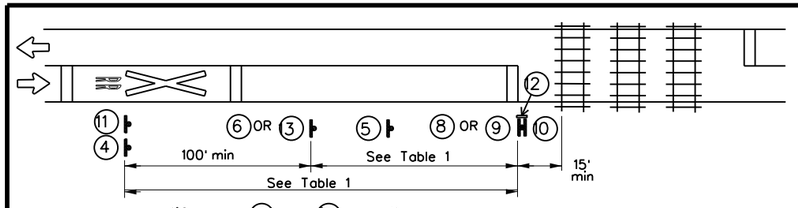
Texas Department of Transportation

Traffic Safety Division Standard

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

FILE: rcd1-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
2-16	DIST	COUNTY		SHEET NO.
11-22	DAL	DENTON, ETC.		76

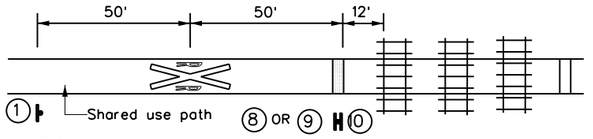
DATE: $DATE$ $TIME$
FILE: $FILE$



PASSIVE CROSSING

NOTES

1. STOP or YIELD sign may also be installed to the left of the crossbuck sign, rather than below it.
2. A 2" white retroreflective strip shall be installed on front and back of crossbuck sign post.
3. See the Crossbuck Assemblies with YIELD or STOP Signs at Passive Grade Crossings section of the TMUTCD for further details about sign mounting arrangements.



NOTES

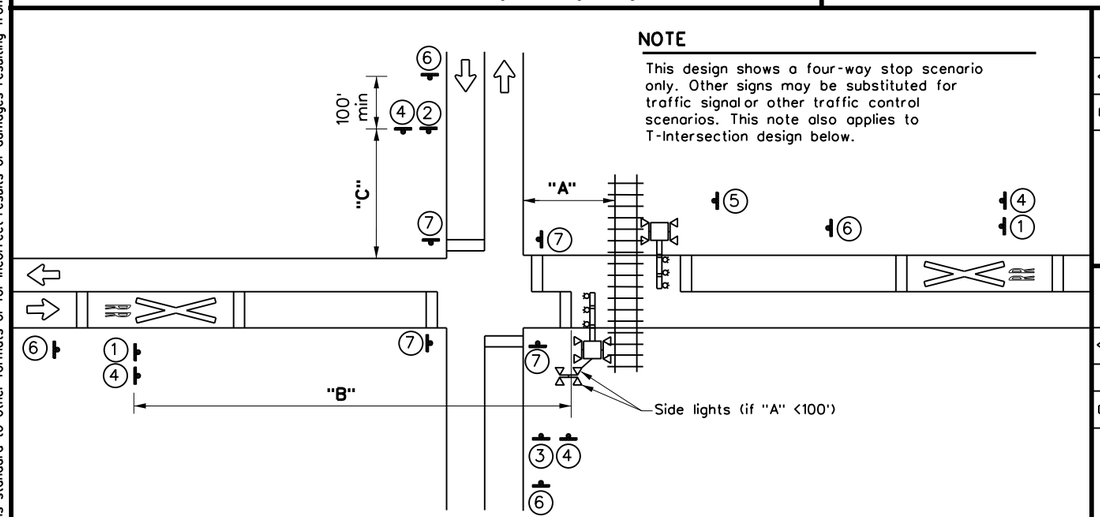
1. A shared use path is considered a separate pathway crossing when more than 25' from traveled way of adjacent roadway.
2. Detectable warning used at stop bar.
3. Smaller signs preferred. See the Design of Bicycle Signs section within the TMUTCD for sizing details.

PATHWAY CROSSING

TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

GENERAL NOTES

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

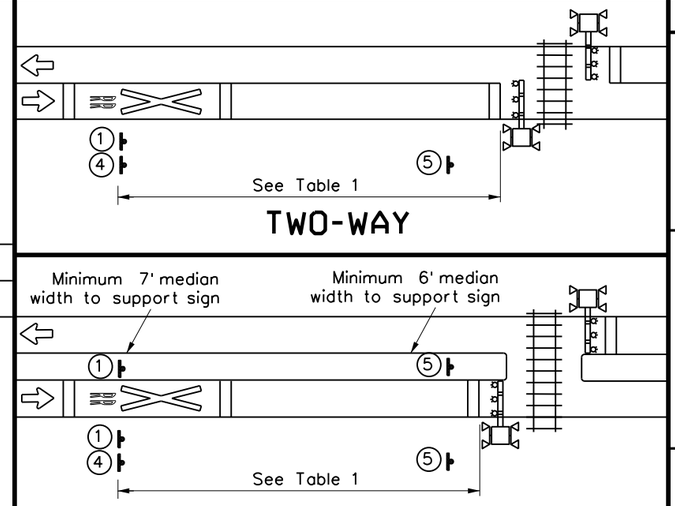


NOTE

This design shows a four-way stop scenario only. Other signs may be substituted for traffic signal or other traffic control scenarios. This note also applies to T-Intersection design below.

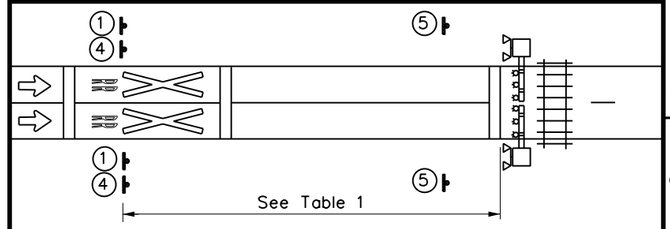
	"A" <100'	"A" ≥100'
"B"	See Table 1. Place pavement markings and signs on opposite side of intersection from rail if spacing from Table 1 would put markings within intersection.	See Table 1. Place pavement markings and signs between rail and intersection if spacing from Table 1 would put markings within intersection.
"C"	See Table 1.	GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2, W10-3, W10-4) signs should only be installed if W10-1 sign is not between intersection and railroad crossing. If needed, see Table 1.

GRADE CROSSING NEAR A PARALLEL STREET



TWO-WAY

TWO-WAY WITH MEDIAN



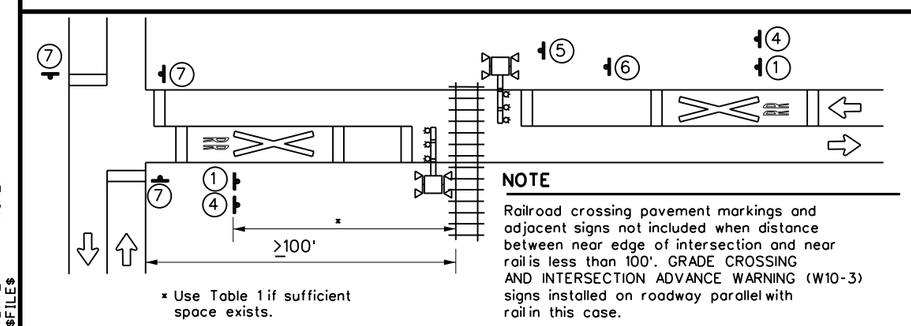
ONE-WAY

SIGNS

** 1	W10-1 36" Dia.	
** 2	W10-2L 36" X 36"	
** 3	W10-2R 36" X 36"	
IF NEEDED 4	W10-5 36" X 36"	LOW GROUND CLEARANCE W10-5P 30" X 24"
IF NEEDED 5	R8-8 24" X 30"	DO NOT STOP ON TRACKS
IF NEEDED 6	W3-1 30" X 30"	
7	R1-1 36" X 36"	STOP ALL WAY R1-3P 18" X 6"
8	R15-1 48" X 9"	RAIL CROSSING ROAD 3 TRACKS R15-2P 27" X 18" STOP R1-1 36" X 36"
9	R15-1 48" X 9"	RAIL CROSSING ROAD 3 TRACKS R15-2P 27" X 18" YIELD R1-2 48" X 48" X 48"
10	R15-1 48" X 9"	RAIL CROSSING ROAD 3 TRACKS R15-2P 27" X 18"
11 **	W10-1 36" Dia.	NO GATES OR LIGHTS W10-13P 30" X 24"
12	I-13 15" X 9"	REPORT EMERGENCY OR PROBLEM 1-800-555-5555 CROSSING 836 597 H — Sign may be placed perpend. to travel lanes.
IF NEEDED 13	W3-2 30" X 30"	

** Includes a NO TRAIN HORN (W10-9P) plaque if crossing is in a Quiet Zone. If needed, is mounted below W10-2/W10-3/W10-4 signs.

NO TRAIN HORN W10-9P 30" X 24"

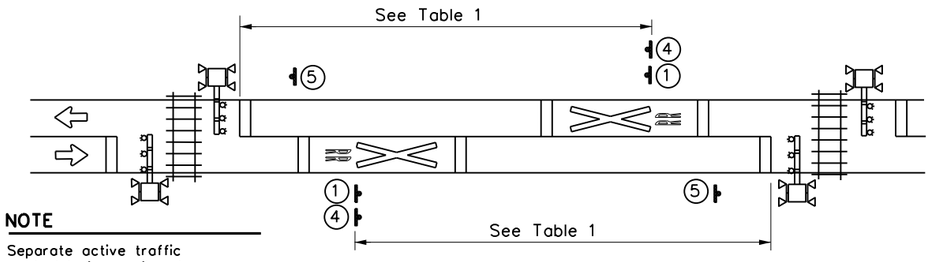


* Use Table 1 if sufficient space exists.

NOTE

Railroad crossing pavement markings and adjacent signs not included when distance between near edge of intersection and near rail is less than 100'. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-3) signs installed on roadway parallel with rail in this case.

T-INTERSECTION



NOTE

Separate active traffic control devices, railroad crossing pavement markings, and adjacent signs required when tracks are more than 100' apart.

TWO ADJACENT CROSSINGS

Texas Department of Transportation

Traffic Safety Division Standard

RAILROAD CROSSING DETAILS SIGNING & STRIPING

RCD(2)-22

FILE: rcd2-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	05	053, ETC.	FM 428, ETC.
2-16 11-22	DIST	COUNTY		SHEET NO.
	DAL	DENTON, ETC.		77

DATE: $DATE$ $TIME$
FILE: $FILE$

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TxDOT policy for projects disturbing less than 1 acre of soil, and not part of a larger common plan of development.

For projects with less than one acre of soil disturbing activity and that have Environmental, Permits, Issues, and Commitments (EPICs) dependent on stormwater controls and water quality measures TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office, Area Office, or electronically.

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

0081-05-053, ETC

1.2 PROJECT LIMITS:

: VARIOUS LOCATION IN COLLIN, DENTON, ELLIS,

:KAUFMAN, NAVARRO, AND ROCKWALL COUNTIES. SEE LOCATION SUMMARY SHEETS

1.3 PROJECT COORDINATES:

SEE PROJECT SUMMARY AND LOCATION MAP SHEETS FOR THE BEGIN AND END POINT OF WORK ON EACH ROADWAY.

1.4 TOTAL PROJECT AREA (Acres): 652.79

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0

1.6 NATURE OF CONSTRUCTION ACTIVITY:

FOR THE CONSTRUCTION OF SEAL COAT CONSISTING OF SEAL COAT, PAVEMENT MARKINGS, AND MILL & INLAY HMAC, WITH NO DISTURBANCE OF SOIL, OR BEYOND THE EDGELINE.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
N/A	N/A

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

☒ PSLs determined during preconstruction meeting
☐ PSLs determined during construction
☐ No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.3.)

☒ Mobilization
☐ Install sediment and erosion controls
☐ Blade existing topsoil into windrows, prep ROW, clear and grub
☒ Remove existing pavement
☐ Grading operations, excavation, and embankment
☐ Excavate and prepare subgrade for proposed pavement widening
☐ Remove existing culverts, safety end treatments (SETs)
☐ Remove existing metal beam guard fence (MBGF), bridge rail
☒ Install proposed pavement per plans
☐ Install culverts, culvert extensions, SETs
☐ Install mow strip, MBGF, bridge rail
☐ Place flex base
☐ Rework slopes, grade ditches
☐ Blade windrowed material back across slopes
☐ Revegetation of unpaved areas
☐ Achieve site stabilization and remove sediment and erosion control measures
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

☐ Sediment laden stormwater from stormwater conveyance over disturbed area
☒ Fuels, oils, and lubricants from construction vehicles, equipment, and storage
☒ Solvents, paints, adhesives, etc. from various construction activities
☐ Transported soils from offsite vehicle tracking
☒ Construction debris and waste from various construction activities
☐ Contaminated water from excavation or dewatering pump-out water
☐ Sanitary waste from onsite restroom facilities
☒ Trash from various construction activities/receptacles
☐ Long-term stockpiles of material and waste
☐ Discharges from concrete washout activities, runoff from concrete cutting activities, and other concrete related activities

1.11 RECEIVING WATERS:

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Collin	
1746-01-030 - FM 1827	BIG BRANCH, TICKY CRK
2247-01-015 - FM 2194	GROVES CRK, BRUSHY CRK
0816-05-028 - FM 2862	ELM GROVE CRK; SISTER GROVE CRK (0821B)
Denton	
0081-05-053 - FM 428	CLEAR CRK (0823C*)
Ellis	
0596-02-055 - FM 66	WEAKLY BRANCH & EAST FORK WEAKLY BRANCE; SOUTH FORK CHAMBERS CRK (0841B)
0596-02-056 - FM 66	MESQUITE BRANCH, OAK BRANCH, GREATHOUSE BRANCH; SOUTH FORK CHAMBERS CRK (0841B), SOUTH PRONG CRK (0816A)
0747-06-015 - FM 157	BOGGY BRANCH, SPRING BRANCH, SOUTH FORK CHAMBERS CRK (0841B)
1049-01-017 - FM 661	JOE POOL LAKE, MOUNTAIN CREEK (0838A)
1051-01-062 - FM 664	RED OAK CRK (0805A)
1048-03-012 - FM 780	INDIA BRANCE, RED OAK CRK (0805A)
1139-01-049 - FM 813	BOYCE CRK, RED OAK CRK (0805A)
Kaufman	
3190-01-013 - FM 2860	PRAIRIE BRANCH, BIG COTTONWOOD CRK, KINGS CRK (0818C*)
3089-01-012 - FM 3039	EAST FORK TRINITY RIVER (0819*)
0495-01-084 - IH 20 FR	BACHELOR CRK, EAGANS CRK, ANTHONY BRANCH, KINGS CRK (0818C*); MUDDY CEAR CRK, ROCKY CEDAR CRK, CEDAR CRK (0818B*)
0561-01-026 - SH 274	KINGS CRK (0818C*)
0197-03-081 - US 175FR	BIG BUSHY CRK, KINGS CRK (0818C*)
0197-04-085 - US 175FR	BIG BUSHY CRK, KINGS CRK (0818C*)
NAVARRO	
0998-03-027 - FM 416	SPRING BRANCH CRK, GREENBRIAR CRK, TEHUACANA CRK (0804F)
1847-01-011 - FM 635	ALLIGATOR CRK, GAS CRK
0121-05-052 - SH 22	BRIAR CRK, CEDAR CRK, RICHLAND CRK (0837*)
0995-01-030 - FM 637	CEDAR CRK (0836B*)
Rockwall	
1014-03-062 - FM 550	BUFFALO CRK (0819B)
1017-01-018 - FM 552	CAMP CRK, PARKER CRK, SOUTH FORK SABINE RIVER (0507G*)

The ultimate classified receiving waterbodies include:
0507: LAKE TAWAKONI (No Impairments)
0804: TRINITY RIVER above Lake Livingston*
0805: UPPER TRINITY RIVER*
0815: BARDWELL RESERVOIR*
0818: CEDAR CREEK RESERVOIR*
0819: EAST FORK TRINITY RIVER*
0821: LAKE LAVON (No Impairments)
0823: LEWISVILLE LAKE (No Impairments)
0836: RICHLAND-CHAMBERS RESERVOIR (RCR)*
0837: RICHLAND CREEK above RCR*
0838: JOE POOL LAKE (No Impairments)
0841: LOWER WEST FORK TRINITY RIVER*

*Water Quality Impairments:
Bacteria in water (Recreation Use): 0507G, 0805, 0818B, 0818C, 0819, 0823C, 0836, 0837 and 0841.

Dioxin and PCBs in edible tissue: 0804, 0805 and 0841.

Sulfate in water: 0815

pH: 0818

Depressed dissolved oxygen in water: 0836B

1.12 ROLES AND RESPONSIBILITIES: TxDOT

☒ Development of plans and specifications
☐ Perform SWP3 inspections
☐ Maintain SWP3 records and update to reflect daily operations

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

X Day To Day Operational Control
X Maintain schedule of major construction activities
X Install, maintain and modify BMPs

STATE OF TEXAS
DARIUS J. HAGGARD
145313
LICENSED
PROFESSIONAL ENGINEER

Darius Haggard, PE

8/2/2024

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

July 2024

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		78
STATE	STATE DIST.	COUNTY	
TEXAS	DAL	DENTON, ETC.	
CONT.	SECT.	JOB	HIGHWAY NO.
0081	05	053	FM 428, ETC.

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- [X] [X] Protection of Existing Vegetation
- [ ] [ ] Vegetated Buffer Zones
- [ ] [ ] Soil Retention Blankets
- [ ] [ ] Geotextiles
- [ ] [ ] Mulching/ Hydromulching
- [ ] [ ] Soil Surface Treatments
- [ ] [ ] Temporary Seeding
- [ ] [ ] Permanent Planting, Sodding or Seeding
- [ ] [ ] Biodegradable Erosion Control Logs
- [ ] [ ] Rock Filter Dams/ Rock Check Dams
- [ ] [ ] Vertical Tracking
- [ ] [ ] Interceptor Swale
- [ ] [ ] Riprap
- [ ] [ ] Diversion Dike
- [ ] [ ] Temporary Pipe Slope Drain
- [ ] [ ] Embankment for Erosion Control
- [ ] [ ] Paved Flumes
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- [ ] [ ] Biodegradable Erosion Control Logs
- [ ] [ ] Dewatering Controls
- [ ] [ ] Inlet Protection
- [ ] [ ] Rock Filter Dams/ Rock Check Dams
- [ ] [ ] Sandbag Berms
- [ ] [ ] Sediment Control Fence
- [ ] [ ] Stabilized Construction Exit
- [ ] [ ] Floating Turbidity Barrier
- [ ] [ ] Vegetated Buffer Zones
- [ ] [ ] Vegetated Filter Strips
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____
- [ ] [ ] Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

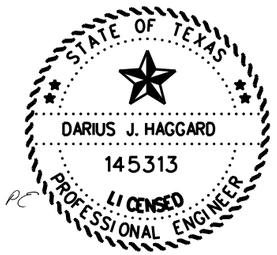
BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
NO PLANNED POST-CONSTRUCTION BMPS		

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- [ ] Excess dirt/mud on road removed daily
- [ ] Haul roads dampened for dust control
- [ ] Loaded haul trucks to be covered with tarpaulin
- [ ] Stabilized construction exit
- [ ] Daily street sweeping
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____



Darius Haggard, PE

8/2/2024

2.5 POLLUTION PREVENTION MEASURES:

- [X] Chemical Management
- [ ] Concrete and Materials Waste Management
- [X] Debris and Trash Management
- [ ] Dust Control
- [ ] Sanitary Facilities
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To
NO ANTICIPATED IMPACT TO ANY PROJECT AREA SURFACE WATER OR ITS VEGETATIVE BUFFERS.		

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- [X] Fire hydrant flushings
- [X] Irrigation drainage
- [X] Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- [X] Potable water sources
- [X] Springs
- [X] Uncontaminated groundwater
- [X] Water used to wash vehicles or control dust
- [X] Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 DEWATERING:

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

2.9 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3 .

2.10 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3.

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

July 2024 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		79
STATE	STATE DIST.	COUNTY	
TEXAS	DAL	DENTON, ETC.	
CONT.	SECT.	JOB	HIGHWAY NO.
0081	05	053	FM 428, ETC.

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

Notes To Designer:
1. Do not alter Sheet Design or Font style, size or weight - match text attributes.
2. If additional space is needed for a numbered section, fence and adjust sections up or down as needed for proportioning and readability but do not relocate from its relative position.
3. All areas should be addressed thoroughly and verify the necessary pay items are set up to support actions needed.

Filled Out: XX/XX/XXXX
Prepared by: Name/Section

I. STORMWATER POLLUTION PREVENTION PLAN-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 adjacent MS 4 Operator(s) that receive discharges from this project. They need to be notified prior to construction activities.
(Note: Leave blank only if no adjacent MS 4 Operator(s) are affected.)

1.

2.

☐ No Action Required ☒ Required Action

Action Number:

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000.
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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. No equipment is allowed in any sream channel below the ordinary High Water Mark except on approved temporary stream crossings or drill pads.

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:

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

1.

2.

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 for applicable 401 General Conditions:
(Note: If CORP Permit not required, do not check boxes.)

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action Number:

IV. VEGETATION RESOURCES

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

☒ No Action Required ☐ Required Action

Action Number:

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

☐ No Action Required ☒ Required Action

Action Number:

1. Follow Special Notes.

Special Notes:

1. Avoid harming all wildlife species if encountered and allow them to safely leave the project site. Due diligence should be used to avoid killing or harming any wildlife species in the implementation of transportation projects.
2. If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediated area, and contact the Engineer immediately.
3. The Migratory Bird Act of 1918 states that it is unlawful to kill, capture, collect, possess, buy, sell, trade or transport any migratory bird, nest, young, feather or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations. The contractor would remove all old migratory bird nests from any structure or trees where work would be done from October 1 to February 15. In addition, the contractor would be prepared to prevent migratory birds from building nest(s) between February 15 to October 1. In the event that migratory birds are encountered on-site during project construction, efforts to avoid adverse impacts on protected birds, active nests, eggs and/or young would be observed.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corp 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 Safety Data Sheets (SDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act. Maintain an adequate supply of on-site spill response materials, as indicated in the SDS. In the event of a spill, take actions to mitigate the spill as indicated in the SDS, 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(s) or replacement(s) (bridge class structures not including box culverts)?

☐ Yes ☒ No

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

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

☐ Yes ☒ No

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

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

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

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

☒ No Action Required ☐ Required Action

Action Number:

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action Number:

1.

GENERAL NOTE:

Any change orders and/or deviations from the final design must be reported to the Engineer prior to commencement of construction activities, as additional environmental clearance may be required.

Texas Department of Transportation
Dallas District

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		FM 428, ETC
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DENTON, ETC	
CONTROL	SECTION	JOB	SHEET NO.
0081	05	053, ETC	80

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

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: See chart.
Crossing Type: See chart.
RR Company Operating Track at Crossing: BNSF
RR Company Owning Track at Crossing: BNSF
RR MP: See chart.
RR Subdivision: See chart.
City: See chart.
County: See chart.
CSJ at this Crossing: CONTROLLING CSJ - 0081-05-053 - SEE CHART FOR CSJ AT XING
Latitude: See chart.
Longitude: See chart.

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

State's contractor will be performing seal coat, pavement marking installation, and traffic control in the RR ROW and parallel to the RR ROW.

Scope of Work to be performed by Railroad Company:

N/A

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 7

On this project, night or weekend flagging is:

☑ Expected
☐ Not Expected

Flagging services will be provided by:

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

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

Contact Information for Flagging:

☐ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☑ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

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

IV. RAILROAD INSURANCE REQUIREMENTS

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

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

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

Escalated Limits

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

Railroad Protective Liability Limits

☐ Not Required	
☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☐ Other: _____	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☐ Not Required
☐ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☑ Required: Contractor to obtain
- ☑ BNSF: tim.huya@bnsf.com
  https://bnsf.railpermitting.com
- ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

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

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

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

VI. RAILROAD COORDINATION MEETING

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

VII. RAILROAD SAFETY ORIENTATION

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

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

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

VIII. SUBCONTRACTORS

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

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call: BNSF Railway
Railroad Emergency Line at: 800-832-5452
Location: DOT See chart.
RR Milepost: See chart.
Subdivision: See chart.

RRD Review Only
Initials: KS
Date: 6-11-2024

Texas Department of Transportation — Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf		DN: TxDOT	CK:	DW:		CK:	
© TxDOT June 2014		CONT	SECT	JOB		HIGHWAY	
REVISIONS		0081	05	053		FM 428, etc.	
6/2023		DIST	COUNTY			SHEET NO.	
		18	DENTON, etc.			81	

DOT #	CROSSING TYPE	RAILROAD OPERATOR	RAILROAD OWNER	RAILROAD MILEPOST	RAILROAD SUBDIVISION	CITY	COUNTY	ROADWAY	CSJ	LATITUDE	LONGITUDE
021906P	AT-GRADE	BNSF	BNSF	28.98	WARD INDUSTRIAL SPUR	MIDLOTHIAN	ELLIS	N. MIDLOTHIAN PKWY	0261-01-051	32.5108924	-96.981383
021907W	AT-GRADE	BNSF	BNSF	30.540	WARD INDUSTRIAL SPUR	MIDLOTHIAN	ELLIS	SHILOH ROAD	0261-01-051	32.5325988	-96.9742615
597208N	AT-GRADE -*P	BNSF	BNSF	222.460	DFW	STREETMAN	FREESTONE	SL0262	0998-03-027	31.87687	-96.3266306
021896L	AT-GRADE -*P	BNSF	BNSF	24.520	WARD INDUSTRIAL SPUR	MIDLOTHIAN	ELLIS	WARD ROAD	0260-02-053	32.4658391	-97.0283877
597219B	AT-GRADE	BNSF	BNSF	235.020	DFW	CORSICANA	NAVARRO	FM 637	0095-01-030	32.0486074	-96.4010942
				*P indicates parallel to roadway							

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK

ADDITIONAL CROSSINGS IN PROJECT LIMITS

FILE: RR Scope of Work.dgn	DN: IxDOT	CK:	DW:	CK:
©TxDOT	CONT	SECT	JOB	HIGHWAY
	0081	05	053, etc.	FM 428, etc
	DIST	COUNTY		SHEET NO.
	DAL	DENTON, etc.		82

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

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: SEE CHART
Crossing Type: SEE CHART
RR Company Operating Track at Crossing: UPRR
RR Company Owning Track at Crossing: UPRR
RR MP: SEE CHART
RR Subdivision: SEE CHART
City: SEE CHART
County: SEE CHART
CSJ at this Crossing: CONTROLLING CSJ - 0081-05-053 - SEE CHART FOR CSJ AT XING
Latitude: SEE CHART
Longitude: SEE CHART

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

State's contractor will be performing seal coat, pavement marking installation, and traffic control in the RR ROW and parallel to the RR ROW.

Scope of Work to be performed by Railroad Company:

N/A

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 10

On this project, night or weekend flagging is:

☑ Expected
☐ Not Expected

Flagging services will be provided by:

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

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

Contact Information for Flagging:

☑ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

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

IV. RAILROAD INSURANCE REQUIREMENTS

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

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

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

Escalated Limits

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

Railroad Protective Liability Limits

☐ Not Required	
☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☐ Other: _____	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☐ Not Required
☑ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☐ Required: Contractor to obtain
- ☐ BNSF: _____
  https://bnsf.railpermitting.com
- ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

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

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

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

VI. RAILROAD COORDINATION MEETING

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

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

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

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

VIII. SUBCONTRACTORS

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

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call: Union Pacific Railroad
Railroad Emergency Line at: 800-848-8715
Location: DOT SEE CHART
RR Milepost: SEE CHART
Subdivision: SEE CHART

RRD Review Only
Initials: KS
Date: 6-11-24

Texas Department of Transportation — Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf		DN: TxDOT	CK:	DW:		CK:	
© TxDOT June 2014		CONT	SECT	JOB		HIGHWAY	
REVISIONS		0081	05	053		FM 428, etc.	
6/2023		DIST	COUNTY			SHEET NO.	
		18	DENTON, etc.			83	

DOT #	CROSSING TYPE	RAILROAD OPERATOR	RAILROAD OWNER	RAILROAD MILEPOST	RAILROAD SUBDIVISION	CITY	COUNTY	ROADWAY	CSJ	LATITUDE	LONGITUDE
765218H	RR UNDER	UPRR	UPRR	23.56	MIDLOTHIAN	MIDLOTHIAN	ELLIS	US 67	0261-01-051	32.4930029	-96.9988793
765219P	AT-GRADE-*P	UPRR	UPRR	23.15	MIDLOTHIAN	MIDLOTHIAN	ELLIS	NINTH ST	0261-01-051	32.4888968	-96.9934672
765563R	AT-GRADE	UPRR	UPRR	238.61	ENNIS	PALMER	ELLIS	FM 813	1139-01-049	32.4313651	-96.6678476
765564X	AT-GRADE-*P	UPRR	UPRR	238.67	ENNIS	PALMER	ELLIS	W. DENTON ST	1139-01-049	32.4322292	-96.6681518
765562J	AT-GRADE-*P	UPRR	UPRR	238.55	ENNIS	PALMER	ELLIS	W. MARSHALL ST	1139-01-049	32.4304894	-96.6675363
765539P	RR UNDER	UPRR	UPRR	232.787	ENNIS	ENNIS	ELLIS	SS 469	0092-15-003	32.3530118	-96.637672
848219W	AT-GRADE-*P	UPRR	UPRR	232.306	ENNIS	ENNIS	ELLIS	CEDAR ROAD	0092-15-003	32.356077	-96.642037
765224L	AT-GRADE-*P	UPRR	UPRR	29.66	MIDLOTHIAN	Mansfield	Tarrant	SOUTH HOLLAND ROAD	1049-01-017	32.5494823	-97.629365

*P - Indicates parallel to roadway

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK

ADDITIONAL CROSSINGS IN PROJECT LIMITS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
© TxDOT	CONT	SECT	JOB	HIGHWAY
	0081	05	053	FM 428, etc.
	DIST	COUNTY		SHEET NO.
	18	DENTON, etc		84

DOT #	CROSSING TYPE	RAILROAD OPERATOR	RAILROAD OWNER	RAILROAD MILEPOST	RAILROAD SUBDIVISION	CITY	COUNTY	ROADWAY	CSJ	LATITUDE	LONGITUDE
765218H	RR UNDER	UPRR	UPRR	23.56	MIDLOTHIAN	MIDLOTHIAN	ELLIS	US 67	0261-01-051	32.4930029	-96.9988793
765219P	AT-GRADE-*P	UPRR	UPRR	23.15	MIDLOTHIAN	MIDLOTHIAN	ELLIS	NINTH ST	0261-01-051	32.4888968	-96.9934672
765563R	AT-GRADE	UPRR	UPRR	238.61	ENNIS	PALMER	ELLIS	FM 813	1139-01-049	32.4313651	-96.6678476
765564X	AT-GRADE-*P	UPRR	UPRR	238.67	ENNIS	PALMER	ELLIS	W. DENTON ST	1139-01-049	32.4322292	-96.6681518
765562J	AT-GRADE-*P	UPRR	UPRR	238.55	ENNIS	PALMER	ELLIS	W. MARSHALL ST	1139-01-049	32.4304894	-96.6675363
765539P	RR UNDER	UPRR	UPRR	232.787	ENNIS	ENNIS	ELLIS	SS 469	0092-15-003	32.3530118	-96.637672
848219W	AT-GRADE-*P	UPRR	UPRR	232.306	ENNIS	ENNIS	ELLIS	CEDAR ROAD	0092-15-003	32.356077	-96.642037
765224L	AT-GRADE-*P	UPRR	UPRR	29.66	MIDLOTHIAN	Mansfield	Tarrant	SOUTH HOLLAND ROAD	1049-01-017	32.5494823	-97.629365

*P - Indicates parallel to roadway

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK

ADDITIONAL CROSSINGS IN PROJECT LIMITS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
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	DIST	COUNTY		SHEET NO.
	18	DENTON, etc		84

PART 1 - GENERAL

1.01 DESCRIPTION

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

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

1.02 REQUEST FOR INFORMATION / CLARIFICATION

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

1.03 PLANS / SPECIFICATIONS

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

PART 2 - UTILITIES AND FIBER OPTIC

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

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

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

3.05 RAILROAD SAFETY ORIENTATION

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

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

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

3.06 COOPERATION

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

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR)and 14'-0" (KCS) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

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

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

SHEET 1 OF 2

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

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	DIST	COUNTY		SHEET NO.
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DATE:
FILE:

3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
   1. Pre-construction meetings.
   2. Pile driving/drilling of caissons or drilled shafts.
   3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
   4. Erection of precast concrete or steel bridge superstructure.
   5. Placement of waterproofing (prior to placing ballast on bridge deck).
   6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

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

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

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

3.13 TRAFFIC CONTROL

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

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

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

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

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

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

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of ¼ inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.15 RAILROAD FLAGGING

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

3.16 CLEANING OF RIGHT-OF-WAY

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

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RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

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