

SECTION	PROJECT NO.	SHEET NO.
6	C 1054-1-9, etc.	1
STATE	COUNTY	
TEXAS	BOSQUE, etc.	
CONTRACT NO.	SECTION	PROJECT NO.
1054	01	009, etc. FM 219, etc.

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<b>GENERAL</b>	
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2-9	PROJECT COUNTY MAPS
10, 10A-10C	GENERAL NOTES AND SPECIFICATION DATA
11, 11A-11G	ESTIMATE & QUANTITY
12	SEAL COAT MATERIAL SELECTION TABLE
13-23	CONSOLIDATED SUMMARIES
24-25	RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS
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69	EPIC

**STATE OF TEXAS  
DEPARTMENT OF TRANSPORTATION**

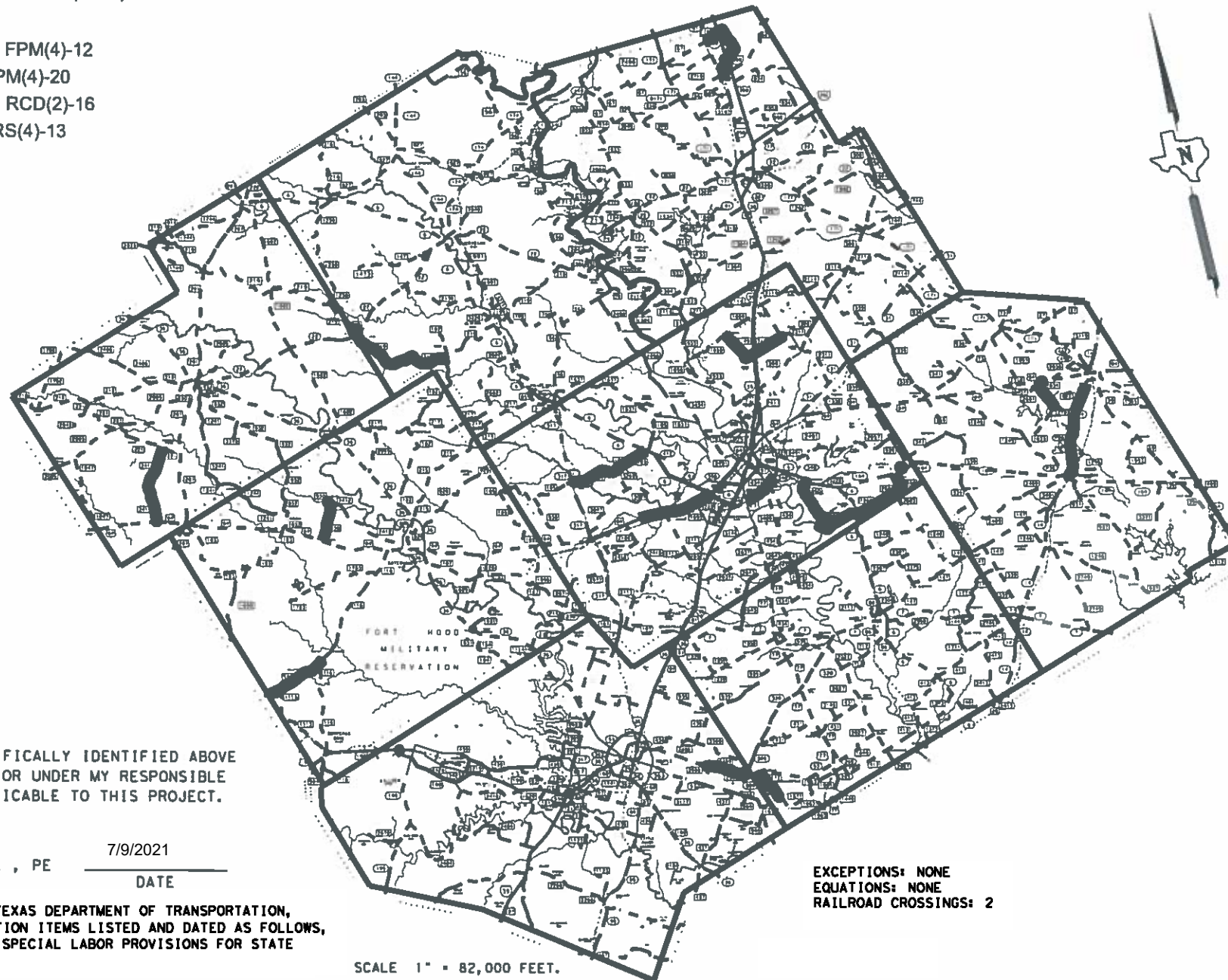
**PLANS OF PROPOSED  
STATE HIGHWAY IMPROVEMENT**

PROJECT NO: C 1054-1-9, etc.

BELL COUNTY -	2936-01-009
BOSQUE COUNTY -	1054-01-009, 1054-02-022
CORYELL COUNTY -	0774-07-015, 1032-02-009
FALLS COUNTY -	1660-01-014
HAMILTON COUNTY -	2308-01-007
HILL COUNTY -	1661-02-020
LIMESTONE COUNTY -	0093-04-049, 0093-05-051, 2754-01-010
MCLENNAN COUNTY -	0055-08-126, 0258-09-149, 0831-03-013, 0831-04-029, 0831-05-003, 1969-01-020, 3234-01-013

TOTAL LENGTH 566,931 FT.  
104.37 MILES

FOR THE CONSTRUCTION OF SEAL COAT TYPE WORK  
CONSISTING OF SEAL COAT



**2021 SEAL COAT**

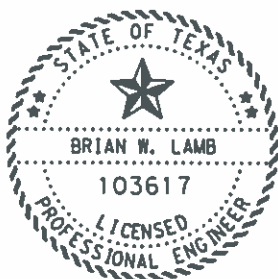
SIGNS G20-5T, G20-6T, R2-1, R20-5aP, R20-5t, R20-5aTP, G20-10T, R20-3T, AND G20-2 SHALL BE PLACED AT EACH END OF THE PROJECT UNDER CONSTRUCTION.

SIGNS CW20-1D, CW21-2, CW20-7d, CW20-7a, FLAGMAN AND CONES SHALL BE USED IN THE VICINITY OF ACTUAL WORK AS DIRECTED BY THE ENGINEER.

SIGNS CW20-1D AND G20-2 SHALL BE PLACED AT ALL ROAD INTERSECTIONS OF PROJECTS UNDER CONSTRUCTION.

SIGNS G20-1aT SHALL BE PLACED AT ALL STATE HIGHWAY INTERSECTIONS.

ALL DEVICES SHALL BE PLACED IN ACCORDANCE WITH THE TEXAS MUTCD AND AS DIRECTED BY THE ENGINEER.



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

*Brian W. Lamb, P.E.*, PE 7/9/2021  
DATE

EXCEPTIONS: NONE  
EQUATIONS: NONE  
RAILROAD CROSSINGS: 2

SCALE 1" = 82,000 FEET.

RECOMMENDED FOR LETTING 7/8/21  
*Julie Johnson, P.E.*  
AREA ENGINEER

RECOMMENDED FOR LETTING 7/19/21  
*Victor Yacub, P.E.*  
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

APPROVED FOR LETTING 7/19/2021  
DocuSigned by:  
*Stanley Swiatek*

COUNTY: \_\_\_\_\_ PROJ. NO.: \_\_\_\_\_ LETTING DATE: \_\_\_\_\_  
Hwy. No.: \_\_\_\_\_ DATE ACCEPTED: \_\_\_\_\_

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: SPECIAL LABOR PROVISIONS FOR STATE PROJECTS (000---008).

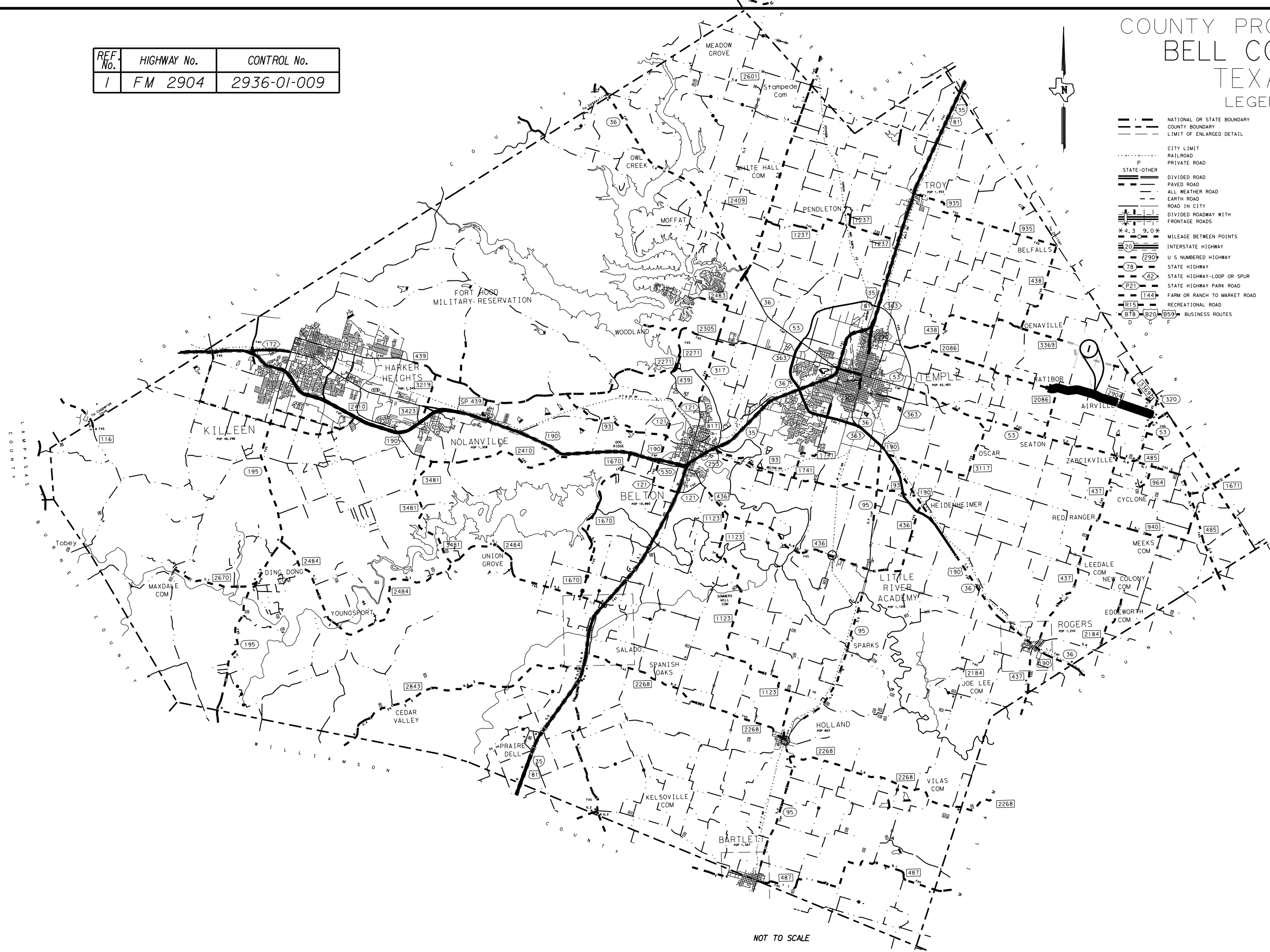
# COUNTY PROJECT MAP

## BELL COUNTY TEXAS

### LEGEND

REF. No.	HIGHWAY No.	CONTROL No.
1	FM 2904	2936-01-009

- NATIONAL OR STATE BOUNDARY
- COUNTY BOUNDARY
- LIMIT OF ENLARGED DETAIL
- CITY LIMIT
- RAILROAD
- PRIVATE ROAD
- STATE-OTHER
- DIVIDED ROAD
- PAVED ROAD
- ALL WEATHER ROAD
- EARTH ROAD
- ROAD IN CITY
- DIVIDED ROADWAY WITH FRONTAGE ROADS
- MILEAGE BETWEEN POINTS
- INTERSTATE HIGHWAY
- U S NUMBERED HIGHWAY
- STATE HIGHWAY
- STATE HIGHWAY-LOOP OR SPUR
- STATE HIGHWAY PARK ROAD
- FARM OR RANCH TO MARKET ROAD
- RECREATIONAL ROAD
- BUSINESS ROUTES
- COUNTY SEAT
- TOWN SYMBOLS
- BRIDGE OR CROSSING
- SEPARATION OVER 20'
- LOW WATER CROSSING
- INTERMITTENT STREAM
- FLOWING STREAM
- SHIP OR BARGE CHANNEL
- LAKE WITH DAM
- AREA SUBJECT TO INUNDATION
- INTERMITTENT LAKE
- PROMINENT ELEVATION
- ESCARPMENT OR BLUFF
- AIRPORT WITH FACILITIES
- MILITARY AIRBASE
- HISTORIC SITE
- SDHPT CO LINE MARKER
- U S CUSTOMS PORT OF ENTRY
- SDHPT TOURIST BUREAU
- CEMETERY
- SDHPT DISTRICT OFFICE
- SDHPT WAREHOUSE
- COUNTRY CLUB / GOLF COURSE



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Texas Department of Transportation 2021

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		2
STATE	DIST.	COUNTY
TEXAS	WAC	BOSQUE, etc.
CONT.	SECT.	JOB
1054	01	009, etc.
		FM 219, etc.

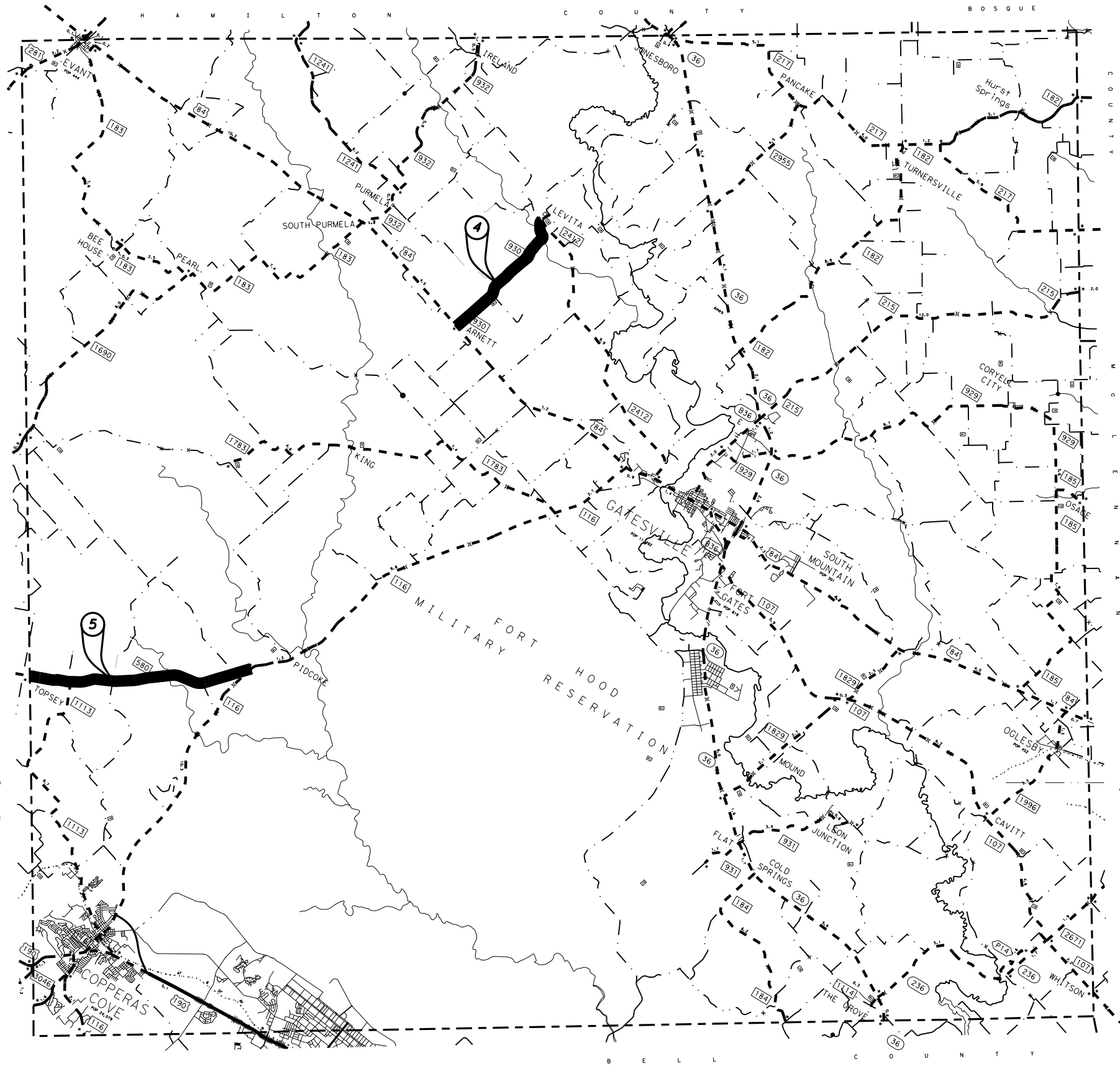


# COUNTY PROJECT MAP CORYELL COUNTY TEXAS

## LEGEND

- NATIONAL OR STATE BOUNDARY
- COUNTY BOUNDARY
- LIMIT OF ENLARGED DETAIL
- CITY LIMIT
- RAILROAD
- PRIVATE ROAD
- STATE-OTHER
- DIVIDED ROAD
- PAVED ROAD
- ALL WEATHER ROAD
- EARTH ROAD
- ROAD IN CITY
- DIVIDED ROADWAY WITH FRONTAGE ROADS
- MILEAGE BETWEEN POINTS
- INTERSTATE HIGHWAY
- U.S. NUMBERED HIGHWAY
- STATE HIGHWAY
- STATE HIGHWAY-LOOP OR SPUR
- STATE HIGHWAY PARK ROAD
- FARM OR RANCH TO MARKET ROAD
- RECREATIONAL ROAD
- BUSINESS ROUTES
- COUNTY SEAT
- TOWN SYMBOLS
- BRIDGE OR CROSSING SEPARATION OVER 20'
- LOW WATER CROSSING
- INTERMITTENT STREAM
- FLOWING STREAM
- SHIP OR BARGE CHANNEL
- LAKE WITH DAM
- AREA SUBJECT TO INUNDATION
- INTERMITTENT LAKE
- PROMINENT ELEVATION
- ESCARPMENT OR BLUFF
- AIRPORT WITH FACILITIES
- MILITARY AIRBASE
- HISTORIC SITE
- TXDOT CO LINE MARKER
- U.S. CUSTOMS PORT OF ENTRY
- TXDOT TOURIST BUREAU
- CEMETERY
- TXDOT DISTRICT OFFICE
- TXDOT WAREHOUSE
- COUNTRY CLUB / GOLF COURSE

REF. No.	HIGHWAY No.	CONTROL No.
4	FM 930	0774-07-015
5	FM 580	1032-02-009



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Texas Department of Transportation  
2021

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		4
STATE	DIST.	COUNTY
TEXAS	WAC	BOSQUE, etc.
CONT.	SECT.	JOB
1054	01	009, etc.
		HIGHWAY NO.
		FM 219, etc.



# COUNTY PROJECT MAP

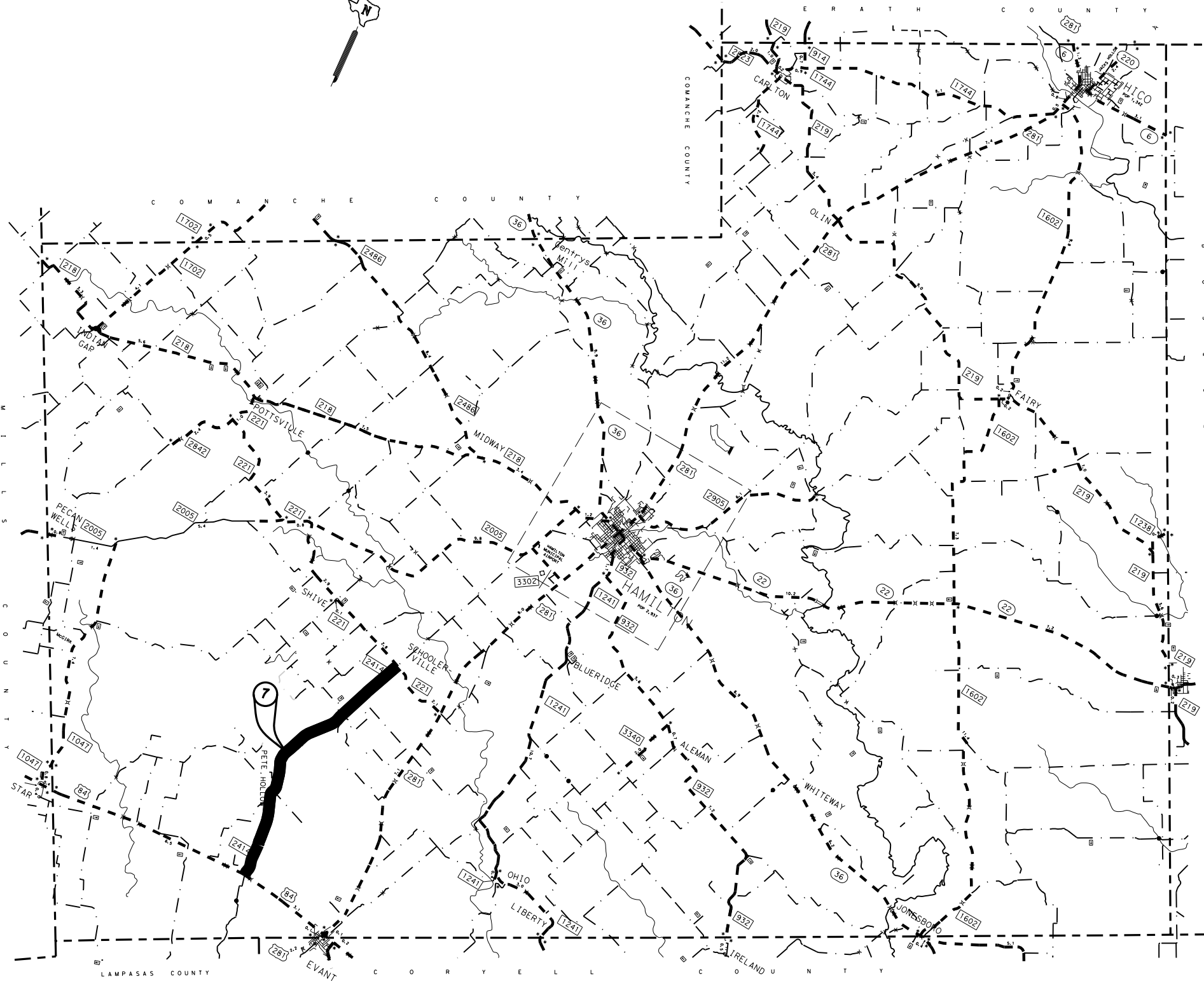
## HAMILTON COUNTY

### TEXAS

#### LEGEND

- NATIONAL OR STATE BOUNDARY
- COUNTY BOUNDARY
- LIMIT OF ENLARGED DETAIL
- CITY LIMIT
- RAILROAD
- PRIVATE ROAD
- STATE-OTHER
- DIVIDED ROAD
- PAVED ROAD
- ALL WEATHER ROAD
- EARTH ROAD
- ROAD IN CITY
- DIVIDED ROADWAY WITH FRONTAGE ROADS
- MILEAGE BETWEEN POINTS
- INTERSTATE HIGHWAY
- U S NUMBERED HIGHWAY
- STATE HIGHWAY
- STATE HIGHWAY-LOOP OR SPUR
- STATE HIGHWAY PARK ROAD
- FARM OR RANCH TO MARKET ROAD
- RECREATIONAL ROAD
- BUSINESS ROUTES
- COUNTY SEAT
- TOWN SYMBOLS
- BRIDGE OR CROSSING SEPARATION OVER 20'
- LOW WATER CROSSING
- INTERMITTENT STREAM
- FLOWING STREAM
- SHIP OR BARGE CHANNEL
- LAKE WITH DAM
- AREA SUBJECT TO INUNDATION
- INTERMITTENT LAKE
- PROMINENT ELEVATION
- ESCARPMENT OR BLUFF
- AIRPORT WITH FACILITIES
- MILITARY AIRBASE
- HISTORIC SITE
- SDHPT CO LINE MARKER
- U S CUSTOMS PORT OF ENTRY
- SDHPT TOURIST BUREAU
- CEMETERY
- SDHPT DISTRICT OFFICE
- SDHPT WAREHOUSE
- COUNTRY CLUB / GOLF COURSE

REF. No.	HIGHWAY No.	CONTROL No.
7	FM 2414	2308-01-007



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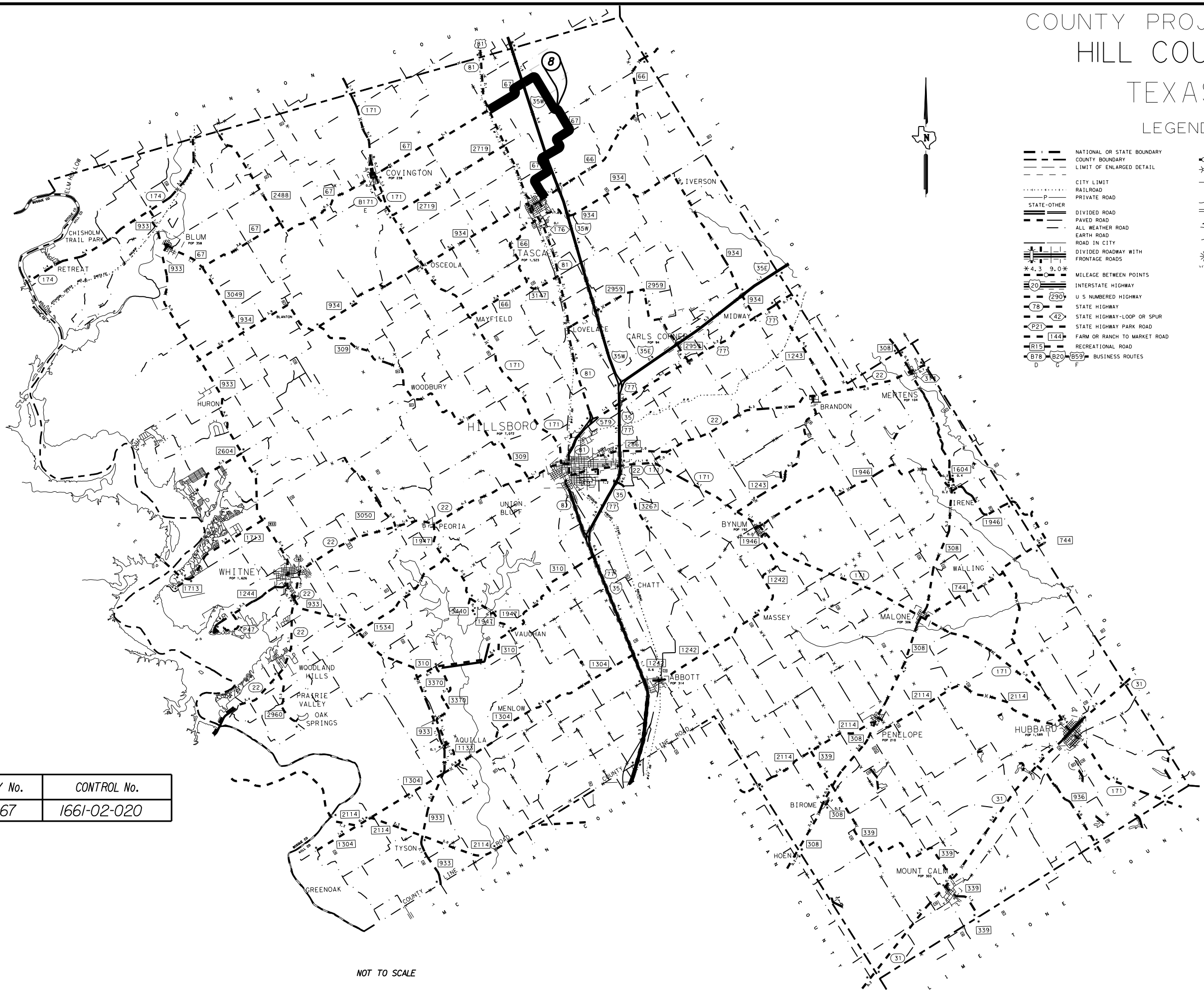
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FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6		6	
STATE	DIST.	COUNTY	
TEXAS	WAC	BOSQUE, etc.	
CONT.	SECT.	JOB	HIGHWAY NO.
1054	01	009, etc.	FM 219, etc.

# COUNTY PROJECT MAP HILL COUNTY TEXAS LEGEND

- NATIONAL OR STATE BOUNDARY
- - - COUNTY BOUNDARY
- - - LIMIT OF ENLARGED DETAIL
- CITY LIMIT
- RAILROAD
- PRIVATE ROAD
- STATE-OTHER
- DIVIDED ROAD
- PAVED ROAD
- ALL WEATHER ROAD
- EARTH ROAD
- ROAD IN CITY
- DIVIDED ROADWAY WITH FRONTAGE ROADS
- \* 4.3 9.0 \* MILEAGE BETWEEN POINTS
- INTERSTATE HIGHWAY
- U S NUMBERED HIGHWAY
- STATE HIGHWAY
- STATE HIGHWAY-LOOP OR SPUR
- STATE HIGHWAY PARK ROAD
- FARM OR RANCH TO MARKET ROAD
- RECREATIONAL ROAD
- BUSINESS ROUTES
- COUNTY SEAT
- TOWN SYMBOLS
- BRIDGE OR CROSSING SEPARATION OVER 20'
- LOW WATER CROSSING
- INTERMITTENT STREAM
- FLOWING STREAM
- SHIP OR BARGE CHANNEL
- LAKE WITH DAM
- AREA SUBJECT TO INUNDATION
- INTERMITTENT LAKE
- PROMINENT ELEVATION ESCARPMENT OR BLUFF
- 1212' AIRPORT WITH FACILITIES
- MILITARY AIRBASE
- HISTORIC SITE
- SDHPT CO LINE MARKER
- U S CUSTOMS PORT OF ENTRY
- SDHPT TOURIST BUREAU
- CEMETERY
- SDHPT DISTRICT OFFICE
- SDHPT WAREHOUSE
- COUNTRY CLUB / GOLF COURSE



REF. No.	HIGHWAY No.	CONTROL No.
8	FM 67	1661-02-020

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**Texas Department of Transportation**  
2021

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		7
STATE	DIST.	COUNTY
TEXAS	WAC	BOSQUE, etc.
CONT.	SECT.	JOB
1054	01	009, etc.
		FM 219, etc.

# COUNTY PROJECT MAP

## LIMESTONE COUNTY

### TEXAS

#### LEGEND

	NATIONAL OR STATE BOUNDARY		COUNTY SEAT
	COUNTY BOUNDARY		TOWN SYMBOLS
	LIMIT OF ENLARGED DETAIL		BRIDGE OR CROSSING SEPARATION OVER 20'
	CITY LIMIT		LOW WATER CROSSING
	RAILROAD		INTERMITTENT STREAM
	STATE-OTHER		FLOWING STREAM
	DIVIDED ROAD		SHIP OR BARGE CHANNEL
	PAVED ROAD		LAKE WITH DAM
	ALL WEATHER ROAD		AREA SUBJECT TO INUNDATION
	EARTH ROAD		INTERMITTENT LAKE
	ROAD IN CITY		PROMINENT ELEVATION ESCARPMENT OR BLUFF
	DIVIDED ROADWAY WITH FRONTAGE ROADS		MILEAGE BETWEEN POINTS
	INTERSTATE HIGHWAY		U.S. NUMBERED HIGHWAY
	U.S. NUMBERED HIGHWAY		STATE HIGHWAY
	STATE HIGHWAY		STATE HIGHWAY-LOOP OR SPUR
	STATE HIGHWAY-LOOP OR SPUR		STATE HIGHWAY PARK ROAD
	STATE HIGHWAY PARK ROAD		FARM OR RANCH TO MARKET ROAD
	FARM OR RANCH TO MARKET ROAD		RECREATIONAL ROAD
	BUSINESS ROUTES		COUNTRY CLUB / GOLF COURSE

REF. No.	HIGHWAY No.	CONTROL No.
9	SH 14	0093-04-049
10	SH 14	0093-05-051
11	FM 2705	2754-01-010

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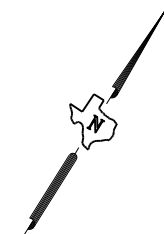
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Texas Department of Transportation  
2021

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		8
STATE	DIST.	COUNTY
TEXAS	WAC	BOSQUE, etc.
CONT.	SECT.	JOB
1054	01	009, etc.
		FM 219, etc.



# COUNTY PROJECT MAP McLENNAN COUNTY TEXAS



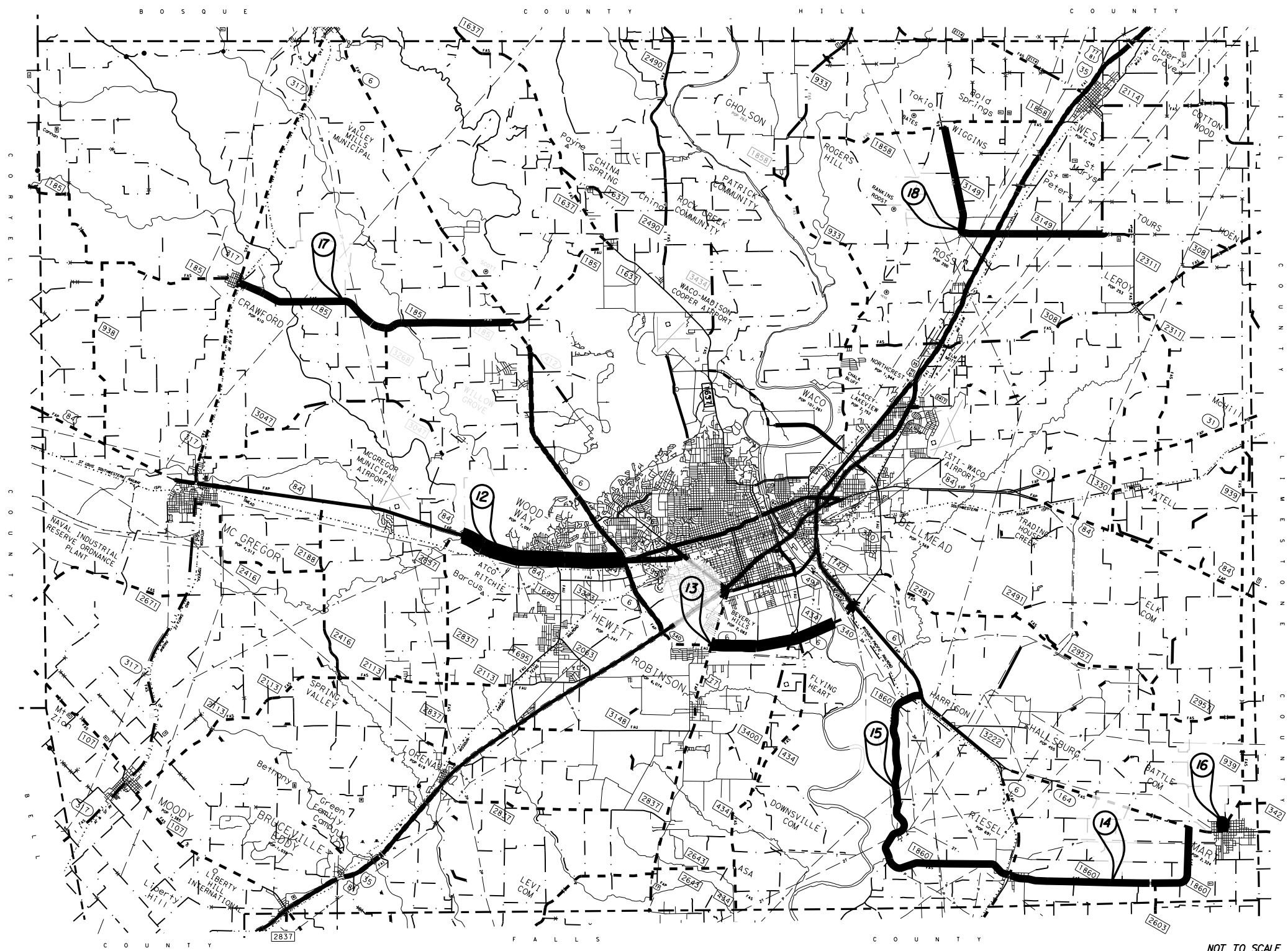
## LEGEND

- NATIONAL OR STATE BOUNDARY
- COUNTY BOUNDARY
- LIMIT OF ENLARGED DETAIL
- CITY LIMIT
- RAILROAD
- PRIVATE ROAD
- DIVIDED ROAD
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- ALL WEATHER ROAD
- EARTH ROAD
- ROAD IN CITY
- DIVIDED ROADWAY WITH FRONTAGE ROADS
- MILEAGE BETWEEN POINTS
- INTERSTATE HIGHWAY
- U.S. NUMBERED HIGHWAY
- STATE HIGHWAY
- STATE HIGHWAY-LOOP OR SPUR
- STATE HIGHWAY PARK ROAD
- FARM OR RANCH TO MARKET ROAD
- RECREATIONAL ROAD
- BUSINESS ROUTES
- COUNTY SEAT
- TOWN SYMBOLS
- BRIDGE OR CROSSING SEPARATION OVER 20'
- LOW WATER CROSSING
- INTERMITTENT STREAM
- FLOWING STREAM
- SHIP OR BARGE CHANNEL
- LAKE WITH DAM
- AREA SUBJECT TO INUNDATION
- INTERMITTENT LAKE
- PROMINENT ELEVATION ESCARPMENT OR BLUFF
- AIRPORT WITH FACILITIES
- MILITARY AIRBASE
- HISTORIC SITE
- SDHPT CO LINE MARKER
- U.S. CUSTOMS PORT OF ENTRY
- SDHPT TOURIST BUREAU
- CEMETERY
- SDHPT DISTRICT OFFICE
- SDHPT WAREHOUSE
- COUNTRY CLUB / GOLF COURSE

REF. No.	HIGHWAY No.	CONTROL No.
12	US 84	0055-08-126
13	SH 6	0258-09-152
14	FM 1860	0831-03-013
15	FM 1860	0831-04-029
16	FM 3529	0831-05-003
17	FM 185	1969-01-020
18	FM 3149	3234-01-013

### NOTES:

1. 0055-08-126 (REF NO 12) IS FRONTAGE ROADS ONLY
2. 0258-09-152 (REF NO 13) IS MAINLANES, SHOULDERS, AND RAMPS ONLY



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LEVELS DISPLAYED

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Texas Department of Transportation  
2021

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		9
STATE	DIST.	COUNTY
TEXAS	WAC	BOSQUE, etc.
CONT.	SECT.	JOB HIGHWAY NO.
1054	01	009, etc. FM 219, etc.

**BASIS OF ESTIMATE TABLES**

Table 1: Basis of Estimate for Seal Coats				
Item	Description	Rate	Basis	Quantities
316	<b>SEAL COAT</b>			
	ASPH (TIER I)	0.40 GAL / SY	637,407 SY	254,962 GAL
	ASPH (TIER II)	0.40 GAL / SY	1,246,235 SY	498,494 GAL
	AGGR (TY-PD GR 4 OR TY-PL GR 4)(SAC-B)	1 CY / 135 SY	913,545 SY	6,767 CY
	AGGR (TY PD GR 3 OR TY PL GR 3)	1 CY / 110 SY	971,410 SY	8,831 CY

**GENERAL**

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 0.0 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).

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.

Contractor questions on this project are to be emailed to the Waco District at the following address:

Bill Compton - [Wacoprebid@txdot.gov](mailto:Wacoprebid@txdot.gov), 254-867-2707, 100 S. Loop Dr., Waco, TX  
 Carmen Chau - [Wacoprebid@txdot.gov](mailto:Wacoprebid@txdot.gov), 254-867-2794, 100 S. Loop Dr., Waco, TX

Or Via phone or in person to the following individual(s):

Area Engineer's: Jarod Johnson, P.E. (254) 865-7115  
 Assistant Area Engineer's: Ross Langdale (254) 865-7115

All contractor questions will be reviewed by the Area Engineer or Assistant Area Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:  
[https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20 Responses/](https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/)

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

**ITEM 2: INSTRUCTIONS TO BIDDERS**

This proposed Contract will not include federal funds. Bid tabulations will include stipulations in accordance with 2.11.5.3 "Rubber Additives" and 2.11.5.5 "Home State Bidding Preference".

**ITEM 5: CONTROL OF THE WORK**

**UNION PACIFIC RAILROAD COMPANY**

Protection of Fiber Optic Cable Systems

Fiber optic cable systems may be buried on the railroad's property. Protection of the fiber optic cable systems is of extreme importance since any break could disrupt service to users resulting in business interruption and loss of revenue and profits. The State and/or its Contractor will telephone the railroad during normal business hours (7:00 A.M. to 9:00 P.M., Central time, Monday through Friday, except holidays) at 1-800-336-9193 (also a 24-hour, seven-day number for emergency calls) to determine if fiber optic cable is buried on the railroad's premises to be used by the State. If it is, the State and/or its Contractor will telephone the telecommunications company(ies) involved, arrange for a cable locator and make arrangements for relocation or other protection of the fiber optic cable prior to beginning any work on the railroad's premises.

**BURLINGTON NORTHERN AND SANTA FE RAILWAY COMPANY**

Protection of Fiber Optic Cable Systems

The State and/or its Contractor must, five (5) working days before any work is performed, call the railroad's communications network control center at 1-800-533-2891 (a 24-hour number) to assist in determining if fiber optic communications, control systems, or other type of cable systems are buried in the general locations where work is to be performed. In the event such cable is present, the State and/or its Contractor must then call the owner of the cable line to determine its exact location. The Contractor will indemnify and hold harmless the railroad against any cost or claims arising out of damage to any fiber optic communications, control systems or other types of cable systems, but only to the extent such damage is caused by negligence of the Contractor.

Work in this contract is required to be done on railroad property. Cooperate with the railroads and comply with all of their requirements including obtaining any training they require before performing work on railroad property.

**ITEM 6: CONTROL OF MATERIALS**

This Contract will not include federal funds. Buy Texas stipulations apply in accordance with 6.1.2 "Buy Texas".

References to manufacturer's trade name or catalog numbers are for the purpose of identification only and the contractor will be permitted to furnish like materials of other manufacturers provided they are of equal quality and comply with specifications for this project.

**ITEM 7: LEGAL RELATIONS AND RESPONSIBILITIES**

No significant traffic generator events identified.

**ITEM 8: PROSECUTION AND PROGRESS**

This project includes Special Provision 008-005.

This Project will be a Standard Workweek in accordance with Article 8.3.1.4.

The latest roadway-start-work date is June 1, 2021.

For this project, provide a Bar Chart progress schedule.

All construction equipment involved in roadway work will be equipped with an audible backup warning device that is in good operating condition and a permanently mounted approved 360 degrees revolving or strobe warning light with amber lens. This light will have a mounting height of not less than six feet above the roadway surface and will be visible from all sides.

In addition to other safety requirements, all trucks used for hauling material and /or equipment to or from these projects will be equipped with an audible backup warning device that is in good operating condition.

**ITEM 300: ASPHALTS, OILS, AND EMULSIONS**

AC-20-5TR material will meet ASTM TEST-D-5546 with minimum solubility of 98%.

Latex additives or modifiers will not be allowed on this project.

**ITEM 302: AGGREGATES FOR SURFACE TREATMENTS**

The pre-coated aggregate target value of residual bitumen will be in the range of 0.5 % to 1.5 % by weight from a pre-coating material.

Material produced by test method TEX-217-F Part II, passing No. 40 sieve, is restricted to no more than 1% by weight.

The course aggregates to be used in surface courses will have a minimum surface aggregate classification requirement of class B for all travel lanes and shoulders. No gravel will be permitted.

Flakiness index will be 12 maximum.

**ITEM 316: SEAL COAT**

*Rates of application and quantities shown on the plans of surface treatment are for estimating purposes only.* It will be the contractor's responsibility to verify all quantities prior to ordering and delivering materials. The asphalt rates will be adjusted as necessary to fit existing field conditions as agreed upon by the contractor's designated project superintendent and the department's designated project manager.

For each project, intersections, ramps, and crossovers will be resurfaced prior to resurfacing the roadway unless otherwise authorized. It is TxDOT's intent to seal from edge of pavement to edge of pavement including all transitions and widenings, regardless of plan width, unless otherwise directed.

Protect all existing bridges, curbs, and other exposed concrete surfaces within the limits of these projects from asphalt materials by any method that is approved. Remove any excessive asphalt materials deposited on these surfaces at the Contractor's expense in a manner approved.

For this contract, wind velocities in excess of 20 mph will be construed as inclement weather and work will be suspended. Wind velocities will be determined at the nearest airport to the area. All surface material will be broomed using a vacuum broom within city limit sections and a rotary broom in all other sections. Brooming will not be paid for directly, but shall be considered subsidiary to the various bid items of the contract.

Stockpile sites for material will be approved and will be located as far as possible from the travel way and in no instance closer than 30 FT measured from pavement edge unless otherwise authorized. They will be kept clear of improved abutting property and, in general, locations at intersections will be avoided in order that sight distance will not be impaired. The contractor will notify the engineer at least 5 days prior to stockpiling of materials closer than 30 FT from the pavement edge provided that adequate barricades and warning signs and devices are provided by the contractor and approved.

Stockpile sites for material will be leveled and cleared of all vegetation prior to materials being stockpiled. Stockpile sites will be kept clear of debris and vegetative growth in a manner approved.

Stockpile locations will be cleared and sites will be re-vegetated prior to partial acceptance of individual projects. This work will not be paid for directly, but will be considered subsidiary to the various bid items of the contract.

A water truck will be made available at all times for wetting uncoated aggregate stock piles as directed. This work will not be paid for directly but will be considered subsidiary to the other contract items.

Repairs to flushing pavement will be made by the contractor on a new seal coat "Before" going to the next road on the contract. The patching will be completed "Before" leaving each reference.

A patch truck and crew, of a make-up that is approved, will be required behind the aggregate spreader box as directed.

During application of the surface treatment, if existing conditions warrant, the lane widths, transitions, and intersection areas may be varied as directed.

Use a medium pneumatic roller meeting the requirements of Item 210, "Rolling", as directed. This work will be subsidiary to the various bid items.

There will be a minimum of 4 pneumatic rollers on every asphalt shot. Rolling patterns will be approved. Successive asphalt shots will not be allowed until acceptable rolling has been accomplished on the preceding asphalt shot.

All aggregate for each reference will come from the same source or blended sources.

Warm Season asphalt will be applied between May 1 and September 15 unless approved in writing.

Cool Season asphalt will be applied between September 15 and May 1 unless approved in writing.

No AC or Emulsion for surface treatment items will be placed between September 15 and May 1 unless approved in writing.

All trucks hauling materials to be paid for by truck measurement will be "struck off" prior to delivery to the project.

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.

In addition to the temperature requirements of this Item, AC Asphalts used in Surface Treatments and Sealcoats must be placed between May 15 and August 31. Emulsions may be substituted for AC Asphalts outside this timeframe only with the approval of the Engineer.

#### **ITEM 500: MOBILIZATION**

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

#### **ITEM 502: BARRICADES, SIGNS, AND TRAFFIC HANDLING**

The Contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic

Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

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

After the installation of the work zone pavement markings (item 662), a 90-day work suspension will go into effect. The contract signs will remain in place during this time suspension, but all other 502 items may be removed. The final pavement markings will be installed after this 90-day work suspension.

All signs indicating no center line stripe will be removed within 24 hours of the placement of standard centerline pavement striping.

Contractor will limit lane closure distance so that pilot vehicle turnaround times are less than 8 minutes when measured from same location.

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

The Contractor Responsible Person(s) (CRP) for Work Zone Traffic Controls will inspect and ensure any deficiencies are corrected each and every day throughout the duration of this contract. Any misaligned or damaged traffic control devices will be repaired as soon as practical after deficiency is discovered.

In addition to providing a Contractor's Responsible Person and a phone number for emergency contact, have an employee(s) available to respond on the project for emergencies and for taking corrective measures within One (1) Hour.

#### **ITEM 506: TEMPORARY EROSION, SEDIMENTATION AND ENVIRONMENTAL CONTROLS**

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.

Cleaning and sweeping of open roadways due to material spillage or loss from Contractor equipment or tires will be the responsibility of the Contractor at no cost to TxDOT. This work will not be charged as Item 738, "Cleaning and Sweeping Highways". Cleaning and sweeping of roadways will be completed as directed, including multiple times per day if necessary, to maintain acceptable roadways for the traveling public and to meet environmental regulations. Construction activities will cease when material deposited on the roadway is not properly removed or when equipment is not available as needed. Adequate construction exits will be planned, constructed

and maintained by the Contractor per Item 506, "Temporary Erosion, Sedimentation, and Environmental Controls".

**ITEM 662: WORK ZONE PAVEMENT MARKINGS**

For this project the contractor will be responsible for furnishing and placing work zone pavement markings (short term) (tab) in accordance with TCP (7-1)-13.

The contractor will be responsible for cutting tabs flush with the pavement immediately after placement of the raised pavement markings or as directed. This work will not be paid for directly, but will be considered subsidiary to the various bid items. The contractor will be responsible for the disposal of all tabs.

Paint and beads may be used for non-removable pavement markings.

**ITEM 666: RETROREFLECTORIZED PAVEMENT MARKINGS**

The Contractor will layout the proposed striping in accordance with TxDOT Traffic Control Plan Standards and latest version Texas Manual on Uniform Traffic Control Devices (TMUTCD) and project striping layout sheets. The Engineer will verify proposed striping layout prior to the beginning of striping operations.

The Contractor will locate the beginning and ending points of No Pass Zones.

**ITEM 668: PREFABRICATED PAVEMENT MARKINGS**

Use Type C prefabricated pavement markings (TxDOT Spec DMS-8240) for all Words, Arrows, and RR Crossing markings.

**ITEM 672: RAISED PAVEMENT MARKERS**

Existing raised pavement markers will be removed in accordance with Item 677, "Eliminating Existing Pavement Markings and Markers". Immediately fill the damaged area in the pavement due to the removal of existing markers with an approved bituminous material. This removal and backfill work will not be paid directly, but will be subsidiary to Item 672, "Raised Pavement Markers".

**ITEM 6001: PORTABLE CHANGEABLE MESSAGE SIGN**

This project will require "full matrix" type portable changeable message signs.

Signs shall be placed at least two (2) working days before work begins thru duration of work.

Ensure that the Contractor's Responsible Person for traffic control can revise messages within thirty (30) minutes of notification.

Supply portable changeable message sign(s) in accordance with the Traffic Control Plan standard sheets and Article 6f.55 of the Texas Manual on Uniform Traffic Control Devices for Streets and Highways Part VI.

**ITEM 6185: TRUCK MOUNTED ATTENUATORS**

The total number of truck mounted attenuators (TMA) required when utilizing the traffic control standards are shown in the tables below.

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

Shadow vehicles equipped for truck mounted attenuators (TMA) for stationary operations will be paid for by the day and must be available for use at any time as determined by the Engineer.

Mobile operations will be paid for by the hour, per specifications. For mobile operations, payment will be made only while the TMA is in use.

For mobile operations requiring multiple TMA's, judgement may be applied in lower speed, urban / in town traffic environments to reduce the numbers of TMA in use where the added TMA may pose a hazard for traffic entering and exiting driveways, side streets, etc.

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 TMA needed for the project for those times per plan requirements. Additional TMAs used that are not specified in the plans in which the contractor expects compensation will require prior approval from the Engineer.



# Estimate & Quantity Sheet

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DISTRICT Waco

COUNTY Bell, Bosque, Coryell, Falls, Hamilton, Hill, Limestone, McLennan

HIGHWAY FM 1772, FM 185, FM 1860, FM 219, FM 2414, FM 2705, FM 2904, FM 3149, FM 3529, FM 580, FM 67, FM 930, SH 14, SH 6, US 84

CONTROL SECTION JOB				0055-08-126		0093-04-049		0093-05-051		0258-09-152		0774-07-015		0831-03-013	
PROJECT ID				A00134088		A00176124		A00176120		A00138852		A00176109		A00129471	
COUNTY				McLennan		Limestone		Limestone		McLennan		Coryell		McLennan	
HIGHWAY				US 84		SH 14		SH 14		SH 6		FM 930		FM 1860	
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-6004	ASPH (TIER I)	GAL	75,311.000		62,356.000		51,574.000		65,721.000					
	316-6005	ASPH (TIER II)	GAL									21,567.000		39,752.000	
	316-6398	AGGR (TY-PD GR-4 OR TY-PL GR-4)(SAC-B)	CY	1,395.000		1,155.000		956.000		1,218.000				737.000	
	316-6407	AGGR (TY-PD GR-3 OR TY-PL GR-3)	CY									491.000			
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	662-6001	WK ZN PAV MRK NON-REMOV (W)4"(BRK)	LF	11,004.000		164.000				8,993.000					
	662-6004	WK ZN PAV MRK NON-REMOV (W)4"(SLD)	LF	52,293.000		61,206.000		60,939.000		25,655.000		48,524.000		77,426.000	
	662-6011	WK ZN PAV MRK NON-REMOV (W)8"(LNDP)	LF	684.000				94.000							
	662-6012	WK ZN PAV MRK NON-REMOV (W)8"(SLD)	LF	15,506.000		90.000		854.000		8,641.000					
	662-6013	WK ZN PAV MRK NON-REMOV (W)12"(LNDP)	LF							1,216.000					
	662-6014	WK ZN PAV MRK NON-REMOV (W)12"(SLD)	LF							1,245.000					
	662-6016	WK ZN PAV MRK NON-REMOV (W)24"(SLD)	LF	1,236.000				583.000				30.000		182.000	
	662-6017	WK ZN PAV MRK NON-REMOV (W)(ARROW)	EA	25.000		1.000		15.000		2.000					
	662-6018	WK ZN PAV MRK NON-REMOV (W)(DBL ARW)	EA	7.000											
	662-6025	WK ZN PAV MRK NON-REMOV (W)(TPL ARW)	EA	1.000											
	662-6026	WK ZN PAV MRK NON-REMOV (W)(UTURN ARW)	EA	5.000						4.000					
	662-6031	WK ZN PAV MRK NON-REMOV(W)36"(YLD TRI)	EA	200.000										15.000	
	662-6032	WK ZN PAV MRK NON-REMOV (Y)4"(BRK)	LF			6,282.000		5,021.000				2,697.000		6,317.000	
	662-6034	WK ZN PAV MRK NON-REMOV (Y)4"(SLD)	LF	56,231.000		24,282.000		21,203.000		35,799.000		34,282.000		38,942.000	
	662-6041	WK ZN PAV MRK NON-REMOV (Y)24"(SLD)	LF	1,562.000											
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	293.000		5.000		3.000		256.000					
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA			754.000		498.000				605.000		942.000	
	666-6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	684.000				94.000							
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	15,506.000		90.000		854.000		8,641.000		371.000			
	666-6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF							1,216.000					
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF							1,245.000					
	666-6147	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	LF	1,562.000											
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	11,004.000		164.000				8,993.000					
	666-6342	REF PROF PAV MRK TY I(W)4"(SLD)(100MIL)	LF	47,043.000		61,206.000		60,939.000		21,655.000		48,524.000		77,426.000	
	666-6344	REF PROF PAV MRK TY I(Y)4"(BRK)(100MIL)	LF			6,282.000		5,021.000				2,697.000		6,317.000	
	666-6345	REF PROF PAV MRK TY I(Y)4"(SLD)(100MIL)	LF	49,731.000		24,282.000		21,203.000		35,799.000		34,282.000		38,942.000	
	666-6430	REFL PAV MRK TY I (W)24"(SLD)(110MIL)	LF	1,236.000				583.000				30.000		182.000	
	666-6433	RE PM W/RET REQ TY I(W) 4"(SLD)(110MIL)	LF	5,250.000						4,000.000					
	666-6435	RE PM W/RET REQ TY I(Y) 4"(SLD)(110MIL)	LF	6,500.000											
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	25.000		1.000		15.000		2.000					
	668-6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	7.000											



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CONTROL SECTION JOB				0055-08-126		0093-04-049		0093-05-051		0258-09-152		0774-07-015		0831-03-013	
PROJECT ID				A00134088		A00176124		A00176120		A00138852		A00176109		A00129471	
COUNTY				McLennan		Limestone		Limestone		McLennan		Coryell		McLennan	
HIGHWAY				US 84		SH 14		SH 14		SH 6		FM 930		FM 1860	
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	668-6079	PREFAB PAV MRK TY C (W) (TPL ARROW)	EA	1.000											
	668-6080	PREFAB PAV MRK TY C (W) (UTURN ARROW)	EA	5.000						4.000					
	668-6083	PREFAB PAV MRK TY C (W) (LNDP ARROW)	EA			2.000									
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	31.000		1.000		7.000		5.000					
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)	EA												
	668-6092	PREFAB PAV MRK TY C (W) (36")(YLD TRI)	EA	200.000										15.000	
	672-6007	REFL PAV MRKR TY I-C	EA	57.000		9.000									
	672-6009	REFL PAV MRKR TY II-A-A	EA	530.000		732.000		678.000				564.000		803.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	1,326.000						448.000					
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	4.000		4.000		3.000		4.000		3.000		3.000	
	6056-6002	PREFORMED CENTERLINE RUMBLE STRIP	LF			1,742.000		491.000				412.000		1,393.000	
	6185-6003	TMA (MOBILE OPERATION)	HR	30.000		30.000		30.000		30.000		30.000		30.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS												
		ENVIRONMENTAL: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS												



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CONTROL SECTION JOB				0831-04-029		0831-05-003		1032-02-009		1054-01-009		1054-02-022		1660-01-014	
PROJECT ID				A00129472		A00129479		A00176085		A00004648		A00004649		A00134196	
COUNTY				McLennan		McLennan		Coryell		Bosque		Bosque		Falls	
HIGHWAY				FM 1860		FM 3529		FM 580		FM 219		FM 219		FM 1772	
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-6004	ASPH (TIER I)	GAL												
	316-6005	ASPH (TIER II)	GAL	59,707.000		3,871.000		42,117.000		6,225.000		64,286.000		17,233.000	
	316-6398	AGGR (TY-PD GR-4 OR TY-PL GR-4)(SAC-B)	CY			72.000									
	316-6407	AGGR (TY-PD GR-3 OR TY-PL GR-3)	CY	1,357.000				958.000		142.000		1,462.000		392.000	
	500-6001	MOBILIZATION	LS							1.000					
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO							8.000					
	662-6001	WK ZN PAV MRK NON-REMOV (W)4"(BRK)	LF												
	662-6004	WK ZN PAV MRK NON-REMOV (W)4"(SLD)	LF	107,333.000		5,270.000		75,811.000		10,993.000		124,112.000		38,576.000	
	662-6011	WK ZN PAV MRK NON-REMOV (W)8"(LNDP)	LF	194.000											
	662-6012	WK ZN PAV MRK NON-REMOV (W)8"(SLD)	LF	762.000				371.000		1,156.000					
	662-6013	WK ZN PAV MRK NON-REMOV (W)12"(LNDP)	LF												
	662-6014	WK ZN PAV MRK NON-REMOV (W)12"(SLD)	LF												
	662-6016	WK ZN PAV MRK NON-REMOV (W)24"(SLD)	LF	169.000		13.000		21.000		61.000		28.000		37.000	
	662-6017	WK ZN PAV MRK NON-REMOV (W)(ARROW)	EA	2.000											
	662-6018	WK ZN PAV MRK NON-REMOV (W)(DBL ARW)	EA												
	662-6025	WK ZN PAV MRK NON-REMOV (W)(TPL ARW)	EA												
	662-6026	WK ZN PAV MRK NON-REMOV (W)(UTURN ARW)	EA												
	662-6031	WK ZN PAV MRK NON-REMOV(W)36"(YLD TRI)	EA	6.000				5.000						15.000	
	662-6032	WK ZN PAV MRK NON-REMOV (Y)4"(BRK)	LF	2,575.000				3,611.000				7,926.000		2,320.000	
	662-6034	WK ZN PAV MRK NON-REMOV (Y)4"(SLD)	LF	95,684.000		4,347.000		59,425.000		10,993.000		79,792.000		25,832.000	
	662-6041	WK ZN PAV MRK NON-REMOV (Y)24"(SLD)	LF	338.000											
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	5.000											
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	1,283.000		55.000		950.000		138.000		1,538.000		475.000	
	666-6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	194.000											
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	762.000						1,156.000					
	666-6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF												
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF												
	666-6147	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	LF	338.000											
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF												
	666-6342	REF PROF PAV MRK TY I(W)4"(SLD)(100MIL)	LF	107,333.000		5,270.000		75,811.000		10,993.000		124,112.000		38,576.000	
	666-6344	REF PROF PAV MRK TY I(Y)4"(BRK)(100MIL)	LF	2,575.000				3,611.000				7,926.000		2,320.000	
	666-6345	REF PROF PAV MRK TY I(Y)4"(SLD)(100MIL)	LF	95,684.000		4,347.000		59,425.000		10,993.000		79,792.000		25,832.000	
	666-6430	REFL PAV MRK TY I (W)24"(SLD)(110MIL)	LF	169.000		13.000		21.000		61.000		28.000		37.000	
	666-6433	RE PM W/RET REQ TY I(W) 4"(SLD)(110MIL)	LF												
	666-6435	RE PM W/RET REQ TY I(Y) 4"(SLD)(110MIL)	LF												
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	2.000											
	668-6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA												





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CONTROL SECTION JOB				0831-04-029		0831-05-003		1032-02-009		1054-01-009		1054-02-022		1660-01-014	
PROJECT ID				A00129472		A00129479		A00176085		A00004648		A00004649		A00134196	
COUNTY				McLennan		McLennan		Coryell		Bosque		Bosque		Falls	
HIGHWAY				FM 1860		FM 3529		FM 580		FM 219		FM 219		FM 1772	
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	668-6079	PREFAB PAV MRK TY C (W) (TPL ARROW)	EA												
	668-6080	PREFAB PAV MRK TY C (W) (UTURN ARROW)	EA												
	668-6083	PREFAB PAV MRK TY C (W) (LNDP ARROW)	EA												
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	2.000											
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)	EA	4.000											
	668-6092	PREFAB PAV MRK TY C (W) (36")(YLD TRI)	EA	6.000				5.000						15.000	
	672-6007	REFL PAV MRKR TY I-C	EA	29.000											
	672-6009	REFL PAV MRKR TY II-A-A	EA	1,477.000		55.000		924.000		138.000		1,394.000		439.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA												
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	4.000		3.000		3.000		3.000		4.000		3.000	
	6056-6002	PREFORMED CENTERLINE RUMBLE STRIP	LF	86.000				260.000				1,436.000		359.000	
	6185-6003	TMA (MOBILE OPERATION)	HR	30.000		30.000		30.000		30.000		30.000		30.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS							1.000					
		ENVIRONMENTAL: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS							1.000					



# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 1054-01-009

DISTRICT Waco

COUNTY Bell, Bosque, Coryell, Falls, Hamilton, Hill, Limestone, McLennan

HIGHWAY FM 1772, FM 185, FM 1860, FM 219, FM 2414, FM 2705, FM 2904, FM 3149, FM 3529, FM 580, FM 67, FM 930, SH 14, SH 6, US 84

CONTROL SECTION JOB				1661-02-020		1969-01-020		2308-01-007		2754-01-010		2936-01-009		3234-01-013	
PROJECT ID				A00134207		A00134065		A00135037		A00129470		A00135032		A00129475	
COUNTY				Hill		McLennan		Hamilton		Limestone		Bell		McLennan	
HIGHWAY				FM 67		FM 185		FM 2414		FM 2705		FM 2904		FM 3149	
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	316-6004	ASPH (TIER I)	GAL												
	316-6005	ASPH (TIER II)	GAL	44,918.000		66,614.000		41,899.000		23,679.000		23,766.000		42,860.000	
	316-6398	AGGR (TY-PD GR-4 OR TY-PL GR-4)(SAC-B)	CY			1,234.000									
	316-6407	AGGR (TY-PD GR-3 OR TY-PL GR-3)	CY	1,021.000				953.000		539.000		541.000		975.000	
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	662-6001	WK ZN PAV MRK NON-REMOV (W)4"(BRK)	LF												
	662-6004	WK ZN PAV MRK NON-REMOV (W)4"(SLD)	LF	91,788.000		96,286.000		89,782.000		35,334.000		46,000.000		79,143.000	
	662-6011	WK ZN PAV MRK NON-REMOV (W)8"(LNDP)	LF			366.000									
	662-6012	WK ZN PAV MRK NON-REMOV (W)8"(SLD)	LF			365.000						93.000			
	662-6013	WK ZN PAV MRK NON-REMOV (W)12"(LNDP)	LF												
	662-6014	WK ZN PAV MRK NON-REMOV (W)12"(SLD)	LF												
	662-6016	WK ZN PAV MRK NON-REMOV (W)24"(SLD)	LF	31.000		50.000		80.000		56.000		38.000		91.000	
	662-6017	WK ZN PAV MRK NON-REMOV (W)(ARROW)	EA			4.000									
	662-6018	WK ZN PAV MRK NON-REMOV (W)(DBL ARW)	EA												
	662-6025	WK ZN PAV MRK NON-REMOV (W)(TPL ARW)	EA												
	662-6026	WK ZN PAV MRK NON-REMOV (W)(UTURN ARW)	EA												
	662-6031	WK ZN PAV MRK NON-REMOV(W)36"(YLD TRI)	EA			17.000						13.000			
	662-6032	WK ZN PAV MRK NON-REMOV (Y)4"(BRK)	LF	3,686.000		8,779.000		6,191.000		2,259.000		2,238.000		7,873.000	
	662-6034	WK ZN PAV MRK NON-REMOV (Y)4"(SLD)	LF	69,425.000		41,472.000		61,604.000		21,954.000		32,653.000		38,220.000	
	662-6041	WK ZN PAV MRK NON-REMOV (Y)24"(SLD)	LF												
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA			10.000									
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	1,128.000		1,169.000		1,132.000		428.000		566.000		975.000	
	666-6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF			366.000									
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF			365.000						93.000			
	666-6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF												
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF												
	666-6147	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	LF												
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF												
	666-6342	REF PROF PAV MRK TY I(W)4"(SLD)(100MIL)	LF	91,788.000		96,286.000		89,782.000		35,334.000		46,000.000		79,143.000	
	666-6344	REF PROF PAV MRK TY I(Y)4"(BRK)(100MIL)	LF	3,686.000		8,779.000		6,191.000		2,259.000		2,238.000		7,873.000	
	666-6345	REF PROF PAV MRK TY I(Y)4"(SLD)(100MIL)	LF	69,425.000		41,472.000		61,604.000		21,954.000		32,653.000		38,220.000	
	666-6430	REFL PAV MRK TY I (W)24"(SLD)(110MIL)	LF	31.000		50.000		80.000		56.000		38.000		91.000	
	666-6433	RE PM W/RET REQ TY I(W) 4"(SLD)(110MIL)	LF												
	666-6435	RE PM W/RET REQ TY I(Y) 4"(SLD)(110MIL)	LF												
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA			4.000									
	668-6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA												



# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 1054-01-009

DISTRICT Waco

COUNTY Bell, Bosque, Coryell, Falls, Hamilton, Hill, Limestone, McLennan

HIGHWAY FM 1772, FM 185, FM 1860, FM 219, FM 2414, FM 2705, FM 2904, FM 3149, FM 3529, FM 580, FM 67, FM 930, SH 14, SH 6, US 84

CONTROL SECTION JOB				1661-02-020		1969-01-020		2308-01-007		2754-01-010		2936-01-009		3234-01-013	
PROJECT ID				A00134207		A00134065		A00135037		A00129470		A00135032		A00129475	
COUNTY				Hill		McLennan		Hamilton		Limestone		Bell		McLennan	
HIGHWAY				FM 67		FM 185		FM 2414		FM 2705		FM 2904		FM 3149	
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	668-6079	PREFAB PAV MRK TY C (W) (TPL ARROW)	EA												
	668-6080	PREFAB PAV MRK TY C (W) (UTURN ARROW)	EA												
	668-6083	PREFAB PAV MRK TY C (W) (LNDP ARROW)	EA												
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA					4.000							
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)	EA											2.000	
	668-6092	PREFAB PAV MRK TY C (W) (36")(YLD TRI)	EA			17.000						13.000			
	672-6007	REFL PAV MRKR TY I-C	EA			27.000									
	672-6009	REFL PAV MRKR TY II-A-A	EA	1,053.000		1,081.000		1,080.000		388.000		521.000		831.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA												
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	3.000		4.000		3.000		3.000		3.000		3.000	
	6056-6002	PREFORMED CENTERLINE RUMBLE STRIP	LF	750.000		2,524.000		518.000		397.000		457.000		1,444.000	
	6185-6003	TMA (MOBILE OPERATION)	HR	30.000		30.000		30.000		30.000		30.000		30.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS												
		ENVIRONMENTAL: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS												



CONTROLLING PROJECT ID 1054-01-009

DISTRICT Waco

COUNTY Bell, Bosque, Coryell, Falls, Hamilton, Hill, Limestone, McLennan

HIGHWAY FM 1772, FM 185, FM 1860, FM 219, FM 2414, FM 2705, FM 2904, FM 3149, FM 3529, FM 580, FM 67, FM 930, SH 14, SH 6, US 84

# Estimate & Quantity Sheet

CONTROL SECTION JOB				TOTAL EST.	TOTAL FINAL
PROJECT ID					
COUNTY					
HIGHWAY					
ALT	BID CODE	DESCRIPTION	UNIT		
	316-6004	ASPH (TIER I)	GAL	254,962.000	
	316-6005	ASPH (TIER II)	GAL	498,494.000	
	316-6398	AGGR (TY-PD GR-4 OR TY-PL GR-4)(SAC-B)	CY	6,767.000	
	316-6407	AGGR (TY-PD GR-3 OR TY-PL GR-3)	CY	8,831.000	
	500-6001	MOBILIZATION	LS	1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	8.000	
	662-6001	WK ZN PAV MRK NON-REMOV (W)4"(BRK)	LF	20,161.000	
	662-6004	WK ZN PAV MRK NON-REMOV (W)4"(SLD)	LF	1,126,471.000	
	662-6011	WK ZN PAV MRK NON-REMOV (W)8"(LNDP)	LF	1,338.000	
	662-6012	WK ZN PAV MRK NON-REMOV (W)8"(SLD)	LF	27,838.000	
	662-6013	WK ZN PAV MRK NON-REMOV (W)12"(LNDP)	LF	1,216.000	
	662-6014	WK ZN PAV MRK NON-REMOV (W)12"(SLD)	LF	1,245.000	
	662-6016	WK ZN PAV MRK NON-REMOV (W)24"(SLD)	LF	2,706.000	
	662-6017	WK ZN PAV MRK NON-REMOV (W)(ARROW)	EA	49.000	
	662-6018	WK ZN PAV MRK NON-REMOV (W)(DBL ARW)	EA	7.000	
	662-6025	WK ZN PAV MRK NON-REMOV (W)(TPL ARW)	EA	1.000	
	662-6026	WK ZN PAV MRK NON-REMOV (W)(UTURN ARW)	EA	9.000	
	662-6031	WK ZN PAV MRK NON-REMOV(W)36"(YLD TRI)	EA	271.000	
	662-6032	WK ZN PAV MRK NON-REMOV (Y)4"(BRK)	LF	67,775.000	
	662-6034	WK ZN PAV MRK NON-REMOV (Y)4"(SLD)	LF	752,140.000	
	662-6041	WK ZN PAV MRK NON-REMOV (Y)24"(SLD)	LF	1,900.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	572.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	12,636.000	
	666-6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	1,338.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	27,838.000	
	666-6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	1,216.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	1,245.000	
	666-6147	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	LF	1,900.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	20,161.000	
	666-6342	REF PROF PAV MRK TY I(W)4"(SLD)(100MIL)	LF	1,117,221.000	
	666-6344	REF PROF PAV MRK TY I(Y)4"(BRK)(100MIL)	LF	67,775.000	
	666-6345	REF PROF PAV MRK TY I(Y)4"(SLD)(100MIL)	LF	745,640.000	
	666-6430	REFL PAV MRK TY I (W)24"(SLD)(110MIL)	LF	2,706.000	
	666-6433	RE PM W/RET REQ TY I(W) 4"(SLD)(110MIL)	LF	9,250.000	
	666-6435	RE PM W/RET REQ TY I(Y) 4"(SLD)(110MIL)	LF	6,500.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	49.000	
	668-6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	7.000	



DISTRICT	COUNTY	CCSJ	SHEET
Waco	Bosque	1054-01-009	11F



**CONTROLLING PROJECT ID** 1054-01-009

**DISTRICT** Waco

**COUNTY** Bell, Bosque, Coryell, Falls, Hamilton, Hill, Limestone, McLennan

**HIGHWAY** FM 1772, FM 185, FM 1860, FM 219, FM 2414, FM 2705, FM 2904, FM 3149, FM 3529, FM 580, FM 67, FM 930, SH 14, SH 6, US 84

# Estimate & Quantity Sheet

CONTROL SECTION JOB				TOTAL EST.	TOTAL FINAL
PROJECT ID					
COUNTY					
HIGHWAY					
ALT	BID CODE	DESCRIPTION	UNIT		
	668-6079	PREFAB PAV MRK TY C (W) (TPL ARROW)	EA	1.000	
	668-6080	PREFAB PAV MRK TY C (W) (UTURN ARROW)	EA	9.000	
	668-6083	PREFAB PAV MRK TY C (W) (LNDP ARROW)	EA	2.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	50.000	
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)	EA	6.000	
	668-6092	PREFAB PAV MRK TY C (W) (36")(YLD TRI)	EA	271.000	
	672-6007	REFL PAV MRKR TY I-C	EA	122.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	12,688.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	1,774.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	60.000	
	6056-6002	PREFORMED CENTERLINE RUMBLE STRIP	LF	12,269.000	
	6185-6003	TMA (MOBILE OPERATION)	HR	540.000	
18		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000	
		ENVIRONMENTAL: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000	



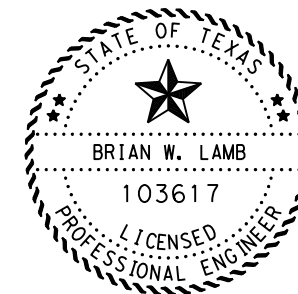
DISTRICT	COUNTY	CCSJ	SHEET
Waco	Bosque	1054-01-009	11G

SEAL COAT MATERIAL SELECTION TABLE		
<b>TIER I: HEAVY USE - USE ONLY THE SELECTED MATERIALS.</b>		
<b>TYPE</b>	<b>ASPHALT RUBBER (A-R)</b> <input type="checkbox"/> A-R ONLY	<b>ASPHALT CEMENT (AC)</b> <input checked="" type="checkbox"/> AC ONLY
<b>ASPHALT</b>	<input type="checkbox"/> A-R TY II <input type="checkbox"/> A-R TY III <input type="checkbox"/> SP 300-	<input checked="" type="checkbox"/> AC-20-5TR <input type="checkbox"/> AC-20XP <input type="checkbox"/> AC-15P <input type="checkbox"/> SP 300-
<b>TIER II: MODERATE USE - USE THESE MATERIALS OR ANY SELECTED TIER I MATERIAL COMBINATIONS OF THE ALLOWED TYPES.</b>		
<b>TYPE</b>	<b>ASPHALT CEMENT (AC)</b> <input checked="" type="checkbox"/> AC ONLY	<b>ASPHALT EMULSION</b> <input type="checkbox"/> EMULSION ONLY
<b>ASPHALT</b>	<input checked="" type="checkbox"/> AC-10-2TR <input checked="" type="checkbox"/> AC-15P <input checked="" type="checkbox"/> AC-20XP <input checked="" type="checkbox"/> AC-12-5TR <input type="checkbox"/> AC-10 W/2%SBR <input type="checkbox"/> AC-5 W/2%SBR <input type="checkbox"/> SP 300-	<input type="checkbox"/> CHFRS-2P <input type="checkbox"/> HFRS-2P <input type="checkbox"/> CRS-2P <input type="checkbox"/> SP 300-
<b>TIER III: LIGHT USE - USE THESE MATERIALS OR ANY SELECTED TIER I OR TIER II MATERIAL COMBINATIONS OF THE ALLOWED TYPES.</b>		
<b>TYPE</b>	<b>ASPHALT CEMENT (AC)</b> <input type="checkbox"/> AC ONLY	<b>ASPHALT EMULSION</b> <input type="checkbox"/> EMULSION ONLY
<b>ASPHALT</b>	<input type="checkbox"/> AC-10-2TR <input type="checkbox"/> AC-15P <input type="checkbox"/> AC-20XP <input type="checkbox"/> AC-10 W/2%SBR <input type="checkbox"/> AC-5 W/2%SBR <input type="checkbox"/> SP 300-	<input type="checkbox"/> CHFRS-2P <input type="checkbox"/> HFRS-2P <input type="checkbox"/> CRS-2P <input type="checkbox"/> SP 300-
<b>DISTRICTWIDE SEAL COAT PROJECT SEASONS: REFER TO ITEM 316 FOR TEMPERATURE AND WEATHER RESTRICTIONS.</b>		
SEASON 1: AMA, CHS, LBB	MAY 15 TO AUG 31	
SEASON 2: ABL, ATL, BWD, DAL, FTW, LFK, ODA, PAR, SJT, TYL, WAC, WFS	MAY 1 TO AUG 31	
SEASON 3: AUS, BMT, BRY, ELP, HOU, SAT, YKM	MAY 1 TO SEP 15	
SEASON 4: CRP, LRD, PHR	APR 1 TO SEPT 30	
NOTE: SEAL COATS ON ROUTINE MAINTENANCE CONTRACTS MUST BE COMPLETED BY AUGUST 31 UNLESS OTHERWISE SHOWN ON THE PLANS.		

**INSTRUCTIONS TO THE CONTRACTOR:**

1. PROVIDE MATERIALS ACCORDING TO THE ALTERNATES SELECTED FOR THE ROADWAY TIER DESIGNATIONS SPECIFIED AT VARIOUS ROADWAY LOCATIONS SHOWN ON THE PLANS;
2. ALTERNATELY, SUPPLY SELECTED BINDERS FROM A HIGHER TIER, BUT ONLY IF THE TYPE OF MATERIAL IS ALLOWED FOR THE DESIGNATED TIER; PAYMENT WILL ONLY BE MADE FOR THE TIER DESIGNATED FOR THE PAVEMENT;
3. SUPPLY THE AGGREGATE TYPE, GRADE AND SURFACE AGGREGATE CLASS SHOWN ON THE PLANS; AND
4. ADHERE TO THE APPLICATION SEASON SELECTED.
5. MAXIMUM FLAKINESS INDEX WILL BE 12.

THERE ARE 75 WORKING DAYS ALLOWED FOR THIS PROJECT.  
THE LATEST ROADWAY START WORK DATE IS June 1st.



The seal appearing on this document was authorized by BRIAN W. LAMB P.E. 103617, on

7/8, 2021.

*Brian W. Lamb, P.E.*

**SEAL COAT MATERIAL SELECTION TABLE**

FILE: sctable.dgn	DN: TxDOT	CK:	DW:	CK:
© TxDOT: March 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	1054	01	009, etc.	FM 219, etc.
	DIST	COUNTY		SHEET NO.
	WAC	BOSQUE, etc.		12

BELL COUNTY												
STATE HIGHWAY	PROJECT CSJ	LIMITS	ASSUMED STATIONS		PROJECT NET LENGTH		RDWY WIDTH	RDWY	TOTAL	316 6005	316 6407	REF #
			BEGIN	END	FT	MI	FT	SY	SY	ASPH (TIER II)	AGGR (TY-PD GR-3 OR TY-PL GR-3)	
										GAL	CY	
FM 2904	2936-01-009	FROM FM 2086 TO SH 320	0+00	230+00	23,000	4.36	23	58,778	59,415	23,766	541	1
<b>TOTALS</b>					23,000	4.36		58,778	59,415	23,766	541	



## CONSOLIDATED SUMMARIES BELL COUNTY

SHEET 1 OF 11

CHANGE ORDER	FED. RD. DIV. NO.	CONT	SECT	JOB	HIGHWAY
	6	1054	01	009, etc.	FM 219, etc.
	STATE	DIST	COUNTY		SHEET NO.
	TEXAS	WAC	BOSQUE, etc.		13

BOSQUE COUNTY												
STATE HIGHWAY	PROJECT CSJ	LIMITS	ASSUMED STATIONS		PROJECT NET LENGTH		RDWY WIDTH	RDWY	TOTAL	316 6005	316 6407	REF #
			BEGIN	END	FT	MI	FT	SY	SY	ASPH (TIER II)	AGGR (TY-PD GR-3 OR TY-PL GR-3)	
										GAL	CY	
FM 219	1054-01-009	FROM HAMILTON CO LINE SH 22	0+00	54+96	5,496	1.04	22	13,435	15,562	6,225	142	2
FM 219	1054-02-022	FROM SH 22 TO FM 182	0+00	620+56	62,056	11.75	23	158,588	160,715	64,286	1,462	3
<b>TOTALS</b>												
					67,552	12.79		172,023	176,277	70,511	1,604	



## CONSOLIDATED SUMMARIES

### BOSQUE COUNTY

SHEET 2 OF 11

CHANGE ORDER	FED. RD. DIV. NO.	CONT	SECT	JOB	HIGHWAY
	6	1054	01	009, etc.	FM 219, etc.
	STATE	DIST	COUNTY		SHEET NO.
	TEXAS	WAC	BOSQUE, etc.		14



CORYELL COUNTY												
STATE HIGHWAY	PROJECT CSJ	LIMITS	ASSUMED STATIONS		PROJECT NET LENGTH		RDWY WIDTH	RDWY	TOTAL	316 6005	316 6407	REF #
			BEGIN	END	FT	MI	FT	SY	SY	ASPH (TIER II)	AGGR (TY-PD GR-3 OR TY-PL GR-3)	
										GAL	CY	
FM 930	0774-07-015	FROM US 84 TO FM 2412	0+00	242+62	24,262	4.60	20	53,916	53,916	21,567	491	4
FM 580	1032-02-009	FROM FM 116 TO LAMPASAS CL	0+00	379+05	37,905	7.18	25	105,292	105,292	42,117	958	5
<b>TOTALS</b>					62,167	11.77		159,208	159,208	63,684	1,449	

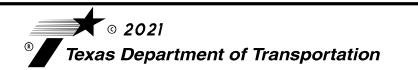


**CONSOLIDATED SUMMARIES**  
**CORYELL COUNTY**

SHEET 3 OF 11

CHANGE ORDER	FED. RD. DIV. NO.	CONT	SECT	JOB	HIGHWAY
	6	1054	01	009, etc.	FM 219, etc.
	STATE	DIST	COUNTY		SHEET NO.
	TEXAS	WAC	BOSQUE, etc.		15

FALLS COUNTY												
STATE HIGHWAY	PROJECT CSJ	LIMITS	ASSUMED STATIONS		PROJECT NET LENGTH		RDWY WIDTH	RDWY	TOTAL	316 6005	316 6407	REF #
			BEGIN	END	FT	MI	FT	SY	SY	ASPH (TIER II)	AGGR (TY-PD GR-3 OR TY-PL GR-3)	
										GAL	CY	
FM 1772	1660-01-014	FROM SH 53 TO FM 1671	0+00	192+88	19,288	3.65	20	42,862	43,081	17,233	392	6
<b>TOTALS</b>					19,288	3.65		42,862	43,081	17,233	392	



**CONSOLIDATED SUMMARIES**  
**FALLS COUNTY**

SHEET 4 OF 11

CHANGE ORDER	FED. RD. DIV. NO.	CONT	SECT	JOB	HIGHWAY
	6	1054	01	009, etc.	FM 219, etc.
	STATE	DIST	COUNTY		SHEET NO.
	TEXAS	WAC	BOSQUE, etc.		16

HAMILTON COUNTY												
STATE HIGHWAY	PROJECT CSJ	LIMITS	ASSUMED STATIONS		PROJECT NET LENGTH		RDWY WIDTH	RDWY	TOTAL	316 6005	316 6407	REF #
			BEGIN	END	FT	MI	FT	SY	SY	ASPH (TIER II)	AGGR (TY-PD GR-3 OR TY-PL GR-3)	
										GAL	CY	
FM 2414	2308-01-007	FROM FM 221 TO US 84	0+00	448+91	44,891	8.50	21	104,746	104,746	41,899	953	7
<b>TOTALS</b>					44,891	8.50		104,746	104,746	41,899	953	



**CONSOLIDATED SUMMARIES**  
**HAMILTON COUNTY**

SHEET 5 OF 11

CHANGE ORDER	FED. RD. DIV. NO.	CONT	SECT	JOB	HIGHWAY
	6	1054	01	009, etc.	FM 219, etc.
	STATE	DIST	COUNTY		SHEET NO.
	TEXAS	WAC	BOSQUE, etc.		17

HILL COUNTY												
STATE HIGHWAY	PROJECT CSJ	LIMITS	ASSUMED STATIONS		PROJECT NET LENGTH		RDWY WIDTH	RDWY	TOTAL	316 6005	316 6407	REF #
			BEGIN	END	FT	MI	FT	SY	SY	ASPH (TIER 11)	AGGR (TY-PD GR-3 OR TY-PL GR-3)	
					FT	MI	FT	SY	SY	GAL	CY	
FM 67	1661-02-020	FROM SH 81 TO FM 66	0+00	458+94	45,894	8.69	22	112,185	112,294	44,918	1,021	8
<b>TOTALS</b>					45,894	8.69		112,185	112,294	44,918	1,021	



**CONSOLIDATED SUMMARIES**  
**HILL COUNTY**

SHEET 6 OF 11

CHANGE ORDER	FED. RD. DIV. NO.	CONT	SECT	JOB	HIGHWAY
	6	1054	01	009, etc.	FM 219, etc.
	STATE	DIST	COUNTY		SHEET NO.
	TEXAS	WAC	BOSQUE, etc.		18

STATE HIGHWAY	PROJECT CSJ	LIMITS	ASSUMED STATIONS		PROJECT NET LENGTH		RDWY WIDTH	RDWY	TOTAL	316 6004	316 6005	316 6407	316 6398	REF #
			BEGIN	END	FT	MI	FT	SY	SY	ASPH (TIER I)	ASPH (TIER II)	AGGR (TY-PD GR-3 OR TY-PL GR-3)	AGGR (TY-PD GR-4 OR TY-PL GR-4) (SAC-B)	
										GAL	GAL	CY	CY	
SH 14	0093-04-049	NAVASOTA RIVER TO FM 1633	0+00	306+03	30,603	5.80	45	153,015	155,889	62,356			1,155	9
SH 14	0093-05-051	SH 164 TO NAVASOTA RIVER	0+00	252+12	25,212	4.78	45	126,060	128,934	51,574			956	10
FM 2705	2754-01-010	FROM US 84 TO FM 1633	0+00	176+67	17,667	3.35	30	58,890	59,197		23,679	539		11
<b>TOTALS</b>					<b>73,482</b>	<b>13.92</b>		<b>337,965</b>	<b>344,020</b>	<b>113,930</b>	<b>23,679</b>	<b>539</b>	<b>2,111</b>	




## CONSOLIDATED SUMMARIES LIMESTONE COUNTY

SHEET 7 OF 11

CHANGE ORDER	FED. RD. DIV. NO.	CONT	SECT	JOB	HIGHWAY
	6	1054	01	009, etc.	FM 219, etc.
	STATE	DIST	COUNTY		SHEET NO.
	TEXAS	WAC	BOSQUE, etc.		19

MCLENNAN COUNTY														
STATE HIGHWAY	PROJECT CSJ	LIMITS	ASSUMED STATIONS		PROJECT NET LENGTH		RDWY WIDTH	RDWY	TOTAL	316	316	316	316	REF #
										6004	6005	6407	6398	
			ASPH (TIER I)	ASPH (TIER II)	AGGR (TY-PD GR-3 OR TY-PL GR-3)	AGGR (TY-PD GR-4 OR TY-PL GR-4) (SAC-B)	BEGIN	END	FT	MI	FT	SY	SY	
US 84	0055-08-126	FROM SH 6 TO Bosque River	0+00	280+16	28,016	5.31	53	164,983	188,277	75,311				12
SH 6	0258-09-152	FROM US 77 TO Brazos River	0+00	178+99	17,899	3.39	82	163,080	164,301	65,721				13
FM 1860	0831-03-013	FROM SH 6 IN RIESEL TO SH 164	0+00	387+13	38,713	7.33	23	98,933	99,378		39,752			14
FM 1860	0831-04-029	FROM SH 6 TO SH 6 IN RIESEL	0+00	535+76	53,576	10.15	25	148,822	149,267		59,707	1,357		15
FM 3529	0831-05-003	FROM SH 164 TO END	0+00	26+35	2,635	0.50	33	9,662	9,676		3,871			16
FM 185	1969-01-020	FROM SH 317 TO SH 6	0+00	480+06	48,006	9.09	31	165,354	166,533		66,614			17
FM 3149	3234-01-013	FROM FM 1858 TO FM 2311	0+00	418+12	41,812	7.92	23	106,853	107,149		42,860	975		18
<b>TOTALS</b>					230,657	43.69		857,687	884,581	141,032	212,804	2,332	4,656	



**CONSOLIDATED SUMMARIES**  
**MCLENNAN COUNTY**

SHEET 8 OF 11

CHANGE ORDER	FED. RD. DIV. NO.	CONT	SECT	JOB	HIGHWAY
	6	1054	01	009, etc.	FM 219, etc.
	STATE	DIST	COUNTY		SHEET NO.
	TEXAS	WAC	BOSQUE, etc.		20

**SUMMARY OF COUNTY TOTALS**

COUNTY	SHEET	PROJECT NET LENGTH		TOTAL	316	316	316	316
					6004	6005	6407	6398
					ASPH (TIER I)	ASPH (TIER II)	AGGR (TY-PD GR-3 OR TY-PL GR-3)	AGGR (TY-PD GR-4 OR TY-PL GR-4) (SAC-B)
		FT	MI	SY	GAL	GAL	CY	CY
BELL	SHEET 1 OF 11	23,000	4.36	59,415		23,766	541	
BOSQUE	SHEET 2 OF 11	67,552	12.79	176,277		70,511	1,604	
CORYELL	SHEET 3 OF 11	62,167	11.77	159,208		63,684	1,449	
FALLS	SHEET 4 OF 11	19,288	3.65	43,081		17,233	392	
HAMILTON	SHEET 5 OF 11	44,891	8.50	104,746		41,899	953	
HILL	SHEET 6 OF 11	45,894	8.69	112,294		44,918	1,021	
LIMESTONE	SHEET 7 OF 11	73,482	13.92	344,020	113,930	23,679	539	2,111
MCLENNAN	SHEET 8 OF 11	230,657	43.69	884,581	141,032	212,804	2,332	4,656
<b>CONTRACT TOTALS</b>		<b>566,931</b>	<b>107.37</b>	<b>1,883,622</b>	<b>254,962</b>	<b>498,494</b>	<b>8,831</b>	<b>6,767</b>

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**CONSOLIDATED SUMMARIES  
COUNTY TOTALS**

SHEET 9 OF 11

CHANGE ORDER	FED. RD. DIV. NO.	CONT	SECT	JOB	HIGHWAY
	6	1054	01	009, etc.	FM 219, etc.
	STATE	DIST	COUNTY		SHEET NO.
	TEXAS	WAC	BOSQUE, etc.		21

SUMMARY OF PAVEMENT MARKING ITEMS															
LOCATION	CSJ	REF NO.	662	662	662	662	662	662	662	662	662	662	662		
			6001	6004	6011	6012	6013	6014	6016	6017	6018	6025	6026		
			WK ZN PAV MRK NON-REMOV (W)4"(BRK)	WK ZN PAV MRK NON-REMOV (W)4"(SLD)	WK ZN PAV MRK NON-REMOV (W)8"(LNDP)	WK ZN PAV MRK NON-REMOV (W)8"(SLD)	WK ZN PAV MRK NON-REMOV (W)12"(LNDP)	WK ZN PAV MRK NON-REMOV (W)12"(SLD)	WK ZN PAV MRK NON-REMOV (W)24"(SLD)	WK ZN PAV MRK NON-REMOV (W)(ARROW)	WK ZN PAV MRK NON-REMOV (W)(DBL ARW)	WK ZN PAV MRK NON-REMOV (W)(TPL ARW)	WK ZN PAV MRK NON-REMOV (W)(UTURN ARW)		
			LF	LF	LF	LF	LF	LF	EA	EA	EA	EA			
									LT	RT	LT/FWD	LT	RT		
FM 2904	2936-01-009	1		46000		93				38					
FM 219	1054-01-009	2		10993		1156				61					
FM 219	1054-02-022	3		124112						28					
FM 930	0774-07-015	4		48524						30					
FM 580	1032-02-009	5		75811		371				21					
FM 1772	1660-01-014	6		38576						37					
FM 2414	2308-01-007	7		89782						80					
FM 67	1661-02-020	8		91788						31					
SH 14	0093-04-049	9	164	61206		90			1						
SH 14	0093-05-051	10		60939	94	854			11	4					
FM 2705	2754-01-010	11		35334						56					
US 84	0055-08-126	12	11004	52293	684	15506			13	12	7	1	5		
SH 6	0258-09-152	13	8993	25655		8641	1216	1245		2			4		
FM 1860	0831-03-013	14		77426						182					
FM 1860	0831-04-029	15		107333	194	762			1	1					
FM 3529	0831-05-003	16		5270						13					
FM 185	1969-01-020	17		96286	366	365			2	2					
FM 3149	3234-01-013	18		79143						91					
			20,161	1,126,471	1,338	27,838	1,216	1,245	2,706	28	21	7	1	5	4

SUMMARY OF PAVEMENT MARKING ITEMS														
LOCATION	CSJ	REF NO.	662	662	662	662	662	662	666	666	666	666	666	
			6031	6032	6034	6041	6109	6111	6033	6036	6039	6042	6147	6300
			WK ZN PAV MRK NON-REMOV(W)36"(YLD TRI)	WK ZN PAV MRK NON-REMOV (Y)4"(BRK)	WK ZN PAV MRK NON-REMOV (Y)4"(SLD)	WK ZN PAV MRK NON-REMOV (Y)24"(SLD)	WK ZN PAV MRK SHT TERM (TAB)TY W	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)
			EA	LF	LF	LF	EA	EA	LF	LF	LF	LF	LF	
FM 2904	2936-01-009	1	13	2238	32653				566		93			
FM 219	1054-01-009	2			10993				138		1,156			
FM 219	1054-02-022	3		7926	79792				1538					
FM 930	0774-07-015	4		2697	34282				605					
FM 580	1032-02-009	5	5	3611	59425				950		371			
FM 1772	1660-01-014	6	15	2320	25832				475					
FM 2414	2308-01-007	7		6191	61604				1132					
FM 67	1661-02-020	8		3686	69425				1128					
SH 14	0093-04-049	9		6282	24282		5	754		90			164	
SH 14	0093-05-051	10		5021	21203		3	498	94	854				
FM 2705	2754-01-010	11		2259	21954				428					
US 84	0055-08-126	12	200		56231	1562	293		684	15,506		1,562	11,004	
SH 6	0258-09-152	13			35799		256			8,641	1,216	1,245	8,993	
FM 1860	0831-03-013	14	15	6317	38942				942					
FM 1860	0831-04-029	15	6	2575	95684	338	5	1283	194	762		338		
FM 3529	0831-05-003	16			4347				55					
FM 185	1969-01-020	17	17	8779	41472		10	1169	366	365				
FM 3149	3234-01-013	18		7873	38220				975					
			271	67,775	752,140	1,900	572	12,636	1,338	27,838	1,216	1,245	1,900	20,161



**CONSOLIDATED SUMMARIES**  
**PAVEMENT MARKINGS**


SHEET 10 OF 11

CHANGE ORDER	FED. RD. DIV. NO.	CONT	SECT	JOB	HIGHWAY
	6	1054	01	009, etc.	FM 219, etc.
	STATE	DIST	COUNTY		SHEET NO.
	TEXAS	WAC	BOSQUE, etc.		22



SUMMARY OF PAVEMENT MARKING ITEMS															
LOCATION	CSJ	REF NO.	666	666	666	666	666	666	668	668	668	668			
			6430	6433	6435	6342	6344	6345	6077	6078	6079	6080			
			REFL PAV MRK TY I (W)24"(SLD)(10MIL)	RE PM W/RET REQ TY I(W)4"(SLD)(110MIL)	RE PM W/RET REQ TY I(Y)4"(SLD)(110MIL)	REF PROF PAV MRK TY I(W)4"(SLD)(100MIL)	REF PROF PAV MRK TY I(Y)4"(BRK)(100MIL)	REF PROF PAV MRK TY I(Y)4"(SLD)(100MIL)	PREFAB PAV MRK TY C (W) (ARROW)		PREFAB PAV MRK TY C (W) (DBL ARROW)	PREFAB PAV MRK TY C (W) (TPL ARROW)	PREFAB PAV MRK TY C (W) (UTURN ARROW)		
LF	LF	LF	LF	LF	LF	EA		EA	EA	EA					
						LT	RT	LT/FWD		LT	RT				
FM 2904	2936-01-009	1	38				46,000	2,238	32,653						
FM 219	1054-01-009	2	61				10,993		10,993						
FM 219	1054-02-022	3	28				124,112	7,926	79,792						
FM 930	0774-07-015	4	30				48,524	2,697	34,282						
FM 580	1032-02-009	5	21				75,811	3,611	59,425						
FM 1772	1660-01-014	6	37				38,576	2,320	25,832						
FM 2414	2308-01-007	7	80				89,782	6,191	61,604						
FM 67	1661-02-020	8	31				91,788	3,686	69,425						
SH 14	0093-04-049	9					61,206	6,282	24,282	1					
SH 14	0093-05-051	10	583				60,939	5,021	21,203	11	4				
FM 2705	2754-01-010	11	56				35,334	2,259	21,954						
US 84	0055-08-126	12	1,236	5,250	6,500		47,043		49,731	13	12	7	1	5	
SH 6	0258-09-152	13		4,000			21,655		35,799		2			4	
FM 1860	0831-03-013	14	182				77,426	6,317	38,942						
FM 1860	0831-04-029	15	169				107,333	2,575	95,684	1	1				
FM 3529	0831-05-003	16	13				5,270		4,347						
FM 185	1969-01-020	17	50				96,286	8,779	41,472	2	2				
FM 3149	3234-01-013	18	91				79,143	7,873	38,220						
			2,706	9,250	6,500		1,117,221	67,775	745,640	28	21	7	1	5	4

SUMMARY OF PAVEMENT MARKING ITEMS														
LOCATION	CSJ	REF NO.	668	668			668	668	672	672	672	6056		
			6083	6085			6089	6092	6007	6009	6010	6002		
			PREFAB PAV MRK TY C (W) (LNDP ARROW)	PREFAB PAV MRK TY C (W) (WORD)			PREFAB PAV MRK TY C (W) (RR XING)	PREFAB PAV MRK TY C (W) (36") (YLD TRI)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	PREFORMED CENTERLINE RUMBLE STRIP	EA	EA
			ONLY	STOP	AHEAD									
FM 2904	2936-01-009	1												
FM 219	1054-01-009	2									13			457
FM 219	1054-02-022	3												1,436
FM 930	0774-07-015	4												412
FM 580	1032-02-009	5									5			260
FM 1772	1660-01-014	6									15			359
FM 2414	2308-01-007	7				2	2							518
FM 67	1661-02-020	8												750
SH 14	0093-04-049	9	2	1				9	732					1,742
SH 14	0093-05-051	10		7					678					491
FM 2705	2754-01-010	11							388					397
US 84	0055-08-126	12		31					57	530	1,326			
SH 6	0258-09-152	13		5							448			
FM 1860	0831-03-013	14								803				1,393
FM 1860	0831-04-029	15		2			4	6	29	1,477				86
FM 3529	0831-05-003	16								55				
FM 185	1969-01-020	17						17	27	1,081				2,524
FM 3149	3234-01-013	18					2			831				1,444
			2	46	2	2	6	271	122	12,688	1,774			12,269



**CONSOLIDATED SUMMARIES**  
**PAVEMENT MARKINGS**

SHEET II OF II

CHANGE ORDER	FED. RD. DIV. NO.	CONT	SECT	JOB	HIGHWAY
	6	1054	01	009, etc.	FM 219, etc.
	STATE	DIST	COUNTY		SHEET NO.
	TEXAS	WAC	BOSQUE, etc.		23

**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.

		<i>Rail Division</i>	
<b>RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS</b>			
FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT October 2018	CONT	SECT	JOB
REVISIONS March 2020	1054	01	009, etc. FM 219, etc.
DIST	COUNTY		SHEET NO.
WAC	BOSQUE, etc.		24

**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 Contractor'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 1/4 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.



**RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS**

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	1054	01	009, etc.FM 219, etc.	
	DIST	COUNTY	SHEET NO.	
	WAC	BOSQUE, etc.	25	

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DATE: \_\_\_\_\_  
 FILE: \_\_\_\_\_

**I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)**

DOT #: 430 321 T  
 Crossing Type: \*\* At-Grade  
 RR Company Owning Track at Crossing: Union Pacific Railroad  
 Operating RR Company at Track: Union Pacific Railroad  
 RR MP: 158.300  
 RR Subdivision: Fort Worth  
 City: Waco  
 County: McLennan  
 CSJ at this Crossing: 0831-04-029  
 Highway/Roadway name crossing the railroad: FM1860  
 # of regularly scheduled trains per day at this crossing: 12  
 # of switching movements per day at this crossing: \_\_\_\_\_  
 % of estimated contract cost of work within railroad ROW: <1%

Scope of Work at this Crossing to Be Performed by State Contractor:  
 Seal Coat  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Scope of Work at this Crossing to Be Performed by Railroad Company:  
 None  
 \_\_\_\_\_  
 \_\_\_\_\_

\*\* Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

**II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)**

None  
 \_\_\_\_\_  
 \_\_\_\_\_

**III. FLAGGING & INSPECTION**

# of Days of Railroad Flagging Expected: 1  
 On this project, night or weekend flagging is:  
 Expected  
 Not Expected  
 Flagging services will be provided by:  
 Railroad Company: TxDOT will pay flagging invoices  
 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  
 BNSF - BNSF.info@railpros.com  
 Call Center 877-315-0513, Select #1 for flagging  
 KCS - 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 Construction Inspection into anticipated construction schedule.

Not Required  
 Required: Contact Information for Construction Inspection:  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD**

On this project, construction work to be performed by a railroad company is:  
 Required  
 Not Required

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.

**V. RAILROAD INSURANCE REQUIREMENTS**

Railroad reference number shall be provided by TxDOT CST or DO.  
 The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.  
 Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.  
 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.

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 combined single limit
Railroad Protective Liability	
<input type="checkbox"/> Not Required	
<input checked="" type="checkbox"/> Non - Bridge Projects	\$2,000,000 / \$6,000,000
<input type="checkbox"/> Bridge Projects	\$5,000,000 / \$10,000,000
<input type="checkbox"/> Other	

**VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT**

On this project, an ROE agreement is:  
 Not Required  
 Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)  
 Required: Contractor to obtain (see Item 5, Article 8.4)  
 With the following railroad companies: \_\_\_\_\_

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

<http://www.txdot.gov/inside-txdot/division/rail/samples.html>

Approved ROE Agreement 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 ROE agreement between the Contractor and the Railroad if required on project.

**VII. RAILROAD COORDINATION MEETING**

On this project, a Railroad Coordination Meeting is:  
 Not Required  
 Required  
 See Item 5, Article 8.1 for more details.

**VIII. SUBCONTRACTORS**

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

**IX. EMERGENCY NOTIFICATION**

**In Case of Railroad Emergency**  
 Call Union Pacific Railroad (UPRR)  
**Railroad Emergency Line at 888-877-7267**  
 Location: DOT 430 321 T  
 RR Milepost 158.300  
 Subdivision Fort Worth

<span style="font-weight: bold; font-size: small;">Texas Department of Transportation</span>			Rail Division		
RAILROAD SCOPE OF WORK					
PROJECT SPECIFIC DETAILS					
FILE: RR Scope of Work.dgn	DN: TxDOT	CK: _____	DW: _____	CK: _____	
© TxDOT June 2014	CONT SECT	JOB	HIGHWAY		
3/2020	REVISIONS	1054 01	009	FM219, etc.	
	DIST	COUNTY		SHEET NO.	
	09	Bosque, etc.		26	

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DATE: \_\_\_\_\_  
 FILE: \_\_\_\_\_

**I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)**

DOT #: 023 073 A  
 Crossing Type: \*\*  
 RR Company Owning Track at Crossing: BNSF Railway  
 Operating RR Company at Track: BNSF Railway  
 RR MP: 250.080  
 RR Subdivision: Fort Worth  
 City: Crawford  
 County: McLennan  
 CSJ at this Crossing: 1969-01-020  
 Highway/Roadway name crossing the railroad: FM 185  
 # of regularly scheduled trains per day at this crossing: 26  
 # of switching movements per day at this crossing: \_\_\_\_\_  
 % of estimated contract cost of work within railroad ROW: <1%

Scope of Work at this Crossing to Be Performed by State Contractor:  
 Seal Coat  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Scope of Work at this Crossing to Be Performed by Railroad Company:  
 None  
 \_\_\_\_\_  
 \_\_\_\_\_

\*\* Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

**II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)**

None  
 \_\_\_\_\_  
 \_\_\_\_\_

**III. FLAGGING & INSPECTION**

# of Days of Railroad Flagging Expected: 1  
 On this project, night or weekend flagging is:  
 Expected  
 Not Expected  
 Flagging services will be provided by:  
 Railroad Company: TxDOT will pay flagging invoices  
 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
- BNSF - BNSF.info@railpros.com  
Call Center 877-315-0513, Select #1 for flagging
- KCS - 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 Construction Inspection into anticipated construction schedule.

- Not Required
- Required: Contact Information for Construction Inspection:  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD**

On this project, construction work to be performed by a railroad company is:  
 Required  
 Not Required

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.

**V. RAILROAD INSURANCE REQUIREMENTS**

Railroad reference number shall be provided by TxDOT CST or DO.  
 The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice. Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.  
 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.

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 combined single limit
Railroad Protective Liability	
<input type="checkbox"/> Not Required	
<input checked="" type="checkbox"/> Non - Bridge Projects	\$2,000,000 / \$6,000,000
<input type="checkbox"/> Bridge Projects	\$5,000,000 / \$10,000,000
<input type="checkbox"/> Other	

**VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT**

On this project, an ROE agreement is:  
 Not Required  
 Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)  
 Required: Contractor to obtain (see Item 5, Article 8.4)  
 With the following railroad companies: \_\_\_\_\_

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

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**VII. RAILROAD COORDINATION MEETING**


On this project, a Railroad Coordination Meeting is:  
 Not Required  
 Required  
 See Item 5, Article 8.1 for more details.

**VIII. SUBCONTRACTORS**

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

**IX. EMERGENCY NOTIFICATION**

**In Case of Railroad Emergency**  
 Call BNSF Railway  
**Railroad Emergency Line at 800-832-5452 (Option 1)**  
 Location: DOT 023 073 A  
 RR Milepost 250.080  
 Subdivision Fort Worth

		Rail Division	
<b>RAILROAD SCOPE OF WORK</b>			
<b>PROJECT SPECIFIC DETAILS</b>			
FILE: RR Scope of Work.dgn	DN: TxDOT	CK: _____	DW: _____
© TxDOT June 2014	CONT SECT	JOB	HIGHWAY
3/2020	1054 01	009	FM 219, etc.
REVISIONS	DIST	COUNTY	SHEET NO.
	09	Bosque, etc.	27

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DATE: \_\_\_\_\_  
 FILE: \_\_\_\_\_

**I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)**

DOT #: 416 016 Y  
 Crossing Type: \*\* At-Grade  
 RR Company Owning Track at Crossing: Union Pacific Railroad  
 Operating RR Company at Track: Union Pacific Railroad  
 RR MP: 210.870  
 RR Subdivision: Fort Worth  
 City: Itasca  
 County: Hill  
 CSJ at this Crossing: 1661-02-020  
 Highway/Roadway name crossing the railroad: FM 67  
 # of regularly scheduled trains per day at this crossing: 18  
 # of switching movements per day at this crossing: 0  
 % of estimated contract cost of work within railroad ROW: <1%

Scope of Work at this Crossing to Be Performed by State Contractor:  
 Seal Coat  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Scope of Work at this Crossing to Be Performed by Railroad Company:  
 None  
 \_\_\_\_\_  
 \_\_\_\_\_

\*\* Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

**II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)**

None  
 \_\_\_\_\_  
 \_\_\_\_\_

**III. FLAGGING & INSPECTION**

# of Days of Railroad Flagging Expected: 1  
 On this project, night or weekend flagging is:  
 Expected  
 Not Expected  
 Flagging services will be provided by:  
 Railroad Company: TxDOT will pay flagging invoices  
 Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT  
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Contact Information for Flagging:

UPRR - UP.info@railpros.com  
 Call Center 877-315-0513, Select #1 for flagging  
 BNSF - BNSF.info@railpros.com  
 Call Center 877-315-0513, Select #1 for flagging  
 KCS - 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 Construction Inspection into anticipated construction schedule.

Not Required  
 Required: Contact Information for Construction Inspection:  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD**

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Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	\$500,000 / \$500,000 / \$500,000
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Business Automobile	\$2,000,000 combined single limit
Railroad Protective Liability	
<input type="checkbox"/> Not Required	
<input checked="" type="checkbox"/> Non - Bridge Projects	\$2,000,000 / \$6,000,000
<input type="checkbox"/> Bridge Projects	\$5,000,000 / \$10,000,000
<input type="checkbox"/> Other	

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 Not Required  
 Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)  
 Required: Contractor to obtain (see Item 5, Article 8.4)  
 With the following railroad companies: \_\_\_\_\_

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

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**VII. RAILROAD COORDINATION MEETING**


On this project, a Railroad Coordination Meeting is:  
 Not Required  
 Required  
 See Item 5, Article 8.1 for more details.

**VIII. SUBCONTRACTORS**

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

**IX. EMERGENCY NOTIFICATION**

**In Case of Railroad Emergency**  
 Call Union Pacific Railroad (UPRR)  
**Railroad Emergency Line at 888-877-7267**  
 Location: DOT 416 016 Y  
 RR Milepost 210.870  
 Subdivision Fort Worth

			<i>Rail Division</i>	
<b>RAILROAD SCOPE OF WORK PROJECT SPECIFIC DETAILS</b>				
FILE: RR Scope of Work.dgn	DN: TxDOT	CK: _____	DW: _____	CK: _____
© TxDOT June 2014	CONT SECT	JOB	HIGHWAY	
3/2020	REVISIONS	1054 01	009	FM219, etc.
DIST	COUNTY	SHEET NO.		28
09	Bosque, etc			

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DATE: \_\_\_\_\_  
 FILE: \_\_\_\_\_

**I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)**

DOT #: 416 082L  
 Crossing Type: \*\* At-Grade  
 RR Company Owning Track at Crossing: Union Pacific Railroad  
 Operating RR Company at Track: Union Pacific Railroad  
 RR MP: 175.650  
 RR Subdivision: Fort Worth  
 City: Ross  
 County: McLennan  
 CSJ at this Crossing: 3234-01-013  
 Highway/Roadway name crossing the railroad: FM 3149  
 # of regularly scheduled trains per day at this crossing: 18  
 # of switching movements per day at this crossing: 0  
 % of estimated contract cost of work within railroad ROW: <1%

Scope of Work at this Crossing to Be Performed by State Contractor:  
 Seal Coat  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Scope of Work at this Crossing to Be Performed by Railroad Company:  
 None  
 \_\_\_\_\_  
 \_\_\_\_\_

\*\* Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

**II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)**

None  
 \_\_\_\_\_  
 \_\_\_\_\_

**III. FLAGGING & INSPECTION**

# of Days of Railroad Flagging Expected: 1  
 On this project, night or weekend flagging is:  
 Expected  
 Not Expected  
 Flagging services will be provided by:  
 Railroad Company: TxDOT will pay flagging invoices  
 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
- BNSF - BNSF.info@railpros.com  
Call Center 877-315-0513, Select #1 for flagging
- KCS - 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 Construction Inspection into anticipated construction schedule.

Not Required  
 Required: Contact Information for Construction Inspection:  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD**

On this project, construction work to be performed by a railroad company is:  
 Required  
 Not Required

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.

**V. RAILROAD INSURANCE REQUIREMENTS**

Railroad reference number shall be provided by TxDOT CST or DO.  
 The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice. Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.  
 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.

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 combined single limit
Railroad Protective Liability	
<input type="checkbox"/> Not Required	
<input checked="" type="checkbox"/> Non - Bridge Projects	\$2,000,000 / \$6,000,000
<input type="checkbox"/> Bridge Projects	\$5,000,000 / \$10,000,000
<input type="checkbox"/> Other	

**VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT**

On this project, an ROE agreement is:  
 Not Required  
 Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)  
 Required: Contractor to obtain (see Item 5, Article 8.4)  
 With the following railroad companies: \_\_\_\_\_

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

<http://www.txdot.gov/inside-txdot/division/rail/samples.html>

Approved ROE Agreement 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 ROE agreement between the Contractor and the Railroad if required on project.

**VII. RAILROAD COORDINATION MEETING**


On this project, a Railroad Coordination Meeting is:  
 Not Required  
 Required  
 See Item 5, Article 8.1 for more details.

**VIII. SUBCONTRACTORS**

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

**IX. EMERGENCY NOTIFICATION**

**In Case of Railroad Emergency**  
 Call Union Pacific Railroad (UPRR)  
**Railroad Emergency Line at 888-877-7267**  
 Location: DOT 416 082 L  
 RR Milepost 175.650  
 Subdivision Fort Worth

		<i>Rail Division</i>		
RAILROAD SCOPE OF WORK PROJECT SPECIFIC DETAILS				
FILE: RR Scope of Work.dgn	DN: TxDOT	CK: _____	DW: _____	CK: _____
© TxDOT June 2014	CONT SECT	JOB	HIGHWAY	
3/2020	1054 01	009	FM219, etc.	
REVISIONS	DIST	COUNTY	SHEET NO.	
	09	Bosque, etc.	29	

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DATE: \_\_\_\_\_  
 FILE: \_\_\_\_\_

**I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)**

DOT #: 430 307 X  
 Crossing Type: \*\* At-Grade  
 RR Company Owning Track at Crossing: Union Pacific Railroad  
 Operating RR Company at Track: Union Pacific Railroad  
 RR MP: 151.230  
 RR Subdivision: Fort Worth  
 City: Riesel  
 County: McLennan  
 CSJ at this Crossing: 0831-04-029  
 Highway/Roadway name crossing the railroad: FM 1860  
 # of regularly scheduled trains per day at this crossing: 12  
 # of switching movements per day at this crossing: \_\_\_\_\_  
 % of estimated contract cost of work within railroad ROW: <1%

Scope of Work at this Crossing to Be Performed by State Contractor:  
 Seal Coat  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Scope of Work at this Crossing to Be Performed by Railroad Company:  
 None  
 \_\_\_\_\_  
 \_\_\_\_\_

\*\* Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

**II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)**

None  
 \_\_\_\_\_  
 \_\_\_\_\_

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bottomline076@aol.com, 903-767-7630
- OTHERS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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Not Required  
 Required: Contact Information for Construction Inspection:  
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Business Automobile	\$2,000,000 combined single limit
Railroad Protective Liability	
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<input checked="" type="checkbox"/> Non - Bridge Projects	\$2,000,000 / \$6,000,000
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<input type="checkbox"/> Other	

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 Location: DOT 430 307 X  
 RR Milepost 151.230  
 Subdivision Fort Worth

		<i>Rail Division</i>
<h2 style="margin: 0;">RAILROAD SCOPE OF WORK</h2> <h3 style="margin: 0;">PROJECT SPECIFIC DETAILS</h3>		
FILE: RR Scope of Work.dgn	DN: TxDOT	CK: _____
© TxDOT June 2014	CONT SECT	JOB HIGHWAY
3/2020	1054 01	009 FM219, etc.
REVISIONS	DIST COUNTY	SHEET NO.
	09 Bosque, etc.	30



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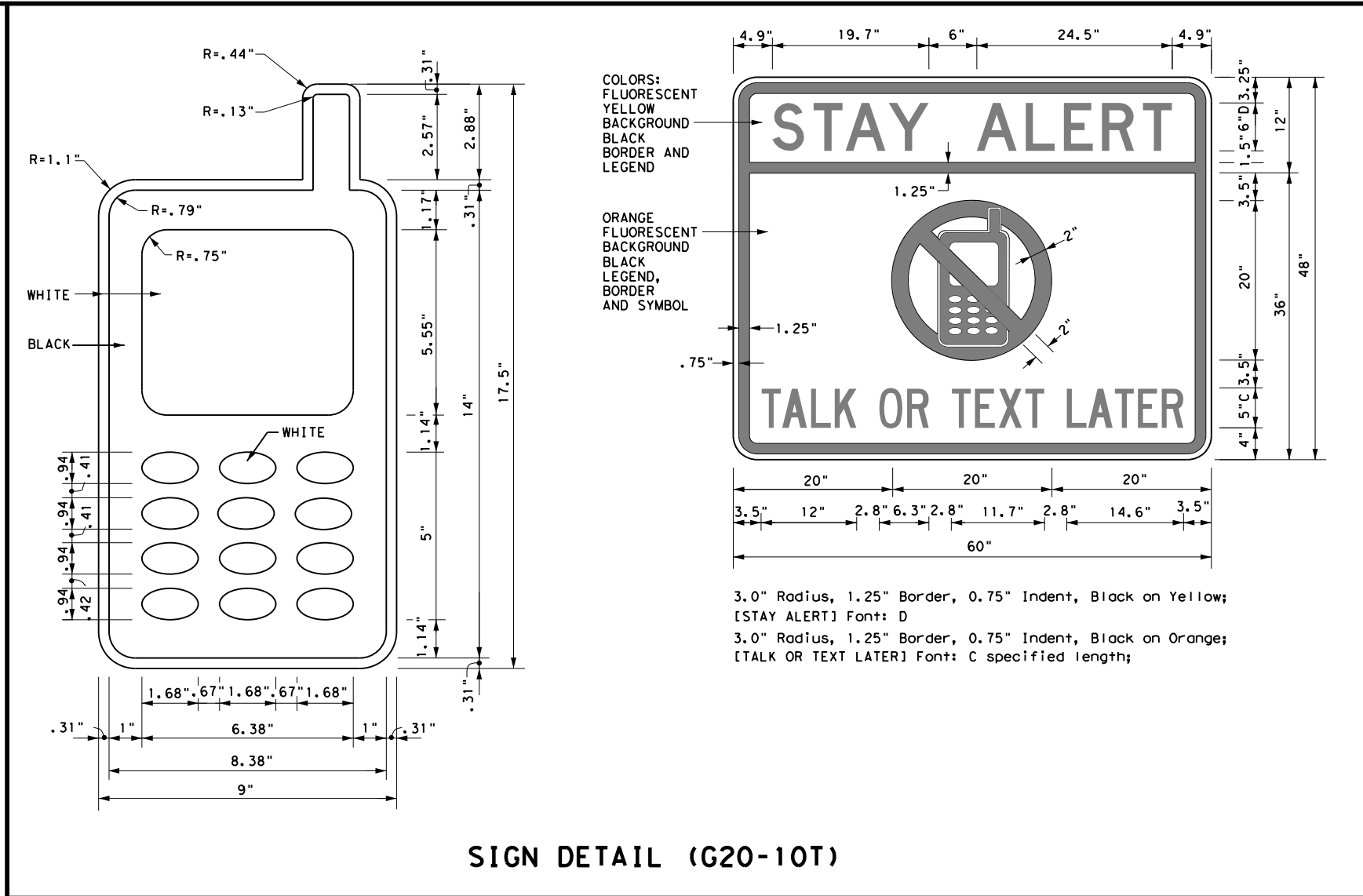
**BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:**

- The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
- The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
- The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
- Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
- When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
- The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
- All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
- The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
- As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER (see Sign Detail G20-10T) and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. However, the TRAFFIC FINES DOUBLE sign will not be required on projects consisting solely of mobile operation work, such as striping or milling edgeline rumble strips. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.
- Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.
- The Engineer has the final decision on the location of all traffic control devices.
- Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

**WORKER SAFETY APPAREL NOTES:**

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

DATE:  
 FILE:



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

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

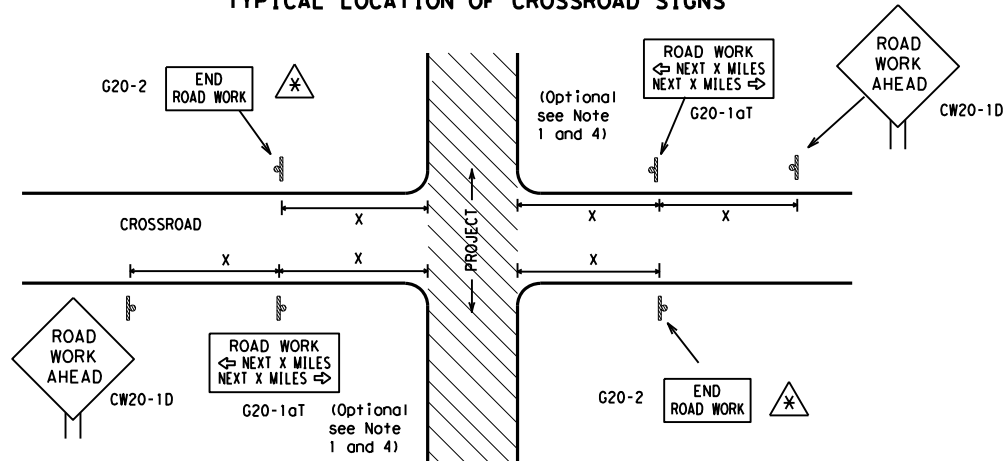
<b>THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT</b> <a href="http://www.txdot.gov">http://www.txdot.gov</a>
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD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

SHEET 1 OF 12

		<i>Traffic Operations Division Standard</i>	
<b>BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS</b>			
<b>BC (1) - 14</b>			
FILE: bc-14.dgn	DW: TxDOT	CK: TxDOT	OW: TxDOT
© TxDOT November 2002	CONT: 1054	SECT: 01	JOB: 009, etc. FM 219, etc.
REVISIONS			
4-03 5-10 8-14	DIST: COUNTY	SHEET NO.	
9-07 7-13	WAC: BOSQUE, etc.	31	

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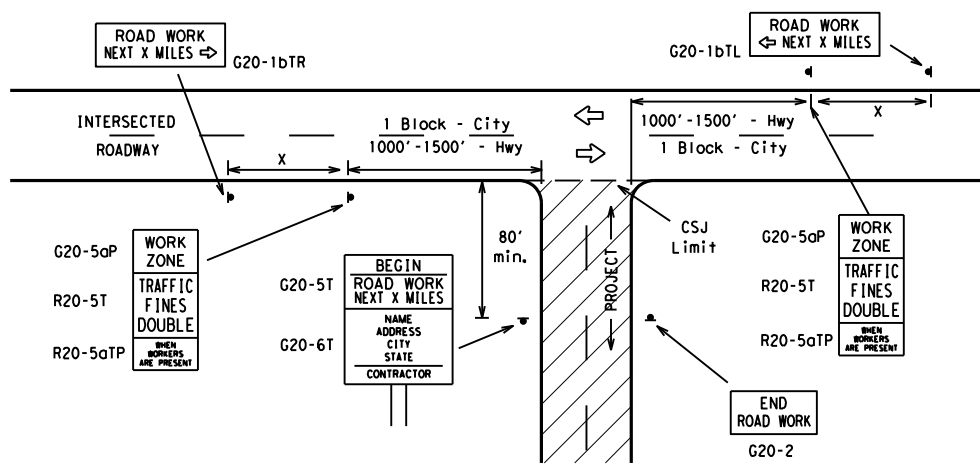
**TYPICAL LOCATION OF CROSSROAD SIGNS**



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

- 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.
- 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. This information shall be shown in the plans.
- Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
- The "ROAD WORK NEXT X MILES" (G20-1aT) 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.
- Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
- When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

**T-INTERSECTION**



**CSJ LIMITS AT T-INTERSECTION**

- The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
- If construction closes the road at a T-intersection the Contractor shall place the "CONTRACTOR NAME" (G20-6T) sign behind the Type 3 Barricades 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<sup>1,5,6</sup>**

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

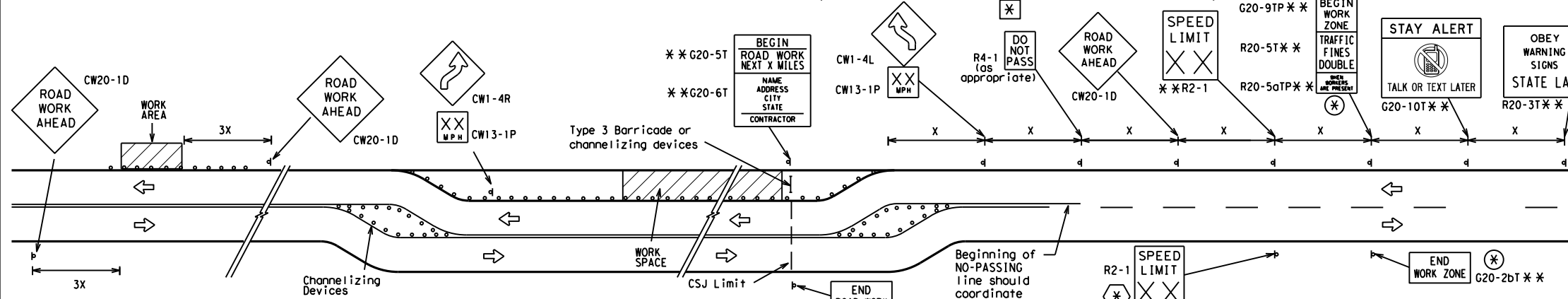
\* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

**GENERAL NOTES**

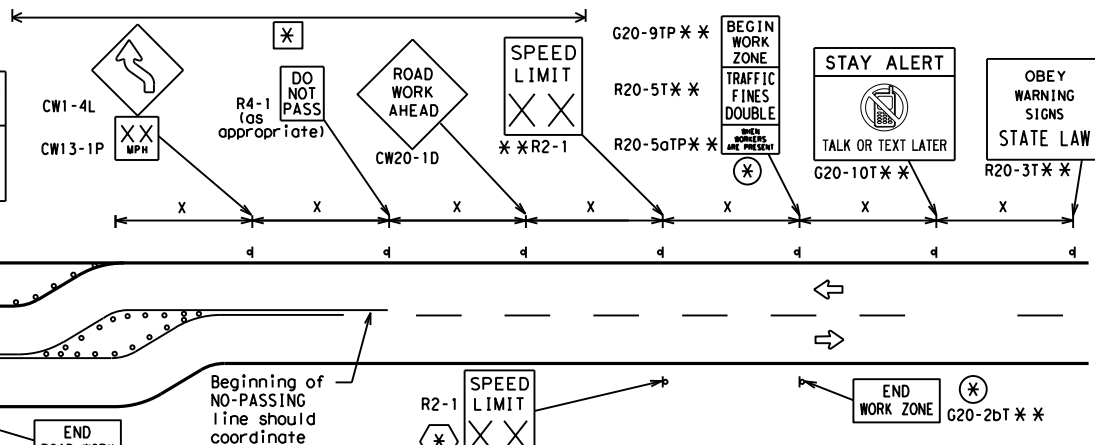
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

**WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS**



When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) 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.

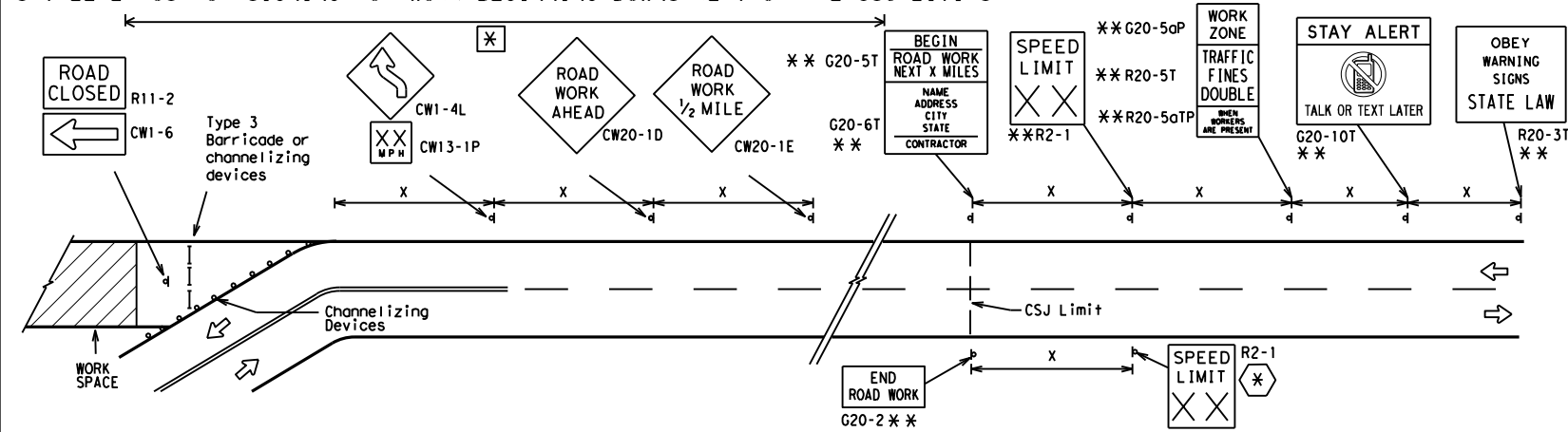
**SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS**



**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.
  - \*\* Required CSJ Limit signing. See Note 10 on BC(1). TRAFFIC FINES DOUBLE signs will not be required on projects consisting solely of mobile operations work.
  - \* 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.

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



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

SHEET 2 OF 12

Texas Department of Transportation  
 Traffic Operations Division Standard

**BARRICADE AND CONSTRUCTION PROJECT LIMIT**

**BC(2)-14**

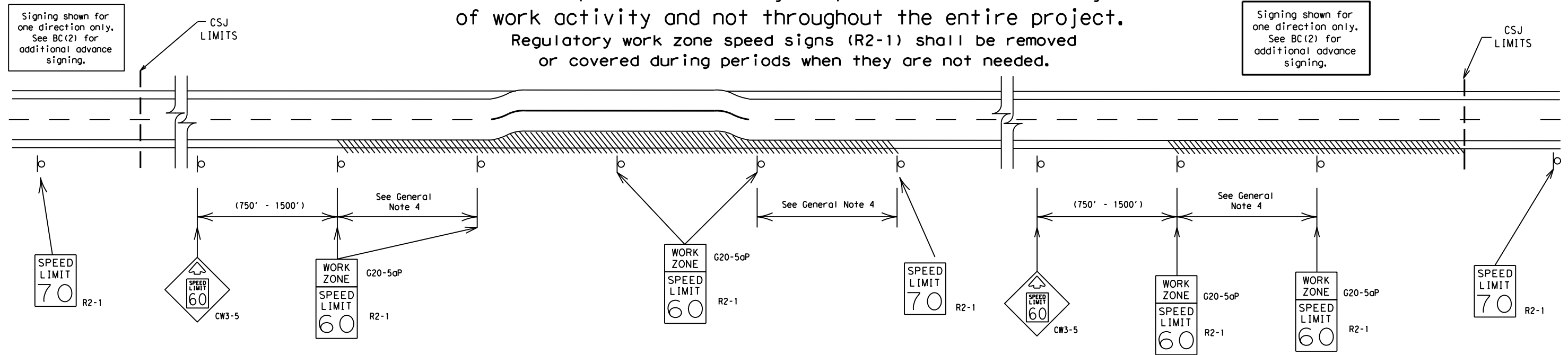
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT SECT	JOB	HIGHWAY	
REVISIONS	1054 01	009, etc.		FM 219, etc.
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13	WAC	BOSQUE, etc.	32	

DATE: FILE:

# TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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



## GUIDANCE FOR USE:

### LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

### SHORT TERM WORK ZONE SPEED LIMITS

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

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

## GENERAL NOTES

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- Frequency of work zone speed limit signs should be:
 

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

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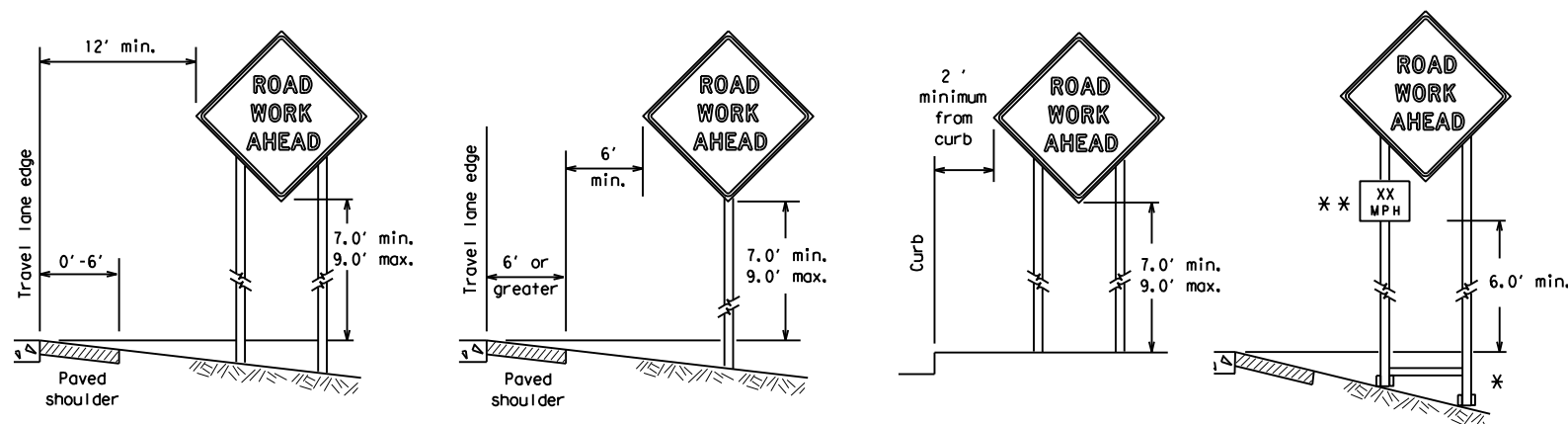


## BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC (3) - 14

FILE:	bc-14.dgn	DW:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS	1054	01	009, etc.	FM 219, etc.					
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13		WAC	BOSQUE, etc.	33					

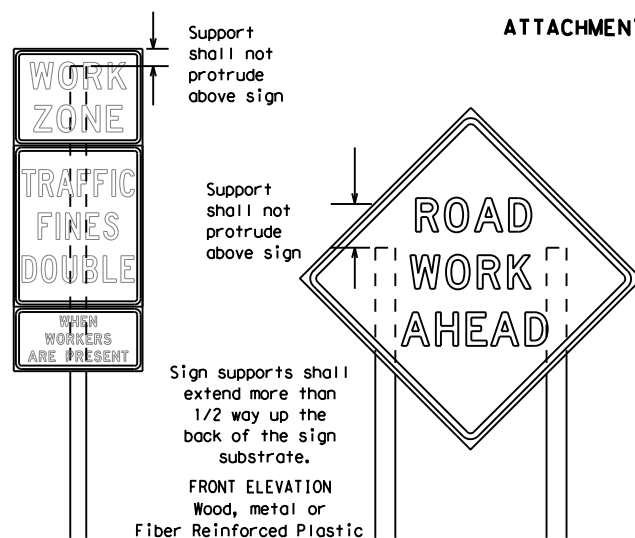
**TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS**



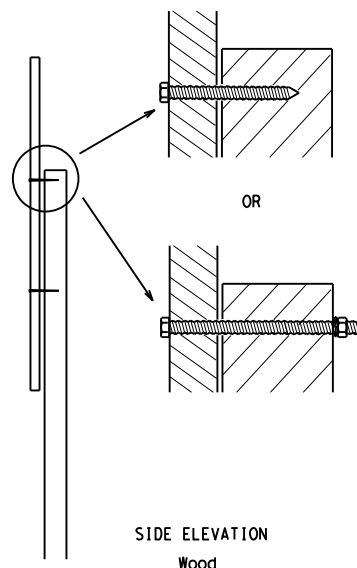
\* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

\*\* 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

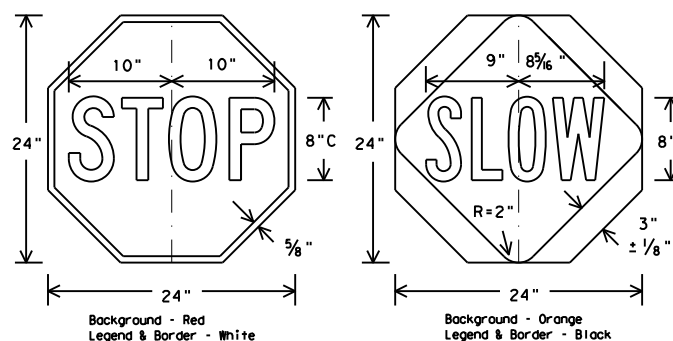


**Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.**

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 splice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

**STOP/SLOW PADDLES**

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



**CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS**

- Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
- When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition.
- When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
- If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
- If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- Any sign or traffic control device that is struck or damaged by the Contractor 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**

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
  - Wooden sign posts shall be painted white.
  - Barricades shall NOT be used as sign supports.
  - All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
  - The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
  - The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
  - The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
  - Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
  - The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.
- DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)**
- The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
    - Long-term stationary - work that occupies a location more than 3 days.
    - Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
    - Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
    - Short, duration - work that occupies a location up to 1 hour.
    - Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

**SIGN MOUNTING HEIGHT**

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

**SIZE OF SIGNS**

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

**SIGN SUBSTRATES**

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

**REFLECTIVE SHEETING**

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

**SIGN LETTERS**

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

**REMOVING OR COVERING**

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

**SIGN SUPPORT WEIGHTS**

- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
- Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
- Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
- Rubber 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.
- Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
- Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

**FLAGS ON SIGNS**

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

SHEET 4 OF 12



**BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES**

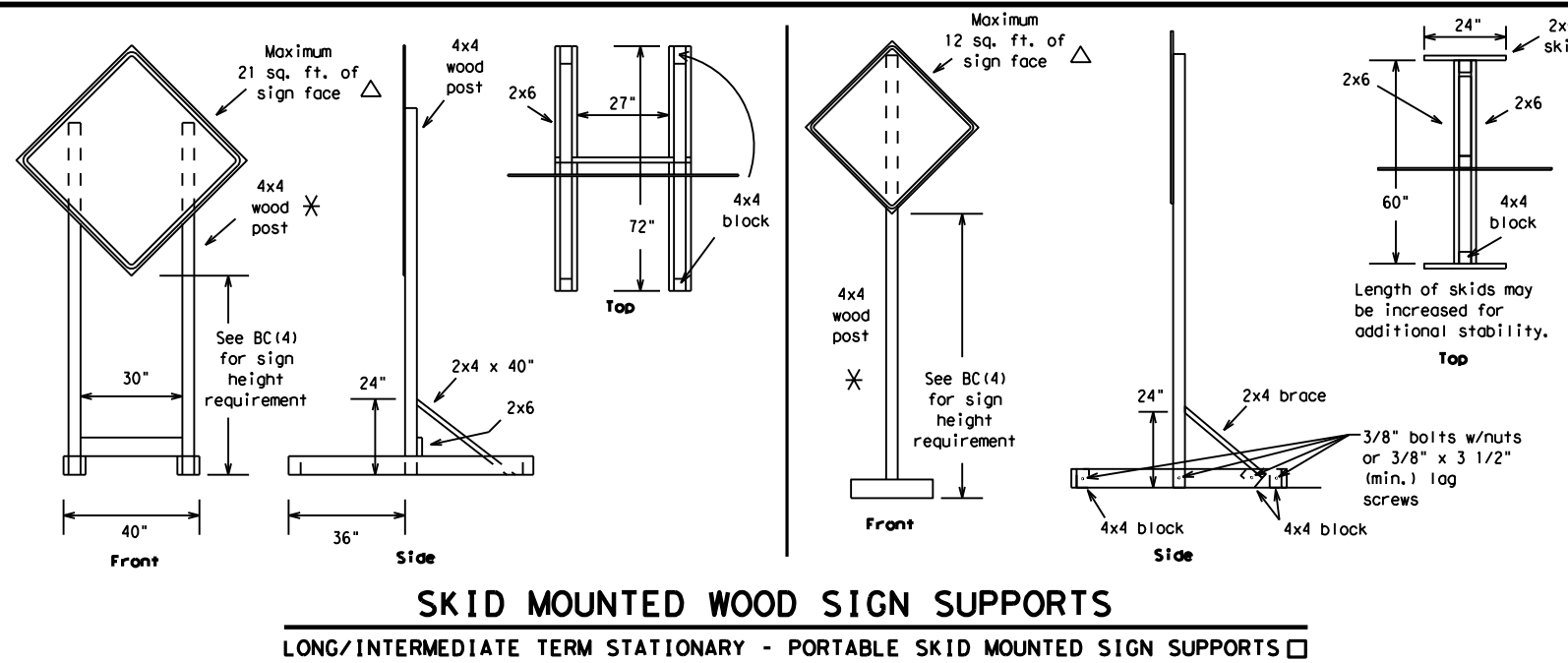
**BC (4) - 14**

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© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		1054	01	009, etc.		FM 219, etc.			
9-07	8-14	DIST	COUNTY		SHEET NO.				
7-13		WAC	BOSQUE, etc.		34				

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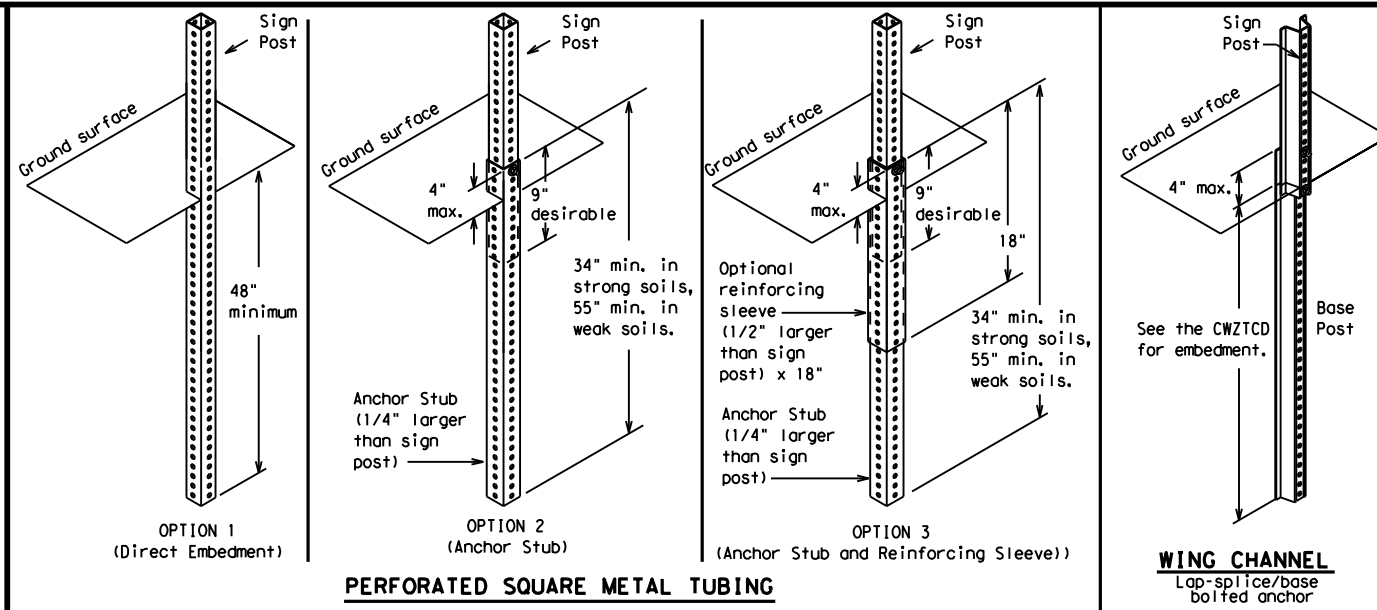
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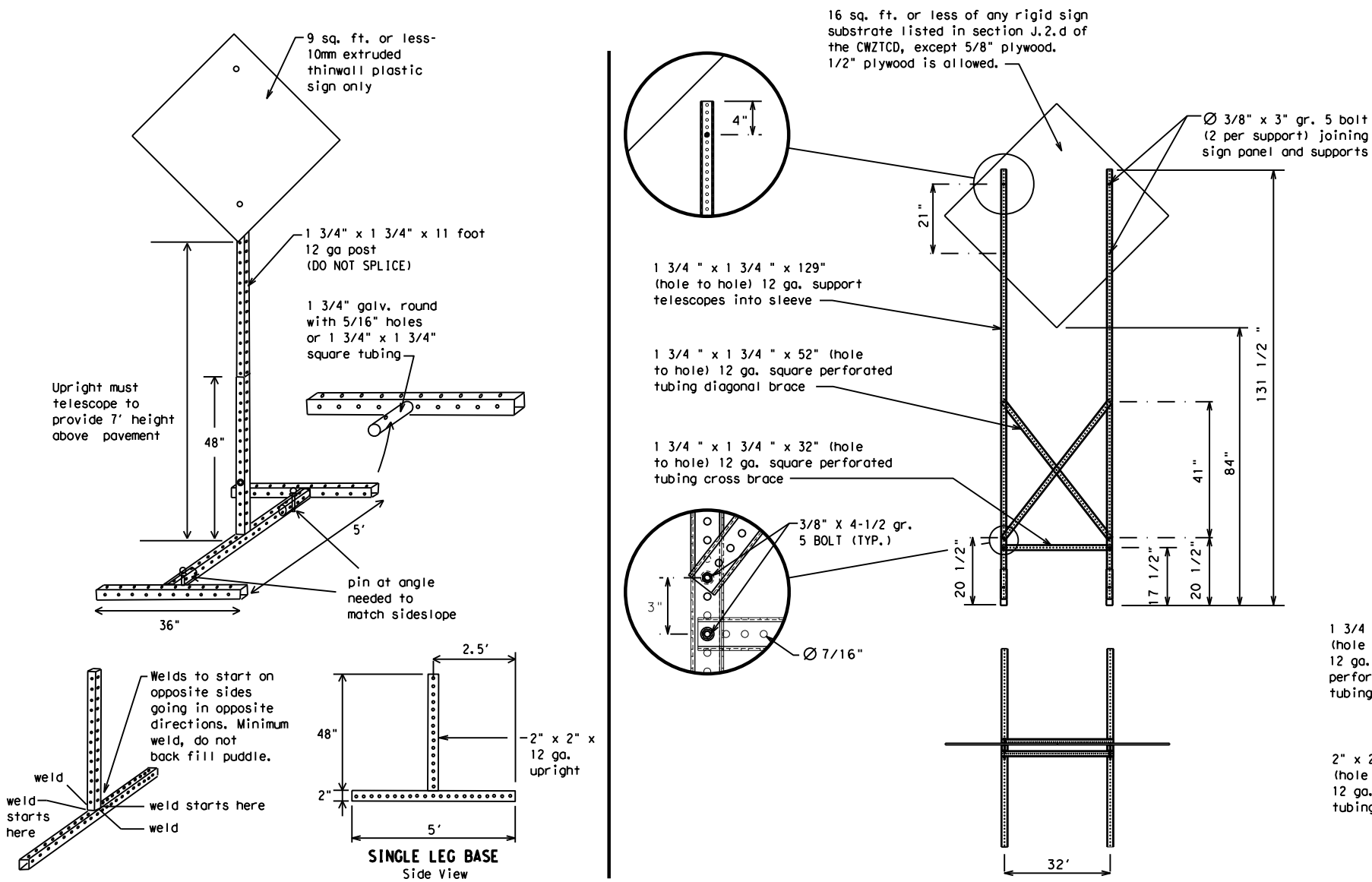
### SKID MOUNTED WOOD SIGN SUPPORTS

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

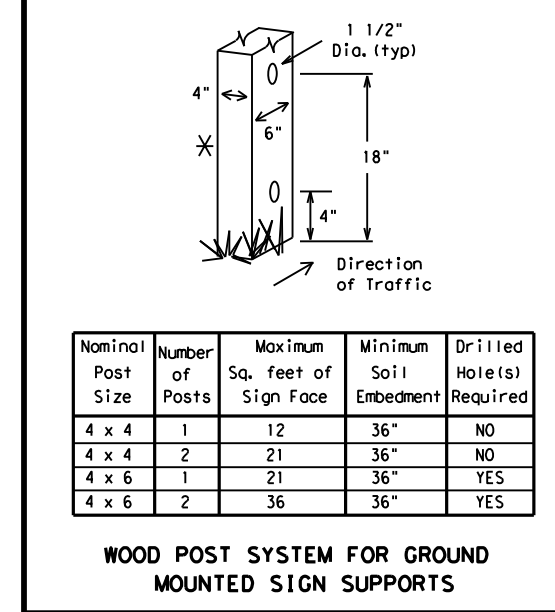


### GROUND MOUNTED SIGN SUPPORTS

Refer to the 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



### WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS

Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

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

- See BC(4) for definition of "Work Duration."
- ✱ Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
- △ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

SHEET 5 OF 12



## BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 14

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1054	01	009, etc.	FM 219, etc.
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13	WAC	BOSQUE, etc.	35	

DATE: FILE:

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

# RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

## PORTABLE CHANGEABLE MESSAGE SIGNS

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

## Phase 1: Condition Lists

### Road/Lane/Ramp Closure List

FREEWAY CLOSED X MILE
ROAD CLOSED AT SH XXX
ROAD CLSD AT FM XXXX
RIGHT X LANES CLOSED
CENTER LANE CLOSED
NIGHT LANE CLOSURES
VARIOUS LANES CLOSED
EXIT CLOSED
MALL DRIVEWAY CLOSED
XXXXXXXX BLVD CLOSED

### Other Condition List

FRONTAGE ROAD CLOSED
SHOULDER CLOSED XXX FT
RIGHT LN CLOSED XXX FT
RIGHT X LANES OPEN
DAYTIME LANE CLOSURES
I-XX SOUTH EXIT CLOSED
EXIT XXX CLOSED X MILE
RIGHT LN TO BE CLOSED
X LANES CLOSED TUE - FRI
ROADWORK XXX FT
FLAGGER XXXX FT
RIGHT LN NARROWS XXXX FT
MERGING TRAFFIC XXXX FT
LOOSE GRAVEL XXXX FT
DETOUR X MILE
ROADWORK PAST SH XXXX
BUMP XXXX FT
TRAFFIC SIGNAL XXXX FT
ROAD REPAIRS XXXX FT
LANE NARROWS XXXX FT
TWO-WAY TRAFFIC XX MILE
CONST TRAFFIC XXX FT
UNEVEN LANES XXXX FT
ROUGH ROAD XXXX FT
ROADWORK NEXT FRI-SUN
US XXX EXIT X MILES
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
DETOUR NEXT X EXITS
USE EXIT XXX
STAY ON US XXX SOUTH
TRUCKS USE US XXX N
WATCH FOR TRUCKS
EXPECT DELAYS
REDUCE SPEED XXX FT
USE OTHER ROUTES
STAY IN LANE *
FORM X LINES RIGHT
USE XXXXX RD EXIT
USE EXIT I-XX NORTH
USE I-XX E TO I-XX N
WATCH FOR TRUCKS
EXPECT DELAYS
END SHOULDER USE
WATCH FOR WORKERS

### Location List

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

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

## WORDING ALTERNATIVES

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

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

## FULL MATRIX PCMS SIGNS

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

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DATE: FILE:

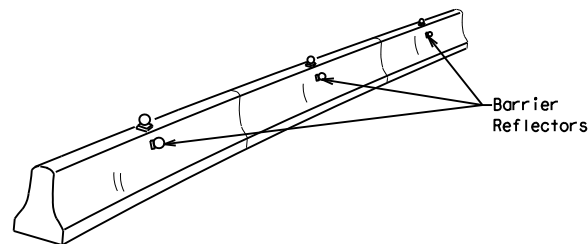
WORD OR PHRASE	ABBREVIATION	WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD	Major	MAJ
Alternate	ALT	Miles	MI
Avenue	AVE	Miles Per Hour	MPH
Best Route	BEST RTE	Minor	MNR
Boulevard	BLVD	Monday	MON
Bridge	BRDG	Normal	NORM
Canal	CANT	North	N
Center	CTR	Northbound	(route) N
Construction Ahead	CONST AHD	Parking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

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

<h3>BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)</h3>			
<h2>BC (6) - 14</h2>			
FILE:	bc-14.dgn	DN:	TxDOT
© TxDOT	November 2002	CONT:	SECT:
REVISIONS	1054 01	JOB:	HIGHWAY
9-07	8-14	DIST:	COUNTY
7-13		WAC:	BOSQUE, etc.
		SHEET NO.:	36

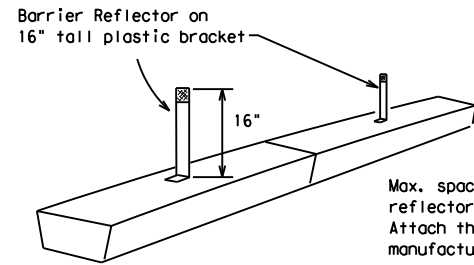
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



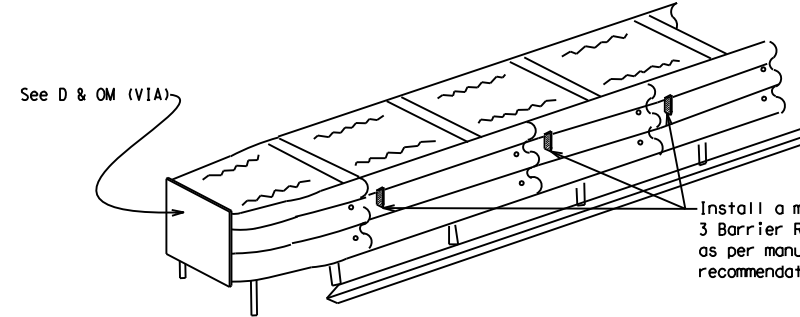
**CONCRETE TRAFFIC BARRIER (CTB)**

- 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.
- 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.
- When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
- Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
- Maximum spacing of Barrier Reflectors is forty (40) feet.
- Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
- Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
- Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
- Single slope barriers shall be delineated as shown on the above detail.



**LOW PROFILE CONCRETE BARRIER (LPCB)**

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



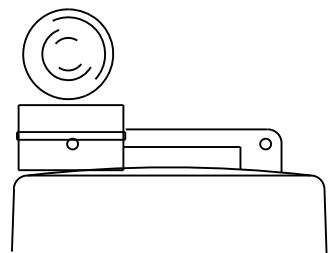
**DELINEATION OF END TREATMENTS**

**END TREATMENTS FOR CTB'S USED IN WORK ZONES**  
 End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

**BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS**

**WARNING LIGHTS**

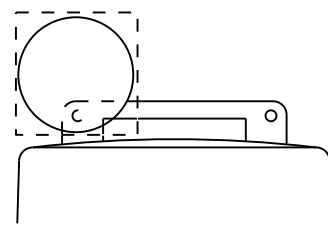
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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



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

**WARNING LIGHTS MOUNTED ON PLASTIC DRUMS**

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



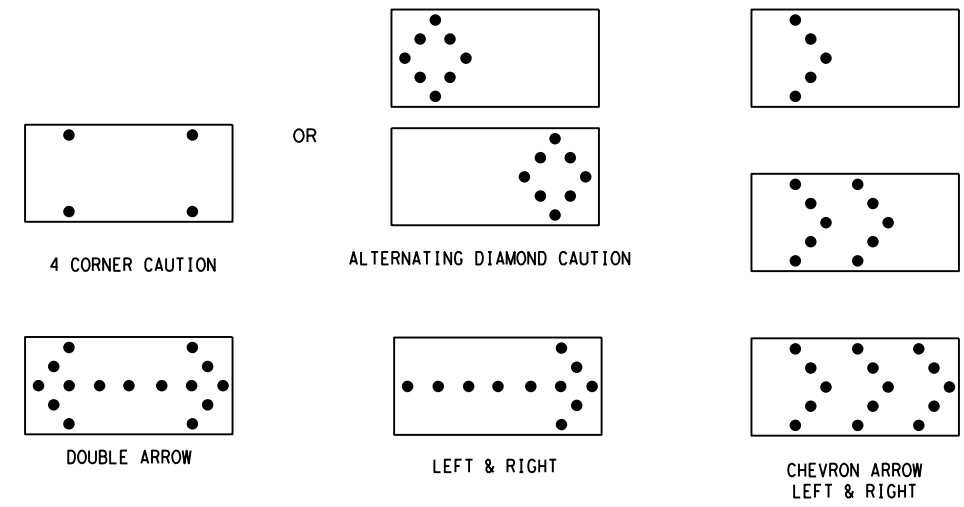
Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

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

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

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

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



- The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
- The straight line caution display is NOT ALLOWED.
- The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
- Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
- The sequential arrow display is NOT ALLOWED.
- The flashing arrow display is the TxDOT standard; however, the sequential Chevron display may be used during daylight operations.
- The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
- A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
- A full matrix 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.
- 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**

SHEET 7 OF 12

**TRUCK-MOUNTED ATTENUATORS**

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350) or the Manual for Assessing Safety Hardware (MASH).
- Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
- Refer to the CWZTCD for a list of approved TMAs.
- TMAs are required on freeways unless otherwise noted in the plans.
- A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
- The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.



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

**BC(7)-14**

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7-13		WAC	BOSQUE, etc.		37				

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**GENERAL NOTES**

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

**GENERAL DESIGN REQUIREMENTS**

Pre-qualified plastic drums shall meet the following requirements:

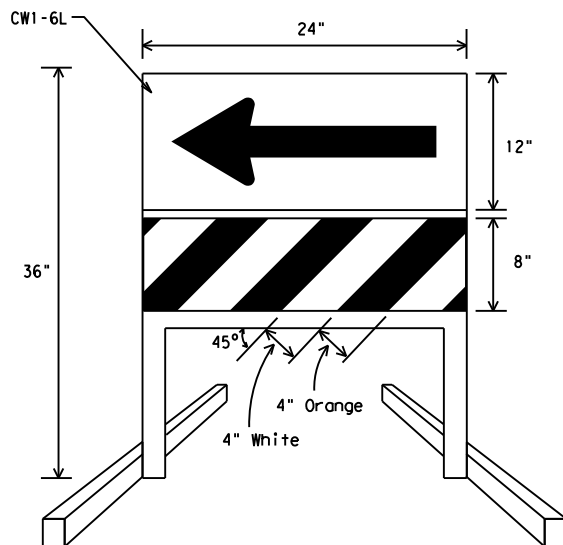
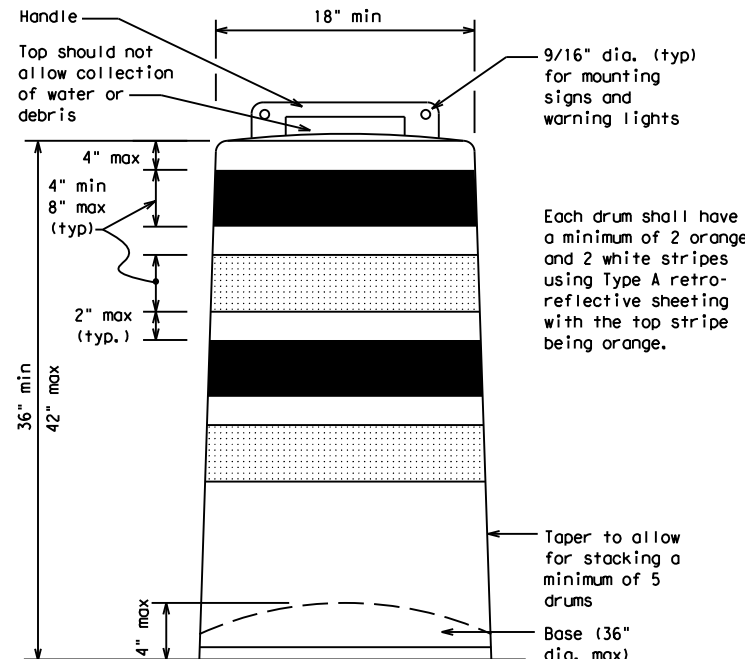
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

**RETROREFLECTIVE SHEETING**

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

**BALLAST**

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

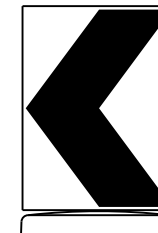


**DIRECTION INDICATOR BARRICADE**

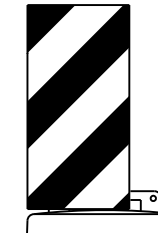
- The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
- If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
- The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CWI-6) sign in the size shown with a black arrow on a background of Type B<sub>FL</sub> or Type C<sub>FL</sub> Orange retroreflective sheeting above a rail with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheetting types shall be as per DMS 8300.
- Double arrows on the Direction Indicator Barricade will not be allowed.
- Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturer's instructions.

**DETECTABLE PEDESTRIAN BARRICADES**

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



18" x 24" Sign  
(Maximum Sign Dimension)  
Chevron CWI-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**

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

SHEET 8 OF 12



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

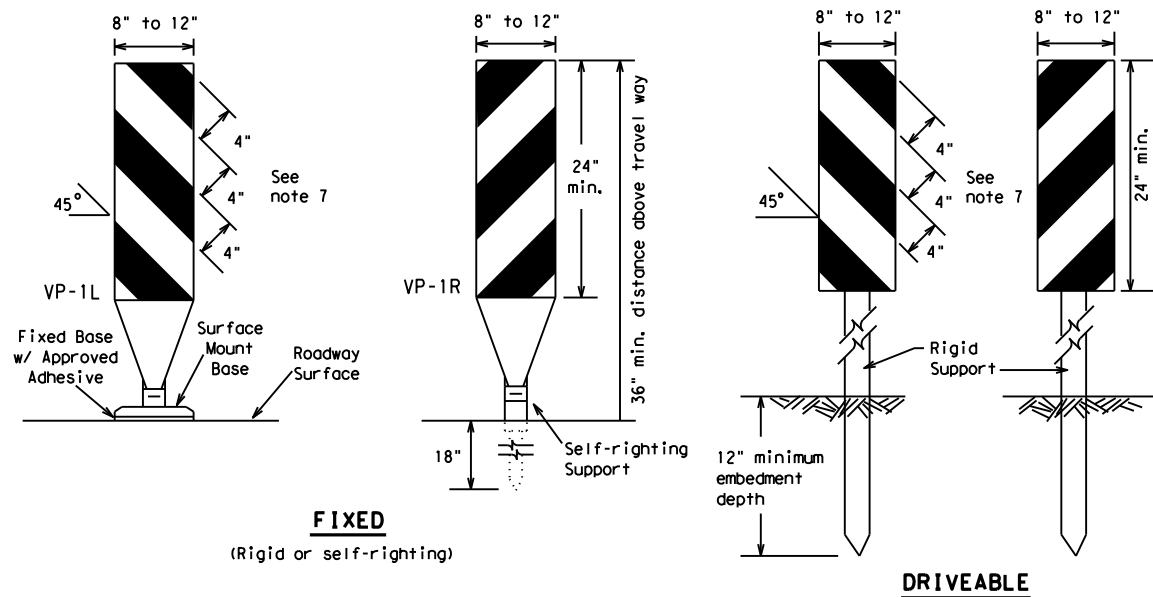
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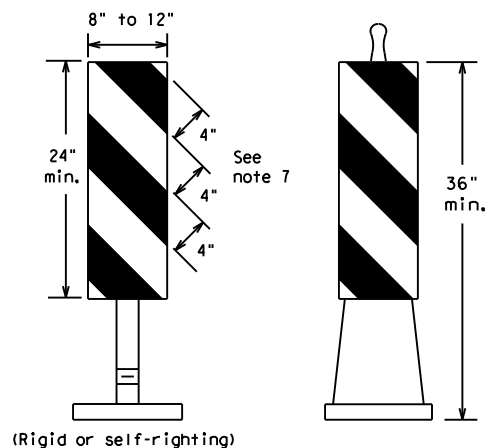


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**FIXED**  
(Rigid or self-righting)

**DRIVEABLE**

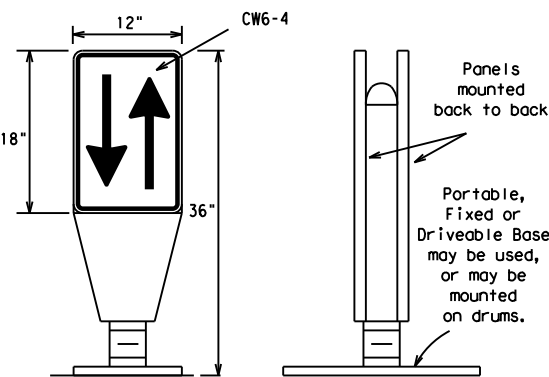


(Rigid or self-righting)

**PORTABLE**

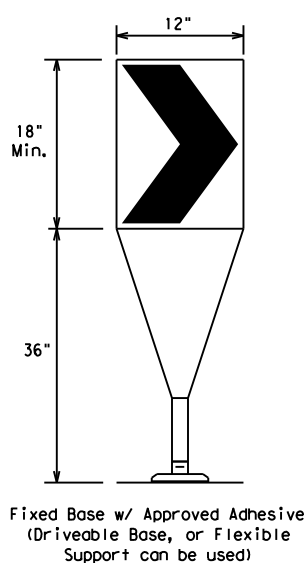
**VERTICAL PANELS (VPs)**

- Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
- 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 Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
- VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
- VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
- Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- Sheeting for the VP's shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
- Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.



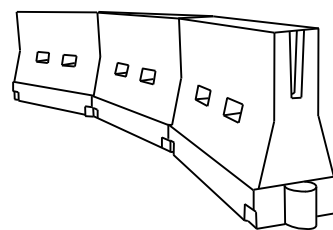
**OPPOSING TRAFFIC LANE DIVIDERS (OTLD)**

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



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

**CHEVRONS**



**LONGITUDINAL CHANNELIZING DEVICES (LCD)**

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

**WATER BALLASTED SYSTEMS USED AS BARRIERS**

- Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
- Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
- Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
- When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or 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**

**GENERAL NOTES**

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

Posted Speed * S	Formula L = WS <sup>2</sup> / 60	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent
30	L = WS <sup>2</sup> / 60	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40	L = WS	265'	295'	320'	40'	80'
45		450'	495'	540'	45'	90'
50	L = WS	500'	550'	600'	50'	100'
55		600'	660'	720'	60'	120'
60	L = WS	650'	715'	780'	65'	130'
65		700'	770'	840'	70'	140'
70	L = WS	750'	825'	900'	75'	150'
75		800'	880'	960'	80'	160'
80	L = WS	800'	880'	960'	80'	160'
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**

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**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (9) - 14**

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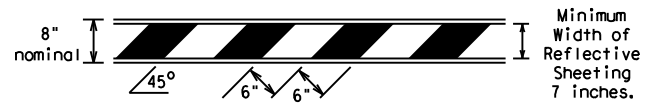
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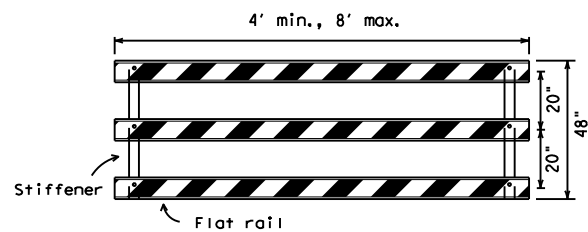
**TYPE 3 BARRICADES**

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 stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.

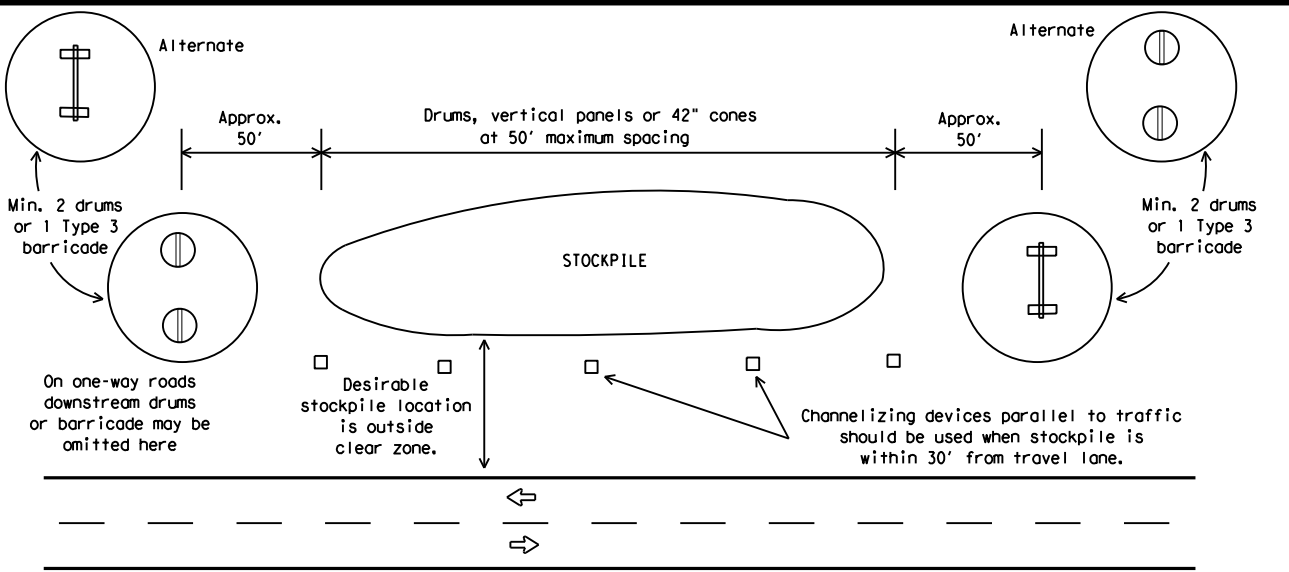


**TYPICAL STRIPING DETAIL FOR BARRICADE RAIL**



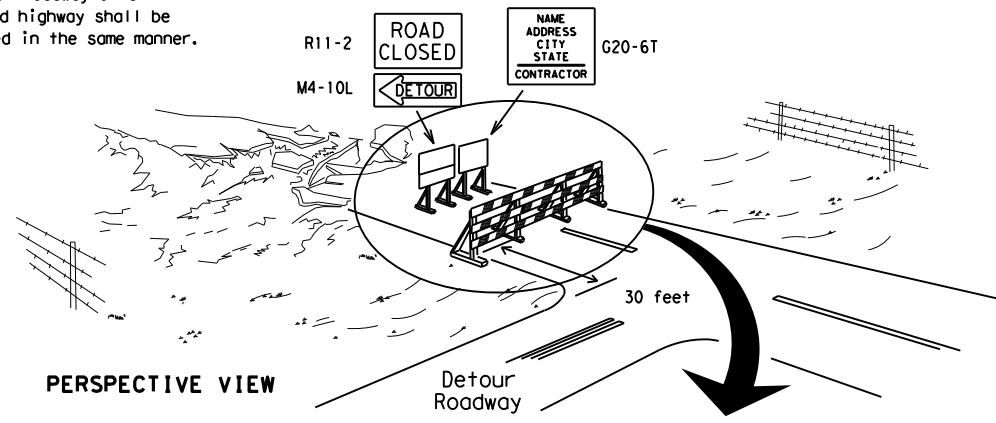
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

**TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES**



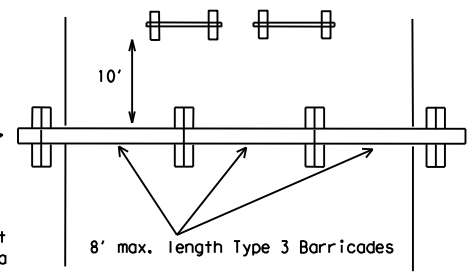
**TRAFFIC CONTROL FOR MATERIAL STOCKPILES**

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



PERSPECTIVE VIEW

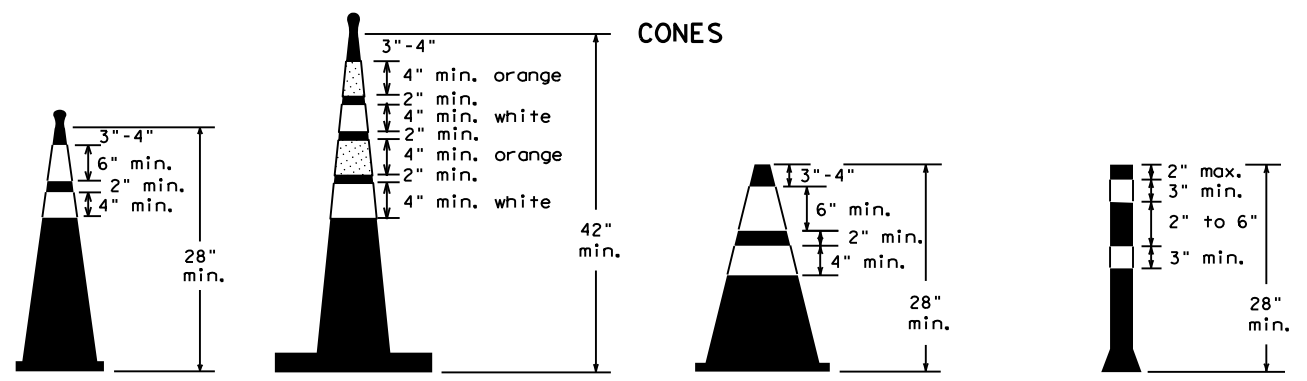
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



PLAN VIEW

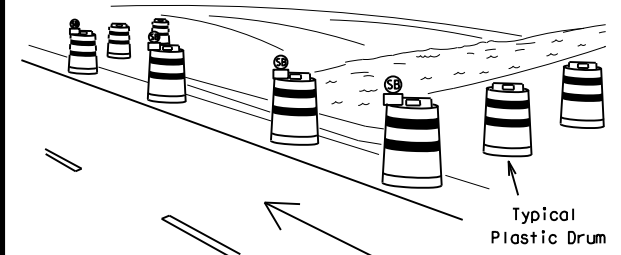
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

**TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION**

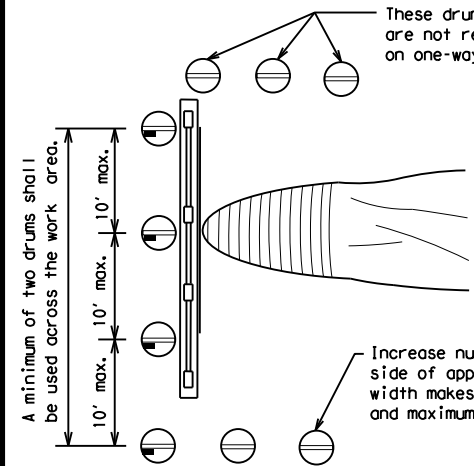


28" Cones shall have a minimum weight of 9 1/2 lbs.  
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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 used at night shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A.
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.



PERSPECTIVE VIEW



PLAN VIEW

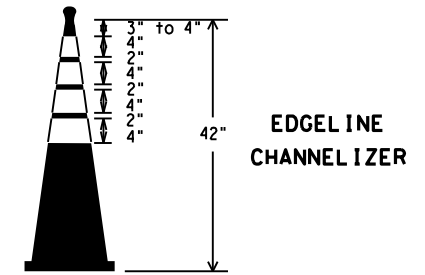
1. Where positive redirection capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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

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

Increase number of plastic drums on the side of approaching traffic if the crown width makes it necessary. (minimum of 2 and maximum of 4 drums)

**CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS**

THIS DEVICE SHALL NOT BE USED ON PROJECTS LET AFTER MARCH 2014.



EDGE LINE CHANNELIZER

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

**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (10) - 14**

FILE: bc-14.dgn	DW: TxDOT	CK: TxDOT	OW: TxDOT	CR: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1054	01	009, etc.	FM 219, etc.
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13	WAC	BOSQUE, etc.	40	

DATE: FILE:

## WORK ZONE PAVEMENT MARKINGS

### GENERAL

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

### RAISED PAVEMENT MARKERS

- Raised pavement markers are to be placed according to the patterns on BC(12).
- All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

### PREFABRICATED PAVEMENT MARKINGS

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

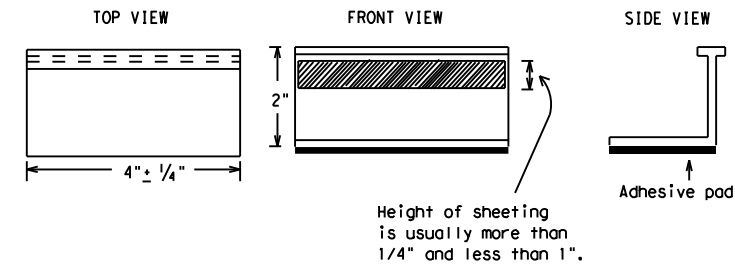
### MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

### REMOVAL OF PAVEMENT MARKINGS

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

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

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

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

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

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

SHEET 11 OF 12



## BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

**BC(11) - 14**

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS		1054	01	009, etc. FM 219, etc.
2-98	9-07			
1-02	7-13	DIST	COUNTY	SHEET NO.
11-02	8-14	WAC	BOSQUE, etc.	41

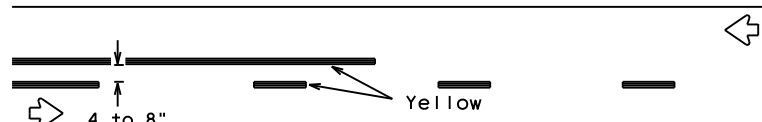
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DATE:  
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## PAVEMENT MARKING PATTERNS

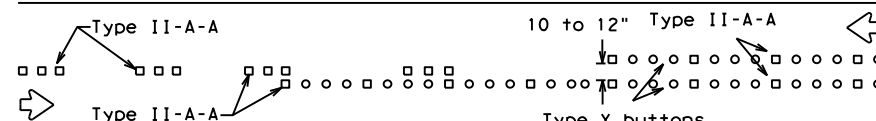


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

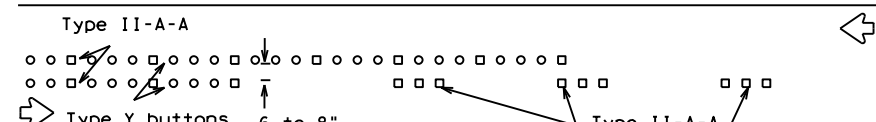


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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

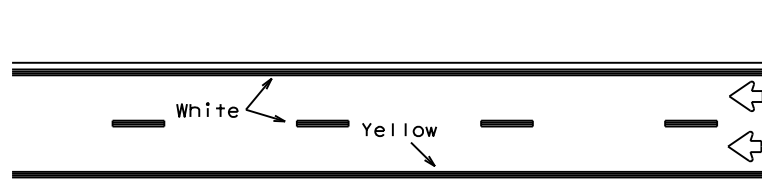


RAISED PAVEMENT MARKERS - PATTERN A



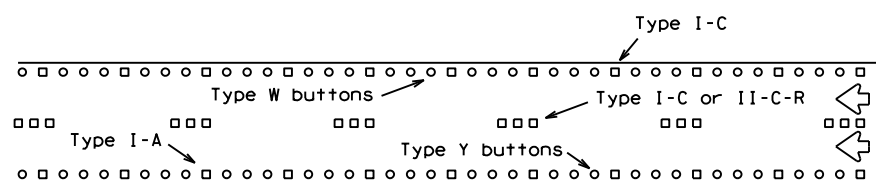
RAISED PAVEMENT MARKERS - PATTERN B

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



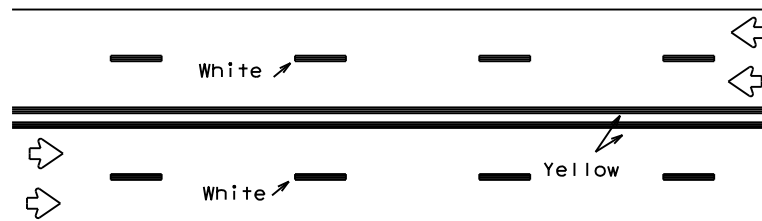
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectorized pavement markings.



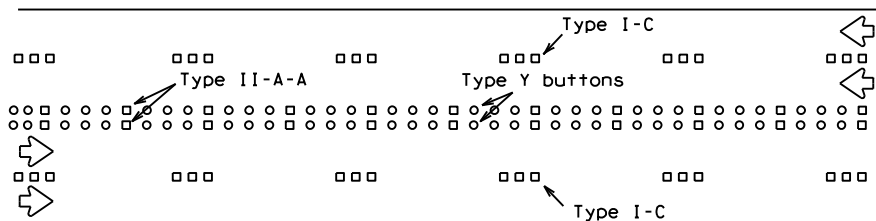
RAISED PAVEMENT MARKERS

## EDGE & LANE LINES FOR DIVIDED HIGHWAY



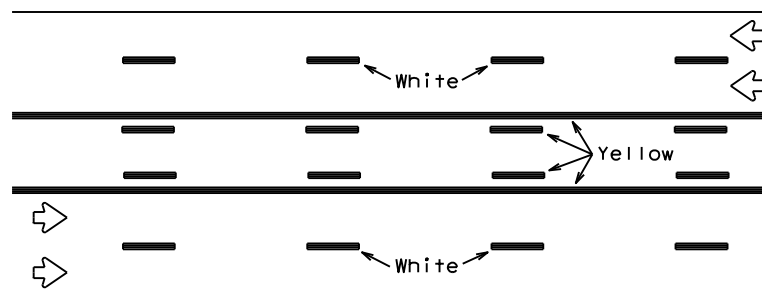
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectorized pavement markings.



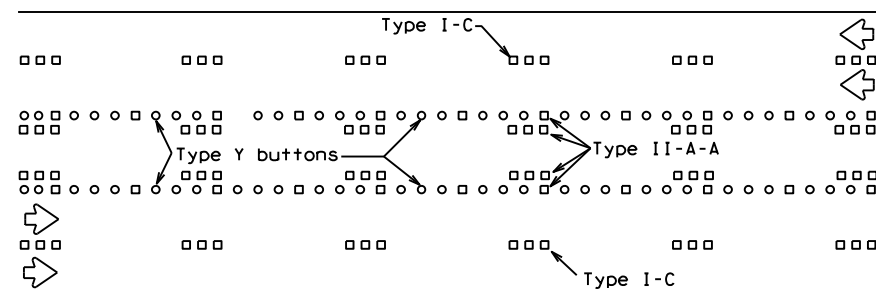
RAISED PAVEMENT MARKERS

## LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

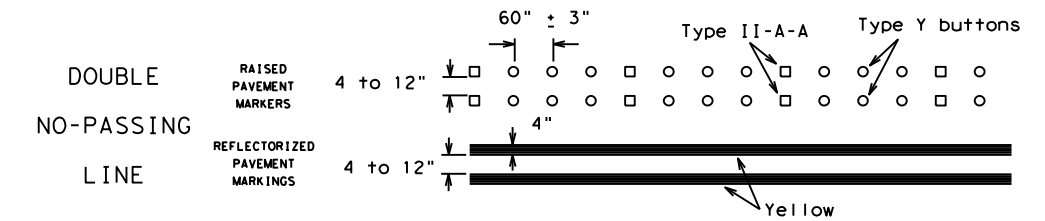
Prefabricated markings may be substituted for reflectorized pavement markings.



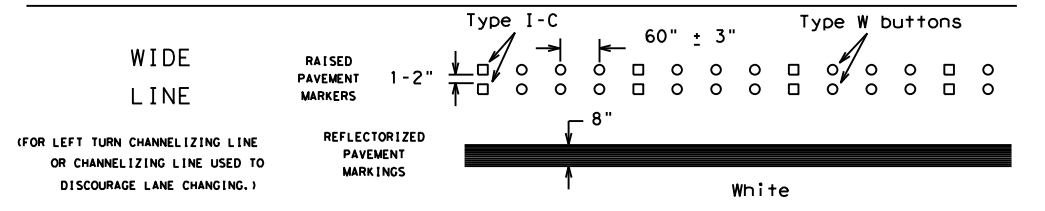
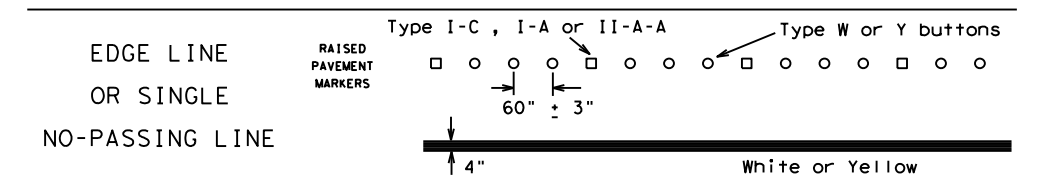
RAISED PAVEMENT MARKERS

## TWO-WAY LEFT TURN LANE

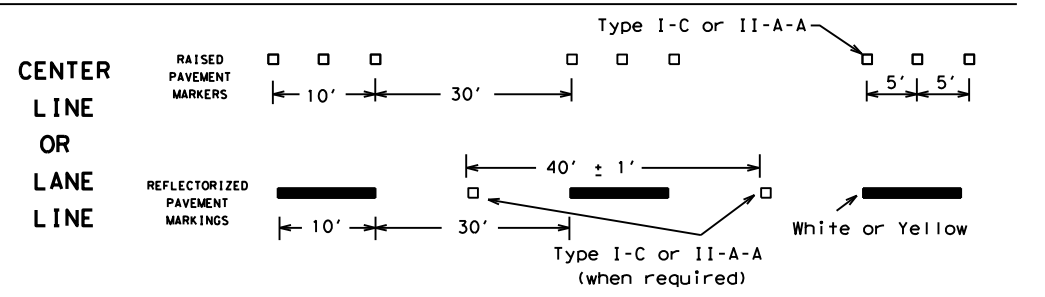
## STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



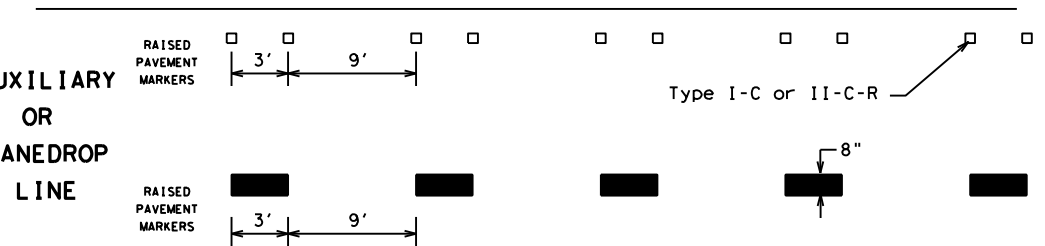
### SOLID LINES



### BROKEN LINES

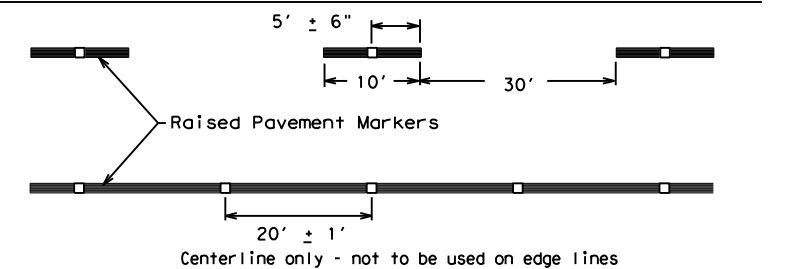


### AUXILIARY OR LANEDROP LINE



### 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.



SHEET 12 OF 12



## BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

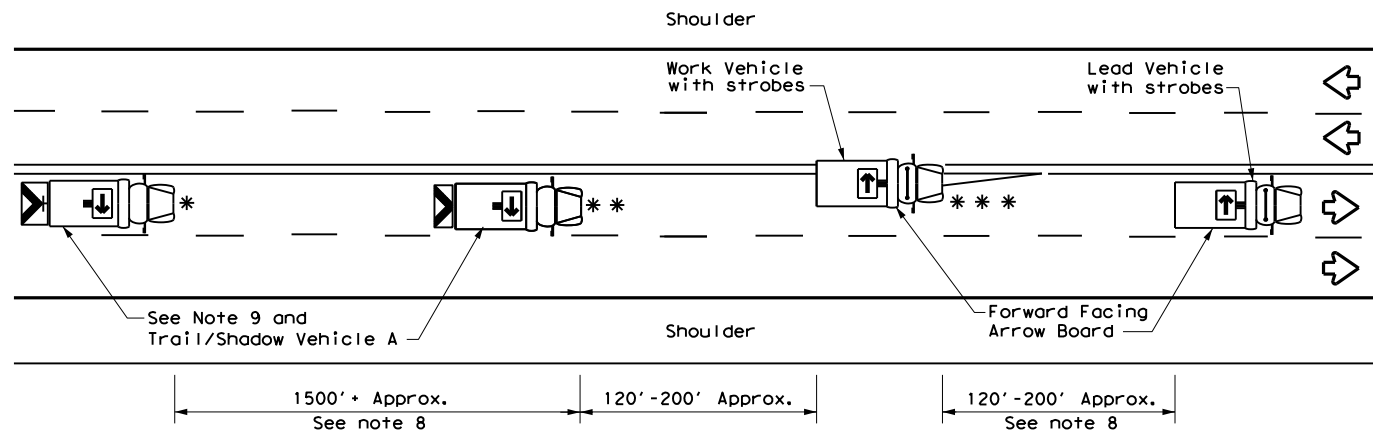
BC (12) - 14

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©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	1054	01	009, etc.	FM 219, etc.
1-97 9-07	DIST	COUNTY	SHEET NO.	
2-98 7-13	WAC	BOSQUE, etc.	42	
11-02 8-14				

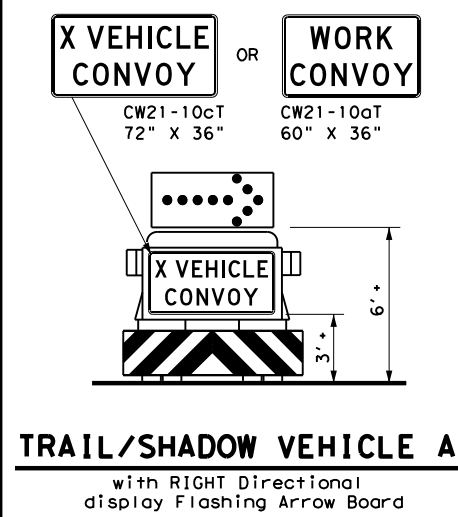
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**TCP (3-1a)**  
**UNDIVIDED MULTILANE ROADWAY**

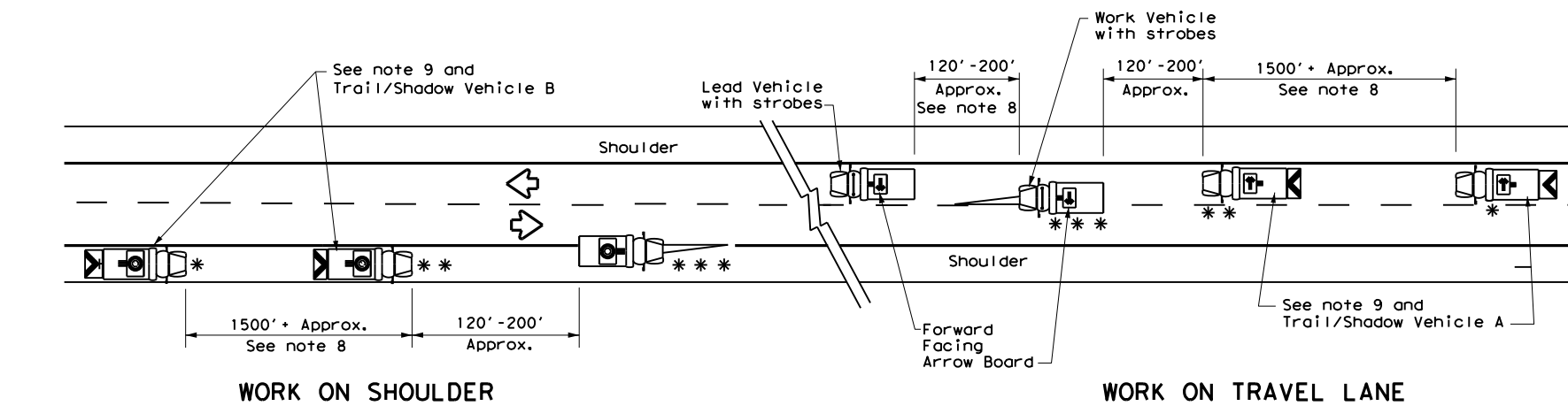


LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

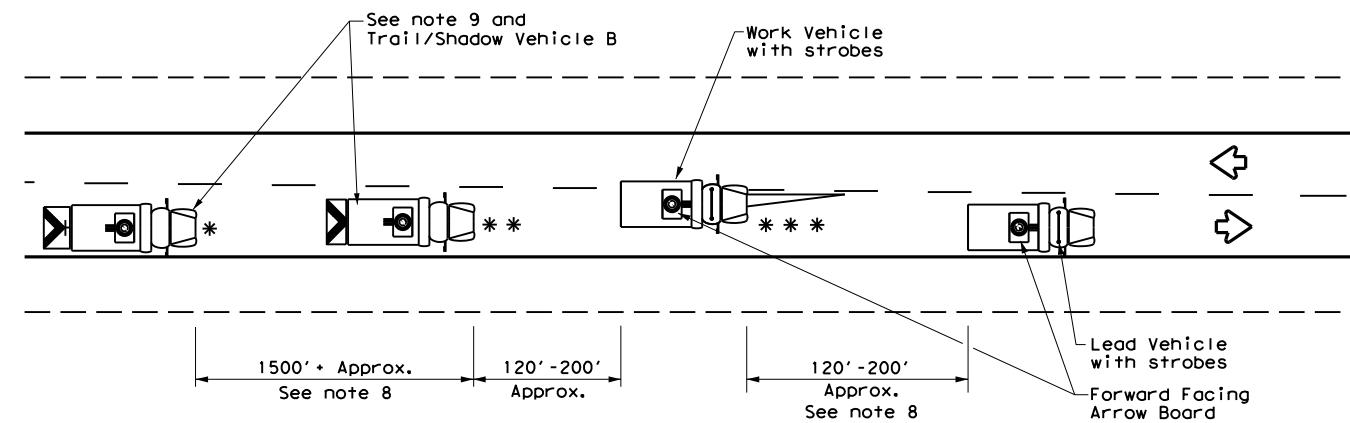
TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
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**GENERAL NOTES**

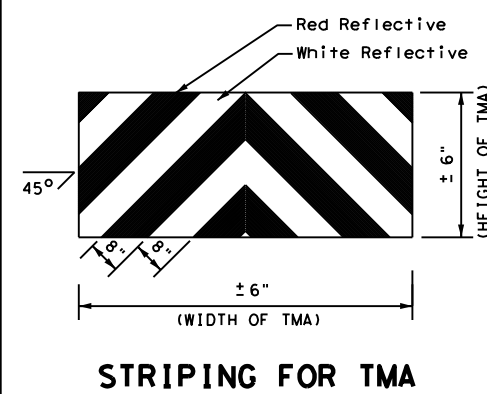
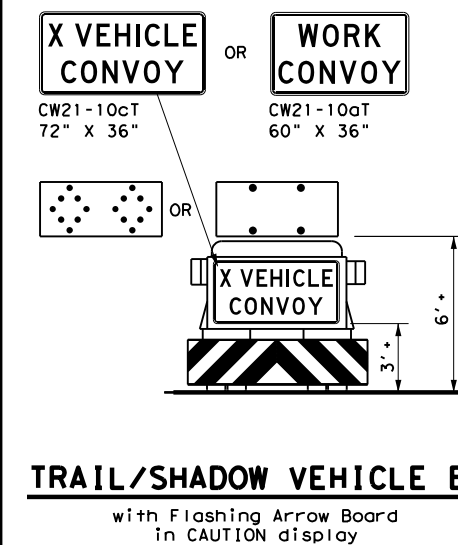
1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic 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.



**TCP (3-1b)**  
**TWO-WAY ROADWAY WITH PAVED SHOULDERS**



**TCP (3-1c)**  
**TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS**



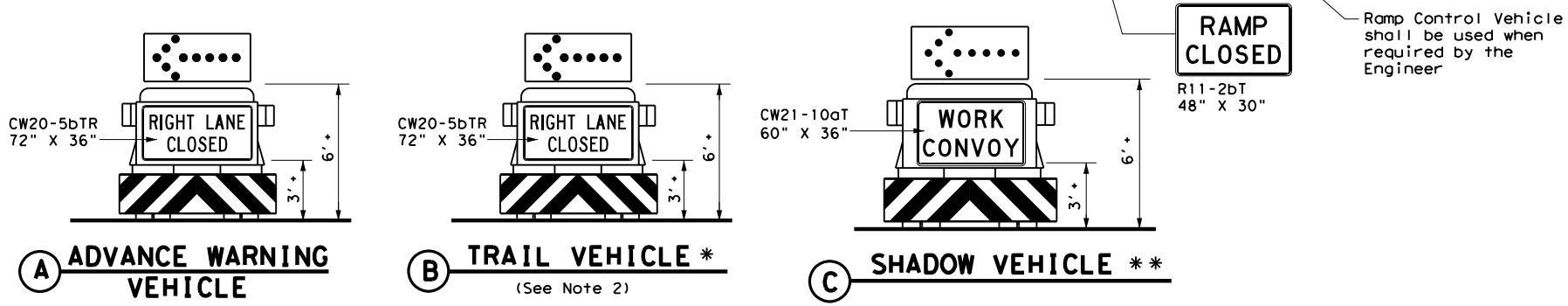
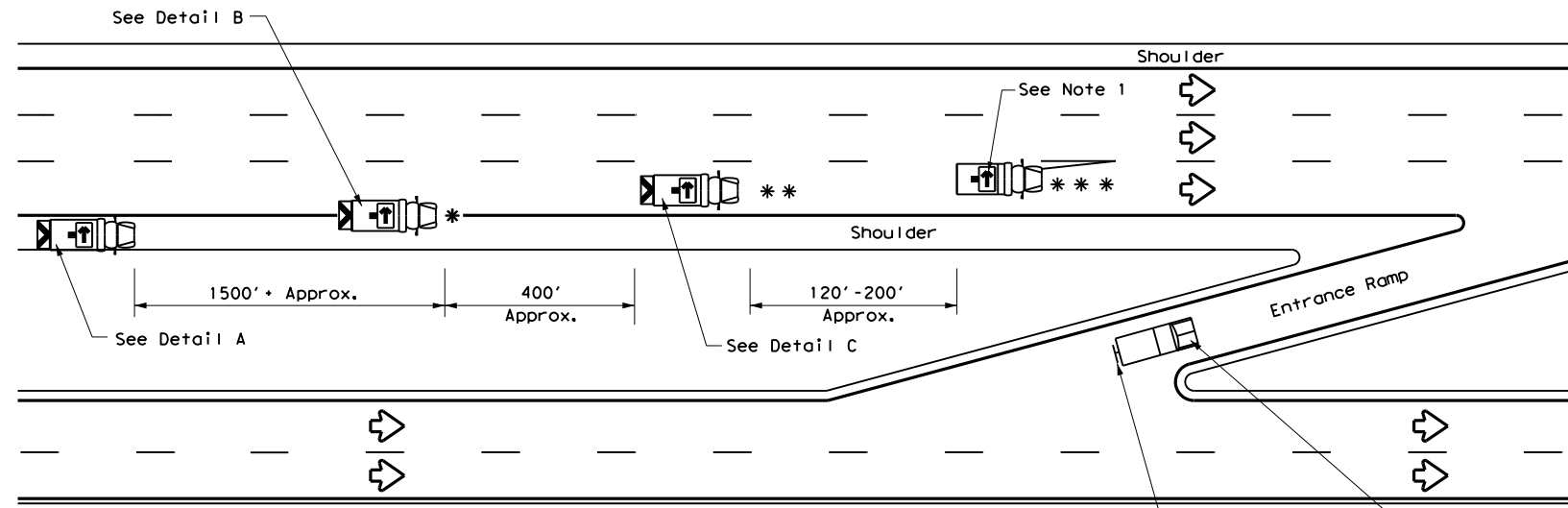
**TRAFFIC CONTROL PLAN  
MOBILE OPERATIONS  
UNDIVIDED HIGHWAYS**

**TCP (3-1) - 13**

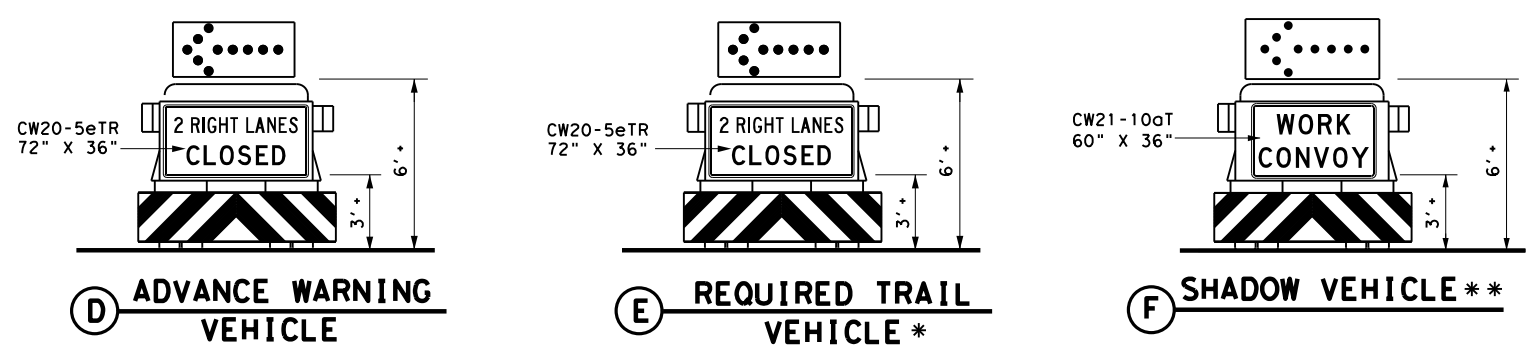
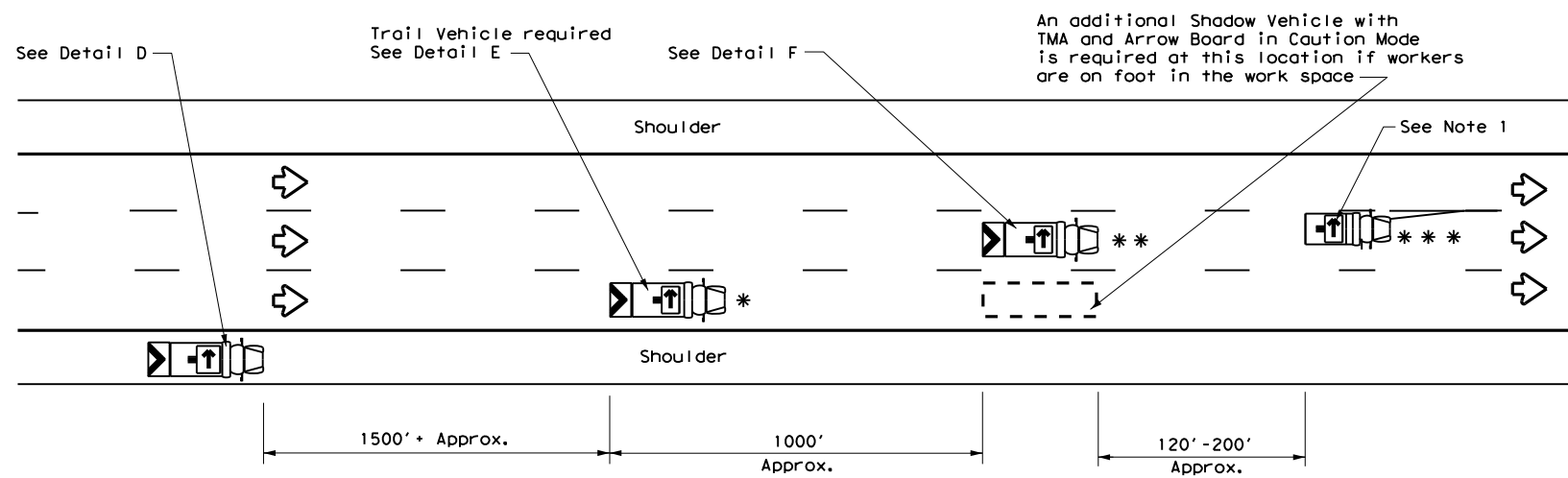
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© TxDOT	December 1985	CONT	SECT	JOB	HIGHWAY				
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2-94	4-98								
8-95	7-13								
1-97									
		DIST	COUNTY		SHEET NO.				
		WAC	BOSQUE, etc.		43				

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DATE: FILE:



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



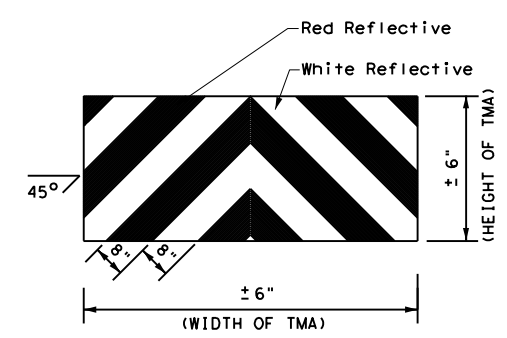
**INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)**

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**

- 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.
- 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.
- 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.
- The use of truck mounted attenuators (TMA) on the ADVANCE WARNING, SHADOW, and TRAIL vehicles are required.
- Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DMS 8300, Type A.
- Each vehicle shall have two-way radio communication capability.
- When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
- 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.
- Standard 48" X 48" diamond shaped warning signs with the same message as those shown may be used where adequate mounting space exists.
- 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.
- Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
- 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.
- Signs and flashing arrow board modes shall be appropriately altered when implementing left lane closures or interior closures which close the left lanes.
- 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

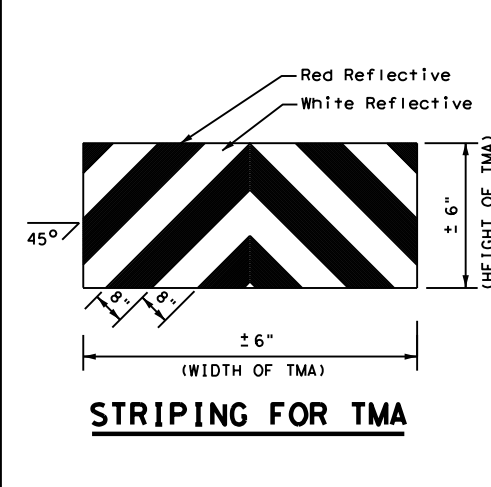
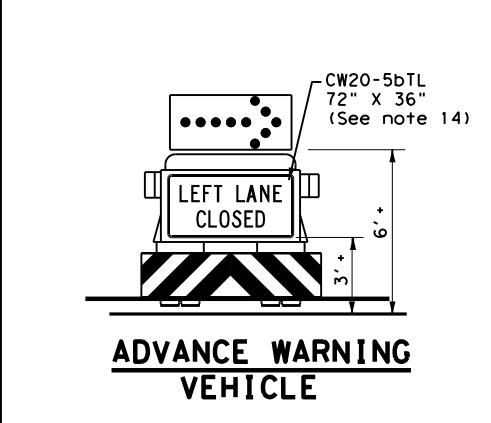
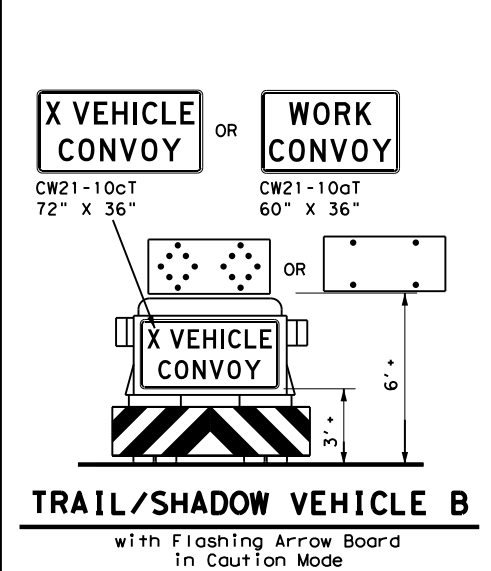
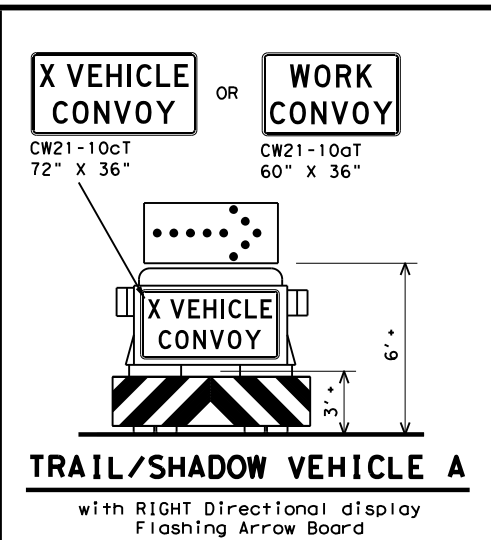
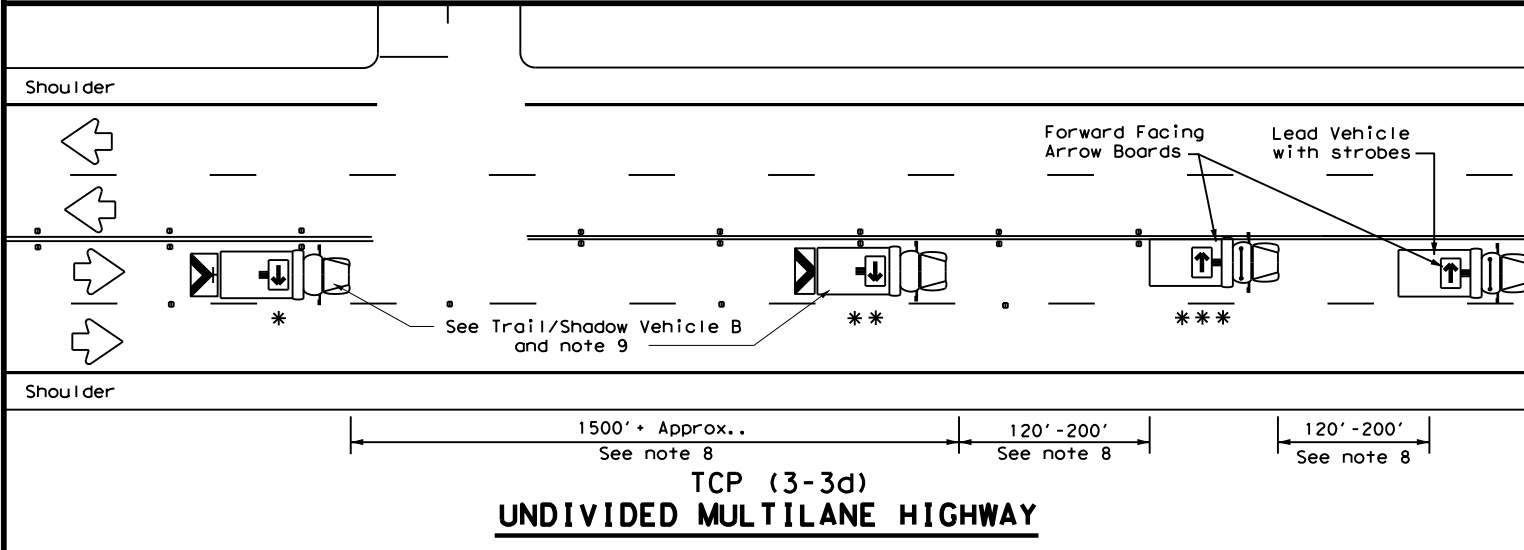
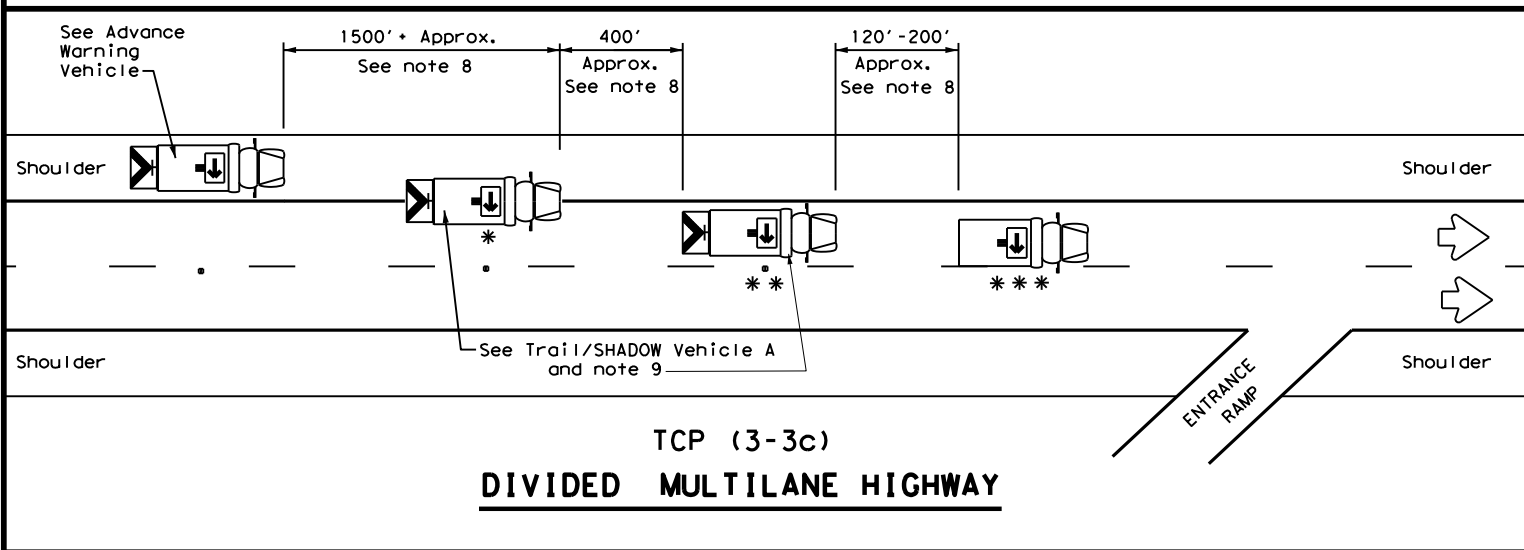
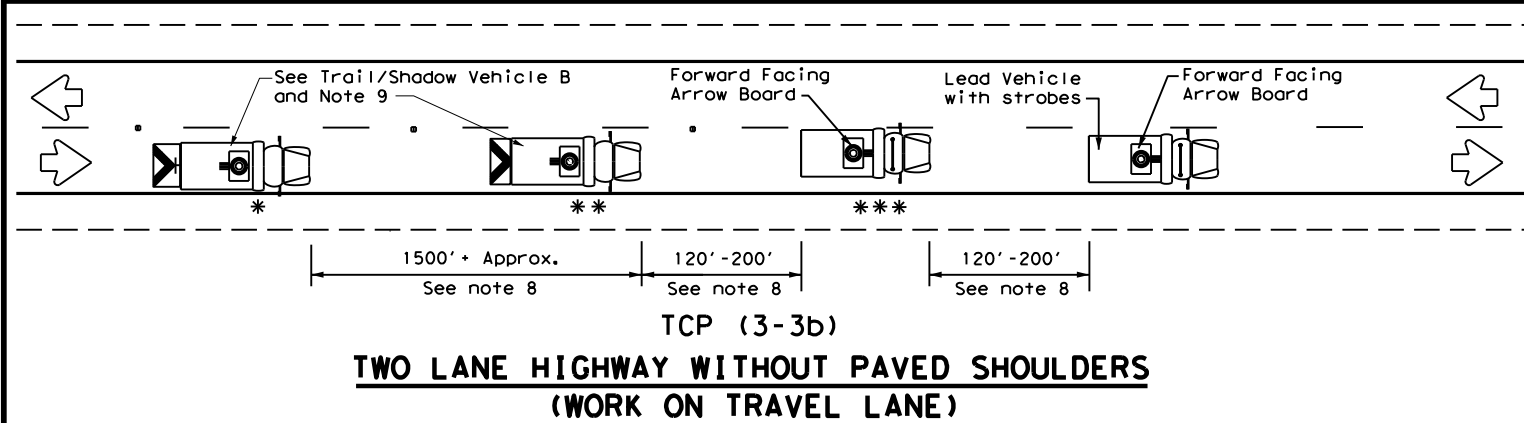
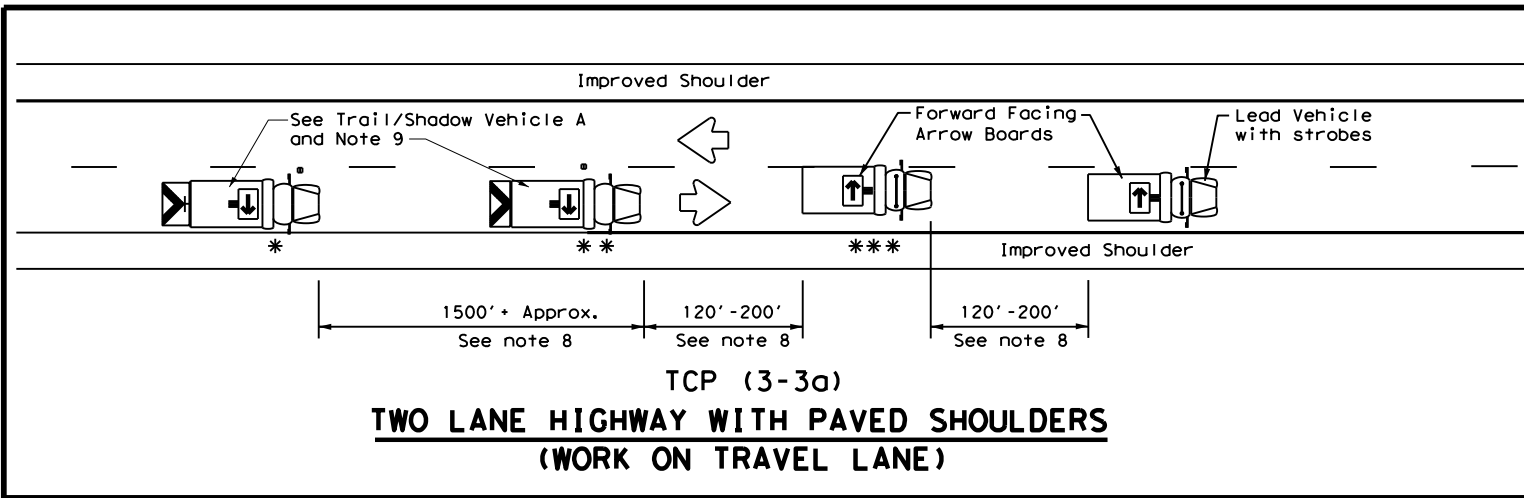
## TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

### TCP(3-2)-13

FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	1054	01	009, etc.	FM 219, etc.
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 7-13	WAC	BOSQUE, etc.	44	
1-97				

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DATE: FILE:



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**

- 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.
- 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.
- The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE, ADVANCE WARNING and TRAIL VEHICLE are required.
- 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.
- 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.
- Each vehicle shall have two-way radio communication capability.
- When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
- 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.
- 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.
- 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.
- A double arrow shall not be displayed on the arrow board on the Advance Warning Vehicle.
- For divided highways with three or four lanes in each direction, use TCP(3-2).
- Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
- The Advance Warning Vehicle may straddle the edgeline when Shoulder width makes it necessary.
- 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**

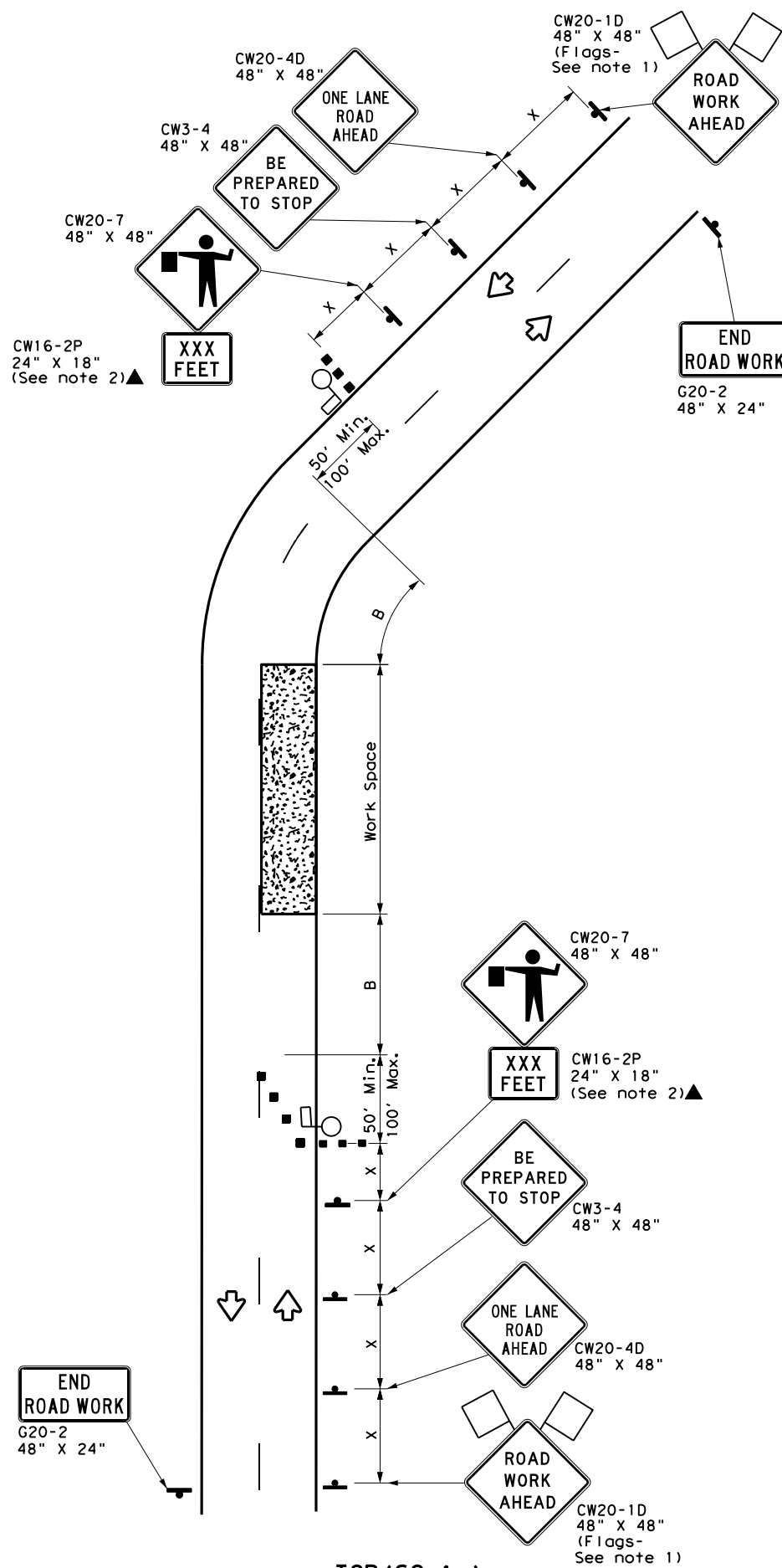
**MARKER INSTALLATION/REMOVAL**

**TCP (3-3) - 14**

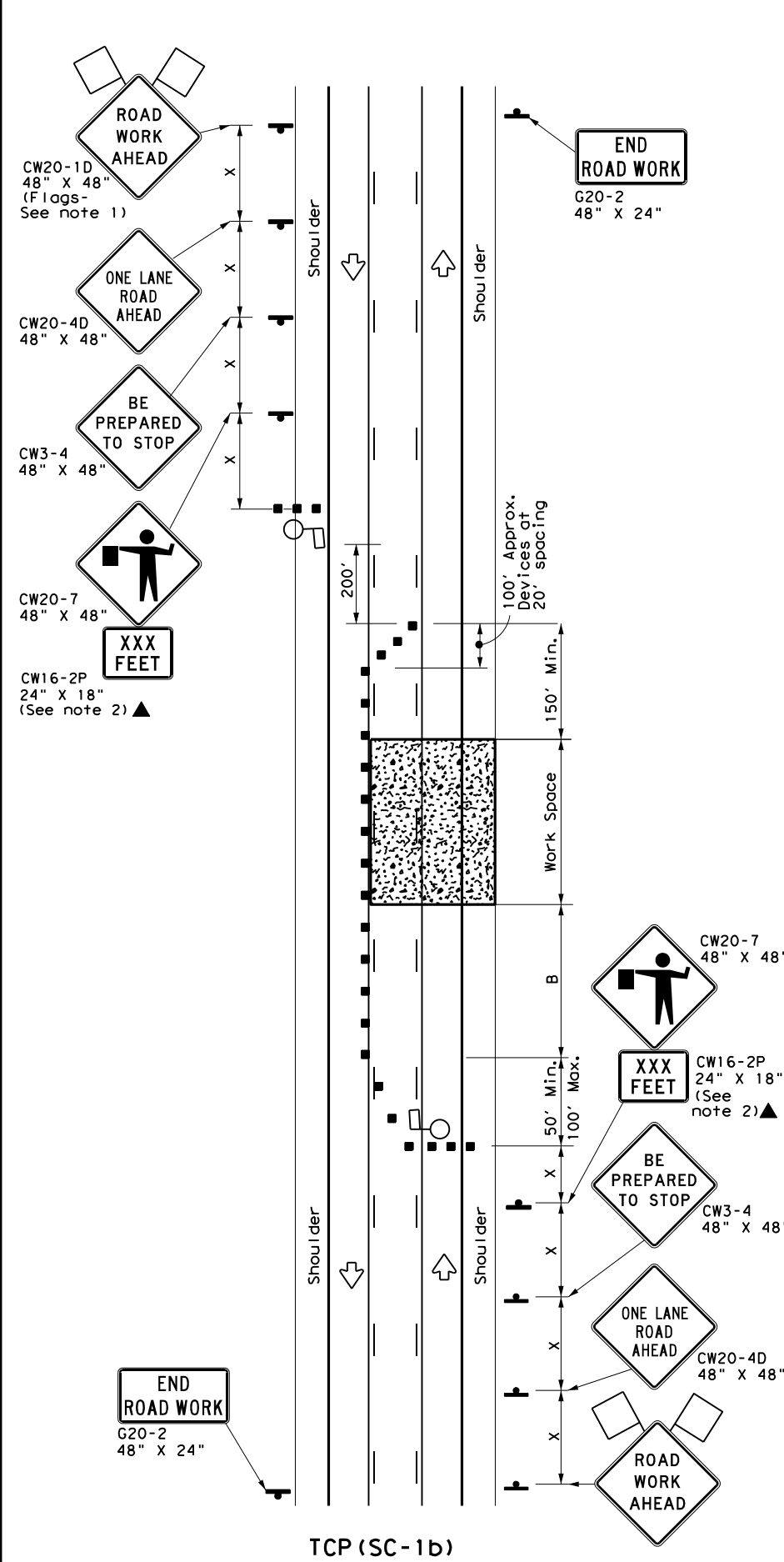
FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CK: TxDOT
© TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	1054	01	009, etc.	FM 219, etc.
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 7-13	WAC	BOSQUE, etc.	45	
1-97 7-14				

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TCP (SC-1a)  
**ONE LANE TWO-WAY (2 LANES)  
CONTROL WITH PILOT VEHICLE**



TCP (SC-1b)  
**ONE LANE TWO-WAY (3 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		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	L = WS <sup>2</sup> / 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**

- Flags attached to signs where shown are REQUIRED.
- All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work when approved by the Engineer.
- The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
- Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger sign is less than 1500 feet.
- Flaggers should use two-way radios or other methods of communication at all times to control traffic.
- Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.
- 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).
- 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 other member of the traffic control crew at the intersection.
- Temporary rumble strips are not required on seal coat operations.
- Pilot car is used to guide vehicles through traffic control zone, vehicle 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)**

- Channelizing devices on the center-line may be omitted when a pilot car is leading traffic.

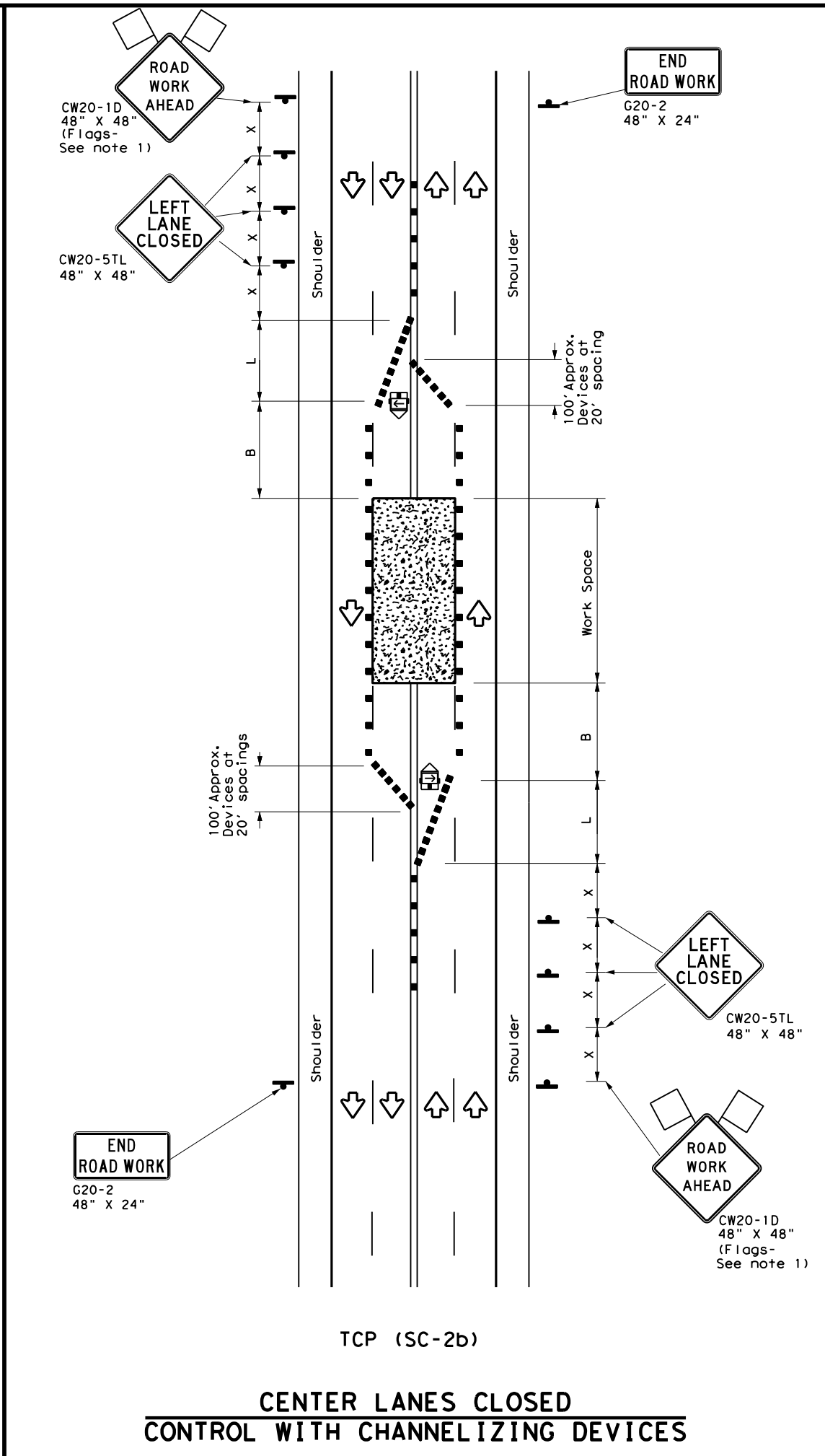
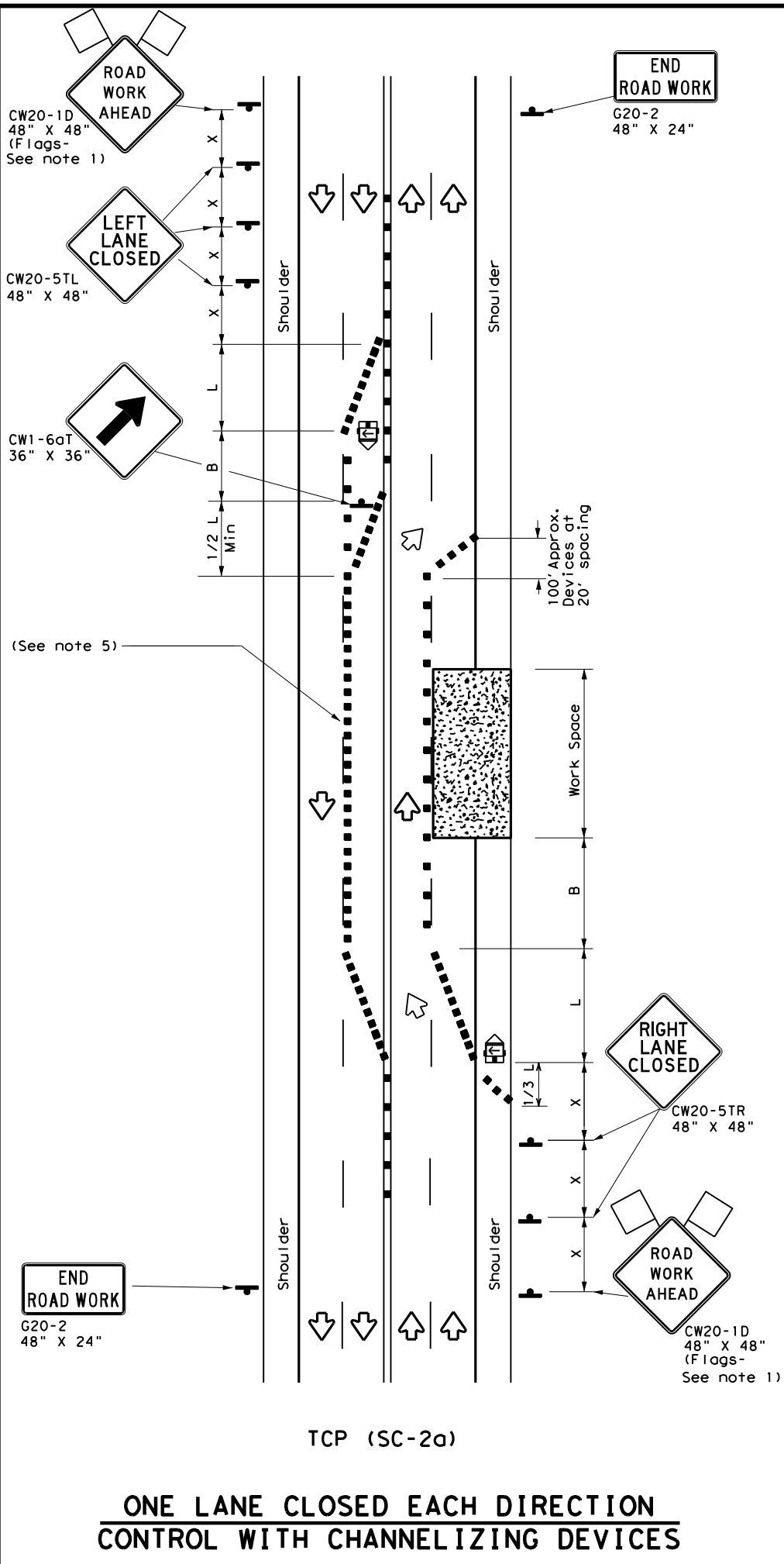
SHEET 1 OF 7

		Traffic Safety Division Standard	
<b>TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS</b>			
<b>TCP (SC-1) - 21</b>			
FILE: tcpsc-1-21.dgn	DN:	CK:	DW: CK:
© TxDOT April 2021	CON: 1054	SECT: 01	JOB: 009, etc. FM 219, etc.
REVISIONS	DIST: WAC	COUNTY: BOSQUE, etc.	SHEET NO: 46



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DATE: FILE:



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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
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**

- Flags attached to signs where shown are REQUIRED.
- All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
- The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
- 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 other member of the traffic control crew at the intersection.
- Temporary rumble strips are not required on seal coat operations.

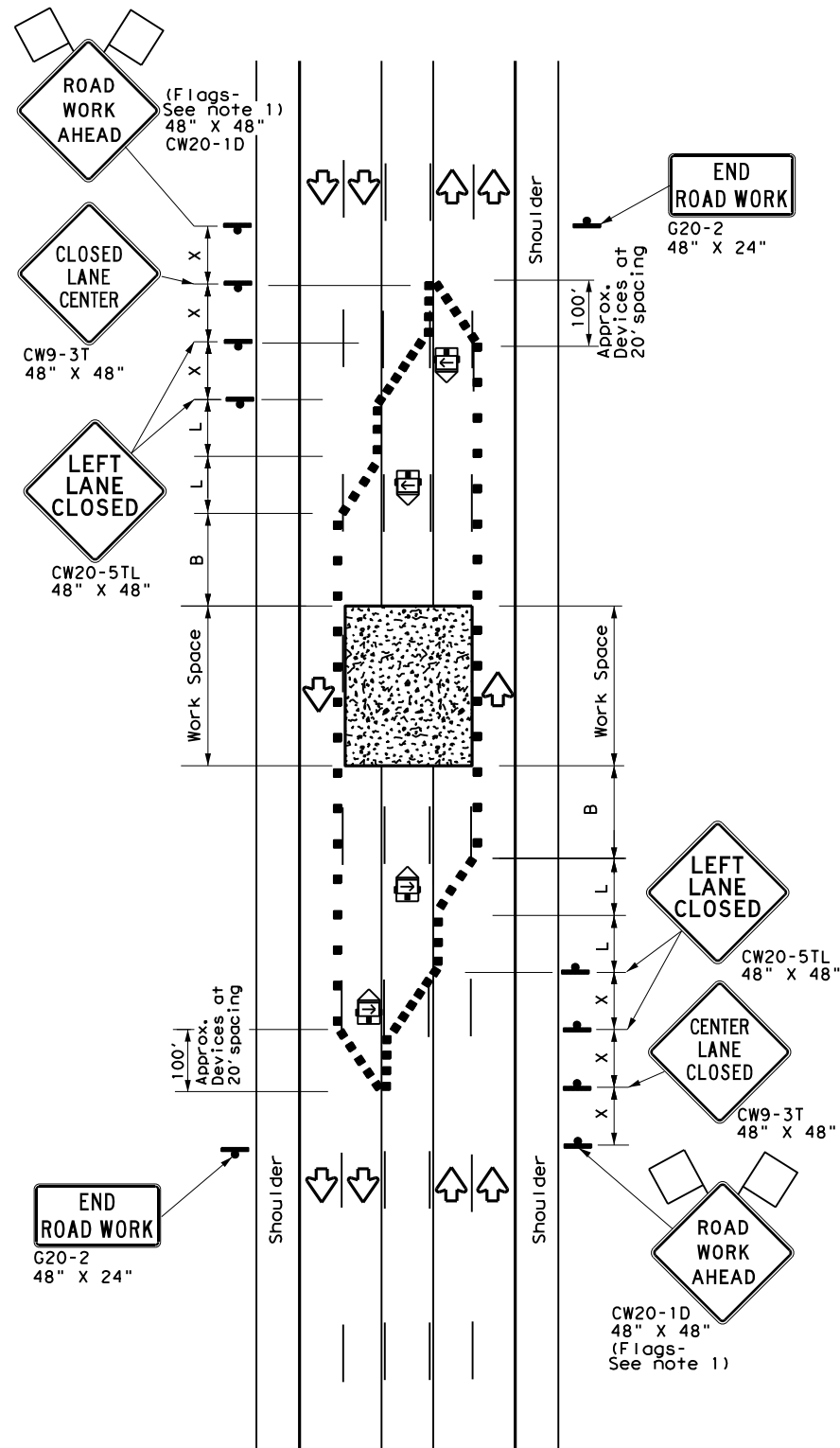
**TCP (SC-2a)**

- 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 posted speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

		Traffic Operations Division Standard	
<b>TRAFFIC CONTROL PLAN          LANE CLOSURES ON MULTILANE          CONVENTIONAL ROADS</b>			
<b>TCP (SC-2) - 21</b>			
FILE:	tcpsc-2-21.dgn	DN:	CK:
© TxDOT	April 2021	CONT:	SECT:
REVISIONS:	1054	01	JOB: 009, etc. FM 219, etc.
	DIST:	COUNTY:	SHEET NO.:
	WAC:	BOSQUE, etc.	47

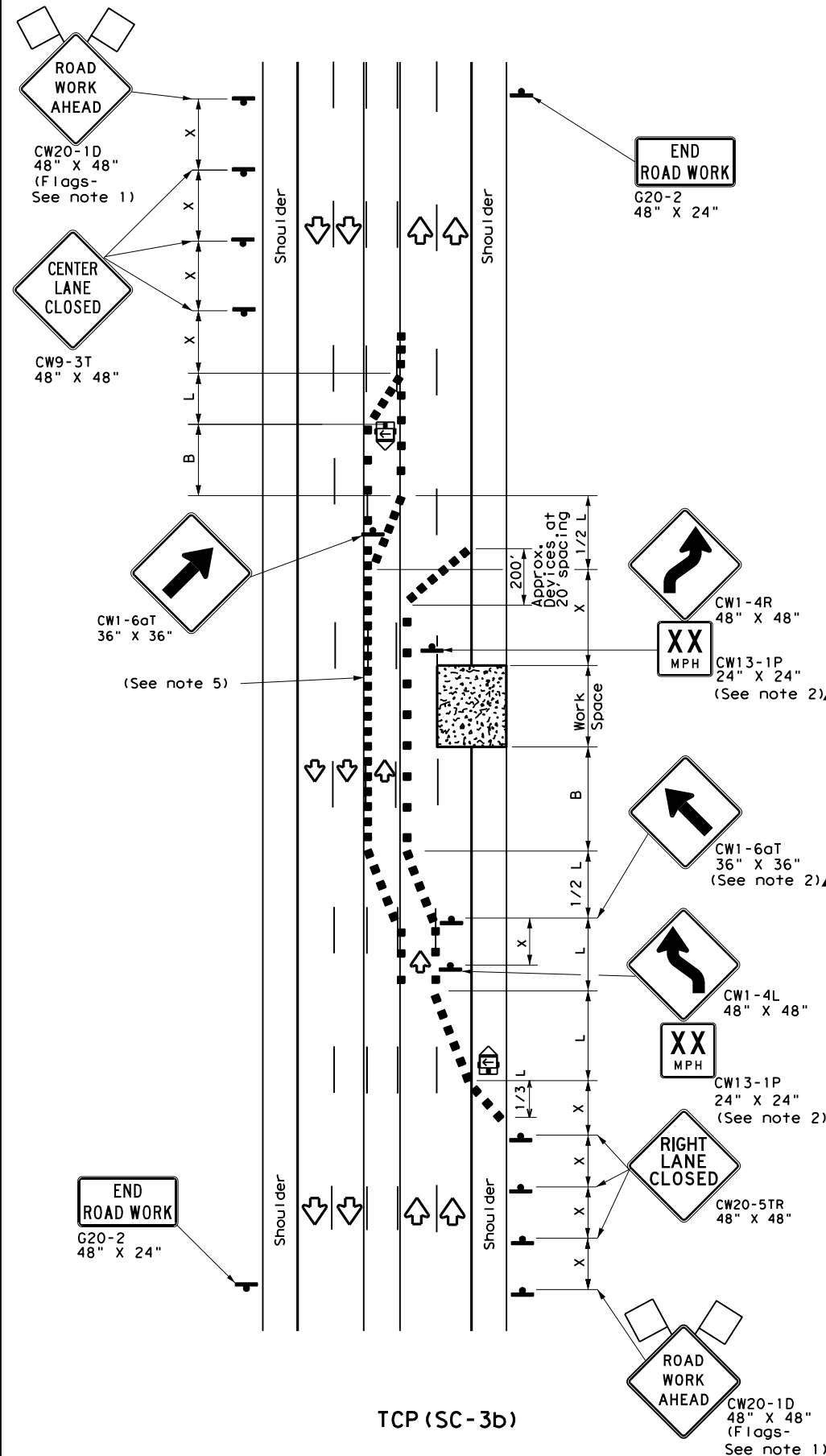
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DATE:  
FILE:



TCP (SC-3a)

**CENTER LANES CLOSED  
CONTROL WITH CHANNELIZING DEVICES**



TCP (SC-3b)

**ONE LANES CLOSED  
CONTROL WITH CHANNELIZING DEVICES**

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

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

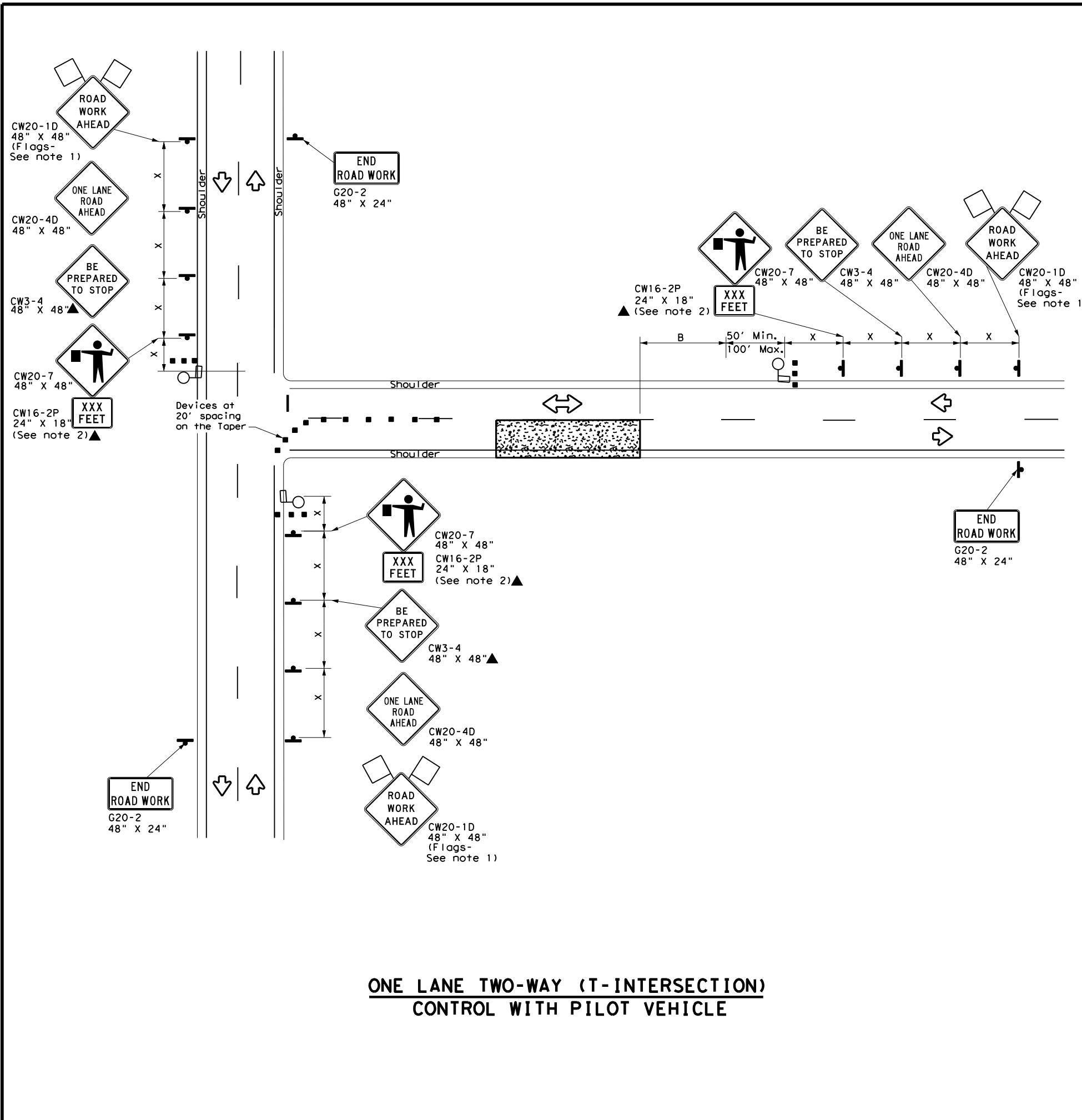
- Flags attached to signs where shown are REQUIRED.
  - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work when approved by the Engineer.
  - If the seal coat operation 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 other members of the traffic control crew at the intersection.
  - Temporary rumble strips are not required on seal coat operations.
- TCP (SC-3b)**
- 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 posted speed in mph. This tighter devices spacing is intended for the area of conflicting markings, not the entire work zone.

SHEET 3 OF 7

		Traffic Safety Division Standard	
<b>TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS</b>			
<b>TCP (SC-3) - 21</b>			
FILE: tcpsc-3-21.dgn	DN:	CK:	DW:
© TxDOT April 2021	CONT	SECT	JOB
REVISIONS	1054	01	009, etc. FM 219, etc.
	DIST	COUNTY	SHEET NO.
	WAC	BOSQUE, etc.	48

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DATE:  
FILE:



**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		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
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**

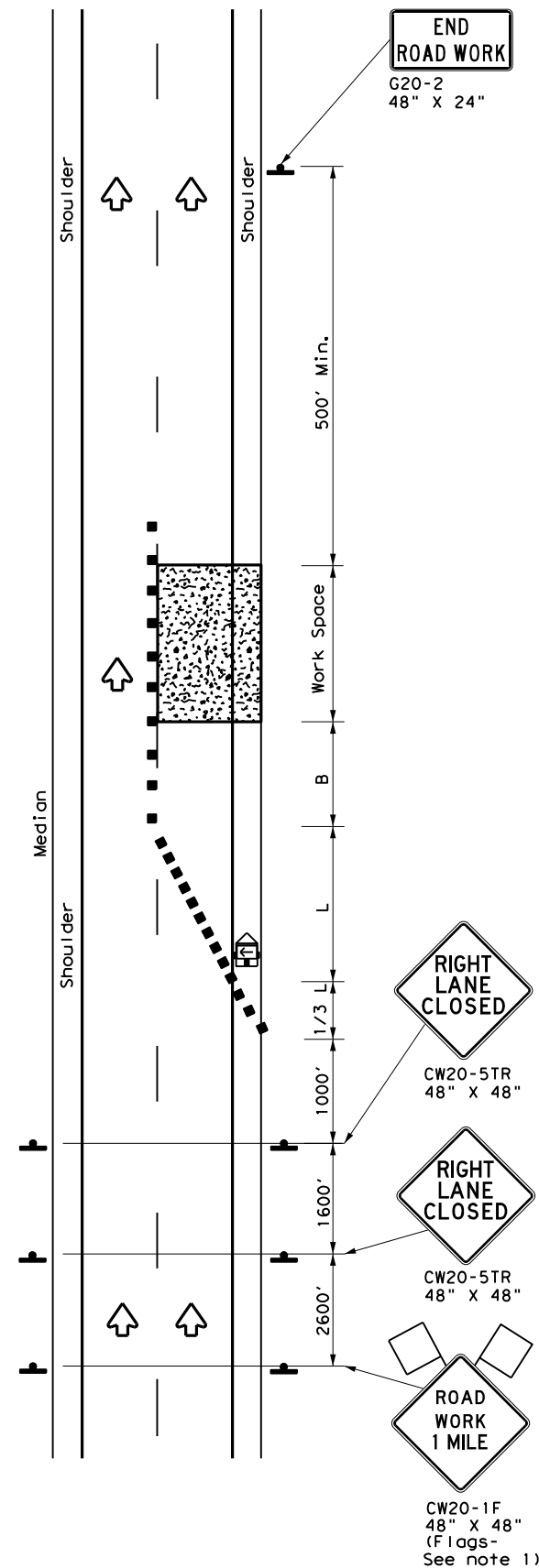
- Flags attached to signs where shown are REQUIRED.
- All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work when approved by the Engineer.
- The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
- Flaggers should use two-way radios or other methods of communication at all times to control traffic.
- Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.
- 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).
- Temporary rumble strips are not required on seal coat operations.
- Pilot car is used to guide vehicles through traffic control zone, vehicle shall have an identification name displayed and "PILOT CAR, FOLLOW ME" (G20-4) sign or message board mounted in a conspicuous position on rear.

SHEET 4 OF 7

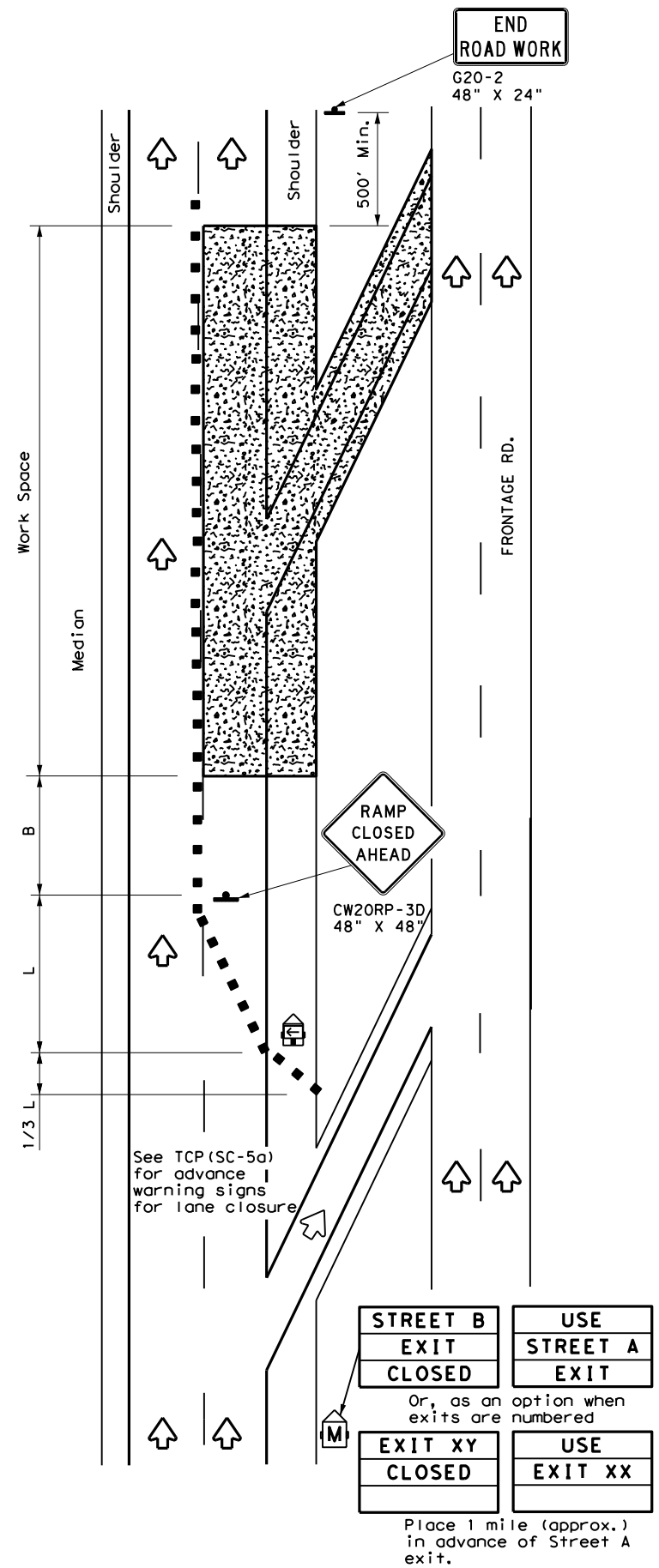
		Traffic Safety Division Standard	
<b>TRAFFIC CONTROL PLAN SEAL COAT OPERATIONS</b>			
<b>TCP (SC-4) - 21</b>			
FILE: tcpsc-4-21.dgn	DN:	CK:	DW:
© TxDOT April 2021	CONT	SECT	JOB
REVISIONS	1054	01	009, etc. FM 219, etc.
	DIST	COUNTY	SHEET NO.
	WAC	BOSQUE, etc.	49

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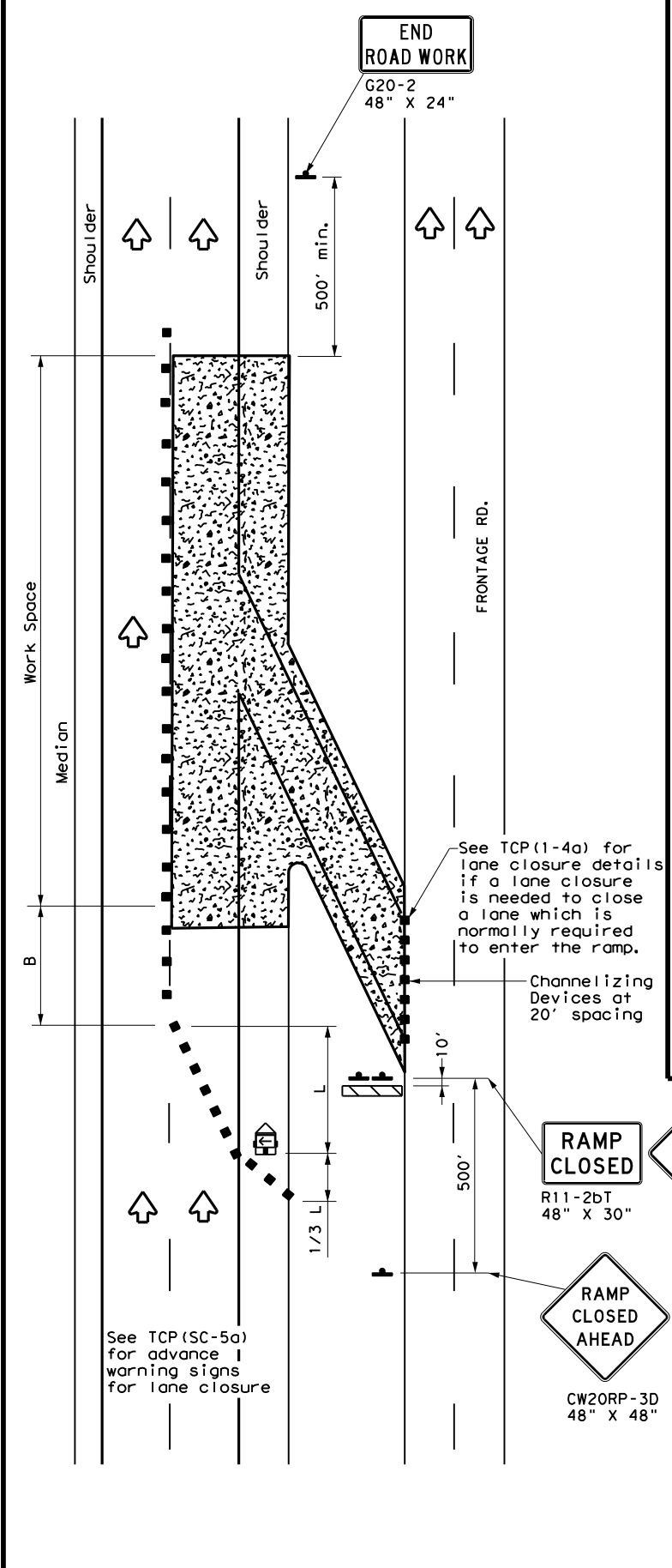
DATE:  
FILE:



TCP (SC-5a)  
**ONE LANE CLOSURE**



TCP (SC-5b)  
**LANE AND RAMP CLOSURE AT EXIT RAMP**



TCP (SC-5c)  
**LANE AND RAMP CLOSURE AT ENTRANCE RAMP**

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	$L = \frac{WS^2}{60}$	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**
- Flags attached to signs where shown, are REQUIRED.
  - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
  - Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
  - Temporary rumble strips are not required on seal coat operations.

SHEET 5 OF 7

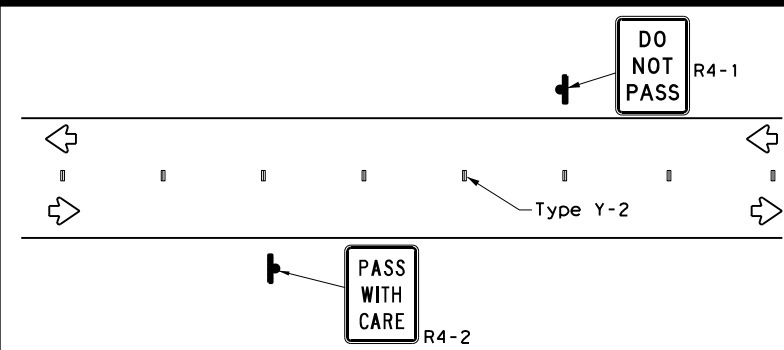
Texas Department of Transportation  
Traffic Safety Division Standard

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

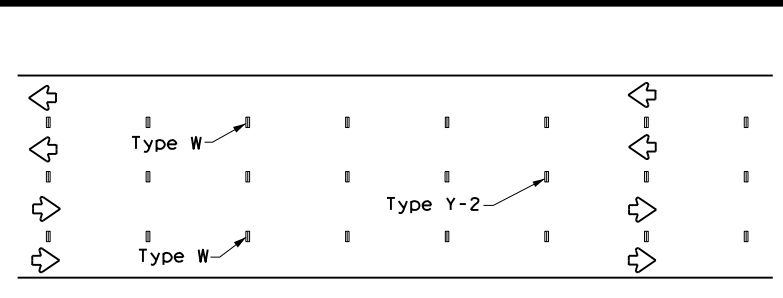
**TCP (SC-5) - 21**

FILE: tcpsc-5-21.dgn	DN:	CK:	DW:	CK:
© TxDOT April 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	1054	01	009, etc.	FM 219, etc.
	DIST	COUNTY		SHEET NO.
	WAC	BOSQUE, etc.		50

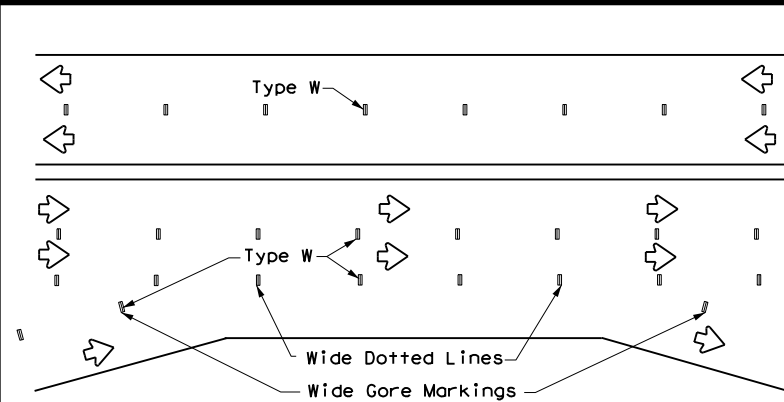
## WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS (TABS)



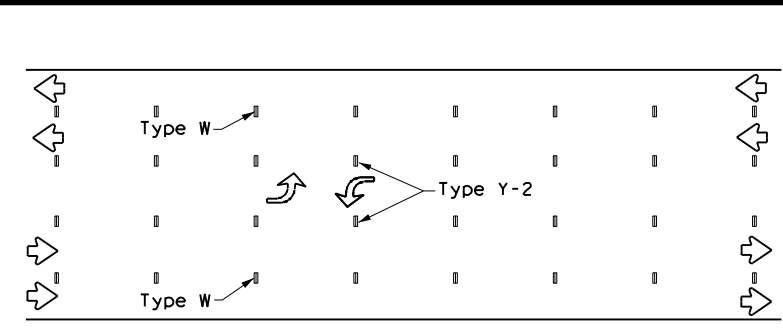
**CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS**



**LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS**



**LANE LINES FOR DIVIDED HIGHWAY**



**TWO-WAY LEFT TURN LANE**

## WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS (TABS)

<b>SOLID LINES</b>	DOUBLE NO-PASSING LINE	$40' \pm 6''$	Type Y-2
	SINGLE NO-PASSING LINE or CHANNELIZATION LINE	$40' \pm 6''$	Type Y-2 or W
<b>BROKEN LINES</b> (FOR CENTER LINE OR LANE LINE)		$40' \pm 6''$	Type Y-2 or W
<b>WIDE DOTTED LINES</b> (FOR LANE DROP LINES)		$40' \pm 6''$	Type W
<b>WIDE GORE MARKINGS</b>		$40' \pm 6''$	Type W

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### NOTES:

1. Short term pavement markings shall be temporary flexible-reflective roadway marker tabs with protective cover unless otherwise specified elsewhere in plans.
2. Short term pavement markings shall NOT be used to simulate edge lines.
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.
4. Temporary flexible-reflective roadway marker tabs will require normal maintenance replacement when used on roadways with an ADT per lane of up to 7500 vehicles with no more than 10% truck mix. When roadways exceed these values, additional maintenance replacement of devices should be planned.
5. No segment of roadway open to traffic shall remain without permanent pavement markings for a period greater than 14 calendar days. 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.
6. 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 allowed for this purpose.

### TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

1. Temporary flexible-reflective roadway marker tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with 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).
2. Tabs shall meet requirements of Departmental Material Specification DMS-8242.
3. 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.
4. 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 3.

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

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

SHEET 6 OF 7

Traffic Safety Division Standard

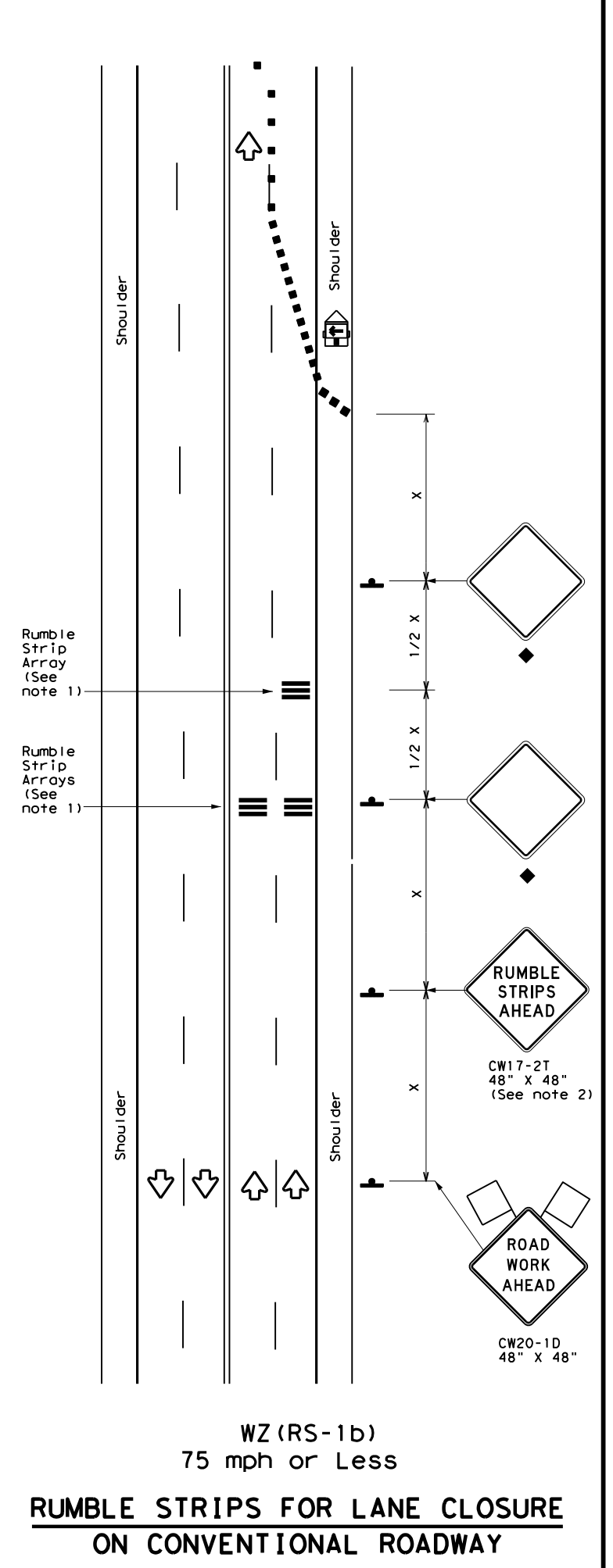
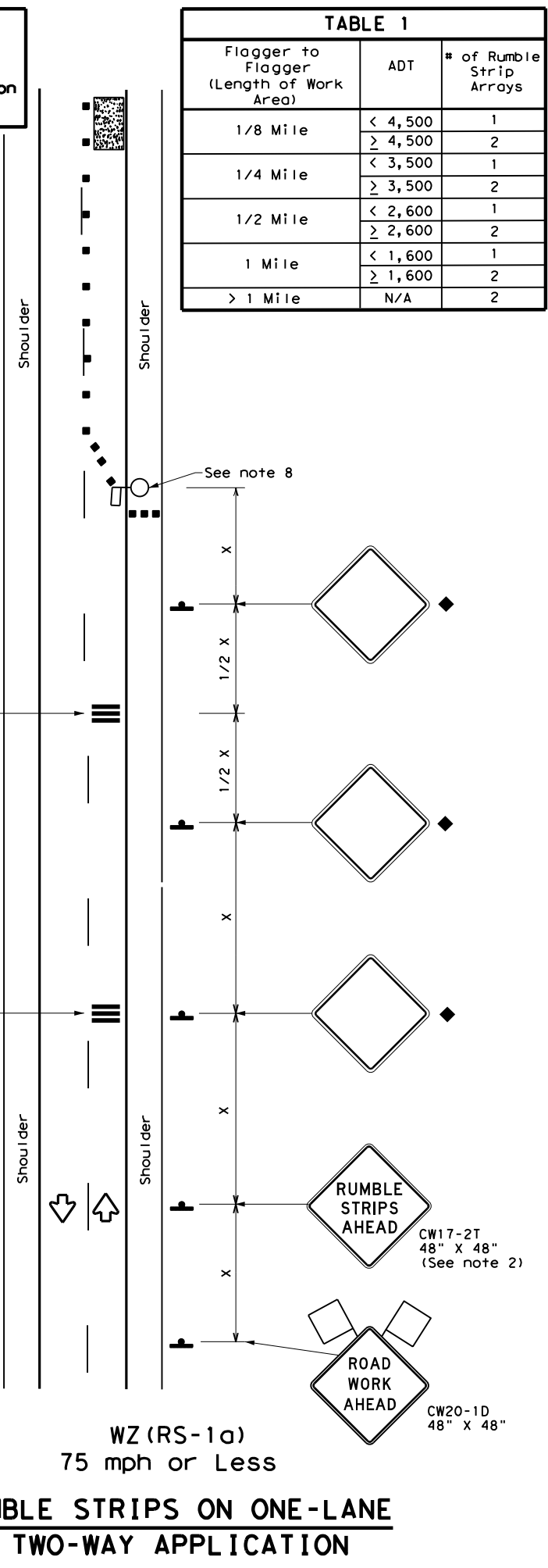
### WORK ZONE SHORT TERM PAVEMENT MARKINGS FOR SEAL COAT OPERATIONS

## TCP (SC-6) - 21

FILE: tcpsc-6-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT April 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	1054	01	009, etc.	FM 219, etc.
	DIST	COUNTY		SHEET NO.
	WAC	BOSQUE, etc.		51

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



GENERAL NOTES

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

Speed	Approximate distance between strips in an Array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
> 55 MPH	20'

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

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

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

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.

Texas Department of Transportation  
 Traffic Operations Division Standard

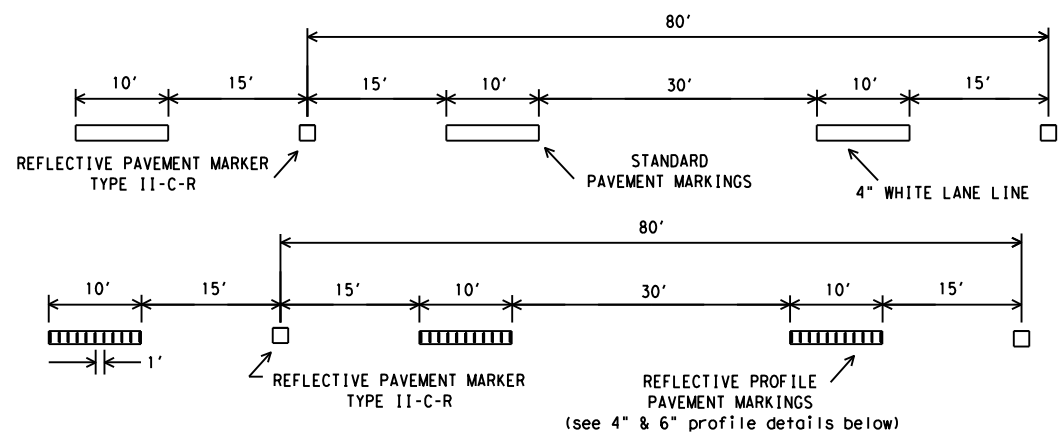
## TEMPORARY RUMBLE STRIPS

### WZ (RS) - 16

FILE: wzrs16.dgn    DN: TxDOT    CK: TxDOT    DW: TxDOT    CK: TxDOT  
 © TxDOT November 2012    CONT SECT JOB HIGHWAY  
 REVISIONS 1054 01 009, etc. FM 219, etc.  
 2-14 DIST COUNTY SHEET NO.  
 4-16 WAC BOSQUE, etc. 52

DATE:  
FILE:

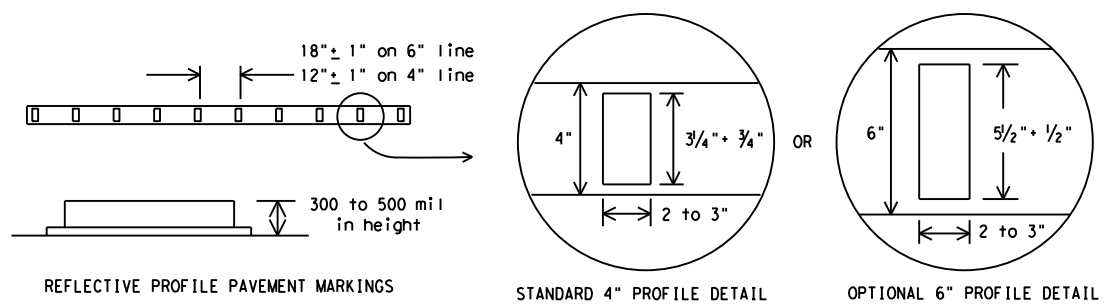
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



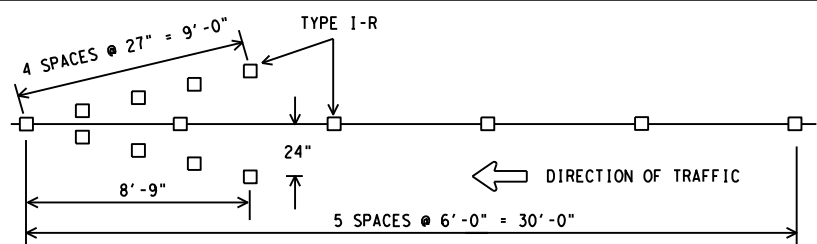
PAVEMENT MARKERS (REFL) TYPE II-C-R SHALL BE SPACED ON 80' CENTERS WITH THE CLEAR FACE TOWARD NORMAL TRAFFIC AND THE RED FACE TOWARD WRONG WAY TRAFFIC.

**TRAFFIC LANE LINES PAVEMENT MARKING DETAILS**

EDGE LINES SHOULD TYPICALLY BE 4" WIDE AND THE MATERIALS SHALL BE AS SPECIFIED IN THE PLANS. IF RAISED PROFILE PAVEMENT MARKINGS ARE USED SEE DETAILS BELOW.

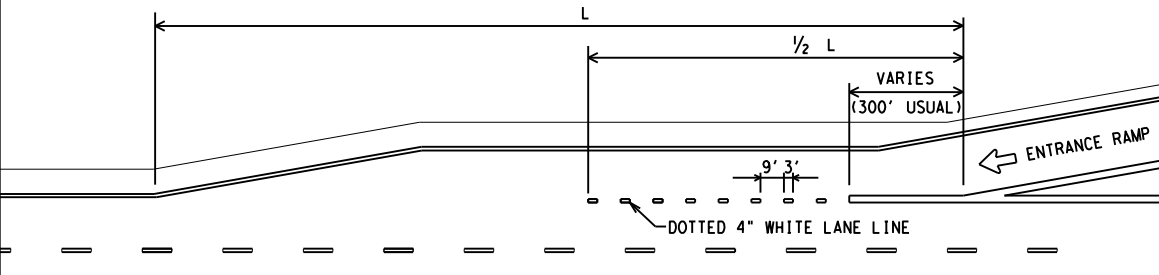


**EDGE LINE PAVEMENT MARKINGS**

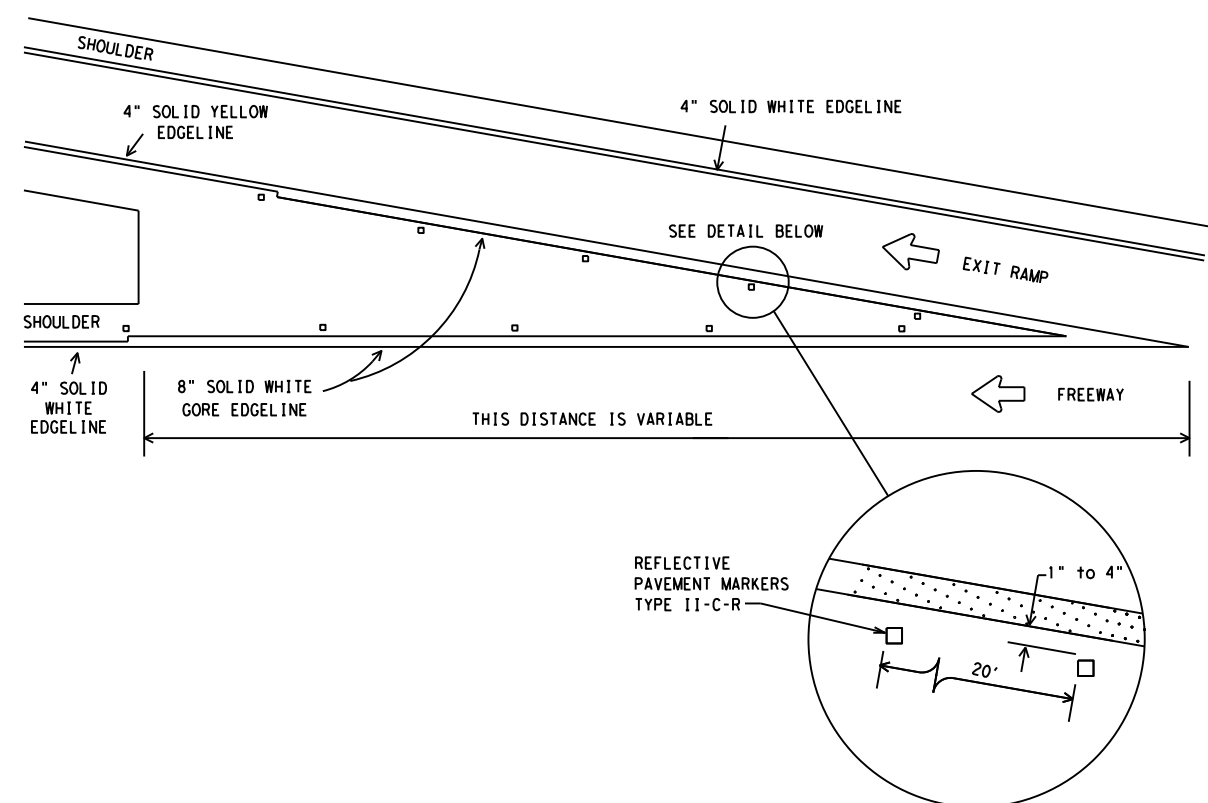


ALL RAISED MARKERS IN THE WRONG WAY ARROW SHALL BE TYPE I-R REFLECTORIZED PAVEMENT MARKERS WITH THE REFLECTORIZED SURFACE FACING THE WRONG WAY TRAFFIC. TYPE II-C-R SHALL NOT BE USED. REFLECTORIZED WRONG WAY ARROWS, NOT TO EXCEED TWO, MAY BE PLACED ON EXIT RAMP. LOCATION OF THE ARROWS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.

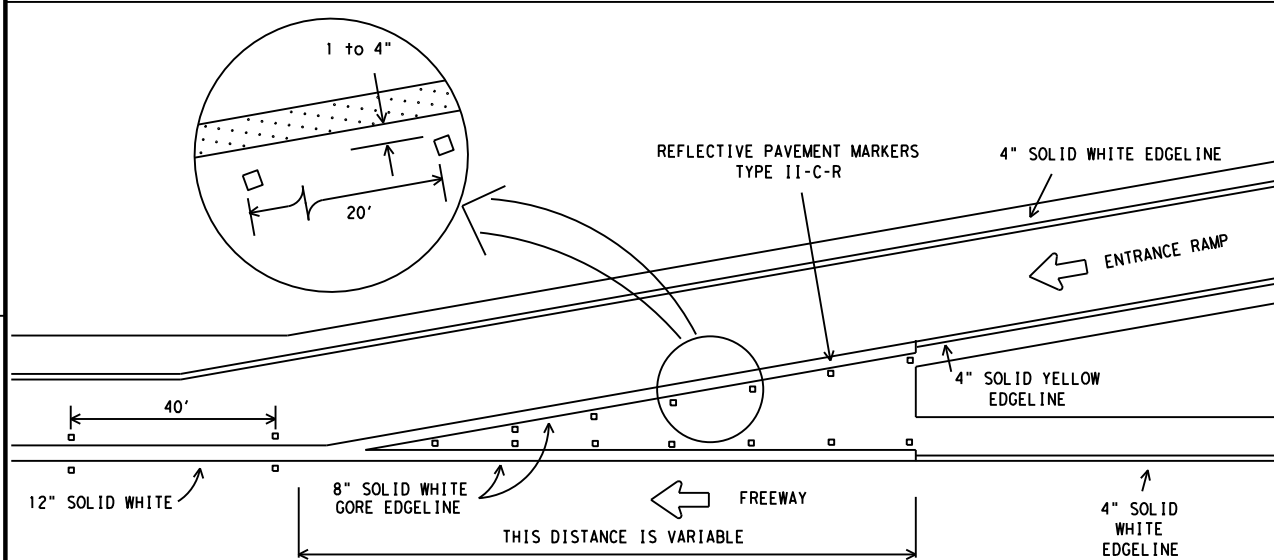
**WRONG WAY ARROW DETAIL**



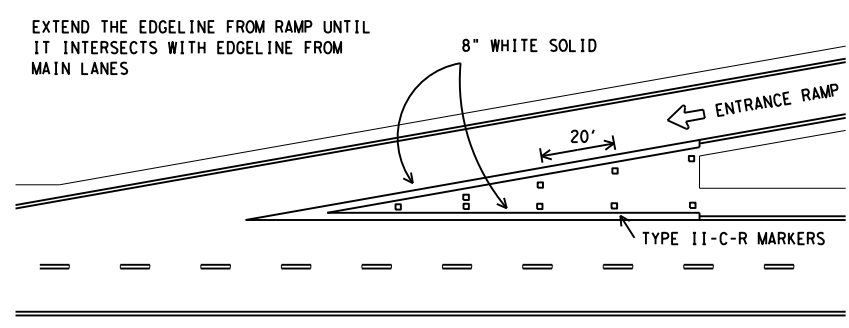
**PARALLEL ACCELERATION LANE**



**TYPICAL EXIT RAMP GORE MARKING**



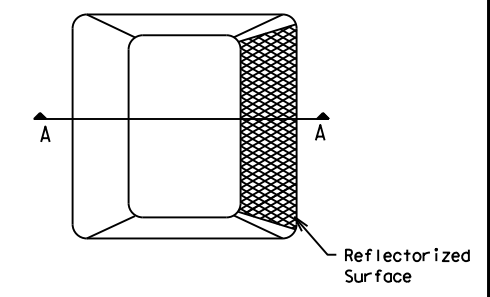
**TYPICAL ENTRANCE RAMP GORE MARKING**



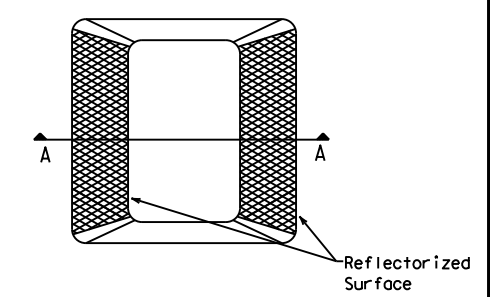
**TAPERED ACCELERATION LANE**

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

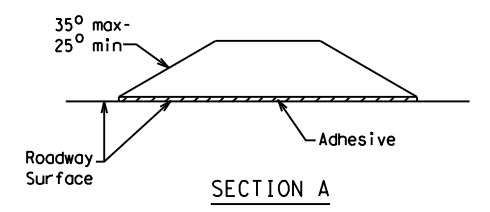
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

**RAISED PAVEMENT MARKERS**

Texas Department of Transportation  
Traffic Operations Division

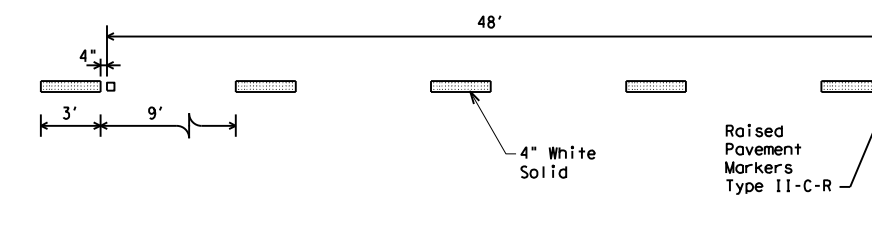
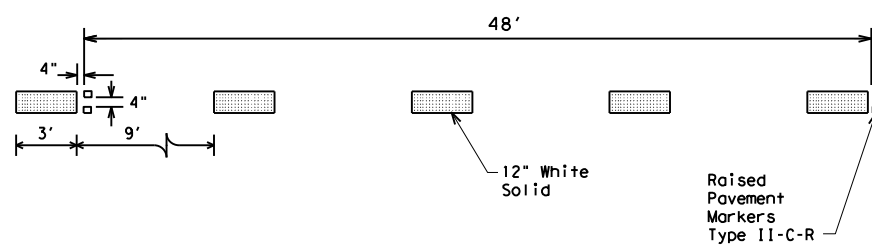
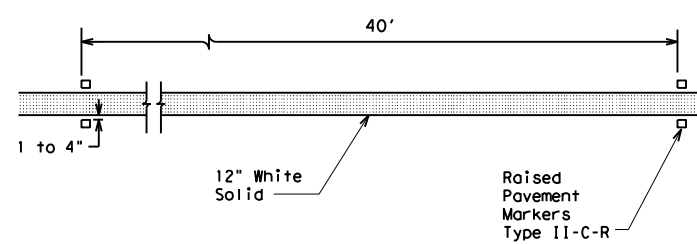
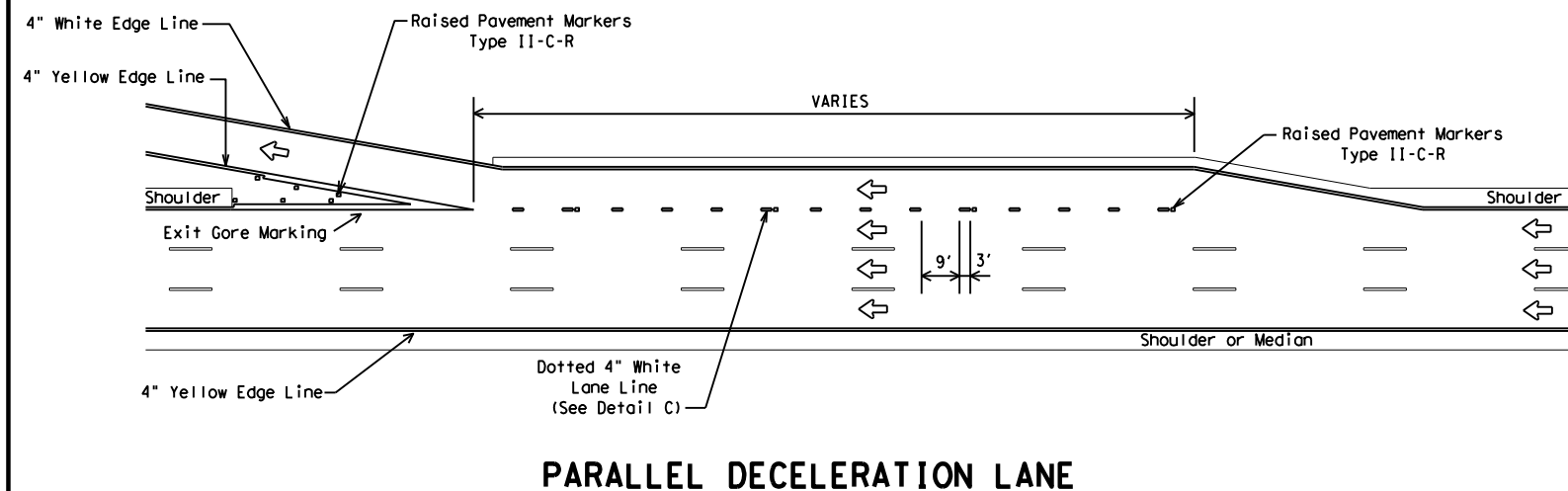
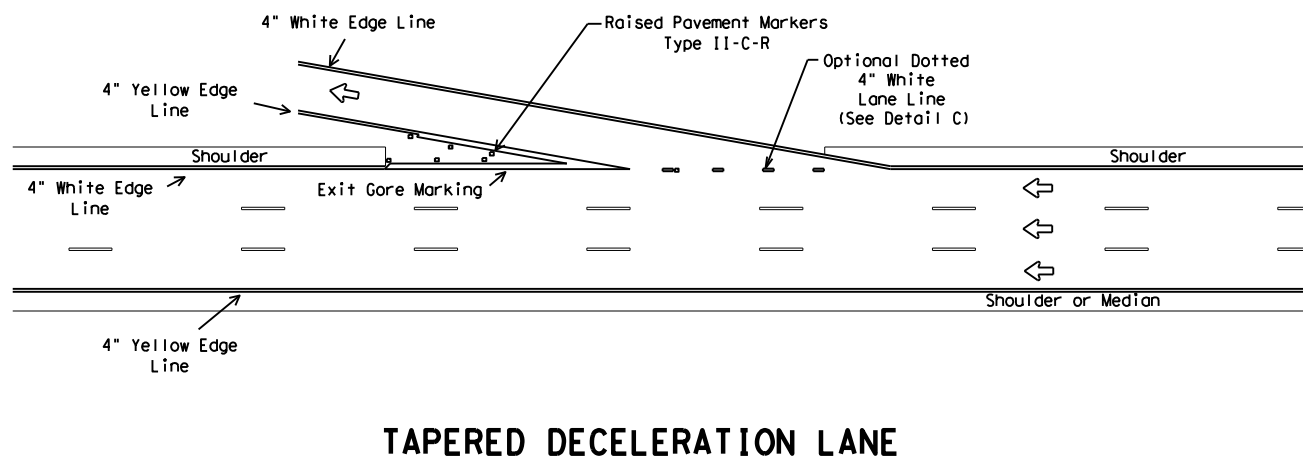
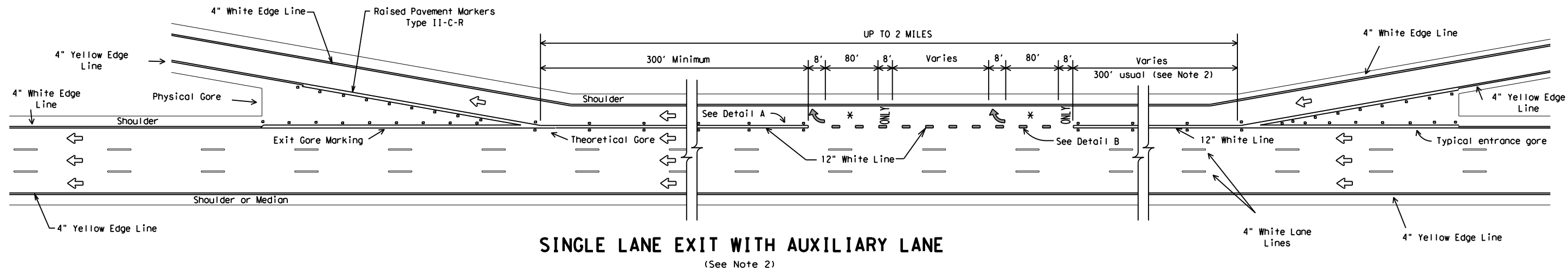
**TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS WITH RAISED PAVEMENT MARKERS**  
**FPM(1)-12**

© TxDOT May 1974		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISONS		CONT	SECT	JOB	HIGHWAY
4-92	2-10	1054	01	009, etc.	FM 219, etc.
5-00	2-12	DIST		COUNTY	SHEET NO.
8-00		WAC		BOSQUE, etc.	53
2-08					

DATE:  
FILE:

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DATE:  
FILE:



**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 from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.
4. Normal (4") Dotted Lane Line (See Detail C) is used at parallel acceleration and deceleration lanes.

LEGEND	
←	Denotes direction of traffic.
↪	Pavement marking arrows (white)
*	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.



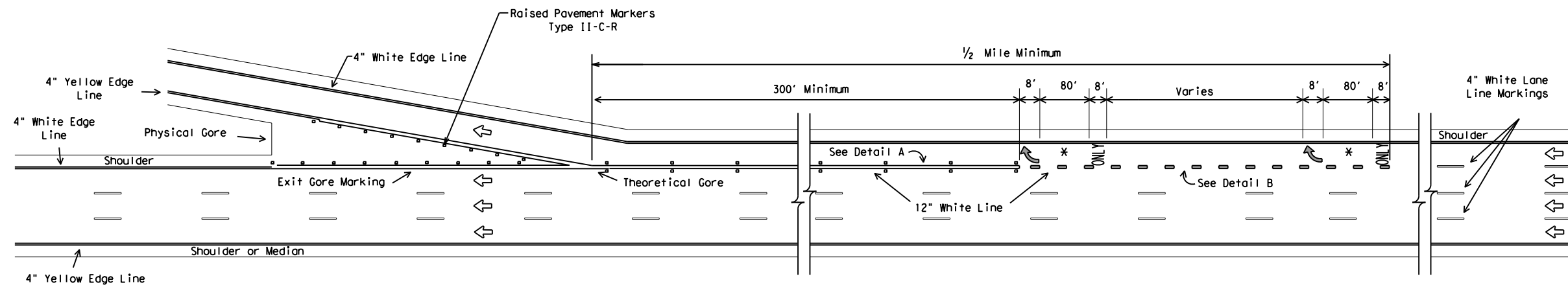
**TYPICAL STANDARD  
FREEWAY PAVEMENT MARKINGS  
ENTRANCE AND EXIT RAMPs**  
FPM(2)-12

REVISIONS		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
NO.	DATE	CON.	SECT.	JOB	HIGHWAY
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5-00					
8-00					
		DIST.	COUNTY	SHEET NO.	
		WAC	BOSQUE, etc.	54	

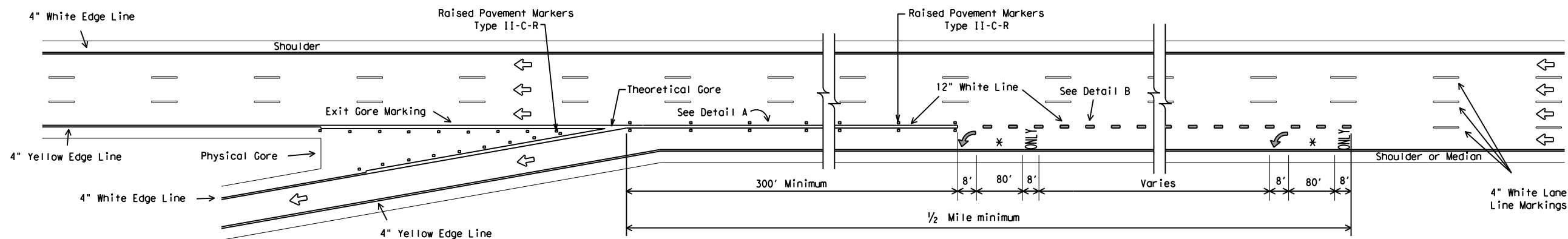


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DATE:  
FILE:



**SINGLE LANE EXIT - LANE DROP OR EXIT ONLY**

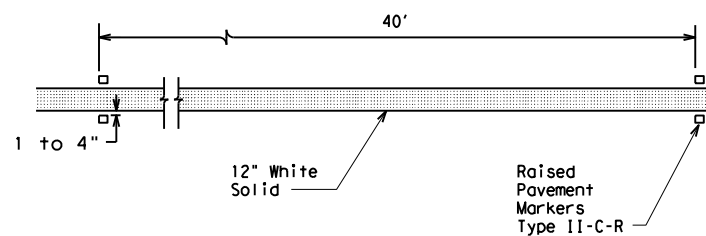


**SINGLE LANE EXIT - LANE DROP OR EXIT ONLY (LEFTHAND)**

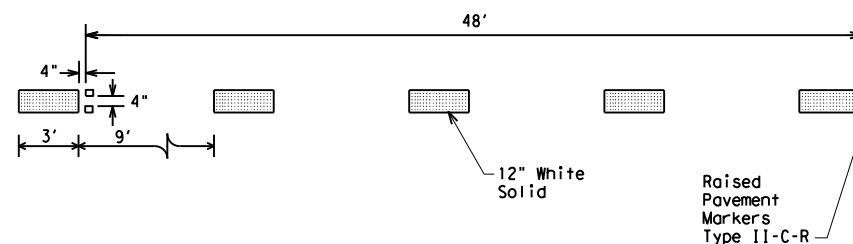
LEGEND	
←	Denotes direction of traffic.
↪	Pavement marking arrows (white)
✱	Arrow markings are optional, however "ONLY" is required if arrow is used

**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 from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.



**DETAIL A**



**DETAIL B**

Wide (12") Dotted Lane Line (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.

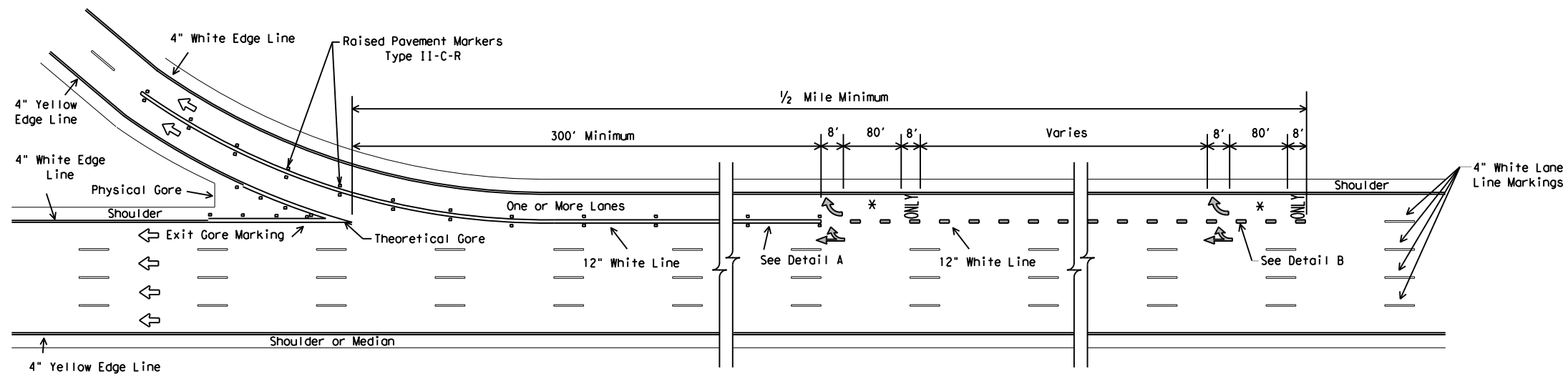
Texas Department of Transportation  
Traffic Operations Division

**TYPICAL STANDARD  
FREEWAY PAVEMENT MARKINGS  
LANE DROP (EXIT ONLY) EXIT RAMPS  
FPM(3) - 12**

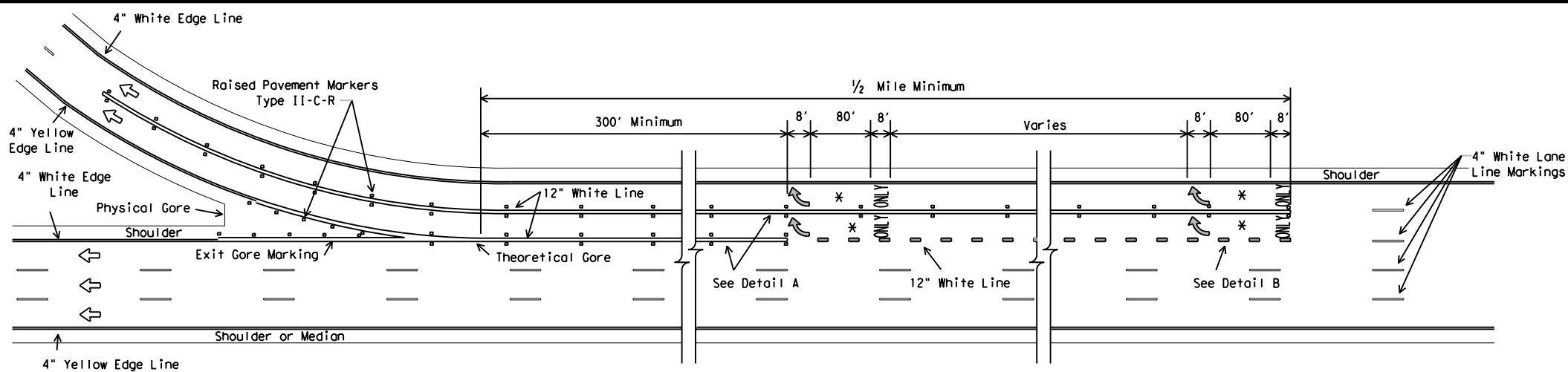
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NO.	DATE	CON.	SECT.	JOB	HIGHWAY
5-00		1054	01	009, etc.	FM 219, etc.
8-00					
2-10					
2-12					
		DIST	COUNTY		SHEET NO.
		WAC	BOSQUE, etc.		55

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DATE:  
FILE:



**MULTIPLE LANE EXIT - EXIT ONLY WITH OPTION LANE**

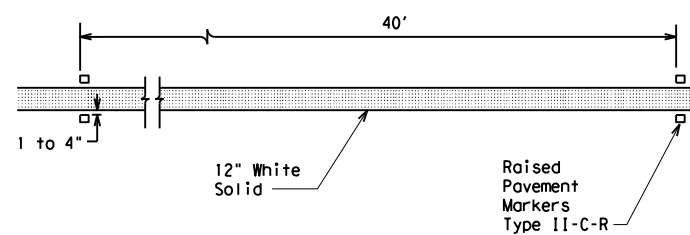


**MULTIPLE LANE EXIT ONLY**

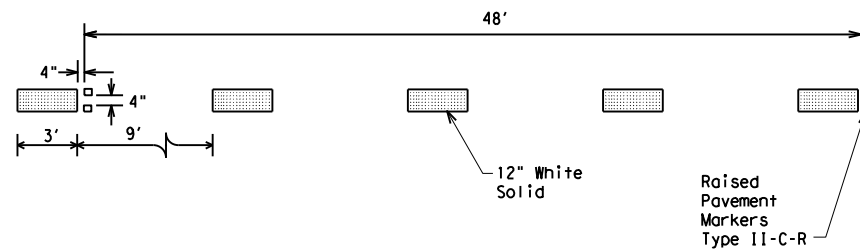
LEGEND	
	Denotes direction of traffic
	Pavement marking arrow (white)
	Optional Pavement Marking Arrows (white)
	Arrow markings are optional, however "ONLY" is required if arrow is used

**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 from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.



**DETAIL A**



**DETAIL B**

Wide (12") Dotted Lane Line (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.

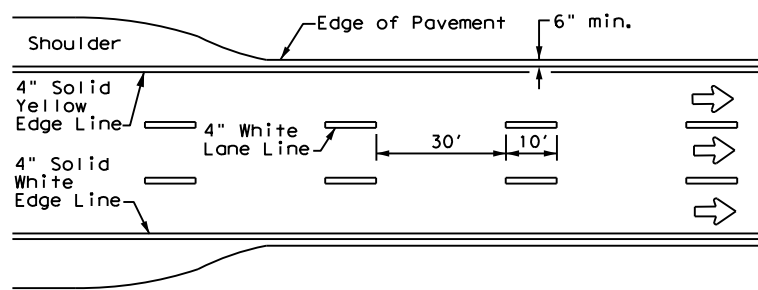
Texas Department of Transportation  
Traffic Operations Division

**TYPICAL STANDARD  
FREEWAY PAVEMENT MARKINGS  
LANE DROP (EXIT ONLY) DETAILS**

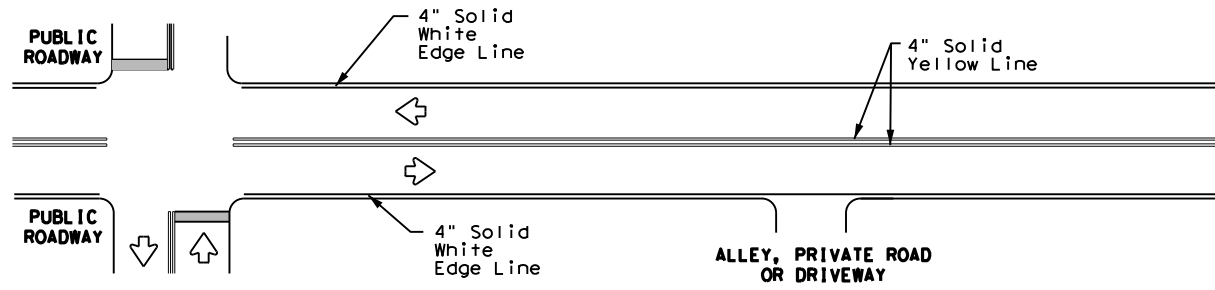
**FPM(4) - 12**

© TxDOT April 1992		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS		CONT	SECT	JOB	HIGHWAY
5-00		1054	01	009, etc.	FM 219, etc.
8-00					
2-10		DIST		COUNTY	SHEET NO.
2-12		WAC		BOSQUE, etc.	56

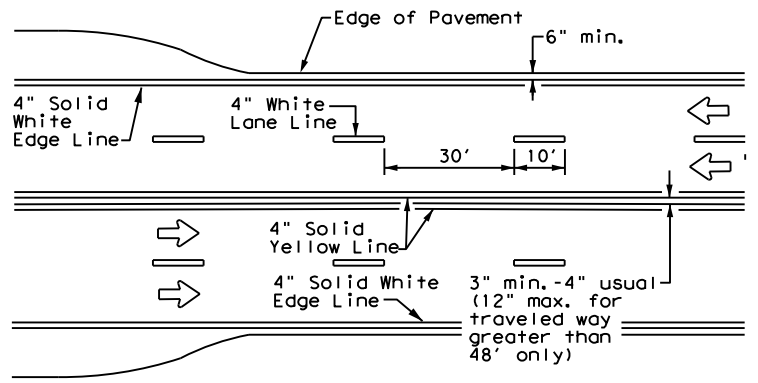
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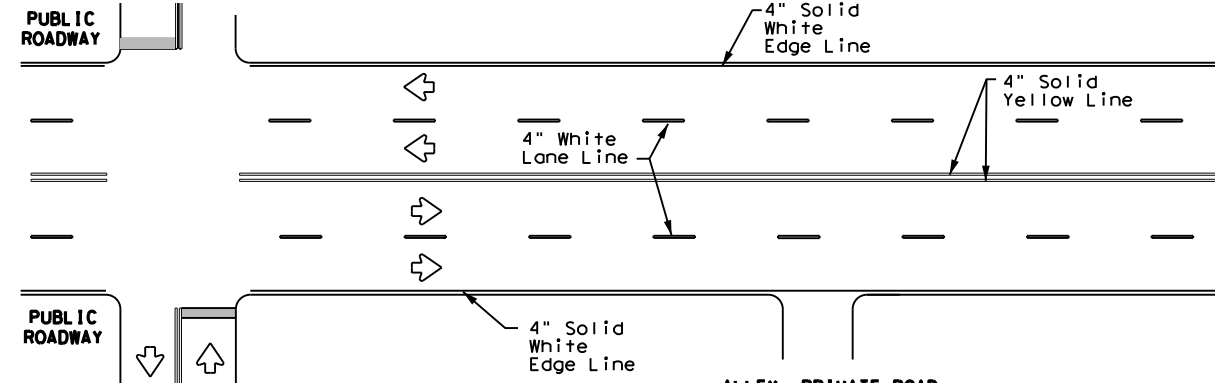
**EDGE LINE AND LANE LINES  
ONE-WAY ROADWAY  
WITH OR WITHOUT SHOULDERS**



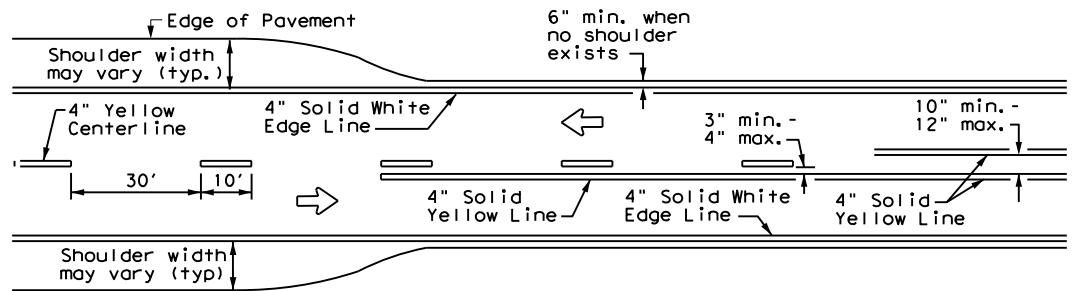
**TYPICAL TWO-LANE, TWO-WAY PAVEMENT  
MARKINGS THROUGH INTERSECTIONS**



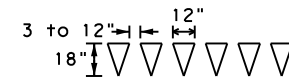
**CENTERLINE AND LANE LINES  
FOUR LANE TWO-WAY ROADWAY  
WITH OR WITHOUT SHOULDERS**



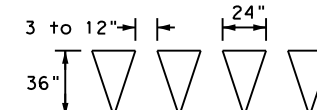
**TYPICAL MULTI-LANE, TWO-WAY PAVEMENT  
MARKINGS THROUGH INTERSECTIONS**



**TWO LANE TWO-WAY ROADWAY  
WITH OR WITHOUT SHOULDERS**

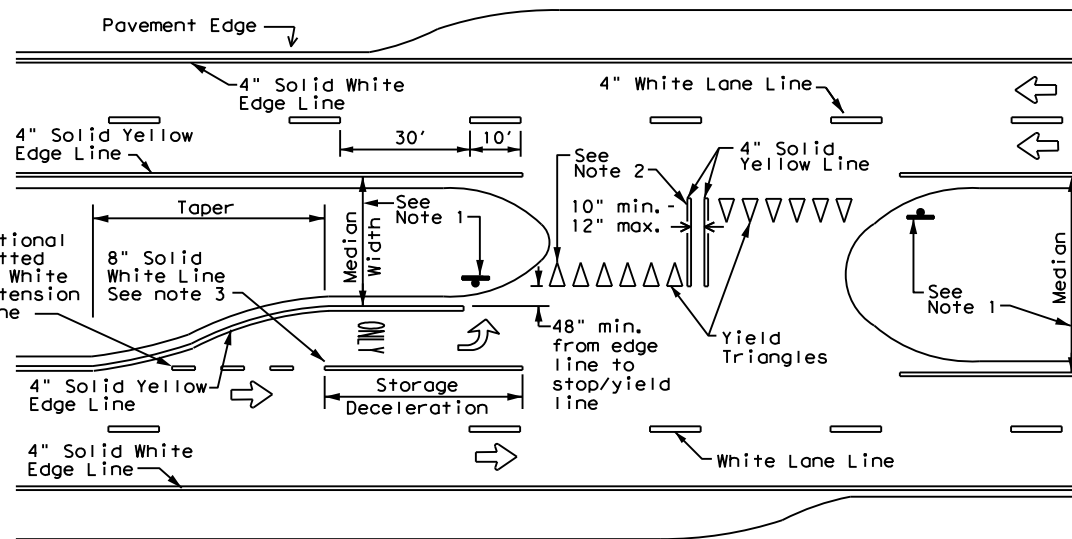


For posted speed on road being marked equal to or less than 40 MPH.



For posted speed on road being marked equal to or greater than 45 MPH.

**YIELD LINES**



**FOUR LANE DIVIDED ROADWAY CROSSOVERS**

**NOTES**

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

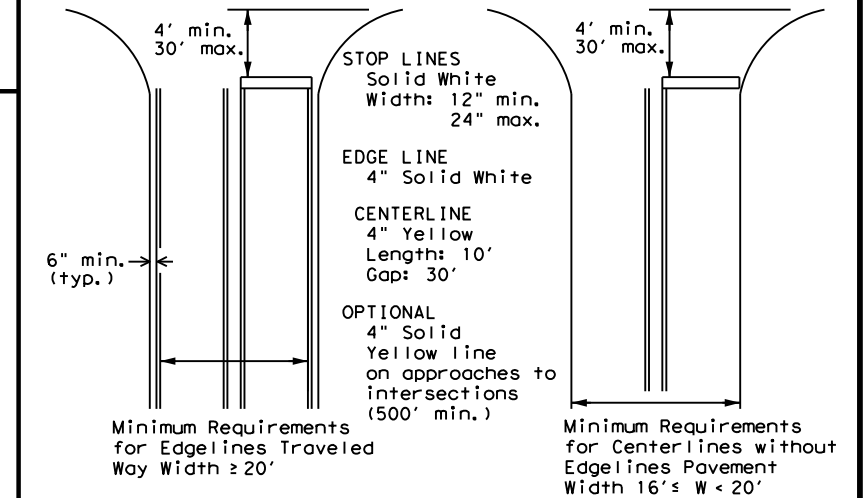
**GENERAL NOTES**

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

**MATERIAL SPECIFICATIONS**

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

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



**GUIDE FOR PLACEMENT OF STOP LINES,  
EDGE LINE & CENTERLINE**

Based on Traveled Way and Pavement Widths for Undivided Highways



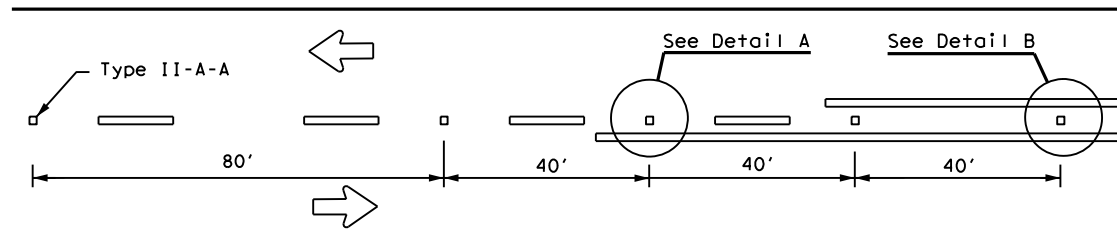
**TYPICAL STANDARD  
PAVEMENT MARKINGS**

**PM(1)-20**

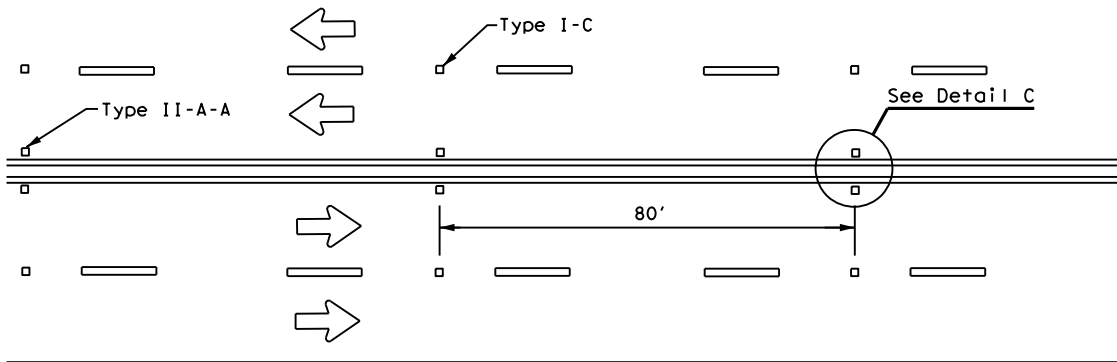
FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
8-95 3-03 REVISIONS	1054	01	009, etc.	FM 219, etc.
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	WAC	BOSQUE, etc.		57

# REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

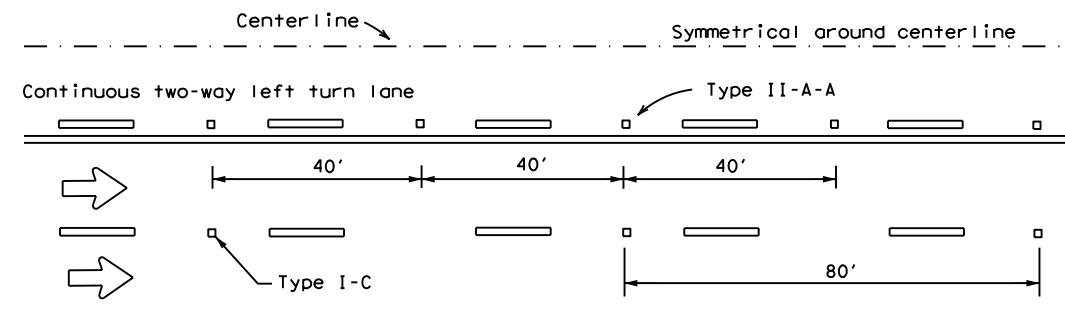
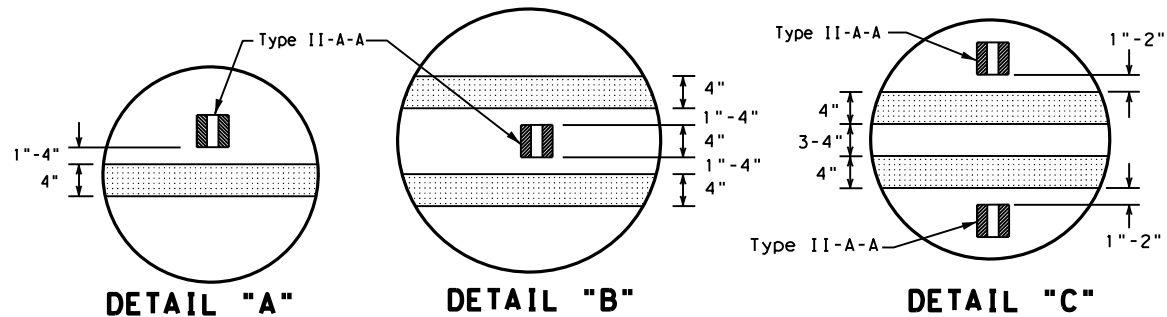
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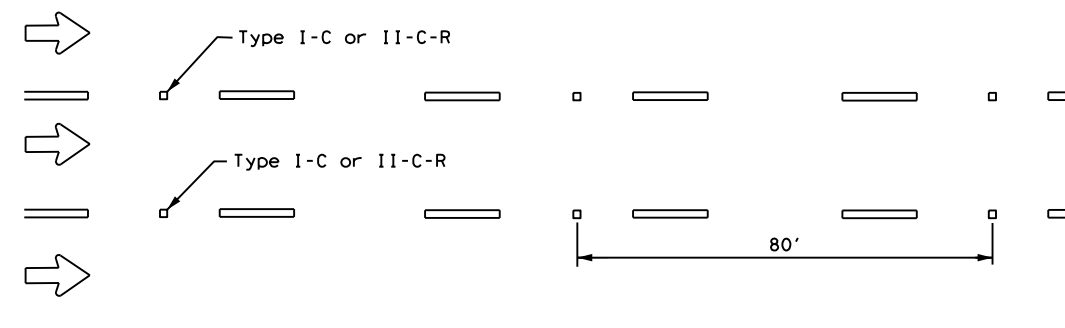
**CENTERLINE FOR ALL TWO LANE ROADWAYS**



**CENTERLINE & LANE LINES  
FOR FOUR LANE TWO-WAY HIGHWAYS**



**CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE**

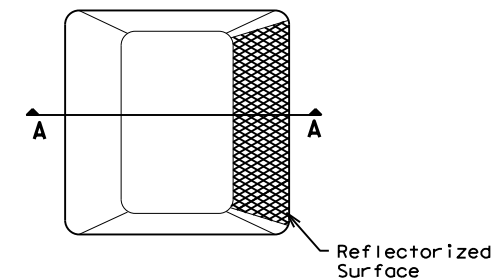


**LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)**

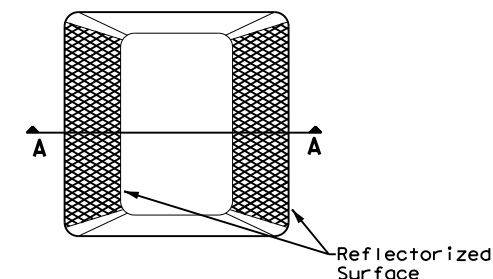
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

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

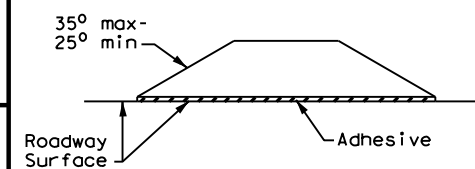
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



**Type I (Top View)**



**Type II (Top View)**

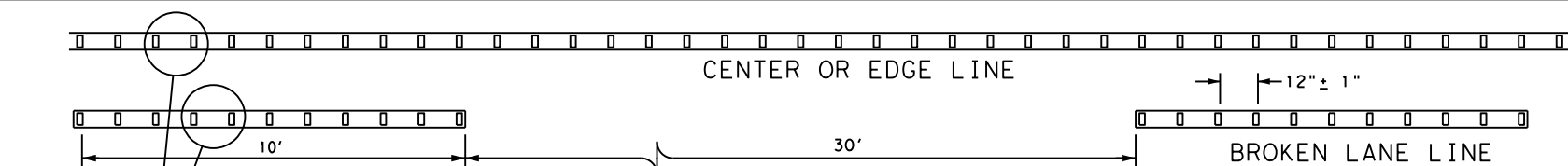


**SECTION A**

**RAISED PAVEMENT MARKERS**

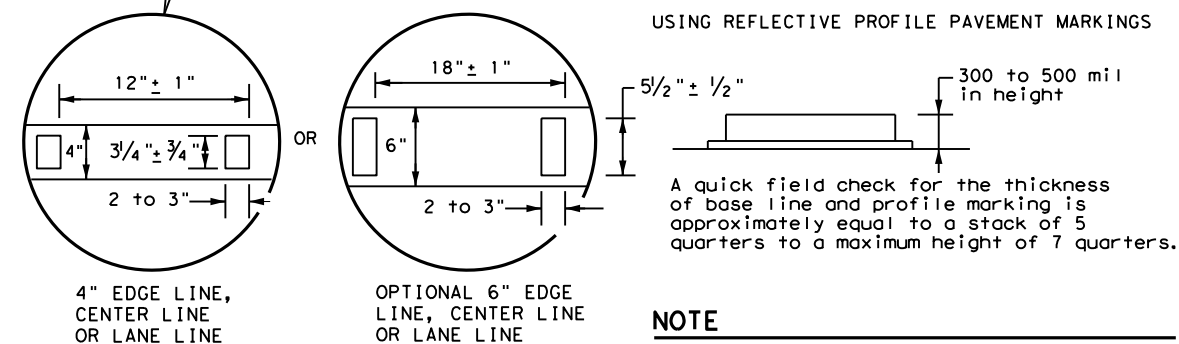
**GENERAL NOTES**

- All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
- On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.



**REFLECTORIZED PROFILE  
PATTERN DETAIL**

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



**NOTE**

Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

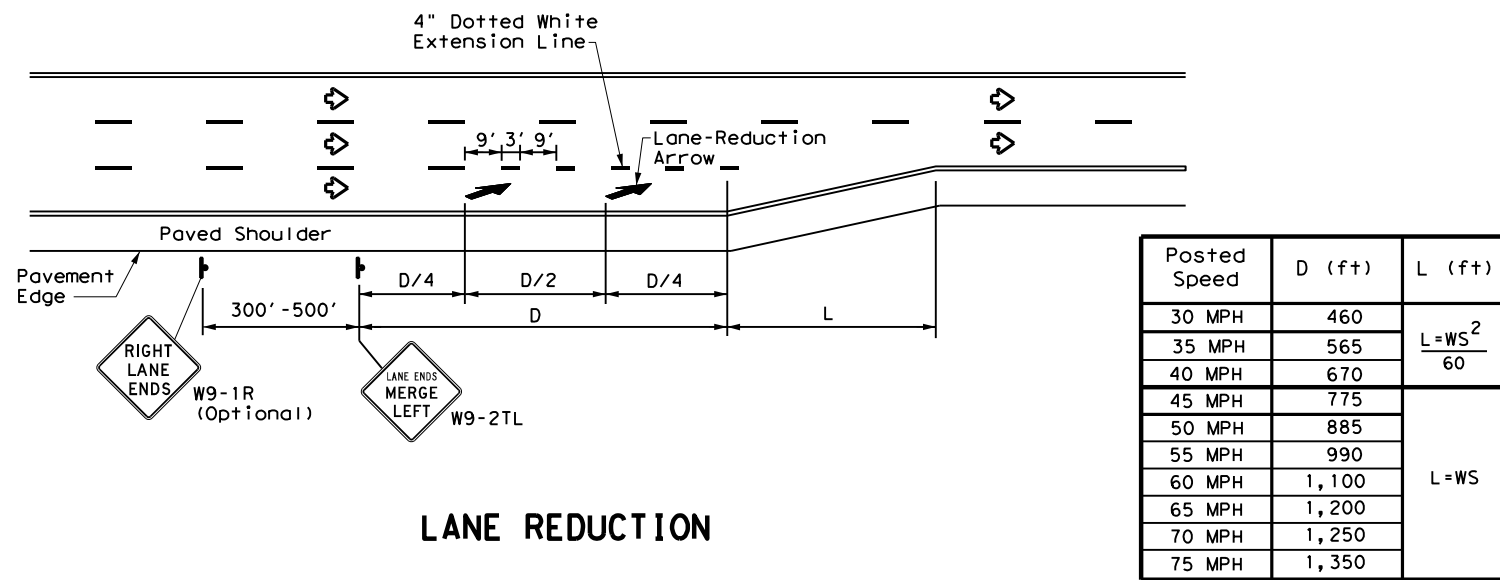


**POSITION GUIDANCE USING  
RAISED MARKERS  
REFLECTORIZED PROFILE  
MARKINGS  
PM(2) - 20**

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
4-92 2-10 REVISIONS	1054	01	009, etc.	FM 219, etc.
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	WAC	BOSQUE, etc.		58

DATE:  
FILE:

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

**NOTES**

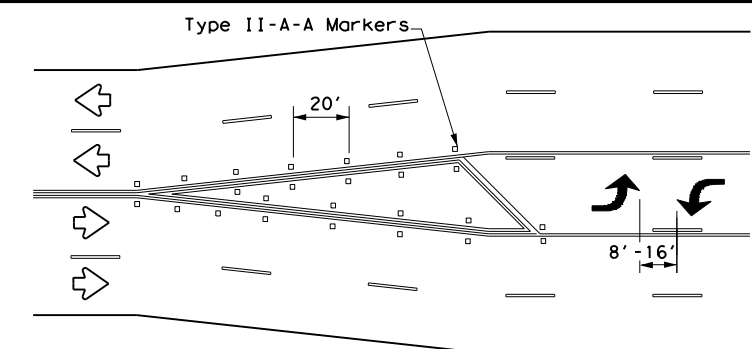
- Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
- On divided highways, an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

**GENERAL NOTES**

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

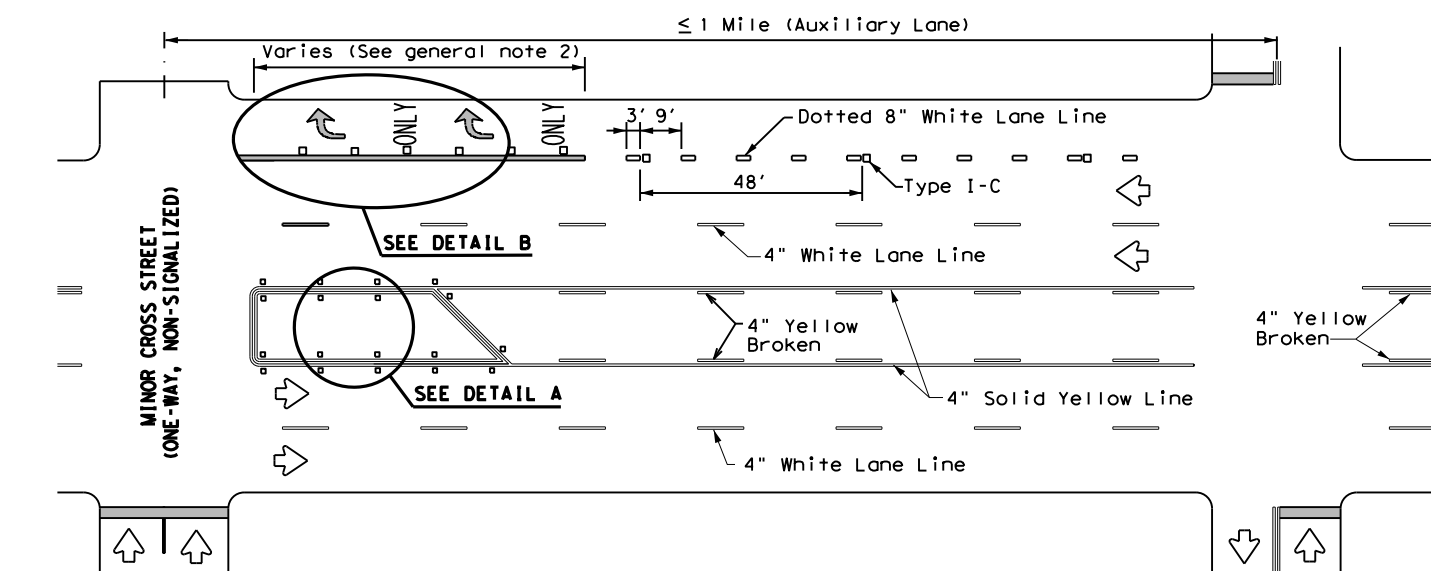
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

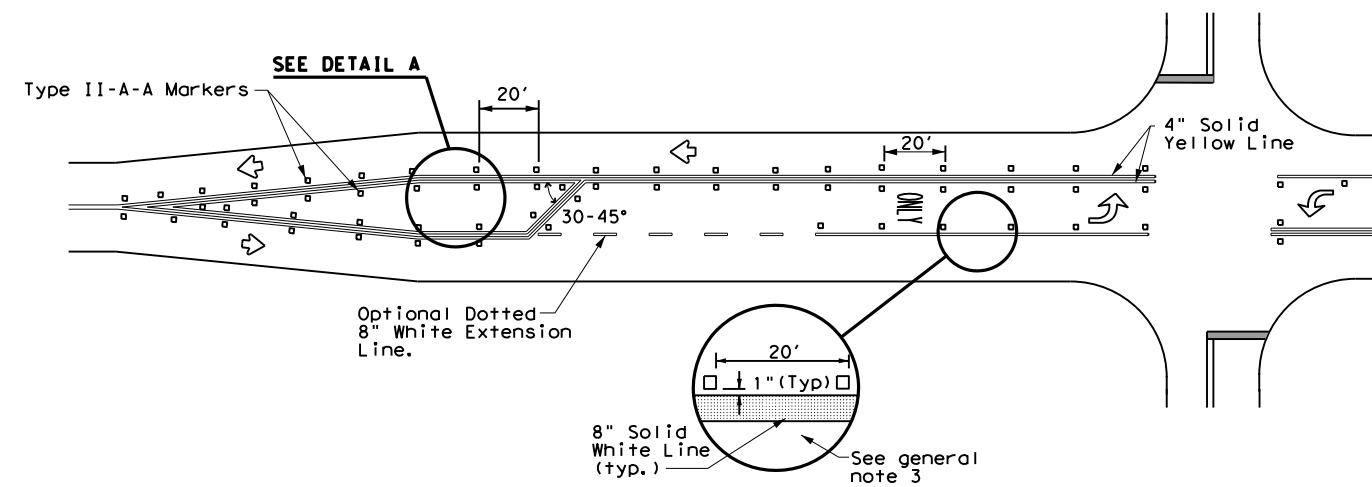


A two-way left-turn (TWLTL) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

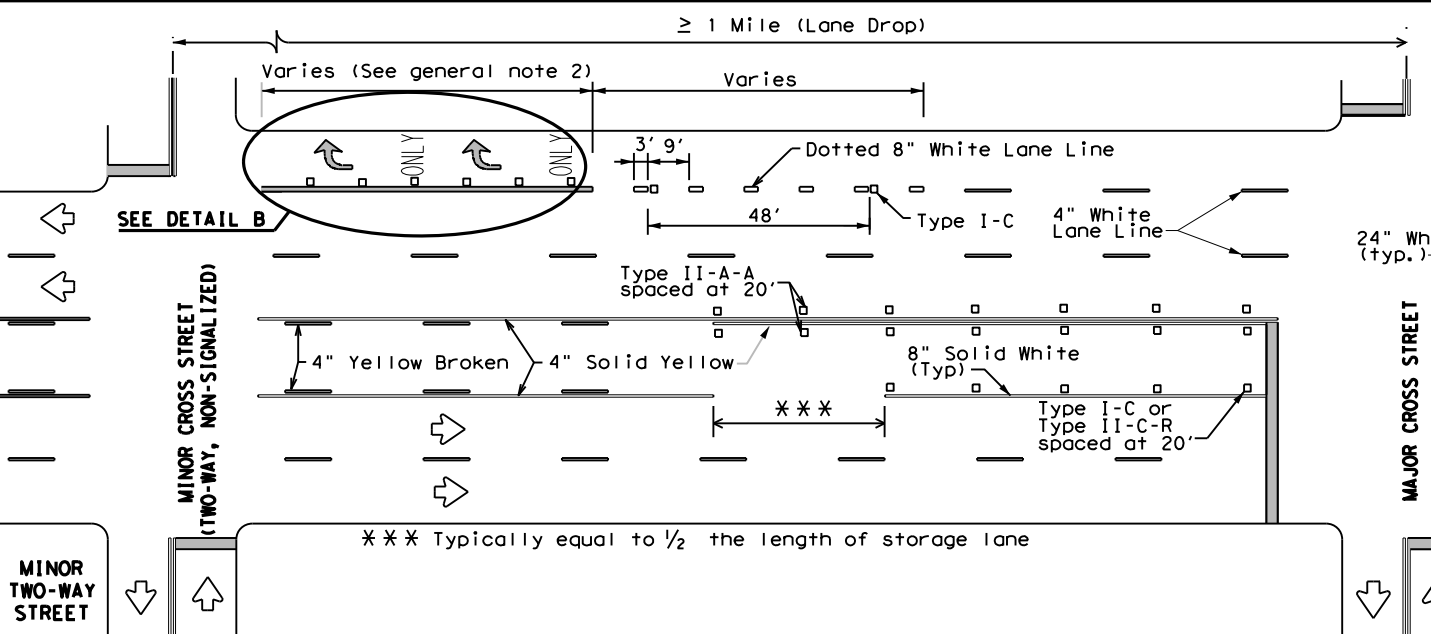
**TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY**



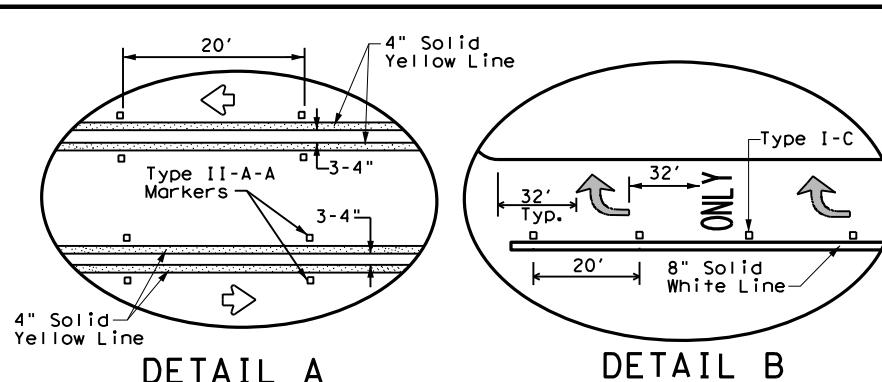
**TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE**



**TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS**



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



DETAIL A

DETAIL B

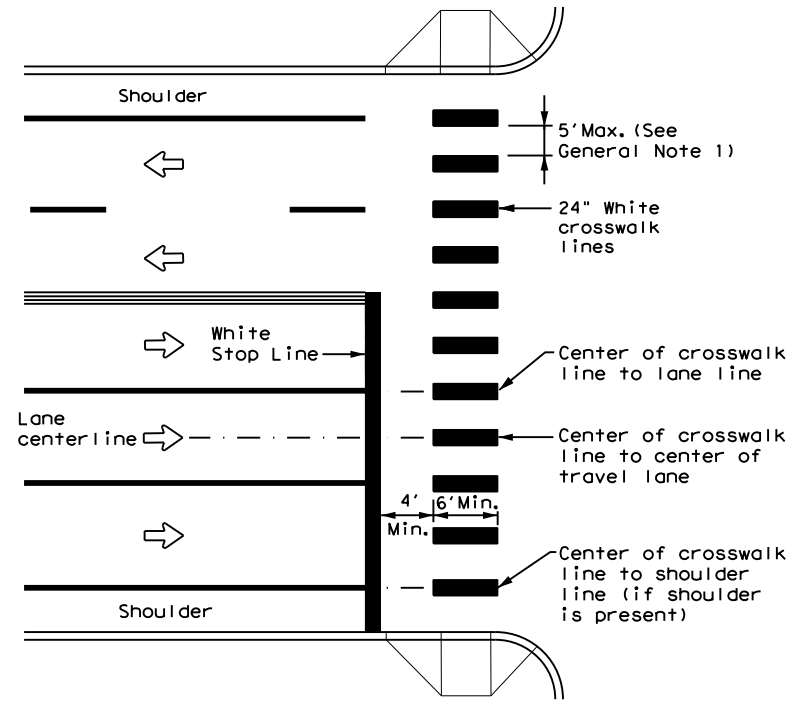
Texas Department of Transportation  
Traffic Safety Division Standard

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

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	1054	01	009, etc.	FM 219, etc.
5-00 2-10	DIST	COUNTY		SHEET NO.
8-00 2-12	WAC	BOSQUE, etc.		59
3-03 6-20				

DATE: FILE:

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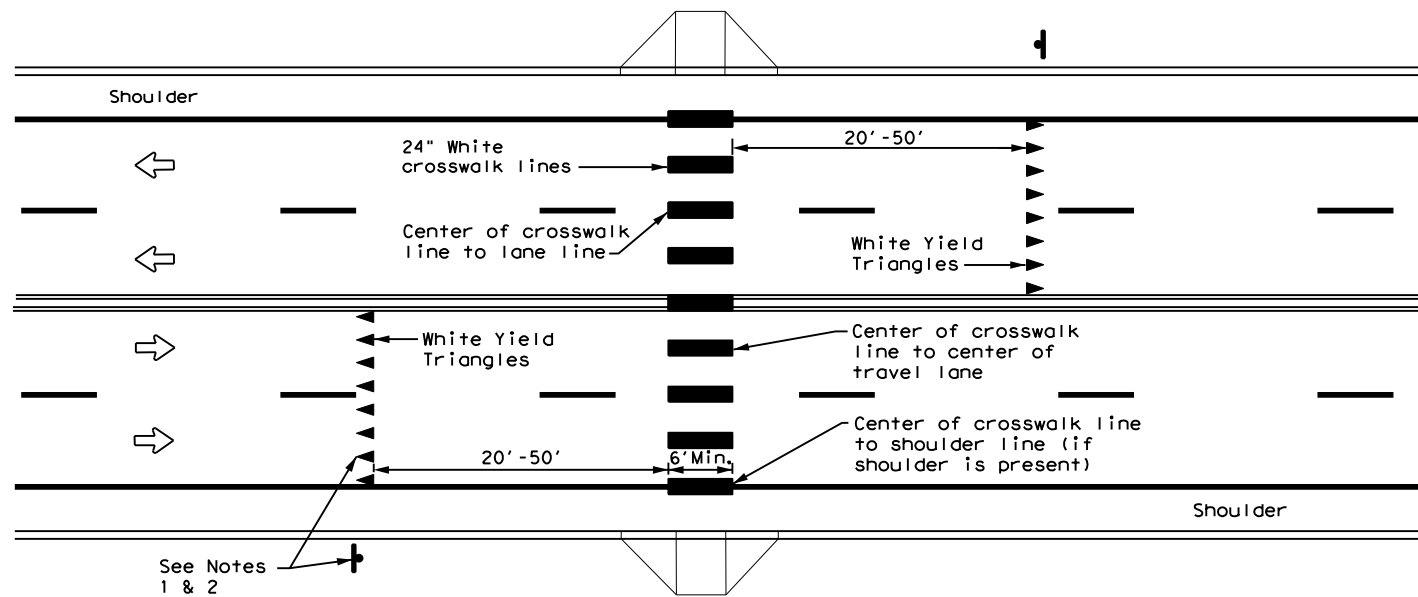
**HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH**

**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/Yield Triangles 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 MID BLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK**

**NOTES**

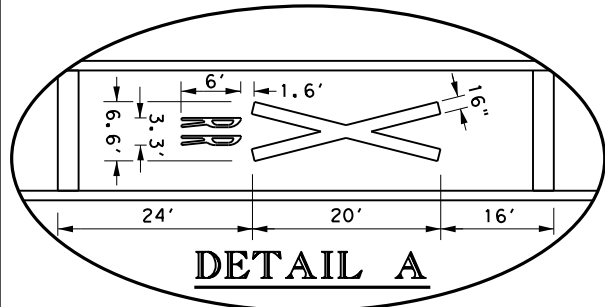
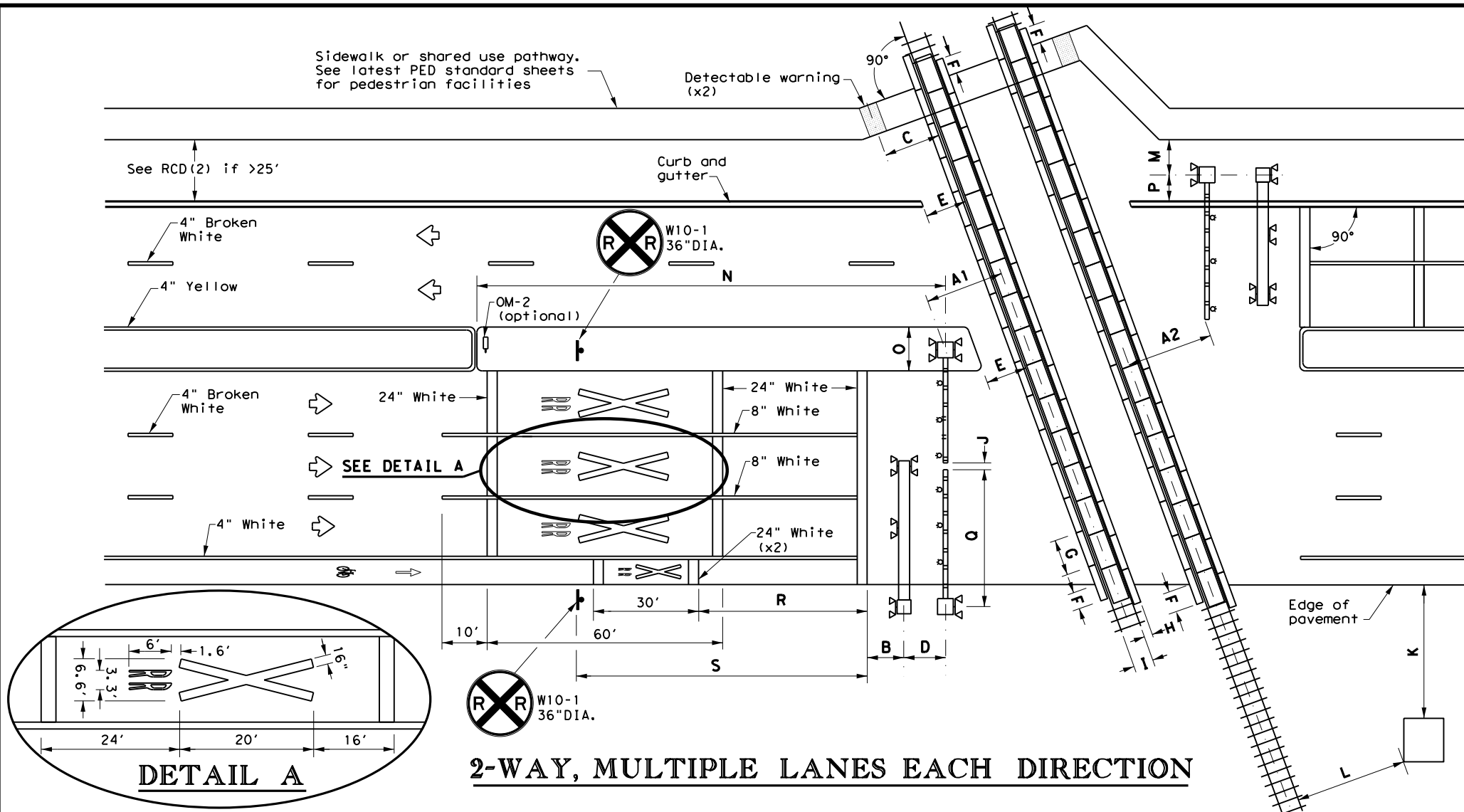
1. Use yield triangles with "Yield Here to Pedestrians" signs at unsignalized mid block crosswalks.
2. Use stop bars with "Stop Here on Red" signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

DATE:  
FILE:

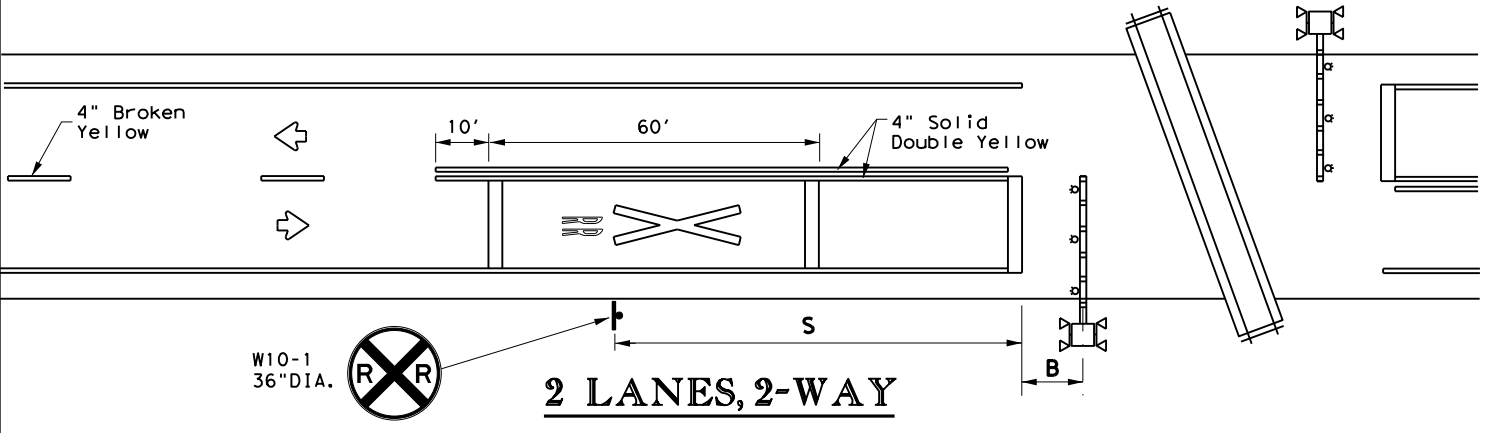
<p><b>CROSSWALK PAVEMENT MARKINGS</b></p> <p><b>PM(4) - 20</b></p>			
FILE: pm4-20.dgn	DN:	CK:	DW:
© TxDOT June 2020	CONT	SECT	JOB
REVISIONS	1054	01	009, etc. FM 219, etc.
	DIST	COUNTY	SHEET NO.
	WAC	BOSQUE, etc.	60

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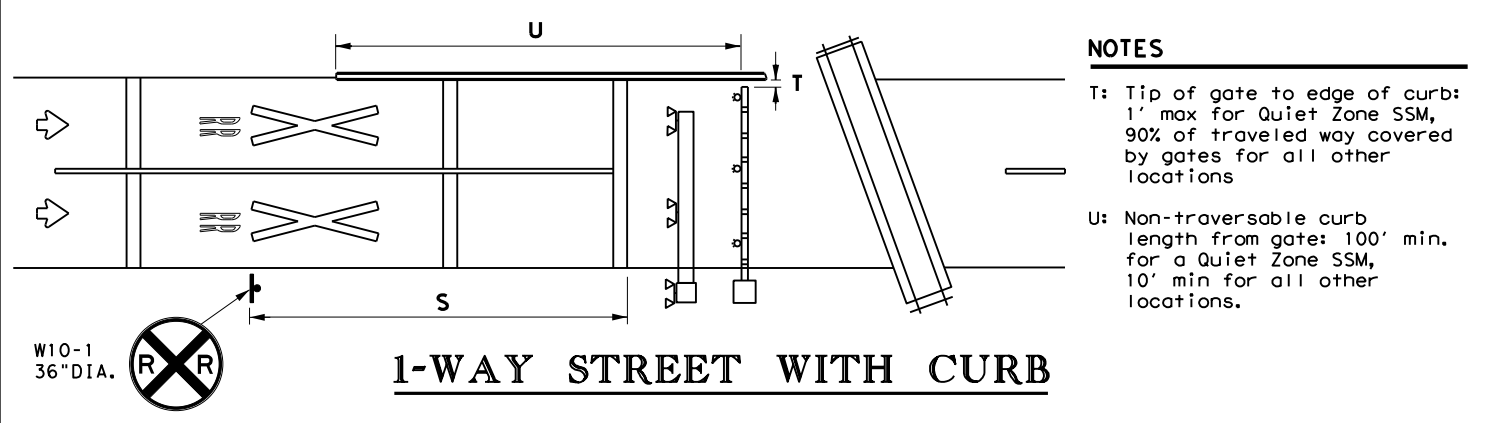
DATE: FILE:



**2-WAY, MULTIPLE LANES EACH DIRECTION**



**2 LANES, 2-WAY**



**1-WAY STREET WITH CURB**

- NOTES**
- T: Tip of gate to edge of curb: 1' max for Quiet Zone SSM, 90% of traveled way covered by gates for all other locations
  - U: Non-traversable curb length from gate: 100' min. for a Quiet Zone SSM, 10' min for all other locations.

**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: Center of detectable warning device to nearest rail: 6' 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'-8.5\".
- J: Tip of gate to tip of gate: 2' maximum for Quiet Zone SSM or 90% of traveled way covered by gates for all other locations.
- K: Nearest edge of RR cabin from edge of pavement: 30' typical. NOTE: Cabinet not required to be parallel to edge of pavement.
- L: Nearest edge of RR cabin 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: 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: 4'-3\" minimum. Center of RR mast to edge of pavement (with shoulder): 6' minimum. Center of RR mast to edge of pavement (no shoulder): 8'-3\" minimum. NOTE: BNSF prefers 5'-3\", 7', and 9'-3\" minimums, respectively.
- 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.

**TABLE 1**

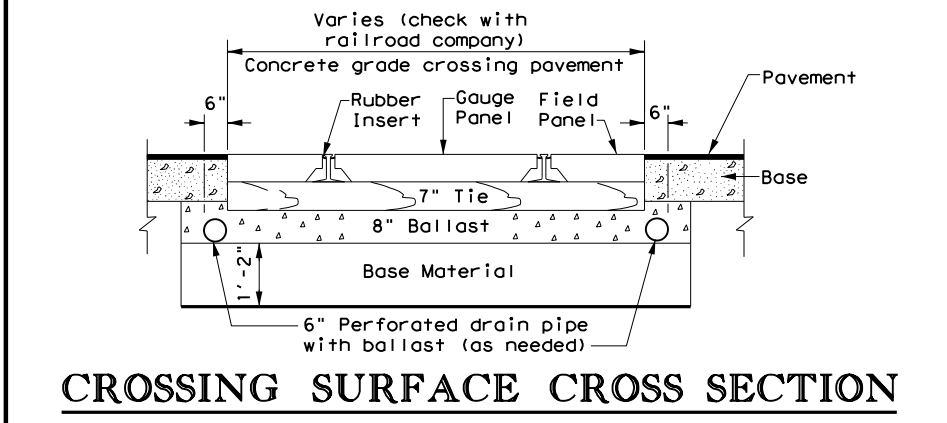
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

**LEGEND**

	Sign
	Object Marker
	Traffic Flow
	Cantilever
	Gate Assembly
	Mast Flasher Pair

**GENERAL NOTES**

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



**CROSSING SURFACE CROSS SECTION**

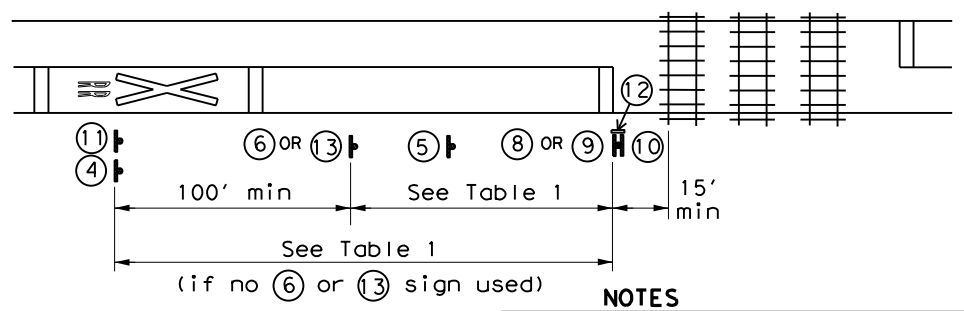
Texas Department of Transportation  
Traffic Operations Division Standard

**RAILROAD CROSSING DETAILS  
SIGNING, STRIPING, AND  
DEVICE PLACEMENT  
RCD(1)-16**

FILE: rcd1-16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT FEBRUARY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1054	01	009, etc.	FM 219, etc.
	DIST	COUNTY		SHEET NO.
	WAC	BOSQUE, etc.		61

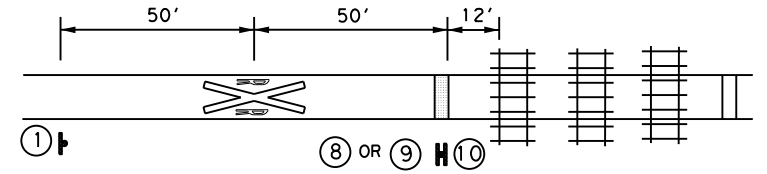
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### PASSIVE CROSSING

- 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.



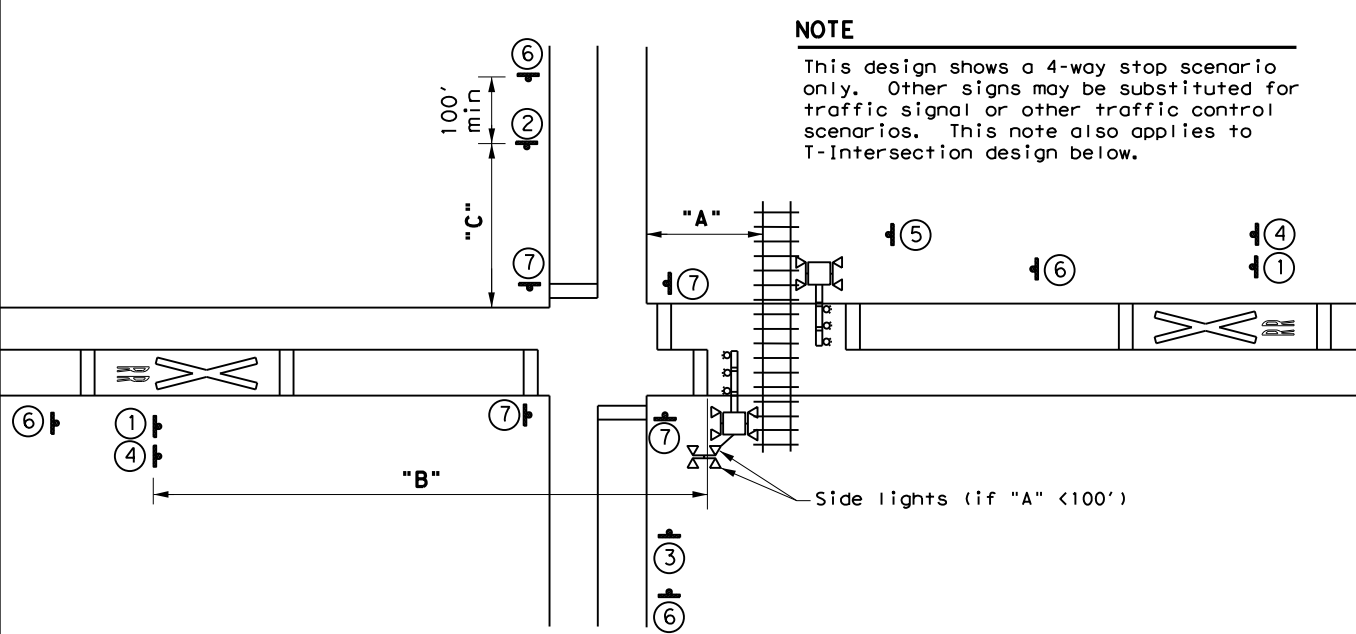
### PATHWAY CROSSING

- NOTES**
1. A shared use pathway 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 sign sizes preferred than shown to the right on this sheet.

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

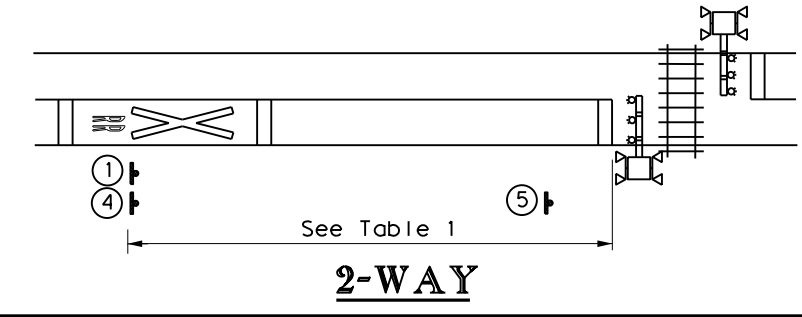
1. Railroad company to provide active traffic control devices, CROSSBUCK (R15-1), NUMBER OF TRACKS Plaque (R15-2P) (if more than 1 track), and EMERGENCY NOTIFICATION (I-13) signs.
2. LOW GROUND CLEARANCE (W10-5) signs may be relocated further upstream of crossing to provide advance warning of alternate 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 Sect. 2C.05 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.



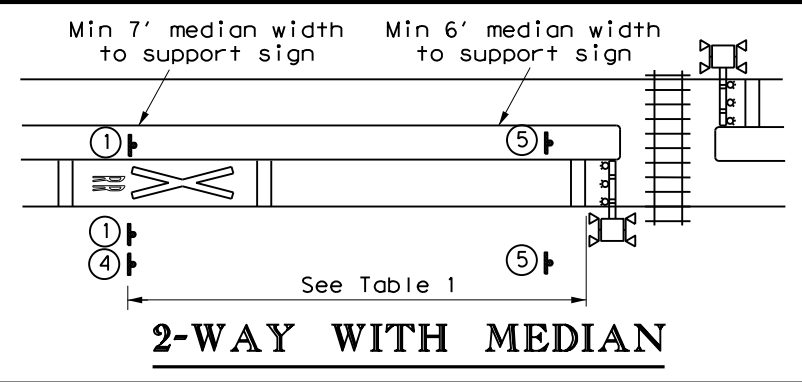
**NOTE**  
 This design shows a 4-way stop scenario only. Other signs may be substituted for traffic signal or other traffic control scenarios. This note also applies to T-intersection design below.

	"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.

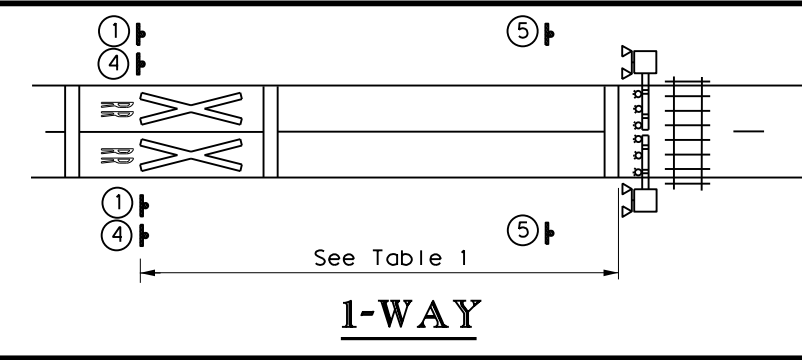
### GRADE CROSSING NEAR A PARALLEL STREET



### 2-WAY



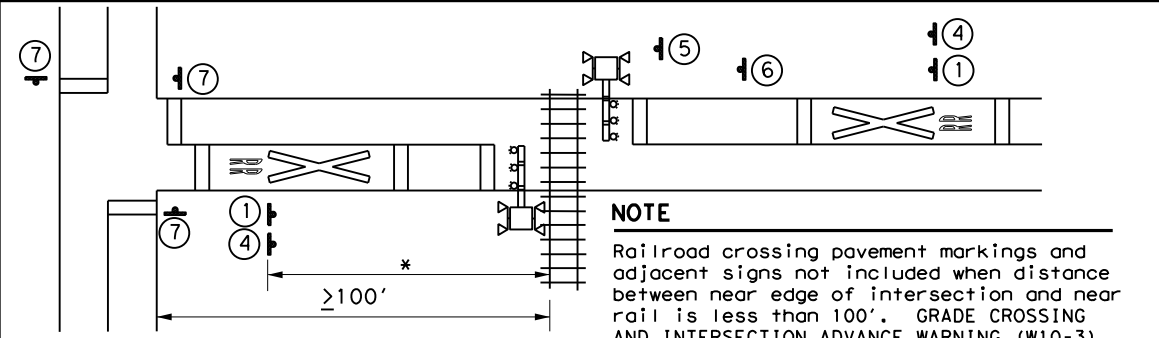
### 2-WAY WITH MEDIAN



### 1-WAY

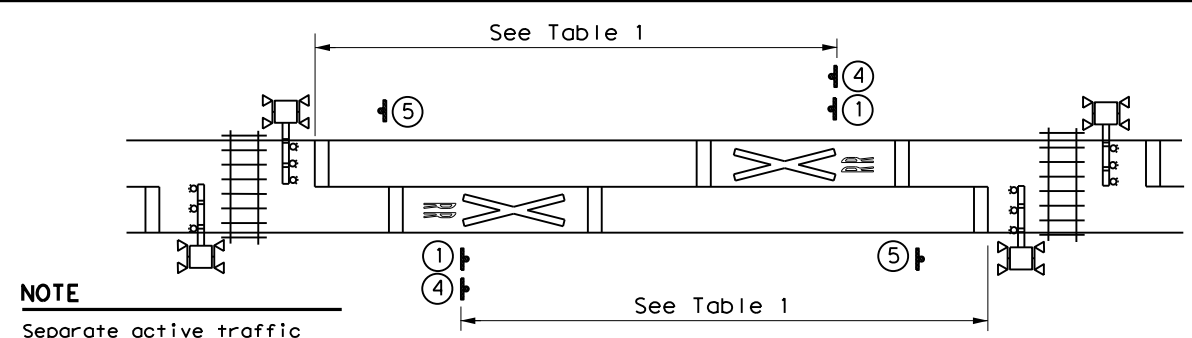
**SIGNS**


**\*\* Includes a NO TRAIN HORN Plaque (W10-9P) if crossing is in a Quiet Zone. LOW GROUND CLEARANCE Plaque (W10-5P) if needed is mounted below W10-2/W10-3/W10-4 signs.**



**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.

### 2 ADJACENT CROSSINGS

Texas Department of Transportation  
 Traffic Operations Division Standard

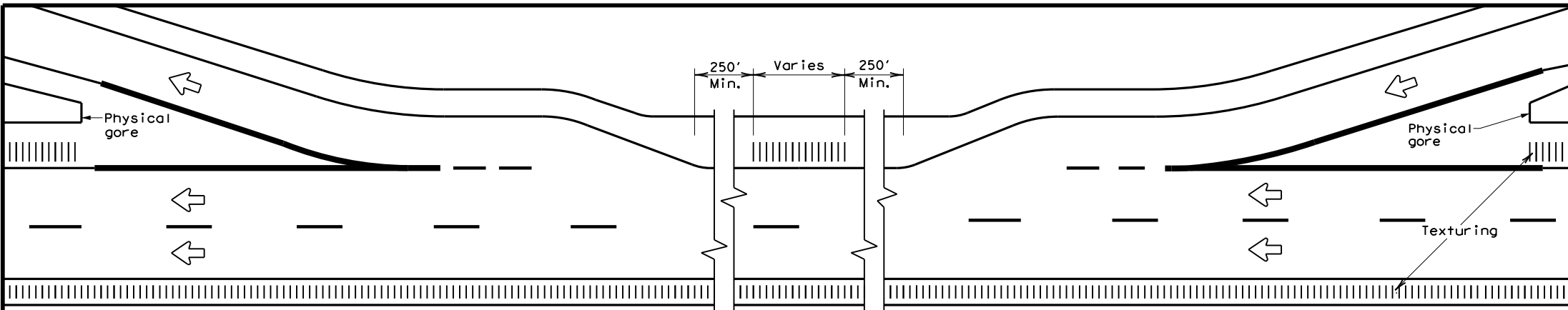
## RAILROAD CROSSING DETAILS SIGNING & STRIPING

### RCD(2)-16

FILE: rcd2-16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT FEBRUARY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1054	01	009, etc.	FM 219, etc.
	DIST	COUNTY	SHEET NO.	
	WAC	BOSQUE, etc.	62	



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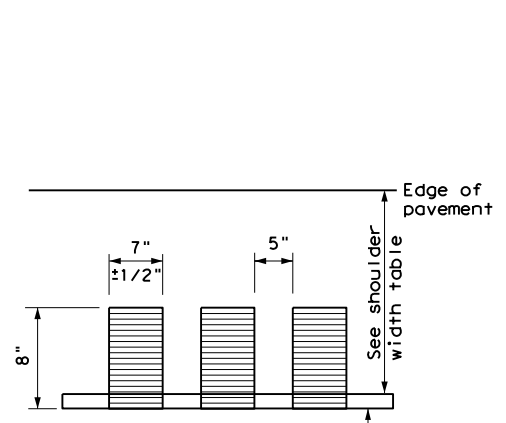
TYPICAL RUMBLE STRIP PLACEMENT AT EXIT AND ENTRANCE RAMP

**GENERAL NOTES**

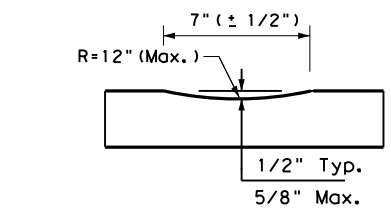
- Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
  - Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
  - Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
  - See the table below for determining what options may be used for edgeline rumble strips.
- WHEN INSTALLING MILLED DEPRESSION EDGELINE RUMBLE STRIPS:**
- See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
  - Pavement markings can be applied over milled shoulder rumble strips to create an edgeline rumble strip.
  - Breaks in edgeline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks when installed on conventional highways.
  - Rumble strips shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
  - Consideration should be given to noise levels when edgeline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inches depth of milled rumble strip may be considered in these areas.
  - On roadways with high bicycle activity, consideration should be given before the installation of edgeline rumble strips. Things to consider include size of rumble strips, rumble strip material and location of rumble strips on the shoulder. If the designer determines that gaps are needed in the rumble strips due to bicycle use of the road, then follow the requirement shown in FHWA Technical Advisory T5040.39, or latest version. A detail of the spacing shall be included in the plans.

**WHEN INSTALLING RAISED OR PROFILE EDGELINE RUMBLE STRIPS:**

- 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 the manufacturer's recommendations.
- Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edgeline when used as a rumble strip. The color of the button should match the color of the adjacent edgeline marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
- Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
- Breaks in edgeline rumble strips using raised traffic buttons shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections and driveways with high usage of large trucks when installed on conventional highways.
- The minimum distance between the edgeline and the buttons should be used if the shoulder is less than 8 feet in width.
- Raised profile thermoplastic markings used as edgelines may substitute for buttons.

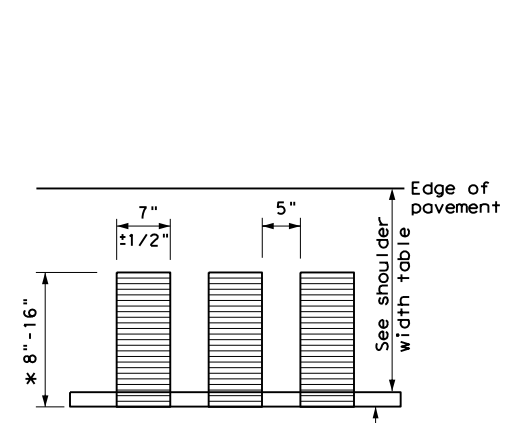


PLAN VIEW



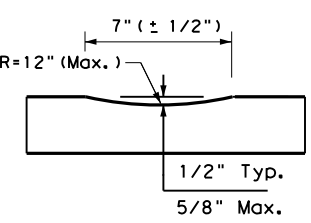
PROFILE VIEW  
OPTION 1

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



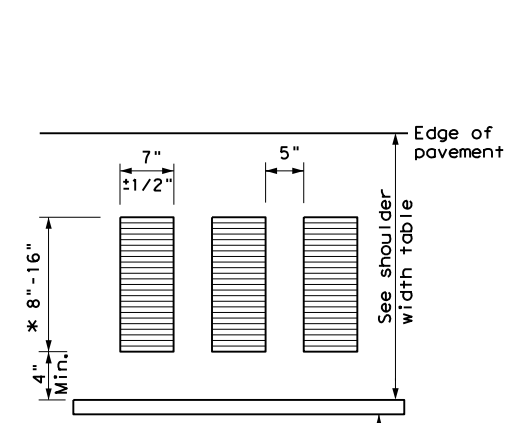
PLAN VIEW

\* This distance may vary based on width of shoulder



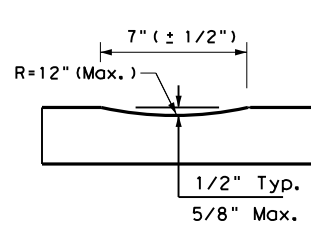
PROFILE VIEW  
OPTION 2

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



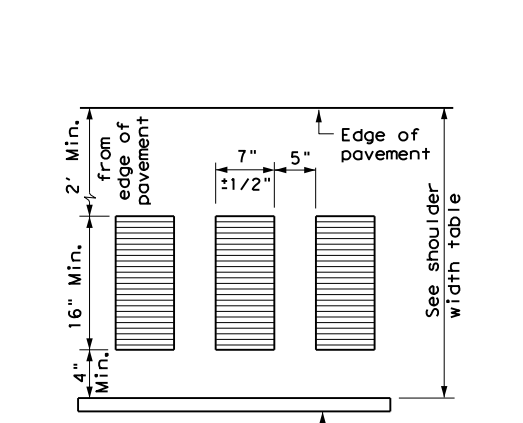
PLAN VIEW

\* This distance may vary based on width of shoulder

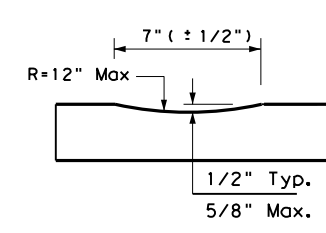


PROFILE VIEW  
OPTION 3

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

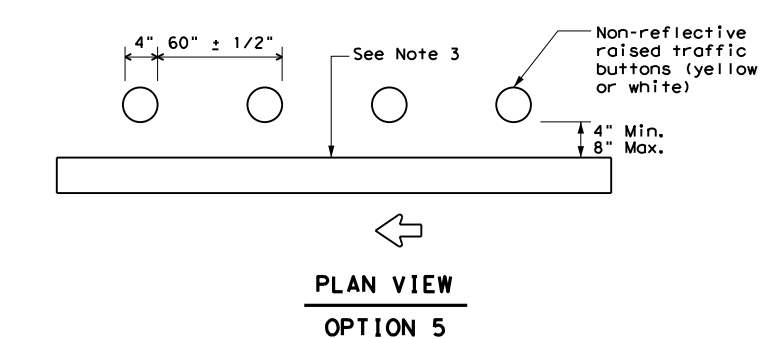


PLAN VIEW



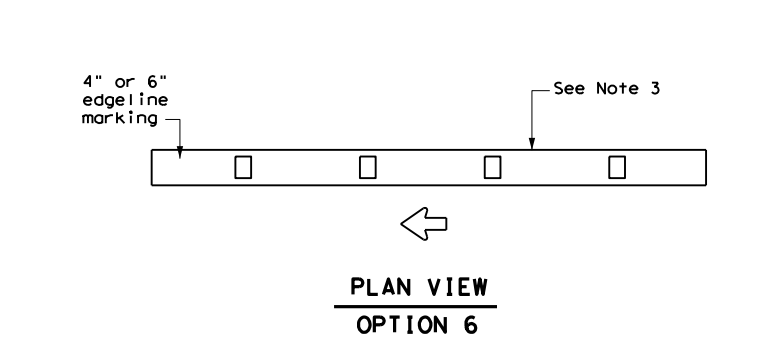
PROFILE VIEW  
OPTION 4

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



PLAN VIEW  
OPTION 5

RAISED EDGELINE RUMBLE STRIPS



PLAN VIEW  
OPTION 6

PROFILE EDGELINE MARKINGS

SHOULDER WIDTH TABLE		
EQUAL TO OR LESS THAN 2 FEET	GREATER THAN 2 FEET LESS THAN 4 FEET	EQUAL TO OR GREATER THAN 4 FEET
Option 1, 5 OR 6	Option 1, 2, 3, 5 or 6	Option 2, 4, 5 OR 6

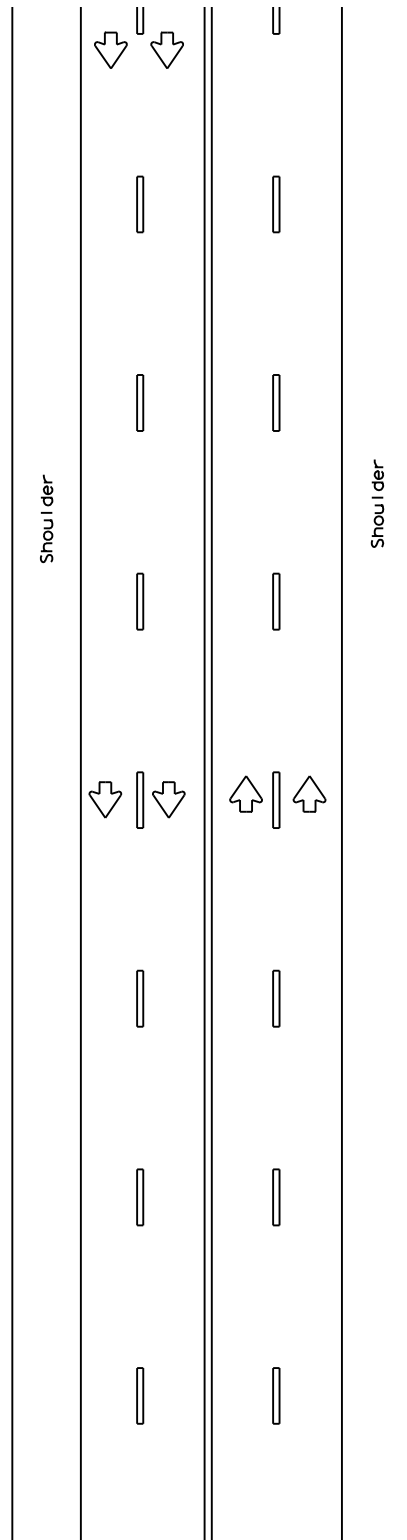
**EDGELINE RUMBLE STRIPS ON FREEWAYS AND DIVIDED HIGHWAYS RS(1)-13**

FILE: rs(1)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2006	CONT	SECT	JOB	HIGHWAY
2-10	1054	01	009, etc.	FM 219, etc.
10-13	DIST	COUNTY	SHEET NO.	
	WAC	BOSQUE, etc.	63	

DATE:  
FILE:

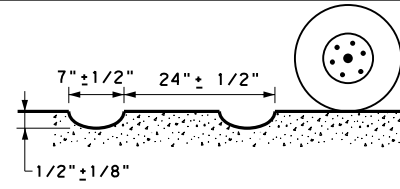
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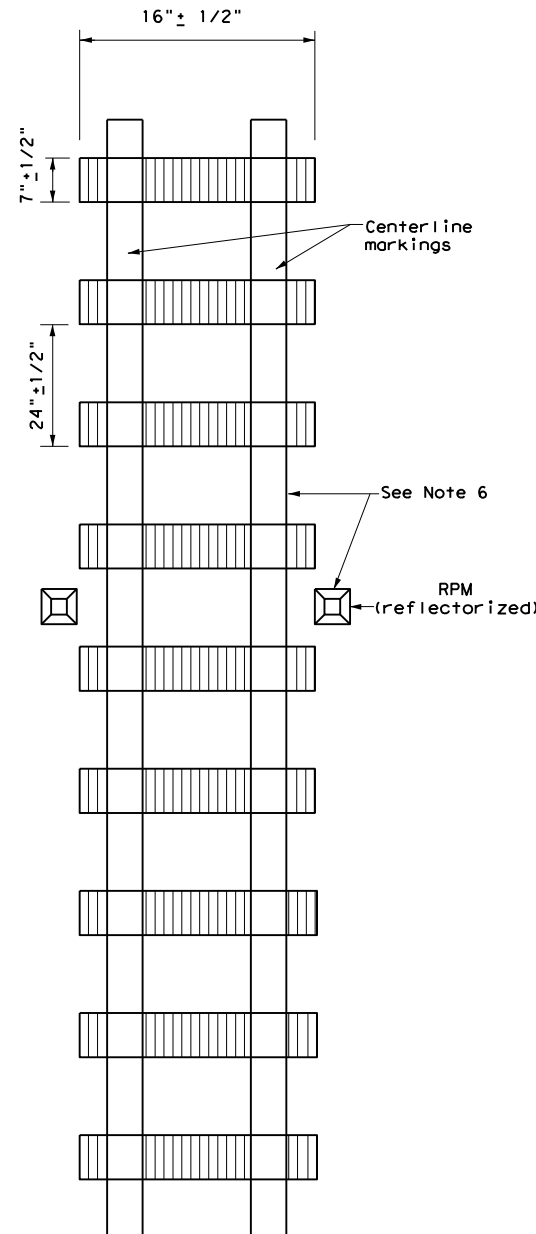


MULTILANE UNDIVIDED  
HIGHWAY WITH  
SHOULDER

CENTERLINE RUMBLE STRIPS

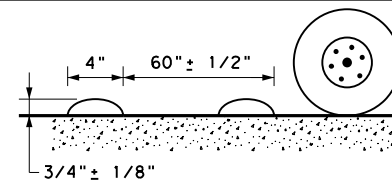


PROFILE VIEW

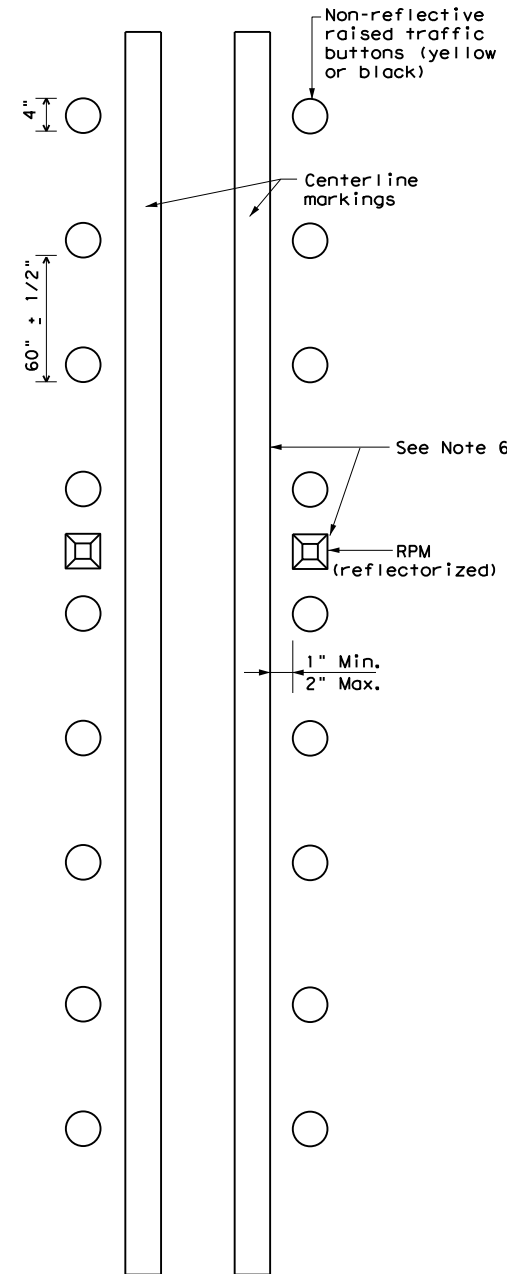


PLAN VIEW  
OPTION 1

MILLED CENTERLINE  
RUMBLE STRIPS

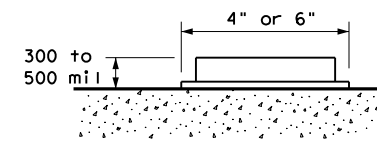


PROFILE VIEW

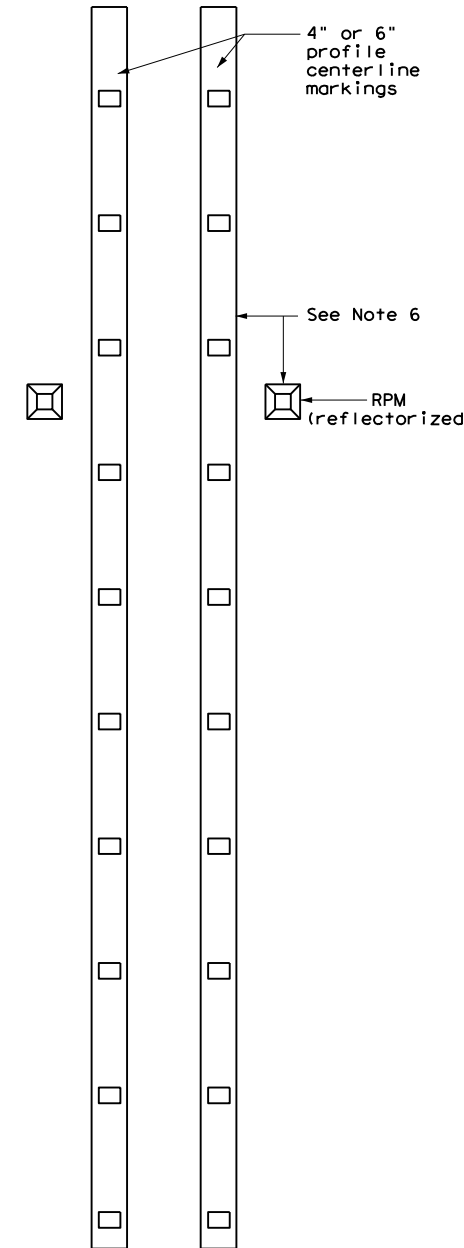


PLAN VIEW  
OPTION 2

RAISED CENTERLINE  
RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW  
OPTION 3

PROFILE CENTERLINE  
MARKINGS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on multilane undivided highways.
2. Centerline and edgeline 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 Operations 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 crossing, intersections and 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 installed near residential areas, schools, churches, etc. A minimum of 3/8 inch depth of milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips for normal centerline spacing. For wider medians, specify in the plans the exact placement of the rumble strips. Place the rumble strips under each centerline marking or centered in the middle of the median.

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 color of the button should be yellow for a continuous no passing roadway. The button will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.

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

11. See standard sheet RS(4).



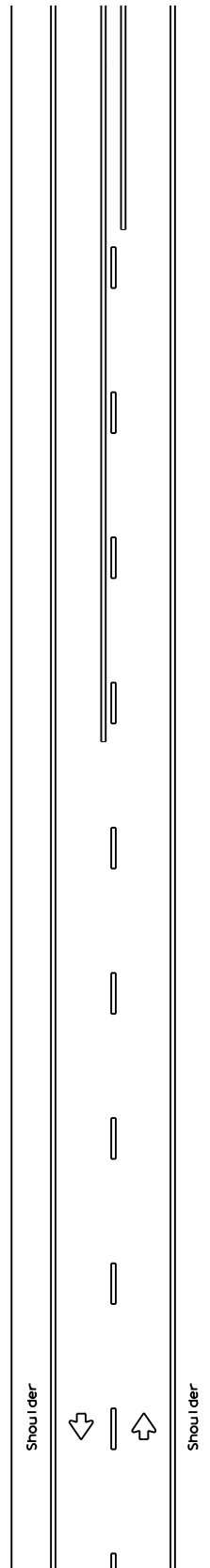
CENTERLINE RUMBLE STRIPS ON MULTILANE UNDIVIDED HIGHWAYS

RS(2) - 13

FILE: r's(2)-13.dgn	DW: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	1054 01	009, etc.FM 219, etc.		
DIST	COUNTY	SHEET NO.		
WAC	BOSQUE, etc.	64		

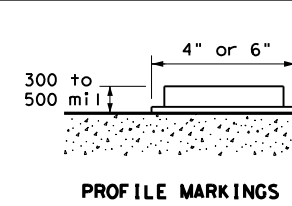
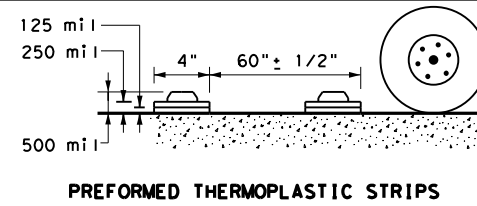
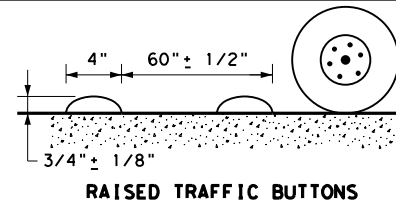
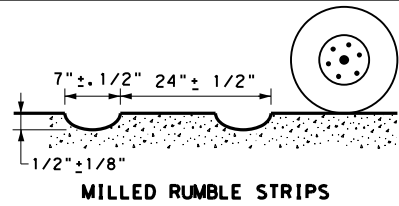
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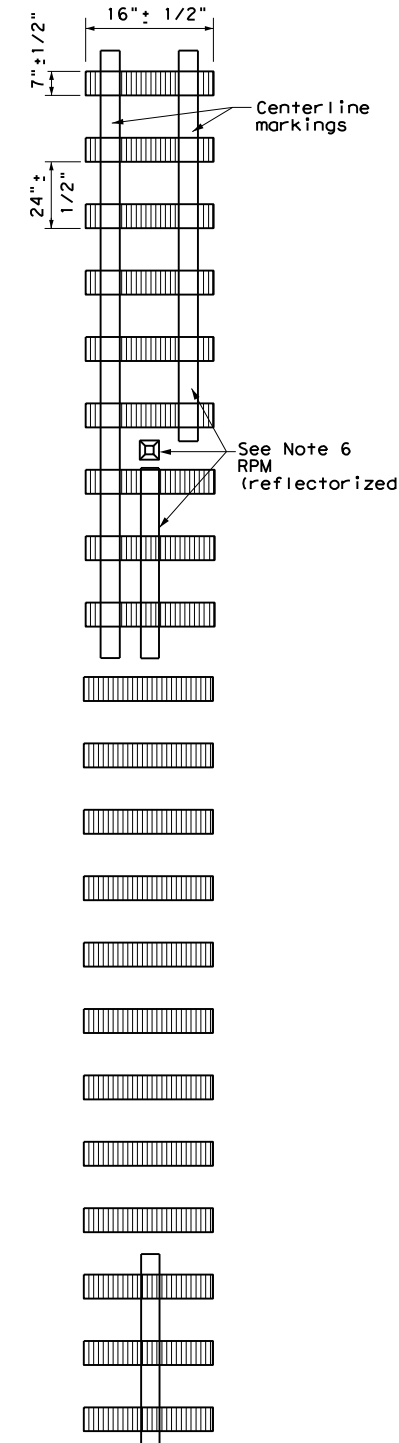


**TWO LANE TWO-WAY ROADWAYS**

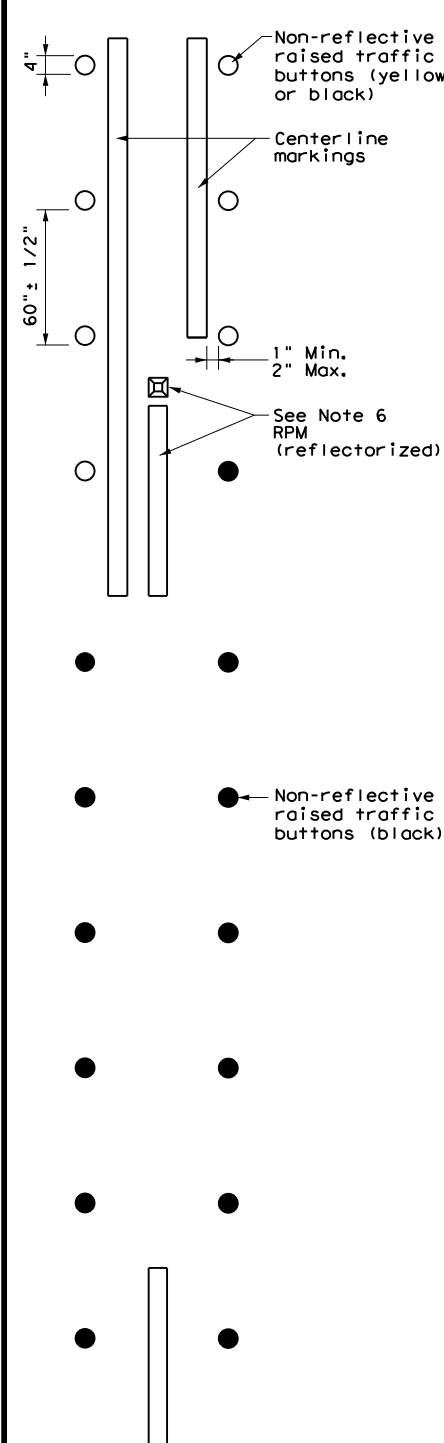
**CENTERLINE RUMBLE STRIPS**



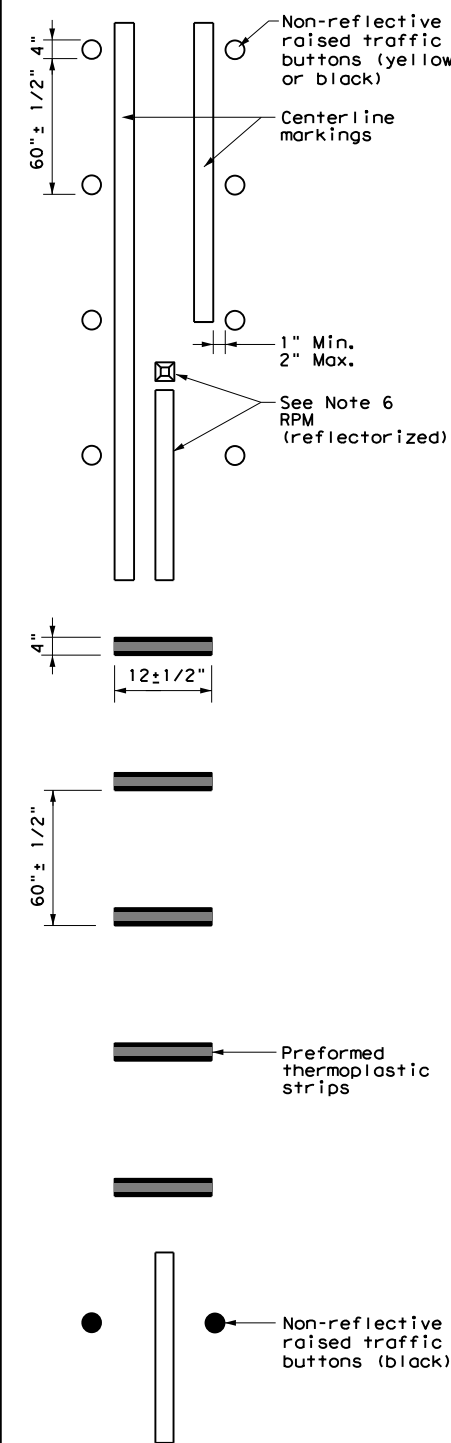
**PROFILE VIEW**



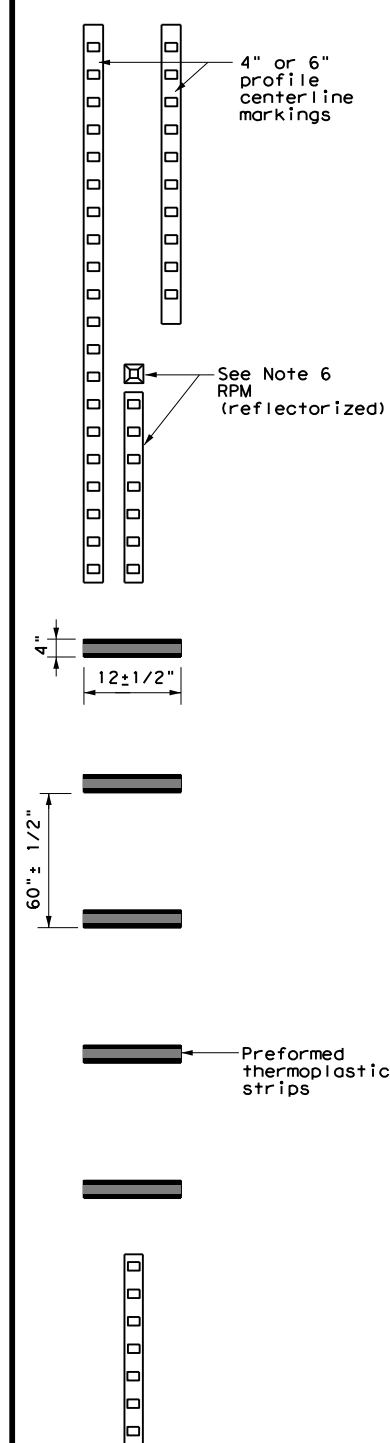
**MILLED CENTERLINE RUMBLE STRIPS**



**RAISED CENTERLINE RUMBLE STRIPS**



**RAISED CENTERLINE RUMBLE STRIPS AND PREFORMED THERMOPLASTIC STRIPS**



**PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC 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 edgeline 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 Operations 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 and driveways with high usage of large trucks.
6. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, and dimensions pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inch depth of 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.

**WHEN INSTALLING EDGELINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:**

12. See standard sheet RS(4).



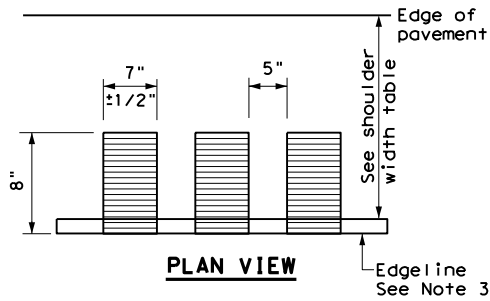
**CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS**

**RS(3) - 13**

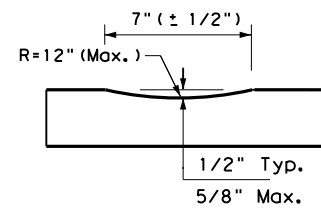
FILE: r's(3) - 13.dgn	DW: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	1054	01	009, etc.	FM 219, etc.
	DIST	COUNTY	SHEET NO.	
	WAC	BOSQUE, etc.	65	

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DATE:  
FILE:

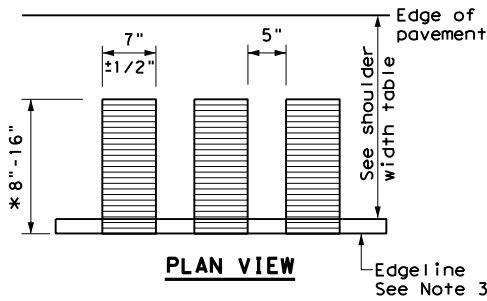


PLAN VIEW

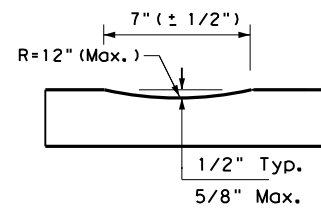


PROFILE VIEW  
OPTION 1

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

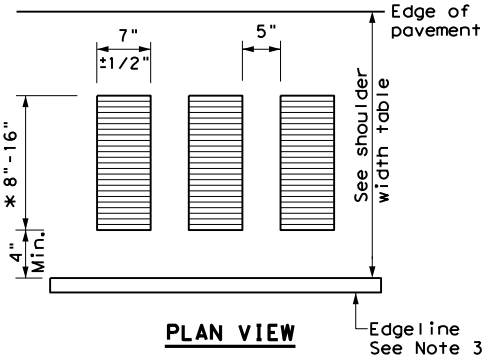


PLAN VIEW



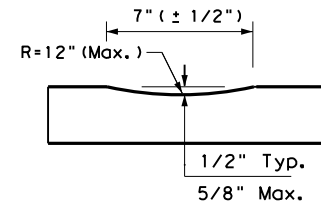
PROFILE VIEW  
OPTION 2

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



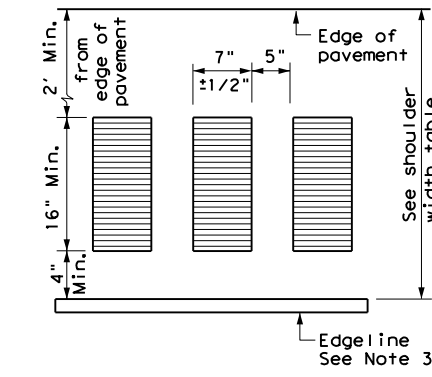
PLAN VIEW

\* This distance may vary based on width of shoulder

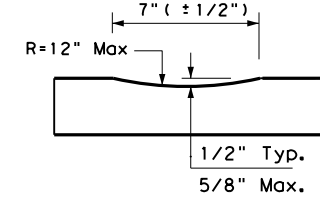


PROFILE VIEW  
OPTION 3

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

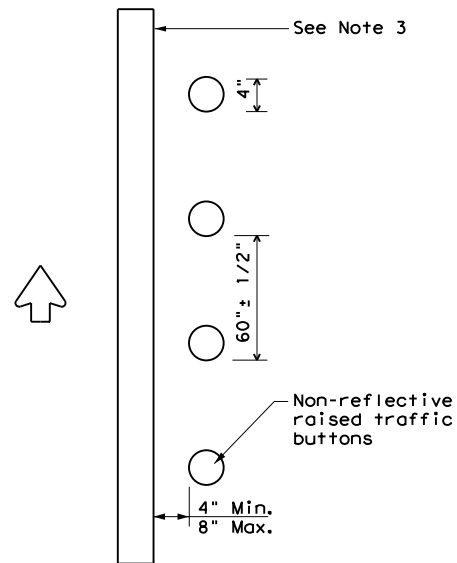


PLAN VIEW



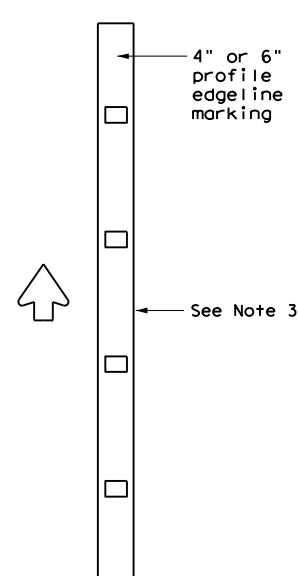
PROFILE VIEW  
OPTION 4

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



PLAN VIEW  
OPTION 5

RAISED EDGELINE RUMBLE STRIPS



PLAN VIEW  
OPTION 6

PROFILE EDGELINE MARKINGS

SHOULDER WIDTH TABLE		
EQUAL TO OR LESS THAN 2 FEET	GREATER THAN 2 FEET LESS THAN 4 FEET	EQUAL TO OR GREATER THAN 4 FEET
Option 1, 5 OR 6	Option 1, 2, 3 5 OR 6	Option 2, 4, 5 OR 6

GENERAL NOTES

- Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
- 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.
- Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
- See the table below for determining what options may be used for edgeline rumble strips.

WHEN INSTALLING MILLED DEPRESSION EDGELINE RUMBLE STRIPS:

- See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
- Pavement markings can be applied over milled shoulder rumble strips to create an edgeline rumble stripe.
- Breaks in edgeline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks when installed on conventional highways.
- Rumble strips shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
- Consideration should be given to noise levels when edgeline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inches depth of milled rumble strip may be considered in these areas.

- On roadways with high bicycle activity, consideration should be given before the installation of edgeline rumble strips. Things to consider include size of rumble strips, rumble strip material and location of rumble strips on the shoulder. If the designer determines that gaps are needed in the rumble strips due to bicycle use of the road, then follow the requirement shown in FHWA Technical Advisory T5040.39, or latest version. A detail of the spacing shall be included in the plans.

WHEN INSTALLING RAISED OR PROFILE EDGELINE RUMBLE STRIPS:

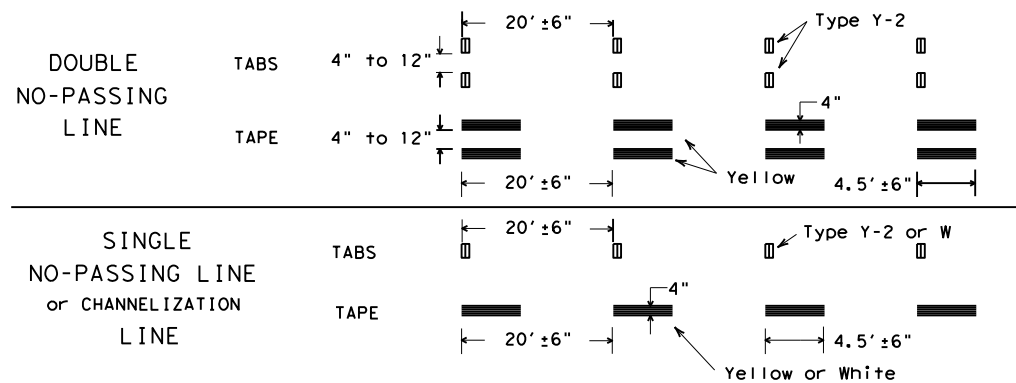
- Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per the manufacturer's recommendations.
- Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edgeline when used as a rumble strip. The color of the button should match the color of the adjacent edgeline marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
- Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
- Breaks in edgeline rumble strips using raised traffic buttons shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections and driveways with high usage of large trucks when installed on conventional highways.
- The minimum distance between the edgeline and the buttons should be used if the shoulder is less than 8 feet in width.
- Raised profile thermoplastic markings used as edgelines may substitute for buttons.

<p><b>EDGELINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS RS(4)-13</b></p>			
FILE:	rs(4)-13.dgn	DN:	TxDOT
©TxDOT	October 2013	CON:	1054
REVISIONS		SECT:	01
		JOB:	009, etc. FM 219, etc.
		HIGHWAY:	
		DIST:	COUNTY
		WAC:	BOSQUE, etc.
		SHEET NO.:	66

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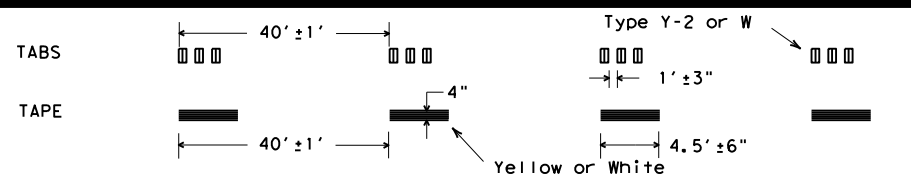
## WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

### SOLID LINES



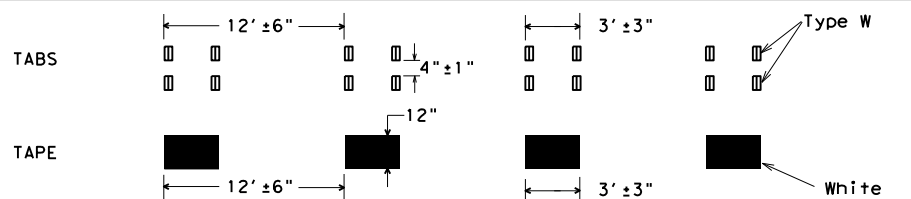
### BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

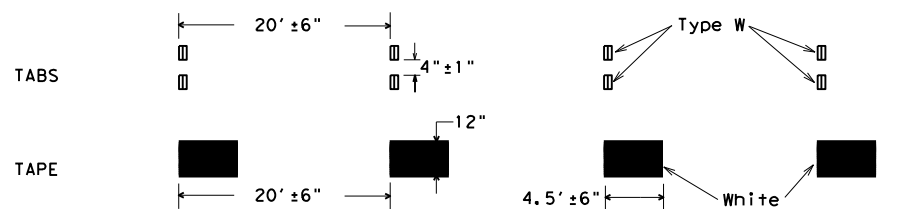


### WIDE DOTTED LINES

(FOR LANE DROP LINES)



### WIDE GORE MARKINGS



#### NOTES:

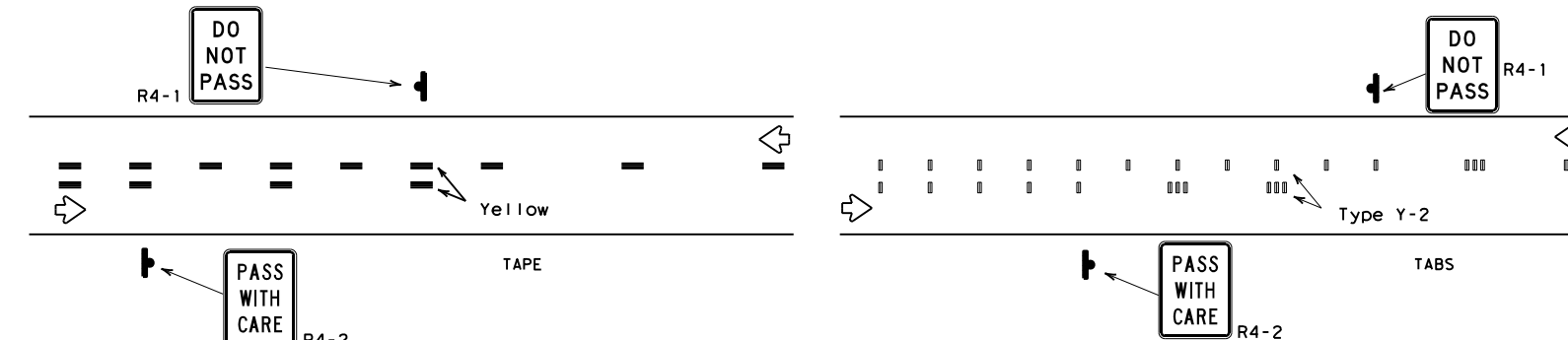
- Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible-reflective roadway marker tabs unless otherwise specified elsewhere in plans.
- Short term pavement markings shall NOT be used to simulate edge lines.
- Dimensions indicated on this sheet are typical 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.
- Temporary flexible-reflective roadway marker tabs will require normal maintenance replacement when used on roadways with an ADT per lane of up to 7500 vehicles with no more than 10% truck mix. When roadways exceed these values, additional maintenance replacement of devices should be planned.
- No segment of roadway open to traffic shall remain without permanent pavement markings for a period greater than 14 calendar days. 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.
- For two lane, two-way roadways, DO NOT PASS signs shall be erected to mark the beginning of sections where passing is prohibited and PASS WITH CARE signs shall be erected to mark the beginning of sections where passing is permitted. Signs shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and may be used to indicate the limits of no-passing zones for up to 14 calendar days. Permanent pavement markings should then be placed.
- For low volume two lane, two-way roadways of 4000 ADT or less, no-passing lines may be omitted when approved by the Engineer. DO NOT PASS and PASS WITH CARE signs shall be erected (see note 6).
- 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 allowed for this purpose.

#### TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

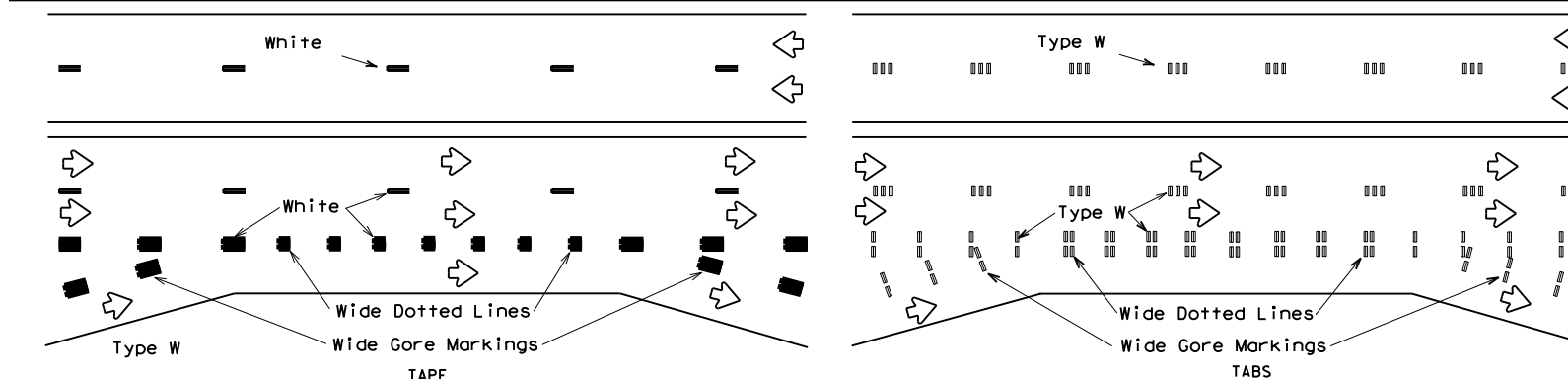
- Temporary flexible-reflective roadway marker tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with yellow body); Type Y (one amber reflective surface with yellow body); and Type W (one white or silver reflective surface with white body). Additional details may be found on BC(11).
- Tabs shall meet requirements of Departmental Material Specification DMS-8242.
- 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.
- 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 3.

DATE:  
FILE:

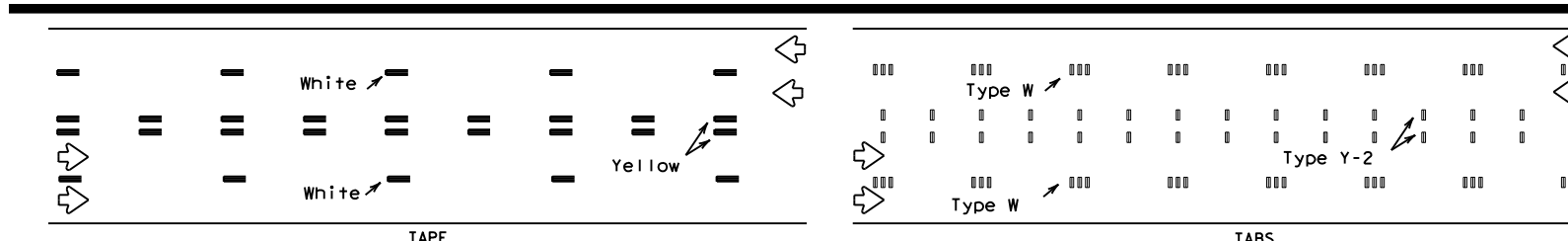
## WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



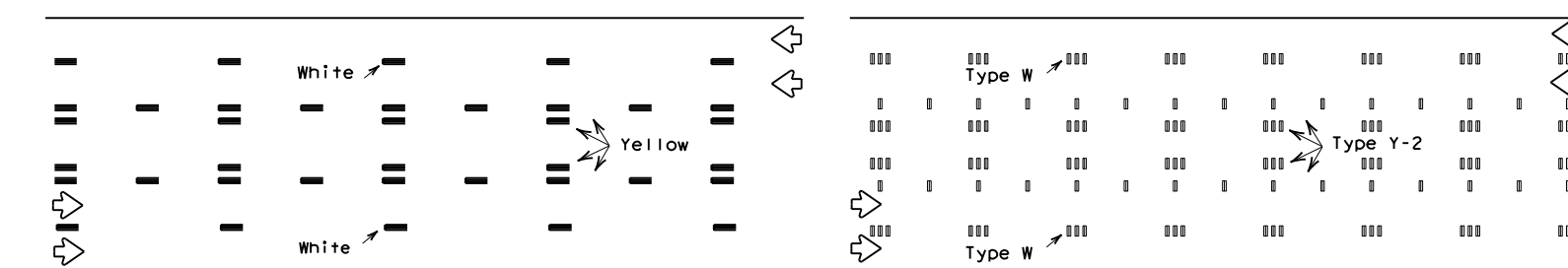
### CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



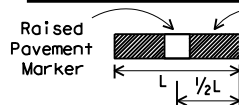
### LANE LINES FOR DIVIDED HIGHWAY



### LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



### TWO-WAY LEFT TURN LANE



If raised pavement markers are used to supplement REMOVABLE short term markings, the markers shall be applied to the top of the tape at the approximate mid length of the tape. This allows an easier removal of raised markers and tape.

#### PREFABRICATED PAVEMENT MARKINGS

- Temporary Removable Prefabricated Pavement Markings shall meet the requirements of DMS-8241.
- Non-removable Prefabricated Pavement Markings shall meet the requirements of either DMS-8240 "Permanent Prefabricated Pavement Markings" or DMS-8243 "Temporary Construction-Grade Prefabricated Pavement Markings."

#### RAISED PAVEMENT MARKERS

- All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and DMS-4200.

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

- DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:  
[http://www.txdot.gov/business/contractors\\_consultants/material\\_specifications/default.htm](http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm)



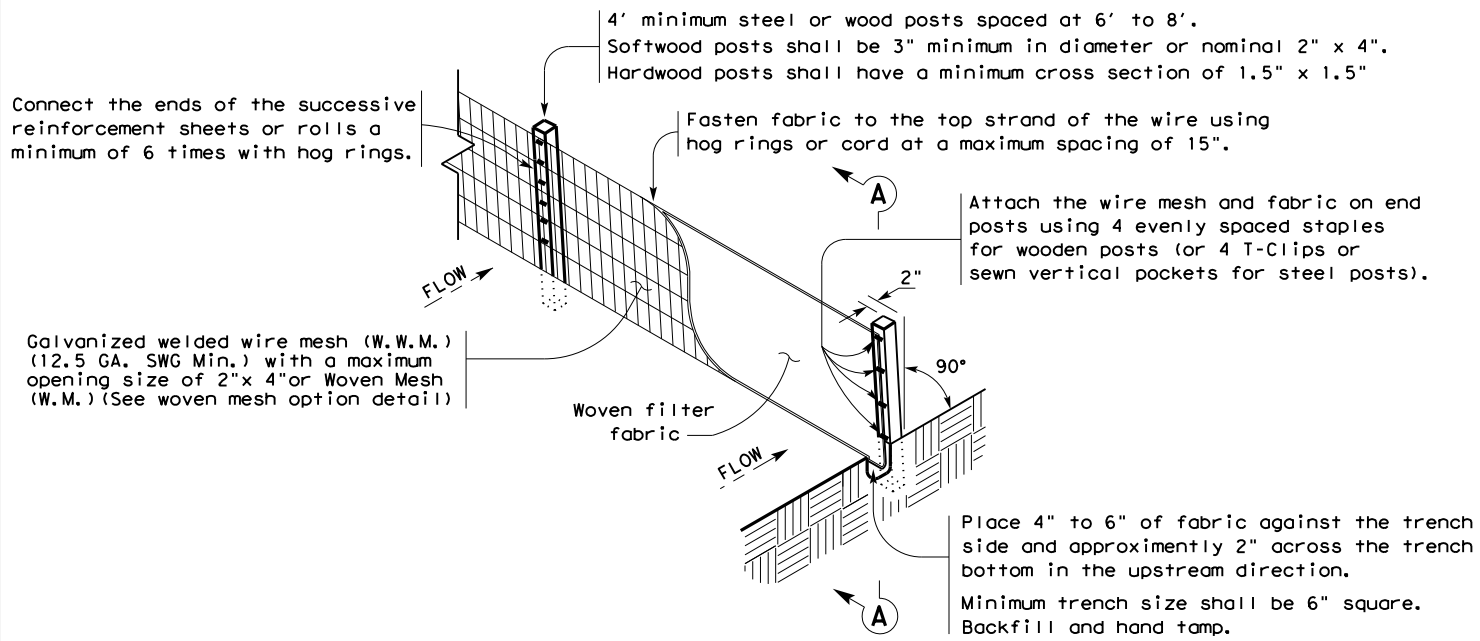
## WORK ZONE SHORT TERM PAVEMENT MARKINGS

### WZ (STPM) - 13

FILE:	wzstpm-13.dgn	DN:	TxDOT	CK:	TxDOT	OW:	TxDOT	CK:	TxDOT
© TxDOT	April 1992	CONT:	1054	SECT:	01	JOB:	009, etc.	FM 219, etc.	HIGHWAY:
REVISIONS:		DIST:		COUNTY:		SHEET NO.:			
1-97		WAC:		BOSQUE, etc.					67
3-03									
7-13									

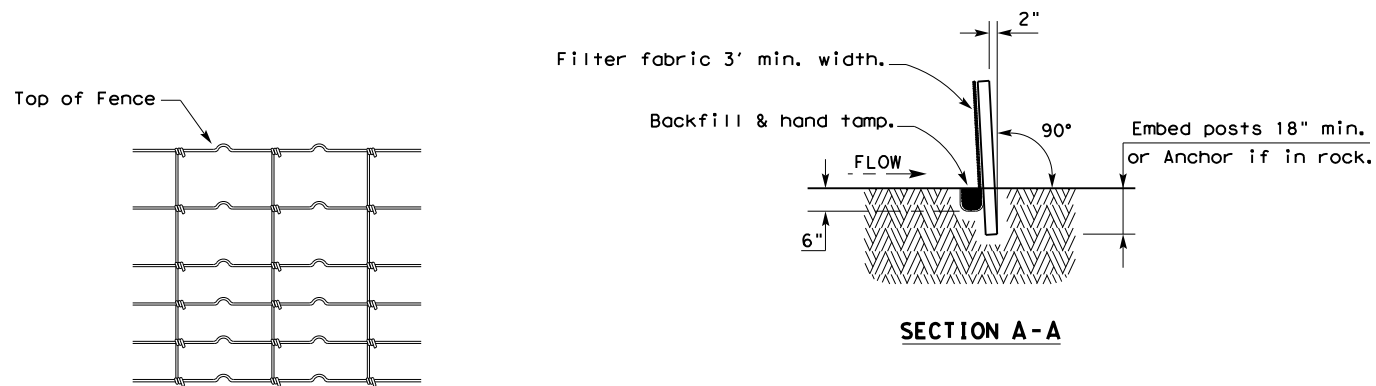
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DATE  
FILE



**TEMPORARY SEDIMENT CONTROL FENCE**

SCF



**HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL**

Galvanized hinge joint knot woven mesh (12.5 GA. SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

**SEDIMENT CONTROL FENCE USAGE GUIDELINES**

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT<sup>2</sup>. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

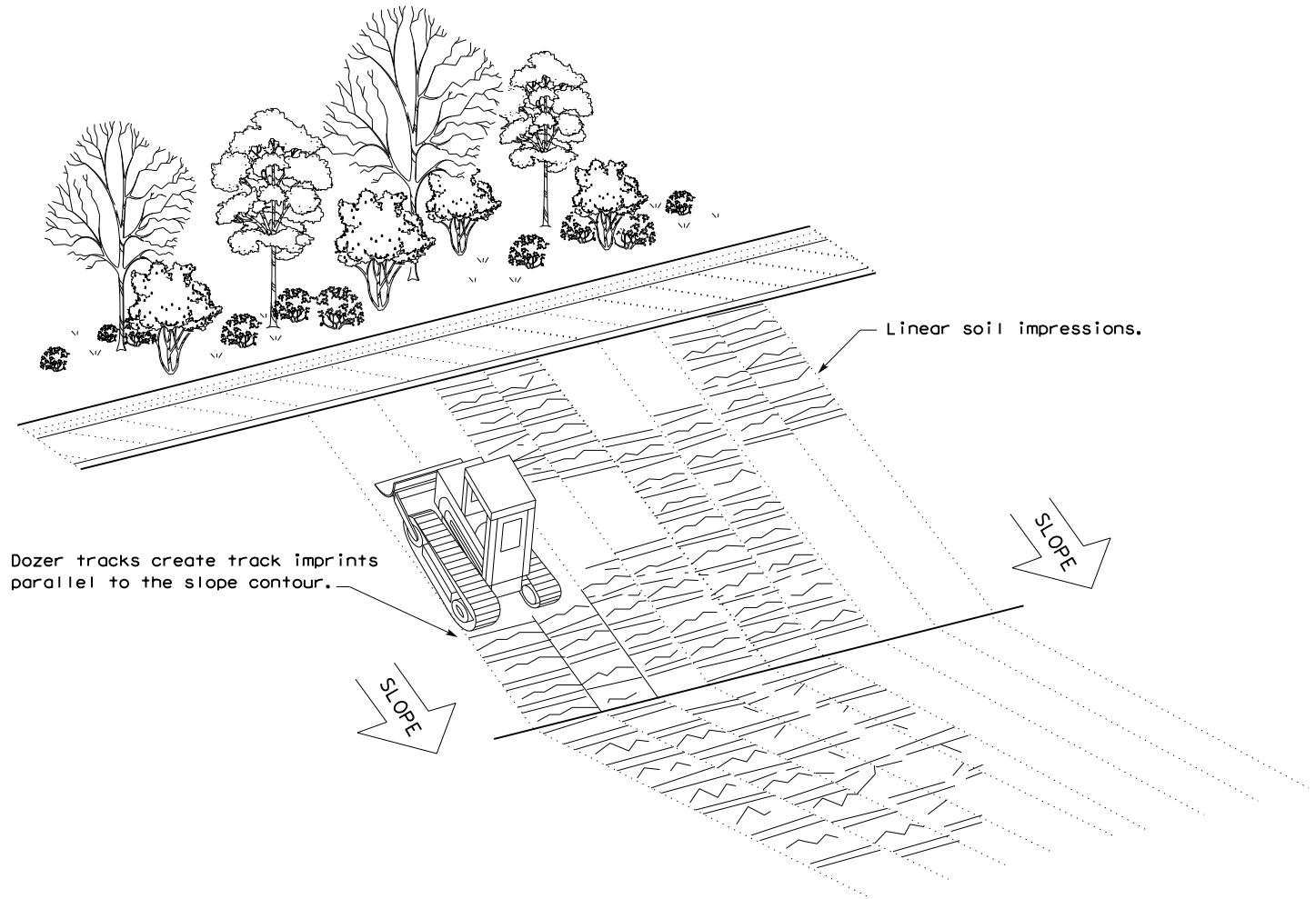
**LEGEND**

Sediment Control Fence

SCF

**GENERAL NOTES**

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continuous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



**VERTICAL TRACKING**

				Design Division Standard	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE &amp; VERTICAL TRACKING EC(1)-16</b>					
FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS		1054	01	009, etc.	FM 219, etc.
	DIST	COUNTY		SHEET NO.	
	WAC	BOSQUE, etc.		68	

DATE: 7/8/2021  
 FILE: c:\txdot\pw\_online\txdot3\isaac.sti\well\d0378124\epic.dgn  
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**I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402**

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

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

1.  
2.
- No Action Required     Required Action

Action No.

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

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

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

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

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

1.  
2.  
3.  
4.

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

**Best Management Practices:**

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

**III. CULTURAL RESOURCES**

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

- No Action Required     Required Action

Action No.

1. See Statement Above

**IV. VEGETATION RESOURCES**

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

- No Action Required     Required Action

Action No.

1. See Statement Above

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

- No Action Required     Required Action

Action No.

1. See Statement Below

If any wildlife species are threatend by construction activities, 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 immediate area, and contact the Engineer immediately.

**LIST OF ABBREVIATIONS**

BMP: Best Management Practice	SPCC: Spill Prevention Control and Countermeasure
CGP: Construction General Permit	SWSP: 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 Corps of Engineers
NOI: Notice of Intent	USFWS: U.S. Fish and Wildlife Service

**VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES**

General (applies to all projects):

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

Contact the Engineer if any of the following are detected:

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

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

- Yes     No

If "No", then no further action is required.

If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

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

- Yes     No

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

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

In either case, the Contractor is responsible for providing the 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 No.

1.  
2.  
3.


**VII. OTHER ENVIRONMENTAL ISSUES**

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

- No Action Required     Required Action

Action No.

- 1.

 <b>Texas Department of Transportation</b>		<b>Design Division Standard</b>		
<h2 style="margin: 0;">ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS</h2> <h1 style="margin: 0;">EPIC</h1>				
FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
12-12-2011 (DS) REVISIONS	1054	01	009, etc.	FM 219, etc.
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY	SHEET NO.	
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	WAC	BOSQUE, etc.	<b>69</b>	