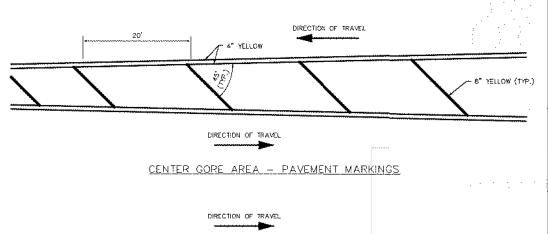
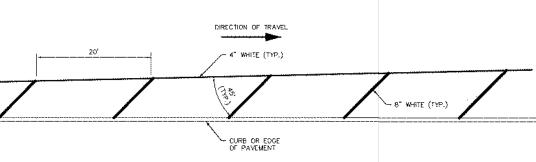


TWO-WAY LEFT TURN LANE - PAVEMENT MARKINGS





CROSS HATCHING FOR MERGING/SHIFTING - PAVEMENT MARKINGS

FORT WORTH

TYPE 1-C 4" (UNLIMIDED) RAISED PAVEMENT MARKER

TYPE 150 4" RAISED PAVEMENT MARKER

CITY OF FORT WORTH, TEXAS

TYPICAL PAVEMENT MARKINGS

REVISED: 6-15-2015

32 17 23-D642

NOTE:

SEE SHEET CO.03E FOR PROJECT SPECIFIC NOTES.
 UNDERGROUND STREET LIGHT WRING IS PRESENT THROUGHOUT DAGGETT ELEMENTARY PROJECT AREA. IF CONDUIT IS HIT, CONTACT TPW STREET LIGHTS DEPARTMENT AT 817–392–7738.

THE CONTRACTOR SHALL CONTACT THE FOLLOWING AT LEAST 48 HOURS PRIOR TO CONSTRUCTION:

AT&T 1-800-331-0500 FORT WORTH T&PW (817)-392-8100 ATMOS ENERGY (817)-207-2821 ONCOR ELECTRIC (888)-313-6862 TXU ENERGY (972)-791-2888 SPECTRUM (866)-874-2389 ALL OTHER FACILITIES 1-800-DIG-TESS

MAPSCO NO. 78-P, 78-Q, 78-T, 78-U, 76-R, 76-V, 77-N, 77-S



Kimley»Horn

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TEXAS DEPARTMENT OF TRANSPORTATION

FY 2018 SAFE ROUTE TO SCHOOL (SRTS) **IMPROVEMENTS**

CFW STANDARDS - D642

FED.RD.	PROJECT NO.			HIGHWA	Y NO.
06		STP 2021(953)TF)	V.	Α
STATE		DISTRICT	COUNTY		SHEET NO.
TEXA	TEXAS FTW TARRANT		RANT		
CONTROL		SECTION	JOB		C7.01
0902	2	90	083		

SHAH, ZAHRA 8/9/2027 TIS3 AM K:/FTW,TPTD\061018211—CFW—2018—SRTS\CADD\SHEETS\PLAN SET 2\CFW STANDARDS.DWC 8/9/2021 11:27 AM

NOTE:

SEE SHEET CO.03E FOR PROJECT SPECIFIC NOTES.
 UNDERGROUND STREET LIGHT WRING IS PRESENT THROUGHOUT DAGGETT ELEMENTARY PROJECT AREA. IF CONDUIT IS HIT, CONTACT TPW STREET LIGHTS DEPARTMENT AT 817–392–7738.

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MAPSCO NO. 78-P, 78-Q, 78-T, 78-U, 76-R, 76-V, 77-N, 77-S





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TEXAS DEPARTMENT OF TRANSPORTATION

FY 2018 SAFE ROUTE TO SCHOOL (SRTS) **IMPROVEMENTS**

CFW STANDARDS - D643

FED.RD. PROJECT NO. HIGHWAY NO. 06 STP 2021(953)TP STATE DISTRICT COUNTY TEXAS FTW TARRANT CONTROL SECTION C7.02 0902 90 083

SHAH, ZAHRA 8/9/2021 11:51 AM K:\FTW_TPTO\061018211-CFW-2018-SRTS\CADD\SHEETS\PLAN 8/9/2021 11:27 AM

PLOTTED BY: PLOT DATE: LOCATION: LAST SAVED:

CURB RAMPS

- 1. Install a curb ramp or blended transition at each pedestrian street crossing.
- 2. All slapes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.

GENERAL NOTES

- 3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
- 4. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5'x 5' passing areas at intervals not to exceed 200' are required.
- 5. Turning Spaces shall be 5'x 5' minimum. Cross slope shall be maximum 2%.
- 6. Clear space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
- 7. Provide flored sides where the pedestrian circulation path crosses the curb ramp. Flored sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substanticly obstructed, or otherwise protected.
- 8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Borriers Compliance Board (Access Board).
- To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
- 10. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
- 11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall olign with theoretical crosswalks unless atherwise directed.
- Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
- 13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
- Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
- 15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
- 16. Provide a smooth transition where the curb ramps connect to the street.
- 17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
- Existing features that comply with applicable standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

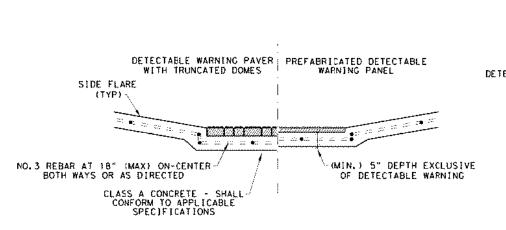
- 19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROMAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
- 20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
- 21. Detectable warning surfaces must be firm, stable and slip resistant.
- 22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
- 23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.
- 24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

DETECTABLE WARNING PAVERS (IF USED)

- 25. Furnish detectable warning pover units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit bosket weave pattern or as directed.
- 26. Lay full-size units first followed by closure units consisting of at least 25 percent (25%) of a full unit. Cut detectable worning paver units using a power saw.

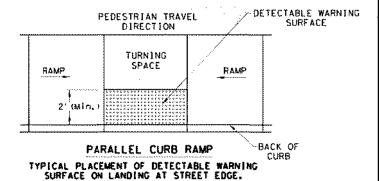
SIDEWALKS

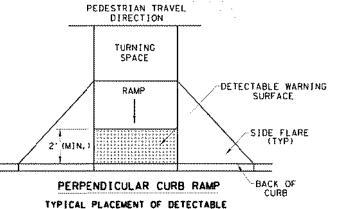
- Provide clear ground space at operable parts, including pedestrian push buttons.
 Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
- 28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or alear ground space.
- 29. Street grades and cross slopes shall be as shown elsewhere in the pions.
- 30. Changes in level greater than 1/4 inch are not permitted.
- 31. The least possible grade should be used to maximize accessibility. The running stope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than five percent (5%) must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with PROWAC R409.
- 32. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
- 33. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
- 34. Sidewalk details are shown elsewhere in the plans.



SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

DETECTABLE WARNING SURFACE DETAILS





PEDESTRIAN TRAVEL
DIRECTION

TURNING
SPACE

*NOTE:
BOTH ENDS OF THE
ITABLE WARNING SURFACE

TURNING
SPACE

**NOTE:
BOTH ENDS OF THE
ITABLE WARNING SURFACE

**NOTE:
BOTH ENDS OF THE
DETECTABLE WARNING SURFACE
SHALL BE 5' OR LESS
FROM BACK OF CURB.

**5' MAX.

**5' MAX.

**5' MAX.

**BACK OF CURB

**DIRECTIONAL CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

Texas Department of Transportation

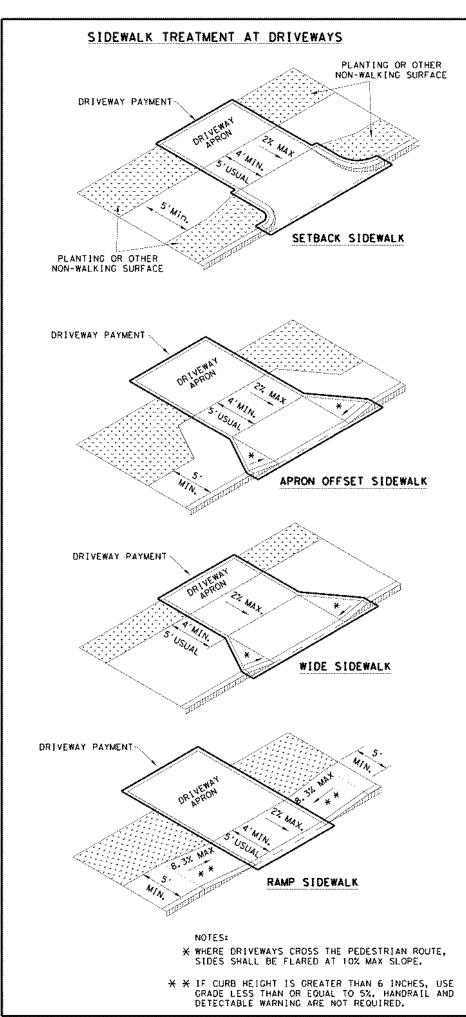
PEDESTRIAN FACILITIES

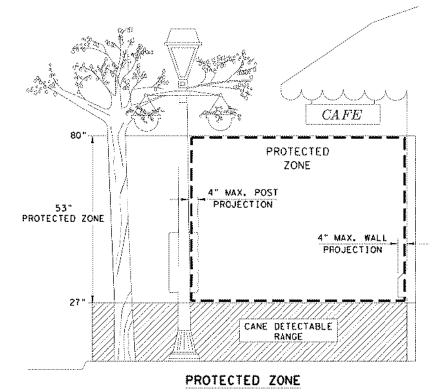
CURB RAMPS

SHEET 2 OF 4

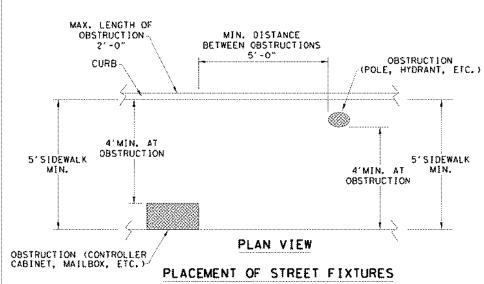
PED-18

JATE:

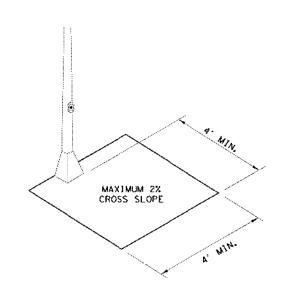




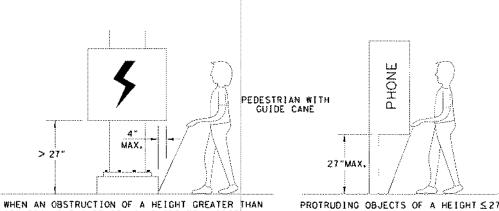
NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



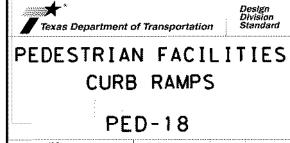
CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



27" FROM THE SURFACE WOULD CREATE A PROTRISION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.

PROTRUDING OBJECTS OF A HEIGHT ≤ 27" ARE DETECTABLE BY CAME AND DO NOT REQUIRE ADDITIONAL TREATMENT.

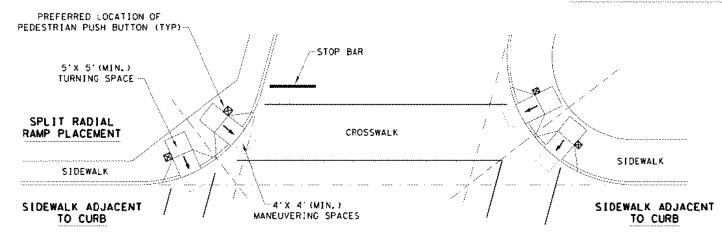
DETECTION BARRIER FOR VERTICAL CLEARANCE < 80°



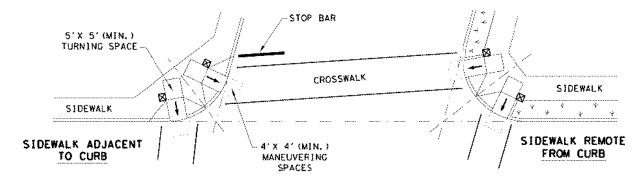
SHEET 3 OF 4

A TE:

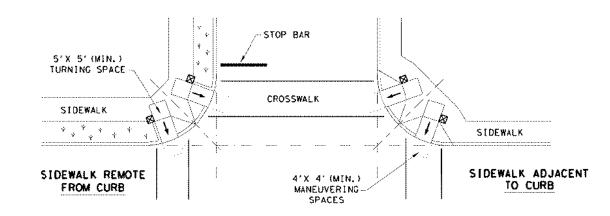
TYPICAL CROSSING LAYOUTS SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



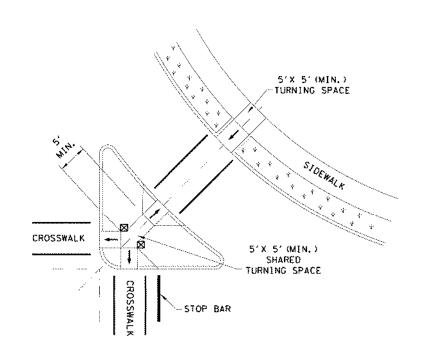
SKEWED INTERSECTION WITH "LARGE" RADIUS



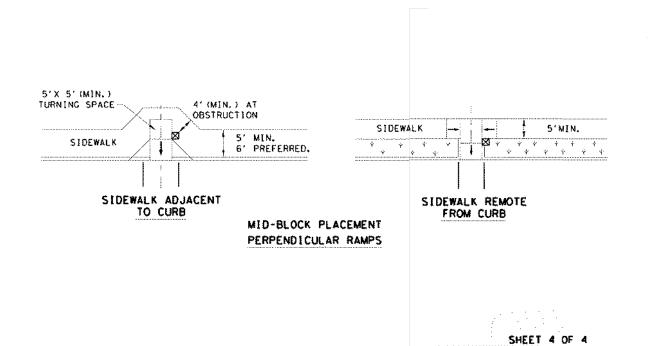
SKEWED INTERSECTION WITH "SMALL" RADIUS



NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION W/FREE RIGHT TURN & ISLAND



LEGEND:

SHOWS DOWNWARD SLOPE.

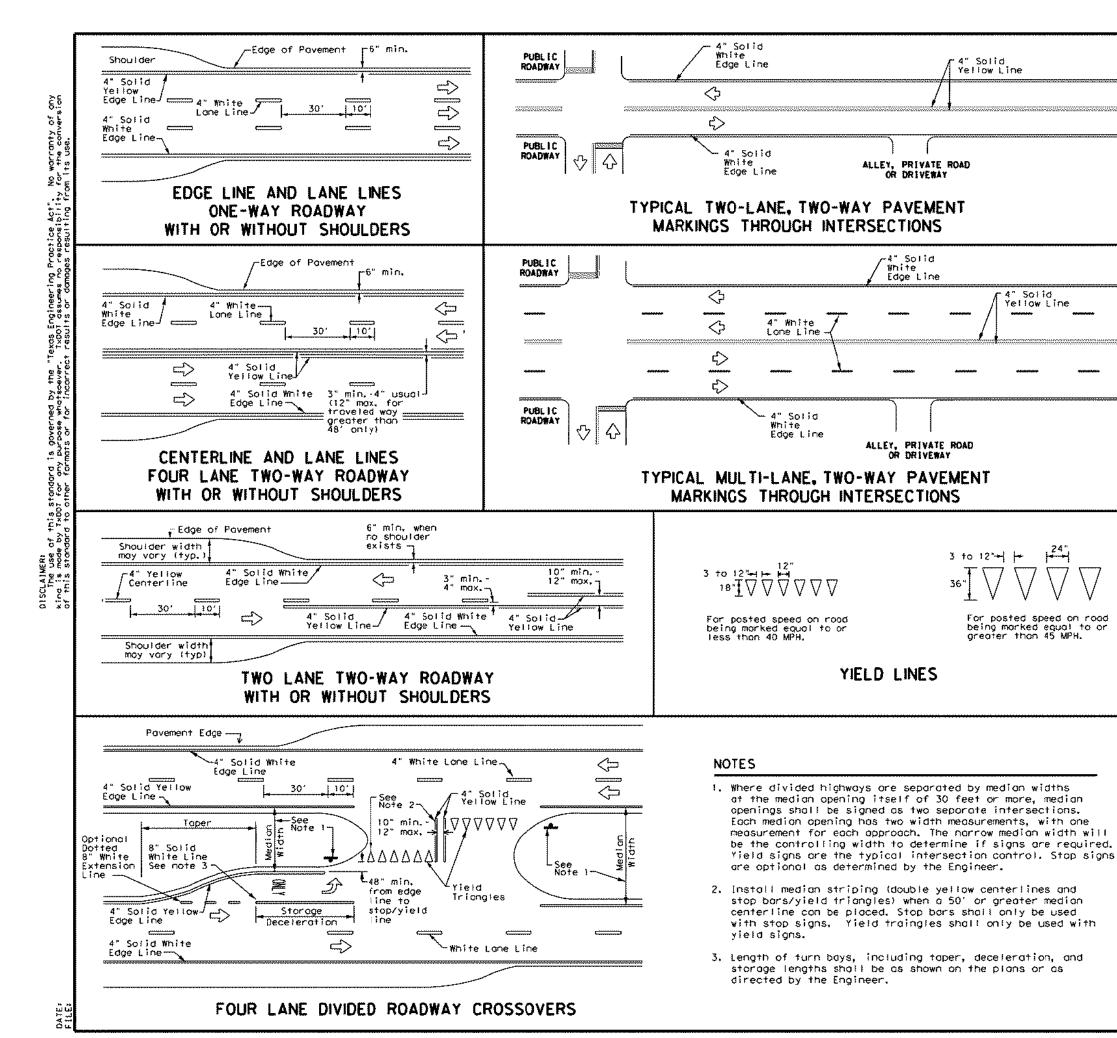
DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE).

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

* * * * * * * *

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

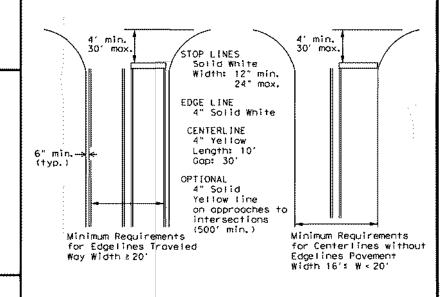


GENERAL NOTES

- Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less 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 autter sections of roadways.
- 2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

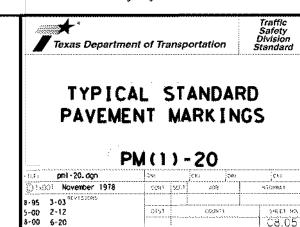
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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



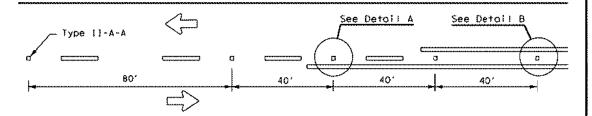
GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Bosed on Troveled Way and Pavement Widths for Undivided Highways

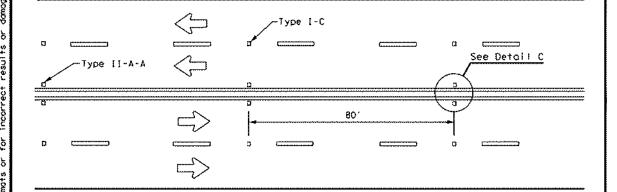


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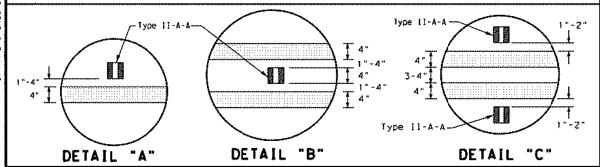
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



CENTERLINE FOR ALL TWO LANE ROADWAYS

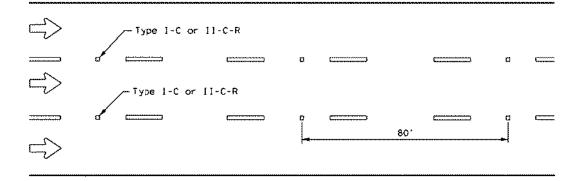


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



Centerline < Symmetrical around centerline Type II-A-A Continuous two-way left turn lane 801 - Type 1-0

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.

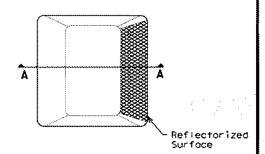
CENTER OR EDGE LINE -12": 1" 301 101 BROKEN LANE LINE REFLECTORIZED PROFILE PATTERN DETAIL USING REFLECTIVE PROFILE PAVEMENT MARKINGS 18": 1" 300 to 500 mil 12": 1" - 51/2" ± 1/2" in height 31/4 "+ 3/4 " A quick field check for the thickness 2 to 3"--of base line and profile morking is 2 to 3"---approximately equal to a stock of 5 quarters to a maximum height of 7 quarters. 4" EDGE LINE, OPTIONAL 6" EDGE LINE, CENTER LINE CENTER LINE NOTE OR LANE LINE OR LANE LINE Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

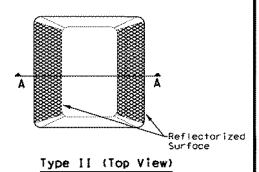
- 1. All raised pavement markers placed in broken lines shall be placed in line with and midway between
- 2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal

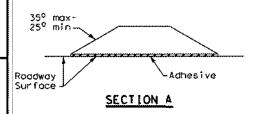
MATERIAL SPECIFICATIONS	·
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIYES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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



Type I (Top View)





RAISED PAVEMENT MARKERS

Traffic Safety Division Standard

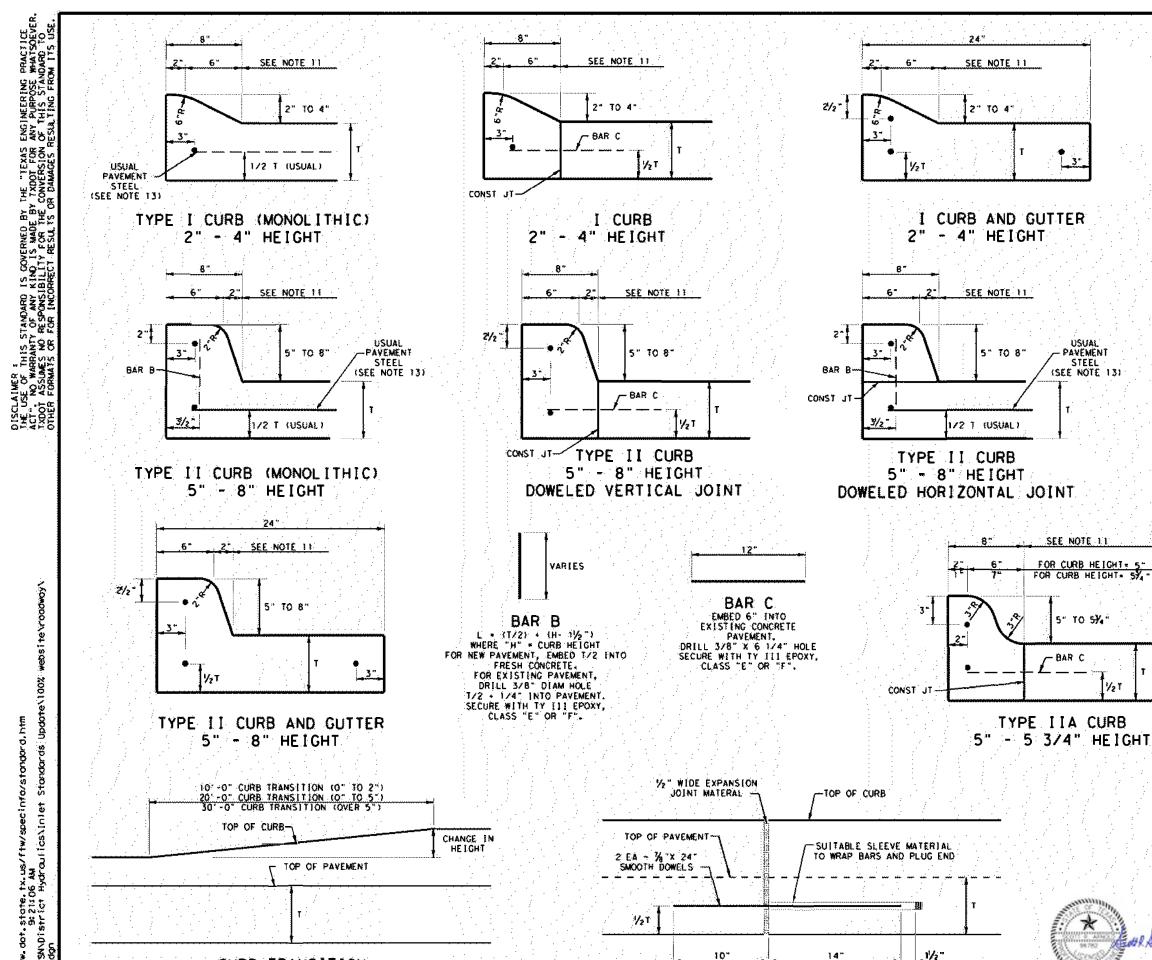


POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE **MARKINGS** PM(2)-20

(151) pri21/20, egn	fire:		CAT	GWs		CK:
DixDor April 1977	CORT	500.1	JO9		11.	1500V6 t
4-92 2-10 REVISIONS						
5-00 2-12	0151	151 COUNTY			SHEET NO.	
8-00 6-20						C8.06

of this standard is governed by the "Texas Engineering Practice Act", by TxDDI for any purpose whatsoever. TxDDI assumes no responsibility add to other formats or for incorrect results or domages resulting from

No warranty of any for the conversion on its use.



CURB TRANSITION

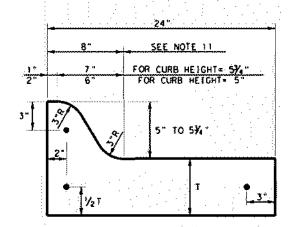
NOTE: TO BE PAID FOR AS HIGHEST CURB

GENERAL NOTES

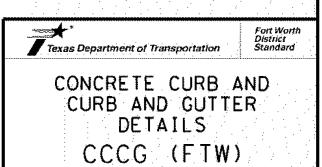
- ALL MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH ITEM 529, "CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER", ALL CONCRETE SHALL BE CLASS "A", ALL REINFORCING BARS SHALL BE #4, UNLESS OTHERWISE
- CURB HEIGHT SHALL BE AS SHOWN ON TYPICAL SECTIONS
- OR PLAN-PROFILE SHEETS.
 ROUND EXPOSED SHARP EDGES WITH A ROUNDING TOOL. TO
- A MINIMUM RADIUS OF W".

 ALL EXISTING CURBS AND DRIVEWAYS TO BE REMOVED SHALL BE SAW CUT FULL DEPTH OR REMOVED AT EXISTING
- JOINTS.
 WHERE CONCRETE CURB IS PLACED ON EXISTING CONCRETE
 PAVEMENT, THE PAVEMENT SHALL BE DRILLED AND THE
 REINFORCING BARS GROUTED OR EPOXIED IN PLACE.
 EXPANSION AND CONTRACTION JOINTS SHALL BE
 CONSTRUCTED TO MATCH PAVEMENT JOINTS IN ALL CURBS OR
 CURB AND GUTTER ADJACENT TO JOINTED CONCRETE
 PAVEMENT, WHERE PLACEMENT OF CURB OR CURB AND GUTTER
 IS NOT ADJACENT TO CONCRETE PAVEMENT, EXPANSION
 JOINTS SHALL BE PROVIDED AT STRUCTURES, CURB RETURNS
 AT STREETS OR DRIVEWERS. AT STREETS OR DRIVEWAYS, AND AT LOCATIONS DIRECTED BY
- AT STREETS OR DRIVEWAYS, AND AT LOCATIONS DIRECTED OF THE ENGINEER, VERTICAL AND HORIZONYAL DOWELS BARS AND TRANSVERSE REINFORCING BARS SHALL BE PLACED AT 4° C-C.
 DIMENSION "T" SHOWN IS THE THICKNESS OF ADJACENT CONCRETE PAVEMENT, OR, WHEN CURB IS INSTALLED ADJACENT TO FLEXIBLE PAVEMENT, "T" IS 6" MINIMUM, 8"
- 11. USUAL PROFILE GRADE LINE. REFER TO TYPICAL SECTIONS AND PLAN-PROFILE SHEETS FOR EXACT LOCATIONS.

 12. A SEALED, 1/2" EXPANSION JOINT SHALL BE PROVIDED WHERE CURB AND GUTTER IS ADJACENT TO SIDEWALK OR RIPRAP.
- LONGITUDINAL AND TRANSVERSE PAVEMENT STEEL SHALL BE PLACED IN ACCORDANCE WITH PAVEMENT DETAILS SHOWN ELSEWHERE IN THE PLANS.



TYPE IIA CURB AND GUTTER 5" - 5 3/4" HEIGHT



0.60 RSPLACES CO-COST 89 COMMEY TEXAS FTW

1/2" 10" EXPANSION JOINT DETAIL

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

WORKER SAFETY NOTES:

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT

http://www.txdot.gov

COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)

DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)

MATERIAL PRODUCER LIST (MPL)

ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"

STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)

TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)

TRAFFIC ENGINEERING STANDARD SHEETS

SHEET 1 OF 12

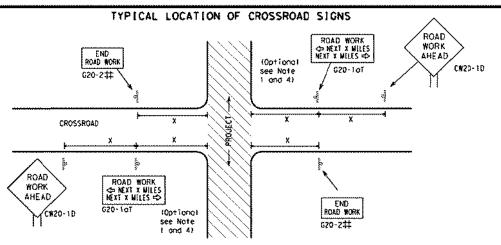
Texas Department of Transportation

Division Standard

BARRICADE AND CONSTRUCTION
GENERAL NOTES
AND REQUIREMENTS

BC(1)-21

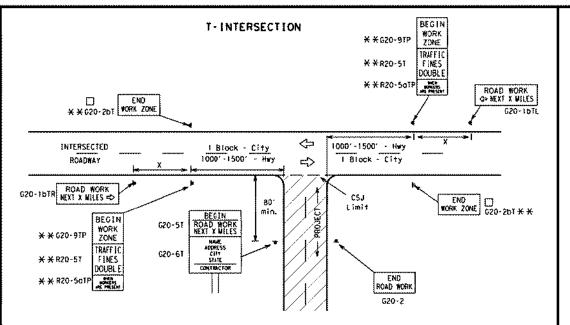
DATE:



- ## May be mounted on back of "ROAD WORK AHEAD" (CW20-10) sign with approval of Engineer. (See note 2 below)
- 1. The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D) sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans
- 2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-10) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK" (G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume as per TWATCO Part 5. This information shall be shown in the plans.
- 3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAYEL, or other oppropriate 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 Stondard Sheets.
- 4. The "ROAD WORK NEXT X MILES" (020-10T) 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.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

- 5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads. 6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in
- the pions or as determined by the Engineer/Inspector, shall be in place.



CSJ LIMITS AT T-INTERSECTION

- 1. The Engineer will determine the types and location of any additional traffic control devices. such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection,
- 2. If construction closes the road at a T-intersection, the Contractor shall place the "CONTRACTOR NAME" (G20-6T) sign behind the Type 3 Barricodes for the road closure (see 8C(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.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING 15.4

C 1 70

SPACING

Sign Number or Series Conventional Expressway/ Freeway CW204 CW21 CW22	51ZE						
CW21 CW22 CW23 CW25 CW1, CW2, CW7, CW8, CW9, CW11, CW14 CW3, CW4, CW5, CW6, CW6, CW8-3,	Number	Conventional Road					
CW7, CW8, CW9, CW11, CW14 CW3, CW4, CW5, CW6, 48" × 48" 48" × 48" 48" × 48" CW8-3,	CW21 CW22 CW23	48" × 48"	48" × 48"				
CW5, CW6, 48" × 48" 48" × 48" CW8-3,	CW7, CW8, CW9, CW11,	36" x 36"	48" x 48"				
	CW5, CW6, CW8-3,	48" × 48"	48" × 48"				

SPACING							
Posted Speed	Sign∆ Spacing "X"						
м₽н	Feet (Apprx.)						
30	120						
35	160						
40	240						
45	320						
50	400						
55	500 ²						
60	600 ²						
65	700 ²						
70	800 ²						
75	900 ²						
80	10002						
*	* 3						

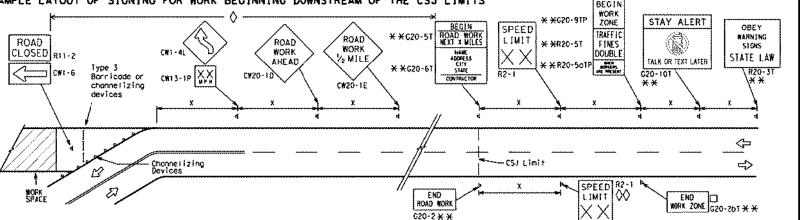
- ¥ For typical sign spacings on divided highways, expressways and freeways, see Port 6 of the "Texas Manual on Uniform Traffic Control Devices" (IMMICD) typical application diagrams or TCP Standard Sheets.
- ⚠ Minimum distance from work area to first Advance Warming sign meanest the work area and/or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

GENERAL NOTES

- 1. Special or larger size signs may be used as necessary.
- 2. Distance between signs should be increased as required to have 1500 feet advance warning.
- 3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 4. 36" x 36" "ROAD WORK AHEAD" (CW20-10) signs may be used on low volume crossroads of the discretion of the Engineer as per TMUTCD Part 5. See Note 2 under "Typical Location of Crossroad Signs".
- 5. Only diamond shaped warning sign sizes are indicated.
- . See sign size listing in "IMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design

* *G20-9T SPEED STAY ALERT ROAD WORK LIMIT OBEY BEGIN ROAD WORK NEXT X WILES * * R20-51 WARNING * * G20-51 R4-1 PASS SIGNS CW20-19 * * R20-5cTP STATE LAW TALK OR TEXT LATER * * 620-6 CW13-18 R2-1 * * ROAD WORK CW1-4R CW20-1D R20-31 * * WORK AHEAD 620-101 X 3 CONTRACTOR AHEAD Type 3 Barricade or WPW CW13-1P CW20-10 channelizing devices <≒ ʹ ⇔ ∜≕ ⇔ \Rightarrow Beginning of --SPEED ➾ WORK SPACE ⇔ END NORK ZONE G20-201 * * R2-1 LIMI tine should $\otimes \times \times$ CSJ Limit coordinate ROAD NOR When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional with sign "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still location

within the project limits. See the applicable TCP sheets for exact location and spacing of signs and SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS



NOTES

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (020-51) 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" (G20-2b) 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 Tying outside the CSJ Limits where traffic fines may doub! if workers are present.
- ** CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.
- Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.
- Contractor will install a regulatory speed limit sign at the end of the work zone.

	LEGEND
 	Type 3 Barricade
000	Channellzing 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

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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(©) Tx00T	November 2002	CON: SECT	708	∹(5996)	
	REVISIONS				
9-07 8-14		0157	COUNTY	50001 NS.	
7-13	5-21			: cn oa	

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.

> > See General Note 4

Signing shown for one direction only. See BC(2) for additional advance signing.

WORK

ZONE

SPEED

LIMIT

16 C

R2-1

See Ceneroi

Note 4

620-5oP

(750" - 1500")

WORK ZONE

SPEE

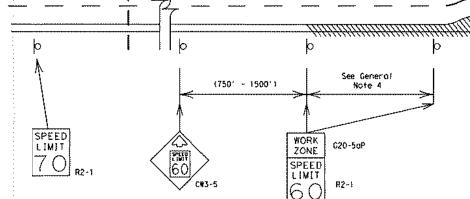
60

CSJ LIMITS

SPEED

LIMIT

R2-1



LIMITS

GUIDANCE FOR USE:

Signing shown for

one direction only.

See BC(2) for

additional advance

signing.

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 to higher design speed is not feasible.

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

WORK

ZONE

SPEED

LIMIT

G20-5oP

R2-1

- 1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- 2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.

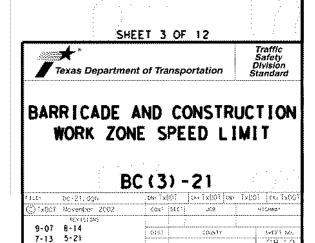
SPEED

- 3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- 4. Frequency of work zone speed limit signs should be:

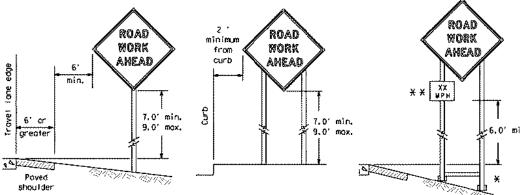
40 mph and areater 35 mph and less

0.2 to 2 miles 0.2 to 1 mile

- 5. Regulatory speed limit signs shall have black legend and border on a white reflective bockground (See "Reflective Sheeting" on BC(4)).
- 6. Fabrication, erection and maintenance of the "ADVANCE SPEED LIMIT" (CW3-5) sign, "WORK ZONE" (G20-50P) plague and the "SPEED LIMIT" (R2-1) signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
- 7. Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
- 8. Techniques that may help reduce traffic speeds include but are not limited to: A. Law enforcement.
- B. Flogger stationed next to sign.
- C. Portable changeable message sign (PCMS).
- D. Low-power (drone) rador transmitter.
- E. Speed monitor trailers or signs.
- 9. Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
- 10. For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

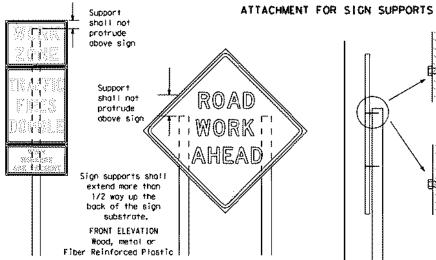


TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* 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.



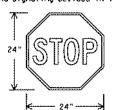
Splicing embedded perforated square metal tubing in order to extend post neight will only be allowed when the splice is made using four bolts, two above and two below the spice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should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

Attochment 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 sion supports

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

STOP/SLOW PADDLES

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



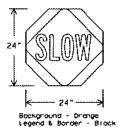
Background - Red Legend & Border - White

WHITE

BLACK

LEGEND & BORDER

LEGEND & BORDER



TYPE B OR C SHEETING

ACRYLIC NON-REFLECTIVE FILM

SHEETING REQUIREMENTS (WHEN USED AT NIGHT) COLOR SIGN FACE MATERIAL USAGE BACKGROUND RED TYPE B OR C SHEETING BACKGROUND TYPE BEL OR CEL SHEETING ORANGE

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, specific service (LOCO), or cultural information. Drivers proceeding through a work zone need the same. if not better route guidance as normally installed on a roadway without construction.

SIDE ELEVATION

- When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition. For details for covering large guide signs see the
- 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 poid for under the appropriate pay item for relocating existing signs.
- If permanent signs are to be removed and relocated using temporary supports. the Contractor shall use crashworthy supports as shown on the BC standard sheets. TERS standard sheets or the CWZTCD list. The signs shall meet the required mounting heights shown on the BC, or the SMD standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soan as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary

FOR WORK ZONE SIGNS

GENER

5.

В.

2.

3. 4.

SIZE

SIGN

3.

2. 3.

SIGN

REMOV

3.

4.

SIGN

2.

3.

DURAT

oll install and maintain signs in a straight and plumb condition and/or as directed by the Engineer. ests shall be painted white.

all NOT be used as sian supports.

be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to requiate, worn, and eling public safely through the work zone. may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The

ector may require the Contractor to furnish other work zone signs that are shown in the IMUTCD but may have been omitted Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's son. All changes must be documented in writing before being implemented. This can include documenting the changes in s TxDOT diory and having both the inspector and Contractor initial and date the agreed upon changes.

shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD) for small roadside

for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question allation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so can verify the correct procedures are being followed.

is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or red reflective sheeting as directed by the Engineer/Inspector,

markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used otion shall be 1 inch.

shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

RK (as defined by the "Texas Manua) on Uniform Traffic Control Devices" Part 6)

ign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of ormed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in shworthiness and duration of work requirements.

stationary - work that occupies a location more than 3 days.

ate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting one hour.

a stationary - daytime work that occupies a location for more than I hour in a single daylight period.

ration - work that accupies a location up to I hour. work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN Long-term/Intermediate term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except supplemental places mounted below other signs.

Short-term/Short Duration signs shall be a minimum of 1 foot above the payement surface but no more than 2 feet above ermediate-term Signs may be used in lieu of Short-term/Short Duration signing

ort Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to

ong-term/Intermediate sign height. gns shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

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

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

terials are NOT an approved sign substrate, regardless of the tightness of the weave. dividual sign pagets fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide. e back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6"

ETING

I be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 is or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).

g, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.

ing, meeting the requirements of DMS-8300 Type $B_{
m FL}$ or Type $C_{
m FL}$, shall be used for rigid signs with orange backgrounds.

ers and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway n (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of rkmanship in accordance with Department Standards and Specifications.

sages may be confusing or do not apply, the signs shall be removed or completely covered.

ionary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when age is not applicable. This technique may not be used for signs installed in the median of divided highways or near any where the sign may be seen from approaching traffic.

ed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely

covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the ace and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting, NOT be used to cover signs.

other adhesive material shall NOT be offixed to a sign face. for stubs shall be removed and holes backfilled upon completion of work.

ingineer may approve other methods of splicing the sign face.

ports require the use of weights to keep from turning over, the use th dry, cohesionless sand should be used. ill be tied shut to keep the sand from spilling and to maintain a

iron, steel or other solid objects shall not be permitted

n support weights. d weigh a minimum of 35 lbs and a maximum of 50 lbs be made of a durable material that tears upon vehicular

(such as fire inner tubes) shall NOT be used. designed for channelizing devices should not be used for table sign supports. Sign supports designed and manufactured

> only be placed along or laid over the base supports of the I device and shall not be suspended above ground level or wire, chains or other fasteners. Sandbags shall be placed the skids to weigh down the sign support

NOT be placed under the skid and shall not be used to level

used to draw attention to warning signs. When used, the flag shall square or larger and shall be arange or fluorescent red-orange in shall not be allowed to cover any portion of the sign face. SHEET 4 OF 12

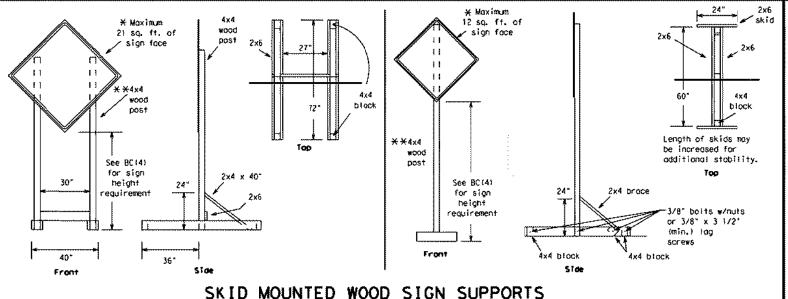
■ Texas Department of Transportation

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

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(() 1×001	November 2002	CONT	SEUT	309	401	SHWA.
	REVISIONS					
9-07		0151	:	0.000013.5		9888! HS
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1. F



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

upr ight

SINGLE LEG BASE

34" min. in Ontional strong soils, reinforcing 48" minimum sieeve -34" min. week soils. (1/2" lorger strong soils than sign 55" min. in post) x 18" week soils. Anchor Stub Anchor Stub (1/4" larger 11/4" langer then sign than sign post) post) OPTION 1 OPTION 2 OPTION 3 (Anchor Stub) (Direct Embedment) (Anchor Stub and Reinforcing Steeve)) PERFORATED SQUARE METAL TUBING

✓ Post

Sign
Post

Ground survoce

4' max.

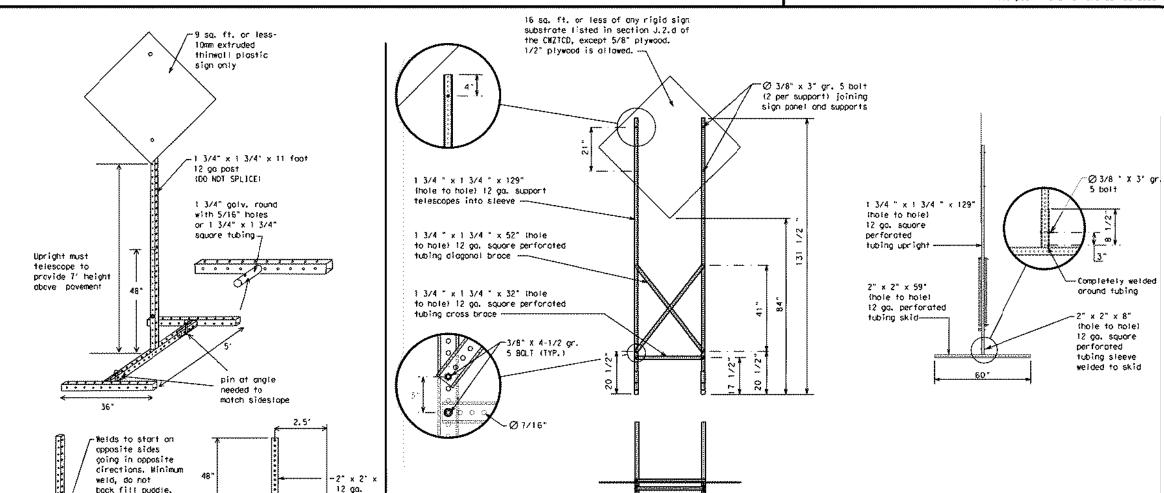
Bose
Post
for embedment.

Lap-splice/base
bolfed anchor

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.



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

- Post

- 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 CMZTCD List.
- When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiory 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

Traffic Safety

Texas Department of Transportation

Transportation

Traffic Safety
Division
Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC (5) -21

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SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

32'

- weld starts here

WHEN NOT BEHIND PORTA

3. Mes

4. Use

Do

13. Do

14. The

16. Ecc

17,]f

MOVE THE POWS FROM THE RIGHT-OF-WAY OR PLACE THE POMS UARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

ABLE MESSAGE SIGNS

1. The spector shall approve all messages used on portable age signs (PCMS). 2. Mes

should contain no more than 8 words (about four to per word), not including simple words such as "TO.

consist of a single phase, or two phases that e-phase messages are not allowed. Each phase of the convey a single thought, and must be understood by

XII" to refer to an exit ramp on a freeway; i.e., Do not use the term "RAMP."

route or interstate designation (IH, US, SH, FW) number when referring to a roadway.

Whe bottom of a stationary PCMS message panel should be above the roodway, where possible. 7. * "WEEKEND" should be used only if the work is to

lay morning and end by Sunday evening at midnight. hours of work should be displayed on the PCMS if work riday evening and/or continue into Monday morning. spector may select one of two options which are availing a two-phase message on a PCMS. Each phase may be ther four seconds each or for three seconds each. messages or words included in a message. The message

burn or continuous while displayed. 10. Do redundant information on a two-phase message: i.e.. es of the message the same and changing the third line. 11. Do

ward "Danger" in message. the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" vers do not understand the message.

messages that scroll horizontally or vertically across

able lists abbreviated words and two-word phrases that for use on a PCMS. Both words in a phrase must be her. Words or phroses not on this list should not be less shown in the TMUTCD.

height should be at least 18 inches for trailer mounted uld be visible from at least 1/2 (.5) mile and the text e from at least 600 feet at night and 800 feet in mounted units must have a character height of 10 inches ible from at least 400 feet.

xt should be centered on the message board rather than

e PCMS should default to an illegible display that will ists and will only be used to alert workers that the ctioned. A pattern such as a series of horizontal solid

£	ABBREVIATION	WORD OR PHRASE	ABBREVIATION
*****	ACCS RD	Major	MAJ
***************************************	ALT	Miles	MI
	AVE	Miles Per Hour	MPH
	BEST RTE	Minor	MNR
************	BLVD	Monday	MON
******	BRDG	Normal	NORM
	CANT	North	N
	CTR	Northbound	(route) N
	CONST AHD	Porking	PKING
		Road	RD
	XING	Right Lane	RTEN
	DETOUR RIE	Saturday	SAT
	DONT	Service Road	SERV RD
	E	Shoulder	SHLDR
	(route) E	Slippery	SLIP
	EMER	South	S
*****	EMER VEH	Southbound	(route) S
er.	ENT	Speed	SPD
	EXP LN	Street	\$1
	EXPWY	Sunday	SUN
	XXXX FT	Telephone	PHONE
	FOG AHD	Temporary	TEMP
	FRWY, FWY	Thur sday	THURS
<u>2</u> 0	FWY BLKD	To Downtown	TO DWINTH
	FRI	Troffic	TRAF
	HAZ DRIVING	Travelers	TRYLRS
eria	HAZMAT	Tuesday	TUES
<i></i>	HOY	Time Minutes	TIME WIN
	HWY	Upper Level	UPR LEVEL
	110 100	Vehicles (s)	VEH, VEHS
	HR, HRS INFO	Warning	WARN
	ITS	Wednesday	WED
	JCT	Weight Limit	WT LINIT
	LFT	West	W
	LFT LN	Westbound	(route) #
	LN CLOSED	Wet Pavement	WET PYMT
	LWR LEVEL	Will Not	WONT
	MAINI		
_	I IRM \$43 F	Ī	

l-number, US-number, SH-number, FM-number

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

MERGE

RIGHT

DE TOUR

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

FRONTAGE ROADWORK

FREEWAY CLOSED ROAD XXX FT CLOSED X MILE ROAD SHOULDER FLAGGER CLOSED CLOSED XXXX FT AT SH XXX XXX FT ROAD RIGHT LN RIGHT LN NARROWS CLSD AT CLOSED

FM XXXX XXX FT RIGHT X RIGHT X MERGING CONST LANES LANES TRAFFIC CLOSED OPEN XXXX FT CENTER DAYTIME

LANE CLOSURES CLOSED NIGHT I-XX SOUTH DETOUR LANF EXIT X MILE CLOSURES CLOSED

EXIT XXX

LANES CLOSED CLOSED 3 MILE EXIT RIGHT LN CLOSED TO BE

VARIOUS

MALL

DRIVEWAY

CLOSED

XXXXXXXX

BLVD

CLOSED

CLOSED X LANES CLOSED TUE - FRI

APPLICATION GUIDELINES

Phose Lists".

1. Only 1 or 2 phases are to be used on a PCMS. 2. The 1st phase (or both) should be selected from the

is not included in the first phose selected.

and should be understandable by themselves.

no more than one week prior to the work.

"Road/Lane/Ramp Clasure List" and the "Other Condition List".

a minimum of 1000 ft. Each PCMS shall be limited to two phases,

6. For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for

3. A 2nd phose can be selected from the "Action to Take/Effect

on Travel, Location, General Warning, or Advance Notice

4. A Location Phase is necessary only if a distance or location

5. If two PCMS are used in sequence, they must be separated by

Other Condition List REPAIRS XXXX FT LANE NARROWS XXXX FT TWO-WAY TRAFFIC XXXX FT XX MILE

TRAFFIC XXX FT LOOSE UNEVEN GRAVEL LANES XXXX FT XXXX FT ROUGH

XXXX FT ROADWORK ROADWORK PAST NEXT SH XXXX FRI-SUN BUMP

US XXX XXXX FT EXIT X MILES

BUYD

TRAFFIC LANES SIGNAL SHIFT XXXX FT

* LANES SHIFT in Phose I must be used with STAY IN LANE in Phose 2.

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

> FORM X LINES RIGHT USE XXXXX

> > USE

I-XX E

TO I-XX N

WATCH

TRUCKS

TO

STOP

END

USE

WATCH

WORKERS

NEXT X EXITS RD EXIT USE USE EXIT FXIT XXX I-XX NORTH

STAY ON US XXX SOUTH

TRUCKS US XXX N

WATCH EXPECT FOR DELAYS TRUCKS

PREPARE EXPECT DELAYS

REDUCE SPEED SHOULDER XXX FT

USE OTHER ROUTES STAY

LANE

Location List

FM XXXX

REFORE RAILROAD CROSSING NEXT

MILES PAST US XXX

EXIT XXXXXXX XXXXXXX

US XXX FM XXXX

DRIVE WITH CARE

See Application Guidelines Note 6.

Worning

List

SPEED

LIMIT

XX MPH

MAXIMIM

SPEED

XX MPH

MINIMUM

SPEED

XX MPH

ADVISORY

SPEED

XX MPH

RIGHT

LANF

EXIT

USE

CAUTION

DRIVE

SAFELY

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

- 1. When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORYABLE CHANGEABLE MESSAGE SIGNS' obove.
- 2. When symbol signs, such as the "Flagger Symbol" (CW20-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above.
- 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
- 4. A full matrix PCMS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(7), for the some size orrow.

SHEET 6 OF 12

* * Advance

Notice List

TUE-FRI

XX AM-

X PM

APR XX-

ХX

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

Traffic Safety

Texas Department of Transportation

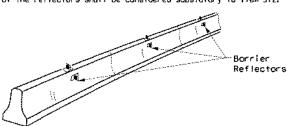
BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) -21

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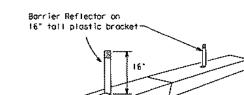
Roo des

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



CONCRETE TRAFFIC BARRIER (CTB)

- 3. Where troffic 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 damoging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
- 4. Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional) while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
- 5. When CTB separates traffic travelling in the same direction, no barrier reflectors will be required on top of the CTB.
- 6. Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
- 7. Moximum spacing of Borrier Reflectors is forty (40) feet.
- 8. Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
- 9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
- 10. Missing or damaged Barrier Reflectors shall be replaced as directed
- 11. Single slope barriers shall be delineated as shown on the above detail.

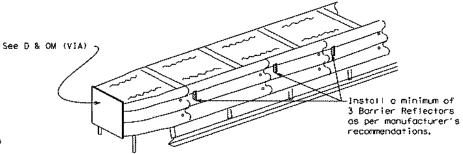


LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

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

LOW PROFILE CONCRETE BARRIER (LPCB)

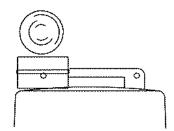


DELINEATION OF END TREATMENTS

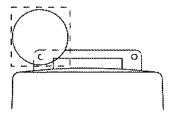
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

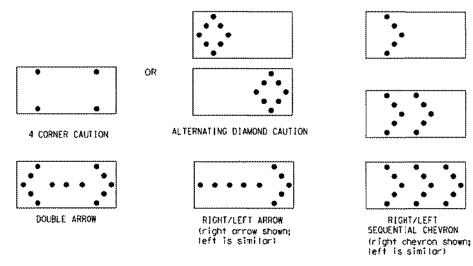
- 1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area,
- 2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- 3. A series of sequential floshing warning lights placed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

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

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

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

- 1. The Floshing Arrow Board should be used for all lane closures on multi-lane roodways, or slow moving maintenance or construction activities on the travel lanes.
- Flashing Arrow Boards should not be used on two-lane, two-way roodways, 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 Boord.
- 4. The Floshing Arrow Board should be able to display the following symbols:



- 5. 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. Winimum 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.
- 11. The Floshing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.

 12. A Floshing Arrow Board SHALL NOT BE USED to laterally shift traffic.
- 13. A full matrix PCMS may be used to simulate a Flashing Arrow Board provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
- 14. Minimum mounting height of traiter mounted Arrow Boards should be 7 feet from roodway to bottom of panel.

REQUIREMENTS									
TYPE	MINIMEM Size	MINIMUM NUMBER OF PANEL LAMPS	MINIAAM VISIBILITY DISTANCE						
8	30 × 60	13	3/4 mile						
¢	48 x 96	15	l mile						

ATTENTION
Floshing Arrow Boords
shall be equipped with
automatic dirming 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.

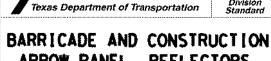
FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

- 1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for
- Assessing Sofety Hordware (MASH).

 2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
- 3. Refer to the CWZTCD for a list of approved TMAs.
- 4. TMAs are required on freeways unless otherwise noted
- A TMA should be used onytime that it can be positioned
 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
- 6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work arew is an extended distance from the TMA



ARROW PANEL. REFLECTORS. WARNING LIGHTS & ATTENUATOR

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GENERAL NOTES

- For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
- 2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42° two-piece cones. In tangent sections, one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
- For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
- 4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMATCD) and the "Compliant Work Zone Traffic Control Devices List" (CMYTCT).
- 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

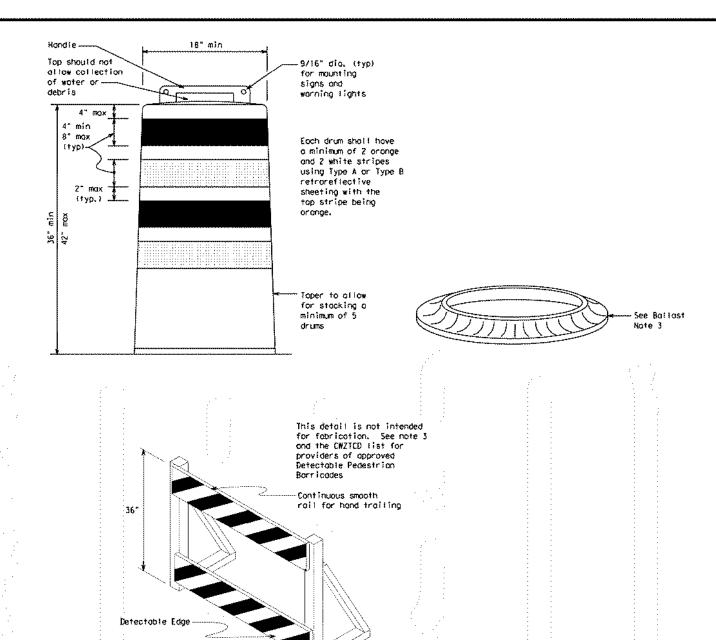
- Pre-qualified plastic drums shall meet the following requirements:
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- 2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents occidental separation due to normal handling and/or air turbulence created by passing vehicles.
- Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
- 4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
- 5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter hales to allow attachment of a warning light, warning reflector unit or approved compliant sign.
- 6. The exterior of the drum body shall have a minimum of four atternating orange and white retrareflective 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, arange, high-density polyethylene (HDPE) or other approved material.
- 9. Drum body shall have a maximum unballasted weight of 11 lbs. 10.Drum and base shall be marked with manufacturer's name and model number.

RETROREFLECTIVE SHEETING

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

BALLAST

- 1. Unbollasted bases shall be large enough to haid 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 powement 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.
- 3. Recycled truck time 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 hozardous to motorists, pedestrions, or workers when the drum is struck by a vehicle.
- When used in regions susceptible to freezing, drums shall have drainage hales in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
- 6. Ballast shall not be placed on top of drums.
- 7. Adhesives may be used to secure base of drums to povement.



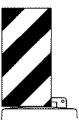
2" Max.

DETECTABLE PEDESTRIAN BARRICADES

- When existing pedestrion focilities 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 pedestrion facility. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
- Where pedestrions with visual disabilities normally use the closed sidewalk, a Detectable Pedestrian Barricade shall be placed across the full width of the closed sidewalk instead of a Type 3 Barricade.
- Detectable pedestrian barricades similar to the one pictured obove, longitudinal channelizing devices, same concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily defineate a pedestrian
- 4. Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines (ADAAG)" and should not be used as a control for pedestrian movements.
- Worning lights shall not be attached to detectable pedestrian barricodes.
- 6. Detectable pedestrian barricodes should use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



18" x 24" Sign (Maximum Sign Dimension) Chevron CM1-8, 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
stoping 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 monufactured using substrates listed on the CMZTCD.
- 2. Chevrons and other work zone signs with an arange background shall be manufactured with Type $B_{\rm FL}$ or Type $C_{\rm FL}$ Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
- Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A or Type B. Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
- 4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, except for the R9 series signs discussed in note 8 below.
- Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one tacking washer for each connection.
- Mounting bolts and nuts shall be fully engaged and adequately torqued, Bolts should not extend more than 1/2 inch beyond nuts.
- 7. Chevrons may be placed on drums on the outside of curves, on merging topers or on shifting topers. 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

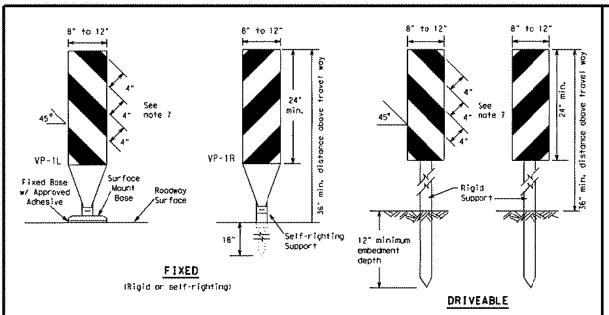
Safety

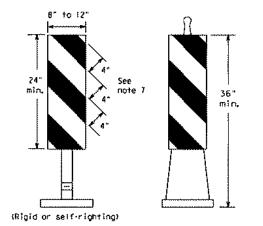
Texas Department of Transportation

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

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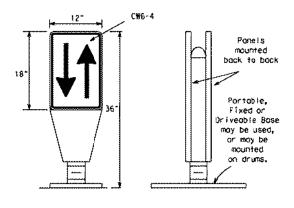


- Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lones of traffic.
- 2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime defineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual for additional requirements on the use 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 partable base.
 See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- 6. Sheeting for the VP's shall be retroreflective Type A or Type B conforming to Departmental Material Specification
- DMS-8300, unless noted otherwise.

 7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.

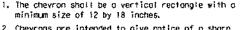
PORTABLE

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

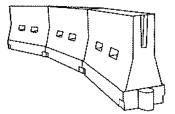


- Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roodway.
- 3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the for side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the materist 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.
- 5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type BrL or Type CrL 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

GENERAL NOTES

- Work Zone channetizing 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.
- 3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZICD).
- 4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, foded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
- Portable bases shall be fobricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
- 6. Povement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the povement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
- 7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

Fixed Bose w/ Approved Adhesive

(Driveoble Base, or Flexible

Support can be used)

- LCDs are croshworthy, lightweight, deformable devices that are highly visible, have good target value and
 can be connected together. They are not designed to contain or redirect a vehicle on impact.
- 2. LCBs may be used instead of a line of cones or drums.

WATER BALLASTED SYSTEMS USED AS BARRIERS

near the top of the LCD along the full length of the device.

- LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CMZICD list.
- 4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
- 5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers
- on 80(7) when placed roughly parallel to the travel lanes.

 6. LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on 80(10). Place reflective sheeting

- Water ballosted systems used as barriers shall not be used solely to channelize road users, but also to protect the
 work space per the appropriate Manual for Assessing Sofety Hardware (MASH) croshworthiness requirements based on
 roadway speed and barrier application.
 Water ballosted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation
- Moter 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 povement 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 flat.

 4. Water ballasted systems used as barriers should not be used for a merging toper except in low speed (less than 45 MPH) urban areas. When used on a toper in a low speed urban area, when used on a toper in a low speed urban area, when used on a toper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
- 5. When water ballasted systems used as barriers have blant 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 ballosted systems must have a continuous detectable bottom for users of long comes and the top of the unit shall not be less than 32 inches in height.

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

Posted: Speed	Formula	Minimum Desirable Toper Lengths **			Suggested Maximum Spacing of Channelizing Devices		
		10' Offset	ll' Offset	12' Offset	On a Taper	On a Tangent	
30	<u>ws²</u>	1501	1651	1801	301	60′	
35	L = WS	2051	225'	2451	35′	701	
40	ò	265'	295'	3201	401	80′	
45		4501	4951	5401	45'	90,	
50		5001	550′	600,	50′	1001	
55	L≠₩S	550′	6051	6601	55′	110'	
60	2 1,73	600′	660,	720'	60,	1201	
65		650′	7151	7801	65′	1301	
70		7001	770′	8401	701	140'	
75		7501	8251	9001	75 '	150'	
80		8001	8801	960'	80,	1601	

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

SUGGESTED MAXIMUM SPACING OF
CHANNELIZING DEVICES AND
MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) -21

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 Borricodes shall be used at each end of construction projects closed to all traffic.
- 3. Barricades extending across a roadway should have stripes that slape downward in the direction toward which traffic must turn in detauring. When both right and left turns are provided, the chevron striping may stage downward in both directions from the center of the barricade. Where no turns are provided at a clased road, striping should slope downword in both directions toward the center of roodway.
- 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 downword to the right.
- 5. Identification markings may be shown only on the back of the barricode rails. The maximum height of letters and/or company logos used for identification shall be 1".
- 6. Borricodes shall not be placed parallel to traffic unless an adequate clear zone is provided.
- . Warning lights shall NOT be installed on barricades.
- B. 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 fied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers ony portion of a barricade rolls reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
- 9. Sheeting for barricodes shall be retroreflective Type A or Type 8 conforming to Deportmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.

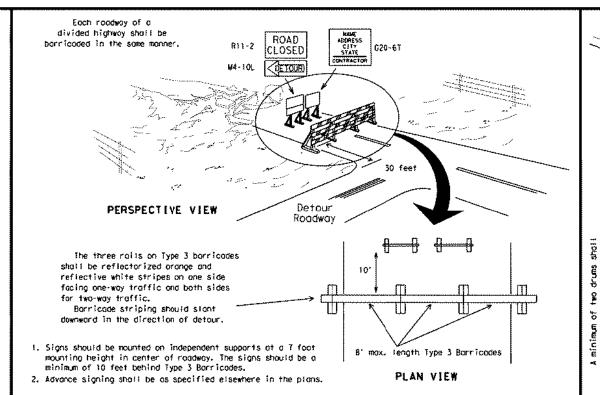


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL

4' min., 8' max. Stiffener 2

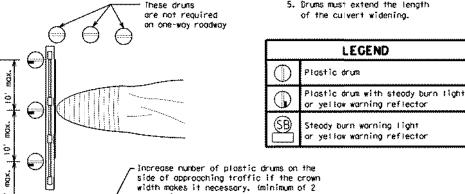
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



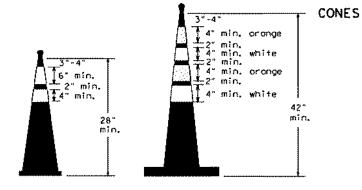
TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION

- 1. Where positive redirectional copobility 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 Typical shoulder width is less than 4 feet. Plastic Drum
 - 4. When the shoulder width is greater than 12 feet, steady-burn lights PERSPECTIVE VIEW may be omitted if drums are used.
 - 5. Brums must extend the length of the culvert widening.

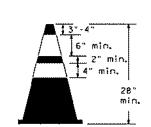


and maximum of 4 drums)

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

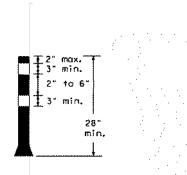


Two-Piece cones

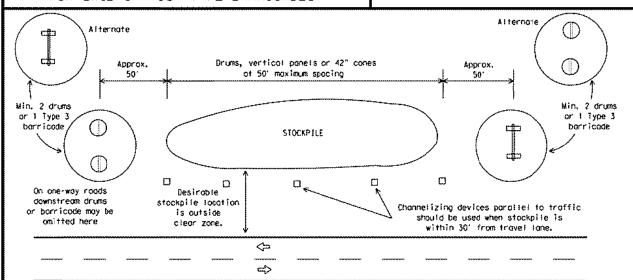


PLAN VIEW

One-Piece cones



Tubular Marker



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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 arange, and meet the height and weight requirements shown above.
- 2. One-piece comes have the body and base of the come moided in one consolidated unit. Two-piece comes have a come shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
- 3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
- 4. Cones or tubular markers shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A or Type B.
- 5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is an-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. Comes or tubular markers used on each project should be of the same size and shape.



Safety Division Texas Department of Transportation

BARRICADE AND CONSTRUCTION CHANNEL IZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

- Roised 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 DWS-4200 or DWS-4300.

PREFABRICATED PAVEMENT MARKINGS

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

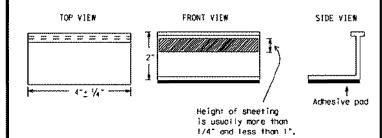
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
- Work zone pavement morkings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
- 3. The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
- 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 (tem 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 fleu of markings to autiline 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 (fem 677 for "Eliminating Existing Pavement Markings and Markers".
- The removal of payement markings may require resurfacing or seal coating partians of the readway as described in Item 677.
- Subject to the approval of the Engineer, any method that proves to be successful on a particular type povement may be used.
- Blast cleaning may be used but will not be required unless specifically shown in the plans.
- 7. Over-pointing of the morkings SHALL NOT BE permitted.
- Removal of raised povement markers shall be as directed by the Engineer.
- Removal of existing povement markings and markers will be poid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
- 10.8lack-out morking 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 PAYEMENT 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 condens.
 - A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Povement Section to determine specification compliance.
 - B. Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. Na more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
- 3. Small design variances may be noted between tob manufacturers.
- See Standard Sheet WZ(STPM) for tab placement on new povements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

- Raised payement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
- All temporary construction raised povement 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,

Cuidemorks shall be designated as:

YELLOW - (two omber reflective surfaces with yellow body).
#HITE - (one silver reflective surface with white body).

DEPARTMENTAL MATERIAL SPECIFICAT	IONS
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

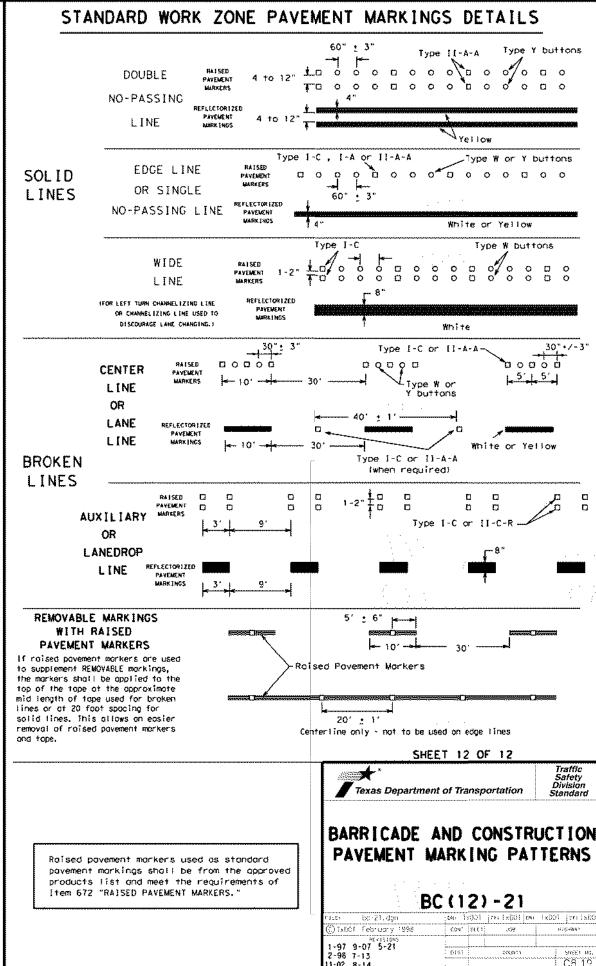
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Texas Department of Transportation
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BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

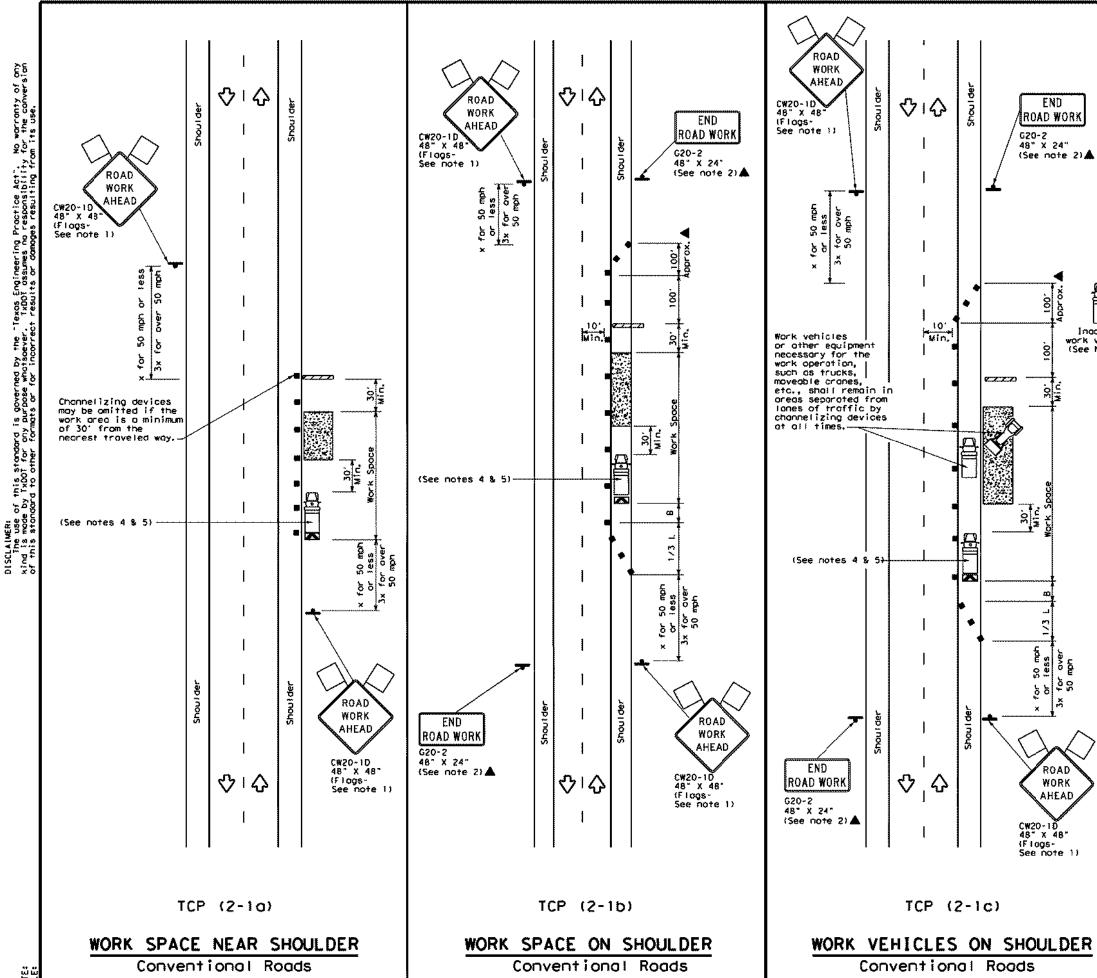
BC(11)-21

DATE: FILE:

PAVEMENT MARKING PATTERNS 10 to 12" Type II-A-A 00000 Yellow ➪> Type II-A-A-REFLECTORIZED PAVENENT WARKINGS - PATTERN A RAISED PAVENENT WARKERS - PATTERN A -Type II-A-A 0 0 0 0 0 0 0 0 0 0 0 0 4 to 8" Type II-A-A-REFLECTORIZED PAVENENT MARKINGS - PATTERN B RAISED PAVEMENT WARKERS - PATTERN B Pottern A is the TXDOT Standard, however Pattern 8 may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectorized pavement markings. CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE. TWO-WAY HIGHWAYS Type I-C 50000 Type W buttons--Type I-C or II-C-R 00000 **00000** E0E00 Type [-A-Type Y buttons 000000000000 ⇆ Type I-A-Type Y buttons-Yellow 20000 00000 Type W buttons-(Type I-C or II-C-R REFLECTORIZED PAVEMENT MARKINGS RAISED PAVEMENT MARKERS -Type I-C Prefabricated markings may be substituted for reflectorized povement markings. EDGE & LANE LINES FOR DIVIDED HIGHWAY -Type I-C ⟨₽ Type W buttons-DODOD White 🗡 -Type II-A-A \diamondsuit rType Y buttons 000000 Yellow 00000 00000 \Leftrightarrow Type W buttons-~Type I-C RAISED PAVEMENT MARKERS REFLECTORIZED PAVEMENT MARKINGS Prefabricated markings may be substituted for reflectorized pavement markings. LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS Type W buftons -Type I-C-മാർത്ത OCOOD DODOD ത്രത്ത DODOG ♦ voe II-A-A Type Y buttons-₹> 100,000 00000 200000 Type W buttons-└-Type I-C REFLECTORIZED PAVEMENT MARKINGS RAISED PAVEMENT MARKERS Prefabricated markings may be substituted for reflectorized pavement markings. TWO-WAY LEFT TURN LANE



11-02 8-14



LEGEND

Type 3 Barricade

Heavy Work Vehicle

Truck Mounted
Attenuator (TMA)

Trailer Mounted
Flashing Arrow Board

Flag

Flag

Flag

Flager

Speed	Formula	D	vicimus esirob er Lend **	le	Spocial Channe		Minimum Sign Specing	Suggested Longitudinal Buffer Space
*		10° Offset	11' Offset	12° Offset	On o Toper	On a Tangent	Distance	.B.
30	2	1501	1651	180	30'	60,	120'	90,
35	L= <u>#5</u> 2	2051	225'	245"	35′	70'	1601	1201
40	60	2651	2951	3201	401	80.	240'	1551
45		450"	495′	540'	45'	90'	320'	1951
50		5001	5501	600,	501	100"	4001	240'
55	L=WS	5501	6051	660,	55′	110'	500'	2951
60	L-112	600.	660'	7201	60'	1201	600'	350'
65		6501	715	780'	65'	130	700`	410'
70		7001	770"	8401	70′	1401	8001	475'
75		7501	8251	9001	751	1501	900,	540'

* Conventional Roads Only

Inactive

work vehicle

(See Note 7)

** Toper lengths have been rounded off.

L*Length of Taper (FT) W*Width of Offset (FY) S*Posted Speed (MPH)

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

GENERAL NOTES

- 1. Flogs offoched to signs where shown, ore REQUIRED.
- All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be amitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
- Stockpited material should be placed a minimum of 30 feet from nearest traveled way.
- 4. Shodow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shodow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
- Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
- See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
- Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
- 8. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D
 "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

Traffic Operations Division Standard

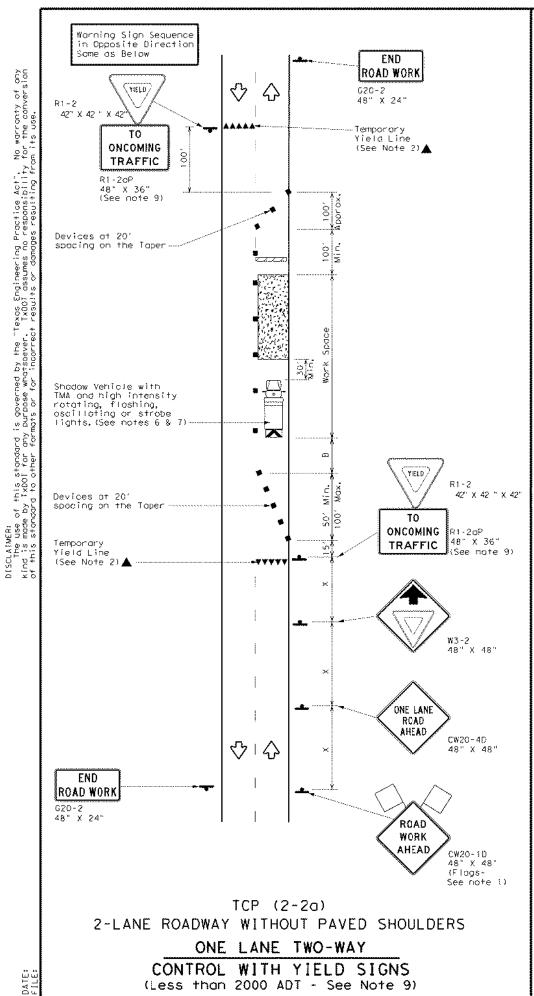
TRAFFIC CONTROL PLAN
CONVENTIONAL ROAD
SHOULDER WORK

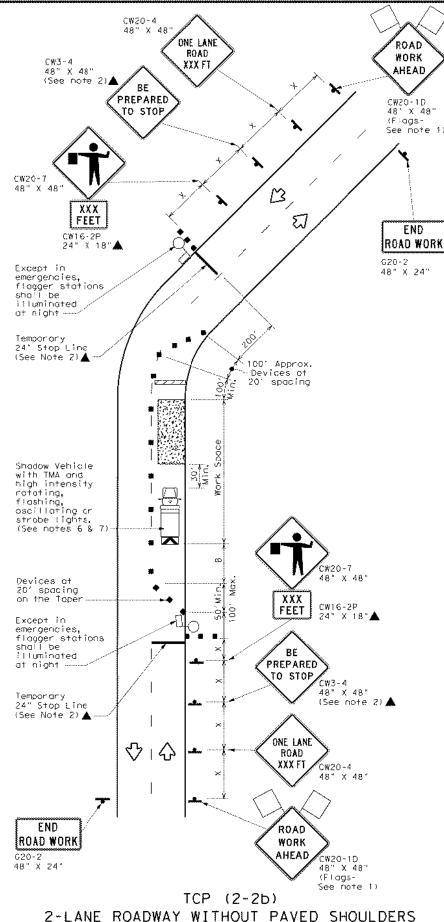
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ONE LANE TWO-WAY

CONTROL WITH FLAGGERS

LEGEND Type 3 Barricade Channelizing Devices ruck Mounted eavy Work Vehicle Altenuator (TMA) Portatile Changeable tashing Arrow Board Message Sign (PCMS) Indffic Flow Log Lagger

Posted Speed	farmula	Minimum Sesirabłe w⊔G łaper Lengths ★★		Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X"	Suggested Longitudinal Buffer Space	Stopping Sight Distance
*		10′ 1!′ OffsetOffset	121 Offset	On a Taper	On a Tangent	Distance	"B"	
30	2.	1501: 1651	1801	307	: 60'	1201	90	2001
35	L= <u>W5</u> 2	205' 225'	2451	351	701	160′	120'	2501
40	60	265'; 295'	3201	401	: 80′	2401	155′	305
45		450' 495'	5401	45′	90′	320'	1951	360′
50		5001 5501	6001	507	1001	4001	240'	4251
55	L=WS	550': 605'	660	557	110'	5001	295′	4951
60	L . 11 3	600' 660'	7201	6C′	1201	600′	35C′	5701
65		650' 715'	7801	651	1301	7001	4101	6451
70		7001: 7701	8401	701	140	800.	475	7301
75		7501; 8251	9001	757	: 150'	900.	54C'	820′

- * Conventional Roads Only
- ** Taper lengths have been rounded off.
- LaLength of Toper(FT) Wawidth of Offset(FT) 5=Posted Speed(MPH)

TYPICAL USAGE								
MQB1LE	SHORT DURATION	SHORT TERM STAT!GNARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY				
	1	1	1					

GENERAL NOTES

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

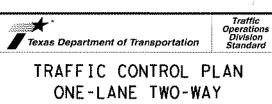
 3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
- 4. Flaggers should use two-way radios or other methods of communication to control traffic.
- 5. Length of work space should be based on the oblifty of flaggers to communicate. 6. A Shadow Vehicle with a TMA should be used anytime It can be positioned 30 to 100 feet
- in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place. Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA
- 7, Additions: Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-2a)

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

TCP (2-2b)

- 10.Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
- il. If the work space is located near a harizantal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
- \$2.Flaggers should use 24" \$10P/SLOW pacdles to control traffic. Flags should be limited to emergency situations.

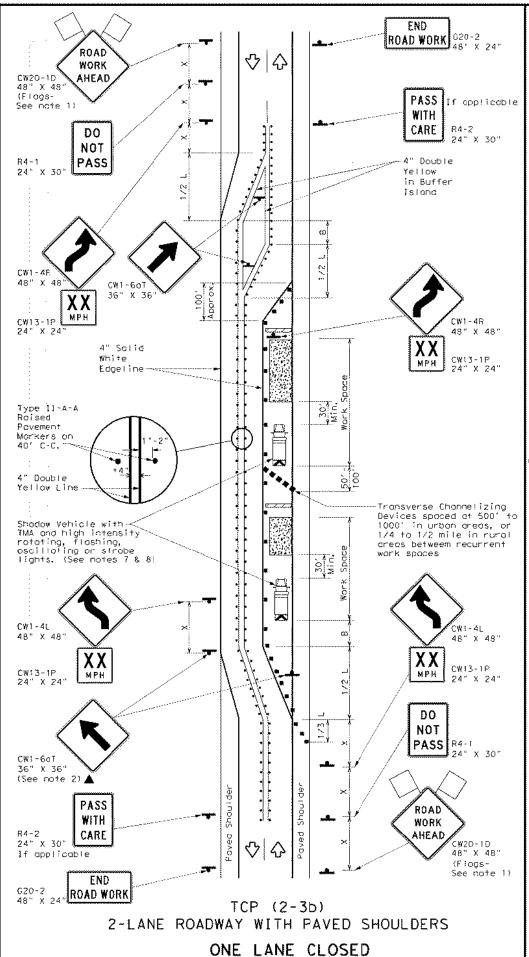


TRAFFIC CONTROL

TCP (2-2) -18

flon2+2+18, dgn () 1x001 December 1985 0081 5001 порямых C8.2

ROAD WORK G20-2 ROAD WORK is governed by the "texas Engineering Practice Act". No worranty of any purpose whatscever. TWDI assumes no responsibility for the conversion mats or for incorrect results or domages resulting from its use. CW20-10 48" X 48" AHEAD ♡ | 公 (Flogs-See note 1) PASS DO If applicable WITH NOT CARE R4-2 PASS 24" X 30' 24" X 30 CW1-4R 48" X 48 CW13-1P 24" X 24' 48" X 48" Shodow Vehicle with 0)SCLA[ME8: The use of this stando Kind is mode by TxDOT for ↑↑ thi≎ standard to other TMA and high intensity rotating, flashing, oscillating ar strabe ХХ CW13-1P 24" X 24' lights. (Sée notes 7 & 8) 4 48" X 48 . CW:-6aT 36" X 36" (See note 2) 🛦 CW13-1P 24" X 24" 48" X 48" CWI - 6eT 36" X 36 CW13-1P (See note MPH DO PASS NOT WITH PASS R4-1 ♡ ♦ CARE 24" X 30" If applicable ROAD ROAD WORK WORK AHEAD CW20-1D 48" x 48" TCP (2~3a) (Flogs-2-LANE ROADWAY WITH PAVED SHOULDERS ONE LANE CLOSED ADEQUATE FIELD OF VIEW



INADEQUATE FIELD OF VIEW

	LEGEND						
<u>27777</u>	Type 3 Barricade	82 SS	Channelizing Devices				
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)				
	Troiter Mounted Flashing Arrow Board		Roised Pavement Markers Ty II-AA				
	Sign	♦	iraffic Flow				
\Diamond	£ log	11-0	Fiagger				

Speed	Min∃mum ⊅esicable Formula Toper Lengths X X		Suggested Maximum Spacing of Channelizing Devices	Minimum Sign Spacing	Suggested Longitudinal Buffer Space			
*		∣O' 1 12 Offse†Offse†Offse†	On a On a Yaper Tangen	Ois÷orce	"В"			
30	ws ²	1501 1651 1801	30' 60'	1201	90.			
35	L= WS	2051 2251 2451	35' 70'	160'	120'			
40	60	2651 2951 3201	40' . 80'	2401	1551			
45	Ċ	4501 4951 5401	45' . 90'	3201	1951			
50		5001; 5501; 6001	50' : 100'	4001	2401			
55	i≞wis	550' 605' 660'	55′ 110′	500′	2951			
60		6001 6601 7201	60' 120'	6001	3501			
65		6501: 7151: 7801	65' 130'	7001	4101			
70		700' 770' 840'	70' : 140'	800'	475'			
75		7501 8251 9001	75' 150'	9001	5401			

* Conventional Roads Only

** Toper lengths have been rounded off.

L=Length of Toper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

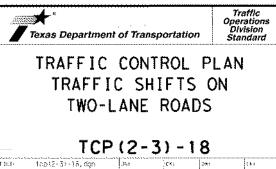
TYPICAL USAGE					
MOBILE	SHORT SURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY	
				10P (2-3b) ONLY	
			1	√	

GENERAL NOTES

- . Flags attached to signs where shown, are REQUIRED.
- 2. All troffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be amitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
- When work space will be in place less than three days existing povement markings may remain in place. Channelizing devices shall be used to separate traffic.
- Flagger control should NOT be used unless rondway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
- The R4-1 "DO NOT PASS, " R4-2 " PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
- Conflicting povement marking shall be removed for long term projects. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 300 feet in advance of the area of arew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but rood or work conditions require the traffic control to remain in place, Type 3 Barricodes or other channellzing devices may be substituted.
- Additional Shadow Vehicles with EMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

(CP (2~3a)

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



00w1 14.01 December 1985 RECHMAN 100ki (j) 8-95 3-03 59615 No.

ROAD DISCLAIMER: The use of this standard is governed by the "Texas Engineering Proctice Act". No warranty of any Kind is ande by RADOT for any purpose whatsaever. TXDOT assumes no respansibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use. WORK AHEAD 43" X 48" (Flags-See note 1) END ROAD WORK 020-2 48" X 24" $| \circlearrowleft | | \circlearrowleft |$ END WORK ROAD WORK AHEAD CW20-3D G20-2 CLOSED 48" X 48' (Flags-48" X 24" CW20-51 See note 48" X 48 XXX FT CW16 - 3cP* ≀ess MPH 30" X 12" (See note 4) over 50 CW1-6aT Shadow Vehicle with TMA and high intensity rotating, floshing, escillating or strobe lights. (See notes 5 % 6) CW13-1P 24" X 24" Shadow Vehicle with TWA and high intensity rotating, flashing, oscillating or strobe lights. (See nates 5 % 6) CW1-6aT RIGHT LANE CLOSED CW20-51R 48" X 48" CW1 - 4i XXXFT 48" X 48" XX CW16-3aP CW13-1P (See note 4) 24" X 241 RIGHT LANE END CLOSED ROAD WORK END C₩20-5TR $\nabla | \hat{\nabla} |$ ROAD 48" X 48" G20-2 48" X 24" ROAD WORK WORK XXX FT AHEAD 30" X 12" 48" X 24" CW20-10 See 48" X 48" (Flags: See note 1 note 4) ROAD TCP (2-4a) TCP (2-4b) WORK AHEAD CW20-10 48" X 48" (Flogs-ONE LANE CLOSED TWO LANES CLOSED See note

LEGEND Type 3 Barricade ⊠ ⊠ Channelizing Devices ruck Mounted leavy Work Vehicle Attenuator (TMA) Portoble Changeable Tashing Arrow Board Message Sig⊓ (PCMS) ♦ Troffic Flow ilo. Flagger

Posted Speed *	* * *		Spacir Chonnel		Minimum Sign Specing	Suggested Longitudinal Buffer Space
*		10' 11' 12' OffsetOffsetOffset	On a Taper	On a Tongent	Distance	"B"
30	<u>ws²</u>	150' 165' 1 80'	301	60′	1201	90'
35	L= WS	205' 225' 245'	351	70′	1601	120′
40	60	2651 2951 3201	401	801	2401	1551
45		450' 495' 540'	451	90′	3201	1951
50		5001 5501 6001	50′	1001	4001	2401
55	L≏WS	550' 605' 660'	551	1101	500′	2951
60	- "-	600' 660' 720'	601	1201	6001	350′
65		650' 715' 780'	651	1301	7001	4101
70		700' 770' 840'	70'	140′	800′	475′
75		750' 825' 900'	751	1501	900'	540′

* Conventional Roads Only

**XX Taper lengths have been rounded off.

L=Length of Taper (FT) W=Width of Offset (FT) S=Posted Speed (MPH)

:			TYPICAL U	JSAGE	
:	MO81LE	SHORE DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
:			1	1	

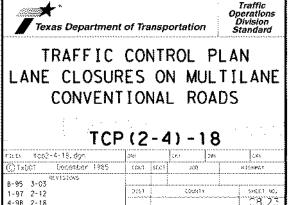
GENERAL NOTES

- 1. Flags attached to signs where shown, are REQUIRED.
- Z. All traffic control devides illustrated one REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
- The downstream taper is optional. When used, it should be 100 feet minimum length per lame.
- 4. For short term applications, when past mounted signs are not used, the distance legend may be shown on the sign face rather than on a CM16-3aP supplementa:
- A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channellizing devices may be substituted for the Shodow
- Additional Shadow Vehicles with TMAs may be positioned in each closed lame, on the shoulder or off the payed surface, next to those shown in order nto protect a wider work space.

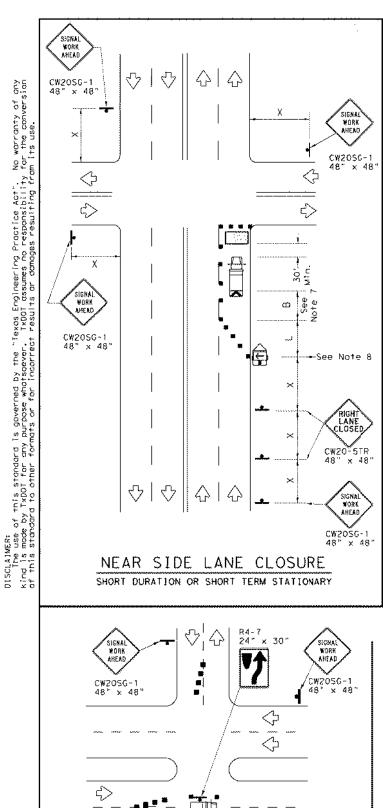
TCP (2-4a)

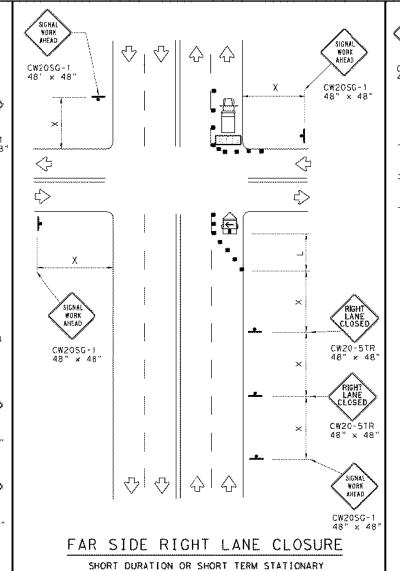
7. If this TCP is used for a left tone closure, C#20-5TL "LEFT LAME CLOSED"signs. shall be used and charmelizing devices shall be placed on the centerline to project the work space from opposing traffic with the arrow board placed in the closed ione near the end of the morging taper.

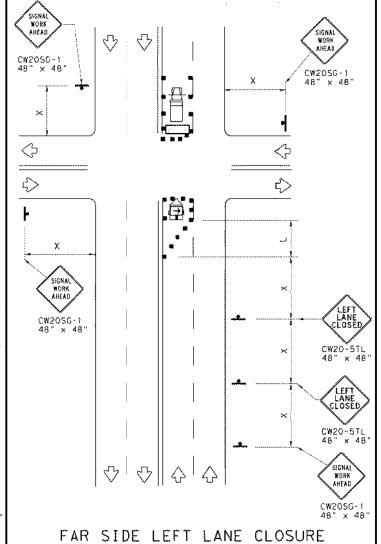
8. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20° or 15° if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter devices spacing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



1-97 2-12 4-98 2-18







LEGEND Type 3 Barricade S 80 Channelizina Devices Truck Mounted Attenuator (TMA) legvy Work Vehicle Portable Changeable Message Sign (PCMS) railer Mounted Flashing Arrow Boord Troffic Flow 5†ga \Diamond filag Flagger

Posted Speed	Formula	0	Minimum esirab er Len X X	le	Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Specing	Suggested Longitudinal Buffer Space
*		10° Offset	ll' Offset	⊺Z' Offse†	On a Taper	On a Tangent	Distance	"В"
30	2	1501	1651	1801	301	601	1201	90,
35	$L = \frac{WS^2}{60}$	2051	225'	2451	35′	701	1601	1201
40	60	2651	295'	3201	401	801	240'	1551
45		4501	495′	5401	45'	901	320'	1951
50		5001	5501	600	501	100'	4001	2401
55	L = W S	5501	6051	660,	551	1101	5001	2951
60	1 113	60C′	660'	7201	601	1201	600'	3501
65		650′	715	7801	651	1301	7001	410′
70		7001	7701	840′	70′	1401	800′	475'
75		7501	8251	9001	751	1501	900′	5401

- * Conventional Roads Only
- XX Taper Lengths have been rounded off.
- L=Length of Taper(FT) W=W:dth of Offset(FT: S≈Posted Speed(MPH)

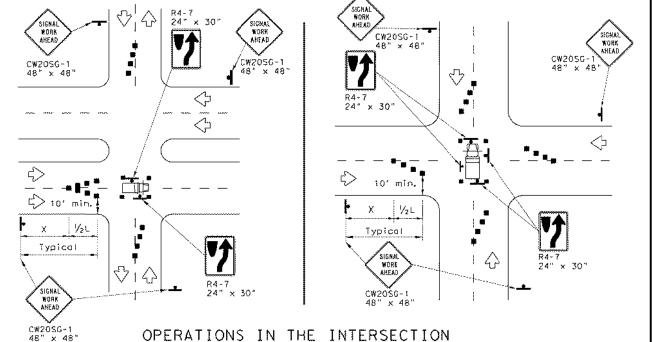
WORKERS IN BUCKET TRUCKS SHALL NOT WORK ABOVE OPEN LANES OF TRAFFIC.

GENERAL NOTES

 The minimum size channelizing device is the 28" cone. 42" Two-piece cones, drums, vertical panels or barricades will be required when the device must be left unattended at night.

SHORT DURATION OR SHORT TERM STATIONARY

- Obstructions or hazords of the work area shall be clearly marked and delineated at all times.
- Flaggers and Flagger Symbol (CW20-7) signs may be required according to field conditions.
- Vehicles parked in roadway shall be equipped with at least two high intensity rotating, flashing, oscillating or strobe type lights.
- 5. High level warning devices iflag trees) may be used at corners of the vehicle.
- 6. When work operations are performed an existing signals, the signals may be placed in floshing red mode when approved by the engineer. If existing signals do not have power, All-Way Stop (RI-1 and RI-3P) signs may be implemented when approved by the engineer.
- 7. For Short-Term Stationary work the buffer space "B" from the above table should be used if field conditions permit. For Short Duration (less than 1 hour) any buffer space provided will enhance the safety of the setup.
- 8. The arrow board at this location may be omitted for Short Duration work if the work vehicle has an arrow board in operation. As an aption, the arrow board may be placed at the end of the taper in the closed lane if space is not available at the beginning of the taper.
- Signs and devices for the NEAR SIDE LANE CLOSURE may be altered for a left (and closure by using a LEFT LANE CLOSED (CW20-5TL) and adding channelizing devices on the centerline to protect the work space from apposing traffic.



SHEET 1 OF 2

Traffic Operations
Division
Standard

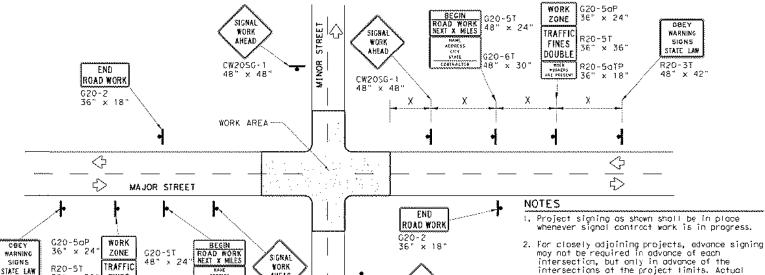
TRAFFIC SIGNAL WORK
TYPICAL DETAILS

WZ (BTS-1)-13

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DATE:

1.2...



YORK

AHEAD

CW205G-

TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

GENERAL NOTES FOR WORK ZONE SIGNS

TRAFFIC

FINE'S

DOUBLE

R20-51

× 36'

Signs shall be installed and maintained in a straight and plumb condition.

020-61

- 2. Wooden sign posts shall be painted white.
- 3. Barricades shall NOT be used as sign supports.
- 4. Nails shall NOT be used to attach signs to any support.
- All signs shold be installed in accordance with the plans or as directed by the Engineer.
- The Contractor shall furnish the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD).
- The Contractor shall furnish sign supports and substrates listed in the "Compliant Work Zone Traffic Contro! Device List" (CWZTCD). installed as per the manufacturer's recommendations.
- Temporary signs that have damaged or cracked substrates and/or agmaged or marred reflective sheeting shall be replaced as directed by the Engineer.
- 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".
- 10. Damaged wood posts shall be replaced. Splicing wood pasts

DURATION OF WORK

Work zone durations are defined in Part 6, Section 66.02 of the Texas Manual on Uniform Traffic Control Devices (YMUYCD).

SIGN MOUNTING HEIGHT

- Sign height of Long-term/Intermediate-term warning signs shall be as shown on Figure 6f-1 of the TMUTCD.
- Sign height of Short-term/Short Duration warning signs shall be as shown on Figure 6F-2 of the TMUTCD.
- Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

REMOVING OR COVERING

- When sign messages may be confusing or do not apply, the signs shall be removed or completely covered, unless otherwise approved by the Engineer. $\frac{1}{2} \left(\frac{1}{2} \right) = \frac{1}{2} \left(\frac{1}{2} \right) \left($
- When sions are covered, the material used shall be opaque, such when signs are covered, the material used shall be opaque, such as heavy mil block plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night without domaging the sign sheeting. Burlop, or heavy materials such as plywood or alluminum shall not be used to cover signs.
- 3. Duct tape or other adhesive material shall NOT be affixed to a
- Signs and anchor stubs shall be removed and hales backfilled upon completion of the work.

REFLECTIVE SHEETING

Č₩20SG-

SIGNAL

WORK

AHEAD

 All signs shall be retroreflective and constructed of sheeting meeting the requirements of the DMS and color usage table shown on this sheet.

directions.

warning sign spacing.

Todations will be as directed by the Engineer.

3. Advance signs shall be removed when signal

construction operations are no longer under way, as directed by the Engineer.

5. See the Table on sheet 1 of 2 for Typical

4. Warning sign spacing shown is typical for both

SIGN SUPPORT WEIGHTS

- Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
- 2. The sandbags will be fied shut to keep the sand from spitting and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support weights.
- 4. Sancbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
- Sancbags shall be made of a durable material that tears upon vehicular impost. Rubber, such as tire inner tubes, shall not be used.
- Rubber ballasts designed for channelizing devices should not be used for ballast or partable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZYCD
- 7. Sancbags 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 fastners. Sandbags shall be placed along the length of the skids to weigh down the sin support.
- 8. Sanchags shall NO) be placed under the skid and shall not be used to level sign supports placed on slapes.

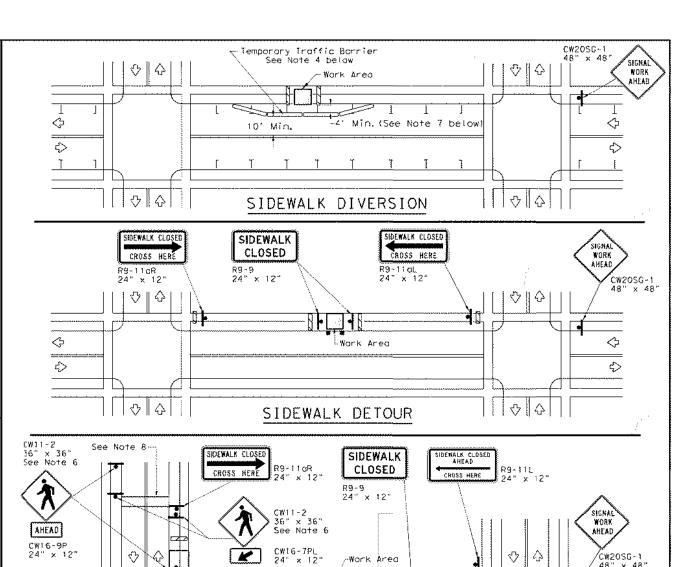
LEGEND				
•	Sign			
E 23	Channelizing Devices			
	Type 3 Barricade			

DEPARTMENTAL MATERIAL	SPECIFICATIONS
SIGN FACE MATÉRIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B _{FL} OR TYPE C _{FL} SHEETING
WHITE	BACKGROUND	TYPE A SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

Only pre-auglified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CW2TCD) describes pre-qualified products and their sources and may be found at the fallowing web address:

http://www.txdot.gov/txdot_library/publications/construction.htm



CROSSWALK CLOSURES

PEDESTRIAN CONTROL

♦

₹>

SEDEWALK CLOSED

USE OTHER SIDE

Holes, trenches or other hazards shall be adequately protected by covering, delineating or surrounding the hazard with orange plastic pedestrian

cwadso-

3

89 - 1 ODBI

fencing or longitudinal channelizing devices, or as directed by the Engineer. "CROSSWALK CLOSURES" as detailed above will require the Engineer's approval prior to installation.

MOSK

R9 series signs shown may be placed on supports detailed on the BC standards or CWZTCD list, or when fobricated from approved lightweight plastic substrates, they may be mounted on top of a plastic drum at or near the location shown.

For speeds less than 45 mph longitudinal channelizing devices may be used instead of traffic barriers when approved by the Engineer. Attenuation of blunt ends and installation of water filled devices shall be as per BC(9) and manufacturer's recommendations.

Location of devices are for general guidance. Actual device spacing and location must be field adjusted to meet actual conditions.

Where pedestrians with visual disabilities normally use the closed sidewalk Detectable Pedestrian Barricades should be used instead of the Type 3 Barricades shown.

The width of existing sidewalk should be maintained if practical.

Povement markings for mid-black crosswalks shall be paid for under the appropriate bid items.

When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian



■ Texas Department of Transportation

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ(BTS-2)-13

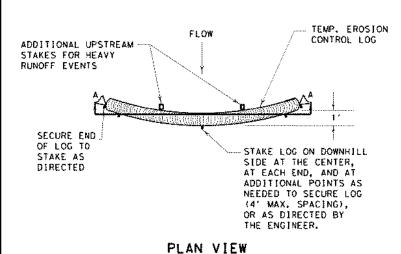
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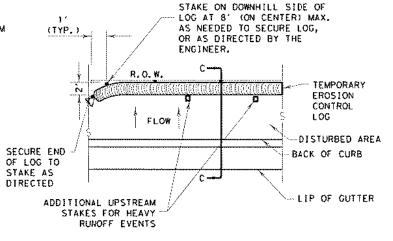
Traffic

Operations

00x1 :rc 1x001 four 1x001 | cr: [x00 wzb15-33, ccc)1×901 April 1992 5981 (SSC) ..08 REVISIONS 025 C014 Q1 2-98 10-99 7-13 4-98 3-03 C82125 TARRAN' FIN



FLOW ADDITIONAL UPSTREAM STAKES FOR HEAVY RUNOFF EVENTS SECURE END OF LOG TO R. O. W. STAKE AS DISTURBED AREA DIRECTED BACK OF CURB LIP OF GUTTER STAKE ON DOWNHILL SIDE OF LOG AT 8' (ON CENTER) MAX. TEMP. EROSION -CONTROL LOG AS NEEDED TO SECURE LOG, OR AS DIRECTED BY THE ENGINEER.

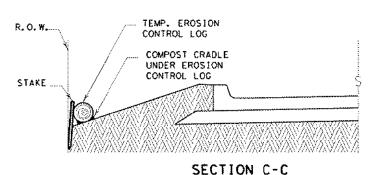


PLAN VIEW

PLAN VIEW

SECTION B-B
EROSION CONTROL LOG AT BACK OF CURB

(CL - BOC)



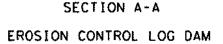
EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW)

AT EACH END, AND AT ADDITIONAL POINTS AS NEEDED TO SECURE LOG TEMP. EROSION (4' MAX. SPACING), OR CONTROL LOG AS DIRECTED BY THE NIN. ENGINEER. 1' (TYP.) ADDITIONAL UPSTREAM COMPOST CRADLE STAKES FOR REAVY UNDER EROSION CONTROL LOG RUNOFF EVENTS

STAKE LOG ON DOWNHILL

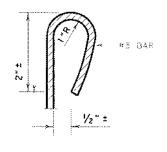
SIDE AT THE CENTER,





LEGEND

- CL-D EROSION CONTROL LOG DAM
- -CL-BOC EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW- EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI) EROSION CONTROL LOG AT DROP INLET
- CL-CI)- EROSION CONTROL LOG AT CURB INLET
- CL-GI EROSION CONTROL LOG AT CURB & GRATE INLET



REBAR STAKE DETAIL

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

<u>Log Traps:</u> The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0,5" over the drainage area).

Control logs should be placed in the following locations:

- 1. Within drainage ditches spaced as needed or min. 500' on center
- 2. Immediately preceding ditch inlets or drain inlets
- 3. Just before the drainage enters a water course
- 4. Just before the drainage leaves the right of way
- Just before the drainage leaves the construction limits where drainage flows away from the project.

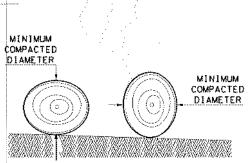
The logs should be cleaned when the sediment has occumulated to a depth of 1/2 the log diameter.

egning and removal of accumulated sediment deposits is incidental

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

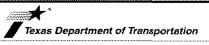
GENERAL NOTES:

- EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
- LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
- 3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
- FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
- 5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
- DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
- COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
- 8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
- TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
- 10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SHEET 1 OF 3

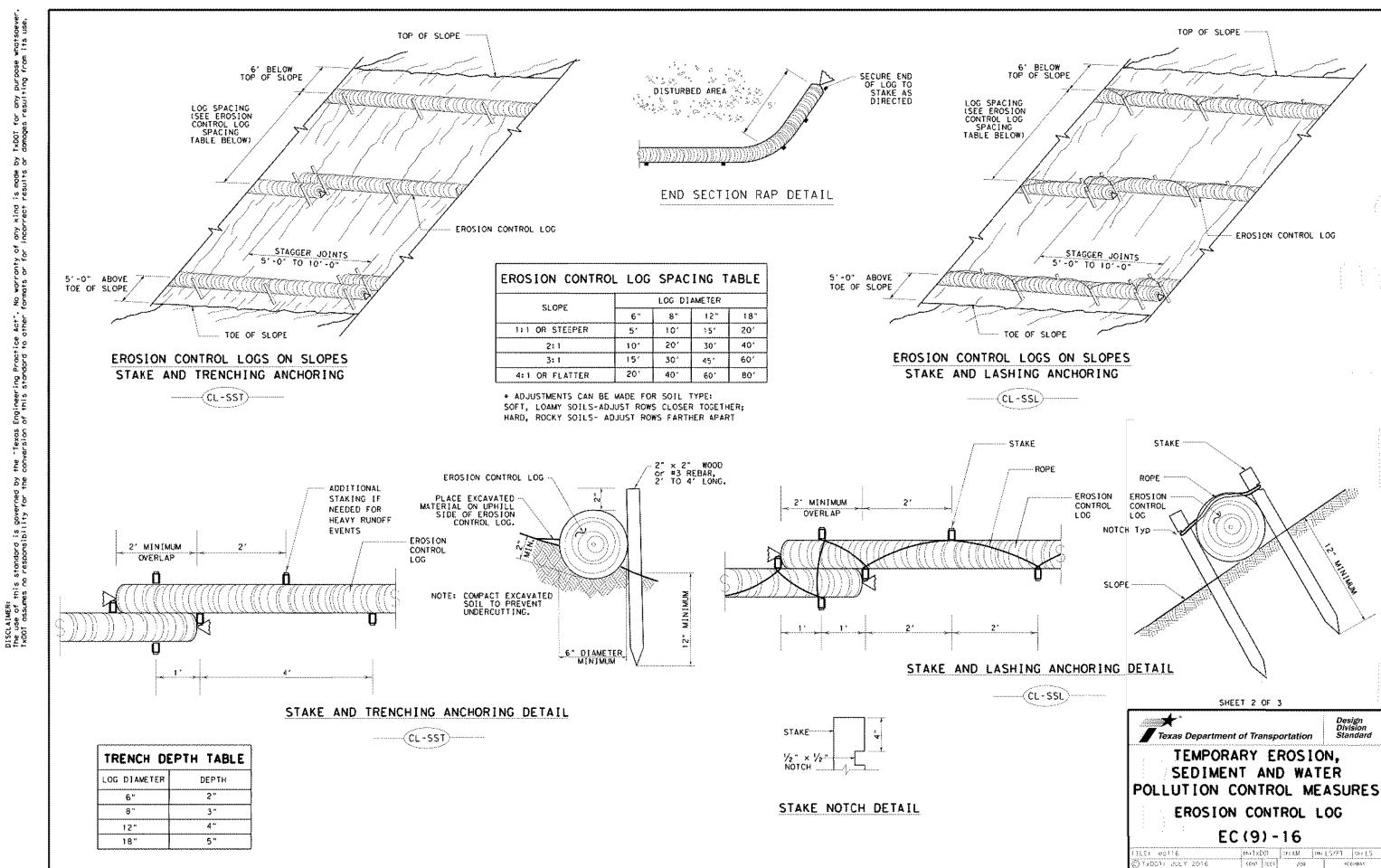


Design Division Standard

TEMPORARY EROSION,
SEDIMENT AND WATER
POLLUTION CONTROL MEASURES
EROSION CONTROL LOG

EC (9) -16

CE	ed916	Del18		OT	CVERT	Del15		OT	CVERT
Y800Tr JULY 2016	Con	Sch	Joo	History					
4TV15 forc	Single	Single	Single	Single					
5751	FORSITY	Single							



TOP OF SLOPE

EROSION CONTROL LOG

SHEET 2 OF 3

TEMPORARY EROSION,

EROSION CONTROL LOG

EC(9)-16

ps. LxDCI

0001 (001

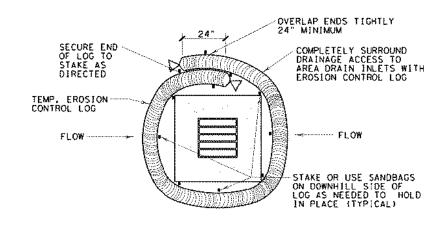
Design Division Standard

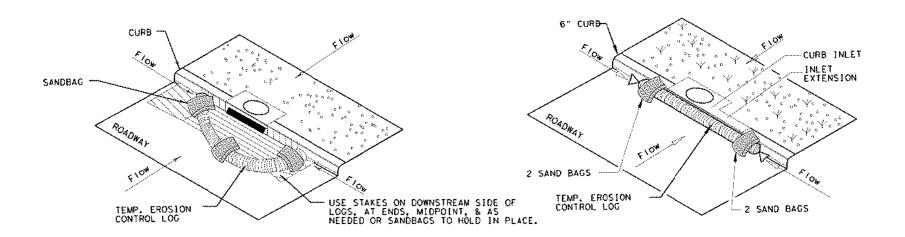
0760WAY

5481.7 NO. C8.27

or: EM | 0% [5797 | 0% [5

398





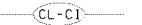
EROSION CONTROL LOG AT DROP INLET

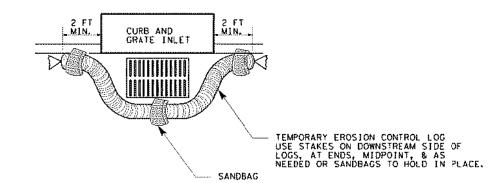
——(CL-DI)——

EROSION CONTROL LOG AT CURB INLET

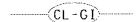


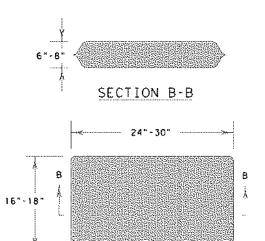
EROSION CONTROL LOG AT CURB INLET





EROSION CONTROL LOG AT CURB & GRADE INLET





SANDBAG DETAIL

EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.

SHEET 3 OF 3



Design Division Standard

TEMPORARY EROSION,
SEDIMENT AND WATER
POLLUTION CONTROL MEASURES
EROSION CONTROL LOG

EC(9)-16

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€ Tx90Tr JULY 2016	CORT	5007	.00		9100945
REVISIONS					
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DATE

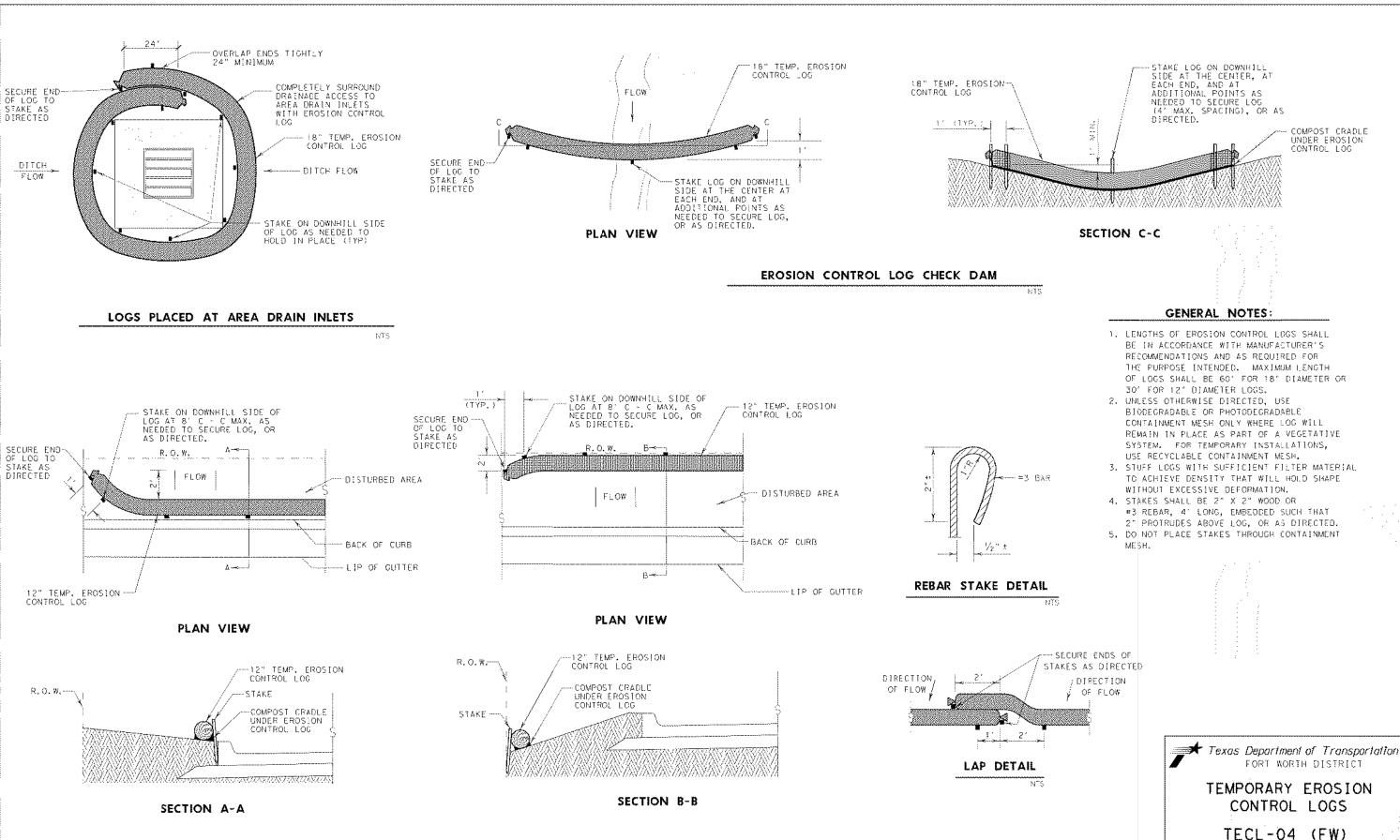






LOG PLACED AT BACK OF CURB

NES



LOG PLACED AT EDGE OF RIGHT-OF-WAY

PROUECT NO.

COUNTY

.108

SHEE!

08.29

ORIGINAL OCT 2004

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37478

CONTROL

01510101

SECTION

ENDANGERED AND/OR THREAT	TÉNED SPECIÉS/WILDLI	FE/MIGRATORY BIRDS	WATER QUALITY:			
SPECIES IN PROJECT AREA	<u> HABITA</u>	SPECIAL NOTES	REFER TO STORMWATER POLLUTION PREVENTION PLAN SHEET			
NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	AVOID SEDIMENT RUNOFF AVOID POLLUTION CONTAIN & PROPERLY DISPOSE OF POTENTIALLY HAZARDOUS SUBSTANCES.			
DO NOT DISTURB OR HARM SPEC VERIFY PRESENCE AND LIMITS CLEARING TREES. MINIMIZE D	OF HABITAT WITH AREA ENG	INEER BEFORE	ALL WORK SHOULD BE PERFORMED ACCORDING TO ALL APPLICABLE STATUTES. COMMENTS			
COMMENTS NOT APPLICABLE			ADEQUATELY MAINTAIN SW3P MEASURES. PROTECT ANY EXCAVATED MATERIALS FROM RUNOFF.			
			WATERS OF U.S. AND/OR WETLANDS:			
			THE CONTRACTOR SHALL ADHERE TO THE PROVISIONS OF ARTICLES 7.18 AND 7.19 OF TXDOT'S STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND BRIDGES, AND SPECIAL PROVISIONS.			
HISTORICAL/ARCHEOLOGICAL			NO FILLING, DREDGING OR EXCAVATING IN ANY WATER BODIES, RIVERS, CREEKS, STREAMS OR WETLAND AREAS UNLESS SPECIFICALLY AUTHORIZED BY UNITED STATES ARMY CORPS OF ENGINEERS PERMIT AND APPROVED BY THE ENGINEER. CONTRACTOR MUST OBTAIN ANY REQUIRED PERMIT FOR IMPACTS TO WATERS OF THE U.S. DUE TO CONSTRUCTION METHODS OTHER THAN THOSE SPECIFIED IN THE PLANS. CONTRACTOR			
CONTRACTOR SHALL AGREER TO STANDARD SPECIFICATIONS FO BRIDGES, AND SPECIAL PROVI	R CONSTRUCTION OF HIGHWAY		MUST COORDINATE SUCH PERMITS WITH THE TXDOT DISTRICT ENVIRONMENTAL QUALIT' COORDINATOR. DO NOT PLACE EXCAVATED MATERIAL, CONSTRUCTION DEBRIS, ETC., OFF-SITE WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.			
KNOWN ITEMS OF HISTORICA BUILDINGS (LIST 3F A)			NA_U.S. ARMY CORPS OF ENGINEERS PERMIT (See Below) STREAM/WATERWAY CROSSING WETLAND CROSSING			
BRIDGESCEMETERIES		NOT APPLICABLE	NA U.S. COAST GUARD PERMIT			
HISTORIC MARKERS/PL/	AQUES	NOT APPLICABLE	THE CONTRACTOR SHALL CONTACT THE TXDOT DISTRICT ENVIRONMENTAL QUALITY COORDINATOR IF WORK WILL RESULT IN IMPACTS TO JURISDICTIONAL WATERS OF U.S. BEYOND THOSE IDENTIFIED IN THE PLANS.			
CONSTRUCTION, CONTRA	CHEOLOGICAL SITES ARE D ACTOR SHALL IMMEDIATELY FIRONMENTAL QUALITY COO	NOTIFY AREA ENGINEER	THE FOLLOWING CORPS OF ENGINEERS PERMITS HAVE BEEN IDENTIFIED AS APPLICABLE TO THIS PROJECT:			
DO NOT ENDANGER HISTORICAL AGE) OR ARCHEOLOGICAL SITE COMMENTS NOT APPLICABLE SEESHEET CO.O.	s.		NWP 3-MAINTENANCE (3)NWP 23-CATEGORICAL EXCLUSION (3)NWP 13-BANK STABILIZATION (3)NWP 25-STRUCTURAL DISCHARGES (3)NWP 14-LINEAR TRANSPORTATION (3,9)NWP 27-STREAM/WETLAND RESTORATION (3)NWP 18-MINOR DISCHARGES (3,9)NWP 33-TEMP. CONST., ACCESS, DEWATERING (3)			
***************************************			(#, *#) APPLICABLE SECTION 401 GENERAL CONDITIONS: Gen.Cond.3 - CATEGORY I AND CATEGORY II BMP'S REQUIRED Gen.Cond.9 - CATEGORY III BMP'S REQUIRED.			
NOISE:	WILLIAM TO THE TOTAL THE TOTAL TO THE TOTAL TOTAL TO THE		COMMENTS (Spedific location where each permit identified above is applicable) NOT APPLICABLE			
THE CONTRACTOR SHALL ADH TXDOT'S STANDARD SPECIFI AND BRIDGES, AND SPECIAL	CATIONS FOR CONSTRUCTIO					
NOISE LEVELS IN RESIDENT KEPT TO A MINIMUM BETWEE THE ENGINEER. AVOID ROUT RESIDENTIAL OR SENSITIVE	N THE HOURS OF 7PM AND ING OF CONSTRUCTION EQU	7AM OR AS DIRECTED BY IIPMENT THROUGH	BEST MANAGEMENT PRACTICES:			
COMMENTS			CATEGORY I BMP'S: (EROSION CONTROL) TEMPORARY VEGETATION SOD SOD			
NOT APPLICABLE			INTERCEPTOR SWALE DIVERSION DIKE EROSION CONTROL COMPOST MULCH FILTER BERMS AND SOCKS COMPOST FILTER BERMS AND SOCKS COMPOST BLANKETS			
IF NEOPRENE PADS AR BETWEEN PANELS. DO	SETWEEN PANELS OR POSTS & REQUIRED, ENSURE THA NOT DAMAGE OR CAUSE ERG COLOR CONTINUITY FOR CO	THEY ARE PLACED DSION TO ADJACENT	CATEGORY II BMP'S: (SEDIMENTATION CONTROL) SILT FENCE TRIANGULAR FILTER DIKE BRUSH BERMS STONE OUTLET SEDIMENT TRAPS EROSION CONTROL COMPOST COMPOST FILTER BERMS AND SOCKS COMPOST FILTER BERMS AND SOCKS CATEGORY III BMP'S: (POST-CONSTRUCTION TSS CONTROL) BETENTION/IPPICATION CONSTRUCTED WETLANDS			
COMMENTS THERE ARE NO NOISE WALLS PRO	PROSED FOR THIS PROJECT.		RETENTION/JRRIGATION CONSTRUCTED WETLANDS EXTENDED DETENTION BASIN WET BASINS VEGETATED FILTER STRIPS VEGETATION-LINED DITCHES GRASSY SWALES SAND FILTER SYSTEMS EROSION CONTROL COMPOST MULCH FILTER BERMS AND SOCKS COMPOST FILTER BERMS AND SOCKS			

VEGETATION:

A MIX OF GRASSES AND FORBS AS SPECIFIED IN ITEM 164 SHALL BE USED TO REVEGETATE THE R.O.W.

AVOID REMOVAL OF NATIVE VEGETATION WHEN POSSIBLE. NOTIFY TXDOT DISTRICT ENVIRONMENTAL QUALITY COORDINATOR 72 HOURS BEFORE REMOVAL OF TREES GREATER THAN 6" DIAMETER, NOT DESIGNATED FOR REMOVAL ON PLANS, DO NOT REMOVE TREES NEXT TO RIVERS, CREEKS, OR STREAMS UNLESS APPROVED BY THE TXDOT DISTRICT ENVIRONMENTAL QUALITY COORDINATOR.

FLAGGING SHALL BE USED BY CONTRACTOR TO DESIGNATE TREES TO BE REMOVED. APPROVAL FOR REMOVAL OF TREES SHALL BE OBTAINED FROM DISTRICT ENVIRONMENTAL QUALITY COORDINATOR.

DISTURBED AREAS SHALL BE RESTORED AND RESEEDED IN ACCORDANCE WITH APPLICABLE SPECIFICATION ITEMS, AND/OR AS SHOWN ON SEEDING LAYOUTS IN ACCORDANCE WITH EXECUTIVE ORDER 13112 ON INVASIVE SPECIES AND THE EXECUTIVE MEMORANDUM ON BENEFICAL LANDSCAPING, LANDSCAPING SHALL BE LIMITED TO SEEDING AND REPLANTING THE ROW WITH NATIVE SPECIES OF PLANTS UNLESS OTHERWISE SPECIFIED IN THE PLANS.

COMMENTS			
•	 •		•

VEGETATION MANAGEMENT PRACTICES:

COMMENTS KEEP VEGETATION REMOVAL TO A MINIMUM NECESSARY TO ACCOMPLISH CONSTRUCTION	ON ACTIVITIES

HAZARDOUS MATERIAL:

CONDUCT AND DOCUMENT ALL OF THE FOLLOWING:

CONDUCT SAFETY MEETING PRIOR TO CONSTRUCTION (MAKING WORKERS AWARE OF THE POTENTIAL HAZARDS THEY MAY ENCOUNTER);

READ AND FOLLOW THE HEALTH AND SAFETY PLAN AS SHOWN IN THE SPECIFICATIONS PRIOR TO CONSTRUCTION; AND

CONTACT/COORDINATE WITH THE APPROPRIATE AGENCY 7 TO 10 DAYS PRIOR TO CONSTRUCTION.

CONTACT AREA ENGINEER IF ANY OF THE FOLLOWING ARE DETECTED:

DEAD OR DISTRESSED VEGETATION (NOT IDENTIFIED AS NORMAL) TRASH PILES, DRUMS, CANISTERS, BARRELS, ETC. UNDESTRABLE SMELLS OR ODORS EVIDENCE OF LEACHING OR SEEPAGE OF SUBSTANCES

NO SPECIFIC CONCERNS. NO KNOWN HAZARDOUS MATERIAL SITES WITHIN PROJECT AREA.

-SPECIFIC SITE DETAILS SHOWN ON ADDITIONAL LAYOUT SHEETS X NO SITE-SPECIAL DETAILS INCLUDED



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EPIC (FW)

SHEET ! OF 1

DIST. FED. PROJECT NO. HIGHWAY cs COUNTY CONT. SECT. JOS SHEET TARRANT 0902 90 083 C8.30

ORIG.: SEP. 2007 REVISIONS:

	A. <u>GENERAL SITE DATA</u>	
	1. PROJECT LIMITS: FORT WORTH, TEXAS	
		٠.
	LATTITUDE: LONGITUDE:	
	2. PROJECT SITE MAPS:	
	* Project Location Map: Title Sheet (Sheet I)	
	* Drainage Patterns: Drainage Area Maps N/A	:
	 Approx. Stopes Anticipated After Mojor Gradings and Areas of Soli Disturbance, Typical Sections N/A 	
	* Major Controls and Locations of Stabilization Practices, N/A	
	SW3P Site Map Sheets • Project Specific Locations:	
	To be specified by Project Field Office and located In the Project SW3P. File	- :
	* Surface Waters and Discharge Locations: Oralinage and Culvert Layout Sheets N/A	
	三重点引起的医电影 医乳管 医乳管 不停止 二十二	
	3. PROJECT DESCRIPTION:	
	4. MAJOR SOIL DISTURBING ACTIVITIES:	
	5. EXISTING CONDITION OF SOIL & VECETATIVE	
	COVER AND % OF EXISTING VEGETATIVE COVER:	
	N/A	
1	6- TOTAL PROJECT AREA: 3 Acres	
	3, 20 %	
	7.TOTAL AREA TO BE DISTURBED: 3 Acres 1200% OF TOTAL PROJECT	ΔĤ
1	B. WEIGHTED RUNOFF COEFFECTENT	
	BEFORE CONSTRUCTION: N/A	
	AFTER CONSTRUCTION: N/A	
ı	9. NAME OF RECEIVING WATERS:	
ı	N/A for the profit of the first of the first	
	一个人的 化二氯化甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基	
1		
ı		
	O ENDANGERED SPECIES, DESIGNATED CRITICAL HABITAT AND HISTORIC PROPER	ŁΙ
ı	No Endangered Species, Designated Critical Habitat or Historic Property	
	has been found on this project site.	
ı	I Statement of What I has been found on this project site.	
ı		
	The documentation satisfying TPDES Construction General Permit eligibility pertain	d-

TEXAS DEPARTMENT OF TRANSPORTATION

FORT WORTH DISTRICT HEADQUARTERS DISTRICT DESIGN SECTION

250/SW LOOP FORT WORTH, TX 76133 PHONE: 817-370-6500

B. EROSION AND SEDIMENT CONTROLS

	TELEDOGIOV CETOVAC	DOTTEDVATION OF MATINDAL DECOMPOSE
一	IND CHING (BOY OF Strow)	PRESERVATION OF NATURAL RESOURCES FLEXIBLE CHANNEL LINER
	BUFFER ZONES	RIGID CHANNEL LINER
	BUFFER ZONES PLANTING SEEDING SODDING	SOIL RETENTION BLANKET
	SEEDING	COMPOST MANUFACTURED TOPSOIL
<u>_P</u>	SODDING	OTHERI (Specify Practice)
-;-		
STOLL	CTURAL PRACTICES:	

(Sele	ect T = Temporary or P = Permonent	, os applicable)
تنتند	SILT FENCES	DIVERSION, INTERCEPTOR, OR PERIMETER DIKE
	HAY BALES	DIVERSION, INTERCEPTOR, OR PERIMETER SWAL
·	SILT FENCES HAY BALES ROCK FILTER DAMS PIPE SLOPE DRAINS PAVED FLUMES	DIVERSION, INTERCEPTOR, OR PERIMETER SWALE DIVERSION INTERCEPTOR, OR PERIMETER SWALE DIVERSION DIKE AND SWALE COMBINATIONS ROCK REPORTED AT CONSTRUCTION FYIT
	PIPE SLOPE DRAINS	ROCK BEDDING AT CONSTRUCTION EXIT
-	PAVED FLUMES	TIMBER MATTING AT CONSTRUCTION EXIT
		. STONE OUTLET STRUCTURES
	SEDIMENT TRAPS SEDIMENT BASINS	VELOCITY CONTROL DEVICES
	SEDIMENT BASINS	CURBS AND GUTTERS
	STORM SEWERS	. STORM INLET SEDIMENT TRAP
	OTHER: (Specify Practice)	
······		
		
- :		May be used as applicable, revised or expanded)

permanent vegetative cover.

4. STORM WATER MANAGEMENT ACTIVITIES: (Sequence of Construction)

(Describe Storm Water Management Activities by Phases)

5. NON-STORM WATER DISCHARGES!

Non-storm water discharges should be filtered, or held in retention basins, before being allowed to mix with storm water. These discharges consist of non-polluted ground water. spring water, foundation and/or fooling drain water, and water used for dust control, povement washing and vehicle washwater containing no detergents.

Design Consultant Lago here - delete black if not opplicable



Texas Department of Transportation

Fort Worth District Standard

STORM WATER POLLUTION PREVENTION PLAN (SW3P)

Signature

SHEET 1 OF 2 SHEETS 8/3/2021 0)1441 (PANTHO) 09/2002 SW3p-f+W. 090 C8.3 TEXAS FTW

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C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:

Alterosion and sediment controls shall be maintained in good working order. If a repair is necessary, It shall be performed at the earliest date possible but no later than 7 calendar days ofter the surrounding exposed ground has dried sufficiently to prevent further damage from heavy equipment. Disturbed areas on which construction activities have ceased, temporarily or permanently, shall be stabilized within 14 calendar days unless they are scheduled to and do resume within 21 calendar days. The areas adjacent to creeks and drainageways shall have priority followed by devices protecting storm sewer Inlets.

2. INSPECTION:

An Inspection shall be performed by a TxDOT Inspector every 14 calendar days as well as within 24 hours after any rainfall of one-half Inch or more is recorded on a non-freezing rain gauge to be located at the project site, or every 7 calendar days. An inspection and Maintenance Report shall be filed for each Inspection. Based on the Inspection results, the controls shall be revised in accordance with the inspection report.

3. WASTE MATERIALS:

Except as noted below, all waste materials shall be collected in a metal dumpster having a secure cover, The dumpster shall meet all state and local solld waste management regulations. All trash and debris from construction shall be deposited in the dumpster. The dumpster shall be emptied, as necessary or as required by local regulation, and hauled to a local approved land fill site. The burying of construction waste on the project site shall not be permitted,

Concrete washoul areas shall be required and shall consist of a plt, lined with an impervious material, of sufficient size to contain, until evaporation, all water used and washout material produced during concrete washout operations. The concrete washout locations shall be as directed by the engineer.

Lime staking tanks shall be surrounded by an earthen berm, capable of containing any overflow,

4. HAZARDOUS WASTE (INCLUDING SPILL REPORTING):

As a minimum, any products in the following categories are considered to be hazardous: paints, acids, solvents, asphall products, chemical additives for soft stabilization, and concrete curing compounds or additivities. In the event of a split which may be hazardous, the split coordinator shall be contacted. Immediately,

5. SANITARY WASTE:

All soultary waste shall be collected from the partable units, as necessary or as required by local regulation, by a licensed sonitary waste management contractor.

6. OFFSITE VEHICLE TRACKING:

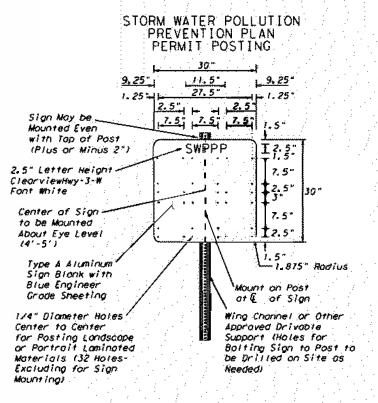
The Contractor shall be required, on a regular basis or as may be directed by the Engineer, to dampen haul roads for dust control, stabilize construction entrances and to remove excess dirt from the roadway.

7. MANAGEMENT PRACTICES: (Example Below - May be used as applicable, revised or expanded)

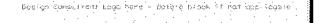
- 1. Disposal areas, stockpiles and havi roads stall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters. Disposal areas shall not be located In any wetland, waterbody or streambed.
- 2. Construction staging areas and vehicle maintenance areas shall be constructed by the Contractor In a manner to minimize the runoff of pollulants,
- 3. Att temporary filts placed in waterways shall be built of erosion resistant material. (NWP 14)
- All waterways shall be cleared as soon as practicable of temporary embankment, temporary bridges. matting, falsework, plling, debris or other obstructions placed during construction operations that are not a part of the finished work.

8. OTHER:

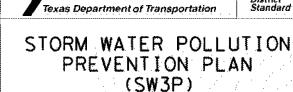
- 1. Listing of construction materials stored on site to be provided by Project Field Office.
- 2. The Project SW3P File located at the project field office shall contain the N.O.L. CGP Coverage Notice. TCEO TPDES Form. Signature Authorization. Certification/Qualification Statements. Inspection Reports, Required Maps, and a copy of the TPDES General Permit No. TXRI50000.



No Permahent Installation Allowed. Sign to be Removed After Project Completion.



Fort Worth District Standard



SHEET 2 OF 2 SHEETS 01 VAL DPAW[NO: 09/2007 C8.32 NUCLS TO TYPES CLASHEY BOTE C.2. ADDRO STON 2:54403 FORNAT TEXAS | FTW

8/3/2021

Date

Signature

©2019 by Texas Department of Transportation;



(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type

FRP = Fibergloss Reinforced Plastic Pipe (see SMD(FRP)) TWT = Thin-Wolled Tubing (see SMD(TWT))

108WG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3)) S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2) --

Anchor Type

UA = Universol Anchor - Concreted (see SMD(FRP) and (TWT)) UB - Universal Anchor - Bolfed down (see SMD(FRP) and (TWI))

Wedge Anchor Steel - (see SME)(TWT))

No more than 2 sign

posts should be located

within a 7 ft. circle.

- Wedge Anchor Plastic (see SMD(TWT))
- SA = Slipbose Concreted (see SMD(SLIP-1) to (SLIP-3))
- SB = Slipbose Bolted Down (see SMD(SEIP-1) to (SLIP-3))

Sign Mounting Designation

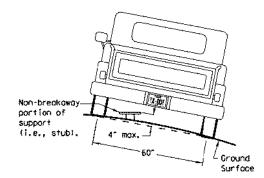
P = Prefab, "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. 'I" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. 'U" (see SMD(SLIP-1) to (SLIP-3))

IF REQUIRED

TEXT or ZEXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT)) BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))

WC = 1.12 #/ft Wing Channel (see SMD(SEIP-1) to (SEIP-3)) EXAL * Extruded Aluminum Sign Ponels (see SMD(SLIP-3))

REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercorriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chard (i.e., typical space between wheel paths).

digmeter

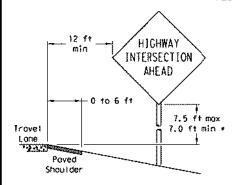
Not Acceptable

circle /

Not Acceptable

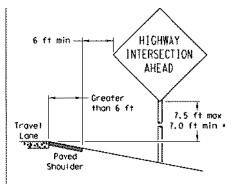
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

HIGHWAY

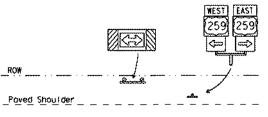
INTERSECTION

AHEAD

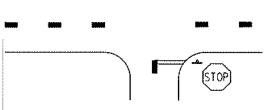
⊢— 6 ft min – 7.5 ft mox 7.0 ft min * Travel .

T-INTERSECTION

When this sign is needed at the end of a two-lone, two way roadway, the right edge of the sign should be in line with the centerline of the roodway. Place as close to ROW as practical.



Edge of Trave! Lone



- Signs shall be mounted using the following condition that results in the greatest sign elevation:
- (1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lone or
- (2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website oddress is: http://www.txdot.gov/publications/traffic.htm

Texas Department of Transportation Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS **GENERAL NOTES & DETAILS**

SMD (GEN) -08

©TXDQT JUTY 2002	DNT TAG	Τατ	CK: TXBQT	₽#:	TXQXT	CM: TXDOT
80°58	CONT	SEC1	106		,	I GHWAY
	0157		COUNTY			SHEET NO.
			•			<u>^8 33</u>

BEHIND BARRIER

2 ft min∗∗

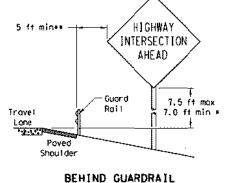
Maximum

Trovel

1.0

Paved

possible



7.5 ft max Concrete Trovel 7.0 ft min * Barrier Payed Shoul der

BEHIND CONCRETE BARRIER

RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)

7.5 ft max

7.0 ft min .

H1GHWAY

INTERSECTION

AHEAD

**Sign disarrance based on distance required for proper guard rail or concrete barrier performance.

TYPICAL SIGN ATTACHMENT DETAIL

7 ft.

diameter

circle /

Single Signs U-bold - Nut, lock Nyton washer, flat Sion Ponel wosher, lock wosher, aut

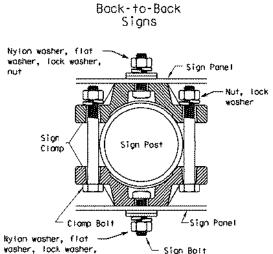
diometer

circle - Not Acceptable

Balts used to mount sign panels to the clamp are 5/16-18 UNC gaivanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs book-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

Sign clamps may be either the specific size clamp or the universal clamp.



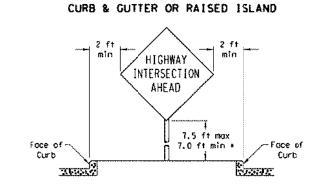
diometer circle _ /

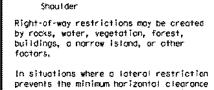
Acceptable

21 - 21	Approximate Bolt Length				
Pipe Diameter	Specific Clamp	Universal Clamp			
2" nominal	3"	3 or 3 1/2"			
2 1/2" nomino:	3 or 3 1/2"	3 1/2 or 4"			
3" nominal	3 1/2 or 4"	4 1/2"			

41141 EAST 7,5 ft max-L OW When a supplemental plaque Travel or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

SIGNS WITH PLAQUES





from the edge of the travel lane, signs should be placed as far from the travel tone as practical. *** Post may be shorter if protected by

post could not be hit due to extreme

guardrail or if Engineer determines the

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS

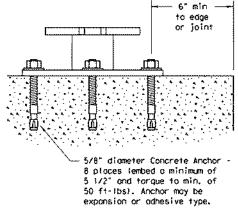
Post 10 BWG Tubing or Bott Schedule 80 Pipe Keeper Plote (See General Note 3) 511p Base \Box Ш 5/8" structural boits (3), nuts (3), and washers (6) per ASTM A325 if required by or A449 and manufacturer galvanized per Item 445 "Galvanizing." Bolt length is 2 1/2". Stub 3/4 " diameter hate. 36" Provide o 7" x 1/2" diameter rod or #4 rebor. Class A concrete 42" 12" min. 24" max. Non-reinforced concrete footing (sha!) be used unless noted elsewhere in the plans). Foundation should take approx. 2.5 of of concrete. -- 12" Dio

SM RD SGN ASSM TY XXXXX (X) SA (X-XXXX)

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer list.htm The devices shall be installed per monufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

CONCRETE ANCHOR



SM RD SGN ASSM TY XXXXX (X) SB (X-XXXX)

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hordened wosher per ASTM F436. The stud bolt shall have a minimum vield and ultimate tensile strenath of 50 and 75 KSI, respectively. Nuts, boits and washers shall be galvanized per 1tem 445, "Calvanizing." Adhesive type anchors sha!! have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the monufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normalweight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

GENERAL NOTES:

- 1. Stip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
- Moterial used as post with this system shall conform to the following specifications: 10 BMG Tubing (2,875" outside diameter)

0.134" nominal wall thickness

Seamless or electric-resistance welded steel tubing or pipe

Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008

Other steels may be used if they meet the following: 55,000 PSI minimum yield strength

70,000 PSI minimum tensile strength

20% minimum etongation in 2"

Wall thickness (uncoated) shall be within the range of 0.122" to 0.138" Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"

Colyonization per ASTM A123 or ASTM A653 C210. For precoated steel tubing (ASTM A653), recoot

tube outside diameter weld seam by metallizing with zinc wire per ASTM 8833.

Schedule 80 Pipe (2.875" outside diometer)

0,276" nominal wall thickness

Steel tubing per ASTM A500 Cr C

Other secretess or electric-resistance welded steel tubing or pipe with equivalent

outside diameter and wall thickness may be used if they meet the following:

46,000 PSI minimum yield strength 62,000 PSI minimum tensile strength

21% minimum elongation in 2"

Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"

Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"

Colvonization per ASTM A123

- 3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbose System components. The website address is:
 - http://www.txdot.gov/publications/traffic.htm
- 4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

Foundation

- 1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
- 2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a partable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
- 3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground,
- 4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer
- 5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

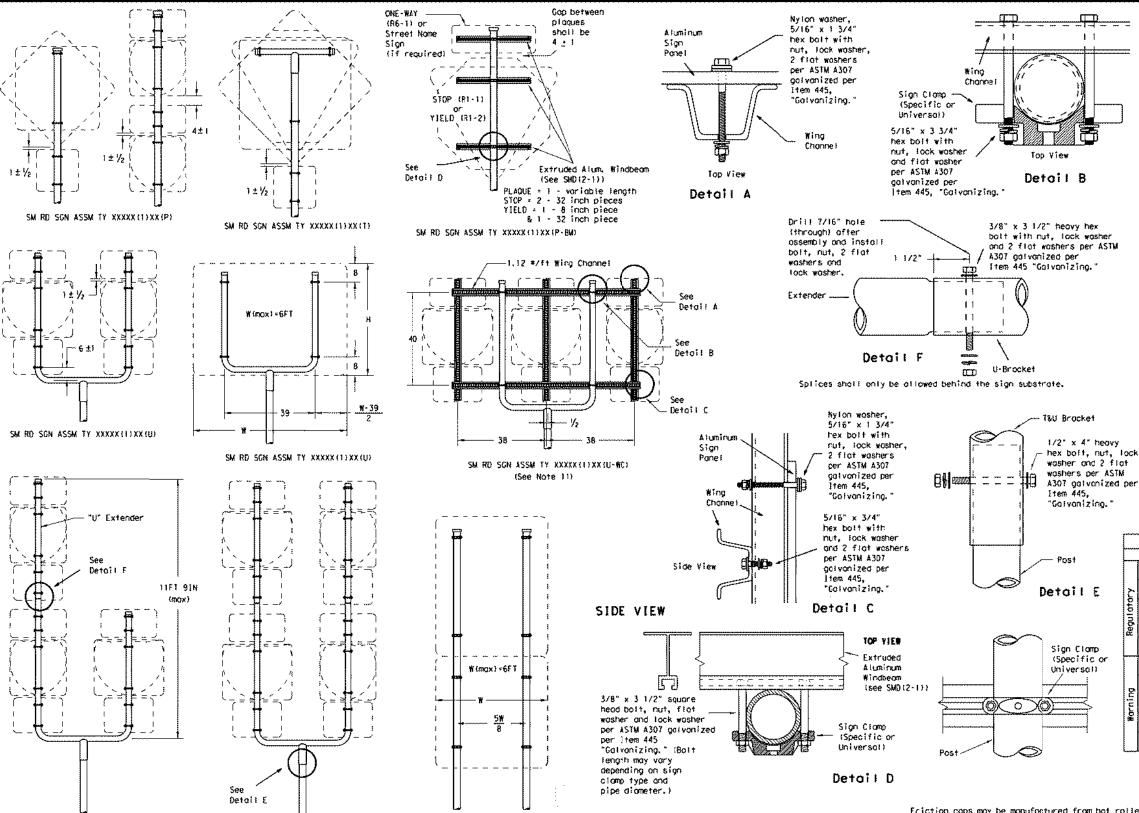
- 1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of payement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and
- 2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(St.IP-2) for clearances based on sign types.



SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

.						
© 1x001 July 2002	UNI TXD	100	CK1 TXDOT	9wa TXD01	CK: TXDOT	
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•					00 74	



SM RD SGN ASSYM TY XXXXX(2)XX(P)

All dimensions are in english

unless detailed otherwise.

SM RD SGN ASSM TY XXXXX(1)XX(1)

(* - See Note 12)

1.05"

Skirt

Variation

Depth

Rolled Crimo to

engage pipe 0.D.

SM RD SGN ASSM TY \$80(1) XX(U-2EXT)

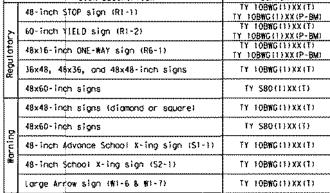
CENERAL NOTES!

1.	SIGN SUPPORT	* OF POSTS	WAX. SIGN AREA
	10 BWG	1	16 SF
	10 BWC	2	32 SF
	Sch 80	1	32 SF
	Sch 80	2	64 SF

- 2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWC where a sign height is abnormally high due to a fill slope.
- 3. Sign supports shall not be spliced except where shown. Sign support posts shall not be soliced.
- 4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
- Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
- For horizontal rectangular signs tabricated from flat aluminum, Y-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
- 7. When two triangular stipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently
- when impacted by an errant vehicle.

 8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be golvanized per ASTM A 123.
- Excess pipe, wing channel, or windbeam shall be out off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair golvanized coating at cut support ends per Item 445, "Galvanizing." 10.Additional route markers may be added vertically.
- provided the total sign area does not exceed the
- maximum allowable amount per Note 1. 11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
- 12. Post open ends shall be fitted with Friction Caps.
- 13. Sign blonks shall be the sizes and shapes shown on the pions.

REQUIRED SUPPORT SIGN DESCRIPTION SUPPORT TY 10BWG(1)XX(T) 48-inch STOP sign (RI-1) TY 108WG(1) XX (P-8W)
TY 108WG(1) XX (T) 60-inch | IELD sign (R1-2) TY 108WG(1) XX(P-BM)
TY 108WG(1) XX(T) 48x16-inch ONE-WAY sign (R6-1) TY TOBWC (1) XX (P-BM) 36x48, 48x36, and 48x48-inch signs TY TOBWG(1)XX(T) 48x60-inch signs TY \$80(11XX(1) 48x48-inch signs (diamond or square) TY 108WG(1) XX(T) TY S80(1)XX(3) 48x60-inch signs 48-inch Advance School X-ing sign (S1-1) TY TOBWG(1)XX(T) 48-Inch School X-ing sign (S2-1) TY 10BWG(1) XX(1) Large Arrow sign (W1-6 & W1-7) TY 108WG(1) XX(T)



FRICTION CAP DETAIL

1° min.

Pipe 0.D.

-.025":.010"

Pipe 0.D.

+. 025" ±, 010"

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Closs FE/ZN 8.

Friction cops may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

TRIANGULAR SLIPBASE SYSTEM

Texas Department of Transportation

Traffic Operations Division

SIGN MOUNTING DETAILS

SMALL ROADSIDE SIGNS

SMD(SLIP-2)-08

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SM RD SGN ASSM TY SB0(1) XX(U-1EXT)

W(mox) = 8FT

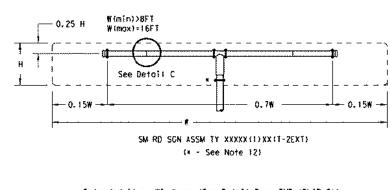
0.6W

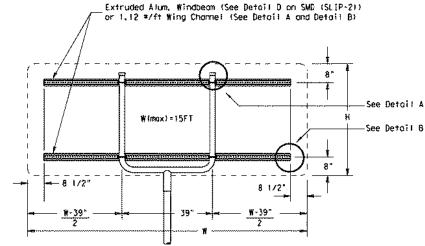
----- 0. 2W

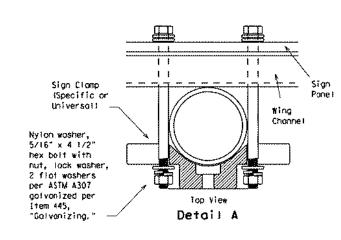
0.25 H

0.2W

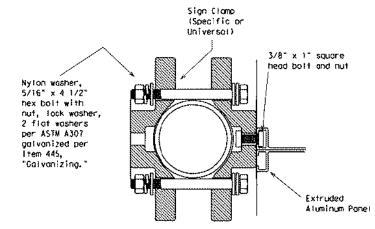
260



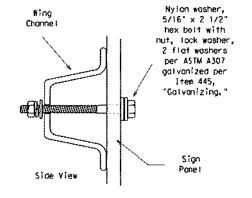




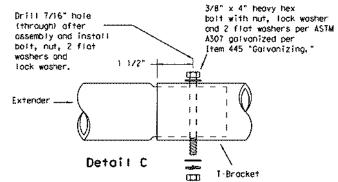
SM RD SCN ASSM TY XXXXX (1) XX (U-XX)



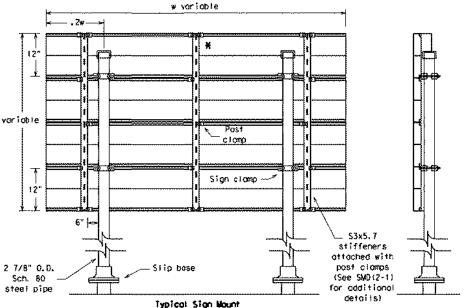
Detoil D EXTRUDED ALUMINUM SIGN WITH T BRACKET



Detail B

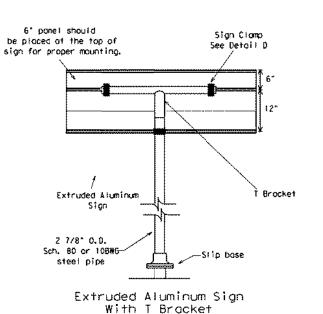


Splices shall only be allowed behind the sign substrate.

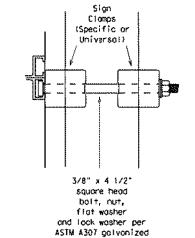


SM RD SCN ASSM TY S80(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



See Detail E for clamp installation

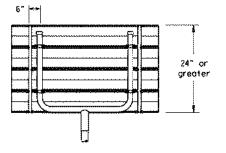


per Item 445,

"Galvanizing.

Detail E

clamp installation



Use Extruded Alum. Windbeam as stiffeners See SMD (2-1) for additional details

See Detail E for clomp installation

GENERAL NOTES:

1.	SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
	10 BWG	ì	16 SF
	IO BWG	2	32 SF
	Sch 80	E .	32 SF
	Sch 80	Ž	64 SF

- The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
- Sign supports shall not be spliced except where shown.
 Sign support posts shall not be spliced.
- 4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
- Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
- For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of areater height.
- greater height.

 7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
- Wing channel shall meet ASTM A 1011 SS Gr 50 and be gatvanized per ASTM A 123.
- 9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair golvanized coating at cut support ends per Item 445, "Galvanizing."
- Sign blonks shall be the sizes and shapes shown on the plans.
- Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
- 12. Post open ends shall be fitted with Friction Cops.

[<u></u>	REQUIRED SUPPOR	T
	SIGN DESCRIPTION	SUPPORT
	48-inch STOP sign (R1-1)	TY 108WC(1)XX(T) TY 108WG(1)XX(P-BM)
č	60-inch (IELD sign (R)-Z)	TY 108WG(1)XX(T) TY 108WG(1)XX(P-BM)
Regulatory	48x16-inch ONE-WAY sign (R6-1)	TY 108WG(1)XX(T) TY 108WG(1)XX(P-BM)
Regu	36x48, 48x36, and 48x48-inch signs	TY 108NG(11XX(T)
	48x60-inch signs	TY \$80(1) XX(T)
	48x48-inch signs (diamond or square)	TY 108WG(1)XX(T)
6	48x60-inch signs	TY \$80(1)XX(T)
₩orning	48-inch Advance School X-ing sign (SI-1)	TY 108WG(1)XX(T)
¥	48-inch School X-ing sign (S2-1)	TY 108WG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

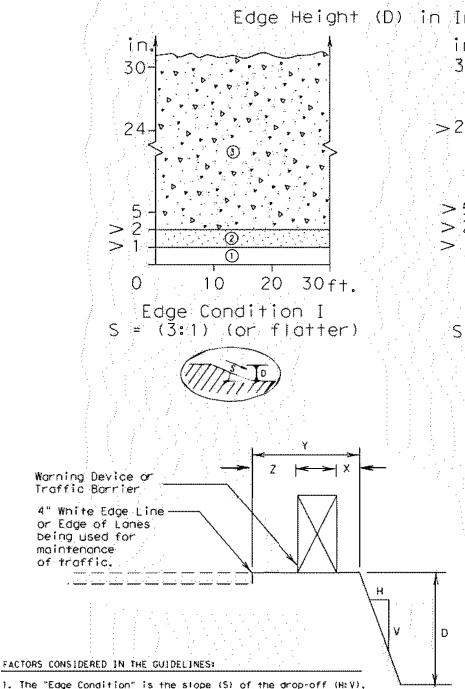
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

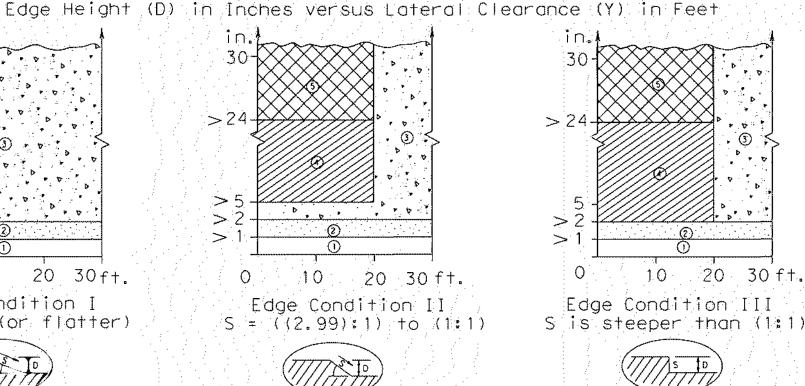
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		D157	Γ	COUNTY			SHEET NO.
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DATE:



- 1. The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height is the depth of the drop-off "D".
- Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of dropoff. Distance "Z" does not have a minimum.
- 3. In addition to the factors considered in the guidelines, each construction zone drop-off situation should be analyzed individually, taking into account other variables, such as: traffic mix, posted speed in the construction zone, horizontal curvature, and the practicality of the treatment options.
- 4. The conditions for indicating the use of positive or protective barriers are given by Zone-5 and Figure-1. Traffic barriers are primarily applicable for high speed conditions. Urban areas with speeds of 30 mph or less may have a lesser need for signing, delineation, and barriers. Right-angled edges, however, with "D" greater than 2 inches and located within a lateral offset of 6 feet, may indicate a higher level of treatment.
- 5. If the distance "Y" must be less than 3 feet, the use of a positive barrier may not be feasible. In such a case, consider either: 1) narrowing the lanes to a desired 11 to 12 feet or 10 foot minimum (see CW20-8 sign), or 2) provide on edge slope such as Edge Condition I.

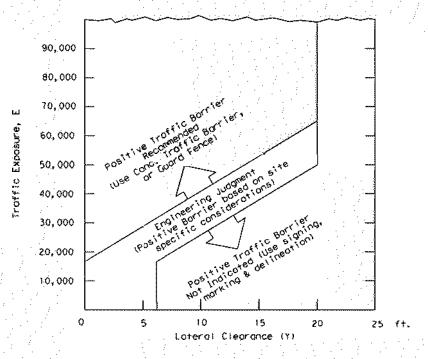


Treatment Types Guidelines: No treatment. ① CW 8-11 "Uneven Lones" signs. CW 8-9a "Shoulder Drop-Off" or CW 8-11 signs plus CW 8-9g or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge fill may be provided to change the edge slope to that of the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

Edge Condition Notes:

- J. Edge Condition It Wost vehicles are able to traverse an edge conditionwith a slape rate of (3 to 1) or flatter. The slape must be constructed with a compacted moter of capable of supporting vehicles.
- 2. Edge Condition II: Wost vehicles are able to traverse on edge condition with a slope between (2.99 to 1) and (1 to 1) so long as "D" does not exceed 5 inches. Under-carriage drog on most automobiles will occur when "D" exceeds 6 inches. As "D" exceeds 24 inches, the possibility for rollover is greater in most vehicles.
- 3. Edge Condition III: When stopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles. if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control of different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularily those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.
- 4. Milling or overlay operations that result in Edge Condition III should not be in place without appropriate warning treatments, and these conditions should not be left in place for extended periods of time.

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



- FF E = ADT x T Where ADT is that portion of the average daily traffic volume traveling within 20 feet (generally two adjacent lames) of the edge dropoff condition; and, I is the duration time in years of the dropoff condition.
- 2 Figure-1 provides a practical approach to the use of positive barriers for the protection of vehicles from pavement drop-offs. Other factors, such as the presence of heavy machinery, construction workers, or the mix and valume of traffic may make the use of positive barriers appropriate, even when the edge condition alone may not justify the use of a barrier.
- An approved end treatment should be provided for any positive barrier end located within a lateral offset of 20 feet from the edge of the travel lane.

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

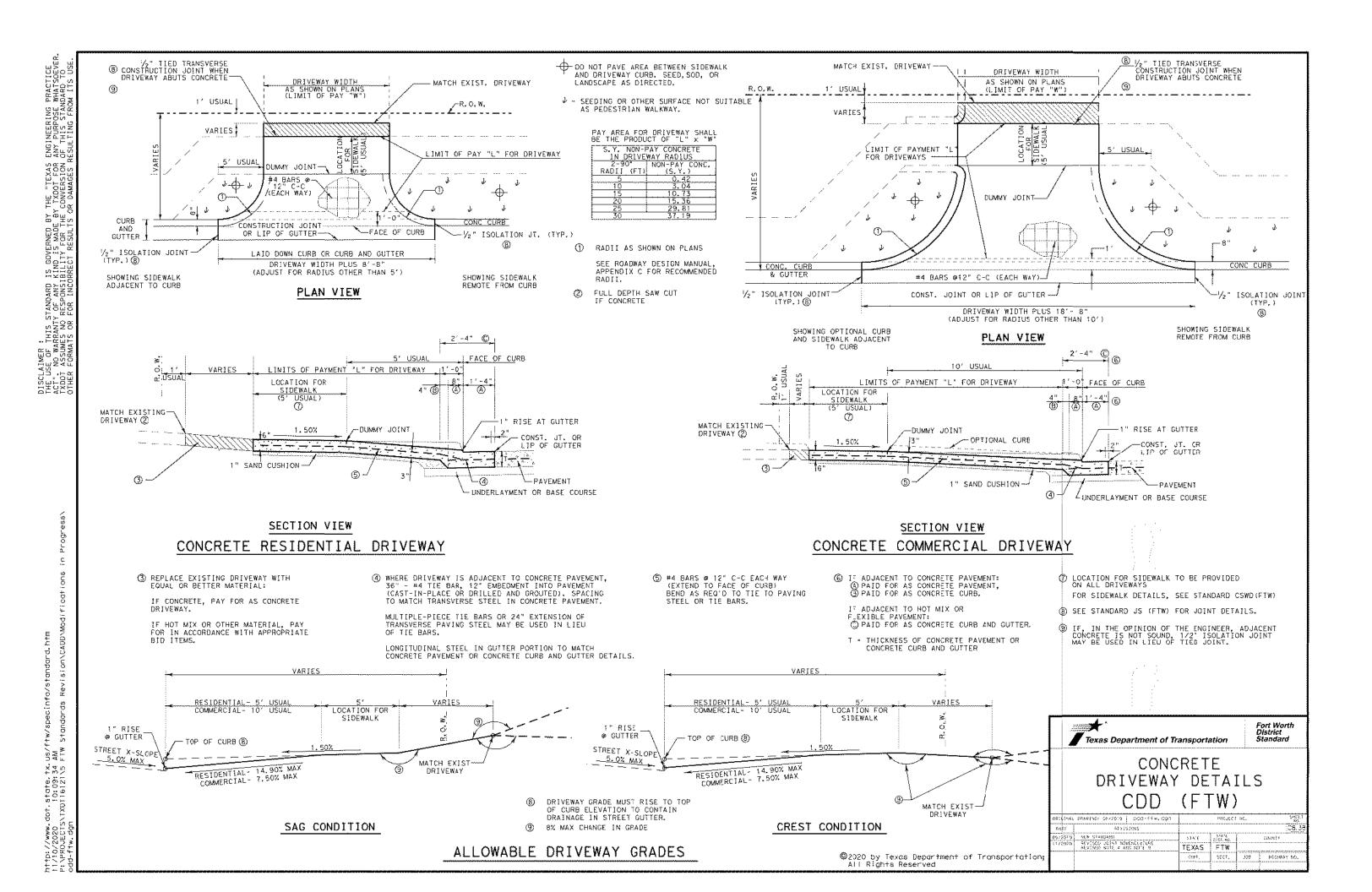


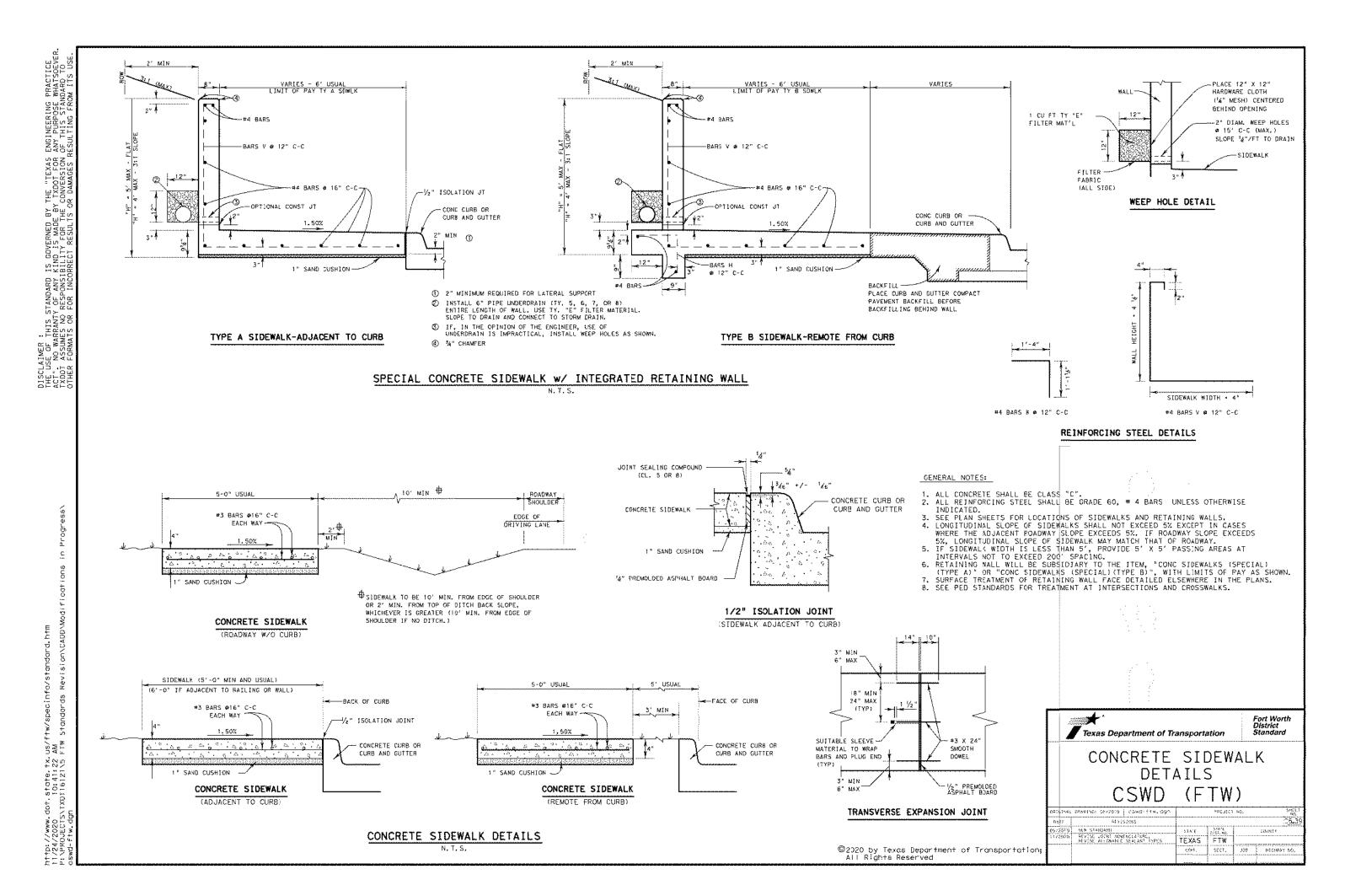
Engineer's Seal

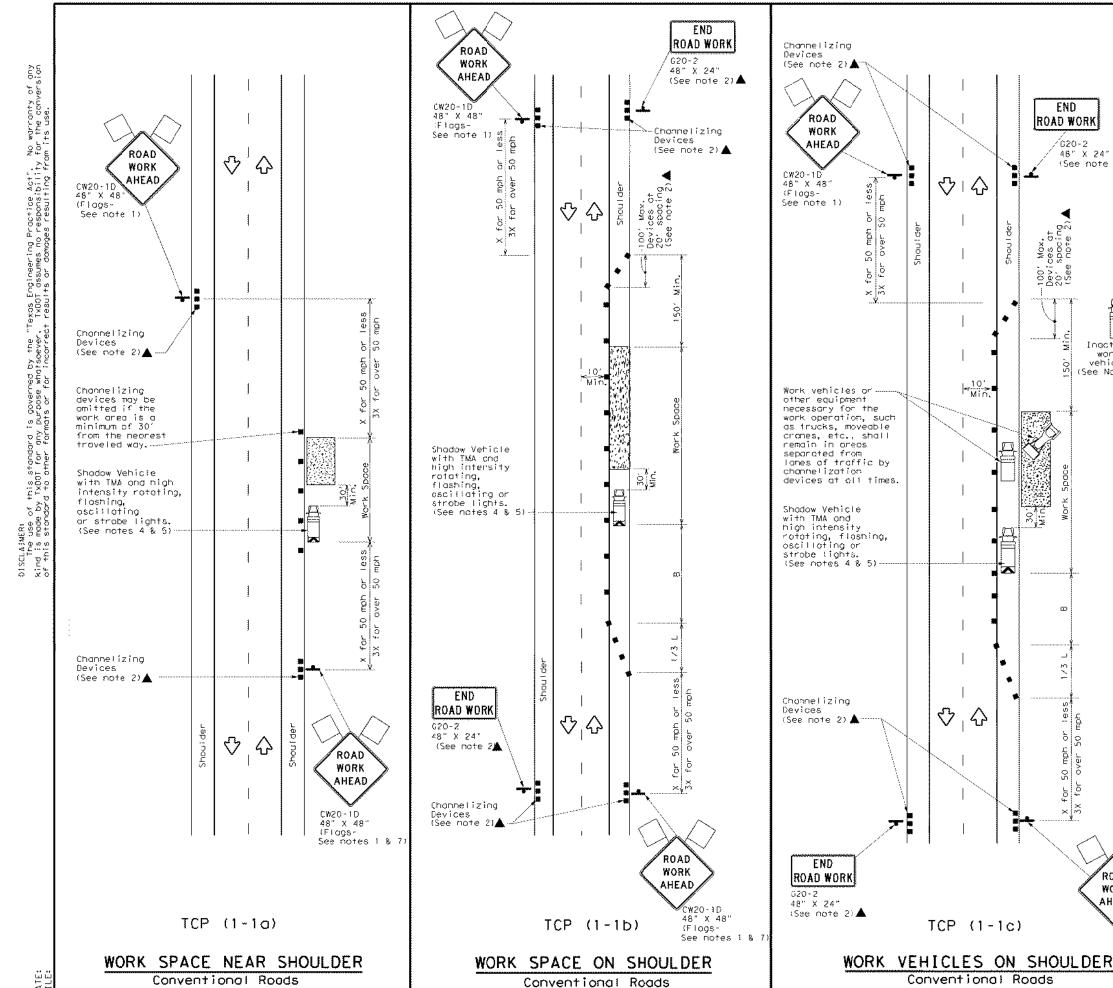


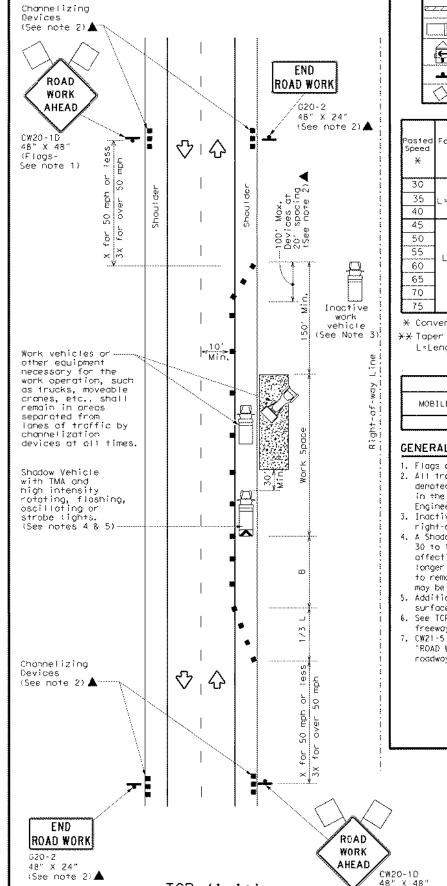
TREATMENT FOR VARIOUS EDGE CONDITIONS

(C) 1x001 August 2000 COXTEND FOOYEARD FRONTEND FOOXFERD or | Griwan 08-01 cornect typos









	LEGEND							
	Type 3 Barr:cade	62 (2)	Channelizing Devices					
	Becvy Work Vehicle		Truck Mounted Attenuator (TMA)					
Ê	Troller Mounted Floshing Arrow Board	M	Partable Changeable Message Sign (PCMS)					
-	Sign	<>>	Traffic Flow					
$\langle \lambda \rangle$	Fłog	П	Fłagger					

Posted Speed	Formulo	Cesiroble		Spaci Chasne	ed Maximum ing of elizing vices	‰inimum Sign Spacing ∽x″	Suggested Longitudinal Buffer Space
*		lQ' 11' OffsetOffse	12′ 10ffset	On g Toper	On a Tangent	Distance	"B"
30	<u>ws²</u>	1501 1651	180′	30′	: 60'	1201	90'
35	i. = WS 60	2051 2251	2451	351	. 70′	1601	1201
40	00	265' 295'	3201	40'	: 80'	2401	155′;
45		450′ 495	5401	451	90'	3201	1951
50		500: 550	6001	501	1001	4001	240'
55	L=WS	550' 605	6601	55′	1101	5001	2951
60] [-#3	600, 690.	7201	601	: 120'	6001	350'
65		650' 715	7801	65′	1301	7001	410'
70		7001 770	840	70′	140'	800'	475′
75		750′ 825	9007	75′	1501	900,	540′

* Conventional Roads Only

**X Taper lengths have been rounded off.

LaLength of Taper (FT) Wawlidth of Offset (FT) SaPosted Speed (MPH)

TYPICAL USAGE							
MOBILE	SHOR1 DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY			
	1	✓					

GENERAL NOTES

- 1. Flags attached to signs where shown are REQUIRED.
- 2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be amitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
- 3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
- 4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and YMA.
- . Additional Shodow Vehicles with IMAs may be positioned off the paved
- surface, next to those shown in order to protect wider work spaces. 6. See TCP15-11for shoulder work on divided highways, expressways and
- 7. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional

Texas Department of Transportation

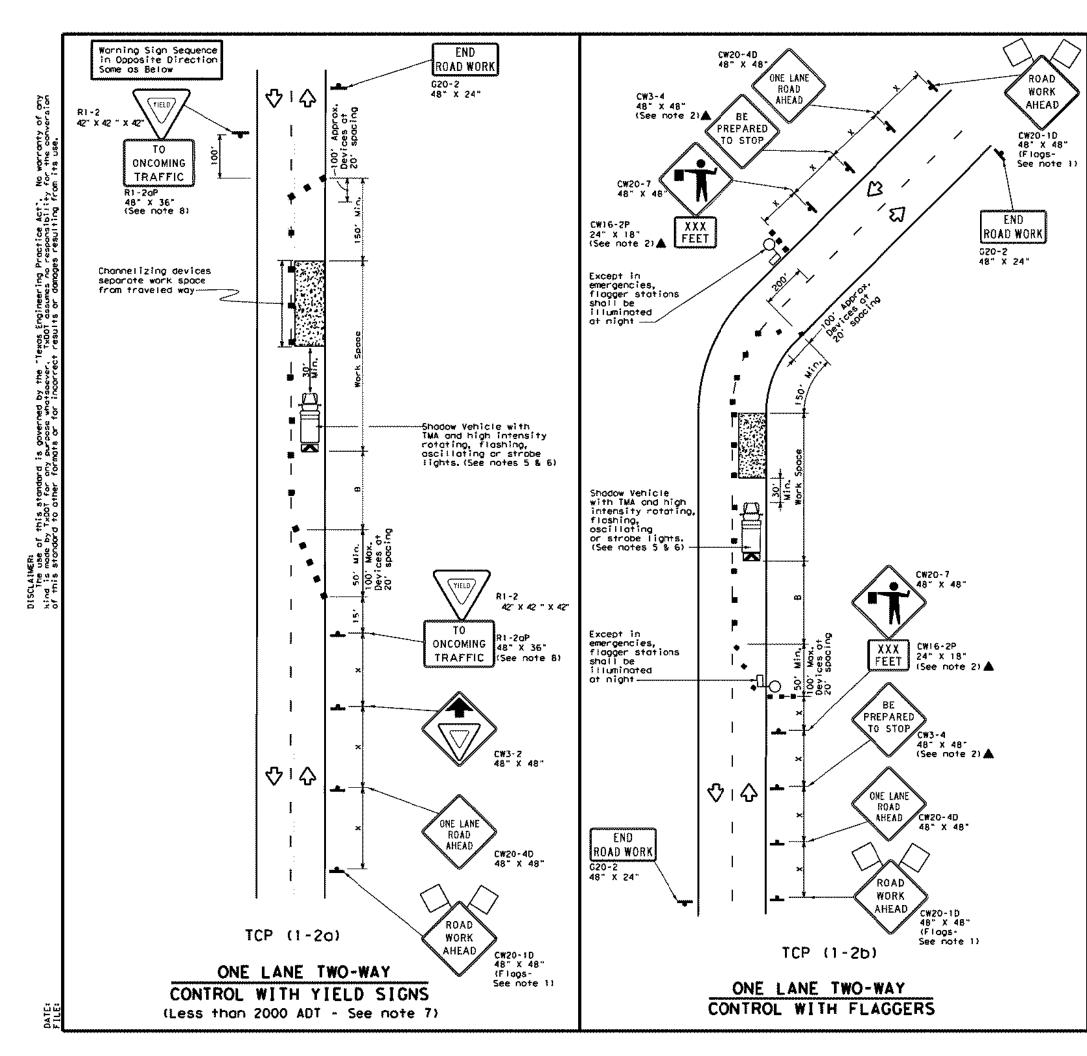
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

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(Flags-See notes 1 & 7)



	LEGEND							
	Type 3 Borricode	* *	Channelizing Devices					
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)					
	Trailer Mounted Flashing Arrow Board	(M)	Portable Changeable Message Sign (PCMS)					
-4-	Sign	♦	Traffic Flow					
\Diamond	Flag	ПO	Flagger					

Speed	Formula	Winimum Desiroble Toper Lengths **		Spacii Channe		Minimum Sign Specing "X"	Suggested Longitudinal Buffer Space	Stopping Signt Distance	
*		10' Offset	11' Offset	12' Offset	On a Toper	On o Tongent	Distance	-B-	
30	ws²	1501	1651	1801	30,	601	120'	90,	2001
35	L* WS	2051	225'	2451	35′	701	160'	120'	2501
40	6	2651	2951	350,	40′	80,	240'	1551	3051
45		450'	4951	5401	45′	901	3201	1951	360'
50		5001	5501	6001	501	1001	400'	2401	425'
55	L=WS	550'	6051	660'	55′	110'	500'	2951	495'
60	L . # 3	6001	660'	720	60′	1201	600'	350′	570'
65		6501	7151	7801	65'	1301	700'	410'	6451
70		7001	770'	840"	701	140'	8001	475′	7301
75		7501	825'	9001	751	1501	900'	540°	8201

* Conventional Roads Only

** Toper lengths have been rounded off, L*Length of Taper(FT) Wewlidth of Offset(FT) S=Posted Speed(MPH)

	TYPICAL USAGE						
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY			
		/	i				

GENERAL NOTES

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

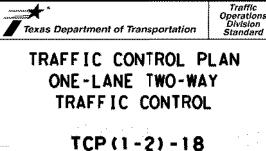
 3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
- 4. Sign spacing may be increased or an additional CW20-19 "ROAD WORK AHEAD" sign may be used if advance warning chead of the flagger or R1-2 "YIEED" sign is less than 1500 feet.
 5. A Shadow Vehicle with a TMA should be used crytime it can be positioned 30 to 100 feet.
- in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers one no longer present but road or work conditions require the traffic control to remain in place, Type 3 Borricodes or other channelizing devices may be substituted for the Shadow Vehicle and YMA.
- Additional Shodow Vehicles with TMAs may be positioned off the paved surface, next to those shows in order to protect wider work spaces.

TCP (1-20)

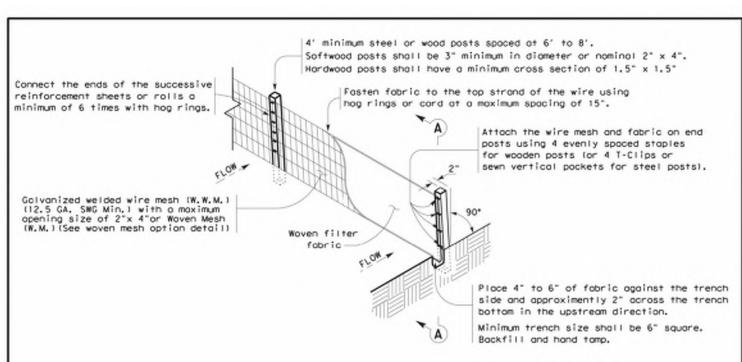
- R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work spaces should be no longer than one half city block. In rura areas on roadways with less than 2000 ADT, work spaces should be no longer than 400 feet.
- 8. R1-2 "YIELD" sign with R1-20P "TO ONCOMING TRAFFIC" plague shall be placed on a support at a 7 foot minimum mounting height.

TCP (1-2b)

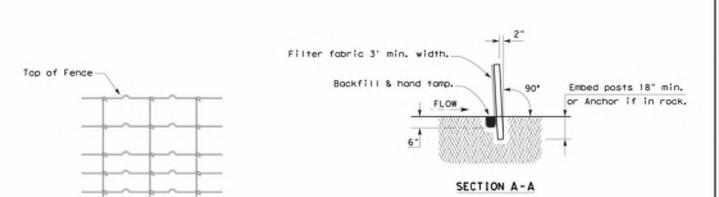
- 9. Flaggers should use two-way radios or other methods of communication to control traffic.
- 0. Length of work space should be based on the oblifty of flaggers to communicate,
- . If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see toble above).
- 2. Channelizing devices on the center-line may be amitted when a pilat car is leading traffic and approved by the Engineer.
- 3. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.



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TEMPORARY SEDIMENT CONTROL FENCE



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.

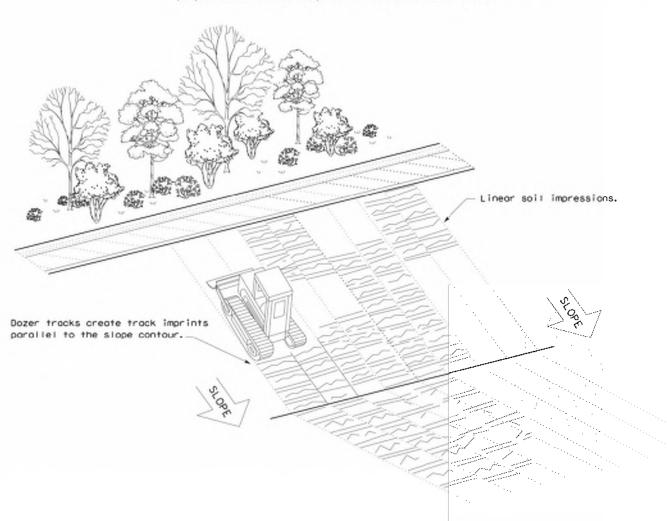
Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT². Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

LEGEND

Sediment Control Fence

GENERAL NOTES

- 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.
- 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.
- Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING



Design Division Standard

TEMPORARY EROSION,
SEDIMENT AND WATER
POLLUTION CONTROL MEASURES
FENCE & VERTICAL TRACKING

EC(1)-16

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